Economic Analysis for the Proposed "Revised Definition of 'Waters of the United States'" Rule

U.S. Environmental Protection Agency

and

Department of the Army

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Abbreviations

ACS	American Community Survey
AFVO	Animal fats and vegetable oils
AJD	Approved jurisdictional determination
APA	Administrative Procedure Act
ASWM	Association of State Wetland Managers
BMP	Best management practice
BPJ	Best professional judgment
C&D	Construction and development
CBG	Census block group
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
Corps	U.S. Army Corps of Engineers
CTs	Census tracts
CWA	Clean Water Act
EA	Economic analysis
ELI	Environmental Law Institute
E.O.	Executive Order
FOSC	Federal on-site coordinator
FR	Federal Register
FRP	Facility Response Plan
HUC	Hydrologic unit code
HUC4	4-digit hydrologic unit code
HUC12	12-digit hydrologic unit code
ICR	Information Collection Request
JD	Jurisdictional determination
LA	Load Allocation
LEDPA	Least environmentally damaging practicable alternative
MEP	Maximum extent practicable
MS4	Municipal Separate Storm Sewer System
MSGP	Multi-sector general permit
NAICS	North American Industry Classification System
NHD	National Hydrography Dataset

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPFC	National Pollution Funds Center
NRC	National Response Center
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
NWPR	Navigable Waters Protection Rule
OMB	Office of Management and Budget
OPA	Oil Pollution Act of 1990
ORM2	Operation and Maintenance Business Information Link, Regulatory Module
OSLTF	Oil Spill Liability Trust Fund
OSRO	Oil spill removal organization
PHMSA	Pipeline and Hazardous Materials Safety Administration
PJD	Preliminary jurisdictional determination
Rapanos	*Rapanos v. United States*, 547 U.S. 715 (2006)
RFA	Regulatory Flexibility Act
RHA	Rivers and Harbors Act
RPA	Resource and Programmatic Assessment
RPWWN	Wetlands adjacent to but not directly abutting relatively permanent waters
SBA	Small Business Administration
SBREFA	Small Business Regulatory Enforcement Fairness Act
SISNOSE	Significant Economic Impact on a Substantial Number of Small Entities
SPCC	Spill Prevention, Control and Countermeasure
SWANCC	*Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers*, 531 U.S. 159 (2001)
SWMP	Stormwater management program
U.S. EPA	U.S. Environmental Protection Agency
TAS	Treatment in a Manner Similar as a State
TBEL	Technology-based effluent limit
TMDL	Total Maximum Daily Load
TNW	Traditional navigable waters
UMRA	Unfunded Mandates Reform Act
USDA	United States Department of Agriculture

USGS	United States Geological Survey
WLA	Wasteload allocation
WOTUS	Waters of the United States
WTP	Willingness to pay
WQBEL	Water quality-based effluent limit
WQS	Water quality standards

Executive Summary

The U.S. Environmental Protection Agency and Department of the Army ("the agencies") are proposing to repeal the Navigable Waters Protection Rule (NWPR) to restore the regulations in place prior to the 2015 Clean Water Rule defining "waters of the United States," with amendments to reflect the agencies' interpretation of the statutory limits on the scope of the "waters of the United States" informed by Supreme Court case law. The term "waters of the United States" establishes the geographic jurisdictional scope of the Clean Water Act (CWA).

This action is a significant regulatory action that was submitted to the Office of Management and Budget for review. Therefore, pursuant to Executive Orders 12866 (Regulatory Planning and Review) and 13563 (Improving Regulation and Regulatory Review), the agencies have prepared this Economic Analysis (EA) to inform the public of potential effects associated with this rulemaking. This analysis is not required by the Clean Water Act and the costs and benefits analysis presented in the EA is not used by the agencies to help determine the extent of their authority under the CWA.

This Economic Analysis (EA) assesses the potential impacts of the proposed changes to the definition of "waters of the United States" based on the potential effects to CWA programs that rely on that definition. While the NWPR remains in the Code of Federal Regulations, two courts have vacated the rule and the agencies are now implementing the definition of "waters of the United States" consistent with the pre-2015 regulatory regime nationwide.[1] As a result, the agencies consider two baselines in this EA: a primary baseline of the pre-2015 regulatory regime,[2] and a secondary baseline of the NWPR (85 FR 22250; June 22, 2020), which was in effect from June 22, 2020 to August 30, 2021. The agencies' primary estimate is that the proposed rule would have zero impact.

Although the definition of "waters of the United States" affects several CWA programs, the quantitative analyses here focus on the CWA 404 dredged and fill permits. These permits are required for activities near many types of water, but the cost analysis focuses on costs to obtain permits, mitigation costs, and administrative costs to states for CWA 401 certifications for CWA 404 permits. The monetized benefits analysis focuses on the value of ecosystem services (e.g., regulating services) provided by wetland areas protected due to mitigation requirements. The agencies expect that costs associated with other programs are not substantial and that there are important categories of benefits that are not monetized, such as

[1] On August 30, 2021 the U.S. District Court for the District of Arizona issued an order vacating and remanding the NWPR in the case of *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency*. The U.S. District Court for the District of New Mexico also remanded and vacated the rule on September 27, 2021 in the case of *Navajo Nation v. U.S. Environmental Protection Agency*. In light of these orders, the agencies have halted implementation of the NWPR and have been interpreting "waters of the United States" consistent with the pre-2015 regulatory regime until further notice. EPA and the Corps have separate regulations defining the statutory term "waters of the United States," but their interpretations were substantially similar and remained largely unchanged between 1977 and 2015. *See* 42 FR 37122, 37124, 37127 (July 19, 1977); 44 FR 32854 (June 7, 1979). For convenience, the agencies in this preamble will generally cite the Corps' longstanding regulations and will refer to them as "the 1986 regulations," "the pre-2015 regulations," or "the regulations in place until 2015" as inclusive of EPA's comparable regulations that were recodified in 1988 and of the exclusion for prior converted cropland both agencies added in 1993.

[2] The pre-2015 regulatory regime refers to the agencies' pre-2015 regulatory definition of "waters of the United States," implemented consistent with relevant caselaw and longstanding practice, as informed by applicable guidance, training, and experience.

stream mitigation and upstream and downstream connectivity of wetlands that could increase benefits. A baseline is a description of the world absent the proposed rule, and the economic analysis thus describes the world with the proposed rule in place relative to that baseline. The remand and vacatur of the NWPR in the *Pascua Yaqui Tribe v. U.S. Environmental Protection Agency* and *Navajo Nation v. U.S. Environmental Protection Agency* decisions provide the primary baseline (*i.e.,* the pre-2015 regulatory regime). The secondary baseline is the NWPR. The secondary baseline is provided for informational purposes only and for the public interest. The NWPR is the definition of "waters of the United States" currently in the Code of Federal Regulations.

Economic Analysis of CWA Jurisdictional Change under the Primary Baseline

The analysis of impacts relative to the primary baseline of the pre-2015 regulatory regime shows no monetized benefits or monetized costs since the proposed rule restores very similar protections and would not change current implementation sufficiently to alter any costs to the regulated public or states and tribes. Thus, this rule is not economically significant relative to the primary baseline. Minor potential differences between the scope of jurisdiction under the proposed rule and the pre-2015 regulatory regime are possible based on how current agency guidance and practice compares to the implementation practices described in the proposal, although the agencies generally seek comment on retaining the pre-2015 guidance approaches.

For the primary baseline, the agencies are proposing to codify in regulation a definition of "waters of the United States" that is very similar to the pre-2015 regulatory regime being implemented nationwide consistent with court vacatur orders.[3] Thus, the national annual quantified benefits of the CWA programs are estimated to be $0, and the national quantified annual costs from the CWA programs are estimated to be $0, as shown in Table ES-1. Per Executive Order (E.O.) 13563, the agencies have determined that the benefits of the proposed rule justify its costs, under the primary baseline. The agencies acknowledge that there would likely be some administrative costs associated with regulated entities as well as states, tribes, and localities reviewing the proposed rule language and ensuring their activities going forward are in keeping with it. However, these administrative costs would be de minimis.

Table ES-1: Total national benefits and costs (2020$) relative to primary baseline of the pre-2015 regulatory regime	
Benefits	$0
Costs	$0
Net Benefits	**$0**

Economic Analysis of CWA Jurisdictional Change Under the Secondary Baseline

The agencies also conducted an economic analysis relative to the secondary, or alternate, baseline of the NWPR to provide the public with best available information on the way the change in jurisdiction under the proposed rule would impact various CWA programs, with an emphasis on the CWA section 404 program, because the agencies have rich data from the 404 program, and experience shows the 404

[3] The agencies generally anticipate consistency with current implementation but are soliciting comment on potential options in some cases. The economic analysis will be updated for the final rule as needed.

program to be the program most impacted by changes to the definition of waters of the United States. The economic analysis consists of a national analysis of the benefits and costs of the proposed rule as they pertain to the CWA section 404 program and a series of qualitative assessments of the effects of the proposed rule on other CWA programs. Here the agencies describe for the public the results of analyzing the proposed rule relative to the secondary baseline of the NWPR.

The economic analysis under the secondary baseline has multiple components. First, it provides a national quantitative assessment of the estimated benefits and costs of the proposed rule's potential effects on the CWA section 404 program, which the agencies assessed as the program likely to be most affected by the change in scope of jurisdictional waters, compared to the NWPR. This benefit-cost analysis builds upon other quantitative and qualitative analyses, including a meta-analysis of wetland valuation studies and an analysis of regulatory practices of individual states relating to "waters of the state." The meta-analysis is an on-going assessment of household WTP for wetlands and the agency intends to continue to work to refine the methods and resulting estimates. The inclusion of two Canadian studies in the meta-analysis will be a part of the agency's work to refine the estimates. As such, this inclusion may be appropriate only for valuation of wetlands for the purpose of this rule. Second, it contains qualitative assessments of certain programs that depend upon the definition of "waters of the United States" including the section 311 and section 402 programs. A sector impact analysis delves into *which economic sectors* would be subject indirectly to the impacts of the proposed rule; though indirect, those impacts are included in aggregate in this analysis. For the final rule, the agencies also are considering inclusion of illustrative case studies that will provide more detailed assessments of the rule impacts in large river basins defined at the 4-digit hydrologic unit code (HUC 4) spatial scale, building on the approach that was used to explore the impacts of the NWPR in that rule's EA (U.S. EPA and Department of the Army, 2020b). The use of HUC 4 boundaries would allow a focus on smaller geographic scales with better than average data availability. When possible, this would also allow for the use of additional location-specific data sources. This case study approach avoids invoking assumptions regarding unwarranted generalizability of results based on specific, narrow studies and maintains the transparency and rigor of feasible approaches. The EA also includes an environmental justice analysis that assesses how the benefits associated with this proposed rule are distributed across vulnerable communities relative to society at large. The EA presents proposed methods for the case studies, as well as proposed approaches for expanding on several of the analyses, such as the sector impact analysis and the environmental justice analysis. The agencies seek comment on these proposed approaches to inform plans for including these improvements in the final rule EA.

The agencies note that the economic analysis of the secondary baseline is subject to various layers of uncertainty regarding the potential implications of the change in CWA jurisdiction as well as data limitations. Notably, the main challenge is quantifying the amount, type, and location of water resources that are affected by changing definition of "waters of the United States." For this proposal analysis, the agencies were able to rely on approximately one year of NWPR CWA section 404 implementation data to help predict the change between the secondary baseline of the NWPR and the proposed rule (*see* Section III.C.2.1 for detail). There are uncertainties associated with both the estimation of benefit and cost estimates. The benefit estimates, in particular, do not reflect the full scope of benefits of the proposed rule, as they omit known sources of benefits that are inherently difficult to quantify. Many of the benefits provided by these water features can be episodic and highly dispersed making them inherently difficult to accurately quantify their aggregate effect over time and across landscapes. Examples of these benefit

categories include the ability to sequester carbon, reduce soil erosion and retain flood waters. For a discussion of the unquantified benefits see section III.C.6 on analytical uncertainties.

The qualitative assessments for the CWA sections 311 and 402 programs provide a national assessment of the potential effects of this proposed rule in cases where the agencies currently lack the datasets to quantitatively assess the effects. The qualitative analyses are intended to provide information on the potential direction of the effects.

National Analysis of Potential Effects and Benefits and Costs of the Proposed Rule on CWA Section 404

The proposed rule could affect requirements to obtain CWA section 404 permits for certain activities in waters where jurisdictional status would change in comparison to the NWPR. Where applicable, it may also affect requirements for permittees to mitigate unavoidable impacts from those activities. In comparison to the NWPR secondary baseline, there are likely to be more jurisdictional waters under the proposed rule. The need to demonstrate that impacts have been minimized to the maximum extent practicable may increase, as may the need for and amount of mitigation to offset impacts of activities.

It is possible to estimate, quantify, and value some but not all of the potential effects of the proposed rule. Accordingly, for the secondary baseline, the agencies focused on potential CWA section 404 program impacts of the proposed rule for which data are sufficient to develop quantitative estimates. Inputs for this analysis include the CWA section 404 permit data from the Corps' Operation and Maintenance Business Information Link, Regulatory Module (ORM2) database, which the agencies used to predict the number of permits potentially affected by the proposed rule, as well as Corps ORM2 data on jurisdictional determinations (JD), which the agencies used to identify affected resources that may change status under the proposed rule, as compared to the NWPR. To estimate potential costs, the agencies used a similar methodology as used in the analysis of the NWPR (U.S. EPA and Department of the Army, 2020b). In the main analysis, states (23 in total) that currently regulate waters more broadly than required under the proposed rule are excluded. The agencies determined that this assumption, based on the agencies' assumptions about how states responded to the NWPR, would best represent national impacts. As shown in Table ES-2, total estimated national annualized social costs (including permitting and mitigation costs and state costs from increases in section 401 reviews) ranged from $109 million to $276 million at a 3 percent discount rate. Using a 7% discount rate, total estimated national annualized costs range from $113 million to $287 million. Appendix D presents raw state-level results that do not account for state regulations, to provide the public with estimates for every state should public comment cause the agencies to revise whether certain states should be considered part of the secondary baseline of the NWPR.

Table ES-2: Total national annualized social costs (millions 2020$), relative to secondary baseline of NWPR

Cost Type	Low[1]	High[1]
Mitigation Costs	$85.3	$190.9
Permit Costs	$23.0	$74.8
State Costs from Increases in Section 401 Reviews	$0.3	$10.2
Total[2]	**$108.6 + A**	**$275.9 + A**

[1] Discounted at a 3 percent rate over the 2023-2042 analysis period. Reflects expected costs in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

Table ES-2: Total national annualized social costs (millions 2020$), relative to secondary baseline of NWPR

[2] The "A" represents unquantified costs such as those for avoidance and minimization efforts required under CWA 404 permits and those costs that may occur under the CWA 311 401 and 402 programs.

To estimate benefits, the agencies relied upon a wetland valuation meta-analysis function. The meta-analysis uses the results of multiple wetland valuation studies to derive an underlying valuation function that can be adjusted and applied nationally (*see* Appendix C for detail). As shown in Table ES-3, the estimated annualized national benefits under the secondary baseline of the NWPR, using a 3 percent discount rate, range between $376 million and $590 million. Using a 7% discount rate, total estimated national annualized benefits range from $379 million to $592 million.

Table ES-3: Total national annualized benefits (millions 2020$), relative to secondary baseline of NWPR

Number of Affected Households in 2019[1,2]	Average Annual Increase in Mitigation Acres[1]	Household WTP (2020$)[1,3]		Annualized Estimate of Benefits[1,4,5] (Millions 2020$)	
		Low	High	Low	High
47,185,707	902.98	$7.10	$11.18	$375.84 + B	$590.09 + B

[1] Values based on the estimated increase in mitigation acres in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Number of households based on 2019 American Community Survey data. The agencies accounted for population growth and change in the number of households throughout the 2023-2042 study period (Woods & Poole Economics Inc., 2021).

[3] Low and high benefit estimates are based on different regional assignments for the states of Alaska and Texas in the meta-regression model (see Appendix C for detail).

[4] Discounted at a 3 percent rate over the 2023-2042 analysis period.

[5] The "B" represents unquantified benefits such as those for wetlands and streams protected through avoidance and minimization efforts required under CWA 404 permits, carbon sequestration benefits, and those benefits that may occur under the CWA 311, 401 and 402 programs.

The mean values of the national annual benefits with respect to the secondary baseline from the CWA section 404 program are estimated to range from approximately $376 million to $590 million. The mean values of the national annual costs of the CWA section 404 program are estimated to range from approximately $109 million to $276 million. These monetized benefit estimates do not fully account for all benefits, such as the water quality benefits associated with stream mitigation and benefits associated with upstream and downstream connectivity of wetlands that may expand beyond the boundary of the states.[4] Many of the benefits provided by these water features can be episodic and highly dispersed making them inherently difficult to accurately quantify their aggregate effect over time and across landscapes. For a discussion of the unquantified benefits see section III.C.6 on analytical uncertainties. Relative to the secondary baseline of the NWPR, the low estimates for benefits and costs result in net benefits of $267 million. Similarly, the high estimates for benefits and costs result in net benefits of

[4] Benefits are measured via willingness-to-pay for residents within given states; thus, resources evaluated are limited to resources within state boundaries of residents.

$314million. Different factors lead to the ranges for costs and benefits, such that low/high benefits are not necessarily correlated with low/high costs. Net benefits could thus range from $100 million to $482 million. The unquantified costs (A) and unquantified benefits (B) would also contribute B-A to any estimate of net benefits, though this unquantified estimate is not expected to negate the positive net benefits. Thus, under E.O. 13563, the agencies would interpret the benefits of the proposed rule as justifying its costs, as compared to the secondary baseline of the NWPR.

State and Tribal Secondary Baseline Protections

The agencies examined the extent to which waters were protected by state and tribal laws and regulations while the NWPR was in effect. The agencies assessed state programs under the NWPR jurisdictional change with respect to aquatic resource protections and water quality protections for "waters of the State." If a state has protections in place that are more protective than CWA jurisdiction under the pre-2015 regulatory regime, the agencies did not count waters within that state towards the benefits and costs associated with the EA for the secondary baseline. The agencies seek comment on this approach as well as on the overall findings regarding the comparative protective status of state programs. The assessments of current state programs can be found in the Supplementary Material to this EA. [5]

Potential Effects of the Proposed Rule Relative to Secondary Baseline on Other Major CWA Programs

The definition of "waters of the United States" has a substantial effect on the implementation of other CWA programs, including the section 303(c) water quality standards program, the section 311 oil spill prevention program, the section 401 water quality certification program, and the section 402 NPDES permit program. A revised definition of "waters of the United States" would affect these CWA programs at both the federal and state level. Potential effects may vary based on a state's authority under their own state law to address aquatic resources and their capacity to address these aquatic resources through non-regulatory efforts.

CWA Section 402

Facilities that currently have a NPDES permit under CWA section 402 or under an authorized state program can be assumed to either discharge to a "water of the United States" or to waters that convey pollutants downstream to a jurisdictional water. Thus, the proposed rule would not result in any additional NPDES permits relative to the secondary baseline of the NWPR. Notwithstanding, reinstating protections on certain receiving waters may move the compliance point for a given discharger and result in incremental costs to meet any more stringent limits *if* the discharger sought relaxed limits after the NWPR was promulgated. Higher costs would be more likely if the state did not regulate these immediate receiving waters under state law.

CWA Section 311

[5] U.S. EPA and Department of the Army, 2021. Compendium of State and Tribal regulatory practice, Docket Number EPA-HQ-OW-2021-0602.This document is also referred to as the Updated State Snapshots.

Section 311 of the CWA, Oil Spill Prevention, Preparedness, Reporting and Response, includes two main components that address the risk and harm from oil spills: (1) spill prevention requirements contained in the EPA's Spill Prevention, Control, and Countermeasure (SPCC) and worst case discharge preparedness requirements in EPA's Facility Response Plan (FRP) regulations for non-transportation related facilities and in the United States Coast Guard and Department of Transportation regulations for transportation-related facilities, and (2) spill notification and response, as described under the National Contingency Plan.

Applicability of the SPCC and FRP depends on whether there is a reasonable expectation that a discharge from the facility could reach navigable waters based on geographical and locational aspects of the facility, and therefore changes in CWA jurisdiction could affect the need for compliance with both SPCC and FRP requirements for some facilities. The agencies estimate that approximately 550,000 facilities are currently subject to SPCC requirements and about 3,800 facilities are subject to FRP requirements.

The agencies do not believe the NWPR caused a change to the compliance costs or spill risk for facilities subject to SPCC and FRP or changed the number of pipeline or rail operators that prepared and maintained facility response plans. The agencies believe that most facilities still chose to continue to implement spill prevention measures that are considered good engineering practices for their industry, such as secondary containment, overfill prevention, practices to ensure the safe transfer of oil to bulk storage containers and visual inspections of bulk storage containers, even if they were not subject to 40 CFR part 112. The agencies also did not find evidence that changes in the scope of "waters of the United States" under the NWPR had a material effect on spill notification and response. Accordingly, the agencies anticipate that impacts of the proposed rule on the CWA section 311 program would be small.

CWA Section 303

The potential effect of the definitional change on the number of waterbodies added to the impaired waters list (and subsequent total maximum daily load (TMDL) development) is uncertain. Absent the application of the CWA to waters that would return to being jurisdictional under the proposed rule, states and tribes can still choose to impose similar state or tribal law requirements on these waters irrespective of federal mandates. Some states have developed standards for certain categories of water (*e.g.*, ephemeral features) that would be jurisdictional under the proposed rule but not jurisdictional under the secondary baseline of the NWPR. Moreover, the development and revision of statewide or tribal water quality standards is typically an ongoing process, so changes that the NWPR could have precipitated might not have been appeared during the year that it was in effect.

Changes in CWA jurisdiction could lead to requests for changes in TMDL waste load allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources. It is unknown what share of the currently more than 73,000 completed TMDLs nationwide covered waters were affected by the NWPR under the secondary baseline and would return to being jurisdictional under the proposed rule.

CWA Section 401

Under the proposed rule, the number of CWA section 404 permits would be expected to increase since certain wetlands and ephemeral streams would no longer be categorically excluded from the definition of "waters of the United States." An increase in CWA section 404 permits could result in costs to states and

authorized tribes by increasing the number of section 401 reviews and required staff time. Simultaneously, it could increase environmental and social benefits related to section 401 reviews.

The vast majority of states have been authorized to administer all or parts of the CWA section 402 program. States that have not been authorized for the section 402 program and tribes authorized to administer section 401 would continue to have the opportunity to complete section 401 certification on EPA-issued 402 permits. If there are a larger number of EPA-issued section 402 permits, then there would be an increase in the number of section 401 reviews, associated staff time and associated environmental and social benefits.

I. Introduction and Overview

The U.S. Environmental Protection Agency and Department of the Army ("the agencies") are proposing to restore the regulations in place prior to the 2015 Clean Water Rule defining "waters of the United States," with amendments to reflect the agencies' interpretation of the statutory limits on the scope of the "waters of the United States" informed by Supreme Court case law. "Waters of the United States" is a foundational term establishing the geographic jurisdictional scope of the Clean Water Act (CWA).

On January 20, 2021, the Biden Administration issued Executive Order 13990 entitled "Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crisis." Executive Order 13990 directs federal agencies to review all existing regulations, orders, guidance documents, policies, and any other similar agency actions promulgated, issued, or adopted between January 20, 2017, and January 20, 2021, including the Navigable Waters Protection Rule (NWPR). Executive Order 13990 also specifically revoked Executive Order 13778 of February 28, 2017 ("Restoring the Rule of Law, Federalism, and Economic Growth by Reviewing the "Waters of the United States" Rule"), which had resulted in promulgation of the NWPR. Beginning on June 9, 2021, the agencies filed declarations from Assistant Administrator Radhika Fox and Acting Assistant Secretary of the Army Jaime A. Pinkham in multiple district court challenges to the NWPR, stating that the agencies had completed their review of the NWPR and determined the rule must be replaced. [6]

On August 30, 2021, the U.S. District Court for the District of Arizona issued an order vacating and remanding the NWPR. *Pascua Yaqui Tribe v. EPA*, No. 4:20-cv-00266, 2021 WL 3855977 (D. Ariz. Aug. 30, 2021). On September 2, 2021, the Department of the Army directed the U.S. Army Corps of Engineers (Corps) to resume conducting approved jurisdictional determinations nationwide consistent with the pre-2015 "waters of the United States" regulatory regime. The pre-2015 regulatory regime refers to the agencies' pre-2015 regulatory definition of "waters of the United States" at 33 CFR 328.3, implemented consistent with relevant caselaw and longstanding practice, as informed by applicable guidance, training, and experience. On September 27, 2021, the U.S. District Court for the District of New Mexico also remanded the NWPR to EPA and the Army and vacated the rule. *Navajo Nation v. EPA*, No. 2:20-cv-00602 (D.N.M. Sept. 27, 2021).

The agencies are proposing to restore the longstanding, familiar 1986 regulations, with amendments to reflect the agencies' interpretation of the statutory limits on the scope of the "waters of the United States" informed by Supreme Court case law. As a result of the *Pascua Yaqui* and *Navajo Nation* vacaturs, this proposed rule would represent the codification of essentially the legal status quo.

This Economic Analysis (EA) assesses the potential impacts of the changes to the definition of "waters of the United States" based on the potential effects on the CWA programs that rely on the definition of "waters of the United States." Two baselines are presented: a primary baseline of the pre-2015 regulatory regime and a secondary baseline of the NWPR. For purposes of meeting the statutory and executive order requirements for a significant rulemaking, the primary baseline of the pre-2015 regulatory regime is used.

[6] Declarations of Radhika Fox and Jaime A. Pinkham, filed in *Conservation Law Found. et al. v, EPA et al*., 20-cv-10820-DPW (D. Mass. Jun. 9, 2021) as well as in every other district court challenge to the NWPR.

This analysis is consistent with the fact that the agencies are implementing the pre-2015 regulatory regime since the *Pascua Yaqui* and *Navajo Nation* vacaturs. An economic analysis using the secondary baseline of the NWPR is also provided for two reasons: (1) it provides the public with best available information about the forecast of impacts of the proposed rule compared to the NWPR, and (2) it provides for a complete economic analysis should court actions result in the NWPR becoming the primary baseline prior to the final rule. This method of using two baselines is consistent with the EPA's *Guidelines for Preparing Economic Analyses* and the Office of Management and Budget (OMB) Circular A-4 regarding developing multiple baselines.

I.A Overview of Economic Analysis

This EA is organized as follows. Chapter One provides an overview of this document, with the EA conducted relative to two baselines. Chapter Two describes the potential state, tribal, and regulated entity responses to the NWPR to better establish the secondary baseline. Chapter Three contains the analysis of the potential impacts of this proposed rule on CWA programs and a national-scale evaluation of the CWA section 404 program, relative to the secondary baseline. Chapter Four provides an Environmental Justice Analysis relative to the secondary baseline. Chapter Five presents a Tribal Impacts Analysis relative to the secondary baseline, and Chapter Six presents a Sector Impact Analysis relative to the secondary baseline.

Chapter One is organized as follows. The remainder of this section provides a high-level overview of the methodology used in Chapter Three, as it differs from the approach used in the economic analysis for the NWPR. The next section of this chapter includes the complete results of the economic analysis relative to the primary baseline. The final section of this chapter includes a summary of changes in CWA jurisdiction between the NWPR and the proposed rule, both for reasons noted above regarding multiple baselines and because it is important to understand how the proposed rule differs from the previous rule codified in the CFR (*i.e.*, the NWPR).

For the secondary baseline analysis, the agencies considered a geospatial analysis of the regulatory option by identifying specific waterbodies that would potentially not be jurisdictional under the NWPR but would be jurisdictional under the proposed rule. However, the agencies determined that they could not easily approximate the categories of waters that the NWPR does and does not regulate using the most comprehensive and nationally consistent geospatial surface hydrology and wetland data available, the National Hydrography Dataset (NHD)[7] and the National Wetlands Inventory (NWI).[8] For example, certain waters are not categorically jurisdictional under the NWPR as implemented (*e.g.*, non-relatively permanent waters such as all ephemeral streams and some intermittent streams), and the jurisdictional status of such waters must be determined using a case-specific significant nexus analysis under the proposed rule. Thus, the agencies did not use the NHD or NWI to assess potential changes in jurisdiction as a result of replacing the NWPR with the proposed rule. Rather, the agencies used CWA section 404 jurisdictional determination data to estimate the change in waters requiring permit protection under the two regulatory regimes. Approved jurisdictional determinations (AJDs) that were based on either the

[7] United States Geological Survey (USGS), https://www.usgs.gov/core-science-systems/ngp/national-hydrography/national-hydrography-dataset?qt-science_support_page_related_con=0#qt-science_support_page_related_con, accessed November 16, 2021.

[8] United States Fish and Wildlife Service (U.S. FWS), https://www.fws.gov/wetlands/, accessed November 16, 2021.

Rapanos Guidance or NWPR were used to estimate the probability of different types of water features being a WOTUS under either regulatory regime. By contrast, preliminary jurisdictional determinations (PJDs) were not used to estimate probabilities because under a PJD, the site owner voluntarily waives or sets aside questions regarding Clean Water Act jurisdiction over a particular site and thus moves forward without a formal determination assuming all waters will be treated as jurisdictional. The difference in the probability of being a WOTUS under these two regulatory regimes was used to estimate the likely extent of change in jurisdiction for different types of water features. This approach allowed the agencies to perform a national analysis of the potential change in benefits and costs to society of moving from the secondary baseline of the NWPR to the proposed rule.

This national analysis is limited to the CWA section 404 program for two reasons. First, the agencies do not have sufficient national data to perform a similar analysis for the waters affected by the CWA sections 402, 311, and other programs. Secondly, the agencies continue to believe that likely jurisdictional changes under the NWPR did not have a substantial effect on the universe of activities covered by these other CWA programs.

There are several supporting documents to this EA, including an updated snapshot of the applicable regulatory and legal framework currently in place in states and on tribal lands to provide context for how aquatic resources are regulated (*see* Supplementary Material), proposed protocols for assessing change in jurisdictional scope via regulatory categories (Appendix A), a detailed appendix of how change in jurisdictional scope was quantified (Appendix B), a wetland meta-analysis (Appendix C), the state-level results of the overall analysis (Appendix D), a sensitivity analysis of national benefits from changes in wetland mitigation requirements (Appendix E), mapped NHD stream mileage and NWI wetland acreage by state (Appendix F), and a sector impact analysis which tracks economic sectors that tend to directly or indirectly be involved in CWA section 404 permitting (Appendix G). Additional appendices are provided to detail protocols used in analyses or to summarize findings via supplementary figures and tables.

I.B Economic Analysis of the Proposed Rule using the Primary Baseline

The primary baseline for the economic analysis is the pre-2015 regulatory regime, which consists of the 1986 "waters of the United States" regulation (33 CFR 328.3), as informed by the 2003 *SWANCC* and 2008 *Rapanos* Guidance documents. The statutory requirements considered during development of the proposed rule include the Regulatory Flexibility Act (RFA) and Small Business Regulatory Enforcement Fairness Act (SBREFA), the Paperwork Reduction Act, the Unfunded Mandate Reform Act, and the National Technology Transfer and Advancement Act. The analysis is also conducted pursuant to Executive Orders 12866 (Regulatory Planning and Review), 12898 (Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations), 13132 (Federalism), 13175 (Consultation and Coordination with Indian Tribal Governments), 13045 (Protection of Children from Environmental Health Risks and Safety Risks), 13211 (Action Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use), and 13563 (Improving Regulation and Regulatory Review). Requirements with specific import for an economic and programmatic analysis are described below; others are addressed in the preamble to the proposed rule.

I.B.1 Unfunded Mandate Reform Act

The Unfunded Mandate Reform Act (UMRA) contains requirements for agencies when regulations include unfunded federal mandates imposed by the federal government on state, local, and tribal

governments. The proposed rule does not contain any unfunded mandate and does not significantly or uniquely affect small governments. The proposed definition of "waters of the United States" applies broadly to Clean Water Act programs. The action imposes no enforceable duty on any state, local, or tribal governments, or the private sector.

I.B.2 Executive Order 12898 Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations

E.O. 12898 requires federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The agencies believe that the proposed rule does not have disproportionately high and adverse human health or environmental effects on minority populations, low-income populations, and/or indigenous peoples. The proposed rule is definitional in nature and is the codification of present legal practice relating to the implementation of definitions of "waters of the United States." The agencies have, however, conducted an environmental justice analysis for the proposed rule relative to the secondary baseline for purposes of supporting a second rulemaking that would be informed by further robust stakeholder engagement as well as experience implementing prior rules related to definitions of "waters of the United States."

I.B.3 Executive Orders 12866 Regulatory Planning and Review and 13563 Improving Regulation and Regulatory Review

The proposed rule is a significant regulatory action that was submitted to OMB for review. However, because the primary baseline is the pre-2015 regulatory regime and the proposed rule essentially represents a codification of that baseline, the world with the proposed rule is very similar to the world without this proposed rule. The analysis of such a proposed rule is straightforward. The agencies acknowledge that there would likely to be some costs associated with regulated entities as well as states, tribes, and localities reviewing the proposed rule language and ensuring their activities going forward are in keeping with it. However, these costs would be de minimis. Any attempts to quantify them would be highly speculative and imprecise. Thus, the proposed rule will have no monetized effect compared to the primary baseline and thus the benefits and the costs of the rule are trivially different from $0. The agencies have determined that, relative to the primary baseline, the benefits of this proposed rule justify the costs.

Table I-1: Total national benefits and costs (millions 2020$) relative to primary baseline of the pre-2015 regulatory regime

Benefits	$0.0
Costs	$0.0
Net Benefits	**$0.0**

I.B.4 Regulatory Flexibility Act and Small Business Regulatory Enforcement Fairness Act

The Regulatory Flexibility Act (RFA, 5 U.S.C. et seq., Public Law 96-354), as amended by the 1996 Small Business Regulatory Enforcement Fairness Act (SBREFA Public Law 104-121), requires federal agencies to consider the economic impact that a new rule will have on small entities. The purpose of the RFA and SBREFA laws is to ensure that, in developing rules, agencies identify and consider ways to avoid undue impacts on small entities that will be affected by the regulation, whether as small businesses

or organizations that will be subject to regulatory requirements or as small governments that will be responsible for complying with or administering the regulation. While the RFA does not require an agency to minimize a rule's impact on small entities if there are legal, policy, factual, or other reasons for not doing so, it does require that agencies:

- Determine, to the extent feasible, the economic impact on small entities subject to the rule;
- Explore regulatory options for reducing any significant economic impact on a substantial number of such entities; and
- Explain the ultimate choice of regulatory approach.

For proposed and final rules subject to notice and comment under the Administrative Procedure Act (APA) or other statutes, the agencies must either certify that the rule "will not, if promulgated, have a significant economic impact on a substantial number of small entities" ("SISNOSE") or prepare a Regulatory Flexibility Analysis if the agency cannot make this certification. Small entities include small businesses and small organizations as defined by the Small Business Administration (SBA), and governmental jurisdictions with populations of less than 50,000.

The agencies certify that this proposed rule will not have a significant economic impact on a substantial number of small entities under the RFA. This action will not impose any requirements on small entities. This rule would codify a regulatory regime very similar to the one currently being implemented nationwide due to the vacatur of the 2020 definition of "waters of the United States." Additionally, the proposed rule does not "subject" any entities of any size to any specific regulatory burden. It is designed to clarify the statutory term "navigable waters," defined as "waters of the United States," which defines the scope of CWA jurisdiction 33 U.S.C. 1362(7). The scope of CWA jurisdiction is informed by the text, structure and history of the CWA and Supreme Court case law, including the geographical and hydrological factors identified in *Rapanos v. United States*, 547 U.S. 715 (2006.) None of these factors are readily informed by the RFA. *See, e.g., Cement Kiln Recycling Coal. v. EPA*, 255 F.3d 855 (D.C. Cir. 2001) ("[T]o require an agency to assess the impact on all of the nation's small businesses possibly affected by a rule would be to convert every rulemaking process into a massive exercise in economic modeling, an approach we have already rejected."); *Michigan v. EPA*, 213 F.3d 663 (D.C. Cir. 2000); *Am. Trucking Ass'n v. EPA*, 175 F.3d 1027, 1045 (D.C. Cir. 1999) ("[A]n agency may justify its certification under the RFA upon the "factual basis" that the rule does not directly regulate any small entities."); *Mid-Tex Elec. Co-op, Inc. v. FERC*, 773 F.2d 327, 343 (D.C. Cir. 1985) ("Congress did not intend to require that every agency consider every indirect effect that any regulation might have on small businesses in any stratum of the national economy.").

Nevertheless, the agencies recognize that the scope of the term "waters of the United States" is of great national interest, including within the small business community. In light of this interest, the agencies sought early input from representatives of small entities while formulating a proposed definition of this term, including holding a public meeting dedicated to hearing feedback from small entities on August 25, 2021 (*see* https://www.epa.gov/wotus/2021-waters-united-states-public-meeting-materials). A variety of small entities such as farmers and ranchers, environmental and conservation non-profits, as well as building, consulting, and brewing businesses provided their input on the rulemaking. This process has

enabled the agencies to hear directly from these representatives from the outset about how they should approach this complex question of statutory interpretation.

I.C Summary of the Proposed Changes in CWA Jurisdiction Relative to the Secondary Baseline

I.C.1 The 2020 NWPR Baseline

The agencies' definition of "waters of the United States" under the NWPR, the secondary baseline, encompassed the following waters:

- The territorial seas and traditional navigable waters (TNWs) (paragraph (a)(1) waters under the NWPR);
- Tributaries (paragraph (a)(2) waters under the NWPR);
- Lakes and ponds, and impoundments of jurisdictional waters (paragraph (a)(3) waters under the NWPR); and
- Adjacent wetlands (paragraph (a)(4) waters under the NWPR).

The NWPR grouped the territorial seas and TNWs (including waters which are subject to the ebb and flow of the tide) as "waters of the United States" into paragraph (a)(1) of the definition to simplify the regulation. The NWPR eliminated interstate waters as a separate, standalone category of jurisdictional waters. Under the NWPR, interstate waters were jurisdictional only where they fell within another category of jurisdictional waters under the rule.

The agencies included tributaries of the territorial seas and TNWs as "waters of the United States" in the NWPR. The NWPR defined "tributary" to mean:

> A river, stream, or similar naturally occurring surface water channel that contributes surface water flow to a paragraph (a)(1) water in a typical year either directly or indirectly through one or more paragraph (a)(2) through (4) waters. A tributary must be perennial or intermittent in a typical year. The alteration or relocation of a tributary does not modify its jurisdictional status as long as it continues to satisfy the flow conditions of this definition. A tributary does not lose its jurisdictional status if it contributes surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a subterranean river, through a culvert, dam, tunnel, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. The term tributary includes a ditch that either relocates a tributary, is constructed in a tributary, or is constructed in an adjacent wetland as long as the ditch satisfies the flow conditions of this definition.

"Perennial" was defined as "surface water flowing continuously year-round." "Intermittent" was defined as "surface water flowing continuously during certain times of the year and more than in direct response to precipitation (*e.g.*, seasonally when the groundwater table is elevated or when snowpack melts)." "Ephemeral" was defined as "surface water flowing or pooling only in direct response to precipitation (*e.g.*, rain or snow fall)." The NWPR's definition of "tributary" included only those rivers and streams with perennial and intermittent flow. The agencies used the term "reach" in the NWPR to mean a section

of a stream or river along which similar hydrologic conditions exist, such as discharge, depth, area, and slope.

Ditches were not a standalone category in the NWPR, but they were jurisdictional if they were TNWs (including tidal ditches) or if they were tributaries. The term "tributary," as defined in the NWPR, included those ditches that either relocated a tributary, were constructed in a tributary, or were constructed in adjacent wetlands as long as those ditches satisfied the flow conditions of the NWPR's "tributary" definition. The term "ditch" was defined as "a constructed or excavated channel used to convey water." Portions of ditches constructed in adjacent wetlands were also jurisdictional as adjacent wetlands if they satisfied the definition of "tributary."

The NWPR included lakes, ponds, and impoundments of jurisdictional waters as a separate category of "waters of the United States." "Lakes and ponds, and impoundments of jurisdictional waters" were defined to mean:

> standing bodies of open water that contribute surface water flow to a territorial sea or TNW in a typical year either directly or through one or more jurisdictional waters. A lake, pond, or impoundment did not lose its jurisdictional status if it contributed surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a culvert, dike, spillway, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. A lake or pond, or impoundment of a jurisdictional water was also jurisdictional if it were inundated by flooding from a territorial sea, a TNW, a tributary, or another jurisdictional lake, pond, or impoundment of a jurisdictional water in a typical year.

The fourth and final category of "waters of the United States" in the NWPR was adjacent wetlands. The NWPR defined "adjacent wetlands" as those wetlands that:

> (i) abut, meaning to touch at least at one point or side of, a territorial sea, a TNW, a tributary, or a lake, pond, or impoundment of a jurisdictional water; (ii) are inundated by flooding from a territorial sea, a TNW, a tributary, or a lake, pond, or impoundment of a jurisdictional water in a typical year; (iii) are physically separated from a territorial sea, a TNW, a tributary, or a lake, pond, or impoundment of a jurisdictional water only by a natural berm, bank, dune, or similar natural feature; or (iv) are physically separated from a territorial sea, a TNW, a tributary, or a lake, pond, or impoundment of a jurisdictional water only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar artificial feature. An adjacent wetland was jurisdictional in its entirety when a road or similar artificial structure divided the wetland, as long as the structure allowed for a direct hydrologic surface connection through or over that structure in a typical year.

The NWPR listed 12 types of non-jurisdictional waters, also known as excluded waters. The first exclusion made clear that waters or water features that were not explicitly included as "waters of the United States" were not jurisdictional. The agencies retained two existing exclusions for prior converted cropland and waste treatment systems, though they defined those categories in regulatory text for the first time. The agencies defined "prior converted cropland" in the regulatory text as:

> Any area that, prior to December 23, 1985, was drained or otherwise manipulated for the purpose, or having the effect, of making production of an agricultural product possible. EPA and the Corps will recognize designations of prior converted cropland made by the Secretary of Agriculture. An area is no longer considered *prior converted cropland* for purposes of the Clean Water Act when the area is abandoned and has reverted to wetlands, as defined in paragraph (c)(16) of this section. Abandonment occurs when prior converted cropland is not used for, or in support of, agricultural purposes at least once in the immediately preceding five years. For the purposes of the Clean Water Act, the EPA Administrator shall have the final authority to determine whether prior converted cropland has been abandoned.

The agencies clarified that a designation of "prior converted cropland" for purposes of the CWA no longer applied if the area had been abandoned and reverted to wetlands.

In the NWPR, the agencies defined "waste treatment systems" to include "all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater prior to discharge (or eliminating any such discharge)."

The NWPR also excluded the following waters from the definition of "waters of the United States:"

- groundwater, including groundwater drained through subsurface drainage systems;
- ephemeral features, including ephemeral streams, swales, gullies, rills, and pools;
- diffuse stormwater run-off and directional sheet flow over upland;
- ditches that are not specifically included as the territorial seas, TNWs, or tributaries, as well as those portions of ditches that were constructed in adjacent wetlands that did not satisfy the conditions of the "adjacent wetlands" definition;
- artificially irrigated areas, including fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease;
- artificial lakes and ponds including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters, so long as those artificial lakes and ponds were not impoundments of jurisdictional waters that met the conditions of the definition of "lakes and ponds, and impoundments of jurisdictional waters;"
- water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel;
- stormwater control features constructed or excavated in upland or in non-jurisdictional waters to convey, treat, infiltrate, or store stormwater run-off; and

- groundwater recharge basins, water reuse, and wastewater recycling structures, including detention, retention, and infiltration basins and ponds, constructed or excavated in upland or in non-jurisdictional waters.

The NWPR included definitions for "high tide line," "ordinary high water mark," "snowpack," "tidal waters and waters subject to the ebb and flow of the tide," "typical year," "upland," and "wetlands" in its regulatory text. The definitions for "wetlands", "high tide line", and "ordinary high water mark" remained unchanged from prior codified definitions in the Corps' 1986 regulations. The agencies defined the term "upland" in their regulations for the first time. "Upland" was defined in the NWPR as any land area that under normal circumstances did not satisfy all three wetland factors (hydrology, hydrophytic vegetation, and hydric soils) identified in the definition of "wetland" and that did not lie below the ordinary high water mark or the high tide line of a jurisdictional water.

I.C.2 The Proposed Rule

The agencies are proposing to adopt the definition of the term "waters of the United States" from the 1986 regulations with certain revisions to reflect the agencies' interpretation of the statutory limits on the scope of the "waters of the United States" informed by the Supreme Court's decisions in *United States v. Riverside Bayview Homes*, *SWANCC*, and *Rapanos*. Consistent with *Rapanos*, waters that meet either the plurality's relatively permanent standard or Justice Kennedy's significant nexus standard would be jurisdictional. The proposed rule is as follows:

> (1) All waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide;
>
> (2) All interstate waters including interstate wetlands;
>
> (3) All other waters such as intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds
>
> > (i) that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to the waters identified in paragraphs (a)(1), (a)(2), (a)(5)(i), or (a)(6) of this section, or
> >
> > (ii) that either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraphs (a)(1), (a)(2), or (a)(6) of this section;
>
> (4) All impoundments of waters otherwise defined as waters of the United States under the definition, other than waters identified in paragraph (a)(3) of this section;
>
> (5) Tributaries of waters identified in paragraphs (a)(1), (a)(2), (a)(4), or (a)(6) of this section
>
> > (i) that are relatively permanent, standing or continuously flowing bodies of water, or
> >
> > (ii) that either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraphs (a)(1), (a)(2), or (a)(6) of this section;
>
> (6) The territorial seas;

(7) Wetlands adjacent to the following waters (other than waters that are themselves wetlands):

(i) (a)(1), (a)(2), or (a)(6) waters, or

(ii) relatively permanent, standing, or continuously flowing bodies of water identified in paragraphs (a)(4) or (a)(5)(i) of this section and with a continuous surface connection to such waters, or

(iii) waters identified in paragraphs (a)(4) or (a)(5)(ii) when the wetlands either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of waters identified in paragraphs (a)(1), (a)(2), or (a)(6) of this section;

(8) Waste treatment systems, including treatment ponds or lagoons designed to meet the requirements of the Clean Water Act, are not waters of the United States.

(9) Waters of the United States do not include prior converted cropland. Notwithstanding the determination of an area's status as prior converted cropland by any other federal agency, for the purposes of the Clean Water Act, the final authority regarding Clean Water Act jurisdiction remains with EPA.

The agencies have long defined TNWs or (a)(1) waters as "[a]ll waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide." Under the proposed rule, the agencies make no changes to the definition of TNWs. The agencies issued guidance in 2007 regarding TNWs that helped inform the application of pre-2015 practice and was applied under each subsequent regulation. The proposed rule would also use this guidance. [9]

Consistent with the 1986 regulations, the agencies' proposed rule defines "adjacent" to mean "bordering, contiguous, or neighboring." The proposed rule also states that "[w]etlands separated from other waters of the United States by man-made dikes or barriers, natural river berms, beach dunes and the like are 'adjacent wetlands.'" Adjacent wetlands that would be jurisdictional under the proposed rule include wetlands adjacent to traditional navigable waters, interstate waters, and the territorial seas; wetlands adjacent to impoundments or to tributaries that are relatively permanent, standing, or continuously flowing bodies of water and that have a continuous surface connection to such waters; and wetlands adjacent to impoundments or to tributaries meeting the significant standard and that significantly affect the chemical, physical, or biological integrity of TNWs, interstate waters, or the territorial seas, either alone or in combination with similarly situated waters in the region.

The proposed rule defines "waters of the United States" to include interstate waters, including interstate wetlands, consistent with the 1986 regulations. Under the proposed rule, interstate waters are "waters of the United States" even if they are not navigable for purposes of federal regulation under (a)(1) and do not connect to such waters. In ORM2 for approved jurisdictional determinations (AJDs) conducted under pre-2015 practice, these waters are generally captured under other categories in the AJD form, including categories for TNWs, tributaries (relatively permanent waters or non-relatively permanent waters),

[9] *See* "U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook, Appendix D, 'Traditional Navigable Waters,'" *available at* https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll11/id/2316.

adjacent wetlands (those adjacent to a TNW, directly abutting a relatively permanent water, adjacent to but not directly abutting a relatively permanent water, or adjacent to non-relatively permanent waters), and impoundments of jurisdictional waters.

Consistent with the CWA,[10] the agencies' proposed rule would include "the territorial seas" as "waters of the United States." The territorial seas are typically categorized as TNWs in the ORM2 database under pre-2015 practice and have a separate category in ORM2 for AJDs conducted under the NWPR.

Under the proposed rule, impoundments of jurisdictional waters would be jurisdictional. Interstate waters and impoundments were not addressed directly by the *Riverside Bayview*, *SWANCC*, or *Rapanos* Supreme Court decisions.

Under the proposed rule, certain waters would be excluded from the definition of "waters of the United States" pursuant to rule language, and additional waters would generally not be considered "waters of the United States" consistent with the agencies' longstanding practice, including under the 1986 preamble language. Excluded waters would be non-jurisdictional and not subject to the regulatory programs of the CWA. Prior converted cropland and waste treatment systems have been excluded from the regulatory definition of "waters of the United States" since 1993 and 1979, respectively, and those exclusions would be continued in the proposed rule.

Further, as noted, the agencies have interpreted certain waters to be generally non-jurisdictional under pre-2015 practice. For example, the 1986 and 1988 preamble language states that the agencies do not generally consider certain waters to be "waters of the United States," such as artificially irrigated areas which would revert to upland if the irrigation ceased or certain artificial stock watering ponds created by excavating and/or diking dry land. In addition, ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water would generally not be "waters of the United States" under the proposed rule.

I.C.3 Comparison of Scope of Jurisdiction between the Secondary Baseline and the Proposed Rule

In this section, the agencies describe potential changes to the CWA jurisdictional status of categories of waters under the proposed rule relative to the secondary baseline, or the NWPR (Table I-2).

Table I-2: Regulatory category crosswalk

Proposed Rule	NWPR	Transferable between Rules?
Regulatory Category	**Regulatory Category**	
(a)(1) Traditional navigable waters	(a)(1) Traditional navigable waters and territorial seas	Mostly
(a)(2) Interstate waters*	N/A	No*
(a)(3) Isolated aquatic resources	(a)(3) Lakes and ponds, and impoundments of jurisdictional waters or (b)(1) Waters that are not (a)(1) - (a)(4)	No
(a)(4) Impoundments of jurisdictional waters	(a)(3) Lakes and ponds, and impoundments of jurisdictional waters	Yes

[10] *See* 33 U.S.C. 1362(7), defining "navigable waters" as "the waters of the United States, including the territorial seas."

Table I-2: Regulatory category crosswalk		
Proposed Rule	**NWPR**	**Transferable between Rules?**
Regulatory Category	**Regulatory Category**	
(a)(5) Tributaries: Relatively Permanent Waters	(a)(2) Tributaries and (a)(3) Lakes and ponds, and impoundments of jurisdictional waters	Yes
(a)(5) Tributaries: consisting of both RPWs and non-relatively permanent waters (NRPWs)	(a)(2) Tributaries	Mostly
(a)(5) Tributaries: NRPWs – Jurisdictional after a case-specific significant nexus analysis	(a)(2) Tributaries, (a)(3) Lakes and ponds, and impoundments of jurisdictional waters, or (b)(1) or (b)(3) exclusions	No
(a)(5) Tributaries: NRPWs – Non-jurisdictional after a case-specific significant nexus analysis	(a)(2) Tributaries, (a)(3) Lakes and ponds, and impoundments of jurisdictional waters, or (b)(1) or (b)(3) exclusions	No
(a)(6) Territorial seas	(a)(1) TNW and territorial seas	Yes
(a)(7) Adjacent wetlands: wetlands adjacent to (abutting and non-abutting) TNWs	(a)(4) Adjacent wetlands or (b)(1) Exclusion	No
(a)(7) Adjacent wetlands: Wetlands directly abutting relatively permanent waters	(a)(4) Adjacent wetlands	Yes
(a)(7) Adjacent wetlands: wetlands not directly abutting relatively permanent waters	(a)(4) Adjacent wetlands or (b)(1) Exclusion	No
(a)(7) Adjacent wetlands: wetlands adjacent to non-relatively permanent waters – jurisdictional after a case-specific significant nexus analysis	(a)(4) Adjacent wetlands or (b)(1) Exclusion	No
(a)(7) Adjacent wetlands: wetlands adjacent to non-relatively permanent waters – non-jurisdictional after a case-specific significant nexus analysis	(b)(1) Waters that are not (a)(1) - (a)(4)	Mostly

* Interstate waters are categorized under the *Rapanos* AJD form as any other type of resource; the distinction, which is not captured in ORM2, is that these resources cross or serve as state boundaries. These resources are not actually separated within ORM2 for aquatic resources associated with *Rapanos* AJDs.

** While these resources should have required an analysis of their commerce links under (a)(3) under the pre-2015 regulatory regime, in practice, this became a 'catch all' category used by Corps staff to denote non-jurisdictional resources.

I.C.3.1 Traditional Navigable Waters (TNWs)

Under the NWPR, the agencies continued the regulation of TNWs as "waters of the United States," but combined TNWs in paragraph (a)(1) with the territorial seas. The NWPR also explicitly excluded TNWs under most of the rule's (b)(1) exclusions for the first time, in a change from longstanding practice. Under the proposed rule, the agencies would return to the prior practice of regulating all TNWs, or (a)(1) waters, including waters subject to the ebb and flow of the tide. The proposed rule separates territorial seas from the (a)(1) category and returns them to the (a)(6) category consistent with the 1986 definitions. This change in the placement of the definitions does not affect their scope. Section IV.A of the proposed rule addresses the rationale for the TNW category.

A "case-specific" determination does not designate the upper and lower extents of the TNW; a water is only designated a TNW for that one AJD and only in the specified review area. Under the pre-2015 regulatory regime, some Corps Districts chose to document an aquatic resource as a perennial relatively permanent water instead of a case-specific TNW for ease of documentation and workload. Some AJDs for relatively permanent waters therefore are TNWs, so the ORM2 data on TNWs under the pre-2015 regulatory regime likely underestimates the number of TNWs. However, those aquatic resources would be captured in the relatively permanent waters category described in the "Tributaries" section below. Similarly, under the NWPR, it is likely that some TNWs could have been classified under the (a)(2) tributary category or the (a)(3) lake, pond, or impoundment category in ORM2. While the NWPR definition included territorial seas as well, this regulatory category historically has been subsumed by the TNW definition (*i.e.*, under the pre-2015 regulatory regime, if a resource was a territorial sea, it was also a TNW, and therefore would be categorized as a TNW rather than a territorial sea; for this reason, 'territorial sea' is not a selectable, separate category in ORM2 under the pre-2015 regulatory regime). The agencies assume that the application of which waters are TNWs and territorial seas under the proposed rule would not pose a change in scope of jurisdiction from the secondary baseline of the NWPR, except for TNWs that were excluded under the NWPR. Such waters would remain TNWs under the proposed rule, representing a change from the secondary baseline.

I.C.3.2 Interstate Waters

The NWPR removed interstate waters as a separate category of "waters of the United States." With this change, interstate waters were only jurisdictional if they met one of the categories of "waters of the United States" under the NWPR (territorial seas or TNWs, tributaries, lakes, ponds, impoundments of jurisdictional waters, or adjacent wetlands). Under the proposed rule, any interstate waters, including wetlands, would be jurisdictional if they cross or serve as state boundaries. For example, a wetland straddling a state line would be considered jurisdictional regardless of whether it satisfies any of the conditions for adjacency described in either the plurality or Justice Kennedy's opinions in *Rapanos*. Relative to the NWPR secondary baseline, the proposed rule would increase the number of waters, including wetlands, considered to be jurisdictional under the interstate waters category.

The *Rapanos* AJD form associated with the pre-2015 regulatory regime and the associated ORM2 data do not indicate whether a water is jurisdictional as an "interstate water." Instead, these waters are generally represented by other ORM2 categories of aquatic resources. Because "interstate waters" are not identified on the *Rapanos* AJD form or in the associated ORM2 data, the agencies are unable to quantify the potential change in jurisdiction under the proposed rule relative to the NWPR with respect to interstate waters.

