This document contains the National Water Quality Inventory: Report to Congress, 2004 Reporting Cycle: Findings

The report can be downloaded from:

http://www.epa.gov/305b/

File 3 of 6

January 2009

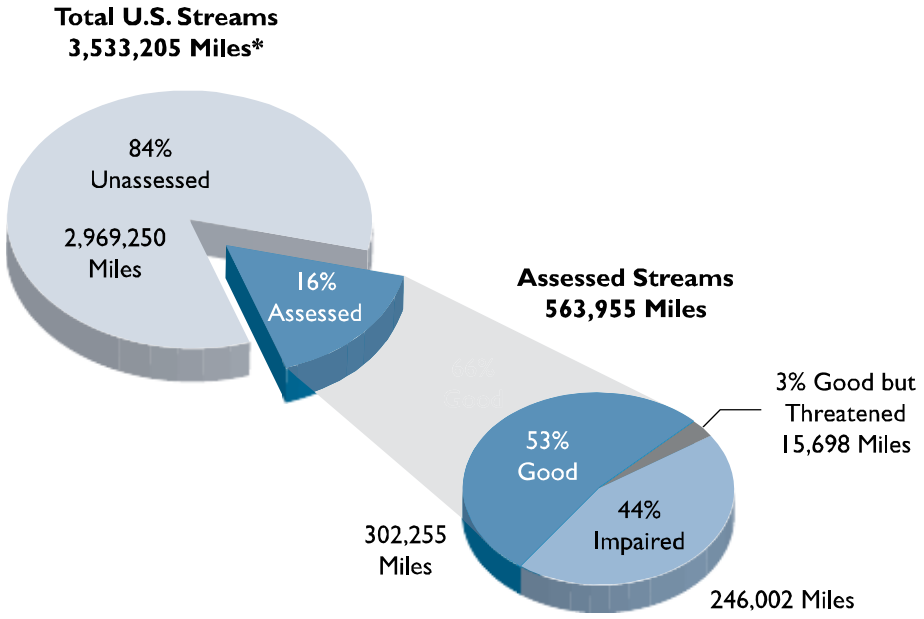
Findings

Rivers and Streams

The 2004 ATTAINS 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; and
- **Impaired** if they are not supporting one or more designated uses.

This report includes states' 2004 assessments of 563,955 miles of rivers and streams, or 16% of the nation's 3.5 million stream miles (Figure 1). Because six states did not provide specific waterbody data electronically in 2004, the findings of this report address about 130,000 fewer stream miles than were reported in 2002. The states identified 44% of the assessed miles as being impaired, or not supporting one or more of their designated uses. The remaining 56% of assessed miles fully supported all uses, and of these, 3% were considered threatened (i.e., water quality supported uses, but exhibited a deteriorating trend).



*Total U.S. river and stream miles based on state 2004 Integrated Reports.
Percents may not add up to 100 because of rounding.

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

Individual use support assessments also provide important details about the nature of water quality problems in rivers and streams. Table 3 shows the top five assessed uses in rivers and streams. The states evaluated support of the Fish, Shellfish, and Wildlife Protection/Propagation use most frequently, assessing a total of 466,617 stream miles (or 13% of U.S. stream miles) and reporting that 36% of assessed stream miles were impaired for this use. In addition, the states assessed 303,317 stream miles for the Recreation use (primary and secondary contact) and found recreation to be impaired in 28% of these waters.

Table 3. Individual Use Support in Assessed River and Stream Miles[a]

Designated Use	Miles Assessed	Percentage of Total U.S. River Miles	Percentage of Waters Assessed		
			Good	Threatened	Impaired
Fish, Shellfish, and Wildlife Protection/ Propagation	466,617	13	61	3	36
Recreation	303,317	9	69	3	28
Agricultural	200,817	6	90	<1	10
Aquatic Life Harvesting	154,746	4	56	4	40
Public Water Supply	139,440	4	79	3	18

[a] Waterbodies can have multiple designated uses, resulting in an overlap of river and stream miles assessed.

The ATTAINS database provides more detailed information about the sources and causes of impairments in rivers and streams, but it is important to note that the information about specific sources and causes is incomplete because the states do not always report the pollutant or source of pollutants affecting every impaired river and stream. Although in some cases 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.

