United States
Environmental Protection
Agency

Office of Water
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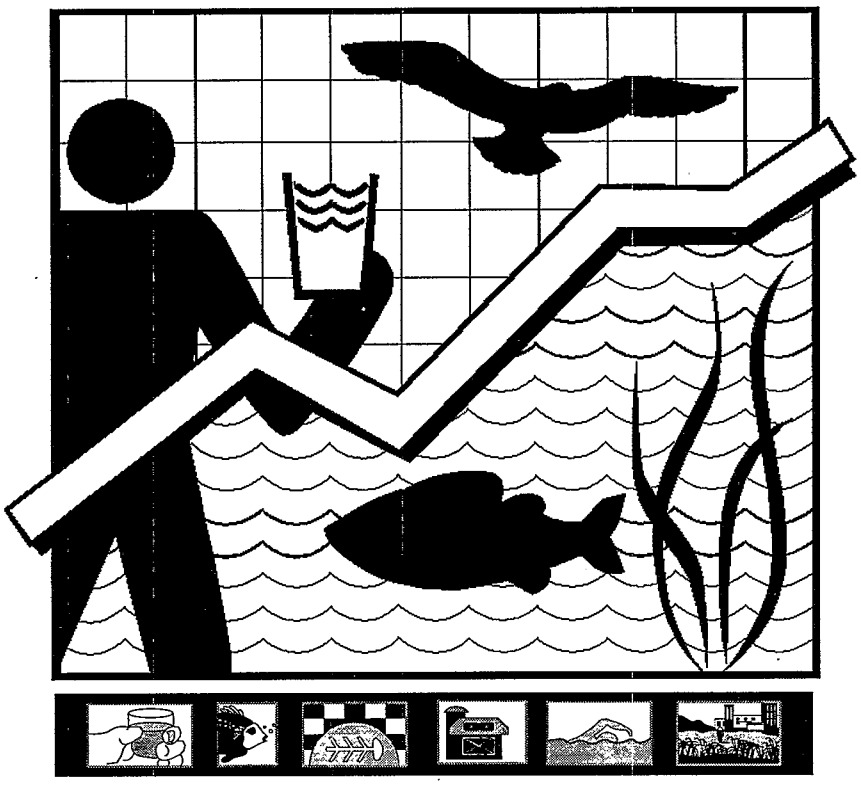
EPA

Environmental Indicators of Water Quality in the United States

Fact Sheets



These fact sheets accompany the environmental indicators report. They provide further details on the 18 environmental indicators that measure progress toward national water goals and objectives.

The indicators were chosen through an intensive multi-year process involving public and private partners including EPA's Office of Water in collaboration with the Center for Marine Conservation; the Centers for Disease Control and Prevention; EPA's Office of Policy, Planning, and Evaluation and Office of Research and Development; the Intergovernmental Task Force on Monitoring Water Quality; Native American Tribes; the National Oceanic and Atmospheric Administration; The Nature Conservancy; the States; the U.S. Department of Agriculture; the U.S. Fish and Wildlife Service; and the U.S. Geological Survey.

National Environmental Goals for Water

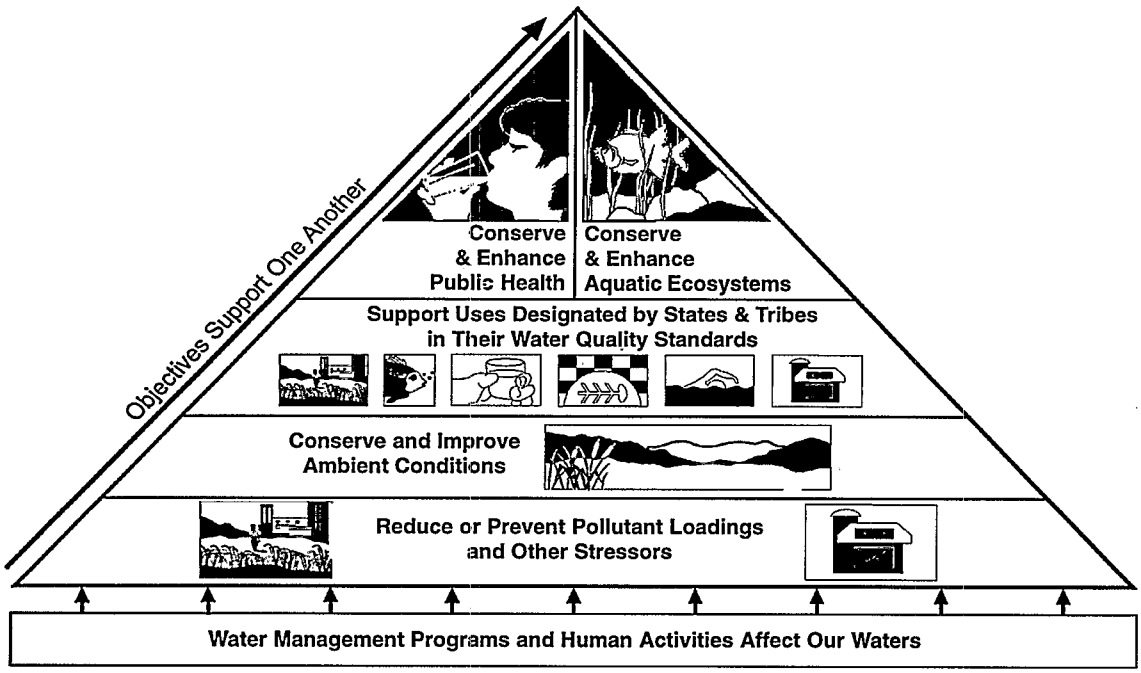
CLEAN WATERS: America's rivers, lakes, and coastal waters will support healthy communities of fish, plants, and other aquatic life, and will support uses such as fishing, swimming, and drinking water supply for people. Wetlands will be protected and rehabilitated to provide wildlife habitat, reduce floods, and improve water quality. Ground waters will be cleaner for drinking and other beneficial uses.

SAFE DRINKING WATER: Every American public water system will provide water that is consistently safe to drink.

Note: Goals taken from *Environmental Goals for America With Milestones for 2005: A Proposal from the Environmental Protection Agency.* Government Review Draft. EPA 230-D-96-002. Washington, DC: USEPA. In press.

Water Objectives to Meet These Goals

Objectives are measured by indicators presented in this report



The objectives adopted by EPA's Office of Water and its partners are shown above. These objectives are like building blocks in a pyramid, where success in reaching the goals at the top is dependent on successful attainment of those lower in the pyramid. For example, by reducing pollutant loads to waters, the overall quality, or ambient condition, of the water and sediment is improved. Consequently, the waters can support the uses designated for them by states and tribes in their water quality standards. Ultimately, the health of both the general public and aquatic ecosystems is protected.

Indicator Data Completeness

Indicators are used to show changes in environmental conditions and are only as good as the quality of the measurements that support them. The indicators presented in this report contain measurements of varying quality. These measurements might differ in precision, accuracy, statistical representativeness, and completeness. This comprehensive national report uses data from many agencies. While these data sources have undergone data quality assessment by their respective agencies, this first national report makes no attempt to describe data quality attributes other than completeness for the indicators. This report includes data of varying quality for two reasons: (1) the indicator describes an important, if as yet imperfect, way to measure a national objective, and (2) efforts are under way to improve indicator measurements in future reports. Further details on the data used to support each indicator are presented in individual fact sheets available from EPA in hard copy or on the Internet at the address at the end of this report. Each indicator graphic in this report shows the level of data completeness using the following symbols:

- ● Data consistent/sufficient data collected
- ◗ Data somewhat consistent/additional data needed
- ○ Data need to be much more consistent/much additional data needed

Water Quality Objectives and Indicators

Objective I: Conserve and Enhance Public Health

1. *Population served by community drinking water systems violating health-based requirements*—Population served by drinking water systems with one or more violations of health-based requirements.
2. *Population served by unfiltered surface water systems at risk from microbiological pollution*—Population served by, and number of, systems that have not met the requirements to filter their water to remove microbiological contaminants.
3. *Population served by drinking water systems exceeding lead action levels*—Population served by, and number of, systems with lead levels in drinking water exceeding the regulatory threshold.
4. *Source water protection*—Number of community drinking water systems using ground water that have programs to protect them from pollution.
5. *Fish consumption advisories*—Percentage of rivers and lakes with fish that states have determined should not be eaten, or should be eaten in only limited quantities.
6. *Shellfish growing water classification*—Percentage of estuarine and coastal shellfish growing waters approved for harvest for human consumption.

Objective II: Conserve and Enhance Aquatic Ecosystems

7. *Biological integrity*—Percentage of rivers and estuaries with healthy aquatic communities.
8. *Species at risk*—Percentage of aquatic and wetland species currently at risk of extinction.
9. *Wetland acreage*—Rate of wetland acreage loss.

Objective III: Support Uses Designated by the States and Tribes in Their Water Quality Standards

10. *Designated uses in state and tribal water quality standards*
    a. *Drinking water supply designated use*—Percentage of assessed waterbodies that can support safe drinking water supply use, as designated by the states and tribes.
    b. *Fish and shellfish consumption designated use*—Percentage of assessed waterbodies that can support fish and shellfish consumption, as designated by the states and tribes.
    c. *Recreation designated use*—Percentage of assessed waterbodies that can support safe recreation, as designated by the states and tribes.
    d. *Aquatic life designated use*—Percentage of assessed waterbodies that can support healthy aquatic life, as designated by the states and tribes.

Objective IV: Conserve and Improve Ambient Conditions

11. *Ground water pollutants*—Population exposed to nitrate in drinking water. In the future, the indicator will report the presence of other chemical pollutants in ground water.
12. *Surface water pollutants*—Trends of selected pollutants found in surface water.
13. *Selected coastal surface water pollutants in shellfish*—The concentration levels of selected pollutants in oysters and mussels.
14. *Estuarine eutrophication conditions*—Trends in estuarine eutrophication conditions.
15. *Contaminated sediments*—Percentage of sites with sediment contamination that might pose a risk to humans and aquatic life.

Objective V: Reduce or Prevent Pollutant Loadings and Other Stressors

16. *Selected point source loadings to (a) surface water and (b) ground water*—Trends for selected pollutants discharged from point sources into surface water, and underground injection control wells that are sources of point source loadings into ground water.
17. *Nonpoint source loadings to surface water*—Amount of soil eroded from cropland that could run into surface waters. Future reports will include additional nonpoint source surface water pollutants as well as sources of nonpoint source ground water pollution.
18. *Marine debris*—Trends and sources of debris monitored in the marine environment.

POPULATION SERVED BY COMMUNITY DRINKING WATER SYSTEMS VIOLATING HEALTH-BASED REQUIREMENTS

What does the indicator tell us?

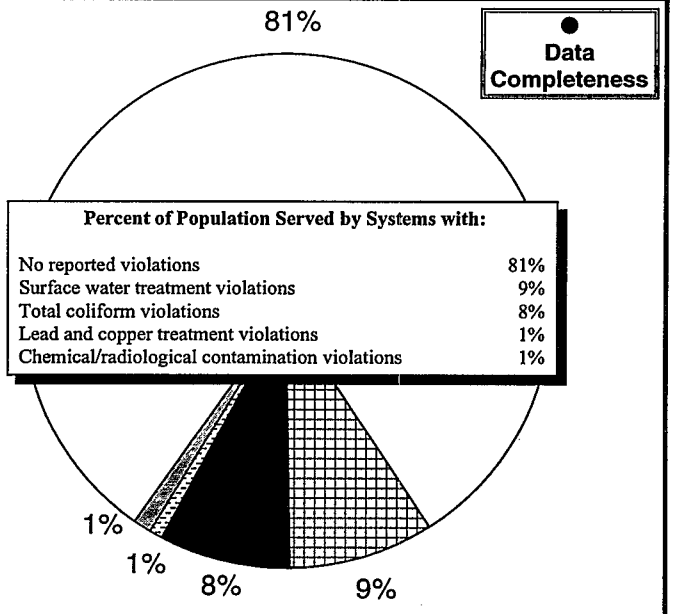
This indicator displays the population provided water in 1994 by community water systems that violated one or more of the health-based requirements during that year. By tracking drinking water violations, the relative risk to humans of exposure to harmful levels of contaminants in drinking water can be illustrated. In 1994, more than 45 million people (19 percent of the population) were served by community drinking water systems that violated health-based requirements at least once during the year. This measure is a "rough cut" indicator of potential exposure to harmful levels of contaminants that have the potential to adversely affect public health. This indicator does not illustrate the persistence of contaminants in drinking water or their level above the violation.

How will the indicator be used to track progress?

EPA and the states regulate approximately 200,000 public drinking water systems that serve more than 240 million people. Public water systems are defined as systems that provide piped water for human consumption to at least 15 service connections or serve an average of at least 25 people for at least 60 days each year. Approximately 60,000 of these water systems are known as community drinking water systems—systems that provide water to the same population year-round. The remaining 120,000 are noncommunity water systems that provide drinking water for nonresidential use (e.g., workplaces, schools, restaurants).

The concentration of contaminants in drinking water provided by water systems to consumers is strictly controlled by standards established to minimize or eliminate risk to human health. Under the 1974 Safe Drinking Water Act and the 1986 Amendments, EPA sets national limits on contaminant levels in drinking water to ensure that the water is safe for human consumption. These limits are known as Maximum Contaminant Levels (MCLs). For some regulations, EPA establishes treatment techniques in lieu of an MCL to control unacceptable levels of contaminants in water. In general, these standards or limits are referred to as health-based requirements and they address several areas including surface water treatment, total coliform, lead and copper treatment, and chemical/ radiological contamination.

INDICATOR 1: Population Served by Community Drinking Water Systems Violating Health-Based Requirements



Note: As many as one-fourth of the water systems did not complete all required monitoring. The compliance status of some of these could not be assessed from reported data. 243 million people were served by community drinking water systems in 1994

Source: State data in EPA Safe Drinking Water Information System, 1994

Proposed Milestone: By 2005, the population served by community water systems in violation of health requirements will be reduced from 19 to 5 percent.

Indicator 1: Population Served by Systems Violating Health-Based Requirements

When violations of health-based requirements occur, water systems are compelled to remove the contaminants or face penalties under EPA and state regulatory programs. More than 80 percent of the population is served by community water systems that reported no violations of drinking water health-based requirements during fiscal year 1994. EPA plans to use the newly developed Safe Drinking Water Information System (SDWIS) to report on the number and types of violations reported from public water systems.

The Agency also regulates how often public water systems monitor their water for contaminants and report the monitoring results to the states or EPA. Generally, the larger the population served by a water system, the more frequent monitoring and reporting are required. In addition, EPA requires PWSs to monitor for unregulated contaminants to provide data on occurrences for future regulatory development. EPA also requires PWSs to notify the public when they have violated any of the regulations.

What is being done to improve the indicator?

Data quality and the process used to report on drinking water system regulatory compliance are critical factors in determining the quality of this indicator. The current data quality can be improved for many states. The Government Accounting Office and EPA have concluded that the overall rate of noncompliance is understated.

In an effort to improve the data used by this indicator, EPA and the states are jointly pursuing a modernization initiative to upgrade and improve their drinking water information systems. EPA is replacing the Federal Reporting Data System with SDWIS. States are now testing the first components of SDWIS, which will improve both data quality and reporting of violations. With the cooperation of the states, EPA will be able to use SDWIS to improve the oversight and management of drinking water programs.

The objective of the SDWIS modernization is to improve the accessibility and quality of the drinking water data that EPA and states provide to the public. The data available through SDWIS might allow better and more targeted measures of the occurrence of contaminants in drinking water by providing information on the type of contaminant, the duration of occurrence, and the degree to which the maximum contaminant level was exceeded.

What is being done to improve conditions measured by the indicator?

EPA currently has drinking water standards in place for 81 contaminants, and several major new regulatory actions are in progress. EPA's drinking water program has promulgated standards designed to protect people from drinking water contaminated by fecal coliform, organic and inorganic chemicals, lead and copper, radionuclides, and by-products from water treatment chemicals. As part of the Safe Drinking Water Act reauthorization process, EPA has identified activities to address the major issues facing the drinking water program today:

- *Building State Capacity to Implement Programs*—Eliminating the gap between needs and funding by increasing federal grants while encouraging states to seek alternative financing.
- *Revising the Mandate to Add 25 New Standards Every 3 Years*—Reducing the number of regulated contaminants to allow EPA to focus on those contaminants which pose real, known public health risks.
- *Enacting a Source Water Protection Program*—Allowing states to ensure drinking water quality by protecting the water at the source, thereby reducing the amount of expensive treatment required.
- *Addressing Problems Facing Small Systems*—Reducing the regulatory burden on small water systems and providing support for building viable water systems.

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Water Environmental Indicators
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POPULATION SERVED BY UNFILTERED SURFACE WATER SYSTEMS AT RISK FROM MICROBIOLOGICAL CONTAMINATION

What does the indicator tell us?