I.C.3.3 Territorial Seas

Under the NWPR, the agencies continued the regulation of "the territorial seas" as "waters of the United States," but combined the territorial seas in (a)(1) with TNWs. Territorial seas were categorized as TNWs in AJDs conducted under pre-2015 regulatory regime, which is what the proposed rule would reinstate. This change in the placement of the definition does not affect its scope. The agencies anticipate that there will be no change in the jurisdictional status of these waters under the proposed rule compared to the secondary baseline of the NWPR. The ORM2 database does not record whether a water is a "territorial sea" under pre-2015 practice.

I.C.3.4 Tributaries

The agencies defined "tributaries" as jurisdictional in the NWPR if they were perennial or intermittent, and excluded ephemeral features. Specifically, to be jurisdictional as a tributary under the NWPR, a river, stream, or similar naturally occurring surface water channel had to contribute surface water flow to a territorial sea or a TNW in a typical year[11] either directly or through other jurisdictional waters, through certain artificial features (including non-jurisdictional ditches, culverts, dams, or tunnels), through subterranean rivers, or through certain natural features (including non-jurisdictional ephemeral features, debris piles, or boulder fields). Ditches that were jurisdictional as tributaries under the NWPR included those constructed in a tributary or that relocated a tributary and ditches constructed in an adjacent wetland as long as those ditches satisfied the flow conditions of the tributary definition.[12]

Under the proposed rule, all tributaries to TNWs, interstate waters, jurisdictional impoundments, or the territorial seas that are relatively permanent, standing, or continuously flowing waters and non-relatively permanent tributaries that have a significant nexus with a TNW, interstate water, or the territorial seas would be jurisdictional. Relatively permanent waters include waters that are perennial as well as intermittent waters that contain continuously flowing or standing water at least seasonally. Non-relatively permanent waters include non-seasonal intermittent tributaries and ephemeral tributaries. Under the proposed rule, ephemeral streams that flow only in response to precipitation and non-seasonal intermittent streams which do not have standing or continuously flowing water at least seasonally would not be categorically jurisdictional; rather, these non-relatively permanent waters would be evaluated according to the significant nexus standard.[13] Ditches would not be explicitly excluded from "waters of the United States" under the proposed rule; however, ditches (including roadside ditches) excavated wholly in and draining only upland and that do not carry a relatively permanent flow of water would generally not be jurisdictional.

The proposed rule identifies and solicits comment on different approaches to applying a significant nexus analysis. The agencies solicit comment on the method used by the *Rapanos* guidance in which the unit of analysis of the significant nexus evaluation would be the individual tributary (*i.e.*, the entire reach of the stream that is of the same order) and any wetlands that are adjacent to that reach of the tributary. Note that the term "reach" under this potential approach differs from implementation of the term "reach" under the NWPR. Under the proposed rule, the agencies are soliciting comment on whether they should implement the term "reach" using a stream order approach, as opposed to the NWPR's interpretation of "reach" as referring to similar flow characteristics.

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[11] In the NWPR, the term *typical year* means when precipitation and other climatic variables are within the normal periodic range (*e.g.*, seasonally, annually) for a geographic area of the applicable aquatic resource based on a rolling thirty-year period.

[12] Ditches were also jurisdictional where they met the requirements to be TNWs. If a ditch was constructed in an adjacent wetland and wetlands within the ditch met the definition of "adjacent wetlands," those portions could be jurisdictional as adjacent wetlands under the NWPR. All other ditches are excluded from the definition of "waters of the United States" under the NWPR.

[13] Ephemeral streams, would not be categorically jurisdictional under the proposed rule. As described in the preamble for the proposed rule, the agencies would conduct a significant nexus analysis for certain types of waters referred to as "non-relatively permanent waters." The agencies are accepting comment on how to define "relatively permanent" and "non-relatively permanent." *See* Preamble at Section V.C.5.

The NWPR did not regulate any ephemeral streams; under the proposed rule, some of these excluded ephemeral streams would likely be jurisdictional based on a case-specific significant nexus evaluation. The NWPR regulated non-seasonal intermittent tributaries that met the definitions of "intermittent" and "tributary" under that rule, while some perennial and intermittent streams did not satisfy jurisdictional requirements due to lack of contribution of surface flow to TNWs in a typical year. For example, although the NWPR allowed for ephemeral streams to serve as a non-jurisdictional connection between upstream and downstream jurisdictional tributaries, it did not regulate perennial or intermittent streams that flowed into ephemeral features that did not contribute surface water flow in a typical year to a downstream jurisdictional water. Under the proposed rule, such upstream perennial and intermittent streams would be jurisdictional if they are relatively permanent waters or meet the significant nexus standard, and ephemeral streams would be jurisdictional if they have a significant nexus to a TNW, interstate water, or territorial sea.

There are some ditches that would be considered jurisdictional under the proposed rule that were not jurisdictional under the NWPR. Under the proposed rule, a ditch would be jurisdictional if it is a relatively permanent tributary. For ditches that are non-relatively permanent, the agencies would consider whether the ditch is excavated wholly in upland and draining only upland (*i.e.*, if it is an "upland ditch"). If the ditch was excavated wholly in upland, draining only upland, and has less than relatively permanent flow, the agencies are proposing that the ditch would generally be considered non-jurisdictional, consistent with pre-2015 practice. For non-relatively permanent ditches that are not upland ditches, the agencies would determine if they have a case-specific significant nexus to a TNW, interstate water, or territorial sea. Under the proposed rule a ditch does not need to relocate a tributary, be constructed in a tributary, or be constructed in an adjacent wetland. Under the NWPR, however, a jurisdictional ditch had to satisfy one of these three criteria and have perennial or intermittent flow at the time it was observed. Given these limitations, fewer ditches could be considered jurisdictional compared to pre-2015 practice.

The agencies have assessed stream reach data nationally and within the arid West (in the states of Arizona and New Mexico) and have found that the NWPR caused a significant change in the number of stream reaches found to be non-jurisdictional in the year from June 22, 2020 to June 21, 2021, in Arizona and New Mexico in comparison to years in which the pre-2015 regulatory regime were implemented.[14] Arizona had the highest proportion of non-jurisdictional stream findings across the nation, with 13 percent of all non-jurisdictional stream determinations in the nation in the first year the NWPR was effective (June 22, 2020 to June 21, 2021). Given that spatially Arizona comprises only 3 percent of the land in the United States, it is clear that the NWPR definition had more substantial effects in some areas of the country than others.[15] The agencies have also assessed approved jurisdictional determination data associated with the Cowardin classification system to identify the proportions of tributaries found to be jurisdictional or non-jurisdictional under pre-2015 regulatory regime and under the NWPR (Section III.C.2) (Cowardin et al, 1979). Neither analysis mentioned above allows the agencies to quantify how

[14] U.S. Environmental Protection Agency and U.S. Department of Army. 2021. Technical Support Document for the Proposed Restoration Rule: Definition of the "Waters of the United States." Available in the docket for this rule, Docket Number EPA-HQ-OW-2021-0602.

[15] *Ibid.*

many perennial or intermittent streams have downstream ephemeral reaches that do not contribute any surface water flow to a jurisdictional water in a typical year.

Tributaries evaluated under the proposed rule would be categorized as either relatively permanent waters or non-relatively permanent waters. The agencies anticipate that the proposed rule would continue to regulate the vast majority of waters that met the NWPR's definition of "tributary," while also allowing for ephemeral streams and some perennial and intermittent streams that did not meet the NWPR's definition of "tributary" to be jurisdictional in situations in which the waters in question meet either the relatively permanent or significant nexus standard. Waters could also be tributaries under the proposed rule when they were not under the NWPR because they are tributaries to interstate waters not connected to a TNW. Relative to the secondary baseline of the NWPR, the proposed rule would therefore regulate more waters as tributaries. The Corps' ORM2 database does not directly track whether a tributary is a ditch or not under either the pre-2015 regulatory regime or the NWPR. However, the proposed rule would regulate relatively permanent upland ditches that meet the "tributary" definition and revert to previous practice for determining whether a ditch relocated a stream or drained only upland. The NWPR excluded all upland ditches regardless of flow (unless they met the conditions of (a)(1)) and limited which other ditches could be regulated as tributaries, for example by indicating that a ditch needed to relocate an "entire portion" of the tributary rather than divert some of the flow and indicating that a ditch created in uplands would be excluded even where it drained a wetland. Thus, the agencies expect that there would be an increase in jurisdictional ditches under the proposed rule compared to the NWPR.

I.C.3.5 Lakes and Ponds

Under the NWPR, the agencies created a new regulatory category for lakes and ponds, as well as impoundments. The following lakes and ponds were jurisdictional under the NWPR:

- lakes and ponds that contributed surface water flow to a territorial sea or a TNW in a typical year either directly or through one or more tributaries, other jurisdictional lakes and ponds or jurisdictional impoundments, or adjacent wetlands;
- lakes and ponds that contributed surface water flow to a downstream jurisdictional water in a typical year through a channelized non-jurisdictional surface water feature, through a culvert, dike, spillway, or similar artificial feature, or through a debris pile, boulder field, or similar natural feature; and
- lakes and ponds that were inundated by flooding from a territorial sea, TNW, tributary, or jurisdictional lake, pond, or impoundment in a typical year.

Open waters that are TNWs (*e.g.*, Lake Michigan, Lake Champlain) were not included in the NWPR definition of "lakes and ponds, and impoundments of jurisdictional waters," but were treated as jurisdictional TNWs under the NWPR.

Under the proposed rule, the agencies are not proposing a separate category for lakes and ponds; rather, consistent with the pre-2015 regulatory regime, the proposed rule reincorporates lakes and ponds into other categories of waters (for example, TNWs, tributaries, other waters, or even in rare cases wetlands, for example when the waters have sufficient wetland fringe to be considered as a wetland), and would separate impoundments into a separate category (the "(a)(4) Impoundments of jurisdictional waters"

category). Because impoundments would comprise a distinct category under the proposed rule, this document discusses them separately.

Under the pre-2015 regulatory regime, TNW lakes and ponds, interstate lakes and ponds, and all relatively permanent lakes and ponds that were considered tributaries were regulated as "waters of the United States." Most continued to be jurisdictional under the NWPR, though certain interstate lakes and ponds and certain relatively permanent lakes and ponds that are tributaries would not meet that rule's definition of "lakes and ponds, and impoundments of jurisdictional waters." The proposed rule would restore the pre-2015 regulatory regime (amending the 1986 regulations to reflect the agencies' interpretation of the statutory limits on the scope of the "waters of the United States" informed by Supreme Court case law), and the agencies anticipate that there will be no practicable difference for most lakes and ponds that would be jurisdictional as relatively permanent waters under the proposed rule as compared to the secondary baseline of the NWPR. Such waters would likely have been jurisdictional as lakes, ponds, and impoundments of jurisdictional waters under the NWPR and would remain jurisdictional under the proposed rule. TNWs and interstate waters were discussed previously, and it is assumed that lakes and ponds associated with these regulatory categories would remain jurisdictional. As noted previously, certain interstate lakes and ponds would be jurisdictional under the proposed rule that would not be jurisdictional under the NWPR, representing a small change from the alternative baseline.

There are cases in which certain lakes and ponds jurisdictional under the NWPR may not be jurisdictional under the proposed rule. The NWPR includes as "waters of the United States" lakes and ponds that are inundated by flooding from a territorial sea, a TNW, a tributary, or a jurisdictional lake, pond, or impoundment in a typical year, such as certain oxbow lakes. Such waters may be considered jurisdictional under the proposed rule as tributaries, although some may not be part of the stream network and would need to be evaluated for jurisdiction under the (a)(3) "other waters category." (The proposed rule articulates a range of potential approaches to (a)(3) other waters.) Some of the lakes and ponds which would have been found jurisdictional under the NWPR could be non-jurisdictional under the proposed rule if they do not meet either the relatively permanent or significant nexus standard under the proposed rule's (a)(3) category, or if the (a)(3) category remains narrowly applied. Thus, while the agencies assume that there may be a change in jurisdiction between the secondary baseline of the NWPR and the proposed rule, these changes cannot be quantified directly based on the regulatory definition.

There are also cases in which certain lakes and ponds considered non-jurisdictional under the NWPR would be jurisdictional under the proposed rule. Under the proposed rule, non-relatively permanent lakes and ponds that are considered tributaries would undergo a case-specific significant nexus evaluation to determine their jurisdictional status. These non-relatively permanent lakes and ponds can include both non-seasonal intermittent waters as well as ephemeral waters. Those ephemeral lakes and ponds would be non-jurisdictional under the NWPR but could be jurisdictional under the proposed rule. Non-seasonal intermittent lakes and ponds that contributed surface water flow to a territorial sea or TNW in a typical year were jurisdictional under the NWPR. Some but not all of these non-seasonal intermittent lake and pond tributaries may be jurisdictional under the proposed rule.

From the available AJD data under the pre-2015 regulatory regime, the agencies are unable to parse tributaries into lakes, ponds, or streams, as there is no field in ORM2 for the Corps to note this status. Thus, the agencies are unable to estimate the percentage of non-relatively permanent lake and pond

tributaries which were deemed jurisdictional under the pre-2015 regulatory regime and, to predict their status under the proposed rule in comparison with the secondary baseline. The agencies are also unable to quantify how many lakes and ponds are upstream of ephemeral reaches that do not contribute surface water flow to a downstream jurisdictional water in a typical year. Under the secondary baseline of the NWPR, this scenario would lead to lakes and ponds being non-jurisdictional, while under the proposed rule, these features could be jurisdictional if a significant nexus to a TNW, interstate water, or territorial sea exists.

I.C.3.6 Impoundments of Jurisdictional Waters

Under the NWPR, the agencies included certain impoundments of jurisdictional waters in the definition of "waters of the United States." The scope of jurisdictional impoundments under the NWPR was narrower than under the 1986 regulations. In order to be "waters of the United States" under the NWPR, impoundments had to be impoundments of jurisdictional waters and had to contribute surface water flow to a territorial sea or TNW in a typical year either directly or through one or more jurisdictional waters or through a channelized non-jurisdictional surface water feature (*e.g.*, an ephemeral stream or non-jurisdictional ditch), through a culvert, dike, spillway or similar artificial feature, or through a debris pile, boulder field, or similar natural feature. An impoundment of a jurisdictional water was also jurisdictional if it was inundated by flooding from a territorial sea, a TNW, or a jurisdictional lake, pond, or impoundment in a typical year. Impounded waters that are themselves TNWs (*e.g.*, Lake Mead, Lake Powell) were jurisdictional under the NWPR and would be under this proposed rule in the (a)(1) category.

Several categories of impoundments were non-jurisdictional under the NWPR, including impoundments of ephemeral streams or non-jurisdictional wetlands. Under the proposed rule, an impoundment of any jurisdictional water would be jurisdictional, including an impoundment of an ephemeral stream that meets either the relatively permanent or significant nexus standard, the impoundment would be jurisdictional as well. Additionally, other impoundments of jurisdictional waters that are disconnected from the tributary system were not jurisdictional under the NWPR if they did not contribute surface water flow to a TNW or territorial sea in a typical year. For example, if an impoundment had no outflow, the jurisdiction was considered severed under the NWPR. The proposed rule would return to the practice that an impoundment of a jurisdictional water would be *per se* jurisdictional.

Non-relatively permanent waters as implemented under the pre-2015 regulatory regime do not directly correlate with ephemeral streams, as previously discussed. Some percentage of non-relatively permanent waters are intermittent streams that are not seasonal but would have been jurisdictional waters under the NWPR. ORM2 data were not available for impoundments of interstate waters that might not be jurisdictional under the NWPR because interstate waters themselves were not tracked separately in ORM2 under pre-2015 practice. The agencies were unable to determine if any of the impoundments that would be found jurisdictional under the proposed rule (using AJDs conducted under the pre-2015 regulatory regime as a proxy) would not be considered jurisdictional under the secondary baseline of the NWPR because they do not contribute surface water flow in a typical year to a territorial sea or TNW. Thus, the agencies could not quantify the change in jurisdiction of impoundments compared to the secondary baseline.

I.C.3.7 Adjacent Wetlands

Under the NWPR, the following were adjacent wetlands:

- wetlands that abut jurisdictional waters;
- wetlands that are inundated by flooding from a jurisdictional water in a typical year;
- wetlands that are physically separated by a jurisdictional water only by a natural berm, bank, dune, or similar natural feature; and
- wetlands that are physically separated from a jurisdictional water only by an artificial dike, barrier, or similar artificial structure so long as that structure allows for a direct hydrologic surface connection between the wetlands and the jurisdictional water in a typical year, such as through a culvert, flood or tide gate, pump, or similar feature.

An adjacent wetland was jurisdictional in its entirety when a road or similar artificial structure divides the wetland, as long as the structure allows for a direct hydrologic surface connection through or over that structure in a typical year.

Under the proposed rule, wetlands that are adjacent would include wetlands that are bordering, contiguous, or neighboring a "water of the United States," including wetlands behind a natural river berm, beach dunes, constructed dikes or barriers, and the like. Not all "adjacent" wetlands would be jurisdictional under the proposed rule. Under the proposed rule, adjacent wetlands would be evaluated differently depending on the water to which they are adjacent (TNWs, interstate waters, impoundments, relatively permanent tributaries, non-relatively permanent tributaries, and the territorial seas). Wetlands adjacent to tributaries that are relatively permanent, standing, or continuously flowing waters would be analyzed in different ways, depending on whether they have a continuous surface connection to such waters. Adjacent wetlands with a continuous surface connection to a relatively permanent tributary would be jurisdictional without the need for further analysis. Wetlands adjacent to but that do not have a continuous surface connection to a relatively permanent water would require a case-specific significant nexus analysis to determine their jurisdictional status. Similarly, all wetlands adjacent to non-relatively permanent waters would require a case-specific significant nexus evaluation to determine their jurisdictional status. The proposed rule would include more streams, such as certain ephemeral streams, as jurisdictional tributaries than the NWPR, and therefore, likely would include more wetlands adjacent to those tributaries as jurisdictional. However, because many of the additional streams the proposed rule would regulate compared to the NWPR are likely ephemeral, the jurisdictional status of wetlands adjacent to such streams must be determined according to the significant nexus standard; such wetlands would not be categorically jurisdictional under the proposed rule.

The proposed rule requests comment as to whether they should continue to implement the adjacent wetlands definition consistent with pre-2015 practice as well as on alternative approaches. For purposes of this Economic Analysis, the agencies use pre-2015 practice as a proxy for the proposed rule for adjacent wetlands. Adjacent wetlands under pre-2015 practice include those with an unbroken surface or shallow sub-surface connection to jurisdictional waters. Some of these wetlands may have been adjacent under the NWPR, for example, where they were inundated by flooding from a jurisdictional water in a

typical year. However, others may not have been, including, for example, those wetlands that would have been adjacent under the proposed rule solely due to a hydrological connection to a jurisdictional water via an unbroken shallow subsurface connection. Wetlands physically separated from jurisdictional waters by natural river berms, beach dunes, and the like were considered adjacent under the NWPR, and would continue to be considered adjacent under the proposed rule. The proposed rule would also include wetlands separated from jurisdictional waters by artificial dikes, barriers, or similar artificial structures as adjacent wetlands, regardless of whether the wetlands have a direct hydrologic surface connection to those jurisdictional waters in a typical year via a culvert, flood or tide gate, or similar feature. This differs from the NWPR which required a direct hydrologic surface connection in a typical year for such wetlands to be jurisdictional.

Finally, adjacent wetlands under the proposed rule consistent with implementation under the pre-2015 approach would also include wetlands that are physically proximate (*i.e.*, reasonably close) to jurisdictional waters, either categorically or through a significant nexus test. Such wetlands were only adjacent under the NWPR if they were inundated in a typical year by a jurisdictional water, if they were physically separated from a jurisdictional water only by a natural berm or similar natural structure, or if they were physically separated from jurisdictional water only by an artificial structure so long as that structure allows for a direct hydrologic surface connection in a typical year. Other proximate wetlands were not considered adjacent under the NWPR that could be found jurisdictional under the proposed rule. Under the proposed rule, such wetlands that are adjacent to TNWs, interstate waters, or the territorial seas would be *per se* jurisdictional, while such wetlands that are adjacent to but not directly abutting relatively permanent waters and non-relatively permanent waters would be jurisdictional only if they have significant nexus to a TNW, interstate water, or territorial sea.

Changes in the "adjacent wetlands" category compared to the secondary baseline of the NWPR would be due to both the revised definition for "adjacent wetlands" in the NWPR as well as revisions to the other categories of waters that were considered jurisdictional as tributaries and as jurisdictional lakes and ponds, and impoundments of jurisdictional waters. The elimination of interstate waters as a separate category of jurisdiction also eliminated jurisdiction over wetlands adjacent to such waters and their tributaries, where such interstate waters are jurisdictional only because they cross or serve as state boundaries. Thus, the proposed rule likely includes more wetlands as "waters of the United States" than the secondary baseline of the NWPR. The agencies are unable to quantify this change in direct relation to regulatory categories.

Potential protocols for assessing the change in jurisdictional scope of wetlands from the NWPR to the proposed rule based on regulatory categories are presented in Appendix A. Again, pre-2015 practice is considered an approximation of practice under the proposed rule. The specific category that cannot be surmised as fully jurisdictional or non-jurisdictional when comparing pre-2015 practices as a proxy for the proposed rule and the NWPR is primarily for wetlands conducted under a significant nexus analysis. This makes a direct comparison to the NWPR categories of adjacent wetlands challenging. Rather than assessing prior significant nexus analyses under the pre-2015 regulatory regime or forecasting how NWPR jurisdictional determinations on wetlands would apply to future significant nexus analyses under the proposed rule, the agencies have proposed an alternative method using the Cowardin classification system to assess the potential change in scope of jurisdiction between the NWPR and the proposed rule (Chapter III).

I.C.3.8 Nonnavigable, Isolated, Intrastate Waters

Under the NWPR, most non-navigable, isolated, intrastate waters would fall under the (b)(1) exclusion for waters not identified in the four categories of "waters of the United States." Some may have been jurisdictional under the NWPR's category for "lakes and ponds, and impoundments of jurisdictional waters" (*e.g.*, non-tributary lakes and ponds that are inundated by flooding in a typical year from a territorial sea, TNW, tributary, or jurisdictional lake, pond, or impoundment). The proposed rule updates the (a)(3) category from the 1986 regulations and revises it to be consistent with the Supreme Court decisions. The agencies propose to eliminate the commerce factors that were listed in the agencies' 1986 (a)(3) regulations and would allow waters that meet either the plurality standard or the significant nexus standard to be jurisdictional. The agencies are proposing to continue the non-exhaustive list of "other waters" that do not meet the other categories of jurisdictional waters that can be evaluated under (a)(3). This non-exhaustive list includes intrastate lakes, rivers, streams (including intermittent streams), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds. Under the proposed rule the agencies would regulate "other waters" that (i) that are relatively permanent, standing or continuously flowing bodies of water with a continuous surface connection to TNWs, interstate waters, relatively permanent tributaries, or the territorial seas, or (ii) that either alone or in combination with similarly situated waters in the region, significantly affect the chemical, physical, or biological integrity of TNWs, interstate waters, or the territorial seas.

The agencies are unaware of any nonnavigable, isolated, intrastate waters, as defined under the (a)(3) category of the 1980s regulations, which have been found to be jurisdictional resources since the Supreme Court's decision in 2001 in *SWANCC*. These resources have been considered non-jurisdictional non-navigable, isolated, intrastate waters under *SWANCC* Guidance, which looked for interstate commerce factors and which the proposed rule eliminates. However, the agencies assume that there would largely be no change between those deemed to be waters identified in the NWPR's four categories of "waters of the United States" and those resources that would be deemed jurisdictional under the proposed rule. For example, lakes or ponds which were jurisdictional under the NWPR due to inundation by flooding in a typical year (for example, some oxbow lakes) may be jurisdictional under the proposed rule where they meet either the relatively permanent or significant nexus standard. The agencies are soliciting comment on how to implement the (a)(3) category.

I.C.3.9 Waters Excluded from the Definition of "Waters of the United States"

The NWPR explicitly excluded waters that were not otherwise included in the definition of "waters of the United States." The proposal returns to the pre-2015 regulatory regime's approach of two codified exclusions for waste treatment systems and prior converted cropland and an interpretation that a list of waters are "generally non-jurisdictional," and takes comments on alternative approaches. This section addresses potential effects of the proposed approach relative to the NWPR's exclusions. Where the agencies assumed no changes or limited changes when comparing the exclusions identified in paragraph (b) of the NWPR and those waters excluded or generally considered non-jurisdiction under the proposed rule, there is no further discussion. For example, many of the water features that are generally not considered "waters of the United States" under the proposed rule would not be included in the NWPR's definition of "waters of the United States" and therefore would be excluded under paragraph (b)(1) of the NWPR definition. In addition, groundwater, including groundwater drained through subsurface drainage

systems, and diffuse stormwater run-off and directional sheet flow over upland are not considered "waters of the United States" under the proposed rule, and are explicitly excluded under the NWPR.

The agencies are unable to query ORM2 to determine how many waters have been determined to meet an exclusion from the definition of "waters of the United States" under the pre-2015 regulatory regime and are unable to quantify the magnitude of the changes in jurisdiction due to some of these exclusions. Therefore, the following section is a qualitative discussion.

Prior Converted Cropland

The NWPR provided a regulatory definition of prior converted cropland for purposes of the Clean Water Act for the first time. Generally, the NWPR's approach to prior converted cropland substantially broadened the scope of prior converted cropland and reduced the likelihood that it would ever lose its excluded status. The NWPR provided that an area remains prior converted cropland for purposes of the Clean Water Act unless the area is abandoned and has reverted to wetlands, defining abandonment to occur when prior converted cropland "is not used for, or in support of, agricultural purposes at least once in the immediately preceding five years." 85 FR at 22339; 33 CFR 328.3(c)(9). The NWPR then presented a broad interpretation of "agricultural purposes," including but not limited to crop production, haying, grazing, idling land for conservation uses (such as habitat; pollinator and wildlife management; and water storage, supply, and flood management); irrigation tailwater storage; crawfish farming; cranberry bogs; nutrient retention; and idling land for soil recovery following natural disasters such as hurricanes and drought. 85 FR at 22321.Given the breadth of "agricultural purposes" under the NWPR, former cropland that reverts to wetlands otherwise meeting the definition of "waters of the United States" could maintain its excluded prior converted cropland status simply by, for example, being grazed or idled for habitat conservation once in five years. These wetlands could then be filled without triggering any Clean Water Act regulatory protection.

The NWPR's definition of prior converted cropland extends the Clean Water Act exclusion beyond those areas that the United States Department of Agriculture (USDA) considers prior converted cropland under the Food Security Act. Specifically, while USDA's implementation of prior converted cropland requires production of an "agricultural commodity," the NWPR defined prior converted cropland to encompass any area used to produce an "agricultural product," a term that introduced ambiguity and further distinguished the Clean Water Act's prior converted cropland exclusion from USDA's approach. *Compare* 7 CFR 12.33(b) *with* 33 CFR 328.3(c)(9). The NWPR's definition provided that the agencies would recognize prior converted cropland designations made by USDA, 33 CFR 328.3(c)(9), but the list of examples that the NWPR provides for "agricultural product" suggests the term is substantially broader than the USDA's requirement for land used for "commodity crops."

The proposed rule would restore the original scope of the Clean Water Act exclusion for prior converted cropland articulated in the 1993 preamble. The proposal would align the exclusion with the purpose of the Clean Water Act, by clarifying that the exclusion is limited to significantly degraded waters that no longer perform the functions of the waters in their natural condition. *See id*. at 45032. The 1993 preamble states clearly that although EPA cannot "delegate" Clean Water Act responsibility to USDA, "recognizing [NRCS]'s expertise in making these [prior converted] cropland determinations, we will continue to rely generally on determinations made by [NRCS]." 58 FR 45033. Consistent with longstanding practice prior to 2020, the agencies' proposed re-adoption of the 1993 rule maintains the pre-NWPR approach, which

ensures USDA retains its primary role in identifying prior converted cropland. A landowner may demonstrate that a water retains its prior converted cropland status through a USDA prior converted cropland certification.

The agencies anticipate that fewer waters would be excluded as prior converted cropland under the proposed rule's reinstatement of 1993 language, compared to under the NWPR. However, the agencies are unable to quantify the change. Not all prior converted cropland that has been officially designated by U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) has been mapped throughout the country. In addition, not all land that qualifies under the Food Security Act of 1985 as prior converted cropland has been officially designated as such. Further, NRCS is statutorily prohibited from sharing data and information on program participants and their land, even with other federal agencies.[16] Therefore, NRCS data were not available for the agencies to identify potential effects or changes in jurisdiction. Although estimates of the acreage of prior converted croplands have been made in the past (*e.g.*, 53 million acres[17]), the agencies could not leverage this information in this analysis. In addition, the Corps does not document in ORM2 when waters met the prior converted cropland exclusion under the pre-2015 regulatory regime, and one year of NWPR data is not sufficient to surmise how the NWPR's definition of prior converted cropland would be implemented. No agency data exist to provide estimates on the current extent of prior converted cropland or the comparable applicability between pre-2015 regulatory regime (that the proposed rule will restore) and under the secondary baseline of the NWPR.

Waste Treatment Systems

Under the NWPR, the agencies retained the pre-2015 exclusion for waste treatment systems, but defined the term for the first time to include all components, including lagoons and treatment ponds (such as settling or cooling ponds), designed to either convey or retain, concentrate, settle, reduce, or remove pollutants, either actively or passively, from wastewater prior to discharge (or eliminating any such discharge). The agencies propose to retain the waste treatment exclusion, with minor text edits to correct outdated cross-refences, but also do not intend for these clerical corrections to change the application of the waste treatment exclusion as compared to pre-2015 practice. Thus, the agencies do not anticipate a substantial change pre-2015 regulatory regime for waste treatment systems under the proposed rule as compared to the secondary baseline of the NWPR but note that if a system were located on a water whose jurisdictional status changes under the NWPR, the application of the exclusion would have likewise changed. It is anticipated that the proposed rule which returns to prior language with minor clerical

[16] Section 1619 of the Food, Conservation, and Energy Act of 2008 prohibits USDA, its contractors, and cooperators, from disclosing information provided by an agricultural producer or owner of agricultural land concerning the agricultural operation, farming or conservation practices, or the land itself, in order to participate in a USDA program, as well as geospatial information maintained by USDA with respect to such agricultural land or operations, subject to certain exceptions and authorized disclosures. Covered information may only be shared with other federal agencies outside USDA for specific purposes under a cooperative program, *i.e.*, not for general regulatory or enforcement purposes. *Available at* https://www.agriculture.senate.gov/imo/media/doc/110-246%20-%20Food,%20Conservation,%20And%20Energy%20Act%20Of%202008.pdf.

[17] *See* the 1993 White House report entitled, "Protecting America's Wetlands: A Fair, Flexible, and Effective Approach."

corrections would not create a substantial difference in jurisdictional status for waste treatment systems. The agencies are unable to quantify this change.

Ephemeral Features, Including Ephemeral Streams

The NWPR excluded ephemeral features, including ephemeral streams, swales, gullies, rills, and pools, from the definition of "waters of the United States." As previously discussed, the exclusion for all ephemeral features in NWPR is not retained in the proposed rule. For example, the proposed rule would include those ephemeral streams, lakes, and ponds that meet the significant nexus standard. Consistent with pre-2015 practice, features like non-wetland swales, gullies,[18] and rills would generally be considered non-jurisdictional under the proposed rule because they are not tributaries or because they do not have a significant nexus to a downstream TNW, interstate water, or territorial sea.

Ditches

Under the NWPR, all ditches that were not subject to jurisdiction as a territorial sea, TNW, or tributary, as well as those portions of ditches that were constructed in an adjacent wetland that did not satisfy the conditions of the "adjacent wetlands" definition were excluded. Some of the ditches excluded under the NWPR would generally be considered non-jurisdictional under the proposed rule, such as ditches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water. In addition, non-relatively permanent ditches that are not "upland ditches" and that lack a case-specific significant nexus would also be non-jurisdictional under the proposed rule. Thus, ditches that would be non-jurisdictional under the proposed rule would not represent a change from the ditch exclusion in the NWPR. However, other ditches that were excluded under the NWPR may be jurisdictional under the proposed rule if they cross state lines regardless of any connection to a TNW, are relatively permanent waters, or are non-relatively permanent ditches that are not excavated wholly in and draining only uplands with a case-specific significant nexus to a TNW, interstate water, or territorial sea.

Certain Other Features

The preamble to the 1986 regulations explains that the agencies generally do not assert jurisdiction over "certain other features" including: artificially irrigated areas which would revert to upland if the irrigation ceased; artificial lakes or ponds created by excavating and/or diking dry land to collect and retain water and which are used exclusively for such purposes as stock watering, irrigation, settling basins, or rice growing; artificial reflecting or swimming pools or other small ornamental bodies of water created by excavating and/or diking dry land to retain water for primarily aesthetic reasons; and waterfilled depressions created in dry land incidental to construction activity and pits excavated in dry land for the purpose of obtaining fill, sand, or gravel unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of "waters of the United States." 51 FR 41217. In the *Rapanos* Guidance, the agencies added an additional category to this list, explaining that "[s]wales or erosional features (*e.g.*, gullies, small washes characterized by low volume, infrequent, or

[18] Some ephemeral streams are colloquially called "gullies." Regardless of the name they are given locally, some such ephemeral streams could be found jurisdictional under the proposed rule if they cross state lines regardless of any connection to a TNW or if they satisfy a significant nexus evaluation.

short duration flow) are generally not waters of the United States." *Rapanos* Guidance at 11-12. The proposed rule would re-implement these practices.

The NWPR excluded "artificially irrigated areas, artificial lakes and ponds, and water filled depressions," which included fields flooded for agricultural production, that would revert to upland should application of irrigation water to that area cease. The text of the exclusion changed somewhat from the 1986 and 1988 preamble language used under the proposed rule by adding "including fields flooded for agricultural production" and with a slight modification from "if the irrigation ceased" to "should application of irrigation water to that area cease," but the agencies anticipate that there would be little to no change in scope of jurisdiction for all of the features associated with these waters.

The NWPR excluded artificial lakes and ponds, including water storage reservoirs and farm, irrigation, stock watering, and log cleaning ponds, constructed or excavated in upland or in non-jurisdictional waters, so long as those artificial lakes and ponds were not impoundments of jurisdictional waters that met the conditions of the "lakes and ponds, and impoundments of jurisdictional waters" definition in the rule. The NWPR's exclusion differs from the scope of waters that would generally be considered non-jurisdictional in a few ways, including by identifying water storage reservoirs, farm ponds, and log cleaning ponds as excluded types of artificial lakes and ponds, and not specifically including settling basins or artificial lakes and ponds used for rice growing in this category of exclusions. The agencies are unable to quantify this change.

In the proposed rule, the exclusion of artificial lakes and ponds would be limited to those excavated fully in uplands, whereas the NWPR allowed artificial lakes and ponds constructed or excavated in non-jurisdictional waters to be excluded. Artificial ponds and lakes constructed or excavated in newly non-jurisdictional waters (waters that were found to be jurisdictional prior to the NWPR) were excluded under the NWPR. For example, under the NWPR an artificial pond could be constructed by impounding an ephemeral stream, but such a pond would be jurisdictional under the proposed rule as an impoundment if the ephemeral stream met the significant nexus standard to be jurisdictional. Therefore, some water features could have been excluded under the NWPR that theoretically could be considered jurisdictional under the proposed rule for this category. The agencies are unable to quantify this change.

The NWPR's exclusion for water-filled depressions constructed or excavated in upland or in non-jurisdictional waters incidental to mining or construction activity, and pits excavated in upland or in non-jurisdictional waters for the purpose of obtaining fill, sand, or gravel differs from the scope of waters generally not jurisdictional under the proposed rule. The 1986 and 1988 preamble language included additional specifications that such waters are generally non-jurisdictional unless and until the construction or excavation operation is abandoned and the resulting body of water meets the definition of "waters of the United States." Although not included in the regulatory text, in the preamble to the NWPR the agencies clarified that once a feature subject to this exclusion is no longer used for its original purpose, it no longer qualifies for the exclusion. Thus, similar to artificial lakes and ponds, water-filled depressions and pits that met the terms of the exclusion that were constructed or excavated in newly non-jurisdictional waters were non-jurisdictional under the NWPR. The agencies are unable to quantify this change, if any.

Stormwater Control Features

The NWPR excluded stormwater control features constructed in upland or in non-jurisdictional waters that convey, treat, infiltrate, or store stormwater run-off. Similar to some of the other exclusions, stormwater control features that met the terms of the exclusion and were constructed in newly non-jurisdictional waters were non-jurisdictional under the NWPR. There is no such exclusion for stormwater control features under the proposed rule and such waters were not listed as generally non-jurisdictional under the 1986 and 1988 preamble language, though some stormwater features would be non-jurisdictional under the proposed rule. The agencies are unable to quantify this change.

Groundwater Recharge, Water Reuse, and Wastewater Recycling Structures

The NWPR excluded groundwater recharge, water reuse, and wastewater recycling structures, including detention, retention, and infiltration basins and ponds, constructed or excavated in upland or in non-jurisdictional waters. Similar to some of the other exclusions, structures that met the terms of the exclusion that were constructed in newly non-jurisdictional waters were non-jurisdictional under the NWPR. The 1986 and 1988 preamble language utilized under the proposed rule does not include a similar category of waters generally considered non-jurisdictional. Such waters were likely not considered jurisdictional under the prior practice unless they were connected to the tributary network or were jurisdictional impoundments, and even then, some such waters could be considered excluded under the exclusion for waste treatment systems. Under the proposed rule, there is the potential for such waters to be jurisdictional if they meet either the relatively permanent or significant nexus standard and do not fall under the waste treatment exclusion. The agencies are unable to quantify this change.

I.C.3.10 Assessing the Change in Scope of Jurisdiction with the Cowardin Classification

The EA for the NWPR included national quantitative analyses and three in-depth case studies. These efforts demonstrated the difficulty of comparing different jurisdictional regimes and quantifying the environmental and economic effects. However, despite these challenges, the agencies recognize the value of quantitative comparisons analyses to the extent possible.

Under the 2015 Clean Water Rule (CWR), a comparison of scope of jurisdiction from baseline to the new rule was carried out by forecasting the change in jurisdictional scope through analysis of prior jurisdictional determinations. Specific regulatory definitions were assessed in one of two ways: (1) Does the regulatory definition translate equally between rules? For example, the definition of Traditional Navigable Waters has been generally comparable between rules, and therefore it has been assumed that such resources would largely remain jurisdictional regardless of rule. [19] (2) If the regulatory definition does not translate equally between rules, what do the agencies forecast the change in jurisdictional scope to be?

Because the NWPR had been in place for just over a year before its vacatur, [20] and the agencies are proposing to largely return to their pre-2015 regulatory regime, one might think that carrying out a similar

[19] The NWPR did allow for most exclusions to apply to TNWs, which is a change from longstanding practice. The agencies are returning to the prior practice that would not allow exclusions to apply to TNWs. Thus, there were potentially some TNWs excluded under the NWPR that would be jurisdictional under both pre-2015 practice and the proposed rule.

[20] The NWPR was subject to preliminary injunction by the U.S. District Court for the District of Colorado and thus the agencies did not implement the NWPR in jurisdictions subject to the court's jurisdiction until April 2021.

review of change in jurisdictional scope would be straightforward. However, the definitions under the NWPR were significantly different from those in the pre-2015 regulatory regime and the proposed rule, and information collected in jurisdictional determinations under the NWPR was far less detailed. Assessing the jurisdictional scope of individual aquatic resources would be more subjective than similar prior assessments have been. Appendix A outlines proposed protocols that could be used to carry out a similar assessment while minimizing subjectivity. The agencies seek comment on these protocols and on the overall benefit of carrying out such an assessment.

An alternative method for assessing the change in scope of jurisdiction has been used in this economic analysis. This method relies on a field within the ORM2 database which has remained unchanged since 2010, the Cowardin code, which is associated with individual aquatic resources categorized by hydromorphic characteristics, such as palustrine features (*e.g.*, wetlands and ponds), lacustrine features (*e.g.*, lakes), and riverine features (*e.g.*, streams and rivers). As this field has remained unchanged regardless of definitional changes, the probability of jurisdictional findings under given rules can be related to specific resource types as defined by the Cowardin classification system (Cowardin et al., 1979). While data within ORM2 is imperfect in nature, the agencies consider this method of assessing potential changes in the scope of jurisdiction is reliable. This method is described in detail in Chapter III and in Appendix B. The agencies are seeking comment on this method.

I.C.4 Summary

As discussed in this chapter, the agencies' ability to make quantitative estimates of changes in CWA jurisdiction under the proposed rule relative to the NWPR (secondary baseline) is limited by available data and the case-by-case consideration of jurisdiction for certain waters that would be required under the proposed rule. That said, in reviewing the first year of implementation of the NWPR, the agencies have ORM2 data that demonstrate the magnitude of the effects of the deregulatory scope of the NWPR, and analyses show ephemeral streams and wetlands to be much more affected than estimated in the analysis of the NWPR in the NWPR's Economic Analysis (U.S. EPA and Department of the Army, 2020b). Additionally, protocols for carrying out a more detailed assessment by regulatory category are presented in Appendix A. An alternative method for assessing change in scope under the proposed rule is used in this analysis. They are presented in **Chapter II**I and in Appendix B.

No ephemeral streams were jurisdictional under the NWPR, whereas those that satisfy the significant nexus standard would be jurisdictional under the proposed rule. Similarly, certain wetlands that would be found jurisdictional under the proposed rule would not have been jurisdictional under the NWPR. This includes certain wetlands that would be jurisdictional under the proposed rule as adjacent but that did not meet the requirements to be adjacent under the NWPR definition, and wetlands adjacent to those ephemeral streams that would be considered jurisdictional under the proposed rule. Some additional streams that were not jurisdictional under the NWPR would be jurisdictional under the proposed rule where they meet either the relatively permanent or significant nexus standard, if such streams do not contribute surface water flow to a territorial sea or TNW in a typical year (*e.g.*, an intermittent or perennial stream that eventually dissipates on the desert floor with surface flow reaching a downstream jurisdictional water only in atypical years), as the NWPR required. In addition, there could be a subset of interstate waters that would be categorically jurisdictional under the proposed rule that may not have been jurisdictional under the NWPR due to the elimination of interstate waters as a standalone category of jurisdictional waters. The proposed rule would not affect the scope of jurisdictional territorial seas or

TNWs nor would it substantially affect the jurisdictional status of most perennial and many intermittent streams relative to the baseline. The proposed rule could result in an increase in jurisdictional lakes and ponds and impoundments in comparison to the NWPR.

II. State and Tribal Regulatory Practice

The CWA programs outlined in this chapter, including the CWA section 303 water quality standards program, the CWA section 311 Oil Spill Prevention program, the section 401 water quality certification program, the CWA section 402 NPDES permit program, and the CWA section 404 permit program for the discharge of dredged or fill material, rely on the definition of "waters of the United States" for program implementation. A revised definition of "waters of the United States" would affect these federal programs as implemented at the state or tribal level. Potential effects of this rule, however, will vary based on a state's independent legal authority and programs under its own state law to regulate aquatic resources. For this analysis, the agencies focus on state regulatory practice as no tribe administers the CWA section 402 or 404 permit programs, and the majority of tribes do not have approved water quality standards or issue CWA section 401 water quality certifications. [21]

States implementing CWA programs — TMDLs, impaired waters, delegated NPDES programs, assumed dredged and fill programs — would need to regulate discharges into all waters that the proposed rule would define as jurisdictional. For those states that did not regulate more broadly than the NWPR, the broader scope of jurisdiction under the proposed rule would represent a change. Programs in states that are typically implemented by the federal government (311 oil spill programs and 404 permitting programs) or triggered by federal permits (state wetlands programs relying on section 401 certification) are affected by the definition of waters of the United States. State regulatory programs operating under state law are independent of CWA jurisdictional issues, and under all definitions of waters of the United States, they may be broader or more limited in scope than the applicable definition.

The Army Corps of Engineers regulates the discharge of dredged or fill material into all waters of the United States in forty-seven states. Permitting for this program is affected by the terms of federal jurisdiction. Before 2015 only 2 states had authorized CWA dredged and fill permitting programs. However, most states had some form of state program implemented under state authorities. Most of these programs were not comprehensive. They regulated only some of the waters also regulated by the Army

[21] This analysis does not consider how the 574 federally recognized tribes might respond to a change in CWA jurisdiction, nor does it include tribes in its calculations of costs and benefits. Currently, 62 tribes have been found eligible to administer a CWA section 303(c) water quality standards program, and the EPA has approved water quality standards (WQS) for 45 of these tribes. The EPA has promulgated federal water quality standards for one additional tribe, and a few tribes have water quality standards that are not current federally approved. Sixty-one tribes have the authority to administer a CWA section 401 water quality certification program. Many tribes may lack the capacity to administer a water quality standards program or a certification program. Other tribes may rely on the federal government for enforcement of water quality standards, particularly for enforcement of non-tribal members. Currently, no tribes have obtained treatment in a manner similar to a state (TAS) status to administer either the CWA section 402 or 404 programs. The agencies (or with a few exceptions for CWA section 402, the state) generally issue CWA sections 402 and 404 permits on tribal lands. A few tribes have some type of permitting program for discharges of dredged or fill material into "waters of the tribe." Many tribes may lack the capacity to administer either the CWA section 402 or the 404 programs, to create permitting programs for discharges, or to expand permitting programs that currently exist. Further, some tribes have stated during tribal consultation and engagement on the proposed rule that they are not interested in seeking TAS for CWA programs like water quality standards and CWA sections 402 and 404 if the federal government reduces the scope of the CWA jurisdiction. In addition, this economic analysis does not account for potential effects related to subsistence fishing, rice growing, or cultural uses of water that are unique to tribes and their reliance on waters that will no longer be considered jurisdictional under the final rule. This analysis also does not account for which tribes regulate waters more broadly than the CWA or have legal frameworks that permit them to regulate "waters of the tribe" more broadly.

Corps of Engineers, and in some cases specifically addressed waters that were not federally jurisdictional under pre-2015 practice. For the NWPR economic analysis, the agencies assessed which states had regulatory practices in place which were broader than the pre-2015 regulatory regime. For this EA, the agencies have assessed which states made changes to their regulatory practice in relation to 404 permitting while the NWPR was being implemented. This includes changes to surface water protections and water quality protections. This document reflects an update to the prior assessment on scope of state jurisdiction carried out for the NWPR EA, based on changes that states made while the NWPR was being implemented.

In the NWPR Economic Analysis, potential state responses to that rule were predicted through a number of scenarios because the deregulatory nature of the rule meant that in many cases states would have the choice of whether to continue to regulate at pre-NWPR levels, to allow the less comprehensive NWPR levels to take effect, or to regulate at an intermediate level.[22] The vacatur of the NWPR and corresponding federal implementation of the pre-2015 regulatory regime has a less clear effect on state regulators. Under the baseline of pre-2015 practice, there would be relatively minimal effects on states were the proposed rule to be finalized. Most states developed their regulatory programs under pre-2015 practice (in many cases even before guidance reflecting Supreme Court decisions). Under the secondary baseline of change from practice under the NWPR, states would not have the same choice as that identified in the NWPR EA. Rather, states that protected fewer waters as a result of NWPR would need to comply with the scope of protections proposed here. States that already regulate at or above the scope specified in this proposed rule would not have waters that are affected by this proposed rule. For this secondary baseline analysis, the agencies have attempted to identify which states already regulate as broadly as intended by this rule because those states will not experience benefits or costs from the rule.

The purpose of this chapter is to summarize the current status of CWA programs in the states based on the agencies' current understanding and to describe how that information is used to characterize the states' current regulated waters of the state under the secondary baseline of the NWPR compared to the level of jurisdiction proposed by this rule. The agencies recognize that the federal and state laws and programs can overlap, and some states have more stringent requirements than the federal regulations. The way in which these programs are administered and affect sources of water pollution will depend on the requirements or permits issued. The agencies seek comment on the accuracy of assumptions for given states and tribes outlined here.

II.A "Waters of the State"

Each state has its own definition of "waters of the state," and many states define similar types of areas and aquatic resources as "waters of the state." A few states also reference "waters of the United States" within their definitions of "waters of the state." All state definitions are more inclusive than past and current definitions of "waters of the United States" in at least some way. Most state definitions also include some combination of groundwater and artificial waters. Some states do not regulate all waters within the scope

[22] Some states have laws restricting them to regulate waters no more broadly than the federal levels. These states would not have a choice to maintain pre-NWPR regulatory levels without changing state laws. These state laws do not apply in the scenario of the proposed rule being applied, as it is a return to the status quo. States have always been required to meet federal requirements in their delegated or assumed programs and have always had the option prior to be more protective than the CWA requirements. As has always been the case, state programs that rely solely on state authorities may apply to some, all, or no waters also covered by CWA programs.

of their definition of "waters of the state," often including exemptions in their regulations for certain types of "waters of the state," for certain industries, or for certain types of permits. Effectively, about half of the states regulate at least some surface waters beyond the scope of federal CWA requirements.

All states have a definition of "wetlands" in their state laws and regulations. While these definitions also vary widely in exact language, they all either recite, reference, incorporate, or outline similar factors as the federal regulatory definition of "wetlands." Some are more inclusive than the federal regulatory definition, while others incorporate the exact federal factors of a wetland. Many states have different wetland definitions for tidal, nontidal, coastal, and freshwater wetlands. Isolated waters are rarely explicitly included under these definitions, but at least 26 states have programs to cover all or some isolated waters, including wetlands.[23] The agencies do not have sufficient information at this time to conclude that those 26 states are the only states that cover some or all isolated waters.

II.B State Regulatory Practice

As a result of the NWPR, discharges into many waters previously regulated by the federal government were left to state governments to address. The economic analysis for the final NWPR had to consider environmental federalism in a detailed manner due to the de-regulatory nature of the rule (U.S. EPA and Department of the Army, 2020b). The economic analysis for this proposed rule returns to a traditional approach whereby states that must expand their regulatory coverage are assumed to realize benefits and costs from rules, while states that currently regulate at or above the levels proposed by this rule would not be affected by this rule and therefore are not assumed to realize benefits and costs.

During NWPR development, the agencies compiled information on state wetland and surface water programs and regulations to describe the breadth of state authorities and to provide a current picture of federal and state regulatory management of aquatic resources. Information was drawn from multiple state and federal sources, as well as from previous analyses undertaken by independent associations and institutions, including an Environmental Law Institute (ELI) report that "examines [the] limitations imposed by state law that could constrain the ability of state agencies" to regulate water resources in the absence of CWA regulation (ELI, 2013).[24] The agencies recognize that these summaries do not necessarily capture all the complexities of state programs.[25] Definitions for state and territorial waters, including wetlands, were drawn from online directories of regulatory titles and codes, therefore pulled directly from state laws. Information on state and territorial water laws and programs was found through state and territorial agency websites, and information on the various CWA programmatic areas (CWA sections 303, 311, 401, 402, and 404) was drawn from EPA and Corps websites, numerous publications, maps, and from EPA regional staff. Corrections were made based on input from state and territorial

[23] This count includes the twenty-five states that regulate the discharge of dredged and fill activities in isolated waters and one additional state (Hawaii) that regulates point source discharges to isolated wetlands.

[24] ELI (2013), State Constraints: State-Imposed Limitations on the Authority of Agencies to Regulate Waters Beyond the Scope of the Federal Clean Water Act, available at https://www.eli.org/sites/default/files/eli-pubs/d23-04.pdf. *See* Appendix I of the ELI report.

[25] While the ELI report is a readily available summary of potential limitations imposed by state law that could constrain states to regulate waters in the absence of federal regulation, there is disagreement about the reliability of their findings. Some commenters on the then-proposed 2015 Rule identified shortcomings and inaccuracies of the analysis and results that may limit the degree to which the agencies can rely upon it.

agencies during the NWPR rulemaking process, resulting in the State Snapshots appendix within the Resource Programmatic Assessment (RPA) for the NWPR.[26] Following the June 9, 2021 declaration that the agencies intended to revise the definition of "waters of the United States," the agencies updated the State Snapshots for this secondary baseline analysis. These updates followed the same logistical pathway as prior efforts, but with a focus on what has changed in the time since the State Snapshots were created. The Updated State Snapshots are provided as supplementary material to this EA titled "Compendium of State and Tribal Regulatory Practice" and are available on the EPA website and in the docket for the proposed rule.[27]

II.B.1 Regulation of Dredge and Fill Material

Twenty-three states regulate waters of the state that would not be subject to federal regulation under the proposed rule (Table).[28] These states either explicitly cover non-federally jurisdictional waters in the text of their regulations or applied their broad regulatory authority in a way that would also capture some waters that were no longer considered "waters of the United States."[29] The updated snapshots reviewed changes that occurred to regulatory practice while the NWPR was in place. Perhaps predictably, such changes were related to the scope of state regulatory programs before the NWPR. At least 11 states made changes to regulatory practice that have either been implemented or will be implemented to alter the regulatory scope of their programs following promulgation of the NWPR. Many of the states that strengthened protections already regulated waters more broadly than the proposed rule would require prior to the NWPR. Similarly, many of the states that weakened protections were already not regulating waters more broadly than the CWA required before the NWPR (Updated States Snapshot).

The agencies are aware that many state dredged and fill programs were designed to complement rather than replace federal permitting programs implemented by the Army Corps of Engineers. As a result, even states with programs designed to address waters that are not federally jurisdictional may not have comprehensive programs that capture all waters regulated under the federal 404 regulatory program implemented by the Army Corps of Engineers. For purposes of the economic analysis, however, the agencies feel it is accurate to represent that states that regulated more broadly than the scope set by the pre-2015 regulatory regime will not experience benefits nor costs as a result of a change in baseline from the NWPR to pre-2015 regulatory practice.

[26] U.S. EPA and Department of the Army. 2020. Resource Programmatic Assessment for the Navigable Waters Protection Rule. Available at https://www.epa.gov/sites/default/files/2020-01/documents/rpa_-_nwpr_.pdf

[27] U.S. EPA and Department of the Army, 2021. Compendium of State and Tribal Regulatory Practice, Docket Number EPA-HQ-OW-2021-0602.

[28] These numbers were compiled from research that was primarily conducted prior to 2015. While some states clearly regulate at least some waters more broadly than baseline set by the pre-2015 regulatory regime, the agencies cannot at this time determine whether all states that regulated beyond that baseline would also regulate beyond the scope of the proposed rule (which would restore the pre-2015 regulatory regime). It is assumed that if they regulate beyond *Rapanos* Guidance practice, they also regulate beyond the scope of the NWPR Additionally, these values have been updated based on changes to regulatory practice which occurred since the NWPR was promulgated.

[29] These states have been determined by the agencies to regulate beyond the scope of the pre-2015 regulatory regime based on the findings of studies mentioned in the economic analysis prepared in support of the 2019 Rule, the NWPR, and this analysis. For more information regarding the sources these findings were based on, *see* the Updated State Snapshots.

Following promulgation of the NWPR, some states, in particular Indiana and Ohio, reduced protections for aquatic resources. This alters the prior conceived rating of those states under the NWPR assessment. These two states now appear to regulate aquatic resources less broadly than the proposed rule would require and would experience benefits and costs. While some states have made substantial changes to establish or expand state programs to regulate waters no longer addressed under the NWPR, the agencies do not think these additional protections constitute changes that are substantial enough to define their regulatory practice as being broader than the proposed rule would require. For purposes of this analysis these states are considered to also receive benefits and costs from implementation of the proposed rule. Thus for purposes of this analysis, Indiana and Ohio, along with the 27 other states (and the District of Columbia) that do not regulate waters more broadly than the proposed rule, would receive benefits and costs from implementation of the proposed rule.

II.B.2 Surface Water Discharge Permitting

Twenty-one states regulate surface water discharges in waters of the state that were not subject to federal regulation under the secondary baseline of the NWPR (Table II-1).[30] These states either explicitly cover non-federally jurisdictional waters in the text of their regulations or apply their broad regulatory authority in a way that also captures some waters that would not have been considered "waters of the United States" under pre-2015 regulatory regime or the proposed rule.[31] These 21 states include states which made substantial changes to regulatory practice since the NWPR was promulgated. This included changes to regulatory practice relating to water quality protections, such as changes to standards for issuing section 401 certification or issuing orders to applicants to cover gap waters that would otherwise occur as part of section 401 certification. At least 14 states made changes to regulatory practice that are being implemented or will be implemented in a way that would expand the scope of surface water discharge permitting (including changing the regulatory scope for waters of the state). The NWPR economic analysis assumed that Indiana and Ohio would continue to regulate more broadly than the NWPR; however, as discussed above, they de-regulated certain waters since the NWPR was promulgated. These states, along with 29 other states (and the District of Columbia) that do not regulate waters more broadly than the proposed rule, would receive benefits and costs from implementation of the proposed rule.

