

GOAL 2 CLEAN AND SAFE WATER

Ensure drinking water is safe. Restore and maintain oceans, watersheds, and their aquatic ecosystems to protect human health, support economic and recreational activities, and provide healthy habitat for fish, plants, and wildlife.

Over the 30 years since the enactment of the Clean Water and Safe Drinking Water Acts, government, citizens, and the private sector have worked together to make dramatic progress in improving the quality of surface waters and drinking water.

Thirty years ago, many of the Nation's drinking-water systems provided water to the tap with either very limited treatment (usually disinfection) or no treatment at all. Drinking water was too often the cause of acute illnesses linked to microbiological contaminants or of longer-term health problems resulting from exposure to low levels of toxic and other contaminants. Today, drinking-water systems monitor the quality of the water they provide and treat water to ensure compliance with standards covering a wide range of contaminants. In addition, new efforts to prevent contaminants from entering drinking-water sources are helping to keep drinking water safe. We now regulate disposal of wastes to ground waters that are potential sources of drinking water.

Thirty years ago, about two-thirds of the surface waters assessed by states were not attaining basic water quality goals and were considered polluted.¹ Some of the Nation's waters were open sewers posing health risks, and many water bodies were so polluted that traditional uses, such as swimming, fishing, and recreation, were impossible. Today, the number of polluted waters has been dramatically reduced, and many clean waters are even healthier. A massive investment of federal, state, and local funds has resulted in a new generation of sewage treatment facilities able to provide "secondary" treatment or better. More than 50 categories of industry now comply with nationally consistent discharge regulations. In addition, sustained efforts to implement "best management practices" have helped reduce runoff of pollutants from diffuse, or "nonpoint," sources.

Cleaner, safer water has renewed recreational, ecological, and economic interests in communities across the Nation. The recreation, tourism, and travel industry is one of the largest employers in the Nation, and a significant portion of recreational spending comes from swimming, boating, sport fishing, and hunting.² Each year, more than 180 million people visit the shore for recreation.³ In 2001, people spent a total of \$70 billion—\$35.6 billion on fishing, \$20.6 billion on hunting, and \$13.8 billion on items used for both hunting and fishing. Wildlife watchers spent an additional \$38.4 billion on activities around the home and on trips.⁴ The commercial fishing industry,

which also depends on clean water and healthy wetlands, contributed \$28.6 billion to the economy in 2001.⁵

The dramatic restoration of some of the Nation's most polluted waters has paid large dividends in enhanced recreation, healthier fisheries, and stronger local economies. The Cuyahoga River, which once caught fire, is now busy with boats and harbor businesses that generate substantial revenue for the city of Cleveland. Oregon's Willamette River has been restored to provide swimming, fishing, and water sports. Even Lake Erie, once infamous for its dead fish, now supports a \$600 million per year fishing industry.⁶

Despite improvements in the quality of water, serious water pollution and drinking-water problems remain. Population growth continues to generate higher levels of water pollution and places greater demand on drinking-water systems. To further our progress toward clean waters and safer drinking water, we must both maintain our commitment to the core measures we have already established and look for new ways to improve water quality and protect human health.

OBJECTIVES

Objective 2.1: Protect Human Health. Protect human health by reducing exposure to contaminants in drinking water (including protecting source waters), in fish and shellfish, and in recreational waters.

Sub-objective 2.1.1: Water Safe To Drink. By 2008, 95 percent of the population served by community water systems will receive drinking water that meets all applicable health-based drinking-water standards through effective treatment and source water protection. (2002 Baseline: 93.6 percent of population; note that year-to-year performance is expected to change over time as new standards take effect.)

(Note: Routine data analyses of the Safe Drinking Water Information System (SDWIS) have revealed a degree of nonreporting of violations of health-based drinking water standards and of violations of regulatory monitoring and reporting requirements. As a result of these data quality problems, the baseline statistic of national compliance with health-based drinking water standards likely is lower than reported. In consultations with states, the Agency is currently engaged in statistical analysis to more accurately quantify the impact of these data quality problems, and this has resulted in significant improvements in data accuracy and completeness. Even as these improvements are made, SDWIS serves as the best source of national information on compliance with SDWA requirements and is a critical database for program management, the development of drinking water regulations, trends analyses, and public information.)

Strategic Targets:

- By 2008, the percentage of the population served by community water systems that receives drinking water that meets health-based standards will be:
 - 95 percent for those requirements with which systems need to comply as of December 2001. (2002 Baseline: 93.6 percent of the population)⁷
 - 80 percent for those requirements with a compliance date of January 2002 or later. (2002 Baseline: percent of population to be determined starting in January 2004 and revised as new standards take effect. Covered standards include: Stage 1 disinfectants and disinfection by-products/interim enhanced surface-water treatment rule/long-term enhanced surface water treatment rule/arsenic; year-to-year performance is expected to change as new standards take effect.)
- By 2008, the percentage of community water systems that provide drinking water that meets health-based standards will be:
 - 95 percent for those requirements with which systems need to comply as of December 2001. (2002 Baseline: 91.6 percent of community water systems)⁸
 - 80 percent for those requirements with a compliance date of January 2002 or later. (2002 Baseline: percent of community water systems to be determined starting in January 2004 and revised as new standards take effect. Covered standards include: Stage 1 disinfection by-products/interim enhanced surface-water treatment rule/long-term enhanced surface-water treatment rule/arsenic; year-to-year performance is expected to change as new standards take effect.)
- By 2008, 95 percent of the population served by community water systems in Indian country will receive drinking water that meets all applicable health-based drinking-water standards. (2002 Baseline: 91.1 percent of the population served by systems. Year-to-year performance is expected to change as new standards take effect.)⁹
- By 2008, 50 percent of source water areas (both surface and ground water)

for community water systems will achieve minimized risk to public health. (2002 Baseline: estimated to be 5 percent; “minimized risk” achieved by substantial implementation, as determined by the state, of source water protection actions in a source water protection strategy.)¹⁰

- By 2015, in coordination with other federal agencies, reduce by 50 percent the number of households on tribal lands lacking access to safe drinking water. (2000 Baseline: Indian Health Service data indicating 31,000 homes on tribal lands lack access to safe drinking water.)¹¹

Sub-objective 2.1.2: Fish and Shellfish Safe to Eat. By 2008, improve the quality of water and sediments to allow increased consumption of fish and shellfish as measured by the strategic targets described below.

