



National Ground-Water Monitoring Network

Advisory Committee on Water Information—Subcommittee on Ground Water

Status Report from the Subcommittee on Ground Water

Activities related to the National Ground Water Monitoring Network

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Presentation adapted for SOGW Face-to-Face Meeting, September 16, 2014

Presentation Basis

- Uses previous presentations & acknowledges other authors / presenters
- Touches on points in today's meeting agenda
- Invites other SOGW participants to fill in any gaps
- Encourages Q&A from participants

Presentation Outline

- ACWI Overview & Other Groups
 - Other slide show
- SOGW History & Key Points
 - Framework Design
 - Implementation Guidance
 - Pilot Testing
 - Key changes
 - Cost estimates
 - NGWMN Expansion
 - New states
 - EPA Labs
 - Innovative Methods & New Functions



Acknowledgements

- SOGW Members and contributors
- ACWI, NWQMC, & other ACWI groups:
 - Coastal network (see next slide)
 - Ongoing support, guidance, & interaction
- Executive Secretary & admin support
 - NGWA
 - USGS HQ & CIDA
- Many others



Coastal Network & SOGW Initiation

- Ocean Commission Report
- Charge to ACWI & NWQMC
- Groundwater Chapter
- Entry Point for Other GW Professionals
- ID of Lack of GW Network
- 2006 National Monitoring Conference
 - After-hours session & pledges of support
- Terms of Reference & ACWI Approval

Why is There an SOGW?

- Overall: Need to raise visibility of GW
 - Literally Invisible
 - Lacking Public Attention (“GW Floods”?)
 - Often a “2nd Cousin”
 - No GW Sub-Group in ACWI < 2006
 - Difficult & Costly to Characterize

Importance of Groundwater

- 99% of Earth's Freshwater Reserves
- Base Flow to Surface Waters
- Primary or Sole Source:
 - Rural Areas
 - Long Island, Cape Cod, etc.
- Multiple Threats – in 3D
- Easily Damaged & Slow to Recover

SOGW Grand Overview

- Created to fill “GW Gap” of ACWI
- Sole Purpose:
 - National GW Monitoring Network (“NGWMN”)
 - Mantra: “Walk Before Running”
- Congressional Authorization w/o Appropriation
 - Volunteer Efforts So Far
- Lessons-Learned and Products-Created
 - Inform & Facilitate “Open Data Initiative”

Part 1 of “Why Do We Need the NGWMN?”

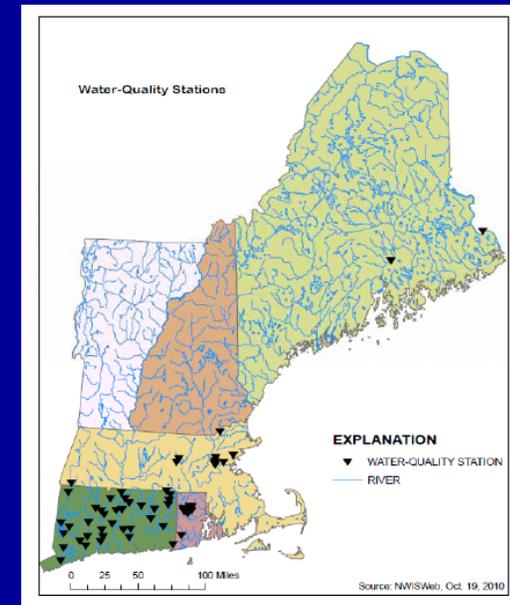
Critical Needs Cited by Key Entities

- 2003 GAO Report
 - 36 States expect water shortages
- 2005 NGWA/AASG Survey
 - GW shortages expected in 43 states
 - Calls for cooperative monitoring
- 2006 Heinz Report
 - GW data inadequate for national reporting
- As surface water supplies are fully (or over-) allocated, users turn to ground water [multiple organizations]

Part 2 of “Why Do We Need the NGWMN?”

What GW Analysts Need

- Trend-Tracking
- Impacts-Identification
- Analysis & Assessment
- Planning & Management
- Fill Data Gaps →



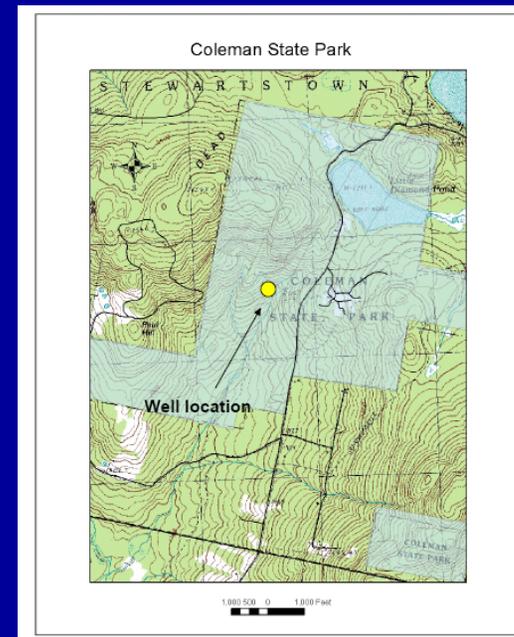
(Morrison, USGS)

We also need a better acronym than
“NGWMN” (please help!)

Part 3 of “Why do we need the NGWMN?”

Key “Drivers” = Impact Factors

- Underground Injection Control (UIC)
- GW Under the Influence of Surface Water
- Sea Level Rise & Saltwater Intrusion
- Hydraulic Fracturing
- Sustainability
- “Energy-Water Nexus”
- Drought
- Nutrients
- Land Use Change

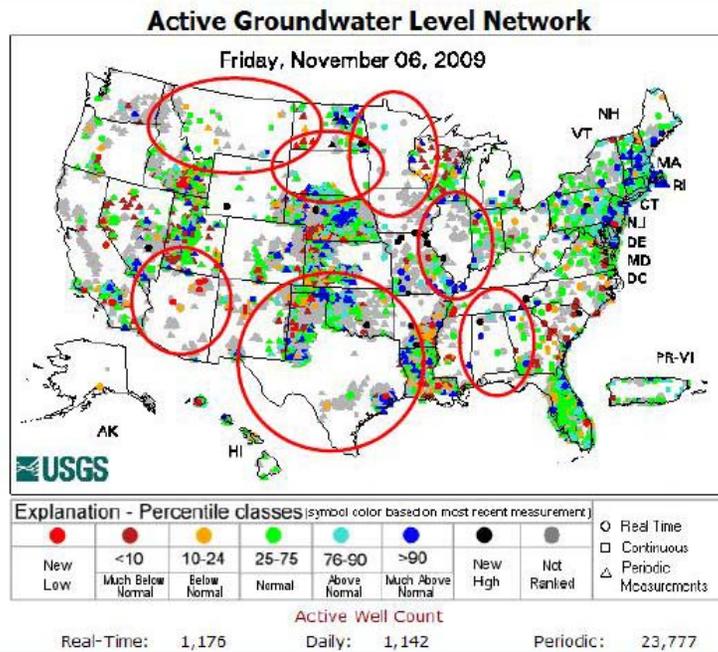


Part 4 of “Why do we need the NGWMN?”

