



National Water Quality Monitoring Network for U.S. Coastal Waters and their Tributaries

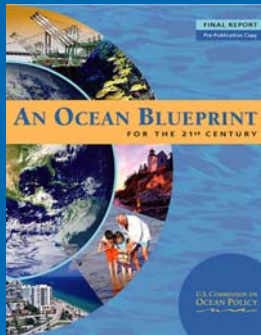
Status of Network, Accomplishments, and Recommendations for Future Directions

Tracy Hancock, USGS

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Ocean Research & Resources Advisory Panel (ORRAP)
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National Water Quality Monitoring Network for U.S. Coastal Waters and Their Tributaries



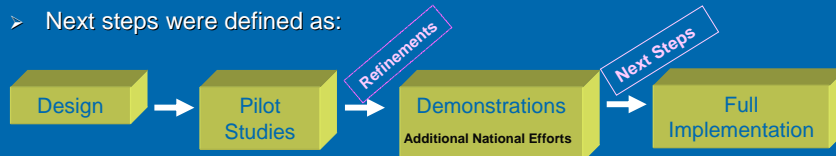
- The Network was recommended by the U.S. Commission on Ocean Policy
- ACWI Charged by the:
 - CEQ, NSTC, SWAQ, and JSOST
 - To design a national Network which:
 - Integrates biological, chemical, and physical characteristics of water resources
 - Links uplands to the coastal ocean
- Original Design Report: *A National Water Quality Monitoring Network for U.S. Coastal Waters and their Tributaries*, 2006



Progress in Monitoring

- ACWI approved the Network design and presented it to CEQ and the other requesting organizations on April 2006

- Next steps were defined as:



- At CEQ request, ACWI undertook three pilot studies to examine the concepts and components of the design.
 - San Francisco Bay
 - Delaware Bay
 - Lake Michigan
- Pilot Studies and Network refinements were reported to ACWI in Feb. 2008.

Structure of the Network Design

- **Nine Resource Compartments**
- **A Continuum of Observations**

Continuum of observations:

- Estuaries
- Nearshore
- Offshore and EEZ
- Great Lakes
- Coastal Beaches (BEACH Act)
- Wetlands

With Flow and Flux from:

- Rivers
- Atmosphere
- Ground water

- Linked data Network
- Sample framework: fixed stations, probabilistic designs, continuous monitoring w/sensors
- Stations, parameters, and sampling frequencies specified
- Provisions for data comparability, management & access



Results of Pilot Studies

- Management issues are similar and represent important issues across the Nation, including nutrient enrichment, sediment management, and toxic algae.
- Data integration and management improvements are needed to optimize the use of available monitoring data.
- Monitoring gaps in all Pilots related to adequate number of representative sites, sampling frequency, and additional analytes.
- Local expertise is paramount in the implementation of any Network design and its relevance to addressing management of water resources.



Results of Pilot Studies

- The Network can effectively include and integrate wetlands monitoring with tributary and estuary monitoring.
- Refinements to the Network:
 - Nutrient parameters and detection limits
 - Suggested contaminants (total of 243 with assumed flexibility)
 - Coastal wetlands monitoring strategy
 - Parameters and ancillary data needed for biological assessments
 - Atmospheric contributions (monitoring or modeling)
 - Ground water
- Annual estimated costs for full implementation of the refined Network (for individual estuaries and tributaries) ranges from \$5-7 million each. Estimated costs for Lake Michigan are higher (\$12 million).



Progress in Monitoring

Status and Accomplishments Pilot Demonstration Phase

Monitoring initiated by USGS (2008-09) to fill gaps needed to address water-quality issues:

- **Delaware Bay:** nutrient and carbon monitoring and assessment added to current USGS tidal stations and estuary boat run sites; real-time monitoring (T, SC, pH, DO, and turbidity) added to selected river and estuary sites.
- **Lake Michigan:** 3 new monitoring sites added; nutrient monitoring was enhanced at 17 existing USGS sites; toxicity testing conducted at selected stations using SPMDs.
- **San Francisco Bay:** real-time monitoring for suspended-sediment; nutrient and toxic algae monitoring enhanced at selected sites.
- The enhanced work is supported through fiscal year 2009. Continued funding is needed to continue the monitoring and complete the assessments.