II.C Incorporation of State Regulations in Economic Analysis

Many states already exceed the aquatic resource or surface water discharge protections of the proposed rule. For purposes of this analysis, these states are assumed to experience no change in environmental benefits or compliance costs under the proposed rule because the proposed rule represents a "return" to the status quo for these states. In short, if there are no changes to programs that are already broadly covering aquatic resource protections, then there would be no new benefits and costs that can accrue.

[30] These numbers were compiled from research that was primarily conducted prior to 2015. These states were determined to regulate at least some waters more broadly than the CWA, including the regulation of surface water discharges. States without authorization for state NPDES programs were assumed to regulate less broadly. Values have been updated based on changes to regulatory practice which occurred since the NWPR was promulgated.

[31] These states have been determined by the agencies to regulate beyond the scope of jurisdiction under the pre-2015 regulatory regime based on the findings of studies mentioned in the economic analysis prepared in support of the 2019 Rule, the NWPR and this analysis. For more information regarding the sources these findings were based on, *see* the Updated State Snapshots in U.S. EPA and Department of the Army, 2021. Compendium of State and Tribal Regulatory Practice, Docket Number EPA-HQ-OW-2021-0602.

Those states in Table II-1 that are denoted as having broader protections than the proposed rule would require would have zero costs and benefits applied within the economic analysis. Conversely, the return to status quo from the secondary baseline of the NWPR for states with less stringent protections for their waters in comparison to the proposed rule would have environmental benefits and compliance costs associated with this proposed action. Those states in Table that are denoted as not having broader protections than the proposed rule would require will have full benefits and costs applied within this economic analysis. The agencies seek comment on these assumptions.

Table reports the information described above for each state relative to the secondary baseline of the NWPR, with 'Yes' indicating zero costs and benefits associated with the given state being applied within the benefits and cost calculations and 'No' indicating full benefits and costs are included within the calculations for the given state.

Table II-1: States' regulatory protections under the proposed rule

State	Regulates waters more broadly than the proposed rule requires	
	404 Program	Surface Waters
Alabama	No	No
Alaska	No	No
Arizona	No	No
Arkansas	No	No
California	Yes	Yes
Colorado	No	No
Connecticut	Yes	Yes
Delaware	No	No
District of Columbia	No	No
Florida	Yes	Yes
Georgia	No	No
Hawaii	No	No
Idaho	No	No
Illinois	Yes	Yes
Indiana	No	No
Iowa	No	No
Kansas	No	No
Kentucky	No	No
Louisiana	No	No
Maine	Yes	Yes
Maryland	Yes	Yes
Massachusetts	Yes	No
Michigan	Yes	Yes
Minnesota	Yes	Yes
Mississippi	No	No
Missouri	No	No
Montana	No	No
Nebraska	No	No
Nevada	No	No
New Hampshire	Yes	No
New Jersey	Yes	Yes
New Mexico	No	No
New York	Yes	Yes

Table II-1: States' regulatory protections under the proposed rule		
State	Regulates waters more broadly than the proposed rule requires	
	404 Program	Surface Waters
North Carolina	Yes	Yes
North Dakota	No	No
Ohio	No	No
Oklahoma	No	No
Oregon	Yes	Yes
Pennsylvania	Yes	Yes
Rhode Island	Yes	Yes
South Carolina	No	No
South Dakota	No	No
Tennessee	Yes	Yes
Texas	No	No
Utah	No	No
Vermont	Yes	Yes
Virginia	Yes	Yes
Washington	Yes	Yes
West Virginia	Yes	Yes
Wisconsin	Yes	Yes
Wyoming	Yes	Yes

III. Analysis of the Impacts of CWA Jurisdictional Changes from the Secondary Baseline (NWPR) to Proposed Rule

This portion of the economic analysis focuses on the impacts of the proposed rule on major programs under sections 311, 402, and 404 of the CWA, relative to the secondary baseline of the NWPR. The level of detail and scope of the analyses depend on the data available to quantify effects. For the CWA sections 311 and 402 programs, the agencies conducted a qualitative analysis of the impacts to assess the direction and potential magnitude of changes but did not quantify those effects due to data limitations and expectations that these impacts would be small. For the CWA section 404 program, the agencies quantified the costs and benefits of the proposed rule relative to the secondary baseline at the national level based on an assessment of permits and other data. Nationally the proposed CWA jurisdictional changes relative to the secondary baseline are estimated to result in benefits between $375.8 and $590.1 million and total social costs ranging from $108.6 million to $275.9 million using a 3 percent discount rate. Total social costs include cost of compliance (404 permitting and mitigation costs) and state costs from an increased section 401 reviews. The agencies note that benefit estimates do not fully account for all benefits, such as the water quality benefits associated with stream mitigation and benefits associated with upstream and downstream connectivity of wetlands that may expand beyond the boundary the states that can be substantial.

This chapter focuses on the potential effects associated with the change from the secondary baseline of the NWPR to the proposed rule implementing the *Rapanos* Guidance on the definition of "waters of the United States." The first three sections describe the potential effects on the CWA section 311, section 402, and section 404 programs, respectively. The fourth section covers other CWA programs.

For the NWPR economic analyses the agencies conducted case studies analyses in three selected geographical areas evaluating the potential effects of the revised definition of "waters of the United States," on the CWA programs. The purpose of the case studies was to evaluate a range of scenarios that illustrate the potential outcomes from the revised definition of "waters of the United States" rather than develop conclusive quantitative estimates of the economic and environmental outcomes of the final rule. The case studies allowed for a more in-depth look at regulated activity within the case study areas and to use more data intensive models for predicting the effects of regulatory changes. The agencies are considering performing a set of case studies for the final rule economic analysis using similar approach to what was done for the NWPR analysis. See Section III.B in the NWPR economic analysis (U.S. EPA and Department of the Army, 2020b), for a more complete discussion of the case study methodology. The agencies are seeking comments on the usefulness of the case study analyses and if they should be done for the final rule economic analysis.

The agencies anticipate that the impacts of the proposed rule may be most important for the section 404 program. Accordingly, the agencies estimated changes in required wetland mitigation areas and the associated benefits and costs. The impacts of the proposed rule relative to the secondary baseline on other CWA programs are anticipated to be small and are discussed qualitatively.

III.A CWA Section 311: Oil Spill Prevention, Preparedness, Reporting and Response

CWA section 311 addresses the risk and harm from oil spills to waters of the United States through two main program components:

- **Spill prevention and preparedness**, which has been addressed in the EPA's Spill Prevention, Control and Countermeasure (SPCC) and Facility Response Plan (FRP) regulations for non-transportation related facilities and in United States Coast Guard and Department of Transportation regulations for vessels and transportation-related facilities.

- **Spill notification and removal**, as described under the National Contingency Plan.

This section describes these program components and discusses the potential impacts of the change in waters subject to CWA jurisdiction.

III.A.1 Spill Prevention and Preparedness

Under the authority of CWA section 311, EPA requires certain non-transportation-related facilities to prepare SPCC plans if they have a reasonable potential to have a discharge of oil to navigable waters or adjoining shorelines and meet other applicability criteria including aggregate oil storage capacity (*see* SPCC rule at 40 CFR 112). Specifically, the SPCC rule applies to facilities "engaged in drilling, producing, gathering, storing, processing, refining, transferring, distributing, using, and consuming oils and oil products, which due to its location, could reasonably be expected to discharge oil in quantities that may be harmful, as described in part 110 of this chapter, into or upon the navigable waters of the United States or adjoining shorelines..." [40 CFF 112.1(b)] where "navigable waters" (as opposed to "navigable waters of the United States") are defined at 40 CFR112.2 as "waters of the United States, including the territorial seas."[32]

The agencies estimate that approximately 550,000 facilities in a broad spectrum of industry sectors, including farms, oil production facilities, industrial sites, manufacturing plants, and retail establishments, are currently subject to the SPCC rule and must prepare, implement, and maintain their SPCC Plan (U.S. Environmental Protection Agency, 2020). Approximately 40 percent of these facilities (230,000) are in the oil production sector, which includes production, drilling, and workover.[33] Other industry sectors with a significant share of facilities include electric utilities (including distribution substations), real estate rental and leasing, and farms. On an ongoing basis, approximately three percent of the universe of SPCC-regulated facilities are new facilities that must develop an SPCC Plan and implement the spill prevention measures required by the regulation (*e.g.*, sized secondary containment, overfill prevention, and employee

[32] The CWA [33 U.S.C. 1321(b)] sets as national policy that there "should be no discharges of oil or hazardous substances into or upon the navigable waters of the United States, adjoining shorelines, or into or upon the waters of the contiguous zone, or in connection with activities under the Outer Continental Shelf Lands Act [43 U.S.C. 1331 et seq.] or the Deepwater Port Act of 1974 [33 U.S.C. 1501 et seq.], or which may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States (including resources under the Magnuson-Stevens Fishery Conservation and Management Act [16 U.S.C. 1801 et seq.])." While CWA section 311 uses the phrase "navigable waters of the United States," which traditionally means waters subject to jurisdiction under the RHA, EPA has historically interpreted it to have the same breadth as the phrase "navigable waters" used elsewhere in section 311, and in other sections of the CWA.

[33] Workover refers to various interventions or maintenance activities on oil or gas wells such as replacing the production tubing.

training) before they start operating and handling oil. The remaining facilities must maintain their existing plan.[34]

Under the FRP rule at 40 CFR 112.20 *et seq.*, EPA requires a subset of SPCC facilities that could, because of their location, reasonably be expected to cause substantial harm to the environment by discharging oil into or on the navigable waters or adjoining shorelines to prepare and submit an FRP to the EPA Regional Administrator for the state where the facility is located. The EPA maintains an internal database on FRP facilities, including their locations and characteristics. According to EPA's Emergency Management-Oil Database, approximately 3,800 facilities are subject to FRP requirements.

Spill preparedness requirements also exist for onshore transportation-related facilities such as pipelines and railcars. These programs derive their authority from CWA section 311 as amended by the Oil Pollution Act of 1990 (OPA) and therefore are affected by changes in the scope of jurisdictional waters. Under 49 CFR 194, the operator of an onshore oil pipeline that, because of its location, could reasonably be expected to cause substantial harm or significant and substantial harm to the environment by discharging oil into or on any navigable waters of the United States or adjoining shorelines must submit an oil spill response plan to the Pipeline and Hazardous Materials Safety Administration (PHMSA) of the Department of Transportation. The pipeline operator needs to identify resources necessary to respond to a worst-case discharge in operator-defined response zones.[35] PHMSA reports 562 oil spill response plans from pipeline operators (PHMSA, personal communication, as of September 28, 2021).

Under 49 CFR 130, railroad owners or operators must prepare oil spill response plans to cover tank car shipments of petroleum oils. Among other requirements, the basic written plan must describe the manner of response to discharges that may occur during transportation; consider the maximum potential discharge of the contents from the packaging; and identify private personnel and equipment available to respond to a discharge.

Under OPA, states may impose additional requirements for facility response plans as long as these requirements are at least as stringent as the federal standards. For example, both Alaska and Washington State have regulations requiring facility response plans or comprehensive contingency plans for certain large facilities such as refineries, refueling terminals, and pipelines. Both states further require public participation in the planning process to ensure that the plans appropriately reflect community concerns and priorities.

The proposed revisions to the "waters of the United States" definition relative to the secondary baseline could result in additional facilities being subject to planning requirements under section 311 of the CWA. The following sections describe the potential impacts of the change in waters subject to CWA jurisdiction on the SPCC and FRP programs and on spill prevention programs for transportation-related sources.

[34] Among other requirements, facilities with an existing Plan must amend their Plan when there is a change in operations that materially affects the risk of a discharge and review their Plan at least once every five years.

[35] The worst-case discharge for planning purposes is the largest foreseeable discharge of oil (*e.g.*, from a pipeline rupture, fire or explosion) in adverse weather conditions (*e.g.*, rain, currents, cold temperatures). 49 CFR 194.5 defines a "response zone" as a "geographic area along a length of pipeline or including multiple pipelines, containing one or more adjacent line sections, for which the operator must plan for the deployment of, and provide, spill response capabilities. The size of the zone is determined by the operator after considering available capability, resources, and geographic characteristics."

III.A.1.1 Potential Impacts on SPCC Program

Changes in the scope of jurisdictional could result in additional facilities being subject to SPCC requirements, as compared to the secondary baseline of the NWPR.

In determining whether a facility has a reasonable expectation of an oil discharge that could reach a jurisdictional water, facility owners consider solely the geographical and locational aspects of the facility [40 CFR 112.1(d)(1)(i)]. As the EPA describes in its SPCC Guidance, "the owner or operator should consider the location of the facility in relation to a stream, ditch, gully, or storm sewer; the volume of material likely to be spilled; drainage patterns; and soil conditions. An owner or operator may not consider constructed features, such as dikes, equipment, or other manmade structures that prevent, contain, hinder, or restrain a discharge as described in section 112.1(b), when making this determination." (U.S. EPA (2013), page 2-34). [36]

Typically, natural conveyances or stream channels are principal spill pathways for impacts to aquatic resources in remote and undeveloped inland areas that lack engineered stormwater conveyance systems. Manufacturing facilities and other facilities located in developed areas may also affect streams through discharges to stormwater drains or other engineered conveyance systems. Given this, the agencies anticipate that owners or operators of facilities located in relatively less developed areas would be more likely to base their applicability determination on whether there is a reasonable potential for an oil discharge to reach waterbodies in the immediate proximity of the facility. The agencies lack data on how many facilities determined, based on the NWPR definition, that the facilities did not have reasonable potential for an oil discharge to navigable waters or adjoining shorelines, and would reach a different conclusion given the revised scope of waters of the United States. The estimated universe of SPCC-regulated facilities (550,000 facilities) is based on the number of establishments in each industry sector and oil storage capacities and does not explicitly account for the location of the facilities and reasonable potential for a discharge to a jurisdictional water. The agencies anticipate that the inland onshore oil production and farm sectors would be the most likely to be affected by changes to the scope of CWA jurisdiction given their locations.

This change would lead these facilities to incur compliance costs to develop and maintain their Plan. The implementation of spill prevention measures could reduce the probability of the facility experiencing an oil discharge. The benefits and costs depend on the stringency of applicable state or local requirements and measures the facilities may implement voluntarily (such as following industry standards or recommended practices), in the secondary baseline. Some states have requirements equivalent to those of 40 CFR 112, but these requirements often apply to only a subset of facilities based on aggregate storage volume, facility type (*e.g.*, farms, production, others), and type of oil (*e.g.*, petroleum oils, non-petroleum oils). Other states reference 40 CFR 112 explicitly. While the degree of state program overlap varies, [37] potential impacts of the revised definition of "waters of the United States" relative to the secondary

[36] The agencies note that guidance cannot impose legally enforceable requirements.

[37] The EPA's regulatory impact analysis for the 2008 amendments to the SPCC regulation researched state regulations affecting the spectrum of facilities subject to the federal SPCC rule and identified some states with complete, substantial, or partial overlap with federal requirements. The degree of state overlap was somewhat higher for larger facilities (33 percent) as compared to smaller facilities (10 percent); overall across the regulated facility universe, the EPA determined that approximately 13 percent of the SPCC burden overlapped with some state requirements (U.S. EPA, 2008; Exhibit 5-22).

baseline are expected to be less in states that have some overlapping requirements (*e.g.*, Alaska, California, Colorado, Delaware, Georgia, Hawaii) and which are regulating ephemeral streams and other waters in the baseline.[38] The agencies expect no change to compliance costs or spill risk for facilities required to comply with equivalent state or tribal regulations or that elect to voluntarily implement SPCC measures. The reduction in probability is likely greatest for facilities that are exempt from state requirements. The agencies do not have sufficient data to quantify the benefits of the change in CWA jurisdiction at this time.

III.A.1.1.1 Potential Impacts on FRP Program

The change in CWA jurisdiction could lead some facilities to incur FRP compliance costs to maintain their FRP, maintain a contract with an oil spill removal organization (OSRO), and conduct periodic drills and exercises to maintain preparedness. The incremental costs attributable to the proposed rule depend on the stringency of any applicable state or local requirements and measures the facility may implement voluntarily in the baseline, in accordance with recommended industry practices. The benefits of these measures include enhanced preparedness and response and the associated reduction in the harm caused by oil discharges.

The proposed rule could potentially affect FRP facilities primarily through changes in the applicability of requirements to the facilities at two stages:

1. **Changes to the overall applicability of 40 CFR 112**: Changes in CWA jurisdiction that makes the facility subject to the SPCC rule because the facility has a reasonable potential of a discharge as described in 40 CFR 112.1(b) make the facility potentially also subject to the FRP requirements if it meets other applicability criteria.

2. **Changes to the FRP-specific self-identification applicability criteria at 40 CFR 112.20(f)(1)**: As defined in 40 CFR 112.20(f)(1), a non-transportation related onshore facility is required to prepare and implement an FRP if:

    1. The facility transfers oil over water to or from vessels and has a total oil storage capacity greater than or equal to 42,000 U.S. gallons, or

    2. The facility has a total oil storage capacity of one million U.S. gallons or more, and at least one of the following is true:

        a) The facility does not have secondary containment for each aboveground storage area sufficiently large enough to contain the capacity of the largest aboveground tank within each storage area plus sufficient freeboard for precipitation.
        b) The facility is located at a distance such that a discharge could cause injury to fish and wildlife and sensitive environments.

[38] Ephemeral streams would not be categorically jurisdictional under the proposed rule. According to the *Rapanos* Guidance, the agencies conduct a significant nexus analysis for certain types of waters referred to as "non-relatively permanent waters," which includes ephemeral features and some intermittent streams. *See Rapanos* Guidance at 7 ("'[R]elatively permanent' waters do not include ephemeral tributaries which flow only in response to precipitation and intermittent streams which do not typically flow year-round or have continuous flow at least seasonally. However, CWA jurisdiction over these waters will be evaluated under the significant nexus standard[.]").

c) The facility is located such that a discharge would shut down a public drinking water intake.
d) The facility has had a reportable discharge greater than or equal to 10,000 U.S. gallons in the last five years.

The criteria related to reportable discharges (item 2d in the list above) and to distance to sensitive environments (2b) could be affected by a change in CWA jurisdiction.[39] For example, changing the scope of waters that trigger the "reportable discharge" applicability criterion may mean that additional facilities need to prepare or maintain an FRP on the basis of their spill history. The agencies expect this effect to be small. This is based on program data available for 3,802 FRP planholders that predate the NWPR and which show only two facilities with FRPs solely because of reportable spill history (*i.e.*, no other FRP applicability factor).[40]

A majority of FRP planholders (2,115 facilities) identify the potential to affect sensitive environments as a determinant of FRP applicability. The potential effect of a change in CWA jurisdiction on sensitive environments is difficult to assess *a priori*. The FRP regulation relies on a definition of "fish and wildlife and sensitive environments" at 40 CFR 112.2 during the applicability evaluation by a facility owner/operator and in the development of the FRP by the planholder (*e.g.*, development of the vulnerability analysis; *see* Appendix F, Section 1.4.2 of 40 CFR 112). As described in 40 CFR 112.2 and in Department of Commerce/NOAA Guidance (1994), "fish and wildlife and sensitive environments" may include wetlands, national and state parks, critical habitats for endangered/threatened species, wilderness and natural areas, marine sanctuaries and estuarine reserves, conservation areas, preserves, wildlife areas, wildlife refuges, wild and scenic rivers, recreational areas, national forests, public drinking water intakes, federal and state lands that are research natural areas, heritage program areas, land trust areas, and historical and archeological sites and parks. These areas may also include aquaculture sites, agricultural surface water intakes, and unique habitats, such as bird nesting areas, critical biological resource areas, designated migratory routes, and designated seasonal habitats. The Area Committee and the spill response Unified Command Structure may consult with the natural resource management agencies, to determine additional areas to be considered sensitive environments for the purposes of OPA. 40 CFR 112.20(g)(1) requires FRP to be consistent with the National Contingency Plan and with the applicable Area Contingency Plans. To the extent that Area Committees designate sensitive areas based on federally-regulated waters, it is possible that the changes to CWA jurisdiction could alter this factor and potentially FRP applicability. The agencies did not have sufficient information about the sensitive environments considered in determining FRP applicability to assess the significance of the change caused by the NWPR or by this proposed rule.

[39] The criterion related to transfers over water to or from vessels is not expected to be affected by changes in CWA jurisdiction because the involvement of vessels necessarily implies navigation and therefore federally regulated waters. The secondary containment criterion is unrelated to the scope of CWA jurisdiction. The criterion related to public drinking water intakes refers specifically to the potential for a discharge to shut down an intake. Public drinking water system intakes are generally expected to draw from perennial streams which will be within scope of CWA jurisdiction under the proposed rule (and were also under the scope of the NWPR).

[40] Most of the 55 FRP planholders with histories of reportable discharges also triggered one or more of the other applicability criteria, such as transfers over water (39 facilities), inadequate secondary containment (8 facilities), or potential to affect drinking water intakes (28 facilities) or sensitive environments (47 facilities).

A change in CWA jurisdiction may also affect the FRP harm designation assigned by the EPA Regional Administrators. The EPA Regional Administrators may categorize a facility that meets multiple criteria as higher risk, denoted as "significant and substantial harm." The EPA reviews all FRPs and must approve the FRP for facilities categorized as significant and substantial harm. The EPA's Emergency Management-Oil Database shows that, of the 55 FRP facilities with reportable discharge history, 52 FRP facilities are categorized as significant and substantial harm facilities. It is uncertain whether the EPA Regional Administrator would have categorized these facilities as lower risk (substantial harm) under the secondary NWPR baseline and how changes to the WOTUS definition could affect the categorization of FRP facilities.

Available data are not sufficiently detailed to estimate the incremental costs and quantify the risk reduction for changes in FRP applicability, but the agencies anticipate that few facilities could be affected by the change in "waters of the United States" definition. To date, EPA received five requests by FRP planholders to reconsider applicability of 40 CFR Part 112 following the promulgation of the NWPR. In three of these cases, EPA determined that the facilities did not have the potential to affect "waters of the United States" under either the NWPR or the proposed rule definitions, leaving two cases where the jurisdictional status of the waters that could potentially be affected by an oil discharge may affect FRP applicability.

III.A.1.1.2 Potential Impacts on Transportation-Related Spill Prevention and Preparedness

The preparation of an FRP for a pipeline facility is based on the potential for a discharge to a jurisdictional water or adjoining shorelines. The existing regulation gives pipeline operators the flexibility to define planning areas and operators generally develop plans that cover response strategies over fairly large geographical areas. Accordingly, the agencies expect marginal changes in the number of jurisdictional water crossings, such as may result from the proposed rule, to have no material effect on the number of FRPs that pipeline operators may develop or their planned response resources. For similar reasons, the agencies anticipate no material impact on the number of rail operators required to develop a facility response plan.

Pipeline integrity management requirements such as pipeline burial depth and inspection of water crossings are specific to streams at least 100 feet wide and to commercially navigable waters.[41] Since these waters are jurisdictional under both NWPR and the proposed rule, the proposed rule will not affect these requirements.

III.A.2 Spill Notification and Removal

Section 311(c) of the CWA as amended by OPA of 1990 authorizes response to discharges or threats of discharges of oil. The CWA provides that the President shall ensure effective and immediate removal of a discharge or substantial threat of discharge (1) into or on navigable waters of the United States, (2) on the adjoining shorelines to such waters, (3) into or on the waters of the exclusive economic zone, or (4) that may affect natural resources belonging to, appertaining to, or under the exclusive management authority of the United States. The CWA requires that oil discharges and releases of reportable quantities of hazardous substances be reported to the National Response Center (NRC), which in turn notifies the

[41] Commercially navigable waters as defined by 49 CFR 195.450.

relevant federal on-scene coordinators (FOSC). FOSCs have the authority to conduct, direct and coordinate response efforts to protect the environment, public health, and worker safety and health under CWA sections 311(c) and (e). Most oil and chemical incidents are addressed by the state, local, or tribal governments and/or by responsible parties. The FOSC determines the need for federal involvement under the CWA and the National Contingency Plan.

Liability for response and cleanup costs falls to the responsible party if one can be identified. The Oil Spill Liability Trust Fund (OSLTF) provides funding to cover removal costs incurred by the U.S. Coast Guard and the EPA and by state and tribal governments. The OSLTF may pay for uncompensated removal costs and damages up to $1 billion per incident, of which no more than $500 million may be paid for natural resource damages. The National Pollution Funds Center (NPFC), which manages the OSLTF, seeks reimbursement from the responsible party for any response expenses, claims, and damage assessment initiation paid by the Fund. One of the key criteria[42] the NPFC applies when approving access to the OSLTF is whether the oil spill incident affected or substantially threatened a water subject to CWA jurisdiction. Accordingly, changes in the scope of jurisdictional waters can potentially affect access to the OSLTF to oversee a responsible party's response to an oil spill or respond to an oil spill.

The jurisdictional status of the water impacted or threatened by a discharge determines oversight authorities under the National Contingency Plan and what resources are available for removal or for compensating damages. For waters that are non-jurisdictional, oversight falls on the states and tribes, with removal requirements depending on the state or tribal requirements for the particular aquatic resource. For waters within CWA jurisdiction under the proposed rule, the FOSC would oversee the response and removal actions. More than 11,000 oil spills[43] were reported to the NRC during calendar year 2017 from sources other than offshore vessels or platforms. Of these incidents, more than 7,000 reportedly affected waters in general. The number of incidents that affected or threatened waters that changed jurisdictional status under the NWPR is uncertain, since notifications to the NRC generally do not provide sufficient detail on the aquatic resources at risk to determine jurisdictional status. This limitation also makes it difficult to quantify the impact of the proposed rule.

The agencies expect the proposed rule would have a limited impact on the frequency of NRC notifications. While impact to waters is one of the criteria for notifying the NRC of an incident, the NRC also receives notifications for a wide range of incidents of public concern under CERCLA, Emergency Planning and Community Right-to-Know Act, and other environmental or safety regulations. Because there are potential penalties for failing to notify the NRC of a reportable incident but no adverse consequence from unnecessarily reporting an incident, NRC notification generally has become standard operating procedure for facility owners or operators and the agencies do not expect an increase in the number of notifications.

Changes in CWA jurisdiction could affect the response to reported incidents as responsibilities for overseeing the response to some incidents shift from state, local, or tribal governments to the FOSC.

[42] Other criteria include whether the substance is an oil as opposed to a hazardous substance (which would be addressed by CERCLA).

[43] Count reflects NRC's Calendar Year 2017 incident data involving substances with names containing the terms "oil," "gasoline," or "diesel."

During the period of 2001-2017, EPA FOSCs oversaw emergency removal activities for 1,064 incidents involving the discharge of oil or substantial threat of a discharge to jurisdictional waters. The agencies reviewed Pollution Reports for each of these emergency oil removal actions.[44] These incidents either involved active oil discharges or substantial threat of a discharge to jurisdictional waters.

There are various possible outcomes of changes to the scope of CWA jurisdiction, including for oil spill incidents affecting newly jurisdictional waters. These outcomes depend on the state requirements and responsible party actions following the incident, but would tend to facilitate cleanup and reduce environmental damages. They range from no change (in cases where the responsible party assumes full responsibility for response and cleanup), to the transfer of the response burden from the state or tribe to the OSLTF. The economic implications of these changes are uncertain since they depend on the location of the future spill, the stringency of state and local requirements, and other factors. It is possible that a responsible party for a future spill affecting non-jurisdictional resources would face increased response costs in cases where federal requirements are more stringent than state requirements. State regulations cover the discharge to state waters or land of any substance that may be detrimental to environmental quality and are generally similar to baseline oil discharge prohibition requirements under the CWA. However, whereas the federal regulations cover spills of non-petroleum oils such as animal fats and vegetable oils (AFVOs), some state requirements focus mainly on petroleum oils and requirements for non-petroleum oils may be less stringent or may not apply. For example, Georgia defines "oil" as "including but not limited to gasoline, crude oil, fuel oil, diesel oil, lubricating oil, sludge, oil refuse, oil mixed with wastes, and another other *petroleum* related product." (Georgia Oil or Hazardous Material Spills or Releases Act (Official Code of Georgia Annotated, section12-14-1 [emphasis added]).[45] The definition explicitly does not include non-petroleum oils such as AFVOs. There may also be higher spill reporting requirement thresholds than provided by the CWA. Accordingly, some additional discharges could become reportable.

Another key difference, even where the state requirements are otherwise equivalent to those of the CWA, is the increased availability of resources to help defray removal costs or compensate affected parties for damages not reimbursed by the RP.

There are limited data available for spills that occurred following NWPR promulgation to assess the degree to which changes in jurisdictional scope may have affected FOSC oversight of incidents or access to OSLTF resources. To date, EPA does not have an indication that the definition of "waters of the United States" in the secondary baseline of the NWPR materially affected the federal government's ability to oversee and address oil spills.

III.A.3 Uncertainty and Limitations for Assessing Potential Effects on CWA Section 311 Program

There is significant uncertainty in the universe of facilities that could be affected by the proposed rule. EPA does not have data on the number of facilities that may have determined that they were not SPCC-regulated under the NWPR and may need to reconsider this determination under the proposed definition. The SPCC rule does not require facility owners/operators to identify themselves to the EPA, unless these

[44] The Pollution Reports are available at https://response.epa.gov/.

[45] See https://law.justia.com/codes/georgia/2010/title-12/chapter-14/12-14-1/.

facilities are subject to the FRP rule, requiring submittal of an oil spill response plan to the EPA. Whereas owners or operators must comply with 40 CFR 112 and prepare and maintain an SPCC Plan, they do not submit this Plan, a Notice of Intent (NOI), or any similar notification to the EPA. No national, state, or industry inventory of SPCC facilities exists, although the EPA has developed estimates of the universe of facilities to support rulemaking and information collection requests (ICRs).

For some sectors, notably onshore oil production, detailed public data provide both the number and location of individual equipment or facility components (*e.g.*, oil wells). This information can be used to characterize the potential distribution of oil production equipment, but this does not necessarily lead to accurate identification of SPCC-regulated facility, since production tank batteries are not necessarily co-located with oil wells and are typically connected to multiple wells. For other sectors, including farms, manufacturing, and other facilities, publicly available data provide counts of facilities per county or state, but does not indicate the aggregate storage capacity to assess SPCC applicability. None of the datasets (except for inspected SPCC facilities and FRP-subject facilities) provide direct information to infer reasonable potential for a discharge.

III.B CWA Section 402: National Pollutant Discharge Elimination System (NPDES)

Section 402 of the CWA establishes the NPDES program to authorize the discharge of pollutants[46] from point sources to "waters of the United States," in compliance with applicable requirements and conditions. The CWA requires a permit for discharges of pollutants to "waters of the United States" from point sources, defined in the Act as any discernable, confined, and discrete conveyances (*e.g.*, pipes, ditches, channels, or concentrated animal feeding operations). Typically, the compliance point for NPDES permits is the location where the effluent is being discharged from the facility. *See* U.S. EPA (2010) NPDES Permit Writers' Manual at pages 8-1 to 8-5. NPDES permits may incorporate different statutory and regulatory requirements depending on the source type, volume of discharge, receiving waterbody, and state/tribal water quality standards.

The NPDES permit program is administered by authorized states or the EPA. The EPA issues some NPDES permits for discharges from federal facilities,[47] most of the tribal reservation lands,[48] and U.S. Territories (except the U.S. Virgin Islands) as well as all permits in the three states that have not been authorized to administer the program (Massachusetts, New Hampshire, and New Mexico) and for certain activities in states with only partial authority. The EPA has authorized most (47) states to operate all or portions of the CWA section 402 permitting program, and states assert jurisdiction over "waters of the state" which must be as inclusive as "waters of the United States" but may be more expansive.

[46] CWA section 402 regulates discharges of the following categories of pollutants: (1) Conventional pollutants: BOD, TSS, oil and grease, fecal coliform, and pH; (2) Toxic pollutants: 126 "Priority Pollutants" (40 CFR part 423), which include metals (*e.g.*, Cu, Pb, Hg) and organic compounds (*e.g.*, PCBs, dioxin); (3) Non-conventional pollutants: all other pollutants (*e.g.*, chlorine, ammonia, nitrogen, phosphorus).

[47] In general, federal facilities are defined as buildings, installations, structures, land, public works, equipment, aircraft, vessels, other vehicles, and property, owned, constructed or manufactured for leasing to the federal government. (https://www.epa.gov/enforcement/enforcement-and-compliance-federal-facilities)

[48] The state of Maine has authority to issue NPDES permits on the territory of two tribes.

Agencies may issue individual or general permits. Individual permits may be issued when site-specific limits, management practices, monitoring and reporting, or other facility-specific permit conditions are needed. One individual permit is issued per one applicant; the individual permit may cover several outfall points. General permits are issued when multiple dischargers require permit coverage, sources and discharges are similar, and permit conditions are relatively uniform. One general permit is issued for multiple dischargers. The permit identifies coverage area, sources covered, and administrative processes for dischargers to identify that they intend to be covered (*e.g.*, whether the applicant must submit an NOI to seek coverage under the general permit).

The EPA's Integrated Compliance Information System-NPDES database contains approximately 250,000 unique permit numbers, including individual and general permits.[49] Some facilities may have more than one permit (*e.g.*, an individual permit for process wastewater and a general permit for stormwater).[50]

Facilities that currently have a NPDES permit under CWA section 402 or a state permit under an authorized state program can be assumed to either discharge to a "water of the United States" or to waters designated to be "waters of the state" by the authorized state in which they are located. NWPR reduced the number of jurisdictional waters (*i.e.*, certain ephemeral streams), potentially leading to some facilities no longer being required to obtain NPDES coverage where the water to which they discharged was no longer jurisdictional and the pollutants discharged from the point source were not conveyed to a "water of the United States." In the NWPR analysis, the agencies anticipated such circumstances to be more likely to happen in arid areas of the country. Dischargers whose receiving waters or downstream waters were not jurisdictional under the CWA or "waters of the state" could opt to: continue with their existing permit (*status quo*); formally request a permit modification;[51] or formally request to have their permit terminated, subject to anti-backsliding permit requirements.

EPA does not have information indicating that a significant number of requests for permit modification or termination followed the promulgation of the NWPR. EPA does acknowledge that there are likely instances where permittees have inquired about potential permit changes and that if the NWPR were in effect for an extended period of time, these types of inquiries could become more common in certain areas where the NWPR had a significant effect on the number of jurisdictional water features, such as the arid southwest. However, the agencies also do not expect the jurisdictional changes resulting from the proposed rule relative to the secondary baseline of the NWPR to result in a material change in the number of NPDES permits or in modifications to existing permit requirements.

After the 2006 *Rapanos* decision, several NPDES permit holders in the Western United States asserted they no longer required a permit because of the potential non-jurisdictional status of a receiving water. The agencies are aware that in some cases such inquiries have resulted in a permitting authority determining that a discharger no longer needed a permit. There are several potential explanations for this, related to the nature of the permitted activity, state requirements, and facility-level incentives.

[49] This estimate includes both active and expired permits in ICIS-NPDES since facilities with expired permits can still operate with administratively continued permits. It excludes "terminated" permits that are no longer binding. It also excludes permits that did not have valid latitude/longitude coordinates or were not truly NPDES permits.

[50] In this section, "facility" refers to plants, construction sites, or other types of point source dischargers.

[51] This request could happen before or during their permit reissuance process.

First, the nature of a traditional discharge permit where a facility is seeking to discharge wastewater is different from a CWA section 404 permit (described in Section III.C below) where a developer or landowner is, for example, seeking to fill a portion of a "water of the United States." There are instances for a CWA section 402-permitted discharger to contribute to creating a perennial or intermittent water feature where there once was an ephemeral stream because of continuous discharge (*i.e.*, an "effluent-dependent" or "effluent-dominated" water). In these cases, the proposed rule would not affect jurisdiction if the water meets the conditions of the "tributary" definition.

Second, the EPA has authorized most states to administer portions or all of the CWA section 402 permitting program. In addition, some states assert state law jurisdiction over "waters of the state" which is inclusive of "waters of the United States" but may be more expansive. These state law programs can, and in some cases already do, cover waters that are not considered "waters of the United States." As discussed in Chapter II, state programs may choose to issue permits for non-federally regulated waters solely based on state authority. States may also revise WQBELs to reflect attenuation or additional dilution farther downstream (to a water subject to the CWA) from the source of the pollutant if the discharge point is no longer into a "water of the United States," subject to applicable anti-backsliding permit requirements. [52]

Additionally, existing facilities may have made the capital investments in wastewater treatment systems that discharge to receiving waters that will no longer be jurisdictional and may willingly continue operating under their permit and see no need to challenge jurisdictional status of the receiving waters. Depending on the individual organization, industry standards or recommended practices, the facility may implement treatment technologies or best management practices voluntarily but could still save on some compliance costs. The following sections discuss the potential impacts of the proposed rule on the number of permits and on permit requirements. Specifically, the sections describe potential permittee's responses by permit type (*i.e.*, individual, general) potentially affected by a change in the definition of "waters of the United States." The agencies anticipate that changes to the scope of jurisdictional waters under the proposed rule are more likely to affect the scope of facilities covered by general permits (including stormwater), but as discussed below any impacts are expected to be small nationwide.

III.B.1 Potential Impacts on Individual NPDES Permits

The potential benefits and costs of the proposed rule relative to the secondary baseline of the NWPR and related to CWA section 402 permits to discharge to newly jurisdictional receiving waters will depend on multiple factors. One factor is the basis for the NPDES permit, specifically whether the permit is based on technology-based effluent limits (TBEL) or water quality-based effluent limits (WQBEL). [53] Another

[52] *See* Appendix A of the RPA for the Navigable Waters Protection Rule: Definition of 'Waters of the United States' Final Rule (U.S. EPA, 2020a)

[53] The EPA and state NPDES permitting agencies develop TBEL for all applicable pollutants of concern. TBELs are based on national technology based effluent limitations and standards (*i.e.*, effluent limitations guidelines and standards) that are developed to establish minimum levels of pollutant controls for most direct and indirect dischargers for conventional pollutants, non-conventional pollutants, and toxic pollutants and provide equity among dischargers within categories. In the absence of national limitations and standards, TBELs are developed on a case-by-case, best professional judgment (BPJ) basis. Instead of the effluent guidelines approach, the statute provides for the EPA to establish secondary treatment standards for publicly-owned treatment works.

factor is whether the facility's discharge conveys to a "water of the United States" downstream from the newly jurisdictional receiving reach. A third factor is whether the facility has the controls necessary to meet permit limits based on the newly jurisdictional receiving reach.

Permittees may incur higher treatment costs to meet any revised limits based on the newly jurisdictional receiving waters. Existing permittees may already have treatment technologies in place and may be able to meet new permit conditions that reflect the newly jurisdictional receiving waters. New establishments in the industrial categories that are subject to effluent limitations may face higher capital and operational costs. A permittee discharging to a jurisdictional water that is not attaining water quality standards is subject to more stringent limits based on a WQBEL which must also be consistent with any applicable wasteload allocations in a TMDL. The permit could be revised to incorporate WQBELs that reflect lower dilution or attenuation of the pollutant(s) occurring at the point where the effluent enters the newly jurisdictional waters. Under this scenario, the permittee could incur additional costs as compared to meeting the previous permit limits under the secondary baseline of the NWPR. More stringent effluent limitations could have a positive impact on water quality in the receiving jurisdictional streams, including downstream waters.

In practice, the agencies anticipate impacts of the proposed rule relative to the secondary baseline of NWPR on individual permits to be small. EPA did not see significant changes under the NWPR in permittees seeking revisions to existing permit conditions and similarly does not expect significant changes under the proposed rule. Given the relatively short period of time that the NWPR was in effect, any shift that may have occurred during this period was likely marginal. However, if the NWPR had remained in effect for a longer period of time this shifting effect would have become more pronounced.

III.B.2 Potential Impacts on General Permits

NPDES general permits cover dischargers with similar characteristics (*e.g.*, within the same industry) within a given geographical location. In most cases, a permittee is required to complete and submit an NOI and comply with the terms of the general permit. Each permittee receives a unique NPDES number. Because a large number of facilities can be covered under a single general permit, general permits may offer a cost-effective option for permitting agencies. Nearly 60 percent of the general permits the agencies analyzed are stormwater permits.

Stormwater runoff is generated when precipitation from rain and snowmelt flows over land or impervious surfaces instead of percolating into the ground. As the runoff travels (especially over paved streets, parking lots, and building rooftops), it can accumulate debris, chemicals, sediment, and/or other pollutants that may be detrimental to stream water quality; runoff can also gain velocity and be directed towards waterbodies, thus increasing the probability of these pollutants reaching a stream. Polluted stormwater

If TBELs are not adequate to protect water quality to meet applicable water quality standards, the CWA requires the permitting authority to include WQBEL as necessary to meet applicable state or tribal water quality standards and that are consistent with any EPA-established or EPA-approved TMDLs that may apply to the discharge. Currently, all states have state water quality standards under CWA section 303, as well as listed impaired waters and TMDLs for those impaired waters under CWA section 303(d). If a TMDL has been developed for the receiving waterbody, states (or EPA regions) assign a waste load allocation to each point source discharge and a load allocation to nonpoint sources such that predicted receiving water concentrations do not exceed water quality criteria. States and tribes may develop standards for non-jurisdictional waters under state or tribal law, but these criteria are not enforceable under the CWA. CWA section 402(p)(3)(B)(iii) provides for a unique standard to be used for controls of municipal separate storm sewer systems (MS4s).

runoff can harm or kill fish and other wildlife. Excess sedimentation can impair aquatic habitat, and high volumes of runoff can cause stream bank erosion. Debris can clog waterways and potentially reach the ocean where it can harm marine wildlife and degrade habitats.

Some stormwater discharges have been designated by statute, regulations, or on a case-by-case basis to require coverage under a NPDES permit. Under CWA section 402(p), the EPA implemented the stormwater program in two phases, with the Phase I rule issued in 1990 and the Phase II rule issued in 1999. The stormwater program regulates stormwater from some construction sites (*i.e.*, those disturbing one or more acres of land, or disturbing less than one acre but part of a common plan of development or sale that will disturb one or more acres), specific industrial sectors specified in the Phase I rule, and discharges from some municipal separate storm sewer systems (MS4s). The EPA's ICIS-NPDES data used by the agencies includes 120,989 stormwater permits, including individual and general permits. Over 20 percent of the permitted dischargers analyzed (26,366) are for stormwater discharges from construction and development activities. Dischargers with unknown industry classification (missing SIC code) and in "other" categories account for 51 and 21 percent of the total stormwater permits respectively. Industrial facilities covered under an industrial stormwater permit, such as the EPA's Multi-Sector General Permit (MSGP) account for approximately five percent of stormwater permit holders. MS4s account for less than one percent of all permittees covered under the stormwater program.

III.B.2.1 Construction Stormwater

In general, the NPDES stormwater program requires permits for discharges from construction activities that disturb one or more acres, and discharges from smaller sites that are part of a larger common plan of development or sale. The Construction and Development (C&D) effluent limitations guidelines (ELGs) apply to permits for stormwater discharges from all construction activities including clearing, grading, and excavation, except operations that result in the disturbance of less than one acre of land area, unless they are part of a common plan of development or sale that disturbs more than one acre (40 CFR 122.26(b)(14)(x) and 40 CFR 122.26(b)(15)). Under 40 CFR part 450 (the C&D ELGs), all covered entities must: (1) design, install, and maintain erosion and sediment controls; (2) initiate soil stabilization in disturbed areas immediately whenever any clearing, grading, excavating, or other earth disturbing activities have ceased; (3) design, install, and maintain pollution prevention measures to minimize the discharge of pollutants to surface waters; (4) prevent the discharge of the wastewater, fuels, oils, or other pollutants used in vehicle and equipment operations and maintenance and equipment washing; and (5) implement other best management practices (BMPs) to minimize adverse effects on surface water.

The agencies considered the potential effect of the revised definition of "waters of the United States" on the issuance of CWA section 402 permits for stormwater from construction and development sites. Due to data limitations and the lack of a strong basis for the necessary analytical assumptions, it is not feasible to rigorously estimate the potential costs to the construction industry and corresponding benefits of needing a CWA section 402 permit for stormwater discharges from construction sites to newly jurisdictional waters. Both costs to the industry and the potential benefits from reducing the environmental impacts from construction activities due to a change to the definition of "waters of the United States" would likely be modest. First, projects disturbing at least one acre of land, and which in turn require NPDES permit coverage, are presumed to be large enough to generate stormwater runoff that could reach a jurisdictional water, either directly or through a conveyance such as a municipal storm sewer, and so would be required

to obtain permit coverage under both the NWPR secondary baseline and the proposed rule. Procedures typically required by construction stormwater general permits have been widely adopted as normal practices in the construction industry and are frequently required by local ordinances. As a result, the requirements are not usually considered to impose a significant burden. An increase in jurisdictional waters is not likely to change these circumstances for most areas of the country. The exception may be for stormwater discharges from construction sites in arid states where many streams are ephemeral (*e.g.*, Arizona, Nevada, and New Mexico).

Second, many states and tribes have specific designated uses and water quality criteria for ephemeral streams in their state or tribal water quality standard (WQS). Under the NWPR, WQBEL-based NPDES permits still applied if the discharge reached state waters. Finally, even if not required by federal law, developers may implement stormwater BMPs for a variety of reasons, including the need to comply with local erosion and sediment control requirements and/or to operate in a manner consistent with industry standards, the additional time required for obtaining an exemption from CWA section 402 permit requirements, or concerns about the public perception of operating without a permit. In the NWPR analysis, the agencies had expected minor changes, mostly at construction sites located in arid states. Accordingly, the agencies also expect minor changes as a result of the proposed rule.

III.B.2.2 Industrial Stormwater

Available data are not sufficiently detailed to develop quantitative estimates of the potential costs and environmental benefits associated with permits for stormwater discharges from regulated industrial facilities discharging to newly jurisdictional waters under the proposed rule. However, qualitative analysis suggest that potential impacts may be limited. Most industrial sectors regulated under the Phase I stormwater rule are located in urbanized areas. Under the NWPR, any permitted entity that is discharging to an ephemeral feature or other non-jurisdictional water is still required to have an NPDES permit if their discharge conveys to a jurisdictional water. Moving the compliance point for NPDES permits upstream may result in lower effluent limitations given the difference in pollutant dilution or attenuation. However, regulated industrial sectors that are likely located near ephemeral streams represent a minority of the regulated industrial stormwater universe. Additionally, these types of facilities are generally large and due to their scale, may be more likely to discharge into perennial streams (outside of the arid West) that are jurisdictional under both the secondary baseline of NWRP and the proposed rule. Therefore, the agencies expect no benefits or costs for industrial facilities with stormwater discharges regulated under the Phase I rule.

III.B.2.3 Municipal Separate Storm Sewer Systems (MS4s)

Stormwater runoff in cities and towns is commonly transported through MS4s, from which it is often discharged, untreated, into local waters. To prevent harmful pollutants from being washed or dumped into, and being discharged from, an MS4, certain MS4s are required by law to obtain NPDES permit coverage and develop a stormwater management program (SWMP). The Stormwater Phase I rule, promulgated in 1990, requires operators of medium and large MS4s serving populations of 100,000 or more to obtain NPDES permit coverage for their stormwater discharges. The Stormwater Phase II rule, promulgated in 1999, required most small MS4s serving populations between 10,000 and 100,000 in urbanized areas, as well as small MS4s outside the urbanized areas that are designated by EPA or the state, to obtain NPDES permit coverage for their stormwater discharges. Generally, Phase I MS4s are

covered by individual permits and Phase II MS4s are covered by general permits. MS4 permits include terms and conditions that are adequate to meet the MS4 standard of reducing pollutant discharges from the MS4 to the "maximum extent practicable" (MEP), eliminating non-stormwater discharges to the MS4, and including other such conditions that the permitting authority deems appropriate to protect water quality.

An MS4 may have many different outfalls within its service area, some of which may discharge to waters newly jurisdictional under the proposed rule. However, MS4s often implement their SWMPs uniformly across their area without regard to the receiving water of a specific outfall. Thus, a change in jurisdictional status of some receiving waters is not expected to have a noteworthy effect in terms of costs or benefits, unless every outfall of a particular MS4 discharged to a non-jurisdictional water in the baseline and that pollutants never reach a jurisdictional water. Therefore, the agencies expect minor change to costs or water quality benefits from MS4s regulated under the EPA Phase I and Phase II stormwater rules.

III.B.3 Potential Impacts on Section 402 State Programs

As discussed in Section III.C, many states already exceed the aquatic resource or surface water discharge protections under the proposed rule (see Table II-1 in Section II.C for a list of states that fall into this category). Accordingly, the agencies anticipate no changes to programs in these states, and no incremental costs. Conversely, the return to status quo from the NWPR for states with less stringent protections for their waters in comparison to "waters of the United States" may incur administrative costs associated with this proposed action. The NPDES program comprises five components: the NPDES permit program, authority to regulate federal facilities, state pretreatment program, general permits program, and biosolids program (U.S. Environmental Protection Agency, 2019a). Forty-seven states are currently authorized for the NPDES permit program and the general permits program. Thirty-seven states are partially authorized for three or four components, and eight states are fully authorized for all components. Only three states and the District of Columbia are not authorized for any NPDES components.

States that continue current practices could experience no change in costs if they already run their own fully authorized NPDES programs and regulate waters more broadly than the NWPR requires. Other states that return to status quo from the NWPR could incur additional costs (e.g., staffing costs) from conducting more CWA section 401 water quality certification reviews of EPA-issued 402 permits. In all cases except where states will continue to regulate more broadly than required by the CWA, a higher number of permits issued by federal agencies is likely to increase state costs associated with certification under CWA section 401.

States that would incur additional costs as a result of increased 401 reviews on EPA-issued 402 permits would be 1) states with no authorized NPDES programs and 2) states with NPDES programs that are not authorized for all components of the NPDES program and need to return to status quo. Massachusetts, New Hampshire, and New Mexico are the only three states without NPDES programs. Given that the percentage of 401 reviews devoted to EPA-issued 402 permits is quite low, as the vast majority of 401 reviews are for Corps-issued 404 permits, the agencies expect total section 401 costs resulting from changes to the section 402 program to be minimal.

III.B.4 Uncertainty and Limitations for Assessing Potential Effects on CWA Section 402 Program

There are multiple sources of uncertainty inherent in the analysis of the potential impacts of the revised definition of "waters of the United States" on the CWA section 402 program.

First, there is significant uncertainty in the universe of entities that would be affected by a change in jurisdictional scope. The discussion of the proposed rule's impacts in this report is based on the agencies' prior analysis of the anticipated effects of NWPR on section 402 permits included in EPA's ICIS-NPDES database. The database is based on states' reporting and may not account for all existing facilities and activities that may affect waters whose jurisdictional status changed under the NWPR and under the proposed rule. For example, data on facilities or activities subject to general permits or facilities with minor status under the CWA section 402 program are limited. Some industrial facilities or activities subject to CWA section 402 requirements may be underrepresented. Some facilities or activities have missing or invalid coordinates and available coordinates for permitted dischargers can be those of the facility and not necessarily the outfall. This limits the agencies' ability to precisely identify the receiving waterbody. The available data also do not necessarily represent all future activities that could have adverse impacts on such waters. In particular, specific locations of future construction activities as well as the potential for their stormwater discharges to affect ephemeral streams are unknown. Similarly, demand for industrial domestic wastewater treatment is driven by land development, and locations of future industrial domestic wastewater treatment facilities are not known.

Second, there is also significant uncertainty regarding the response of permittees. Some entities have incentives to voluntarily use technologies and best management practices, based on industry standards, public relations, sustainability and related policies. For existing permittees, the time required for obtaining exemption from CWA section 402 requirements may have served as an extra incentive to maintain existing practices even where the receiving water changed status under the NWPR.

III.C CWA Section 404: Discharge of Dredged or Fill Material

Unless the activity is statutorily exempted,[54] the CWA prohibits discharges of dredged or fill material from a point source into "waters of the United States", including wetlands, without a permit. Such discharges are regulated under CWA section 404, which is administered by the U.S. Army Corps of Engineers with oversight by the EPA. In addition, the states of Michigan, New Jersey, and recently Florida have assumed administration of the CWA section 404 permitting program for certain waters within their borders.

For a project to be permitted under the 404 program, the permittee must demonstrate that, to the extent practicable, the permittee has taken steps to avoid impacts to wetlands and other aquatic resources, minimized potential impacts, and compensated for remaining unavoidable impacts if required. *See, e.g.*,

[54] The statutory exemptions to CWA Section 404 are set forth in subsection (f)(1). The first and most significant 404(f)(1) exemption is for normal and ongoing farming, silviculture and ranching activities. Other examples of statutory exemptions are for maintenance, including emergency repair of recently damaged, currently serviceable structures, and for construction or maintenance of farm ponds, irrigation ditches, farm or forest roads, and temporary roads for moving mining equipment. These statutory exemptions may not apply in certain limited circumstances if the otherwise exempted activity brings an area subject to jurisdiction into a use to which it was not previously subject, where the flow or circulation of navigable waters may be impaired or the reach or waters reduced (CWA Section 404(f)(2)).

33 U.S.C 1344(b)(1). This process, commonly referred to as the mitigation sequence, applies the following mitigation steps in sequential order:

- **Avoidance:** Mitigating an aquatic resource impact by selecting the least-damaging project type, spatial location, and extent compatible with achieving the purpose of the project. Avoidance is achieved through an analysis of appropriate and practicable alternatives and a consideration of impact footprint.

- **Minimization:** Mitigating an aquatic resource impact by managing the severity of a project's impact on resources at the selected site. Minimization is achieved through the incorporation of appropriate and practicable design and risk avoidance measures.

- **Compensatory Mitigation:** Mitigating an aquatic resource impact by replacing or providing substitute aquatic resources for impacts that remain after avoidance and minimization measures have been applied. Compensatory mitigation is achieved through appropriate and practicable restoration, establishment, enhancement, or preservation of aquatic resource functions and services.

Avoidance and minimization steps assure that only projects that are the least environmentally damaging practicable alternative (LEDPA) will receive legal authorization to discharge. The Corps may only permit the LEDPA (40 CFR 230.10(a)). While this sounds straightforward, there are many variables at play and they multiply in complexity depending on the type of project, the local market, the geographic context, and the type, functionality, and local importance of the aquatic resources involved. The agencies were unable to quantify and monetize benefits of the proposed rule with regard to the avoidance and minimization steps because the steps permittees take are not tracked or recorded in a systematic way. Therefore, the agencies' analysis focuses on benefits stemming from changes in compensatory mitigation requirements, which is likely to understate the total benefits of the proposed rule.

Compensatory mitigation may be required to replace the loss of wetland and aquatic resource functions by offsetting unavoidable adverse impacts which remain after appropriate and practicable avoidance and minimization have been achieved. There are three mechanisms for providing compensatory mitigation (as established by the regulations[55]) with mitigation banks and in-lieu fee programs preferable to permittee-responsible mitigation:

- **Mitigation bank:** A site, or suite of sites, where aquatic resources are restored, established, enhanced, or preserved for the purpose of providing compensatory mitigation for impacts authorized by Department of the Army permits. Mitigation banks sell compensatory mitigation credits to permittees with regulatory requirements to offset aquatic resource impacts. The purchase of credits transfers responsibility for compensation from the permittee to the mitigation bank. Large compensatory mitigation banks generally provide compensation for multiple, smaller impacts.

- **In-lieu fee program:** A program involving the restoration, establishment, enhancement, or preservation of aquatic resources through funds paid to a "governmental or non-profit natural resources management entity" to satisfy compensatory mitigation requirements for Department of the Army permits. The fund payment transfers responsibility for compensation from the permittee to the

[55] *See* 40 CFR 230-91-230.98 and 33 CFR 332.1-332.8.

in-lieu program operator. In-lieu fee programs identify and initiate projects across their service area within set timeframes from when funds are collected.

- **Permittee-responsible mitigation:** Aquatic resource restoration, establishment, enhancement, or preservation activity undertaken by the permittee (or an authorized agent or contractor) to provide compensatory mitigation for which the permittee retains full responsibility.

The agencies generally consider banks and in-lieu fee programs preferable to permittee-responsible mitigation because they consolidate compensatory mitigation projects where ecologically appropriate, use a watershed approach, provide a greater level of financial planning and scientific expertise, reduce temporal losses of ecological functions, increase economic efficiency, and reduce uncertainty over project success.