Lack of Consistent Coverage

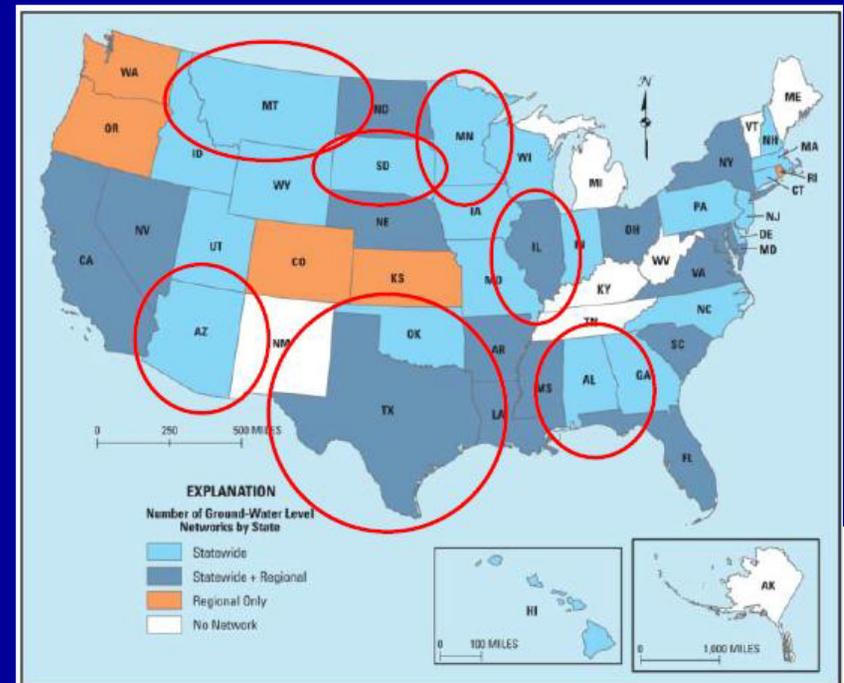
Wells operated by USGS

Groundwater Watch



Wells operated by States

Results from survey of State networks



P.L. 111-11 SECURE Water Act 2009

(B) in coordination with the **Advisory Committee and State and local water resource agencies—**

- (i) assess the current scope of groundwater monitoring based on the access availability and capability of each monitoring well in existence as of the date of enactment of this Act; and
- (ii) develop and carry out a monitoring plan that maximizes coverage for each major aquifer system that is located in the United States;
and.....

P.L. 111-11 SECURE Water Act 2009

(C) prior to initiating any specific monitoring activities within a State after the date of enactment of this Act, **consult and coordinate with the applicable State water resource agency** with jurisdiction over the aquifer that is the subject of the monitoring activities, and comply with all applicable laws (including regulations) of the State.

SOGW – Terms of Reference

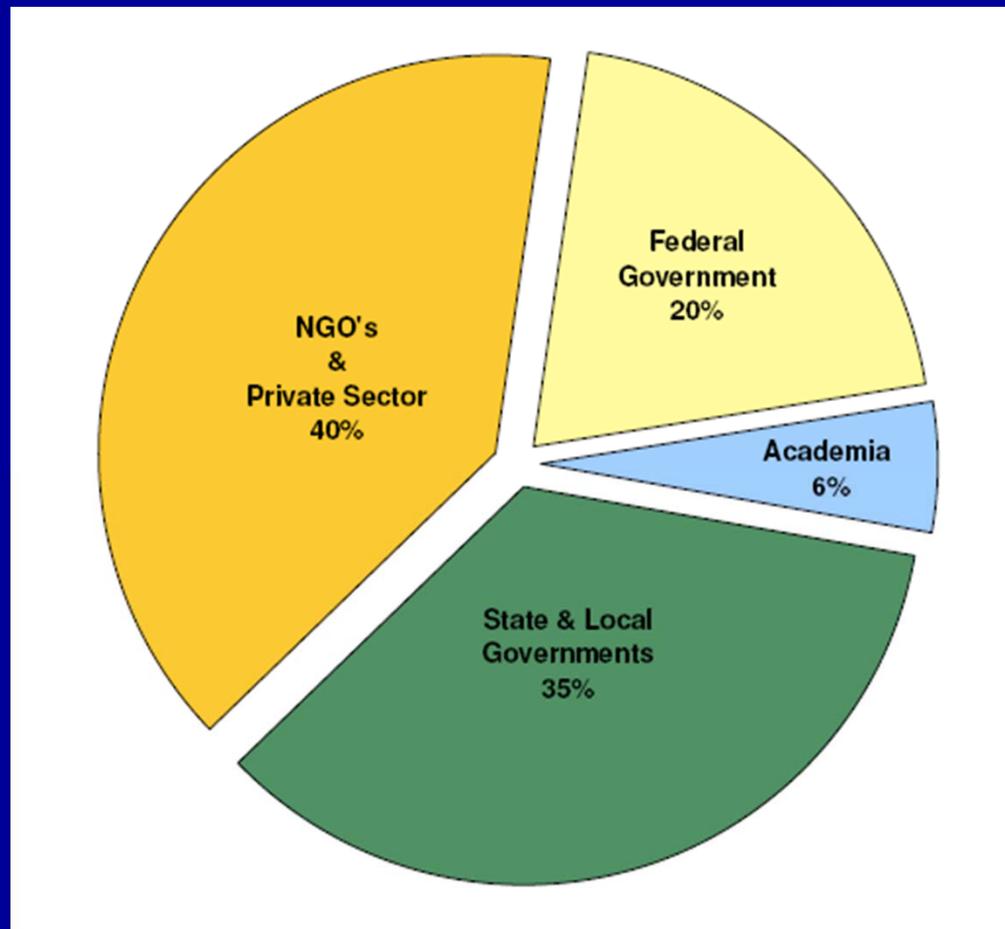
The overall goal of the SOGW is to develop and encourage implementation of a nationwide, long-term ground-water quantity and quality monitoring framework that would provide information necessary for the planning, management, and development of ground-water supplies to meet current and future water needs, and ecosystem requirements.

SOGW – Terms of Reference

Scope: This national framework for ground-water monitoring and collaboration will be developed to assist in assessments of the quantity of U.S. ground-water reserves, as constrained by ground-water quality.

SOGW's Early Participation – Now Enhanced

- ASCE
- GWPC
- ICWP
- AASG
- NGWA
- TCEQ
- USGS
- USEPA HQ & Region 8
- ASDWA
- WEF
- USDA NFS
- ASIWPCA
- ASTM



SOGW Planned Approach

- Determine “current picture” of GW monitoring
- Agree upon network design principles
- Identify field methods and data standards
- Determine approach for compiling data
- Pilot the network design and approach
- Revise as needed per pilot-testing results
- Develop implementation plan

SOGW Actual Timeline

January	2007	SOGW formed by ACWI
February	2009	Framework Document approved
December	2009	Five pilot projects selected
January	2011	Pilot projects report results
July	2011	Web portal version 1 public release
September	2011	Pilot project synthesis report
Summer	2013	Framework Document revisions
Fall	2013	Web portal updated version
	2014	WQ piloting – 2 States
	2015+	Formal full-scale implementation

