



**ACWI SOGW Meeting
National Ground Water Monitoring Network
September 17-18, 2014
Reston, VA**

TUESDAY, SEPTEMBER 16, 2014

Introductory Remarks:

Participants were welcomed to the meeting and details including process for travel reimbursement were discussed. Participants are encouraged to return travel expenses to Miranda Robinson this week, prior to shutdown of system for fiscal year turnover. If expenses are not returned expeditiously, it will mean a delay, although they will be processed through.

Action item:

- 1. Participants are asked to promptly return expense reimbursement forms**
- 2. Miranda will resend expense forms**

Introduction of attendees: Participants in-person and on-the-phone introduced themselves (see attachment)

Purpose of the meeting:

1. Bring everyone up to speed on National Ground Water Monitoring Network status
2. Provide information on changes to the Terms of Reference for the Subcommittee on Ground Water
3. Define a roadmap for implementation including:
 - a. Portal priorities
 - b. Recommend advisory board functions, members and procedures
 - c. Funding priorities

Other questions raised for consideration at the meeting or in the future include:

- a. Collaboration with other data providers/portals outside of the NGWMN*
- b. Why not flow all data available to portal*

Background on the SOGW and NGWMN (Bob Schreiber – see presentation)

The presentation covered pertinent background on the federal Advisory Committee for Water Information, work products, participation and subcommittee structure, including the Subcommittee on Ground Water. Specifically the SOGW is to fill in the groundwater gap on the ACWI with a purpose of developing framework for a National Ground Water Monitoring Network. Reports, e.g. 2003 Government Accountability Office report and others, identify need for national network. Specifically the NGWMN is needed to provide trend tracking, identify impacts, provide a basis for analysis and assessment as well as planning and management. Currently, there is a lack of national coverage using a consistent, comparable monitoring approach.

The SECURE Water Act, which authorizes the network, was reviewed as was the SOGW Terms of Reference (TOR) which outlines the operating framework for the subcommittee. The effort is aimed at assessing the quantity of groundwater as constrained by quality. Quantity and quality are both included. Quantity is being taken to mean groundwater levels. Water use, water storage and water rights are not within the scope of the SOGW's work.

Multiple organizations have been involved. Work has included an inventory of existing programs as well as agreement on design principles, field methods and data compilation with access through a portal. The design concept, field procedures, data management have been validated through the five pilots as well as cost information gathered. The pilot testing confirmed that a NGWMN is feasible and that while the cost of incorporation of data is low, existing data does not fill all data gaps.

Pilot found network benefits to include

- A single consistent data set that can be shared interstate
- Enhanced sharing of intrastate data
- Allows for critical review of procedures
- Initiative raises groundwater awareness.

Other lessons learned that may be applicable to the Open Water Data Initiative or other efforts include:

- Walk before you run
- Learn from other countries
- Be inclusive of standards and procedures within certain limits
- USGS's CIDA and their portal development capabilities offers benefits beyond USGS
- Pilot testing has great value
- Data owners should retain data ownership
- Web portal concept is transferable.

Water quality pilots were discussed. The water quality pilots allowed the NGWMN to move forward in lieu of funding. The initiative depends on state participation. Mike Wireman and Chuck Job received the approval from EPA labs to help states (currently Utah and New England states). The support is meant to be an interim measure until federal or state funding becomes available. Delaware is exploring potential for future water quality piloting.

Potential funding sources and funding models were identified as possibilities included:

- Federal agency to federal agency collaboration
- USGS STATEMAP Program
- USGS Cooperative Water Program
- U.S. EPA support
- Additional opportunities may be available, with industry leveraging as one thought

Next steps to consider as move into FY 15 and beyond include further development of the program board concept and overall management structure. A key consideration is how to incorporate data providers and roles of SOGW and Program Board. On funding priorities, there is a need to discuss how to set priorities, e.g. richer datasets versus more wells, how to balance new participants and support for existing partners. Possible additional areas for discussion as move into FY 2015 that go beyond walk before run include the use of innovative techniques, linking stream flow data, groundwater monitoring to improve permitting and better understanding costs

Action item: Following on discussion of various ACWI subgroups and coordination among them, the group thought it was beneficial and there was openness to an article for the upcoming National Water Quality Monitoring Council newsletter on Subcommittee on Ground Water activities.

Questions, comments and advice offered:

1. *Are we going to make lab capability available to other original pilot states that are not part of water quality pilots? (see Phase 2 Pilot minute notes below for discussion and response)*
2. *Be careful in suggesting network can go beyond what it can do, e.g. UIC wells and their impacts. When talk about benefits be sure to put in appropriate caveats considering scale of network*
3. *Should we be talking more about deep groundwater and monitoring in that area/setting? Point was raised as much to have group begin to consider so can get ahead of this issue given potential growing demand for water and increased activity such as hydraulic fracturing in the deep subsurface that could impact future source.*

Phase 1 Pilot Updates – Daryll Pope as session lead

The session is intended to provide information on pilot project results and highlight benefits.

Phase 1 Pilot: Montana – Tom Patton (see presentation for further details)

Montana utilizes the non-regulatory Montana Bureau of Mines and Geology (MBMG) for long-term monitoring, so the MBMG's work is isolated from regulatory responsibility. Regulatory agencies call on the MBMG as a neutral third party.

Montana selected 271 sites from its long-term network of about 990 monitoring wells for the NGWMN, but was not able to review all of its network wells during the pilot project. Based on the pilot project,

Montana estimates that about 70% of Montana's monitoring network wells would meet NGWMN criteria and could be incorporated into the national network.

The process for selecting the NGWMN sites included looking at each record as to whether:

1. The site is replicated by other records nearby. If so, the well with the best record was retained.
2. The well produces water-level data of acceptable quality.
3. The well is difficult to access.

Selected wells were put into the then existing framework sub-networks using the definitions in place at that time. Jessica Lucido has since remapped wells to the new classification scheme. States have not reviewed this reclassification.

The Montana wells selected for the NGWMN remain connected through the portal. Data from none of the wells are going to STORET. All of Montana's monitoring wells have water-level data, but not all have groundwater quality data. Montana's total projected NGWMN cost may be higher than shown in the framework document because it appears the framework document used the number of "defined" NGWMN wells in the Pilot Project report, rather than the "projected" number of wells anticipated for a complete network. Montana was not able to assess all of its long-term network wells for NGWMN inclusion during the pilot project

The benefits of long-term monitoring for Montana include:

- Allowing the state to take a look at climate and departure from normal precipitation patterns and demonstrate impact to people.
- Providing context within which to assess impacts of hydraulic-fracturing-related water withdrawals in Montana from a shared aquifer with North Dakota. North Dakota is not allowing in-state groundwater withdrawals for hydraulic fracturing so companies are coming to Montana and withdrawing from same shared aquifer.
- Development of a MBMG mapper to deliver data from monitoring wells.

