



National Water Quality Inventory: Report to Congress

2002 Reporting Cycle

Section 305(b) of the Clean Water Act

This report was prepared pursuant to Section 305(b) of the Clean Water Act, which states:

- (b) (1) Each State shall prepare and submit to the Administrator by April 1, 1975, and shall bring up to date by April 1, 1976, and biennially thereafter, a report which shall include—
 - (A) a description of the water quality of all navigable waters in such State during the preceding year, with appropriate supplemental descriptions as shall be required to take into account seasonal, tidal, and other variations, correlated with the quality of water required by the objective of this Act (as identified by the Administrator pursuant to criteria published under section 304(a) of this Act) and the water quality described in subparagraph (B) of this paragraph;
 - (B) an analysis of the extent to which all navigable waters of such State provide for the protection and propagation of a balanced population of shellfish, fish, and wildlife, and allow recreational activities in and on the water;
 - (C) an analysis of the extent to which the elimination of the discharge of pollutants and a level of water quality which provides for the protection and propagation of a balanced population of shellfish, fish, and wildlife and allows recreational activities in and on the water, have been or will be achieved by the requirements of this Act, together with recommendations as to additional action necessary to achieve such objectives and for what waters such additional action is necessary;
 - (D) an estimate of (i) the environmental impact, (ii) the economic and social costs necessary to achieve the objective of this Act in such State, (iii) the economic and social benefits of such achievement; and (iv) an estimate of the date of such achievement; and
 - (E) a description of the nature and extent of nonpoint sources of pollutants, and recommendations as to the programs which must be undertaken to control each category of such sources, including an estimate of the costs of implementing such programs.
- (2) The Administrator shall transmit such State reports, together with an analysis thereof, to Congress on or before October 1, 1975, and October 1, 1976, and biennially thereafter.

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List of Acronyms

BEACH	Beaches Environmental Assessment and Coastal Health
EPA	U.S. Environmental Protection Agency
FWS	U.S. Fish and Wildlife Service
NOAA	National Oceanic and Atmospheric Administration
PCBs	polychlorinated biphenyls
TMDLs	total maximum daily loads
USGS	U.S. Geological Survey

Executive Summary



Photo courtesy of John Theilgard

This *National Water Quality Inventory: Report to Congress*, prepared under Section 305(b) of the Clean Water Act, summarizes water quality reports submitted electronically by the states and territories to the U.S. Environmental Protection Agency (EPA) for the 2002 reporting cycle. This state water quality information is contained in EPA's National Assessment Database for the 2002 reporting cycle, available online at <http://www.epa.gov/waters/305b>.

For the first time, the National Assessment Database provides the public with easy Internet access to a wide range of state water quality assessment results. The database contains summary assessment information as reported electronically by the states to EPA and includes a set of national tables

that summarize key water quality assessment findings (as in previous Section 305(b) reports). Users can also view assessments of individual waterbodies within any state or watershed included in the National Assessment Database, which presents data in a format designed for quick reference by water quality professionals and individuals familiar with water quality reporting. The database also provides Internet addresses for all the state water quality reports to users interested in learning more about a particular state's water quality protection program.

The key findings of the 2002 National Assessment Database are presented in this report. It is important to note that the information about specific sources and causes of impairment is incomplete because the

states do not always report the pollutant or source of pollutants affecting every impaired waterbody. In some cases, states may recognize that water quality does not fully support a designated use; however, they may not have adequate data to document the specific pollutant or source responsible for the impairment. In past national reports, unknown or unspecified causes and sources were included only as footnoted material to summary statistics. For the first time, this report includes unspecified causes and sources in all summary statistics to more clearly represent what states are reporting to EPA.

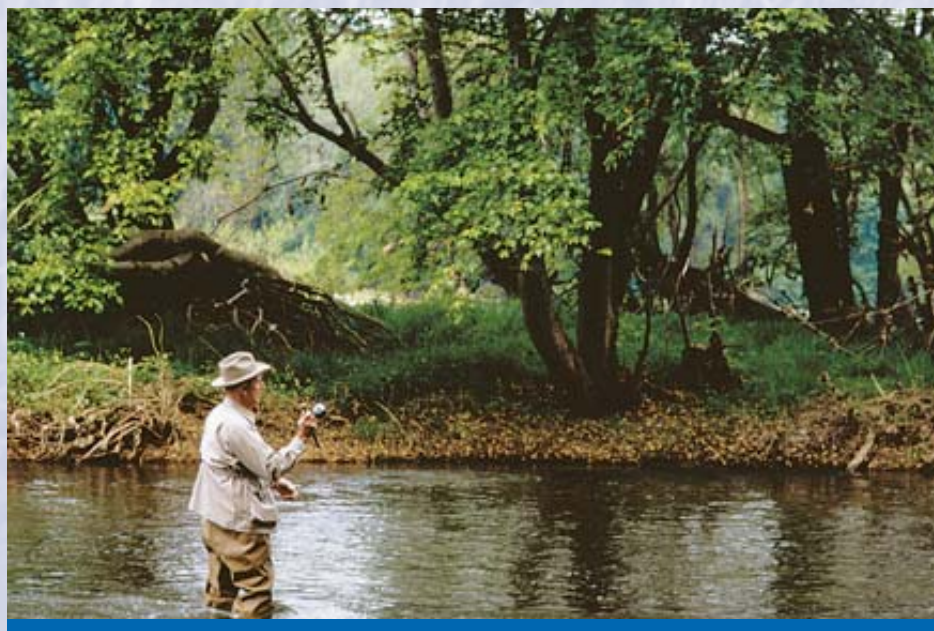
Rivers and Streams

States assessed 19% of the nation's 3.7 million miles of rivers and streams for the 2002 reporting cycle. Of these waterbodies, 45% were reported as impaired or not clean enough to support their designated uses, such as fishing and swimming. States found the remaining 55% to be fully supporting of all designated uses. Sediment, pathogens, and habitat alterations were cited as the

leading causes of impairment in rivers and streams, and top sources of impairments included agricultural activities, unknown/unspecified sources, and hydrologic modifications (such as water diversions and channelization).

Lakes, Ponds, and Reservoirs

States assessed 37% of the nation's 40.6 million acres of lakes, ponds, and reservoirs during the 2002 reporting cycle. Of these waterbodies, 47% were reported as impaired and 53% were fully supporting all designated uses. Nutrients, metals (primarily mercury), and organic enrichment/low dissolved oxygen were cited as the leading causes of impairment in lakes. Top sources of pollutants to lakes, ponds, and reservoirs included unknown/unspecified sources, agricultural activities, and atmospheric deposition.



States assessed 19% of U.S. river and stream miles, and of those, 55% fully support all designated uses, such as aquatic life harvesting and aesthetic value (Photo courtesy of Luther Goldman, U.S. Fish and Wildlife Service).

Bays and Estuaries

States assessed 35% of the nation's 87,370 square miles of bays and estuaries for the 2002 reporting cycle. Of these waterbodies, 32% were reported as impaired and the remaining 68% fully supported all designated uses. Metals (primarily mercury), nutrients, and organic enrichment/low dissolved oxygen were the leading causes of impairment in bays and estuaries. Top sources of impairment to bays and estuaries included unknown/unspecified sources, industrial sources, and municipal discharges (e.g., sewage treatment plants).



States reported nutrients, metals, and organic enrichment/low dissolved oxygen to be the leading causes of impairment in lakes, ponds, and reservoirs (Photo courtesy of Karen Rodriguez, EPA).



Boating, fishing, swimming, and bird watching are just a few of the recreational activities people enjoy in estuaries (Photo courtesy of John Theilgard).

National Studies of Water Quality

Statistically valid, probability-based studies can complement targeted monitoring and assessment programs and add substantially to our understanding of state, regional, and national water quality conditions, including how broad water quality conditions may change over time. These studies select sites at random to represent the condition of waters in regions that share similar ecological characteristics and are a more cost-effective approach to monitoring than more traditional census-type or targeted approaches.

EPA and its partners have embarked on three national probability-based studies that are discussed later in this report: the National Coastal Assessment, the National Study of Chemical Residues in Lake Fish Tissue, and the Wadeable Streams Assessment. EPA is also funding pilot projects that will provide a foundation for a future comprehensive assessment of the nation's lakes. National, regional, and state-wide probability-based studies will provide much-needed information on water quality throughout the United States.

Future Reporting

States are working to strengthen their water monitoring and assessment programs by developing long-term monitoring strategies that identify the specific actions needed to move toward more comprehensive and consistent reporting of water quality conditions. In addition, states and EPA are streamlining water quality monitoring and assessment by integrating various Clean Water Act reporting requirements and moving toward improved electronic reporting of water data. The results of these efforts will be more comprehensive information that can be easily accessed by water quality managers and the public.



Data collected from probability-based studies and targeted monitoring efforts can be combined to broaden our understanding of water quality conditions (Photo courtesy of Tetra Tech, Inc.).

Background



Photo courtesy of John Theilgard

Under Section 305(b) of the Clean Water Act, states, territories, and other jurisdictions of the United States are required to submit reports on the quality of their waters to the U.S. Environmental Protection Agency (EPA) every two years. In the past, states submitted these reports in hardcopy format, and EPA prepared a national hardcopy report that summarized their findings (see <http://www.epa.gov/305b>). Under Section 303(d) of the Clean Water Act, states also biennially provide a separate prioritized list of waters that are impaired and require the development of pollution controls (to learn more about Section 303(d) reporting, visit <http://www.epa.gov/owow/tmdl>).

Beginning with the 2002 reporting cycle, EPA urged states to combine these two reporting requirements into one integrated report and to submit these reports electronically. Few states submitted fully integrated reports for the 2002 cycle, although an increasing number are expected to do so in future reporting cycles. This electronic information on water quality assessment results is housed in the 2002 National Assessment Database. To increase the usefulness of this information to the public, EPA is presenting state-reported assessment information (which does not include Section 303(d) information prioritizing impaired waters for 2002) on the Internet at <http://www.epa.gov/waters/305b>.

About the National Assessment Database

The 2002 National Assessment Database presents electronic water quality information for almost all states, the District of Columbia, and the U.S. Virgin Islands. Three states (Alabama, North Carolina, and Washington), Puerto Rico, the tribal nations, and the island territories of the Pacific did not provide data electronically in 2002. This lack of data may account, at least in part, for the fewer number of river miles, lake acres, and estuarine square miles reported as assessed in 2002 compared to the previous reporting cycle.

To view the 2002 National Assessment Database, go to <http://www.epa.gov/waters/305b> and click on the map to find summary information and assessment results for specific states, watersheds, and waterbodies of interest. A series of tables and charts summarizing water quality information for the nation as a whole, based on the 2002 state reports, can also be viewed at this Web site.

One of the goals of the Clean Water Act is “to restore and maintain the chemical, physical, and biological integrity of the nation’s waters.”

The information contained in the National Assessment Database is useful for the snapshot view it provides of waters assessed by the states during the 2002 reporting cycle. The database collects the findings of 49 state and territory water quality monitoring programs for 2000–2002; lists which pollutants and pollution sources affected individual waters, watersheds, and states; and reports which waters met the uses for which they were designated. This state data can be viewed through the National Assessment Database’s interactive mapping tool, which displays a wide range of environmental information.

