Linking IOOS® to the National Water Quality Monitoring Network

Improving Water Quality Nationwide

Overview:

Our inland water systems contribute to the overall health of our oceans, coasts, and Great Lakes. Contaminants and sediments can travel for miles, impacting our watersheds, coasts and oceans. To monitor waters long term - including inland and coastal areas - a new system was needed to better understand water quality status and trends to reduce the impacts people and their activities have on our waters.

What is IOOS?

The Integrated Ocean Observing System (IOOS) is a federal, regional, and private sector partnership providing new tools and forecasts to improve safety, the economy, and our environment. The effort includes 17 federal agencies and 11 regions.

Integrated ocean information is now available in near real time, and retrospectively. Easier and better access to this information is improving our ability to understand and predict ecosystem events such as habitat degradation, harmful algal blooms, and beach closures. This knowledge is used for management decisions such as earlier and more accurate

A national monitoring network will improve management of our waters - from inland to coasts to oceans. The Advisory Committee on Water Information and the National Water Quality Monitoring Council developed the initial design for a National Water Quality Monitoring Network. This photo shows how the Network can track substances such as the algae shown here in Lake Erie.

forecasts for harmful contaminants that threaten fish populations and recreational use of our waters.

What is the Network?

The National Water Quality Monitoring Network (the Network) is an integrated approach to addressing a range of resource issues, from upland watersheds to offshore waters.

The nation's coastal bays and estuaries may require beach and shellfish bed closures due to problems such as pathogens, oxygen depletion, nutrient over-enrichment, toxic contamination, sedimentation, habitat

degradation, and invasive species.

The Network supports ecosystem-based management by monitoring water quality. This allows better management of aquatic resources to avoid problems like dead zones, intrusion of invasive species, and loss of wetlands.

The Network will coordinate and expand on existing monitoring of both coastal and upland areas and provide scientific information to support management decisions.

The plan is a multi-year effort consisting of four phases: network design; completion

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Integrated Ocean Observing System (IOOS®) Program

www.ioos.noaa.gov

May 2013

of pilot studies; demonstration studies; and implementation to determine best practices, identify gaps, and enhance the system.
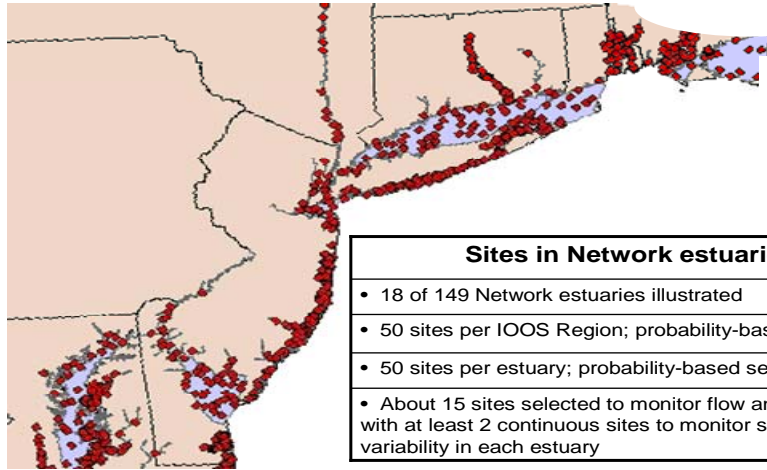
Completed in 2006, the Network design objectives are flexible over time, link to management questions and IOOS, and define how data are stored and used. Three pilot studies tested the Network design and found certain components were ideally suited to contribute and enhance IOOS. For example:

- The Delaware Bay Project partnered with the Mid-Atlantic Regional Association and found that some national design components needed re-evaluation to better integrate with IOOS.
- The San Francisco Bay Project partnered with the Central and Northern California Ocean Observing System to enhance high frequency radar surface maps for wastewater tracking and forecast models predicting pathways of spilled oil.
- The Lake Michigan Project worked with the Great Lakes Observing System to find a link in implementing access to data and benefits from river monitoring.

The Network and IOOS

The Network is designed to be compatible with IOOS. Data from both require many of the same measurements and tests for similar environmental parameters, making the two programs mutually supportive. IOOS and the Network linked through data management and development of data standards, They are also similar in that they are using a regional approach to develop national monitoring systems by linking region-al systems that measure a common set of 'variables' (IOOS) or 'constituents' (the Network).

Monitoring Estuaries

Sites in Network estuaries

- 18 of 149 Network estuaries illustrated
- 50 sites per IOOS Region; probability-based selection
- 50 sites per estuary; probability-based selection
- About 15 sites selected to monitor flow and transport with at least 2 continuous sites to monitor short-term variability in each estuary

Sites both inland and along the coasts that will monitor waters.

Linking these systems will facilitate measuring short and long term impacts of pollutants on habitat, water quality, and humans; provide a better understanding of aquatic resources, population dynamics, and have resources to monitor changes that could impact the health of ecosystems.

Benefits:

Combined data from the Network and IOOS will improve abilities to monitor water quality and protect public health with early warnings. When both systems are operational, they will improve capabilities to describe current conditions and detect changes or trends. The systems will expand scientific ability to link society activities to changes in coastal and estuarine water quality and predict or mitigate habitat loss. Specifically, managers will be better equipped to act on issues such as dead zones in fishery hab-itats or predictions of E. coli out-breaks on beaches.

Partnerships:

The Network is a combined effort of the Environmental Protection

Agency, the US Geological Survey, and the National Oceanic and Atmospheric Administration. The Network will use and build upon existing federal, state, tribal, and local monitoring. It will not replace existing efforts; but will supplement these efforts resulting in more useful products. Other partners include other federal agencies, state agencies, universities, non-governmental organizations and private companies.

For More Information:

U.S. IOOS
1100 Wayne Avenue, Suite 1225
Silver Spring, MD 20910
Phone: (301) 427-2420
www.ioos.noaa.gov

Environmental Protection Agency
Atlantic Ecology Division
Phone: (402) 782-3188
www.epa.gov/aed

United States Geological Survey
USGS Office of Water Quality
Phone: (703) 648-6862
water.usgs.gov/nawqa/

U.S. Department of Commerce
National Oceanic and Atmospheric Administration
Integrated Ocean Observing System (IOOS®) Program

www.ioos.noaa.gov

May 2013