NGWMN Pilot Project benefits included:

- A current review of Montana's standard operating procedures.
- An in-depth review of Montana's current statewide network.
- Discovery of data gaps.
- Discussion of mutual cost sharing if there is NGWMN interest in Montana data.

Hurdles Montana encountered during the pilot phase included:

- Montana didn't get all wells evaluated within pilot project timeframe. Montana's pilot report extrapolated "Montana-NGWMN" expenses for a complete network based upon the ratio of "selected" wells to total wells within the national aquifers evaluated during the pilot. This ratio was used to estimate total costs for NGWMN network wells for all national aquifers within Montana.

- Without “contractual” support Montana has had difficulty justifying the time to add new Montana-NGWMN wells.

Progress since the pilot ended

- Montana has maintained the sites, casing, completion, lithology, and water-level web services developed for the pilot.
- Montana has added a water-quality service so that groundwater chemistry data for Montana-NGWMN wells are available through the portal.

Framework document thoughts or recommendations:

1. Have we overthought sub-networks – how do we balance benefits and costs/problems?
2. Have we overthought future conditions - not sure how we suspect or anticipate future?
3. What do we do about well records that fit into more than one sub-network – e.g., 30 years of non-anthropomorphic followed by 10 years of nearby pumpage? Need to be able to maintain record in original sub-network. Need procedure for this.
4. Monitoring categories – mixture of whether talk about purpose or frequency – mix bag in language
5. Section 1.4.4.2 talks about backbone but then in 7.1 talks about importance of funding. Add sentence to earlier discussion.
6. Section 4.4.3 – does not include a caveat that Montana did not finish well evaluation which impacts per well costs.
7. Section 7.5 on page 50 – talks about it not being an interpretative product. Need to remember this about NGWMN.

Question, discussion, or comment:

- *Consider including as a future task to have the original pilot states relook at their sub-network classifications as a double check for how the well were reassigned by CIDA when new classifications and classification terms were instituted. Also no wells were put into the new category of “potentially could be impacted.”*
- *Need to have some metadata on how people determined which wells were in each sub-network*
- *Defer question of whether need sub-networks until see how this proceeds.*
- *An example of wells that could be classified in category of “potential future impacts, would be wells near an area where oil and gas development is expected to occur in the future.*
- *New Hampshire used state park wells as background and other wells were identified as expecting problems – so may be able to identify endpoints easier than gradations.*
- *The local knowledge is valuable and it is a good idea to give data users some idea of where these wells are and land use or other factors in the area.*

Phase 1 Pilot: Minnesota – Greg Kruse (see presentation for further details):

Minnesota Pollution Control Agency (MPCA) and Minnesota Department of Natural Resources (MDNR) worked together on this project to bring quality and quantity together. Minnesota looked at southeast part of state covering four aquifers. A total of 89 wells are in the pilot network. Since pilot, five domestic wells no longer are being monitored. MPCA went to new data system called EQuIS and their data flows to EPA. For water level monitoring, number of wells has expanded from 750 in 2010 to 950 in 2014. Legislature has provided additional funding and goal is to add 75-100 wells. Currently, 300 wells have continuous hourly monitoring and working to have all that way. Most wells have data sets greater than 3 years. The state has also sealed and/or replaced 150 poorly functioning observation wells. The state also anticipates continuing to expand telemetry. Emerging concerns include surface and ground water interaction, mainly from agriculture appropriations. The state also has or is working on updates its data systems and web site presentation of state data. Minnesota is also looking at working with its municipalities to capture groundwater level data. They have four pilot communities now looking at feeding data on hourly basis.

Framework document thoughts or recommendations:

- Provide additional guidance on well selection including number of wells needed to support assessment.
- Increase frequency of water level measurement requirements
- Lengthen water quality sampling frequency in aquifers with longer residence times
- Add guidance on defining unstressed or targeted wells to insure consistency

Question, discussion, or comment:

- *New framework document has a table with aquifer type and frequency that may address some of these issues.*
- *Portal can handle more frequent monitoring. Portal currently only serves discrete monitoring for Minnesota. .*
- *On water quality side, we may want to look at which well's groundwater quality data goes to STORET and make sure those data are available through the portal.*
- *Presentation confirms the need for funding to data providers for ongoing changes or data system changes at state level.*
- *\$2-million is available to Minnesota DNR to look at groundwater management areas in the state. Only small part of that data currently feeds the NGWMN.*

Phase 1 Pilot: Texas – Janie Hopkins (see presentation for further details)

The Texas Water Development Board is not a regulatory agency, but provides data collection, water planning, grants and loans. Their mission is to help provide sustainable and affordable water for Texas.

During the pilot, the state chose wells in eight of nine major aquifers. They did not include the Ogallala because so much more has been done on it. For water levels, they elected 426 wells. They selected the water quality wells but have not connected them with the portal. The TWDB works closely with the

groundwater conservation districts, which provide data to TWDB. Approximately 90% of groundwater usage in the state is within the groundwater management districts. TWDB also works with Texas Commission on Environmental Quality.

Benefits of NGWMN Pilot Participation:

- Data management within our monitoring group has been raised.
- Have fairly robust data network

Some developments since pilot project:

- Huge reduction in force – lost equivalent of three full-time employees (FTEs)
- Reduced lab analysis contract, although this may be relooked at
- No capital expense budget for automatic recorders fiscal years 12-14, although this may be reinstated
- \$2 billion is available to TWDB to implement management strategies
- Funding is available for groundwater and drillers report data base and online mapping
- Money to purchase data recorders may be reinstated
- As relates the network specifically:
 - More cooperating districts added
 - 35 data recorder sites were added
 - Identified 900 plus public water supply wells with raw water quality data
 - Water Data for TX – new data base

Questions, discussion or comments:

- *Is it likely you will enter water quality data into NGWMN? Been concentrating on drought last four years. Data already collected and continue to be collected, so available to input.*
- *Are you experimenting with continuous water quality monitoring? We are for one well.*
- *Do you have two different data bases and are you trying to get wells that do both? Water quality and water level data are both in same data base. We have to on kindness of cooperators. We look at combination of grid and random because did not want to eliminate wells with long data history.*
- *Do you need a water right for fracking? No water rights permit required.*

Phase I Pilot: Illinois and Indiana – George Roadcap, Jerry Unterreiner, and Jim Sullivan (see presentation for further details)

Illinois has seen a lot of changes in the last 2-3 years. The agency has received significant funding for water supply planning. They published a Mahomet aquifer report. There have also been improvements to the state data base, especially related to water quality. They are working with Illinois EPA to have data submitted electronically rather than through paper files. They are starting an online water level data feed. They have also developed a supermodel for most of northern Illinois. They are cooperating

with Wisconsin on its developments. They've added some observation wells and are building a network for the deep aquifer. Given the drought, the increase in irrigation wells, and other factors, aquifers that were not stressed previously are now stressed with domestic wells going dry in some places. The state is finding that major droughts have permanently altered the hydraulic response of the aquifer. The amount of seasonal fluctuation has gotten much smaller, which preliminarily is being attributed to the drying out of shallow sands above the aquifer. The state is finding value in long-term data records. They are working to put data on line that will combine data from shallow groundwater wells with weather station and stream flow information. The data will be helpful for climate change research.