Strategic Targets:

- By 2008, improve the quality of water and sediments to allow increased consumption of safe fish in not less than 3 percent of the water miles/acres identified by states or tribes as having a fish consumption advisory in 2002. (2002 Baseline: 485,205 river miles and 11,277,276 lake acres were identified by states or tribes in 2002 as having fish with chemical contamination levels resulting in an advisory of potential human health risk from consumption.)¹²
- By 2008, 85 percent of the shellfish-growing acres monitored by states will be approved for use. (1995 Baseline: 77 percent approved for use of 21.6 million acres monitored: 69 percent approved and 8 percent conditionally approved.)¹³

Sub-objective 2.1.3: Water Safe for Swimming. By 2008, restore water quality to allow swimming in not less than 5 percent of the stream miles and lake acres identified by states in 2000 as having water quality unsafe for swimming. (2000 Baseline: approximately 90,000 stream miles and 2.6 million lake acres reported by states as not meeting a primary contact recreational use in the 2000 reports under section 305(b) of the Clean Water Act.)¹⁴

Strategic Targets:

- By 2008, protect the quality of recreational waters nationwide so that the number of waterborne disease outbreaks attributable to swimming in, or other recreational contact with, the ocean, rivers, lakes, or streams will be reduced to

not more than 8, measured as a 5-year average. (2002 Baseline: an average of 9 recreational contact waterborne disease outbreaks reported per year by the Centers for Disease Control over the years 1994 to 1998; adjusted by the Heinz Center to remove outbreaks associated with waters other than natural surface waters [such as pools or water parks].)¹⁵

- By 2008, coastal and Great Lakes beaches monitored by state beach safety programs will be open and safe for swimming in more than 96 percent of the days of the beach season. (2002 Baseline: monitored beaches open 94 percent of the days of the beach season.)¹⁶

Means and Strategies for Achieving Objective 2.1

Protecting and Improving Drinking Water

Safe drinking water and clean surface waters are critical to protecting human health. More than 260 million Americans rely on the safety of tap water provided by water systems that comply with national drinking-water standards.¹⁷ EPA's strategy for ensuring safe drinking water over the next several years includes four key elements:

- ▼ Developing or revising drinking-water standards
- ▼ Supporting states, tribes, and water systems in implementing standards
- ▼ Promoting sustainable management of drinking-water infrastructure
- ▼ Protecting sources of drinking water from contamination.

Develop Drinking-Water Standards

The Safe Drinking Water Act directs EPA to establish national standards for contaminants in drinking water provided to consumers by water systems. Over the past 30 years, EPA has established standards for some 91 contaminants. Over the next several years, EPA expects to establish additional standards for microbial contaminants, disinfectants, disinfection by-products, and microbial pathogens or other contaminants found in distribution systems.

Through 2008, EPA will continue to assess the need for new or revised drinking-water standards. Based on recommendations from the National Research Council, the National Drinking Water Advisory Council, and other stakeholders, the Agency will continue to evaluate health effects data and risks of exposure to contaminants; information on technologies that prevent, detect, and remove contaminants; and compliance costs. If there is adequate information, EPA will determine whether a new risk-based drinking-water standard is necessary, or whether revision to an existing

standard is warranted. Where the source of the contamination is surface water, the Agency will also consider applying the pollution control authorities of the Clean Water Act, including development of water quality criteria for human health under Section 304 of the Act. These criteria, once adopted by states and authorized tribes, will form the basis for limits on discharges of the contaminants to surface waters and guide programs to reduce runoff.

Implement Drinking-Water Regulations

EPA works closely with states, tribes, and owners and operators of municipal water systems to ensure the full and effective implementation of drinking-water standards and to support the highest possible rate of compliance with those standards. Over the next 5 years, EPA will provide guidance, training, and technical assistance to states, tribes, and systems; ensure proper certification of water system operators; and promote consumer awareness of the safety of drinking-water supplies.

Small community water systems are more likely to have difficulty complying with drinking-water standards. Consistent with the Agency's Small Systems Strategy, EPA will provide training and assistance addressing the use of cost-effective treatment technologies, proper waste disposal, and compliance with standards for high-priority contaminants, including arsenic in drinking water and microbes, disinfectants, and disinfection by-products.

High-quality information is needed to support the effective implementation of drinking-water standards. The Safe Drinking Water Information System serves as the primary source of national information on compliance with all Safe Drinking Water Act requirements, and is a critical database for program management. EPA will work to ensure that all applicable drinking-water regulatory requirements are incorporated into this new data system to help states and authorized tribes manage their drinking-water programs. EPA will also continue to work with states and others to improve data completeness, accuracy, timeliness, and consistency.

Support Sustainable Drinking-Water Infrastructure

Providing drinking water that meets safe standards often requires an investment in the construction or maintenance of infrastructure. The Drinking Water State Revolving Fund (DWSRF) provides water systems with low-interest loans to make infrastructure improvements.

Even with financial assistance from the DWSRF, the Agency's September 2002 report on the infrastructure gap identifies a multi-billion-dollar gap in capital infrastructure financing over the next 20 years.¹⁸ Thus, EPA will continue to provide infrastructure grants to capitalize DWSRFs. EPA will also work with states to ensure that funds are effectively managed, and with water system owners and operators to encourage them to adopt sustainable management systems.

In a related effort, EPA will work with other federal agencies to develop a coordinated approach to improving access to safe drinking water. The 2002 World Summit in Johannesburg adopted the goal of reducing the number of people lacking access to safe drinking water by 50 percent by 2015.¹⁹ EPA will contribute to this work through its support for development of drinking-water facilities in Indian country and Alaskan Native villages, using set-aside funds from the DWSRF and targeted grants. Other federal agencies, such as the Department of the Interior (DOI) and the U.S. Department of Agriculture (USDA), also play key roles in addressing this problem. EPA will work with these agencies to develop a coordinated strategy by 2005 and to begin implementing the strategy in 2006. In addition, Mexico Border infrastructure projects, described under Goal 4: Healthy Communities and Ecosystems, will also increase access to safe drinking water.

Prevent Contamination of Sources of Drinking Water

There is growing recognition that protecting the quality of sources of drinking water, including surface waters and ground water, can reduce violations of drinking-water standards. EPA will support protection of drinking-water sources through training and technical assistance to states, tribes, and communities that are taking voluntary measures to prevent or reduce contamination of source water. The Agency will foster coordination of contamination prevention strategies across jurisdictions, and will also work with states and tribes to use Clean Water Act authorities to prevent contamination of waters that serve as public water supplies and are at high risk.

In a related effort, EPA will protect ground water that is a source of drinking water by ensuring safe underground injection of waste materials. EPA will continue working with states and tribes to educate and assist underground injection control well operators; working with industry and stakeholders to collect and evaluate data on potential ground-water contamination from more than two dozen types of Class V (shallow) wells, including agricultural and storm-water drainage wells and large-capacity septic systems; and exploring best management practices for protecting underground sources of drinking water.

Safeguarding Water Infrastructure

EPA is also the federal organization responsible for ensuring the safety of critical water infrastructure in the event of terrorist or other intentional acts. Over the next several years, EPA will continue to provide technical support and financial assistance to help drinking-water and wastewater utilities assess their vulnerability to terrorist or other intentional acts and develop or revise their emergency response plans. The Public Health Security and Bioterrorism Preparedness and Response Act of 2002 (Bioterrorism Act) requires community water systems supplying drinking water to more than 3,300 people (of which there are about 9,000 nationwide) to conduct vulnerability assessments and prepare emergency response plans by certain dates. Wastewater systems have also been

conducting vulnerability assessments and developing emergency response plans through technical assistance provided by EPA. While the deadlines in the Bioterrorism Act and the statutory mandates are time specific for vulnerability assessments and emergency response plans, EPA and the water infrastructure community agree that these protective activities are not “one time only” endeavors, but represent an iterative process based on new and emerging information, science, and technology.

The Agency will spearhead and support efforts to develop effective and affordable methods, technologies, equipment, and other tools needed to protect drinking-water and wastewater systems from attack. Another aspect of maintaining a secure infrastructure is ensuring that critical information reaches the right people by the fastest means necessary. The Agency will continue to support the operation of a secure, internet-based, password-protected Information Sharing and Analysis Center that provides data on threats of attacks or actual alerts and notices to drinking-water and wastewater utilities.