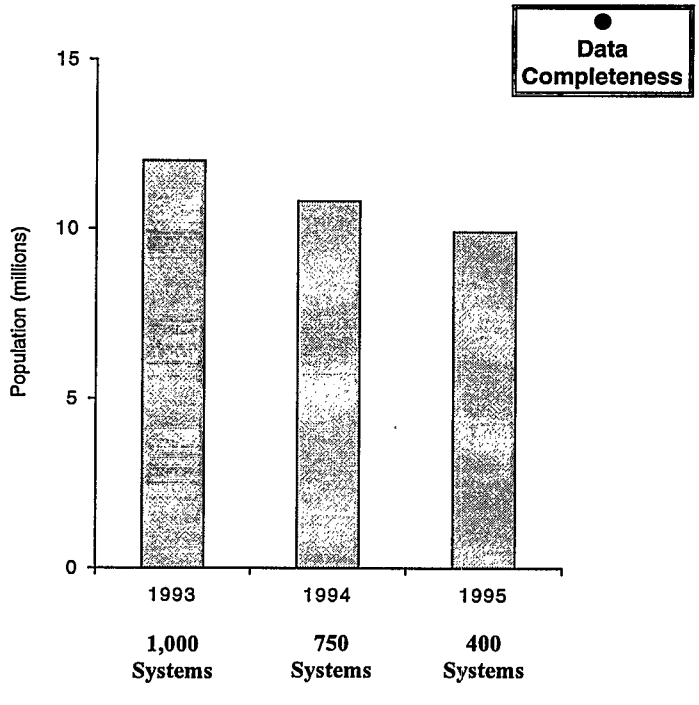
Drinking water systems supplied by surface waters can sometimes withdraw water that contains harmful levels of disease-causing microbiological contaminants, such as *Giardia lamblia, Legionella,* and viruses. Under the Surface Water Treatment Rule (SWTR), EPA and the states require all inadequately protected drinking water systems using surface water sources to install filtration and disinfection treatment to remove these microbiological contaminants from the drinking water. Compliance with the rule will dramatically reduce the probability of human exposure to harmful levels of microbiological contaminants from surface water sources.

This indicator displays the population provided water by unfiltered surface water systems that did not comply with the SWTR requirements that went into effect in 1993. Over 12 million people were provided drinking water from more than 1,000 unfiltered community water systems not in compliance with the SWTR in 1993. These numbers decreased in 1995, with approximately 9.9 million people being provided drinking water from 400 systems not in compliance with the rule.

How will the indicator be used to track progress?

EPA's Office of Ground Water and Drinking Water, in coordination with the Office of Enforcement and Compliance Assurance (OECA), will use the Safe Drinking Water Information System (SDWIS) to track both the number of systems in non compliance with the SWTR and the population served by these systems. States report this information to EPA on a quarterly basis, in accordance with regulations governing delegation of the drinking water program to the states.

INDICATOR 2: Population Served by Unfiltered Surface Water Systems at Risk from Microbiological Pollution



Source: State data in EPA Safe Drinking Water Information System, 1994

Proposed Milestone: By 2005, every person served by a public water system that draws from an unprotected river, lake, or reservoir will receive drinking water that is adequately filtered.

Indicator 2: Population Served By Unfiltered Surface Water Systems

This indicator uses the SWTR compliance program status as a surrogate measure of the risk to the population from using drinking water from inadequately protected water sources. This program evaluation is being undertaken as a pilot project for EPA under the Government Performance and Results Act, which requires all federal agencies to have a strategic planning process including clearly stated goals and indicators to measure them.

What is being done to improve the indicator?

Data quality and the process used to report on drinking water system regulatory compliance are critical factors in determining the quality of this indicator. The current quality of the SWTR database is questionable in some states.

In an effort to improve the data for this indicator, EPA and the states are jointly pursuing a modernization initiative to upgrade and improve their drinking water information systems. EPA is replacing the Federal Reporting Data System with the Safe Drinking Water Information System. States are now testing the first components of SDWIS, which will improve both data quality and reporting of violations. With the cooperation of the states, EPA will be able to use SDWIS to improve the oversight and management of drinking water programs.

The objective of the SDWIS modernization is to improve the accessibility and quality of the drinking water data that EPA and states provide to the public. The SWTR database is now being integrated into SDWIS, which will make data management more efficient and improve data quality and analyses of program performance.

What is being done to improve conditions measured by the indicator?

Through aggressive action by EPA, the states, and the water systems themselves, the risk of human exposure to microbiological contaminants is being reduced. By the end of fiscal year 1995, the number of surface water systems not complying with the SWTR was reduced from 1,000 to 400. However, because most of the progress has been made in small and medium water systems, the population at risk has not dropped as dramatically—from 12 million to 9.9 million.

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Population Served By Community Drinking Water Systems Exceeding Lead Action Levels

What does the indicator tell us?

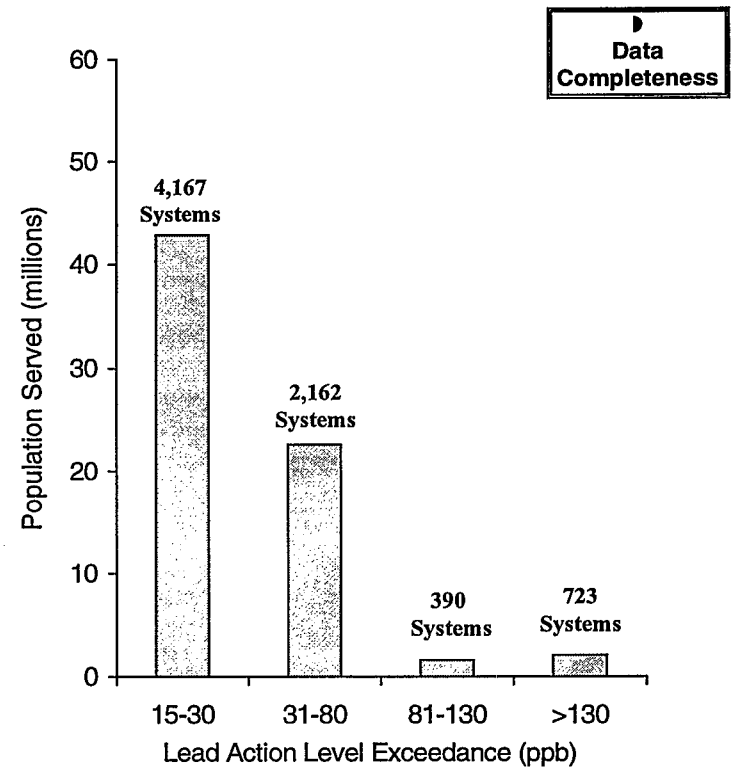
This indicator measures the population provided water by community water systems that have exceeded lead action levels and are required to take corrective action. It is not a precise predictor of the risk of exposure to the general population provided water by the targeted water systems. The monitoring results reflect the situation in only the worst portions of the distribution system and represent only the relative probability of risk for consumers of those targeted water systems.

Based on the results of lead monitoring through fiscal year 1995, 69.1 million people were provided drinking water by water systems that exceeded the action level of 15 parts per billion (ppb) at least once. Of that number, 42.8 million people were provided water by systems where sampling results showed lead levels between 15 and 30 ppb, and 26.3 million people received water from systems where sampling results showed lead levels over 30 ppb, which EPA views as a significant exceedance. About 2.1 million people received water from water systems where sampling results showed lead levels greater than 130 ppb. Higher exceedances increase the probability that people consuming water are at risk.

How will the indicator be used to track progress?

EPA, under its Lead and Copper Rule, requires that water systems follow a series of steps to reduce the likelihood of lead entering the drinking water from distribution system materials. Water systems are required to monitor for lead in their distribution systems and

INDICATOR 3: Population Served by Community Drinking Water Systems Exceeding Lead Action Levels



Source: State data in EPA Safe Drinking Water Information System, 1995

to take action when lead in more than 10 percent of the samples taken at the tap exceeds the regulatory action level of 15 ppb. Depending on the size and type of the system, actions range from establishing a public education program to implementing corrosion control treatment or replacing lead pipes. EPA requires large systems to install lead controls regardless of sampling results. The lead monitoring data for water systems exceeding the lead action level are contained in EPA's Safe Drinking Water Information System (SDWIS).

What is being done to improve the indicator?

Data quality and the process used to report on drinking water system regulatory compliance are critical factors in determining the quality of this indicator. This indicator measures the results of lead monitoring required under the Lead and Copper Rule. It shows exceedances of an action level defined in the rule to trigger additional actions. It is not in itself an indicator of a drinking water standard violation. The quality and completeness of the data for this indicator is questionable in some states.

In an effort to improve the indicator, EPA and the states are jointly pursuing a modernization initiative to upgrade and improve their drinking water information systems. EPA is replacing the Federal Reporting Data System with the Safe Drinking Water Information System. States are now testing the first components of SDWIS, which will improve both data quality and reporting of violations. With the cooperation of the states, EPA will be able to use SDWIS to improve the oversight and management of drinking water programs.

The objective of the SDWIS modernization is to improve the accessibility and quality of the drinking water data that EPA and states provide to the public. The new system will make reporting of lead monitoring results more efficient and data validation more complete.

What is being done to improve conditions measured by the indicator?

EPA estimates that 20 percent of human exposure to lead is attributable to lead in drinking water. Lead enters the drinking water through pipes in the distribution system, lead service lines, and household plumbing, including faucets and other fixtures. Lead in drinking water, however, is controllable through actions taken by water systems and their customers. Under the Lead and Copper Rule, EPA has established a series of steps that water systems must take to reduce the likelihood of lead entering drinking water from distribution system materials. These steps include corrosion control treatment and lead service line replacement.

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SOURCE WATER PROTECTION

What does the indicator tell us?

To protect drinking water sources even before water is withdrawn by a supplier, EPA has instituted the Source Water Protection Program. Currently, the program protects ground water used for drinking water by requiring the (1) delineation of the ground water area to be protected, (2) identification of potential sources of contamination, (3) development of contingency plans in case of a threat to the drinking water source, and (4) development of source management plans to control potential sources of contamination. Source water protection will be extended to surface waters.

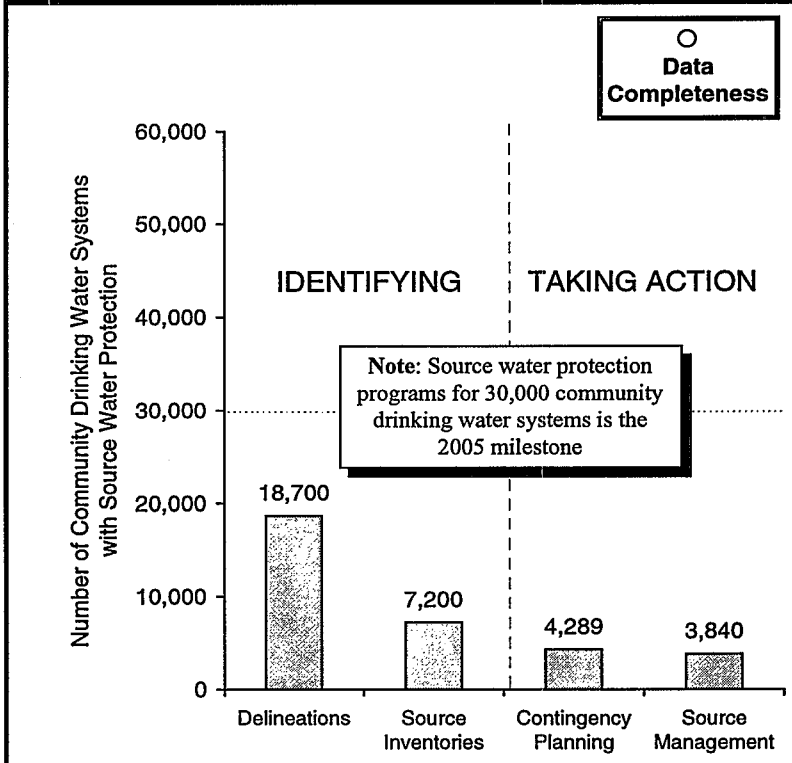
This indicator focuses on state progress in implementing the critical elements of ground water protection programs established to protect drinking water sources. Approximately 3,800 of the 60,000 community drinking water systems are covered by all four parts of the ground water protection program.

How will the indicator be used to track progress?

The Safe Drinking Water Act established EPA's Wellhead Protection (WHP) program. The WHP program requires states to develop systematic and comprehensive programs to protect public ground water supplies. To measure progress toward implementing ground water protection programs, EPA will track local-level implementation through the WHP program report. States are required to produce these reports every 2 years in an effort to update EPA and the public on the status of their drinking water protection programs.

These reports will help in determining the reduction in the number of people potentially exposed to harmful contaminants found in ground water used as a community drinking water source. It also will assess the adequacy of the pollution prevention controls that are critical to the safety of ground water used as drinking water supplies.

INDICATOR 4: Source Water Protection



Source: State Biennial Wellhead Reports to EPA, 1993

Proposed Milestone: By 2005, 60 percent of the population served by community water systems will receive their water from systems with source water protection programs in place.

What is being done to improve the indicator?

The 1995 guidelines for the wellhead protection report were expanded to include state reporting of communities relying on surface water. This tracking mechanism will measure not only the number of community water systems with ground water and surface water protection, but also the population protected. As more states begin to establish wellhead protection areas and implement ambient and compliance monitoring, the information might be used to validate the effectiveness of the source water protection program.

What is being done to improve conditions measured by the indicator?

The goal of reducing the number of people potentially exposed to harmful contaminants from community drinking water supplies is consistent with the compliance policies and programs of the current public water system regulatory program. Implementing source water protection programs around water systems reflects a new direction toward preventing pollution at the source.

Prevention is often more cost-effective than cleanup. This indicator might forecast dramatic changes in current EPA policies and programs and might alter what is expected of public water suppliers. The outline of the new approach is included in EPA's reauthorization recommendations, which would provide alternative regulatory programs for water systems in designated source water protection areas.

Well-implemented and enforced local prohibition ordinances can be a primary means for managing potential contamination sources. Also, data on maximum contaminant level violations for nitrates, volatile organic compounds, and pesticides can be used to illustrate the value of source water program implementation in preventing drinking water contamination.

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FISH CONSUMPTION ADVISORIES

What does the indicator tell us?

This indicator identifies the percentage of river miles and lake acres for which fish consumption advisories have been issued. A total of 46 states have issued fish consumption advisories. Information obtained by EPA's Office of Science and Technology from state reporting efforts indicates that one or more fish consumption advisories have been issued for 14 percent of the Nation's lake acres and 4 percent of the Nation's river miles.

States issue fish consumption advisories to warn recreational and subsistence anglers and other members of the public of the risks associated with consuming contaminated noncommercial fish. A fish consumption advisory may involve one or more of the following warnings: (1) do not eat any fish caught in a certain area; (2) eat only a specified limited amount of fish, particularly if you are in a high-risk group (e.g., pregnant women or young children); or (3) eat fish only after special preparation.

The U.S. Food and Drug Administration is responsible for protecting consumers from contaminants in fish sold through interstate commerce.

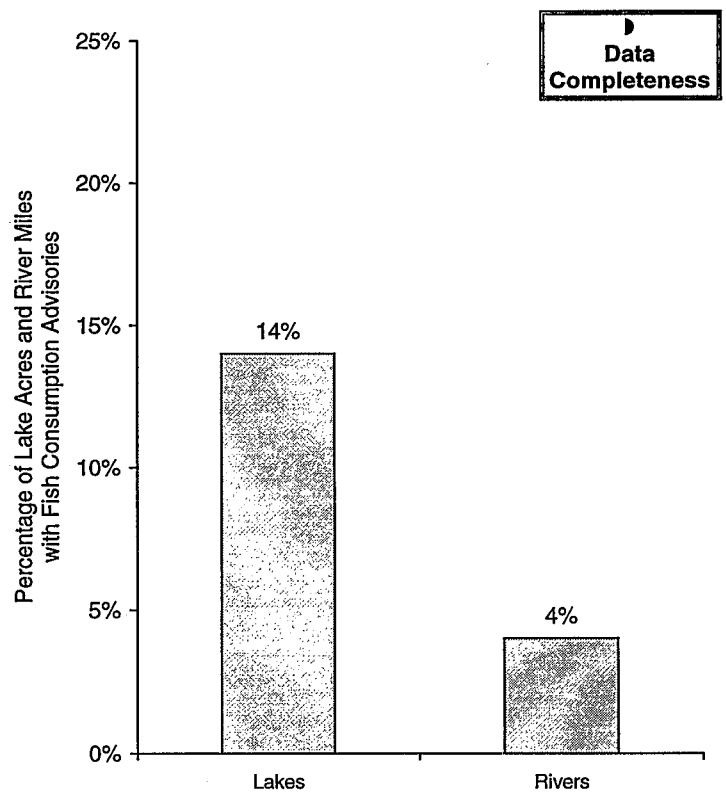
How will the indicator be used to track progress?

States provide EPA with information on fish consumption advisories. EPA collects and stores this information in the National Listing of Fish Consumption Advisories, which is updated annually. The database is used to map advisories by pollutant on a national, regional, state, and watershed basis. It helps identify the risks posed by a particular chemical on a geographic basis and could be used to target control, remediation, and risk management programs to high-risk areas.

What is being done to improve the indicator?

