Ohio River Basin States
CWP Cooperator's Roundtable
Summary

September 11-12, 2008 **Cincinnati, OH**

Co-sponsored by the

Overview: In cooperation with the Ohio River Basin Commission (ORBC), the Ohio River Valley Water Sanitation Commission (ORSANCO), the Interstate Council on Water Policy (ICWP) and the US Geological Survey (USGS) organized the first Cooperative Water Program (CWP) Cooperator's Roundtable for the five of the Ohio River Basin States in Cincinnati, OH. This roundtable was the sixth in a series of regional stakeholder meetings around the US, the purpose of which is to extend information about the USGS streamgaging and cooperative water science programs and create an opportunity for stakeholders to help strengthen those programs.

The program included presentations by USGS staff on the purposes, history and capabilities of the CWP and some of the challenges facing it. Several Cooperator representatives presented excellent descriptions of the scientific contribution that the CWP data collection and interpretive investigations have made and the benefits they bring to state and local water management. The Hach Company, Sutron Corporation, YSI/SonTek displayed new equipment and software capabilities and provided financial support to assure the registration would be affordable for everyone who wanted to participate.

The program, meeting book and PowerPoint presentation files are available from the ICWP website.

Welcome and Keynote Address: Peter Evans, Director of the ICWP, welcomed the almost 50 participants and drew their attention to the contents of the meeting book, described the program and emphasized the value of the break-out sessions at the end of the meeting. He also described the growing number of organizations and states that have endorsed letters to the Secretary of the Interior and Congress urging full implementation of the National Streamflow Information Program (NSIP) and restoration of the CWP capacity to match Cooperators' investment dollar-for-dollar.

Peter introduced and thanked Larry Feazell, the ORBC Executive Director, and Jerry Schulte, the Manager of Source Water Protection and Emergency Response Programs for ORSANCO, who each contributed to the program development and speaker selection for this program. Peter also introduced many of the USGS leaders that were in attendance, including:

- Matt Larsen, Associate Director for Water, USGS headquarters in Reston;
- Hugh Bevans, Director of the USGS West Virginia Water Science Center;
- Pat Lietman, Director of the USGS Pennsylvania Water Science Center;
- Scott Jackson, Acting-Director of the USGS Ohio Water Science Center;
- Mike Griffin, Assistant Director of the USGS Kentucky Water Science Center; and
- Bill Guertal, Director of the USGS Indiana Water Science Center.

LaJuana Wilcher delivered the keynote address. After leading the EPA Office of Wetlands, Oceans and Watersheds (1989-93) and the Kentucky Environmental & Public Protection Cabinet (2003-06), she is now practicing law in Bowling Green, KY. She used recent data from a national public opinion poll to

illustrate that protection and availability of water resources is of great concern to most of the American public, when people are asked specifically about our environment. However, the environment (generally) and water resources (specifically) are not among the top concerns when the public is asked generally about the greatest problems facing our society; the economy and the war in Iraq get top priority, and education and health care are identified as big concerns much more often when citizens are asked generally about their greatest concerns. LaJuana suggested that this helps explain why our elected officials don't give environmental protection (or water resource monitoring and management) more priority is the allocation of agency budgets and staff.

LaJuana also identified several "myths" that require clarification if we want the general public and our elected officials to understand the need for better measurement and evaluation of our waters:

