

**Upper Mississippi River Basin Association
Water Quality Task Force Meeting
February 5-6, 2014
Davenport, Iowa**

Meeting Summary

Participants

Gregg Good*	Illinois EPA
Matt Short*	Illinois EPA
John Olson	Iowa DNR
Joel Chirhart	Minnesota PCA
Glenn Skuta	Minnesota PCA
Mohsen Dkhili	Missouri DNR
Jim Baumann*	Wisconsin DNR
Aaron Larson*	Wisconsin DNR
John Sullivan	Wisconsin DNR
Linda Holst*	US EPA, Region 5
Kevin Richards	USGS, Iowa Water Science Center
Albert Ettinger	Mississippi River Collaborative
Lori Stenzel	American Water Company
Rich Batiuk*	US EPA, Chesapeake Bay Program
Peter Tango*	USGS, Chesapeake Bay Program
Jeff Thomas*	Ohio River Valley Water Sanitation Commission (ORSANCO)
Tom Fikslin*	Delaware River Basin Commission (DRBC)
Lark Weller	NPS, Mississippi National River and Recreation Area
Trevor Russell*	Friends of the Mississippi River
Dru Buntin	UMRBA
Dave Hokanson	UMRBA

* *Joined the meeting by phone.*

Call to Order and Introductions

The meeting of the UMRBA Water Quality Task Force (WQTF) was called to order at 1:05 p.m. on February 5, 2014 by Chair Mohsen Dkhili. Introductions by all participants followed.

UMR CWA Monitoring Strategy Project Update

Dave Hokanson gave a brief update on the WQTF's monitoring strategy project, noting that the draft *UMR CWA Recommended Monitoring Plan* had been discussed by the UMRBA Board and Water Quality Executive Committee (WQEC) during their joint meeting in November 2013. He indicated that some modifications had been made to the *Plan* in response to Board and WQEC discussions and in particular: 1) the broader value of data collected under the *Plan* in detecting change and potential impact of management activities receives greater emphasis (i.e., beyond specific CWA functions alone), and 2) the development of a shared CWA assessment is now characterized in terms of determining its feasibility rather than portraying such an assessment as a "sure thing." Hokanson noted that the work group examining shared UMR CWA assessment has been formed, holding its first conference call on January 29, 2014. He explained that this topic would be discussed in detail later in the meeting. Hokanson noted that other monitoring strategy-related developments since the last WQTF meeting have

included the drafting of a data comparison “crosswalk” and a monitoring strategy frequently asked questions sheet.

Hokanson said he and UMRBA Executive Director Dru Buntin would be discussing the *Plan* with leadership of the Iowa Department of Agriculture and Land Stewardship and the Iowa Department of Natural Resources on February 7, 2014. He said the *Plan* would then be presented to the UMRBA Board for its consideration during the quarterly UMRBA meeting on February 25, 2014. Should the Board approve the Plan, UMRBA staff would then proceed in arranging for its printing and would create an accompanying summary flyer. Hokanson commented that, should implementation of the monitoring strategy proceed, the WQTF will likely be addressing the issues of assessment, data management, pilot projects, building partnerships, and identifying resources to support monitoring in the long term. Along these lines, he said the presentations scheduled for this WQTF meeting are intended to aid the group’s consideration of these issues.

Chesapeake Bay Program Monitoring, Assessment, and Data Management

Chesapeake Bay Program Partnership Organization Structure

Rich Batiuk began the Chesapeake Bay Program presentation by reviewing the Program’s organizational structure, emphasizing the importance of broad engagement given the scale of the resource and the number of entities involved. He also noted that an annual gathering of Governors and cabinet secretaries is a key part of their partnership process. Batiuk explained that the Program’s activities are organized under the auspices of the Chesapeake 2000 agreement. He emphasized that the structure of the partnership cultivates a need for good data and ensures that the data collected is indeed utilized by various entities.

Tidal and Watershed Monitoring Networks

Batiuk said the Program’s monitoring has evolved over time from a focus on status and trends to a focus on understanding ecosystem processes. He explained that, about 20 years into the life of the monitoring program, senior management from partnership members gathered to identify monitoring network priority objectives, which were delineated as follows:

- Maintain the tidal Bay network for assessing water quality criteria attainment (listing/delisting waters), providing an integrated picture of condition.
- Enhance watershed monitoring network to assess more local responses to management actions, including an improved understanding of potentially delayed responses to management actions. .
- Evaluate management effectiveness, feeding back to adaptation of program implementation (i.e., adaptive management).

Batiuk emphasized the importance of periodically carrying out this type of exercise, allowing decision-makers to provide feedback and to determine what they see as priorities. He also said it has been critical in the development of the network that states’ programs become knit together to become consistent and interdependent. This has included utilizing consistent data collection and analysis methods, with states all contributing into a collective pool of funding. Additionally, Batiuk displayed a slide illustrating the Program’s monitoring networks and which have operated continually over the past 30 years, which have been dropped, and which have been added.

Batiuk next described the Program’s Watershed Monitoring Network. He explained that this had not been an emphasis area for the first 30 years of monitoring by the Program, but that it had been initiated via the signing of MOU in 2004, building from existing state programs to a current network of 122 long term monitoring stations throughout the Chesapeake Bay watershed. Batiuk noted that one of the key features of this network has been the collection of storm event samples.

Batiuk then turned to a description of the Program's Tidal Bay Monitoring Network, a fixed-station network collecting information on 26 different parameters within 92 defined Bay segments. He said this network has been up and running for approximately 30 years and incorporates the measurement of physical, chemical, and biological parameters including submerged aquatic vegetation and benthic invertebrates.