Indiana has also seen a significant increase in irrigation wells also. The state network has 35 observation wells and the state works with USGS. For the pilot, Indiana selected five wells within the Teays aquifer. This area the state would define as unstressed. In Indiana, the Teays is only a mile wide.

Benefit of the Pilot Project

- By working together with Illinois, the state has boundary information for concurrence
- They uncovered a glitch during the state network review process, i.e. one well in the network was not being sampled and that has been rectified.
- The Indiana Water Monitoring Council formed a groundwater focus group as an outgrowth of the pilot project. The focus group has been a positive for the state groundwater program.

In the future:

- Indiana has other wells, such as around Marion, Indiana, that would be potential NGWMN wells that would save on drilling a new well.
- They find they benefit from having USGS use their equipment.
- They would like to add some of their additional observation wells into the NGWMN and believe they can find other partners.

Questions, discussion, or comments:

- *Since the 2011 pilot data dump, it sounds like Illinois has done significant work. Going forward, it might be beneficial to discuss about web service capabilities are available.*

Phase 1 Pilot: New Jersey – Ray Bousenberry (see presentation for further details)

The New Jersey trend monitoring covers the entire state. The surveillance monitoring focuses on the Coastal Plain and fluoride results from the coastal network and statewide water quality network.

The New Jersey Geological and Water Survey and the New Jersey Water Science Center cooperate to operate the New Jersey monitoring program with both agencies doing actual sampling and measurements. All the data goes to National Water Information System (NWIS) and then is fed directly to the portal. For New Jersey, it was not difficult to get data to the portal.

Benefit of Pilot:

- Able to reassess all of networks – found gaps which they can't address all at once.
- As water resources become more important it will be beneficial for states to have same baseline and be able to share with neighboring states. This information provides at least a common starting point for discussions.

Since the pilot the state has added several wells and is working to address pilot study gaps (see presentation slide).

Recommendations going forward:

- Allow inclusion of all existing state network wells to ensure state's ability to utilize historic data and avoid having to operate separate networks, i.e. state and NGWMN.
- State had some issues with frequency of sampling
- Believe trend networks should have continuous data (check this as to whether captured correctly)
- Surveillance network should be denser
- Baseline should not necessarily be five years continuously. New Jersey believes that is making trends wells into surveillance wells.
- Local aquifer names should be added
- Potable supply wells be allowed
- Better definition of targeted or stressed wells should be provided.

Hurdles since pilot report

- Funding under threat for networks
- Reprogram money from corporate business tax to purchase open space acquisition and NJ voters have supported in past. Unintended consequence is \$2 million of money going to open space acquisition may impact monitoring network.
- Dedicated funding source or increased federal money would be beneficial to keep the networks at current levels.

Phase 2 Pilot: New England Richard Verdi/Leslie Desimone (remote)

Initially, they were going to sample just wells in Massachusetts, but as time progressed, they will now be doing 20 wells in New England – MA, VT, ME, NH, CT, RI. Several calls were held between EPA and the states. They are looking to begin sampling this quarter. The communication has been going well and upfront work with lab director is critical. Richard is developing a work plan and has some comments to incorporate from feedback on draft.

Questions, discussion or comments:

- *Do you have drinking water people engaged? Yes. Primarily client is state. Do not want any end-run on states. The most involved state at this point is Massachusetts.*

- *Which wells are you sampling in New England? Are these private wells or monitoring wells? All are in current USGS observation network.*
- *Will data go to STORET or NWIS? NWIS.*
- *Need to get list of wells and designations as far as subnetworks and names of wells so Jessica Lucido can turn them on for NGWMN*
- *Are you doing water level monitoring? Yes all are monitored for water levels now.*

Action items:

- 1. Final work plan should be sent to SOGW for its information and potential posting on web site as model for other states/EPA labs.**
- 2. Once plan gets finalized need to have wells designed as far as sub-networks and send well identification numbers and sub-network names to Jessica so they can be added to NGWMN.**

Phase 2 Pilot: Utah - Janae Wallace (see presentation for further details)

The state set up a monitoring network in 2007 and put in 27 wells, with some nested piezometers. Some are quite deep and they are getting good quality water at depth.

Criteria for selecting wells for the NGWMN effort, included

- USGS principal aquifers
- Prior sampling data
- Accessibility
- Geographic spread
- Aquifer importance – who are they serving now or in future

The agencies involved included the Utah Division of Water Quality, Utah Division of Drinking Water and Utah Division of Water Rights.

As part of the NGWMN effort, the state is sampling 36 wells and 21 springs. From the May to September timeframe 57 samples have been sent to the EPA lab, with the May results returned to the state. The EPA lab has saved the state up to \$22,430 because of their willingness to analyze the samples.

Benefits of the Pilot

- Cost savings to the state
- Contact with well owners for future groundwater studies
- Implement data collector device via field tablet
- Helps staff work together on statewide project
- Develop and enhance GIS skills
- Complements EPA funded EN (program to analyze compiled statewide water chemistry data for notable spatial and temporal trends).

Unexpected hurdles

- Incomplete well log records
- Well owner reluctance – skeptical of providing information to government agency even a non-regulatory agency. EPA lab data will not be kept in EPA data base. The state tries to emphasize this to well owners and assure them the data is given to them and it is up to them whether to act upon the results.
- 3-day sampling workweek and deadlines
- Lack of access to measure water levels
- Glitches in tablets

Future

- Gaps in coverage by county
- Sample at least one site per county
- Collect from April to October
- Include alternate sites to sample and measure

Overall experience

- Very positive and organized
- Discovered variety of groundwater quality in state
- Covering more areas in the state because not specific study
- Consider groundwater in entire state

Question, discussion or comments:

- *Is there a plan to transfer to public? Getting ready to put on web site*
- *Is there a need to set up web service to pull data into NGWMN? Eventually Utah will be ready to do so.*
- *Did you use same NGWMN data requirements? Utah went thru same process and protocols.*
- *How did you decide which springs to use? In some areas, springs were targeted as background. For some, Utah selected alternate springs because of accessibility.*

General Comments on Phase 2 Pilot: Mike Wireman

Dave Wunsch and Mike Wireman are working and talking to EPA Region 3 about potential pilot between EPA lab and Delaware. Other potential state for Phase 2 pilot is Wyoming. The EPA lab has been doing analysis for the last five years for the data. All the data have gone to NWIS. There is a general lack of interest by Wyoming in seeing data transferred. We do not want to make state data available without state endorsement but maybe active involvement in the transfer is not required. Mike will be presenting a talk at the upcoming Ground Water Protection Council meeting. He is also looking for an EPA person to step in to work with the EPA labs on this project.