- Water quality in the US is getting worse –in fact, many of the major pollution disasters (like the Cuyahoga River and Prince William Sound) have been cleaned up and life is returning to our rivers;
- We are gathering enough data and have enough information to accurately assess water quality in the US –the truth is that we are lucky when we can evaluate our alternatives using a set of streamgages with an average of 50-years of record, hardly enough to be really confident about the designs and operations we invest so much public finding in; we need real-time data and the science to identify problems and evaluate the sources and solutions much more rapidly;
- The US has plenty of water, especially in the eastern states –unfortunately, the experience of interstate disputes over both water quantity and water quality is becoming common among eastern states as it has among western states;
- We're doing a good job of regulating our biggest water quality problems in the US –it turns out that sediment and nutrients are now the toughest problems because the Clean Water Act doesn't include adequate authority to regulate agricultural runoff or municipal stormwater runoff; control of pharmaceuticals and personal care products in wastewater discharges is another example;
- Good science makes good public policy –it seems like it should, but we don't always do a very good job explaining the science or in resolving the discrepancy among experts to earn the trust and confidence of the general public, especially on the economically challenging issues;
- The public is willing to pay to protect the environment –the rates we charge our communities for clean drinking water and treated wastewater are far below cost in almost every community because the public resistance to paying the true cost as a direct fee is overwhelming.

Ms. Wilcher closed with a story about three bricklayers who were asked what they are doing one day as they worked near a public area. The first said he was laying brick; the second said she was building a wall; the third said they were laying the foundation for a great cathedral that would attract and inspire the faithful in their prayers. Too often, LaJuana suggested, we give the public and our elected officials the impression that we are just measuring streamflow or various pollutants instead of helping them see that we are providing the means to protect our communities from floods and droughts and to protect the fisheries and wildlife habitat within our watershed.

Regional Monitoring Networks

Overview of the ORSANCO Monitoring Network: Jerry Schulte is the Manager of Source Water Protection & Emergency Response; he described the overall responsibilities and capabilities of the ORSANCO. Jerry presented a description of the ORSANCO and its history, beginning with the approval of an interstate compact in 1948 among eight of the twelve states that include portions of the Ohio River Basin. Although all twelve states participated in the negotiation of the compact, it was enacted and signed into law by the states of Indiana, Illinois, New York, Kentucky, Ohio and Virginia, and the commonwealths of Pennsylvania and Virginia. The ORSANCO is governed by a 27 member commission made up of three representatives from each of the eight states and three federal representatives, providing

a strong and diverse source of expertise for monitoring and abating water pollution concerns. The Commission is supported by a technical committee and all meetings are held in public three times a year.

The geography and characteristics of the river are immense: the basin includes 220,000 square miles and the ORSANCO monitors and regulates water quality in a 981 mile stretch between Pittsburgh, PA and the confluence with the upper Mississippi river at Cairo, IL, where the Ohio contributes approximately 2/3 of the flow of the Mississippi River. Jerry described "ORSANCO land" as including 33 drinking water intakes, 144 industrial intakes, over 600 in NPDES-permitted discharges, over 150 species of fish more than 1300 CSOs and about 20 locks and dams! Since turbidity can vary from 3-1500 within a few hours, drinking water supplies must be filtered. They are currently operating almost a dozen monitoring programs that monitor dissolved oxygen, algae, nutrients, bacteria, organics, fish population dynamics, macro invertebrates and emerging contaminants. There are also conducting wet weather studies and watershed protection studies.

In addition to an extensive monitoring program, the states have authorized ORSANCO to establish water quality standards and given a responsibility for all public drinking water supplies when there is a significant spill. The ORSANCO gets about half of its funding and from you the US EPA (under section 106 of the federal Clean Water Act) and the other half from its' member states.

Overview of the Regional USGS Monitoring Network: Michael Griffin is the Hydrologic Surveillance Section Chief and Assistant Director of the USGS Kentucky Water Science Center. In his presentation, Mike provided an overview of the many important needs for the streamgage data. He indicated that, while streamgage data is "the backbone" of USGS, there has been increasing interest in data from their lake and reservoir stations, their groundwater monitors, their precipitation and meteorological measurements, and that water quality data has become their biggest push.

He described the Cooperator's emerging needs, including flood forecasting, climate change forecasts and hypoxia monitoring and control. Mike also described the extensive range of new technologies being installed, including the high data rate radios, acoustic sensors (which are more accurate and require less maintenance), the non-contact radar water level sensors (which also require less installation and maintenance support, and are less vulnerable to damage during high water and storm surge), and optical DO sensors. Most surface water stations are reporting real time data, and real-time groundwater seems to be increasingly popular.

