

WORKSHOP

Navigating Salt Marsh Restoration in Massachusetts: Challenges, Strategies, and Opportunities

SEPTEMBER 19, 2023

Planning and Process

- Since December 2022, SNEP has been engaged in bimonthly conversations with key restoration, regulatory, and resource agency partners.

Planning Team Members:

Heidi Ricci, <i>Mass Audubon Society</i>	Rachel Freed, <i>CBI</i>
Adrienne Pappal, <i>MA CZM</i>	Lisa Rhodes, <i>MA DEP</i>
Katie Kahl, <i>UMass Amherst</i>	Danielle Perry, <i>NOAA</i>
Georgeann Keer, <i>MA DER</i>	Ed Reiner, <i>U.S. EPA Region 1</i>
Haley Miller, <i>U.S. EPA Region 1</i>	Rachel Croy, <i>U.S. EPA Region 1</i>
Marty Chintala, <i>U.S. EPA ORD</i>	Adam Reilly, <i>U.S. EPA Region 1</i>

Agenda

9:30-9:35a Welcome and Introductions

9:35 – 9:45a Agenda Overview and Rules of the Road 9:45 – 9:50a Review of Goals and Objectives

9:50a – 10:00a The Impact of Climate Change on Salt Marshes

10:00 – 11:15a Session 1: Discussion of Existing Permitting Landscape

11:30a – 12:45p Session 2: Identifying and Addressing Risk of Adverse Impact

12:45p – 1:45p Lunch Break ***Please start to return to the building by 1:30 to allow time to get through security***

1:45 – 3:00p Session 3: Working Together: Identifying Gaps and Opportunities for the Planning and Implementation of Salt Marsh Restoration Projects

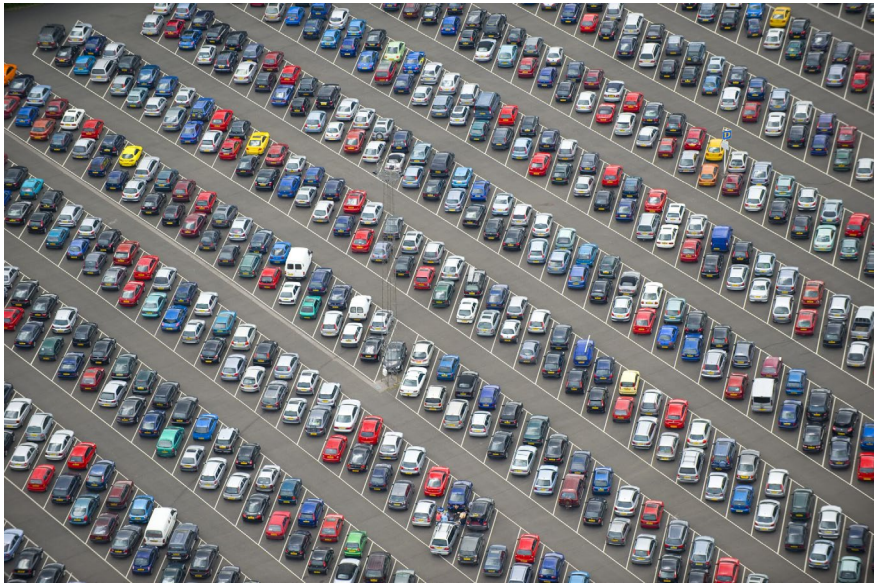
3:00 – 3:30p Closing and Next Steps

Rules of the Road

- One person speaks at a time
- Please turn your tent card up or raise your hand to speak.
- Be Present.
- Engage in the conversation and be an active participant.
- Speak to the issue, not the person.
- Be open-minded and objective.
- Have fun.



Enough, **L**et's **M**ove **O**n



PARKING LOT:

Placeholder for capturing ideas that should be followed up at a later date outside of the meeting.

TIP JAR:

Place where we are going to place helpful hints identified during the meeting.



Goals and Objectives

1. To identify gaps in information to develop a shared understanding between restoration practitioners and regulators of the multiple permit pathways for restoration and existing permitting rules
2. To identify the types of information required and recommended for inclusion in permit applications
3. To discuss the concept of risk and uncertainty when designing adaptive management strategies and/or corrective action.
4. To have a clearer idea of where/how regulators and practitioners can work together on restoration projects.
5. To identify continued gaps in information that still exist after the workshop

Outputs and Outcomes

As a result of this workshop, attendees should:

- 1) Have a better understanding of the regulatory landscape for permitting ecological restoration projects in Massachusetts,
- 2) Better understand the concepts of adverse impact, adaptive management, and corrective action; and how to incorporate these principles into permitting applications; and
- 3) Benefit from directly engaging with likeminded participants to better understand the existing permitting landscape, determine tangible next steps and opportunities for participants, and suggest ways that participants can further work together to navigate the existing permitting landscape.

Session 1: Discussion of Existing Permitting Landscape

Goal: To understand as a group the nuances of the existing permitting landscape to encourage more proficient navigation of the existing permitting landscape.

Anticipated Output/Outcome: At the conclusion of Session 1, attendees should have a better understanding of the regulatory landscape for the permitting of ecological restoration projects in Massachusetts. Further, attendees should have a better understanding of the trigger points of various MA regulatory agencies based on project type and/or project approach. Critically, attendees should understand that there is no “one size fits all” approach to the permitting pathway. While each project is unique in how it works its way through the process, at the conclusion of session 1, attendees should have a better understanding of the “rules of the road” for the permitting process for ecological restoration projects in Massachusetts.

Permitting for "My Favorite" Salt Marsh Restoration Project

Surveys, Assessments,
Evaluations, Feasibility,
Alternatives, OH MY!

Design Process

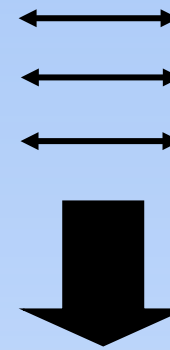
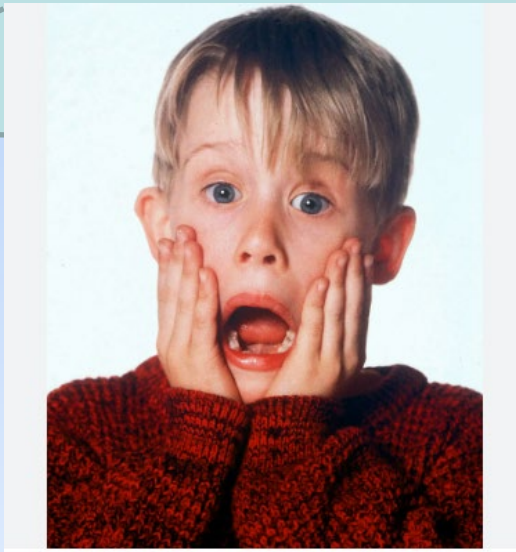
Permitting

Final Construction Plans and Issued Permits

Bid Process / Contracting

Project Implementation!!!