Making Fish and Shellfish Safe to Eat

Some toxic contaminants that enter water bodies can move up the food chain and build up to levels that make fish unsafe to eat. States and tribes report they have issued fish consumption advisories for some 14 percent of river miles and 28 percent of lake acres.²⁰ Shellfish also can accumulate disease-causing microorganisms and toxic algae. In 1995, shellfishing was prohibited in 11 percent of the approximately 25 million acres that support shellfishing.²¹ EPA is working with states, tribes, and other federal agencies to improve water and sediment quality so all fish and shellfish are safe to eat and to protect the public from consuming fish and shellfish that pose unacceptable health risks.

Make More Fish Safe to Eat

Most fish consumption advisories today are issued because of unhealthy levels of mercury in fish. Although small amounts of mercury are discharged to waters, most mercury in fish originates from combustion sources, such as coal-fired power plants and incinerators, which release it into the air. The mercury is then deposited by rainfall onto land and water, where it is concentrated in water bodies and moves up the food chain through fish to people. EPA is working to reduce releases of mercury to the air through controls on combustion sources. For example, EPA expects that by 2010, federal market-based and other air regulatory programs will reduce electric-generating unit emissions of mercury by 22 tons from their 2000 level of 48 tons (see Goal 1 of this *Strategic Plan*).

Improving water and sediment quality is another key element of the strategy for making more fish safe to eat. Implementation of Clean Water Act programs will improve water quality by reducing discharges from storm-water systems, combined sewer overflows, and concentrated animal feeding operations, and by reducing runoff from nonpoint sources.

These water quality programs rely on sound scientific information concerning individual contaminants in fish. EPA recently issued a criteria document under the Clean Water Act identifying the safe levels of mercury in fish tissue and will help states and tribes adopt the criterion into water quality standards. EPA expects that states and authorized tribes will adopt the new mercury fish tissue criterion by 2008. In 2000, EPA revised the methodology calculating “human health criteria” for contaminants found in surface waters. This new methodology reflects recent research on the health effects of contaminants and their potential in water to be concentrated in the food chain and to pose a greater risk to people who consume fish. EPA partly recalculated the criteria for 83 pollutants and will be revising these criteria and additional criteria more completely over the next several years.

EPA is also working to restore the quality of aquatic sediment in critical water bodies, with special emphasis on the Great Lakes. In addition, EPA will use Superfund program authorities to restore the quality of sediment. To reduce the potential for future sediment contamination, EPA is working to reduce the use of polychlorinated biphenyls (PCBs), a major sediment contaminant, in electrical equipment. (See Goal 4 of this *Strategic Plan*.)

Another key element of EPA’s strategy for making more fish safe to eat is expanding the amount and type of information about fish safety and making this information available to the public. EPA provides guidance to states and tribes on monitoring and fish sampling. EPA also provides funding and technical training to help states and tribes assess fish safety in more of their waters every year. The Agency expects that by 2008, the percentage of rivers and lakes monitored to determine the need for fish advisories will continue to increase. EPA is also conducting a nationwide survey of contamination in fish.

A key public information tool is the Internet-based National Listing of Fish and Wildlife Consumption Advisories.²² This website allows states and tribes to enter their advisories and provides the public with information about the location of advisories, the fish that are affected, and the number of meals or amount of fish that a person can safely eat.

Make More Shellfish Safe to Eat

The safety of shellfish is managed through a partnership of the U.S. Food and Drug Administration (FDA), the Interstate Shellfish Sanitation Commission (ISSC), and coastal states. States monitor shellfishing waters and can restrict harvesting if shellfish taken from the waters are unsafe.

Although a sound system for monitoring the condition of shellfishing waters and limiting public exposure to unsafe shellfish is in place, shellfish harvesting is restricted in many acres of otherwise productive shellfishing waters. EPA is working with states, the FDA, the ISSC, and the National Oceanic and Atmospheric Administration (NOAA) to increase the percentage of shellfishing acres where harvesting is permitted from the estimated 1995 level of 77 percent to 85 percent in 2008.

Over the past several years, the ISSC, working with states and federal agencies, has developed a new information system that uses state monitoring data to pinpoint areas where shellfishing has been restricted. This information system will enable EPA and the states to more readily identify possible sources of pollutants restricting the use of shellfishing waters. This information can also be used to strengthen water pollution control activities, including development of watershed plans, implementation of National Estuary Program plans, issuance or reissuance of permits to point sources, enforcement of existing permits, and implementation of controls over diffuse sources of polluted runoff.

Making Waters Safe for Swimming

Recreational waters, especially beaches in coastal areas and the Great Lakes, provide outstanding recreational opportunities for many Americans. Swimming in some recreational waters, however, can pose a serious risk of illness as a result of exposure to microbial pathogens. Beach closures to protect the public from harmful levels of pathogens can have significant economic impacts. In some cases, these pathogens can be traced to sewage treatment plants, malfunctioning septic systems, and discharges from storm-water systems and animal feeding operations. EPA is implementing a three-part strategy to protect the quality of the Nation's recreational waters. The Agency will work to protect recreational water generally, control combined sewer overflows (CSOs), and protect the quality of public beaches along the coasts and Great Lakes.

Protect Recreational Waters

The first element of the strategy is broadly focused on all recreational waters. To protect and restore these waters, EPA works with state, tribal, and local governments to implement the core programs of the Clean Water Act. For example, development and implementation of total maximum daily loads (TMDLs) will generally benefit recreational waters that are impaired. The continuing implementation of the discharge permit program, urban storm-water controls, and nonpoint pollution control programs will also reduce pollution to recreational waters.

Control Combined Sewer Overflows

Full implementation of controls for overflows from combined storm and sanitary sewers is another key step in protecting recreational waters. These overflows release untreated sewage containing high levels of pathogens. CSOs, which occur in about 770 communities around the country, can have a significant impact on the quality of recreational waters. EPA, states, and local governments are making steady progress toward reducing overflows under the “CSO Policy.”²³ Most communities with CSOs have now implemented basic control measures. Some 34 percent of these communities have submitted long-term plans for controlling overflows and 16 percent have begun implementation.²⁴

Protect Coastal and Great Lakes Beaches

The third element of the strategy to protect and restore recreational waters is focused on public beaches along coastal areas and the Great Lakes. Under the recently enacted Beaches Environmental Assessment and Coastal Health (BEACH) Act, EPA provides grants to state, tribal, and local governments for programs to monitor beach water quality and notify the public when bacterial contamination poses a risk to swimmers. EPA expects that 100 percent of significant public beaches will be managed under BEACH Act programs by 2008.

The BEACH Act requires that coastal and Great Lakes states adopt scientifically sound water quality criteria for bacteria. EPA expects that all 35 coastal and Great Lakes states will have adopted such criteria for beaches by 2008. As a result of a related effort, Agency-approved analytic methods will be available for pathogens of concern at beaches.

Finally, EPA will continue to expand public access to Internet-based beach information on its website. Governments receiving BEACH Act grants and communities responding to EPA’s annual National Beach Health Protection Survey will provide information on water quality, beach monitoring and advisory programs, and beach closures.

Objective 2.2: Protect Water Quality. Protect the quality of rivers, lakes, and streams on a watershed basis and protect coastal and ocean waters.