Use of Monitoring to Support Shared Decision-Making

Peter Tango next described how data produced from the monitoring network has been used to support shared decision-making among Chesapeake Bay partners. Specifically, he detailed how consistent data collection has supported the calculation of nitrogen loads and flow adjusted concentrations. Batiuk said another example of the use of the data has been development of shared aquatic life use definitions, noting that the data was critical in allowing these uses to be agreed upon. Hokanson asked Batiuk to comment further on the notion of which comes first – the data or the uses – as this has been something the WQTF has discussed in pursuing the development of its monitoring strategy. Batiuk responded that gathering the data was mission critical in developing shared use definitions, as this gave the states a level of comfort with the descriptions of conditions that accompany the use categories. He explained that, while there will always be some uncertainties and data limitations, it is important to develop a shared understanding of conditions that allows states to share use definitions. Tango added that having area-specific data is also important in order to build comfort and confidence in use definitions.

In terms of the application of data, Batiuk explained it has been utilized in developing models for TMDL development and in examining the potential impacts of climate change. He noted that the data has been used in multiple ways, by multiple partners, including in GIS/mapping applications.

Water Quality Assessments

Batiuk emphasized that data collected had also allowed for the development of specific assessment procedures associated with designated use definitions (e.g., seasonal application of some uses). He said a cabinet-level agreement had been reached among the states describing how the states making impairment determinations, adding that transparency and clarity is essential in these processes. In particular, he said the states look to the outcomes of Chesapeake workgroup deliberations in making determinations regarding their impairment lists. Batiuk explained that, ultimately, the Program is able to produce a unified statement or map illustrating the Bay's condition which ties back to states' assessment and impairment determinations.

Monitoring Program Finances

Batiuk displayed a graph illustrating US EPA's contribution to Chesapeake Bay monitoring over the past five years, which has ranged from \$2.4 million to \$4.9 million annually, noting that funding has increased substantially since 2009 due to both state and federal funding contributions. He explained that US EPA's contribution is augmented by matching funds provided by grantees as well as additional contributions by network partners. For example, in 2012, US EPA contributed approximately \$5 million, matching funds amounted to \$2 million, and network partners contributed \$5 million, for a total of approximately \$12 million in monitoring funds. Batiuk noted that the diversity of funding sources can be advantageous at time of budget downturns.

Data Sources and Data Management Structures

Batiuk said the program had begun with one single database but had evolved to a networked data system, using an exchange network. He said data is brought into the system from a variety of sources and partners, with quality assurance/quality control procedures employed to give partners confidence in the quality and consistency of the information. Batiuk noted that data management is a topic of

considerable complexity and could be the subject of future, dedicated discussion involving Program data management staff and the WQTF.

Lessons Learned

Batiuk offered the following lessons learned from the implementation of their monitoring program over nearly 30 years:

- Get senior agency managers' agreement on shared objectives for monitoring
- Fund shared staff empowered to coordinate networks
- Put in place a management structure for making shared monitoring network decisions
- Institutionalize, re-enforce, and reward collaborative decision making
- Build on initial successes to further empower partners to take advantage of the collaborative efforts/networks

Additionally, Batiuk offered his suggestions for next steps in the WQTF's monitoring strategy work:

- Draft and sign a multi-state/federal agency agreement establishing a shared monitoring network and its future governance. He suggested Chesapeake's 2004 monitoring MOU as a possible model for this.
- Reach agreement among the basin states and the two EPA regions on a system for making collaborative WQS assessments and shared listing/delisting decisions.
- Move towards adoption of a common designated use framework applied across shared waters embedded into each states' water quality standards regulations

John Olson asked what the original impetus had been for the creation of the Chesapeake Bay Program. Batiuk replied that, in the 1970s, Bay fish populations were declining and massive algal blooms were occurring. He explained that the initial Chesapeake Bay agreement of 1983 was signed in response to these declining conditions. Olson asked when TMDLs were put into place on the Bay. Batiuk said TMDLs started to be put in place after the 1983 agreement and the Chesapeake 2000 agreement did anticipate the creation of a Bay-wide TMDL. Sullivan asked when the first impairment listings were made for the Bay. Batiuk replied that only narrative standards were in place in the 1970s and that non-attainment of these standards at the time was essentially the first impairment listing for the Bay.

Olson noted that the program's monitoring and assessment activities appear to be focused only on the aquatic life use. He asked whether other uses were addressed by the Program. Batiuk said the partnership had decided early on just to focus on the aquatic life use and that the monitoring and assessment of other uses, such as recreation and drinking water, was best done at the state level.

Glenn Skuta asked Batiuk to further describe the process by which the states adopted compatible standards and reached agreement on impairment listings. Batiuk said the states each utilized their typical rule-making process to adopt compatible criteria. He explained that the Program would evaluate the science behind a potential standard to see if it appeared to be "criteria-ready" before the states would initiate a rule-making process, noting again the importance of the science preceding the regulatory determination. Batiuk added that lawsuits and apparent inevitability of a Bay-wide TMDL also drove the states toward common agreement.

Sullivan asked how the Program determines what monitoring to cut back in low budget years. Batiuk said the Program's management structure/work groups are utilized in the decision-making process.

Albert Ettinger asked whether discharger-collected or citizen monitoring data is incorporated into the Program's databases. Batiuk replied that this has not been done to date, but that it will be a next step in the evolution of the monitoring program. He emphasized that the Program will want to be able to actively employ this type of data in its work, not just gather it in.