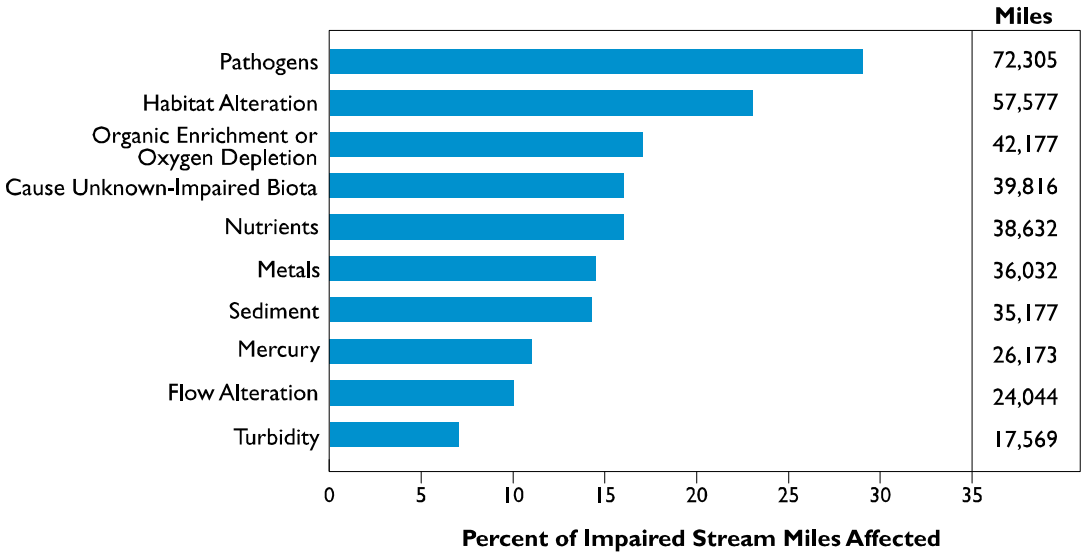
It is also important to note that—in an effort to provide clearer and more specific information—the actual categories of causes of impairment have changed since previous reporting cycles. For example, the cause of impairment category previously identified as Metals has now been divided into two cause categories, Metals and Mercury; however, some states may continue to report mercury under the Metals category.

More information on state-reported causes and sources of impairment is available from the ATTAINS Water Quality Assessment and TMDL Information database at *http://www.epa.gov/waters/ir*.

Similar changes have occurred to the source categories used in this report. For example, a new source category, Unspecified Nonpoint Source, was created in 2004 to capture sources previously part of the Unknown/Unspecified category, but for which *some* information (i.e., nonpoint source origins) had been identified; therefore, the Unknown/Unspecified category is somewhat smaller in 2004 than it was in 2002. Similarly, the 2002 source category Municipal Permitted Discharges has been renamed Municipal Discharges/Sewage and now captures combined and sanitary sewer overflows; therefore, this category is larger than it was in 2002.

Figure 2 shows the top 10 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:

- **Pathogens (bacteria)**, which indicate possible fecal contamination that may cause illness in people;
- **Habitat alteration,** such as disruption of stream beds and riparian areas; and
- **Organic enrichment/oxygen depletion,** or low levels of dissolved oxygen, often due to the decomposition of organic materials.



Note: Percents do not add up to 100% because more than one cause may impair a waterbody.