Integrated Water Quality Reporting

EPA has encouraged states to combine biennial state water quality reporting requirements under Sections 305(b) and 303(d) of the Clean Water Act for several reasons. Integrating these reports will merge environmental data from a variety of water quality programs and will benefit the public by providing a more informed summary of the quality of state waters. It will also provide decision makers with better information on the actions necessary to protect and restore these waterbodies. The integrated report will also streamline state reporting requirements by eliminating the need for two separate reports.

In the 2004 cycle, EPA expects to see state progress toward integration of Sections 305(b) and 303(d) water quality reporting, although full integration may not occur until 2006 or beyond. To facilitate the states’ efforts to improve integrated reporting, EPA published new integrated reporting guidance in August 2005. For information on the current status of 303(d) lists of impaired waters and integrated reporting, go to <http://www.epa.gov/owow/tmdl>.

Comparability of Water Quality Data

Although the information in the National Assessment Database provides a picture of state assessment results, these data should not be used to compare water quality conditions between states or to identify trends in statewide or national water quality. The following are reasons for this lack of comparability:

- The methods states use to monitor and assess their waters, including what and how they monitor and how they report their findings to EPA, vary from state to state and within individual states over time. To better protect the health of their citizens, many states target their limited monitoring resources to waters that are suspected of being impaired or to address local priorities and concerns; therefore, the small percentage of waters assessed may not reflect statewide conditions. States may monitor a different set of waters from one reporting cycle to another, or they may monitor fewer waters when state budgets are limited.
- The science of monitoring and assessment varies over time, and many states are better able to identify problems as their monitoring and analytical methods improve. For example, states are conducting more fish tissue sampling than in previous years. The use of improved assessment methods to collect more and better information may result in more extensive and protective fish consumption advisories, even though water quality conditions themselves may not have changed.
- 2002 was a transition period between traditional 305(b) reporting and integrated 305(b)/303(d) reporting. States that included 303(d) assessment information may have relied on more stringent rules for data acceptability than those states without integrated reporting.
- Under the Clean Water Act, each state has the authority to set its own water quality standards; therefore, each state's definition of its designated uses (e.g., Warm Water Fishery or Livestock Watering) may differ from definitions used by other states, along with the criteria against which states determine impairments. (See the *Assessing Water Quality* section for more information.) EPA has collected the 2002 data into a set of national use categories defined in the National Water Quality Standards Database at <http://www.epa.gov/wqsdatabase>. These use categories are somewhat different from those outlined in previous national 305(b) reports.

The most efficient way to get a good understanding of national water quality conditions and trends is to use probability surveys. Probability surveys are scientifically based studies designed to sample water quality conditions at randomly selected sites that are statistically representative of the nation's many distinct ecological regions. EPA and its monitoring partners have used this methodology to develop a series of *National Coastal Condition Reports* (<http://www.epa.gov/nccr>). These reports summarize the findings of the National Coastal Assessment, a probability-based study. Another probability-based project currently underway is the National Study of

Chemical Residues in Lake Fish Tissue (<http://www.epa.gov/waterscience/fishstudy>), the first national fish contamination survey to have statistically selected sampling sites. EPA has also conducted a probability-based Wadeable Streams Assessment (<http://www.epa.gov/owow/streamsassessment>) to determine the biological condition of small streams in the United States. The Wadeable Streams Assessment was completed in 2006.

To learn more about the water quality monitoring, assessment, and reporting practices of a specific state, visit the state's water quality Internet site and read the

Reporting Results of Statewide Probability Surveys

The 2002 National Assessment Database contains only electronically reported waterbody-level information from the states. A few states conduct statewide or regional probability-based surveys (based on statistical random sampling) to supplement this information and to draw broad-scale conclusions about ecologically related waters. EPA fully supports these efforts to increase the percentage of assessed waters. Although the results of these state surveys are not included in the 2002 database, future versions of the database will incorporate the results of state probability surveys.

explanatory and programmatic information included in most reports. The National Assessment Database contains the Web address for each state water quality Internet site.

Assessing Water Quality

States assess the quality of their waters based on water quality standards they develop in accordance with the Clean Water Act. Water quality standards may differ from state to state, but must meet minimum requirements. EPA must approve these standards before they become effective under the Clean Water Act.

Water quality standards are comprised of three elements: the **designated uses** assigned to waters (e.g., recreation, public water supply, the protection and propagation of aquatic life); the **criteria** or thresholds (expressed as numeric pollutant concentrations or narrative requirements) that are necessary to protect the designated uses; and the **antidegradation** policy intended to prevent waters from deteriorating from their current condition. Waters may be designated for more than one use. To learn

more about water quality standards, visit <http://www.epa.gov/waterscience/standards>.

After setting water quality standards, states assess their waters to determine the degree to which the standards are being met. State water quality assessments are normally based on five broad types of monitoring data: biological integrity, chemical, physical, habitat, and toxicity. (Examples of the different types of data used to determine a state's water quality are shown in the box *Types of Monitoring Data*.) Each type of monitoring data yields an assessment that must be integrated with other data types for an overall assessment. Depending on the designated use, one data type may be more informative than others for making the final assessment.



Water quality monitoring results are used for a variety of purposes, including to determine if waters are meeting a state's water quality standards (Photo courtesy of Lynn Betts, National Resources Conservation Service).

Designated Use Categories in this Report

The states have different names for the various uses they have designated for their waters. For example, one state might designate as Class A those waters that are capable of supporting fish species of commercial and recreational value (e.g., salmon and trout), whereas another state might classify similar waters as Cold Water Fishery waters. In order to be consistent with EPA's Water Quality Standards Database, the 2002 National Assessment Database groups state-reported uses according to the following overall categories:

- **Fish, Shellfish, and Wildlife Protection and Propagation**—Is water quality good enough to support a healthy, balanced community of aquatic organisms?



Photo courtesy of Brad Ashbaugh

- **Recreation**—Can people safely swim or enjoy other recreational activities in and on the water?
- **Public Water Supply**—Does the waterbody safely supply water for drinking after standard treatment?
- **Aquatic Life Harvesting**—Can people safely eat fish caught in the waterbody?
- **Agricultural**—Can the waterbody be used for irrigating fields and watering livestock?
- **Industrial**—Can the water be used for industrial processes?
- **Aesthetic Value**—Is the waterbody aesthetically appealing?
- **Exceptional Recreational or Ecological Significance**—Does the waterbody qualify as an outstanding natural resource or support rare or endangered species?

You can find out which state classifications fit under each of these categories by clicking on the individual use category name in the National Assessment Database.

Hundreds of organizations in the United States conduct water quality monitoring. Monitoring organizations include federal, state, interstate, tribal, and local water quality agencies; research organizations such as universities; industries and sewage and water treatment plants; and citizen volunteer programs. For example, EPA and the U.S. Geological Survey (USGS) are two federal agencies that collect water quality monitoring data. Monitoring organizations may collect water quality data for their own purposes or to share with government decision makers. States evaluate and use much of these data when preparing their water quality reports.

The states, territories, and tribes maintain monitoring programs to support several objectives, including assessing whether water is safe for drinking, swimming, and fishing. States also use monitoring data to review and revise water quality standards, identify impaired and threatened waters under Clean Water Act Section 303(d), develop pollutant-specific total maximum daily loads (TMDLs), determine the effectiveness of control programs, adjust drinking water treatment requirements, measure progress toward clean-water goals, and respond to citizen complaints or events such as spills and fish kills.

Types of Monitoring Data

- **Biological Integrity Data**—Objective measurements of aquatic biological communities (usually aquatic insects, fish, or algae) used to evaluate the condition of an aquatic ecosystem. Biological data are best used when deciding whether waters support aquatic life uses.
- **Chemical Data**—Measurements of key chemical constituents in water, sediments, and fish tissue. Examples of these constituents include metals, oils, pesticides, and nutrients such as nitrogen and phosphorus. Monitoring for specific chemicals helps states assess waters against numerical criteria, as well as identify and trace the source of the impairment.
- **Physical Data**—Characteristics of water, such as temperature, flow, suspended solids, sediment, dissolved oxygen, and pH. These physical attributes are often useful indicators of potential problems and can have an effect on the impacts of pollution.
- **Habitat Assessments**—Descriptions of sites and surrounding land uses; condition of streamside vegetation and banks; and measurement of key features, such as stream width, depth, and substrate. These assessments are used to supplement and interpret other kinds of data.
- **Toxicity Testing**—Measurements of mortality of a test population of selected organisms, such as fathead minnows or daphnia (“water fleas”). These organisms are exposed to known dilutions of water taken from the sampling location. The resulting toxicity data indicate whether an aquatic life use is being attained. These tests can help determine whether poor water quality results from toxins or from habitat degradation.



Habitat assessment data may include measurements of streamside vegetation and stream width, depth, and substrate (Photo courtesy of Colin Hill, Tetra Tech, Inc.).

Findings



Photo courtesy of Charlie Rahm, Natural Resources Conservation Service

Rivers and Streams

The 2002 National Assessment Database summarizes river and stream designated use support information reported by the states by overall use support and by individual categories of uses.

Waters are rated for overall use support as follows:

- **Good**—if they fully support all their designated uses;
- **Threatened**—if they fully support all uses, but exhibit a deteriorating trend; or
- **Impaired**—if they are not supporting one or more designated uses.

Overall for 2002, states assessed 695,540 miles of rivers and streams, or 19% of the nation's approximately 3.7 million stream miles (Figure 1). This is about 4,400 fewer stream miles than in the previous reporting cycle. States identified 45% of the assessed miles as being impaired, or not supporting one or more of their designated uses. The remaining 55% of assessed miles fully supported all uses, and of these, 4% were considered threatened (i.e., water quality supported use, but exhibited a deteriorating trend).

Individual use support assessments also provide important details about the nature of water quality problems in rivers and streams. Table 1 shows the top five assessed uses in rivers and streams. States evaluated support of the Fish, Shellfish, and Wildlife Protection and Propagation use most frequently, assessing a total of 596,433 stream miles (or 16% of U.S. stream miles) and reporting that 41% of assessed stream miles were impaired for this use. States assessed 321,750 stream miles for Recreation uses (primary and secondary contact) and found recreation to be impaired in 33% of these waters.

The National Assessment Database also reports the sources and causes of impairments, but it is important to note that the information about specific sources and causes of impairment is incomplete. States do not always report the pollutant or source of pollutants affecting every impaired river and stream. Although states may recognize that water quality does not fully support a designated use, they may not have adequate data in some cases to document the specific pollutant or source responsible for the impairment. In past national reports, unknown or unspecified causes and sources were included only

Figure 1. Water quality in assessed river and stream miles.

