



National Water Quality Monitoring Council

Working together for clean water



Meeting Minutes – National Water Quality Monitoring Council (Council) USGS Idaho Water Science Center – Boise, Idaho November 6-8, 2018

(Agenda and list of participants on pages 5-7, presentations posted on Council website at: <http://acwi.gov/monitoring/>)

Actions, Decisions and other Information

1. **Decision:** Upon a motion duly made (Mary Skopec), seconded (Monty Porter), and carried, the August 29, 2018 Council Meeting minutes were approved and will be posted on the website.
2. **Water Quality Portal (WQP) Overview and Strategic Plan:** Jim Kreft and Laura Shumway led the group in an overview of current functionality and use of the Water Quality Portal (see presentation "[NWQMC WQP Strategic plan update November 2018](#)"). The WQP development team has met key benchmarks set forth in the original strategic plan, and the WQP continues to have ever increasing usage. The WQP tends to serve between 10 and 40 billion records per month and new efforts are underway to figure out how data are being used and made accessible. Eventually a service will be stood up for providers that allow them to see use of their data. Mary Skopec asked if agencies could run these types of queries on their own, and if this would help to add value to data from the organizational perspective. Danielle Tijerina suggested that we provide a standard way to cite data from the WQP. As the WQP moves towards cloud data storage, cost structures will change and the WQP team is trying to rethink data delivery. In addition, USGS plans for supporting the WQP are being integrated into broader plans for developing new USGS Water Mission Area web products that support the "[Internet of Water](#)" concept, which is an effort of linking datasets together and making water data more discoverable. The WQP team is also thinking of ways to add summary statistics for each water quality property and constituent combination. Jim and Laura shared a draft of a new strategic plan for the next several years, and NWQMC members broke out and discussed topics. Below are the results of the breakout discussions:
 - **System Performance:** The group answered yes to every goal. These are admirable goals moving towards next-generation output of the WQP. They recommend further refining the goals for clarity. The group wants to see metrics to see how things are being seen and used ("a Portal with in the WQP") and also recommended making users aware of applications that make use of the Portal.
 - **Data Quantity and Quality:** The group discussed site pages for the WQP and said there should not be a large investment in site pages since many people get to the WQP through the homepage. In terms of data quality, the group agreed that the quality of data should be described in a more robust way but were undecided on whether or not tiering data is a good idea. The group suggested setting up a working community with open source information for setting up services to serve data to the WQP.
 - **Data Display:** This group discussed the concept of delivering data in "bites, snacks, and meals," meaning delivering different sizes of data for different types of consumers. Chris Greene had an idea of being able to have a query for a specific chemical to generate summary statistics that would deliver "bites" to users, but recognized this will also include the need to process data to a common format for analysis (see example in technical presentation by Rusty Wasem). The group also emphasized the importance of serving quality assurance project plans (QAPPs) with data so that the data users can read a QAPP and determine if data served are of high enough quality for their use.
 - **Outreach:** The breakout group suggested that marketing is different than outreach and that we may need to hire someone for marketing and messaging as part of outreach campaigns. The group spent time discussing audiences and the need to have regional advocates for the WQP in each program or region. The group suggests further developing the "core message" for the WQP and how to tailor it for target audiences.
 - **System Performance:** The group came up with an idea of a challenge to incentivize organizations to make sure they are getting their data into the WQP. They suggested developing a dashboard of the holdings of different organizations to show the date of the more recent submission. The group also suggested working with the volunteer monitoring community to define some data standards and related metadata requirements for in-field monitoring mobile

applications to ensure high-quality data collection and data that can be easily entered into WQX and the WQP. The group also suggested that the efforts of the WQP are helping the Council to reach its overall objectives.