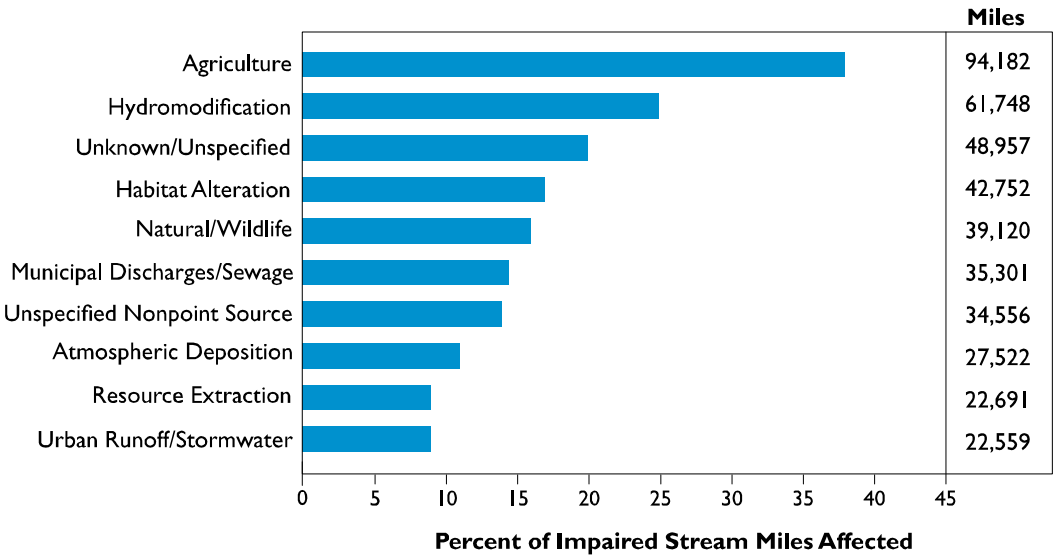
Figure 2. Top 10 causes of impairment in assessed rivers and streams.

The listed top 10 causes of impairment (Figure 2) for the 2004 reporting cycle differ from those reported in 2002. This difference is more likely attributable to reporting changes (e.g., fewer river and stream miles assessed; improved reporting of the results of fish tissue monitoring; administrative changes in cause category definitions, described above) than to actual changes in water quality.

Figure 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;
- **Hydromodifications**, such as water diversions, channelization, and dam construction; and
- **Unknown or unspecified sources** (i.e., the states could not identify specific sources).

Other leading sources of impairment in streams included habitat alteration (e.g., loss of streamside habitat), natural sources (e.g., floods, droughts, wildlife), municipal discharges/sewage (which includes sewage treatment plant discharges and combined sewer overflows), and unspecified nonpoint sources.



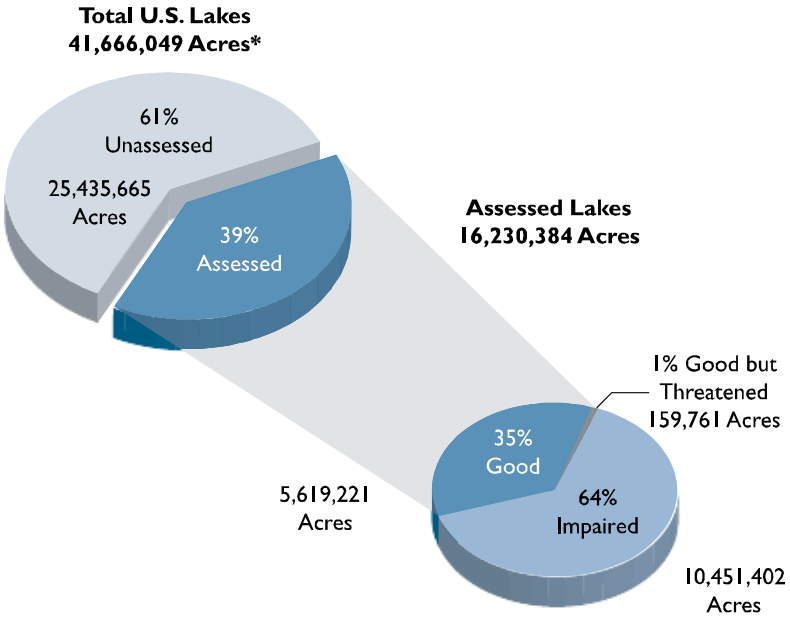
Note: Percents do not add up to 100% because more than one source may impair a waterbody.

Figure 3. Top 10 sources of impairment in assessed rivers and streams.

Lakes, Ponds, and Reservoirs

The 2004 ATTAINS database summarizes designated use support information reported by the states for lakes, ponds, and reservoirs (hereafter referred to as lakes) by overall use support and by individual categories of uses.

This report includes the states' assessments of 16.2 million acres of lakes (excluding the Great Lakes), or 39% of the nation's total 41.7 million lake acres, for the 2004 reporting cycle (Figure 4). The states identified 64% of assessed acres as impaired, or not supporting one or more of their designated uses (such as fishing or swimming). The remaining 36% of assessed acres fully supported all uses, and of these, 1% was considered threatened. It should be noted that 3.7 million impaired lake acres—about a third of all impaired lake acres— were reported by one state, Minnesota, due to increased fish tissue and water monitoring activities addressing mercury.