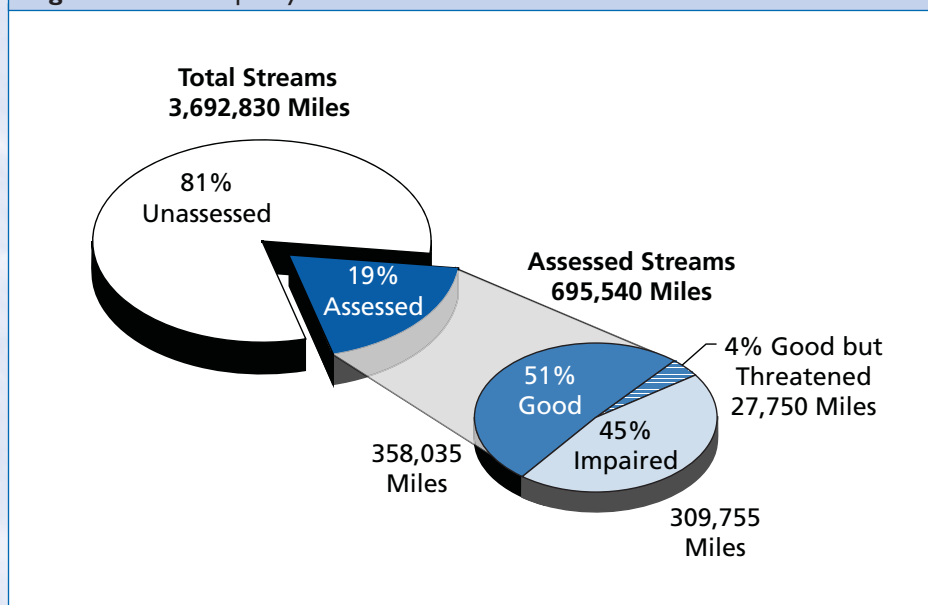


Table 1. Individual Use Support in Assessed River and Stream Miles^a.

Designated Use	Assessed Miles	Percent of Total U.S. Stream Miles	Percent of Waters Assessed		
			Good	Threatened	Impaired
Fish, Shellfish, and Wildlife Protection/Propagation	596,433	16%	55%	4%	41%
Recreation	321,750	9%	64%	3%	33%
Agricultural	189,332	5%	92%	<1%	7%
Aquatic Life Harvesting	186,721	5%	57%	16%	27%
Public Water Supply	150,492	4%	81%	2%	18%

^aWaterbodies can have multiple designated uses, resulting in overlap of Assessed Miles.

as footnoted material to summary statistics. For the first time, this 2002 report includes unspecified causes and sources in all summary statistics to more clearly represent what states are reporting to EPA.

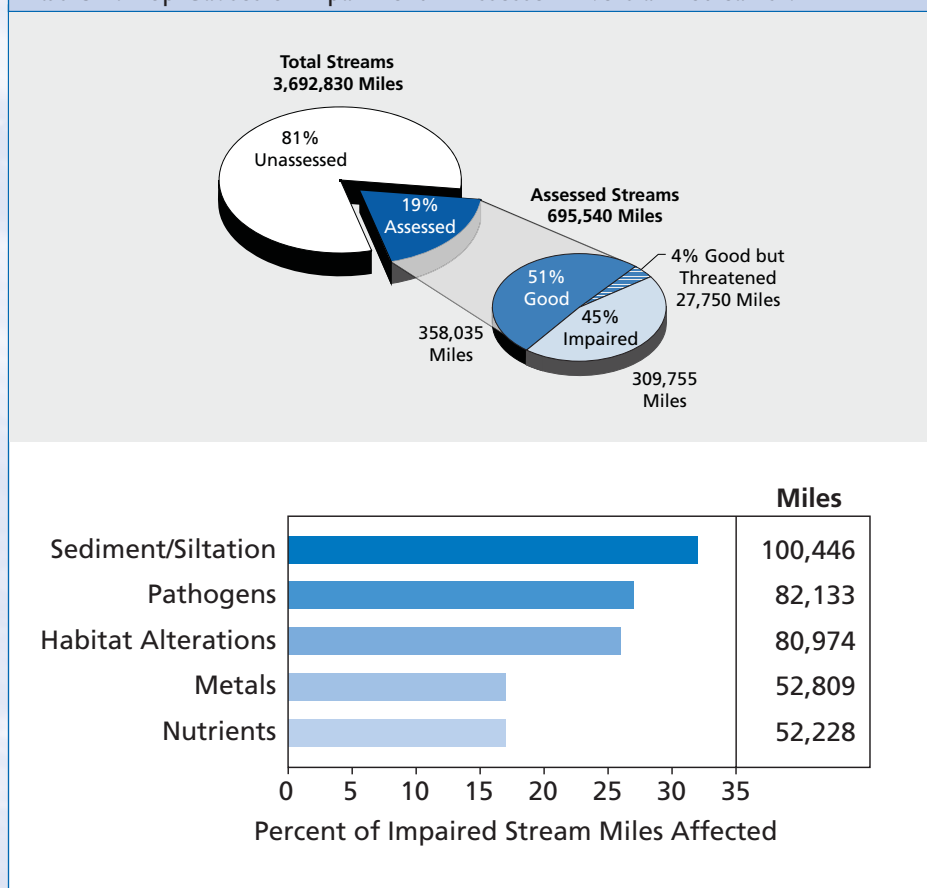
Table 2 shows the top reported causes of impairment in assessed rivers and streams. According to the states, the top causes of river and stream impairment regardless of designated use were the following:

- **Sediment or siltation**, which can smother stream beds, suffocate fish eggs and bottom-dwelling organisms, and interfere with drinking water treatment and recreational uses
- **Pathogens** (bacteria), which indicate possible fecal contamination that may cause illness in people
- **Habitat alterations**, such as disruption of stream beds and riparian areas.



Excess sediments, pathogens, and alterations to habitat are the leading reported causes of impairment in rivers and streams (Photo courtesy of Tim McCabe, National Resources Conservation Service).

Table 2. Top Causes of Impairment in Assessed Rivers and Streams*.



*Percents do not add up to 100% because more than one cause or source may impair a waterbody.

More information on state-reported causes and sources of impairment is available from the National Assessment Database at <http://www.epa.gov/waters/305b>.

States also reported other leading causes of impairments of rivers and streams, including metals (primarily mercury), nutrients, thermal modifications (e.g., water heated by factories or by runoff from paved areas), organic enrichment/low dissolved oxygen (i.e., organic materials such as plant matter, food processing waste, and sewage consume oxygen when they degrade in water), and flow alterations.

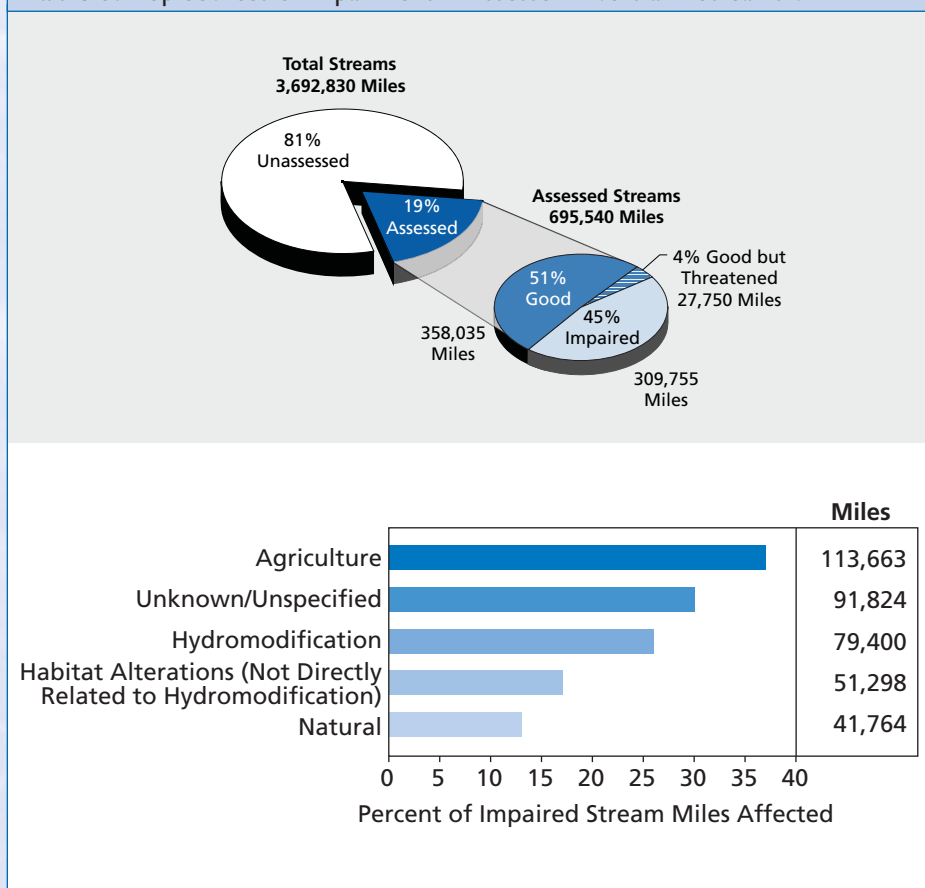
Table 3 shows the top reported sources of impairment in assessed rivers and streams. According

to the states, the top sources of river and stream impairment included the following:

- **Agricultural activities**, such as crop production, grazing, and animal feeding operations
- **Unknown or unspecified sources** (i.e., the states could not identify specific sources)
- **Hydrologic modifications**, such as water diversions, channelization, and streambank destabilization.

Other leading sources of impairment in streams included habitat alterations (e.g., loss of streamside habitat), natural sources (e.g., floods, droughts, and wildlife), urban runoff and storm water, and municipal permitted discharges (e.g., sewage treatment plants).

Table 3. Top Sources of Impairment in Assessed Rivers and Streams*.



*Percents do not add up to 100% because more than one cause or source may impair a waterbody.

Lakes, Ponds, and Reservoirs

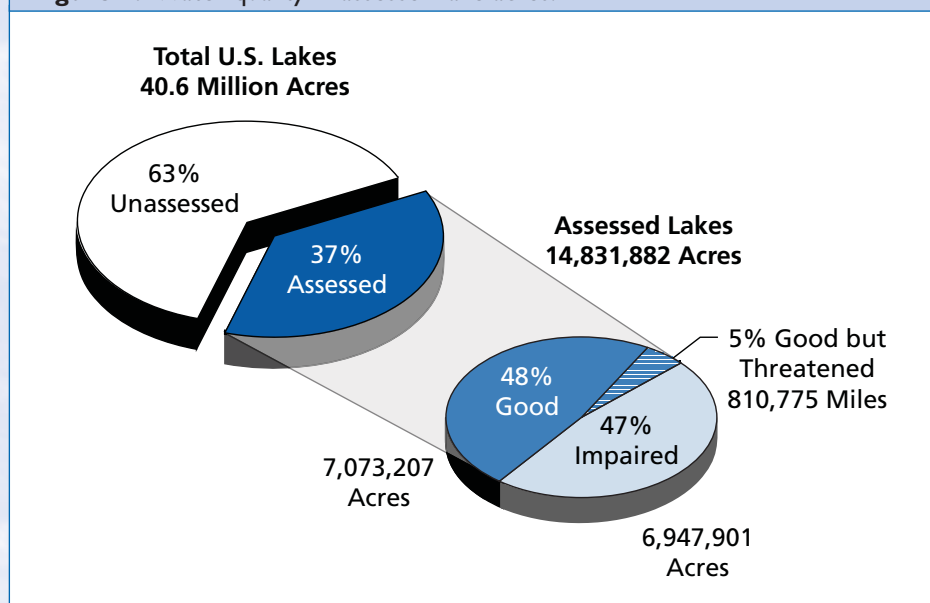
The 2002 National Assessment Database summarizes designated use support information reported by the states for lakes, ponds, and reservoirs by overall use support and by individual categories of uses.