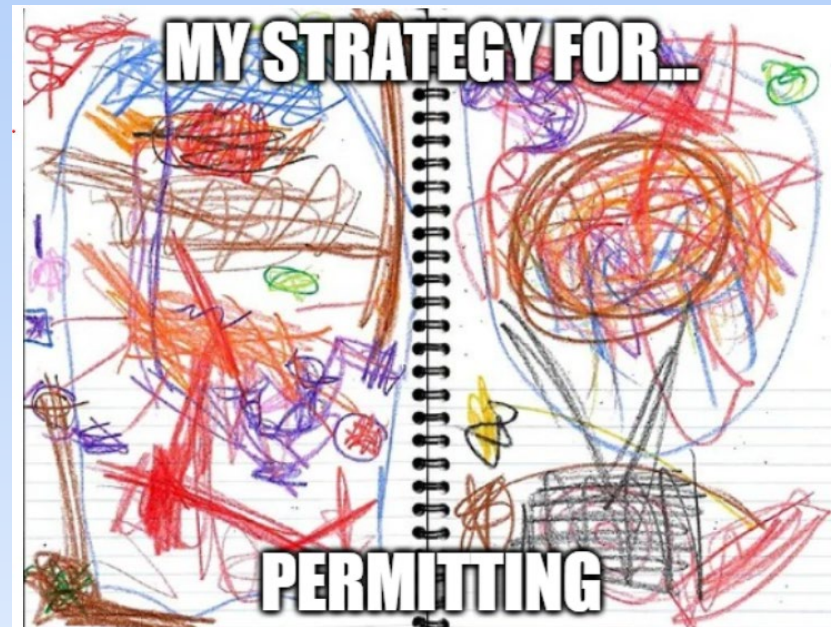
Monitoring



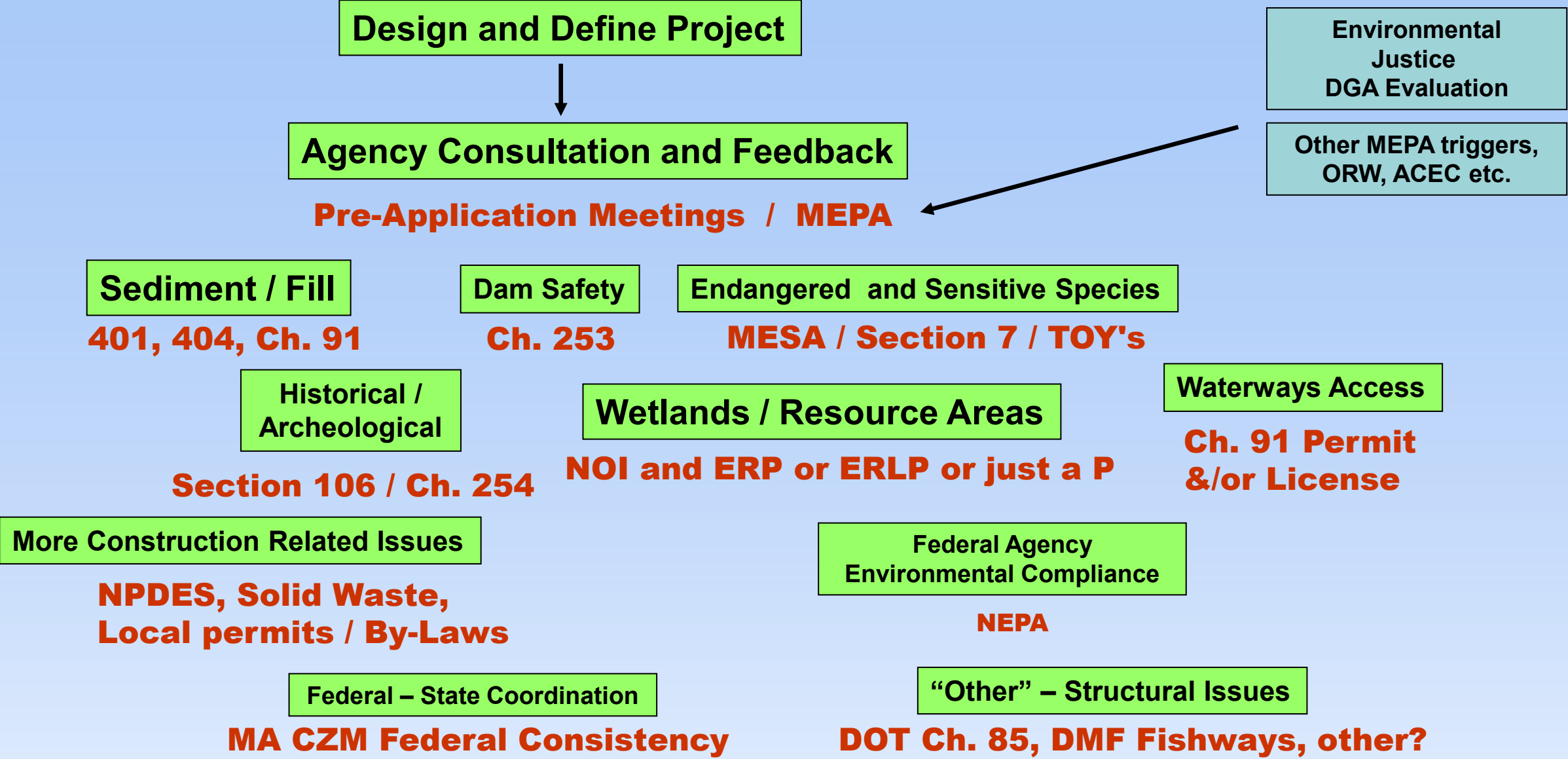
Permitting should be:

- Based on a solid Feasibility Study and Alternatives
- Related to the **Triggers** AND **Impacts** to Resource Areas
 - Direct and Indirect Impacts
- Considered an iterative process, there needs to be communication between Practitioners and Regulators
- Approached with a plan...

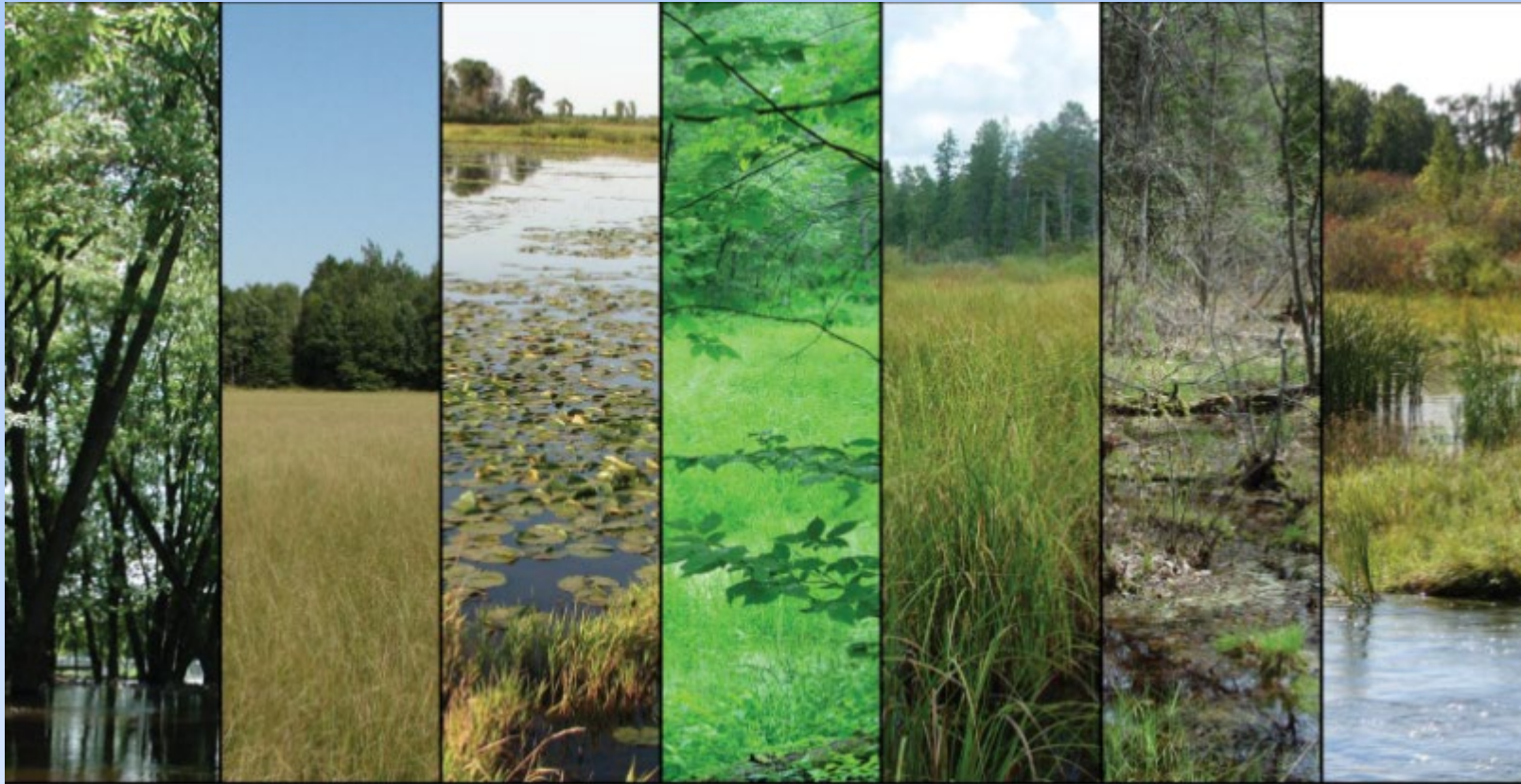
Permitting should not be:



Permitting: Major Regulatory Permitting and Authorizations that **may** be part of a Restoration Project



Remember: All Restoration Projects are unique and individual, and Permitting Processes will greatly depend on the **stressors** being addressed, **triggers** and **impacts**!



Let's Discuss: Hypothetical Model for Determining a Permit Process

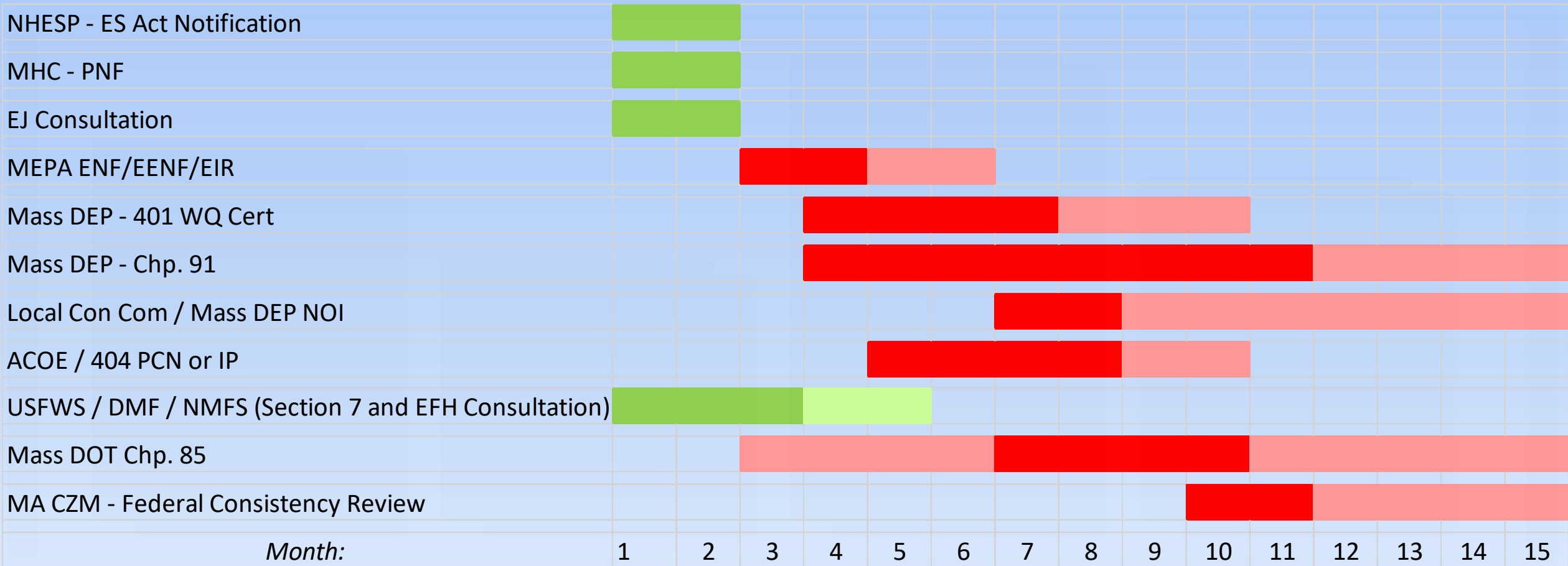
** The following models are DRAFT and not vetted by DEP, they are written from the Restoration Practitioner experience...*