*Total U.S. lake acreage estimate based on 2004 state Integrated Reports.

Figure 4. Water quality in assessed lake acres.

Individual use support assessments provide important details about the nature of water quality problems in lakes and reservoirs. Table 4 shows the top five uses assessed in lakes, ponds, and reservoirs. The states assessed 11.8 million lake acres for support of the Fish, Shellfish, and Wildlife Protection/Propagation use, of which 30% were found to be impaired. The Aquatic Life Harvesting use (primarily fish consumption) was assessed in 9.4 million acres; of these, 73% were impaired and 1% were considered threatened (i.e., water quality is deteriorating). This high percentage of lake, pond, and reservoir waters impaired for fish consumption is most likely related to changes in how the states report on waters with statewide fish consumption advisories. For example, in previous cycles, some states may not have reported waters with fishing advisories as impaired. The Recreational use (e.g., swimming, boating) was assessed in 8.1 million acres of lakes and found to be impaired in 26%.

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

Designated Use	Acres Assessed	Percentage of Total U.S. Lake Acres	Percentage of Waters Assessed		
			Good	Threatened	Impaired
Fish, Shellfish, and Wildlife Protection/ Propagation	11,770,370	28%	66%	4%	30%
Aquatic Life Harvesting	9,390,396	23%	26%	1%	73%
Recreation	8,069,018	19%	70%	4%	26%
Public Water Supply	6,427,687	15%	78%	1%	20%
Industrial	2,848,335	7%	82%	<1%	17%

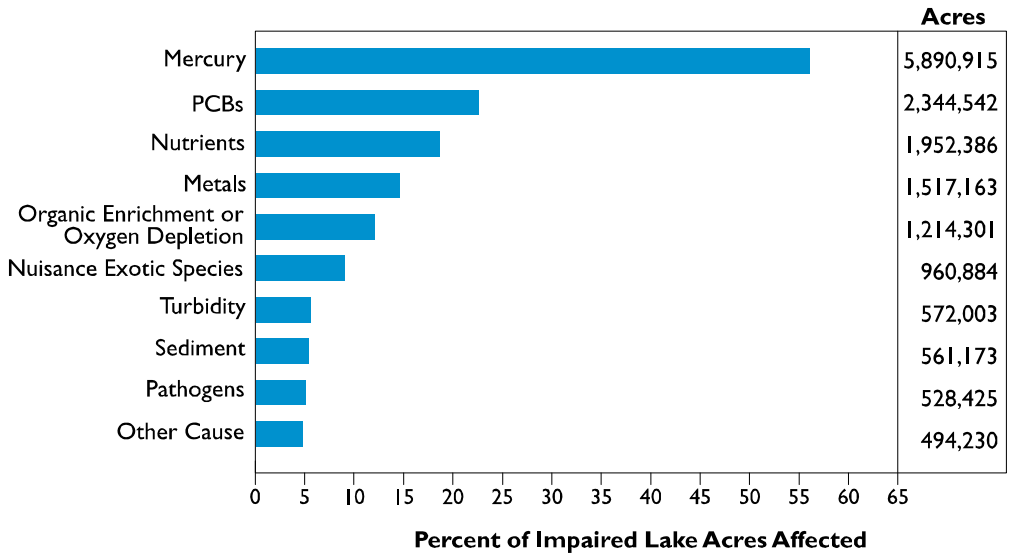
[a] Waterbodies can have multiple designated uses, resulting in an overlap of acres assessed.

The ATTAINS database provides more detailed information on the sources and causes of impairments in lakes, 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, the 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.

It is also important to note that, in some cases, groupings of causes and sources may have changed since previous reporting cycles. These changes were made to more accurately categorize the source and cause information reported by the states.

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

- **Mercury**, which has been widely detected in fish tissue, where it may pose a health risk to people and animals who eat fish;
- **Polychlorinated biphenyls (PCBs),** which are hazardous chemicals released via industrial and municipal waste disposal, spills, and leaks; and
- **Nutrients,** such as phosphorus and nitrogen, which when present in excess can disrupt lake ecosystems by stimulating growth of undesirable algae and aquatic weeds.