National GW Monitoring Network

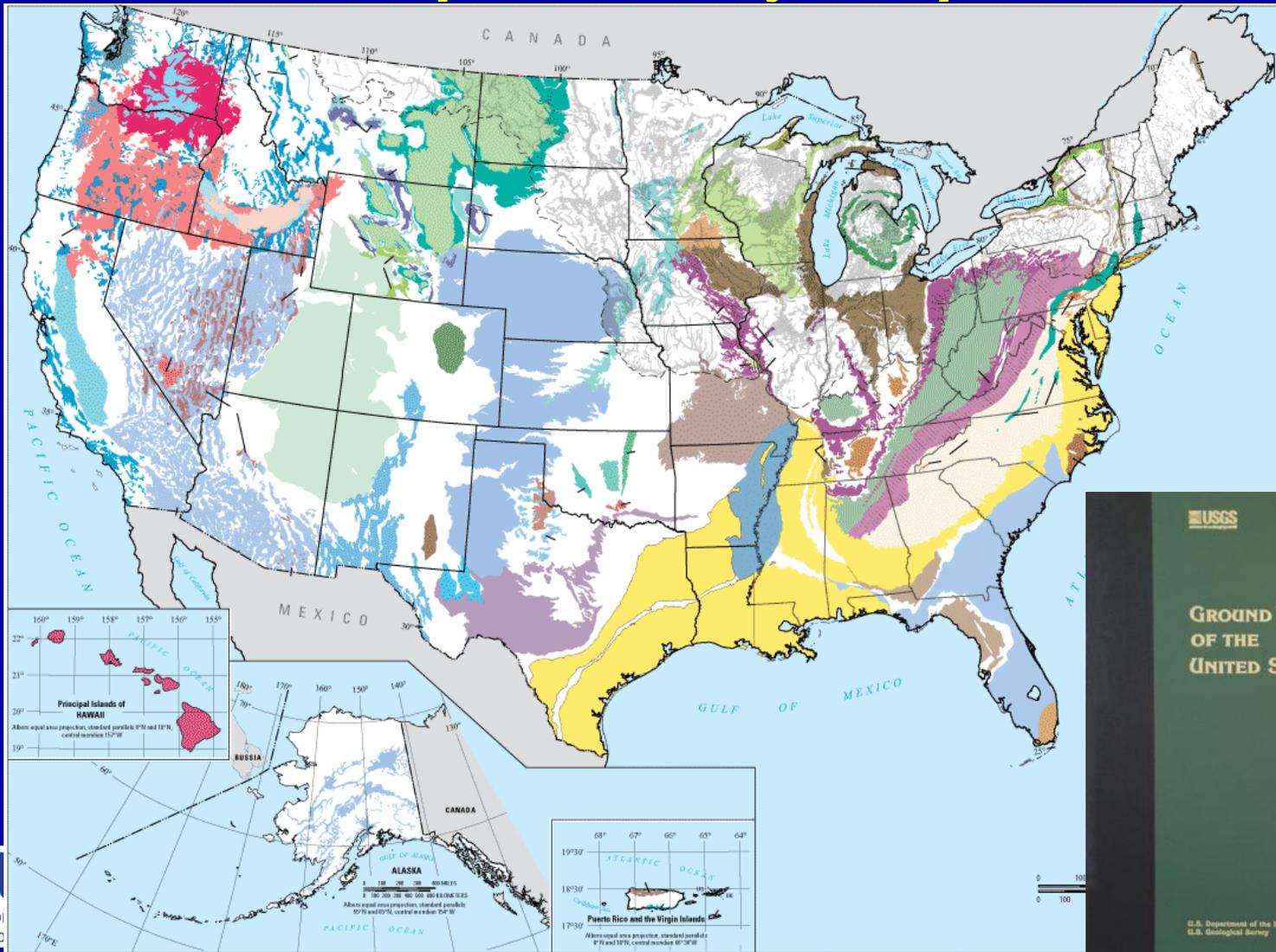
“Framework Document”

- Design for a collaborative National GW Monitoring Network
- Inventoried Federal and State monitoring programs
- Guidance for Field Methods
- Guidance for Minimum Data Elements, Standards, & Mgmt
- Implementation Plan and Recommendations
- 2009 and 2013



Network Design

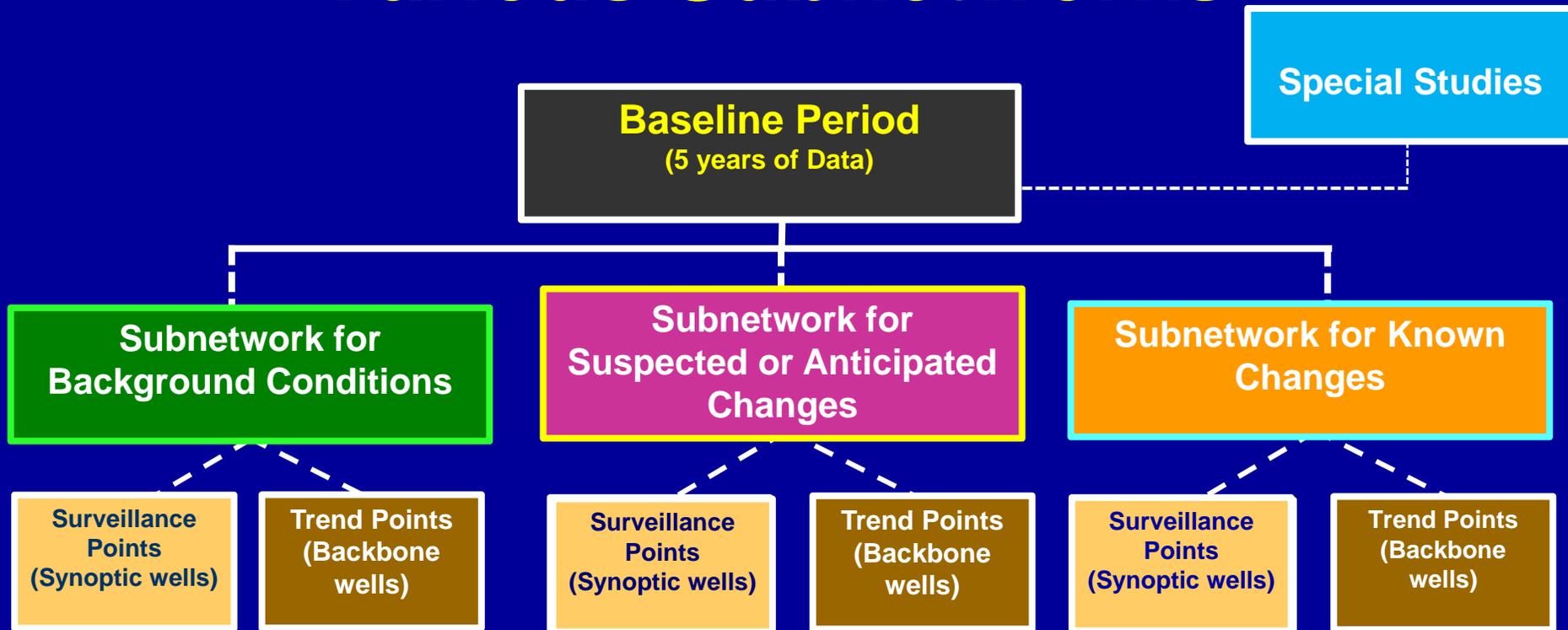
→ *Principal and Major Aquifers*



NGWMN Design Elements

- Principal and major aquifers
- GW levels and quality, but focus is availability
- Priority on wells/springs with long-term data
- Network, not a Warehouse or Master Database
- Not for specific science question
- Willing data providers: State, Federal, Tribes, others
- Sites classified by local experts / data providers
- Data available to all without restriction or cost
- Data provider is the authoritative data source

Network Design: Various Subnetworks

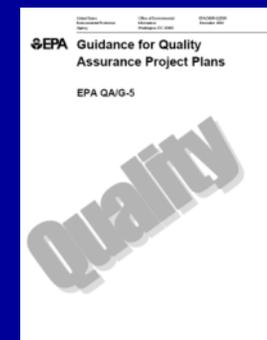


“Classified” based on water level or water quality change
and on frequency of data collection

What about data quality? Field Practices

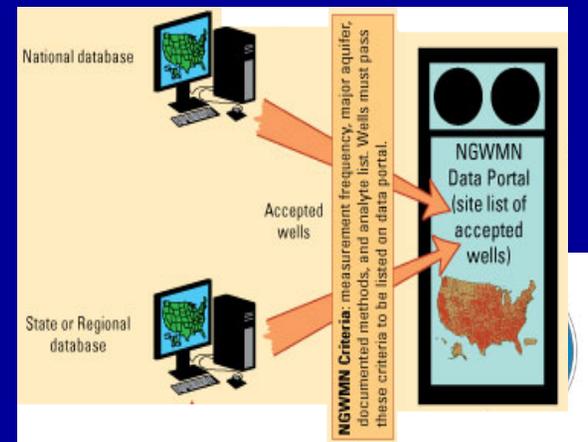


- Few absolute requirements--flexible and adaptable.
- Requires documentation of techniques to ensure comparability and assure quality in ground-water measurement and sampling activities.
- Documentation must be available to the user — known provenance