Gregg Good observed that an MOU such as that utilized on the Chesapeake Bay to coordinate monitoring may indeed be helpful in moving forward with UMR CWA monitoring. Batiuk recommended that the states' decision-making regarding UMR water quality be hinged on the existence of the monitoring network. Skuta asked whether Batiuk felt Governor-level buy-in is important for the success of the monitoring program. Batiuk replied that the Governors are in position to get the attention of other lawmakers and US EPA Regional Administrators. Skuta asked whether UMRBA is in a position to get Governors' support. Hokanson replied that UMRBA can, and has worked in the past, to develop Governors' statements regarding various issues where appropriate, including the 2007 Governors' statement regarding UMR water quality.

Ohio River Valley Sanitation Commission (ORSANCO) Data Management and Water Quality Assessment

Jeff Thomas began his presentation by comparing ORSANCO to the Chesapeake Bay Program, which had been the topic of the previous presentation. Thomas commented that while the Chesapeake Bay Program relies on a series of agency monitoring efforts to be integrated into a single "entity," ORSANCO is a single entity which maintains a series of monitoring networks. He added that another contrast between ORSANCO and the Chesapeake Bay Program is that ORSANCO focuses only on the mainstem river while Chesapeake's activities have expanded into the watershed.

Thomas emphasized that, while he will be describing the processes of assessment and data management in detail, it is really ORSANCO's various workgroups that make these functions successful – as it is the work groups which make the decisions supporting monitoring, data management, and assessment.

Data Management

Thomas briefly described the major elements of ORSANCO's monitoring programs, which are:

- Fish Community
- Macroinvertebrate Community
- Fish Tissue Contaminants
- Phytoplankton/Nutrients
- Bacteria
- Bimonthly Water Chemistry
- Continuous Monitors
- Flow

He noted that the first three elements listed – fish community, macroinvertebrate community, and fish tissue contaminants are closely related in terms of data management, adding that the overlaps and relationships between the various data sets are important. Thomas also indicated that the use of continuous monitoring is a relative new component of ORSANCO's monitoring program.

Thomas next described specific data management procedures for fish community data. He said all of this data is stored in-house in an Access database. Skuta asked whether any issues with performance have been encountered with the growing amount of data stored. Thomas replied that no issues have

been encountered to date and all data is backed up both on site at ORSANCO and to “cloud” storage. He added that metadata and QA/QC processes are very important components of data management.

Thomas explained that ORSANCO has standalone databases for fish, phytoplankton, bacteria, bimonthly and clean metals sampling. He said most data is collected by ORSANCO staff, plus a limited number of contract workers. Hokanson asked whether data could be compared and linked easily across the standalone databases. Thomas replied that, in some cases, the data would need to be queried out of the individual databases in order for a comparison to be made, explaining that a locational coding system is in place only across biological parameters at the current time. He added that ORSANCO is currently seeking to better integrate its sampling and specifically is drafting a comparison study of the relationship between various parameters at a specific sampling locations. Thomas said he is happy to share the comparison study with the WQTF once it is complete.

Ettinger asked whether ORSANCO is utilizing continuous monitoring of dissolved oxygen. Thomas replied that ORSANCO is beginning to collect this type of information both from its two Hydrolab sensors and by utilizing data from data collectors outside ORSANCO, including USACE, USGS, and private industry. He explained that ORSANCO is also utilizing six “HOBO” data loggers as an inexpensive approach to the hourly collection of temperature and conductivity data. Thomas said the Hydrolab data is currently being placed into an Excel spreadsheet, while the data from outside collectors and the HOBO loggers is being stored in Access databases following quality assurance review.

Noting that the continuous monitoring is all taking place at dam sites, Sullivan asked whether these sites are all upstream, all downstream, or a mixture of location types. Thomas replied that all dam sites are located upstream along the lock wall, typically in a lower flow area. As such, he explained, all the sites are similar and these locations provide for some protection of the data collection equipment.

In terms of flow information, Thomas said ORSANCO hand enters flow information received from the National Weather Service (NWS) and USACE into a database and that ORSANCO has become the long-repository for the NWS information. He said USACE provides ORSANCO with modeled flow and velocity based on data collected the previous year from over 200 Ohio main stem nodes, as well as over 200 tributary nodes.

In concluding the data management portion of his presentation, Thomas displayed a table of the various data sets maintained by ORSANCO, the program in which they are stored, and the years for which data are available. Sullivan asked whether ORSANCO collects chlorophyll data. Thomas replied that ORSANCO does have this data, likely as part of the bimonthly sampling program. Ettinger asked if this information is readily available online. Thomas replied that the data can be retrieved from <http://www.orsanco.org/data>.

Olson asked whether ORSANCO maintains a reference collection for use with fish and macroinvertebrate sampling. Thomas answered that yes, ORSANCO has maintained such a collection, but that they are moving to the use of photos of various specimens and species. Olson asked where the reference collection is housed. Thomas answered that it is kept at Thomas Moore College in the Cincinnati area.

Hokanson asked whether ORSANCO’s organics detection system (ODS) data is included in the data sets described in this presentation. Thomas answered that the ODS data is not part of the data system he has described and it is not utilized 305(b) assessment development, adding that ORSANCO’s Jerry Schulte would be in a better position to address how ODS data is collected and stored. Ettinger asked whether the nutrient trading pilot program led by the Electric Power Research Institute (EPRI), in which ORSANCO participates, is utilizing the nutrient data described in the presentation. Thomas said he is not familiar with the extent to which the data is used in the trading program, but noted that the trading

program is a basin-wide initiative, while ORSANCO's water quality monitoring data is largely limited to the main stem Ohio River. As such, he suggested that these data sets are likely not central to the trading effort.