All this data is quickly processed for delivery to their websites. Mike reviewed the range of website displays, including Real-Time Streamflow, and indicated the regional frustration caused by the continuing loss of streamgages with statistically significant records.

Overview of the Cooperative Water Program: Ward Staubitz is the National Coordinator of the CWP. His presentation described the scope and purpose of the oldest and largest USGS program for water data collection. The CWP developed over the past 112 years around a 50:50 cost share relationship between USGS and the water resource agencies in state, tribal and local government, representing a shared commitment to monitor the highest priority sites. Over the past 25 years, the number of cooperating agencies has more than doubled, with about 1,504 participating in 2007 and a combined budget of about $225M from the following sources:

- federal funds for the CWP ($64.3M);
- state, tribal and local agency funds ($161M)

The CWP continues to build national water databases, integrating data from over 15,000 sites throughout the country and making them accessible through the National Water Information System (NWIS) and its internet site (which responds to 25-30 million requests for data every month). These data support many interpretive studies (about 700 are currently underway) and models used by other public agencies and private companies, as well as the USGS, for flood frequency analysis, reservoir design and operations,

watershed modeling, aquifer characterization, conjunctive use of surface and ground water, limiting the intrusion of saltwater in aquifers, restoring habitat, protecting water quality and many other purposes.

The CWP has served an important role in establishing national protocols and standards for data quality and consistency and in keeping USGS scientists abreast of the changing needs and priorities of water resource management at all levels of government and in the business community.

Overview of the National Streamflow Information Program: Mike Norris is the National Coordinator of the NSIP, but he wasn't able to attend this meeting; Ward Staubitz gave Mike's presentation. He described the progress that USGS streamgaging programs have made, indicating that about 90% of the active streamgaging stations are now providing real-time data. he also discussed the shifting priorities and variation in some of the Cooperators' budgets during the 1990s that caused sufficient concern over the nationwide loss of long-record gages that Congress gave USGS additional funding to implement its design for a National Streamflow Information Program (NSIP) beginning in 2001. Based upon an assessment by the USGS, the NSIP was designed to stabilize a base network of streamgages at critical points with a reliable commitment of federal funds to assure sufficient data will be available for the following purposes:

- meeting legal and treaty obligations on interstate and international waters (to monitor legal requirements for deliveries of water at state and national borders);
- flow forecasting (sites needed for validation and improvement of forecasts where the NWS and other federal agencies carry out flood or water supply forecasts);
- measuring river basin outflows (for calculating regional water balances for principal watersheds);
- monitoring sentinel watersheds (for determining long-term trends in streamflow across the nation); and
- measuring flow for water quality purposes (for characterizing the quality of surface waters)

Of the 7,551 active gages operated by USGS within the CWP and NSIP, approximately 3,244 (43%) meet one or more of those five national needs. However, federal funds appropriated for the NSIP in 2006 were sufficient to provide full support for only 352 stations and partial support for another 266 stations, as illustrated on page 96 of the meeting book; this means that more than 2,600 of the 3,244 NSIP gages (i.e., more than 80%) are supported with a combination of funds from Cooperators, the USGS CWP and other federal agencies. Approximately 176 of those 7,551 active streamgages were at risk of discontinuation, adding to the set of more than 780 discontinued since 2001 (shown on another map included in the meeting book).

New issues, public interest and new technologies have increased the demand for streamflow information. Unfortunately, the capability of our combined streamgage network to meet the five national goals has declined in recent years as a result of an increasing instability in the network due to the way the streamgaging programs are funded.

Full implementation of the NSIP is estimated to cost $117M; this would provide for the reactivation of about 970 discontinued streamgages, installation of about 435 new streamgages, "flood hardening" the existing streamgages to assure their continuity through at least a 100-yr flood event and providing real-time data transmission at all NSIP streamgages. Future operation and maintenance of the full NSIP network of about 4,780 streamgages is estimated to cost approximately $108M/year. For next year (i.e., FY-2009), the President requested $23.8M and the Congress is looking to give it a little more.

