



National Aquatic Resource Surveys: A Progress Report

February 2009

Working with our partners in the states, tribes, and other federal agencies, the U.S. Environmental Protection Agency (EPA) is conducting statistical surveys of the nation's waters.

Purpose

Report on the condition of the nation's waters.

Help build state capacity for monitoring and assessment.

Promote collaboration across jurisdictional boundaries in the assessment of water quality.

Design of the Surveys

Statistically-representative surveys of the aquatic resources of the U.S. have begun providing us with the information we need to identify national priorities and evaluate the effectiveness of pollution control actions. These assessments report on core indicators using standardized field and lab methods, and include a national quality assurance program. The surveys are designed to yield unbiased estimates of the condition of a whole resource, based on a representative sample of waters.

These surveys are designed to answer key questions asked by decision makers, Congress, and the public, such as:

- What's the extent of waters that support healthy ecosystems, recreation, and fish consumption?
- How widespread are the most significant water quality problems?
- Is water quality improving?
- Are we investing in restoration and protection wisely?

State Use and Adoption of Surveys

States are finding that statistical surveys are a cost-effective means of reporting and communicating to their citizens on the condition of their waters. Survey data can supplement monitoring data collected using more traditional targeted approaches.

Thirty states currently conduct statewide surveys of at least one waterbody type. The primary value of these surveys is to efficiently assess the status and trends of 100% of the state's waters. States also use survey data to develop or evaluate water quality standards; evaluate and manage lists of impaired waters; supplement data sets on high quality reference waters; and evaluate the relationships between stressors, watershed characteristics, and the condition of waters to prioritize additional monitoring and management needs.

EPA Use of Surveys

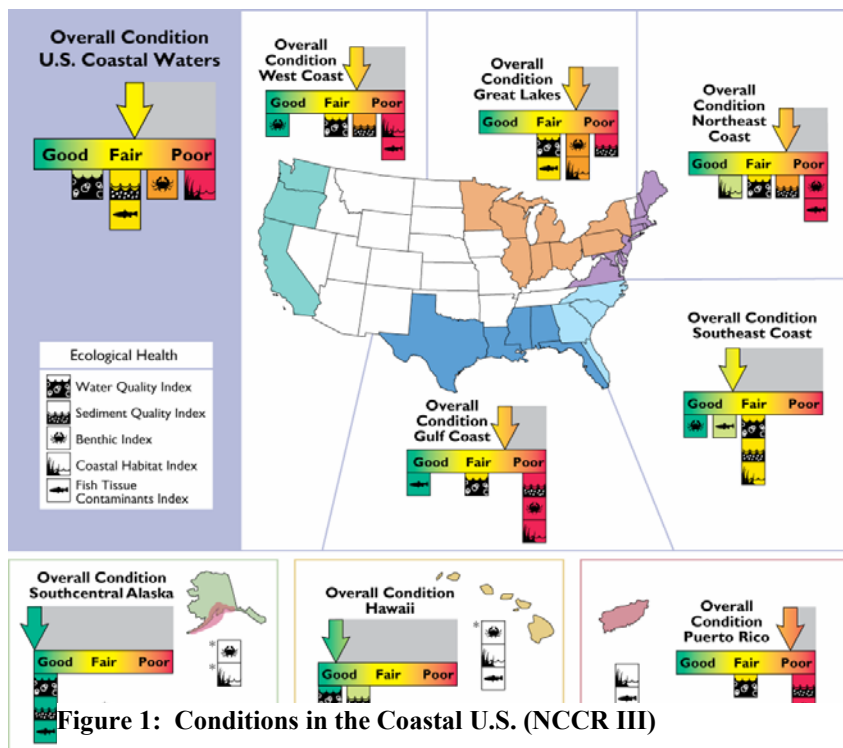
The results of the first national surveys -- the National Coastal Assessments and the Wadeable Streams Assessment -- are included in EPA's Report on the Environment, a key tool for communicating to the public what we know about the condition of our waters. EPA's strategic plan also uses survey results as a key measure of the performance of our protection and restoration programs.

The surveys and national assessment reports will continue to provide nationally-consistent indicators of water quality we can use to gauge the impact of our national investment in protecting and restoring the nation's watersheds.



Survey Updates -- For more information, visit www.epa.gov/owow/monitoring/reporting.html

Coastal Waters: The National Coastal Assessment was the first national survey using the EPA's Office of Research and Development's (ORD) Environmental Monitoring and Assessment Program (EMAP) survey design. Working with states, the National Oceanic and Atmospheric Administration and the U.S. Geological Survey (USGS), EPA has produced three national reports (one is still in draft) since 2001. These National Coastal Condition Reports include statistical assessments of 100% of the nation's estuaries in the contiguous 48 states, Puerto Rico, and Hawaii. Statistical surveys of Alaska's coastline are being implemented as a series of smaller surveys addressing a different coastal region each year. These reports send a clear message about the challenges facing our ocean and coastal resources.