EPA is increasing the scope of the fish advisory program to include information on advisories for turtles, frogs, and waterfowl. The expanded database will be known as the National Listing of Fish and Wildlife

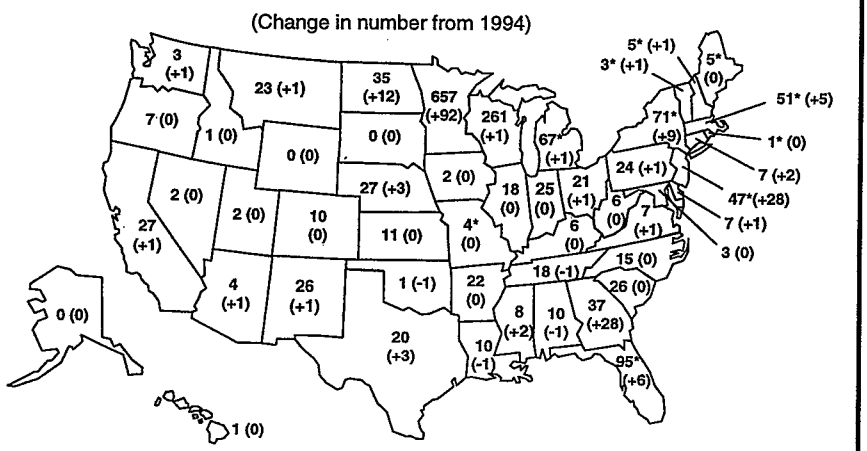
INDICATOR 5:
Fish Consumption Advisories



Source: State data reported to EPA's Office of Science and Technology, 1994

Consumption Advisories. Other improvements to the information system include listing the total river miles and lake acres under advisory and automatically calculating the percentage of waters covered by state-issued fish consumption advisories for 37 particular contaminants, including mercury, dioxin, chlordane, PCBs, and DDT. In addition, the information system will overlay county and major city lines and index the advisories with a code for the stream or river segment to enable integration of the National Listing with other geographic information systems. The 1995 update will be available on CD-ROM, diskette, or the Internet.

Number of Fish Advisories Issued by Each State in 1995



Note: This map depicts the number of waterbodies, by state, where fish consumption advisories were in effect in 1995 based on information reported to EPA by the states. Because of the variability of the information reported, the numbers depicted here do not reflect the geographic extent of chemical contamination of fish tissue in each state nor the extent of a state's monitoring efforts. An asterisk(*) denotes a state that has issued statewide advisories for particular pollutants or types of waterbodies.

To improve the comparability and consistency of state-issued fish consumption advisories and accuracy in reporting, EPA has published guidance for states to use in developing advisories and in notifying recreational and subsistence anglers of potential risk from contaminated fish. EPA periodically sponsors conferences and technical training sessions, and serves as a national clearinghouse for related information to assist states with their fish advisory programs.

EPA also is working with the states to link information from state agencies that issue fish consumption advisories with the information other state agencies provide on attainment of the fish and shellfish consumption designated use, gathered in compliance with section 305(b) of the Clean Water Act. This approach should result in more consistent information on fish consumption issues.

What is being done to improve conditions measured by the indicator?

Fish can become contaminated because of proximity to (1) a hazardous waste site, (2) a discharge outfall, (3) a chemical spill, (4) a public recreation area, or (5) a nonpoint source. Pollutants from these sources can also collect and persist in sediment and bioaccumulate through the food chain, becoming a potential hazard to aquatic life and human health.

As a result, EPA is working with its partners to place further restrictions on pollution from point sources, clean up Superfund sites, improve containment of accidental spills, and reduce nonpoint source pollution. These efforts should reduce the incidence of contaminated fish.

EPA is also developing a guidance document on managing the risks associated with fish consumption. The document will help states and tribes reduce loadings of high-risk chemicals to water and sediment. It will also provide guidance on the types of actions that states and tribes can take to reduce the risks to particularly susceptible individuals.

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SHELLFISH GROWING WATER CLASSIFICATION

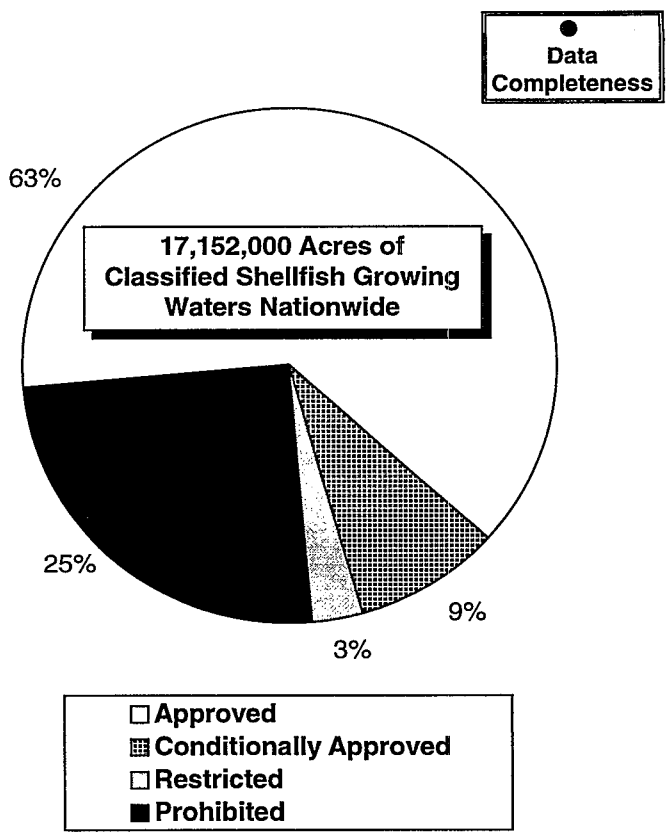
What does the indicator tell us?

This indicator shows the percentage of classifed shellfish growing waters nationwide where shellfish harvesting is (1) approved (waters may be harvested for direct marketing at all times); (2) conditionally approved (waters do not meet the criteria for approved waters if subjected to intermittent microbiological pollution, but may be harvested when criteria are met); (3) restricted (waters may be harvested if shellfish are subjected to a suitable purification process); and (4) prohibited (no harvest for human consumption at any time).

Harvest-limited classifications are assigned to waters based on water quality as well as management decisions. Classifications based on water quality are supported by sanitary surveys that identify actual pollution sources and water sampling data. Management decisions include mandatory buffer zones and wastewater treatment plant outfalls, marinas, and situations in which regulations requiring current and complete sanitary surveys have not been met. Thus, in cases where it is known that water quality problems are the cause of shellfish bed closures, this indicator could be used to determine the area and extent of pollution. Closures could also help determine pollution sources with the most impact and future problems that are likely to occur if no action is taken.

In 1990, 17 million estuarine acres were classified, with 63 percent approved for shellfish harvest—a 6 percent decline from 1985. Of the other 37 percent, termed harvest-limited acreage, 9 percent were conditionally approved for harvest under certain conditions, such as season, river stage, or amount of rainfall.

INDICATOR 6: Shellfish Growing Water Classification



Source: National Oceanic and Atmospheric Administration, 1990

How will the indicator be used to track progress?

All shellfish growing waters in the United States are classified using National Shellfish Sanitation Program guidelines developed by the Interstate Shellfish Sanitation Commission (ISSC) to protect the health of people who consume shellfish, such as oysters, clams, and mussels. These guidelines are based primarily on fecal coliform bacteria levels.

The ISSC includes representatives from states, industry, and the federal government. Every 5 years, the National Oceanic and Atmospheric Administration (NOAA), in cooperation with ISSC, produces the *National Register of Classified Estuarine Waters*, which catalogs the location, current acreage, classifications, and the reasons for the classifications.

What is being done to improve the indicator?

Although data on shellfish bed closures have been collected and published since 1966 for all 23 coastal states in the *Register*, it was not until 1990 that the collection process included information on the cause of harvest restrictions. The 1995 *Register*, the most accurate to date, will be released in late 1996 and will contain data for each shellfish growing area on (1) size, (2) location, (3) spatial extent, (4) harvest classification, (5) reason for harvest restriction, (6) relative abundance of the resources, (7) contributing pollution sources, and (8) the presence or absence of restoration activities, such as pollutant input reduction measures.

To perform trend analyses using this indicator, a base year must be established and data collected in subsequent years must reflect the same parameters and protocols used in the base year. Using 1995 as the base year would provide the most accurate baseline data on reasons for harvest-restricted classifications.

This is important because harvest restricted classifications might or might not be caused by problems with water quality. Other reasons for harvest restricted classifications include limited administrative resources, areas closed or opened for conservation purposes, or lack of a completed sanitary survey. However, accurately collecting data on the reasons for harvest restrictions ensures using only those harvest restrictions resulting from water quality problems.

In addition to the above improvements, changes should be considered in the way that NOAA collects *Register* information. Visiting all coastal states is extremely time-consuming, labor-ntensive, and expensive. If all states used the same geographic information system to track all elements of each shellfish growing water, data gathering, processing, and analysis could occur on a yearly basis.

What is being done to improve conditions measured by the indicator?

Shellfish are contaminated by several pollution sources including sewage treatment plants, industrial facilities, septic systems, and nonpoint sources. The largest increases in pollution of shellfish beds between 1985 and 1990 were attributed to urban runoff, septic systems, and boat pollution.

These increases reflect a common problem for shellfish areas—the influence of increased tourism and coastal development. As a result, EPA, NOAA, and their partners will enhance the protection of the Nation's shellfish areas by focusing on and improving coastal zone management efforts.

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BIOLOGICAL INTEGRITY

What does the indicator tell us?

This indicator shows data from (1) 31 states that currently have comprehensive biological monitoring programs in streams and wadeable rivers and (2) EPA's Environmental Monitoring and Assessment Program (EMAP), which uses biological monitoring to evaluate estuaries. Of those rivers and estuaries actually assessed for biological integrity, 50 percent of rivers and 74 percent of estuaries have healthy aquatic communities.

Pronounced changes in these biological communities indicate a disruption of healthy environmental conditions and can be useful in identifying cumulative effects of pollutants, habitat alteration that is difficult to see, effects from bioaccumulative chemicals, and other impacts that chemical monitoring does not reveal.

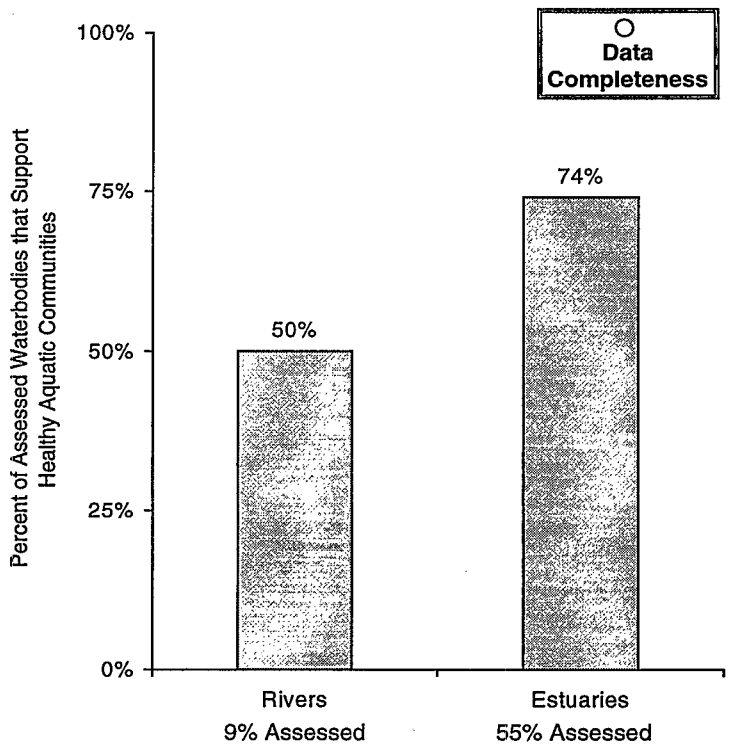
How will the indicator be used to track progress?

The data for rivers and streams are based on state monitoring programs that compare the aquatic organisms monitored at many locations to the expected composition, abundance, and condition of aquatic organisms typical of a minimally impaired reference condition. Information for estuaries is collected by EMAP, which uses a sample survey design to assess a wide area of waters.

What is being done to improve the indicator?

Assessing a water for healthy biological communities is a complex task, and the science to do so is newer and used less frequently than that used for chemical monitoring. EPA and its partners are working together to strengthen biological monitoring programs, assess more waters, and gather better data for producing

INDICATOR 7: Biological Integrity



Source: EPA EMAP, 1994, and state biological monitoring data, 1992-1994

Proposed Milestone: By 2005, 80 percent of the Nation's surface waters will support healthy aquatic communities.

the indicator. Methods for biological monitoring in lakes are not yet standardized, so there are not enough data to confidently report the number of lakes supporting healthy aquatic life.

This indicator could be improved by increasing the number of estuaries and rivers assessed and by beginning to perform lake biological assessments. Greater consistency in monitoring techniques must be ensured through the use of comparable methods and assessments. This could be accomplished through work done by the Intergovernmental Task Force on Monitoring Water Quality (ITFM). ITFM will also work to ensure consistency among federal and state data needed for representative reference conditions throughout a region.

EPA is working with states to develop methods and guidance to quantitatively measure the biological integrity of specific surface water types. Protocols for wadeable rivers and streams are available, and those for lakes are in draft form. Protocols for monitoring estuaries, wetlands, and large rivers are still needed.

To improve the amount and cross section of data used to characterize biological integrity, EPA is actively supporting states and tribes in the comprehensive biological assessment of their waters. EPA is also working with other federal agencies such as the Tennessee Valley Authority and the U.S. Geological Survey's National Water Quality Assessment program to determine how those data can be used to support this indicator.

What is being done to improve conditions measured by the indicator?

EPA and other federal and state agencies recognize that while most point sources are controlled with specific permit limits, less visible stormwater runoff and nonpoint sources of pollution also should be controlled. EPA and its partners are now placing greater emphasis on reducing the effects of habitat perturbation from grazing, farming, stream channelization, stormwater runoff, introduction of nonnative species, dam operations, and dredging. These activities affect aquatic ecosystems by reducing waterside vegetation, which provides both shade and bank stabilization; by increasing siltation; by scouring and removing important habitat components; and by raising water temperatures.

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SPECIES AT RISK

What does the indicator tell us?

This indicator shows the percentage of species dependent on freshwater aquatic or wetland habitats that are at risk. Currently, the groups of animals at greatest risk overall are those dependent on aquatic systems. More than 60 percent of freshwater mussels and crayfish are at risk, the highest imperilment ratio documented for any group of plants and animals in the United States.

How will the indicator be used to track progress?

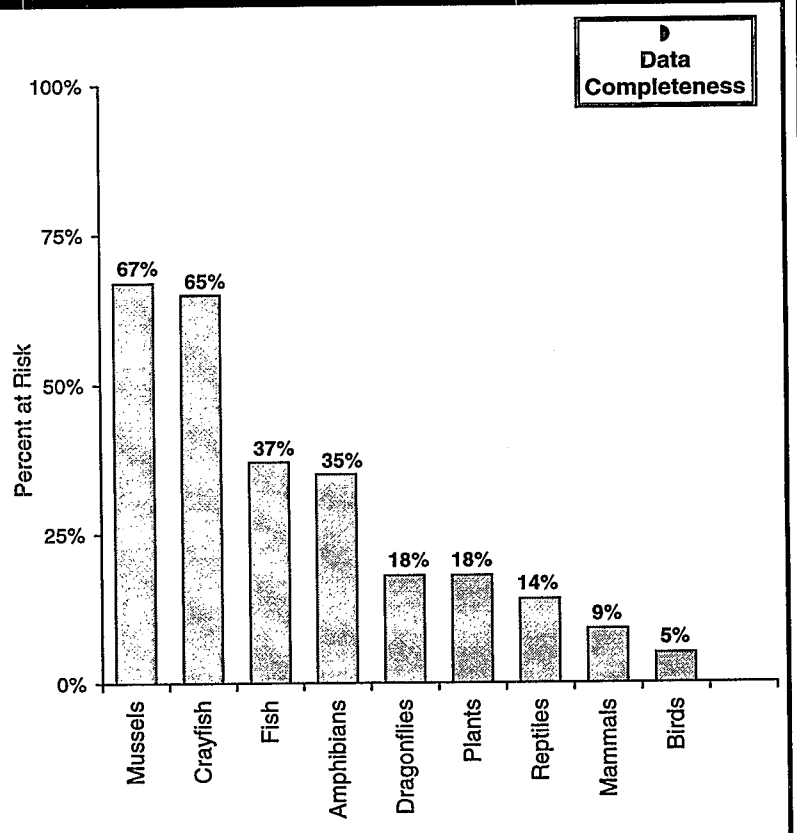
An important part of assessing the biological diversity and integrity in a waterbody is determining whether the aquatic species that should naturally exist in the waters are actually there and at the expected population size.

This indicator uses data from The Nature Conservancy and the Network of State Natural Heritage Data Centers, a public-private network of biological inventory and assessment programs. The biological and conservation status of species are assessed, and the species are ranked by the state agency-based Heritage Network as extinct, critically imperiled, imperiled, vulnerable, apparently secure, or demonstrably secure. Criteria for ranking a given species include the number of populations or occurrences known and their health, the estimated number of individuals, the distributional range and extent of appropriate habitat, the population and range trends, threats, and fragility or susceptibility to these threats. Approximately 30,000 U.S. species have been assessed and ranked, and rankings are updated as new information becomes available.