Note: Percents do not add up to 100% because more than one cause may impair a waterbody.

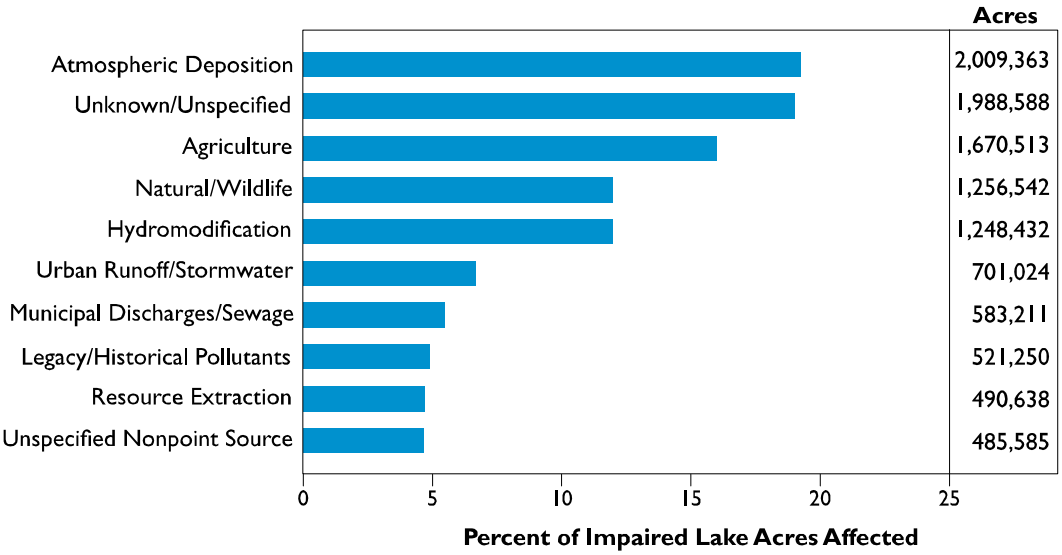
Figure 5. Top 10 causes of impairment in assessed lakes, ponds, and reservoirs.

Heightened reporting of mercury, PCBs, and metals is largely the result of the reporting of broad-based fish consumption advisories due to these substances in fish tissue; some states have begun reporting the extent of waters affected by such advisories and bans. For example, Minnesota reported 3.7 million acres impaired by mercury (representing 63% of the lake acres impaired by mercury in the United States) and 1.6 million acres impaired by PCBs (representing 70% of the lake acres impaired by PCBs in the United States). Other leading causes of impairments in lakes include organic enrichment/low dissolved oxygen, nuisance exotic species, turbidity, sediment, and pathogens.

More information on state-reported causes and sources of impairment is available from the ATTAINS Water Quality Assessment and TMDL Information database at *http://www.epa.gov/waters/ir*.

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

- **Atmospheric (or air) deposition,** primarily of toxic substances such as mercury, PCBs, and other metals, from both local and long-range sources;
- **Unknown or unspecified sources** (i.e., the states could not identify specific sources); and
- **Agricultural activities**, such as crop production and grazing.



Note: Percents do not add up to 100% because more than one source may impair a waterbody.

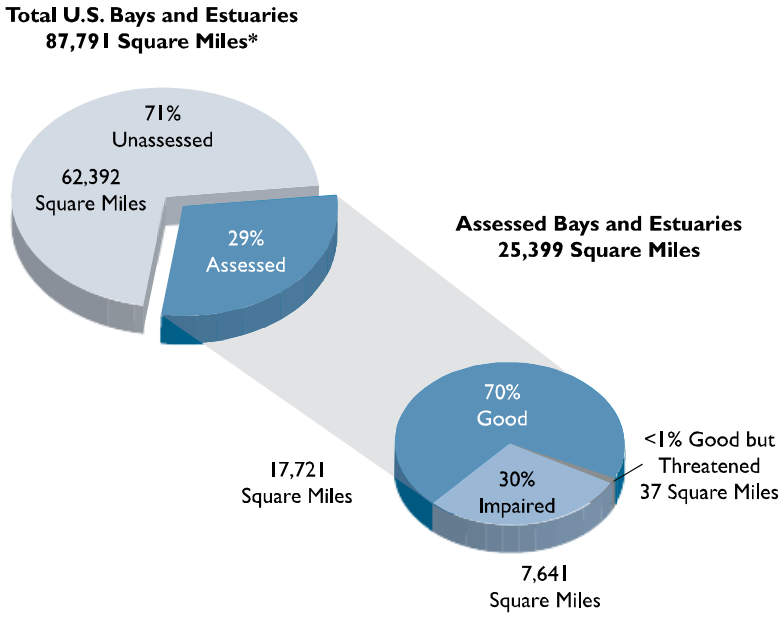
Figure 6. Top 10 sources of impairment in assessed lakes, ponds, and reservoirs.