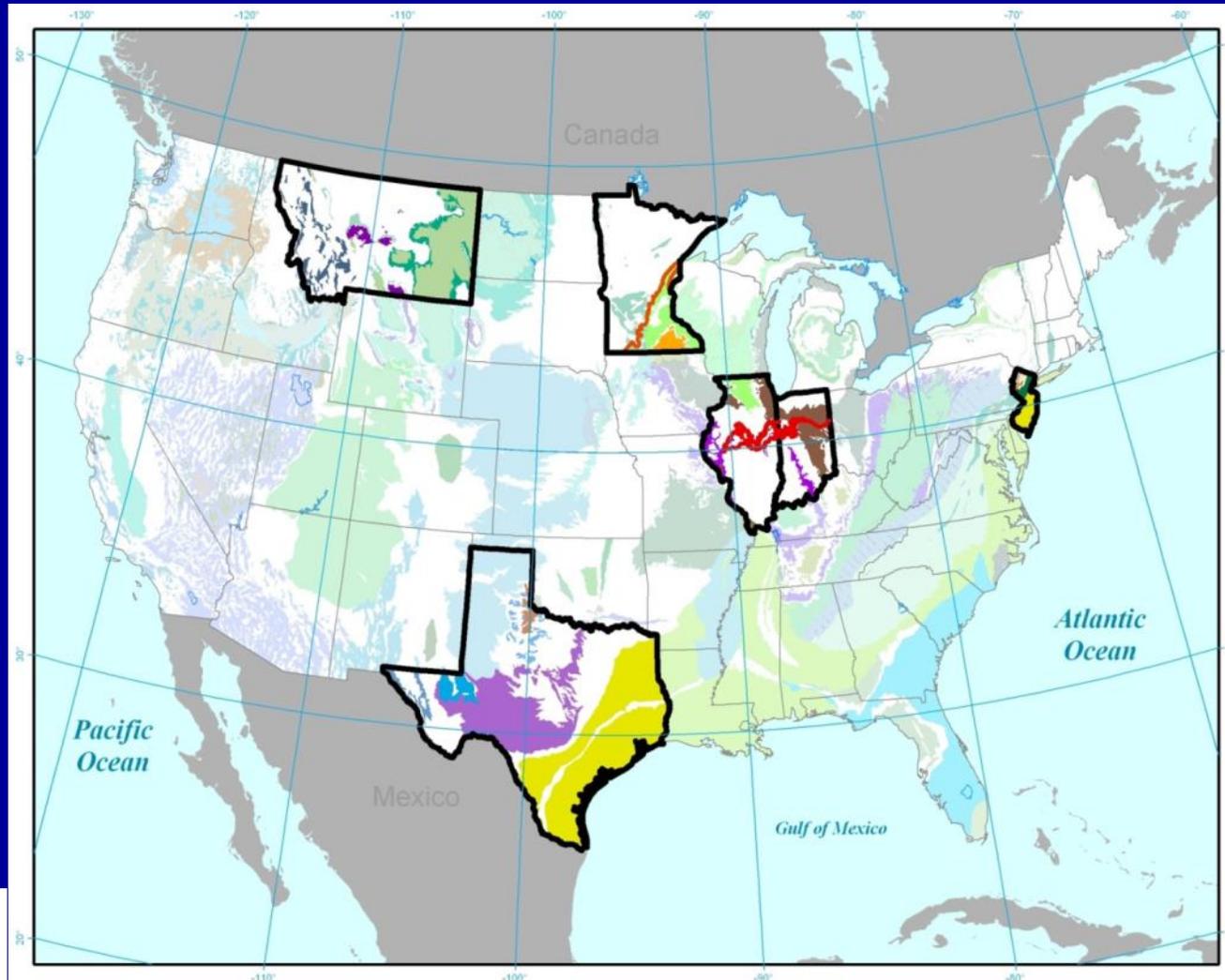


Data Standards & Management

- Minimum Data Elements for wells, measurements, and results are established: source agency, location, depth, aquifer, analytical method.....
- NGWMN data must be freely available without restriction via the NGWMN Data Portal



National Ground Water Monitoring Network Pilot Projects



NGWMN Pilot Studies

- Validated Design Concepts
- Evaluated Field Practices and Data Mgt Procedures
- Identified Network Gaps & Costs of Participation

The Subcommittee on Ground Water of The Advisory Committee on Water Information

National Ground-Water Monitoring Network— Results of Pilot Studies



September 2011

Pilot Conclusions

- A collaborative NGWMN is feasible.
- Pilot states record data differently and use different database platforms, but most “minimum data elements” are available.
- Incremental costs of incorporating data from existing state monitoring systems are low. Existing monitoring will not fill all data gaps.
- **The NGWMN Internet data portal is a key element to the success of a NGWMN**

Pilots Benefitted from:

- Single, consistent dataset for shared interstate GW resources
- Data sharing among state agencies
- Critical review of procedures:
 - Field data collection
 - Data management
- Raised awareness for GW monitoring

Side Trip – Advice for Open Data Initiative from NGWMN Efforts

- “Walk Before Running”
- Learning from Other Countries
- Inclusive Standards & Procedures
- USGS CIDA – Serving Others beyond USGS
- Pilot-Testing Value
- Data-Owners Retain Data-Ownership
- Web Portal Transferability

→ Segue to Portal Demo

NGWMN User Interface

Search results - wcu... x DEPARTMENT OF TH... x Google Contacts x National Ground-Wa... x

cida.usgs.gov/ngwmn/

ACWI
Advisory Committee
on Water Information

National Ground-Water Monitoring Network

The **National Ground-Water Monitoring Network (NGWMN)** is a compilation of selected groundwater monitoring wells from Federal, State, and local groundwater monitoring networks across the nation.

The **NGWMN** is a product of the [Subcommittee on Groundwater](#) of the Federal Advisory Committee on Water Information ([ACWI](#)).

The **NGWMN Data Portal** provides access to groundwater data from multiple, dispersed databases in a web-based mapping application. The portal contains current and historical data including water levels, water quality, lithology, and well construction. The NGWMN is transitioning from a pilot phase into full implementation. In the future we will be adding additional data providers to the network.

CURRENT NETWORK:

- 2806 water-level wells
- x water-quality wells
- 10 subnetworks
- 7 contributing agencies
- 29 states
- 48 principal aquifers

LEARN about the Network

Subnetwork for Suspected Changes
Documented Changes

Surveillance Monitoring Wells
Trend Monitoring Wells
Surveillance Monitoring Wells
Trend Monitoring Wells

Backbone
Backbone Wells

EXPLORE the Network

Search results - wcur x DEPARTMENT OF TH x Google Contacts x National Ground-Wal x

← → ↻ cida.usgs.gov/ngwmn/learnmore.jsp ☆ [Icons]



National Ground-Water Monitoring Network

The **National Ground-Water Monitoring Network (NGWMN)** is a compilation of selected wells monitoring groundwater aquifers all around the nation. The **NGWMN Data Portal** brings groundwater data together in one place to provide users with current and reliable information for the planning, management, and development of groundwater resources.

ABOUT THE NETWORK	THE DATA PORTAL	DATA PROVIDERS	GET INVOLVED
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About the Network

<u>BACKGROUND</u>	<u>NETWORK DESIGN</u>	<u>NETWORK STATUS</u>
--------------------------	------------------------------	------------------------------

Background

The NGWMN network is sponsored by the Advisory Committee on Water Information's ([ACWI](#)) Subcommittee on Ground Water ([SOGW](#)) and was established in 2009 with a pilot network.

The goal of the National Ground-Water Monitoring Network (NGWMN) is to provide information needed for planning, management, and development of groundwater supplies to meet current and future water needs and ecosystem requirements. This will be accomplished by aggregating suitable groundwater data from local, State, and Federal organizations. A consensus-based framework document (<http://acwi.gov/sogw/pubs/tr/>) was developed to provide guidance to ensure that the data are comparable and can be included in a nationally consistent network. The framework design focuses on providing information needed to assess the quantity of groundwater reserves as constrained by quality. The scale of the network focuses on Principal and Major Aquifers of the United States.

