

2007 EMAP Symposium
Surveys Gauge Program Effectiveness and Emerging Issues
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1. *Improving monitoring and measuring for clean, safe and secure water.*
2. *National statistical surveys have begun providing us with the information we need to evaluate the effectiveness of our actions.*
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Good morning. I'm very pleased to have the opportunity to speak here today. The Office of Water and ORD's Environmental Monitoring and Assessment Program have worked in close partnership for many years, with remarkable results. I believe this symposium will shine a light on many of the achievements of our two offices and of our valued partners in the states, and on the pathway we're taking together to improve our understanding of water conditions so that we may better protect and restore the water resources of the U.S.

1. **Improving Monitoring and Measuring for Clean, Safe, and Secure Water**

- Water quality monitoring programs in our nation have been the object of criticism for a number of years. Beginning in 2000, GAO, the National Academies of Sciences, the Heinz Center, and others noted that EPA and states cannot make statistically-valid statements about the condition of the nation's waters, and that states and tribes lacked the basic information they need to make the many water quality management decisions they face on a daily basis.
- We know that states have many needs for the data they collect. They need data to make statistically valid statements about the condition of all waters in order to know whether problems are widespread or localized and to help establish priorities across water quality management programs. They need data to help set water quality standards; identify impaired waters and implement watershed plans and pollution budgets, or TMDLs, for those waters; and to evaluate the effectiveness of their water pollution control efforts. They also need good data, of course, to keep their citizens informed.

- EPA was criticized because the nation lacked the data to make scientifically-valid characterizations of water quality regionally and across the U.S. Instead, the national water quality inventory relied on state-reported data for a subset of the nation's waters, collected for a variety of purposes using inconsistent methods, to characterize water quality.
- That was five years ago. Today we're making significant progress. Improving monitoring is one of our top priorities.
- We have done this through a set of key actions: collaborating with states to produce statistically-valid surveys of the nation's waters; strengthening state, tribal and interstate monitoring programs; expanding the accessibility and use of data; and promoting monitoring partnerships to make the best use of our resources.
- This has been made possible through a Clean Water Act (CWA) Section 106 grant fund monitoring initiative that provides the states and tribes with \$8.4 million annually to participate in national and regional statistically-valid surveys of water quality conditions, and \$9.8 million annually to enhance

their monitoring programs, including adopting state-scale surveys consistent with the national surveys.

2. National statistical surveys have begun providing us with the information we need to evaluate the effectiveness of our actions.

- Working with our partners in the states, tribes, and other federal agencies, EPA’s Office of Water and Office of Research and Development have conducted surveys of coastal waters and wadeable streams of the U.S. in recent years. We are committed to continuing and expanding these surveys to look at other waterbody types – lakes, rivers, and wetlands – and repeating the surveys every five years.
- These surveys report on core indicators using standardized methods, and yield unbiased estimates of condition based on a representative sample of waters. They are designed to answer key questions asked by Congress, the public, and decision makers in federal and state environmental agencies, such as:
 - To what extent do waters support healthy ecosystems, recreation, and fish consumption?
 - What are the most significant water quality problems?
 - Is water quality improving?

-- Are we spending pollution control dollars wisely?

- The National Coastal Assessment is the first national statistical survey developed using the EMAP survey design. Working with states, NOAA, and USGS, we've produced three national reports since 2001 (one is still in draft form). The reports, known as the 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 vast 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 Assessment is also a component of the National Water Quality Monitoring Network for U.S. Coastal Waters and Their Tributaries called for under the President's U.S. Ocean Action Plan submitted to Congress in 2004.
- The most recent report, now out for review in draft form, finds that the overall condition of the Nation's coastal waters is generally fair and has improved slightly since the initial report in 2001. Condition is rated based on key indicators of

ecological health, including water chemistry, sediment toxicity, macroinvertebrates, fish tissue, and coastal habitat.

- The report finds that the water chemistry indicator in U.S. coastal waters has improved substantially, while smaller improvements in sediment quality and benthic condition are noted. Fish tissue contaminants and coastal habitat condition have shown little or no improvement since the first report. From a regional perspective, the condition of coastal waters in Alaska and Hawaii is good; in the Southeast is fair; in the West, Northeast, Gulf Coast, and Great Lakes is fair to poor; and in Puerto Rico is poor.
- We know these are important resources we need to protect. Coastal recreation and tourism generate between 8 and 12 billion dollars annually, and more than 28 million jobs are associated with our coasts. By providing information on key impairment issues in different parts of the country, the coastal assessments help focus protection and restoration efforts. They also provide a baseline against which to evaluate the effectiveness of our actions.