Water Quality Assessment

Thomas next described the process by which ORSANCO develops its biennial water quality assessment of the Ohio River, noting the following elements:

- The assessment is the product of an interagency workgroup led by ORSANCO staff that includes one member from each of six main stem states.
- The workgroup meets via 2-3 conference calls during the development of the assessment.
- In general, the assessments use data from most recent five year period
- An external data use policy is in development and can be shared with the WQTF when it is complete
- A "weight of evidence" approach is used in making the assessment, with "most trusted" dataset being used to "break ties" in cases of conflicting information. For aquatic life use assessment, the biological data set is considered to be the definitive data source.
- The final assessment is simply a recommendation to the states, and some states elect to list their waters differently than what the work group recommends.
- The assessment covers the four main designated uses assigned to the Ohio River: public water supply, contact recreation, aquatic life and fish consumption.

Skuta asked how frequently a state will make an assessment/listing determination that differs from the ORSANCO assessment. Thomas replied that, in general, states will agree with the outcomes of the ORSANCO assessment. However, he noted that differences do arise and states may have differing limitations in their ability to adopt the ORSANCO assessment. Good concurred that, in his experience working with ORSANCO, the states will typically incorporate the results of the shared assessment. However, he added, it is very important for the states to have the last word in decision-making, as is the case with ORSANCO's approach. Thomas added that ORSANCO's assessment processes also evolve over time and as such are responsive to evolving knowledge and state input.

Thomas next described in greater detail ORSANCO's approach to fish consumption use assessment, which he noted is done at the navigational pool level and is broken into two components as follows:

- *PCBs and Dioxins*: The entire river is listed as impaired due to the results of a 1997-2004 longitudinal water column survey.
- *Mercury*: ORSANCO has moved away from using fish consumption advisories in making assessment determinations. Rather, they now are focusing on methyl mercury concentrations in fish tissue and total mercury values in the water column. Both the fish tissue and water column values are considered in determining attainment status.

Ettinger asked whether much correlation has been observed between water column concentrations and fish tissue concentrations. Thomas responded that Erich Emery, formerly with ORSANCO, had examined this question but did not find much in terms of correlation. Additionally, Thomas explained, ORSANCO has observed considerable variation by species and location in mercury results. As such, ORSANCO has chosen to keep the two independent measurements as part of its assessment, at least for the time being. Sullivan asked whether ORSANCO monitors for PCBs in fish tissue. Thomas explained that ORSANCO does indeed collect this information, but that it is not used in the assessment

process as the existing longitudinal water column survey has been seen as definitive in triggering a river-wide impairment.

Thomas next described ORSANCO's approach to aquatic life use assessment. He said a fish index – the Modified Ohio River Fish Index (mORFIn) – is currently the only biological index incorporated into ORSANCO's assessment, though the use of a macroinvertebrate index is also being explored. The incorporation of a second biological measure would raise the question of how to address conflicting results among the indices, though Thomas said the current thinking at ORSANCO is that either index could independently trigger an impairment listing. He explained that 15 sites are sampled per pool for the fish index calculation, with a mORFIn score of 20 or more indicating that the fish community is in good health. Thomas said that, while the biological score is central to determining aquatic life use attainment, chemical measurements from bimonthly sampling are also incorporated in attainment determinations. He described ORSANCO's approach wherein both fish community scores and the percentage of chemical results exceeding a criterion are considered in making the aquatic life use attainment determination. Sullivan asked if the water chemistry results are drawn from fixed sites and, if so, which sites are then used alongside the randomly sampled fish metrics. Thomas replied that fixed site data is used, but that in his role he is not specifically familiar with how fixed site chemistry data are matched up with fish data. He concluded by noting that ORSANCO has not currently identified any impairments for aquatic life use on the Ohio River.

Thomas explained that contact recreation use is assessed over a season running from April 1 to October 31 each year, and incorporates results from both ORSANCO's annual community-based sampling as well as an historic longitudinal survey conducted in 2003-2008. He noted that ORSANCO had recently revised its criterion to utilize a 90-day geometric mean, as had been previously proposed by US EPA. However, US EPA has subsequently withdrawn this proposal leaving ORSANCO – at least temporarily – with a less stringent criterion than its states. As such, ORSANCO is currently deferring to its states' approaches on contact recreation attainment determinations. He noted that ORSANCO currently identifies approximately two-thirds of the Ohio River as impaired for the contact recreation use, adding that recreation use determinations can be very challenging as data can be very dynamic and dependent on river flow conditions.

Thomas said data for drinking water use assessment comes primarily from bimonthly/clean metals sampling, bacteria surveys, and ODS monitoring for spills, noting that there are 33 drinking water intakes on the Ohio River serving approximately five million individuals. He added that public water systems are also surveyed in regard to intake closures and maximum contaminant level (MCL) violations. He explained that results greater than an MCL in source water and intake closures are factors which may cause the drinking water use to be considered impaired. To date, Thomas said, ORSANCO has not had to list any segments of the Ohio River as impaired for the drinking water use.

Ettinger asked whether ORSANCO has eutrophication standards in place similar to those in Kentucky. Thomas replied that ORSANCO does not have such standards at this time and anything similar is probably a few years away in terms of its development. Ettinger asked if chlorophyll-a results were incorporated in ORSANCO's assessment process. Thomas answered that this data is incorporated, but he would need to confirm exactly how and for which use(s) it is employed.