Network Design

NGWMN Pilot Portal



National Ground-Water Monitoring Network

NGWMN NETWORKS

Water level: ⓘ

Subnetwork: ⓘ

- Background
- Suspected Changes
- Documented Changes

Monitoring Category: ⓘ

- Surveillance
- Trend
- Special

Water quality: ⓘ

Subnetwork: ⓘ

- Background
- Suspected Changes
- Documented Changes

Monitoring Category: ⓘ

- Surveillance
- Trend
- Special

>> FILTER MAP DATA ⓘ

CURRENT STATUS

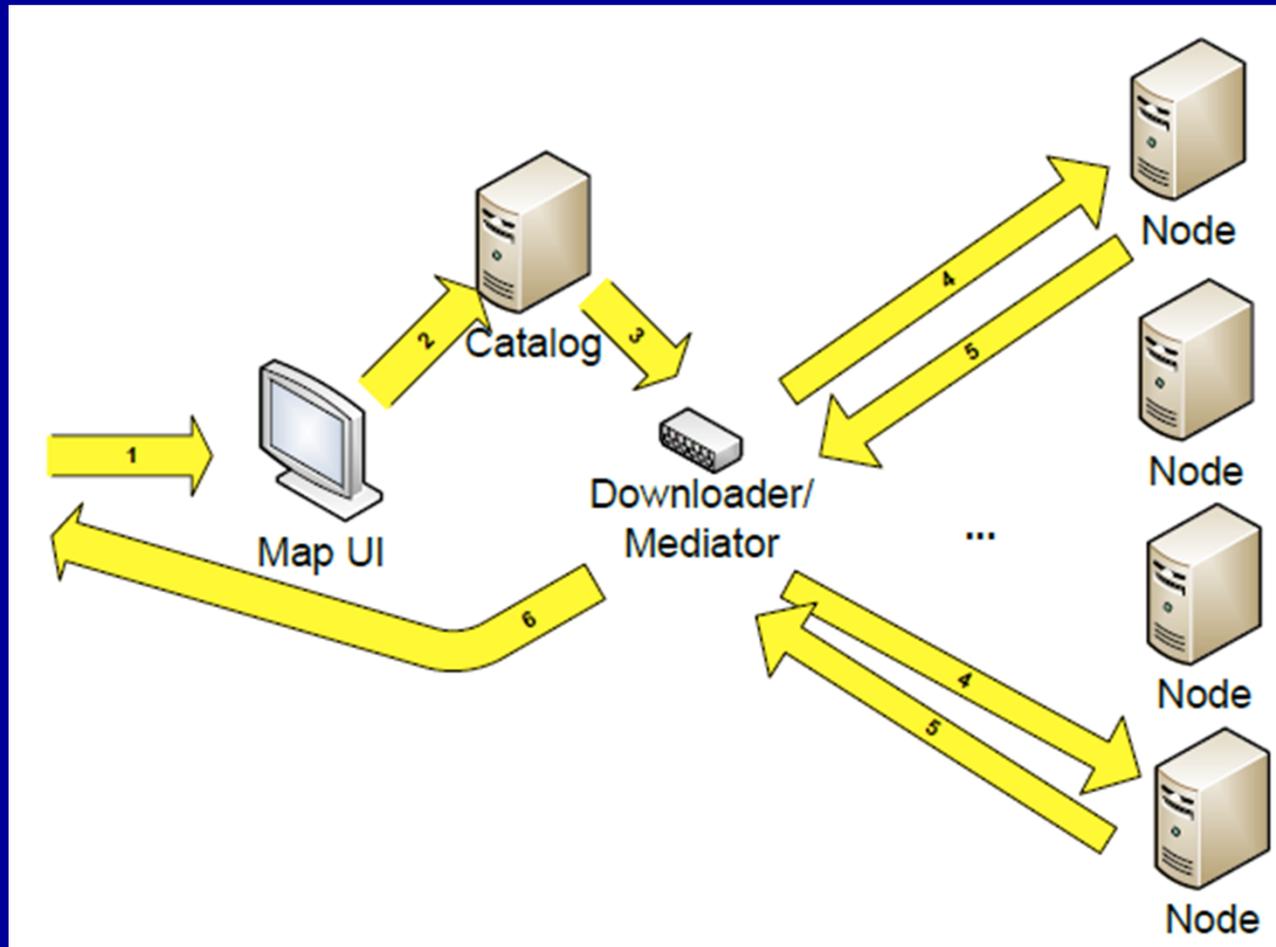
- 3022 Sites mapped
- 3022 Sites matching filter
- 2806 Water-level network wells

<http://cida.usgs.gov/ngwmn/>

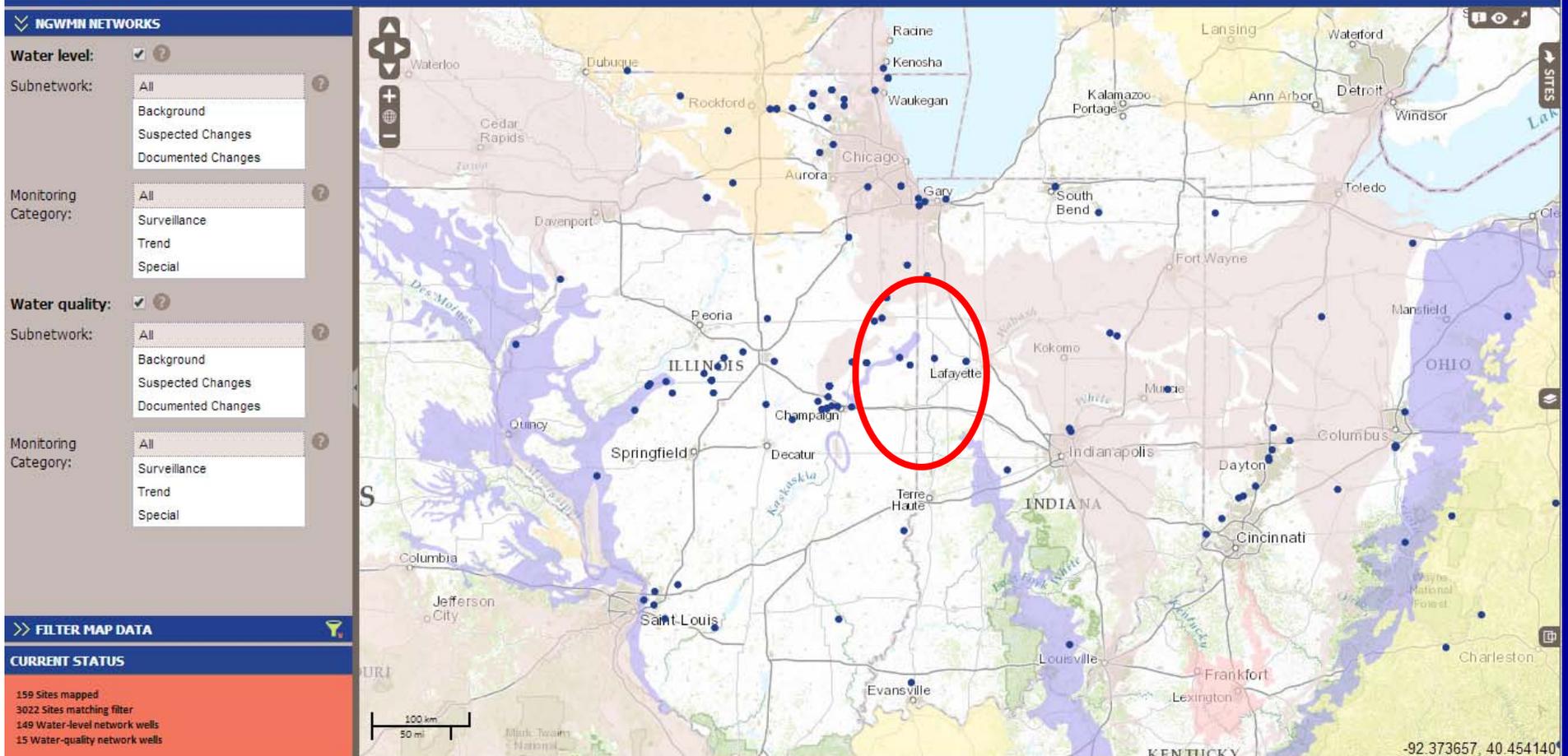
Network Portal Requirements

- Map-based interface
- Acceptable data download performance
- Translates heterogeneous state data formats to common standard formats
- Data provider maintains ownership. Data User can track source of all data
- Display real-time or nearly real-time data
 - Well characteristics (lithology, construction, aquifer)
 - Spring information
 - Water levels
 - Water quality