Two types of permits are available through the 404 program: individual permits and general permits. Individual permits are required for potentially significant impacts. The Corps evaluates potential environmental and socioeconomic effects of the proposed activity and issues a public notice that describes the proposed project. The Corps reviews all comments received and makes a final permit decision. Alternatively, letters of permission, a type of individual permit, may be used when the district engineer determines that the proposed work would be minor, would not have significant individual or cumulative impacts on the environment, and would encounter little to no public opposition.

General permits are suitable for activities that will have only minimal adverse effects individually or cumulatively. General permits authorize activities the Corps has identified as being substantially similar in nature and causing only minimal individual and cumulative environmental impacts. General permits may authorize activities in a limited geographic area (*e.g.*, county or state), a particular region of the country (*e.g.*, group of contiguous states), or the nation (called Nationwide Permits). The general permit process eliminates individual review and allows certain activities (*e.g.*, minor road maintenance, utility line backfill) to proceed with little or no delay, provided that the conditions for the general permit are met.

III.C.1 Potential Effects of the Proposed Rule on the CWA Section 404 Program

Under the NWPR, the following features, among others, were no longer jurisdictional: wetlands that are not adjacent to otherwise jurisdictional waters; rivers and streams that do not contribute surface water flow to traditional navigable waters or the territorial seas in a typical year; ephemeral features, including ephemeral streams, isolated lakes, ponds, and impoundments; and certain ditches. The NWPR also codified twelve exclusions. Under the NWPR, project proponents no longer needed to obtain 404 permit coverage for waters whose jurisdictional status has changed and did not need to mitigate impacts from their project activities. The proposed rule removes these changes made by the NWPR and returns the federal jurisdiction to where it was under the pre-2015 regulatory regime.

At the time NWPR was promulgated, some states, tribes, and localities had their own dredged/fill programs already in place regulating these waters. As a result, developers and other project proponents affecting these non-jurisdictional waters in these areas could still have been required to take steps to avoid impacts to wetlands and other aquatic resources. In these areas, the proposed rule would reinstate the federal jurisdiction removed under the NWPR, but since these state, tribal, or local program were in place, the proposed rule does not meaningfully change what waters receive protection in these areas. The agencies include an estimate of existing states programs (see Chapter II, State and Tribal Regulatory

Practice), which is meant to account for the effects of these state programs on the national cost and benefit estimates. However, the agencies acknowledge that this is not a full accounting of all existing state, tribal, and local efforts that continued to provide regulatory protection during the period when the NWPR was in place. The agencies seek input on which existing state, tribal, or locally administered dredge and fill programs extended regulatory protection to waters that became non-WOTUS under the NWPR.

Several potential overall effects on the CWA section 404 permit program are possible based on the change in CWA jurisdiction between the NWPR and the proposed rule:

- **Transfers:** Under the NWPR, projects may have shifted away from areas containing waters that required 404 permits to areas with waters that were no longer jurisdictional (*e.g.*, non-adjacent wetlands and ephemeral features). All else being constant, profit-maximizing entities will aim to avoid regulatory requirements and the associated costs. Therefore, the agencies expect that during the period when the NWPR was in effect, there may have been a relative decrease in activity affecting waters that remained jurisdictional and an increase in activity affecting waters that were newly non-jurisdictional. The agencies do not have sufficient information from the period of time when the NWPR was in effect to estimate how much of this type of shift in project activity occurred. Given the relatively short period of time that the NWPR was in effect, any shift that may have occurred during this period was likely marginal. However, if the NWPR had remained in effect for a longer period of time this shifting effect would have become more pronounced, in areas where state, tribal, or local programs did not provide regulatory protection for these waters that lost federal jurisdiction under NWPR.

- **Permit and administrative costs:** Several possible scenarios could result in changes to permit costs. For projects that only affected waters that lost jurisdiction under the NWPR and where no state, tribal, or local permits were required, permitting costs would increase with the proposed rule. Costs would also increase for the Corps as the overall permit volume would increase, and for states and tribes in terms of increased CWA section 401 certification reviews. Time delays associated with the permitting process would also be reduced, although in most cases there would still need to be a jurisdictional determination, even if a permit was determined not to be needed. For projects that would still have required a permit under NWPR there may be additional costs and burden resulting from a larger number of waters affected by their project being jurisdictional due to the proposed rule. This could lead to a greater likelihood of needing an individual permit, which have higher costs than general permits.

- **Mitigation sequence costs:** Those projects that affect a water feature whose jurisdictional status changes between the NWPR and the proposed rule would not only have increased permitting costs, they would also likely incur greater project costs from having to implement the mitigation sequence required by their permit. Similarly, for projects that affect multiple waters, if some of those waters were non-jurisdictional under NWPR but jurisdictional under the proposed rule, the permit costs may not differ substantially, but these projects would likely be required to implement greater avoidance, minimization, and compensatory mitigation measures under the proposed rule than under the NWPR. Avoidance and minimization measures are not tracked by the Corps, so they are difficult to include in

estimates of changes in costs. However, compensatory mitigation measures are tracked by the Corps, and so changes to mitigation levels and the resulting costs can be estimated.

- **Benefits:** Returning federal jurisdictional status lost under the NWPR to water features such as: non-adjacent wetlands, ephemeral features, certain ditches, and certain lakes and ponds, for example, would reduce impact areas from projects (from the minimization requirements), increase mitigation measures, and reduce loss of wetlands acreage in states that do not currently regulate these waters (see Table in Section II.C for a list of states that are expected to be affected by the definitional changes of "waters of the United States"). Additionally, potential impacts of the proposed rule on the types of 404 permits that would be issued (*i.e.*, lower likelihood for general permits; likely more individual permits with public hearings and fewer individual permits with letters of permission) could result in increased protections for waters that were non-jurisdictional under the NWPR. The protections for these waters from additional avoidance, minimization, or compensation requirements would result in benefits to society over time, including wildlife habitat support, recreation, and aesthetic benefits.

III.C.2 Quantitative Assessment of Potential National Impacts

To evaluate the potential impacts of the proposed rule, the agencies focused on potential CWA section 404 program impacts for which data are sufficient to develop quantitative estimates at the national level. Inputs for this analysis were derived using 404 permit data from the Corps' ORM2 database to identify aquatic resources and permits potentially affected by the proposed rule. To estimate costs, the agencies relied on a similar methodology to that used in the NWPR analysis (U.S. EPA and Department of the Army, 2020b). To estimate benefits of wetland mitigation, the agencies used a meta-analysis of wetland valuation studies described in detail in Appendix C. The agencies evaluated potential impacts of the proposed rule relative to the secondary baseline of the NWPR (*see* Section II.C, Potential State and Tribal Response, for detail) in the estimates of benefit and costs. National-level estimates of this analysis are summarized below. State-level estimates of costs and benefits are provided in Appendix D.

III.C.2.1 Estimating Future Activity Requiring CWA Section 404 Permitting

The agencies started with ten years of Corps CWA section 404 permit data for the years 2010 through 2019 to derive average annual estimates of the: types, amount, and general location of permitted projects; water features such as wetlands, streambanks, and shorelines affected by dredged or fill activities; and the extent of impacts requiring compensatory mitigation under the 404 permitting process.[56] During much of this ten-year period, the *Rapanos* Guidance was used to determine the jurisdictional status of waters potentially affected by permitted projects. However, during the years 2015 through 2019, the CWR was in effect at varying time periods in 38 states. The section 404 permits issued in those states during the times that the CWR was in effect were removed from the dataset, so they do not factor into the average annual estimates. Since these average annual estimates of permits, affected waters, and mitigation were derived from the remaining data on permits and jurisdictional determinations based only on the *Rapanos* Guidance, the agencies consider them to be reasonably representative of future activity and regulatory requirements that would apply on an annual basis under the proposed rule.

[56] Calendar year 2019 was the most recent complete year of permit data available before the NWPR was promulgated.

During this ten-year timeframe, the U.S. Army Corps issued 478,439 permits under the section 404 program that were subject to the *Rapanos* Guidance, were not permits issued for mitigation or restoration activities, had accurate coordinate data that enabled mapping to a 12-digit hydrologic unit code (HUC12) watershed, and had complete, Cowardin information, which remains consistent across regulatory regimes. After accounting for states that currently regulate waters more broadly than the NWPR required, the number of section 404 permits issued between 2010 and 2019 that meet the above conditions dropped to 225,144. See Appendix B for summary information on this 404 permit data analysis. Table III-1 shows the annual average estimated change in mitigation requirements relative to the secondary baseline of the NWPR, based on 225,144 permits issued between 2010 and 2019 (see Appendix D for a breakout of the estimated change in mitigation requirements by state). The estimated mitigation requirements are based on an assumption of a 1:1 ratio between authorized impacts and mitigation requirements.[57] When mitigation required is more than one acre per acre impacted, the additional acreage is generally to ensure that the mitigation acres provide the same ecosystem services that the impacted acres would have, and thus the focus is on the acres of impacts requiring compensatory mitigation rather than the acres of mitigation.

The Cowardin code categorizes individual aquatic resources categorized by their hydromorphic characteristics, such as palustrine features (*e.g.*, wetlands and ponds), lacustrine features (*e.g.*, lakes), and riverine features (*e.g.*, streams and rivers). The Cowardin types with the largest estimated annual average change in mitigation requirements under the proposed rule include several palustrine types (general palustrine (P), emergent (PEM), forested (PFO), aquatic bed (PAB), scrub-shrub (PSS), and open water (POW)) as well as two riverine types (general riverine (R) and ephemeral (R6)).[58] The states of Florida, Alaska, Louisiana, and Minnesota have the largest estimated annual average change in mitigation requirements under the proposed rule. These states are estimated to have the largest benefits and costs under the proposed rule relative to the secondary baseline. However, Florida and Minnesota currently regulate waters more broadly than the NWPR requires (see Section II.B), so the estimated change in mitigation requirements from these two states drop from the main analysis.

Table III-1: Estimated annual average change in mitigation requirements under the proposed rule relative to the secondary baseline, based on CWA section 404 permits issued in 2010-2019, by Cowardin code

Cowardin Type	Permanent Impacts[1,2,3]			Temporary Impacts[1,2,3]		
	Acres	Linear Feet	Total Permanent Impacts (Acres)[4]	Acres	Linear Feet	Total Temporary Impacts (Acres)[4]
Estuarine	0.0	0.2	0.0	0.0	0.0	0.0
E1	0.0	0.7	0.0	0.1	0.7	0.1
E2	0.2	1.9	0.2	0.0	1.8	0.0
Lacustrine	5.3	194.6	5.5	0.0	0.0	0.0
L1	8.2	571.3	8.8	4.0	36.5	4.1

[57] This assumption helps account for different mitigation options (*e.g.*, on-site, off-site, in-lieu fee, mitigation credits). For example, the number of acres or linear feet per mitigation credit varies among and within U.S. Army Corps Districts, so translating mitigation credit data listed in the ORM2 database into acreage and linear feet values is not straightforward.

[58] The Cowardin code, as created by Lewis M. Cowardin et al. in 1979, does not include a category for ephemeral streams; this category was created by the Corps in ORM2 for the sake of tracking ephemeral streams.

Table III-1: Estimated annual average change in mitigation requirements under the proposed rule relative to the secondary baseline, based on CWA section 404 permits issued in 2010-2019, by Cowardin code

Cowardin Type	Permanent Impacts[1,2,3]			Temporary Impacts[1,2,3]		
	Acres	Linear Feet	Total Permanent Impacts (Acres)[4]	Acres	Linear Feet	Total Temporary Impacts (Acres)[4]
L2	4.6	746.9	5.5	0.8	31.0	0.8
Marine	0.0	0.0	0.0	0.0	0.0	0.0
M1	0.0	-0.1	0.0	0.0	0.0	0.0
M2	0.0	-0.2	0.0	0.0	-0.2	0.0
Palustrine	35.1	735.5	35.9	1.0	72.3	1.1
PAB	2.9	129.1	3.1	0.3	256.0	0.6
PEM	242.1	5,681.0	248.6	40.0	2,250.8	42.6
PFO	179.3	1,529.1	181.0	28.2	916.1	29.2
PML	0.1	0.0	0.1	0.0	0.0	0.0
POW	39.2	246.5	39.5	0.9	13.5	1.0
PRB	0.5	48.7	0.6	0.0	0.0	0.0
PSS	71.1	126.3	71.2	13.1	357.2	13.5
PUB	8.0	543.0	8.6	3.7	174.5	3.9
Riverine	1.6	25,252.2	30.6	0.3	1,892.9	2.5
R1	0.0	0.5	0.0	0.0	0.0	0.0
R2	1.1	703.1	1.9	0.8	399.8	1.3
R3	0.1	247.8	0.4	0.1	70.7	0.2
R4	2.0	6,193.8	9.1	0.5	636.5	1.2
R5	0.5	774.9	1.4	0.3	88.2	0.4
R6	24.5	90,749.1	128.7	14.9	4,268.7	19.8
Riparian	5.6	1,268.8	7.0	0.1	133.6	0.2
RP1	0.7	265.9	1.0	1.9	209.5	2.1
RP2	3.7	107.2	3.8	0.5	0.0	0.5
Upland	25.1	175.1	25.3	1.6	717.4	2.5

Source: Analysis of U.S. Army Corps of Engineers' ORM2 and jurisdictional determination data.

[1] Excludes mitigation type permits, permits issued when the CWR was in effect, permits with missing/inaccurate permit coordinates, and permits with missing or historical Cowardin codes.

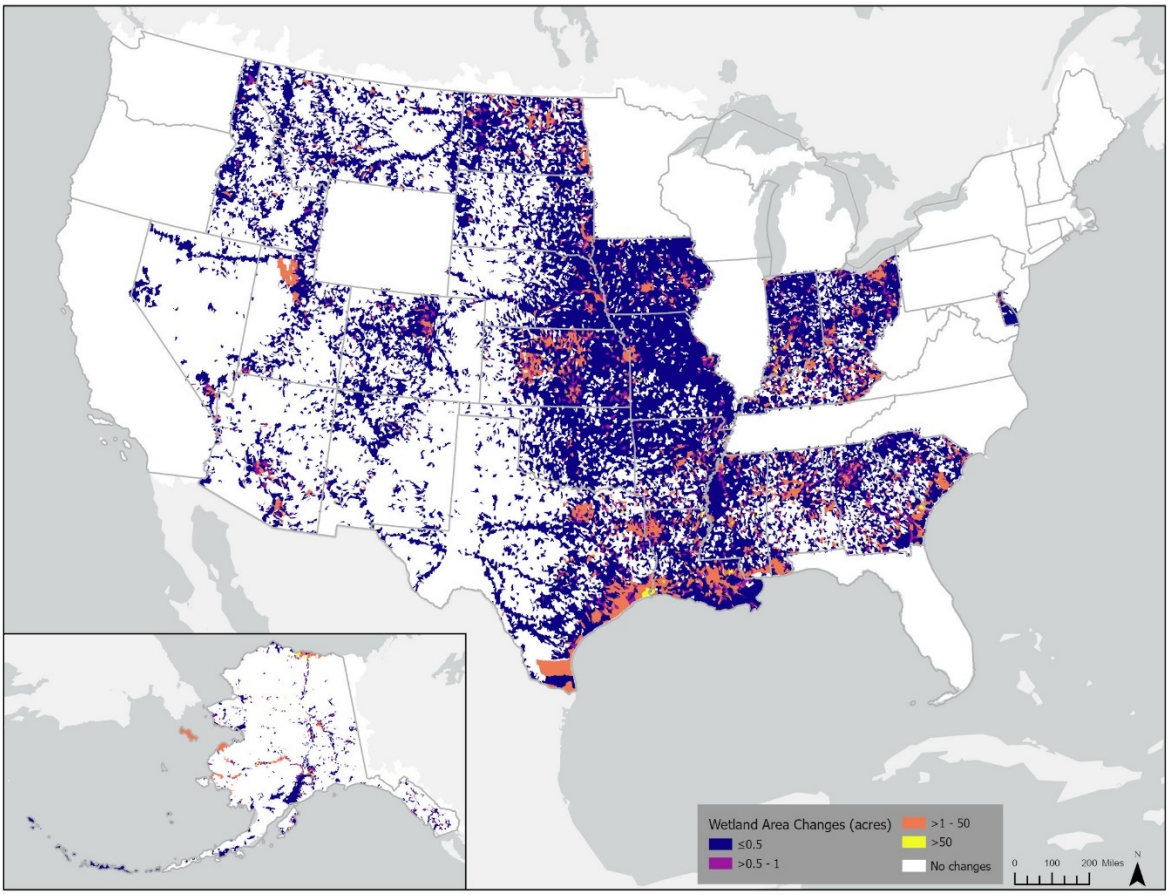
[2]The estimated impact area does not include projects from New Jersey and Michigan, as they implemented the CWA 404 program in their states and so maintain their own separate data.

[3] Includes Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[4] Impacts in linear feet were converted to acres by multiplying total linear feet by an average total buffer width of 50 feet (25 feet on each side of the stream) and converting square feet to acres.

Figure III-1 shows the distribution of annual average changes in mitigation requirements under the proposed rule, as compared to the secondary baseline of the NWPR, by HUC12.

Figure III-1: Average annual changes in mitigation area under the proposed rule, relative to the secondary baseline of the NWPR, by HUC12



III.C.2.2 Potential Costs to Section 404 Program

The analysis of the proposed rule costs follows the same general approach the agencies used in the NWPR analysis (U.S. EPA and Department of the Army, 2020b). The proposed rule could increase costs in two ways:

1) Increased permit costs, including application costs, permitting time costs, and impact avoidance and minimization costs, for projects affecting newly jurisdictional waters regulated under the proposed rule, and

2) Increased compensatory mitigation costs when impacts occur on in waters regulated under the CWA.

To estimate permit cost increases, the agencies first determined how many 404 permitted waters on average are covered by either a single-water individual permit, a single-water general permit, a multi-water single permit, or multi-water general permit in a given year, based on permits issued from 2010 to 2019. The agencies then used these averages to estimate what proportion of the waters that became no longer regulated as "waters of the United States" under the NWPR, would be covered by either a single-

water individual or general permit. These single-water individual and general permits were assumed to no longer be needed under the NWPR and the permit costs would not occur in the baseline.

The number of permits considered in the permit cost analysis may differ from the number considered in the mitigation cost analysis. The permit cost analysis considered only single-water 404 permits that potentially affect waters that became no longer jurisdictional under the NWPR. These single-water permits may or may not have had mitigation requirements. Multiple-water permits were not considered in the permit cost analysis. The mitigation cost analysis considered both single-water and multiple-water permits with mitigation requirements for waters that became no longer jurisdictional under the NWPR, excluding permits issued for mitigation or restoration activities.

The agencies used the Corps' ORM2 section 404 permit database to determine the average annual number of single-water permits affecting waters that became no longer jurisdictional under the NWPR. The agencies then multiplied the annual average change in the number of individual and general 404 permits by lower bound Corps estimates of permit costs (U.S. EPA and Department of the Army, 2015).

The Corps estimated section 404 permit application costs to calculate incremental permit application costs associated with the replacement of Nationwide Permit 26 (NWP 26) with a suite of new and modified nationwide permits in the year 2000 (U.S. EPA and Department of the Army, 2015). The Corps analysis, which noted that the costs were developed for "typical" projects affecting up to three acres of jurisdictional waters, estimated costs for individual permits ranging from $10,000 to $24,000 and for general permits ranging from $3,000 to 10,000 (1999$). For each permit type, the agencies used the low end of the range as the low estimate and the high end of the range as the high estimate. The Corps unit cost estimates are adjusted from 1999$ to 2020$ using the CPI-U ($15,500 to $37,300 per individual permit; $4,700 to $15,500 per general permit). Table III-2

Table III-2: National annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the NWPR (millions 2020$)

Permit Type	Estimated Annual Average Increase in Permits[1,2]	Unit Costs from Corps NWP Analysis (2020$)		Estimated Increase in Permit Costs (millions 2020$)[1,3]			
				3% Discount Rate		7% Discount Rate	
		Low	High	Low	High	Low	High
IP	80	$15,500	$37,300	$1.3	$3.1	$1.3	$3.2
GP	4,491	$4,700	$15,500	$21.7	$71.7	$22.6	$74.5
Total	**4,571**			**$23.0**	**$74.8**	**$23.9**	**$77.7**

[1] Reflects annual increase in permits in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Estimated annual average permit increases based on single-water 404 permits issued in years 2010-2019 affecting waters that became no longer jurisdictional under the NWPR.

[3] Permit costs are calculated by multiplying the estimated annual average increase in the number of single-water individual and general permits by the low and high unit costs for each permit type from the Corps NWP analysis ($15,500 to $37,300 per individual permit; $4,700 to $15,500 per general permit), and annualizing over the 2023-2042 analysis period.

shows the estimated annual average increase in the number of individual and general section 404 permits, Corps unit application costs, and the estimated annualized increase in permit costs for individual and general permits nationwide (estimated over a twenty-year timeframe from 2023 to 2042). Relative to the secondary baseline of the NWPR, which includes 26 states that were not regulating waters more broadly

than the NWPR required, annualized permit costs range from $23 million to $75 million using a 3 percent discount rate and from $24 million to $78 million using a 7 percent discount rate.

Table III-2: National annualized permit costs from increases in section 404 permits, relative to the secondary baseline of the NWPR (millions 2020$)

Permit Type	Estimated Annual Average Increase in Permits[1,2]	Unit Costs from Corps NWP Analysis (2020$)		Estimated Increase in Permit Costs (millions 2020$)[1,3]			
				3% Discount Rate		7% Discount Rate	
		Low	High	Low	High	Low	High
IP	80	$15,500	$37,300	$1.3	$3.1	$1.3	$3.2
GP	4,491	$4,700	$15,500	$21.7	$71.7	$22.6	$74.5
Total	**4,571**			**$23.0**	**$74.8**	**$23.9**	**$77.7**

[1] Reflects annual increase in permits in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Estimated annual average permit increases based on single-water 404 permits issued in years 2010-2019 affecting waters that became no longer jurisdictional under the NWPR.

[3] Permit costs are calculated by multiplying the estimated annual average increase in the number of single-water individual and general permits by the low and high unit costs for each permit type from the Corps NWP analysis ($15,500 to $37,300 per individual permit; $4,700 to $15,500 per general permit), and annualizing over the 2023-2042 analysis period.

To estimate costs from changes in mitigation requirements, the agencies multiplied the cost of each mitigation acre or linear foot (low and high estimates) by the estimated average annual change in mitigation requirements and summed the acreage and linear feet values for each scenario. The Corps estimated state-specific per-acre costs of wetland mitigation and per linear foot estimates of stream mitigation by examining published studies and survey results, making phone inquiries to Corps Districts and mitigation banks, and researching web sites (U.S. EPA and Department of the Army, 2015). A team of Corps experts developed a range of values for each state. Costs for mitigation in estuarine environments, whose jurisdictional status will not be affected by this rule, are not included where explicitly identified by mitigation bank and in-lieu fee program fee schedules. Mitigation costs for each state vary widely. Costs vary based on land acquisition costs, the nature of the work being done, demand for mitigation in the state, as well as other factors. The unit costs identified here, based on mitigation bank and in-lieu-fee program fee schedules, represent fully loaded unit costs and include the costs of land acquisition, construction work completed on site, monitoring for mitigation success, and long-term stewardship. In some cases, permittees do not purchase credits from a mitigation bank but rather complete a permittee-responsible mitigation project. The costs of this permittee-responsible mitigation project may be lower than the purchase of credits, particularly in circumstances where a mitigation project is constructed on the same tract of land as the permitted impacts. In this circumstance, new land would not have to be acquired, lowering the costs of the project. Therefore, the Corps' mitigation costs estimates may be an overestimate if completing a permittee responsible project is feasible on the same tract of land (U.S. EPA and Department of the Army, 2015). Otherwise, in-lieu fee program identified by mitigation banks is likely to be more cost-efficient.

Table III-3 provides annualized cost estimates from increased mitigation requirements nationwide, based on a twenty-year timeframe from 2023 to 2042. Under the secondary baseline of the NWPR, which

includes only 26 states that were not regulating waters more broadly than the NWPR required, annualized mitigation costs range from $85 million to $191 million using a 3 percent discount rate and from $89 million to $198 million using a 7 percent discount rate.

Table III-3: National annualized mitigation costs from increases in mitigation requirements, relative to the secondary baseline of the NWPR (millions 2020$)

Unit	Estimated Annual Average Mitigation Change[1,3]	Estimated Increase in Mitigation Costs (Millions 2020$)[1,2]			
		3% Discount Rate		7% Discount Rate	
		Low	High	Low	High
Acres	770.1	$41.5	$83.5	$43.1	$86.7
LF	143,740	$43.8	$107.4	$45.5	$111.6
Total		**$85.3**	**$190.9**	**$88.6**	**$198.3**

[1] Reflects annual average mitigation change in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Mitigation costs are calculated by multiplying the Corps' state-level costs for each mitigation acre or linear foot (low and high estimates) by the expected increase in annual mitigation requirements and annualizing the values over the 2023-2042 analysis period.

[3] Estimated annual average mitigation change based on permits issued in years 2010-2019 with mitigation requirements on waterways that became no longer jurisdictional under the NWPR, excluding permits issued for mitigation or restoration activities because the main purpose of these activities is to restore or enhance ecosystem services provided by water resources as opposed to dredge and fill activities that lead to permanent or temporary losses of ecosystem services.

Table III-4 provides total annualized 404 program costs resulting from the proposed rule, or the sum of permit and mitigation costs, based on a twenty-year timeframe from 2023 to 2042. Relative to the secondary baseline of the NWPR, total national annualized costs range from $108 million to $266 million using a 3 percent discount rate and from $113 million to $276 million using a 7 percent discount rate. These estimates are subject to the uncertainty discussed in Section III.C.3. The sources of uncertainty come from data limitations and as well as parameter uncertainty used as input in this analysis (*e.g.*, the ratio used for estimating compensatory mitigation and per unit mitigation costs).

Table III-4: Total national annualized compliance costs, relative to the secondary baseline of the NWPR (millions 2020$)

Cost Category	3% Discount Rate[1]		7% Discount Rate[1]	
	Low	High	Low	High
Mitigation Costs	$85.3	$190.9	$88.6	$198.3
Permit Costs	$23.0	$74.8	$23.9	$77.7
Total	**$108.3**	**$265.7**	**$112.5**	**$276.0**

[1] Total costs annualized over the 2023-2042 analysis period. Reflects expected costs in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

III.C.2.3 Potential Benefits of Changes in Wetland Mitigation Requirements Using State Approach

The analysis of the benefits of increased wetland mitigation requirements resulting from the proposed rule follows the same general state-level approach the agencies used in the NWPR analysis (U.S. EPA and

Department of the Army, 2020b). This approach relies on a meta-analysis of wetland valuation studies that provide data on the public's willingness-to-pay (WTP) for wetland preservation by Moeltner et al. (2019). The meta-data used in Moeltner et al. (2019) were limited to only U.S. based studies. To improve model predictions for larger baseline wetland areas, the agencies augmented the meta-data for this economic analysis to include two Canadian based studies (Lantz et al., 2013; Pattison et al., 2011) that provide values of freshwater wetlands similar to those found in the Midwest of the U.S. (see Appendix C for detail). The agencies re-estimated the meta-regression model (MRM) in a Bayesian framework as described in Moeltner et al. (2019). Following recommendations of the External Environmental Economics Advisory Committee (E-EEAC) (Keiser et al., 2020), the agencies also made changes to the benefits transfer application of the meta-analysis results. Specifically, the agencies estimated annual WTP values for wetland losses that would be avoided in moving from the NWPR to the proposed rule. This category of benefits accounts for state-specific wetland characteristics (*i.e.*, baseline forested and non-forested wetland areas), different values for local and non-local wetland areas, and an alternative approach to assigning values to ecosystem service indicators.

The estimated meta regression used for benefits estimation indicates the larger values generated by forested wetlands and more localized resources, as shown by positive and significant coefficients on "forested" and "local" variables (see Appendix C for detail). Accordingly, the agencies separated each state's baseline wetland acreage (based on NWI estimates; see Appendix F) into four primary prediction scenarios based on the "local" and "forested" status of baseline wetland acres and the expected change under the proposed rule relative to the secondary baseline. Because the value of wetland preservation is affected by wetland type and wetland proximity to the affected population, the agencies accounted for these factors. The agencies assumed that some wetland acres are "local" to the entire population of a given state, with the remaining wetland acreage defined as "nonlocal." Based on the average proportion of the wetland areas in the studies that valued local wetlands to the total wetland area in a given state, the fraction of local wetlands is set to equal 0.032 for all states. To estimate per household WTP values for avoiding wetland losses in a given state, the agencies first obtained four separate WTP estimates for each state, one for the wetlands acreage associated with each combination of "local" and "forested." and then aggregated these values to estimate total WTP per household per year for the estimated changes in wetland areas. As shown in Moeltner et al. (2019), the Bayesian linear MRM developed for this analysis approximately satisfies the adding-up condition, a desirable theoretical property. Appendix C presents the detailed methodology for generating benefit-transfer predictions based on the wetland meta-analysis.

To estimate the stream of future benefits from changes in wetland mitigation requirements in each state, the agencies multiplied the average per-household WTP values for the estimated annual change in wetland areas by the number of households within each state in a given year. Benefits from avoided wetland losses are estimated for all years from 2023 through 2042, assuming that all benefits from average annual *permanent* mitigation changes begin accruing in 2023, whereas average annual *temporary* mitigation changes have a 5-year lag and begin accruing in 2028. [59] The 5-year lag in benefits from

[59] Permanent mitigation changes are based on expected increases in mitigation to address authorized permanent impacts, which permanently change an affected resource to dry land (e.g., for permanent road construction). Temporary mitigation changes are based on expected increases in mitigation to address authorized temporary impacts, which includes impacts necessary for construction activities that do NOT permanently change an affected resource to dry land, such as access fills, dewatering of construction sites, or temporarily side-casting material from trenching.

mitigation measures for temporary impacts is based on discussions with the Corps and accounts for the time required for temporarily impacted areas to return to their original state. Once a temporarily impacted area returns to its original state, mitigation acres for the temporary impacts represents a net increase in wetland area. The agencies aggregated total discounted WTP values over the time period of analysis (*i.e.*, 2023 to 2042), using 3 and 7 percent discount rates. For each time period, the total number of households is adjusted to reflect predicted population growth based on 2020 Woods and Poole population projections (Woods & Poole Economics Inc., 2021). The agencies then calculated annualized total WTP values for each state, using 3 percent and 7 percent discount rate (see Appendix C for additional detail).

Table III-56 presents total national annualized benefit estimates, based on annual WTP for wetlands for a twenty-year timeframe from 2023 to 2042. Using a 3 percent discount rate, estimates range between $376 million and $590 million under the secondary baseline of the NWPR. Using a 7 percent discount rate, estimates range between $379 million and $592 million under the secondary baseline of the NWPR.

Table III-5: Total national annualized benefits, relative to the secondary baseline of the NWPR (millions 2020$)

Discount Rate	Number of Affected Households in 2019[1,2]	Average Annual Increase in Mitigation Acres[1,3]	Household WTP (2020$)[1,4]		Annualized Estimate of Benefits (Millions 2020$)[1,5]	
			Low	High	Low	High
3% discount	47,185,707	902.98	$ 7.10	$ 11.18	$ 375.84	$590.09
7% discount	47,185,707	902.98	$7.10	$11.18	$ 378.96	$591.80

[1] Based on the number of households in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Number of households based on 2019 American Community Survey data in the states affected by the proposed rule relative to the NWPR secondary baseline. The agencies accounted for population growth and change in the number of households throughout the 2023-2042 study period (Woods & Poole Economics Inc., 2021).

[3] A weighted value that accounts for only permanent mitigation requirements in years 1-5 and (permanent + temporary mitigation requirements) in years 6-20 of the analysis.

[4] A weighted value that accounts for household WTP for permanent mitigation requirements only in years 1-5 and household WTP for (permanent + temporary mitigation requirements) in years 6-20 of the analysis. Low and high benefit estimates are based on different regional assignments for the states of Alaska and Texas in the meta-regression model. The low estimate is based on assigning Texas to the South Atlantic/Gulf Coast region and Alaska to the North/Midwest, while the high estimate is based on setting regional indicators to zero for both states (see Appendix C for detail).

[5] Total benefits annualized over the 2023-2042 analysis period.

The agencies contrast this coarse, state-level approach to estimating benefits from changes in wetland mitigation requirements to the refined GIS-based approach detailed in Appendix H.

III.C.2.4 Potential Impacts to States

As discussed in Chapter I, many states already exceed the scope of aquatic resources or surface waters that would be protected under the proposed rule. Under the NWPR, states may have expanded existing programs or initiated new programs to protect waters that became non-jurisdictional. With the proposed rule's return to the status quo, states may choose to continue these program initiations or extensions, or they may choose to return to their procedures prior to the NWPR. Costs associated with continued program initiations or extensions are not attributable to the proposed rule since the process began as a response to the NWPR. However, as discussed in Section III.C.2.2, the agencies anticipate additional section 404 permit volume under the proposed rule relative to the secondary baseline of the NWPR, which means that states will either complete additional section 401 reviews for these permits or waive review. The agencies assumed that all states that were regulating waters more broadly than the pre-2015 regulations and practice require (see Section II.B) already have procedures in place that would entail reviewing these additional permits sufficiently to make section 401 certification determinations and thus would not face any additional costs. However, under the secondary baseline of the NWPR, for states that are not regulating waters more broadly than the proposed rule the pre-2015 regulatory regime required, the additional section 404 permit volume under the proposed rule would likely increase their section 401 review costs.

For states that would be expected to experience such an increase in costs resulting from CWA section 401 certification reviews of Corps-issued 404 permits, the agencies estimated a range of values for cost per permit. Values were gathered from case studies conducted by the Association of State Wetland Managers (ASWM). ASWM surveyed 11 states [60] and asked them for estimates regarding the number of FTEs required for CWA section 401 reviews. The agencies divided FTE estimates by the number of average annual 404 permits for the state (based on ORM2 data from 2010 to 2019), which yielded a range of estimates for FTEs required per permit. ASWM asked states for FTE estimates for all 401 reviews of federal permits, including those issued by the Federal Energy Regulatory Commission, those issued under the Rivers and Harbors Act (RHA) Sections 9 and 10, and those issued by the Nuclear Regulatory Commission in addition to 404 permits. Most permits that states review are 404 permits, although they are typically not the most complex. For example, according to the ASWM case studies, 99 percent and 90 percent of CWA section 401 certifications are for 404 permits in Louisiana and North Carolina, respectively (ASWM, 2011). Because most permits reviewed are CWA section 404 permits and there is no additional information for how many FTEs each state requires to only review 404 permits, the agencies assumed that FTE estimates from ASWM are for section 404 permits only. Dividing FTE estimates by the number of section 404 permits for the ASWM case study states and multiplying by the average state employee salary yielded a range of section 401 review costs per permit ranging between $70-$2,172, with an average review cost per permit of $886 (2020$). The agencies multiplied these low, mean, and high values by the number of additional single-water section 404 permits affecting waters that became no longer jurisdictional under the NWPR but would be subject to section 401 review under the proposed rule.

[60] ASWM case studies on resources devoted to section 401 reviews include Delaware, Georgia, Idaho, Kentucky, Louisiana, Missouri, North Carolina, South Carolina, Tennessee, Texas, and Wisconsin (ASWM, 2011).

Table provides estimated annualized state costs from increases in section 401 reviews, based on states that under the secondary baseline of the NWPR were not regulating waters more broadly than the NWPR required and a twenty-year analysis period from 2023 to 2042.

Table III-6: Estimated annualized state costs from increases in section 401 reviews, relative to the secondary baseline of the NWPR (million 2020$)

3% Discount Rate[1]			7% Discount Rate[1]		
Low	Mid	High	Low	Mid	High
$0.3	$4.2	$10.2	$0.3	$4.3	$10.6

[1] State costs associated with increased volume of section 401 reviews are annualized over the 2023-2042 analysis period. Includes anticipated costs for Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

III.C.2.5 Benefit Cost Comparison

As shown in Table III-7, the benefits range from $376 million to $590 million, while social costs range from $109 million to $276 million, both at a 3 percent discount rate. However, the agencies were only able to estimate the benefits associated with impacted acreage subject to compensatory mitigation and were unable to estimate benefits associated with the avoidance and minimization aspects of the mitigation sequence. For many projects, the avoidance and minimization steps that permittees are required to take are all that is needed to prevent impacts to permitted waters. Furthermore, these benefit estimates, do not fully account for all potential benefit categories, they do not include the changes to water quality inside ephemeral and intermittent streams, downstream water quality and flood avoidance outside of the vicinity of wetlands, and additional services provided by wetlands such as carbon sequestration. The agencies also did not estimate benefits associated with other CWA programs, though they are not expected to be anywhere near as substantial as the benefits from the section 404 permitting program. The total social cost estimates include direct compliance costs from changes in mitigation requirements, changes in expected number of permits required, and state costs from increases in section 401 reviews. Likewise, the agencies' estimate of social costs does not include costs under other CWA programs (e.g., 311 and 402) though these are not expected to be anywhere near as substantial as the costs for the section 404 permitting program. Social cost totals also do not include costs associated with avoidance and minimization measures. The placeholders, A and B, are included in the totals to reflect these categories of costs and benefits, respectively, that the agencies did not monetize.

Table III-7: Total national annualized benefits and costs, relative to the secondary baseline of the NWPR (millions 2020$)

Benefit Cost Category	3% Discount Rate[1,2,3,4]		7% Discount Rate[1,2,3,4]	
	Low	High	Low	High
Mitigation Costs	$85.3	$190.9	$88.6	$198.3
Permit Costs	$23.0	$74.8	$23.9	$77.7
State Costs from Increases in Section 401 Reviews	$0.3	$10.2	$0.3	$10.6
Total Social Costs	**$108.6 + A**	**$275.9 + A**	**$112.8 + A**	**$286.6 + A**
Total Benefits	**$375.9 + B**	**$590.1 + B**	**$379.0 + B**	**$591.8 + B**

[1] Total benefits and costs annualized over the 2023-2042 analysis period.

Table III-7: Total national annualized benefits and costs, relative to the secondary baseline of the NWPR (millions 2020$)				
Benefit Cost Category	3% Discount Rate[1,2,3,4]		7% Discount Rate[1,2,3,4]	
	Low	High	Low	High
[2] Reflects estimated benefits and costs for Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah. [3] The "A" represents unquantified costs such as those for avoidance and minimization efforts required under CWA 404 permits and those costs that may occur under the CWA 311 401 and 402 programs. [4] The "B" represents unquantified benefits such as those for wetlands and streams protected through avoidance and minimization efforts required under CWA 404 permits, carbon sequestration benefits, and those benefits that may occur under the CWA 311, 401 and 402 programs.				

Note that other than discount rates, there are different drivers for the ranges for benefits and costs and it is not necessarily the case that low costs apply to low benefits and high costs to high benefits. Relative to the secondary baseline of the NWPR, the low estimates for benefits and costs result in net benefits of $267 million at a 3 percent discount rate. Similarly, the high estimates for benefits and costs result in net benefits of $314 million at a 3 percent discount rate. However, net benefits could also range from $100 million to $482 million. The unquantified costs (A) and unquantified benefits (B) would also contribute B-A to any estimate of net benefits, though this unquantified estimate is not expected to be substantially negative, that is, enough to negate the positive net benefits. Thus, the agencies can reasonably conclude even under the secondary baseline that the benefits would justify the costs.

Both benefit and cost estimates are subject to uncertainty. III.C.3 below documents data limitations and potential sources of uncertainty in the benefit cost analysis (e.g., due to data gaps or necessary methodological simplifications). To assess sensitivity of benefit and cost estimates to variability of underlying parameters, the agencies developed a range of benefit and cost estimates based on alternative assumptions. For costs, the range is based on the low and high mitigation cost values provided by the Corps. For benefits, low and high estimates are based on alternative assignments of regional indicators for Texas and Alaska. The low estimate is based on assigning Texas to the South Atlantic/Gulf Coast region and Alaska to the North/Midwest region. The high estimate is based on setting regional indicators to zero for both states, which corresponds to Arid or semi-Arid West and Pacific Northwest region. Given that both Alaska and Texas cut across several ecological zones due to the size of these states multiple regions may apply and neither model is preferred to the other (see Appendix C for details on benefit prediction methodology). Appendix E presents benefit estimates based on a meta-analysis of wetland valuation studies conducted in the U.S. only.

III.C.3 Uncertainty and Limitations for Assessing Potential Effects on CWA Section 404 Program

The likely response of states to definitional changes is uncertain. Differing state responses makes quantifying impacts to changes in jurisdictional water difficult. Past environmental policies and current state regulations offer some indication of potential proposed rule responses, but actual responses may differ from the agencies' projections in this analysis.

Certain categories of waters are not categorically jurisdictional.[61] When a proposed project may impact such waters, the Corps can assess jurisdictional status via a jurisdictional determination to determine whether a section 404 permit is required for the project and which affected waters must be covered under the permit. Because jurisdictional determinations are often required to assess the jurisdictional status of affected waters, the scope of waters considered to be jurisdictional under different regulatory regimes is subject to uncertainty. For many of these water features, their jurisdictional status under any regulatory regime is unknown until a project is considered that might impact the water feature and the property owner initiates a jurisdictional determination with the Corps, or state permitting authority. For this analysis, the agency has relied on jurisdictional determination data organized by Cowardin classifications.

Although jurisdictional determinations are the first part of the overall CWA section 404 permitting process, not all property owners who request a jurisdictional determination for water features on their property proceed with a project requiring a permit. There is an implicit assumption in applying the jurisdictional probabilities from the AJD data, and the data on the proportion of jurisdictional determinations that result in AJDs to permit data, that the likelihood of proceeding with a permit does not vary depending on the type of jurisdictional determination that occurred.

Mitigation credits complicate efforts to quantify the amount of mitigation that would be required under the proposed rule. This is because the number of acres or linear feet per credit varies among and within U.S. Army Corps Districts depending on assessment practices. Converting the number of mitigation credits into a consistent unit of measure for a national analysis is thus difficult without consulting individual permits. To avoid conversion errors, the agencies focused on authorized impacts instead of attempting to convert the various mitigation types into acre- and linear feet.

The response of regulated entities to the revised definition of "waters of the United States" under the secondary baseline of the NWPR is also unclear. For instance, regulated entities in some cases may have continued using a protocol that avoids and minimizes impacts to non-jurisdictional waters—regardless of state-level regulations—for example, to standardize their protocol across states. Also, the response of regulated entities in states with less stringent requirements would likely depend on the type of work, the stage of work (e.g., planning, active, completed, an on-going basis), local permitting requirements, and the stringency of permit requirements that the entity faces in other areas.

The NWPR's effect on permit costs is also unclear. It is expected that there was a reduced permit burden for projects that did not need a permit under the NWPR but would have under the *Rapanos* Guidance. The agencies also anticipate that under the NWPR, some permittees were able to receive a general rather than a more expensive individual permit. However, permit costs depend on many factors, including existing state, tribal, and local requirements, which may not be as protective as the section 404 permitting process under the *Rapanos* Guidance but still required some protections for water features that became non-jurisdictional under the NWPR. Project owners still were required to determine the jurisdiction of water features on their property, and there is evidence that the NWPR resulted in an increase in the number of AJDs, relative to preliminary jurisdictional determination (PJDs) or no JDs, requested by applicants who wanted confirmation that their impacted water features were excluded. This shift towards more AJDs can

[61] Waters that are not categorically jurisdictional include non-navigable tributaries that are not relatively permanent, wetlands adjacent to non-navigable tributaries that are not relatively permanent, and wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

increase costs and construction delays, all else equal. However, since the NWPR was implemented for just slightly more than a year, it is difficult to know if the shift to more AJDs would have been permanent or temporary.

Additionally, in keeping with the previous NWPR analyses, the agencies used a range of cost estimates for section 404 individual and general permits from the most recent Corps analysis performed in 2000 (as described in U.S. EPA and Department of the Army, 2015). The agencies are aware of additional permit cost estimates from Sunding & Zilberman (2002), which are presented in 2020$ in Table III-8 (Sunding & Zilberman, 2002). The Sunding & Zilberman values have a wide range. Their low values are lower than the Corps' low estimates, but their high values are 14 and 60 times greater than the Corps' high estimates for general and individual permits, respectively. Because Sunding & Zilberman did not provide a cost breakdown by category for their estimates, their values may include cost components that will remain under the proposed rule (e.g., costs associated with completing a jurisdictional determination to determine whether a section 404 permit is required). The high-end estimates from the Sunding & Zilberman paper also very likely represent large permits covering multiple water features. These types of permits are still likely to be needed even if one or more of those waters would have been non-jurisdictional under NWPR. The agencies therefore used the Corps' low and high permit cost values to estimate the range of costs associated with the increase in required section 404 permits. If the agencies had used the Sunding & Zilberman values instead of the Corps values, the high section 404 permit cost estimates for the proposed rule would be significantly greater, but the low estimates would be smaller. The agencies request comment on whether the Sunding & Zilberman costs should be considered for this analysis.

Table III-8: Range of section 404 permit values (2020$) from Sunding & Zilberman (2002)

Permit Type	Low	High	Mean	Median	Base + Acre
Individual	$10,900	$2,376,800	$421,900	$240,800	$67,900 plus $18,300/acre
General	$3,100	$217,600	$44,900	$18,300	$26,200 plus $14,400/acre

The estimated changes in mitigation requirements are also subject to uncertainty, which affects both estimated mitigation costs and estimated benefits:

- First, the agencies converted linear feet impacts to acres by multiplying linear feet by an average total buffer width of 50 feet (25 feet on each side of the stream) and converting square feet to acres, but the actual width for linear feet mitigation requirements may differ.

- Second, the ORM2 database that the agencies used to estimate changes in mitigation requirements may have some data entry errors. For example, ORM2 entries for 3,007 single-water permits issued between 2010 and 2019 did not list any authorized impacts but were flagged as requiring mitigation.

- Third, the agencies estimated the change in mitigation requirements using the proportion of waters from different Cowardin categories that are covered by section 404 permits under the *Rapanos* Guidance and under the NPWR, which were based on jurisdictional determination data. Since the NWPR proportions were based on a much shorter time span than the *Rapanos* proportions, the change in the proportions between *Rapanos* and NWPR are subject to uncertainty.

When quantifying mitigation costs, the agencies accounted for uncertainty in state-level per acre and linear foot costs by using the Corps' low and high estimates. However, for reasons presented in Section III.C.2.2, the Corps' mitigation costs estimates may be an overestimate (U.S. EPA and Department of the Army, 2015).

In addition to typical limitations and uncertainties inherent in benefit transfer (Johnston and Bauer, 2020), key limitations in the agencies' benefit analysis include:

- Extent of the market assumptions. The benefits analysis presented here relies on the assumption that only state residents value changes in the wetland area in each state. This is a simplified (or coarse) approach that makes the analysis less complicated to perform and that provides reasonable results. However, the agencies acknowledge that there is no theoretical basis to believe that households only value wetlands within their own state boundaries, or that all households in a state value all the wetlands in their state (particularly for larger states). Limiting affected populations to state residents omits a substantial component of the wetland values associated with upstream and downstream connectivity of wetlands that may go beyond the boundary the states. For the final rule analysis, the agencies are intending to use a different approach that relies on estimating household willingness-to-pay for wetlands within a given distance radius from households. Several distance estimates could be used to examine how different assumptions regarding the extent of household willingness-to-pay have on overall benefit estimates. The agencies have included a preliminary version of this analysis in Appendix H and encourage comment on using this more refined approach.

- Meta-data limitations. The majority of wetland studies included in the meta-data elicited values for wetlands in rural areas (see Appendix C for detail). However, wetland values are likely to be higher for urban wetlands compared to rural wetlands (Keiser et al., 2020). Because development and the associated wetland loss typically occur in urban or suburban areas the estimated WTP for avoiding wetland losses near population centers may be biased downward.

- The affected wetland area that is local. The agencies used a simplified approach to estimating the fraction of the wetland area (baseline and change) that is local based on the information available from the meta-data (see Appendix C for detail). The effect of this assumption on the benefit estimates is uncertain due to uncertainty in geographic distribution of the future 404 projects.

The agencies acknowledge that the meta-analysis benefit transfer approach does not account for all potential benefits associated with wetland and stream protection. Beyond limiting the household WTP estimates to just those wetland changes within state, there are additional ways that benefits are likely being underestimated. Although the estimated change in wetlands acreage is relatively small and dispersed across the landscape, in the aggregate and over time these changes have potential effects on larger water resources many miles downstream. There are other categories of benefits not likely captured by the studies in the meta-analysis. For example, the benefits of wetland carbon sequestration are not included. Wetlands sequester carbon from the atmosphere through plant photosynthesis and by trapping sediment from runoff. The carbon is sequestered in living vegetation as well as in litter, peats, organic soils, and sediments (e.g., Nag et al., 2017; Tangen et al., 2020). Finally, the benefit estimates do not account for the ability of wetlands to help allay the future effects of climate change. Future severe weather events are expected to increase in duration, frequency, and intensity, and the ability of wetlands to reduce soil erosion and retain flood waters will only become more valuable when these events occur

(e.g., Bullock et al., 2003; Lawrence et al., 2019; Tang et al., 2020; Watson et al., 2016; Williams et al., 2015). The agencies expect that these unquantified and unmonetized benefits have the potential to be substantial.

III.D Other CWA Sections

III.D.1 CWA Section 303: Water Quality Standards and Total Maximum Daily Loads

CWA section 303 includes development of state or tribal water quality standards, assessment of water quality, and development of total maximum daily loads (TMDLs) for waters that are determined to not meet applicable water quality standards.

States and tribes typically develop water quality standards for general categories of waters, including wetlands, in addition to creating site-specific standards and general standards that can apply more broadly.

State water quality standards for waters jurisdictional under the CWA are required to be consistent with the CWA, for example in terms of designating uses, criteria to protect those uses, and anti-degradation policies. If a feature is not jurisdictional under the CWA, states and authorized tribes are not required to develop water quality standards for it under the CWA. There is also no federal requirement under CWA section 303(d) for states to assess "non-jurisdictional" waterbodies. Therefore, a change in the scope of CWA jurisdiction has the potential to increase the number of waters that are assessed or otherwise identified as impaired pursuant to CWA section 303(d). As a result of the proposed rule relative to the secondary baseline of the NWPR, states would be required to develop TMDL restoration plans for waters that were impaired but were not so identified and not jurisdictional under the NWPR.

Relative to the secondary baseline of the NWPR, the proposed rule may affect the number of waterbodies added to the impaired waters list (and subsequent TMDL development). States typically have a set budget for water quality monitoring and assessment and monitor only a subset of waters in any year since water quality sampling needs are often higher than budgets allow. The proposed rule may increase the number of waters that states choose to monitor. Under the proposed rule relative to the secondary baseline of the NWPR, states may need to reallocate monitoring resources to newly jurisdictional waters to collect data in waters that meet the new definition of "tributary," the definition of "lakes and ponds, and impoundments of jurisdictional waters," and revised definition of "adjacent wetlands."

The development and revision of water quality standards is an ongoing process that operates independent of changes to the definition of "waters of the United States"— absent CWA jurisdiction, states and tribes can still choose to regulate waters irrespective of federal mandates and can apply water quality standards to non-federal waters. Therefore, some states continued implementing and/or developing standards for certain categories of waters (*e.g.,* ephemeral features) that were non-jurisdictional under the NWPR. The agencies have collected information relating to these changes in the Updated States Snapshot and welcome comment on the identified changes that occurred while the NWPR was implemented. The agencies were unable to project additional costs related to development or revision of water quality standards as a consequence of the proposed rule relative to the secondary baseline of the NWPR.

Changes in CWA jurisdiction may have in some circumstances led to requests for changes in TMDL waste load allocations (WLAs) for point sources and load allocations (LAs) for nonpoint sources and

related margins of safety. Under the NWPR, TMDL revisions could have shifted additional pollutant reduction responsibility to those sources discharging to jurisdictional waters downstream. Given that there are currently more than 73,000 completed TMDLs nationwide, revising even a small percentage of them may require significant resources to complete (U.S. EPA and U.S. Department of the Army 2018a). The agencies are unaware of any TMDL revisions that occurred as a result of the NWPR and are interested in hearing feedback from states if such revisions occurred.

III.D.2 CWA Section 401: State and Tribal Roles

Under section 401 of the CWA, states, authorized tribes, and interstate agencies have the authority to review and approve, impose conditions for approval, or deny any federal permits or licenses that may result in a discharge to "waters of the United States" within their borders, including wetlands. States, authorized tribes, and interstate agencies make their decisions to deny, certify, or impose permit or license conditions primarily by ensuring the activity will comply with applicable water quality standards, effluent limitation guidelines, new source performance standards, toxic pollutants restrictions, and other appropriate water quality requirements of state or tribal law. CWA section 401 certification is commonly applied to CWA section 404 permits and RHA section 10 permits issued by the U.S. Army Corps of Engineers, CWA section 402 permits in the states where the EPA issues NPDES permits, and Federal Energy Regulatory Commission licenses for non-federal hydroelectric dams. States, authorized tribes, and interstate agencies may choose to waive their CWA section 401 certification authority, either explicitly or through the passage of time (up to one year as mandated by section 401(a)(1)).

Under the proposed rule, the agencies estimate that the number of CWA section 404 permits will likely increase since non-adjacent wetlands, ephemeral features, certain ditches, and certain lakes and ponds would become jurisdictional based on a significant nexus analysis, whereas under the some of these waters would have been found to be non-jurisdictional under the NWPR. As noted before, an increase in 404 permits could result in increased costs to states and authorized tribes by increasing the number of 401 reviews and associated staff time. The vast majority of states have been authorized to administer section 402 of the CWA, and any cost changes that would result from the proposed rule due to CWA section 402 permitting are discussed in Section III.B. States that have not been authorized to administer all or some of the CWA section 402 program and tribes authorized to administer CWA section 401 would continue to issue CWA section 401 certification on EPA-issued 402 permits. An increase in EPA-issued 402 permits could result in increased costs to states and authorized tribes by increasing the number of 401 reviews and associated staff time.

For waters whose jurisdictional status would change under the proposed rule relative to the secondary baseline of the NWPR, federal license or permit applicants must obtain a section 401 certification or waiver for the related federal license or permit in those waters. States and authorized tribes can grant or deny certification or can place additional conditions on these federally-issued permits or licenses through their CWA section 401 authority, potentially enhancing environmental benefits and increasing costs to permittees.

IV. Environmental Justice Analysis

Executive Order (E.O.) 12898 (59 FR 7629, February 11, 1994) requires that, to the greatest extent practicable and permitted by law, each federal agency must make the achievement of environmental justice (EJ) part of its mission. E.O. 12898 provides that each federal agency must conduct its programs, policies, and activities that substantially affect human health or the environment in a manner that ensures such programs, policies, and activities do not have the effect of (1) excluding persons (including populations) from participation in, or (2) denying persons (including populations) the benefits of, or (3) subjecting persons (including populations) to discrimination under such programs, policies, and activities because of their race, color, or national origin.

Executive Order 14008 (86 FR 7619, January 27, 2021) expands on the policy objectives established in Executive Order 12898 and directs federal agencies to develop programs, policies, and activities to address the disproportionately high and adverse human health, environmental, climate-related and other cumulative impacts on disadvantaged, historically marginalized, and overburdened communities, as well as the accompanying economic challenges of such impacts.

Executive Order 13563 (76 FR 3821, January 18, 2021) also indicates that federal agencies may consider equity, human dignity, fairness, and distributional considerations, where appropriate and permitted by law.

EPA also published "Technical Guidance for Assessing Environmental Justice in Regulatory Analysis" (U.S. EPA, 2016) to provide recommendations that encourage analysts to conduct the highest quality analysis feasible, recognizing that data limitations, time and resource constraints, and analytic challenges will vary by media and circumstance.

As discussed in Section I.A, the pre-2015 regulatory practice is the baseline used to formally meet the directives under E.O.s 12898 and 14008. This environmental justice analysis was conducted to provide the public with additional information on the potential implications of the proposed rule, based on available data. [62]

IV.A Screening Analysis of the Proposed Rule using the Secondary Baseline of the NWPR

For the proposed rule, the agencies examined whether the change in benefits from the reinstatement of the pre-2015 practice may be differentially distributed among population groups of concern [63] in the affected areas when compared to the secondary baseline of the NWPR. [64] In determining the potential for EJ concerns in affected areas, the agencies considered the following factors in this analysis: population

[62] It should be noted that the baseline (pre-2015 regulatory practice) could have pre-existing impacts for populations of concern but this analysis focuses on the impacts of changes due to the proposed rule for populations of concern.