The National Coastal Condition Report (NCCR) III finds that the overall condition of the nation's coastal waters is generally fair and has improved slightly since the 1990s. This rating is based on five key indicators of ecological condition: water quality, coastal habitat loss, sediment quality, benthic community condition, and fish tissue contaminants. For each of these five indicators, a score of good, fair, or poor was assigned to each coastal region of the U.S. These ratings were then averaged to create overall regional and national scores (Fig. 1).

The NCCR III finds that 57% of assessed resources are in good condition for the water quality index, 6% are in poor condition, and 35% are in fair condition. The indicators that show the poorest conditions are coastal habitat and benthic condition. The indicators that generally show the best condition are the individual components of water quality – dissolved oxygen and dissolved inorganic nitrogen.

In 2010, EPA and its partners will undertake a new survey of coastal waters, and expect to report the survey results in 2012. EPA sponsored a national meeting in 2008 to begin planning the 2010 survey.

Streams: The Wadeable Streams Assessment (WSA), released in 2006, used standardized methods for sampling key indicators in streams across the country. The WSA used macro-invertebrate communities to report on biological condition, and also reported on key stressors such as habitat, nutrients, salinity, and acidity.

The WSA found that, compared to best available reference sites in their ecological regions, 42% of U.S. stream miles are in poor condition, 25% are in fair condition, and 28% are in good condition (Fig.2).

The WSA cites confidence levels for these key findings of plus or minus 2.8%.

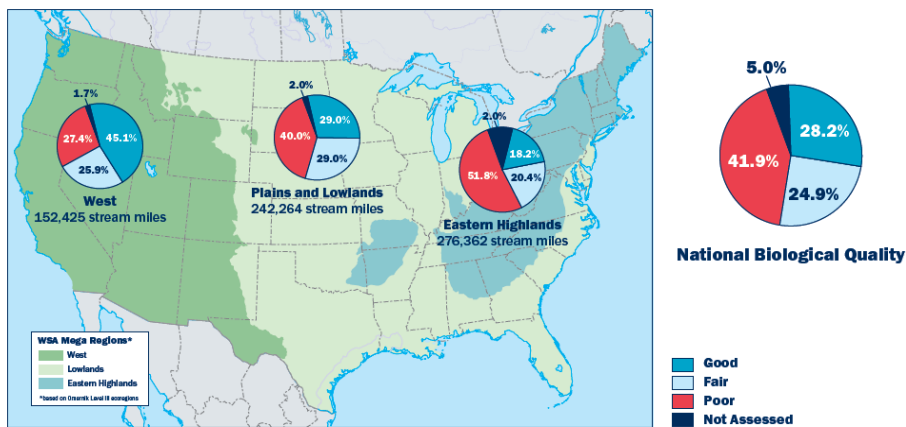


Figure 2: Biological Quality of the Nation's Streams (WSA)

Of the stressors the WSA analyzed, the most widespread across the country are nitrogen, phosphorus, excess sedimentation, and riparian disturbance (i.e., evidence of human disturbance in or alongside streams.) This finding reinforces reports from states and USGS that have identified nutrients and sediments as leading water quality stressors in the small percentage of assessed waters of the U.S. The WSA allows us to say, for the first time, that 25 to 30% of the nation’s streams have high levels of these pollutants.

WSA analysis of the association between stressors and biological condition found that high levels of nitrogen, phosphorus, and sediments more than double the risk for poor biological condition (Fig. 3). This underscores the critical importance of efforts to address nutrients and sediments. Such key actions include development of appropriate nutrient criteria and load allowances, and implementation of effective management actions such as low impact development and agricultural best management practices.

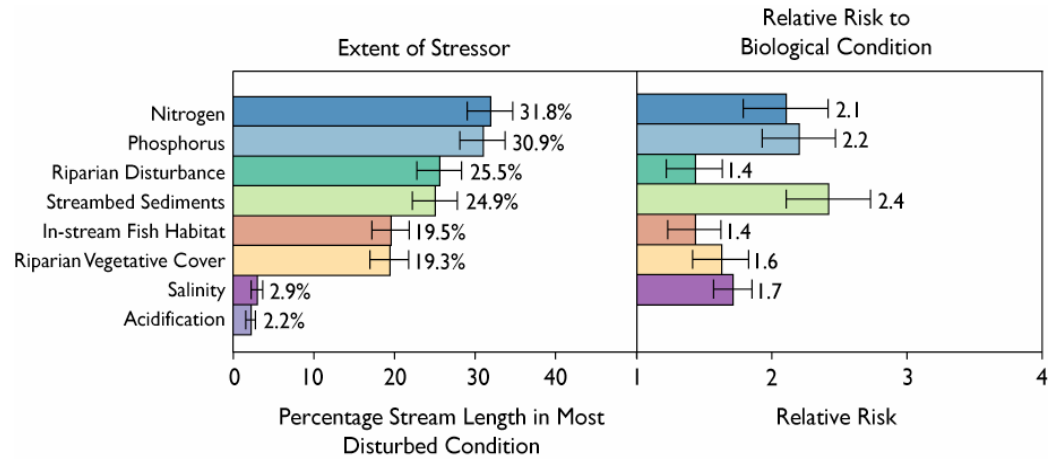


Figure 3: Extent of Stressors and their Relative Impact on Biological Condition in Streams (WSA)