Collaborative Watershed Monitoring in the Ohio River Basin States

Contributions to Hypoxia in the Gulf of Mexico: –Richard Alexander works for the USGS in its National Water Quality Assessment (NAWQA) Program as a Research Hydrologist. Rich opened this set of presentations with an overview of the "SPARROW" water quality model. In his presentation, he illustrated several important applications of this model and its dependence on high quality water monitoring data. Rich described the recent application of this model in the Mississippi River Basin to evaluate nutrients sources, their relative contribution to anoxic conditions in the Gulf of Mexico, and the contribution that various human activities and land – cover types make.

SPARROW is a geospatial model that provides the ability to analyze various watershed attributes using regression techniques to help understand the relationship between hydrologic, water quality, geographic and other factors that influence water quality in the Mississippi River and in the Gulf of Mexico; its statistical capabilities also indicate the uncertainty in these geospatial computations. Rich presented several maps comparing the local contribution of phosphorus at the watershed outlet with the overall contribution of phosphorus to the Gulf of Mexico, illustrating the important influence of spatial, temporal and other factors. In this instance, for example, targeting the investment of resources available to control all phosphorus loading could be more intelligently directed as a result of the SPARROW analysis. Rich also illustrated the model's capability of apportioning the stream nutrient loads among major source types (e.g., urban runoff, air deposition, various agricultural activities and several land cover types). In essence, the SPARROW model serves as a kind of "rating curve" which enables us to study the relationship between hydrology and water quality impacts and, as a result, refine our monitoring and mitigation strategies.

SPARROW has also been used in the southeastern United States to evaluate the possibility of incorporating data from diverse sources, including EPA's STORET and state and municipal agencies. Starting with nutrient data from 21,500 streams sites, slightly over ¾ were unusable because they had no streamgage close by or had insufficient streamflow records to support the analytical functions. Although these results were disappointing, they illustrate the value of coordinating data collection protocols and demonstrate the value of streamgages with long monitoring records.

Rich also described the application of the SPARROW model in evaluating WQ-impaired reaches of the Elk River Basin, which flows from northern Alabama into Tennessee. In comparing the modeled prediction against measured nutrient yields, it became apparent that phosphate-rich soils were an important but unidentified factor. In fact, the contribution from the soils was substantially greater than any of the suspected sources (i.e., point source discharges, agricultural return flows or runoff from developed land), with significant implications for the plans that the state wanted in mitigating the conditions that were causing the impairment.

In concluding, Rich described the value that data-driven watersheds models, like SPARROW, have provided to various the CWP Cooperators in getting greater value from the data available and enhancing the efficiency with which limited resources can be directed toward data collection and analytical needs.

Interagency Flow Model for Ohio River Basin and Regional Data Needs: Deborah Lee, Corps of Engineers. Debbie is responsible for policy and oversight of the Corps' water management operations in the Great Lakes and Ohio River watersheds and is managing their effort to develop an interagency flow model for the Ohio River. Given the availability of significantly better data and computing capabilities, as the Corps improves flood control and navigation infrastructure in the Ohio River Basin, they want to develop a "community dynamic model" to replace outdated finite difference models and object oriented models. She described their progress in gathering geographic and hydrologically data and compiling them with their measured cross sections and hydraulic characterization of existing flood protection and navigation infrastructure. The Corps is making progress with the calibration of the basic model, working with National Weather Service to provide flood forecast and inundation projections (in addition to the

river operation functions required by the Corps) and looking for partners to share the design and development cost. In the process, the Corps has identified the need for a better flow monitoring network for the river (because the flow is substantially regulated in its locks and dams) and is working with USGS on plans to install acoustic Doppler velocity profilers at key sites and to estimate ungaged inflows on specific tributaries.