Overall, states assessed approximately 14.8 million acres of lakes, ponds, and reservoirs (excluding the Great Lakes), or 37% of the nation's total 40.6 million lake acres for the 2002 reporting cycle (Figure 2). This is 2.5 million fewer acres than were assessed in the previous reporting cycle. States identified 47% of assessed acres as impaired, or not supporting one or more of their designated uses (e.g., fishing, swimming). The remaining 53% of assessed acres fully supported all uses, and of these, 5% were considered threatened.

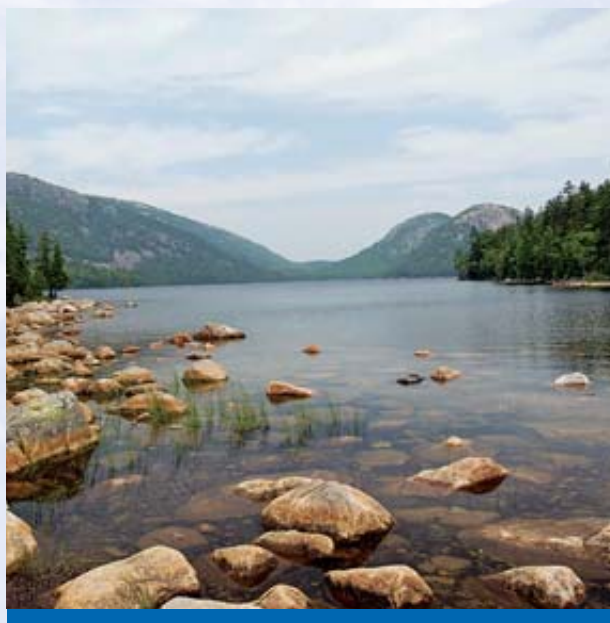


Excess nutrients, such as nitrogen and phosphorus, can disrupt lake ecosystems by stimulating growth of algae and aquatic weeds (Photo courtesy of Brad Ashbaugh).

Figure 2. Water quality in assessed lake acres.



Individual use support assessments provide important details about the nature of water quality problems in lakes, ponds, and reservoirs. Table 4 shows the top five uses assessed in lakes, ponds, and reservoirs. States assessed about 9.7 million lake acres for support of the Fish, Shellfish, and Wildlife Protection and Propagation use, of which 47% were found to be impaired. Thirty-six percent of the approximately 9.6 million lake acres assessed for Recreation uses (e.g., swimming and boating) were



The states assessed 37% of the nation's total lake acres (Photo courtesy of Jeffrey Cole).

impaired. States assessed about 5.7 million acres of lakes and reservoirs for support of the Public Water Supply use and identified 22% as impaired. The Aquatic Life Harvesting use (primarily fish consumption) was assessed in approximately 4.6 million acres; of these, 48% were impaired and 11% were considered threatened (i.e., water quality is deteriorating).

The National Assessment Database also reports the sources and causes of impairments, but it is important to note that the information about specific sources and causes of impairment is incomplete. The states do not always report the pollutant or source of pollutants affecting every impaired lake, pond, and reservoir. In some cases, states may recognize that water quality does not fully support a designated use; however, they may not have adequate data to document the specific pollutant or source responsible for the impairment. The states may then simply report the cause or source of impairment as “unknown” or “unspecified.”

Table 4. Individual Use Support in Assessed Lake, Pond, and Reservoir Acres^a.

Designated Use	Assessed Acres	Percent of Total U.S. Lake Acres	Percent of Waters Assessed		
			Good	Threatened	Impaired
Fish, Shellfish, and Wildlife Protection/Propagation	9,738,351	24%	46%	7%	47%
Recreation	9,564,367	24%	60%	4%	36%
Public Water Supply	5,669,057	14%	75%	3%	22%
Aquatic Life Harvesting	4,562,746	11%	41%	11%	48%
Agricultural	2,931,970	7%	71%	13%	16%

^aWaterbodies can have multiple designated uses, resulting in overlap of Assessed Acres.

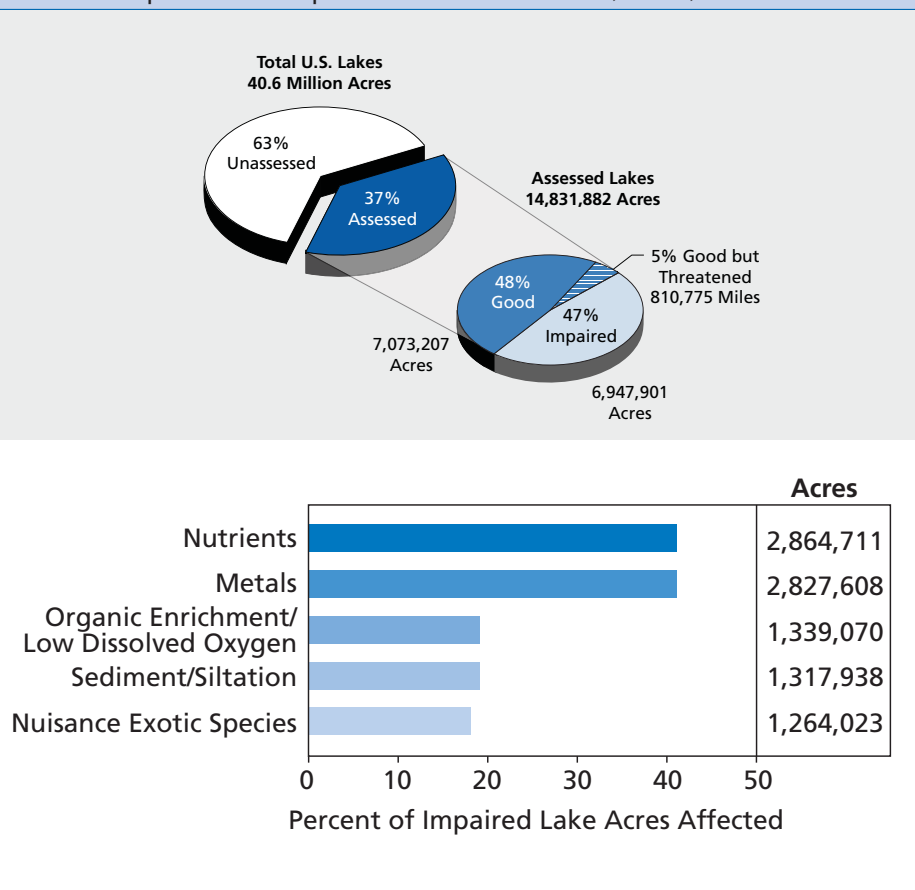
Table 5 shows the top reported causes of impairment in assessed lakes, ponds, and reservoirs. According to the states, the top causes of impairment were the following:

- **Nutrients**, such as phosphorus and nitrogen, which disrupt lake ecosystems by stimulating growth of undesirable algae and aquatic weeds
- **Metals**, such as mercury, which have been widely detected in fish tissue, where they may pose a health risk to people and animals who eat fish
- **Organic enrichment/low dissolved oxygen**, which can adversely affect aquatic life and cause foul odors.

States also reported sediment or siltation, nuisance exotic and invasive species (e.g., non-native plants, fish, and shellfish), toxic organics (e.g., polychlorinated biphenyls [PCBs]), harmful algal blooms, salinity, and flow alterations as other leading causes of impairment.

More information on state-reported causes and sources of impairment is available from the National Assessment Database at <http://www.epa.gov/waters/305b>.

Table 5. Top Causes of Impairment in Assessed Lakes, Ponds, and Reservoirs*.



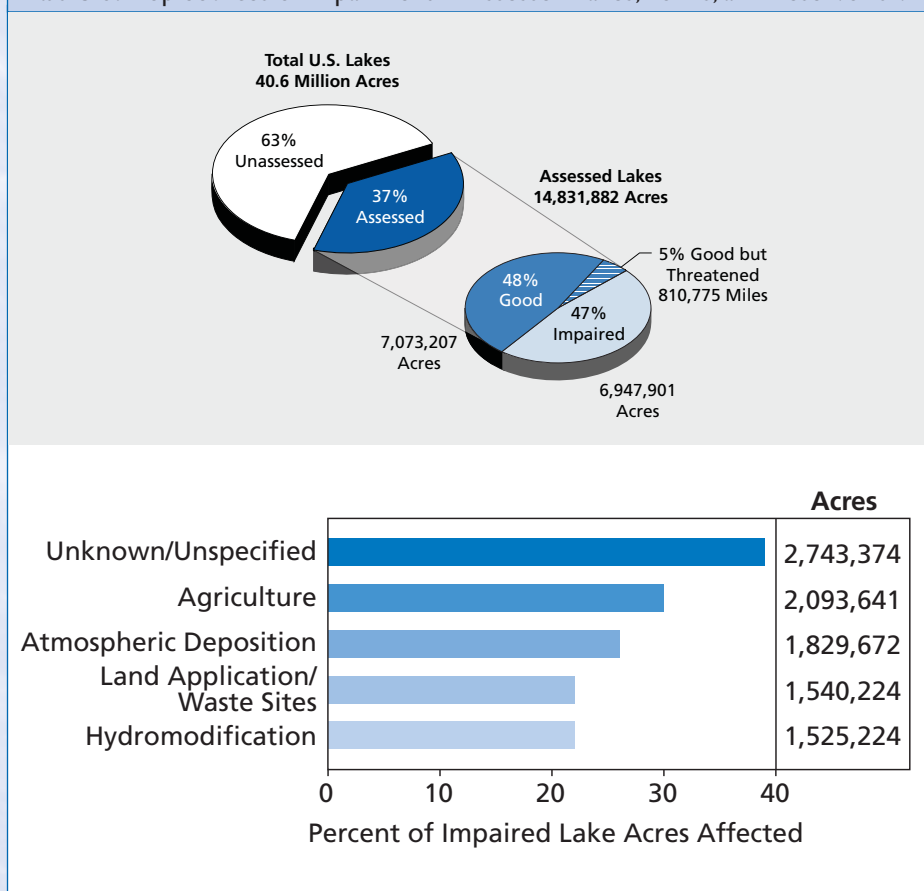
*Percents do not add up to 100% because more than one cause or source may impair a waterbody.

Table 6 shows the top reported sources of impairment in assessed lakes, ponds, and reservoirs. According to the states, the top sources of lake impairment included the following:

- **Unknown or unspecified sources** (i.e., the states could not identify specific sources)
- **Agricultural activities**, such as crop production, grazing, and irrigation
- **Atmospheric deposition** from both local and long-range sources.

Other leading sources of impairment were land application of wastes (e.g., septic systems and landfills), hydrologic modifications (e.g., water diversions and flow regulation), and “other” sources (a catch-all category, including such things as out-of-state sources and exotic species).

Table 6. Top Sources of Impairment in Assessed Lakes, Ponds, and Reservoirs*.



*Percents do not add up to 100% because more than one cause or source may impair a waterbody.

Bays and Estuaries

The National Assessment Database summarizes state-reported designated use support information for bays and estuaries by overall use support and by individual categories of uses.

Overall, states assessed 30,446 square miles of bays and estuaries, or 35% of the nation's total estimated 87,370 square miles, for the 2002 reporting cycle (Figure 3). This is 626 fewer square miles than were assessed by the states in the previous reporting cycle. States identified 32% of assessed square miles as impaired, or not supporting one or more of their designated uses (e.g., swimming, fishing, or shellfishing). The remaining 68% of assessed square miles were fully supporting all uses, and of these, 2%

were threatened. It should be noted that Alaska alone accounted for 44% of assessed estuarine square miles in the United States and 67% of those square miles rated as fully supported all uses.