Sub-objective 2.2.1: Improve Water Quality on a Watershed Basis. By 2008, use both pollution prevention and restoration approaches, so that:

- In 600 of the Nation’s watersheds, water quality standards are met in at least 80 percent of the assessed water segments (2002 Baseline: 453 watersheds of the total 2,262 U.S. Geological Survey (USGS) cataloguing unit scale watersheds across the

Nation)²⁵

- In 200 watersheds, all assessed water segments maintain their quality and at least 20 percent of assessed water segments show improvement above conditions as of 2002. (2002 Baseline: 0 USGS cataloging unit scale watersheds)

Strategic Targets:

- By 2012, fully attain water quality standards in over 25 percent of those water bodies identified in 2000 as not attaining standards, with an interim milestone of restoring 5 percent of these waters by 2006. (2002 Baseline: 0 percent of the 255,408 miles and 6,803,419 acres of waters on 1998/2000 lists of impaired waters developed by states and approved by EPA under section 303(d) of the Clean Water Act.)²⁶
- By 2008, reduce levels of phosphorus contamination in rivers and streams so that phosphorus levels are below levels of concern established by USGS or levels adopted by a state or authorized tribe in a water quality standard in:
 - 55 percent of test sites for major rivers (1992-1998 Baseline: 50 percent)²⁷
 - 38 percent of test sites for urban streams (1992-1998 Baseline: 33 percent)²⁸
 - 30 percent of test sites for farmland streams (1992-1998 Baseline: 25 percent)²⁹
- By 2008, improve water quality in Indian country at not fewer than 90 monitoring stations in tribal waters for which baseline data are available (i.e., show at least a 10 percent improvement for each of four key parameters: total nitrogen, total phosphorus, dissolved oxygen, and fecal coliforms). (2002 Baseline: four key parameters available at 900 sampling stations in Indian country.)
- By 2015, in coordination with other federal partners, reduce by 50 percent the number of households on tribal lands lacking access to basic sanitation. (2000 Baseline: Indian Health Service data indicating that 71,000 households on tribal lands lack access to basic sanitation.)³⁰

Sub-objective 2.2.2: Improve Coastal and Ocean Waters. By 2008, prevent water pollution and protect coastal and ocean systems to improve national and regional coastal aquatic ecosystem health by at least 0.2 points on the “good/fair/poor” scale of the National Coastal Condition Report. (2002 Baseline: National rating of “fair/poor” or 2.4, where the rating is based on a 5-point system in which 1 is poor and 5 is good, and is expressed as an areally- weighted mean of regional scores using the National Coastal Condition Report indicators addressing water clarity, dissolved oxygen, coastal wetlands loss, eutrophic conditions, sediment contamination, benthic health, and fish tissue contamination.)³¹

Strategic Targets:

- By 2008, maintain water clarity and dissolved oxygen in coastal waters at the national levels reported in the 2002 National Coastal Condition Report. (2002 Baseline: 4.3 for water clarity; 4.5 for dissolved oxygen.)
- By 2008, improve ratings reported on the national “good/fair/poor” scale of the National Coastal Condition Report for:
 - Coastal wetlands loss by at least 0.2 points (2002 Baseline: 1.4)
 - Contamination of sediments in coastal waters by at least 0.2 points (2002 Baseline: 1.3)
 - Benthic quality by at least 0.2 points (2002 Baseline: 1.4)
 - Eutrophic conditions by at least 0.2 points (2002 Baseline: 1.7)
- By 2010, in cooperation with other nations, federal agencies, states, tribes, and local governments, reduce the rate of increase in the number of invasions by non-native invertebrate and algae species of marine and estuarine waters. (2000 Baseline: rate of increase approximately 1 percent per year.)³²

Means and Strategies for Achieving Objective 2.2

Improving Water Quality on a Watershed Basis

To protect and improve water quality on a watershed basis, EPA will focus its work with states, interstate agencies, tribes, and others on six key areas: (1) strengthen the water quality

standards program; (2) improve water quality monitoring; (3) develop effective watershed plans and TMDLs; (4) implement effective nonpoint pollution control programs; (5) strengthen the National Pollutant Discharge Elimination System (NPDES) permit program; and (6) effectively manage infrastructure assistance programs.

While EPA expects to work with states, interstate agencies, and tribes in each of these areas, progress toward water quality improvements will largely depend on success in integrating programs on a watershed basis; engaging diverse stakeholders in solving problems; and applying innovative ideas, such as water quality trading, to deliver cost-effective water pollution control.

Strengthen the Water Quality Standards Program

State and tribal water quality standards provide the environmental baselines for water quality programs. EPA provides scientific information concerning contaminants in the form of “water quality criteria” guidance and identifies innovative approaches to support state and tribal adoption of water quality standards that protect water for such uses as swimming, public water supply, and fish and wildlife.

In July 2003, EPA published the Water Quality Standards and Criteria Strategy.³³ Developed in cooperation with states, tribes, and the public, the strategy provides a foundation for EPA’s work to strengthen state and tribal water quality standards programs. Over the next 5 years, the strategy calls for EPA to develop guidance for implementing new and existing water quality criteria; develop a criteria methodology for waterbody sedimentation; develop a revised aquatic life criteria methodology; publish additional nutrient criteria (for example, for coastal waters and wetlands) and provide implementation guidance; and promote increased use of biological criteria and ecological evaluation to support assessment of water conditions on a watershed scale.

In addition, the strategy identifies some key efforts to strengthen the program in the coming years, including developing nutrient standards, adopting biological criteria, and assisting tribal governments in adopting water quality standards. In a complementary effort, EPA will review risk assessment methodologies applied to chemical pollutants and pathogens in biosolids generated by wastewater treatment plants and will assess the need for new or revised standards to protect public health and the environment.

Finally, EPA will work with states and tribes to ensure the effective operation and administration of the standards program. For example, all states and authorized tribes are expected to review and revise their standards every 3 years, as required by the Clean Water Act. In addition, EPA will promptly review and approve or disapprove changes to standards, as required by the Act.

Improve Water Quality Monitoring

Scientifically defensible data and information are essential tools in the Information Age. Water quality monitoring and assessment programs—the essential underpinning of all aspects of the watershed approach— must be strengthened and upgraded across the country.

Over the next 5 years, EPA will assist states and tribes in significantly improving information concerning the condition of the Nation’s rivers, lakes, streams, wetlands, and ground water (to the extent possible). Specifically, EPA will work with other federal agencies, states, and tribes to adopt comprehensive monitoring strategies, addressing all the elements essential to an effective monitoring program, and statistically valid monitoring networks. EPA will also encourage them to develop biological monitoring programs and will provide states with technical assistance to increase their submission of monitoring data to the STORET national water quality data repository. This monitoring work will be coordinated with assessments of fish tissue contamination, the condition of water at beaches, the condition of coastal waters, and the condition of ground water.

Develop Effective Watershed Plans and TMDLs

EPA is working with states, interstate agencies, and tribes to foster a “watershed approach” as the guiding principle of clean water programs. EPA is encouraging states to develop watershed plans with a comprehensive approach to assessing water quality, defining problems, integrating management of diverse pollution control, and financing projects. States have successfully adopted watershed approaches that use a “rotating basin” approach as well as other methods. Where necessary, states will upgrade their continuing planning processes to ensure development of a watershed approach. EPA is also working with tribes to support development of watershed approaches to protecting tribal waters.

EPA is supporting the development of watershed plans in specific geographic areas. In addition to continuing watershed protection programs as part of the National Estuary Program, the Chesapeake Bay Program, the Great Lakes Program, and the Gulf of Mexico Program, EPA has provided grants for watershed-based plans in recent years and is beginning a new watershed grant program in 2003. EPA expects to continue supporting development of plans in key watersheds over the next 5 years.