Water Availability Issues: Bill Caldwell, Senior Environmental Scientist, KY Division of Water, Dept. of Environmental Protection. Bill presented an overview of the water monitoring issues facing the State of Kentucky and the benefits of their relationship with USGS.

The concept of water "availability" is subject to interpretation and has changed in recent years in response to new conditions, laws and public perception. It used to be a simple function of water supply yield in dry years. However, since the 1970s, new uses (e.g., wasteload assimilation and instream ecological protection) have complicated the computation of water availability for future for human needs. Water quality, of course, functions as another limitation on water availability, imposing greater treatment expense to make potable use of poor quality supplies.

Many water users and state agencies have adopted their own definition of water availability and the computation is further complicated by a variety of state laws. For example, agricultural irrigation and cooling water intake for power plants are unregulated and unreported in many states. In Kentucky, as in many states, some communities and watersheds have abundant supplies relative to their current needs, while others already experience shortages. From the perspective of a state water official, this complicates the question of water availability with questions regarding the technical, financial and political feasibility of redistributing supplies from areas with surplus to areas suffering shortage.

The state has found it difficult to invest necessary resources in collecting water data and supporting a necessary analytical studies; one consequences of this underfunding this that the state is now using low flow studies that are over 20 years old in establishing water quality standards and making water quality permit decisions, since the last low flow statistical analysis was completed in 1991. The quality of our decisions is directly related to the quality of our data. Bill concluded with this question: have we put a priority on maintaining adequate data collection networks and developing our abilities to use them effectively?

WV Water Gaging Council: Ed Cox, Watershed Program Analyst, WV Conservation Agency. Ed spoke as Chairman of the West Virginia Water Gaging Council and provided an overview of the development of West Virginia streamgage network, which managed to sustain almost 130 gauges in the late nineteen seventies before suffering budget cuts and the reduction of their streamgage network.

By the mid-1990s, their network had been cut in half and in 2002 they were facing the loss of another 20 gages due to budget shortfalls. As a result, the River Gauge Workshop was cosponsored by the Canaan Valley Institute and USGS West Virginia Water Science Center, involving stakeholders from state and Federal agencies nonprofit organizations universities and the private sector. The result was a proposal to organize an *ad hoc* committee that would help maintain a viable river gaging program within the state. This led to the organization of the West Virginia Water Gaging Council in 2005 based on an MOU signed by 11 organizations. The purpose of the Council is to serve as a "statewide collaborative body to help achieve effective collection and dissemination of hydrologic data applicable to the full range of water resources in West Virginia…"

The Council currently includes six state agencies working with USGS, the National Weather Service, the NRCS, the Corps of Engineers, two NGOs and a consulting firm. It meets quarterly and has managed to rebuild and sustain an effective statewide network of streamgage, lake level and ground water stations. Their priority activities include supporting state agency requests for funding during state legislative budget hearings, improving public awareness of the important role that good water data service and the maintenance of a web site for quicker access to gaging data.

Stakeholder Strategic Issues –Panel Presentation

Water Supply: Joe Lee, Chief, Source Water Protection Section, Pennsylvania Department of Environmental Protection. Joe described the complex water supply considerations that Pennsylvania has undertaken in its recent update of the State Water Plan. Noting that a water supply plan is never really "done," the Pennsylvania DEP expects that this plan will provide a useful structure for future water resource management decisions. In the course of this update, they have identified several critical areas where usable water supply is already short; they expect to identify a few more areas where usable supply is likely to become short in the near future. These determinations are very data intensive and the DEP intends to make them accessible on the Internet with a graphical user interface; watershed organizations continue to play a substantial role in the evaluation and planning for water resource management, and helping them access and understand the available water data and studies has proven very valuable.

Water supply in Pennsylvania relies on both surface water and ground water withdrawals, requiring careful examination of the effect that groundwater usage has on surface water flow and quality. The complex topography and geology of Pennsylvania are complicated by a history of mining and drilling. The expertise of USGS seems especially helpful in this context.

