

Federal Science for Sustainable Water: Subcommittee on Water Availability and Quality (SWAQ)

Co-Chairs: Rochelle Araujo, EPA
Robert Hirsch, USGS

Co-Executive Secretaries: Iris Goodman, EPA
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ICOSSE Workshop – Cincinnati
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Subcommittee of NSTC – Committee on Environment and Natural Resources (2004)

- Charged with:
 - (1) identifying science and technology needs to address the growing issues related to fresh water supplies,
 - (2) developing a coordinated, multi-year plan to improve research to understand the processes that control water availability and quality, and
 - (3) enhancing the collection and availability of the data needed to ensure an adequate water supply for the Nation's future.

Membership

- Department of Interior
 - US Geological Survey
 - Bureau of Reclamation
 - US Fish and Wildlife Service
- US Environmental Protection Agency
 - Office of Research and Development
 - Office of Water
- Department of Agriculture
 - Economic Research Service
 - Cooperative State Research, Extension and Education Service
 - Natural Resources Conservation Service
 - Agricultural Research Service
- Department of Commerce, National Oceanographic Service
 - Office of Atmospheric Research
 - National Weather Service

Membership

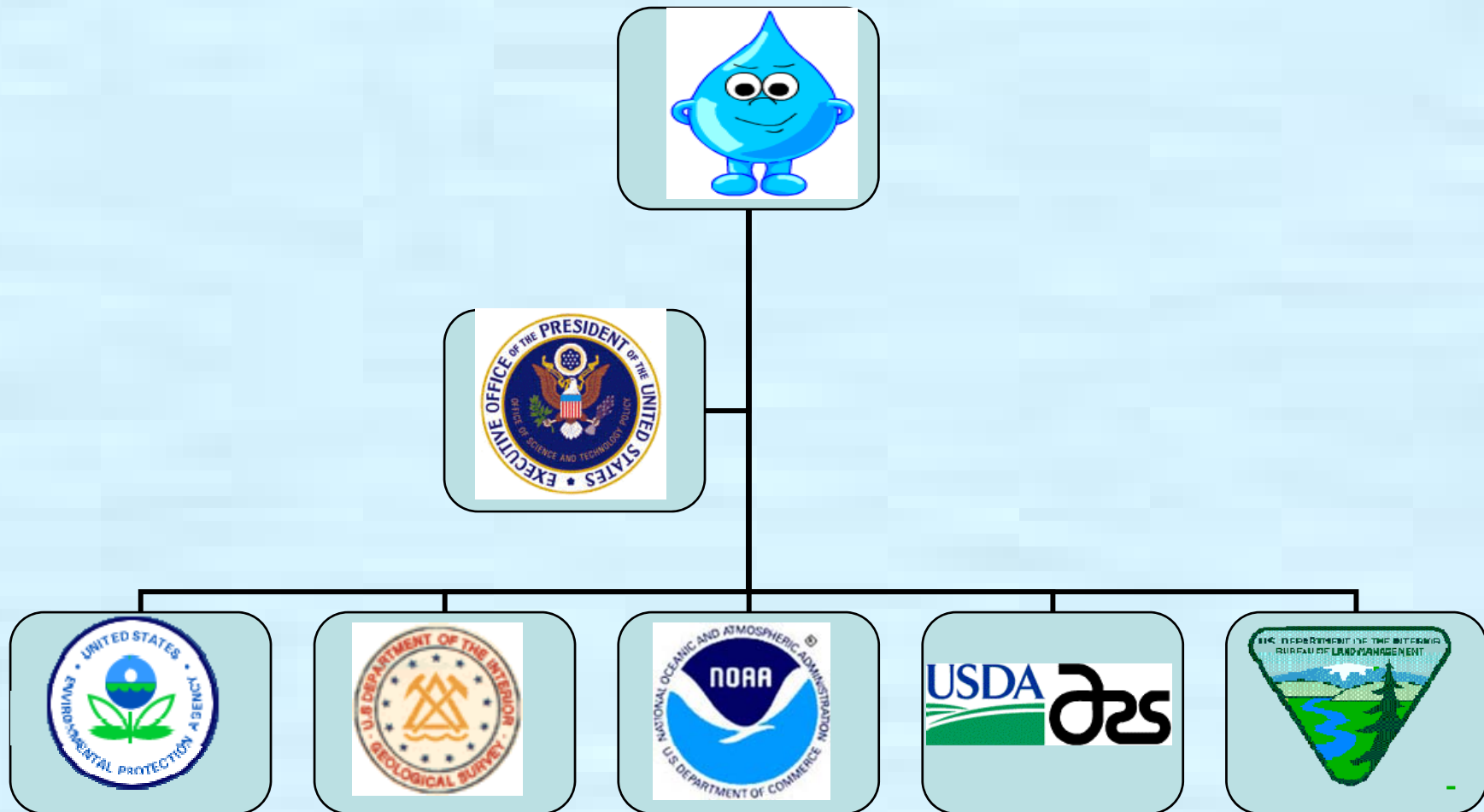
- Department of Defense
 - US Army Corps of Engineers
- Department of Energy
 - Office of Energy Efficiency and Renewable Energy
 - Office of Science
- Department of Health and Human Services
- Department of State
- National Aeronautics and Space Administration
- Tennessee Valley Authority
- Executive Office of the President
 - Office of Management and Budget
 - Office of Science and Technology Policy