Network Portal Data Model



Illinois-Indiana Example



CRESCENT CITY #2 (MTBV 2)

SUMMARY WELL LOG WATER QUALITY

Agency	Illinois Environmental Protection Agency
Site Name	CRESCENT CITY #2 (MTBV 2)
Site #	P406197
Lat/Long(WGS84)	40.7706,-87.8569
Well Depth	132 ft
Local Aquifer Name	Mahomet Aquifer
National Aquifer Name	Sand and gravel aquifers (glaciated regions)
Water Level Network	Unknown - Unknown
Water Quality Network	Surveillance - Background
Additional info	link



SELECT FOR DOWNLOAD

BENTON 4 (BE 4)

SUMMARY WELL LOG WATER LEVELS

Agency	U.S. Geological Survey
Site Name	BENTON 4 (BE 4)
Site #	402851087213501
Lat/Long(WGS84)	40.4809,-87.3597
Well Depth	310 ft
Local Aquifer Name	Pleistocene Series
National Aquifer Name	Sand and gravel aquifers (glaciated regions)
Water Level Network	Surveillance - Background
Water Quality Network	Unknown - Unknown
Additional info	link



SELECT FOR DOWNLOAD

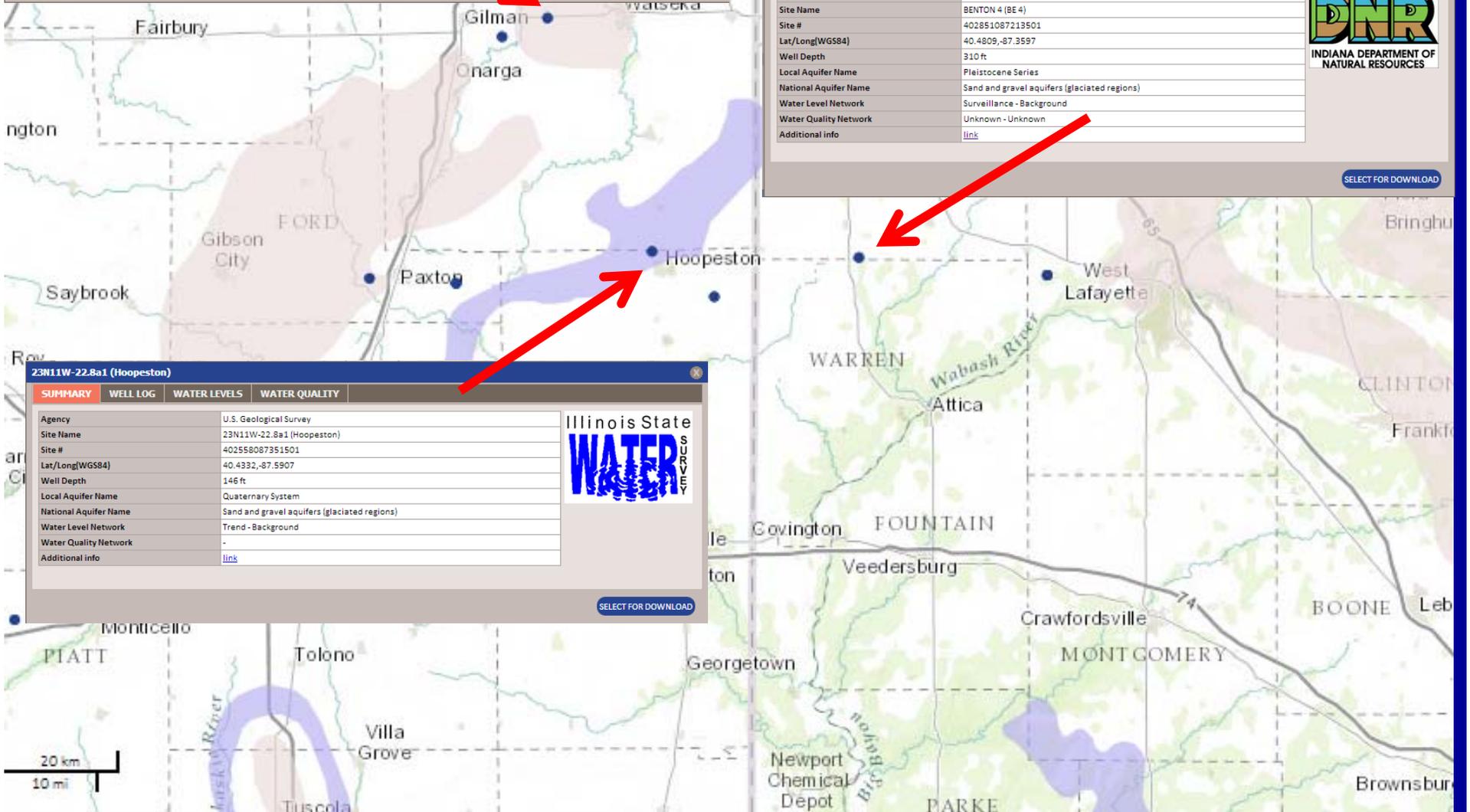
23N11W-22.8a1 (Hoopeston)

SUMMARY WELL LOG WATER LEVELS WATER QUALITY

Agency	U.S. Geological Survey
Site Name	23N11W-22.8a1 (Hoopeston)
Site #	402558087351501
Lat/Long(WGS84)	40.4332,-87.5907
Well Depth	146 ft
Local Aquifer Name	Quaternary System
National Aquifer Name	Sand and gravel aquifers (glaciated regions)
Water Level Network	Trend - Background
Water Quality Network	-
Additional info	link



SELECT FOR DOWNLOAD



Methods of Site Selection

The screenshot displays the NGWMN website interface with several filtering menus highlighted by red circles:

- NGWMN NETWORKS** (Left sidebar menu)
- State and County** (Top filter menu)
- Contributing Agency** (Middle filter menu)
- Principal Aquifer** (Right filter menu)

State and County Filter Options:

- Multiple states
- One state, multiple counties
- States: All, ALABAMA, ARKANSAS, CALIFORNIA, CONNECTICUT, FLORIDA, GEORGIA

Contributing Agency Filter Options:

- Illinois Environmental Protection Agency
- Illinois State Water Survey
- Minnesota Department of Natural Resources
- Minnesota Pollution Control Agency
- Montana Bureau of Mines and Geology
- Texas Water Development Board
- U.S. Geological Survey

Principal Aquifer Filter Options:

- Ada-Vamoosa aquifer
- Alluvial aquifers
- Arbuckle-Simpson aquifer
- Basin and Range basin-fill aquifers
- Biscayne aquifer
- California Coastal Basin aquifers
- Cambrian-Ordovician aquifer system
- Castle Hayne aquifer
- Central Oklahoma aquifer
- Central Valley aquifer system
- Coastal lowlands aquifer system
- Columbia Plateau basaltic-rock aquifers

Available Data Filter Options:

- Water Level
- Water Quality
- Well Log

Map and Status:

- Map showing the United States with monitoring sites marked as blue dots.
- Scale bar: 1000 km / 1000 mi.
- Bottom status bar: 3022 Sites mapped, 3022 Sites matching filter, 2806 Water-level network wells.