In watersheds where water quality standards are not attained, states will be developing TMDLs. Some impaired waters are isolated segments that can be addressed individually. The vast majority of impaired waters, however, are clustered on a watershed basis. EPA is encouraging states to develop TMDLs for these waters on a watershed basis, because watershed-based TMDLs are less expensive to develop and create the opportunity for innovations such as water quality trading and

watershed-based permitting. Trading is a valuable tool that allows sources of pollution to share responsibility for controlling pollution within a watershed and to achieve pollution reductions at the lowest possible cost.

While supporting state watershed plans, EPA will continue working with states to develop TMDLs consistent with state TMDL development schedules and court-ordered deadlines. States and EPA have made significant progress in the development and approval of TMDLs and expect to maintain the current pace of approximately 3,000 TMDLs per year.

Control Nonpoint Source Pollution

Watershed plans and TMDLs will focus pollution control efforts for impaired waters on a range of pollution sources, including runoff from diffuse, or “nonpoint,” sources. EPA will also support state, interstate agency, tribal, and other federal agency efforts to implement management practices that will reduce levels of nonpoint source pollution in both impaired waters and in other waters, including surface water and groundwater, nationwide.

A critical step in this effort is for EPA to forge strategic partnerships with a broad range of agricultural interests at all levels. EPA will work with USDA to ensure that federal resources, including grants under section 319 of the Clean Water Act and Farm Bill funds, are managed in a coordinated way. As part of this effort, EPA will work with states on developing and implementing watershed-based plans, focused on watersheds with impaired water quality caused by nonpoint sources. These plans are a mechanism to coordinate monitoring and planning on a watershed basis and will build a foundation for effective implementation actions using federal and other funding. EPA will also work cooperatively with USDA to develop voluntary nutrient management plans for small animal feeding operations (not covered by regulations) and to implement riparian and stream bank protection measures over the next 5 years.

In related efforts, EPA will collaborate with state managers of Clean Water Revolving Loan Funds to increase investments in projects to reduce nonpoint source pollution. Properly managed on-site/decentralized systems are an important part of the Nation’s wastewater infrastructure. EPA will encourage state, tribal, and local governments to adopt voluntary guidelines for the effective management of these systems and to use Clean Water Revolving Loan Funds to finance systems where appropriate.

Strengthen NPDES Permit Program and Implement National Industrial Regulation Strategy

The NPDES requires point sources discharging to water bodies to be permitted and pretreatment programs to control discharges from industrial facilities to the Nation’s sewage treatment

plants. This program provides a management framework for protecting the Nation's waters through the control of billions of pounds of pollutants. EPA has five key strategic objectives for the program over the next 5 years: (1) ensure effective management of the permit program, including focusing on permits that have the greatest benefit for water quality; (2) implement wet-weather point source controls, including the storm-water program; (3) implement the newly developed program for permits at large, concentrated animal feeding operations (CAFOs); (4) advance program innovations, such as watershed permitting and trading; and (5) develop national industrial regulations for industries where the risk to water bodies supports a national regulation.

In 2003, EPA is developing the "Permitting for Environmental Results Strategy" to address concerns about the backlog in issuing permits and the health of state NPDES programs. The strategy focuses limited resources on the most critical environmental problems by targeting three key areas: (1) developing and strengthening systems to ensure program integrity; (2) focusing EPA and states on achieving environmental results; and (3) fostering efficient permitting operations. The need to increase data quality and quantity, including modernizing the Permits Compliance System and integrating it with other environmental databases, is common to all three areas. Beginning in FY 2004, EPA will assess NPDES program integrity and track the implementation of followup actions that result from the assessments.

EPA is working with states, tribes, and other interested parties to strengthen the permit program in several other areas that will benefit water quality. The Agency recently finalized new rules for discharges from CAFOs and will work with states to ensure that most CAFOs are covered by permits by 2008. In addition, over the next 5 years, EPA expects that 100 percent of NPDES programs will have issued general permits requiring storm-water management programs for Phase II (mid-sized) municipalities and requiring storm-water pollution prevention plans for construction sites covered by Phase II of the storm-water program. Finally, EPA and states will monitor the percentage of significant industrial facilities that have control mechanisms in place to implement applicable pretreatment requirements prior to discharging to publicly owned treatment works.

Most industrial facilities discharging directly to water bodies or to sewage treatment plants have permit limits or pretreatment controls based on national regulations developed for the class of industrial activity. Regulations are now in place for most major industrial classes. Over the next 5 years, EPA will complete national regulations now under development (including, for example, meat and poultry processing, construction and development sites, aquaculture farms, and cooling-water intake structures). In consultation with the public, EPA will also establish program priorities based on sound science and demonstrated benefits, including the potential for cost-effective risk reduction. In addition to evaluation of regulatory options, EPA will consider other approaches (including clarifying guidance, environmental management systems, and permit writer support).

Support Sustainable Wastewater Infrastructure

Much of the dramatic progress in improving water quality is directly attributable to investment in wastewater infrastructure—the pipes and facilities that treat the Nation’s sewage. But the job is far from over. Communities are challenged to find the fiscal resources to replace aging infrastructure, meet growing infrastructure demands fueled by population growth, and secure their infrastructure against threats.

Clean Water State Revolving Funds (CWSRFs) provide low-interest loans to help finance wastewater treatment facilities and other water quality projects. These projects are critical to the continuation of the public health and water quality gains of the past 30 years. As of early 2003, the federal government had invested almost \$20 billion in CWSRFs.³⁴ The revolving nature of the funds and substantial additions from states have magnified that investment, so that \$42.4 billion has been available for loans.³⁵ Recognizing the substantial remaining need for wastewater infrastructure, EPA expects to continue to provide significant annual capitalization to CWSRFs for the foreseeable future. This continued federal investment in state revolving funds, along with other traditional sources of financing (including increased local revenues), will result in significant progress toward addressing the Nation’s wastewater treatment needs.

Over the next 5 years, EPA will work with CWSRFs to meet several key objectives:

- ▼ Fund projects designed as part of an integrated watershed approach
- ▼ Link projects to environmental results through the use of scientifically sound water quality and public health data
- ▼ Support development of integrated priority lists addressing nonpoint pollution and estuaries protection projects, as well as wastewater projects
- ▼ Maintain the CWSRF’s excellent fiduciary condition.

Another important approach to closing the gap between the need for clean water projects and available funding is to use sustainable management systems to ensure that infrastructure investments are tailored to the needs of the watershed and are well capitalized and well maintained. Sustainable management systems prolong the lives of existing systems and provide Americans with clean water at lower cost. EPA will work to institutionalize these systems and will also encourage rate structures that lead to full cost pricing and support water metering and other conservation measures. As part of this effort, EPA will continue to promote environmental management systems, especially for public agencies, that focus on improved compliance, environmental performance beyond compliance, pollution prevention, and sustainable water infrastructure. Response to date is very positive, and support for adoption of environmental management systems in the public sector is growing rapidly.

In a related effort, EPA will work with other federal agencies to improve access to basic

sanitation. The 2002 World Summit in Johannesburg adopted the goal of reducing the number of people lacking access to safe drinking water and basic sanitation by 50 percent by 2015.³⁶ EPA will contribute to this work through its support for development of sanitation facilities in Indian country and Alaskan Native villages, using funds set aside from the CWSRF and targeted grants. Other federal agencies, such as DOI and USDA, also play key roles in addressing this problem. In addition, Mexico Border infrastructure projects, described under Goal 4: Healthy Communities and Ecosystems, will improve access to basic sanitation.