If any of original pilot states is interested, we would have to check with the EPA lab and any decision would be made by lab director. The constituent would have to be something that the lab analyzes for now, and something the state could sample now. EPA labs specialize in specific issues. On paper you are not limited to Regional lab for your area, but in reality that may be the case. Decisions regarding the lab's capacity to take on the work would involve not only what they can test for but also their work load. Use of the EPA labs to do the more frequent analysis required to establish a baseline may fit within the concept, which is that the EPA lab work was not intended to be ongoing but an interim measure. Now would be the time to approach the regional labs as we are at the beginning of the fiscal year and they are putting work plans in place.

Action item:

- 1. If any Phase 1 pilot states are interested in EPA lab as potential source for testing, contact Mike Wireman, Bill Cunningham, Chuck Job or Bob Schreiber.**
- 2. Mike will check on whether something is available to the states so they understand what expectations EPA labs may have for them. (Note: Following field procedures is the key).**

Web Portal: Jessica Lucido (see presentation for further details)

Jessica opened her remarks emphasizing that she is hoping during the meeting to get feedback as to priorities and suggestions on things to add or what portal changes may be needed.

Jessica identified some of the overall design features and objectives as:

- Integrate federal and state data and make it available through one portal
- Maintain management with the data providers
- Act like centralized data base but distributed system

To date the pilots have focused on water levels but need to move to incorporate water quality. Based on the pilot testing and portal operations, we have learned, among other things, the following:

- Data provider technical capabilities vary
- Complicated organizational structures
- Some missing data elements (minimal)
- Structure of well log data varies greatly.
- Some spatial and temporal data gaps
- Consistent data quality
- Outages and reliability of services have been addressed by developing a cache as back-up.
- Differences in vocabulary challenge for well logs and also water quality. Jessica Lucido suggested that maybe SOGW would want to move toward a defined vocabulary rather than all various permutations. At some point, the group may want to consider working with NEMI on set list of parameters and terms.

Enhancements under consideration or that will be needed as move forward include:

- Scale up service to support full implementation – performance, reliability, stability
- Enhanced data availability filtering
- Prepare for multi-site download
- New user interface and more site controls of what you want downloaded
- Address well registry management. Allow data providers to manage their well information, including logging of changes to well classification.

Action item: Jessica Lucido to send out url needed by data providers to make portal-related changes.

FY14 portal activities and improvements included:

- Hooked up new service for Montana
- Worked with Canadian partners to develop sensor observation service in standard format
- Notice of service outage – does require work and so maintenance component is not trivial
- Improved data download
- Added alluvial aquifer layer
- Aquifer lithology filter
- Participated in international standardization effort.

Among FY15 plans or future considerations are:

- Work with new data providers or work with existing ones on changes to existing providers data
- Document provenance of data providers
- Attribute data sets to appropriate organizations
- Streamline data service mediation process
- Summary statistics of data selected by user
- Implement saved filters and site selections, e.g. wells with x years of data
- Display figure of well construction
- Provide visual of current groundwater quality or quantity at a glance – similar to Groundwater Watch. (see broader discussion on graphics and visualization below)
- Development and maintenance costs are going to rise considerably.
- Additional site filters are expected
- Inclusion in Open Water Data initiative
- Streamline data cross-walking process – especially for lithology information
- Portal mobile compatibility – don't get a lot of traffic on tablets
- Include remotely sensed or modeled data sources – NASA potential involvement

Questions, discussions or comments:

- The question was raised as to whether some kind of graphic should be available to show how latest observations compare to averages for the well. Caution was raised that group needs to

be careful in considering what visualization or graphics to display that we not stray from focus that NGWMN is not an interpretative tool. Users will come to the network with their questions. The questions will be varied so user will have to evaluate what data are needed and interpret on own. Another consideration, however, is the importance of showing value of network to users. A possible criterion for considering what illustrations to include would be those that help people select data. A graph showing trends or the big picture of how far above or below normal the measurement is, for example. The decision should factor in who the intended audience is meant to be.

- The group also discussed improving and documenting portal data service (outputs). While noting that most people won't be interested, that information may be helpful to share with government entities who may be interested in participating, or who support or fund the network or other initiatives. For example, UNESCO wants to create a worldwide network and this would give them information. People are pulling data from the NGWMN portal now.
- The group discussed how the Open Water Data portal, which is an initiative of the Office of Science and Technology Policy, may impact NGWMN. The suggestion was made to keep the NGWMN as the main access point. It is unclear at this point where the Open Water Data portal will go. The Open Water Data Portal is also current envisioned as having a more interpretative focus. As long as the Open Water Data Initiative is open to accepting the NGWMN network data that is fine. It is important, however, to recognize the value of the NGWMN wells as having been specifically selected as part of a network and sub-networks. The sense was to continue what we are doing in NGWMN development and implementation and have groundwater data available when Open Water Data Initiative moves forward and wants groundwater data as part of that. At some point, may need to do some tweaking based on Open Water Data Initiative but not now.
- The question was raised as to whether NGWMN data providers can take down a whole well? Yes, but for some other changes, it would be good to communicate with CIDA so not the issue is not a computer exchange problem.
- Did you find well log using specific software any easier? Only saw what ended up getting. They were just very different – not one was easier than others.
- Soil moisture group is going to use groundwater framework as model
- The NGWMN Portal Work Group can look at portal priority list during this meeting. While considerable input has been gathered in developing the list and we don't want to undo that list this meeting provides another opportunity to discuss the portal in person.

Action item:

- 1. SOGW should consider and provide guidance on what constitutes interpretation and what should be graphically displayed.**

Questions, discussion or comments:

Do we need a public outreach piece beyond data providers? Whose responsibility should public outreach be? This question brought up the role of the SOGW and Program Board. Views expressed included:

The SOGW should not fade away. Need to assure a meaningful role for both the SOGW and Program Board. Currently the updated Terms of Reference does not expand the SOGW scope too far at this time but rather follows through on items such as looking at innovative methods that fit within implementation of the overall network.

Different opinions were expressed as to whether the SOGW and Program Board are on same level or one is subservient to the other. SOGW represents wider group of stake holders, including data users. Program Board represents the data providers. A mission statement should be written for each. There may also be “growing pains” as work out roles and processes.

Need to recognize and deal with potential for conflict of interest if program board composed of data providers is the group reviewing funding applications. Dave Wunsch shared that when proposals under the StateMap Program are being reviewed and if a review committee member’s proposal come up for discussion, the committee member leaves the room during that discussion.