[63] EPA's Technical Guidance for Assessing Environmental Justice in Regulatory Action (U.S. EPA, 2016) defines population groups of concern as those identified under EO 12898 (minority, low-income, and indigenous populations) as well as sub-populations that may be at greater risk for experiencing adverse effects, including those that rely on fish/wildlife for subsistence, age groups, and gender groups (p. 6).

[64] Section V includes a qualitative discussion of how the changes in benefits may affect tribal areas across the United States.

characteristics, proximity to effects of the proposed rule, and selected indicators of vulnerability to environmental risk. The agencies assessed the demographic characteristics of the populations affected by the proposed rule. The analysis defines the affected population as those residing within the same watershed as wetland area changes anticipated under the proposed rule, following the approach described in Section III.C. The demographic characteristics match those included in EPA's EJSCREEN.

The agencies collected population-specific data from the U.S. Census Bureau's American Community Survey (ACS) from 2015 to 2019 on:

- the percent of the population below twice the poverty threshold,[65] referred to as low-income population for the purpose of this analysis;
- the population categorized in various racial/ethnic groups, from which EPA calculated the percent of the total population that belongs to a minority racial/ethnic group;[66]
- the percent of the population age 25 or older whose education is short of a high school diploma;
- the percent of linguistically isolated households where all members age 14 years and over speak a non-English language and also speak English less than "very well;"
- the percent of the population under the age of five;
- the percent of the population over the age of 64; and
- the percent of the population that belongs to an American Indian tribe.[67]

The agencies also utilized selected environmental indicators included in EJSCREEN, including:

- toxicity weighted stream concentrations divided by distance to the nearest stream segment, as indicator of dischargers with NPDES permits under the CWA section 402 program; and
- the count of Risk Management Plan (RMP)[68] facilities within five kilometers (or the nearest neighbor outside of five kilometers), divided by distance to the facilities, as indicator of facilities that may be subject to Facility Response Plan requirements under the CWA section 311 program.

[65] Poverty status is based on data from the Census Bureau's American Community Survey using a rationale established by EPA's EJSCREEN. The rationale for using twice the poverty threshold rather than just the poverty threshold is described in Appendix B of the EJSCREEN Technical Documentation (U.S. EPA, 2019b).

[66] The racial/ethnic categories are based on the breakout of ethnic/racial populations in Census data, which distinguishes racial groups within Hispanic and non-Hispanic categories. Minority groups include: African American (non-Hispanic); Asian (non-Hispanic); Native Hawaiian/Pacific Islander (non-Hispanic); American Indian/Alaska Native (non-Hispanic); Other non-Hispanic; Hispanic/Latino.

[67] This variable is not available for the same spatial resolution or extent as the other ACS variables. The data are available at the Census tract (CT) level and were not sampled and, therefore, unavailable for some CTs across the country.

[68] RMP facilities are those facilities required by the Clean Air Act (section 112(r)) to file risk management plans if they maintain a quantity of substance, provided the substance is included on the List of Regulated Substances, that exceeds the defined threshold quantity.

The agencies compiled these data for all Census boundaries[69] across the country.[70] The agencies then intersected the Census boundaries with HUC12 boundaries and used the intersecting area to proportionally adjust the socioeconomic and environmental risk data.[71] These data were then compared to national data to give context to each socioeconomic and environmental risk indicator. The agencies compared the demographic and environmental risk metrics to national metrics to identify communities where EJ concerns may exist for HUC12s affected by the proposed rule relative to the secondary baseline of the NWPR.

This first analysis considers the spatial distribution of population groups of concern (based on their demographic characteristics only), in relation to estimated changes in wetland areas and affected waters under the proposed rule, relative to the NWPR. Results of the analysis are presented in the context of population groups of concern and summarize selected demographic characteristics in relation to national statistics.

Table IV-1 and Table IV-2 summarize the socioeconomic characteristics of HUC12 watersheds based on estimated changes in wetland area and affected waters, respectively, under the proposed rule. For reference, Figure V-1 and Figure V-2 (in Section V: Tribal Impact Analysis) show the spatial distribution of the changes to wetland area and affected waters presented in the tables.

[69] Census block groups and Census tracts depending on the associated socioeconomic variable.

[70] In line with the economic analysis, Hawaii and the District of Columbia were not included in the environmental justice analysis due to a lack of data in the case of Hawaii and a lack of impacts in the case of the District of Columbia. These states were also excluded from the analyses for the 2015, 2019, and 2020 rules.

[71] The socioeconomic data (based on population or household counts) was proportionally adjusted based on the ratio of the intersect area to the total census block group or tract area. The environmental risk data were proportionally adjusted based on the ratio of the intersect area to the total HUC12 area.

Table IV-1: Socioeconomic characteristics of communities within HUC12 watersheds experiencing wetland area changes, compared to national averages

Wetland Area Changes (acres)	Total Number of HUC12s (% of Affected HUC12s)	Individuals that are Minority[a]	Individuals that are Low-Income[b]	Individuals with Less than High School Education	Households with Linguistic Isolation	Individuals under Age 5	Individuals over Age 64	Individuals that Belong to an American Indian Tribe
No changes	52,401	32.2%	32.3%	12.8%	3.3%	3.1%	16.8%	0.3%
<= 0.5	39,017 (86.9%)	36.7%	31.2%	12.1%	4.3%	3.1%	16.1%	0.3%
> 0.5 - 1	2,004 (4.5%)	43.6%	29.6%	11.9%	4.9%	3.1%	14.4%	0.3%
> 1 – 50	3,773 (8.4%)	43.0%	29.9%	11.0%	4.3%	3.2%	14.6%	0.3%
> 50	96 (0.2%)	74.0%	38.4%	20.4%	14.0%	3.2%	14.3%	0.3%
National Averages		**39.2%**	**30.9%**	**12.0%**	**4.4%**	**3.1%**	**15.6%**	**0.3%**

a. The socioeconomic characteristic data are calculated based on the proportion of the area of Census boundaries that intersect with HUC12s experiencing wetland area changes under the proposed rule.

b. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2021

Table IV-2: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, compared to national averages

Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Individuals that are Minority[a]	Individuals that are Low-Income[b]	Individuals with Less than High School Education	Households with Linguistic Isolation	Individuals under Age 5	Individuals over Age 64	Individuals that Belong to an American Indian Tribe
No changes	52,401	32.2%	32.3%	12.8%	3.3%	3.1%	16.8%	0.3%
<= 5	32,027 (71.3%)	37.9%	33.1%	13.5%	4.7%	3.1%	16.4%	0.3%
> 5 - 10	5,382 (12.0%)	39.4%	30.9%	11.6%	4.1%	3.1%	15.7%	0.3%
> 10 – 100	7,226 (16.1%)	41.2%	29.1%	11.0%	4.5%	3.1%	14.9%	0.3%
> 100 – 1,000	255 (0.6%)	42.2%	28.2%	11.1%	3.9%	3.2%	13.9%	0.2%
National Averages		**39.2%**	**30.9%**	**12.0%**	**4.4%**	**3.1%**	**15.6%**	**0.3%**

Table IV-2: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, compared to national averages

Changes to Affected Waters	Total Number of HUC12s (% of Affected HUC12s)	Individuals that are Minority[a]	Individuals that are Low-Income[b]	Individuals with Less than High School Education	Households with Linguistic Isolation	Individuals under Age 5	Individuals over Age 64	Individuals that Belong to an American Indian Tribe

a. The socioeconomic characteristic data are calculated based on the proportion of the area of CBGs or CTs that intersects with HUC12s experiencing wetland area changes under the proposed rule.

b. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

Source: U.S. EPA analysis, 2021

As shown, socioeconomic characteristics for HUC12s experiencing wetland area changes and changes to affected waters due to the proposed rule are similar to national averages (within five percent), the exception being HUC12s with expected wetland area changes greater than 50 acres. For the few HUC12s with wetland area changes greater than 50 acres, the percentage of individuals that are minority, individuals that are low-income, individuals with less than high school education, and households with linguistic isolation are much larger than national averages (between eight to 30 percent greater than national averages). In addition, the percentage of individuals that are minority generally trend with changes to affected waters and wetland area. In other words, the greater the change in wetland area or affected waters, the larger the percentage of individuals that are minority. However, based on the low percentage of HUC12s that are both affected by the proposed rule and have a higher proportion of minority, low income, or other population groups of concern, the screening analysis indicates some select HUC12s that may be candidates for further analysis, although most affected HUC12s do not require further analysis of potential EJ concerns. HUC12s that may be candidates for further analysis are those with population groups of concern that are disproportionately represented in comparison to unaffected HUC12s or national averages. For example, the HUC12s with expected wetland area changes greater than 50 acres that also have socioeconomic characteristics that differ from national averages.

Table IV-3 and Table IV-4 summarize the cumulative socioeconomic and environmental risk characteristics of HUC12 watersheds based on estimated changes in wetland area and affected waters, respectively, under the proposed rule. In particular, the environmental indicators included in this analysis are used as proxies for other CWA programs affected by the proposed rule, including CWA sections 402 and 311. For reference, Figure V-1 and Figure V-2 show the spatial distribution of the changes to wetland area and affected waters presented in the tables.

Table IV-3: Socioeconomic characteristics of communities within HUC12 watersheds experiencing wetland area changes, wastewater discharges, and proximity to RMP sites, compared to national averages

Wetland Area Changes (acres)	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio[a]	Average RMP Site Count-Distance Ratio[b]	Individuals that are Minority[c]	Individuals that are Low-Income[d]	Individuals with Less than High School Education	Households with Linguistic Isolation	Individuals under Age 5	Individuals over Age 64	Individuals that Belong to an American Indian Tribe
No changes	22,871	5.7	0.2	31.1%	31.9%	12.4%	3.2%	3.1%	16.7%	0.3%
<= 0.5	30,228 (67.3%)	121.6	0.3	36.5%	31.1%	12.1%	4.2%	3.1%	16.0%	0.2%
> 0.5 - 1	1,675 (3.7%)	0.4	0.4	43.9%	29.7%	12.0%	5.0%	3.1%	14.3%	0.3%
> 1 – 50	3,134 (7.0%)	11.4	0.5	43.3%	30.0%	11.1%	4.3%	3.2%	14.3%	0.3%
> 50	65 (0.1%)	2.5	0.5	70.7%	39.5%	22.6%	9.2%	3.5%	11.9%	0.3%
National Average for Communities with Wastewater Discharges and in Proximity to RMP sites[e]		**66.3**	**0.3**	**39.0%**	**30.8%**	**12.0%**	**4.3%**	**3.1%**	**15.4%**	**0.3%**

a. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

b. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

c. The socioeconomic characteristic data are calculated based on the proportion of the area of CBGs or CTs that intersects with HUC12s experiencing wetland area changes under the proposed rule.

d. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

e. The wastewater discharge and proximity to RMP sites indicators are available at the CBG level. As a result, the socioeconomic variables at the same Census boundary level were adjusted to include communities with nonzero values for these indicators. For the socioeconomic variable only available at the census tract level (individuals that belong to an American Indian tribe), the national average for all census tracts was used.

Source: U.S. EPA analysis, 2021

Table IV-4: Socioeconomic characteristics of communities within HUC12 watersheds with affected waters, wastewater discharges, and proximity to RMP sites, compared to national averages

Changes to Affected Waters	Total Number of HUC12s (%) with Wetland Change, Wastewater Discharge, and Proximity to RMP sites	Average Wastewater Discharge Concentration-Distance Ratio[a]	Average RMP Site Count-Distance Ratio[b]	Individuals that are Minority[c]	Individuals that are Low-Income[d]	Individuals with Less than High School Education	Households with Linguistic Isolation	Individuals under Age 5	Individuals over Age 64	Individuals that Belong to an American Indian Tribe
No changes	22,871	5.7	0.2	31.1%	31.9%	12.4%	3.2%	3.1%	16.7%	0.3%
<= 5	24,234 (54.0%)	151.6	0.3	37.4%	33.1%	13.4%	4.5%	3.1%	16.2%	0.3%
> 5 - 10	4,407 (9.8%)	1.7	0.3	39.6%	30.9%	11.6%	4.1%	3.1%	15.4%	0.3%
> 10 – 100	6,230 (13.9%)	4.6	0.4	41.0%	29.2%	11.0%	4.4%	3.2%	14.7%	0.2%
> 100 – 1,000	231 (0.5%)	0.5	0.5	42.5%	28.3%	11.2%	3.9%	3.2%	13.9%	0.2%
National Average for Communities with Wastewater Discharges and in Proximity to RMP sites[e]		**66.3**	**0.3**	**39.0%**	**30.8%**	**12.0%**	**4.3%**	**3.1%**	**15.4%**	**0.3%**

a. The wastewater discharge indicator is calculated as the toxicity-weighted stream concentration of Toxic Release Inventory (TRI)-reported pollutants in stream reach segments within 500 meters(m) of the centroid of a CBG, divided by the distance to the reach segment in kilometers(km).

b. The RMP indicator is calculated as the count of RMP facilities within five kilometers (km) of the centroid of a CBG, each divided by the distance to the facilities in km.

c. The socioeconomic characteristic data are calculated based on the proportion of the area of CBGs or CTs that intersects with HUC12s experiencing wetland area changes under the proposed rule.

d. Low-income is defined as the percent of individuals where the individual's income is less than or equal to twice the federal "poverty level." This is in line with the definition of low-income used in EPA's EJSCREEN.

e. The wastewater discharge and proximity to RMP sites indicators are available at the CBG level. As a result, the socioeconomic variables at the same Census boundary level were adjusted to include communities with nonzero values for these indicators. For the socioeconomic variable only available at the census tract level (individuals that belong to an American Indian tribe), the national average for all census tracts was used.

Source: U.S. EPA analysis, 2021

As shown, the HUC12s with a confluence of changes to wetland areas or impacted waters and environmental risk indicators associated with other programs affected by the proposed rule have similar community socioeconomic characteristics to HUC12s with just changes to wetland areas or impacted waters. In addition, the proximity to RMP facility indicator is similar across HUC12s, regardless of whether or not there are projected changes in wetland area or impacted waters. Lastly, although the wastewater discharge indicator is highest for HUC12s expected to experience a difference of five or fewer impacted waters or wetland area changes less than 0.5 acres, the associated socioeconomic characteristics are similar to national averages (within five percent). For the few HUC12s with socioeconomic characteristics that differ from national averages, the wastewater discharge indicator is lower than the national average.

Overall, this analysis shows that, for the proposed rule, additional analyses to evaluate potential EJ population groups may be warranted for a set of impacted HUC12s, but for a majority of the affected HUC12s, the screening analysis does not show a potential for benefits to EJ concerns. This conclusion is based on the very low percentage of HUC12s that would be affected by the proposed rule, include population groups of concern, and that would experience potential cumulative environmental risk reduction due to the proposed rule relative to the secondary baseline of the NWPR.

For the final rule, the agencies plan to broaden consideration of cumulative environmental risk by including exposure to air pollution (*e.g.,* particulate matter and ozone) and proximity to hazardous waste management facilities. This would allow population groups of concern to not only be defined by socioeconomic and demographic information but also their cumulative exposure to environmental hazards beyond those in the scope of the final rule. The agencies also plan to expand the analysis into illustrative case studies for locations where a more detailed assessment of the downstream effects of wetland area changes may be possible and may help inform understanding of how changes in the scope of federally protected waters may be distributed relative to affected populations. Finally, the agencies plan to disaggregate the socioeconomic characteristic of individuals that are minority into major race and ethnicity categories.

IV.B Uncertainty and Limitations

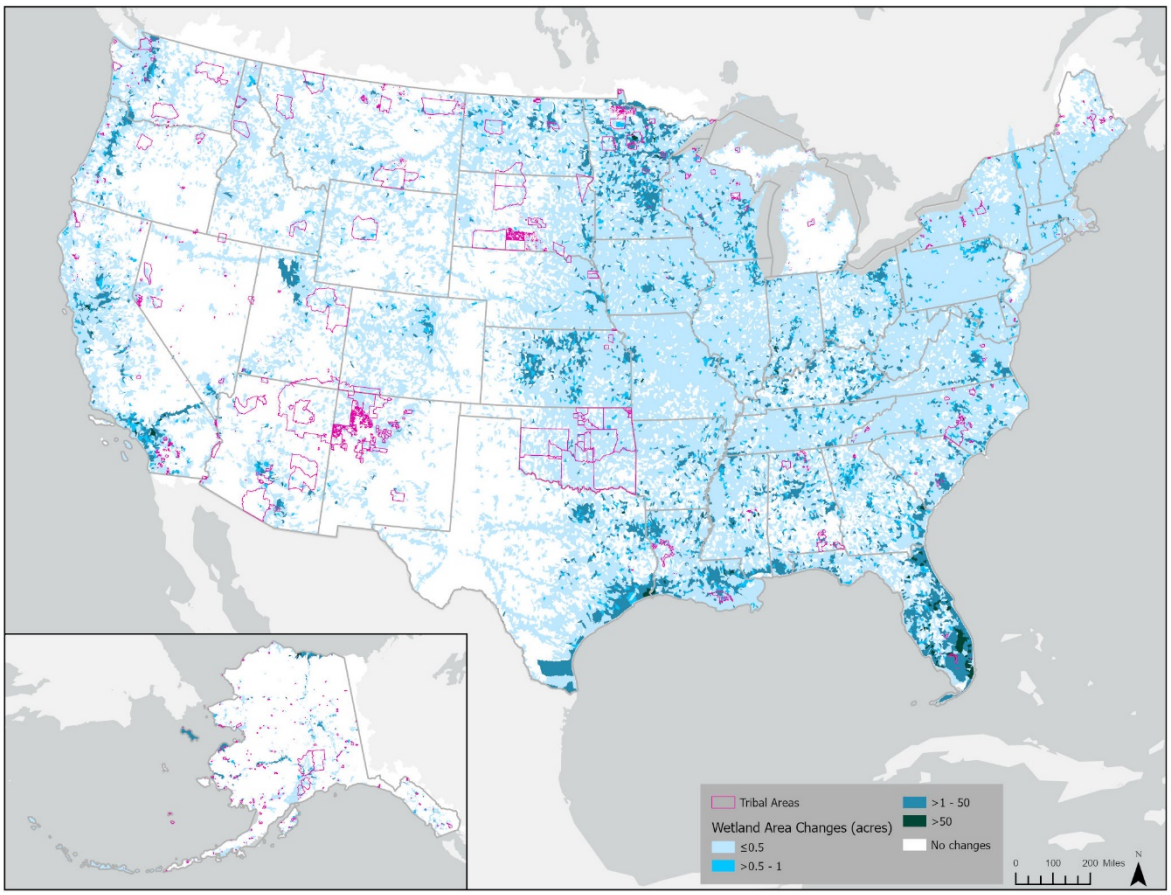
The analysis is built on the framework of HUC12s with summarized socioeconomic and environmental risk data from a different spatial framework (Census boundaries). The summary assumes even population distribution within the respective Census boundary to apportion socioeconomic data by the ratio of intersect area to Census boundary area. This has an uncertain effect on the results of the analysis. The environmental risk indicator values were calculated for each HUC12 by calculating an area-weighted average. This may mute the presence of Census geographies within the HUC12 with relatively high environmental risk indicator values adjacent to Census geographies with relatively low environmental risk indicator values.

The analysis assumes that benefits would be realized for communities living within the same watershed boundaries as wetland area or impacted waters changes. Downstream communities from the water body changes could also benefit from the associated water quality changes. EPA's proposed analysis for the final rule would evaluate the socioeconomic characteristics and environmental risk indicators for select downstream communities.

V. Tribal Impact Analysis

In addition to the anticipated tribal response to the reinstatement of the pre-2015 proposed rule described in Chapter I, Figure V-1 and Figure V-2 qualitatively summarize the overlap between tribal areas [72] and the estimated changes in wetland area and affected waters under the proposed rule, as compared to the secondary baseline of the NWPR.

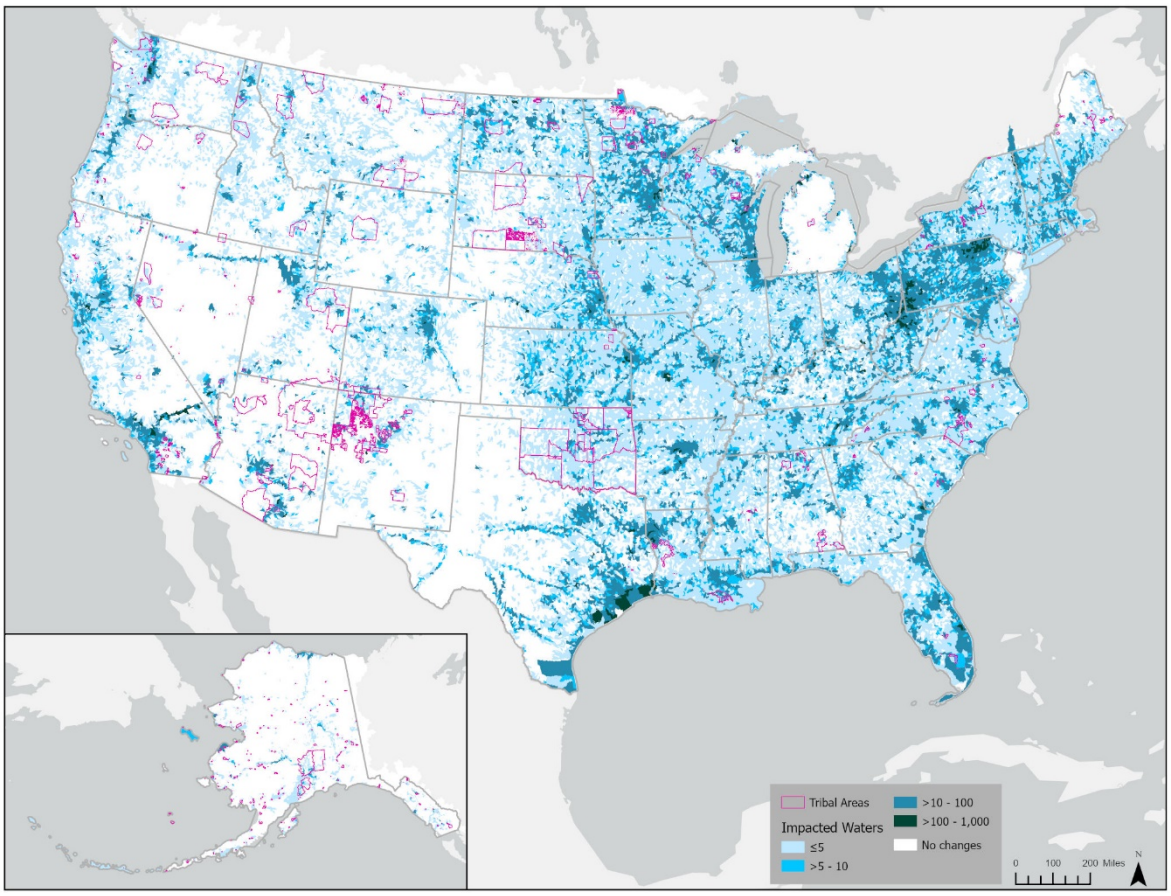
Figure V-1: Tribal areas relative to HUC12 watersheds experiencing wetland area changes under the proposed rule, as compared to the NWPR



As shown, tribal areas overlap with wetland area changes throughout the country. In particular, there is a confluence of tribal area and relatively large estimated wetland area changes in Florida and Minnesota.

[72] Tribal lands used for this overlay were defined by the US Census TIGER/Line dataset (2020 American Indian/Alaska Native/Native Hawaiian Area). The dataset can be downloaded here. (https://www.census.gov/cgi-bin/geo/shapefiles/index.php?year=2020&layergroup=American+Indian+Area+Geography)

Figure V-2: Tribal areas relative to HUC12 watersheds experiencing changes in affected waters under the proposed rule, as compared to the NWPR



The overlap between tribal areas and affected waters follows the same distribution as the wetland area changes map. However, in addition to Florida and Minnesota, Wisconsin and western New York also show a confluence of tribal area and relatively large affected waters changes.

In addition to changes expected to wetland areas and affected waters (based on the Section 404 Dredged and Fill Material Permit program), the proposed rule will affect other EPA programs, like the CWA section 311 oil spill prevention, preparedness and response programs (*i.e.*, the SPCC and FRP regulations) and the CWA section 402 NPDES program.

For the final rule, in addition to the qualitative geospatial comparison, the agencies plan to assess the location of facilities and permitted activities associated with the CWA sections 311 and 402 programs relative to tribal areas to further inform understanding of the potential rule impacts and the distribution of the rule's benefits.

To assess potential implications of the final rule for facilities currently subject to CWA section 311 programs, EPA will identify oil production wells – which are associated with a significant share of SPCC-regulated facilities nationwide – and FRP plan holders located on tribal lands.

To assess potential impacts of the final rule on water quality within tribal lands based on changes to CWA section 402 NPDES permitting, EPA will identify existing NPDES permits with outfalls located within tribal lands.

For illustrative case study locations, EPA also proposes evaluating the potential impacts of the final rule on facilities and activities upstream of tribal lands as these effects are relevant to understanding potential benefits from reducing pollution from oil or point source discharges, wetland loss, and other adverse effects from dredge and fill activities.

VI. Sector Impact Analysis

The agencies have conducted a sector impact analysis. This analysis identifies which types of entities have historically sought permits associated with the Clean Water Act section 404 program, and how costs to these entities may change in relation to the proposed rule's definition of "waters of the United States." Due to the nature of the data used in this sector impact analysis, differentiation between small and large entities is not feasible. The types of sectors identified for this analysis include: industrial sectors (*e.g.*, mining, residential and commercial development, the energy sector; and public sectors such as State departments of transportation, county governments, stormwater management agencies, and public utilities). The Sector Impact Analysis identifies the different types of entities performing projects that required a 404 permit, but does not estimate how many of these projects impact waters that change jurisdiction and may no longer need permitting. The approach for estimating changes in permitting requirements is described earlier in Section III.C.2.

The proposed rule will not impose requirements on entities of any size. Instead, this rule establishes a definition of "waters of the United States," a foundational term in determining the scope of key CWA programs. The sector analysis provided herein is used to describe the potential impacts to entities that may be affected by a change in jurisdictional status under the proposed rule.

As discussed in the Introduction, the agencies lack sufficient information that could be used to identify specific water resources that will experience a jurisdictional change and the different regulated activities that may be affected under the proposed rule. However, the agencies reviewed available information on the type of entities that are regulated under the CWA section 404 program, with the purpose of identifying sectors with entities that may be affected by a change in jurisdictional status.

A return to the pre-2015 regulatory regime relative to the secondary baseline of the NWPR is expected to increase the number of waters under CWA jurisdiction for the CWA section 404 program, which may increase the amount of avoidance, minimization, and mitigation measures necessary to obtain CWA section 404 permit coverage and may increase the total number of future CWA section 404 permits relative to the NWPR baseline. The agencies reviewed national 404 permit data from 2011 through 2020 to identify North American Industrial Classification System (NAICS) codes corresponding to entities that obtained 404 permit coverage during that period. NAICS codes divide the economic activity into 20 sectors based on production activity. The NAICS codes have a hierarchical structure with the first two digits identifying the sector and the subsequent numbers identifying subsectors and specific activities. The agencies assigned private sector permits to one or more NAICS industry codes.

The ORM2 database does not track the NAICS category of the permit applicant. The agencies categorized the sector for each permit based on the reported project name, type of work performed, and project description. The agencies identified the general category of work based on the listed work type, further refining the sector based on key words in the project name and project description. For non-public categories, the agencies assigned one or more NAICS code. Some permits provided enough information to assign a single 6-digit NAICS code. Others did not provide enough information to be able to assign a single 6-digit NAICS code, and in these cases the agencies assigned a broader industry (one or more 2- to

5-digit NAICS).[73] Table VI-1 presents the sectors identified and estimated number of affected entities. The agencies were able to assign an industry sector to 98 percent of the CWA section 404 permits. For two percent of permits, the reported work type, project name, and project description did not provide sufficient information to categorize the permit by a specific NAICS sector. These entities are listed as "Unassigned" in Table VI-1.

Table VI-1: Affected CWA section 404 permits by industry sector

NAICS	NAICS industry description	Number of affected permits
11	Agriculture	2,528
11251	Aquaculture	3,125
113310	Logging	1
2111	Oil and gas extraction	19,751
212	Mining (except oil and gas)	2,233
22111	Electric power generation	7,602
22112	Electric power transmission, control, and distribution	9,480
221210	Natural gas distribution	7,055
2361	Residential building construction	12,726
2361, 2362	Mixed use building construction	3,191
23621	Industrial building construction	1,357
23622	Commercial building construction	9,407
237310	Highway, street, and bridge construction	102,052
237990	Dredging	44,791
48211	Rail transportation	9,329
4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products	55,164
488119	Airport	18,116
562211	Hazardous waste treatment and disposal	805
562212	Solid waste landfills	258
713930	Marinas	27,956
Public	Public	73,927
Unassigned	Unassigned	9,344
Total	N/A	420,198

Table VI-2 summarizes the percent of permit records in each identified sector, stratified by Cowardin classification.

Table VI-2: Affected CWA section 404 permits by Cowardin classification

NAICS	NAICS industry description	Wetland type[1]						
		Estuarine	Lacustrine	Marine	Palustrine	Riparian	Riverine	Uplands
11	Agriculture	1%	1%	0%	20%	1%	78%	0%
11251	Aquaculture	15%	1%	79%	0%	0%	4%	0%
113310	Logging	0%	0%	0%	100%	0%	0%	0%
2111	Oil and gas extraction	2%	0%	0%	34%	0%	63%	0%

[73] For example, the agencies classified permits identified as single-family residential development, which could fall into either NAICS 236115 or NAICS 236117, as NAICS 2361 Residential Building Construction. The agencies classified permits identified as mining, with no mention of oil or gas but no other material listed, as NAICS 212 Mining (except oil and gas).

Table VI-2: Affected CWA section 404 permits by Cowardin classification								
NAICS	NAICS industry description	Wetland type[1]						
		Estuarine	Lacustrine	Marine	Palustrine	Riparian	Riverine	Uplands
212	Mining (except oil and gas)	9%	1%	2%	31%	2%	54%	1%
22111	Electric power generation	4%	1%	1%	39%	1%	54%	1%
22112	Electric power transmission, control, and distribution	1%	0%	0%	39%	0%	59%	0%
221210	Natural gas distribution	1%	0%	1%	32%	0%	66%	0%
2361	Residential building construction	3%	4%	1%	63%	2%	26%	0%
2361, 2362	Mixed use building construction	2%	3%	1%	49%	2%	43%	1%
23621	Industrial building construction	2%	1%	1%	63%	2%	30%	1%
23622	Commercial building construction	3%	6%	1%	59%	2%	28%	1%
237310	Highway, street, and bridge construction	6%	7%	2%	19%	2%	63%	0%
237990	Dredging	10%	35%	3%	3%	1%	48%	0%
48211	Rail transportation	2%	2%	1%	18%	2%	75%	1%
4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products	4%	0%	1%	37%	1%	57%	0%
488119	Airport	7%	12%	5%	11%	2%	63%	0%
562211	Hazardous waste treatment and disposal	8%	7%	5%	32%	3%	45%	0%
562212	Solid waste landfills	2%	1%	0%	36%	2%	57%	2%
713930	Marinas	17%	47%	10%	3%	0%	23%	0%
Public	Public	3%	4%	2%	23%	1%	66%	0%
Unassigned	Unassigned	4%	8%	2%	48%	1%	36%	1%

[1] Row cells may not add up to 100 percent due to rounding.

The amount of meaningful information within the work type, project name, and project description fields that can be used to inform the NAICS code assignment varies considerably across permits, which adds uncertainty to the characterization of affected entities. In some instances, the work type, project name, and project description fields resulted in limited information on the specific activity that occurred, and the agencies categorized these in broader industry categories (e.g., highway, street, bridge construction) that may be representative of the entity performing the permitted work, but not the entity that would be affected by the return to the pre-2015 regulatory regime. In addition, the agencies relied on keyword

categorization to identify the specific industry associated with the permitted work (e.g., marina, airport, energy generation). The number of permits assigned to specific NAICS codes is limited by the keywords developed, and it is likely that searching with keywords resulted in misclassification of some permits. However, the agencies are unable to determine the number of misclassified permits without reviewing each permit and creating new categories as needed. Therefore, the agencies do not have enough information to quantify uncertainty associated with the analysis. The steps used to assign industry sectors to CWA section 404 permits, including the key words used, are described further in Appendix G, along with other information on the sector analysis.

The Sector Impact Analysis identifies the types of entities performing the permitted work. However, for many categories such as dredging and road construction, it does not identify the sector category of the actual project owner. This limits the ability of agencies to attribute the costs from the cost analysis to the sectors identified in this analysis. For example, a construction project falls under the NAICS category 237310 for highway, street, and bridge construction. However, the construction firm building the road is likely performing the work for another entity that owns the land, and any 404 permitting costs for the road construction would likely be passed directly to the property owner.

The agencies expect that the increase in future CWA section 404 permit obligations may result in cost increases, unless States continued to require permits for waters that were no longer jurisdictional under the NWPR. These increases are expected to extend to the universe of small entities required to obtain CWA section 404 permit coverage approximately equal to their existing portion of the overall 404 regulatory burden. [74]

[74] See EA tables for a discussion of the total estimated avoided costs.

VII. References

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Appendix A: Proposed protocols for assessing change in jurisdictional scope via regulatory categories

A.1 Using Regulatory Categories

This section describes an analytical approach the agencies used for the Clean Water Rule but did not employ for the Navigable Waters Protection Rule, or this proposed rule. This analysis is a manual assessment of a sample of approved jurisdictional determinations (AJDs), using the characteristics of the projects to provide a counterfactual analysis of whether the results of the AJD would "flip" under a different regulatory regime.

To assess anticipated change in jurisdiction using the regulatory categories associated with the NWPR and the proposed rule, data associated with Corps AJDs from pre-2015 regulatory practice were assessed for how they would apply if instead carried out under the NWPR. Using NWPR AJDs was not the preferred method due to the limited information provided in the jurisdictional determination forms, which would have led to a qualitative analysis. Additionally, using AJDs from pre-2015 regulatory practice allowed for a larger sample size.

Certain regulatory categories under the pre-2015 regulatory practice are assumed to be fully transferable to regulatory categories under the NWPR. These are detailed in Section I.B and in Table A-1. No further analyses of data associated with these categories are needed. [75]

Table A-1: Regulatory category crosswalk for waters that are fully transferrable between regulatory regimes

Pre-2015 Practice		NWPR	
Regulatory category/description	**ORM2 denotation**	**Regulatory category**	**ORM2 denotation**
(a)(1) Traditional navigable waters	TNW	(a)(1) Traditional navigable waters and territorial seas	A1TNW10, A1TNWCOMM, A1TNWFED
(a)(2) Interstate waters*	N/A	N/A	N/A
(a)(4) Impoundments of jurisdictional waters	IMPNDMNT	(a)(3) Lakes and ponds, and impoundments of jurisdictional waters	A3LPIFLOOD, A3LPIFLOW
(a)(5) Tributaries - Relatively permanent waters	RPW	(a)(2) Tributaries	A2TRIBINT, A2TRIBPER
(a)(5) Tributary consisting of both RPWs and non-relatively permanent waters (NRPWs)	TNWRPW	(a)(2) Tributaries	A2TRIBINT, A2TRIBPER
(a)(6) Territorial seas	TNW	(a)(1) Traditional navigable waters and territorial seas	A1TNWSEAS

[75] While there may be some resources within these regulatory categories that would change jurisdictional status, such occurrences would be marginal. For more details on scenarios where jurisdiction could change, see section I.B.

Table A-1: Regulatory category crosswalk for waters that are fully transferrable between regulatory regimes			
Pre-2015 Practice		**NWPR**	
Regulatory category/description	**ORM2 denotation**	**Regulatory category**	**ORM2 denotation**
(a)(7) Abutting wetlands adjacent to RPWs	RPWWD	(a)(4) Adjacent wetlands	A4WETABUT
(a)(7) Wetlands adjacent to non-relatively permanent waters	NRPWW	(b)(1) Waters that are not (a)(1) - (a)(4)	B1WETNONADJ
* The Rapanos AJD form does not contain a field for interstate waters. Instead, interstate waters are categorized on the form as any other type of resource; the distinction, which is not captured in ORM2, is that these resources cross state boundaries.			

There are four regulatory categories from the pre-2015 regulatory practice that require further analyses to determine their category under the NWPR. These include: isolated aquatic resources ("other waters") evaluated under category (a)(3) of the pre-2015 regulations (ISOLATE), non-relatively permanent waters (NRPW), wetlands adjacent to but not directly abutting relatively permanent waters (RPWWN), and wetlands adjacent to (both abutting and non-abutting) traditional navigable waters (TNWW). Jurisdiction under these categories is detailed in section I.B of the EA. There are specific questions that need to be answered to assess jurisdiction for these regulatory categories under the NWPR. These are listed in Table A-2.

Table A-2: Regulatory category crosswalk requiring further analysis		
Pre-2015 Practice		**Questions to answer in regards to the NWPR**
Regulatory description	**ORM2 denotation**	
Isolated aquatic resource*	ISOLATE	What percent are wetland, stream, or lake, pond, or impoundment?
(a)(5) Tributaries - Non-relatively permanent waters	NRPW	What percent are ephemeral/intermittent and what percent are jurisdictional/non-jurisdictional?
(a)(7) Wetlands - not directly abutting relatively permanent waters	RPWWN	What percent are jurisdictional/non-jurisdictional?
(a)(7) Wetlands - adjacent to (both abutting and non-abutting) traditional navigable waters	TNWW	What percent are jurisdictional/non-jurisdictional?
*While these resources should have required an analysis of their commerce links under (a)(3), in practice, this became a 'catch all' category used by Corps staff to denote non-jurisdictional resources.		

It is assumed that all of the resources associated with isolated resources would be non-jurisdictional under the (b)(1) exclusion category under NWPR, but it is uncertain what proportion of these resources are comprised of streams, wetlands, lakes, ponds, impoundments, or other features (e.g., ditches). There may

be an insignificant number of resources under this category that could be jurisdictional under the NWPR due to inundation by flooding parameters. However, such waters may potentially be jurisdictional under the proposed rule (a)(3) category if they meet either the relatively permanent or significant nexus standard, which is different than implementation under the pre-2015 regulatory regime, and thus would not result in a change from the baseline of the NWPR. The most critical question to be answered is: what percent of these resources are wetlands, streams, or lakes, ponds, or impoundments?

It is likely that most resources associated with the NRPW category under the pre-2015 regime are non-jurisdictional under the NWPR, either as (b)(1) or (b)(3) exclusions. However, two questions have to be answered to confirm: what percent are ephemeral streams versus non-seasonal intermittent streams, and of the intermittent streams, what percent would be jurisdictional versus non-jurisdictional under the NWPR?

For the last two categories, RPWWN and TNWW, determining the percent of these features that are jurisdictional versus non-jurisdictional depends on whether the wetland is behind a natural berm or the like, if a direct surface water connection in a typical year exists for wetlands behind artificial levees and the like, or if inundation by flooding exists in the typical year. The question of whether the wetlands are abutting would also have to be answered for the TNWW category. Some of these questions are difficult to answer without a typical year analysis, as required under the NWPR. This is the main concern with using the regulatory approach to assess changes in jurisdiction using the regulatory categories. While the agencies have attempted to minimize subjectivity in these proposed protocols, the agencies do not have a method that would fully eliminate error in these cases. The best method for addressing this would be to carry out typical year analyses via desktop analyses for each individual resource. This would require substantial human resources to carry out and still would not safeguard from errors, as local knowledge, site visits during and after major precipitation events, hydrologic modeling, and further site history investigations would all be resources available to given landowners during original requests for approved jurisdictional determination. Those resources are not available to Corps and EPA staff for all of the waters that would need to be assessed for this analysis. The agencies seek comment on this or other potential methods for assessing jurisdiction of these resources under the NWPR. Based on uncertainty and labor engrained in forecasting the determination for many of these resources, the agencies propose to not use this method of determining the change in scope of jurisdiction.

Sampling

Assuming that analyses can be standardized and subjectivity minimized, sampling of prior AJDs would occur. The AJD pool would come from all AJDs finalized from 2016 to 2021 that were carried out using the pre-2015 regulatory practice. [76]

For each water type of interest (Isolate, NRPW, RPWWN, TNWW), the goal is to create a sample of observations on which to conduct the analysis that is generally geographically representative of the United States. To do so, a proportionate stratified sampling approach would be established using the following assumptions:

[76] During the years 2015 through 2019, the CWR was in effect at varying time periods in 38 states.

1. Margin of error of 10% and a confidence interval of 90%.

2. Census regions are used as a measure of geographic regions

   - Northeast: CT, MA, ME, NH, NJ, NY, PA, RI, VT
   - Midwest: IA, IL, IN, KS, MI, MN, MO, NE, ND, OH, SD, WI
   - South: AL, AR, DL, FL, GA, KT, LA, MD, MS, NC, OK, SC, TN, TX, VA, WV
   - West: AZ, CA, CO, ID, OR, MT, NM, NV, UT, WA, WY

Under these assumptions, the following steps would be used to derive the sample of observations. Below, w represents WATER TYPE and r represents geographic regions.

Step 1: Determine the minimum sample size needed for each water type. The following equation is used to determine sample size, S_w:

$$S_w = \frac{\frac{z^2 * \hat{p}(1-\hat{p})}{\epsilon^2}}{1 + \frac{z^2 * \hat{p}(1-\hat{p})}{\epsilon^2 N_w}}$$

z represents the z-score associated with the assumed confidence interval level. For 90%, the value is 1.645.

ϵ represents the margin of error, taken to be 0.1.

$\hat{p}$ represents the population proportion. To get the most conservative estimate, a value of 0.5 is assumed.

Step 2: Calculate the percentage of water bodies by geographic region, P_{wr}:

$$P_{wr} = \frac{\mathrm{N_{wr}}}{\sum_r N_{wr}}$$

where $N_w = \sum_r N_{wr}$. N_w represents the total number of water bodies of type w and $\mathrm{N_{wr}}$ represents the number of water bodies of type w in region r.

Step 3: Determine the number of observations needed for each water type broken down by region by multiplying the sample size needed determined in Step 1 by the percentage determined in Step 2:

$$S_{wr} = P_{wr} * S_w$$

Step 4: For each water type and geographic region, conduct a random selection without replacement of S_{wr} observations.

Proposed Analysis

Corps and EPA staff would be provided with the AJD form and ORM2 data associated with the aquatic resources requiring assessment (*i.e.*, those sampled using protocols above). Individual staff would be given one aquatic resource category to assess to minimize the number of individuals assessing each resource category.

"ISOLATE" Aquatic Resource Type

Primary analysis:

Step 1: Review the AJD form and ORM2 data associated with the given resource.

Step 2: Within the spreadsheet for ISOLATE features, denote in the provided column on "Resource Type" whether the resource in question is a wetland, perennial/intermittent/ephemeral stream, lake, pond, or impoundment, or other feature (e.g., ditch).

Step 3: Denote in the column "Juris?" if the resource seems like it has potential to be jurisdictional under the NWPR by entering "1"; otherwise enter "0". Situations where the resource could have the potential to be jurisdictional include inundation by flooding in a typical year, which could happen for certain hydrogeomorphic features, such as oxbow lakes.

Secondary analysis:

Step 1: For features that were denoted as having the potential to be jurisdictional under the NWPR, further assess the resource by looking at the latitude and longitude for the given resource in Google Earth or another readily available mapping tool with satellite imagery. Historic imagery in Google Earth can be used.

Step 2: If there is evidence available for inundation by flooding for the given resource, highlight the overall row of data.

Tertiary analysis:

After all staff have reviewed all ISOLATE observations, Corps and EPA HQ staff will calculate the percent of resources that would be categorized as non-jurisdictional streams, non-jurisdictional wetlands, non-jurisdictional lakes, ponds or impoundments, etc. under the NWPR. If there are any resources that were highlighted as being jurisdictional under the NWPR via inundation by flooding, these would be separated into their respective jurisdictional category under the NWPR (likely (a)(3) lakes, ponds, and impoundments).

"NRPW" Aquatic Resource Category

Primary analysis:

Step 1: Review the AJD form and ORM2 data associated with the given resource.

Step 2: Within the spreadsheet for NRPW features, denote in the provided column on "Resource Type" whether the resource in question is an intermittent/ephemeral stream or other feature (e.g., ditch).

Step 3: For intermittent streams, use descriptions provided in the jurisdictional determination form and in the associated ORM2 data (*e.g.,* Cowardin code) to assess whether these would likely meet the tributary requirements under the NWPR and within the column "Juris?" denote the feature as being jurisdictional under the NWPR by entering a "1" and non-jurisdictional by entering a "0".

Secondary analysis:

After all staff have reviewed all NRPW observations, Corps and EPA HQ staff will calculate the percent of resources that would be categorized as (b)(3) ephemeral features, (b)(1) waters that are not (a)(1) through (a)(4) waters, or (a)(2) tributaries.

"RPWWN" Aquatic Resource Category

Primary analysis:

Step 1: Review the AJD form and ORM2 data associated with the given resource.

Step 2: Further assess the resource by looking at the latitude and longitude for the given resource in Google Earth or another readily available mapping tool with satellite imagery. Historic imagery in Google Earth can be used.

Step 3: Based on the available information, estimate whether the resource would be jurisdictional under the NWPR. If so, within the RPWWN spreadsheet, under the column "Juris?" denote the feature as being jurisdictional under the NWPR by entering a "1" or non-jurisdictional by entering a "0".

Secondary analysis:

After all staff have reviewed all RPWWN observations, Corps and EPA HQ staff will calculate the percent of resources that would be categorized as (b)(1) excluded waters and (a)(4) adjacent wetlands under the NWPR.

"TNWW" Aquatic Resource Category

Primary analysis:

Step 1: Review the AJD form and ORM2 data associated with the given resource.

Step 2: Based on the available information, was the resource adjacent under the pre-2015 regime because it was found to be directly abutting the TNW? If so, within the TNWW spreadsheet, under the column "Juris?" denote the feature as being jurisdictional by entering a "1". Otherwise, move onto next step.

Step 3: Further assess the resource by looking at the latitude and longitude for the given resource in Google Earth or another readily available mapping tool with satellite imagery. Historic imagery in Google Earth can be used. Does the wetland appear to be abutting the TNW? Does it appear to be inundated by flooding from the TNW? Does it appear to be behind a natural berm or similar natural feature? Does the wetland appear to be behind an artificial levee or similar artificial feature, and if so, does it appear to have a direct hydrologic surface connection between the wetlands and the TNW in a typical year, such as through a culvert, flood or tide gate, pump, or similar feature?

Step 4: Based on the available information, estimate whether the resource would be jurisdictional under the NWPR. If so, within the TNWW spreadsheet, under the column "Juris?" denote the feature as being jurisdictional under the NWPR by entering a "1" or non-jurisdictional by entering a "0".

Secondary Analysis:

After all staff have reviewed all TNWW observations, Corps and EPA HQ staff will calculate the percent of resources that would be categorized as (b)(1) excluded waters and (a)(4) adjacent wetlands under the NWPR.

Final step

The percentages above would then be applied to the total number of resources that had AJDs finalized in this time period under these regulatory categories.

The differences between how many of these resources were found to be jurisdictional under the pre-2015 regulatory practice compared to this forecasted NWPR application represents the estimated change in scope of jurisdiction of implementing the proposed rule as compared to the secondary baseline.

Based on uncertainty and labor engrained in forecasting the determination for many of these aquatic resources, the agencies did not use this protocol for the proposed rule and do not propose to use this method of estimating the change in scope of jurisdiction for the final rule. The agencies seek comment on these proposed protocols.

A.2 Machine learning and artificial intelligence

A primary issue with the approach outlined in the previous section of this appendix is that it is very time intensive. An approach that could overcome this drawback is to employ machine learning. By combining existing Army Corps CWA section 404 decision records with the National Hydrography Dataset (NHD), the Nationals Wetlands Inventory (NWI), the SSURGO Soil database, topography data, and remote sensing and satellite data, it may be possible to use machine learning and artificial intelligence methods to develop a jurisdictional status predictive model. This proposed rule presents a unique situation in that it is essentially the same as a prior regulatory regime, and that there is a little bit more than a year's worth of data for implementation of the secondary baseline of the NWPR. Machine learning algorithms applied to AJDs for each period, in combination with the other data sources could conceivably produce a predictive model that overcomes the limitations of the underlying data sources in determining jurisdiction. Theoretically, the model could predict the probability that any given location is jurisdiction under different criteria. The agencies are considering such an approach for the final rule.

Appendix B: Using Cowardin Classification to Assess Change in Jurisdictional Scope

Performing an economic analysis of potential regulations first requires estimating how future activities and outcomes under the proposed rule differ from future activities and outcomes under the baseline. For the proposed rule's secondary baseline this requires predicting future activities and outcomes under the NWPR as well as the proposed rule. Since the proposed rule is intended to codify in regulation a definition of "waters of the United States" that is very similar to the pre-2015 regulatory regime where the Rapanos guidance was used to determine jurisdiction, the agencies can leverage historical permit data to predict future conditions under the proposed rule. Ten years of Corps CWA section 404 permit data for the years 2010 through 2019 were used to derive average annual estimates of the: types, amount, and general location of permitted projects; water features such as wetlands, streambanks, and shorelines affected by dredged or fill activities; and the extent of mitigated impacts under the 404 permitting process. During most of this ten-year period, the *Rapanos* Guidance was used to determine the jurisdictional status of waters potentially affected by permitted projects. For part of this period the CWR was in effect in some states. All permits issued under the CWR during this period were removed from the data. Since these average annual estimates of permits, affected waters, and mitigation were derived from data on permits and jurisdictional determinations based on the *Rapanos* Guidance, the agencies consider them to be reasonably representative of future activity and regulatory requirements under the proposed rule.

To perform the economic analysis the agencies had to first estimate the change in water features that would likely be permitted under the NWPR if it would have continued to be in effect. The first step in determining the probability of an impacted water being included in a permit is to derive the probabilities that if a water feature receives an AJD that it will be a WOTUS. These probabilities are sensitive to the water feature's characteristics, so these probabilities need to be derived based on categories of these characteristics, and the Cowardin classification provides a convenient way to categorize these waters.

The Cowardin classification is hierarchical with the highest level, System dividing into Subsystem, Class, and Subclass levels. The Cowardin classification for water features is in two fields in the dataset: COWARDIN_CATEGORY, which represents the System level, and COWARDIN_CODE, which represents the code down to the Subclass level. The agencies calculate probabilities at the System level and the Subsystem level. The Subsystem level can be derived from the COWARDIN_CODE field.

The regulation that the determination was based on is also important. The two regulations that are relevant for our analysis are RAPANOS and NWPR, which are entries found in the JD_FORM_TYPE field. For the AJDs performed based on RAPANOS the resulting jurisdictional status can be found in the JA field. For the AJDs performed based on NWPR the resulting jurisdictional status can be found in the WATERS_TYPE field, where those entries beginning with "A" are WOTUS and those beginning with "B" are non-WOTUS. The difference between the Rapanos probability and the NWPR probability for each of the Cowardin codes represents the change in probabilities between to two regulatory regimes. The other possible entries in JD_FORM_TYPE are: RAPANOS_FORM used primarily before the Rapanos guidance, and CWR for those areas where 2015 rule was in effect. These entries were not be used for deriving AJD probabilities needed for the analysis. Table B-1 provides the relevant fields used from the ORM2 database.

Table B-1: Relevant JD data fields for Estimating the Change	
Fields	**Description**
JD_ID	JD identifier associated with the water
WATERS_ID	Unique identifier for water features
ACTION_FOLDER_ID	
END_DATE	Date the JD action was closed
Year	Added field to sort data by year
JD_FORM_TYPE	Indicates the regulation or guidance used to determine jurisdiction
JD_TYPE_CATERGORY	AJD, PJD, DELIN, NJD, OTHER
JA	Yes is Jurisdictional, No is Non-Jurisdictional
WATERS_TYPE	Army codes used to identify waters, relevant for NWPR
COWARDIN_CODE	Complete Cowardin code down to the Subclass level.
COWARDIN_CATEGORY	System level Cowardin code identifier

Using the relevant fields from the JD data, the AJD records based on Rapanos Guidance and AJDs based on NWPR were grouped by Cowardin Category and Sub-category and the probabilities of being found to be a WOTUS were derived. Table B-2 shows these probabilities results. For the Marine and Estuarine Cowardin categories there were an insufficient number of records at the subcategory-level to use sub-categories and only the Cowardin category information was used to derive probabilities. For the Upland category there are no corresponding subcategories.

Table B-2: Probability of an AJD Resulting in a WOTUS Determination Under the Rapanos Guidance and the NWPR

Water Feature Type	Approved Jurisdictional Determination (AJD data based on Rapanos Guidance) [77]			Approved Jurisdictional Determination (AJD data based on NWPR) [78]		
Cowardin Category and Sub-Category	**WOTUS**	**Total**	**% WOTUS**	**WOTUS**	**Total**	**% WOTUS**
Marine	**5,927**	**5,947**	**100%**	**4**	**4**	**100%**
Estuarine	**14,061**	**14,126**	**100%**	**177**	**182**	**97%**
Lacustrine	**16,539**	**18,040**	**92%**	**184**	**1,329**	**14%**
Lacustrine-Limnetic (L1)	4,810	5,585	86%	94	618	15%
Lacustrine-Littoral (L2)	10,191	10,750	95%	90	711	13%
Palustrine	**51,864**	**90,620**	**57%**	**6,423**	**28,312**	**23%**
Palustrine-Aqua Bed (PAB)	711	1,022	70%	11	176	6%
Palustrine-Emergent (PEM)	20,303	49,512	41%	2,639	17,266	15%
Palustrine- Forested (PFO)	21,190	26,583	80%	3,030	7,257	42%
Palustrine-Open Water (POW)	1,073	2,305	47%	164	1,331	12%
Palustrine-Scrub Shrub (PSS)	4,658	5,938	78%	477	1,312	36%
Palustrine-Unconsolidated Bottom (PUB)	2,143	2,894	74%	101	953	11%
Riverine	**51,695**	**62,689**	**82%**	**5,591**	**19,596**	**29%**

[77] Rapanos Guidance jurisdictional determination data are from the years 2010-2019, and exclude all determinations based on the CWR.

[78] The NWPR jurisdictional determination data a from June, 2020 through July of 2021.

Table B-2: Probability of an AJD Resulting in a WOTUS Determination Under the Rapanos Guidance and the NWPR						
Water Feature Type	**Approved Jurisdictional Determination (AJD data based on Rapanos Guidance) [77]**			**Approved Jurisdictional Determination (AJD data based on NWPR) [78]**		
Cowardin Category and Sub-Category	**WOTUS**	**Total**	**% WOTUS**	**WOTUS**	**Total**	**% WOTUS**
Riverine-Tidal (R1)	4,215	4,356	97%	68	74	92%
Riverine-Lower Perennial (R2)	11,001	11,117	99%	582	716	81%
Riverine-Upper Perennial (R3)	10,691	10,822	99%	946	1,007	94%
Riverine-Intermittent (R4)	11,111	13,162	84%	3,508	4,547	77%
Riverine-Unkown Perennial (R5)	6,681	6,860	97%	466	734	63%
Riverine-Ephemeral (R6)	4,657	12,644	37%	21	12,518	0%
Riparian	**2,895**	**3,075**	**94%**	**158**	**549**	**29%**
Riparian-Lotic (RP1)	616	638	97%	63	91	69%
Riparian-Lentic (RP2)	249	286	87%	35	134	26%
Uplands	**1,572**	**33,798**	**5%**	**0**	**271**	**0%**

Assuming historical permit data are a good predictor of the type and quantity of future permitted projects, these changes in probabilities can be applied to historical Rapanos Guidance permit data to estimate how many water features would receive permit protection if the NWPR were to remain in place. However, many permittees forgo the AJD process, which can be time consuming and expensive, and instead use a PJD to voluntarily waive or set aside questions regarding Clean Water Act jurisdiction over a particular site and thus move forward assuming all waters will be treated as jurisdictional without making a formal determination. In some cases, the jurisdictional determination process is bypassed altogether and all affected waters are treated as jurisdictional. As a result, applying the change in probabilities estimated from the AJD data to the entirety of the Rapanos Guidance permit data would likely overestimate the actual change in waters receiving permit protection under NWPR. Therefore, the AJD-based probabilities should only be applied to the proportion of historical permit data that likely received an AJD.