Pennsylvania is also developing early warning spill detection capabilities to assist its public water supply managers, modeling its effort after those demonstrated by the ORSANCO. This early warning system requires a reliable communication network and is highly dependent on access to good surface water data. As DEP addresses its remaining water quality impairments, it is finding most of them to be related to non-point sources, and that understanding and controlling those sources is heavily dependent on reliable surface water data. The collaboration with USGS in these programs is also a big advantage.

While the need for better surface water data seems obvious, where water supply reliability depends so frequently on groundwater sources, weak regulation and limited monitoring of ground water is emerging as a strong concern. Joe closed his remarks with the observation that data collection and interpretive capacity need to be maintained along with the rest of our water infrastructure.

Flood Protection: Mike Ekberg, Manager, Water Resources Monitoring & Analysis, Miami Conservancy District. Mike described a cooperative flood forecasting project that the Miami Conservancy District has undertaken with support from the USGS based on rainfall runoff models. Showing maps of their district, he described the geography of the District and the five large earthen dams they operate as retarding basins. Their flood protection system was built in response to flood in 1913, which is the largest flood on record for their area. Their plans combine flood warning and infrastructure operation of storage and bypass facilities designed to handle an event 40% greater that the flood of 1913.

Mike described the network of 26 streamflow gauges, 76 precipitation gauges and eight HSPF models that support forecast capabilities at 30 sites within the District. He also described the complex integration of USGS and National Weather Service data and showed an example of their forecast capabilities, comparing their observed stage levels with the forecasts that are used to anticipate the timing of the peak river stage and the management of floodgates, and the posting of road closures outside of the areas protected by the District.

Mike described a close relationship with the community, based in part on a recognition that their water resources are a key strategic asset for community development that supports recreation and agricultural production as well as municipal and industrial uses. He also described their ongoing effort to "sell the network" so that the community appreciates the value of its ongoing investment (since the river hasn't caused major flood damages since 1913, community appreciation depends on periodic alerts to

landowners about when to move their cattle or to contractors about when to move their equipment to higher ground).

Emerging Contaminants: John Wirts, Manager, Watershed Assessment Branch, West Virginia DEP Division of Water & Waste Management. John provided an overview of the West Virginia watershed management and monitoring programs. They operate a Statewide Monitoring Program, which covers 26 sites on the major rivers monitored quarterly, and a probabilistic, random monitoring of wadeable streams, which involves sampling 150 sites annually. They also operate a Watershed Specific Monitoring Program to identify new and emerging issues, which includes general water quality sampling and TMDL monitoring.

They participate in a number of cooperative agreements with USGS including support for the streamgaging network, the Chesapeake Bay non-tidal monitoring network, a low flow study and ambient groundwater monitoring. They are also working with the USGS to evaluate methane concerns in drinking water from ground water sources and the possibility of using coal seam aquifers as a source for drinking water in southern West Virginia. In response to several fish kill incidents since 2002, research in conjunction with the Leetown Fish Health Lab identified a significant incidence of intersex characteristics among smallmouth bass. Each of these special projects involving USGS has engaged staff resources and expertise that would not ordinarily have been available to the DEP.

Ecological Flows: John Stark, Director of Freshwater Conservation, The Nature Conservancy, Ohio Field Office. John opened his remarks with a question about whether, in a contemporary sense, the Ohio River Basin can be considered "water rich." Certainly, in some places and at some times, that is a fair characterization; however, there are already some tributary reaches that are effluent dominated in the summer months. There are also land-use trends, such as the increasing production of biofuels, that will demand additional water and complicate the protection of water quality; there are also climate change trends to consider. Undoubtedly, in the absence of good science, thirst and economic opportunity will drive water policy development.

Turning to the question of ecological flow protection, more progress has been made with the science than with on-the-ground-protection. So far, flow protection standards and implementation have been fairly arbitrary and fairly limited, with little consideration for specific ecological needs; there has also been little provision made for changing natural and sociological conditions.