What is being done to improve the indicator?

These conservation status ranks are not legal categories, as are the U.S. Fish and Wildlife Service (USFWS) listings of threatened and endangered species. These status ranks focus on

INDICATOR 8: Aquatic and Wetland Species at Risk

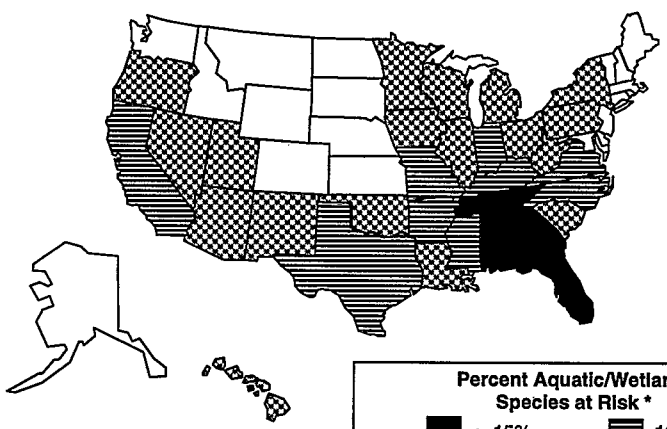


Source: The Nature Conservancy and State Natural Heritage Data Centers, 1996

known biological factors, with any individual status rank considered a hypothesis based on the best available information. Thus, ranks are less precise for species with less current inventory information.

To improve the confidence and accuracy of the ranks, additional inventory efforts are needed. The indicator will also need to distinguish between those species that are naturally rare and those that are imperiled because of human induced threats. Improvements to the National Wetlands Inventory, which provides information on wetland use by plants, and to the Natural Heritage Network, which covers habitat use generally, will result in a more complete list of wetland species and animal species habitat information.

Aquatic Species at Risk by State



Source: The Nature Conservancy and State Natural Heritage Data Centers, 1996

Although trend information, where available, is incorporated into the assessment of these conservation status ranks, the indicator cannot currently show specific trends. The indicator does not distinguish between those species that have stable or increasing populations and those that have declining populations. To allow the indicator to better differentiate between cause of imperilment and population trends, additional research is needed to carry out a trend monitoring strategy. EPA, The Nature Conservancy, and USFWS are working together to better integrate multiple data to support development of a second part to this indicator that will focus on trends.

What is being done to improve conditions measured by the indicator?

Degraded water quality and altered water flow are considered two of the primary threats affecting aquatic organisms and leading to these dramatic levels of imperilment. Any effort to prevent, control, or clean up water pollution or maintain or restore natural flow regimes should contribute to a decrease in species at risk by providing those species with a clean and safe habitat. More specifically, there are various programs that target species at risk for protection. Many of the species identified as at risk by The Nature Conservancy and Natural Heritage Network are also listed as threatened or endangered by USFWS. Listing a species as threatened or endangered guarantees that it will receive special protection.

The Nature Conservancy itself works to protect species at risk by determining which species are truly vulnerable and where they exist, and by working with partners to acquire or manage lands and waters harboring these rarities, as well as representative examples of ecological communities.

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WETLAND ACREAGE

What does the indicator tell us?

More than 200 million acres of wetlands existed in the conterminous United States during colonial times. Today, less than half of those original wetlands remain. Many wetlands have been converted to farmland or dredged and filled to accommodate urban development. Twenty-two states have lost at least 50 percent of their original wetlands; 7 of those states have lost over 80 percent.

This indicator recognizes historical wetland loss but focuses on wetland loss trends. The U.S. Fish and Wildlife Service and the U.S Department of Agriculture report that from the mid-1970s to the mid-1980s approximately 290,000 acres of wetlands were lost annually on non-federal lands in the conterminous United States. During the mid-1980s to the early 1990s this trend slowed to about 70,000 to 90,000 acres annually. These non-federal lands represent about 75 percent of the Nation's lands.

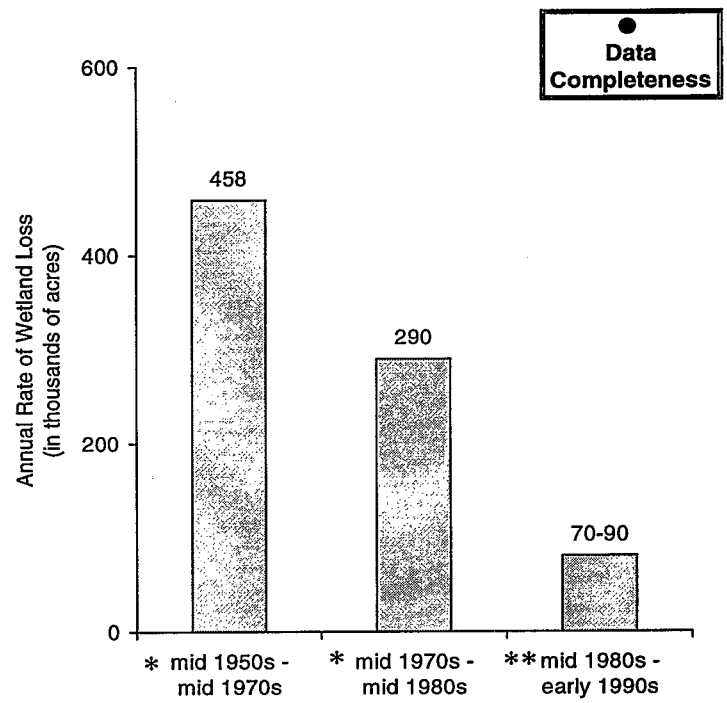
How will the indicator be used to track progress?

This indicator uses information from the U.S. Fish and Wildlife Service (USFWS) on wetland acreage on federal and non-federal lands. In addition to USFWS, the Natural Resource Conservation Service (NRCS) reports on wetland acreage on non-federal lands in *its National Resource Inventory*. EPA will continue to work with USFWS and NRCS to monitor wetland loss and report improvements in wetland acreage.

What is being done to improve the indicator?

Although efforts to eliminate wetland loss and realize a net gain in wetlands are under way, wetland loss is still a problem. Equally important, however, is the condition of existing wetlands. Wetland monitoring programs to

INDICATOR 9: Wetland Acreage



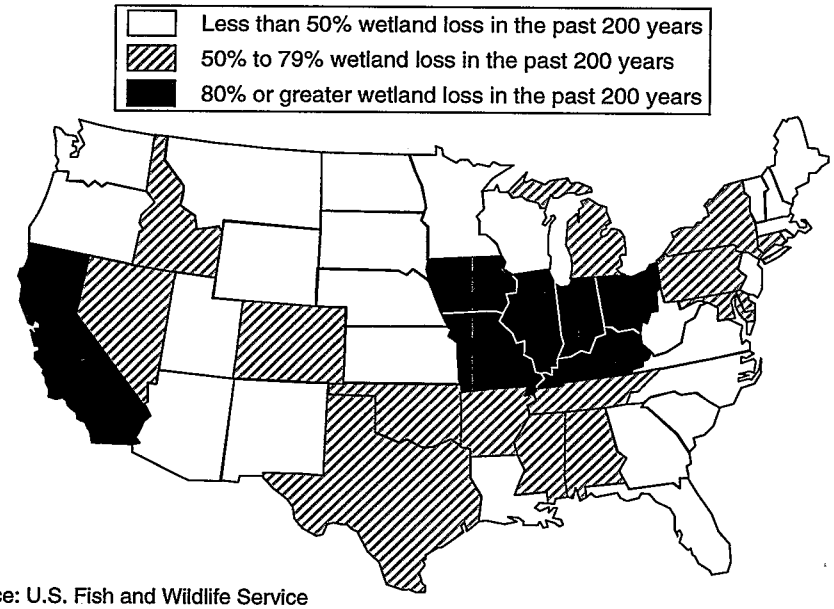
Sources: * U.S. Fish and Wildlife Service, 1990 (Data include federal lands)
** U.S. Department of Agriculture, 1992 (Data exclude federal lands)

Proposed Milestone: By 2005, there will be an annual net increase of at least 100,000 acres of wetlands, thereby supporting valuable aquatic life, improving water quality, and preventing health- and property-damaging floods and drought.

determine whether wetlands are healthy, functioning systems are still in their infancy.

Comprehensive studies of the extent of wetland degradation are just beginning to assess the condition of the biological life that is dependent on healthy wetlands. To improve the indicator's ability to assess wetland conditions, efforts to determine not only wetland acreage but also wetland quality will increase.

Historical Wetland Loss by State



Source: U.S. Fish and Wildlife Service

What is being done to improve conditions measured by the indicator?

As awareness of the importance of wetlands has increased, programs and initiatives to protect them have become more prevalent. In addition, several important trends have emerged that have supported wetland protection programs. Together, these programs, initiatives, and trends have led to a decrease in wetland losses and an increase in emphasis on wetland protection and restoration.

The support and continuation of these efforts and trends into the future will improve the health and status of our nation's wetlands. Some of the efforts and trends responsible for these improvements include:

- Decline in the profitability of converting wetlands for agricultural production.
- Passage of the Swampbuster provision in the 1985 and 1990 farm bills.
- Presence of Clean Water Act section 404 permit program and growth in state management programs.
- Greater public interest and support for wetland protection and restoration.
- Implementation of federal, state, and local programs that protect and restore wetlands, such as the Conservation Reserve Program, Partners for Wildlife, and Reinvest in Minnesota.

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DRINKING WATER SUPPLY DESIGNATED USE

What does the indicator tell us?

This indicator shows the percentage of assessed waterbodies that have attained the drinking water supply use designated by states and tribes as part of their water quality standards. This designated use requires that water obtained from the waterbody is safe to drink following conventional treatment, such as chlorination, by a water supplier.

States and tribes define their waterbodies, monitor their quality, and report the results to EPA, which publishes the individual and aggregated results in the *National Water Quality Inventory*. According to the 1994 *Inventory*, 83 percent of assessed rivers and streams and 87 percent of assessed lakes and reservoirs can be used safely as a drinking water supply.

How will the indicator be used to track progress?

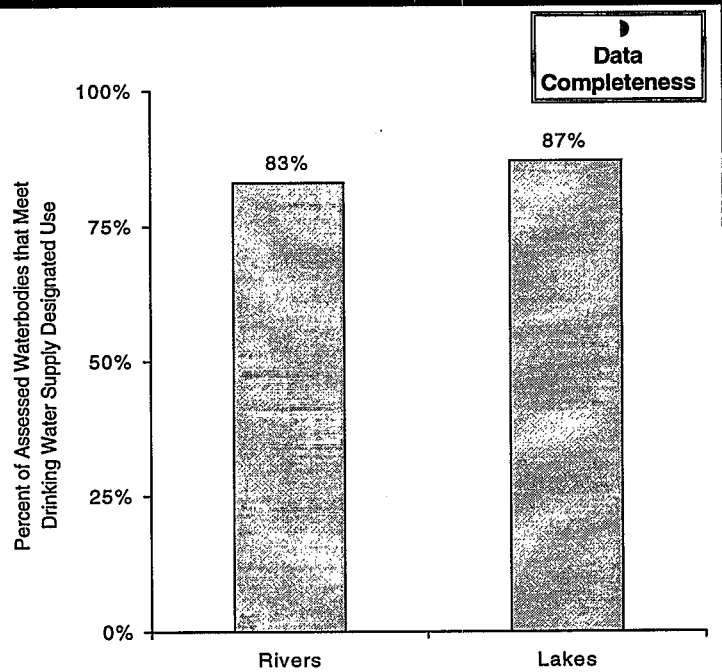
The Clean Water Act requires states and tribes (if authorized) to adopt standards with designated uses for waterbodies or waterbody segments. One of these designated uses is drinking water supply. Section 305(b) of the Clean Water Act requires that states and tribes assess the degree to which their surface waters support the designated uses.

States and tribes report the results of the assessments to EPA every 2 years through the issuance of 305(b) Reports. Data from the reports are then aggregated to form the *National Water Quality Inventory*, which is used to portray the status of the Nation's waters. The results reported in the *National Water Quality Inventory* will be used to track changes in the indicator.

What is being done to improve the indicator?

Section 305(b) of the Clean Water Act currently requires states and tribes to report water quality monitoring results to EPA. It is important to note that states, tribes, and other

INDICATOR 10a: Drinking Water Supply Designated Use



Source: *National Water Quality Inventory: 1994 Report to Congress*, 1995; 17 percent of all river and stream miles (48 percent of constantly flowing miles), 42 percent of lake and reservoir acres, and 78 percent of estuarine square miles were assessed.

Proposed Milestone: By 2005, 90 percent of the Nation's rivers, streams, lakes, and reservoirs designated as drinking water supplies will provide water that is safe to use after conventional treatment.

jurisdictions do not use identical survey methods or criteria to assess waters, in spite of guidelines issued by EPA and developed by the 305(b) Consistency Workgroup, composed of 25 states, 3 tribes, and 7 federal agencies. In addition, most states and tribes do not assess all of their waterbodies during the 2-year 305(b) reporting cycle, and they might even modify criteria or assess different waterbodies every 2 years. In 1994, only 17 percent of the Nation's total river and stream miles (48 percent of those which are constantly flowing), 42 percent of its lake and reservoir acres, and 78 percent of its estuaries were assessed for overall water quality.

305(b) data used to support this indicator might not represent general conditions in the Nation's waters because states, tribes, and other jurisdictions often focus on major perennial rivers, estuaries, and public lakes with suspected pollution problems in order to direct scarce resources to areas that could pose the greatest risk. Many states, tribes, and other jurisdictions lack the resources to collect information for nonperennial streams, small tributaries, and private ponds. This indicator does not predict the health of these or other unassessed waters. Because of these limitations, EPA must use caution in comparing data between states, tribes, and other jurisdictions, as well as between reporting periods.

In an effort to improve future reporting, EPA is pursuing several initiatives. First, EPA is working with the states and tribes to better link the source water assessment to the existing drinking water standards and to tighten the criteria used to identify actual or potentially impaired waters.

EPA is working with its partners to develop monitoring and assessment approaches that will improve state-to-state consistency in reporting. This will provide a more accurate picture of the Nation's waters when all of the data are aggregated on a national basis.

EPA is working with states, tribes, and other federal agencies to change the 305(b) reporting cycle from 2 years to 5 years, with annual reporting of key data for the waters assessed in each year. This will enable comprehensive reporting of waters meeting designated uses each 5-year period.

The 305(b) Consistency Workgroup and the Intergovernmental Task Force on Monitoring Water Quality (ITFM) are providing guidance and assistance in an effort to improve monitoring, assessment, and reporting.

What is being done to improve conditions measured by the indicator?

EPA's *National Water Quality Inventory* shows that states identify agriculture, urban runoff/ stormwater, and municipal point sources as the largest pollutant sources for rivers, lakes, and estuaries. These sources can adversely affect drinking water supply. In addition to continuing to control point sources, EPA and its partners also need to control nonpoint source pollution from both rural and urban areas.

EPA encourages states to use a place-based watershed framework and source water protection programs to identify the causes of water quality degradation, to determine appropriate controls, and to manage the control programs.

The watershed framework and source water protection programs assist water resource managers in reducing stresses on water quality, such as toxic chemicals, siltation, and nutrients from phosphate-based detergents and fertilizers, all of which can increase the cost and reduce the efficiency of treatment.

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FISH AND SHELLFISH CONSUMPTION DESIGNATED USE

What does the indicator tell us?

This indicator shows the percentage of assessed waterbodies that have attained the fish and shellfish consumption use designated by states and tribes as part of their water quality standards.

States and tribes define their waterbodies, monitor their quality, and report the results to EPA, which publishes the individual and aggregated results in the *National Water Quality Inventory*. According to the 1994 *Inventory*, 95 percent of assessed rivers and streams, 82 percent of assessed lakes and reservoirs, and 92 percent of assessed estuaries provide fish safe for human consumption. In addition, 74 percent of assessed estuaries provide shellfish safe for human consumption.

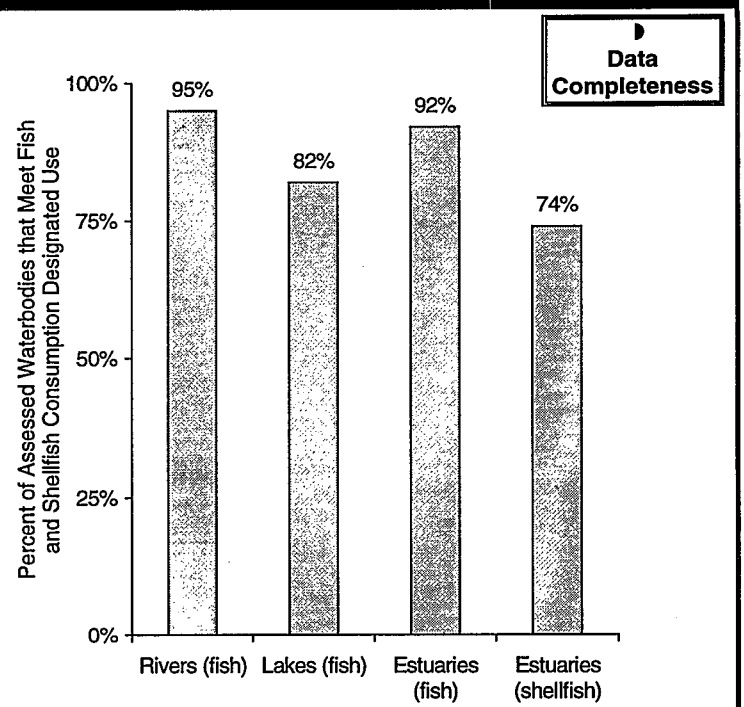
How will the indicator be used to track progress?