Output Options

NGWM NETWORKS

Water level: ⓘ

Subnetwork:

- Background
- Suspected Changes
- Documented Changes

Monitoring Category:

- Surveillance
- Trend
- Special

Water quality: ⓘ

Subnetwork:

- Background
- Suspected Changes
- Documented Changes

Monitoring Category:

- Surveillance
- Trend
- Special

>> FILTER MAP DATA

CURRENT STATUS

3022 Sites mapped
3022 Sites matching filter
2806 Water-level network wells

BIG SPRING FISH HATCHERY - WILL FWPL 06

SUMMARY WELL LOG WATER LEVELS

Depth of water level, feet below land surface

Month/Year

Date created: 04/05/2013 15:23:24

Date	Time	Value	Unit	Comment
03-13-2013	15:47:05.00	29.4300	FEET	
12-06-2012	08:34:08.00	29.4700	FEET	
07-13-2013	16:50:08.00	29.5100	FEET	

[SELECT FOR DOWNLOAD](#)

TIPPECANOE 17 (TC 17)

SUMMARY WELL LOG WATER LEVELS WATER QUALITY

Agency	U.S. Geological Survey (National Water Information System)
Site Name	TIPPECANOE 17 (TC 17)
Site #	402734087033401
Lat/Long(WGS84)	40.4595,-87.0595
Well Depth	212.54 ft
Local Aquifer Name	Outwash
National Aquifer Name	Sand and gravel aquifers (glaciated regions)
Water Level Network	Surveillance - Background
Water Quality Network	Unknown - Unknown
Additional info	link

[SELECT FOR DOWNLOAD](#)

SMITH AL

SUMMARY WELL LOG WATER LEVELS

Well Information

Well Depth	145.00 ft.	Latitude	-106.9149
Elevation	2638.00 ft.	Longitude	47.3237

Depth from (ft)	Depth to (ft)	Screen/Casing Material
0.00 ft.	145.00 ft.	PVC-SCHED 40

Detailed Lithology

Depth From (ft)	Depth To (ft)	Lithology	Description
0.00	12.00	SAND	SAND
12.00	15.00	ROCK	ROCK
15.00	20.00	COAL	COAL
20.00	110.00	SHALE	SHALE
110.00	140.00	SAND	SAND
140.00	145.00	CLAY	CLAY

[SELECT FOR DOWNLOAD](#)

SITES

Site Selection

Site Name	Agency	WL	WQ	Log
GREAT NORTHERN RAILWAY COMPA...	MBMG	●	●	●
PIA-2000A Cisco	ISWS	●	●	●
TWDB-7764401	TWDB	●	●	●
250790-- lmlaystown MW1	USGS	●	●	●
GRANT 10 (GT 10)	USGS	●	●	●
66018	MN DNR	●	●	●
MPCA Ambient Network Site 1152	MPCA	●	●	●

7 sites selected.

[REMOVE SELECTED](#) [DOWNLOAD](#)

Water Quality Data

NGWMN NETWORKS

Water level: ?

Subnetwork: All Background Suspected Ch Documented C

Monitoring Category: All Surveillance Trend Special

Water quality: ?

Subnetwork: All Background Suspected Ch Documented C

Monitoring Category: All Surveillance Trend Special

PAXTON #7 (MTBV 1)

	SUMMARY	WELL LOG	WATER QUALITY			
2008-08-26Z	00:00:00	CST	NITROGEN-AMMONIA AS (N)	1.47	MG/L	
2008-08-26Z	00:00:00	CST	ARSENIC	1.34	UG/L	
2008-08-26Z	00:00:00	CST	BIARIUM	146	UG/L	
2008-08-26Z	00:00:00	CST	CADIUM	0		< 3 UG/L detection limit
2008-08-26Z	00:00:00	CST	CHLORIDE	1.08	MG/L	
2008-08-26Z	00:00:00	CST	CALCIUM	83100	UG/L	
2008-08-26Z	00:00:00	CST	CHROMIUM	0		< 5 UG/L detection limit
2008-08-26Z	00:00:00	CST	COPPER, FREE	0		< 100 UG/L detection limit
2008-08-26Z	00:00:00	CST	CYANIDE	0		< 0.01 MG/L detection limit
2008-08-26Z	00:00:00	CST	FLUORIDE	0.268	MG/L	
2008-08-26Z	00:00:00	CST	IRON	2010	UG/L	
2008-08-26Z	00:00:00	CST	LEAD	0		< 5 UG/L detection limit
2008-08-26Z	00:00:00	CST	MAGNESIUM	32600	UG/L	
2008-08-26Z	00:00:00	CST	MANGANESE	26.4	UG/L	
2008-08-26Z	00:00:00	CST	MERCURY	0		< 0.1 UG/L detection limit
2008-08-26Z	00:00:00	CST	NICKEL	0		< 25 UG/L detection limit
2008-08-26Z	00:00:00	CST	NITRATE-NITRITE	0		< 0.1 MG/L detection limit
2008-08-26Z	00:00:00	CST	POTASSIUM	1780	UG/L	
2008-08-26Z	00:00:00	CST	SELENIUM	0		< 2 UG/L detection limit
2008-08-26Z	00:00:00	CST	SILICA	19000	UG/L	
2008-08-26Z	00:00:00	CST	SILVER	0		< 10 UG/L detection limit
2008-08-26Z	00:00:00	CST	STRONTIUM	710	UG/L	
2008-08-26Z	00:00:00	CST	SODIUM	25300	UG/L	

>> FILTER MAP DATA

SELECT FOR DOWNLOAD

CURRENT STATUS

3022 Sites mapped
3022 Sites matching filter
2806 Water-level network wells

Water Quality Pilots

- Water quality is an important part of ground-water availability
- Several initial NGWMN pilots included water quality, but limited or absent in others
- US EPA stepped forward to develop new Water Quality Pilots by providing limited analytical services



EPA Regional Laboratories Support

- **Basis:**
 - Wells selected fit Framework well categories
 - Analytes fit Framework criteria
 - States may not have analytical capability yet
- **Initial Analytical Support to States:**
 - For some contaminants, states not ready to analyze
 - Providing interim support to during early phases
 - Within Regional budgeted resources and capacity
 - Enables NGWMN to start and provide states time necessary to arrange permanent analytical support

States Seeking EPA Lab Support for NGWMN Samples

- Ongoing (Began in FY2014)
 - Utah Pilot – 3 rounds of testing done through EPA Region 8 (Denver)
 - New England Pilot (MA, NH) – First Round planned September 2014 through EPA Region 1 (Boston)
- Future
 - Delaware – Proposed to join in EPA Lab testing through EPA Region 3 (Philadelphia)

→ Segue to Implementation



The Future of NGWMN FY15 and Beyond

- Activities in FY15 and beyond will depend on Congressional funding
- Funds for the NGWMN are in the Budgets of the Administration, House, and Senate at various levels in FY15
- With adequate funds, NGWMN “Implementation” will begin.....

