

# **Concepts for an Open Water Data Infrastructure**

**Subcommittee on  
Spatial Water Data  
August 28, 2014**



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Steering Committee Meeting

# Open Water Data Initiative

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# Open Water Data Vision

- ◆ Foundational **National** Data Sets with **Data Services** to support a wide variety of water user applications
- ◆ Water data **metadata**, **web services** and a **community** accessible on the Federal Geospatial Platform
- ◆ Access to integrated **real-time monitoring data**
- ◆ Data Assimilation for a **National Modeling** capability
- ◆ Water Maps and other **Derivative Products** that integrate geospatial & water observations
  - Such as: current conditions, precipitation estimates, reservoir storage
- ◆ **Marketplace of open source applications** (models, data visualizations, etc.) built upon **Open Water Web Services**



# Foundational Water Data Sets

- ◆ Streamflow
- ◆ Groundwater levels
- ◆ Aquifers
- ◆ Water quality
- ◆ Reservoir storage
- ◆ Elevation
- ◆ Hydrography – NHD/WBD
- ◆ Landscape Variables
- ◆ Climate/Weather/ET
- ◆ Soil moisture
- ◆ Human water use
  - Withdrawals
  - Return flows
  - Diversions
  - Losses



# ACWI – Advisory Committee on Water Information

**WICP** Water Information Coordination Program  
**ACWI** Advisory Committee on Water Information

## Advisory Committee on Water Information


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**Features:**  
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**9th National Monitoring Conference**

**April 28 - May 2, 2014**

**Location:**  
Cincinnati



[Sheet](#)

**Water Information Coordination Program**  
The WICP ensures collaborative efforts among Federal Agencies to improve water information for decisionmaking about natural resources management and environmental protection.

**Advisory Committee on Water Information**  
The ACWI represents the interests of water-information users and professionals in advising the Federal Government on Federal water-information programs and their effectiveness in meeting the Nation's water-information needs. ([ACWI Fact Sheet](#))

◆ Established in 1991

# Proposal

- ◆ We are proposing an Open Water Data Initiative that will:
  - integrate currently fragmented water information into a connected, national water data framework
  - leverage existing shared infrastructure and tools to provide a platform for innovation, modeling, and data sharing and solution development.
  - capitalize on cross-government interest in big data, IT innovation, Open Data, Data.gov, etc.
  - Build on the ground-breaking work of the FGDC, OGC, IWRSS, CUASI, ACWI, and others.



# Charge for the FGDC

- ◆ In collaboration with the ACWI and other partners – Advance an Open Water Data Initiative, including:
  - Reviving and populating the joint Subcommittee on Spatial Water Data to design a national open water data infrastructure;
  - Supporting IWRSS consortium members in the scoping and implementation pilot activities;
  - Creating an integrated water data portfolio for specific hydrologic regions or basins;
  - Developing a technical reference architecture that supports the sharing of water data and links observations to geospatial data;
  - Leveraging the Geospatial Platform to make water data more accessible and to support water data community collaboration;



# Charge for the FGDC cont.

- Identifying how existing investments in water data sharing can be integrated and leveraged;
- Engaging the international community in standards and technology development including the Open Geospatial Consortium;
- Identifying and prioritizing improvements to relevant framework geospatial data (National Hydrographic Dataset, Watershed Boundary Dataset, National Elevation Dataset, National Geologic Map Database, and the National Cooperative Soil Survey);
- Utilizing the FGDC coordination and governance structure to support related activities in the federal water sector.





# Next Steps

- ◆ Endorse revival and re-populating of Subcommittee on Spatial Water Data
- ◆ Issue charge to the subcommittee
  - Work with IWRSS consortium members to:
    - ◆ Refine charge going forward
    - ◆ Define and implement Pilot Projects
- ◆ Schedule “periodic” check-ins with the Steering Committee



# Starting concepts:

- Observations data: WaterML2, e.g. NWIS, others?
- Surface-water geospatial framework:
  - NHDPlus flowlines, catchments, nodes
  - Services: EPA WATERS Web Services
    - Consider these a straw man
    - What do we need that these don't do?
- Ground-water geospatial framework
  - Aquifers?
  - Wells?
- What other categories do we have?

## Water: WATERS

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The **Watershed Assessment, Tracking & Environmental Results System (WATERS)** unites water quality information previously available only from several independent and unconnected databases.

EPA gathers water quality information to address public concerns such as:

- How healthy is my watershed?
- Can I drink the water?
- Can I eat the fish?
- Is it safe to swim in the water?

To answer these questions EPA must examine data from several different databases. WATERS has the power to improve program efficiency, communication, and analytical capacity by linking these databases so the information can easily be shared and combined.

- [Basic Information](#) about the system.
- [Download Data](#) from WATERS to support environmental analysis.
- [Documentation](#) about the system and associated data sets.
- [Mailing List](#) allowing partners to stay informed about announcements related to WATERS.

- [Tools](#) using the WATERS data in support of environmental analysis.
- [Web Services](#) to perform complex analysis based on WATERS related data.
- [Mapping services](#) providing access to WATERS data to support data visualization.



# Existing web services (EPA WATERS NHDPlus 100K-based)

- EPA WATERS Web and Database services
  - Event indexing
  - Point indexing
  - Name service
  - Navigation service
  - Navigation delineation service
  - RAD event info service
  - Lookup services
  - Results queue service
  - Spatial assignment service

# Other Perspectives on OWDI

- Dave Blodgett
- Ed Clark
- Others?

# Inventory of current water data/services

- What water data does your agency currently hold?
- Is it available via open web services?
- If not, are there plans to make it available?
- Other relevant details?
- NGDA Datasets—Starting point
- Should we develop inventory via a web form? (Google or Doodle?)

# Potential Use Cases/Pilots

- **NFIE**
- **Water Portfolio—Lower Colorado (or other pilot area)**
- **Short Term Networks/temporary gages (Marie Peppler)**
  - **Data from Sandy, other floods**
    - Project underway now
    - Can exercise the services
    - Main goal: NHD indexing (events)
    - Secondary goal: navigation, event discovery
- **Hydro Geospatial Fabric/National Hydrology Model (Roland Viger)**
- **Chemical spill**
- **Others?**

# What services are needed for NFIE?

- Do WATERS services do everything needed?
  - Event indexing
  - Up/Downstream navigation?
  - Others?
- Does NFIE need to reference any network other than NHDPlus?
- What supporting services are needed?
  - WFS? Which features?
  - WCS for elev?
  - 2D to 3D line service?