The Clean Water Act requires states and tribes (if authorized) to adopt standards with designated uses for waterbodies or waterbody segments. One of these designated uses is fish and shellfish consumption. Section 305(b) of the Clean Water Act requires that states and tribes assess the degree to which their surface waters support the designated uses. The results of the assessments are reported to EPA every 2 years through the issuance of 305(b) Reports. Data from these reports are then aggregated to form the *National Water Quality Inventory*, which is used to portray the status of the Nation's waters. The results reported in *the National Water Quality Inventory* will be used to track changes in the indicator.

What is being done to improve the indicator?

Section 305(b) of the Clean Water Act currently requires states and tribes to report water quality monitoring results to EPA. It is important to note that states, tribes, and other

INDICATOR 10b: Fish and Shellfish Consumption Designated Use



Source: *National Water Quality Inventory: 1994 Report to Congress*, 1995; 17 percent of all river and stream miles (48 percent of constantly flowing miles), 42 percent of lake and reservoir acres, and 78 percent of estuarine square miles were assessed.

Proposed Milestone: By 2005, 90 to 98 percent of the Nation's fish and shellfish harvest areas will provide food safe for people and wildlife to eat.

jurisdictions do not use identical survey methods or criteria to assess waters, in spite of guidelines issued by EPA and developed by the 305(b) Consistency Workgroup, composed of 25 states, 3 tribes, and 7 federal agencies. In addition, most states and tribes do not assess all of their waterbodies during the 2-year 305(b) reporting cycle, and they might even modify criteria or assess different waterbodies every 2 years. In 1994, only 17 percent of the Nation's river and stream miles (48 percent of those which are constantly flowing), 42 percent of its lake and reservoir acres, and 78 percent of its estuaries were assessed for overall water quality.

305(b) data used to support this indicator might not represent general conditions in the Nation's waters because states, tribes, and other jurisdictions often focus on major perennial rivers, estuaries, and public lakes with suspected pollution problems in order to direct scarce resources to areas that could pose the greatest risk. Many states, tribes, and other jurisdictions lack the resources to collect information for nonperennial streams, small tributaries, and private ponds. This indicator does not predict the health of these or other unassessed waters. Because of these limitations, EPA must use caution in comparing data between states, tribes, and other jurisdictions, as well as between reporting periods.

In an effort to improve future reporting, EPA is pursuing several initiatives. First, EPA is working with the states and tribes to link the information from state agencies that issue fish consumption advisories with the information other state agencies provide on use attainment.

EPA is working with its partners to develop monitoring and assessment approaches that will improve state-to-state consistency in reporting. This will provide a more accurate picture of the Nation's waters when all of the data are aggregated on a national basis.

EPA is working with states, tribes, and other federal agencies to change the 305(b) reporting cycle from 2 years to 5 years, with annual reporting of key data for the waters assessed in each year. This will enable comprehensive reporting of waters meeting designated uses each 5-year period.

The 305(b) Consistency Workgroup and the Intergovernmental Task Force on Monitoring Water Quality (ITFM) are providing guidance and assistance in an effort to improve monitoring, assessment, and reporting.

What is being done to improve conditions measured by the indicator?

EPA's *National Water Quality Inventory* shows that states identify agriculture, urban runoff/stormwater, and municipal point sources as the largest pollutant sources for rivers, lakes, and estuaries. These sources can contribute to excessive levels of pollutants in fish and shellfish. Pollutants can also collect and persist in sediments and bioaccumulate through the food chain, reaching excessive levels in fish and shellfish. Hydrologic modification, resource extraction, contaminated sediments, and natural sources, such as atmospheric deposition, however, also degrade water quality. In addition to continuing to control point sources, EPA and its partners also need to control nonpoint source pollution from both rural and urban areas.

EPA encourages states to use a place-based watershed framework to identify the causes of water quality and habitat degradation, to determine appropriate controls, and to manage the control programs. The watershed framework assists water resource managers in reducing stresses on water quality, such as toxic chemicals, siltation, habitat loss, nutrients from phosphate-based detergents and fertilizers, and elevated water temperatures resulting from loss of vegetative cover.

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RECREATION DESIGNATED USE

What does the indicator tell us?

This indicator shows the percentage of assessed waterbodies that have attained the swimming and recreation use designated by states and tribes as part of their water quality standards.

States and tribes define their waterbodies, monitor their quality, and report the results to EPA, which publishes the individual and aggregated results in *the National Water Quality Inventory*. According to the 1994 *Inventory*, 77 percent of assessed rivers and streams, 81 percent of assessed lakes and reservoirs, and 85 percent of assessed estuaries are safe for swimming. In addition, 87 percent of assessed rivers and streams, 86 percent of assessed lakes and reservoirs, and 83 percent of assessed estuaries are safe for other forms of recreation.

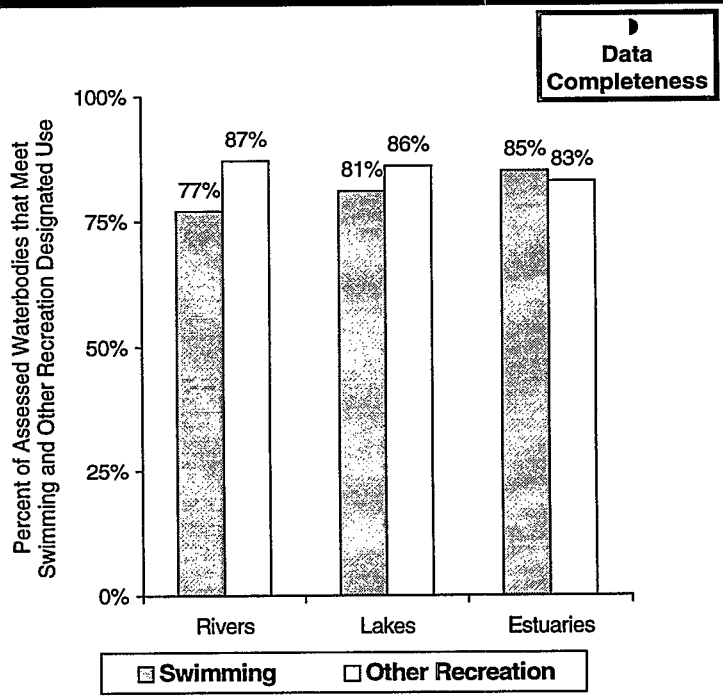
How will the indicator be used to track progress?

The Clean Water Act requires states and tribes (if authorized) to adopt standards with designated uses for waterbodies or waterbody segments. One of these designated uses is swimming and recreation. Section 305(b) of the Clean Water Act requires that states and tribes assess the degree to which their surface waters support the designated uses. States and tribes report the results of these assessments to EPA every 2 years through the issuance of 305(b) Reports. Data from the reports are then aggregated to form *the National Water Quality Inventory*, which is used to portray the status of the Nation's waters. The results reported in the *National Water Quality Inventory* will be used to track changes in the indicator.

What is being done to improve the indicator?

Section 305(b) of the Clean Water Act currently requires states and tribes to report water quality monitoring results to EPA. It is important to note that states, tribes, and other

INDICATOR 10c: Recreation Designated Use



Source: *National Water Quality Inventory: 1994 Report to Congress*, 1995; 17 percent of all river and stream miles (48 percent of constantly flowing miles), 42 percent of lake and reservoir acres, and 78 percent of estuarine square miles were assessed

Proposed Milestone: By 2005, 95 percent of the Nation's surface waters will be safe for recreation.

jurisdictions do not use identical survey methods or criteria to assess waters, in spite of guidelines issued by EPA and developed by the 305(b) Consistency Workgroup, composed of 25 states, 3 tribes, and 7 federal agencies. In addition, most states and tribes do not assess all of their waterbodies during the 2-year 305(b) reporting cycle, and they might even modify criteria or assess different waterbodies every 2 years. In 1994, only 17 percent of the Nation's river and stream miles (48 percent of those which are constantly flowing), 42 percent of its lake and reservoir acres, and 78 percent of its estuaries were assessed for overall water quality.

305(b) data used to support this indicator might not represent general conditions in the Nation's waters because states, tribes, and other jurisdictions often focus on major perennial rivers, estuaries, and public lakes with suspected pollution problems in order to direct scarce resources to areas that could pose the greatest risk. Many states, tribes, and other jurisdictions lack the resources to collect information for nonperennial streams, small tributaries, and private ponds. This indicator does not predict the health of these or other unassessed waters. Because of these limitations, EPA must use caution in comparing data between states, tribes, and other jurisdictions, as well as between reporting periods.

In an effort to improve future reporting, EPA is pursuing several initiatives. First, EPA is working with the states and tribes to more precisely define their recreational uses to differentiate, at a minimum, between contact recreation, such as swimming, and noncontact recreation, such as boating and wading, where immersion in the water is unlikely.

EPA is working with its partners to develop monitoring and assessment approaches that will improve state-to-state consistency in reporting. This will provide a more accurate picture of the Nation's waters when all of the data are aggregated on a national basis.

EPA is working with states, tribes, and other federal agencies to change the 305(b) reporting cycle from 2 years to 5 years, with annual reporting of key data for the waters assessed in each year. This will enable comprehensive reporting of waters meeting designated uses each 5-year period.

The 305(b) Consistency Workgroup and the Intergovernmental Task Force on Monitoring Water Quality (ITFM) are providing guidance and assistance in an effort to improve monitoring, assessment, and reporting.

What is being done to improve conditions measured by the indicator?

EPA's *National Water Quality Inventory* shows that states identify agriculture, urban runoff/stormwater, and municipal point sources as the largest pollutant sources for rivers, lakes, and estuaries. The ability of a waterbody to support recreation can be impacted by one or more of these sources.

In addition to continuing to control point sources, EPA and its partners also need to control nonpoint source pollution from both rural and urban areas. EPA encourages states to use a place-based watershed framework to identify the causes of water quality degradation, to determine appropriate controls, and to manage the control programs.

The watershed framework assists water resource managers in reducing stresses on water quality, such as toxic chemicals, nutrients from phosphate-based detergents and fertilizers, and bacterial contamination.

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AQUATIC LIFE DESIGNATED USE

What does the indicator tell us?

This indicator shows the percentage of assessed waterbodies that have attained the aquatic life use designated by states and tribes as part of their water quality standards. States and tribes define their waterbodies, monitor their quality, and report the results to EPA, which publishes the individual and aggregated results in the *National Water Quality Inventory*. According to the 1994 *Inventory*, 69 percent of assessed rivers and streams, 68 percent of assessed lakes and reservoirs, and 70 percent of estuaries can support healthy aquatic life.

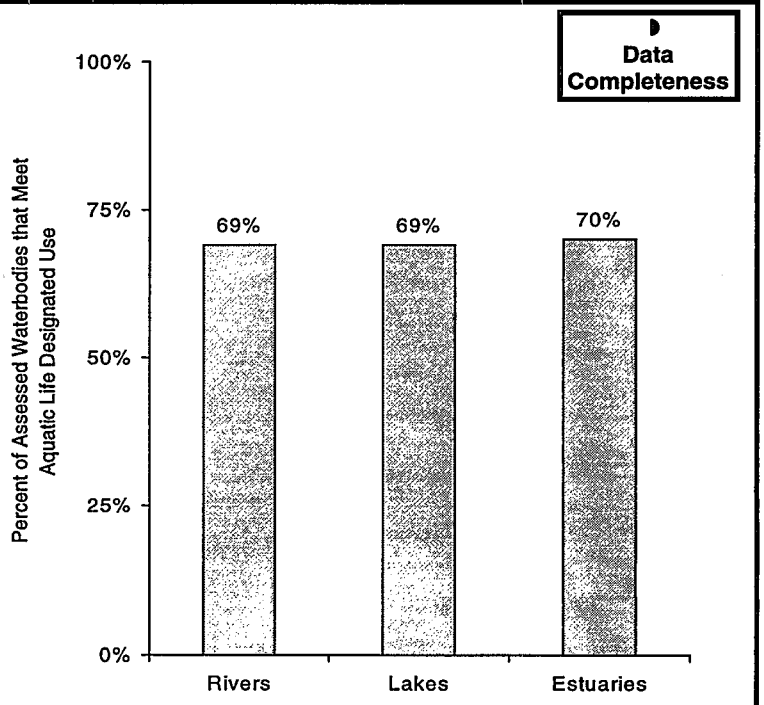
How will the indicator be used to track progress?

The Clean Water Act requires states and tribes (if authorized) to adopt standards with designated uses for waterbodies or waterbody segments. One of these designated uses is aquatic life. Section 305(b) of the Clean Water Act requires that states and tribes assess the degree to which their surface waters support the designated uses. State and tribes report the results of the assessments to EPA every 2 years through the issuance of 305(b) Reports. Data from the reports are then aggregated to form the *National Water Quality Inventory*, which is used to portray the status of the Nation's waters. The results reported in the *National Water Quality Inventory* will be used to track changes in the indicator.

What is being done to improve the indicator?

Section 305(b) of the CWA currently requires states and tribes to report water quality monitoring results to EPA. It is important to note that states, tribes, and other jurisdictions do not use identical survey methods or criteria to assess waters, in spite of guidelines issued by EPA and developed by the 305(b) Consistency Workgroup, composed of 25 states, 3 tribes, and 7 federal agencies. In addition, most states and tribes do not assess all of their waterbodies during the 2-year 305(b) reporting cycle, and they might even modify criteria or assess different waterbodies every 2 years. In 1994, only 17 percent of the Nation's river and stream miles (48 percent of those which are constantly flowing), 42 percent of its lake and reservoir acres, and 78 percent of its estuaries were assessed for overall water quality.

INDICATOR 10d: Aquatic Life Designated Use



Source: *National Water Quality Inventory: 1994 Report to Congress*, 1995; 17 percent of all river and stream miles (48 percent of constantly flowing miles), 42 percent of lake and reservoir acres, and 78 percent of estuarine square miles were assessed

Proposed Milestone: By 2005, 80 percent of the Nation's surface waters will support healthy aquatic communities.

305(b) data used to support this indicator might not represent general conditions in the Nation's waters because states, tribes, and other jurisdictions often focus on major perennial rivers, estuaries, and public lakes with suspected pollution problems in order to direct scarce resources to areas that could pose the greatest risk. Many states, tribes, and other jurisdictions lack the resources to collect information for nonperennial streams, small tributaries, and private ponds. This indicator does not predict the health of these or other unassessed waters. Because of these limitations, EPA must use caution in comparing data between states, tribes, and other jurisdictions, as well as between reporting periods.

In an effort to improve future reporting, EPA is pursuing several initiatives. First, EPA is working with the states and tribes to more precisely define their aquatic life uses, such as salmon spawning in rivers and lakes, cold freshwater habitat, warm freshwater habitat, and marine habitat. EPA is also working with states and tribes to better link assessments to the particular aquatic life designated use and to evaluate and reconcile potentially conflicting chemical and biological data.

EPA is working with its partners to develop monitoring and assessment approaches that will improve state-to-state consistency in reporting. This will provide a more accurate picture of the Nation's waters when all of the data are aggregated on a national basis.

EPA is working with states, tribes, and other federal agencies to change the 305(b) reporting cycle from 2 years to 5 years, with annual reporting of key data for the waters assessed in each year. This will enable comprehensive reporting of waters meeting designated uses each 5-year period.

The 305(b) Consistency Workgroup and the Intergovernmental Task Force on Monitoring Water Quality (ITFM) are providing guidance and assistance in an effort to improve monitoring, assessment, and reporting.

In addition, EPA is working with states and tribes to develop a guidance document to improve the assessment of the aquatic life in our nation's waters. The guidance will include ecological risk assessment principles that will assist states and tribes in identifying causes of impairment. It will also include quantitatively based biological criteria for different types of waterbodies and ecological regions. The biological criteria will assist states and tribes in determining impairment of aquatic life. The criteria, in conjunction with habitat assessment methods, will also provide a more comprehensive and scientifically defensible basis for assessing aquatic life impairment.

What is being done to improve conditions measured by the indicator?

EPA's *National Water Quality Inventory* shows that states identify agriculture, urban runoff/ stormwater, and municipal point sources as the largest pollutant sources for rivers, lakes, and estuaries. Aquatic life may be impacted by one or more of these sources.

Hydrologic modification, resource extraction, contaminated sediments, and natural sources such as atmospheric deposition, however, also impair aquatic life uses. In addition to continuing to control point sources, EPA and its partners also need to control nonpoint source pollution from both rural and urban areas.

EPA encourages states to use a place-based watershed framework to identify the causes of water quality degradation, to determine appropriate controls, and to manage the control programs. The watershed framework assists water resource managers in reducing stresses on water quality, such as toxic chemicals, siltation, habitat loss, nutrients from phosphate-based detergents and fertilizers, and elevated water temperatures resulting from loss of vegetative cover.