Other Budget Challenges

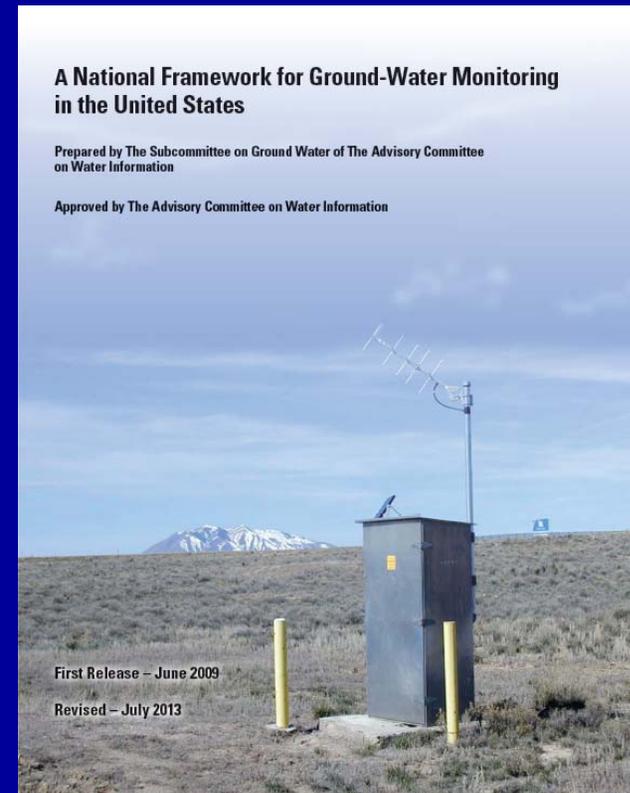
- Posed to ACWI
- Basic Approach:
 - Understand Current Programs
 - Set & Rank Priorities
- Specific GW-Related Factors:
 - “Poor Cousin” to Surface Water
 - Strong Representation on ACWI



SOGW Needs

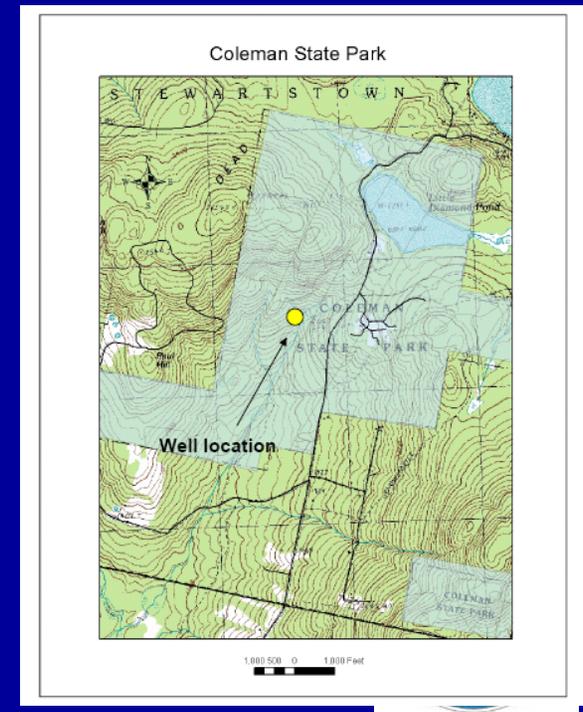
Your Input Through Collaboration

- Funding “Drivers”
- Funding “Models”
- Partnering Ideas
- Priority-Setting
- Cost Efficiency Ideas
- Innovative Techniques



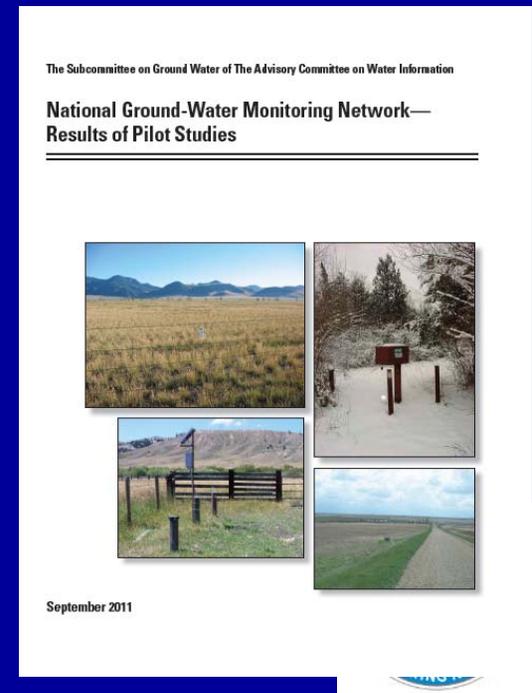
Key “Drivers” for GW Funding

- Underground Injection Control (UIC)
- GW Under the Influence of Surface Water
- Hydraulic Fracturing
- Sustainability
- Water-Energy
- Drought
- Nutrients
- Others.....Your Ideas



Funding “Models” & Opportunities

- Cited in Framework Design:
 - FED Programs & FED-FED agency collaboration
 - USGS “STATEMAP Program”
 - USGS “Cooperative Water Program”
 - USEPA-Provided Support
- Additional Opportunities:
 - Leveraged “Drivers”
 - Private Industry Collaboration
- Others.....Your Ideas



Implementation Next Steps, FY15+

Pending available resources

- SOGW will solicit new data providers and initiate the “**National Program Board.**”
- National Program Board will begin to identify “backbone” sites and assess “data gaps”.
- USGS will participate in cooperative agreements to help support data providers
- NGWMN portal capabilities will expand with new data providers
- Pilot program for EPA analytical services will expand
- USGS will incorporate remaining USGS water-level sites, and add water-quality sites

Network Implementation: *Recommended Management Structure*

Management of the National Ground-Water Monitoring Network (NGWMN)

Data Providers

[Networks and Individual Sites That Meet NGWMN Criteria]

Federal

State

Tribal

Regional

Local

Other

Advisory Committee on Water Information
Subcommittee on Ground Water

[Federal Interface]

U.S. Geological Survey
Management and Operations Group

[Day-to-day operations]

NGWMN Program Board
[Representatives from Data Providers]

[Guidance and Direction]

Program Board Implementation

Balancing Act – Funding Priorities

- Support for existing versus new participants
 - How to support for “spin up” costs while maintaining long-term monitoring?
- Add new wells or increase frequency?
- Water levels versus water quality?
- Drilling?
- Innovative methods?

Terms of Reference (TOR)

- Current TOR – develop Framework & NGWMN
- Framework – SOGW key implementation role(s)
- Proposed TOR – allow SOGW to help guide implementation of the NGWMN
- SOGW requests approval of TOR edits submitted to ACWI on August 19, 2014.

Innovative Techniques – Examples for Triggering Ideas

- Probes for Measuring Nutrients
- Remote Sensing for Water Levels
- Leveraging Smartphone Capabilities
- Linking Streamflow & GW Monitoring
- Capturing Data from Various Programs
- Others.....Your Input

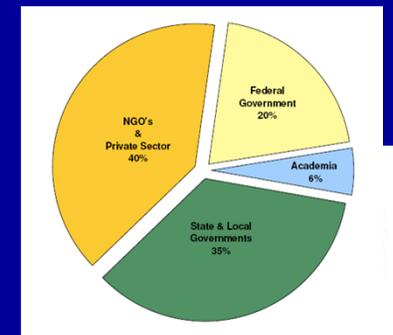


New SOGW Functions?

- “Walk Before Running”
 - Much to Do Now for Full NGWMN Implementation
 - Maintain this Mantra is Current Mantra
- When Time is Right:
 - Ensure Impact & Influence of SOGW for Good of GW
 - Explore Functions beyond NGWMN
- Your Input & Involvement Are Critical
 - Open Discussion Now as Time Allows
 - Or, Interact at Later Time / Venues

Summary of Take-Aways

- You CAN Make a Difference
- Yes – Significant Hurdles Exist....But:
 - You Have Seen What Volunteers Can Do
 - GW Professionals Need to Band Together
 - We Can and Will Produce Results
 - There is “Strength in Numbers”
 - And, Significant Resources Exist to Help You:
 - With Getting Started
 - For Being Productive and Effective



Contact Information

- Weblinks:
 - SOGW: www.acwi.gov/sogw
 - Web portal: Contact SOGW Co-Chairs
- SOGW Co-Chairs:
 - Bob Schreiber: schreiberrp@cdmsmith.com
 - Bill Cunningham: wcunning@usgs.gov
- SOGW Executive Secretary:
 - Searching right now for replacement

Questions/Discussion

How Collaboration & Interaction Can Make a Difference

- Mission Overlap
- Coordination, Consistency, Collaboration
- Surface Water – Groundwater Overlap
- Monitoring Councils – State, Regional, Local

→ Examples:

→ Laboratory Capacity for Testing GW Samples

(Discussions underway with USEPA Regional Labs)

→ R&D “Proof of Concept” Testing of Probes