Rivers: EPA is undertaking a survey of the nation’s rivers, and will combine it with a second assessment of wadeable streams.

In January 2007, EPA and its partners held a national meeting to discuss survey design, indicator selection and interpretation, sampling methods and opportunities to leverage the survey to support state, tribal and other monitoring programs and objectives. Workgroups consisting of state and EPA representatives were formed to discuss indicators and methods for the survey.

During the summers of 2008 and 2009, field crews are collecting data on indicators of ecological condition, such as periphyton, phytoplankton, benthic macroinvertebrates, and fish; recreational indicators such as fecal contaminants and fish tissue; indicators of physical habitat condition such as bank stability, channel alterations, and invasive species; and basic water chemistry. A national report on rivers and streams is scheduled for 2011.



Lakes: The first assessment of the biological condition of the nation's lakes, ponds, and reservoirs is underway. Early in 2007, EPA held ten sessions around the country training over 80 field crews who then sampled over 1,000 lakes, ponds, and reservoirs in the course of the summer (Fig. 4). Field crews collected data for indicators of regional and national ecological integrity, such as sediment diatoms, phytoplankton, zooplankton, and shoreline physical habitat conditions; indicators of trophic status, such as nutrients, chlorophyll a, and transparency; and pathogens and algal toxins as recreational indicators. Sample results are undergoing quality review and being readied for analysis and presentation. A report on the National Lakes Assessment is planned for 2009.

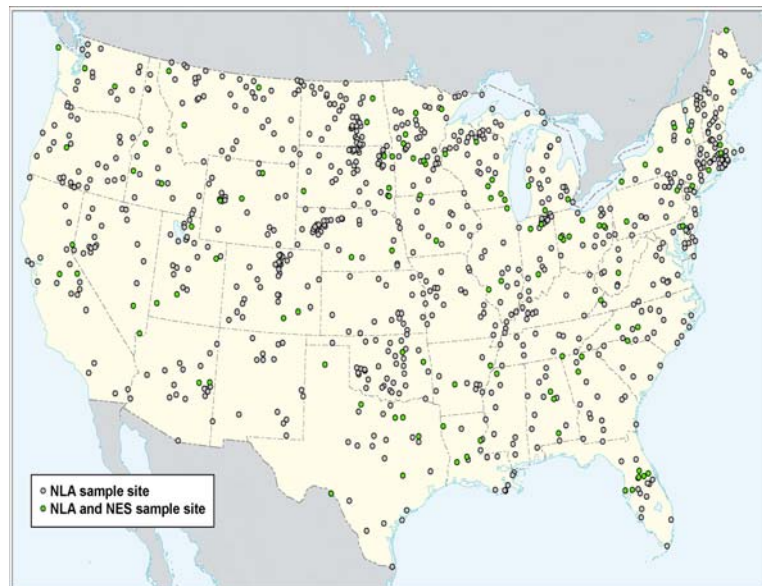


Figure 4: Sampling Locations for the National Lakes Assessment

The National Lake Fish Tissue Survey is currently undergoing final review. This EPA study includes the largest set of chemicals ever studied in fish, and is the first national fish contamination survey to use statistical techniques to select sampling sites. It will provide the first national estimates of mean concentration 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.

Wetlands: In 2011, EPA and the states will be conducting a survey of the condition of the nation's wetlands, with a report planned for 2013. EPA is collaborating with the U.S. Fish and Wildlife Service (FWS) to design the wetland assessment to ensure that it effectively complements the FWS *Status and Trends* reports, which focus on the distribution of wetlands rather than their condition.

EPA, working with states and tribes, is coordinating a number of regional pilot projects to test design approaches, field protocols, and indicators for use in the National Wetland Condition Assessment. EPA anticipates that the lessons learned from these pilot projects will inform final decision-making for the national effort.

In 2008, the project team made initial decisions on condition indicators and assessment methods that can apply across a wide range of wetland types. As a consequence of initial discussions about the survey at a variety of conferences and workshops across the country, EPA's national wetland monitoring and assessment workgroup has re-engaged many states in wetland monitoring.



For more information on the National Aquatic Resource Surveys, visit <http://www.epa.gov/owow/monitoring/nationalsurveys.html>

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