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GROUND WATER POLLUTANTS: NITRATE

What does the indicator tell us?

Nitrate is the most widespread agricultural contaminant and is a human health concern since it can cause methemoglobinemia, or "blue-baby syndrome." Nitrate is also an environmental concern as a potential source of nutrient enrichment of coastal waters. High levels of nitrate in well water typically indicate that pollution is seeping in from septic tanks, animal wastes, fertilizers, municipal landfills, or other nonpoint sources. The Safe Drinking Water Act requires that EPA establish federal safety standards that limit the allowable levels of nitrate in water. This level is established at 10 milligrams per liter (mg/L).

This indicator uses information from the 1990 National Pesticides Survey to demonstrate the number of people exposed to nitrate concentrations above the EPA maximum contaminant level. The survey offers the first national look at pesticide and nitrate contamination in rural domestic wells and community drinking water systems. The survey indicates that 4.5 million people were potentially exposed to elevated levels of nitrate from drinking water wells.

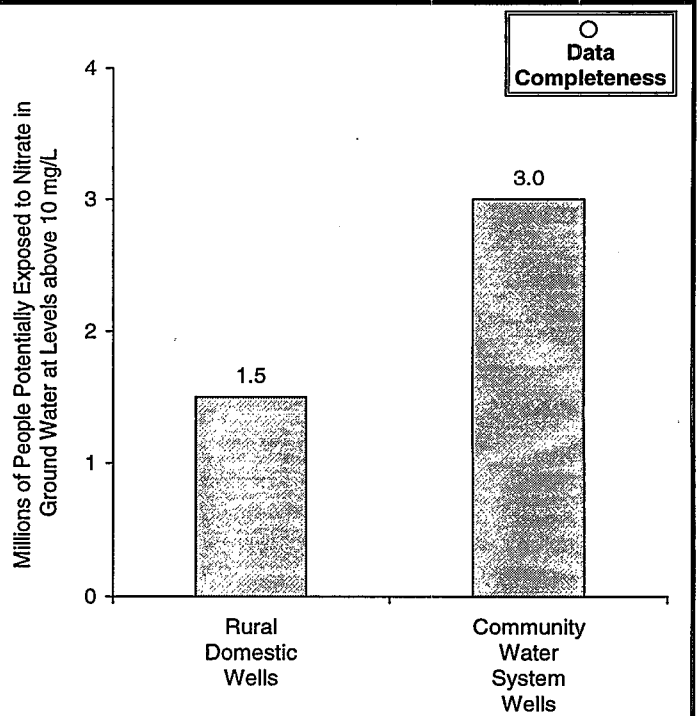
How will the indicator be used to track progress?

Most ground water studies use nitrate as an indicator because of its stability and solubility in water. Therefore, comparisons between nitrate concentrations can be made across many of these studies. It is also convenient to use nitrate concentration to track changes in ground water quality because it is a primary health-based drinking water standard. The lack of ambient ground water monitoring networks, however, hampers the tracking of any definitive trends on a national basis.

EPA will continue to review and analyze the data from public drinking water programs. It will also investigate the many studies conducted by the U.S. Geological Survey (USGS), other federal agencies, states, and local authorities that apply to existing conditions and threats to the quality of ground water. Those studies on nitrate contamination, as well as studies using other contaminants (e.g., pesticides and organic compounds) as indicators of ground water quality, will be used to update this indicator.

The modernization of the Safe Drinking Water Information System (SDWIS) and water quality monitoring data from EPA's Storage and Retrieval (STORET) systems will provide additional data to

INDICATOR 11:
Ground Water Pollutants: Nitrate



Source: *National Survey of Pesticides in Drinking Water Wells,* 1990.

Proposed Milestone: By 2005, the number of Americans served by community and rural water wells containing high concentrations of nitrate, which can cause illness, will be reduced.

track sources of ground water contamination. SDWIS provides data on how well drinking water systems are meeting safety standards.

What is being done to improve the indicator?

Information on ground water quality is usually obtained from the monitoring of known or suspected contamination sites or from specific studies that monitor for various contaminants in limited areas. However, available data do not always provide an accurate representation of ambient ground water quality or an indication of the extent and severity of ground water contamination problems. In addition, there is considerable difficulty in using the results of ground water studies to project both the degree of contamination on a national level and decreases in the population served by contaminated systems. In the meantime, the best available source of ground water data is studies of drinking water supplies. Ultimately, however, this indicator should measure ground water quality directly. Achieving this will require the development and implementation of monitoring strategies and programs at the local, state, and regional levels.

EPA encourages states to conduct ground water monitoring and to build comprehensive monitoring programs through integration of existing efforts aimed at characterizing the overall quality of ground water resources. This will help develop a national picture of the needs and progress of ground water protection efforts. More research and development are also needed on the natural and human-induced factors affecting ground water quality and monitoring, as well as the selection of the best indicators. Agencies at all levels of government must address problems in their monitoring efforts, collect the most useful data for their own applications, and achieve the most economical use of their monitoring investment.

EPA also strongly encourages states, through the *National Water Quality Inventory* and the Intergovernmental Task Force on Monitoring Water Quality, to assess selected aquifers or hydrogeologic settings to provide a more meaningful interpretation of ground water within the states. It is anticipated that as states develop and implement ground water monitoring plans, programs, and collection mechanisms, information will become more uniform and trends in ground water quality in states, regions, and the Nation can be evaluated more reliably.

In the future, to provide a more accurate picture of overall ground water quality, this indicator might include other contaminants as well as other uses of the ground water resource.

What is being done to improve conditions measured by the indicator?

To prevent the contamination of ground water, both the Clean Water Act and the Safe Drinking Water Act, along with other federal laws, establish requirements for states and tribes to actively protect their ground water. Unfortunately, our knowledge of the extent and severity of ground water contamination is incomplete. Other than drinking water suppliers regulated by EPA, few keep detailed monitoring records. However, with more states recognizing the need to establish ambient ground water monitoring programs, drinking water data using samples from the distribution system or blended samples from various wells will be relied on less to obtain good-quality information.

The challenge for ground water includes protecting ground water—particularly wells that supply public water systems—from pollution and helping the public better understand the ways in which it becomes polluted. Much of this effort will be supported by voluntary implementation of local or regional management strategies by cooperating agencies. Expanded ambient and site-specific monitoring can target known or suspected pollution sources, yielding valuable information on ground water quality.

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SURFACE WATER POLLUTANTS

What does the indicator tell us?

This indicator shows changes in concentration levels for selected surface water parameters. Using data from the U.S. Geological Survey (USGS), currently the indicator presents six parameters USGS monitored in rivers and streams: dissolved oxygen, dissolved solids, nitrate, total phosphorus, fecal coliform, and suspended sediments. For example, from 1980 to 1989 USGS monitoring data from select National Stream Quality Accounting Network stations showed no change in nitrate concentration levels in 86 percent of the stations, a downward trend in 8 percent, and an upward trend in 6 percent.

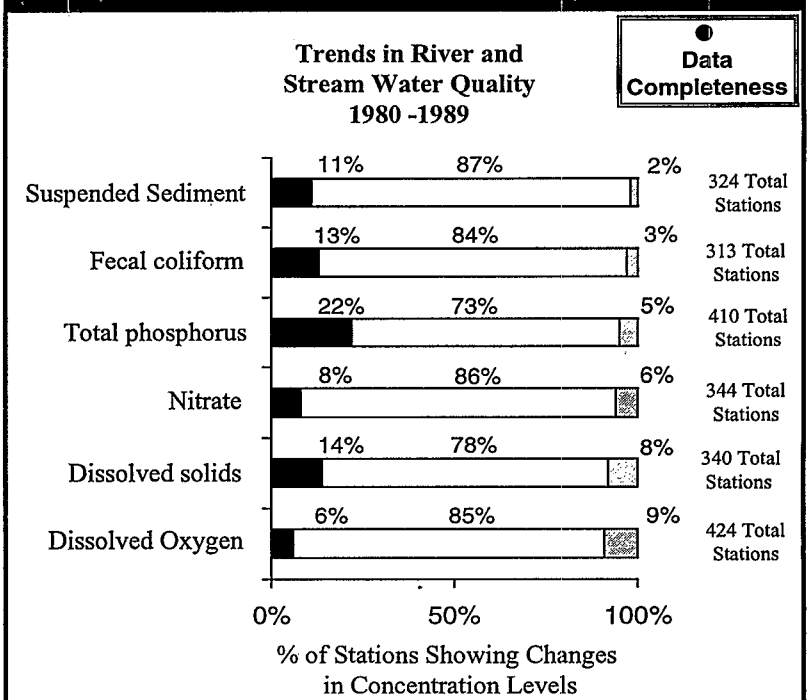
How will the indicator be used to track progress?

This indicator is intended to track, over time, the group of parameters that we have identified as significant pollutants in our rivers, streams, lakes, estuaries, and coastal waters. This is a measure of ambient surface water quality, ambient meaning the quality of waters in general, as opposed to waters at a specific point impacted by an identified pollutant.

What is being done to improve the indicator?

The information displayed by this indicator covers only rivers and streams and does not include all of the parameters being measured by the loading indicator (Indicator 16a). EPA and its partners intend to track the following list of parameters for both this ambient indicator and for the loadings indicator.

INDICATOR 12: Surface Water Pollutants



Note: The presence of an upward trend indicates an increase in the concentration of a particular constituent while a downward trend indicates a decrease in the concentration. Analyses were made on data from USGS National Stream Quality Accounting Network stations. Trend data for phosphorus is from 1982-1989.

Source: U.S. Geological Survey, 1990

Toxic Pollutants	*Conventional Pollutants*
• Cadmium	• Ammonia
• Copper	• BOD
• Lead	• Nitrogen (and nitrate)
• Mercury	• Pathogens
• Phenol	• Phosphorus
• Total residual chloride	• Suspended solids

These parameters would provide the basis for the national indicator providing general information on changes in the measurements taken in surface waters.

EPA will work with its partners, particularly states, tribes, USGS, and the National Oceanic and Atmospheric Administration (NOAA), to more accurately and consistently assess and report the data collected. Data sources that can be used for reporting this indicator are the USGS databases (particularly for rivers and streams); EPA's Storage and Retrieval information system (STORET), which contains state, USGS, and other data, for all surface waters; and NOAA for coastal waters. Partners will need to work together to determine the best method for aggregating, interpreting, and presenting the information for this indicator. Once agreement is reached, guidance can be provided to those collecting the data to ensure the data's quality and accuracy.

What is being done to improve conditions measured by the indicator?

This indicator provides only the general chemical information with which to assess national water quality conditions. The chemical information must be used along with physical and biological information (Indicator 7) to provide a holistic picture of water quality. However, this indicator does provide general trends for specific pollutants of concern and general water quality conditions, and it can indicate where additional action to control chemical impacts is necessary. For example, EPA and its partners might need to upgrade treatment at sewage treatment plants or industrial facilities, or recommend best management practices or policies to control nonpoint sources and address ambient water quality problems.

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SELECTED COASTAL SURFACE WATER POLLUTANTS IN SHELLFISH

What does the indicator tell us?

This indicator shows the percent change in concentration levels from 1986/87 to 1992/93 of six pollutants in shellfish (oysters and mussels) collected from about 140 locations along the Nation's coastline. The pollutants shown are six of the toxic chemicals of greatest concern in terms of their effects on the fish and other organisms in U.S. estuaries.

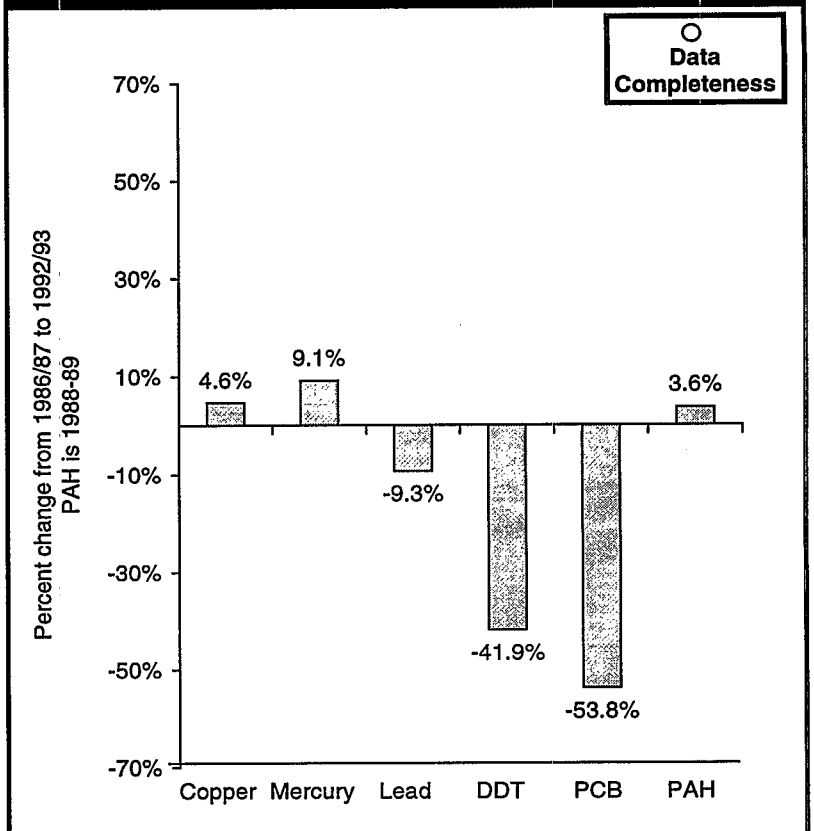
Three metals and three groups of organic chemicals are included. The metals copper, mercury, and lead are commonly used in our society for a number of purposes. The use of two of the organic chemicals included in this indicator, the DDT pesticides and the industrially important polychlorinated biphenyls (PCBs), was very common until about 20 years ago, and although these chemicals are now banned, they can still be found in the environment. The carcinogenic polycyclic aromatic hydrocarbons (PAHs) are common constituents of oil and are also produced by the burning of coal and wood.

As shown in the graph, concentration levels of DDT and PCBs decreased substantially from 1986/87 to 1992/93. During the same time period, concentration levels of lead and mercury showed evidence of a moderate decrease and increase, respectively, while copper showed little change. From 1988 to 1989 levels of PAHs also showed little change.

How will the indicator be used to track progress?

Data on these pollutant levels have been gathered by the National Oceanic and Atmospheric Administration (NOAA) since 1986. A survey to continue to measure the levels at the established study locations is being carried out every 2 years to furnish additional points for establishing trends in pollutant levels.

INDICATOR 13: Selected Coastal Surface Water Pollutants in Shellfish



Source: National Oceanic and Atmospheric Administration, 1995

What is being done to improve the indicator?

Additional results are being gathered as explained above. As part of NOAA's National Status and Trends monitoring program, additional chemicals (e.g., dioxin) are being added to the pollutants measured as concerns regarding these chemicals are identified.

What is being done to improve conditions measured by the indicator?

A number of control measures, such as eliminating the addition of lead to gasoline, forbidding the use of DDT and PCBs, and strengthening the requirements for removal of pollutants from treatment plant effluents, have been enacted over the past 25 years.

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ESTUARINE EUTROPHICATION CONDITIONS

What does the indicator tell us?

This indicator shows changes in specific constituents related to water quality that together can be used to assess the extent of eutrophication within an estuary, and thus assess its health and condition. Eutrophication is a process by which a body of water begins to suffocate from receiving more nutrients, such as nitrogen and phosphorus, than it can handle. The excess nutrients fuel the heavy growth of microscopic aquatic plants. As these plants die and decompose, the supply of dissolved oxygen in the water is depleted and its availability to other aquatic organisms, especially those which live on the bottom, is reduced. Symptoms of eutrophication include low levels of dissolved oxygen, extensive algal blooms, fish kills and reduced populations of fish and shellfish, high turbidity in the water, and diebacks of seagrasses and corals. Monitoring the changes in parameters such as chlorophyll *a*, nitrogen, and other nutrient concentrations; concentrations of dissolved oxygen; and the spatial coverage of seagrasses (or submerged aquatic vegetation) helps assess whether estuarine and coastal waters are receiving too many nutrients.

This indicator shows trends in eutrophication-related conditions from the 1960s to 1995 in selected estuaries throughout the country as measured by two different data sets. The nationwide framework for the indicator of estuarine eutrophication is NOAA's *National Estuarine Inventory*. The 129 estuaries contained in the inventory represent a consistent and complete framework for characterizing the Nation's estuarine resource base. NOAA is collecting information on 16 eutrophication-related water quality parameters for each estuary in the inventory through a knowledge-based consensus process with over 400 estuarine scientists. In 1990, NOAA estimated that nearly half the Nation's estuaries were susceptible to eutrophication. In 1992, NOAA initiated its *National Estuarine Eutrophication Survey* to evaluate which estuaries had problems in the following regions: North Atlantic (16 estuaries), Mid-Atlantic (22 estuaries South Atlantic (21 estuaries), Gulf of Mexico (36 estuaries), and the West Coast (34 estuaries).