Gary Rowe shared background and experiences from the National Water Quality Monitoring Council. The Council has seven boards or work groups under it. It is important to keep in mind that it is a volunteer organization. Council is being very judicious with what they take on, considering potential trade-offs between existing and new things. He recommends maintaining a clear focus with the innovative methods a logical complement to current efforts, but consider new initiatives carefully. Gary also brought attendees up-to-date on the Oceans Report that is the basis for the national water monitoring network. They have done two rounds of pilots with some funding available. Second pilot round is wrapping up. They believe they’ve gotten everything they can out of pilot process. So question now is if new funding is available would it go for more pilot or new sensors, for example. They’ve run into issue of whether really a national effort – there are USGS and regional areas covered but getting wider coverage is a challenge. There is a desire to a national network with consistent methods, but the needs are at the local level.

Indiana expressed that the STATEMAP model, from their perspective, is a way for them to express their state needs. They believe that is a nice structure and process. The group was cautioned that there are also the data user’s needs. There is potential value in identifying who users are and invite them to participate.

Potential models for consideration include:

- The National Water Quality Monitoring Council and its work groups
- The National Cooperative Geologic Mapping Program (STATEMAP)
- Drinking Water State Revolving Fund (DWSRF) allocation based on survey of need

Applying the STATEMAP model would have the SOGW putting out the request for proposals (RFP). The Program Board would peer-review the applications and there would be a one to one match requirement. An important purpose of matching funds is that should non-federal budget cuts be considered, sometimes the presence of a federal match component helps protect the state funding. The point was raised that there must be funding continuity to maintain long term perspective and nationwide coverage considerations with the NGWMN, which may differ from STATEMAP program considerations.

At some point, someone also needs to tell data providers how many wells may be needed in certain areas driven from point of view of the entire aquifer. The SOGW or the Program Board should make those types of decisions. It will be important to make sure wells in each state make sense from coverage perspective. It should be noted that wells selected may change over time. A possible path to jump start effort would be to assume that 30 wells are needed in each major aquifer. Then look at GIS and determine where and what is needed in each state. The SOGW could then do a gap analysis to determine what more is needed in a statistical way.

Chuck Job shared that the Drinking Water State Revolving Fund allocation is set in law based on a survey of state infrastructure need and is statistically valid at state level. Every state is involved. You would look to see what you would measure among the states as to what would be equitable. EPA has a State-EPA work group that is its own federal advisory committee. State and EPA co-chairs and they invite all states to come. It is like a board of directors but doesn't direct – it advises. Not every state is on this advisory board. There is a three year rotation. Every region has states that are representatives to the group. EPA has a Clean Water and Drinking Water Program representative and a finance representative (3 total). Maybe the group wants to think about whether there are statistics upon which funding allocations would be based.

Work Group Breakout Sessions:

Meeting participants discussed the work group process and expectations. Participants could self-select their workgroups. After discussion, the Training and Innovative Methods Work Group and related discussion was deferred to a later time. Leaders for the three remaining work groups were identified as follows:

1. Portal Work Group – Jessica Lucido (lead), Daryll Pope, Jim Sullivan, Janie Hopkins, Sandy Eberts
2. Framework/Advisory Board Work Group – Mike Wireman (lead), Chuck Job, Jeff Davis, George Roadcap, Janae Wallace
3. Funding Work Group – Dave Wunsch (lead), Gary Rowe, Cary Betz, Mary Musick, Jerry Unterreiner, Tom Patton, Ray Bousenberry, Greg Kruse, Bob Schreiber, and Chris Carlson.

Preliminary Report Back from Work Group Breakouts:

Funding – Dave Wunsch:

Discussions looked at or came to preliminary agreement on:

1. Trying to maximize participation such as through potentially providing funding for all
2. Enabling states to make available existing wells to network rather than focus on new well construction
3. Allowing existing pilots to have flexibility in how they use money so as to enable them to potentially receive continued support.

Portal – Jessica Lucido:

Discussions looked at or came to preliminary agreement on:

1. Technical issues:
 - a. Additional portal enhancements
 - b. A review of the existing list of portal changes
 - c. Identification of metrics for portal success, such as ease of use, additional provides added, increased use of portal
2. Implementation issues:
 - a. Discussed how many data providers could be added, i.e. don't select 30 states to add all at once as that will create problems from perspective of integrating them into portal. Need to have phased approach to bringing new data providers into portal.
 - b. If some states are not ready to meet portal requirements, they should not be added at this point.
 - c. Need to have clear criteria for how and why a state was included or excluded

SOGW and Program Board – Mike Wireman:

Discussions looked at or came to agreement on:

1. SOGW attributes or responsibilities include:
 - a. Link to ACWI and existing bylaws
 - b. Other interest in network beyond data providers, e.g. data users
 - c. A national viewpoint
 - d. SOGW can represent state views and fit them into larger national view
 - e. SOGW would advise those federal agencies on ACWI
2. Program Board attributes, responsibilities or structure include:
 - a. Would interact with USGS management group
 - b. Would be a work group of the SOGW
 - c. Work would revolve around implementing network, with SOGW retaining final say
 - d. Would bring state viewpoint and can represent their specific states.

WEDNESDAY, SEPTEMBER 17, 2014:

Introductory Remarks: Group was welcomed back. The day's schedule was highlighted including:

1. Design of NAWQA Cycle 3 by Ken Belitz that will provide some thoughts on water quality sampling design, frequency and other considerations.
2. Regional Groundwater Assessments by Kevin Dennehy that will provide frame on how monitoring and modeling are linked that group may want to keep in mind
3. Briefing on Forest Service Directive its purpose and status by Chris Carlson
4. Open Water Data initiative by Nate Booth as background for group.

The question was raised as to whether more focus should be given to getting user groups involved so as to document and provide impetus for network. As an example of a future possibility, Section 106 grants have mainly focused on surface water, but with droughts and Hurricane Sandy the Agency is re-evaluating its focus. If user groups see a need for groundwater data, it would be helpful to gather that information, e.g. a survey of states regarding who they are providing data for. The suggestion was made that it may not be just groundwater levels but also brackish water as alternate source and knowing its quality. The group discussed potential to get on agenda of relevant state commissions to explain the NGWMN and what is happening.

Action item: Those interested in discussing the outreach topic and potential for developing an outreach strategy (or strategies) further should get together during the lunch break.