It should be noted that about one fourth (485,376 acres) of lake acres impaired by atmospheric deposition were reported by one state, Wisconsin. This is because Wisconsin reported that all its lake acres are under a fish consumption advisory due to mercury from atmospheric deposition sources. However, the number of lake acres impaired by atmospheric deposition does not include lake acres that may be affected by this source in Minnesota, which reported the largest number of lake acres impaired for mercury and PCBs. This is because Minnesota did not identify the source of these impairments. It is likely that the majority of impairment by mercury and PCBs in Minnesota is from atmospheric deposition. Other leading sources of impairment include natural/wildlife sources (e.g., droughts, flooding, waterfowl), hydromodification, urban-related runoff/stormwater, municipal discharges/sewage, and legacy/historical pollutants (primarily in sediments).

Bays and Estuaries

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

This report includes states' assessments of 25,399 square miles of bays and estuaries, or 29% of the nation's total estimated 87,791 square miles, for the 2004 reporting cycle (Figure 7). About 5,000 fewer estuarine square miles were assessed in 2004 than in 2002, at least in part because several coastal states did not provide electronic data in 2004. The states identified 30% of assessed square miles as impaired, or not supporting one or more of their designated uses (e.g., swimming, fishing, shellfishing). The remaining 70% of assessed estuarine square miles were fully supporting all uses.



*Total U.S. estuarine square miles estimate based on 2004 state Integrated Reports.

Figure 7. Water quality in assessed bay and estuary square miles.

Individual use support assessments provide important details about the nature of water quality problems in bays and estuaries. Table 5 shows the top three uses assessed in bays and estuaries. The states assessed 24,338 estuarine square miles for support of the Fish, Shellfish, and Wildlife Protection/Propagation use and found that 27% were impaired; the Aquatic Life Harvesting use was assessed in 11,004 square miles and found to be impaired in 19% of assessed waters; and 13% of the 9,322 square miles assessed for the Recreation use (e.g., swimming, boating) were reported as impaired.

Table 5. Individual Use Support in Assessed Bay and Estuary Square Miles [a]

Designated Use	Square Miles Assessed	Percentage of Total U.S. Estuarine Miles	Percentage of Waters Assessed		
			Good	Threatened	Impaired
Fish, Shellfish, and Wildlife Protection/ Propagation	24,338	28%	73%	<1%	27%
Aquatic Life Harvesting	11,004	13%	81%	<1%	19%
Recreation	9,322	11%	87%	<1%	13%

[a] Waterbodies can have multiple designated uses, resulting in an overlap of square miles assessed.