Using the historical jurisdictional determination data under both the Rapanos Guidance and the NWPR, the proportion of permits that likely received AJDs under each regulatory regime can be estimated. Table B-3 Provides the relative proportion of jurisdictional determinations that received AJDs or one of the less definitive options such as a PJD or no JD at all for both regulatory regimes. These data are also broken out by the same Cowardin categories and sub-categories as in Table B-2 above.

Table B-3: Proportion of Jurisdictional Determinations that Resulted in AJDs or Non-AJDs under the Rapanos Guidance and the NWPR

Water Feature Type	Jurisdictional Determination Type			
	Rapanos Guidance		NWPR	
Cowardin Category and Sub-Category	AJD%	Non-AJD%	AJD%	Non-AJD%
Marine	**24%**	**76%**	**2%**	**98%**
Estuarine	**25%**	**75%**	**7%**	**93%**
Lacustrine	**35%**	**65%**	**39%**	**61%**
Lacustrine-Limnetic (L1)	34%	66%	45%	55%
Lacustrine-Littoral (L2)	35%	65%	36%	64%
Palustrine	**18%**	**82%**	**56%**	**44%**
Palustrine-Aqua Bed (PAB)	26%	74%	54%	46%
Palustrine-Emergent (PEM)	19%	81%	65%	35%
Palustrine- Forested (PFO)	20%	80%	43%	57%
Palustrine-Open Water (POW)	24%	76%	68%	32%
Palustrine-Scrub Shrub (PSS)	8%	92%	46%	54%
Palustrine-Unconsolidated Bottom (PUB)	12%	88%	61%	39%
Riverine	**13%**	**87%**	**51%**	**49%**
Riverine-Tidal (R1)	24%	76%	10%	90%
Riverine-Lower Perennial (R2)	16%	84%	22%	78%
Riverine-Upper Perennial (R3)	14%	86%	24%	76%
Riverine-Intermittent (R4)	10%	90%	40%	60%
Riverine-Unknown Perennial (R5)	13%	87%	21%	79%
Riverine-Ephemeral (R6)	11%	89%	86%	14%
Riparian	**23%**	**77%**	**55%**	**45%**
Riparian-Lotic (RP1)	18%	82%	49%	51%
Riparian-Lentic (RP2)	22%	78%	56%	44%
Uplands	**65%**	**35%**	**99%**	**1%**

Appendix C: Methodology for Generating Benefit-Transfer Predictions based on Wetland Meta-Analysis

The analysis for estimating the benefits of increasing wetland mitigation requirements that would result from the proposed rule relative to the secondary baseline of the NWPR follows the same general approach the agencies used in the NWPR analysis (U.S. EPA and Army, 2020). That analysis used a meta-analysis of the wetland valuation studies that provide data on the public's willingness to pay (WTP) for wetland preservation. However, the meta-analysis has been slightly updated, as explained in this appendix.

The approach is based on the meta-analysis of wetland valuation studies by Moeltner et al. (2019) in which the authors performed a meta-analysis of wetland valuation studies to estimate a benefit function for preserving or restoring acres of wetlands. In their study, the researchers limited the meta-data to U.S. based studies focused on valuation of freshwater wetlands, resulting in 21 observations taken from 11 studies.[79, 80] The study applies the Bayesian estimation techniques (e.g., Moeltner et al. (2007), Moeltner et al., (2009), Moeltner et al., (2014), and Moeltner (2015)). They performed a Bayesian non-linear meta-regression that ensures the benefits function meets a set of utility theoretic validity criteria. Those criteria are: sensitivity to scope, a scope elasticity that is not restricted by the functional form of the benefit function, and the adding-up condition which ensures dividing a change into smaller increments does not affect the total benefit. Moeltner et al. (2019) also estimated a linear regression model that closely approximates the adding-up condition.

The agencies used the non-linear model for estimating foregone benefits under the NWPR. The meta-analysis incorporated a convex WTP function (*e.g.*, where benefits from wetland services such as flood risk reduction compound synergistically with wetland acreage) which, although theoretically valid, could lead to problematic benefit transfer predictions because adding-up does not hold. Moeltner et al. (2019) also included a linear meta-regression model. Although the linear meta-regression model is not affected by convexity issues, applying this model to policy scenarios where baseline or policy acreage conditions are far outside the range of the underlying meta-data is likely to generate less reliable predictions.

This meta-analysis was reviewed by E-EEAC (Keiser et al., 2020). E-EEAC found that "*The meta-analysis used to estimate the forgone benefits of removing wetlands from CWA protection is generally well done, but its subsequent use for predicting wetland damages was less so, and the approach would benefit from additional transparency and sensitivity analysis*." Specifically, E-EEAC suggested several changes to the meta-analysis and its application to benefit transfer, including:

[79] The original data for the meta-regression consisted of 38 observations from 17 stated preference studies identified in the 2017 Abt Associates wetlands literature review that contained WTP estimates potentially useful in a meta-analysis. Of those observations, 17 observations from 6 studies target salt marshes or, more broadly, "coastal wetlands" and thus were excluded from the freshwater model.

[80] The memorandum to Todd Doley and Steve Whitlock, U.S. EPA, Office of Water, entitled "Notes on inclusion of source studies and data preparation for wetlands meta-data," details reasons for selecting or excluding specific wetland valuation studies from meta-data and subsequent development of meta-regression (December 10, 2018, DCN# EPA-HQ-OW-2018-0149-0053).

- Augmenting meta-data to include a wide range of studies and, in particular, studies that value wetlands in urban watersheds.
- Estimating WTP for avoiding for wetland losses in a state conditional on the size of wetland systems in the state that are affected by the change of jurisdiction. [81]
- Considering dropping ecosystem service indicators from the regression model or considering alternative treatment the ecosystem service indicators in the benefit transfer application.
- Coding the dummy variable "lump sum" to "zero" for benefit estimation. [82]
- Selecting a different extent of the market to estimate the value of changes in wetland acres.

The agencies have addressed many of the E-EEAC comments on application of the meta-analysis in the context of this proposed rule.

To improve model predictions for the linear model, the agencies augmented the meta-data to include two Canadian based studies (Lantz et al., 2013; Pattison et al., 2011). The agencies carefully considered suitability of these studies for inclusion in meta-analysis used for valuing benefits of increased wetland protection in the United States. In addition to evaluating studies' quality, the agencies assessed similarities of the wetland characteristics, the market extent, and demographic characteristics of the survey respondents in the Canadian studies and U.S. studies included in the meta-data. First, the two Canadian studies valued freshwater wetlands similar to those found in the Midwest of the U.S. Lantz et al. (2013) valued wetland restoration programs in the Credit River watershed that discharges to Lake Ontario. The study area includes a greater Toronto area that experienced a significant urban development pressure and therefore adds information on the value of wetlands in the proximity to urban areas. Pattison et al. (2011) focused on valuation of wetland retention and restoration in Manitoba. The southern portion of the province lies in the continental "prairie pothole region," the latter of which also includes north-central Iowa. In addition to similarities of the wetland characteristics valued in these studies and those valued in the U.S. studies only, these studies also consider a similar extent of the market (i.e., province and watershed level). Finally, the average income of the surveyed population in the Canadian studies ($53.6 thousand, 2020 USD) is comparable to the average income in population surveyed in the U.S. studies ($63.2 thousand, $2020). Adding the two Canadian studies increased the number of observations by 7 for a total of 28 observations. Table C-1 summarizes freshwater valuation studies included in the meta-data. The agencies estimated the linear MRM using a Bayesian framework as described in Moeltner et al. (2019), with noninformative prior settings for all coefficients and the error variance. The following sections describe the results of the regression analysis and its application to the policy context of the proposed rule.

[81] E-EEAC recommends conducting a sensitivity analysis as follows: (1) varying the uniform assumption used the baseline acres variable for all states and/or (2) tailoring the assumption to conditions in individual states.

[82] Setting lumpsum to zero, requires accounting for cumulation of the mitigation acre changes over the 2023-2042 analysis period. When the lumpsum variable is set to 1, the average annual change in mitigation is used as the wetland change for each year in the analysis under the assumption that the average annual change holds constant over the 20-year period. The resulting household willingness-to-pay (WTP) values are based on a one-time payment and an assumption that the mitigation acres will be protected in perpetuity.

C.1 Regression Results

Following Moeltner et al. (2019), this meta-analysis includes studies that value freshwater wetlands only.[83] Of the 11 U.S. studies, six of the studies value state-wide changes in wetland area and five focus on wetlands at the sub-state level. One of the two Canadian studies focuses on wetlands at the province level and the other one value wetland area changes at the watershed level (*i.e.*, sub-state level).

Table C-1: Studies used in the 2021 freshwater only MRM

Author	Year	Target Population	Wetland Type	Change in Acres	WTP (2020$)
Awondo et al.	2011	Maumee Bay SP, OH, visitors	freshwater, unspec.	2,499	$204
Beran, L.J.	1995	all SC HHs	freshwater, forested	2,500	$38
Beran, L.J.	1995	all SC HHs	freshwater, forested	2,500	$29
Beran, L.J.	1995	all SC HHs	freshwater, forested	2,500	$35
Blomquist & Whitehead	1998	all KY HHs	Freshwater	500	$3
Blomquist & Whitehead	1998	all KY HHs	freshwater, forested	500	$8
Blomquist & Whitehead	1998	all KY HHs	freshwater, forested	500	$7
Blomquist & Whitehead	1998	all KY HHs	freshwater, forested	500	$20
deZoysa	1995	selected MSAs, OH	freshwater, unspec.	3,000	$115
Lantz et al.	2013	Credit River Watershed, Ontario, Canada	freshwater, unspec.	2,523	$128[1]
Lantz et al.	2013	Credit River Watershed, Ontario, Canada	freshwater, unspec.	3,523	$131[1]
Loomis et al.	1991	all CA HHs	freshwater, unspec.	58,000	$264
Loomis et al.	1991	all CA HHs	freshwater, unspec.	40,000	$437
MacDonald et al.	1998	Atlanta region, GA	freshwater, unspec.	330	$114
Mullarkey & Bishop	1999	all WI HHs	freshwater, forested	110	$68
Newell & Swallow	2013	Two townships, RI	freshwater, forested	29	$9
Newell & Swallow	2013	Two townships, RI	freshwater, forested	45	$13
Newell & Swallow	2013	Two townships, RI	freshwater, forested	69	$16
Pattison et al.	2011	Manitoba province, Canada	freshwater, unspec.	94,918	$269[1]
Pattison et al.	2011	Manitoba province, Canada	freshwater, unspec.	133,903	$276[1]
Pattison et al.	2011	Manitoba province, Canada	freshwater, unspec.	172,887	$284[1]
Pattison et al.	2011	Manitoba province, Canada	freshwater, unspec.	250,856	$298[1]
Pattison et al.	2011	Manitoba province, Canada	freshwater, unspec.	406,793	$326[1]
Poor	1999	all NE HHs	freshwater, unspec.	16,000	$50
Poor	1999	all NE HHs	freshwater, unspec.	41,000	$44
Poor	1999	all NE HHs	freshwater, unspec.	66,000	$50
Whitehead et al.	2009	selected counties, MI	freshwater, unspec.	1,125	$77
Whitehead & Blomquist	1991	all KY HHs	freshwater, forested	5,000	$20

[83] Moeltner et al. (2019) finds that values from saltwater studies diverge significantly from freshwater studies, so while that information will not contribute to the benefits function, it is an indication of validity in the primary studies in that somewhat different environmental services are valued differently by respondents to the stated preference surveys.

Table C-1: Studies used in the 2021 freshwater only MRM					
Author	**Year**	**Target Population**	**Wetland Type**	**Change in Acres**	**WTP (2020$)**
HHs = Households					
[1]Agencies converted WTP values reported in the Canadian studies to 2020 USD by first using Canadian GDP deflator and then converting to USD using average 2020 exchange rate.					

The dependent variable in the meta-regression is the natural log of household WTP for the specified change, expressed in per-acre terms. WTP is modeled as a function of "context-defining" and "moderator" variables in the log-linear regression equation. Context-defining variables are those that are relevant to the proposed rule including the baseline number of acres, the number of acres preserved or restored, whether those acres are forested wetlands, whether they were described by the primary study to provide several specific ecosystem services, and the study's region (*e.g.*, Canada or U.S. Northeast). Moderating variables generally refer to details on how the original study was conducted and are not relevant to benefit transfer but are included to avoid omitted variable bias and to adjust for the study characteristics (*e.g.*, voluntary payment) to ensure that the meta-regression function used in benefit transfer reflects the best benefit transfer practices and desired study characteristics (*e.g.*, non-voluntary payment such as income tax). The means and standard deviations of all explanatory variables are reported in Table C-2. The model specification used to estimate the benefit parameters for transfer is:

$$ln\, y_{js} - ln\left(q_{1,js} - q_{0,js}\right) = x_{fs}^{'}\beta_f + x_{ms}^{'}\beta_m + \gamma\left(\frac{q_{1,js}+q_{0,js}}{2}\right) + \varepsilon_{js} \qquad \textbf{(Equation 1)}$$

where y_{js} is the estimated WTP to obtain an increase (or avoid a loss) in wetland acres for observation j in study s, $q_{0,js}$ and $q_{1,js}$ are the corresponding baseline and policy-endpoint acres of wetlands, respectively, and ε_{js} is a standard error term with zero mean and variance of σ_ε^2. The left-hand side of the equation [ln y_{js} - ln($q_{1,js}$ - $q_{0,js}$)] corresponds to the estimated per acre value for each observation from meta-data. This specification ensures that the estimated model meets adding-up requirements, as shown in Moeltner et al. (2019). For ease of exposition, the explanatory variables on the right-hand side of Equation 1 have been separated into *fixed variables* for which specific settings will be inserted for a given prediction context ($\boldsymbol{x}_{fs}$), and *auxiliary variables* whose influence will be averaged out in the prediction process ($\boldsymbol{x}_{ms}$). β_f and β_m are vectors of estimated parameters. The three ecosystem service indicators (*regulating, provisioning*, and *cultural*) are treated as auxiliary variables. All other variables are fixed and will be given a specific setting in benefit transfer prediction. This simple normal regression model with independent, homoscedastic error is the best-fitting specification compared to models with more complex error structure (see Moeltner et al.,2019 for detail on other specifications that allow for unobserved study-level heterogeneity and observation-level heteroskedasticity).

Table C-2: Meta-regression variable summary							
	Description	**Model 1[1] U.S. and Canadian Studies**			**Model 2[2] U.S. Studies Only**		
		Mean	**Min**	**Max**	**Mean**	**Min**	**Max**
Dependent variable							
Lnwtp	log(total WTP in 2020 dollars)	4.07	1.11	6.11	3.62	1.11	6.11
Context specific variables							
Lnyear	log(year of data collection - oldest year	1.93	0.00	3.04	1.57	0.00	2.89

Table C-2: Meta-regression variable summary							
	Description	Model 1[1] U.S. and Canadian Studies			Model 2[2] U.S. Studies Only		
		Mean	Min	Max	Mean	Min	Max
Lninc	log(income in 2020 dollars)	10.98	10.70	11.54	11.02	10.70	11.54
Sagulf	1 = S-Atlantic/Gulf (AL,GA,SC,LA)	0.14	0.00	1.00	0.19	0.00	1.00
Nema	1 = NE/mid-Atlantic,(DE,MD,NJ,PA,RI)	0.11	0.00	1.00	0.14	0.00	1.00
Nmw	N/Mid-West (KY,MI,NE,OH,WI)	0.43	0.00	1.00	0.57	0.00	1.00
CAN	1 = Canadian study	0.25	0.00	1.00			
Local	1 = target population at sub-state level	0.32	0.00	1.00	0.33	0.00	1.00
Prov	1 = provisioning function affected	0.184	0.00	1.00	0.238	0.00	1.00
Reg	1 = regulating function affected	0.64	0.00	1.00	0.52	0.00	1.00
Cult	1 = cultural function affected	0.57	0.00	1.00	0.76	0.00	1.00
Forest	1 = forested wetland	0.39	0.00	1.00	0.52	0.00	1.00
q_0	baseline acres (1000s)	200.08	0	949.18	39.64	0	219.89
q_1	policy acres (1000s)	246.80	1.41	1,355.98	51.20	1.41	220.00
Moderator variables							
lumpsum	1 = payment frequency = lump sum (single payment)	0.32	0.00	1.00	0.43	0.00	1.00
Volunt	1 = payment mechanism = voluntary contribution	0.32	0.00	1.00	0.43	0.00	1.00

[1] Summary statistics are based on the 28 observations from the U.S. and Canadian freshwater valuation studies.

[2] Summary statistics are based on the 21observations from the U.S. freshwater valuation studies (Moeltner et al., 2019).

The Bayesian estimation routine provides distributions for each of the estimated parameters and is performed using Gibbs sampling (Train, 2009).

Table C-3 presents the posterior means and standard deviations for the parameters of the two MRMs. Model 1 is based on the meta-data that include both U.S. and Canadian studies. Model 2 is based on the U.S. studies only. Based on the estimated distributions of the parameters, the variables *local*, *regulating, forested,* and *provisioning* are the strongest predictors of WTP with more than 90% of their probability mass on one side of zero. In general, Model 1 results which include Canadian studies are in line with Model 2 results which only includes U.S. studies (*see* Moeltner et al. (2019) for a detailed discussion of Model 2). Model 1 results indicate that wetland values elicited in a local context (from studies evaluating substate changes in wetlands) produce values that exceed non-local values by a factor of 14.35. When regulating services, and forested wetlands are affected, wetland values respectively increase by factors of 1.627 and 1.589. Additionally, *lninc* produced a clearer positive signal in Model 2 compared to the models with U.S.-only studies (p>90 compared to p>70). In other words, higher income individuals have higher WTP values for wetlands. More importantly, a near zero coefficient on the average wetland area between the baseline and policy scenarios $[(q_0+q_1)/2]$ allows application of this model across a wider range of the baseline wetland areas (see the following section for detail). The improvements in *p*-values across key findings suggest that the meta-regression model benefits from the inclusion of Canadian studies.

To implement the E-EEAC recommendations regarding meta-regression specification, the agencies also estimated a regression model without wetland ecosystem service indicators (*i.e.*, *regulating, provisioning*, and *cultural*) and compared the estimation results with the original models. Results of this analysis are not

presented in this Appendix (see DCN # for detail). A comparison of the models without and with ecosystem service indicators shows a Bayes Factor[84] of 1001, the original meta-regression model is 1000 times more probable than the meta-regression without ecosystem service indicators. This is a decisive difference. In addition, error variance essentially doubles for the models that do not include ecosystem service indicators. These models also did not perform well in benefit transfer applications. In summary, dropping wetland ecosystem service indicators leads to clearly inferior models.

Table C-3: Meta-regression results

	Model 1[1] U.S. and Canada Studies			Model 2[2] U.S. Studies Only		
	mean	std.	p(> 0)[3]	mean	std.	p(> 0)[3]
Constant	-1.250	3.078	0.342	-0.528	3.102	0.433
Context-specific						
Lnyear	-1.023	0.383	0.005	-0.347	0.676	0.291
Lninc	0.438	0.295	0.931	0.209	0.362	0.721
Sagulf	-0.010	1.343	0.493	-0.394	1.740	0.407
Nema	-1.760	1.016	0.044	-0.748	1.545	0.303
Nmw	-0.908	1.141	0.213	-1.057	1.554	0.246
CAN	-1.817	2.032	0.186	-	-	-
Local	3.666	0.515	1.000	3.103	0.911	0.999
Prov	-3.059	0.591	0.000	-2.253	0.883	0.009
Reg	1.492	0.665	0.986	1.619	0.850	0.968
Cult	-0.992	0.911	0.138	-0.283	1.573	0.421
Forest	1.463	0.604	0.991	1.107	0.728	0.935
(q0+q1)/2	0.000	0.001	0.695	0.009	0.007	0.886
Moderators						
Volunt	-0.584	0.828	0.240	-0.014	1.036	0.497
lumpsum	2.126	0.548	1.000	1.472	0.777	0.966
σ_{ϵ}^2	0.360	0.148	1.000	0.472	0.257	1.000

[1] Model 1 is a log-linear model based on the 28 observations from the U.S. and Canadian freshwater valuation studies.

[2] Model 2 is a log-linear model based on the 21 observations from the U.S freshwater valuation studies.

[3] Prob(>0) equals the share of the posterior density to the right of zero.

C.2 WTP prediction

Given that the majority of the observations in the meta-analysis come from studies conducted at the state (or province) level, the agencies estimate changes in benefits at the state level, assuming WTP for out of state changes is zero, and aggregate WTP across states.

Using the results of the meta-analysis to estimate per household WTP for a change in state's wetland area requires the following state-specific variables: baseline wetland areas in a given state (q_0), expected change in wetland acres because of CWA jurisdictional changes, median household income (*lninc* = log

[84] The use of Bayes factors is a Bayesian alternative to classical hypothesis testing. Bayes Factor is defined as the ratio of the likelihood of one particular hypothesis to the likelihood of another hypothesis (*i.e.*, of an alternative hypothesis to a null hypothesis). Similar to p-values, one can use thresholds to decide when we should reject a null hypothesis. A Bayes Factor of 10 or higher suggests strong enough evidence to reject the null hypothesis.

of 2020 median census or reported income)[85], proportion of baseline and change in acres that is forested, and region of the United States. The value for q_1 for each state is the baseline acres plus the expected change in jurisdictional wetland acres for each state. Table C-4 lists the values for each state-specific variable used in the benefit transfer.

For each U.S. state the agencies consider different valuation scenarios, based on the "*local*" and "*forested*" status of acres for baseline (q_0) and the estimated increase under the proposed regulation. The agencies assumed a common set of acres that is "*local*" to the entire population of a given state, with the remaining wetland acreage defined as "*nonlocal*". The fraction of local wetlands in a given state (α) is set to equal 0.0318 for all states. This value was estimated based on the average proportion of the wetland areas in the studies that valued local wetlands to the total wetland area in a given state.

The agencies further assume that (i) the share of forested wetlands (λ), is homogeneous across local and nonlocal acres, and that (ii) the share of local and forested wetlands, respectively, applies equally to baseline acres and increase in acreage under the new policy. The agencies relied on NWI and the wetland classification code (Cowardin code) to estimate a proportion of forested wetlands in each state.

Given these assumptions, the agencies estimate four separate per household WTP for each state, one for each combination of "*local*" and "*forested*." Each of these valuation scenarios is characterized by setting baseline (q_0), policy acres (q_1), and the indicator settings for *local* and *forested*. Specifically, letting the total baseline acres and total change be (q_{0T}), and (q_{cT}), respectively (suppressing state-specific subscripts for convenience), the four primary valuation scenarios are as follows:

Scenario I: Local, forested wetlands (local = 1 and forested = 1 in $\boldsymbol{x}_{fs}$)

$$q_0 = \alpha\lambda q_{0T}$$

$$q_1 = \alpha\lambda(q_{0T} + q_{cT})$$

Scenario II: Local, non-forested wetlands (local = 1 and forested = 0 in $\boldsymbol{x}_{fs}$)

$$q_0 = \alpha(1-\lambda)q_{0T}$$
$$q_1 = \alpha(1-\lambda)(q_{0T} + q_{cT})$$

Scenario III: Non-local, forested wetlands (local = 0 and forested = 1 in $\boldsymbol{x}_{fs}$)

$$q_0 = (1-\alpha)\lambda q_{0T}$$
$$q_1 = (1-\alpha)\lambda(q_{0T} + q_{cT})$$

Scenario IV: Non-local, non-forested wetlands (local = 0 and forested = 0 in $\boldsymbol{x}_{fs}$)

$$q_0 = (1-\alpha)(1-\lambda)q_{0T}$$
$$q_1 = (1-\alpha)(1-\lambda)(q_{0T} + q_{cT})$$

[85] The agencies evaluated WTP for avoiding wetland losses using both mean and median income values, the resulting WTP estimates were nearly identical.

To avoid unrealistic predictive draws for WTP, the agencies imposed a ceiling of 0.95 million acres on the non-local baseline wetland area of a given type (forested and non-forested). This threshold is based on the maximum value of the baseline wetland area in meta-data (see Table C-2). This threshold affects WTP estimation for 17 of the 26 states included in the main analysis of benefits relative to the secondary baseline of the NWPR.[86] WTP estimates are dependent on the regional indicator settings for each state (*Sagulf, Nema*, and *Nmw*). Given that both Alaska and Texas cut across several ecological zones due to the size of these states, alternative regional indicators are considered to generate low and high benefit estimates:

- *Low benefit estimates* are based on assigning Texas to the South Atlantic/Gulf Coast region and Alaska to the North/Midwest region.
- *High benefit estimates* are based on setting regional indicators to zero for both Alaska and Texas, which corresponds to Arid or semi-Arid West and Pacific Northwest region.

The remaining variables in ($\boldsymbol{x}_{fs}$) are set as follows: *lnyear* = 3.4965 (log (2021-1988), CAN = 0 since the analysis focuses on the U.S. households, *lumpsum* = 1 resulting in household WTP values that are based on a one-time payment and an assumption that the mitigation acres will be protected in perpetuity, *volunt* = 0 since voluntary payments are not incentive compatible and generally not supported in by economic literature (Carson and Groves, 2007; Johnston et al., 2017), with the three regional indicators (*Sagulf, Nema*, and *Nmv*) taking state-specific settings as applicable.

WTP for each of the four primary scenarios is estimated as a weighted average over WTP predictions corresponding to all possible 8combinations of the three auxiliary variables in $\boldsymbol{x}_{ms}$. After setting wetland acreage, *forested*, and *local* to correspond to one of the four scenarios discussed above, the agencies estimate WTP values corresponding to this primary scenario for all 8 combinations of the auxiliary variables. We then assign a probability weight to each combination, based on sample proportions for the wetland service indicators (prob (*prov*=1)=0.179; prob (*reg*=1)=0.643; and prob (*cult*=1)=0.571)).

The WTP estimate for a given primary scenario is calculated as the weighted sum of these 8 individual predictions, with weights determined by the joint probability of observing a given combination for the auxiliary variables. For example, the weight for the combination of "all 1's" for the ecosystem service indicators is derived as follows:

prob (*prov*=1, *reg*=1, *cult*=1) = 0.179*0.643*0.571 = 0.066.

The sum of all weights for 8 combinations of auxiliary variables is equal to "1".

The agencies use the variable settings described above to develop the posterior mean of the predictive WTP distribution, as well as the lower and upper bound of the corresponding highest posterior density interval. Mathematically, the probability-weighted prediction of WTP for primary scenario p (p =1 through 4), for the r-th draw of parameters from the original Gibbs Sampler, can be expressed as:

$$\boldsymbol{y}_{p,r} = \sum_{m=1}^{M}\left(\boldsymbol{\pi}_m * \boldsymbol{exp}\left(\boldsymbol{x}_{fp}^{'}\boldsymbol{\beta}_{f,r} + \boldsymbol{x}_{m}^{'}\boldsymbol{\beta}_{m,r} + \boldsymbol{\gamma}_r\left(\frac{q_{1,p}-q_{0,p}}{2}\right) + \boldsymbol{\varepsilon}_r\right)\left(q_{1,p} - q_{0,p}\right)\right) \quad \textbf{(Equation 2)}$$

[86] See Section II.C for a list of states included in the main analysis.

where now subscript *m* denotes a specific combination of auxiliary variable settings, *M* is the total number of variable setting combinations (8), and π_m is the probability weight for combination *m*, as described above.

The scenario-specific settings for a given wetland type (*e.g.*, "*nonlocal*," "*forested*", etc.) are based on the corresponding acreage amounts $q_{0,p}$ and $q_{1,p}$, and the settings for *local* and *forested* in $\boldsymbol{x}_{fp}$, as discussed above. All predictions for Gibbs Sampler iteration *r* receive the same error term ε_r, drawn from a zero-mean normal density with iteration-specific variance σ_r^2 .

This process is repeated for all r=1…R draws of coefficients and variances from the original Gibbs Sampler. The resulting set of draws characterizes the full posterior predictive distribution of the WTP for, y_p. The agencies then obtained the posterior mean as well as the lower and upper bound of the corresponding highest posterior density interval from the posterior distribution, as described in Moeltner et al. (2019).

The end results of this analysis are full predictive distributions for WTP corresponding to each of the four *local / nonlocal* and *forested / non-forested* combinations of wetland types for each state in the U.S. These distributions can be further added up to obtain WTP for all local acres, all forested acres, all nonlocal acres, and all non-forested acres, respectively. For the purpose of this analysis, the agencies obtained the full posterior distribution of grand total WTP for the entire increase in wetland acres in a given state by adding up each predictive draw over all four wetland types.

Following the best practices from the economic literature, the agencies truncated the WTP distribution at the 99th percentile prior to estimating both mean and low and upper bounds of WTP. [87]

Table C-4: State-specific benefit transfer variables

State	Median HH Income (Thous 2020$)	Region[1]	Baseline Acres (Thousands)	Proportion of Forested Acres	Change in Wetland Acres (Increase Relative to Baseline)[2]	
					Permanent	Temporary
AK	78.58	Various[3]	-	0.43	181.78	198.49
AL	51.15	SAG	4,203.98	0.96	34.39	39.80
AR	48.17	SAG	2,408.52	0.97	13.18	15.74
AZ	59.66		354.06	0.82	13.02	14.41
CA	76.15		3,028.62	0.29	55.06	142.94
CO	73.21		2,002.31	0.16	4.58	5.38
CT	79.39	NMA	310.51	0.91	0.17	1.83
DE	69.11	SAG	263.33	0.93	0.67	0.92
FL	56.33	SAG	12,183.13	0.69	786.46	790.53
GA	59.41	SAG	6,548.30	0.95	32.73	34.11
HI[3]	82.26		-	0.90	0.00	0.01
IA	61.26	NMW	1,088.44	0.52	17.60	18.01
ID	56.46		1,324.82	0.23	2.12	2.22
IL	66.68	NMW	1,301.28	0.80	13.75	14.67
IN	56.99	NMW	1,055.93	0.78	73.15	73.85
KS	60.32	NMW	1,899.86	0.36	33.31	34.99

[87] See Moeltner K. and R. Woodward. 2009. Meta-Functional Benefit Transfer for Wetland Valuation: Making the Most of Small Samples. Environmental and Resource Economics, 42:89-108.

Table C-4: State-specific benefit transfer variables

State	Median HH Income (Thous 2020$)	Region[1]	Baseline Acres (Thousands)	Proportion of Forested Acres	Change in Wetland Acres (Increase Relative to Baseline)[2]	
					Permanent	Temporary
KY	51.20	NMW	465.60	0.92	49.71	50.64
LA	50.07	SAG	8,028.27	0.69	110.30	135.28
MA	82.20	NMA	695.75	0.91	0.30	1.62
MD	85.83	SAG	814.72	0.92	2.58	3.25
ME	58.62	NMA	2,548.33	0.90	2.60	2.79
MI	57.84	NMW	7,796.98	0.90	1.91	1.94
MN	72.17	NMW	10,854.65	0.71	75.99	152.92
MO	56.13	NMW	1,386.53	0.81	35.23	36.24
MS	45.63	SAG	3,968.57	0.96	32.68	46.72
MT	55.64		3,227.10	0.14	5.94	6.08
NC	55.26	SAG	4,366.49	0.97	54.15	58.15
ND	65.68	NMW	1,509.00	0.02	25.06	34.06
NE	62.18	NMW	1,314.90	0.18	9.02	9.34
NH	77.70	NMA	310.19	0.84	0.80	1.01
NJ	83.54	NMA	889.19	0.90	0.30	0.55
NM	50.36		363.02	0.44	0.94	3.47
NV	61.10		1,033.17	0.25	1.26	1.43
NY	69.32	NMA	2,207.89	0.84	4.72	7.61
OH	57.29	NMW	538.92	0.80	22.80	24.60
OK	53.56	SAG	1,379.59	0.81	2.08	2.20
OR	63.58		1,895.76	0.20	38.85	39.60
PA	62.49	NMA	544.46	0.84	3.54	10.77
RI	67.98	NMA	60.71	0.95	0.09	1.12
SC	53.84	SAG	3,932.56	0.94	24.32	25.00
SD	58.98	NMW	2,065.24	0.03	7.78	8.60
TN	53.97	SAG	1,165.67	0.94	9.46	10.05
TX	62.62	Various[3]	4,630.57	0.46	65.14	104.04
UT	72.49		758.80	0.11	7.90	9.47
VA	75.12	SAG	1,454.95	0.89	11.01	14.76
VT	62.72	NMA	86.12	0.79	0.73	1.11
WA	74.67		959.63	0.48	13.61	17.84
WI	62.50	NMW	6,868.32	0.79	21.38	35.10
WV	47.28	SAG	57.05	0.64	5.28	7.17
WY	64.82		1,852.43	0.21	3.28	3.38

[1] SAG = South Atlantic/Gulf, NMA = Northeast/Mid-Atlantic, NMW = Northern/Mid-West. The omitted category includes states in the Arid or semi-Arid West and Pacific North-West.

[2] Average annual permanent mitigation changes begin accruing in 2023, whereas average annual temporary mitigation changes have a 5-year lag and begin accruing in 2028. The 5-year lag in benefits from mitigation measures for temporary impacts is based on discussions with the Corps and accounts for the time required for temporarily impacted areas to return to their original state.

[3] In estimates of low benefits, TX = SAG and AK = NMW, and in estimates of high benefits, TX and AK are set to the omitted region category (i.e., all regional indicators are set to zero).

[4] Hawaii and District of Columbia are excluded from the analysis. Baseline wetland area was not estimated for Alaska, so it was set to the threshold value.

Source: EPA analysis

Estimating Total WTP

To estimate total WTP (TWTP) for water quality improvements for each state, the agencies multiplied the per-household WTP values for the estimated annual change in wetland areas protected as jurisdictional by the number of households within each state in a given year. Annual benefits (TWTP) from avoided wetland losses are estimated for all years between 2023 and 2042. For each time period, the total number of households is adjusted to reflect predicted population growth, so it takes a different value for each year and state. The agencies then aggregate state-specific TWTP for all time periods of interest to account for the following: (1) annual WTP accrue over time and (2) each year, more wetland acres are protected as jurisdictional. A discount factor is applied to each time period before aggregating over years to derive the present value (PV) of future streams of WTP, where *i* is the chosen discount rate. The agencies then calculated annualized total WTP values for each state with both a 3 percent and 7 percent discount rate as shown below in Equation 3. Benefits from avoided wetland losses are estimated for all years between 2023 and 2042. For this analysis, the agencies used a simplified assumption that all benefits from mitigation measure to address permanent impacts on wetland areas begin accruing in 2023. The agencies further assumed a 5-year lag in benefits from mitigation measures to minimize temporary impacts on wetlands.

$$\boldsymbol{TWTP_{T,S}} = \left(\sum_{T=2023}^{2042} \frac{HWTP_{T,S} \times HH_{T,S}}{(1+i)^{T-2023}}\right) \times \left(\frac{i \times (1+i)^{n}}{(1+i)^{n+1} - 1}\right) \quad \textbf{(Equation 3)}$$

where:

$TWTP_{T,S}$	=	Total household WTP in 2020$ for households in state (S) in year (T),
$HWTP_{T,S}$	=	Annual household WTP in 2020$ for households in state (S) in year (T),
$HH_{T,S}$	=	the number of households residing in state (S) in year (T),
T	=	Year when benefits are realized
i	=	Discount rate (3 or 7 percent)
n	=	Duration of the analysis (20 years).

The agencies generated annual household counts for each state through the period of analysis based on projected population growth, using 2020 Woods and Poole population projections (Woods & Poole Economics Inc., 2021).

Appendix D: Proposed Rule Analysis State-level Results

This appendix provides state-level results of the agencies' quantitative assessment of the benefits and costs relative to the secondary baseline of the NWPR (Scenario 1). In addition, this appendix presents an upper bound on impacts in the counterfactual scenario in which all states offered no protection to non-WOTUS after NWPR was promulgated (Scenario 0). Scenario 0 is included for the purpose of providing the public with notice of the raw state-level results in case the agencies make adjustments for the final rule regarding how a state was characterized in the secondary baseline as protecting waters after the promulgation of the NWPR; Scenario 0 is itself not considered to be a scenario with much likelihood at all of being presented as the secondary baseline for the final rule. The estimated benefits and costs are based on the 2023-2042 analysis period. Table D-1 presents average annual changes in CWA section 404 program-related permit and mitigation requirements relative to the secondary baseline of the NWPR, by state. Table D-2, Table D-3, and Table D-4 present permit costs, mitigation costs, and total costs (sum of permit costs and mitigation costs), respectively, by state for Scenarios 1 and 0.

Table D-5 and Table D-6 present benefits from increased CWA section 404-related mitigation requirements (and associated increases in wetlands) by state for Scenarios 1 and 0, respectively.

Table D-1: Estimated average annual change in CWA section 404-related permit and mitigation requirements by state, relative to the secondary baseline of the NWPR

State	Average Annual Change in Number of Permits[1]				Average Annual Change in Mitigation Requirements[2]			
	Individual Permits		General Permits		Acres		Linear Feet	
	Scenario 0[3]	Scenario 1[4]	Scenario 0[3]	Scenario 1[4]	Scenario 0[3]	Scenario 1[4]	Scenario 0[3]	Scenario 1[4]
AK	12.4	12.4	72.1	72.1	197.9	197.9	518	518
AL	2.9	2.9	82.0	82.0	22.9	22.9	14,741	14,741
AR	2.1	2.1	277.0	277.0	12.8	12.8	2,600	2,600
AZ	1.7	1.7	117.0	117.0	13.4	13.4	879	879
CA	8.2	0.0	631.7	0.0	94.6	0.0	42,105	0
CO	1.5	1.5	112.8	112.8	4.4	4.4	833	833
CT	0.3	0.0	24.7	0.0	1.8	0.0	7	0
DE	0.2	0.2	7.0	7.0	0.7	0.7	155	155
FL	22.2	0.0	134.4	0.0	786.4	0.0	3,582	0
GA	2.4	2.4	96.3	96.3	31.5	31.5	2,308	2,308
IA	2.4	2.4	107.7	107.7	15.2	15.2	2,448	2,448
ID	0.6	0.6	70.1	70.1	1.4	1.4	721	721
IL	3.1	0.0	220.4	0.0	9.5	0.0	4,515	0
IN	2.2	2.2	150.4	150.4	38.6	38.6	30,712	30,712
KS	2.0	2.0	285.6	285.6	10.0	10.0	21,736	21,736
KY	0.9	0.9	73.9	73.9	16.9	16.9	29,390	29,390
LA	25.5	25.5	283.6	283.6	132.5	132.5	2,464	2,464
MA	0.3	0.0	34.4	0.0	1.6	0.0	60	0
MD	0.9	0.0	41.5	0.0	2.4	0.0	782	0
ME	1.3	0.0	108.9	0.0	2.8	0.0	1	0
MI	11.9	0.0	283.7	0.0	1.8	0.0	83	0
MN	9.1	0.0	146.6	0.0	145.4	0.0	6,517	0
MO	2.4	2.4	476.5	476.5	33.9	33.9	2,029	2,029
MS	4.0	4.0	118.9	118.9	44.5	44.5	1,903	1,903
MT	0.6	0.6	58.5	58.5	5.5	5.5	548	548
NC	2.6	0.0	143.6	0.0	56.4	0.0	1,520	0
ND	1.2	1.2	101.6	101.6	29.0	29.0	4,424	4,424
NE	0.6	0.6	67.3	67.3	8.2	8.2	1,015	1,015
NH	0.4	0.0	83.2	0.0	1.0	0.0	7	0
NJ	0.1	0.0	1.8	0.0	0.5	0.0	12	0
NM	0.7	0.7	101.0	101.0	3.3	3.3	156	156

Table D-1: Estimated average annual change in CWA section 404-related permit and mitigation requirements by state, relative to the secondary baseline of the NWPR

State	Average Annual Change in Number of Permits[1]				Average Annual Change in Mitigation Requirements[2]			
	Individual Permits		General Permits		Acres		Linear Feet	
	Scenario 0[3]	Scenario 1[4]	Scenario 0[3]	Scenario 1[4]	Scenario 0[3]	Scenario 1[4]	Scenario 0[3]	Scenario 1[4]
NV	0.4	0.4	91.2	91.2	1.0	1.0	379	379
NY	2.6	0.0	225.0	0.0	6.5	0.0	949	0
OH	2.4	2.4	284.6	284.6	16.4	16.4	7,190	7,190
OK	0.6	0.6	115.8	115.8	1.9	1.9	219	219
OR	2.6	0.0	48.8	0.0	37.0	0.0	2,238	0
PA	1.3	0.0	836.7	0.0	8.1	0.0	2,298	0
RI	0.1	0.0	5.6	0.0	1.1	0.0	20	0
SC	1.6	1.6	46.6	46.6	24.2	24.2	707	707
SD	1.2	1.2	67.4	67.4	7.4	7.4	1,063	1,063
TN	4.0	0.0	210.9	0.0	6.7	0.0	2,879	0
TX	7.0	7.0	1,134.2	1,134.2	88.6	88.6	13,450	13,450
UT	0.7	0.7	91.7	91.7	8.1	8.1	1,151	1,151
VA	1.7	0.0	107.2	0.0	10.5	0.0	3,746	0
VT	0.6	0.0	40.7	0.0	1.1	0.0	12	0
WA	5.2	0.0	64.8	0.0	12.3	0.0	4,854	0
WI	5.2	0.0	253.2	0.0	27.4	0.0	6,742	0
WV	0.6	0.0	449.3	0.0	3.5	0.0	3,152	0
WY	0.1	0.0	39.7	0.0	2.9	0.0	438	0
Total	**164.5**	**80.2**	**8,627.6**	**4,490.8**	**1,991.5**	**770.1**	**230,259**	**143,740**

[1] Estimated annual average permit increases based on single-water section 404 permits issued in years 2010-2019 affecting waters that became no longer jurisdictional under the NWPR.

[2] Estimated annual average mitigation increase based on permits issued in years 2010-2019 with mitigation requirements on waterways that became no longer jurisdictional under the NWPR, excluding permits issued for mitigation or restoration activities because the main purpose of these activities is to restore or enhance ecosystem services provided by water resources as opposed to dredge and fill activities that lead to permanent or temporary losses of ecosystem services.

[3] Reflects changes in permit numbers and mitigation requirements in 49 states (excludes Hawaii and District of Columbia).

[4] Reflects changes in permit numbers and mitigation requirements in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

Table D-2: Estimated annualized permit costs by state, relative to the secondary baseline of the NWPR (thousands 2020$)

State	Scenario 0[1,2]				Scenario 1[1,3]			
	3% Discount Rate		7% Discount Rate		3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High
AK	$547	$1,628	$568	$1,691	$547	$1,628	$568	$1,691
AL	$442	$1,418	$460	$1,473	$442	$1,418	$460	$1,473
AR	$1,374	$4,502	$1,427	$4,677	$1,374	$4,502	$1,427	$4,677
AZ	$594	$1,934	$617	$2,009	$594	$1,934	$617	$2,009
CA	$3,189	$10,400	$3,313	$10,804	$0	$0	$0	$0
CO	$570	$1,858	$592	$1,930	$570	$1,858	$592	$1,930
CT	$124	$404	$128	$420	$0	$0	$0	$0
DE	$38	$121	$39	$125	$38	$121	$39	$125
FL	$1,005	$2,999	$1,044	$3,115	$0	$0	$0	$0
GA	$505	$1,631	$525	$1,695	$505	$1,631	$525	$1,695
IA	$560	$1,812	$582	$1,883	$560	$1,812	$582	$1,883
ID	$349	$1,143	$363	$1,187	$349	$1,143	$363	$1,187
IL	$1,116	$3,638	$1,160	$3,779	$0	$0	$0	$0
IN	$763	$2,485	$792	$2,581	$763	$2,485	$792	$2,581
KS	$1,415	$4,638	$1,470	$4,818	$1,415	$4,638	$1,470	$4,818
KY	$372	$1,214	$386	$1,261	$372	$1,214	$386	$1,261
LA	$1,781	$5,509	$1,850	$5,723	$1,781	$5,509	$1,850	$5,723
MA	$172	$562	$179	$584	$0	$0	$0	$0
MD	$214	$694	$223	$721	$0	$0	$0	$0
ME	$548	$1,789	$569	$1,858	$0	$0	$0	$0
MI	$1,563	$4,986	$1,624	$5,179	$0	$0	$0	$0
MN	$855	$2,691	$888	$2,795	$0	$0	$0	$0
MO	$2,344	$7,698	$2,435	$7,997	$2,344	$7,698	$2,435	$7,997
MS	$640	$2,053	$665	$2,133	$640	$2,053	$665	$2,133
MT	$293	$958	$305	$996	$293	$958	$305	$996
NC	$737	$2,394	$766	$2,487	$0	$0	$0	$0
ND	$510	$1,666	$530	$1,731	$510	$1,666	$530	$1,731
NE	$336	$1,098	$349	$1,141	$336	$1,098	$349	$1,141
NH	$409	$1,343	$425	$1,395	$0	$0	$0	$0
NJ	$10	$32	$10	$33	$0	$0	$0	$0
NM	$501	$1,642	$520	$1,705	$501	$1,642	$520	$1,705
NV	$448	$1,472	$466	$1,529	$448	$1,472	$466	$1,529
NY	$1,131	$3,694	$1,175	$3,837	$0	$0	$0	$0
OH	$1,415	$4,634	$1,470	$4,814	$1,415	$4,634	$1,470	$4,814
OK	$570	$1,871	$592	$1,944	$570	$1,871	$592	$1,944
OR	$278	$879	$289	$913	$0	$0	$0	$0
PA	$4,072	$13,410	$4,230	$13,930	$0	$0	$0	$0
RI	$28	$93	$29	$96	$0	$0	$0	$0
SC	$252	$807	$262	$838	$252	$807	$262	$838
SD	$345	$1,121	$358	$1,164	$345	$1,121	$358	$1,164
TN	$1,085	$3,522	$1,127	$3,658	$0	$0	$0	$0
TX	$5,602	$18,376	$5,820	$19,089	$5,602	$18,376	$5,820	$19,089
UT	$454	$1,489	$472	$1,547	$454	$1,489	$472	$1,547

Table D-2: Estimated annualized permit costs by state, relative to the secondary baseline of the NWPR (thousands 2020$)

State	Scenario 0[1,2]				Scenario 1[1,3]			
	3% Discount Rate		7% Discount Rate		3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High
VA	$546	$1,777	$567	$1,846	$0	$0	$0	$0
VT	$207	$674	$215	$700	$0	$0	$0	$0
WA	$396	$1,233	$412	$1,281	$0	$0	$0	$0
WI	$1,309	$4,243	$1,360	$4,408	$0	$0	$0	$0
WV	$2,184	$7,194	$2,269	$7,474	$0	$0	$0	$0
WY	$193	$637	$201	$661	$0	$0	$0	$0
Total	**$44,393**	**$144,060**	**$46,116**	**$149,654**	**$23,020**	**$74,776**	**$23,914**	**$77,680**

[1] For each state, permit costs are calculated by multiplying the estimated annual average increase in the number of single-water individual and general permit (see Table E-1) by the low and high unit costs for each permit type from the Corps NWP analysis ($15,500 to $37,300 per individual permit; $4,700 to $15,500 per general permit), summing the individual permit and general permit values, and annualizing the values over the 2023-2042 analysis period.

[2] Reflects expected costs in 49 states (excludes Hawaii and District of Columbia).

[3] Reflects expected costs in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

Table D-3: Estimated annualized mitigation costs by state, relative to the secondary baseline of the NWPR (thousands 2020$)

State	Cost Per Acre (2020$)		Cost Per LF (2020$)		Scenario 0[1,2] (Thousands 2020$)				Scenario 1[1,3] (Thousands 2020$)			
					3% Discount Rate		7% Discount Rate		3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
AK	$57,665	$112,553	$314	$721	$11,922	$23,327	$12,384	$24,233	$11,922	$23,327	$12,384	$24,233
AL	$57,665	$112,553	$284	$721	$5,672	$13,596	$5,892	$14,124	$5,672	$13,596	$5,892	$14,124
AR	$32,079	$58,088	$258	$577	$1,114	$2,307	$1,157	$2,397	$1,114	$2,307	$1,157	$2,397
AZ	$57,665	$89,701	$314	$721	$1,080	$1,891	$1,122	$1,964	$1,080	$1,891	$1,122	$1,964
CA	$224,252	$410,327	$314	$721	$35,468	$71,244	$36,845	$74,011	$0	$0	$0	$0
CO	$55,369	$77,410	$96	$384	$335	$682	$348	$709	$335	$682	$348	$709
CT	$351,505	$502,568	$314	$721	$663	$950	$689	$987	$0	$0	$0	$0
DE	$36,307	$266,966	$400	$748	$91	$322	$95	$335	$91	$322	$95	$335
FL	$57,665	$112,553	$314	$721	$47,867	$93,828	$49,726	$97,472	$0	$0	$0	$0
GA	$183,673	$290,459	$938	$1,041	$8,181	$11,888	$8,499	$12,350	$8,181	$11,888	$8,499	$12,350
IA	$39,270	$86,188	$96	$409	$857	$2,381	$891	$2,473	$857	$2,381	$891	$2,473
ID	$45,117	$86,588	$314	$721	$298	$660	$310	$686	$298	$660	$310	$686
IL	$68,828	$112,506	$243	$640	$1,805	$4,074	$1,875	$4,233	$0	$0	$0	$0
IN	$53,393	$75,818	$314	$679	$12,054	$24,498	$12,522	$25,449	$12,054	$24,498	$12,522	$25,449
KS	$57,665	$112,553	$96	$384	$2,748	$9,771	$2,855	$10,150	$2,748	$9,771	$2,855	$10,150
KY	$117,482	$176,223	$320	$806	$11,744	$27,475	$12,200	$28,542	$11,744	$27,475	$12,200	$28,542
LA	$10,679	$64,072	$314	$721	$2,254	$10,570	$2,341	$10,981	$2,254	$10,570	$2,341	$10,981
MA	$636,492	$663,497	$107	$214	$1,026	$1,076	$1,066	$1,118	$0	$0	$0	$0
MD	$66,920	$242,050	$589	$815	$637	$1,244	$662	$1,292	$0	$0	$0	$0
ME	$267,934	$400,039	$0	$0	$770	$1,150	$800	$1,195	$0	$0	$0	$0
MI	$56,348	$139,677	$246	$1,060	$128	$356	$133	$370	$0	$0	$0	$0
MN	$9,925	$81,631	$314	$721	$3,594	$17,067	$3,734	$17,730	$0	$0	$0	$0
MO	$28,832	$86,497	$96	$432	$1,208	$3,925	$1,255	$4,077	$1,208	$3,925	$1,255	$4,077
MS	$27,764	$34,706	$284	$721	$1,830	$3,005	$1,901	$3,122	$1,830	$3,005	$1,901	$3,122
MT	$32,036	$39,511	$314	$721	$357	$629	$371	$653	$357	$629	$371	$653
NC	$28,240	$76,110	$317	$418	$2,137	$5,076	$2,220	$5,273	$0	$0	$0	$0
ND	$42,715	$64,072	$314	$721	$2,706	$5,198	$2,811	$5,399	$2,706	$5,198	$2,811	$5,399
NE	$57,665	$112,553	$96	$384	$586	$1,349	$609	$1,402	$586	$1,349	$609	$1,402
NH	$166,889	$235,313	$262	$785	$175	$249	$182	$259	$0	$0	$0	$0
NJ	$40,579	$320,360	$314	$721	$26	$184	$27	$192	$0	$0	$0	$0
NM	$55,369	$77,410	$314	$721	$238	$378	$247	$393	$238	$378	$247	$393

Table D-3: Estimated annualized mitigation costs by state, relative to the secondary baseline of the NWPR (thousands 2020$)

State	Cost Per Acre (2020$)		Cost Per LF (2020$)		Scenario 0[1,2] (Thousands 2020$)				Scenario 1[1,3] (Thousands 2020$)			
					3% Discount Rate		7% Discount Rate		3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
NV	$113,372	$211,230	$314	$721	$239	$498	$248	$517	$239	$498	$248	$517
NY	$76,886	$97,795	$331	$449	$840	$1,096	$873	$1,138	$0	$0	$0	$0
OH	$40,045	$230,659	$176	$1,442	$1,979	$14,561	$2,056	$15,126	$1,979	$14,561	$2,056	$15,126
OK	$53,073	$65,117	$251	$593	$163	$264	$170	$275	$163	$264	$170	$275
OR	$58,199	$133,665	$45,212	$87,137	$106,428	$205,936	$110,561	$213,934	$0	$0	$0	$0
PA	$71,280	$210,257	$428	$924	$1,610	$3,947	$1,673	$4,100	$0	$0	$0	$0
RI	$493,999	$583,033	$314	$721	$565	$673	$586	$700	$0	$0	$0	$0
SC	$105,957	$183,285	$628	$729	$3,096	$5,097	$3,217	$5,295	$3,096	$5,097	$3,217	$5,295
SD	$42,715	$64,072	$314	$721	$669	$1,277	$695	$1,326	$669	$1,277	$695	$1,326
TN	$40,045	$40,045	$256	$387	$1,038	$1,425	$1,079	$1,480	$0	$0	$0	$0
TX	$57,665	$112,553	$561	$961	$13,029	$23,586	$13,535	$24,502	$13,029	$23,586	$13,535	$24,502
UT	$57,665	$112,553	$314	$721	$856	$1,799	$889	$1,869	$856	$1,799	$889	$1,869
VA	$32,036	$213,573	$400	$748	$1,890	$5,185	$1,964	$5,386	$0	$0	$0	$0
VT	$117,465	$140,477	$314	$721	$136	$167	$142	$174	$0	$0	$0	$0
WA	$74,029	$1,190,129	$314	$721	$2,505	$18,642	$2,602	$19,366	$0	$0	$0	$0
WI	$75,605	$112,553	$314	$721	$4,311	$8,178	$4,478	$8,495	$0	$0	$0	$0
WV	$128,144	$192,216	$777	$882	$2,992	$3,566	$3,109	$3,705	$0	$0	$0	$0
WY	$44,495	$54,106	$314	$721	$273	$485	$284	$504	$0	$0	$0	$0
Total					**$302,192**	**$636,732**	**$313,927**	**$661,460**	**$85,305**	**$190,933**	**$88,618**	**$198,348**

[1] For each state, costs are calculated by multiplying the cost of each mitigation acre or linear foot (low and high estimates) by the expected increase in annual mitigation requirements (see Table F-1), summing the acreage and linear feet values, and annualizing the values over the 2023-2042 analysis period.

[2] Reflects expected costs in 49 states (excludes Hawaii and District of Columbia).