Individual use support assessments provide important details about the nature of water quality problems in bays and estuaries. Table 7 shows the top three uses assessed in bays and estuaries. States assessed 29,064 estuarine square miles for support of the Fish, Shellfish, and Wildlife Protection and Propagation use and found that 29% were impaired. (Alaska alone accounted for 13,472 square miles assessed for this use and reported 99% of these square miles fully supported all uses.) The Aquatic Life Harvesting use was assessed in 10,025 square miles and found to be impaired in 29% of assessed

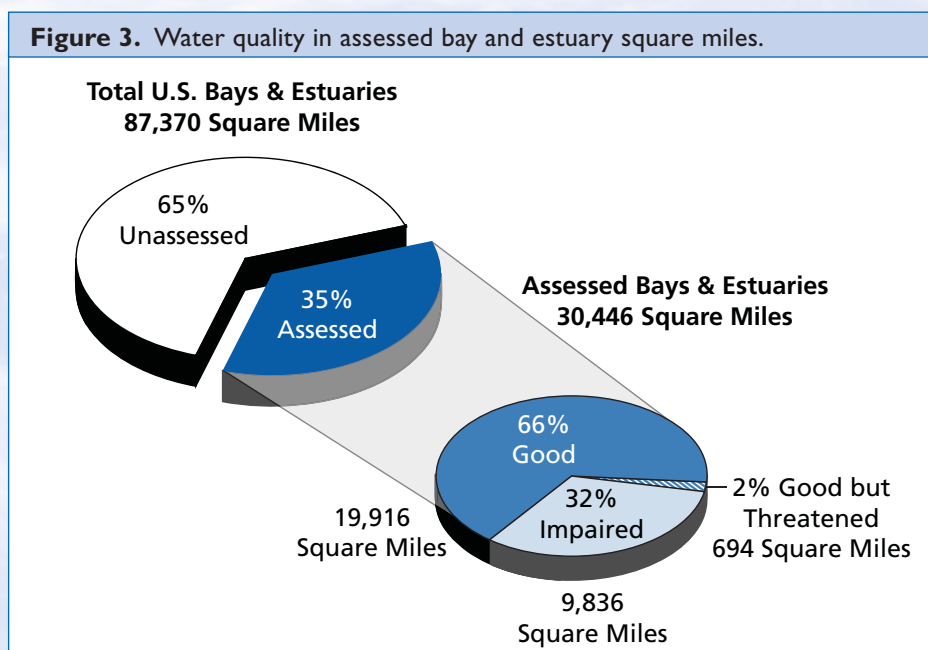


Table 7. Individual Use Support in Assessed Bay and Estuary Square Miles^a.

Designated Use	Square Miles Assessed	Percent of Total U.S. Estuarine Square Miles	Percent of Waters Assessed		
			Good	Threatened	Impaired
Fish, Shellfish, and Wildlife Protection/Propagation	29,064	33%	69%	3%	29%
Aquatic Life Harvesting	10,025	11%	68%	3%	29%
Recreation	9,290	11%	84%	<1%	15%

^aWaterbodies can have multiple designated uses, resulting in overlap of Square Miles Assessed.

waters; 15% of the 9,290 square miles assessed for Recreation uses (e.g., swimming and boating) were reported as impaired.

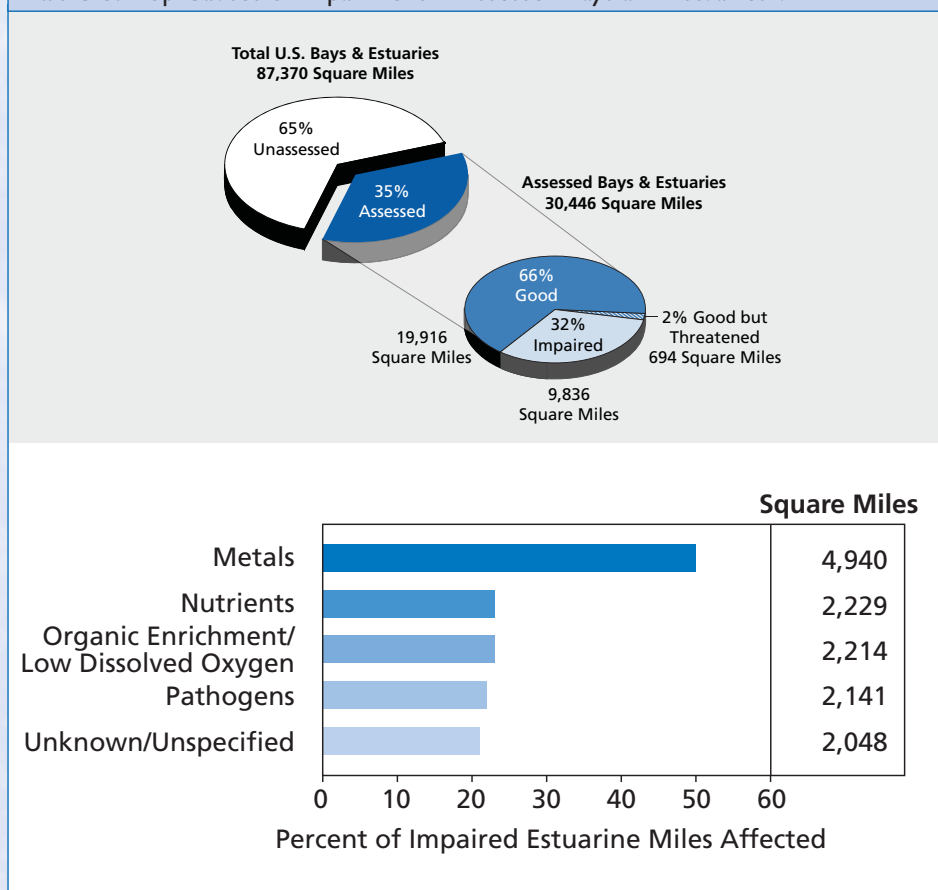
The state-reported information about specific sources and causes of impairment is incomplete. The states do not always report the pollutant or source of pollutants affecting every impaired bay and estuary. In some cases, states may recognize that water quality does not fully support a designated use; however, they may not have adequate data to document the specific pollutant or source responsible for the impairment and report the cause or source as “unknown” or “unspecified.” For the first time, this 2002 report includes unknown/unspecified causes and sources in all summary statistics to more clearly represent what states are reporting to EPA.

More information on state-reported causes and sources of impairment is available from the National Assessment Database at <http://www.epa.gov/waters/305>.

Table 8 shows the top reported causes of impairment in assessed bays and estuaries. According to the states, the top causes of estuarine impairment were the following:

- **Metals**, primarily mercury, which has been detected in fish tissue (Alaska alone reported 2,243 estuarine square miles impaired by metals)
- **Nutrients**, such as nitrogen and phosphorus from fertilizers, which can stimulate the excess growth of algae and aquatic weeds
- **Organic enrichment/low dissolved oxygen**, which can adversely affect aquatic life and cause foul odors.

Table 8. Top Causes of Impairment in Assessed Bays and Estuaries*.



*Percents do not add up to 100% because more than one cause or source may impair a waterbody.

Other leading causes of impairment in bays and estuaries included pathogens, unknown or unspecified causes (i.e., causes that could not be identified), impacts to benthic aquatic communities, turbidity, pesticides, and harmful algal blooms.

Table 9 shows the top reported sources of impairment in assessed bays and estuaries. According to the states, the top sources of estuarine impairment included the following:

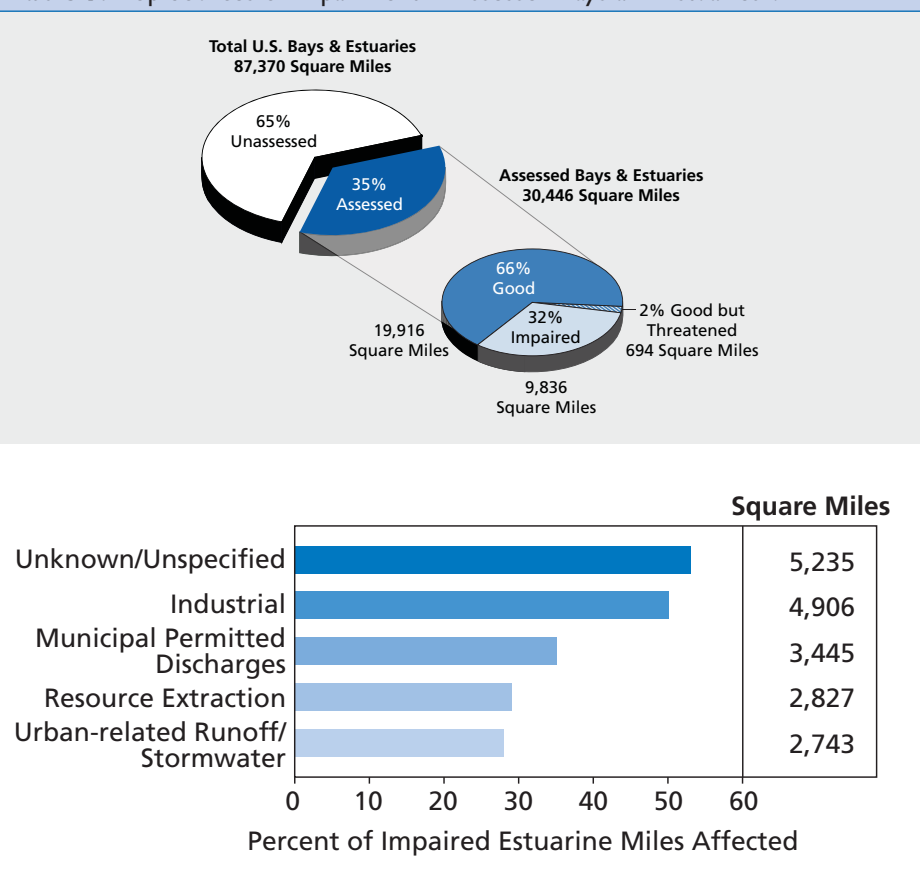
- **Unknown or unspecified sources** (i.e., states could not identify specific sources)
- **Industrial sources** (Alaska alone reported 2,397 square miles impaired by industrial sources)
- **Municipal permitted discharges** (e.g., sewage treatment facilities).

Other leading sources of impairment in bays and estuaries were resource extraction (e.g., mining and runoff of mine tailings), urban runoff/stormwater, and atmospheric deposition.

Other Waters

The 2002 National Assessment Database also contains state-reported information on conditions in coastal shoreline waters, ocean waters, Great Lakes, and wetlands; however, in some cases, only a small percentage of these resources were assessed in the 2002 reporting cycle. These waters are discussed on the following pages.

Table 9. Top Sources of Impairment in Assessed Bays and Estuaries*.



*Percents do not add up to 100% because more than one cause or source may impair a waterbody.

Coastal Resources

Coastal resources are identified in the National Assessment Database in two categories: coastal shorelines (the water immediately offshore, reported in miles) and ocean/near-coastal waters (the area of water extending into the ocean or gulf, range not specified, in square miles). Very few states reported on these important resources; therefore, this information should not be used to draw national conclusions.