Good asked whether ORSANCO has specific water quality standards. Thomas replied that, yes, ORSANCO has established a specific set of standards (available at <http://www.orsanco.org/pcs>). Good further asked how these standards are otherwise used or viewed by the states, given that ORSANCO's assessment is essentially a recommendation to the states. Thomas replied that states often choose to defer to ORSANCO's standards in applying the CWA programs to the Ohio River.

Water Quality Task Force Discussion/Reaction to Presentations

Good said his preference is to begin with ORSANCO's approach to water quality assessment, at least as a starting point for UMR assessment. He added that there is benefit in there being consistency on the Ohio River and Mississippi River. Skuta agreed, noting that taking similar approaches on the two rivers could help in communicating consistently regarding the rivers' condition. Sullivan expressed some concern that ORSANCO's methodology was not entirely clear, particularly in regard to the application of its "weight of evidence" approach. Good concurred that there is definitely a need to get further clarity, but that in general it seemed that ORSANCO's approach allowed for the incorporation of best professional judgment in making assessment determinations.

Sullivan suggested that, if an ORSANCO-like methodology is crafted for the UMR, one way to test it out would be to run existing EMAP-GRE data through the methodology as this would highlight any difficulties in processing the data and unintended consequences/unexpected results in assessment outcomes. Essentially, this would allow for ground-truthing of the methodology using the only existing river-wide data set.

Skuta noted that the Chesapeake Bay presentation emphasized the importance of high-level buy-in for monitoring programs to be successful. Ettinger concurred, saying he has heard similar messages in regard to Great Lakes monitoring. Skuta asked whether UMRBA can provide this type of buy-in. Hokanson said UMRBA's Board is composed of Governor appointees representing their states as a whole. As such, UMRBA can, and has, facilitated Governor-level expressions of support, such as the 2007 Governors' statement on UMR water quality.

Hokanson asked whether a UMRBA Board endorsement of the monitoring plan would be helpful or necessary for Skuta to move forward in pursuing the *UMR CWA Recommended Monitoring Plan* on Minnesota's segment of the river. Skuta replied that, in terms of technical information, he has enough in hand to proceed, but that the states' endorsement via UMRBA would definitely strengthen his case in pursuing funding. Sullivan suggested that Wisconsin DNR may be able to collaborate with Minnesota PCA in implementing monitoring on their shared segment of the river. As such, he suggested, implementation of pilot monitoring may be closer to a reality than we realize.

The meeting adjourned for the day at 5:00 p.m. and resumed at 8:00 a.m. on February 6, 2014.

Delaware River Basin Commission (DRBC) Monitoring, Assessment, and Data Management

Hokanson introduced Tom Fikslin, Manager of DRBC's Modeling, Monitoring and Assessment Section.

Water Quality Monitoring

Fikslin began his presentation by describing the two primary objectives of DRBC's monitoring programs as follows:

- 1) To support management programs of the Commission including:
 - Compliance with water quality standards,
 - Compliance with Existing Water Quality (EWQ) in Special Protection Waters,
 - To develop TMDLs and assimilative capacity determinations,
 - To establish and calibrate water quality models, and
 - To track the salt front for reservoir operations.
- 2) To evaluate emerging threats to the water resources of the Basin.

He next gave an overview of the components of DRBC's monitoring programs which include the following activities:

- Boat run sampling,
- Real time water quality monitors,
- Scenic rivers monitoring program (SRMP),
- Natural Gas Baseline monitoring, including:
 - Conductivity loggers;
 - Archived sample re-analysis;
 - Radiochemistry;
 - Macroinvertebrates;
 - Chronic toxicity testing - standard and mayfly species
- Fish tissue monitoring,
- Freshwater mussel survey,
- Annual/bi-annual biomonitoring: macroinvertebrates and periphyton,
- Nutrient estuary point discharge monitoring,
- Chronic toxicity,
- Emerging toxics, and
- Assisting with National Rivers and Streams Assessment (NRSA)

For each monitoring component, Fikslin described the monitoring design, sample location, parameters sampled and purpose of the monitoring. He displayed sample outputs from several of the monitoring elements. Fikslin also noted the composition of DRBC's Modeling, Monitoring and Assessment Branch staff, commenting that this staff of nine permanent positions, plus interns, offers a diverse set of experiences and expertise. He said the work of the branch is focused on supporting monitoring and modeling efforts, as well as the development of DRBC's 305(b) assessment.

Ettinger asked Fikslin to describe any efforts DRBC has made to develop nutrient limits. Fikslin responded that DRBC efforts have focused on keeping nutrients at levels to prevent degradation. Ettinger asked if this results in more of an anti-degradation approach than a water quality standards approach *per se*. Fikslin said DRBC feels this is actually a superior approach as it both protects waters and typically results in higher expectations than a typical water quality standards approach.

Sullivan asked if DRBC has undertaken sediment studies and, if so, what conclusions they've reached from these investigations. Fikslin replied that DRBC has done some sediment sampling but does not feel it needs to be part of routine monitoring program (i.e., helpful information can be gathered at less frequent sampling events). He added that DRBC is currently examining how sediment may act as a reservoir for PCBs.