***Again, remember, the final pathway is determined by triggers, impacts, and consultation and feedback from both Regulatory Agencies and Public Comment throughout an iterative process!!*

- 1) *The ERP - Ecological Restoration Project:* ...which may qualify for a Restoration Order of Conditions (See 310 CMR 10.14) or as a Limited Project... The ERP Permit contains standard conditions which makes the permitting process more predictable and consistent for qualified restoration projects that include: Dam Removal, Freshwater Culvert Repair or Replacement, Culvert Replacement to Eliminate or Reduce Tidal Restrictions; Stream Daylighting, Restoration of Rare Species Habitat, Improvement of Fish Passage...
- 2) *The ERLP - Ecological Restoration Limited Project:* ... projects not eligible for an Ecological Restoration Order of Conditions may be permitted as a Limited Project under 310 CMR 10.24(8) or 10.53(4). These projects may include tidal and shellfish habitat restorations, the restoration, enhancement, or management of rare species habitat, and the removal of aquatic nuisance vegetation to impede eutrophication... Ecological Restoration projects do not include mitigation for alteration of a resource area authorized by a final Order of Conditions or a 401 Water Quality Certificate. ER projects primarily involve restoration of resources “degraded by human activities” but not resource area impacts associated with natural disasters...

Hypothetical Permit Process for “My Favorite Salt Marsh” Restoration Project #1

Assumptions: ERP, No significant ES Issues, Tidal Culvert Crossing, No Tide Gate, new structure is >10ft (qualifies as Bridge), No significant Federal Funding.





Building Coastal Resiliency through Salt Marsh Restoration and Conservation

Dr. Mo Correll, USFWS / Atlantic Coast Joint Venture (ACJV)
EPA - SNEP meeting | September 19, 2023



USFWS and the Department of the Interior prioritize Atlantic coastal marshes as one of seven **Keystone Initiatives**

Saltmarsh Sparrow



Black Rail



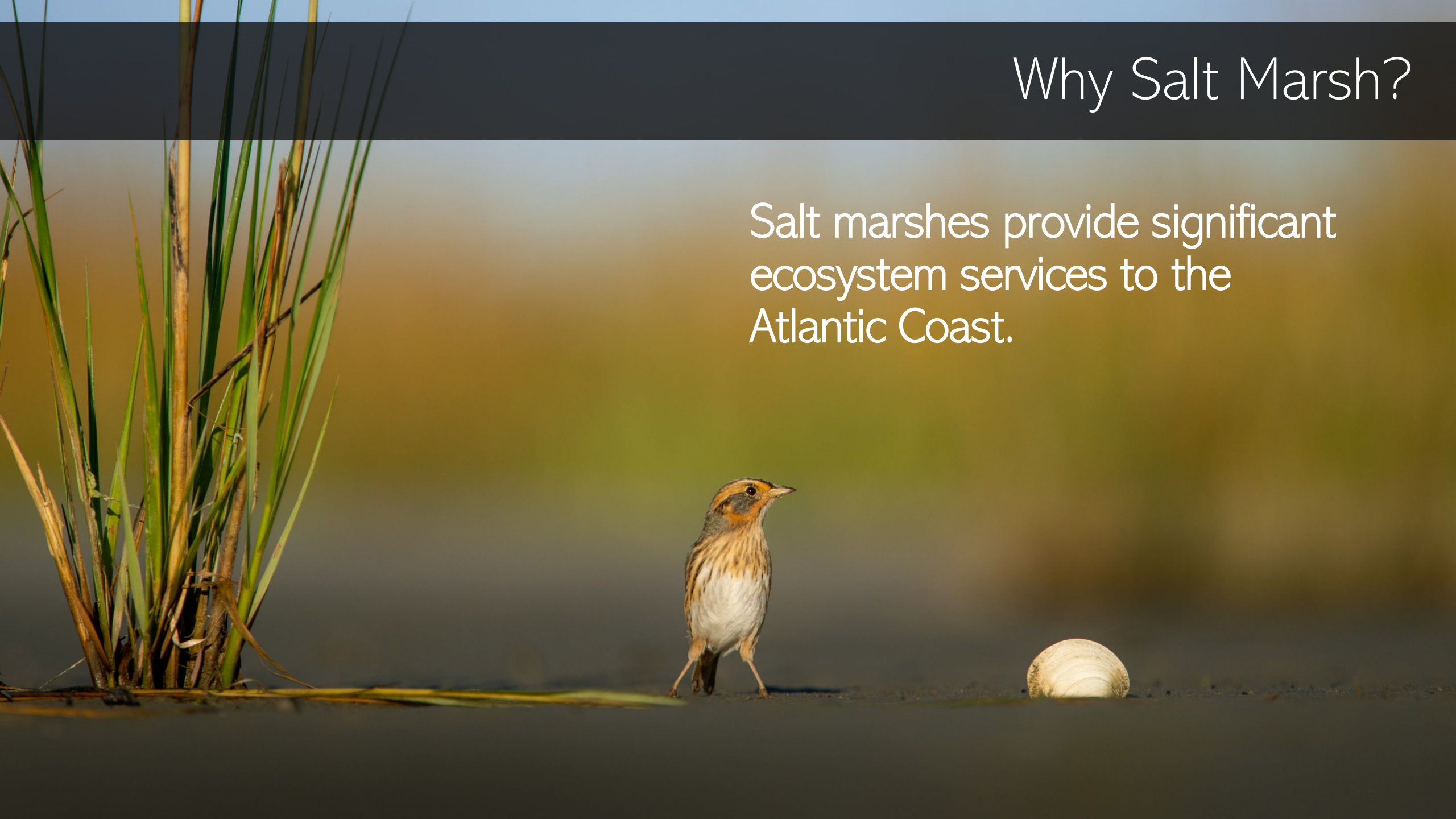
American Black Duck



The ACJV focuses on coastal marshes through three flagship species

Why Salt Marsh?

Salt marshes provide significant ecosystem services to the Atlantic Coast.



Why Salt Marsh?

- Carbon storage (can sequester carbon 10-40 times faster than terrestrial forests)
- Protects coastal communities from extreme storm events
- Supports a multi-billion-dollar fisheries industry
- Provides habitat to the most endemic salt marsh vertebrates globally

Salt marshes provide significant ecosystem services to the Atlantic Coast.



Why do salt marshes need restoration?



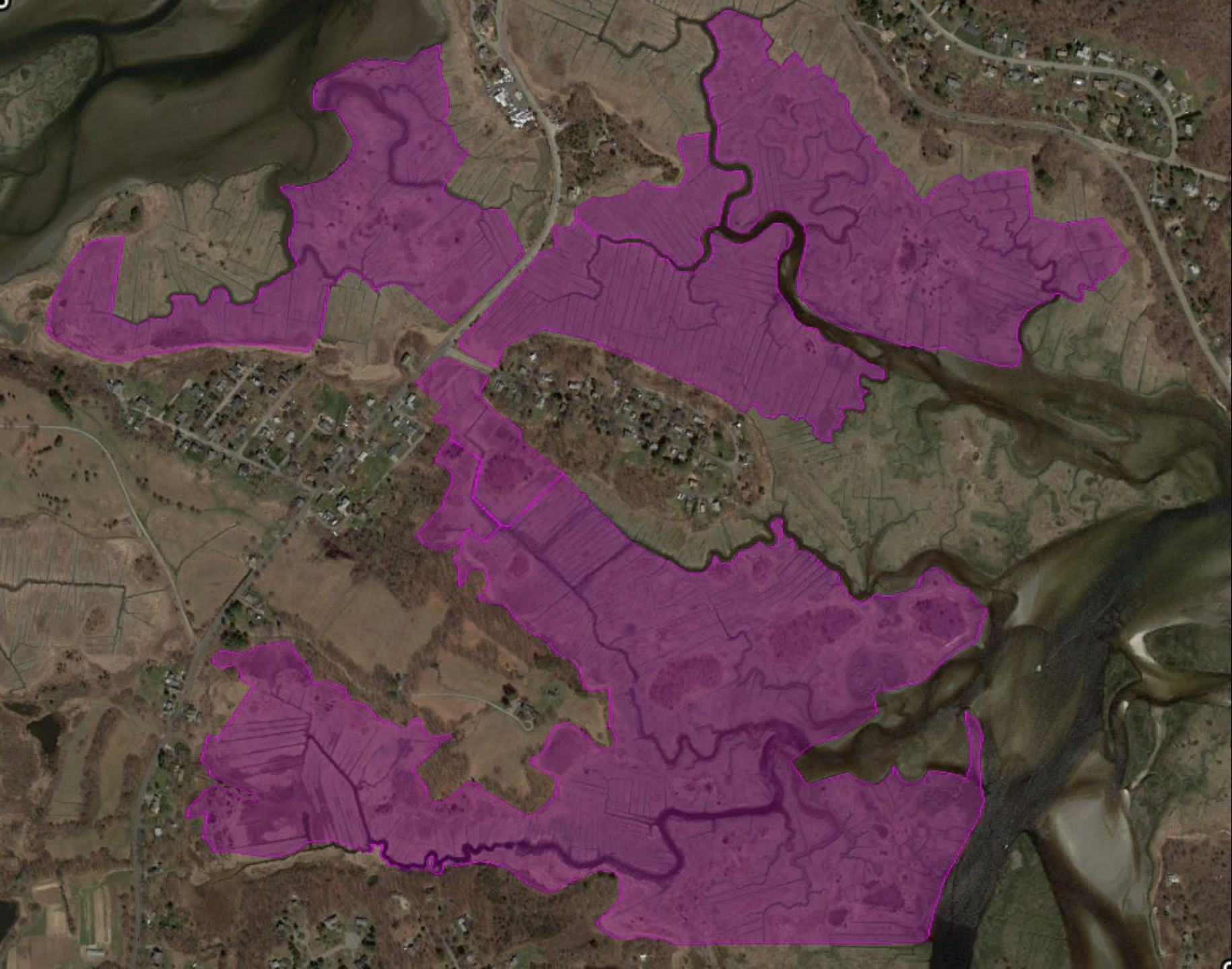
Why do salt marshes need restoration?