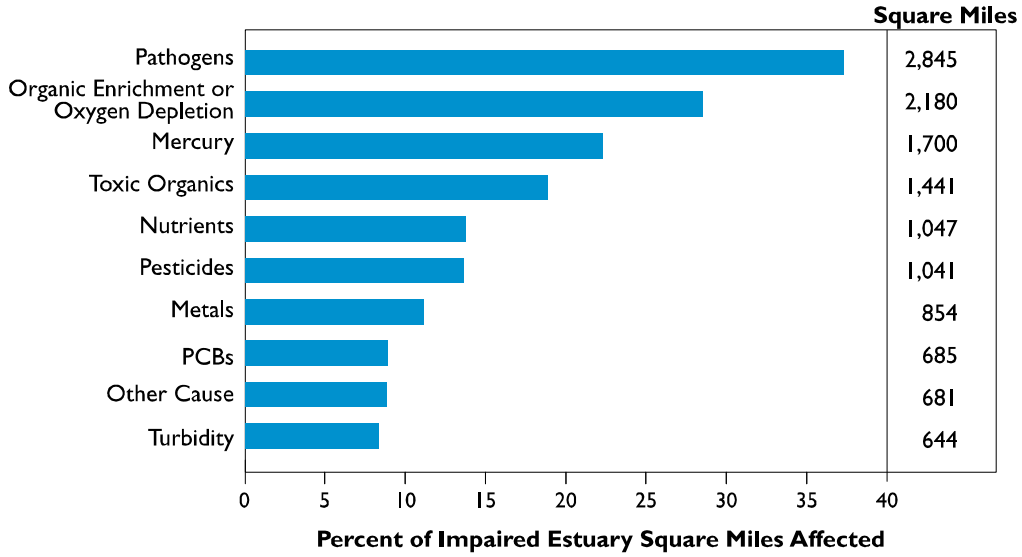
State-reported information about specific sources and causes of impairment may be incomplete because the states do not always report the pollutant or source of pollutants affecting every impaired bay and estuary. In some cases, the states may recognize that water quality does not fully support a designated use; however, they may not have adequate data to document the specific pollutant or source responsible for the impairment and therefore report the cause or source as unknown/unspecified.

More information on state-reported causes and sources of impairment is available from the ATTAINS Water Quality Assessment and TMDL Information database at *http://www.epa.gov/waters/ir*.

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

- **Pathogens,** i.e., bacteria used as indicators of possible contamination by sewage, livestock runoff, and other sources;
- **Organic enrichment/oxygen depletion,** i.e., high levels of oxygen-demanding substances and/or low levels of dissolved oxygen (e.g., organic waste); and
- **Mercury,** a toxic metal found in fish tissue, and, to a lesser extent, in the water column, often entering the aquatic environment via atmospheric deposition.

Toxic organics, nutrients, pesticides, and metals are also reported as top causes of impairment for estuarine waters.



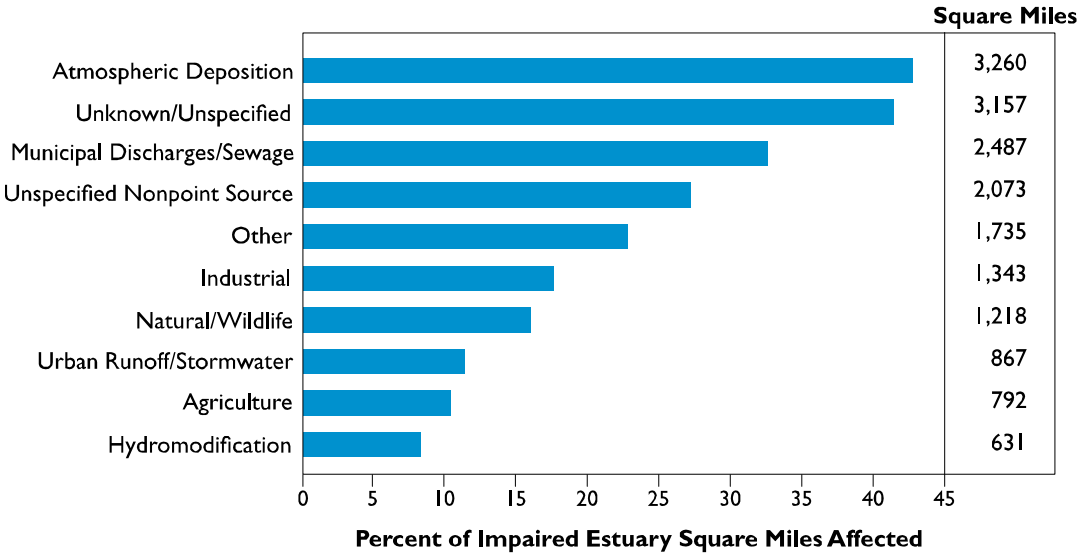
Note: Percents do not add up to 100% because more than one cause may affect a waterbody.

Figure 8. Top 10 causes of impairment in assessed bays and estuaries.

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

- **Atmospheric (or air) deposition,** which can bring pollutants such as mercury from distant locations such as industrial centers;
- **Unknown/unspecified sources,** or sources that cannot be further identified by the states; and
- **Municipal discharges/sewage,** which includes septic systems, sewage treatment plants, and sanitary and combined sewer overflows.