The group had a follow-up conversation about the Strategic Plan for the WQP on Wednesday. All member organizations of the Council should ensure that they are serving data to the WQP. Serving data remains the top priority of the WQP; analysis and synthesis tools are up to end users. As the group continued conversations about qualifying data, someone suggested flagging data as having been used in Integrated Reports so that users know that data met a certain level of quality for states. Many members of the Council do not want to tier data, but instead work on educating people on providing minimum data elements. Gary Rowe suggested the Council can lead by example with the efforts of standing up a National Monitoring Network and showing how we arrived at a key set of data requirements. As a community, the Council is working to raise the bar to identify and document data of known quality; they want to facilitate tools for communities to evaluate data for their needs. Susan Holdsworth mentioned that EPA's Quality Assurance office had put together a checklist of using third-party data and that such tools would be helpful to share. Jim Kreft and Laura Shumway will continue to work on the strategic plan and present a further revised version to the Council.

3. **Water Quality Portal Communications Plan:** Jim Kreft and Laura Shumway covered the draft of the communications plan and led a follow-up conversation about Council roles and responsibilities in communications. Council members suggested having a PowerPoint presentation about the WQP that would detail submission levels, use stories for various levels of maturity, and how easy it is to download data from the WQP. Julie Vastine suggested that state representatives could meet with regional groups and generate a laundry list of concerns and potential upgrades for the WQP. Liz Smith suggested enhancing internal education to the Council about the Portal to make sure Council members feel comfortable being ambassadors for the WQP. Mary Skopec suggested having targeted training for early-career professionals regarding how to become familiar with submitting and using data from the WQP.

The WQP Communication and Outreach effort will likely require a sustained multi-year effort. The messaging needs to be worked on by the Council and a feedback loop should be incorporated into communications to define which messages and outreach materials resonate with different WQP providers, stakeholders, and user groups. Mike Eberle suggested targeting presentations and outreach to agency database administrators who make many decisions about data output and sharing. Barb Horn suggested defining four to five target groups we could develop tailored communication plans for that would include audience specific user stories.

4. **Water Data Collaborative:** Danielle Donkersloot and John Dawes introduced the Council to the efforts of the Water Data Collaborative (see presentation "NWQMC_WDC"). The Water Data Collaborative is a group that is working on citizen science and volunteer monitoring (VM) programs. The Collaborative is working to establish a common data format for these groups. Keeping the VM community engaged is important to keeping people involved, and the Collaborative wants to move them toward bigger contributions. The Collaborative is also trying to help these volunteer groups get their data into the cloud by emphasizing consistent data formats. Mobile applications can help to collect data in a unified format and keep current issues in the media, and the Collaborative would like to push mobile application development forward. The Collaborative is trying to figure out best practices for web services, the framework for data exchange, and metadata standards. The proposed Citizen Science Framework is an inclusive and scalable framework that the Collaborative has drafted that allows users to agree on a standard for data exchange. Danielle, John, and Barb Horn are proposing a Study-Design Support Hub platform that supports an initial survey/questionnaire that points user to a number of online educational modules that provide advice and guidance on various aspects of monitoring for VM/CS groups to get stood up including 1) monitoring design, 2) developing a QAPP, 3) data management plans, 4) data delivery plans, 5) evaluating monitoring plans with performance metrics, and 6) published data and/or information products.

The Collaborative asked the Council to: 1) Review the content and products they are developing; 2) Continue taking the lead on developing recommended standards for data exchange; and 3) ask state liaisons to contact their sister agencies and help answer the question of what services are currently being provided that inform the proposed data collection work flow.

5. **Collaboration and Outreach Work Group:** Candice Hopkins and Danielle Donkersloot presented updates for the C&O Work Group. The group has been focused on publishing the biannual newsletter, running the webinar series, and keeping contact with the monitoring community up and running. The group has been losing momentum, and Danielle suggests that outreach should be a process involved in all work groups. Leslie McGeorge suggested that the C&O work group should refocus efforts on helping

regional monitoring councils. Candice and Danielle will focus future C&O work group discussions on answering fundamental questions to help improve the WQP Communications Plan.