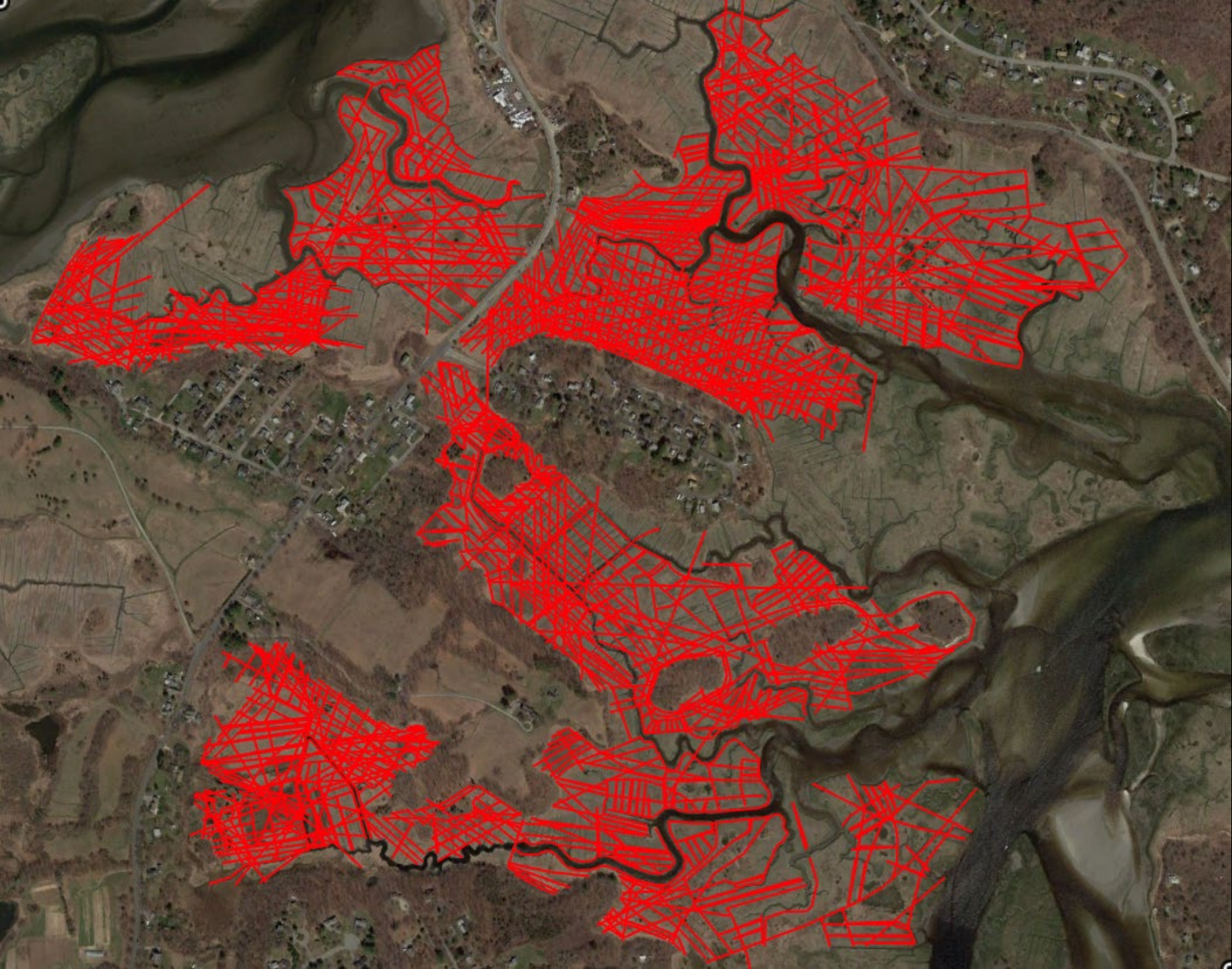
Why do salt marshes need restoration?



- Historical agricultural use through modification of the marsh platform (ditching, mowing)
- Mosquito control (more ditching)
- Tidal restriction from road crossings and other development
- Nutrient and freshwater input from surrounding development
- Synergistic effects of these alterations with sea-level rise



Great Marsh,
MA: 294 acres



1,000+
agricultural
berms



1,300 ditches
identified

Human alterations accelerate flooding and marsh loss.



Human alterations accelerate flooding and marsh loss.



- Altered tidal flooding results in loss of sediment supply
- Even small berms can result in standing water and marsh subsidence
- Surrounding development and altered tidal regime result in changed vegetation communities, including invasive species
- Significant human populations in the northeast result in coastal squeeze
- Development results in limited marsh migration



Restoration strategies

- Repair hydrology on the marsh platform to restore functional coastal systems
- Enhance elevation to improve sediment supply
- Mitigate tidal restrictions to restore natural tidal regimes
- Protect migration corridors
- Facilitate marsh migration