Improving Coastal and Ocean Water Quality

Coastal and ocean waters are environmentally and economically valuable to the Nation. Key programs focused on and critical to improving coastal waters are:

- ▼ Assessing coastal conditions
- ▼ Reducing vessel discharges
- ▼ Controlling coastal nonpoint pollution
- ▼ Managing dredged material
- ▼ Managing non-indigenous invasive species
- ▼ Supporting international marine pollution control.

In addition, coordinating our efforts with those of other federal agencies, states, tribes, and public and private parties is essential. Improving coastal waters will depend on successful implementation of pollution controls in inland watersheds (see Sub-objective 2.2.1). Progress in protecting and restoring coastal waters is also directly tied to geographically focused projects, such as the Chesapeake Bay Program, the Gulf of Mexico Program, and the National Estuary Program. These programs are described under Goal 4: Healthy Communities and Ecosystems.

Assess Coastal Conditions

Progress in meeting these strategic targets will be tracked through the National Coastal Condition Report, created in 2002 as a cooperative project of EPA, NOAA, USDA, and DOI. The report describes the ecological and environmental condition of U.S. coastal waters according to seven key parameters. EPA and other federal agencies will review changing conditions and periodically issue updated assessments of the health of coastal waters. In support of this work, EPA is developing indices for measuring the health of coral reefs and guidance for protecting such back-reef ecosystems as mangroves, seagrass beds, and sandflats. EPA is also developing guidance to assist states, tribes, and local governments in anticipating and responding to harmful algal blooms.

Reduce Vessel Discharges

To improve the health of the Nation's ocean and coastal waters, EPA will focus on enhancing regulation of discharges of pollution from vessels. Key work includes developing discharge standards for cruise ships operating in Alaskan waters; cooperating with the Department of Defense to develop discharge standards for certain armed forces vessels; and assessing the effectiveness of current regulations for marine sanitation devices and promoting technological advancement to reduce sewage discharges from vessels.

Implement Coastal Nonpoint Source Pollution Programs

Rapid population growth in coastal areas can result in significant increases in pollution from nonpoint sources. For the past 10 years, EPA and NOAA have been working with coastal and Great Lakes states to improve and expand programs to reduce nonpoint source pollution in the "coastal zone" identified by states. Most states have used federal grant funds to develop coastal nonpoint programs, and EPA and NOAA are working with the remaining states to complete the program by providing continued support and assistance. These nonpoint control programs, focused on the critical coastal zone areas, will play an important role in accomplishing the environmental improvements sought for coastal waters by 2008.

Manage Dredged Material

Several hundred million cubic yards of sediment are dredged from waterways, ports, and harbors every year to maintain the Nation's navigation system for commercial, national defense, and recreational purposes. All of this sediment must be disposed of safely. EPA and the U.S. Army Corps of Engineers (COE) share responsibility for regulating how and where the disposal of sediment occurs. EPA and COE will focus additional resources on improving how disposal of dredged material is managed, including evaluating disposal sites, designating and monitoring the sites, and reviewing and concurring on the disposal permits issued by COE.

EPA is also working with its state partners and other federal agencies, including COE, the Fish and Wildlife Service, and the Coast Guard, to ensure that comprehensive dredged material management plans, which include provisions for the beneficial reuse of dredged material, are developed and implemented in major ports and harbors.

Manage Invasive Species

One of the greatest threats to U.S. waters and ecosystems is the uncontrolled spread of invasive species. Invasive species commonly enter U.S. waters through the discharge of ballast water

from ships. Although the majority of these organisms never become established in a new ecosystem, an increasing number of them are harming the environment and local economies and posing risks to human health. EPA is assisting the U.S. Coast Guard in its efforts to develop ballast water exchange requirements and discharge standards and is addressing this issue at the international level.

Support International Marine Pollution Control

EPA works closely with the Coast Guard, NOAA, and the Department of State to address environmental threats to U.S. waters that require international cooperation. Recognizing the effect of international shipping on the quality of the U.S. waters, EPA is heavily involved in the negotiation of international standards at the International Maritime Organization. These standards are the principal mechanism EPA is using to address invasive aquatic species, tributyltin and other harmful antifoulants, and marine debris. Negotiations are currently underway for a global treaty designed to prevent further introductions of invasive aquatic species through ballast water. EPA is also engaged in cooperative efforts to reduce other sources of pollution affecting the Gulf of Mexico, Great Lakes, Arctic Ocean, Straits of Florida, and the Wider Caribbean Basin.

Objective 2.3: Enhance Science and Research. Provide and apply a sound scientific foundation to EPA's goal of clean and safe water by conducting leading-edge research and developing a better understanding and characterization of the environmental outcomes under Goal 2.

Sub-objective 2.3.1: Apply the Best Available Science. By 2008, apply the best available science (e.g., tools, technologies, and scientific information) to support Agency regulations and decisionmaking for current and future environmental and human health hazards related to reducing exposure to contaminants in drinking water, fish and shellfish, and recreational waters and protecting aquatic ecosystems.

Sub-objective 2.3.2: Conduct Leading-Edge Research. By 2008, conduct leading-edge, sound scientific research to support the protection of human health through the reduction of human exposure to contaminants in drinking water, fish and shellfish, and recreational waters and to support the protection of aquatic ecosystems— specifically, the quality of rivers, lakes and streams, and coastal and ocean waters.

Means and Strategies for Achieving Objective 2.3

Drawing on Clean and Safe Water Science

Meeting the goal of clean and safe water requires that EPA effectively apply basic research findings to the specific needs of water programs. The Agency will draw on the results of basic research to prove and refine existing conclusions about drinking water safety and water quality. Critical scientific aspects of water program research include development of analytic test methods to support programs' scientific integrity; laboratory certification; and analysis of questions more commonly thought of as "social science," such as the costs and benefits of safe drinking water and healthy aquatic ecosystems.

Develop Analytic Test Methods

EPA establishes analytic test methods that describe laboratory procedures for measuring contaminant levels in drinking and surface waters. In some cases, EPA itself develops methods; in other cases, the Agency approves alternative test procedures. Approximately 550 EPA-approved analytical methods exist for nearly 300 contaminants. These test methods support the development of drinking-water standards, surface-water quality criteria and standards, industrial discharge regulations, water monitoring, discharge permitting, pretreatment, and compliance.

EPA has several goals for improving the analytic methods program over the next 5 years. These include reducing the backlog of applications for approval of alternative test procedures, many involving new technology; developing new analytic methods that support increasingly more stringent levels of protection for some contaminants; and making analytic methods readily available to the public through a new Internet-based system.

Ensure Laboratory Certification

To ensure a sound scientific basis for determining whether a system has complied with EPA's drinking-water standards, each drinking-water regulation incorporates quality control and testing procedures for the laboratories that analyze drinking-water samples for contaminants. EPA's Drinking Water Laboratory Certification Program evaluates whether Agency, state, and privately owned laboratories are analyzing drinking-water samples accurately using approved laboratory methods and procedures, and whether they are properly implementing quality assurance plans. Only certified laboratories may analyze drinking-water samples.