6. **Water Information Strategies(WIS) Work Group:** Mary Skopec and Aaron Borisenko gave an overview to the Council on recent WIS activities. In the focused work group time, the Evaluating Progress subgroup reviewed their strategy and mentioned they potentially need to look at refining the terms of reference of the Council for approval by ACWI. The Evaluating Progress subgroup plans to finish a write up of their work and have the WIS chairs (Mary and Aaron) identify next steps for this group, including sharing the Council's progress at the 2019 NMC. The Water Quality Standards subgroup is developing a fact sheet aimed at managers; they are focusing on monitoring for standards development and guidance values for drinking water. Monty Porter has reports that could be a starting point, and the paper plans to explain the difference between human health criteria and drinking water standards. The Water Quality Standards subgroup discussed ways to move the fact sheets forward, including talking with the Volunteer Monitoring Work Group about information regarding standards for citizens. The Water Quality Portal subgroup discussed users of the WQP and creating story maps of uses. The WQP subgroup also suggested using state liaisons to ask questions to states within their region, including questions about use of the portal, type of data that are submitted or missing, and what would make the WQP easier to use.
7. **Volunteer Monitoring (VM) Work Group:** Julie Vastine and Danielle Donkersloot covered recent activities within the VM work group. There are inconsistent practices between watersheds; the VM group can help fix inconsistencies and discuss standardization of field methods. In the focused work group time, VM reviewed the 2018 work plan and what was achieved out of the plan. They also discussed VM opportunities at the 2019 NMC, including a booth, meeting, and dinner for the group. The VM scholarship fund for the 2019 NMC has \$1,500 and Jeff suggested exploring exhibitors donating their registration to VM groups. For 2019, the group would like to focus on getting more volunteer monitoring data submitted to the WQP, as well as helping to recommend equipment and methods to VM groups.
8. **Methods Board and Sensors Work Group:** Dan Sullivan reviewed the activities of the Methods Board, which includes rebooting the Bioassessment Comparability Work Group and updating the National Environmental Methods Index (NEMI) with additional metadata. The Bioassessment Comparability Work Group met during breakout sessions and discussed planning for an extended session proposed during the 2019 NMC. The group finalized the order of presentations in the championed session and worked on a detailed agenda for the workshop. In addition, the group discussed bottlenecks to entering biological data, including taxonomy, as well as taxa mapping and requirements.
9. **National Network of Reference Watersheds (NNRW):** Mike McHale reviewed NNRW, a network of watersheds with core watersheds for background data. During the focused work group time, the group discussed how the NNRW website may be improved. Kathleen Weathers asked if there were lake watersheds in the network, there are not currently, but Mike is planning to incorporate lake watersheds from the EPA Long-Term Monitoring network in the coming year. Mike then talked a little bit about his workplan for 2019. One of the primary goals of 2019 is to redefine the Core Watersheds part of the website. Mike has been writing code in R to pull water quality data from the portal for each site in the network and set criteria for those data based on parameters, frequency of sampling, and length of record. When that is complete Mike is also planning to revise the text on the website.

Candice Hopkins then asked Mike to take a step back and think about how this effort might fit into the Internet of Water or Lori Sprague and Brian Pellerin's Coordinated National Water Quality Monitoring Effort. Mike said that his initial vision of the NNRW was to include all types of watersheds, not just reference watersheds. He had always wanted to include agricultural and urban influenced watersheds. Mike is participating in one of Lori's workgroups (Consistency in Data Collection). The NNRW could serve as the platform for the results of that work. Mike also brought up the GAGES III effort that started a couple of years ago, he does not know the status of that work. The group discussed dropping the Reference title from the NNRW and finished by discussing some broad scale ideas about where the NNRW could go in the future, right now the site gets very little traffic, Mike said he is open to any ideas that make the NNRW more visible and useful. Lori and Brian's work is aimed at creating a national monitoring network; perhaps that is what the NNRW needs to be transformed into?