[3] Reflects expected costs in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

Table D-4: Total estimated annualized costs by state, relative to the secondary baseline of the NWPR (thousands 2020$)

State	Scenario 0[1]				Scenario 1[2]			
	3% Discount Rate		7% Discount Rate		3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High
AK	$12,469	$24,954	$12,953	$25,923	$12,469	$24,954	$12,953	$25,923
AL	$6,114	$15,015	$6,352	$15,598	$6,114	$15,015	$6,352	$15,598
AR	$2,487	$6,809	$2,584	$7,074	$2,487	$6,809	$2,584	$7,074
AZ	$1,674	$3,824	$1,739	$3,973	$1,674	$3,824	$1,739	$3,973
CA	$38,656	$81,644	$40,158	$84,815	$0	$0	$0	$0
CO	$904	$2,540	$939	$2,639	$904	$2,540	$939	$2,639
CT	$787	$1,354	$817	$1,407	$0	$0	$0	$0
DE	$129	$443	$134	$460	$129	$443	$134	$460
FL	$48,873	$96,827	$50,771	$100,588	$0	$0	$0	$0
GA	$8,686	$13,519	$9,024	$14,044	$8,686	$13,519	$9,024	$14,044
IA	$1,417	$4,193	$1,472	$4,356	$1,417	$4,193	$1,472	$4,356
ID	$647	$1,803	$672	$1,873	$647	$1,803	$672	$1,873
IL	$2,921	$7,712	$3,035	$8,011	$0	$0	$0	$0
IN	$12,817	$26,983	$13,314	$28,031	$12,817	$26,983	$13,314	$28,031
KS	$4,163	$14,408	$4,325	$14,968	$4,163	$14,408	$4,325	$14,968
KY	$12,116	$28,689	$12,586	$29,803	$12,116	$28,689	$12,586	$29,803
LA	$4,034	$16,080	$4,191	$16,704	$4,034	$16,080	$4,191	$16,704
MA	$1,198	$1,638	$1,245	$1,702	$0	$0	$0	$0
MD	$852	$1,938	$885	$2,014	$0	$0	$0	$0
ME	$1,318	$2,938	$1,369	$3,053	$0	$0	$0	$0
MI	$1,691	$5,342	$1,757	$5,550	$0	$0	$0	$0
MN	$4,449	$19,758	$4,622	$20,525	$0	$0	$0	$0
MO	$3,552	$11,623	$3,690	$12,074	$3,552	$11,623	$3,690	$12,074
MS	$2,470	$5,058	$2,566	$5,254	$2,470	$5,058	$2,566	$5,254
MT	$651	$1,587	$676	$1,649	$651	$1,587	$676	$1,649
NC	$2,874	$7,470	$2,986	$7,760	$0	$0	$0	$0
ND	$3,216	$6,863	$3,341	$7,130	$3,216	$6,863	$3,341	$7,130
NE	$922	$2,448	$957	$2,543	$922	$2,448	$957	$2,543
NH	$584	$1,592	$606	$1,654	$0	$0	$0	$0
NJ	$36	$216	$37	$225	$0	$0	$0	$0
NM	$739	$2,020	$768	$2,098	$739	$2,020	$768	$2,098
NV	$687	$1,970	$713	$2,046	$687	$1,970	$713	$2,046
NY	$1,972	$4,790	$2,048	$4,976	$0	$0	$0	$0
OH	$3,394	$19,194	$3,526	$19,940	$3,394	$19,194	$3,526	$19,940
OK	$733	$2,136	$762	$2,219	$733	$2,136	$762	$2,219
OR	$106,706	$206,815	$110,850	$214,847	$0	$0	$0	$0
PA	$5,682	$17,356	$5,903	$18,030	$0	$0	$0	$0
RI	$593	$766	$616	$796	$0	$0	$0	$0
SC	$3,348	$5,903	$3,478	$6,133	$3,348	$5,903	$3,478	$6,133
SD	$1,013	$2,397	$1,053	$2,490	$1,013	$2,397	$1,053	$2,490
TN	$2,123	$4,946	$2,206	$5,138	$0	$0	$0	$0
TX	$18,631	$41,961	$19,355	$43,591	$18,631	$41,961	$19,355	$43,591
UT	$1,311	$3,288	$1,361	$3,416	$1,311	$3,288	$1,361	$3,416
VA	$2,436	$6,961	$2,531	$7,232	$0	$0	$0	$0
VT	$343	$841	$357	$874	$0	$0	$0	$0
WA	$2,901	$19,875	$3,014	$20,646	$0	$0	$0	$0

Table D-4: Total estimated annualized costs by state, relative to the secondary baseline of the NWPR (thousands 2020$)

State	Scenario 0[1]				Scenario 1[2]			
	3% Discount Rate		7% Discount Rate		3% Discount Rate		7% Discount Rate	
	Low	High	Low	High	Low	High	Low	High
WI	$5,620	$12,420	$5,838	$12,903	$0	$0	$0	$0
WV	$5,176	$10,761	$5,377	$11,178	$0	$0	$0	$0
WY	$467	$1,122	$485	$1,166	$0	$0	$0	$0
Total	**$346,584**	**$780,792**	**$360,044**	**$811,114**	**$108,325**	**$265,709**	**$112,532**	**$276,028**

[1] Reflects expected costs in 49 states (excludes Hawaii and District of Columbia).

[2] Reflects expected costs in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

Table D-5: Annualized national benefit estimates by state, relative to the secondary baseline of the NWPR (Scenario 1)

State	Number of Affected Households in 2019[1,2]	Average Annual Increase in Mitigation Acres[1,3]	Household WTP (2020$)[1,4]		Annualized Estimate of Benefits (Thousands 2020$)[1,5]			
					3% Discount Rate		7% Discount Rate	
			Low	High	Low	High	Low	High
AK	253,346	194.31	$12.40	$67.87	$3,520.26	$19,273.06	$3,602.86	$19,725.29
AL	1,867,893	38.45	$9.45	$9.45	$19,065.85	$19,065.85	$19,488.90	$19,488.90
AR	1,158,071	15.10	$3.61	$3.61	$4,584.03	$4,584.03	$4,667.00	$4,667.00
AZ	2,571,268	14.06	$5.66	$5.66	$17,562.12	$17,562.12	$17,832.65	$17,832.65
CO	2,148,994	5.18	$1.09	$1.09	$2,720.86	$2,720.86	$2,758.96	$2,758.96
DE	363,322	0.85	$0.05	$0.05	$21.82	$21.82	$21.94	$21.94
GA	3,758,798	33.77	$8.76	$8.76	$38,230.55	$38,230.55	$39,143.33	$39,143.33
IA	1,265,473	17.91	$1.08	$1.08	$1,458.58	$1,458.58	$1,507.61	$1,507.61
ID	630,008	2.20	$0.08	$0.08	$62.33	$62.33	$63.68	$63.68
IN	2,570,419	73.67	$5.99	$5.99	$16,672.74	$16,672.74	$17,230.81	$17,230.81
KS	1,129,227	34.57	$1.74	$1.74	$2,122.81	$2,122.81	$2,187.33	$2,187.33
KY	1,734,618	50.41	$4.13	$4.13	$7,780.68	$7,780.68	$8,032.26	$8,032.26
LA	1,739,497	129.03	$24.85	$24.85	$45,735.34	$45,735.34	$46,628.12	$46,628.12
MO	2,414,521	35.98	$3.11	$3.11	$8,122.82	$8,122.82	$8,381.96	$8,381.96
MS	1,104,394	43.21	$10.11	$10.11	$11,776.68	$11,776.68	$11,872.26	$11,872.26
MT	427,871	6.05	$1.10	$1.10	$523.94	$523.94	$539.18	$539.18
ND	318,322	31.81	$0.80	$0.80	$279.61	$279.61	$281.78	$281.78
NE	759,176	9.26	$0.33	$0.33	$271.67	$271.67	$280.00	$280.00
NM	780,249	2.84	$0.69	$0.69	$578.27	$578.27	$552.72	$552.72
NV	1,098,602	1.39	$0.29	$0.29	$407.18	$407.18	$411.09	$411.09
OH	4,676,358	24.15	$1.86	$1.86	$9,175.75	$9,175.75	$9,455.17	$9,455.17
OK	1,480,061	2.17	$0.47	$0.47	$762.04	$762.04	$783.34	$783.34
SC	1,921,862	24.83	$6.08	$6.08	$13,456.38	$13,456.38	$13,803.30	$13,803.30
SD	344,397	8.39	$0.21	$0.21	$78.88	$78.88	$80.75	$80.75
TX	9,691,647	94.31	$14.79	$32.16	$168,996.87	$367,503.49	$167,471.77	$364,186.89
UT	977,313	9.08	$1.59	$1.59	$1,867.15	$1,867.15	$1,884.55	$1,884.55
Total	**47,185,707**	**902.98**			**$375,835.20**	**$590,094.63**	**$378,963.31**	**$591,800.86**

[1] Reflects estimated increase in mitigation acres in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Number of households based on 2019 American Community Survey data. The agencies accounted for population growth and change in the number of households throughout the 2023-2042 study period.

Table D-5: Annualized national benefit estimates by state, relative to the secondary baseline of the NWPR (Scenario 1)								
State	**Number of Affected Households in 2019[1,2]**	**Average Annual Increase in Mitigation Acres[1,3]**	**Household WTP (2020$)[1,4]**		**Annualized Estimate of Benefits (Thousands 2020$)[1,5]**			
					3% Discount Rate		**7% Discount Rate**	
			Low	**High**	**Low**	**High**	**Low**	**High**

[3] A weighted value that accounts for permanent impacts only in years 1-5 and (permanent + temporary impacts) in years 6-20 of the analysis.

[4] A weighted value that accounts for household WTP for permanent impacts only in years 1-5 and household WTP for (permanent + temporary impacts) in years 6-20 of the analysis.

[5] Total benefits annualized over the 2023-2042 analysis period.

Table D-6: Annualized national benefit estimates by state, relative to the secondary baseline of the NWPR (Scenario 0)

State	Number of Affected Households in 2019[1,2]	Average Annual Increase in Mitigation Acres[1,3]	Household WTP (2020$)[1,4]		Annualized Estimate of Benefits (Thousands 2020$)[1,5]			
					3% Discount Rate		7% Discount Rate	
			Low	High	Low	High	Low	High
AK	253,346	194.31	$12.40	$67.87	$3,520.26	$19,273.06	$3,602.86	$19,725.29
AL	1,867,893	38.45	$9.45	$9.45	$19,065.85	$19,065.85	$19,488.90	$19,488.90
AR	1,158,071	15.10	$3.61	$3.61	$4,584.03	$4,584.03	$4,667.00	$4,667.00
AZ	2,571,268	14.06	$5.66	$5.66	$17,562.12	$17,562.12	$17,832.65	$17,832.65
CA	13,044,266	120.97	$34.01	$34.01	$481,354.97	$481,354.97	$466,924.88	$466,924.88
CO	2,148,994	5.18	$1.09	$1.09	$2,720.86	$2,720.86	$2,758.96	$2,758.96
CT	1,370,746	1.42	$0.09	$0.09	$127.61	$127.61	$119.16	$119.16
DE	363,322	0.85	$0.05	$0.05	$21.82	$21.82	$21.94	$21.94
FL	7,736,311	789.51	$160.72	$160.72	$1,477,822.25	$1,477,822.25	$1,514,188.77	$1,514,188.77
GA	3,758,798	33.77	$8.76	$8.76	$38,230.55	$38,230.55	$39,143.33	$39,143.33
IA	1,265,473	17.91	$1.08	$1.08	$1,458.58	$1,458.58	$1,507.61	$1,507.61
ID	630,008	2.20	$0.08	$0.08	$62.33	$62.33	$63.68	$63.68
IL	4,846,134	14.44	$1.34	$1.34	$6,792.92	$6,792.92	$7,008.86	$7,008.86
IN	2,570,419	73.67	$5.99	$5.99	$16,672.74	$16,672.74	$17,230.81	$17,230.81
KS	1,129,227	34.57	$1.74	$1.74	$2,122.81	$2,122.81	$2,187.33	$2,187.33
KY	1,734,618	50.41	$4.13	$4.13	$7,780.68	$7,780.68	$8,032.26	$8,032.26
LA	1,739,497	129.03	$24.85	$24.85	$45,735.34	$45,735.34	$46,628.12	$46,628.12
MA	2,617,497	1.29	$0.09	$0.09	$243.69	$243.69	$230.79	$230.79
MD	2,205,204	3.08	$0.23	$0.23	$559.99	$559.99	$568.20	$568.20
ME	559,921	2.74	$0.18	$0.18	$108.64	$108.64	$111.91	$111.91
MI	3,935,041	1.93	$0.19	$0.19	$789.85	$789.85	$818.79	$818.79
MN	2,185,603	133.69	$12.29	$12.29	$28,856.28	$28,856.28	$28,402.35	$28,402.35
MO	2,414,521	35.98	$3.11	$3.11	$8,122.82	$8,122.82	$8,381.96	$8,381.96
MS	1,104,394	43.21	$10.11	$10.11	$11,776.68	$11,776.68	$11,872.26	$11,872.26
MT	427,871	6.05	$1.10	$1.10	$523.94	$523.94	$539.18	$539.18
NC	3,965,482	57.15	$14.56	$14.56	$66,748.48	$66,748.48	$68,204.74	$68,204.74
ND	318,322	31.81	$0.80	$0.80	$279.61	$279.61	$281.78	$281.78
NE	759,176	9.26	$0.33	$0.33	$271.67	$271.67	$280.00	$280.00
NH	532,037	0.96	$0.06	$0.06	$33.77	$33.77	$34.32	$34.32
NJ	3,231,874	0.48	$0.04	$0.04	$121.25	$121.25	$120.38	$120.38
NM	780,249	2.84	$0.69	$0.69	$578.27	$578.27	$552.72	$552.72

Table D-6: Annualized national benefit estimates by state, relative to the secondary baseline of the NWPR (Scenario 0)

State	Number of Affected Households in 2019[1,2]	Average Annual Increase in Mitigation Acres[1,3]	Household WTP (2020$)[1,4]		Annualized Estimate of Benefits (Thousands 2020$)[1,5]			
					3% Discount Rate		7% Discount Rate	
			Low	High	Low	High	Low	High
NV	1,098,602	1.39	$0.29	$0.29	$407.18	$407.18	$411.09	$411.09
NY	7,343,234	6.89	$0.47	$0.47	$3,558.74	$3,558.74	$3,565.71	$3,565.71
OH	4,676,358	24.15	$1.86	$1.86	$9,175.75	$9,175.75	$9,455.17	$9,455.17
OK	1,480,061	2.17	$0.47	$0.47	$762.04	$762.04	$783.34	$783.34
OR	1,611,982	39.41	$8.33	$8.33	$15,210.65	$15,210.65	$15,638.96	$15,638.96
PA	5,053,106	8.96	$0.52	$0.52	$2,639.90	$2,639.90	$2,553.67	$2,553.67
RI	410,489	0.86	$0.05	$0.05	$20.98	$20.98	$19.57	$19.57
SC	1,921,862	24.83	$6.08	$6.08	$13,456.38	$13,456.38	$13,803.30	$13,803.30
SD	344,397	8.39	$0.21	$0.21	$78.88	$78.88	$80.75	$80.75
TN	2,597,292	9.90	$2.39	$2.39	$6,966.86	$6,966.86	$7,145.22	$7,145.22
TX	9,691,647	94.31	$14.79	$32.16	$168,996.87	$367,503.49	$167,471.77	$364,186.89
UT	977,313	9.08	$1.59	$1.59	$1,867.15	$1,867.15	$1,884.55	$1,884.55
VA	3,151,045	13.82	$1.02	$1.02	$3,619.43	$3,619.43	$3,644.89	$3,644.89
VT	260,029	1.02	$0.05	$0.05	$14.33	$14.33	$14.41	$14.41
WA	2,848,396	16.78	$5.46	$5.46	$17,795.70	$17,795.70	$17,924.71	$17,924.71
WI	2,358,156	31.67	$2.92	$2.92	$7,239.76	$7,239.76	$7,230.88	$7,230.88
WV	732,585	6.70	$0.27	$0.27	$207.53	$207.53	$210.28	$210.28
WY	230,101	3.35	$0.73	$0.73	$186.66	$186.66	$192.02	$192.02
Total[2]	**120,012,238**	**2,170.02**			**$2,496,855.43**	**$2,711,114.86**	**$2,523,836.75**	**$2,736,674.30**

[1] Reflects estimated changes in mitigation acres in 49 states (excludes Hawaii and District of Columbia).

[2] Number of households based on 2019 American Community Survey data. The agencies accounted for population growth and change in the number of households throughout the 2023-2042 study period.

[3] A weighted value that accounts for permanent impacts only in years 1-5 and (permanent + temporary impacts) in years 6-20 of the analysis.

[4] A weighted value that accounts for household WTP for permanent impacts only in years 1-5 and household WTP for (permanent + temporary impacts) in years 6-20 of the analysis.

[5] Total benefits annualized over the 2023-2042 analysis period.

Appendix E: Analysis of National Benefits based on the U.S. Studies Only

To address the potential effect of including Canadian studies in the meta-data, the agencies also analyzed the benefits from changes in mitigation requirements under the proposed rule using a meta-regression model that relies on the U.S. studies only. Appendix C presents meta-regression results from Moeltner et al. (2019) and describes the benefit transfer methodology used in benefits estimation. The main difference between application of the revised meta-analysis and application of the model from Moeltner et al. (2019) is the use of the uniform baseline wetland area (10,000) for all states. In this analysis, the baseline wetland acreage is set to 10,000 acres (the sample median for the freshwater meta-data), as it was done for the NWPR analysis. Table E-1 and E-2 present national benefit and state level benefit estimates relative to the secondary baseline of the NWPR based on the U.S. studies only under Scenario 1 (main analysis).

Table E-1: Annualized national benefits, relative to the secondary baseline of the NWPR (Scenario 1, millions 2020$)

Discount Rate	Number of Affected Households in 2019[1,2]	Average Annual Increase in Mitigation Acres[1,2]	Household WTP (2020$)[1,4]		Annualized Estimate of Benefits (Millions 2020$)[1,5]	
			Low	High	Low	High
3% discount	47,185,707	902.98	$4.63	$9.74	$245.37	$513.45
7% discount	47,185,707	902.98	$4.63	$9.74	$247.58	$513.78

[1] Reflects estimated changes in mitigation acres in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Number of households based on 2019 American Community Survey data in the states affected by the proposed rule relative to the NWPR secondary baseline. The agencies accounted for population growth and change in the number of households throughout the 2023-2042 study period (Woods & Poole Economics Inc., 2021).

[3] A weighted value that accounts for permanent impacts only in years 1-5 and (permanent + temporary impacts) in years 6-20 of the analysis.

[4] A weighted value that accounts for household WTP for permanent impacts only in years 1-5 and household WTP for (permanent + temporary impacts) in years 6-20 of the analysis. Low and high benefit estimates differ based on state regional assignments in the meta-regression model. In low estimates, Alaska's region is in the North/Midwest and Texas' region is in the South Atlantic/Gulf Coast. In high estimates, they are set to the Arid or semi-Arid West and Pacific Northwest region.

[5] Total benefits annualized over the 2023-2042 analysis period.

Table E-2: Annualized national benefit estimates by state, relative to the secondary baseline of the NWPR (Scenario 1)

State	Number of Affected Households in 2019[1,2]	Average Annual Increase in Mitigation Acres[1,3]	Household WTP (2020$)[1,4]		Annualized Estimate of Benefits (Thousands 2020$)[1,5]			
					3% Discount Rate		7% Discount Rate	
			Low	High	Low	High	Low	High
AK	253,346	194.31	$8.44	$66.79	$2,397.99	$18,966.52	$2,454.26	$19,411.57
AL	1,867,893	38.45	$5.60	$5.60	$11,305.89	$11,305.89	$11,556.76	$11,556.76
AR	1,158,071	15.10	$2.19	$2.19	$2,784.58	$2,784.58	$2,834.98	$2,834.98
AZ	2,571,268	14.06	$6.32	$6.32	$19,589.45	$19,589.45	$19,891.19	$19,891.19
CO	2,148,994	5.18	$1.22	$1.22	$3,064.52	$3,064.52	$3,107.45	$3,107.45
DE	363,322	0.85	$0.13	$0.13	$52.87	$52.87	$53.17	$53.17
GA	3,758,798	33.77	$4.95	$4.95	$21,601.99	$21,601.99	$22,117.77	$22,117.77
IA	1,265,473	17.91	$0.83	$0.83	$1,117.15	$1,117.15	$1,154.70	$1,154.70
ID	630,008	2.20	$0.07	$0.07	$52.38	$52.38	$53.52	$53.52
IN	2,570,419	73.67	$4.28	$4.28	$11,899.82	$11,899.82	$12,298.14	$12,298.14
KS	1,129,227	34.57	$1.33	$1.33	$1,623.04	$1,623.04	$1,672.37	$1,672.37
KY	1,734,618	50.41	$3.22	$3.22	$6,057.74	$6,057.74	$6,253.61	$6,253.61
LA	1,739,497	129.03	$15.15	$15.15	$27,880.41	$27,880.41	$28,424.71	$28,424.71
MO	2,414,521	35.98	$2.13	$2.13	$5,574.02	$5,574.02	$5,751.85	$5,751.85
MS	1,104,394	43.21	$6.19	$6.19	$7,206.80	$7,206.80	$7,265.30	$7,265.30
MT	427,871	6.05	$1.26	$1.26	$604.47	$604.47	$622.04	$622.04
ND	318,322	31.81	$0.70	$0.70	$245.83	$245.83	$247.74	$247.74
NE	759,176	9.26	$0.27	$0.27	$226.43	$226.43	$233.37	$233.37
NM	780,249	2.84	$0.84	$0.84	$706.04	$706.04	$674.86	$674.86
NV	1,098,602	1.39	$0.35	$0.35	$481.42	$481.42	$486.05	$486.05
OH	4,676,358	24.15	$1.43	$1.43	$7,017.56	$7,017.56	$7,231.27	$7,231.27
OK	1,480,061	2.17	$0.28	$0.28	$462.24	$462.24	$475.16	$475.16
SC	1,921,862	24.83	$3.58	$3.58	$7,914.37	$7,914.37	$8,118.42	$8,118.42
SD	344,397	8.39	$0.19	$0.19	$71.03	$71.03	$72.71	$72.71
TX	9,691,647	94.31	$9.03	$31.04	$103,140.92	$354,653.60	$102,210.19	$351,453.15
UT	977,313	9.08	$1.95	$1.95	$2,292.57	$2,292.57	$2,313.94	$2,313.94
Total	**47,185,707**	**902.98**			**$245,371.55**	**$513,452.76**	**$247,575.54**	**$513,775.81**

[1] Reflects estimated changes in mitigation acres in Alabama, Alaska, Arizona, Arkansas, Colorado, Delaware, Georgia, Idaho, Indiana, Iowa, Kansas, Kentucky, Louisiana, Mississippi, Missouri, Montana, Nebraska, Nevada, New Mexico, North Dakota, Ohio, Oklahoma, South Carolina, South Dakota, Texas, and Utah.

[2] Number of households based on 2019 American Community Survey data. The agencies accounted for population growth and change in the number of households throughout the 2023-2042 study period.

[3] A weighted value that accounts for permanent impacts only in years 1-5 and (permanent + temporary impacts) in years 6-20 of the analysis.

[4] A weighted value that accounts for household WTP for permanent impacts only in years 1-5 and household WTP for (permanent + temporary impacts) in years 6-20 of the analysis.

[5] Total benefits annualized over the 2023-2042 analysis period.

Appendix F: Mapped NHD Stream Mileage and NWI Wetland Acreage by State

This appendix summarizes stream and wetland resources in each state, based on an analysis of available national-level data. We first describe the data and highlight uncertainty and limitations for the agencies' ability to conduct a national-level analysis to evaluate 1) waters changing jurisdictional status; 2) the relationship between these waters and facilities and activities covered under the CWA; and 3) the potential impacts of changes in the level of regulation of jurisdictional and non-jurisdictional waters.

High-resolution NHD

For the proposed rule, the agencies considered using the U.S. Geological Survey's (USGS) NHD at high resolution and the U.S. Fish and Wildlife Service's (U.S. FWS) NWI to estimate the potential effect of the proposed rule on certain water types across the country. The datasets represent the best national datasets of the potential location and extent of streams, rivers, lakes, ponds, and wetlands of which the agencies are aware. The high-resolution NHD represents the water drainage network of the United States as mapped at a scale of 1:24,000 or better (1:63,360 or better in Alaska). The data are maintained in partnership with states and other stewards. The NHD is not a regulatory dataset and does not indicate whether streams and other features are jurisdictional for CWA purposes. The agencies determined that they could not easily approximate the categories of waters that the NWPR does and does not regulate using the NHD. For example, certain tributaries are not categorically jurisdictional under the NWPR as implemented (*e.g.*, non-relatively permanent waters such as all ephemeral streams and some intermittent streams), and the jurisdictional status of such waters must be determined using a case-specific significant nexus analysis under the proposed rule.

A summary of High Resolution NHD mapping by state is presented in Table F-1. However, for the reasons discussed here, the agencies were not able to accurately identify waters that could change jurisdictional status under the proposed rule using the NHD.

National Wetlands Inventory (NWI)

The agencies considered relying on a combination of the NWI and high-resolution NHD to identify wetlands that may change jurisdictional status under the proposed rule. Like the NHD, while the NWI is the best national dataset of the potential extent of wetlands across the country of which the agencies are aware, it was not intended or designed for regulatory purposes. The agencies determined that they could not easily approximate the categories of wetlands that the NWPR does and does not regulate using the NWI. For example, wetlands must meet certain criteria to be jurisdictional as "adjacent wetlands" under the NWPR, and it is difficult to model wetlands that would likely meet the NWPR's criteria using the national datasets. In addition, not all adjacent wetlands are categorically jurisdictional under the proposed rule, and the jurisdictional status of such waters must be determined using a case-specific significant nexus analysis. Thus, the agencies did not use the NWI to assess potential changes in jurisdiction as a result of replacing the NWPR with the proposed rule.

Jurisdictional status of certain waters under the proposed rule

In addition to the limitations of the NHD and NWI datasets, the agencies face the confounding factor of not being able to map under the proposed rule the jurisdictional status of certain waters as a category, including:

- Non-navigable tributaries that are not relatively permanent;
- Wetlands adjacent to non-navigable tributaries that are not relatively permanent; and
- Wetlands adjacent to but that do not directly abut a relatively permanent non-navigable tributary.

According to the *Rapanos* Guidance, such waters are not categorically jurisdictional. Rather, the agencies must conduct a case-specific significant nexus analysis to determine their jurisdictional status. Thus, for purposes of this EA the agencies did not attempt to conduct a comprehensive national-scale analysis of waters that would be jurisdictional based on a significant nexus analysis.

Table F-1: Mapped NHD Stream Mileage and NWI Wetland Acreage by State: The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the proposed rule. The data are presented to illustrate the incomplete national coverage of the NHD data with regard to ephemeral streams.

State	NHD Streams								NWI Wetlands
	Perennial		Intermittent		Ephemeral[1]		Other[2]		
	Miles	% of Total	Miles	% of Total	Miles	% of Total	Miles	% of Total	Acres
AK	666,417	48%	18,624	1%	82	0%	700,893	51%	-
AL	48,075	23%	69,415	33%	0	0%	95,602	45%	4,203,980
AR	20,915	9%	89,091	40%	30	0%	111,599	50%	2,408,523
AZ	4,194	1%	35,305	7%	249,591	51%	202,384	41%	354,060
CA	44,290	7%	85,290	13%	213,359	34%	291,058	46%	3,028,618
CO	32,715	7%	151,915	34%	66,955	15%	197,296	44%	2,002,309
CT[3]	7,593	35%	1,892	9%	-	0%	12,035	56%	310,505
DC[3]	26	19%	6	4%	-	0%	103	76%	319
DE[3]	2,404	26%	1,112	12%	-	0%	5,838	62%	263,327
FL	19,337	12%	8,123	5%	2	0%	127,332	82%	12,183,132
GA[3]	44,081	23%	53,965	28%	-	0%	93,464	49%	6,548,298
HI									
IA	27,730	15%	72,310	39%	2,396	1%	82,259	45%	1,088,441
ID	54,355	30%	96,072	53%	8,551	5%	22,010	12%	1,324,822
IL	26,033	22%	78,490	65%	287	0%	15,676	13%	1,301,283
IN[3,4]	15,030	6%	33,453	13%	-	0%	217,363	82%	1,055,925
KS	19,065	10%	153,419	83%	316	0%	11,687	6%	1,899,863
KY	26,118	26%	59,695	60%	3	0%	13,133	13%	465,603
LA	34,365	25%	59,755	44%	24	0%	41,649	31%	8,028,273
MA[3]	8,519	51%	3,734	23%	-	0%	4,328	26%	695,752
MD[3]	13,399	53%	3,872	15%	-	0%	8,191	32%	814,720
ME	25,864	50%	13,413	26%	0	0%	12,893	25%	2,548,325
MI[3]	29,251	36%	15,136	18%	-	0%	37,753	46%	7,796,982
MN	26,461	26%	38,028	37%	1	0%	38,269	37%	10,854,648
MO[3]	22,323	12%	141,077	76%	-	0%	21,160	11%	1,386,533
MS[3]	24,376	15%	114,831	70%	-	0%	23,982	15%	3,968,569

Table F-1: Mapped NHD Stream Mileage and NWI Wetland Acreage by State: The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the proposed rule. The data are presented to illustrate the incomplete national coverage of the NHD data with regard to ephemeral streams.

State	NHD Streams								NWI Wetlands
	Perennial		Intermittent		Ephemeral[1]		Other[2]		
	Miles	% of Total	Miles	% of Total	Miles	% of Total	Miles	% of Total	Acres
MT	49,899	13%	304,329	78%	3,627	1%	32,901	8%	3,227,102
NC[4]	43,069	31%	49,442	35%	1	0%	47,726	34%	4,366,486
ND	5,926	7%	73,640	81%	0	0%	11,165	12%	1,508,999
NE	13,472	11%	98,408	77%	521	0%	15,144	12%	1,314,903
NH	8,281	44%	6,861	37%	3	0%	3,592	19%	310,193
NJ[3]	12,834	54%	1,064	4%	-	0%	10,081	42%	889,188
NM	7,124	3%	60,237	25%	156,822	66%	13,182	6%	363,015
NV	10,741	3%	26,141	8%	267,153	85%	11,487	4%	1,033,171
NY[3]	56,516	57%	20,921	21%	-	0%	21,236	22%	2,207,886
OH	26,905	29%	53,172	58%	9	0%	11,627	13%	538,919
OK	33,924	20%	115,235	69%	482	0%	17,777	11%	1,379,591
OR	77,102	24%	192,672	61%	23,402	7%	22,322	7%	1,895,761
PA[3]	43,800	51%	30,131	35%	-	0%	12,065	14%	544,458
RI[3]	1,224	62%	92	5%	-	0%	647	33%	60,714
SC[3]	25,819	33%	31,934	41%	-	0%	19,731	25%	3,932,560
SD	12,070	7%	135,766	82%	2,809	2%	13,957	8%	2,065,241
TN	68,240	60%	32,065	28%	254	0%	12,984	11%	1,165,666
TX	36,044	7%	346,494	65%	84,783	16%	62,472	12%	4,630,573
UT	15,117	8%	83,888	45%	71,561	39%	13,927	8%	758,798
VA	36,123	33%	55,846	51%	4	0%	17,581	16%	1,454,954
VT[3]	22,677	86%	11	0%	-	0%	3,757	14%	86,122
WA	69,058	29%	148,082	62%	2,330	1%	21,204	9%	959,626
WI[3]	27,876	32%	42,114	49%	-	0%	16,745	19%	6,868,324
WV	21,230	39%	27,505	50%	11	0%	6,220	11%	57,052
WY	34,404	12%	197,979	69%	35,683	12%	20,774	7%	1,852,425
Total	**2,002,413**	**21%**	**3,532,050**	**37%**	**1,191,051**	**12%**	**2,828,260**	**30%**	**118,004,537**

Table F-1: Mapped NHD Stream Mileage and NWI Wetland Acreage by State: The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the proposed rule. The data are presented to illustrate the incomplete national coverage of the NHD data with regard to ephemeral streams.

State	NHD Streams								NWI Wetlands
	Perennial		Intermittent		Ephemeral[1]		Other[2]		
	Miles	% of Total	Miles	% of Total	Miles	% of Total	Miles	% of Total	Acres

Source: Based on the 2018 adjacency analysis of NHD at high resolution and NWI data completed for NWPR, using data extracted in 2017. See Section I.A for a description of the limitations of the NHD and NWI data in characterizing the waters that may be potentially affected by the changes to the definition of "waters of the United States" under the proposed rule as compared to the secondary baseline. The numbers and percentages of streams and wetlands by category do not equate to a quantification of waters that will or will not be jurisdictional under the proposed rule.

[1] The percentages for this category represent the percentages of streams in each state that the NHD at high resolution maps as ephemeral. Zero percent for this category does not mean that the state has no ephemeral streams. Ephemeral streams are not independently mapped in many states. Often ephemeral streams are mapped in the intermittent stream category or are not mapped at all, which can result in an overstatement of intermittent streams and an understatement of ephemeral streams. This table is a summary of the available NHD data and may not accurately represent the types of waters in any given state.

[2] Includes unclassified streams, artificial paths, canal, ditches, aqueducts, and other feature without attributes.

[3] NHD has no stream miles mapped as ephemeral for these states. See FN 1 above.

[4] NHD has a high percentage of streams that are not classified as perennial, intermittent, or ephemeral (unclassified streams) for these states.

Appendix G: Sector Impact Analysis State-level Results

The agencies used the following steps to assign a sector to each affected 404 permit, based on the reported work type, project name, and project description. The agencies applied the steps in order, unless otherwise noted.

1. Projects with any of the following terms in the project name are classified as "Public": city of, town of, county, state, parish, township, municipality, municipal, department of, dept of, dot, usdot, usda, dpw, village, Caltrans, nysdot, division of, dnr, odnr, md sha, kdfwr, agfc, ag&fc, ahtd, nceep, achd, adcnr
2. Projects with "INDIAN TRIBE OR STATE 404 PROGRAM" in worktype are classified as "TSP"
3. Projects with "DEVELOPMENT" as first worktype are classified as Development ("D"). Projects with "TRANSPORTATION" as first worktype and "DEVELOPMENT" as another worktype classified as Development ("D"). Projects are further classified as:
    a. C if Commercial is only work type listed, if recreational project that doesn't include residential, or if AI and C are the only work types listed.
    b. I in Industrial is only work type listed, or if AI and I are only work types listed.
    c. R (-M, -S, -X) if Residential is only work type listed, if AI and R are only work types listed, or if R and Recreational are only work types listed. Project is mixed used (-X) if both single- and multi-family listed. Otherwise, either single family (-S) or multi-family (-M).
    d. X (Mixed Use) if more than one of Commercial, Industrial, and Residential work types listed.
    e. AI if Associated Infrastructure is only work type listed.
    f. ***Exceptions***: If Industrial or Commercial or Associated Infrastructure development is listed with Agriculture, Logging, Mining and Drilling, Energy Production (including generation, transmission, pipelines), Airport, Marina, or Landfill then development is considered secondary.
        i. If D-I or D-C and "agriculture" appears in worktype, classified as Agriculture ("Ag").
        ii. If D-I or D-C and "logging" appears in worktype, classified as Logging ("Lg").
        iii. If D-I or D-C and "mining and drilling" appears in worktype, classified as Mining and Drilling ("MD"). Classified as drilling ("MD-D") if "mining and drilling drilling" is listed before "mining and drilling mining"; mining ("MD-M") if opposite; unknown ("MD-UK") otherwise.
        iv. If D-I or D-C and "energy generation" appears in the worktype, classified as Energy Generation ("EG").
        v. If D-I or D-C and "pipeline" appears in worktype, project name, or project description, classified as Pipeline ("PL").
        vi. If D-I or D-C and "transmission" appears in worktype, project name, or project description, classified as Transmission ("Trans").
        vii. If D-I or D-C and "distribution" appears in worktype, project name, or project description, classified as Distribution ("Dist").
        viii. If D-I or D-C and "airport" appears in worktype, project name, or project description, classified as Airport ("Airport").
        ix. If D-I or D-C and either "yacht club" or "marina" appears in worktype, project name, or project description or "boat" or "dock" appears but not "residential", classified as Marina ("Marina").

x. If D-I or D-C and "landfill" appears in worktype, project name, or project description, classified as Landfill ("Landfill").

4. In addition to projects classified as Agriculture in 3(f)(i) above, projects with "AGRICULTURE" as first worktype listed are classified as Agriculture ("Ag").
5. Projects with "AQUACULTURE" as first worktype listed are classified as:
   a. "Aquaculture-Plants" if "plant" appears in worktype.
   b. "Aquaculture-Finfish" if "finfish" appears in worktype.
   c. "Aquaculture-Shellfish" if "shellfish" appears in worktype.
   d. "Aquaculture-UK" otherwise.
6. In addition to projects classified as Logging in 3(f)(ii) above, projects with "logging" in worktype are classified as Logging ("Lg").
7. In addition to projects classified as "EG" in 3(f)(iv) above, projects with "ENERGY GENERATION" as first worktype listed are classified as Energy Generation ("EG").
   a. All EG projects with "utility" in worktype are further classified as Utility ("UL-EG"). See #14, below.
   b. Projects are further classified if following terms appear in worktype, project name, or project description: coal, cogen, geothermal, hydropower, natural gas, nuclear, oil, solar, wind. Otherwise considered unknown (-UK).
8. In addition to projects classified as MD in 3(f)(iii) above, projects with "MINING AND DRILLING" as first worktype listed and
   a. "MINING" as second worktype listed are classified as Mining ("MD-M").
   b. "DRILLING" as second worktype listed are classified as Drilling ("MD-D").
   c. Projects are further classified if following terms appear in worktype, project name, or project description: shale gas, oil, gas, coal, gravel, peat, phosphate, rock, sand, other mineral. Otherwise considered unknown (-UK).
9. In addition to projects classified as Trans in 3(f)(vi) above, projects with "transmission" in worktype, project name, or project description are classified as Transmission ("Trans").
   a. All Trans projects with "utility" in worktype are further classified as Utility ("UL-TD").
10. Projects with "TRANSPORTATION" as first worktype listed and "RAIL" as second worktype listed, or with any of the following terms in the project name are classified as "Rail": rail, railway, rr.
11. Projects with "CLEANUP HAZARDOUS OR TOXIC WASTES" listed in worktype are classified as Cleanup of Hazardous or Toxic Waste ("CHTW").
12. In addition to projects classified as Pipeline in 3(f)(v) above, projects with "TRANSPORTATION" as first worktype listed and "PIPELINE" as second worktype listed, or with "pipeline" in worktype, project name, or project description are classified as Pipeline ("PL").
   a. All PL projects with "utility" in worktype are further classified as Utility ("UL-PL").
   b. If "gas" appears in worktype, project name, or project description but "oil" does not, further classified as Natural Gas Pipeline ("PL-NG"). If "oil" but not "gas", Oil Pipeline ("PL-OIL"). Otherwise considered unknown ("PL-UK").
13. Projects with "utility" in worktype classified as Utility ("UL"). Further classified as:
   a. If "water", "wwtp", or "interceptor" appears in worktype, project name, or project description, classified as Water Utility ("UL-W").
   b. If "sewer" or "sewage" appears in worktype, project name, or project description, classified as Sewer Utility ("UL-S").
   c. If "gas" or "pipeline" appears in worktype, project name, or project description, classified as Natural Gas Distribution Utility ("UL-NG").

   d. If any of the following appears in worktype, project name, or project description, classified as EG Utility ("UL-EG"): energy generation, power, electric, generation, substation, energy, kv, entergy, national grid.
14. In addition to projects classified as Marina in 3(f)(ix) above, if either "yacht club" or "marina" appears in worktype, project name, or project description or "boat" or "dock" appears but not "residential", classified as Marina ("Marina").
15. In addition to projects classified as Airport in 3(f)(viii) above, projects with "airport" or "air" in worktype, project name, or project description classified as Airport ("Airport").
16. In addition to projects classified as Landfill in 3(f)(x) above, projects with "landfill" in worktype, project name, or project description classified as Landfill ("Landfill").
17. Projects with "DREDGING" as first worktype listed or "bank stabilization" or "channelization" in worktype are classified as Dredging ("Dr").
18. Projects with any of the following search terms in worktype, project name, or project description are classified as Highway, Street, Bridge ("HSB"): highway, hwy, road, rd, roads, street, st, bridge, culvert.
19. Remaining projects are unclassified ("Unknown").

The agencies then assigned an industry sector to each classification ID, as summarized in Table G-1.

Table G-1: NAICS classification crosswalk		
Classification ID	**NAICS**	**NAICS industry description**
Ag	11	Agriculture
Airport	488119	Airport
Aquaculture-Finfish	11251	Aquaculture
Aquaculture-Plants	11251	Aquaculture
Aquaculture-Shellfish	11251	Aquaculture
CHTW	562211	Hazardous waste treatment and disposal
D-AI	2361, 2362	Mixed use building construction
D-C	23622	Commercial building construction
D-I	23621	Industrial building construction
D-R-M	2361	Residential building construction
D-R-S	2361	Residential building construction
D-R-UK	2361	Residential building construction
D-R-X	2361	Residential building construction
D-X	2361, 2362	Mixed use building construction
Dr	237990	Dredging
EG-COAL	22111	Electric power generation
EG-COGEN	22111	Electric power generation
EG-GEOTHERMAL	22111	Electric power generation
EG-HYDROPOWER	22111	Electric power generation
EG-NATURAL GAS	22111	Electric power generation
EG-NUCLEAR	22111	Electric power generation
EG-OIL	22111	Electric power generation
EG-SOLAR	22111	Electric power generation
EG-UK	22111	Electric power generation
EG-WIND	22111	Electric power generation
HSB	237310	Highway, street, and bridge construction
Landfill	562212	Solid waste landfills
Logging	113310	Logging
Marina	713930	Marinas
MD-D-COAL	212	Mining (except oil and gas)
MD-D-GAS	2111	Oil and gas extraction
MD-D-GRAVEL	212	Mining (except oil and gas)
MD-D-OIL	2111	Oil and gas extraction
MD-D-OTHER MINERAL	212	Mining (except oil and gas)
MD-D-ROCK	212	Mining (except oil and gas)
MD-D-SAND	212	Mining (except oil and gas)
MD-D-SHALE GAS	2111	Oil and gas extraction
MD-D-UK	212	Mining (except oil and gas)
MD-M-COAL	212	Mining (except oil and gas)
MD-M-GAS	2111	Oil and gas extraction
MD-M-GRAVEL	212	Mining (except oil and gas)
MD-M-OIL	2111	Oil and gas extraction
MD-M-OTHER MINERAL	212	Mining (except oil and gas)
MD-M-PEAT	212	Mining (except oil and gas)
MD-M-PHOSPHATE	212	Mining (except oil and gas)
MD-M-ROCK	212	Mining (except oil and gas)

Table G-1: NAICS classification crosswalk		
Classification ID	**NAICS**	**NAICS industry description**
MD-M-SAND	212	Mining (except oil and gas)
MD-M-SHALE GAS	2111	Oil and gas extraction
MD-M-UK	212	Mining (except oil and gas)
PL-NG	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
PL-OIL	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
PL-UK	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
PL-X	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
Public	Public	Public
Rail	48211	Rail transportation
Trans	22112	Electric power transmission, control, and distribution
TSP	Public	Public
UL-EG-COAL	22111	Electric power generation
UL-EG-COGEN	22111	Electric power generation
UL-EG-HYDROPOWER	22111	Electric power generation
UL-EG-NATURAL GAS	22111	Electric power generation
UL-EG-OIL	22111	Electric power generation
UL-EG-SOLAR	22111	Electric power generation
UL-EG-UK	22111	Electric power generation
UL-EG-WIND	22111	Electric power generation
UL-PL-NG	221210	Natural gas distribution
UL-PL-OIL	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
UL-PL-UK	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
UL-PL-X	4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products
UL-TD	22112	Electric power transmission, control, and distribution
Unknown	Unassigned	Unassigned

Table G-2 summarizes the percent of permit costs in each identified sector, stratified by Cowardin classification.

Table G-2: Permit costs by Cowardin classification								
NAICS	**NAICS industry description**	**Estuarine**	**Lacustrine**	**Marine**	**Palustrine**	**Riparian**	**Riverine**	**Uplands**
11	Agriculture	1%	1%	0%	20%	1%	78%	0%
11251	Aquaculture	15%	1%	79%	0%	0%	4%	0%
113310	Logging	0%	0%	0%	100%	0%	0%	0%
2111	Oil and gas extraction	2%	0%	0%	34%	0%	63%	0%
212	Mining (except oil and gas)	9%	1%	2%	31%	2%	54%	1%

Table G-2: Permit costs by Cowardin classification								
NAICS	**NAICS industry description**	**Estuarine**	**Lacustrine**	**Marine**	**Palustrine**	**Riparian**	**Riverine**	**Uplands**
22111	Electric power generation	4%	1%	1%	39%	1%	54%	1%
22112	Electric power transmission, control, and distribution	1%	0%	0%	39%	0%	59%	0%
221210	Natural gas distribution	1%	0%	1%	32%	0%	66%	0%
2361	Residential building construction	3%	4%	1%	63%	2%	26%	0%
2361, 2362	Mixed use building construction	2%	3%	1%	49%	2%	43%	1%
23621	Industrial building construction	2%	1%	1%	63%	2%	30%	1%
23622	Commercial building construction	3%	6%	1%	59%	2%	28%	1%
237310	Highway, street, and bridge construction	6%	7%	2%	19%	2%	63%	0%
237990	Dredging	10%	35%	3%	3%	1%	48%	0%
48211	Rail transportation	2%	2%	1%	18%	2%	75%	1%
4861, 4862, 4869	Pipeline transportation of crude oil, natural gas, and refined petroleum products	4%	0%	1%	37%	1%	57%	0%
488119	Airport	7%	12%	5%	11%	2%	63%	0%
562211	Hazardous waste treatment and disposal	8%	7%	5%	32%	3%	45%	0%
562212	Solid waste landfills	2%	1%	0%	36%	2%	57%	2%
713930	Marinas	17%	47%	10%	3%	0%	23%	0%
Public	Public	3%	4%	2%	23%	1%	66%	0%
Unassigned	Unassigned	4%	8%	2%	48%	1%	36%	1%

Table G-3 summarizes the number of potentially affected permits by state and Cowardin classification, stratified by industry sector.