In designing a regional environmental flow methodology, design criteria should include the ability to address many rivers simultaneously, the ability to link flow and ecological needs, and the ability to accommodate the broad range of flow alteration, data availability and sociopolitical circumstances. The Nature Conservancy has been working on the establishment of a regionally applicable methodology in collaboration with more than a dozen federal, state, university and non-governmental partners. The result was illustrated in a fairly complex outline for developing the hydrologic foundation, relating that foundation to a stream classification, and incorporating flow alteration and ecological relationships before entering the "social" process of determining acceptable ecological changes and setting flow alteration allowances.

They are referring to this methodology has "Ecological Limits of Hydrological Alteration (ELOHA). It requires hydrological metrics that are linked to ecological conditions and usable as water management targets; examples would include the timing of flood peaks, the duration of low flow events and the percentage of late summer flow withdrawals. In selecting appropriate ecological criteria, the preference is for indicators that are responsive to existing and altered flow conditions, that can be validated with monitoring data, and reflect ecological functions that are valued by society; examples would include the richness of aquatic invertebrate species, the recruitment of riparian vegetation, and the abundance of larval fish. A technical paper describing this methodology is currently undergoing peer review and should be published soon. Due to the dependence on long-term hydrologic and ecological databases, TNC is

hoping to apply this methodology in the Lake Erie basin next, and would like to explore its application in the Ohio River Basin in the next few years.

Following these for presentations, there was an opportunity for a discussion. Most notable from that conversation was the agreement by all four speakers that, if USGS and the Cooperators must face the dilemma of allocating CWP funds between data collection and interpretive studies, allowing each state Water Science Center to decide for itself (according to the needs and abilities of the Cooperators in their state) makes the most sense.

Break-Out Group Discussion of Opportunities & Priorities: The participants divided into two groups to explore opportunities for both the USGS and the Cooperators to improve the CWP. The two groups met for about an hour, one lead by Larry Feazell (Ohio river Basin Commission) and the other by John Stark (The Nature Conservancy) to respond to three questions and prioritize the results. Those questions and the combined results are available, but and **the highest ranking recommendations were:**

What can the USGS do to improve the CWP?

- Organize more state monitoring councils to strengthen support for funding, identify opportunities to share costs, identify needs and agree on priorities; make sure Cooperators are aware of USGS Science Strategy
- Explain the value of the CWP data collection and interpretive studies more clearly and make the results more accessible; newsletters, presentations to community groups, briefings for local agencies and officials, attendance in watershed group meetings were suggested;
- Look for opportunities to share cost of interpretive studies among WSCs, especially where transfer value is stronger, e.g., interstate waters; also, streamline/standardize design for interpretive studies to increase administrative efficiency

What can the Cooperators do to improve the CWP?

- Do better in explaining value & importance of CWP to our congressional delegation and to state and local policy makers; work with USGS to "get the word out" to public and local policy makers; press releases, outreach events
- Build stronger awareness among Cooperators and with OFAs of their respective needs and expand collaboration among Cooperators in designing CWP studies and the development of interpretive tools; look for opportunities to share interpretive tools
- Highlight USGS involvement when using CWP data & study results in program and project decisions

What should USGS & Cooperators do to enhance data compatibility across networks?

- Expand awareness of National Water Quality Monitoring Council and National Atmospheric Deposition Program (NADP) –and other efforts to establish and use common standards
- Work with USGS and others to engage all the stakeholders in basinwide coordination groups; consider developing & supporting statewide Monitoring Councils

Before the meeting adjourned, Matt Larsen responded to some of the break-out meeting results; Matt, Ward Staubitz and Mike Norris expressed their appreciation for the time and energy that the Cooperators and USGS staff put into the presentations, the discussion and recommendations.

The meeting materials, including the presentation slides, are available to anyone who is interested from any of the five Water Science Centers, from the ORBC, ORSANCO or from the ICWP.

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