Some ideas that were batted around:

1. Historical Water Quality: Can we link watersheds to studies that have been published about the watershed? Could we display long-term water quality trends for each watershed?
2. Can real-time data be linked to each watershed (quantity and quality)? For USGS gages this is already available through the NNRW, each watershed is linked to the USGS page that contains discharge data for the watershed. What about data visualizations for each watershed?
3. Mike is currently developing metrics for each watershed, could these and/or others be made available for each watershed through the site? What about reporting requirements for states and tribes?
4. Could we develop a policy tool that delivers information that policy makers need? How about a breakdown of watershed information along political boundaries for example congressional districts? What can we learn from EPA's "How's My Waterway?" website?

The session ended with these grand vision questions, Mike and Candice will talk further about these possibilities during the next month or two.

10. **Water Quality Coordination Work Groups Update:** Lori Sprague gave a presentation on work groups on coordinated monitoring and reporting. The purpose of the work groups is to coordinate to leverage multiple efforts, add value to data being used for purposes beyond the original goals of data collection, and increase our collective ability to address multijurisdictional issues at multiple scales. Each of the three work groups were able to give an update. Group #1 identified questions that could be addressed by a national monitoring network and identified a minimum set of common design elements for sites to be included in such a national network; this group has white paper in draft form. Group #2 has been focused on increasing data submissions by highlighting benefits to supporting data to the WQP and on providing recommendations for how WQP web services can be reused. Group #3 has started a draft document to provide specific guidance on best practices for metadata. These groups plan to have a panel session at the 2019 National Monitoring Conference and provide recommendations to the Council in July of 2019.

Lori's presentation spurred conversation amongst Council members about what this national network could look like. Mary Skopec suggested leveraging work that was already done on the National Monitoring Network and finding incentives for sites that should be monitored but are not being monitored. Leslie McGeorge said her state would support a backbone of national sites if resources were provided; she also emphasized that the Council has always encouraged comparability, not consistency, and that is important to remember that when developing recommendations for a national network. Lori emphasized that the groups are focused on consistency in metadata documentation and timing of sampling. Monty Porter asked if period of record is a metric that would make a site more competitive for inclusion in the national network. Lori's group is looking at sites that had a short period of record, about ten years, but that don't necessarily need to have certain parameters or flow data collected at the same site. The group is also exploring the ability to create artificial streamflow records of prediction. Monty Porter recommended including streamflow for loading calculations and collection of biological data to tell how water quality affects the ecosystem condition. Scott Miller said he wanted key questions or objectives defined for a national network; Gary Rowe noted that the group is trying to create consistent metadata that will allow people to answer different questions, including evaluation of current conditions (status) and how water quality is changing over time (trends). Scott Miller likes the idea of a "network of networks" that can blend sites together to answer specific questions. Aaron Borisenko suggested doing an NHD analysis to determine basin size to figure out if there are current networks that meet criteria, but Leslie McGeorge cautioned that leveraging networks makes an assumption about the sustainability of networks and funding that supports them. Tim Asplund noted that if this effort goes forward, the Council can tell states which sites are important and valuable, which is useful information for prioritizing sites if funding is being reduced or eliminated (having a site be part of a national effort may sway state agencies from eliminating such sites). Jim Dorsch thinks that data at the local and watershed level would be excluded from this group, but utilities may be able to provide well documented data to fill this void in some watersheds.