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																				
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
AK	Estuarine	0%	0%	0%	1%	3%	6%	0%	0%	16%	2%	1%	6%	18%	10%	1%	5%	3%	1%	0%	11%	18%	1%
AK	Lacustrine	0%	0%	0%	0%	0%	1%	0%	0%	12%	4%	0%	5%	10%	17%	0%	0%	5%	1%	0%	28%	13%	3%
AK	Marine	0%	1%	0%	0%	4%	3%	0%	0%	7%	1%	1%	3%	15%	11%	1%	13%	2%	1%	0%	21%	14%	1%
AK	Palustrine	0%	0%	0%	2%	11%	5%	0%	0%	25%	4%	3%	9%	15%	1%	1%	2%	3%	1%	0%	1%	15%	2%
AK	Riparian	0%	0%	0%	0%	36%	1%	0%	0%	15%	2%	1%	3%	20%	5%	3%	1%	2%	0%	0%	1%	8%	0%
AK	Riverine	0%	0%	0%	0%	11%	4%	0%	0%	2%	1%	0%	3%	23%	19%	2%	3%	4%	0%	0%	3%	22%	2%
AK	Uplands	0%	0%	0%	0%	53%	0%	6%	0%	12%	0%	0%	0%	18%	0%	0%	0%	0%	0%	0%	0%	12%	0%
AK	All water types	0%	0%	0%	1%	10%	5%	0%	0%	16%	2%	2%	7%	17%	7%	1%	4%	3%	0%	0%	5%	16%	1%
AL	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	2%	19%	11%	0%	1%	3%	0%	0%	57%	6%	0%
AL	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	31%	0%	0%	1%	0%	0%	46%	6%	5%
AL	Marine	0%	1%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	24%	11%	0%	1%	2%	0%	0%	52%	6%	1%
AL	Palustrine	0%	0%	0%	0%	1%	1%	2%	4%	19%	2%	2%	8%	26%	1%	3%	4%	4%	1%	0%	3%	14%	3%
AL	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	10%	2%	2%	6%	28%	6%	0%	0%	12%	0%	0%	14%	20%	0%
AL	Riverine	0%	0%	0%	0%	2%	0%	0%	3%	4%	1%	1%	4%	31%	8%	3%	4%	5%	0%	0%	15%	17%	3%
AL	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	45%	9%	0%	0%	0%	0%	0%	0%	36%	0%
AL	All water types	0%	0%	0%	0%	1%	0%	0%	2%	5%	1%	1%	3%	22%	14%	2%	2%	3%	0%	0%	28%	11%	3%
AR	Lacustrine	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	21%	48%	4%	1%	6%	0%	0%	12%	7%	0%
AR	Palustrine	3%	0%	0%	1%	0%	0%	18%	1%	1%	0%	0%	4%	16%	0%	2%	41%	1%	0%	0%	0%	9%	2%
AR	Riparian	2%	0%	0%	0%	0%	0%	0%	0%	2%	2%	2%	16%	39%	0%	6%	3%	0%	0%	0%	3%	26%	0%
AR	Riverine	1%	0%	0%	8%	0%	0%	4%	3%	0%	0%	0%	1%	23%	6%	1%	28%	7%	0%	0%	1%	17%	1%
AR	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	18%	18%	0%	0%	0%	0%	0%	0%	55%	0%
AR	All water types	1%	0%	0%	7%	0%	0%	5%	2%	0%	0%	0%	1%	22%	7%	1%	28%	6%	0%	0%	2%	16%	1%
AZ	Lacustrine	0%	60%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	7%	0%	0%	0%	0%	0%	13%	7%	0%
AZ	Palustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	78%	0%	0%	0%	11%	0%	0%	0%	11%	0%
AZ	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	48%	14%	5%	5%	14%	5%	0%	0%	10%	0%
AZ	Riverine	0%	0%	0%	0%	1%	0%	1%	0%	2%	0%	0%	1%	54%	6%	8%	13%	3%	0%	0%	2%	8%	1%
AZ	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	50%	17%	0%	0%	0%	0%	0%	0%	17%	0%
AZ	All water types	0%	0%	0%	0%	1%	0%	1%	0%	2%	0%	0%	1%	54%	6%	8%	12%	3%	0%	0%	2%	8%	1%
CA	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	13%	37%	17%	1%	1%	6%	1%	0%	11%	2%	8%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																				
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
CA	Lacustrine	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%	2%	18%	14%	0%	3%	14%	0%	0%	22%	21%	3%
CA	Marine	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	17%	14%	1%	4%	20%	2%	0%	29%	8%	1%
CA	Palustrine	0%	0%	0%	0%	0%	2%	2%	1%	5%	1%	1%	16%	46%	1%	2%	7%	4%	1%	0%	0%	7%	1%
CA	Riparian	1%	0%	0%	0%	1%	0%	0%	0%	8%	3%	0%	4%	38%	12%	2%	5%	16%	0%	0%	0%	7%	1%
CA	Riverine	0%	0%	0%	0%	0%	1%	11%	1%	2%	1%	0%	1%	22%	5%	22%	3%	9%	0%	0%	1%	15%	7%
CA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	2%	80%	0%	0%	2%	4%	0%	0%	0%	7%	0%
CA	All water types	0%	0%	0%	0%	0%	1%	8%	1%	2%	1%	0%	4%	27%	6%	16%	3%	9%	0%	0%	3%	13%	6%
CO	Lacustrine	0%	0%	0%	0%	1%	0%	0%	1%	2%	1%	0%	5%	29%	17%	2%	2%	9%	0%	0%	18%	8%	4%
CO	Palustrine	0%	0%	0%	1%	1%	4%	2%	2%	6%	3%	0%	6%	36%	2%	5%	15%	3%	0%	0%	0%	11%	2%
CO	Riparian	1%	1%	0%	0%	1%	2%	0%	2%	3%	4%	1%	5%	13%	8%	6%	25%	6%	2%	0%	2%	21%	0%
CO	Riverine	0%	0%	0%	1%	0%	2%	0%	4%	1%	0%	0%	1%	35%	15%	4%	5%	13%	0%	0%	1%	16%	1%
CO	Uplands	0%	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%	0%	14%	7%	7%	36%	0%	0%	0%	0%	7%	14%
CO	All water types	0%	0%	0%	1%	0%	2%	1%	3%	2%	1%	0%	2%	35%	12%	4%	8%	10%	0%	0%	1%	15%	1%
CT	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	23%	8%	1%	0%	16%	1%	0%	28%	18%	4%
CT	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	14%	4%	0%	0%	35%	0%	0%	0%	33%	12%
CT	Marine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	18%	9%	0%	0%	23%	0%	0%	30%	15%	2%
CT	Palustrine	1%	0%	0%	0%	0%	0%	4%	0%	2%	1%	0%	2%	55%	1%	0%	2%	4%	1%	0%	0%	20%	6%
CT	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	0%	9%	0%	0%	18%	18%	0%	0%	36%	9%
CT	Riverine	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	21%	6%	1%	1%	9%	0%	0%	17%	40%	2%
CT	All water types	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	1%	30%	5%	1%	1%	12%	1%	0%	16%	26%	4%
DE	Estuarine	0%	2%	0%	0%	0%	0%	0%	0%	8%	0%	0%	5%	14%	16%	5%	7%	4%	3%	0%	18%	18%	0%
DE	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%	0%	63%	0%
DE	Marine	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	21%	23%	2%	3%	10%	0%	0%	31%	10%	0%
DE	Palustrine	1%	0%	0%	0%	0%	1%	0%	0%	39%	2%	1%	10%	11%	4%	1%	4%	3%	1%	2%	3%	20%	1%
DE	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	25%	0%	0%	0%	0%	0%	25%	0%	25%	0%
DE	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	13%	2%	0%	3%	17%	10%	1%	3%	4%	1%	0%	1%	45%	0%
DE	Uplands	0%	0%	0%	0%	0%	33%	0%	0%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
DE	All water types	0%	0%	0%	0%	0%	0%	0%	0%	20%	1%	0%	6%	14%	11%	2%	4%	4%	1%	1%	9%	25%	0%
FL	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	1%	22%	19%	1%	0%	4%	0%	0%	36%	13%	1%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																				
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
FL	Lacustrine	0%	1%	0%	0%	0%	0%	0%	0%	5%	2%	0%	4%	21%	8%	1%	0%	4%	0%	0%	25%	25%	1%
FL	Marine	0%	0%	0%	0%	0%	0%	1%	0%	2%	0%	0%	0%	11%	8%	1%	0%	10%	0%	0%	59%	7%	1%
FL	Palustrine	0%	0%	0%	0%	0%	0%	3%	0%	29%	4%	1%	10%	22%	2%	1%	1%	4%	0%	0%	2%	18%	2%
FL	Riparian	0%	0%	0%	0%	2%	0%	2%	0%	9%	0%	1%	2%	34%	4%	4%	1%	3%	0%	0%	7%	26%	3%
FL	Riverine	0%	0%	0%	0%	0%	0%	1%	0%	6%	2%	0%	2%	29%	8%	2%	1%	5%	0%	0%	20%	22%	1%
FL	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	14%	4%	4%	4%	29%	25%	4%	0%	0%	0%	0%	4%	14%	0%
FL	All water types	0%	0%	0%	0%	0%	0%	1%	0%	13%	2%	1%	5%	22%	9%	1%	1%	5%	0%	0%	23%	16%	1%
GA	Estuarine	0%	0%	0%	0%	0%	0%	2%	0%	1%	0%	0%	1%	25%	22%	1%	1%	20%	1%	0%	19%	5%	2%
GA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	1%	11%	11%	0%	2%	6%	0%	0%	60%	2%	2%
GA	Marine	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	20%	2%	0%	4%	0%	0%	16%	4%	18%
GA	Palustrine	0%	0%	0%	0%	1%	1%	4%	7%	10%	2%	2%	11%	30%	1%	2%	7%	3%	0%	0%	0%	9%	9%
GA	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	3%	27%	7%	20%	7%	3%	0%	0%	23%	0%	0%
GA	Riverine	0%	0%	0%	0%	0%	1%	1%	12%	7%	2%	1%	4%	33%	7%	2%	7%	6%	0%	0%	4%	11%	2%
GA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
GA	All water types	0%	0%	0%	0%	0%	1%	2%	9%	7%	2%	1%	6%	30%	6%	2%	6%	6%	0%	0%	8%	9%	5%
HI	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	20%	0%	0%	30%	0%	0%	0%	10%	0%
HI	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
HI	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	31%	7%	0%	0%	21%	0%	0%	19%	21%	0%
HI	Palustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	33%	33%	0%	0%	0%	0%	0%	0%	0%	0%
HI	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
HI	Riverine	1%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	0%	43%	16%	2%	2%	22%	0%	0%	0%	12%	2%
HI	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%
HI	All water types	1%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	0%	39%	14%	1%	1%	24%	0%	0%	4%	13%	1%
IA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	7%	63%	0%	0%	5%	0%	0%	3%	19%	0%
IA	Palustrine	2%	0%	0%	0%	1%	0%	0%	1%	4%	1%	1%	10%	26%	3%	3%	6%	3%	0%	0%	0%	37%	2%
IA	Riparian	1%	0%	0%	0%	1%	1%	0%	0%	2%	1%	1%	4%	27%	15%	15%	7%	2%	0%	0%	4%	20%	4%
IA	Riverine	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	1%	37%	23%	3%	4%	8%	0%	0%	2%	17%	1%
IA	Uplands	0%	0%	0%	0%	2%	0%	0%	2%	2%	0%	0%	2%	60%	7%	5%	2%	7%	2%	0%	0%	5%	2%
IA	All water types	1%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	2%	33%	24%	3%	4%	7%	0%	0%	2%	19%	1%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
ID	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	12%	30%	1%	0%	6%	0%	0%	40%	6%	1%
ID	Palustrine	4%	0%	0%	0%	1%	0%	1%	0%	28%	2%	0%	7%	33%	3%	2%	4%	3%	0%	0%	2%	10%	1%
ID	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	83%	1%	2%	1%	8%	0%	0%	0%	2%	0%
ID	Riverine	1%	0%	0%	0%	0%	0%	0%	0%	6%	1%	0%	2%	38%	21%	2%	1%	9%	0%	0%	5%	13%	1%
ID	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%
ID	All water types	1%	0%	0%	0%	0%	0%	0%	0%	7%	1%	0%	2%	36%	19%	2%	1%	8%	0%	0%	9%	11%	1%
IL	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	31%	46%	1%	0%	4%	0%	0%	8%	4%	3%
IL	Palustrine	1%	0%	0%	0%	0%	0%	3%	0%	2%	2%	2%	6%	39%	3%	5%	22%	4%	1%	0%	0%	7%	2%
IL	Riparian	1%	0%	0%	0%	0%	0%	0%	1%	2%	2%	1%	6%	38%	9%	4%	17%	4%	1%	0%	2%	11%	2%
IL	Riverine	1%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	44%	14%	4%	13%	5%	0%	0%	2%	12%	2%
IL	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	47%	7%	0%	7%	0%	0%	0%	7%	20%	7%
IL	All water types	1%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	2%	41%	17%	4%	13%	5%	0%	0%	2%	10%	2%
IN	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	7%	1%	0%	5%	16%	58%	0%	0%	2%	0%	0%	5%	3%	2%
IN	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	0%	67%	0%	0%
IN	Palustrine	1%	0%	0%	0%	0%	3%	10%	0%	8%	3%	2%	7%	26%	2%	4%	13%	2%	0%	1%	1%	15%	4%
IN	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	3%	34%	7%	7%	0%	2%	0%	0%	0%	46%	1%
IN	Riverine	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	0%	2%	34%	12%	3%	7%	5%	0%	0%	1%	30%	1%
IN	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	50%	0%	0%	0%	0%	0%	0%	0%
IN	All water types	0%	0%	0%	0%	0%	1%	2%	0%	3%	1%	0%	3%	29%	21%	3%	6%	4%	0%	0%	2%	22%	2%
KS	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%
KS	Lacustrine	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	23%	17%	0%	2%	9%	0%	0%	22%	18%	4%
KS	Palustrine	4%	0%	0%	0%	1%	3%	19%	15%	1%	0%	1%	3%	9%	1%	2%	29%	0%	1%	0%	0%	10%	1%
KS	Riparian	17%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	17%	67%	0%	0%	0%	0%	0%	0%	0%	0%	0%
KS	Riverine	16%	0%	0%	0%	0%	1%	4%	2%	1%	1%	0%	0%	30%	4%	4%	12%	2%	0%	0%	0%	21%	1%
KS	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	50%	0%
KS	All water types	14%	0%	0%	0%	0%	1%	6%	3%	1%	1%	0%	1%	28%	4%	3%	14%	2%	0%	0%	1%	20%	1%
KY	Estuarine	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%
KY	Lacustrine	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	14%	51%	0%	0%	0%	3%	0%	17%	8%	5%
KY	Palustrine	0%	0%	0%	0%	0%	0%	7%	10%	2%	0%	2%	4%	39%	0%	3%	27%	1%	0%	0%	0%	3%	1%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
KY	Riparian	4%	0%	0%	0%	19%	0%	0%	0%	0%	0%	0%	4%	44%	11%	7%	0%	4%	0%	0%	0%	7%	0%
KY	Riverine	0%	0%	0%	0%	1%	0%	1%	7%	1%	1%	0%	2%	49%	7%	2%	11%	2%	0%	0%	3%	6%	3%
KY	All water types	0%	0%	0%	0%	1%	0%	2%	7%	1%	1%	0%	2%	46%	9%	2%	12%	2%	0%	0%	3%	6%	3%
LA	Estuarine	0%	0%	0%	7%	4%	5%	1%	1%	1%	0%	0%	1%	21%	8%	1%	32%	2%	0%	0%	5%	8%	1%
LA	Lacustrine	0%	1%	0%	4%	1%	5%	1%	1%	0%	0%	0%	1%	13%	5%	1%	16%	1%	0%	0%	10%	37%	1%
LA	Marine	0%	1%	0%	10%	3%	7%	1%	5%	1%	0%	0%	0%	16%	6%	0%	34%	2%	0%	0%	3%	8%	3%
LA	Palustrine	0%	0%	0%	2%	2%	2%	1%	1%	5%	1%	1%	3%	11%	2%	1%	21%	2%	1%	0%	2%	42%	1%
LA	Riparian	0%	0%	0%	2%	0%	4%	1%	1%	6%	1%	0%	3%	19%	5%	5%	26%	1%	0%	0%	6%	18%	1%
LA	Riverine	0%	0%	0%	2%	1%	2%	0%	4%	0%	0%	0%	0%	10%	5%	1%	25%	1%	0%	0%	7%	40%	1%
LA	Uplands	0%	0%	0%	3%	1%	5%	3%	0%	3%	2%	2%	5%	18%	3%	3%	15%	2%	0%	0%	5%	23%	5%
LA	All water types	0%	0%	0%	4%	2%	3%	1%	2%	2%	1%	0%	1%	14%	5%	1%	25%	2%	0%	0%	5%	30%	1%
MA	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	26%	10%	1%	1%	10%	1%	0%	11%	30%	7%
MA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	5%	15%	6%	2%	1%	5%	1%	0%	4%	54%	6%
MA	Marine	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	24%	11%	0%	0%	8%	0%	0%	18%	32%	3%
MA	Palustrine	0%	0%	0%	0%	0%	2%	1%	0%	5%	1%	1%	2%	61%	0%	1%	1%	3%	0%	0%	0%	15%	6%
MA	Riparian	0%	2%	0%	0%	0%	0%	4%	0%	12%	0%	0%	2%	37%	2%	0%	0%	0%	9%	2%	0%	21%	11%
MA	Riverine	0%	0%	0%	0%	0%	1%	1%	0%	2%	0%	0%	2%	36%	3%	2%	1%	3%	1%	0%	3%	43%	3%
MA	All water types	0%	0%	0%	0%	0%	1%	1%	0%	3%	0%	0%	2%	40%	4%	1%	1%	4%	1%	0%	4%	34%	4%
MD	Estuarine	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	43%	21%	0%	0%	11%	0%	0%	14%	6%	0%
MD	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	16%	53%	0%	0%	5%	0%	5%	11%	11%	0%
MD	Marine	0%	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	30%	30%	1%	0%	2%	0%	0%	15%	15%	0%
MD	Palustrine	3%	0%	0%	0%	0%	1%	2%	0%	10%	13%	1%	5%	25%	7%	1%	1%	6%	0%	0%	0%	22%	1%
MD	Riparian	0%	0%	0%	0%	0%	2%	1%	0%	8%	6%	1%	5%	10%	9%	3%	0%	20%	1%	0%	0%	34%	1%
MD	Riverine	0%	3%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	26%	12%	0%	1%	6%	0%	0%	6%	40%	0%
MD	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MD	All water types	0%	4%	0%	0%	0%	0%	0%	0%	2%	2%	0%	1%	33%	16%	0%	0%	9%	0%	0%	9%	22%	0%
ME	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	2%	2%	20%	24%	0%	0%	10%	0%	0%	10%	29%	2%
ME	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	11%	37%	0%	0%	5%	0%	0%	28%	14%	2%
ME	Marine	0%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	35%	23%	0%	0%	4%	0%	0%	16%	12%	1%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
ME	Palustrine	0%	0%	0%	0%	0%	5%	2%	0%	17%	1%	1%	12%	16%	1%	0%	0%	3%	0%	0%	1%	39%	1%
ME	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	20%	40%	0%	0%	0%	0%	0%	0%	0%	0%
ME	Riverine	0%	1%	0%	0%	0%	1%	0%	0%	5%	1%	0%	2%	23%	5%	1%	3%	4%	0%	0%	6%	48%	0%
ME	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%
ME	All water types	0%	3%	0%	0%	0%	3%	1%	0%	10%	1%	1%	7%	22%	10%	0%	0%	4%	0%	0%	7%	30%	1%
MI	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	50%	0%	0%
MI	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	18%	46%	0%	0%	3%	0%	0%	26%	4%	1%
MI	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	24%	1%	1%	8%	32%	7%	1%	2%	3%	1%	0%	11%	6%	2%
MI	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	47%	7%	0%	0%	7%	0%	0%	7%	27%	7%
MI	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	26%	22%	0%	1%	3%	0%	0%	31%	12%	2%
MI	All water types	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	20%	40%	0%	0%	3%	0%	0%	26%	5%	1%
MN	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	5%	20%	44%	0%	0%	4%	0%	0%	10%	12%	1%
MN	Palustrine	2%	0%	0%	0%	1%	2%	1%	0%	9%	2%	0%	7%	36%	4%	4%	3%	3%	0%	0%	1%	24%	2%
MN	Riparian	12%	0%	0%	0%	0%	0%	0%	2%	5%	0%	0%	4%	40%	11%	0%	5%	5%	0%	0%	0%	16%	0%
MN	Riverine	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	42%	18%	3%	1%	5%	0%	0%	2%	24%	1%
MN	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	44%	0%	0%	0%	22%	0%	0%	0%	22%	0%
MN	All water types	2%	0%	0%	0%	1%	1%	1%	0%	6%	1%	0%	5%	36%	12%	3%	2%	4%	0%	0%	2%	23%	1%
MO	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	26%	32%	0%	0%	1%	0%	0%	38%	1%	1%
MO	Palustrine	1%	0%	0%	0%	0%	13%	1%	3%	1%	1%	0%	4%	25%	1%	2%	27%	4%	0%	0%	1%	12%	2%
MO	Riparian	1%	0%	0%	0%	0%	14%	1%	0%	0%	0%	0%	0%	27%	0%	4%	3%	4%	0%	0%	0%	44%	3%
MO	Riverine	0%	0%	0%	0%	1%	3%	2%	1%	1%	0%	0%	1%	38%	10%	2%	9%	11%	0%	0%	1%	18%	2%
MO	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	20%	20%	20%	0%	0%	0%	0%	0%	0%	40%	0%
MO	All water types	0%	0%	0%	0%	1%	3%	1%	1%	1%	0%	0%	1%	34%	16%	1%	8%	7%	0%	0%	12%	13%	2%
MS	Estuarine	1%	5%	0%	0%	0%	0%	0%	0%	2%	1%	1%	2%	22%	7%	2%	8%	3%	0%	0%	27%	17%	1%
MS	Lacustrine	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	2%	18%	18%	1%	1%	5%	0%	0%	27%	22%	5%
MS	Marine	0%	10%	0%	0%	0%	0%	0%	0%	2%	0%	2%	2%	25%	12%	2%	0%	6%	0%	0%	17%	19%	4%
MS	Palustrine	0%	0%	0%	0%	0%	1%	21%	0%	7%	2%	1%	8%	20%	1%	2%	18%	1%	0%	0%	0%	14%	3%
MS	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	4%	11%	26%	1%	3%	21%	5%	0%	0%	0%	22%	1%
MS	Riverine	0%	0%	0%	0%	0%	0%	15%	1%	1%	0%	0%	1%	24%	8%	3%	9%	2%	0%	0%	3%	30%	2%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																				
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
MS	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	29%	43%	0%	0%	0%	0%	0%	0%	0%	29%	0%
MS	All water types	0%	0%	0%	0%	0%	0%	16%	0%	3%	1%	1%	4%	23%	6%	3%	13%	2%	0%	0%	3%	23%	2%
MT	Estuarine	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	0%
MT	Lacustrine	0%	0%	0%	0%	0%	1%	0%	0%	13%	0%	0%	4%	10%	32%	0%	0%	5%	0%	0%	30%	4%	0%
MT	Palustrine	1%	0%	0%	0%	0%	1%	3%	0%	6%	1%	0%	5%	35%	1%	3%	29%	1%	0%	0%	1%	13%	0%
MT	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	8%	8%	17%	0%	0%	0%	33%	8%
MT	Riverine	1%	0%	0%	0%	1%	0%	1%	0%	1%	0%	0%	1%	32%	18%	5%	11%	12%	0%	0%	4%	13%	0%
MT	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	50%	0%
MT	All water types	1%	0%	0%	0%	0%	1%	1%	0%	3%	0%	0%	2%	31%	16%	4%	13%	9%	0%	0%	5%	12%	0%
NC	Estuarine	0%	1%	0%	0%	0%	0%	0%	0%	6%	0%	0%	1%	23%	9%	0%	0%	2%	0%	0%	33%	23%	1%
NC	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	13%	28%	0%	0%	6%	0%	0%	39%	6%	2%
NC	Marine	0%	0%	0%	0%	0%	0%	0%	0%	28%	1%	0%	1%	10%	18%	1%	0%	6%	0%	0%	9%	26%	0%
NC	Palustrine	0%	0%	0%	0%	0%	2%	0%	4%	23%	4%	1%	9%	22%	1%	0%	8%	1%	0%	0%	1%	20%	2%
NC	Riparian	0%	0%	0%	0%	0%	1%	0%	0%	11%	1%	1%	6%	18%	3%	0%	5%	2%	0%	0%	1%	50%	1%
NC	Riverine	0%	0%	0%	0%	0%	2%	0%	2%	10%	3%	0%	5%	14%	8%	1%	4%	3%	0%	0%	2%	44%	1%
NC	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	29%	0%	0%	0%	14%	14%	14%	0%	0%	0%	0%	14%	14%	0%
NC	All water types	0%	0%	0%	0%	0%	2%	0%	2%	13%	3%	1%	6%	17%	8%	1%	5%	2%	0%	0%	6%	34%	1%
ND	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	18%	16%	2%	5%	4%	0%	0%	42%	8%	2%
ND	Palustrine	1%	0%	0%	0%	0%	5%	5%	1%	0%	0%	0%	1%	30%	0%	11%	7%	3%	0%	0%	1%	34%	0%
ND	Riparian	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	1%	45%	1%	25%	4%	3%	0%	0%	0%	16%	1%
ND	Riverine	2%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	1%	32%	12%	3%	5%	8%	0%	0%	4%	31%	1%
ND	Uplands	11%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%	0%	33%	11%	0%	0%	0%	0%	0%	22%
ND	All water types	1%	0%	0%	0%	0%	3%	3%	1%	0%	0%	0%	1%	29%	5%	8%	6%	4%	0%	0%	7%	29%	1%
NE	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	22%	55%	1%	1%	4%	0%	0%	11%	1%	3%
NE	Palustrine	2%	0%	0%	0%	0%	0%	1%	0%	1%	1%	0%	2%	40%	4%	3%	4%	3%	0%	0%	1%	32%	3%
NE	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE	Riverine	2%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	47%	23%	5%	4%	5%	0%	0%	2%	7%	2%
NE	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NE	All water types	2%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	1%	40%	24%	3%	3%	4%	0%	0%	4%	13%	3%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
NH	Estuarine	0%	15%	0%	0%	0%	0%	0%	0%	9%	0%	0%	2%	11%	7%	0%	0%	4%	0%	0%	24%	25%	4%
NH	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	6%	17%	13%	0%	0%	17%	0%	0%	32%	11%	2%
NH	Marine	0%	7%	0%	0%	0%	0%	0%	0%	4%	2%	0%	4%	27%	9%	0%	0%	7%	0%	0%	22%	18%	0%
NH	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	15%	1%	1%	12%	39%	2%	0%	0%	3%	0%	0%	3%	19%	3%
NH	Riparian	1%	0%	0%	0%	0%	1%	0%	0%	5%	4%	1%	8%	22%	8%	1%	1%	5%	0%	0%	4%	29%	9%
NH	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	2%	20%	6%	0%	0%	2%	0%	0%	2%	62%	1%
NH	All water types	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%	1%	7%	28%	6%	0%	0%	6%	0%	0%	9%	30%	2%
NJ	Estuarine	0%	1%	0%	0%	0%	1%	0%	1%	2%	0%	0%	0%	27%	8%	1%	1%	3%	1%	0%	40%	14%	0%
NJ	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%	25%	50%	0%
NJ	Marine	0%	1%	0%	0%	0%	1%	0%	1%	0%	0%	0%	1%	24%	6%	0%	1%	7%	0%	0%	51%	10%	0%
NJ	Palustrine	0%	0%	0%	0%	0%	0%	0%	3%	20%	3%	0%	3%	28%	0%	3%	8%	10%	8%	0%	0%	18%	0%
NJ	Riparian	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	0%	10%	10%	10%	20%	0%	10%	0%	0%	10%	0%
NJ	Riverine	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	0%	2%	40%	8%	0%	2%	7%	3%	1%	19%	13%	0%
NJ	All water types	0%	1%	0%	0%	0%	1%	0%	1%	2%	0%	0%	1%	29%	8%	1%	2%	5%	2%	0%	35%	13%	0%
NM	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	13%	4%	0%	2%	15%	4%	0%	30%	28%	0%
NM	Palustrine	0%	0%	0%	0%	0%	0%	8%	0%	0%	3%	0%	3%	46%	3%	3%	11%	0%	0%	0%	0%	24%	0%
NM	Riparian	0%	0%	0%	0%	0%	0%	4%	2%	0%	0%	0%	0%	41%	12%	0%	2%	16%	0%	2%	0%	18%	2%
NM	Riverine	0%	0%	0%	1%	0%	1%	5%	0%	0%	0%	0%	0%	39%	6%	3%	25%	6%	1%	1%	1%	9%	1%
NM	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NM	All water types	0%	0%	0%	1%	0%	1%	5%	0%	0%	0%	0%	0%	41%	6%	3%	23%	6%	1%	1%	1%	9%	1%
NV	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NV	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	43%	4%	0%	1%	4%	0%	0%	31%	12%	3%
NV	Palustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	9%	1%	0%	87%	1%	0%	0%	0%	0%	1%
NV	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	50%	0%
NV	Riverine	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	31%	2%	15%	37%	1%	0%	0%	0%	5%	0%
NV	All water types	0%	0%	0%	0%	0%	0%	6%	0%	0%	0%	0%	0%	30%	2%	14%	39%	1%	0%	0%	1%	5%	0%
NY	Estuarine	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	39%	16%	0%	0%	13%	0%	0%	13%	17%	0%
NY	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%	18%	35%	0%	0%	11%	0%	0%	24%	8%	1%
NY	Marine	0%	5%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	45%	11%	0%	0%	10%	0%	0%	16%	12%	0%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																				
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
NY	Palustrine	0%	0%	0%	0%	3%	11%	3%	7%	12%	2%	2%	11%	14%	1%	1%	9%	1%	1%	0%	1%	21%	2%
NY	Riparian	0%	0%	0%	0%	0%	2%	0%	2%	1%	0%	0%	2%	22%	11%	1%	7%	5%	0%	0%	0%	46%	0%
NY	Riverine	0%	0%	0%	0%	1%	2%	1%	2%	1%	0%	0%	1%	16%	12%	2%	3%	4%	0%	0%	5%	49%	1%
NY	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	43%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	43%	0%
NY	All water types	0%	0%	0%	0%	1%	3%	1%	2%	3%	0%	0%	3%	21%	14%	1%	3%	6%	0%	0%	9%	31%	1%
OH	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%
OH	Lacustrine	0%	0%	0%	1%	0%	0%	0%	0%	0%	1%	0%	1%	12%	45%	0%	0%	3%	0%	0%	17%	19%	1%
OH	Palustrine	0%	0%	0%	16%	0%	6%	14%	7%	3%	0%	0%	5%	9%	0%	1%	23%	1%	0%	0%	0%	13%	1%
OH	Riparian	0%	0%	0%	70%	0%	0%	0%	0%	4%	0%	0%	0%	17%	0%	0%	4%	0%	0%	0%	0%	4%	0%
OH	Riverine	0%	0%	0%	16%	0%	4%	8%	4%	1%	0%	0%	1%	17%	3%	1%	21%	3%	0%	0%	1%	16%	1%
OH	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%
OH	All water types	0%	0%	0%	16%	0%	5%	10%	5%	2%	0%	0%	2%	14%	4%	1%	21%	2%	0%	0%	1%	16%	1%
OK	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	15%	9%	4%	0%	3%	0%	0%	17%	22%	25%
OK	Palustrine	0%	0%	0%	1%	0%	4%	0%	3%	1%	0%	0%	5%	14%	1%	0%	38%	1%	0%	0%	0%	33%	0%
OK	Riparian	0%	0%	0%	33%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	0%	0%	17%	0%	0%	0%	17%	0%
OK	Riverine	0%	0%	0%	0%	0%	0%	1%	1%	1%	0%	0%	1%	25%	3%	2%	16%	4%	0%	0%	1%	43%	2%
OK	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	50%	0%	0%	0%	0%	0%	0%	25%	0%
OK	All water types	0%	0%	0%	0%	0%	1%	1%	1%	1%	0%	0%	1%	24%	3%	2%	17%	4%	0%	0%	1%	42%	2%
OR	Estuarine	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	28%	12%	1%	1%	6%	2%	0%	30%	17%	1%
OR	Lacustrine	2%	0%	0%	0%	0%	4%	2%	0%	0%	0%	0%	0%	16%	14%	2%	0%	10%	0%	0%	27%	22%	2%
OR	Marine	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%	59%	0%	9%	0%	0%	0%	0%	18%	5%	5%
OR	Palustrine	0%	0%	0%	0%	0%	1%	22%	2%	6%	1%	1%	6%	16%	1%	2%	21%	1%	0%	0%	0%	18%	1%
OR	Riparian	0%	0%	0%	0%	0%	0%	0%	3%	3%	0%	0%	6%	23%	20%	0%	3%	17%	3%	0%	0%	23%	0%
OR	Riverine	0%	0%	0%	0%	0%	0%	6%	1%	1%	0%	0%	1%	30%	10%	1%	14%	6%	1%	0%	5%	22%	1%
OR	All water types	0%	0%	0%	0%	0%	1%	10%	1%	2%	1%	0%	2%	26%	8%	1%	15%	5%	1%	0%	5%	20%	1%
PA	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	9%	9%	0%	0%	0%	0%	0%	9%	69%	3%
PA	Lacustrine	0%	0%	0%	1%	0%	0%	0%	0%	1%	0%	0%	0%	14%	17%	0%	0%	4%	0%	0%	57%	3%	2%
PA	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	60%	20%	0%	20%	0%	0%	0%	0%	0%	0%
PA	Palustrine	0%	0%	0%	57%	0%	2%	2%	2%	0%	0%	0%	1%	6%	0%	0%	13%	1%	0%	0%	0%	15%	0%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
PA	Riparian	0%	0%	0%	22%	1%	1%	0%	1%	4%	0%	0%	0%	35%	5%	1%	1%	4%	1%	0%	0%	23%	0%
PA	Riverine	0%	0%	0%	23%	0%	1%	1%	2%	0%	0%	0%	0%	24%	7%	1%	7%	4%	0%	0%	2%	27%	0%
PA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%	25%	25%	0%	0%	0%	0%	25%	0%	0%	0%
PA	All water types	0%	0%	0%	30%	0%	1%	1%	2%	0%	0%	0%	0%	21%	6%	1%	8%	3%	0%	0%	2%	24%	0%
RI	Estuarine	0%	8%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	25%	0%	0%	0%	5%	0%	0%	10%	50%	0%
RI	Lacustrine	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%	25%	0%	0%	0%	8%	0%	0%	8%	50%	0%
RI	Marine	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%	10%	0%	0%	9%	3%	0%	35%	21%	10%
RI	Palustrine	0%	0%	0%	0%	0%	1%	6%	0%	3%	0%	0%	1%	56%	0%	0%	0%	6%	3%	0%	0%	17%	5%
RI	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	0%	0%	0%	0%	0%	0%	9%	27%	0%
RI	Riverine	0%	0%	0%	0%	0%	1%	1%	2%	1%	0%	0%	0%	19%	4%	0%	1%	6%	1%	0%	3%	58%	4%
RI	All water types	0%	1%	0%	0%	0%	1%	3%	1%	1%	0%	0%	1%	35%	3%	0%	0%	6%	2%	0%	9%	31%	5%
SC	Estuarine	0%	4%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	40%	14%	0%	2%	6%	0%	0%	20%	8%	3%
SC	Lacustrine	0%	0%	0%	0%	0%	0%	1%	0%	1%	0%	0%	2%	41%	17%	1%	1%	7%	0%	0%	18%	5%	4%
SC	Marine	0%	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	29%	41%	1%	0%	3%	0%	0%	10%	13%	1%
SC	Palustrine	0%	0%	0%	0%	0%	1%	2%	2%	16%	3%	2%	14%	39%	1%	1%	5%	3%	0%	0%	1%	6%	5%
SC	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	9%	0%	0%	0%	52%	0%	4%	0%	0%	0%	0%	13%	4%	17%
SC	Riverine	0%	0%	0%	0%	0%	0%	2%	1%	6%	1%	1%	2%	40%	7%	1%	6%	5%	0%	0%	17%	9%	3%
SC	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	13%	20%	0%	0%	53%	0%	0%	0%	0%	0%	13%
SC	All water types	0%	1%	0%	0%	0%	0%	1%	1%	8%	1%	1%	6%	39%	8%	1%	5%	4%	0%	0%	12%	7%	4%
SD	Lacustrine	0%	2%	0%	0%	0%	0%	1%	0%	5%	0%	0%	2%	21%	23%	2%	1%	7%	0%	0%	25%	9%	1%
SD	Palustrine	0%	0%	0%	0%	0%	2%	13%	4%	3%	3%	0%	3%	20%	0%	0%	11%	1%	0%	0%	0%	39%	0%
SD	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	0%	0%	33%	33%	0%	0%	0%	0%	0%
SD	Riverine	3%	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%	1%	34%	6%	1%	4%	6%	0%	0%	2%	40%	1%
SD	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	0%	0%	0%	0%	0%	0%	50%	0%
SD	All water types	2%	0%	0%	0%	0%	1%	4%	1%	2%	1%	0%	2%	29%	6%	1%	6%	5%	0%	0%	3%	37%	1%
TN	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	11%	1%	0%	0%	0%	0%	72%	9%	1%
TN	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	5%	4%	1%	11%	25%	0%	2%	6%	4%	0%	0%	0%	36%	3%
TN	Riparian	0%	0%	0%	2%	2%	0%	2%	2%	0%	2%	0%	4%	22%	14%	4%	0%	2%	0%	0%	2%	42%	0%
TN	Riverine	1%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	30%	22%	1%	3%	7%	0%	0%	4%	26%	1%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																					
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
TN	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	40%	40%	0%	0%	0%	0%	0%	20%	0%	0%
TN	All water types	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	19%	16%	1%	2%	4%	0%	0%	35%	19%	1%
TX	Estuarine	0%	0%	0%	0%	0%	1%	0%	0%	2%	0%	0%	1%	16%	12%	1%	26%	2%	0%	0%	15%	17%	7%
TX	Lacustrine	0%	0%	0%	0%	0%	1%	1%	0%	1%	1%	0%	2%	32%	18%	1%	7%	5%	0%	0%	23%	5%	3%
TX	Marine	0%	1%	0%	0%	0%	0%	1%	0%	3%	0%	0%	2%	25%	16%	1%	10%	3%	1%	0%	27%	8%	1%
TX	Palustrine	0%	0%	0%	0%	0%	3%	0%	3%	0%	0%	0%	1%	4%	0%	1%	65%	1%	0%	0%	0%	5%	16%
TX	Riparian	0%	0%	0%	1%	0%	1%	1%	0%	2%	2%	1%	1%	20%	8%	7%	36%	4%	0%	0%	0%	16%	1%
TX	Riverine	0%	0%	0%	0%	0%	5%	1%	4%	1%	1%	0%	1%	12%	2%	3%	60%	1%	0%	0%	1%	7%	1%
TX	Uplands	0%	0%	0%	0%	0%	6%	0%	0%	3%	3%	0%	6%	22%	13%	6%	6%	0%	0%	0%	9%	25%	0%
TX	All water types	0%	0%	0%	0%	0%	4%	1%	3%	1%	0%	0%	1%	9%	2%	1%	59%	1%	0%	0%	2%	6%	9%
UT	Estuarine	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
UT	Lacustrine	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	16%	40%	0%	4%	2%	0%	0%	20%	13%	0%
UT	Marine	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
UT	Palustrine	1%	0%	0%	2%	0%	3%	1%	5%	9%	2%	1%	6%	21%	0%	3%	36%	0%	0%	0%	1%	6%	3%
UT	Riparian	0%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	2%	40%	27%	2%	15%	6%	1%	0%	0%	2%	1%
UT	Riverine	1%	0%	0%	1%	0%	0%	12%	4%	1%	0%	0%	0%	28%	14%	1%	27%	4%	0%	0%	0%	4%	1%
UT	All water types	1%	0%	0%	1%	0%	1%	9%	4%	2%	1%	0%	1%	28%	14%	2%	27%	4%	0%	0%	1%	4%	1%
VA	Estuarine	0%	5%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	26%	38%	0%	0%	5%	0%	0%	21%	3%	0%
VA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	15%	47%	0%	0%	5%	0%	0%	24%	3%	1%
VA	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	64%	0%	0%	0%	7%	0%	0%	14%	14%	0%
VA	Palustrine	1%	0%	0%	0%	0%	1%	3%	0%	14%	6%	4%	9%	29%	5%	1%	2%	3%	0%	0%	1%	15%	4%
VA	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	14%	0%	0%	14%	36%	0%	0%	0%	7%	0%	0%	0%	21%	7%
VA	Riverine	1%	0%	0%	0%	0%	2%	1%	0%	3%	2%	1%	2%	39%	10%	1%	3%	4%	0%	0%	5%	21%	4%
VA	Uplands	0%	0%	0%	0%	0%	0%	14%	0%	14%	0%	0%	0%	29%	14%	0%	0%	0%	0%	0%	14%	14%	0%
VA	All water types	0%	2%	0%	0%	0%	1%	1%	0%	4%	2%	1%	3%	32%	20%	1%	2%	4%	0%	0%	10%	13%	3%
VT	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	12%	29%	0%	0%	8%	0%	0%	21%	26%	3%
VT	Palustrine	2%	0%	0%	0%	0%	6%	0%	0%	20%	4%	2%	10%	18%	0%	2%	2%	2%	0%	1%	0%	18%	15%
VT	Riverine	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	25%	11%	2%	0%	9%	0%	0%	1%	47%	2%
VT	All water types	1%	0%	0%	0%	0%	2%	0%	0%	6%	1%	0%	3%	21%	10%	2%	1%	7%	0%	0%	3%	35%	6%

Table G-3: Affected CWA section 404 permits by Cowardin classification and industry sector

State	Cowardin	NAICS																				
		11	11251	113310	2111	212	22111	22112	221210	2361	2361, 2362	23621	23622	237310	237990	48211	4861, 4862, 4869	488119	562211	562212	713930	Public	Unassigned
WA	Estuarine	0%	11%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	36%	6%	1%	2%	16%	0%	0%	7%	18%	1%
WA	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	21%	7%	1%	1%	18%	0%	0%	33%	16%	2%
WA	Marine	0%	75%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	8%	1%	0%	0%	4%	0%	0%	4%	6%	1%
WA	Palustrine	0%	0%	0%	0%	0%	0%	1%	0%	19%	5%	2%	8%	23%	1%	6%	5%	3%	1%	0%	0%	21%	3%
WA	Riparian	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	37%	4%	10%	5%	6%	1%	0%	0%	34%	1%
WA	Riverine	0%	0%	0%	0%	0%	1%	1%	0%	0%	0%	0%	1%	35%	9%	2%	1%	9%	0%	0%	6%	31%	3%
WA	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	80%	0%	0%	0%	0%	0%	0%	0%	20%	0%
WA	All water types	0%	33%	0%	0%	0%	0%	0%	0%	2%	1%	0%	1%	20%	4%	2%	1%	7%	0%	0%	7%	17%	2%
WI	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	25%	0%	0%	25%	0%	0%	0%	0%	0%
WI	Lacustrine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	11%	57%	0%	0%	14%	0%	0%	8%	6%	2%
WI	Marine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%	60%	0%	0%	10%	0%	0%	0%	20%	0%
WI	Palustrine	1%	0%	0%	0%	0%	0%	2%	0%	8%	1%	1%	11%	35%	2%	2%	4%	3%	0%	0%	0%	23%	3%
WI	Riparian	0%	0%	0%	1%	0%	1%	1%	0%	3%	0%	1%	2%	55%	15%	3%	0%	3%	0%	0%	1%	15%	1%
WI	Riverine	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	2%	28%	35%	2%	1%	5%	0%	0%	3%	22%	1%
WI	Uplands	0%	0%	0%	0%	0%	0%	6%	0%	11%	0%	0%	14%	20%	23%	3%	3%	11%	0%	0%	0%	6%	3%
WI	All water types	0%	0%	0%	0%	0%	0%	1%	0%	3%	0%	0%	5%	25%	31%	2%	2%	7%	0%	0%	4%	18%	2%
WV	Estuarine	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	50%	0%	50%	0%	0%	0%	0%
WV	Lacustrine	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%	0%	4%	22%	30%	4%	0%	7%	0%	0%	15%	11%	0%
WV	Palustrine	0%	0%	0%	39%	1%	13%	12%	5%	0%	0%	0%	1%	5%	0%	0%	22%	0%	0%	0%	0%	1%	0%
WV	Riparian	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%	0%	0%	15%	0%	0%	54%	8%	0%	0%	0%	8%	0%
WV	Riverine	0%	0%	0%	22%	2%	7%	4%	4%	0%	0%	0%	0%	25%	5%	0%	23%	1%	0%	0%	0%	4%	1%
WV	Uplands	0%	0%	0%	93%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
WV	All water types	0%	0%	0%	25%	2%	8%	5%	4%	0%	0%	0%	0%	21%	4%	0%	23%	1%	0%	0%	0%	4%	1%
WY	Lacustrine	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	21%	23%	0%	0%	2%	2%	0%	39%	5%	5%
WY	Palustrine	0%	0%	0%	0%	1%	1%	0%	0%	3%	0%	0%	2%	27%	1%	3%	26%	1%	0%	0%	0%	31%	3%
WY	Riverine	1%	0%	0%	0%	1%	12%	0%	0%	0%	0%	0%	0%	17%	16%	2%	24%	4%	0%	0%	1%	20%	1%
WY	Uplands	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	33%	67%	0%	0%	0%	0%	0%
WY	All water types	1%	0%	0%	0%	1%	9%	0%	0%	1%	0%	0%	1%	20%	12%	2%	24%	3%	0%	0%	2%	23%	2%

Appendix H: Alternative Radius-based Benefit Transfer Approach for Wetlands Benefits

As an alternative to the state-based approach to the benefit transfer results presented in the economic analysis and Appendix C above, this appendix presents a radius-based approach for calculating census tract-level average benefits from wetland changes. The underlying meta-analysis and meta-regression model (MRM) are the same as those used for the state-based approach.

This subsection is structured as follows. First, the agencies explain why a radius-based approach is potentially preferable to the state-based benefit transfer approach currently used for the economic analysis. Second, the methodology underlying this alternative approach is illustrated in detail using census tracts in two arbitrarily chosen states: Rhode Island and Georgia. Lastly, the methodology is applied to census tracts across the country. These tract-level benefits are then aggregated up by state. State-level benefits are then aggregated to the national level, allowing for a comparison to results from a state-level approach.

H.1 Advantages of a Radius-based Approach

A radius-based approach for benefits transfer is potentially preferable to the state-based approach in Section III.C of this economic analysis for several reasons. First, a radius-based methodology for wetlands benefit transfer would align with the approach EPA uses for valuation of surface water quality changes. Second, and more importantly, it helps to address shortcomings of the state-based approach related to distance decay. For the purposes of this analysis, distance decay is defined as the decline in household WTP per acre of wetland that would be expected as the changes in wetlands that occur are farther from the household.

Notably, two key shortcomings of state-level approaches are that wetland benefits arbitrarily stop at state borders and that the measurement of additional benefits from immediately local wetlands is not straightforward (Keiser et al., 2020).

As an overview, the fundamental improvements that result from taking a radius-based approach are five-fold:

1. Household average benefits from wetland changes are calculated at a census tract (rather than state) level; thus, a spatially uniform approach to distance decay replaces the heterogeneous distance decay implied by state-level benefit transfer. Put simply, in this approach, wetland benefits do not arbitrarily stop at state borders, nor does distance decay depend on states' geographic size.

2. The radius-based approach, used to specify an outer distance boundary where benefits decline to zero, also lends itself naturally to measuring wetland change that falls within an inner, local distance boundary. By leveraging the "local" parameter from the Moeltner et al., (2019) meta-regression model, the radius-approach accounts for additional value that accrues to households when wetland gains are more proximate.

3. Using census tracts also provides a more rigorous set of benefit measures by representing local demographic characteristics and tastes. Feedback received during recent public listening sessions period suggested probable differences in wetland valuation in rural versus urban areas. For example, in large, western states, where most wetland gains/losses may fall in rural areas that aren't well represented by state level average socio-demographics, a radius-based approach should outperform a state-based approach in the measurement of a state's total benefits.

4. A radius-based approach allows households residing in one state to value changes in wetlands in a nearby state and presumably affect their willingness-to-pay values.

5. A radius-based approach also means that households are not necessarily expected to have WTP for all wetlands within their state, especially for those waters beyond the

6. chosen radius. This change will have the most effect in larger states.

The agency seeks feedback from the public on the methods described in this section. Of particular interest are comments regarding a reasonable range of distances over which the agencies can defensibly measure and quantify household benefits from wetland gains/losses.

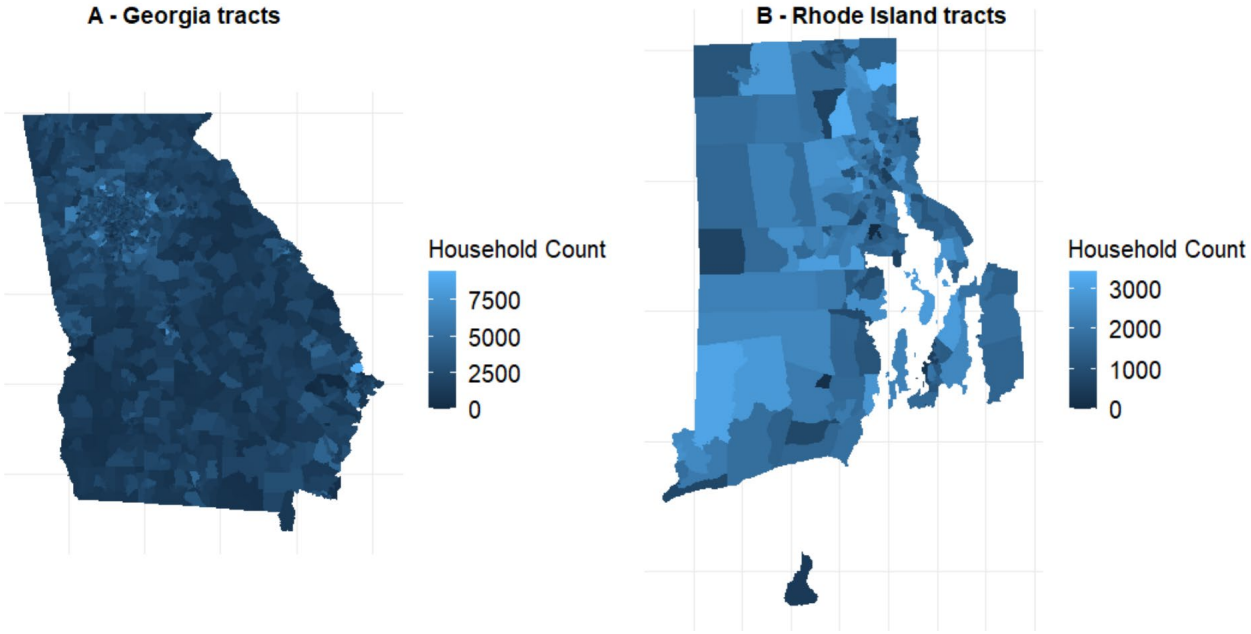
H.2 Illustrative Examples of the Radius Based Approach

In this section, details on the implementation of the radius-based approach are provided and illustrated. The methodology was applied using ***illustrative*** wetland data at the HUC12 sub-watershed level in two arbitrarily chosen states. This illustrative data differs from the actual wetland change estimates for the analysis. Use of this data allowed the agencies to develop the radius-based methodology, while the actual wetland change estimates were being developed. The methodology yielded intuitive results, discussed in Appendix subsection H3.

1) Household Data

The radius-based approach is constructed around data at the census-tract scale. The census tract is the smallest census geography for which the agencies can reliably obtain both a household count and median household income measure from the 2015-2019 American Community Survey (ACS). Census tracts also vary in size, thus this approach does not lead to a completely homogeneous distance decay over the smaller geographic areas. Nevertheless, using tracts as the main geography of interest represents a significant improvement over the previous approach which estimates benefits at the (coarse) state level. See Figure H-1 for an illustration of tract geographies studied in Georgia (Panel A) and Rhode Island (Panel B).

Figure H-1: Census tract geometries for Georgia (panel A) and Rhode Island (panel B). Variable displayed is the tract's count of total households, later used to aggregate WTP from the household to tract (and state) level. States are not displayed to scale.



2) Wetland Acreage

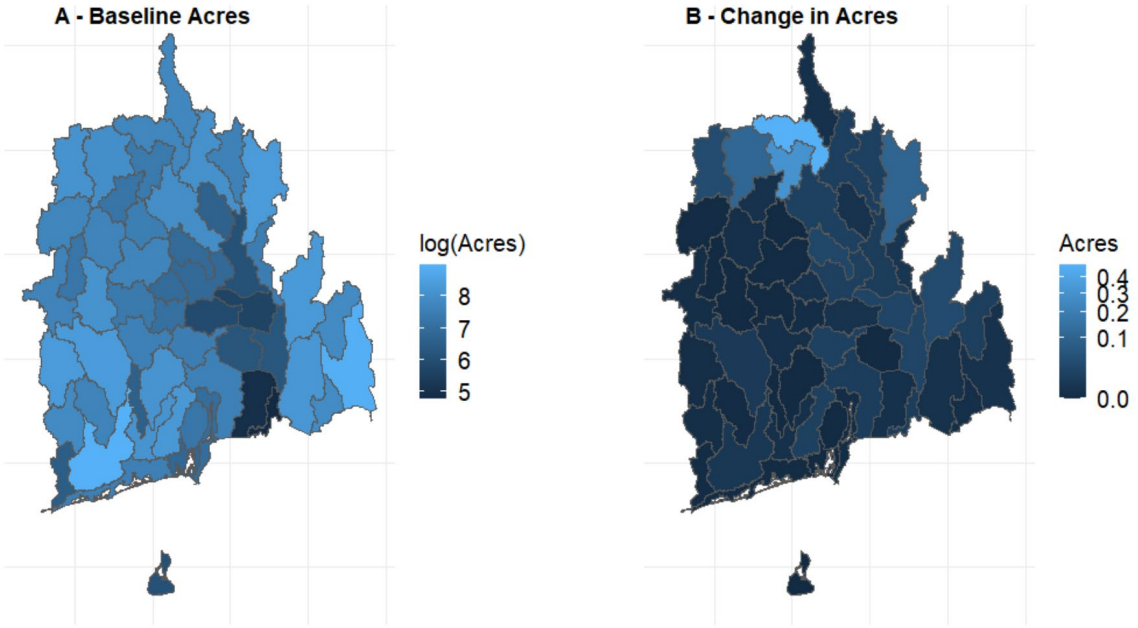
For this exercise, ***illustrative*** HUC12-level wetland data were generated. A baseline wetland acreage was calculated for each HUC12 in the continental US. This is measured as the total acreage of vegetated wetlands that fall inside the sub-watershed's borders. Similarly, each HUC12 received a "policy change" acreage measure, calculated from the Army Corps' permitting data as the sum of actual mitigation wetland acreage observed in relevant Cowardin classes under the NWPR. Lastly, the fraction of each HUC12's wetland acreage with forest cover was assigned using state level forested wetland proportions provided by ICF in Appendix D of the 2020 NWPR EA.[88] To do this, each HUC12 was assigned to the state in which the majority of its area overlaps.

The wetland HUC12 level data, generated in shapefile format, is shown below for Rhode Island in Figure H-2; Panel A shows the baseline acreage in each HUC12 and Panel B shows the change in acres. Baseline acres in Panel A are displayed as log(acres) for visualization purposes. For computational purposes, when mapping these measures to census tracts, these data were rasterized using a 10-km grid.[89]

[88] Ideally, future work will also individually calculate forested fractions at the HUC12 scale.

[89] This large size was chosen to ease computational speed; for regulatory analysis a finer-grained raster would be more appropriate.

Figure H-2: Distribution of wetland acres in HUC12s that fully/partially fall in state of Rhode Island. Panel A shows baseline acreage (logged). Panel B shows changes in wetland acreage from proposed rule using illustrative data on wetland changes.



3) Aggregating wetland acreage within radii around census tracts

To simplify GIS calculations for this illustrative analysis, tract geographies are reduced to their centroids. Using these centroid latitude/longitude coordinates, radii of various lengths are then used to draw circles, referred to as buffer areas, around each census tracts' centroid. At this time the agencies do not have a preferred set of maximum and local radius lengths, so in what follows, several distance decay assumptions are considered.

This approach is illustrated in Figure H-3. In panel 1, a representative census tract in the state of Rhode Island is shown. In Panel B, illustrative buffer areas for the census tract include radii of 25, 50, 100, and 200 miles. For each tract and its relevant buffer area, the total sum of baseline wetland acres and total change in wetland acres are computed.

For this illustrative analysis, an upper bound on the outer boundary threshold was set at 200 miles. Note that this upper bound is likely a conservative one: 200 miles is well less than half of California or Texas's north-south length (both around 800 miles). A lower bound on the outer boundary distance was set at 50 miles.

Additionally, this analysis allows the household WTP estimates for local wetlands to vary based on distance from a tract to relevant wetlands; local wetlands are those most proximate and from which households presumably derive the most benefits. The distance from households at which a wetland ceases to be "local" is also a subjective analytic decision. To guide this selection, the agencies referred to the wetland meta-data used to generate benefit transfer parameter estimates. Five freshwater studies were coded as "local" in this data. In these five studies, the physical distances between targeted survey households and the wetlands in question shed light on reasonable set of local boundaries within scope of the source studies. The minimum local distance boundary in these five studies was 11 miles (Newell et

al., 2013). The maximum is roughly 180 miles (Awondo et al, 2011), while the average distance boundary across the five studies is 92 miles.

Figure H-3: Measuring baseline wetlands and changes from policy using distance buffers. In left panel, highlighted in red is Rhode Island census tract 44003020800. The centroid of this census tract is marked with a circle in both panels. In right panel, buffers are drawn at distances of 25 (lightest blue), 50, 100, and 200 (darkest blue) miles from the example tract's centroid.

4) Calculating tract level WTP: preliminary results

Average household WTP for the wetland change for each census tract is predicted using the same meta-regression parameters as in the state-based approach, provided in Appendix Table C-3.[90] Results described here rely on predictive estimates from the linear benefit transfer parameterization (MRM2) described in Moeltner et al (2019):

$$\ln(WTP_s) - \ln(q_{1,s} - q_{0,s}) = X_s\beta + \gamma\left(\frac{q_{1,s} + q_{0,s}}{2}\right) + \varepsilon_s$$

One important note: tract-level household WTP is calculated using the *average value* of parameter estimates from the Bayesian distribution drawn in the Moeltner et al., (2019) approach and the tract-level household data described above in subsection 1. Study-level random effects were also ignored. In the work envisioned for the final rule, a fully Bayesian approach to calculating tract-level WTP will be pursued.

For tract-level predictions, the meta-regression function's components are set in line with those in Appendix C: *lnyear* = 3.4965, *volunt* = 0, prob (*prov*=1) = 0.179, prob (*reg*=1) = 0.643, and prob (*cult*=1)

[90] Note that these parameters estimates are based on the inclusion of two Canadian studies which are new to the meta-analysis. One of these papers studied a scenario with large baseline wetland acreage. The inclusion of this study greatly aids in accurately pinning down the parameter, γ, over a larger support of q.

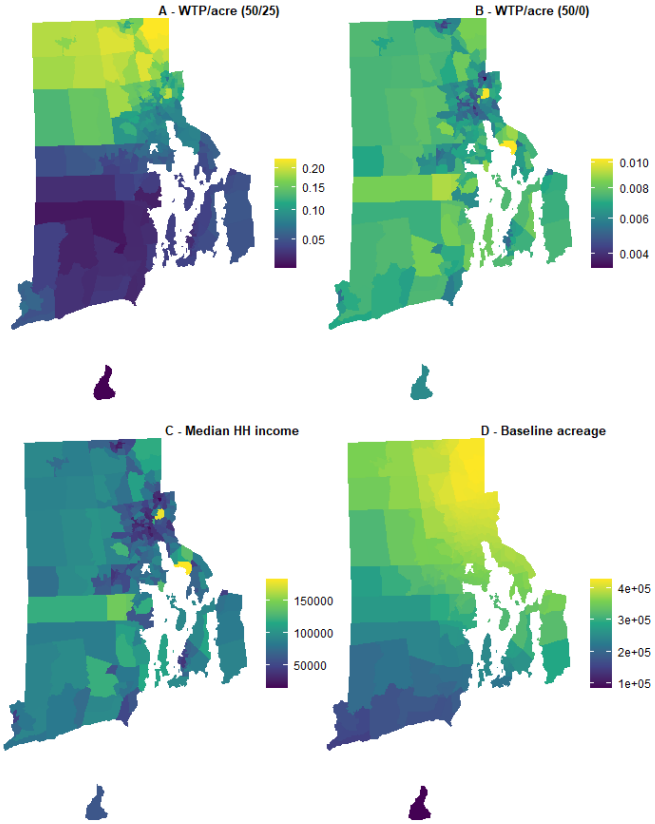
= 0.571, and *lumpsum* is set to 1. However, *lnincome* now varies at the census tract level, as do baseline and policy wetland acreages $(q_{0,s}, q_{1,s})$.

Similar to the state approach, each tract's average household WTP values for each of four wetland types are independently predicted: non-local and non-forested, non-local and forested, local and non-forested, local and forested. Baseline and policy change wetland acreage are calculated for each wetland type, with the final household WTP measure being the sum of benefits (assumed separable) measured across the four wetland categories.

In the top panels of Figure H-4 (A & B), the results from these predictions are shown for Rhode Island. As an illustrative example, tract-level WTP/acre measures in the top left panel (A) are calculated using an outer radius of 50 miles and local radius of 25 miles. In Figure H-3 above, this would correspond to aggregate wetland changes that fall between level within the second buffer ring from center; wetlands that fall within the smallest, light blue buffer ring are treated as local wetlands. The top right panel (B) show results when the premium for "local" benefits are fixed to zero. Similar predictions (not shown) are observed for Georgia.

Predicted HH WTP per acre in Panel B is less than $0.04/acre everywhere in the state, though there is notable heterogeneity across census tracts. Allowing for additional local benefits markedly affects the spatial distribution and estimated size of benefits. In Panel A of Figure H-4, the local (noncoastal) wetland benefits are heavily concentrated in the northern part of the state. Alternatively, in Panel B, where the local wetlands variable was set to zero and all wetlands were considered non-local, the benefits are largely driven by a tract's median income level. When comparing Panel C of Figure H-4 with Panels A and B, there is some degree of visual correlation between a tract's income and itsWTP. This would be expected and desired given the benefit transfer's functional form. In Panel D, one can get a sense of how total baseline acreage varies by tract; in this case, tracts further from the coast have a larger baseline wetland acreage. Differences in baseline acreage levels do impact WTP.

Figure H-4: Rhode Island wetland benefits and income measures at the census tract level. Panel A – average household WTP per acre of wetlands gained (in $US) with outer radius of 50 miles, local radius of 25 miles (50/25). Panel B - household WTP per acre of wetlands gained when no wetlands are attributed the "local" premium (50/0). Panel C – median household income ($US). As expected, notable (but not complete) correlation with tract-level benefits. Panel D – baseline wetland acreage within 50 miles of census tract.



Finally, in Table H-1, the tract-level benefits in Georgia and Rhode Island are aggregated to state totals using the estimated household WTP values and census tract household counts. In this table, one can compare total state level benefits under a variety of outer- and local-radius combinations (right to left increases the size of the local radius, moving downwards increases the size of the outer radius). Parameter values used for benefit transfer are taken at the mean of the meta-analysis's Bayesian distribution.

Table H-1: Statewide total benefits using different distance decay radii. Panel A and B provide benefits aggregated to the state level for Georgia and Rhode Island, respectively. The distances in miles shown in the main column reflects the outer distance, the distance in the main row reflects the radius for local areas. Total WTP for preliminary estimates of policy wetland gains, rounded to the nearest dollar, rely on the linear meta-regression specification.

Panel A: Georgia								
		Local radius						
		25	**37.5**	**50**	**62.5**	**75**	**87.5**	**100**
Outer radius	**50**	9,094,216						
	75	9,587,861	16,438,506					
	100	10,537,796	17,305,410	24,896,636				
	125	12,428,325	19,058,578	26,491,974	35,802,069			
	150	15,958,576	22,380,016	29,567,815	38,579,161	49,302,405		
	175	21,995,090	28,135,689	34,921,930	43,444,543	53,727,086	69,625,058	
	200	31,016,638	36,753,670	42,999,283	50,825,166	60,458,126	75,805,211	97,953,606
Panel B: Rhode Island								
		25	**37.5**	**50**	**62.5**	**75**	**87.5**	**100**
Outer radius	**50**	90,760						
	75	93,322	169,930					
	100	96,559	173,089	233,670				
	125	98,836	175,307	235,831	290,912			
	150	100,823	177,237	237,709	292,742	337,793		
	175	104,049	180,393	240,797	295,766	340,758	399,589	
	200	110,759	186,998	247,290	302,154	347,046	405,777	472,868

H.3 National Estimates

Following the approach discussed above, benefits estimates are aggregated to the national level using the radius-based methodology for Scenario 1, provided in Table H-2. Scenario 1 is implemented by zeroing out benefits for HUC12s that fall within states that currently regulate waters more broadly than the CWA required under the secondary baseline of NWPR.[91] An advantage of the radius-approach is that it allows for the quantification of benefits derived from households residing in one of these states that regulates waters more broadly for changes in wetlands in nearby states without state-level protections.

[91] For the current radius-based approach, those HUC12s that cross state boundaries are assigned to states based on the state that the majority of the HC12 falls within. This approach will be revised with an approach that apportions the HUC12 wetland changes across states based on area weights.

Table H-2: Total national benefits using different distance decay radii. The distances in miles shown in the main column reflects the outer distance, the distance in the main row reflects the radius for local areas. Total WTP for preliminary estimates of policy wetland gains, rounded to the nearest dollar, rely on the linear meta-regression specification.

		Local radius						
		25	**37.5**	**50**	**62.5**	**75**	**87.5**	**100**
Outer radius	**50**	149,774,692						
	75	158,754,027	278,992,532					
	100	174,974,348	294,790,373	430,995,010				
	125	196,750,163	316,066,968	451,632,345	606,323,257			
	150	219,119,377	337,852,687	472,691,163	626,497,022	818,008,482		
	175	247,605,553	365,625,409	499,570,271	652,262,283	842,458,824	1,110,642,172	
	200	284,750,671	401,860,284	534,669,309	685,994,991	874,653,596	1,141,176,845	1,498,002,095

A feature of the radius-based approach is that it allows for the benefit estimates to be generated for a range of outer and local radii. The results in Table H-2 show national benefit estimates for outer radii between 50 and 200 miles, and local radii between 25 and 100 miles. What these results clearly illustrate is that the distance from households increases so does overall WTP. The agencies selected these sets of distances for illustrative purposes. Note that the 200-mile radius is less than the distances between some wetlands and households within larger states like California or Texas.

To use the radius-based approach for the economic analysis, a set of radii must be chosen that are considered the most representative of household WTP for wetland changes. The studies used for the meta-analysis were not designed to examine how far household WTP for wetlands extends and how those values change over distance. As a result, they are not necessarily a useful guide for selecting the proper radii or set of radii. An important consideration when performing benefit transfer applications is the issue of scope. The farther out of scope a benefit transfer application is with regards to key parameters from the existing studies, the less reliable the results will be. The distances used for the results in Table H-2 are within scope of the distances considered for many of the studies in the meta-analysis. However, there are other scope constraints that could be considered such as the area of wetlands considered for the studies, the size of wetland changes, and the average household WTP per acre of wetland. The agencies would like to consider how these scope constraints could be used to derive a set of results for the proposed rule economic analysis.