Progress in Monitoring

Status of Network and Accomplishments Pilot Demonstration Phase

- **NASQAN:** 5 stations added to the USGS Surface-Water Network, following protocols used for monitoring large rivers and the quality of water at the terminus of large watersheds.
 - 31 NASQAN river stations in Surface-Water Network: routine monitoring
 - 113 NAWQA stations at smaller rivers and streams: status and trends
- Continued resources are needed to maintain the 5 stations and ensure water-quality sample collection continues beyond fiscal year 2009.





Progress in Monitoring

Status of Network and Other Accomplishments
(Additional National Efforts)

- **Joint Web Services (WQX):** Water-quality data from USGS NWIS and in EPA STORET is produced in a common format. Continued resources needed to maintain and update the online services and capabilities beyond fiscal year 2009.
- **Additional Data Elements:** At ACWI's request, the Methods Board has added to ACWI's list of recommended data.
- **National Aquatic Resource Surveys:** These EPA/State surveys provide "snapshot" assessments of water quality in estuaries, lakes, streams and rivers.
- **The State of the Nation's Ecosystems:** Heinz center report released in 2008. To fill environmental data gaps: collaboration, national set of indicators, and monitoring.



Progress in Monitoring

Status of Network and Other Accomplishments
Coordination with NOAA

- Network design involves the IOOS **Regional Associations** in managing and monitoring
- Network design has a data management plan that is consistent with the IOOS Data Plan
- Network design relies on IOOS plans for monitoring offshore compartments
- Panel discussion at March 2009 NWQMC Meeting: Network Pilot Study Representatives and NOAA to discuss links and future directions



Future Directions National Monitoring Network

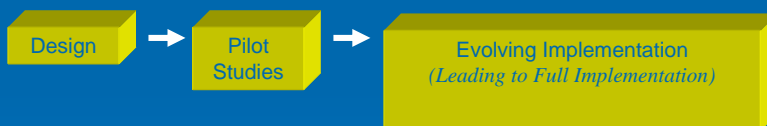
- **National Ground Water Monitoring Network:**
 - May embrace certain concepts and components of the National Network; link with a Pilot study
- **National Environmental Status and Trends (NEST):**
 - Indicators for the Nation's water
- **Water Data Portal (WQX):**
 - Extend and enhance USGS and EPA web services capabilities
- **Wetlands Assessment:**
 - Wetland surveys are being designed for the year 2011
- **Advancing Sensors:**
 - The Methods Board's Sensor Workgroup
- **Regional Ocean Observing Associations:**
 - Increasingly active
- **Global Earth Observation System of Systems (GEOSS):**
 - Increasingly recognized



Next Steps National Monitoring Network

Monitoring Council Recommendations:

- That ACWI adopt the evolving implementation of the Network

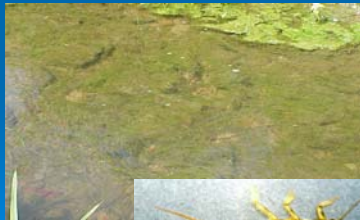


- That ACWI communicate progress to CEQ and other requesting agencies regarding:
 - Pilot Studies, NASQAN sampling, and WQX in the evolving Network
 - Other monitoring programs



Next Steps (continued)

- Consider inclusion of streams, lakes, and small rivers in the Network design
- Collaboration: identifying specific Federal and State programs that should be examined for their future contributions to the Network's evolving implementation



**For additional information on the
National Water Quality Monitoring Network:**

<http://acwi.gov/monitoring/network/>

through the National Water Quality Monitoring Council Co-Chairs

Chuck Spooner, USEPA
(202) 566-1174
spooner.charles@epa.gov



Pixie Hamilton, USGS
(804) 261-2602
pahamilt@usgs.gov