11. **USGS National Academies of Sciences Report and the Internet of Water:** Gary Rowe gave a presentation on future directions for the USGS Water Mission Area (see presentation "[USGS NAS IOW presentation GLR 110918](#)"). There is new leadership for the USGS (new USGS Director James Reilly) as well as for the Water Mission Area (new Associate Director for Water Don Cline). The new Associate Director for Water commissioned a National Academies of Sciences (NAS) study to look at priorities for the future. The NAS report highlighted need for USGS to do a better job of water accounting, maintaining long-term water quantity, quality, and use monitoring networks, increasing capabilities in integrated water modeling to support short and long-term prediction, increasing USGS expertise in big data science, and supporting efforts to build the Internet of Water (which Gary covered in latter half of his talk). Gary sees the USGS's role as bringing data and science on water quantity, quality, and use together and moving out on integrated modeling, prediction, and water availability assessments at the regional and

national scale. Leslie McGeorge asked what this all meant for the Council and Gary responded that the Council can help provide guidance on how to define “fit-for-purpose” data tiering, criteria for developing a “network of networks” for national water-quality monitoring, and increasing participation in the WQP which is where initial USGS efforts on supporting the Internet of Water concept will be focused. Monty Porter responded that he wonders if the Council can provide more information on defining and communicating the economic value of good (and bad) water-quality; Gary responded that the Water Resources Research Institute (WRRI) and the Consortium of Universities for the Advancement of Hydrologic Science, Inc. (CUHASI) may be able to help us do this.

12. **2019 National Monitoring Conference (NMC):** Jeff Schloss discussed the venue and logistics for the 2019 NMC (see presentation [“NMN CPC Update_181108js”](#)), including challenges given space limitations in the Denver Sheraton venue currently reserved. Jeff noted that the role of Council volunteers is essential to having the conference run smoothly. Mike McHale suggested having two poster sessions that would allow more people to visit posters. Barb Horn discussed networking opportunities and suggested several mixers. Liz Smith suggested having demos and usability testing for the WQP somewhere in a social setting at the NMC. Other ideas for improvements to the Conference were given to Jeff Schloss, who will try to incorporate them into planning efforts. In addition, afternoons of all three days of the Boise Council meeting were reviewing and forming oral sessions for the 2019 NMC out of submitted abstracts. The Program Committee hopes to rank sessions and start notifying accepted presenters by December 8, 2018. Lareina Guenzel presented ideas for local field trips and asked for feedback from the Council.
13. **12th National Monitoring Conference:** Candice Hopkins initiated a conversation about when to have the 12th NMC (after the 11th NMC in March of 2019). The Council needs to decide a timeframe for the next NMC for planning purposes, and the potential dates were Spring 2020, Spring 2021, and Spring of 2022. While some members expressed concern that the NMC may be forgotten or reprioritized if we do not hold it soon, others suggested that the Council had a high number of abstracts submitted even after a three-year hiatus for the 2019 NMC. Monty Porter suggested driving the entire conference on a championed-based process, thereby eliminating a large amount of the work needed for conference planning. Danielle Donkersloot suggested having regionally-based monitoring conferences to span the gap of years. Gary Rowe pointed out that the Council has limited capacity, so we have to be judicious with what we’re getting done; he and other Council members did recommend that the Council consider sponsoring specialty or virtual conferences for off years. The Council voted on the timing of the 12th NMC and the Spring 2022 timeframe received a majority vote. Jeff Schloss recommended locating the conference somewhere in the Northeast or North (such as Minneapolis).
14. **2019 NMC Code of Conduct:** Mike McHale presented a draft Code of Conduct for the 2019 NMC. This code encompasses behaviors that are both acceptable and unacceptable for attendees. Many Council members had comments and suggestions for the draft code of conduct, and Mike is going to speak with some other organizations to see how they have dealt with liability issues in the past and will redraft the code of conduct for review by the Council.
15. **Technical Presentations:**
 - Pierre Glynn of the US Geological Survey gave a presentation on Records of Engagement (see presentation [“RoE-Glynn-et-al-NWQMC-council-nov-6-rev3”](#)). Pierre covered the topic of planning and managing human futures through adaptive management; he encourages creating Records of Engagement and decision-making (RoE) to help with decision making. Pierre suggests that RoEs can potentially help address water-quality issues. He also included a draft of his current paper for follow-up reading (see paper “Records of Engagement and Decision Tracking for Adaptive Management and Policy Development”).
 - Rusty Wasem of the Environmental Protection Agency gave a presentation on the Water Quality Indicators Tool (see presentation [“WQI V2.5 Presentation”](#)). The tool uses nutrient data from the portal, screens and processes it to generate summary statistics, compares them to action levels, and displays the results on a map that uses NHD plus upstream/downstream services. The map shows monitoring stations’ results, NPDES permitted facilities, and has some land use characteristics, all geo-referenced to NHDPlus. The tool allows for upstream discharger pollutant source that can be used for NPDES permitting as well as for monitoring.
 - Nancy Schuldt spoke on the success of using an economic benefits analysis to support water quality. Nancy works for the Fond du Lac Band of the Lake Superior Chippewa tribe who has recently had to promote a sulfate water-quality