Water Quality Assessment

Fikslin noted that in 2012 DRBC produced a 305(b) report for the Delaware River and Bay and has also contributed to a "State of the Estuary/Basin" report produced by the Partnership for the Delaware Estuary. He described the distinctions between these two efforts as follows:

- 2012 Delaware River and Bay Water Quality Assessment (305(b)):
 - Compares observations to DRBC criteria
 - Determines whether water quality is supporting or not supporting of designated use(s)
 - Uses five year data window
 - Covers mainstem Delaware River and Bay only

- 2012 State of the Estuary/Basin Report:
 - Uses indicators, most of which are not criteria
 - Examines current status, long term trends, and future predictions
 - Uses ten year data window for current status, full period of record for long term trends
 - Covers entire basin

Fikslin said DRBC is now working on the 2014 305(b) report for the River and Bay. He next displayed a table showing the assessment units established by DRBC for the river and bay, as well as the designated uses assigned in these segments. Fikslin noted that the assessment units were established early on by DRBC and have been in place for many years. Ettinger asked for clarification in regard to assessment of the recreation uses. Fikslin replied that DRBC does assess recreation use but does not enter into determinations regarding individual swimming beaches. He also noted that DRBC does not assess public water supply in use in Zones 4, 5, or 6 due to higher salt content of the water in the bay which precludes its use as a drinking water sources. Sullivan asked why the shellfish consumption use is only assessed in Zone 6 and not in other areas of the bay. Fikslin replied that Zone 6 is the only area where oyster habitats are typically found.

Fikslin next displayed graphical results of dissolved oxygen (DO) monitoring, noting that low DO levels had been one of the problems which led to the creation of DRBC and that DO standards had been established by DRBC in 1967. Fikslin and other DRBC noted that DO levels have improved since the 1960s, but that there are still problem areas where DO criteria are not met – leading to impairment of the aquatic life use. Ettinger asked what DRBC’s standard is for DO. Fikslin replied that DRBC utilizes a 3.5 mg/l, 24-hour average and does not currently employ an instantaneous standard. However, he added, DRBC may be revising this and moving closer to US EPA recommendations.

Fikslin said DRBC conducts monitoring for both macroinvertebrates and periphyton, noting that currently just the macroinvertebrate results are incorporated in DRBC’s biological assessment via a six metric macroinvertebrate index of biotic integrity. Joel Chirart asked what the significance of the 75.6 score on the biological criteria assessment table is. Fikslin and DRBC staff explained that this is a combined macroinvertebrate IBI score covering the years of the assessment, adding that the (draft) biological assessment methodology is available on DRBC’s website (see www.state.nj.us/drbc/quality/reports/biological/index.html).

Fikslin next displayed a summary of DRBC’s 2010 and 2012 305(b) assessment results. He noted that fish consumption use was not supported in any of the assessment units in either year, aquatic life use was not supported in nearly all units in both years, and drinking water was not supported in most units in 2012. Fikslin said DRBC’s 2014 assessment is due to US EPA on April 1, 2014.

Data Management

Fikslin described DRBC’s data management approach as having been developed for current needs and as being adequate to manage the current data stream. However, he said that their current approach probably would not be sufficient for a greatly increased data stream, such as might result from continuous monitoring or large amounts of data collected in relationship to natural gas development. In terms of specific approaches to data storage, Fikslin said discrete chemistry data are kept in STORET/WQX (along with internal databases), while biological data and continuous logger data are stored only in internal databases. He added that data submission to STORET is not done by DRBC, but

rather via the states, as it is more efficient to use the state-based nodes. Fikslin highlighted DRBC's interactive maps available at <http://www.state.nj.us/drbc/basin/map/interactive-map.html> and noted that DRBC would also like to take advantage of the new national water quality information portal being developed by USGS, US EPA, and the National Water Quality Monitoring Council.

Skuta asked Fikslin to clarify whether biological information is currently being submitted to STORET. Fikslin replied that it is not currently being submitted to STORET, but that this is being investigated. Olson asked why nearly all of DRBC's zones were not in attainment for aquatic life use. Fikslin replied that this is largely being driven by high pH results, adding that DRBC is pursuing the inclusion of a "natural conditions" component in its standards which may mean that high pH results will not necessarily be considered an impairment. Olson noted that, in Iowa, greater than 10% of results must exceed a standard in order for an impairment to be identified, which means that periodic high values for pH do not necessarily trigger an impairment. Fikslin replied that their data would likely indicate impairment due to pH even if a 10% cutoff was employed, adding that time of day also affects results. As such, he continued, implementing continuous monitoring may reduce the proportion of results above the criteria. Holst asked how DRBC is justifying the use of a natural conditions approach for pH. Fikslin replied that the approach will look at the co-occurrence of nutrients/nutrient effects in determining whether a pH value above 8.5 is actually contributing to an impaired water condition or whether this may be a naturally occurring condition.

Sullivan asked whether DRBC has criteria for periphyton or filamentous algae. Fikslin replied that this is something DRBC is working on, and in particular is considering the use of the percentage of eutrophic diatoms and/or a multimetric index.

Skuta asked about the relationship between the 305(b)-type assessment developed by DRBC and states' 303(d) impairment listings. Fikslin replied that DRBC works with the states as it develops the 305(b) assessment, also inviting US EPA into the discussion. He added that DRBC seeks to initiate work as soon as possible in an assessment cycle, to allow plenty of time for coordination with the states. Buntin asked whether there are shared or consistent water quality standards among the states for the Delaware River and Bay. Fikslin answered that, except for New York, the states defer to DRBC-established standards. He noted that the presence of shared standards is key in developing the 305(b) assessment for the Delaware River and Bay.

Buntin asked whether the submission of data to STORET is driven by grant requirements or whether there is another driver in using STORET. Fikslin indicated that there are limitations in the use of STORET, an example being that not all of the information gathered in gas chromatography/mass spectrometer analysis can be entered into STORET. Hokanson asked Fikslin to further describe DRBC's data management approach, with participation by a large number of partners in data collection, analysis, and submission. Fikslin replied that the specific data management approach varies by program, with some types of data going directly to STORET and others being processed at DRBC at then submitted to STORET. He added that, while DRBC does do a data solicitation, most of the data used in assessment comes from DRBC and its partners, further noting that a small amount of citizen-collected information is utilized via its submission to New Jersey's database.