NAWQA Program Cycle 3 – Ken Belitz (see presentation for further details)

The groundwater component of NAWQA Cycle 1 and 2 focused on shallower groundwater. During Cycle 3 the focus will be on deeper groundwater used for public water supply. They will also be building a modeling component to answer questions about climate change, drought and other topics. Sandy would be able to brief the group at another time on that topic. Cycle 3 will also look more closely at trends. The question they are trying to answer in this effort is “over what time scales does groundwater quality change.” During Cycle 3 they will sample fewer wells for pesticides and VOCs. NAWQA has found that these constituents are ubiquitous. The effort in Cycle 3 will look more at how constituent levels may be changing over time. Cycle 3 will have a focus on the three dimensions of groundwater looking at flow paths and age dating to assess the link between shallower and deeper groundwater and address over what time scales does groundwater quality change. NAWQA will also look at the differences among the aquifers.

Questions, discussion or comments:

- What is the geographic bias for use of existing public water supply and domestic wells, e.g. you may find wells in flatlands but they may be affected by uphill groundwater flow? Good point – NAWQA addresses this by use of grids.
- When will you be using state data? At beginning of Cycle put in call for state ambient data. Hopefully we will have all that data labeled and aggregated. Second call will go out that will allow regulatory data which is ambient to be included. To extent data is mounted and available, such as through the NGWMN, all the better

- Nitrate is getting worse but this is not a regional but local problem. Will you be able to relate what see in aquifer to land use practice? NAWQA program will develop fertilizer loading rates and will have maps and use those to develop statistical work
- Are you going to look at virus? Yes but not on a national basis
- How might your studies use or find it useful to have a consistent water level data base as well as inorganic and trace elements or do you see it better for NAWQA to continue to develop own data set? NAWQA will use NGWMN. NAWQA data been tagged and boxed in useful way. Integration of networks allow for labeling. Being able to reach out for water level and depth to water table data will be very useful. Nitrate and regulated data sets are helpful but NAWQA does things outside of regulated constituents.
- Is there a concern about sample bias in use of public water supply wells? For example, Illinois has public water supply wells that were contaminated and are no longer used as a public water supply source? Not as much of sample bias as one would think
- Is the NAWQA in the NGWMN data? There is USGS water quality data in NGWMN. NAWQA data is USGS data. USGS data will be looked at for inclusion in NGWMN but that has not been done because network is not yet funded. All USGS will need to be evaluated based on frequency of data and other factors in line with NGWMN framework design.
- Need to consider talking further about how to provide information so that people can explain differences to funding sources. NWQMC has done quite a bit of work on branding. They also have fewer filters on water quality portal. It was put forth that the Open Water Data Initiative may subsume other data portals. The big selling point suggested right now for the NGWMN is the groundwater level data and filters.

Regional Groundwater Assessments - Kevin Dennehy (see presentation for further details)

USGS groundwater availability studies assess nation's groundwater at regional and national scale. The assessments are important to resource management, help address cross-political boundary issues, establish baseline and context for water demands for entire hydrologic system. The objectives are to quantify groundwater resource and evaluate changes over time as well as provide a tool to help forecast system changes and response over time. The program is looking at aquifers that constitute 90 plus percent of groundwater use. The program has completed approximately 20 to 25 percent of the planned assessments, with 7 to 8 complete and another 8 they are working on, so there is a considerable way to go to completion. Kevin shared some examples of feedback from stakeholders and partners on the usefulness of the reports, including from the Central Valley, Denver basin, and Mississippi Embayment. Examples were provided how modeling can inform monitoring and how monitoring can be used to verify and inform modeling results. The regional models are also helpful to provide larger context for work, such as in the Denver Basin, where they are seeing and looking to understand why groundwater levels are dropping faster than predicted. Questions, discussion or comments

Can this work help in the looking at oil and gas development? The program is looking at regional scale and not localized issues. If one has a good regional understanding that provides a framework for more localized studies.

What data are being used? Best available data. Few new data are being collected.

How would model results go back into NGWMN? Have extensive historical data – 1800s that gives us predevelopment perspective. The preference is to incorporate wells with long history. Further discussions may be beneficial such as in terms of incorporating modeling results into network design.

Does your model allow you to look at land cover and determine whether that has impacted groundwater resources, e.g. look whether infiltration has been affected by impermeable surfaces? They do back-cast and forecast so as to consider climate and land use changes. While models cannot predict future, they can look at potential impacts under various stress scenarios.

Do you have recommendations on monitoring gaps after do models/availability study? What is connection between what you are doing and the SOGW effort? A requirement of every one of these studies is to show how tool can be used to better establish a monitoring network.

If you wanted to start a regional aquifer study, would your program be a customer of the NGWMN? Yes we use every available data there is. The question was then raised whether there should be more groundwater level data included in the NGWMN and less filtered out.

Forest Service Groundwater Directive - Chris Carlson

The group was briefed on the recently released draft Forest Service Groundwater Directive. The directive is meant as internal guidance to Forest Service staff aimed at increasing consistency of internal processes related to groundwater.. It is currently out for public comment.

Open Water Data Initiative - Nate Booth (see presentation for further details)

There is interest from the White House and within the Department to undertake this initiative. It is meant to build off of the success of many of these data systems, e.g. NGWMN. The Initiative is looking to:

- Build off of foundational national data sets.
- Use web services
- Develop a community which will bring in partners to refine effort.
- Access real time monitoring data – not only historical data
- Data, in part, are intended to support national modeling capability
- Derivative products of interest include maps, such as current groundwater status and current surface water conditions. This would be similar to drought monitor maps.
- Marketplace of open source applications, e.g. models data visualization

Foundational data sets upon which to build include:

- NGWMN portal
- Water quality portal
- WaDE – water use data exchange for exchanging water allocation information.
- Integrated water resources science and surfaces - focus on flood forecasting

Initial Use Cases have been identified and include:

1. National flood interoperability
2. Integrate water portfolio – this is similar to National Water Census concept
3. Chemical spill response – event driven water quality information needs.

Questions, discussion or comments:

At what scale are you looking? Starting at national scale but want to bring in local data as well. The goal is to have a nationally consistent data set that can meet local objectives.

What is your (Nate's) role? He has helped to put initial thoughts together into charge. Two committees will chew on charge.

Concern was expressed about people grabbing data and not understanding data and using it inappropriately in models, e.g. combining data from different aquifers. Caution raised in providing a large number of interpretative tools that people who don't understand what data to select use to generate inaccurate outputs.

Nate encouraged SOGW, if they have an interest, in developing a groundwater-based use case study to write it up. To do this, he suggested the SOGW develop a series of questions that local people, state people or federal people will be concerned about. Look at what questions the NGWMN is or can be used to answer and cast your use case around those. The Mahomet Teays aquifer transboundary monitoring is a potential OWDI case study example. Another possibility raised was Texas where you had drought and groundwater monitoring data to document impacts. The framework document also provides a potential source of questions that can be drawn upon to build the groundwater case study proposal. While it is estimated that the OWDI will take 10-15 years, the SOGW needs to move quickly if they want a groundwater use case study to be considered.