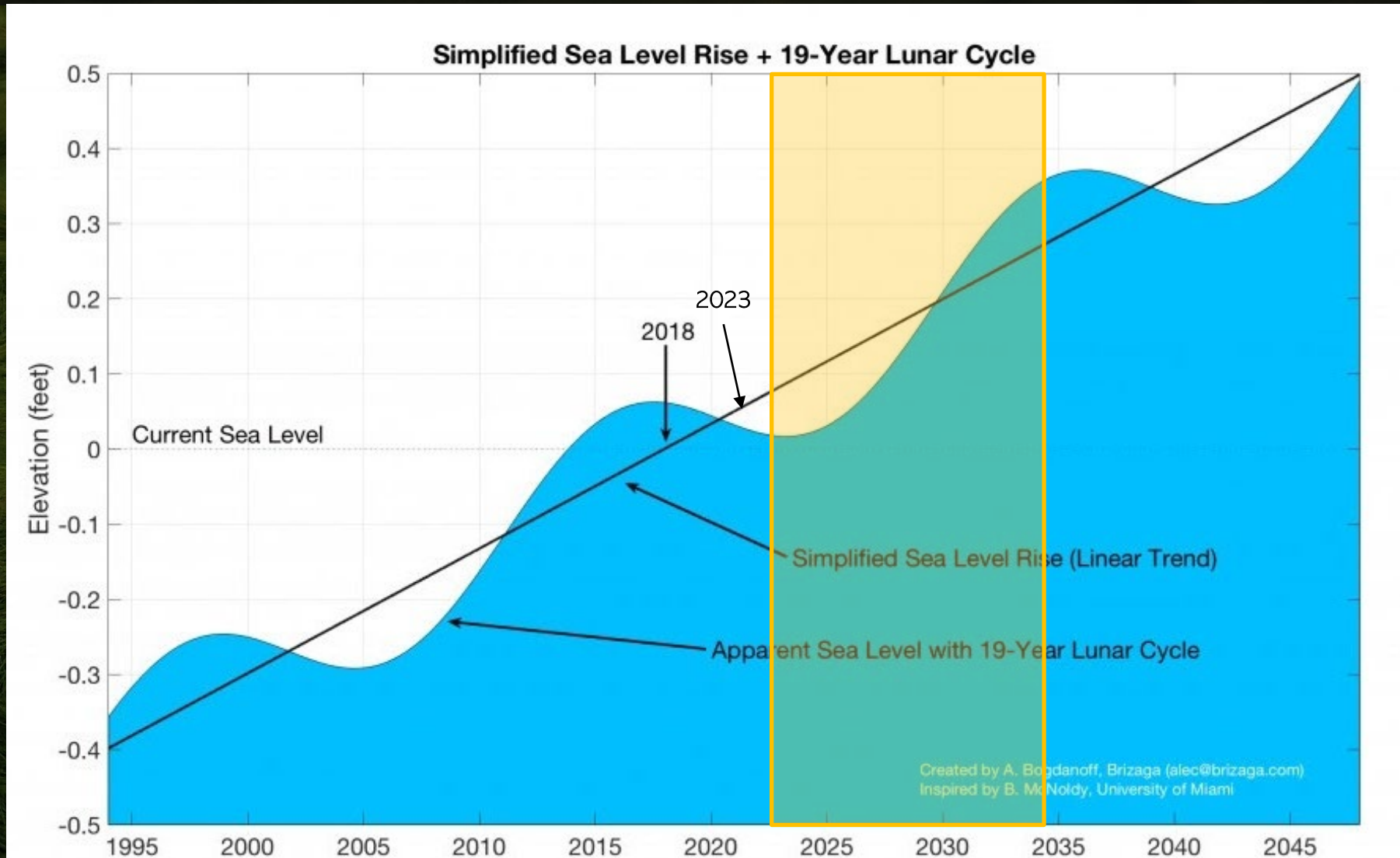
Restoration strategies

An urgent timeline

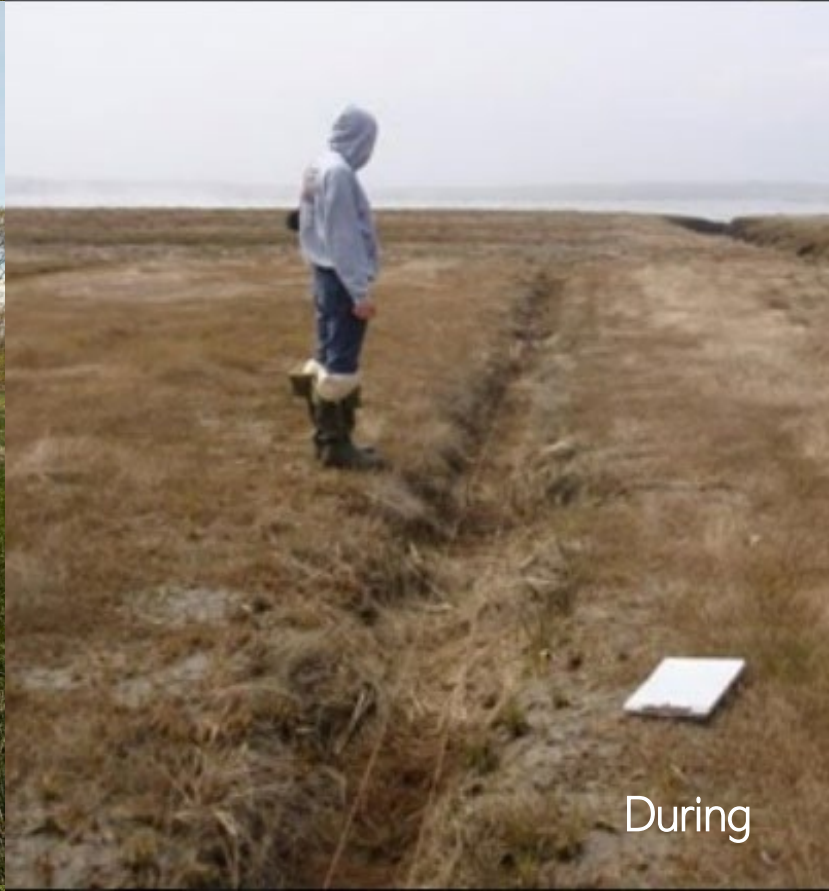


- Without intervention, marsh composition will continue to change, resulting in further degradation and loss.
- Saltmarsh sparrows are facing extinction due to increased flooding by 2050.
- Marsh migration alone cannot replace this loss.

The metonic cycle will drive additional flooding soon.



Ditch remediation

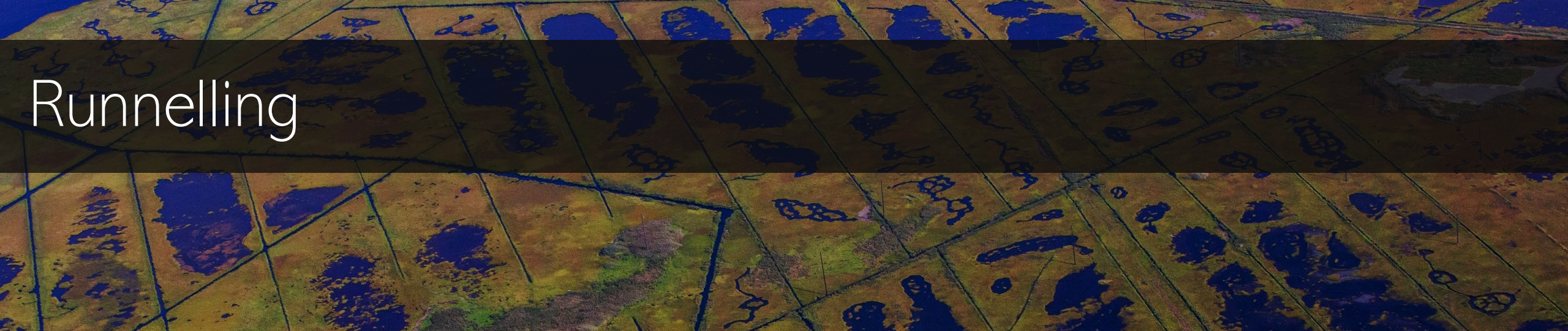


During



After

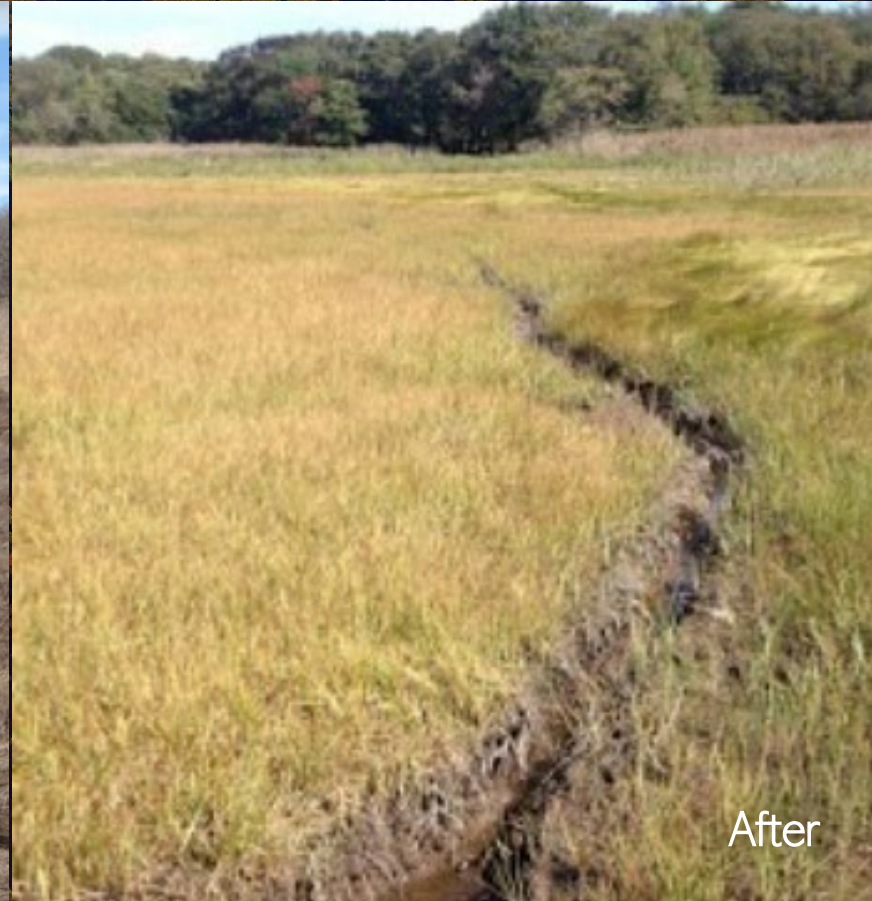
Runnelling



Before



During



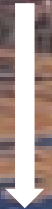
After

Tidal restriction mitigation & removal



downstream

tidal restriction



upstream

Sediment Placement (elevation enhancement, beneficial use of dredged sediment, thin layer placement, hummock placement)



Facilitated marsh migration



These strategies can restore function to our coastlines.

Prime Hook National Wildlife Refuge – 4,000 ac restoration

2016



2021



Notes for Massachusetts marshes



- Above and below Cape Cod have different tidal regimes and biological communities
- There is limited room for marsh migration
- Most marshes experience a lack of sediment supply

Questions?