Good asked how the DRBC assessment relates to the states' 303(d) impairment lists and what role the US EPA regions have in this process. Fikslin replied that the process is analogous to that utilized by ORSANCO, in that the states can utilize the assessment outcomes in their own 305(b) assessments and 303(d) lists, but are not necessarily required to do so.

Monitoring of West Virginia Spill Plume

Jerry Schulte presented regarding ORSANCO's work to monitor the plume resulting from the recent chemical release on the Elk River in West Virginia as it traveled down the Ohio River. He noted that

the spill occurred just 1.5 miles upriver from the West Virginia American drinking water intake on the Elk River in Charleston, West Virginia and that the chemical released was 4-methylcyclohexane methanol (MCHM), a product used in the coal industry. Schulte then described the movement of the spill plume to the Ohio River and how ORSANCO's organics detection system (ODS) was utilized to help track the spill plume, noting that there are five drinking water intakes within 100 miles downstream of where the spill entered the Ohio River. With the flow of the relatively fast (about 3 miles an hour), the plume reached these intakes in about 24 hours after hitting the Ohio River. Schulte described the decreasing concentrations measured as the plume moved down the Ohio River, noting that there appeared to be degradation of the product in addition to dilution. He also emphasized that communication among entities involved was critical during this incident.

Albert Ettinger asked whether monitoring was done for degradation products in addition to MCHM specifically. Schulte replied that monitoring focused on MCHM, but there was not an indication of degradation products present in the mass spectrometer analysis run as part of the ODS system. Hokanson asked whether the spill resulted in changes in treatment processes at drinking water plant and whether conventional treatment processes would be effective at removing the MCHM. Lori Stenzel said an incident such as this may result in an increased use of powdered activated carbon (PAC) or granular activated carbon (GAC). Schulte concurred, saying one of the benefits of the ODS system is that it can help utilities know when/if they may need to up the use of PAC or GAC, allowing them to target treatment timing.

Sullivan asked whether a report will be produced on the response monitoring and the costs of additional monitoring. Schulte replied that ORSANCO is compiling cost information, but that a great increase in cost above the typical operations of the ODS is not expected, since much of the monitoring was conducted using facilities and personnel already part of the ODS. In terms of a report on the monitoring of the spill, Schulte said he hopes to be able to develop such a report. Kevin Richards asked Schulte to describe the function of the ODS in greater detail. Schulte replied that the system utilizes laboratory-based gas chromatography/mass spectrometer detection.

Schulte also noted the introduction of a bill (S. 1961) by Senator Joe Manchin of West Virginia to increase the inspection and regulation of chemical storage facilities. Buntin commented that the bill appears to create an inspection requirement for chemical facilities under the Safe Drinking Water Act (SDWA), a function beyond the traditional role of the SDWA.

Twin Cities Metro Mississippi River State of the River Report

Lark Weller of the National Park Service and Trevor Russell of Friends of the Mississippi River jointly presented an overview of the *State of the River* report released in late 2012 and covering 72 miles of the Upper Mississippi River from the Crow River confluence to just below the St. Croix River confluence, as well as 4 miles of the Minnesota River. This segment of the river flows through the Twin Cities metropolitan area and matches the designated area of the Mississippi National River and Recreation Area (MNRRA). They explained that the report was designed to answer questions commonly asked by the public, including: *Can I swim in the river? What about bacteria levels? What about Asian carp? Is flow really increasing? Is nitrate increasing? Can I eat the fish I catch?* Further, Weller and Russell characterized the goals of the report as follows:

- Communicate information on the state of the Mississippi River to a broad audience in an easily accessible way.
- Increase public awareness about the range of factors affecting water quality and river health.
- Build public support around priorities for action to protect the river and its watershed.

Weller and Russell then described the process by which the report was created, involving several funding sources and input from a variety of science and technical advisors.

Of the 13 indicators covered by the report, Weller and Russell chose to focus on three – sediment, Asian carp, and triclosan – for the presentation to the WQTF. In their discussion of sediment, Weller and Russell noted the adverse effect of sediment on aquatic plants and animals, increased rates of sedimentation in Lake Pepin, the Minnesota River as a primary source of sediment to the UMR within Minnesota, and potential methods of reducing sediment loading including agricultural conservation, water retention, urban runoff controls, and in-river restoration actions such as island building and draw-downs. Regarding Asian carp, they discussed the known extent of Asian carp presence, threats to ecosystem health and recreation posed by Asian carp, ongoing collaborative actions, and mechanisms of prevention and control. Weller and Russell also discussed triclosan in detail, commenting on the concerns associated with its use including impacts environmental and human health such as bacterial resistance and dioxin formation. They also noted several policy actions that have recently been taken to address triclosan concerns, including the State of Minnesota's decision to end the use of triclosan-containing products by state agencies. Weller and Russell also briefly mentioned the other indicators addressed in the report: flows, bacteria, nitrate, phosphorus, fish consumption, fish survey, mussels, bald eagles, perfluorooctane sulfonate (PFOS), and additional contaminants of concern. They additionally noted that the report had been accompanied by a *Stewardship Guide* and a *Policy Guide*.

Weller and Russell noted that there has been strong interest in the report since its release, leading to over 50 presentations and over 40,000 visits to the State of the River website.