- In fact, as you will hear tomorrow, the states and territories are using the detailed information provided by the National Coastal Assessment to help them assess the location, extent, and probable causes of impairment in their coastal waters. They are also using the data to assist in developing reference conditions, biological criteria and standards.
- The other survey we've completed is the Wadeable Streams Assessment, or WSA, which used EMAP methods for sampling stream resources, including macroinvertebrates, 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. We are able to cite confidence levels for these key findings of plus or minus 2.8%. (Five percent were not covered due to a decision in New England to exclude first order streams.)
- The WSA reports on three major regions of the country – the Eastern Highlands, the Plains and Lowlands, and the West. It also presents findings for nine smaller ecological regions. Of

the three major regions, the Eastern Highlands (where, of course, the population of the U.S. is greatest) presents the most concerns, with only 18% of the miles of wadeable streams in good condition, and 52% in poor condition.

- The study found that the most widespread stressors across the country are nitrogen, phosphorus, excess sedimentation, and riparian disturbance (which is evidence of human disturbance in or alongside streams). This finding reinforces reports from states and USGS that identify nutrients and sediments as leading water quality stressors in assessed waters -- a small percentage of the streams of the U.S. But now, with the WSA, for the first time we can say 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. This underscores the critical importance of our current efforts to address nutrients and sediments through development of water quality standards and TMDLs, and the implementation of effective controls.

- The results of both the coastal and stream surveys have also been included in EPA's Report on the Environment, a key tool for communicating what we know about the condition of our ecosystems to the public. The Agency's strategic plan also uses survey results as key measures of the performance of water quality protection and restoration programs.

3. States are building capacity for their own statistical surveys.

- Clearly it's important to use these surveys to inform and guide decision makers responsible for water resource protection and restoration on a nationwide scale. However, I am also encouraged to see more and more states applying statistical surveys to better characterize their waters on a statewide scale.
- At last count, almost 30 states told us they were including surveys as a component of their monitoring programs to meet needs that traditional fixed-station monitoring does not. It was certainly one of the goals of the monitoring budget initiative to develop and expand this capacity, but I am particularly impressed by the enthusiasm of a number of states, many of which you'll hear from tomorrow – states such as Alabama,

Minnesota, Alaska, Virginia, Pennsylvania, Wisconsin, Oklahoma, New Hampshire, South Carolina, and many more – who have embraced this approach as a cost-effective means of reporting on the condition of all waters in the state and for directing their water quality monitoring and restoration actions.

- These states are finding that statistical survey data can supplement monitoring data collected using more traditional targeted approaches. Survey data is being used by states to help develop state water quality criteria; to develop predictive tools at the state scale to identify vulnerable watersheds and waters; to support the development of reference conditions; to identify and manage lists of impaired waters under Section 303(d); and to track changes and trends. We look forward to hearing from the many states represented at this conference on their uses of statistical survey data and the findings of their surveys. We also look forward, in the future, to including the results of an increasing number of statewide surveys in national assessments.

4. Statistical surveys are sparking advances in science.

- In addition to characterizing the condition of our water resources and helping build capacity among states for improved monitoring, the statistical surveys provide rich and unique data sets that have sparked interest in many additional areas of investigation. For example, WSA data may be examined to determine the comparability of field protocols which vary from state to state; to refine how we describe least-disturbed reference conditions; and to determine associations between watershed characteristics such as slope and soil type and the effectiveness of Best Management Practices.
- In future assessments, we can also add the capability to assess emerging stressor indicators of concern, to allow for a more comprehensive assessment of condition, and to more fully identify the wide variety of stressors affecting our waters.

5. Next steps for statistical surveys of the nation's waters.

- We are committed to continuing the statistical surveys of the nation's waters, waterbody type by waterbody type, through our collaboration with ORD and with our state, tribal, and federal partners.
- For example, we are about to start the field season for our first assessment of the condition of the nation's lakes, ponds, and reservoirs. We will be looking at indicators of regional and national ecological integrity, such as sediment diatoms, phytoplankton, zooplankton, and shoreline physical habitat conditions; indicators of trophic status; and pathogens and algal toxins as recreational indicators. As we continue these surveys, we expect to examine additional pollutants of concern such as endocrine disruptors to complement the screening work done by our Office of Science and Technology and USGS in the National Lake Fish Tissue Survey, due out in late 2007. We expect to report on the Survey of the Nation's Lakes in 2009.

- In 2008, we will begin the survey of rivers, and combine it with a re-assessment of wadeable streams for a national report on *both* water types by 2011. In 2010 we will be embarking on a new survey of coastal waters, and expect to report the survey results in 2012. And in 2011, we will be conducting the first-ever survey of the condition of the nation's wetlands, with a report in 2013. The wetlands survey will provide baseline wetland condition information and complement the Fish and Wildlife Service's inventory of status and trends in wetland acreage nationwide. The surveys and national assessment reports will continue to provide, at last, statistically-valid indicators of water quality we can use to gauge the impact of our national investment in protecting and restoring the nation's watersheds.
- This is, as you can see, a very ambitious schedule. We'll face many challenges – for example, we must maintain consistency in design and methods from assessment to assessment while providing the flexibility that allows the science of monitoring to improve over time and allows us to detect new and emerging issues of concern.

- Future surveys will need to rely on continued close collaboration, a free exchange of technical, scientific knowledge, and a deep well of energy and enthusiasm among all our many partners.
- Thank you.