Has your group talked about federal interest in being able to create all these tools to help solve local problems? Intent is to bring together in this community, people from all levels. The goal is to liberate some of these national data sets for use across the country. Sounds like you are using federal data sets. To start, we are looking at that as the low-hanging fruit and will use federal data. As you found with the NGWMN, there is also the social side on data recruitment where one needs to build trust to liberate data into these national data systems.

Have you started to consider how to get people to use this data? The case studies will do a deeper dive, such as conversations with the local emergency management people on what is out there and what may help them by bringing together.

Outreach Breakout Discussions

A small breakout group met over the lunch hour to discuss who the potential NGWMN users are and begin looking at developing an outreach strategy to reach those groups. The goal would be to have these user groups help the network gain traction – as users and potential supporters who would reach out to others.

The group identified following drivers that may increase concern about groundwater or interest in providing or having data available:

- Energy development
- Biofuels
- Drought
- Climate change
- Interstate conflicts
- Conflicts between urban and rural areas, e.g. Illinois
- Peer pressure because neighboring jurisdiction participates
- Fear of lawsuits
- Trends affecting future use.
- State has made water supply planning a priority – directed by state legislature

Group discussed potential development of a survey that could identify what state laws may be in place that would drive support for the NGWMN. Chris Carlson suggested checking on state groundwater management survey recently done by Sharon Megdal in Arizona and her [work](#). (Note: There is also an earlier survey by NGWA and GWPC on state groundwater laws that could be a possible starting point if you want to draft a survey)

The identified user groups to include:

- Local, regional or state government
- Groups supporting habitat preservation

Benefits of participation for data providers identified included:

- Stimulation of technology for monitoring
- Identification of best practices among communities
- Communities banding together for their water supply – sustainability may not happen on town by town basis. A lot of communities are at tipping points as far as economics.
- State, e.g. Illinois has no centralized national resource data management system – so why not let USGS develop that.

Possible groups to target for outreach include:

- Environmental Council of States

- National Conference of State Legislatures
- NGWMN participants talking with colleagues in state government and local communities

Another question is how to brand the network – what will it be used for. Goal is to collect decadal consistent comparable water level and water quality data to answer question questions on status and trends in groundwater at the national and regional scale. It was pointed out that the framework document provides good information and language upon which to build. The portal provides a unique feature. It comes down to messaging and getting the message out there.

The potential use of Drinking Water State Revolving Fund set aside money was also discussed. The restructuring of local community water supplies to make those water supplies more sustainable is eligible use for funds. Some states have been able to use those funds but Dave Wunsch was not able to use those funds in his state. The question may be that the DWSRF is focused on sustainability of water systems and not sustainability of aquifers.

Action item:

- 1. Talk to 305b people on Clean Water Act side and see whether money can be used for NGWMN.**
- 2. Chuck will look at language – his daughter is a branding person**

Breakout Groups:

The breakout groups were given some general direction prior to separating to continue the previous day's discussions. After discussions within each breakout group, the following reports were presented:

Program Board Work Group Breakout Report:

Proposed Program Board

Purpose: Assure appropriate stakeholder participation and effective partnership between data providers and Federal government

Duties / responsibilities

- Manage Network growth /development
 - o Advise on new data providers,
 - o Advise on details of monitoring – number of and location of monitoring points
 - o Growth vs maintenance decisions
- Ensure consistency in implementation:
 - o Across borders. Doesn't need to be identical but consistency in protocols is necessary
 - o Oversight
- Funding:
 - o Assure fairness in funding-allocation, and consistency in funding methods.

- Assume Request for Proposals (RFP) as boilerplate. Could help submitters. How they should be evaluated is to be determined. .
- Help assure adequate and complete response.
- Liaison between SOGW and data-providers:
 - Policy issues.
 - Implementation.
 - Bring questions and conflicting issues to SOGW.

Organization

- Overall: Where does this Board fit?
 - As a workgroup / board under SOGW
 - Program Board will work directly with SOGW and management / operations groups
- Board make-up:
 - Main problem is keeping Board manageable.
 - Up to 10 total but acknowledge need for odd # of voting representatives
 - Representatives from various – States, tribes, FEDS (but could include other entities).
 - Federal representatives in total – less than half.
 - Need to devise some way of equal representation amongst 50 states:
 - By region (especially Western vs. Eastern).
 - Rotate within regions and on board as a whole – need to stagger “veteran representatives” vs. “new representatives” for overlapping.
 - Add sub-boards? Not now.
 - Chair/co-chair – couple of models were discussed, with main criterion being to ensure different type of representative in the multiple positions.
- Board meetings:
 - ACWI provide travel funds (expenses).
 - 1-2 face to face meetings per year
 - Meet by phone / skype as needed
 - Board should have co-chairs –perhaps Federal and non-Federal

Issues:

- Federal agencies should not respond to RFP....
- but certainly OK for Federal agencies to be a data-provider.
- Encourage reaching-out to other Federal agencies for direct assistance, which could include IAG/funding of CIDA, e.g., and also in-kind services.
- Break-out group didn't discuss timing in regard to potential for Federal government still not funding.

Portal Work Group Breakout Report:

Workflow of Data Provider Inclusion:

Stage 1) Education, Site Selection, Well Classification, Populate Registry
Stage 2) Database crosswalk, Plan for Service Implementation, Provide Technical Expertise
Stage 3) Implementation of Web Services, Mediator Cross-walking

Here are our notes and recommendations:

Pilot Data Sharing Criteria:

- Must be digitized (not stored filing cabinets!)
- Must store their data in a common database (not an Excel or Access file on someone's PC)
- Data must be updated into the database regularly (not annually, for instance)
- Must provide required data elements, as outlined in the framework
- Must expose their database to the NGWMN portal via web services
- Searchable by site number
- Support temporal queries (for WQ and WL data)
- Use the same ID in well registry as in web services (numeric), no duplicate wells (coordinate at state level)
- Services return XML (Suggested)
- Using standards is a bonus (e.g. WFS, SOS, WaterML, GWML, etc...) (Suggested)
metadata records for each dataset (question, do we need/want this?)

Suggested Portal Features for Development:

- New Site Filters
 -
 - Filter based on status and use code of well
 - Filter based on categories of WQ data (nutrients, metals, physical, etc...)
 - Filter WL data shallower or deeper than a threshold
 - Filter well depth above or below threshold
 - Filter for confined/unconfined aquifers
 - Filter for wells completed in alluvial vs. bedrock aquifers
 - Filter/sort WQ parameters to view or download
 - Filter for Dry wells
- Water quality constituent data filter
- Support for provisional data
- Performance improvements
- Catch-up portal with new framework data types
- Link to dataset reports
- Improve web statistics collection to capture more detailed information about users and how they use the site

During report back, questions that were raised and discussion included:

- Are questions about data security of web portals through web services something that is increasing? Definitely has become more on radar. I don't think site is more vulnerable than others.