Eight of the 27 coastal states assessed 2,571 miles of coastal shorelines, or about 4% of the nation's total 58,618 shoreline miles. The vast majority of assessed shoreline miles (83%) fully supported their designated uses. In the 17% of shoreline miles not fully supporting their uses, pathogens and metals were the leading causes of impairment, and urban-related runoff/stormwater, unknown/unspecified sources, and industrial discharges were listed as top sources of impairment.

EPA works with states, tribes, territories, and local governments to protect coastal swimming beaches, and monitoring of these important resources is increasing. Under the Beaches Environmental Assessment and Coastal Health (BEACH) Act of 2000, EPA is developing improved tools to measure, identify, and address contaminants in recreational waters and to better understand how these pollutants affect people's health. EPA also awards grants to eligible coastal and Great Lakes states, territories, and tribes to develop and implement beach monitoring and notification programs. For more information on the BEACH program, visit <http://www.epa.gov/beaches>.

Nearly 5,000 square miles of oceans and near-coastal waters, or 9% of approximately 54,120 square miles in the United States, were assessed by seven states in 2002. Of the assessed square miles, 87% were identified as impaired. Metals (particularly mercury) were by far the most commonly reported



EPA is developing improved tools to measure, identify, and address contaminants in recreational waters (Photo courtesy of John Theilgard).

cause of impairment. Atmospheric deposition was the predominant reported source of impairment in oceans and near-coastal waters. (It is important to note that Texas alone assessed nearly 3,879 square miles of ocean and near-coastal waters and reported that 100% of its assessed square miles were impaired due to mercury from atmospheric deposition.)

Detailed information on U.S. coastal condition trends is available in the series of *National Coastal Condition Reports*, which present the findings of a collaborative effort between the states, EPA, and other federal agencies to characterize the condition of 100% of the nation's coastal resources. Section 3 of this report summarizes key findings of the *National Coastal Condition Report II*.

Great Lakes

The Great Lakes—Superior, Michigan, Huron, Erie, and Ontario—are freshwater inland seas of vast importance for water consumption, recreation, fisheries, power, transportation, and many other uses. Of the eight states bordering the Great Lakes, three states (Indiana, Michigan, and New York) reported on the condition of their Great Lakes shoreline miles, and three states (Indiana, Michigan, and Pennsylvania) reported on Great Lakes open waters.

Only about 520 of 5,521 total Great Lakes shoreline miles were assessed in 2002, and of these, 91% were reported as impaired. The leading causes of impairment included pathogens, metals, and toxic organics. Legacy or historical pollution—primarily contaminated sediment—was by far the leading source of shoreline impairment reported by the states.



Lake Superior, MN (Photo courtesy of Richard B. Mierement, National Oceanic and Atmospheric Administration).

The states assessed 50,866 square miles, or 84% of the 60,546 square miles of Great Lakes open waters in the United States. Ninety-nine percent of the assessed square miles of Great Lakes open waters were rated as impaired. Priority organics, metals (primarily mercury), and pesticides were the top three causes of impairment, and atmospheric deposition, industrial sources, legacy or historical pollution, and agriculture were all cited as leading sources of impairment in the open waters of the Great Lakes.

Wetlands

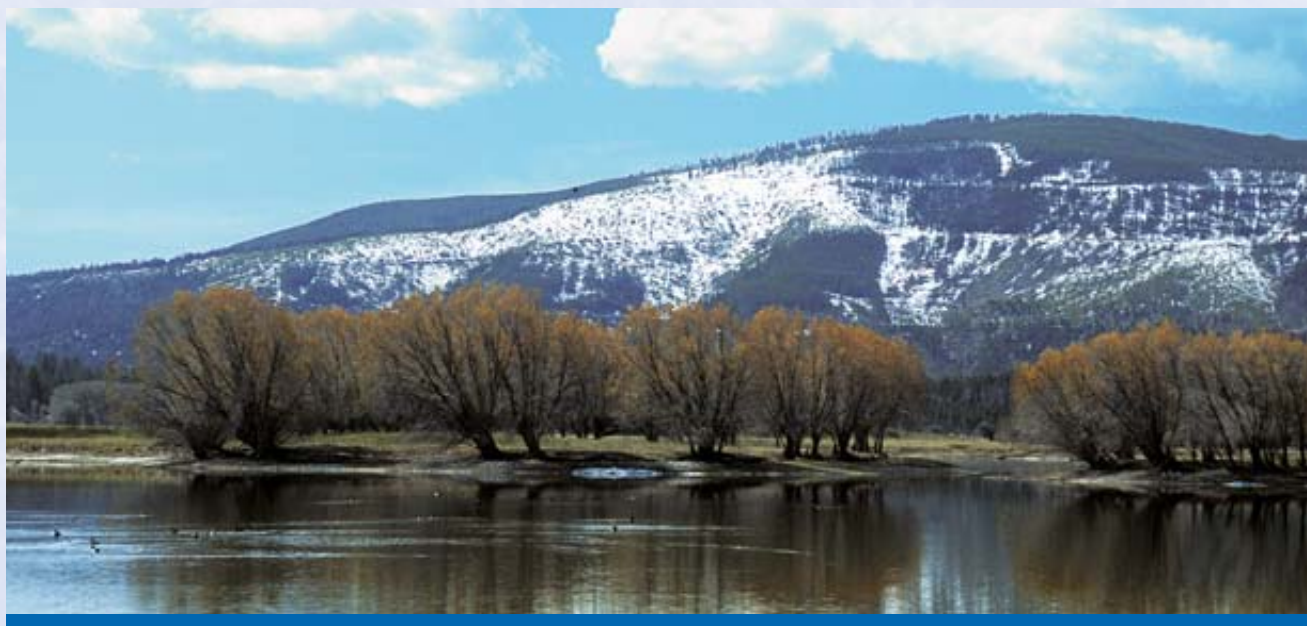
Wetlands occur where water and land come together for a prolonged period of time; saturation of the land with water is the dominant factor determining soil types and the plant and animal communities living in the soil and on the surface. Wetlands vary widely because of regional and local differences in soils, topography, climate, hydrology, water chemistry, vegetation, and other factors, including human disturbance. Included among the many types of U.S. wetlands are marshes, bogs, swamps, wet meadows, vernal pools, playas, pocosins, sloughs, peat lands, prairie potholes, and fens.

Wetlands are a critically important resource due to the many benefits they provide to humans, aquatic life, wildlife, and the environment. Wetlands produce great quantities of food that attract a huge variety of animal species. They serve as nurseries and habitat for many game and commercial fish and wildlife species, and they help improve water quality by intercepting surface runoff and removing, retaining, or filtering out a broad range of substances (e.g., nutrients, sediments, and organic wastes). By storing and slowly

releasing water, wetlands help reduce the impacts of floods and erosion, as well as help replenish groundwater and stream flow during dry periods. Wetlands are also of great recreational value to bird watchers, hunters, fishermen, and nature lovers.

Most states lack wetland-specific designated uses, criteria, and monitoring programs, and without these programs, cannot evaluate support of designated uses for wetlands. Only six states provided information on support of designated uses for 1.3 million acres of wetlands in their 2002 reports—a tiny portion of the nation's estimated 105 million acres. States identified 52 percent of these assessed acres as impaired. Metals (primarily mercury), organic enrichment/low dissolved oxygen, and sediment/siltation were the leading causes of wetland degradation in these six states. The sources of these and other pollutants were mostly unspecified. Where sources were identified, atmospheric deposition and agriculture were top contributors to impairment.

Wetlands produce great quantities of food that attract a huge variety of animal species.



Wetlands vary widely because of regional and local differences in soil, topography, climate, hydrology, water chemistry, vegetation, and other factors (Photo courtesy of Gary Kramer, National Resources Conservation Service).

National Studies of Water Quality



Photo courtesy of Paul Fusco, Natural Resources Conservation Service

State 305(b) reports provide insight into the condition of the relatively small number of waters that are assessed, but should not be compared to each other and cannot be used to track trends in water quality over time. Water quality standards and methods vary from state to state, and monitoring and reporting methods also change over time. Most states monitor only a small percentage of their waters for each reporting cycle, and many monitor in different watersheds from one cycle to the next. Thus, as noted earlier in this report, 2002 state 305(b) assessment data exists for only 19% of the nation's stream miles, 37% of lake and reservoir acres, and 35% of bay and estuary square miles. Furthermore, as states improve their abilities to monitor—for example,

as they analyze more fish tissue samples or monitor the quality of more beaches—they may discover problems that were previously unidentified.

EPA, other federal agencies, and the states have embarked on a more cost-effective approach to track trends in the quality of the nation's waters: statistically valid, probability-based studies that complement existing monitoring and assessment programs and add to our understanding of national, regional, and local water quality conditions. Probability-based studies select a specific number of sites at random to represent the condition of waters in regions that share similar ecological characteristics. Scientists can then draw inferences for 100% of waters with a known degree of confidence.

Probability-based studies are generally characterized by standard sampling methodologies, a defined set of relevant indicators, and stringent quality assurance (QA) requirements. Three of these studies, and one study that is still in the planning stages, are discussed over the following pages. These study results should not be compared to the 305(b) report findings because they address the entire resource (e.g., all U.S. streams, coastal waters).

National Coastal Assessment

The National Coastal Assessment surveys the condition of the nation's coastal resources, as well as state efforts to protect, manage, and restore coastal ecosystems. The results of these surveys are compiled periodically into a *National Coastal Condition Report*. The states, EPA, and partner agencies—the National Oceanic and Atmospheric Administration (NOAA), USGS, and the U.S. Fish and Wildlife Service (FWS)—issued the *National Coastal Condition Report II* in January 2005 as the second in this series

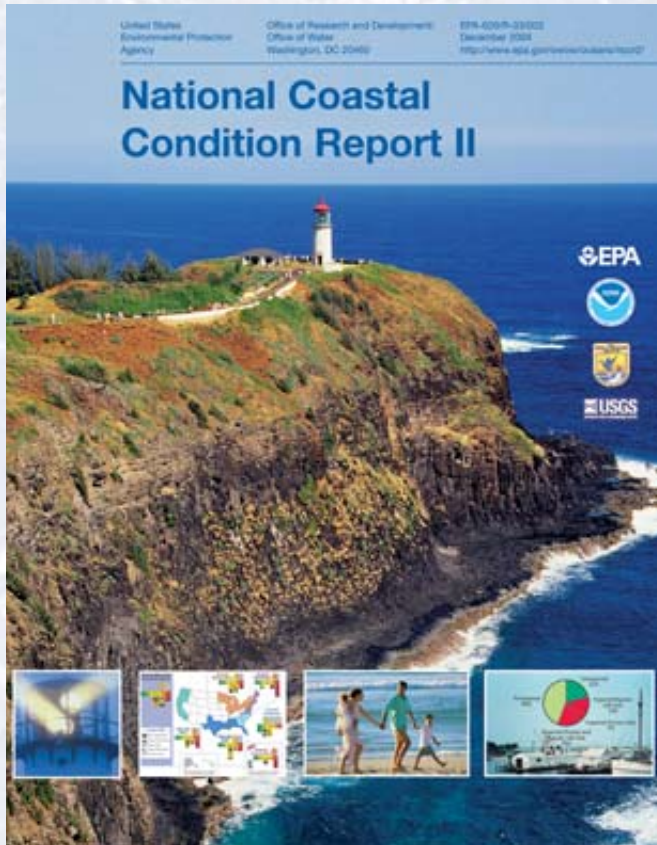
Understanding the Value of Statistical Surveys and the National 305(b) Report

Although some of the findings of the national 305(b) report appear similar to the findings of the statistically based coastal and streams surveys, there are many differences in the scope of these reports and how they are best used to inform water quality management.