This indicator also uses data from EPA's National Estuary Program (NEP). Currently, there are 28 estuaries around the country in the NEP. In many of these estuaries, state and local managers have identified eutrophication and excess nutrients as critical problems. NEPs are collecting historical and baseline monitoring information to assess the effectiveness of corrective actions being undertaken. Taken together, the NOAA and EPA efforts will provide the most comprehensive and complete information base possible for the foreseeable future.

How will the indicator be used to track progress?

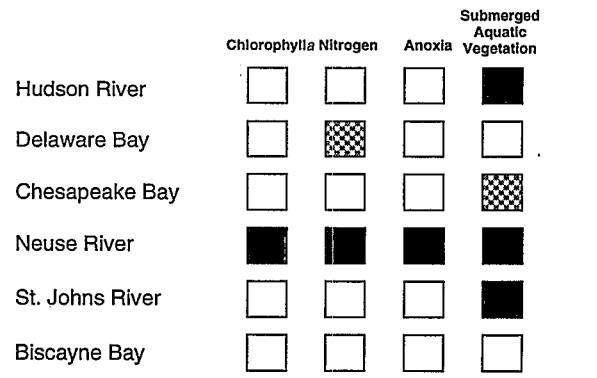
Based on data collected from mailed survey responses, individual interviews, and regional workshops in January 1995 and February 1996, NOAA compiled information on eutrophication trends from 1974 to 1995 and existing eutrophication conditions in estuaries in the Mid-Atlantic and South Atlantic regions. NOAA will be releasing a summary report of this information in mid-1996. The remaining regions will be completed later in 1996. Data will be collected and an indicator estimation made every 5 years.

For the NEP data, those NEPs which have identified eutrophication or its parameters as priority problems will develop monitoring plans to (1) evaluate trends in key variables, (2) link the observed patterns to specific management actions, and (3) provide information to redirect and refocus actions based on monitoring results. Because it is difficult to establish immediate causal relationships between specific actions and environmental change, NEP monitoring plans try to reinforce the understanding that tracking progress depends on a

INDICATOR 14: Estuarine Eutrophication Conditions

NOAA DATA

○ Data Completeness



Trends observed from 1974 to 1995

■ worse ▩ better □ no trend

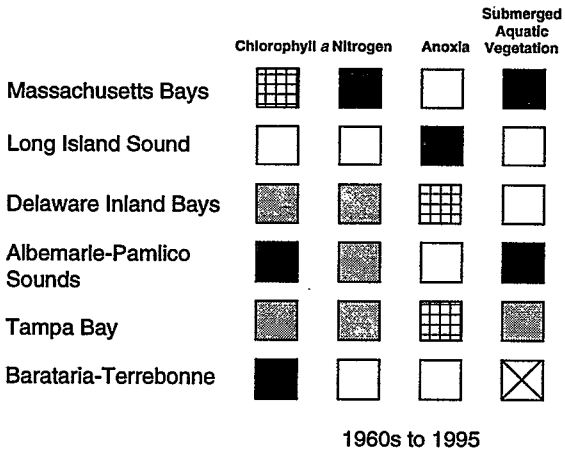
Note: EPA and NOAA data should not be compared.

Source: National Oceanic and Atmospheric Administration, 1996

INDICATOR 14: Estuarine Eutrophication Conditions

EPA DATA

○ Data Completeness



worse | better | no trend | not known | non applicable

Note: EPA and NOAA data are not comparable. For EPA's NEP data, collection periods varied from 15 to 30 years, seasonal or short-term trends are not reflected, and individual NEPs are not comparable.

Source: Data from EPA's National Estuary Program, 1996

commitment to long-term data collection. At the national level, EPA has published examples of NEPs that have developed a "Bay Quality Index," which offers a suite of parameters and conditions, including eutrophication, that can be used to capture a composite picture of an estuary's overall quality and major components. Tracking the extent and changes in eutrophic conditions helps to highlight the water quality impacts of activities in a watershed and gauge the effectiveness of pollution controls and other management actions.

What is being done to improve the indicator?

Despite a variety of monitoring efforts by many different organizations and agencies, including EPA and NOAA, data on eutrophication parameters for most estuaries in the NEP are either incomplete or not comparable. Differences in monitoring parameters, methods, and sampling stations and periods make it difficult to establish trends even within a single estuary. Factors such as seasonality, spatial relationships, and level of monitoring effort also affect the interpretation and value of data. These difficulties are compounded when comparisons are made between different estuaries because each estuary responds to the stress of excess nutrients based on its own physical and biological circumstances.

NOAA has attempted to address this problem by applying a consistent survey technique to characterize the scale and scope of past and present eutrophication levels. NOAA has also initiated a process for improving the indicator that involves interviews and workshops at the local and regional levels. NOAA is planning a national eutrophication workshop later in 1996. The workshop will determine the best way to aggregate parameters estimated for each estuary into an overall indicator.

For the NEP data, EPA will participate with NOAA in its national workshop and facilitate the inclusion of data collected by individual estuary programs. By working together, NOAA, individual NEPs, and EPA hope to improve the availability of nationwide information on eutrophication and other indicators in the NEP. The integration of NOAA and EPA data into a single, unified indicator marks the beginning of these efforts.

What is being done to improve conditions measured by the indicator?

Control of nutrients is a critical factor in preventing eutrophication. Approaches for controlling nutrients range from expensive engineering to simple prevention and maintenance. In Long Island Sound, for example, effluent from wastewater treatment plants is the primary nutrient source, and many facilities have begun retrofitting their processes to remove nitrogen. In contrast, in other areas controlling fertilizer runoff from farms, residences, and managed greenways such as golf courses is the most effective solution. Yet other communities are establishing more stringent zoning or encouraging the use of denitrifying septic systems to reduce nitrogen loadings to ground water. What these approaches have in common is a process that reflects local conditions by carefully identifying the sources of nutrients, calculating their contributions to specific water-quality problems, and working with a variety of tools to reduce their impacts.

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CONTAMINATED SEDIMENTS

What does the indicator tell us?

This indicator shows the chemicals or chemical groups that are measured most frequently at concentrations that might cause adverse ecological or human health effects at a particular site. EPA and others determine concentration levels potentially causing risk by examining the results of field surveys, laboratory toxicity tests, and studies of the chemical's behavior in the environment and in living tissue.

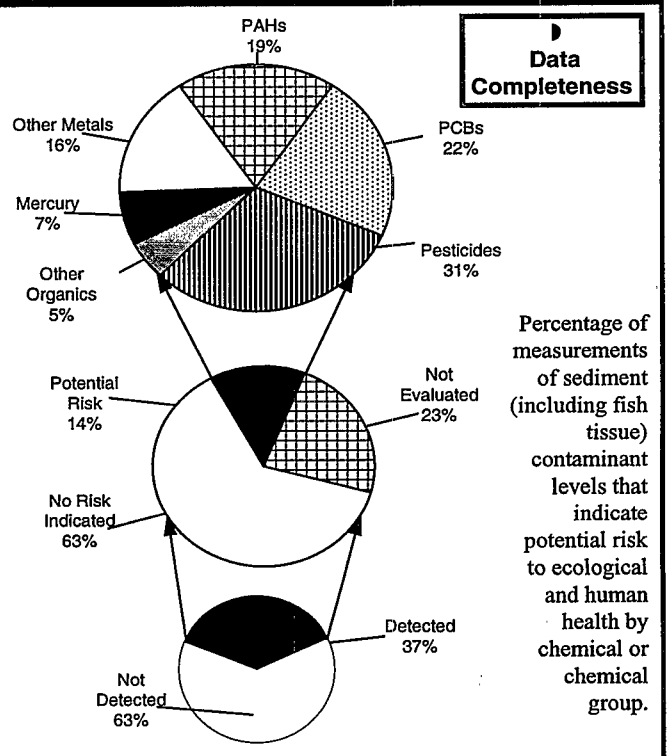
Certain types of chemicals in water tend to settle and collect in sediment. Chemicals in sediment often persist longer than those in water, in part because they tend to resist natural degradation and in part because conditions might not favor natural degradation. Also, these contaminants accumulate at distinct locations in sediment but will disperse in water.

When present at elevated concentrations in sediment, pollutants can be released back to water or accumulate in fish and shellfish and move up the food chain. In both cases, excessive levels of chemicals in sediment might become hazardous to aquatic life and humans.

EPA collects and analyzes sediment and fish tissue data from state, EPA regional, and other monitoring programs as part of the National Sediment Inventory (NSI). The goals of the NSI are to survey data regarding sediment quality nationwide, identify locations that are potentially contaminated, and describe the sources of contaminants responsible for contamination.

Environmental managers can use NSI data and assessments to determine the potential extent and severity of contamination and to identify areas that require closer inspection. In time, NSI data and assessments will reveal trends and help measure progress in minimizing risk.

INDICATOR 15: Contaminated Sediments



Source: National Sediment Inventory from EPA's Office of Science and Technology, 1993

Proposed Milestone: By 2005, point sources of contamination will be controlled in 10 percent of the watersheds where sediment contamination has been determined to be widespread.

How will the indicator be used to track progress?

EPA will report to Congress every 2 years on the condition of the Nation's sediments. As the NSI grows to include information on more locations and future measurements, EPA and other stewards of environmental quality will gain a better idea of the full extent of contaminated sites and whether conditions have improved or worsened on the whole and at single sites.

EPA's current assessment of sediment quality in the Nation is based largely on chemical concentrations in sediment and in the edible portion of fish that do not migrate and tend to live near sediment. These measures allow EPA assessors to determine the probability that contaminants at the site might cause adverse effects on aquatic life or human health. EPA classifies sites as having a higher probability of adverse effects, an intermediate probability of adverse effects, or no indication of potential adverse effects based on available data.

EPA's assessments can provide a national perspective and indicate the potential contamination problems at specific locations. However, site classification based on NSI data cannot substitute for additional study or application of knowledge at the regional, state, and local levels.

What is being done to improve the indicator?

Future assessments based on NSI data will benefit from the collection of a greater quantity of information addressing conditions at more locations. Although the NSI currently has data representing over 20,000 locations, this coverage represents only 11 percent of the Nation's rivers, lakes, and coastlines. EPA will continue to coordinate with the regional offices, states, tribes, and others to identify and compile additional data.

EPA is committed to using state-of-the-art assessment methods to determine whether sediment at a site poses a risk to ecological or human health. EPA has consulted extensively with experts within the Agency and has commissioned outside scientific review panels to examine its methods. EPA will continue to promote research and improve assessment methods as scientific knowledge in this relatively new field expands.

EPA will also make NSI data and assessments available to all interested individuals and organizations by placing data and summary reports on the Internet at EPA's World Wide Web site.

What is being done to improve conditions measured by the indicator?

EPA assessors can use the NSI to demonstrate the scope of contaminated sediments nationwide and to identify watersheds where further efforts are needed to address potentially serious contamination problems. Further assessment might indicate the need for pollution prevention or remediation. Environmental managers can use pollution prevention and control approaches to reduce point and nonpoint source discharges containing those types of contaminants which accumulate in sediment. This will enable some contaminated systems to recover naturally.

Where short-term risks and effects can be tolerated, the preferred treatment of a contaminated site is to implement prevention measures and source controls and to allow natural processes, such as natural degradation and the deposition of clean sediment, to diminish risk associated with the site. At sites where these measures will not reduce risk in an acceptable time frame, EPA might seek remediation under the appropriate statutory authority.

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SELECTED POINT SOURCE LOADINGS TO SURFACE WATER

What does the indicator tell us?

This indicator presents the change in point source loadings from 1990 to 1995 for two key pollutants—biochemical oxygen demand (BOD) and lead. The indicator shows whether the amount of contaminant being discharged increased, decreased, or remained stable for each state. The results show that the majority of states are showing a decrease in these point source loads.

How will the indicator be used to track progress?

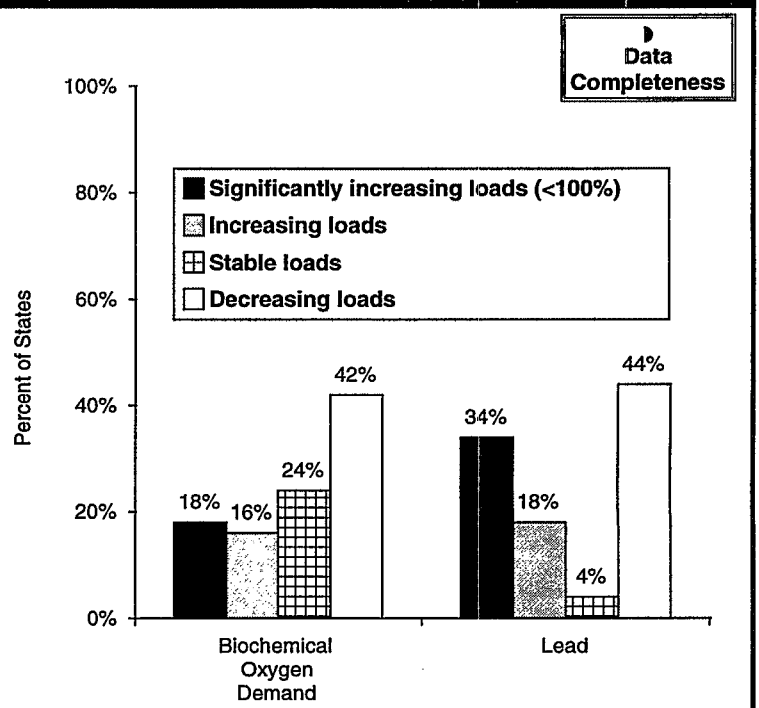
Information about these pollutants is contained in EPA's Permit Compliance System (PCS). The states report to EPA loadings numbers for those facilities permitted through the National Pollutant Discharge Elimination System (NPDES). The NPDES permitting process sets limits on the amount of discharge or the amount of contaminant contained in a discharge from facilities that discharge wastewater directly to a waterbody through a point source like a pipe.

What is being done to improve the indicator?

While the information displayed under this indicator covers only lead and BOD, many point sources contaminate our surface waters, many contaminants have been identified as a priority of particular concern, and PCS has information on many more. EPA and its partners have chosen several toxic and conventional pollutants to track as indicators of progress toward reducing point source pollution. In the future, this indicator should include all the pollutants in the following list:

Toxic Pollutants	*Conventional Pollutants*
• Cadmium	• Ammonia
• Copper	• BOD
• Lead	• Nitrogen (and nitrate)
• Mercury	• Pathogens
• Phenol	• Phosphorus
• Total residual chloride	• Suspended solids

INDICATOR 16a: Selected Point Source Loadings to Surface Water



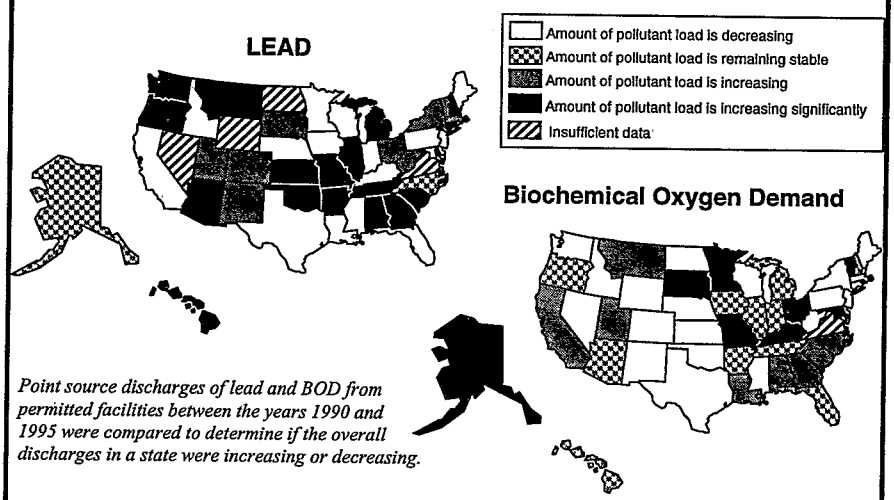
Source: Permit Compliance System, 1995

Proposed Milestone: By 2005, annual pollutant discharges from key point sources that threaten public health and aquatic ecosystems will be reduced by 3 billion pounds, or 28 percent.

Indicator 16a: Selected Point Source Loadings to Surface Water

In addition to including more contaminants in the future, other issues need to be addressed to improve the indicator. Although the number of NPDES permitted facilities remains fairly consistent, the contaminants covered by these permits can change. For example, the number of permits limiting lead in 1990 was 2,630, but this number increased to 4,134 in 1995. Therefore, comparison between 1990 and 1995 lead loadings can be misleading.

Point Source Loading Trends in the United States



Point source discharges of lead and BOD from permitted facilities between the years 1990 and 1995 were compared to determine if the overall discharges in a state were increasing or decreasing.

Source: State data in EPA's Permit Compliance System

In addition, some facilities, especially smaller facilities, do not consistently report the results of point source monitoring to PCS, while other facilities discharging contaminants of concern are not required to relay discharge information to PCS. EPA is working with its partners to more accurately and consistently report this indicator so that it presents a true picture of the amount and severity of point source loads nationally. EPA will take actions that address (1) changes in permitting requirements from year to year, (2) inconsistent reporting from facilities required to submit discharge data, (3) facilities not required to report discharge data but still responsible for releasing contaminants to receiving waters, and (4) differing chemical composition among contaminants in the same general category.