- Who are users and can you track those? We can generally group people through google analytics. That maybe a measure of success metric. Also, surveys could be considered.
- Part of outreach strategy may be to get NGWMN linked on other west sites and then tracking web site links as another metric.
- It is important to keep it fairly simple so people can understand how data providers are selected.

Funding Work Group Breakout Report:

Category A: Guiding principles (maybe some are other categories such as RFP criteria) assuming have \$1 or \$2 million in funding

- Incorporate resiliency into network funding
- Assumption is that this is a long-term program and investment
- Encourage current and future participation through processes that are fair and predictable
- Enable states to make existing wells available to network - no new wells initially
- In-kind and cash matching funds should be given priority points
- To fill in map is major objective (long-term goal) but in short-term need to ramp up.
- Need to keep data from pilots coming and rework what is needed, e.g. Montana not getting all wells reviewed, Texas not getting in water quality wells
- Avoid losing states and avoid losing long-term wells (Note: As a practical consideration, group discussed whether there were options related to length of funding available given burden of annual application process. The sense was that every state should be allowed to apply for one-year grant. The question was whether multi-year grants are possible and whether those could be used in some cases, e.g. in the network already. In some cases, it may be possible to provide two-year funding authority but that is limited. Issue not resolved)
- Funding should be used to support both water quality and water level data. (Note: The group considered option of filling in water levels before funding water quality but given EPA support of water quality analysis, the decision to recommend funding availability or both was made)
- There should be one application per state or tribe encompassing all data providers who are interested in participating in state or tribe. Caveat considered: if a state does not want to submit an application or has no statewide or state-run regional network, local data providers may be able to submit application if a letter from the state is included supporting the application. Do these local data providers get a lower priority point (need more consideration possibly)? Approach supports portal discussions. May want to even promote state groundwater monitoring council in RFP.
- What about new equipment, software update, and ability to test wells beyond well installations? Okay if already a data provider
- Walk before run should continue – fine line between demonstration of progress and durability.
- Demonstrate value – marketing to states and funders (may be different) – need to have plan.

Category B: Priority setting options to consider in writing RFP and assigning priority points to state and tribal applicants – Possible long-term priority options for phasing in/growing the network (no agreement reached on which to use):

- Build around completion of monitoring of principal aquifers,
- Build around pilots, or
- Build around states experiencing problems, e.g. drought

Category C: Criteria for selection: See Category A above – some may be in there.

Category D: Deliverables or output requirements to include in RFP

- Develop a fact sheet on how NGWMN benefited state or tribe (good – already used in funding discussions)
- Must have data up and deliverable through NGWMN web portal within one year. (need to link this to what actually can be done by portal staff at USGS)

Category E: Other considerations for later

- We may need to change framework document to limit amount of overhead by participants (Feds, States, and others) or find way to cover overhead costs. (possible bonus points under RFP if limit)

Category F: types of funding classifications within RFP based on Section 7.4 – metrics to identify network success

- Getting states in so build network up – Getting into network
- Consistency in data and protocols as well as basic data exchange maintenance– already in network bullet 2 thru 4
- Richness/augment, e.g. adding automatic water level measurement devices or at some point maybe new wells (possibly get to ramping up)
- Demonstration of how data have been used to help address issues, or benefit current operating network (e.g. improved QA/QC) – should not punish state if don't do this.

Action item:

- 1. Work group leaders are asked to type up their notes and send them to Bill Cunningham, Bob Schrieber and Chris Reimer.**

Outreach Discussion:

Jessica reported that she has already completed an earlier action item. She already submitted an article to the National Water Quality Monitoring Council newsletter.

The group also discussed current and potential outreach options.

The NGWA Summit is going to be held March 16-18, 2015 in San Antonio. The deadline for abstracts is September 28, which is coming up soon. There are also 90-minute learning sessions. Bill has submitted an abstract for a 90 minute session where we can share lessons learned from the NGWMN. The 90-minute session may give the SOGW more flexibility to address funding and other issues. Maybe we can present something on the historical perspective, NGWA's role and other things that were done to show how we did it and how we got this far, and encourage people to join and support the effort in the future. If the 90-minute session makes the cut, Bill will reach out to the group for input. An abstract is needed for both a 90-minute as well as platform talk.

Mike Wireman will be presenting a talk at the upcoming [Ground Water Protection Council annual forum](#), October 5-8, in Seattle, Washington

Action items:

1. **Chris Reimer is to check whether an article on the NGWMN has already been carried in the Groundwater journal's News and Views section.**
2. **Consider submitting an abstract for the [NGWA Summit](#) – deadline is September 28.**
3. **Bill will let group know if 90 minute learning session on the NGWMN is accepted.**
4. **Daryll and Mike will work together using the GWPC abstract as basis for NGWA Summit talk.**

Closing Comments:

Thanks were expressed to the attendees for participating and to Bill for organizing the meeting. The meeting moved outside where a group photo was taken.

Submitted by: Christine Reimer, National Ground Water Association and note taker pro-tem

<u>Affiliation</u>	<u>Participant</u>
SOGW Non-Fed Co Chair (ASCE/CDM Smith)	Bob Schreiber
SOGW Federal Co-Chair (USGS)	Bill Cunningham
US EPA	Chuck Job
Association of American State Geologists	David Wunsch
Ground Water Protection Council	Mary Musick
State (Texas Commission on Environmental Quality)	Cary Betz
USDA Forest Service	Chris Carlson
Retired EPA	Mike Wireman
USGS	Daryll Pope
USGS	Jessica Lucido
USGS (NWQMC Co-Chair and SOGW liaison)	Gary Rowe
USGS	Sandy Eberts
MT Bureau of Mines and Geology	Tom Patton
NGWA	Chris Reimer
Cardno ENTRIX	Jeffrey Davis

Pilots

Montana Bureau of Mines and Geology
Texas Water Development Board
Minnesota Department of Natural Resources
Minnesota Pollution Control (remote)
Illinois State Water Survey
Indiana Department of Natural Resources
Indiana Department of Environmental Management
New Jersey Geological and Water Survey
Utah Geological Survey
New England USGS (remote)

Other Presenters

USGS—National Water Quality Assessment program
USGS—Groundwater Resources Program
USGS—Office of Water Information

Others:

USGS- Groundwater Resources Program
USGS – Water Budget Officer

Tom Patton
Janie Hopkins
Greg Kruse
Sherri Kroenig
George Roadcap
Jerry Unterreiner
Jim Sullivan
Ray Bousenberry
Janae Wallace
Richard Verdi/Leslie Desimone

Ken Belitz
Kevin Dennehy
Nate Booth

Tom Reilly
Adrienne Bartlewitz