The statistical surveys provide consistent environmental indicators of the condition of the nation's water resources, much as economic indicators report on the health of the nation's economy. Their design ensures that results represent the population of all waters of a certain type across the United States, and their consistent sampling methods ensure that results can be aggregated into regional and national indicators of the health of the resource. The survey results quantify, with documented confidence, how widespread water quality problems are across the country and estimate the extent of waters affected by key stressors. This helps set priorities for water resource protection and restoration. Nationally consistent surveys provide a standardized measure for tracking changes in the condition of the nation's waters over time

and for evaluating, at a broad scale, progress in investments to protect and restore water quality.

In contrast to the statistical surveys, the national 305(b) report summarizes information reported by states for only a portion of waters (approximately 19% of U.S. river and stream miles and 35% of bay and estuarine square miles). Although an increasing number of states are adopting statistical survey designs to represent the condition of all state waters, most still select monitoring sites to meet specific needs, such as the evaluating potential downstream impacts of permitted discharges. The national 305(b) report tallies state findings based on data collected using a variety of sampling methods and parameters, water quality standards and interpretation methods, extrapolation methods, and time periods. The 305(b) report provides useful information on the nature of water quality problems identified by state monitoring programs; documents the amount of waters assessed and unassessed; supports the identification of specific waters not meeting water quality standards; and thereby helps states set priorities for these waters.



of environmental surveys of U.S. coastal waters. This report includes evaluations of 100% of the nation's estuaries in the contiguous 48 states and Puerto Rico. Federal, state, and local agencies collected more than 50,000 samples between 1997 and 2000 for the report, using nationally consistent methods and a probability-based design to assess five key indicators of coastal water health. These indicators included water quality, coastal habitat loss, sediment quality, benthic community condition, and fish tissue contaminants.

The *National Coastal Condition Report II* finds that the quality of U.S. coastal waters is generally fair—essentially the same finding as the first *National Coastal Condition Report*, which was published in 2001. Nationally, 35% of coastal resources are in poor condition, 21% are in good condition, and 44% are threatened (fair condition) for aquatic life use or human use. Overall confidence in the accuracy of the data varies by indicator and region and is about 95% nationally. Other key findings of the report include the following:

- A fish tissue contaminants index was used to determine the suitability of waters for fishing. Twenty-two percent of coastal waters are impaired for fishing, based on EPA's guidelines for moderate consumption of recreationally caught fish.



Twenty-two percent of coastal waters are impaired for fishing based on the findings of the *National Coastal Condition Report II* (Photo courtesy of John Theilgard).

- Water quality, sediment quality, habitat loss, and benthic indices were used to determine the suitability of waters for aquatic life use. Twenty-eight percent of coastal waters are impaired for aquatic life use.
- Among the key indicators, coastal habitat condition, sediment quality, and benthic condition ranked the lowest. Individual components of water quality, including dissolved oxygen and dissolved inorganic nitrogen, ranked slightly better.
- From a regional perspective, the coastal condition in the Southeast is rated as good, the Gulf of Mexico and the West are rated as fair, the Great

Lakes are rated as fair to poor, and the Northeast and Puerto Rico are rated as poor. Figure 4 summarizes these ratings.

The *National Coastal Condition Report II* presents a broad baseline picture of the condition of estuaries across the United States from 1997–2000 and will serve as a benchmark for analyzing the progress of coastal programs in future years. A third report is expected in 2008 and will assess regional trends for the majority of the United States. To view the *National Coastal Condition Report II*, go to <http://www.epa.gov/nccr>.

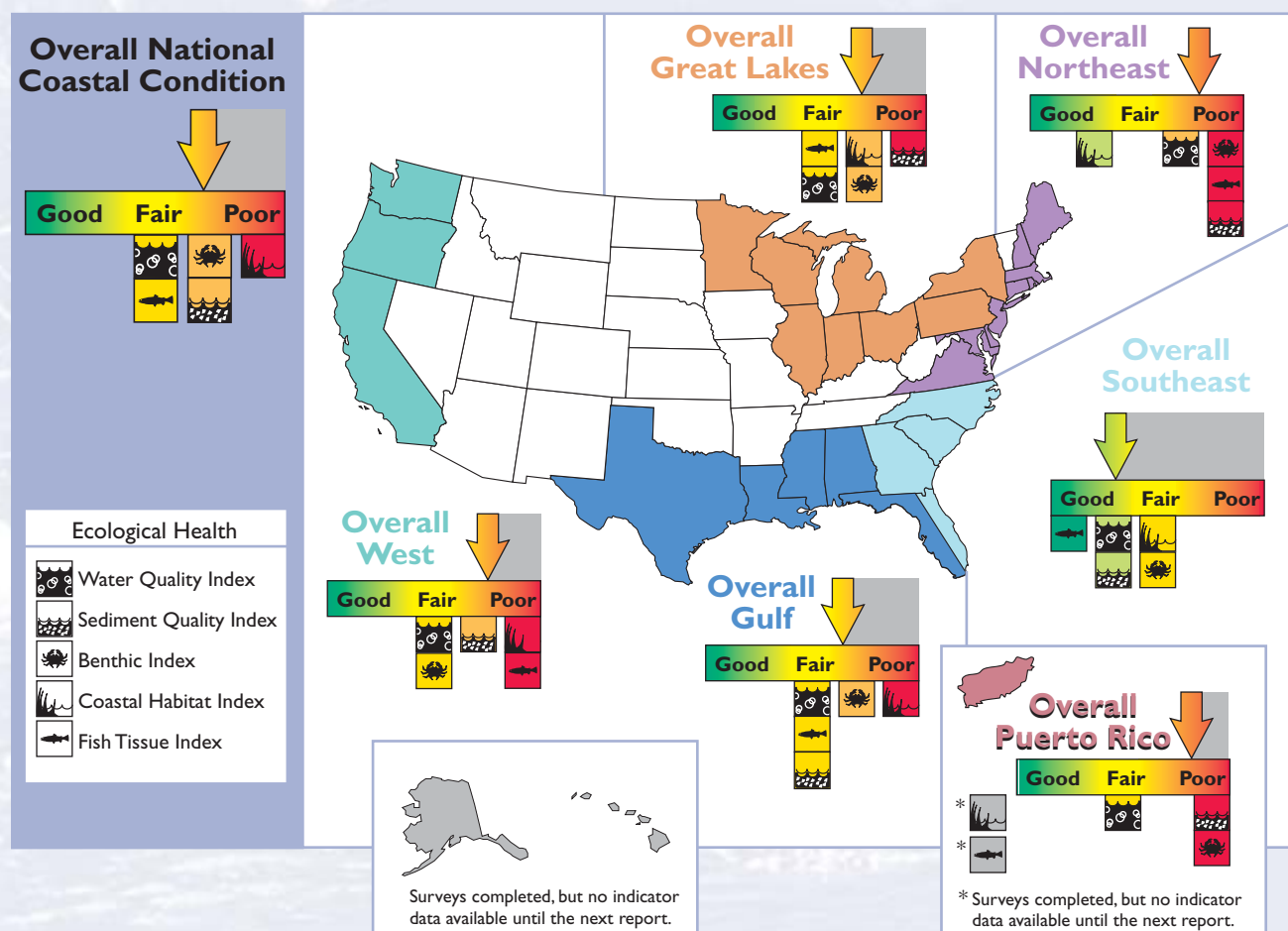


Figure 4. Summary of the overall national coastal condition (U.S. EPA/NCA).

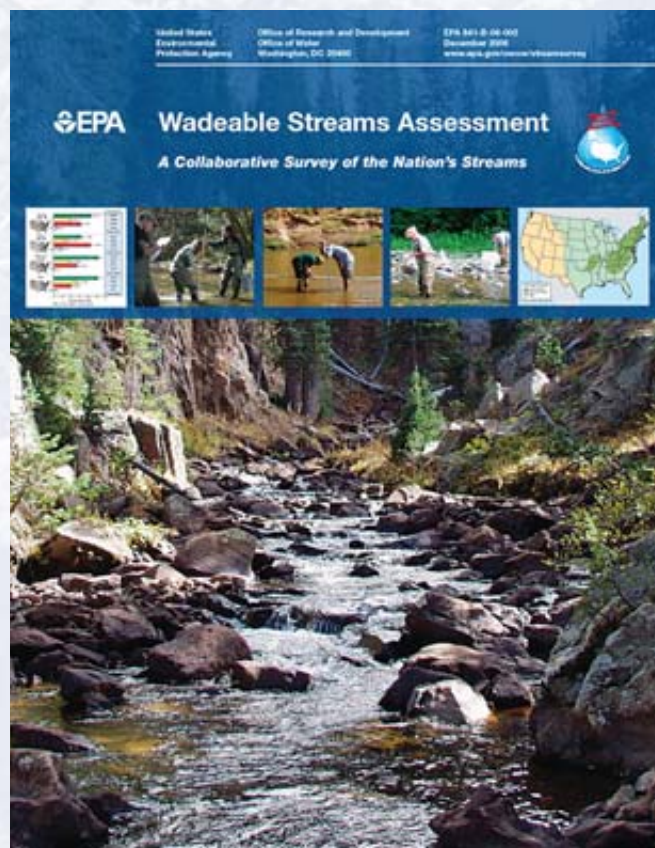
National Study of Chemical Residues in Lake Fish Tissue

The National Study of Chemical Residues in Lake Fish Tissue (or the National Lake Fish Tissue Study) is nearing completion. This study includes the largest set of chemicals studied in fish and is the first national fish contamination survey to have sampling sites that were statistically selected. Agencies in 47 states, 3 tribes, and 2 other federal agencies collaborated with EPA for 4 years to collect fish from 500 lakes and reservoirs in the lower 48 states. Sampling teams applied consistent methods nationwide to collect samples of predator and bottom-dwelling species from each lake.

EPA is analyzing fish tissue samples for 268 chemicals, including mercury, arsenic, dioxins and furans, PCBs, and pesticides. A draft report is expected in the fall of 2007. This study will provide the first national estimates of mean concentrations of the 268 target chemicals in fish, as well as a national baseline to track the progress of pollution-control activities that limit release of these chemicals into the environment. For more information on the National Lake Fish Tissue Study, go to <http://www.epa.gov/waterscience/fishstudy>.



The National Lake Fish Tissue Study is analyzing fish tissue samples for 268 chemicals (Photo courtesy of EPA).



Wadeable Streams Assessment

The Wadeable Streams Assessment, a survey of the biological health of the nation's wadeable streams, was launched in 2004 by EPA and the states to provide a scientific baseline of stream water quality based on conditions at approximately 500 randomly selected sites across the central and eastern United States. With support from EPA, state water quality agencies sampled streams between June and October 2004 using the same types of methods at all sites. Crews collected macroinvertebrates, sampled water quality conditions, and evaluated physical habitat (i.e., the condition of the streambed, streambanks, and vegetation surrounding the stream site) at each site. Data from these sites were combined with data collected by EPA and western states in the Western Streams Pilot Study to draw conclusions about the condition of 100% of streams throughout each major ecological region of the contiguous United States (Figure 5).