Over the next 5 years, EPA will work to ensure that laboratories are appropriately classified as "certified," "provisionally certified," "interim certified," or "not certified." In making certification decisions, EPA will consider laboratory certification criteria, on-site audits conducted at least once every 3 years, and analysis of test samples.

Develop Methods for Valuing Ecological and Recreation Benefits

A related scientific effort is developing improved methods to assess and value ecological and recreational benefits that result from improvements in water quality. EPA is supporting studies of the monetary value of cleaner water for aquatic life and other ecological and recreational benefits, such as boating, and will use this information to develop more precise estimates of the benefits of water pollution control programs and requirements. This economic work is discussed in greater detail in Appendix 1.

Conducting Clean and Safe Water Research

EPA's water research program enables EPA to pursue its objectives for protecting human health and water quality. The Agency's Office of Research and Development (ORD) has developed multi-year plans for drinking water and water quality that describe the research it will conduct over the next 5 to 10 years.³⁷

Conduct Research to Protect Human Health

The Safe Drinking Water Act Amendments of 1996 direct EPA to conduct research to strengthen the scientific foundation for standards that limit public exposure to drinking-water contaminants. The Amendments contain specific requirements for research on waterborne pathogens, such as *Cryptosporidium* and Norwalk virus; disinfection by-products; arsenic; and other harmful substances in drinking water. EPA is also directed to conduct studies to identify and characterize population groups, such as children, that may be at greater risk from exposure to contaminants in drinking water than is the general population.

In response to these requirements, EPA will conduct a multi-disciplinary research program that addresses exposure, health effects, risk assessment, and risk management. Research to support water quality programs will also focus on developing and implementing ambient water quality criteria to protect uses of aquatic ecosystems, including fishing and recreation.

Conduct Research to Protect Water Quality

The water quality research program supports the Agency and its partners in developing and applying criteria for designated uses and in developing tools to diagnose and assess impairment and restore and protect aquatic systems. While water quality research addresses a wide spectrum of aquatic ecosystem stressors, it pays particular attention to stressors that the Agency most often cites as impairing water bodies: embedded and suspended sediment, nutrients, and pathogens and pathogen indicators.

The products that result from these research efforts will be useful to a variety of water

programs. For example, information on risk management and restoration of waters impaired by sediment will be helpful to the TMDL program, as well as to voluntary watershed protection initiatives, in developing site-specific management alternatives. A report to be developed demonstrating the use of time series analysis to identify nonpoint source impacts can be used by the Agency's nonpoint source, TMDL, and monitoring programs to identify sources of water quality impairment. And a report to be developed describing factors and processes that control the fate of nutrients in streams will assist the Agency in determining in-stream nutrient thresholds and developing TMDLs.

EXTERNAL FACTORS

EPA's strategies for achieving clean and safe water depend on substantial contributions and investments by many public and private entities.

States are primary partners in implementing both clean water and safe drinking-water programs. Many states, however, are facing budget problems and even deficits. EPA recognizes that state budget shortfalls are an external factor that may limit progress toward clean and safe water goals.

Consistent with the federal government's unique trust responsibility to federally recognized tribes, EPA implements programs in Indian country, helps build tribal capacity to administer clean and safe water programs, and works with authorized tribes as co-regulators. Tribal resource needs are great. Unlike states, many tribes are still developing programs to administer clean and safe water programs. Inadequate progress in developing these programs will limit progress toward clean water goals.

Local governments play a critical role in implementing clean and safe water programs. Municipalities and other local entities have proven to be strong partners with states and the federal government in the financing of wastewater treatment and drinking-water systems, and continued partnership in financing these systems is essential to meeting water goals. Despite sometimes significant resource limits, municipalities are also now taking on additional responsibilities for addressing storm-water and CSOs. In the case of the drinking-water program, effective local management of drinking-water systems, including protection of source waters, is essential to maintaining high rates of compliance with drinking-water standards. Ninety-five percent of the 160,000 or more public water systems responsible for meeting drinking-water safety standards are small systems that often struggle to provide safe drinking water.³⁸ Continued consultation with local governments is critical to achieving clean and safe water.

Several key elements of the national water program, including nonpoint source control, source water protection, and watershed management, require broad partnerships among many federal, state,

and local agencies. Over the next several years, building partnerships with the agricultural community (such as USDA, state agricultural agencies, and local conservation districts) is a top priority for meeting clean water goals. We must also continue to provide water quality data and technical assistance that can help USDA target its runoff control programs.

EPA relies on many other agencies to provide monitoring data to measure progress toward its goal of clean and safe water. States lead the effort in water quality monitoring. Other agencies provide critical information as well, such as the USGS, which maintains water monitoring stations throughout the nation, and NOAA, which provides information on coastal waters. EPA also relies on COE to co-administer the Section 404 program of the Clean Water Act. In fact, COE acts as the lead federal agency for permitting the discharge of dredged or fill material and, as part of its civil works projects, addressing dredged material management and disposal issues in U.S. waters. In addition to the domestic activities that support the 2002 World Summit goal, EPA will continue working internationally in support of the U.S. government effort to help fulfill this goal. We will continue to work with the U.S. Agency for International Development, the U.S. Department of State, and other interested stakeholders to improve access to safe drinking water and sanitation.

Finally, all of the EPA's coastal and oceans activities are carried out in partnership with other federal agencies and, in some cases, international, state, local and private entities as well. EPA relies on its work with the Department of Defense, the Coast Guard, Alaska and other states, and a number of cruise ship and environmental and nongovernmental organizations regarding regulatory and nonregulatory approaches to managing wastewater discharges from vessels. Meeting ocean and coastal goals will also depend on the extent to which the growth in coastal areas is directed in ways that minimize effects on water quality.

Human Capital Focus For Achieving Goal 2

EPA needs to strengthen the knowledge, skills, and abilities of staff involved in implementing core water programs, including those of the scientists involved in establishing drinking water standards and developing water quality criteria. Success also depends on stakeholder partnerships and cooperation. EPA will:

- Train federal, state, local, and tribal employees in such areas as community development, communication, and effective listening
- Exchange staff with other federal agencies, such as USDA
- Enter into intergovernmental assignments between EPA and our state and tribal partners

Efficiency Measures For Goal 2

Efficiency measures relate results to the resources or time invested to achieve those results and augment effectiveness measures in evaluating performance. They help us integrate EPA's budget and performance—part of the President's Management Agenda—and demonstrate the cost-effectiveness and timeliness of program activities.

In this goal, EPA's efficiency measures will track the utilization rate—the ratio of the cumulative dollars lent to the cumulative funds available for projects—for both the Drinking Water State Revolving and Clean Water State Revolving Funds:

As a measure of efficiency, the Agency tracks each fund's utilization rate, which is the ratio of the cumulative loan agreement dollars to cumulative funds available for projects.