SWAQ Purpose

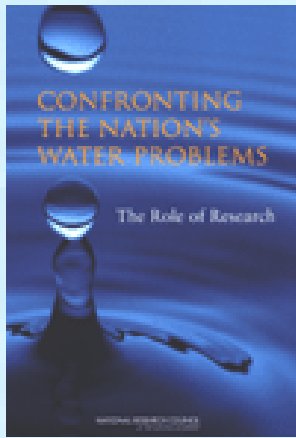
Facilitate communication and coordination among federal agencies and representatives from nonfederal sectors on issues of science, technology, and policy related to water availability and quality

- **Advise the Committee** on significant recent developments in science and technology related to the assessment and enhancement of water availability and quality.
- **Determine needs** for additional research, monitoring, and technology development.
- **Develop a plan** for a coordinated multiagency effort to provide the needed research, monitoring, and development.
- **Recommend budget priorities** that will target federal spending toward the most critical needs for ensuring safe and sustainable water supplies for human and ecological uses.
- **Provide reviews and analyses** of federal policies and programs that affect water availability and quality.
- Advise the Committee on **linkages between** the availability and quality of **water and the nation's economic and strategic security.**
- **Assess** periodically (a) **priorities** for research and development of systems related to **enhancement of water supplies**, and (b) research and development of systems related to monitoring and forecasting water flow and **quality and their effect on aquatic life**

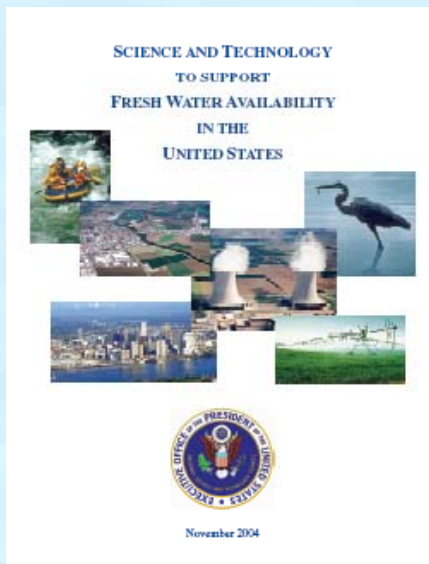
Our Charge - “Act like the Department of Water”



SWAQ Publications



- Confronting the Nation's Water Problems: Appendix E
 - <http://www.nap.edu/catalog/11031.html>
 - SWAQ Charter
 - “Third Era of Water”