Mo Correll, USFWS / ACIV
Maureen_correll@fws.gov

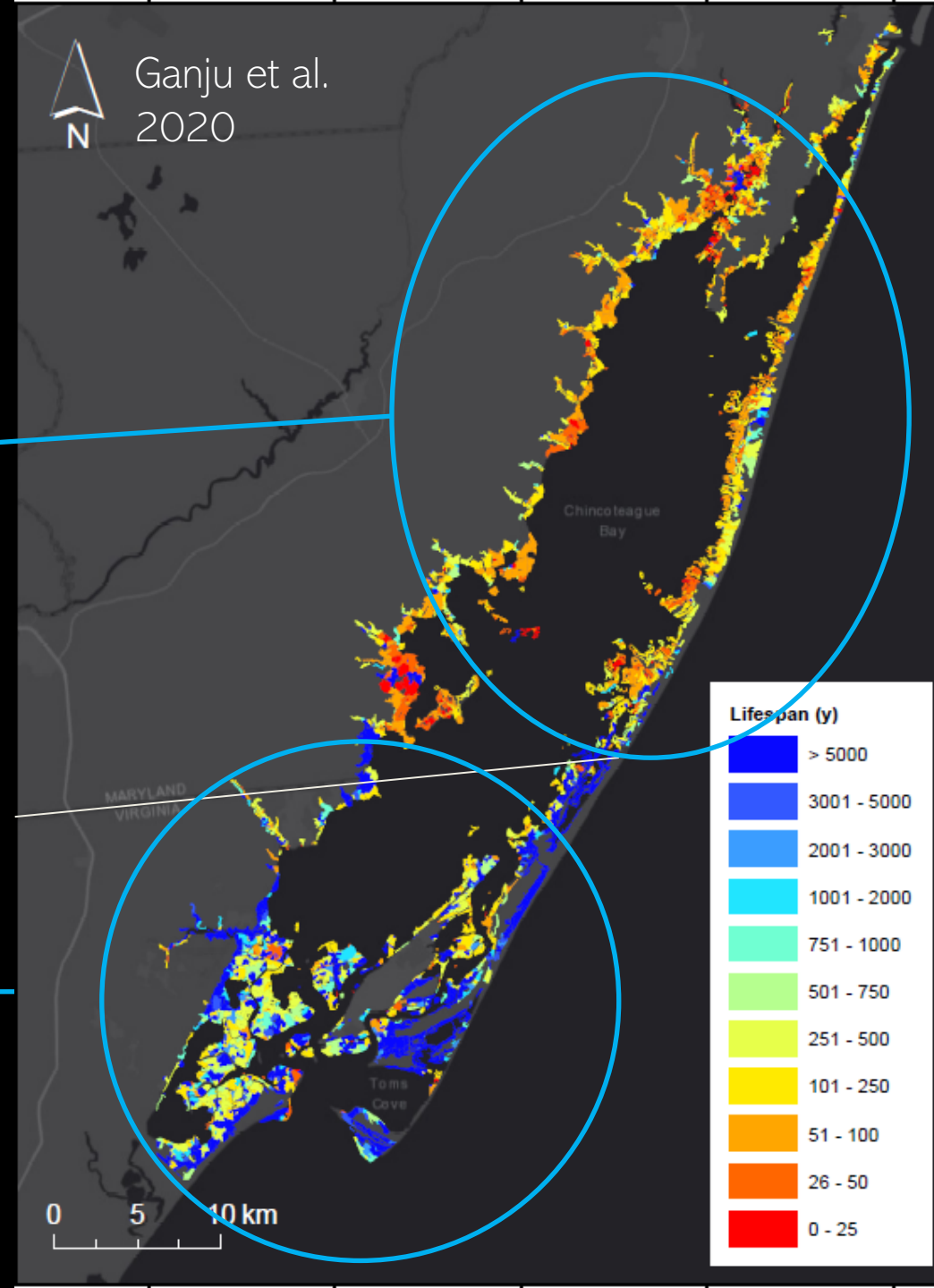


Extra slides

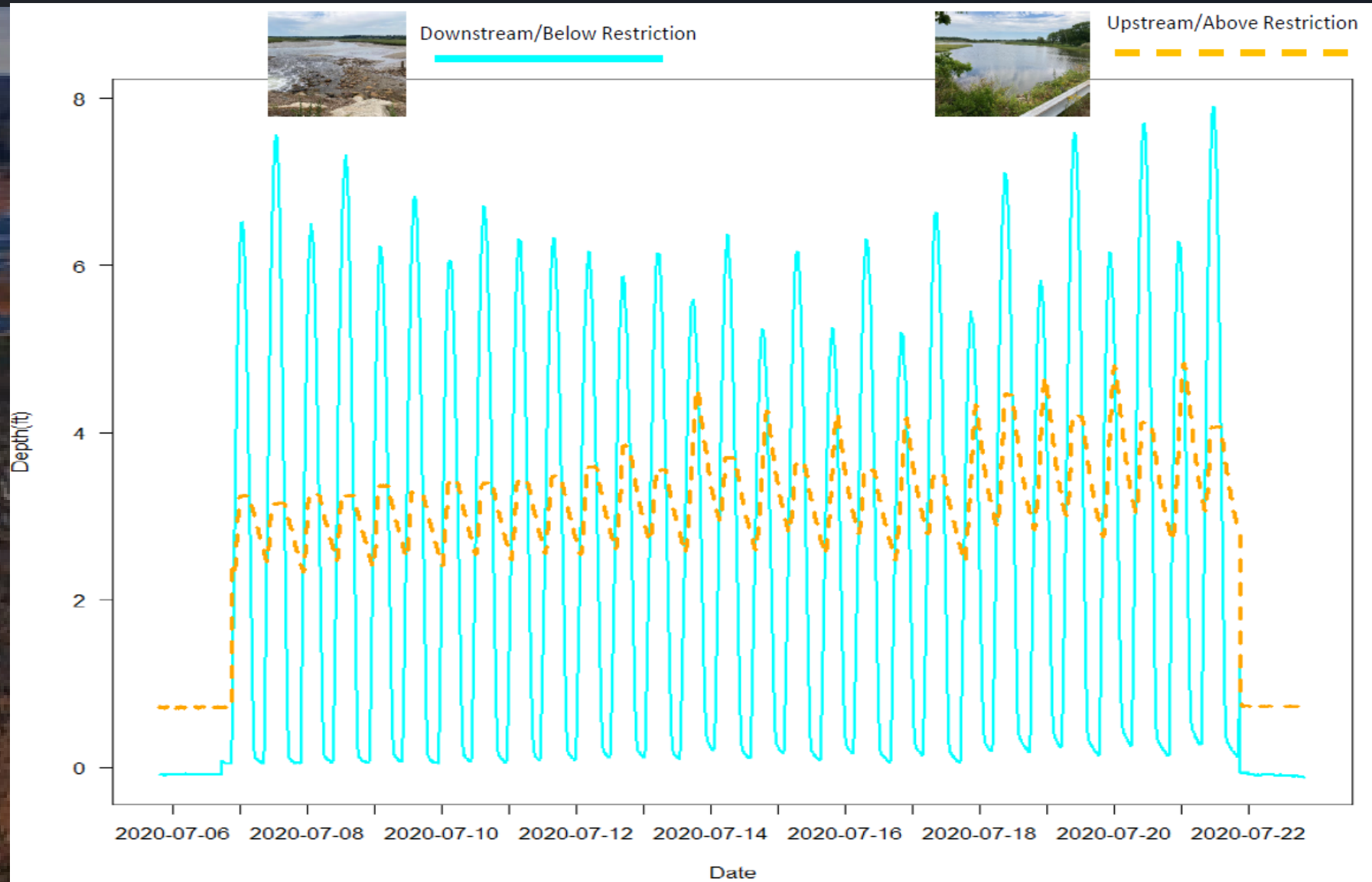
Human alterations have consequences

MD – Extensive ditching and marsh alteration – average lifespan: 0-500 yrs

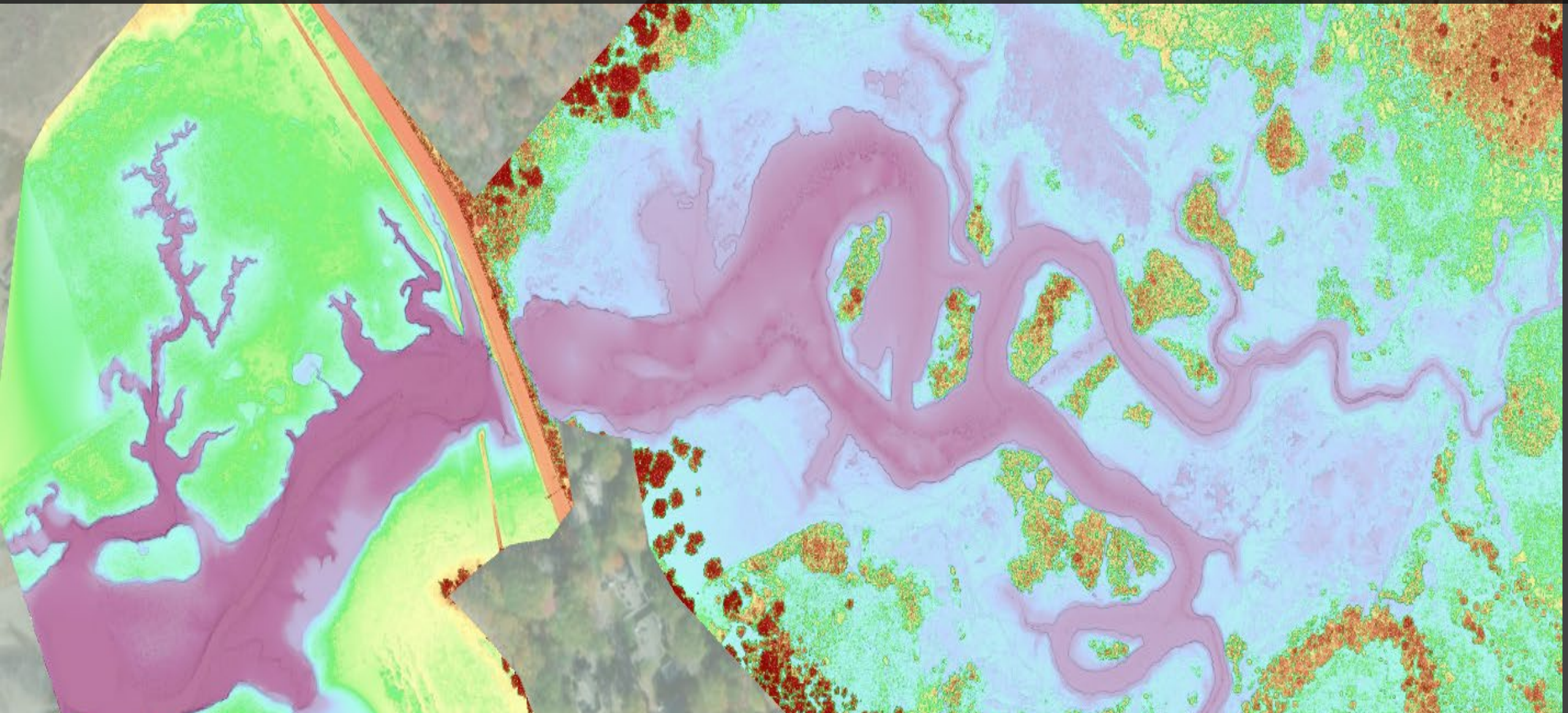
VA – little ditching and alteration – average lifespan 500->5000 years



Tidal restriction mitigation & removal



Tidal restriction mitigation & removal



Session 2: Identifying and Addressing Risk of Adverse Impact

Goal: Using the foundational conversation set in Session 1, the goal of Session 2 is to identify and address risk of adverse impact in project proposals so proponents can more easily navigate the permitting landscape.

Anticipated Output/Outcome: Session 2 offers attendees the unique opportunity to engage with one another about designing stronger project proposals. The concepts of adverse impact, adaptive management, and corrective action are difficult and can be confusing. At the conclusion of this session, attendees should walk away with a stronger understanding of these concepts, how and when to apply them; and have a better understanding of the expectations and best practices in applying these topics as well as a better understanding of where sticking points exist in applying these concepts.