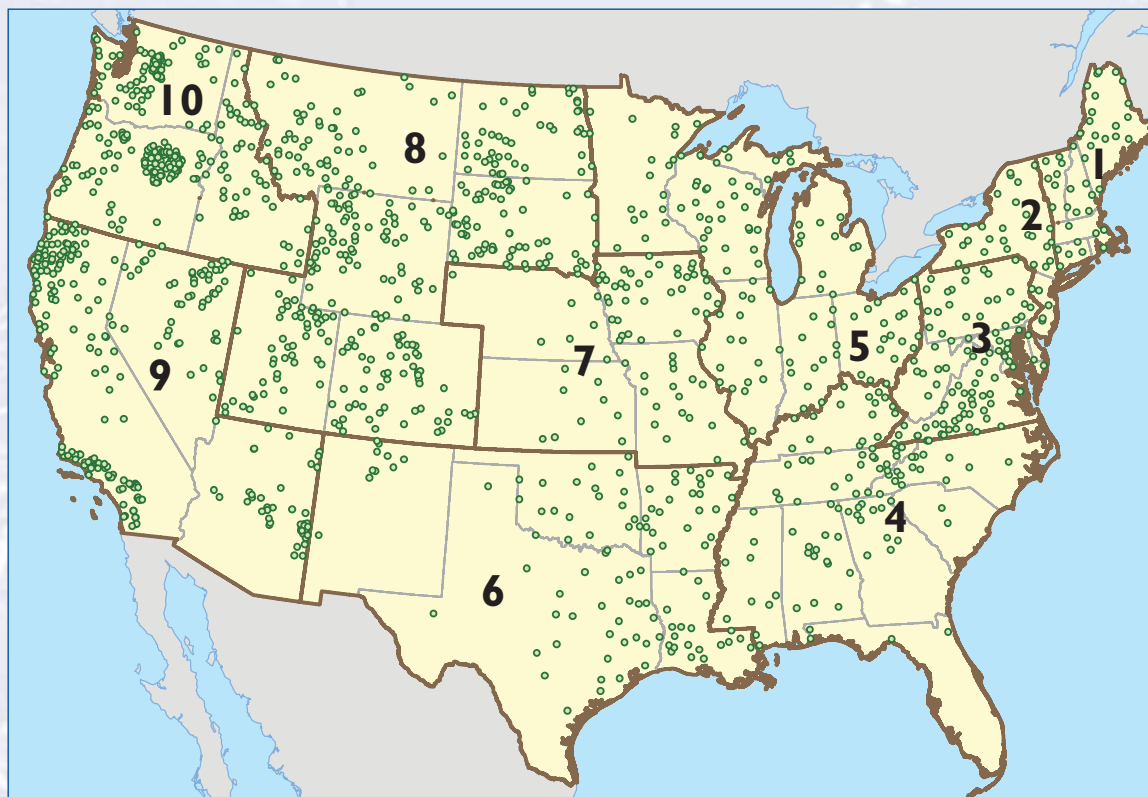


Figure 5. Wadeable Streams Assessment sampling sites (U.S. EPA/WSA).



The Wadeable Streams Assessment collected data at 1,392 wadeable, perennial stream locations, such as this one in Sawmill Creek, MA, in the Northern Appalachians ecoregion (Photo courtesy of Colin Hill, Tetra Tech, Inc.).

Key Findings of the Wadeable Streams Assessment

The Wadeable Streams Assessment found that 42% of U.S. stream miles are in poor condition compared to best-available reference sites in their ecological regions, 25% are in fair condition, and 28% are in good condition (Figure 6). The confidence level for these key findings of biological quality is + or -2.8%. Five percent of U.S. stream miles were not assessed.

Three major regions were outlined for this assessment: the Eastern Highlands, the Plains and Lowlands, and the West. Of these three groups, the West is in the best condition, with 45% of the length of wadeable, flowing waters in good condition. The Eastern Highlands region presents the most concerns, with only 18% of the length of wadeable streams and rivers in good condition and 52% in poor condition.

The study also found that the most widespread stressors observed across the country and in each of the three major regions are nitrogen, phosphorus, riparian disturbance, and streambed sediments. Increases in nutrients and streambed sediments have the highest impact on biological condition; streams scoring poor for these stressors are twice as likely to have poor biological condition as streams that score in the good range for the same stressors.

Future updates of this study will include work currently being conducted in Alaska, Hawaii, and Guam. The study will be repeated in future years to track national trends in stream condition. For more information on the assessment, go to <http://www.epa.gov/owow/streamsurvey>.

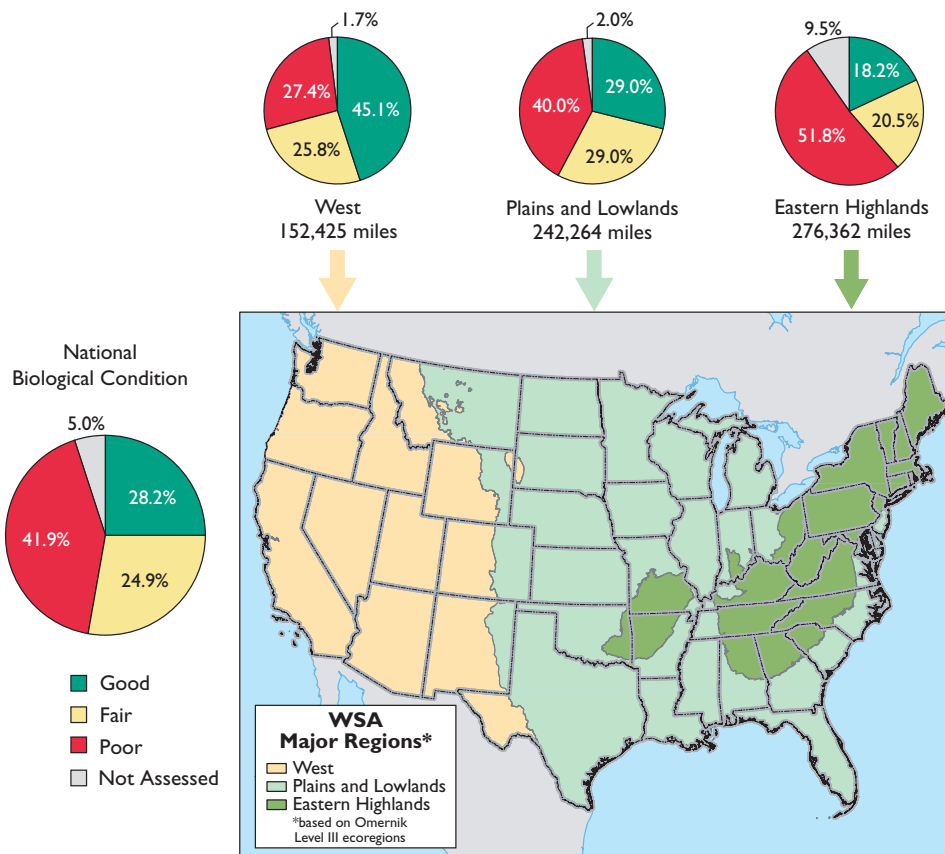


Figure 6. Biological condition of wadeable streams (U.S. EPA/WSA).

Assessing Lakes

EPA and the states are currently making preparations for a comprehensive assessment of the nation's lakes that will serve as a baseline of lake water quality against which future trends can be tracked. EPA has awarded National Lakes Assessment Planning Project grants to study which sampling designs, indicators, collection methods, and data-interpretation methods would best suit the many types and sizes of lakes and reservoirs in the United States. A national meeting was held in the spring of 2006 to share findings and to develop a consensus approach to a national assessment of lake water quality.

Through the institution of regular probability surveys of all waterbody types, EPA and its partners in the states and other federal agencies will be able to cost-effectively assess 100% of the water resources of the United States and track trends in water quality over time. This scientifically based data will assist in the evaluation of the effectiveness of pollution-control activities and will greatly improve our ability to manage the nation's water resources.



A total of 909 lakes, ponds, and reservoirs in the contiguous United States are included in the National Lakes Assessment Survey of the Nation's Lakes (Photo courtesy of Gene Alexander, National Resources Conservation Service).

Future Reporting



Photo courtesy of Lauren Holbrook, IAN Image Library

For many years, water quality monitoring, assessment, and reporting in the United States has suffered from inconsistencies in state programs and methods, as well as the lack of scientifically defensible, national-level information that could be used to track water quality changes over time. The probability-based studies mentioned above are designed to address the need for national-level information.

Improving state water monitoring and assessment programs is an ongoing effort. EPA issued guidance in March 2003 describing basic elements of a state monitoring and assessment program (e.g., monitoring objectives, monitoring designs, core water quality indicators, a quality assurance program, a data

management system, data analysis methodologies, reports on findings, periodic program evaluation, identification of future needs, and a long-term strategy to implement these elements). In response to this guidance, states have prepared comprehensive, long-term strategies that address all water types, including those for which little data currently exist. These strategies will help identify needed actions and overall challenges facing states as they work to improve monitoring over the coming decade.

The states and EPA are taking steps toward streamlining and improving water quality monitoring and assessment by integrating monitoring and reporting requirements under Sections 305(b) and

303(d) of the Clean Water Act. Section 305(b) requires states to report biennially on the condition of their waters. Under Section 303(d), states, territories, and authorized tribes are required to develop lists of impaired waters. Impaired waters are those waters that do not meet water quality standards, even after point sources of pollution have installed the required levels of pollution-control technology. The Clean Water Act requires that these jurisdictions establish priority rankings for waters on the lists and develop TMDLs for these waters.

A TMDL specifies the maximum amount of a pollutant that a waterbody can receive and still meet water quality standards; it also allocates pollutant loadings among point and nonpoint pollutant sources.

EPA has issued guidance to the states to clarify integrated reporting requirements for the 2006 reporting cycle and has established a goal that all 50 states and 6 territories and jurisdictions use the integrated reporting format by 2008. EPA continues to promote this comprehensive assessment approach to improve the states' ability to track both the programmatic and environmental goals of the Clean Water Act, and ideally, to increase the pace of achieving these important environmental goals. (See <http://www.epa.gov/owow/tmdl> for more information on EPA's national water quality reporting guidance.)

For the 2002 305(b) cycle, states were asked to submit their monitoring findings electronically using EPA's Assessment Database, a tool developed for state reporting. Most provided electronic data in alternate yet compatible formats, and EPA transferred these data into the National Assessment Database for purposes of national reporting. This electronic reporting requires a significant commitment at the state and national levels. EPA and the states are working to ensure that each assessed watershed and waterbody is identified using a consistent national surface water locational system (the National Hydrography Dataset). States enter their assessment results (e.g., whether a waterbody is supporting its designated uses, which uses are not supported, and what is causing impairment) for each sampling location. EPA will continually adapt and improve the National Assessment Database to reflect new reporting requirements and the full range of state monitoring activities (including probability-based surveys), as well as continue to fully support state efforts to adopt electronic reporting. This commitment will yield more comprehensive information that can be easily accessed by water quality managers and the public.

As this report has shown, we are limited by our lack of complete knowledge about many of the nation's waters. Without this knowledge, we cannot accurately determine how effective our pollution-control programs are or if water quality conditions are improving or declining. Monitoring strategies, integrated reporting, and electronic reporting of assessment findings, along with probability-based national and regional studies, are all designed to improve what we know about the nation's water quality conditions. EPA and the states are committed to working toward providing better methods for water quality monitoring and assessment and improved data in the future.



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