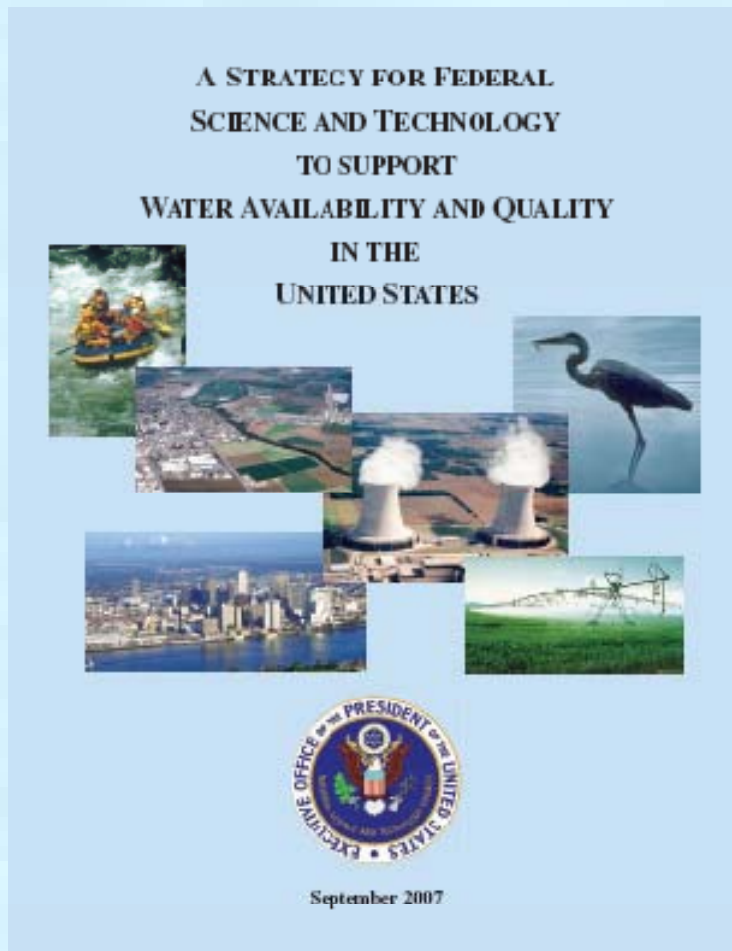
- Science and Technology to Support Fresh Water Availability in the United States
 - http://www.ostp.gov/NSTC/html/swaqr_eport_2-1-05.pdf

Three Eras of Water Management

- Increasing Water Supply, Power Generation, Flood Control (Colonial – 1972)
 - Dams
 - Groundwater exploitation
- Regulating Use (1972 – 1990)
 - Few new storage projects
 - Water Quality
- Collaborative Decisionmaking (1990's – future)
 - Mediating among conflicting uses



2007 Publication



- 3000 printed copies
- <http://www.ostp.gov/nstc/html/Fed%20S&T%20Strategy%20for%20Water%209-07%20FINAL.pdf>
- (OSTP website – NSTC Reports and Documents http://www.ostp.gov/nstc/html/_reports.html)

Guiding Principles

- Economic health of nation relies on sustainable supplies of fresh water
- Advances should inform and be informed by the private sector
- Water availability is a function of quantity *and* quality
- Key role for science is to expand options

Guiding principles

- Water users, managers, and researchers must work together to guide development of science and technology
- Scientists and managers must employ systems approach that considers physical, chemical, biological, social, behavioral, culture aspects of water
- Water law, economics, public awareness and education are cornerstones of effective water resource management

Scientific and Technical Challenges for the Nation

- Measure and account for its water
- Develop methods that will allow expansion of fresh water supplies while using existing supplies more efficiently
- Develop, improve, and expand the use of predictive water management tools

Challenge 1: Measure and Account for Water

- Water resources and how they are changing
- Water use
- Role of ecosystems in maintaining water availability and quality
- Water infrastructure