Adaptive Management

Incorporates learning-based decision making into management actions

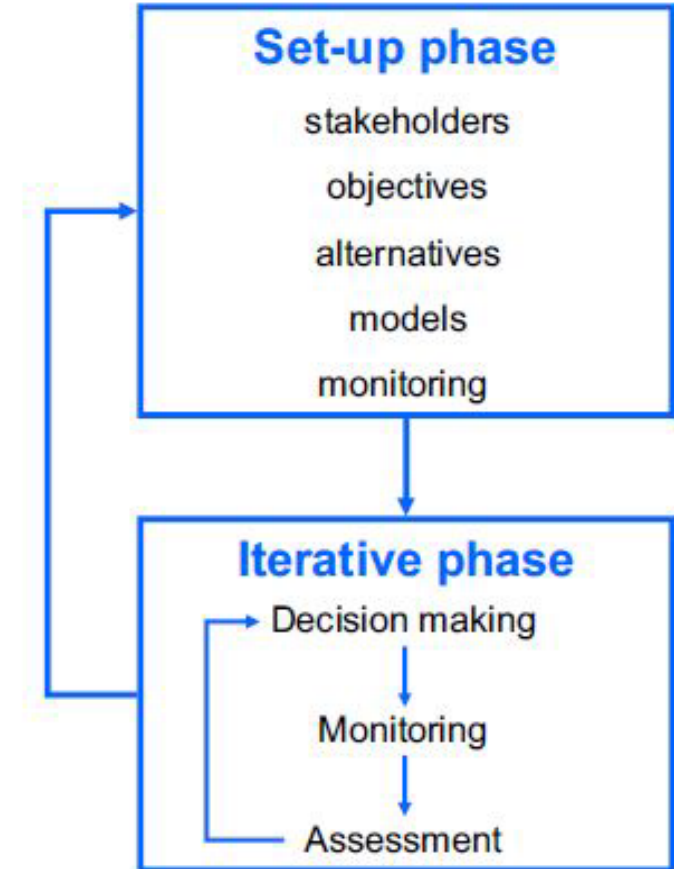


Fig. 2. Two-phase learning in adaptive management. Technical learning involves an iterative sequence of decision making, monitoring, and assessment. Process and institutional learning involves periodic reconsideration of the adaptive management setup elements.

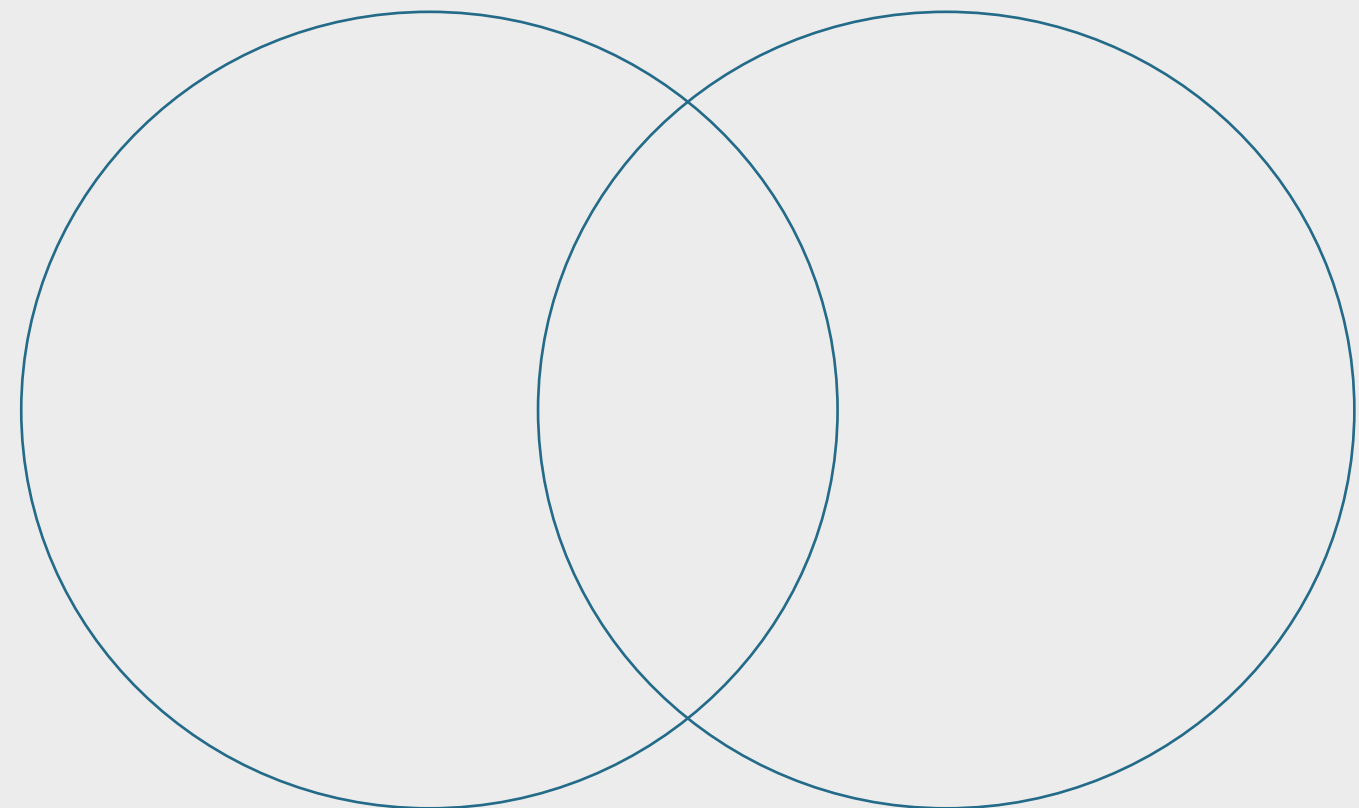
Adaptive Management Components

- Stakeholders Involvement
- Establish a Common Goal/Action
- Management and Monitoring Plan
- Monitor, Analyze Results, Iterate
- Communicate Results

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Goals
Statement



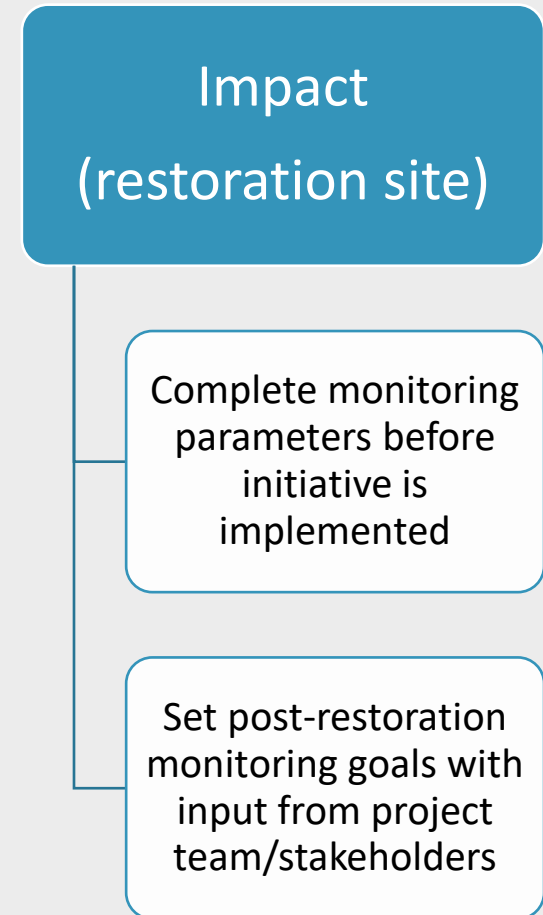
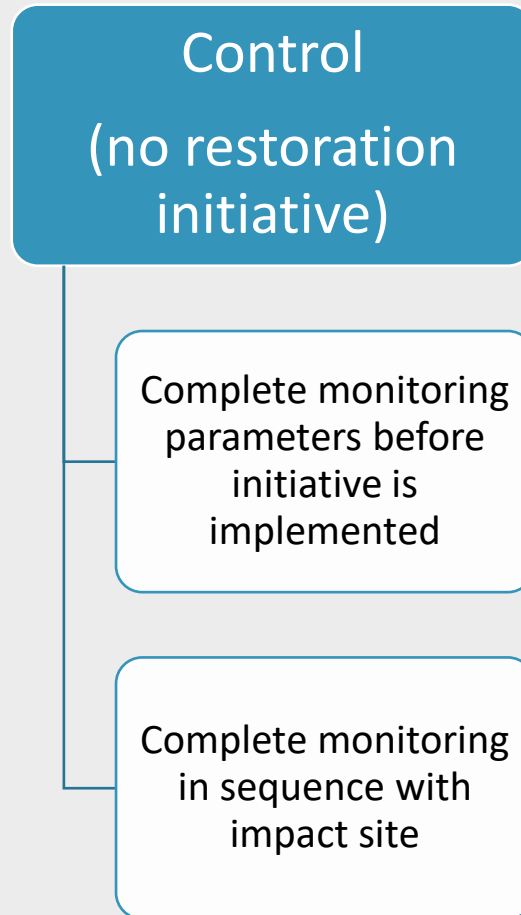
Restoration and
Research Monitoring

Regulatory

Adaptive Management Components

- Stakeholder Involvement
- Establish a Common Goal/Action
- Management and Monitoring Plan
- Monitor, Analyze Results, Iterate
- Communicate Results

Before, After, Control, Impact (BACI) Experimental Design



Management and Monitoring Plan

Incorporated into the Management Plan:

1. Project Goals and Objectives
2. Monitoring Design
3. **Metrics and Parameters**
4. **Targets**
5. **Alternatives (Corrective Action)**



Adaptive Management Components

- Stakeholder Involvement
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- **Monitor, Analyze Results, Iterate**
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Adaptive Management