Hokanson asked about the process of collaborating with various agency representatives and their reactions to the report's findings. Weller replied that she and Russell worked closely with science and technical advisors from the agencies throughout the process of report development, asking for their review of and input on draft report text in order to assure that the conclusions presented in the report have a strong science base. As a result, she said, agencies were not surprised by the findings of the report and have been largely supportive of the recommendations made in the Policy Guide. Russell also added that the Report may be updated/repeated on a 4-5 year cycle. Linda Holst asked whether specific monitoring is being conducted to examine triclosan-derived dioxins in fish tissue. Russell replied that he is not aware of any specific monitoring currently being done. Good asked whether PFOS or triclosan appear on 303(d) lists for this section of the river. Russell replied that PFOS does appear in 303(d) listings, but that no standard yet exists for triclosan and it therefore cannot appear on 303(d) lists at this time.

Skuta thanked Weller and Russell for their presentation, noting that the *State of the River Report* has definitely generated a lot of attention and action in Minnesota, adding that a non-regulatory report such as this can potentially have more impact than typical regulatory actions. He then asked whether Weller and Russell had any suggestions for partners on the larger UMR who could potentially play a role similar to that of Friends of the Mississippi River had taken on in producing the report. Russell suggested both River Network and the McKnight Foundation as potential partners.

UMR CWA Assessment Project

Hokanson gave a brief summary of work on the UMR CWA assessment project to date. In particular, he noted the following:

- The UMR CWA assessment work group held its first conference call on January 29, 2014.
- The work group's initial mission statement is as follows: *The group's mission is to develop a draft, shared Clean Water Act assessment methodology for the UMR addressing its four major designated uses (aquatic life, drinking water, fish consumption, and recreation).*

- Some of the group’s initial discussion focused on assessment format and function (e.g., 305(b)-type, “state of the river” report, etc.)
- A criteria comparison chart is in draft, which includes possible parameters, indices, and thresholds to be utilized in UMR CWA assessment.
- The proposed work group process is as follows:
 - Approximately 6 months in duration.
 - Meet primarily via conference call.
 - Draft methodology as outcome.

Reflecting on the first day’s presentations to the WQTF, Hokanson further noted that there had been definite interest in ORSANCO’s approach as providing a starting point for UMR assessment work. Also, he recalled John Sullivan’s suggestion that - once a methodology is drafted - an existing data set, such as EMAP-GRE’s, be run through the methodology to help groundtruth and detect any problems in its function.

Skuta asked Mohsen Dkhili whether he is comfortable with the work group mission statement as written, given that Missouri had expressed some reservations regarding work on the UMR CWA assessment. Dkhili said he is comfortable with the statement as it uses the more general “UMR CWA assessment” description rather than a specific 305(b) reference.

Albert Ettinger asked whether nutrients would be incorporated into the UMR CWA assessment methodology. Dkhili replied that, to the extent nutrients affect the condition of the river, they should be included in the assessment. Skuta noted that it may be possible to look at multiple parameters in evaluating nutrient impacts. Dkhili agreed that a variety of assessment approaches for nutrients may be available, noting that the key is that this be considered in a scientific and coordinated manner.

Dru Buntin suggested that a “state of the river” type report could be pursued in the near term, with a 305(b) assessment then being developed if desired. Dkhili concurred, saying the key is to develop a methodology now, even if it is characterized as supporting a “state of the river” report than a 305(b)-type assessment *per se*.

Ettinger said that, from his perspective, he would rather see some progress now rather than the collaboration potentially being undermined by trying to go immediately to a 305(b)-type assessment.

John Olson said his opinion is that an ORSANCO-type approach, where the states are free to use or not use the outcomes of the river assessment, may be the best way to proceed. Gregg Good agreed, saying the WQTF could start with the ORSANCO assessment, using it as a model to follow in developing the specifics of the methodology, with an end product that might ultimately look more like a state of the river report. The WQTF emphasized that the focus of the work group should be on the methodology development, with public outreach and education efforts such as a state of the river report being later steps and outside of the group’s immediate mission.

The WQTF briefly reviewed the annotated criteria comparison document drafted by Olson. Ettinger said this appears to be a fairly comprehensive list, but asked if chloride could be added. Olson responded that this should be possible and requested that Hokanson send the document to the WQTF membership electronically to allow more time for review.

Skuta suggested that the work group begin by looking in more detail at ORSANCO’s assessment approach. There was general concurrence among the WQTF members with this suggestion. Sullivan

stated his concurrence with Skuta's proposal, though he added that the real challenges will be in the selections of thresholds and in the management of biological data. Skuta asked whether the assessment work group members felt comfortable with this direction. Olson replied that he felt comfortable in proceeding. Ettinger said the environmental groups he works with would be supportive of unified approaches, adding that the steps discussed seem to be on track.

UMR CWA Monitoring Strategy Project Implementation

Buntin noted that MPCA has previously expressed an intent to pilot monitoring as described in the *Plan*. He asked Skuta what level of support would need to be demonstrated by the states to help Minnesota in moving forward. Skuta replied that it would definitely be beneficial to have an explicit statement of support from all the states. Sullivan said it is likely that Wisconsin DNR would also be able to contribute, at least at some level, to a pilot monitoring project. Skuta said MPCA may be able to begin implementing monitoring as soon as 2016, though in order to do so he would have to put in a budget request very soon.

Next Steps

Hokanson noted that, due to the weather-delayed start of the meeting, not all of the originally listed agenda items had been addressed. He asked the WQTF members their preference for addressing these topics. The group was in agreement that a followup conference call should be held to address these items and well as discuss any further advancements in regard to the monitoring strategy project.

With no further business, the meeting adjourned at 12:30 p.m. on February 6, 2014.