The National Oceanic and Atmospheric Administration has developed the Typical Pollutant Concentration (TPC) matrix, which will estimate point source loadings from dischargers based on the type of activity that occurs at the facility. USGS and EPA are working closely with NOAA to determine how best to use the TPC methodology with an improved PCS system to help ensure accurate, consistent reporting of this indicator. EPA also plans to provide guidance to regional and state permit writers on how to enter data more accurately and consistently into PCS to help facilitate improved reporting of this indicator.

What is being done to improve conditions measured by the indicator?

For surface waters, the major point sources of pollution are sewage treatment plants, industrial facilities, and "wet-weather" sources like combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), and stormwater. Sewage treatment plants treat and discharge wastewater from homes, public buildings, commercial establishments, stormwater sewers, and some industries. Many industrial facilities treat and discharge their own wastewater. Combined sewers combine stormwater and sewage in the same system and can overflow directly to waterbodies without treatment during periods of intense rainfall. EPA will continue to permit and regulate these facilities to continue to reduce pollution from point sources.

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SOURCES OF POINT SOURCE LOADINGS THROUGH CLASS V WELLS TO GROUND WATER

What does the indicator tell us?

This indicator characterizes industrial wastewater discharges to freshwater aquifers through shallow disposal wells, particularly septic systems. EPA considers septic systems to be Class V injection wells, subject to regulatory control, unless they are small and receive only sanitary wastes. Recent studies suggest that probably 10 percent of septic systems in the United States release as much as 4 million pounds of industrial waste each year—enough to contaminate trillions of gallons of drinking water. By 2005, EPA plans to reduce the number of pounds of ethylene glycol and other industrial wastes discharged through septic systems to zero.

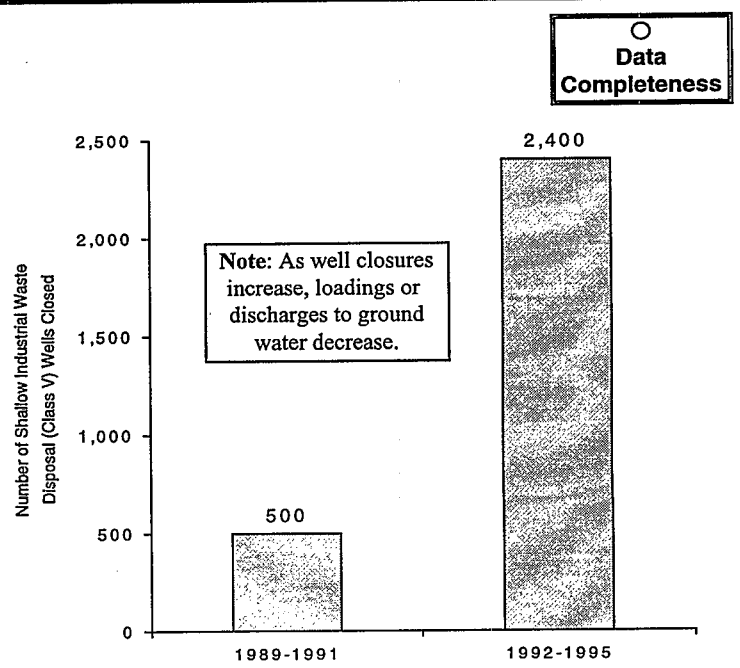
How will the indicator be used to track progress?

This indicator serves as a barometer of the effectiveness of a comprehensive Class V strategy initiated by EPA in 1995. EPA will determine the reduction in pollutant loadings from the number of septic systems that are "closed," that is, no longer injecting any industrial fluids to the subsurface. EPA will use Class V data from annual reports provided by EPA-approved state Underground Injection Control (UIC) programs. EPA will also conduct a special study to verify the number of systems reported closed, particularly in community wellhead protection areas.

What is being done to improve the indicator?

Septic systems are designed to treat solely sanitary wastes. However, some manufacturing and commercial businesses place their industrial wastes directly into the ground through a dry hole or cesspool or direct them into their septic tanks. Either way, the

INDICATOR 16b: Sources of Point Source Loadings Through Class V Wells to Ground Water



Source: EPA Office of Ground Water and Drinking Water, 1995

Proposed Milestone: By 2005, wellhead protection areas and vulnerable ground water resources will no longer receive industrial wastewater discharges from septic systems.

untreated waste might eventually find its way to a water-table aquifer. Contamination of freshwater aquifers can result in serious and costly consequences to public health and the environment, including onset of waterborne disease, expensive ground water remediation, loss of private and public domestic drinking water supplies, and degradation of aquatic ecosystems, wetlands, watersheds, and coastal zones.

Although the misuse of septic systems is a nationwide concern, the threat is not immediately obvious because it occurs, unseen, in the subsurface. The biggest problem is that Class V data on the actual volume of industrial waste released to ground water is currently speculative. For example, no one knows how many septic tanks are being misused. The results presented by the Class V indicator should be interpreted with caution until the data quality can be improved. Future EPA toxic release reports will distinguish between classes of injection wells. Currently, Class V waste release data are extrapolated from random sampling of typical high-risk wells. Class V data should improve as EPA's strategy for the comprehensive management of Class V wells proceeds and public awareness develops.

What is being done to improve conditions measured by the indicator?

EPA has documented Class V contamination of drinking water supplies across the United States (e.g., Colorado, Florida, Montana, New Hampshire, New York, Oregon, Pennsylvania, Virginia, and Washington). The EPA UIC program works with other federal agencies and state, tribal, and local governments to adequately manage this major source of pollution as part of source water protection programs, which will be developed for 30,000 community water supplies by the year 2005. This strategy recognizes that to reduce new high-risk injection practices, EPA will have to (1) raise public awareness through education and outreach; (2) provide technical assistance; (3) forge federal, state, and local government partnerships; (4) enlist the involvement of industry; and (5) support voluntary compliance initiatives. EPA will rely less on regulation, penalties, and other traditional approaches to permitting and enforcement, which are inadequate to deal with large numbers of shallow wastewater disposal wells with a potential to contaminate underground sources of drinking water.

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NONPOINT SOURCE SEDIMENT LOADINGS FROM CROPLAND

What does the indicator tell us?

Nonpoint source pollution is derived from a wide range of sources, including agriculture, forestry, hydromodification, onsite wastewater disposal, and construction sites. No single indicator can fully capture the extent of nonpoint sources and their impacts on the aquatic environment, but sediment delivery from cropland is a reasonably good indicator of the degree to which nonpoint source pollution is prevented on agricultural lands.

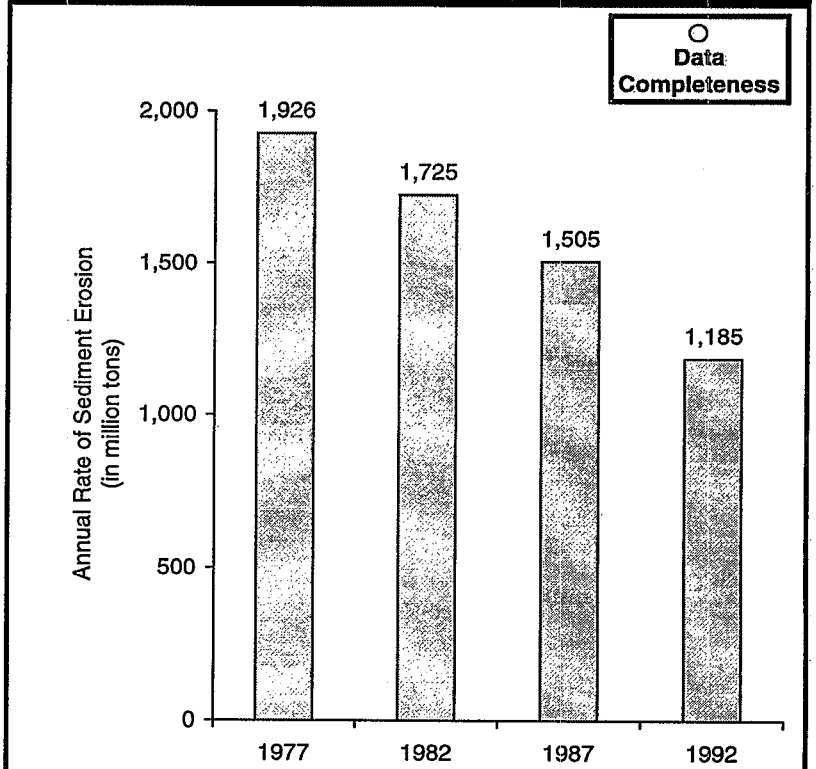
This indicator presents rates of erosion from agricultural cropland. From 1977 to 1992, the amount of sediment eroded from cropland decreased by about 750 million tons. Rates of erosion from cropland are an indirect indicator of the delivery of sediment to surface waters. In any given watershed, however, the reliability of erosion rates as predictors of sediment loads is dependent on the extent to which sediment is contributed by other sources, such as gully or streambank erosion.

How will the indicator be used to track progress?

In the absence of direct measures of nonpoint source pollution, it is necessary to estimate national nonpoint source loadings. The U.S. Department of Agriculture (USDA) estimates soil erosion with field measurements and statistical models, such as the universal soil loss equation. USDA tracks and reports progress in reducing erosion rates on the Nation's agricultural lands through the National ResourcesInventory (NRI), which is conducted every 5 years.

The NRI is a multi-resource inventory based on soils and other resource data collected at scientifically selected random sampling sites. The NRI covers the 48 coterminous states, Hawaii, Puerto Rico, and the U.S. Virgin Islands, but excludes Alaska. Data for the 1992 NRI were collected at more than 800,000 locations by USDA field personnel and resource inventory specialists.

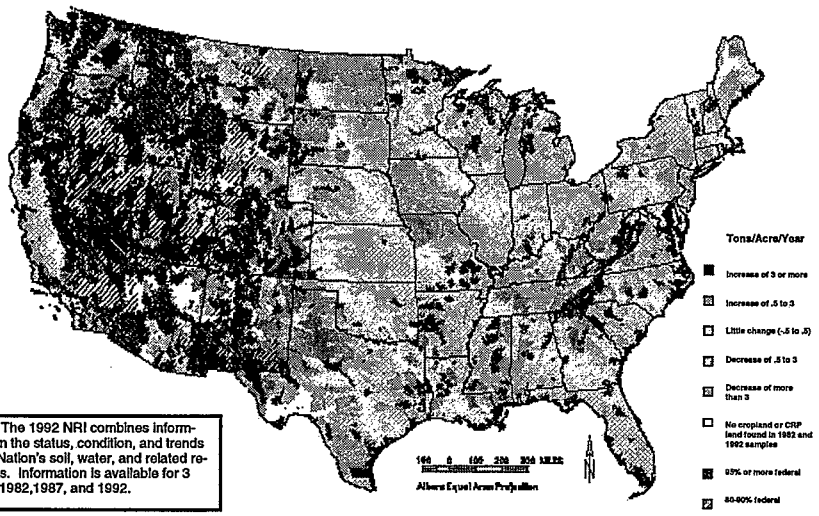
INDICATOR 17: Nonpoint Source Sediment Loadings from Cropland



Source: USDA, National Resource Inventory, 1992

Proposed Milestone: By 2005, the annual rate of soil erosion from agricultural croplands will be reduced 20 percent from 1992 levels to a total of 948 million tons per year.

Change In Average Annual Soil Erosion by Wind and Water on Cropland and Conservation Reserve Program Land, 1982 - 1992



Note: The 1992 NRI combines information on the status, condition, and trends of the Nation's soil, water, and related resources. Information is available for 3 years: 1982,1987, and 1992.

Source: U.S. Department of Agriculture, Natural Resources Inventory, 1993

In addition, USDA will provide ecosystem-based assistance to landowners in the future. This effort will include a focus on reducing the offsite delivery of sediment and associated pollutants.

What is being done to improve the indicator?

Other national measures of nonpoint source pollution are under consideration and might be developed as more national data are made available. Another possible approach for examining nonpoint source loading focuses on selected watersheds. A combined approach, using both national and selected watershed studies, will be considered as improvements to the current indicator are pursued.

What is being done to improve conditions measured by the indicator?

The control of erosion and sedimentation from cropland is achieved by landowners and managers, often with the assistance of local, state, and federal technical experts. EPA will continue to work with representatives from USDA, state agencies, and local soil and water conservation districts to encourage the adoption of erosion and sediment control practices, such as conservation tillage, on agricultural cropland.

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MARINE DEBRIS

What does the indicator tell us?

The marine debris indicator includes trash left behind by visitors to the beach, discarded from boats, carried by inland waterways to the coast, or conveyed by overflowing sewer or storm systems. As an indicator, marine debris can be useful in ascertaining (1) early warning signs of possible human health risk associated with pollution, (2) biological health risk such as entanglement or ingestion by wildlife, (3) limits on coastal recreation and fishing, (4) the effectiveness of programs to control or prevent marine debris, (5) the aesthetic value of a coastal area and the economy it supports, (6) ambient conditions, and (7) human health risks through entanglement, injury, or exposure to medical waste.

How will the indicator be used to track progress?

To measure this indicator a total of 20 survey sites in each of nine regions of the United States will be sampled. Volunteers will sample each site monthly for a period of 5 years, measuring the status and trends of 30 specific debris items. The program has been designed to answer two specific questions:

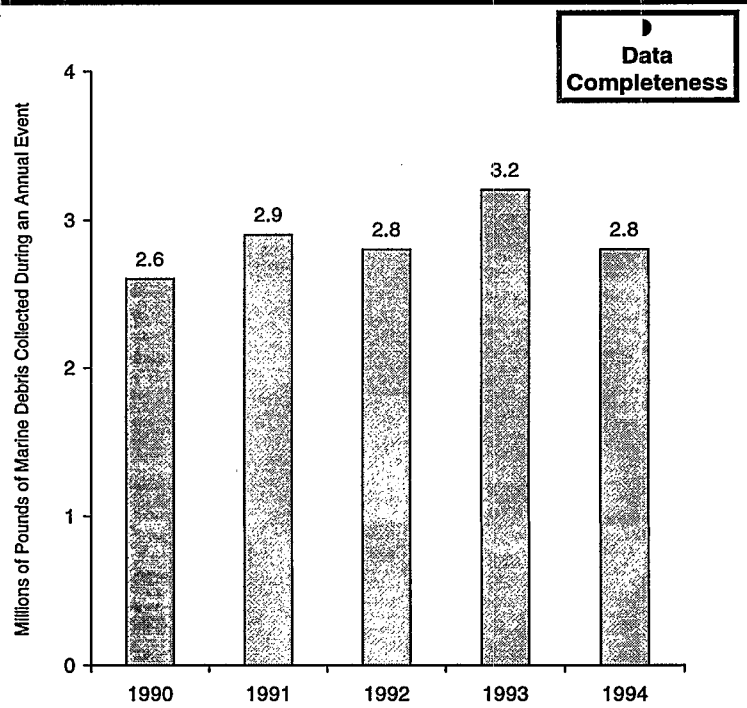
1. Is the amount of debris on our coastlines decreasing?

2. What are the major sources of the debris?

Even though this is a national survey, trend analysis will be computed for each region. Regional analyses can be combined to get a national picture of marine debris.

The National Marine Debris Monitoring Program is currently being coordinated by the Center for Marine Conservation (CMC) and is supported by EPA, the National Marine Fisheries Service, the National Park Service, and the U.S. Coast Guard.

INDICATOR 18: Marine Debris



Note: Data in this graph are variable by number of beaches cleaned, number of volunteers participating, and weather conditions on the day of cleanup.

Source: Center for Marine Conservation, 1995.

What is being done to improve the indicator?

EPA chairs an inter-agency workgroup that includes representatives from NOAA, the U.S. Park Service, the U.S. Coast Guard, and other federal organizations. The workgroup has developed a statistically valid methodology for monitoring the trends and sources of marine debris. Monitoring efforts using this methodology began in 1996, and currently are being coordinated by CMC with support from EPA and other federal agencies. Data obtained from these efforts will be used as a baseline for this indicator.

What is being done to improve conditions measured by the indicator?

Marine debris causes harm to marine life, damages boats, endangers human health, and can cripple coastal economies. More than 255 species of animals are known to ingest or become entangled in marine debris. Marine debris disables fishing and recreational boats by engaging propellers or clogging cooling water intakes.

The economic impacts of marine debris on coastal communities has been demonstrated by beach closures in New York and New Jersey in 1987 and 1988 due to medical wastes washing up on the beaches. As more is learned about the sources of marine debris, regulatory efforts (e.g., the International Convention for the Prevention of Pollution from Ships (MARPOL Annex V) and stormwater permits) can be implemented to reduce the flow of debris into the marine environment. In addition, public education can be used to improve the environment. EPA and CMC have both developed a marine debris curricula for teachers and fact sheets for the public and industry.

Marine debris clean-up efforts can also help to reduce the risk of marine entanglement through removal of debris. CMC conducts annual beach clean-up events that engage tens of thousands of volunteers. In addition, CMC's Million Points of Blight program is a storm drain stenciling project that reminds people that what they dump into the streets or down drains ends up in the connected waterway. Prevention is the best solution.

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Comments on the indicator fact sheets and requests for copies of the report should be sent to the address below:

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