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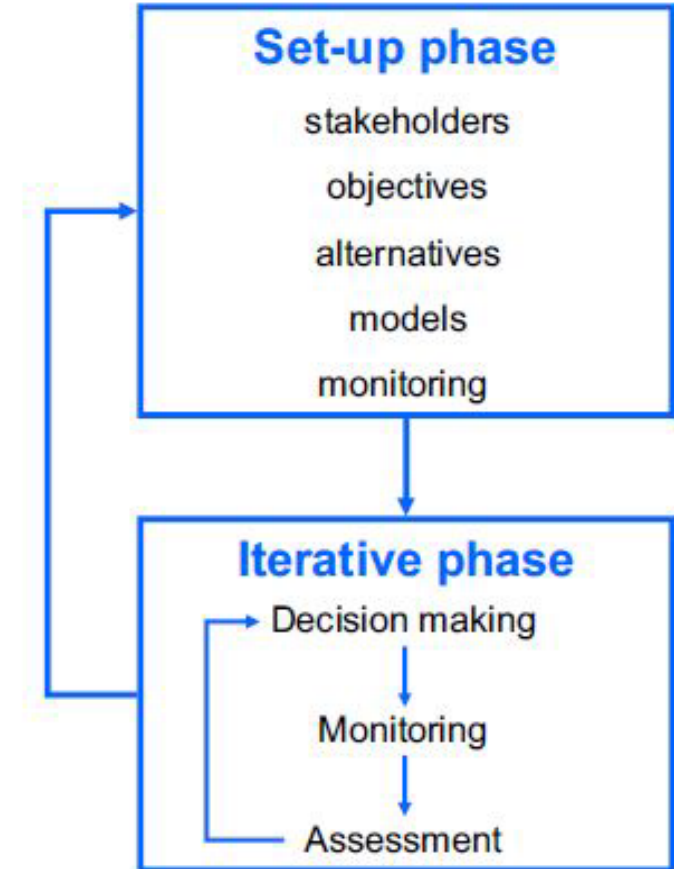
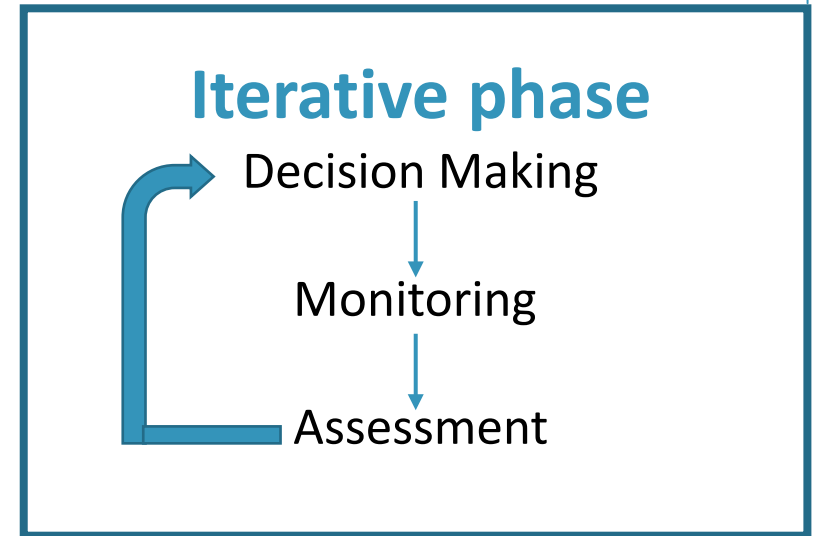


Fig. 2. Two-phase learning in adaptive management. Technical learning involves an iterative sequence of decision making, monitoring, and assessment. Process and institutional learning involves periodic reconsideration of the adaptive management setup elements.

Adaptive Management

Incorporates learning-based decision making into management actions



Monitor, Analyze Data and Iterate

Goal	Monitoring Measurement	Milestone	Trigger to ID Problem	Corrective Action
Targeted area revegetates	Vegetation Percent Cover	>20% increase in cover by Year 3	50% less of milestone	Marsh planting or apply seed

Adaptive Management Components

- Stakeholder Involvement
- Establish a Common Goal/Action
- Management and Monitoring Plan
- Monitor, Analyze Results, Iterate
- Communicate Results



Communicate Results:
Outreach and
Engagement

Reporting
Workshops
Site Visits
Restoration Videos

Adaptive Management

Incorporates learning-based decision making into management actions

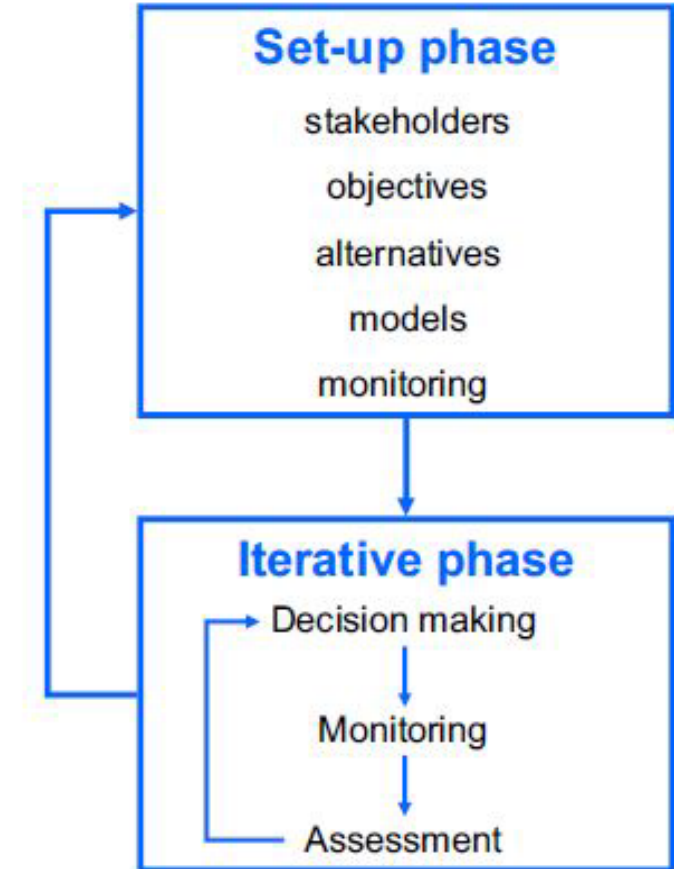
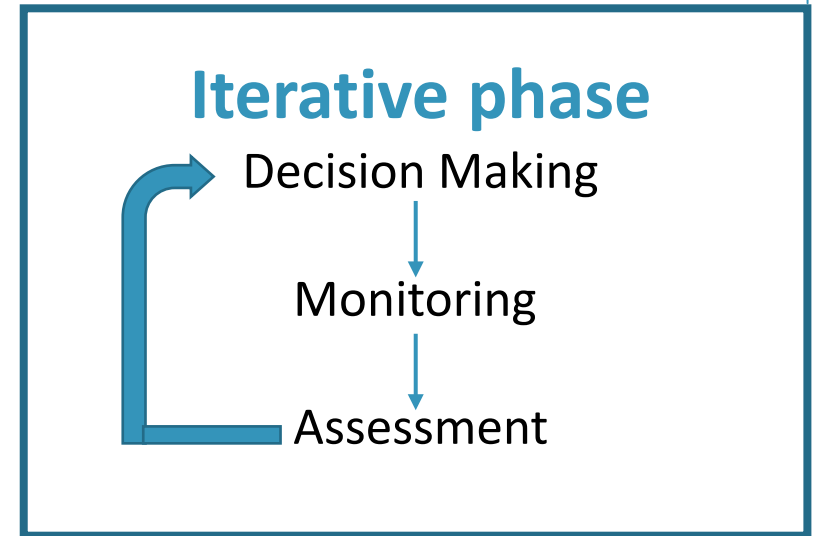


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Adaptive Management

Incorporates learning-based decision making into management actions



Questions?



Adaptive Management Barriers

1. Minimized stakeholder engagement
2. Lack of resources and communication
3. Inherent lack of flexibility

Analyze Data and Iterate

Unexpected
Result: Vegetation
recovery is slower
than anticipated

- Seeding of unvegetated areas
- Marsh plantings

Unexpected
Result: Too much
drainage

- Install sill
- Adjust runnel dimensions

Adaptive Management Essentials

1. Stakeholder Engagement and Communication
2. Resources
3. Flexibility

Session 2: Identifying and Addressing Risk of Adverse Impact

- **Goal:** Using the foundational conversation set in Session 1, the goal of Session 2 is to identify and address risk of adverse impact in project proposals so proponents can more easily navigate the permitting landscape.
- **Anticipated Output/Outcome:** Session 2 offers attendees the unique opportunity to engage with one another about designing stronger project proposals. The concepts of adverse impact, adaptive management, and corrective action are difficult and can be confusing. At the conclusion of this session, attendees should walk away with a stronger understanding of these concepts, how and when to apply them; and have a better understanding of the expectations and best practices in applying these topics as well as a better understanding of where sticking points exist in applying these concepts.

Lunch Break

12:45 – 1:45P

PLEASE START TO RETURN BY 1:30P

Session 3: Working Together: Identifying Gaps and Opportunities for the Planning and Implementation of Salt Marsh Restoration Projects

Goal: To find common ground as a group and to identify gaps and opportunities to better navigate the existing permitting process and to promote the future planning and implementation of salt marsh restoration projects more successfully.

Anticipated Output/Outcome: Session 3 offers attendees the opportunity to directly engage with one another on better understanding the permitting landscape, determine tangible next steps and opportunities for participants, and suggest ways that this group can further work together to increase understanding of the existing permitting landscape.

Closing and Next Steps

Using the post-its at your tables, answer the following questions:

One question that I still have...

One thing that I learned...

One action that I will take...

Post-Meeting Evaluation

Using the evaluation sheet in your packet, answer the following questions:

What did you take away from the workshop?

What questions do you still have?

Would you be interested in attending another workshop?

Thank you!

Visit our [SNEP Website](#) for workshop outputs and materials.

If you have any questions or would like to follow-up, please email Reilly.Adam@epa.gov