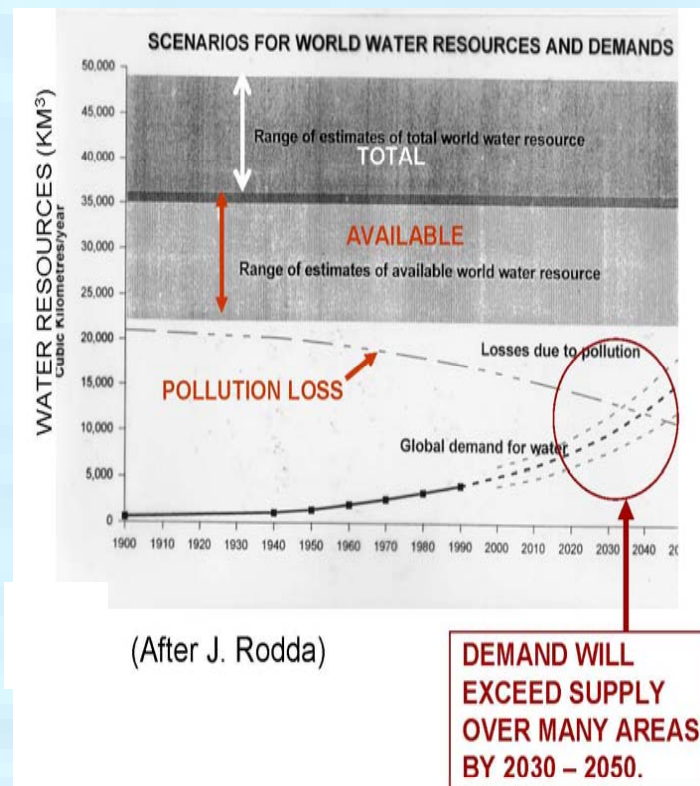
Challenge 2: Develop methods that will allow expansion of fresh water supplies while using existing supplies more efficiently



- Develop tools to make more efficient use of existing water supplies and infrastructure
- Develop tools to expand water resources

Challenge 3. Develop, improve, and expand the use of predictive water management tools

- Short-term decisions about water release, storage and use
- Outcomes of Long-term planning and policy decisions



Recommendations

- Implement a National Water Census
- Develop a New Generation of Water Monitoring Techniques
- Develop and Expand Technologies for Enhancing Reliable Water Supply
- Enhance Public Acceptance of Innovative Water-Use Technologies
- Develop Collaborative Tools and Processes for U.S. Water Solutions
- Improve Understanding of Ecosystem Water Needs and Water-Provisioning Services
- Improve Hydrologic Prediction Models and Their Applications

Unique Capabilities of Federal Agencies

- Large scale
- Multijurisdictional
- \$\$\$\$
- Coordinate disparate efforts

Filters for Federal Research

1. Is there a Federal role in this research area?
2. What is the expected value of the research?
3. To what extent is the research of national significance?
4. Does the research fill a gap in knowledge?
5. How well is this research area progressing?
6. How does the research area complement the overall water-resources research portfolio?

Research Outcomes

- New **frameworks** for water availability, quality, and management issues that consider interactions between various physical, chemical, biological, and social components;
- **Systems approach** to water management that considers the multiple dimensions of competing demands; supports quantitative methods to compare options and assess the tradeoffs among them.
- **Tools** to model these complex systems, decision-makers will be able to assess consequences of specific policies and decisions under a broad range of scenarios.
- More effective use of existing infrastructure; expansion of the **engineered and natural infrastructure** where it is most needed.

2009 Activities

- Reflected in Agency Budgets and pending legislation
- Workgroups for interagency collaboration:
 - Carbon sequestration and groundwater
 - Collaborative Tools and Processes
 - Food-Energy-Water Nexus

H.R. 1145 National Water Research and Development Initiative Act of 2009

- (1) Implementation of a National Water Census, which shall include the collection of data on national water resources to create a comprehensive database that includes information about the quantity, availability, and quality of ground water and surface water resources.**
- (2) Development of a new generation of water monitoring techniques.**
- (3) Development of technologies for enhancing reliable water supply.**
- (4) Development of innovative technologies and tools to enhance water-use efficiency and tools to encourage public acceptance of such technologies.**
- (5) Development of tools and processes to facilitate resolution of conflicts over water resources.**
- (6) Improvement of understanding of water-related ecosystem services and ecosystem needs for water.**
- (7) Improvement of hydrologic prediction models and their applications.**
- (8) Analyses of the energy required to provide reliable water supplies and the water required to provide reliable energy supplies throughout the United States.**

H.R. 631 Water Use Efficiency and Recovery Act

- **Requires EPA/ORD to research water use and efficiency**
 - collection, storage, treatment, and reuse of rainwater, stormwater, and greywater
 - water storage and distribution systems;
 - behavioral, social, and economic barriers to achieving greater water use efficiency.

- **With National Academy of Sciences to study**
 - "low impact" (mimicking predevelopment hydrology)
 - "soft path" (using natural capacities of ecosystems) strategies for management of water supply, wastewater, and stormwater.

A Vision for Water Sustainability