criteria that was put in place 30 years ago and has adversely impacted wild rice growth. The tribe needs to protect water quality in order to protect wild rice, which is fundamental to tribes in the region. Nancy's group agreed to commission an economic benefits analysis to show the value of the wild rice resource to tribes. They also worked to come up with very specific recommendations on how to protect tribal resources and health; the documentation for this effort can be found here: <http://www.fdlrez.com/RM/waterrevisedwqs.htm>.

MEETING AGENDA

Tuesday, November 6th, 2018

Time (MST)	Topic	Duration	Speaker
8:00 AM	Welcome and Housekeeping	15	Kyle Blasch
8:15 AM	Introductions and opening remarks	20	All
8:35 AM	Approval of August Meeting Notes	5	Candice Hopkins
8:40 AM	Water Quality Portal	120	Jim Kreft and Laura Shumway
10:40 AM	Better tools for Managing, Exchanging, and Publishing Volunteer Collected Data	80	Danielle Donkersloot, Barb Horn, John Dawes
12:00 PM	Records of Engagement Presentation	60	Pierre Glynn
1:00 PM	2019 NMC Session Formation	240	See theme assignments for review teams (lead: Monty Porter)
5:00 PM	Wrap up for day	5	Gary/Susan

Wednesday, November 7th, 2018

Time (MST)	Topic	Duration	Speaker
8:00 AM	Introduction and review of Tuesday	10	Gary/Susan
8:10 AM	Water Quality Portal	60	Jim Kreft and Laura Shumway
9:10 AM	Work Group Introductions (for new members)	30	Work Group Chairs
9:40 AM	Work Group Breakouts (with task group breakouts)	140	Work Group Chairs
12:00 PM	Technical Speaker: Water Quality Indicators Mapping Tool	60	Rusty Wasem
1:00 PM	2019 NMC Session Formation	240	See theme assignments for review teams (lead: Monty Porter)
5:00 PM	Wrap up for day	5	Gary/Susan

Thursday, November 8th, 2018

Time (MST)	Topic	Duration	Speaker
8:00 AM	Introduction and review of Wednesday	10	Gary/Susan
8:10 AM	Water Quality Portal Work Groups Update	60	Lori Sprague (Gary is going to make sure that is enough time. Are we on track to report out in March?)
9:10 AM	National Academies Report and Internet of Water Intro	80	Gary Rowe
10:30 AM	Overview of 2019 NMC	30	Jeff Schloss
11:00 AM	12th NMC Timing and Venue	60	Candice Hopkins
12:00 PM	Bystander Training	60	Alex Etheridge
1:00 PM	2019 NMC Code of Conduct	30	Mike McHale
1:30 PM	Field trips and local activities at 2019 NMC	30	Lareina Guenzel
2:00 PM	Conference wrap-up	180	(if this finishes early, we would like to do Agency Updates in Round Robin style)
5:00 PM	Adjourn	5	Gary/Susan

Attendees:

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