Other leading sources of impairment in bays and estuaries were unspecified nonpoint sources, other sources (such as sources outside state waters), and industrial sources.



Note: Percents do not add up to 100% because more than one source may impair a waterbody.

Figure 9. Top 10 sources of impairment in assessed bays and estuaries.

Other Waters

The 2004 ATTAINS 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 2004 reporting cycle. These waters are discussed below.

Coastal Resources

Coastal resources are identified in the ATTAINS database in two categories: coastal shorelines (the water immediately offshore, reported in miles) and ocean/near-coastal waters (i.e., the area of water extending into the ocean or gulf, range not specified, in square miles). Eight states assessed 1,859 miles of coastal shorelines, or about 3% of the nation's total 58,618 shoreline miles. The majority of assessed shoreline miles (68%)

fully support their designated uses, with 12% of these miles classified as supporting uses, but threatened (i.e., water quality is deteriorating). In the 32% of shoreline miles not fully supporting their uses, metals (which could in some cases include mercury) and pathogens were the leading causes of impairment, and municipal discharges/sewage and industrial sources were listed as the top sources of impairment.

More information on state-reported causes and sources of impairment is available from the ATTAINS Water Quality Assessment and TMDL Information database at *http://www.epa.gov/waters/ir*.

To help protect the public at coastal recreation waters, Congress passed the Beaches Environmental Assessment and Coastal Health Act of 2000 (BEACH Act), which requires that coastal and Great Lakes states and territories report to EPA on beach monitoring and notifications to the public of potential health risks. Public notification may include issuing a beach advisory, warning people of possible risks of swimming due to water quality problems, or closing a beach to the public. The BEACH Act also requires EPA to maintain an electronic monitoring and notification database of those data.

For the 2004 swimming season, 28 of 30 coastal states and Puerto Rico reported public notification actions to EPA. Of the 3,574 beaches that were monitored in 2004, 942 (26%) had at least one advisory or closing. A total of 4,907 beach notification actions were reported. EPA calculates "beach days" (i.e., the number of beaches multiplied by number of days in the swimming season) to get a better sense of the extent of the advisory and closure information. For the 2004 season, EPA determined that there were 584,150 beach days for all of the monitored beaches, and actions were reported about 4% of the time. EPA is continuing to work to improve the delivery of its beach advisory information to the public. Visit *http://www.epa.gov/beaches* for more information on beach monitoring and notification.

A total of 5,544 square miles of oceans and near-coastal waters, or 10% of approximately 54,120 square miles of oceans and near-coastal waters in the United States, were assessed by 5 states in 2004. Of the assessed square miles, 88% were identified as impaired. Mercury was by far the most commonly reported cause of impairment, followed by organic enrichment/oxygen depletion. 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 oceans and near-coastal waters and reported that 100% of its assessed square miles are impaired due to mercury in fish tissue from atmospheric deposition.)

Detailed information on U.S. coastal condition trends is available in the EPA's *National Coastal Condition Report* series, which presents 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 III of this report summarizes key findings of the *National Coastal Condition Report III.*

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, six reported on the condition of their Great Lakes shoreline miles.

About 1,070 of 5,521 total Great Lakes shoreline miles were assessed in 2004, and of these, 93% were reported as impaired. The leading causes of impairment included PCBs, toxic organics, pesticides, and dioxins. Legacy or historical pollution—primarily contaminated sediment—was the leading source of shoreline impairment reported by the states, followed by municipal discharges/sewage.

Wetlands

Wetlands occur where water and land come together for a prolonged period of time and where 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, organic wastes). By storing and slowly releasing water, wetlands help reduce the impacts of floods and erosion and help replenish groundwater and stream flow during dry periods. Wetlands are also of great recreational value to bird watchers, hunters, fishermen, and nature lovers.

Only 10 states provided information on the support of designated uses for 1.8 million acres of wetlands assessed in their 2004 reports—a tiny portion of the nation's estimated 107 million acres. The states identified 30% of these assessed acres as impaired. Organic enrichment/oxygen depletion, sediment, and turbidity were the leading causes of wetland degradation in these six states. Agriculture, unknown/unspecified sources, and atmospheric deposition were listed by the states as top contributors to impairment.

Section III of this report discusses plans for an upcoming National Wetlands Condition Assessment.