Notes

1. U.S. Environmental Protection Agency. 1998. *Clean Water Action Plan: Restoring and Protecting America's Waters*. Washington, DC: Government Printing Office.
2. Travel Industry Association of America. 2002. *Tourism Works for America*, 11th Edition. Washington, DC: Travel Industry of America.
3. Pew Oceans Commission. 2002. *America's Living Oceans Charting a Course for Sea Change*. Arlington, VA: Pew Oceans Commission.
4. U.S. Fish and Wildlife Service. 2002. *2001 National Survey of Fishing, Hunting and Wildlife-Associated Recreation*. Washington, DC: Government Printing Office.
5. National Marine Fisheries Service. 2002. *Fisheries of the United State 2001*. Washington, DC: Government Printing Office.
6. U.S. Environmental Protection Agency. 1998. *Clean Water Action Plan: Restoring and Protecting America's Waters*. Washington, DC: Government Printing Office.
7. U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water Accessing, Drinking Water Data in SDWIS/Fed (Safe Drinking Water Information System/Federal Version) Web Site, <http://www.epa.gov/safewater/data/getdata.html>.
8. U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water Accessing, Drinking Water Data in SDWIS/Fed (Safe Drinking Water Information System/Federal Version) Web Site, <http://www.epa.gov/safewater/data/getdata.html>.
9. U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water Accessing, Drinking Water Data in SDWIS/Fed (Safe Drinking Water Information System/Federal Version) Web Site, <http://www.epa.gov/safewater/data/getdata.html>.
10. Information collected from EPA regions and housed in an internal EPA database. For more information, contact the Drinking Water Protection Division, Prevention Branch, at 202 564-3797.
11. Indian Health Service. 2001. *The Sanitation Facilities Construction Program of the Indian Health Service Public Law 86-121 Annual Report for 2001*. Bethesda, MD: Indian Health Service Division of Sanitation Facilities Construction.
12. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology. "National Listing of Fish and Wildlife Advisories." Washington, DC. Available online at <http://map1.epa.gov>. Date of Access: May 1, 2003.
13. U.S. National Oceanic and Atmospheric Administration. 1998. Classified Shellfish Growing Waters. In *State of the Coast Report*. Silver Spring, MD: National Oceanic and Atmospheric Administration.

14. 2000 303(d) information (waters impaired for swimming) comes from: U.S. Environmental Protection Agency. *States' Listing of Impaired Waters as Required by Clean Water Act Section 303(d)*. Washington, DC. Available online at <http://epa.gov/waters/>. Date of Access: June 2002.
15. The Heinz Center for Science, Economics, and the Environment. 2002. *The State of the Nations's Ecosystems; Measuring the Lands, Waters, and Living Resources of the United States*. Washington, DC:Cambridge University Press.

Centers for Disease Control and Prevention. 2002. Surveillance for Waterborne Diseases Outbreaks – United States, 1999 – 2000 Web Site. Atlanta, GA. Available online at <http://www.cdc.gov/mmwr/preview/mmwrhtml/ss5108a1.htm>: CDC Morbidity and Mortality Weekly Review.
16. U.S. Environmental Protection Agency. Office of Water. *National Health Protection Survey of Beaches*. Washington, DC. Available online at <http://www.epa.gov/waterscience/beaches/>. Date of Access: May 23, 2003.
17. U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water Accessing, Drinking Water Data in SDWIS/Fed (Safe Drinking Water Information System/Federal Version) Web Site, <http://www.epa.gov/safewater/data/getdata.html>.
18. U.S. Environmental Protection Agency. 2002. *The Clean Water and Drinking Water Infrastructure Gap Analysis*. Washington, DC: Government Printing Office.
19. United Nations. 2002. *Report of the World Summit on Sustainable Development: Johannesburg, South Africa, 26 August - 4 September, 2002*. New York, NY:United Nations.
20. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology. *National Listing of Fish and Wildlife Advisories*. Washington, DC. Available online at <http://map1.epa.gov>. Date of Access: May 1, 2003.
21. U.S. National Oceanic and Atmospheric Administration. 1998. Classified Shellfish Growing Waters. In *State of the Coast Report*. Silver Spring, MD: National Oceanic and Atmospheric Administration.
22. U.S. Environmental Protection Agency, Office of Water, Office of Science and Technology. *National Listing of Fish and Wildlife Advisories*. Washington, DC. Available online at <http://map1.epa.gov>. Date of Access: May 1, 2003.
23. U.S. Environmental Protection Agency. Tuesday, April 19, 1994. Combined Sewer Overflow (CSO) Control Policy. *Federal Register* Vol. 59, No. 75, page 18788.
24. Data from a Report to Congress under development. Consolidated Appropriations Act for Fiscal Year 2001, *Public Law 106-554* requires that EPA submit a Report to Congress by December 2003, addressing the impacts caused by CSOs and SSOs. Data collected for this report as of November 2002, indicate 842 CSO permits held by 772 communities with CSOs; 748 (88.8 percent) include requirements for the Nine Minimum Controls (NMC). 34 percent have submitted draft LTCPs; 17 percent have begun implementation. .

25. U.S. Environmental Protection Agency. 2003. *Accomplishments Report*. Washington, DC: Government Printing Office
26. 2000 303(d) information (waters impaired for swimming) comes from: U.S. Environmental Protection Agency. *States' Listing of Impaired Waters as Required by Clean Water Act Section 303(d)*. Washington, DC. Available online at <http://epa.gov/waters/>. Date of Access: June 2002.
27. The Heinz Center for Science, Economics, and the Environment. 2002. *The State of the Nations's Ecosystems; Measuring the Lands, Waters, and Living Resources of the United States*. Washington, DC: Cambridge University Press.
28. The Heinz Center for Science, Economics, and the Environment. 2002. *The State of the Nations's Ecosystems; Measuring the Lands, Waters, and Living Resources of the United States*. Washington, DC: Cambridge University Press.
29. The Heinz Center for Science, Economics, and the Environment. 2002. *The State of the Nations's Ecosystems; Measuring the Lands, Waters, and Living Resources of the United States*. Washington, DC: Cambridge University Press.
30. Indian Health Service. 2001. *The Sanitation Facilities Construction Program of the Indian Health Service Public Law 86-121 Annual Report for 2001*. Bethesda, MD: Indian Health Service Division of Sanitation Facilities Construction.
31. U.S. Environmental Protection Agency. 2002. *National Coastal Condition Report*. Washington, DC: Government Printing Office.
32. Ruiz, Gregory. 2000. Invasion of coastal marine communities in North America: Apparent patterns, processes, and biases. *Annual Review of Ecology and Systematics* 31: 481-531.
33. U.S. Environmental Protection Agency, Office of Water. August 2003. *Strategy for Water Quality Standards and Criteria: Setting Priorities to Strengthen the Foundation for Protecting and Restoring the Nation's Waters*. EPA-823-R-03-010. Washington, DC: Government Printing Office. Available online at <http://www.epa.gov/waterscience/standards/strategy>: EPA's Office of Water, Water Quality Standards.
34. U.S. Environmental Protection Agency. June, 2002. CWNIMS National Report. *CWSRF Funds Available for Projects, Net Sources*. Washington, DC: Government Printing Office.
34. U.S. Environmental Protection Agency. June, 2002. CWNIMS National Report. *CWSRF Funds Available for Projects, Net Sources*. Washington, DC: Government Printing Office.
36. United Nations. 2002. *Report of the World Summit on Sustainable Development: Johannesburg, South Africa, 26 August - 4 September, 2002*. New York: United Nations.
37. For more detailed information on ORD's multi-year plans, see: U.S. Environmental Protection Agency, Office of Research and Development. *Research Directions: Multi-Year Plans*. Washington, DC. Available online at <http://www.epa.gov/osp/myplan.htm>.

38. U.S. Environmental Protection Agency, Office of Ground Water and Drinking Water Accessing, Drinking Water Data in SDWIS/Fed (Safe Drinking Water Information System/Federal Version) Web Site, <http://www.epa.gov/safewater/data/getdata.html>.