

MID-ATLANTIC REGION COOPERATORS' ROUNDTABLE FOR THE USGS COOPERATIVE WATER PROGRAM

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Overview: In cooperation with the US Geological Survey (USGS), the Interstate Council on Water Policy (ICWP) organized this Cooperative Water Program (CWP) Roundtable for stakeholders in Delaware, the District of Columbia, Maryland, New Jersey, New York, Pennsylvania, Virginia and West Virginia. This roundtable was the eighth in a series of regional stakeholder meetings designed to provide information about the USGS water data and science programs and create an opportunity for stakeholders to help strengthen those programs.

We had extensive help in developing the topics and selecting the presentations from the Delaware River Basin Commission, Interstate Commission on the Potomac River Basin, Interstate Environmental Commission and the Susquehanna River Basin Commission. The Hach Company, YSI/SonTek and Sutron Corporation, 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 included presentations by USGS staff about the purpose, history and capabilities of the CWP and some of the challenges facing it. Cooperator representatives provided excellent descriptions of the scientific contribution that the CWP data collection and interpretive investigations have made in the fulfillment of local and regional water planning and management responsibilities.

The [program](#), [meeting book](#), and PowerPoint presentation files are available from the ICWP website.

Welcome and Program Overview: Peter Evans, Director of the ICWP, welcomed the 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 recent letters to the Secretary of the Interior and to Members of Congress urging full implementation of the National Streamflow Information Program (NSIP) and restoration of the CWP capacity to match Cooperators' investment dollar-for-dollar.

Overview of the CWP from the National Perspective: Ward Staubitz is the National Coordinator of the Cooperative Water Program (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)

Nationwide, the CWP continues to build 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 and models used by other public agencies and private companies, as well as the USGS (about 700 are currently underway), 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 other vital 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 NSIP from the National Perspective: Mike Norris is the National Coordinator of the National Streamflow Information Program (NSIP). His [presentation](#) showed the progress that USGS streamgaging programs have made, indicating that about 90% of the active streamgaging stations are now providing real-time data. Mike 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 asked the USGS to design a National Streamflow Information Program (NSIP) in 1998. 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 (FY-2009), the President's budget request included \$23.8M for the NSIP and Congressional committees are looking at opportunities to provide a little more.

USGS MONITORING NETWORKS IN THE MID-ATLANTIC REGION

Surface Water: Bob Hainly, Assistant Director of the USGS Pennsylvania Water Science Center, provided a helpful overview of the [surface water networks](#) within the seven state region, showing the vast majority of surface water stations provide real time data and the mix of streamflow, stream stage and lake level stations in each of the states. Bob also described their rapid deployment capabilities for replacing lost streamgages on a temporary basis and other new technologies and techniques, including the satellite transmission upgrades for over 1200 streamgage sites, the use of acoustic Doppler technologies and radar water level sensors. He closed his presentation with a discussion of the database management, quality control and interpretive work needed to convert high-quality measurements in two usable information and assessments.

Water Quality: Holly Weyers, Office Chief in the USGS Delaware Water Science Center, picked up the regional overview where Bob left off, shifting to the [regional monitoring of water quality](#), slides 20-40. Holly outlined some of the more important uses of water quality monitoring data in connection with surface water and groundwater measurements, including compliance with Clean Water Act requirements and modeling efforts to establish baseline and assess trends for various chemical components that affect human and ecological health. She also described the use of this information in the understanding of geochemical and biochemical cycling in both the water column and streambed sediments. The water quality network maps for this region (slides 23-24) show a dense monitoring network of sampling stations that are visited periodically throughout New York, New Jersey and Delaware and in eastern Pennsylvania and eastern Virginia; periodic sampling in central and western portions of Pennsylvania and Virginia is less dense and, by comparison, the operation of continuous sampling stations is relatively limited.

Holly also described some of the ongoing water quality investigations, which range from trend assessments of organic chemicals and nutrients in public drinking water supplies to TMDL studies of trace metals and pharmaceuticals, and remediation studies of chlorinated solvent contamination sites. She displayed a selection of the interpretive web pages designed to enhance the communication and understanding of water quality problems. The Water Science Centers in this region are also applying new technologies in the assessment of water quality concerns, including UV absorption and bio-monitoring techniques. They are engaged in research concerning a variety of emerging issues including the effects of excess nutrients on stream health, the assessment of nutrient and ecosystem processes as a function of dissolved oxygen levels, the occurrence of VOCs, pesticides and trace elements in stream water and sediments, and contaminants affecting public water supplies.

Ground Water: Ward Freeman, Associate Director in the USGS New York Water Science Center characterized the [regional monitoring of groundwater](#), (slides 41-66). He opened this portion of this regional monitoring overview by illustrating the influence of geology on the quality and availability of groundwater and the resulting pattern of groundwater uses. The mid Atlantic states include many urban centers and densely populated suburban areas that rely heavily upon groundwater supplies. Approximately 19 million people living and working in this region depend on groundwater and public and domestic uses consume almost 3 billion gallons of groundwater per day. Monitoring the groundwater in this region is essential in identifying short-term changes and long-term trends in groundwater recharge and storage, assessing the impacts of climate change, identifying the effects of land-use changes, and understanding the interaction between surface and groundwater supplies.

The distribution and density of groundwater monitoring wells is considerably different than the streamgage pattern, in that continuous record groundwater sites are relatively evenly distributed at a much lower density, except in New Jersey, while the concentration of periodic and synoptic sampling sites is relatively concentrated in a few areas. (map slides 48-50). The USGS makes a variety of useful and interesting interpretive products available over the website, and Ward displayed several maps and graphs to illustrate the ease with which regional patterns and changes over time can be easily understood.

Among the emerging issues concerning groundwater supplies, the recent interest in rapid development of natural gas from the Marcellus Shale, which requires which involves horizontal drilling and hydraulic fracturing through the use of large volumes of fluids/chemicals. Other major concerns include climate change and the likelihood of sea level rise (with the potential for salt water intrusion), reliance on awkward for storage and recovery, and wastewater injection.

There was an interesting discussion with this panel following their presentation, including an exploration of the relative cost of supporting the typical streamgauge (\$14,000/yr) and adding the water quality components (an additional \$36,000/yr).

INTERSTATE & RIVER BASIN COMMISSION MONITORING NETWORKS

Interstate Environmental Commission –Boris Rukovets, Assistant Executive Director of the IEC, provided a useful overview of the 35 interstate water organizations with sufficient problem solving capability to warrant national recognition before describing the monitoring responsibilities and network of his organization.

While the IEC has considerable regulatory authority, Boris focused on their [monitoring programs](#). These involve the interstate waters of the Long Island Sound, the New York Harbor, and tidal portions of many rivers associated with them. The IEC monitoring programs have been developed over many years with the primary objective of assuring compliance with water quality permits for numerous wastewater treatment plants and combined sewer overflows that discharge into these waters. In addition to monitoring that is designed to characterize ambient water quality conditions, the IEC also monitors effluent from public and private sewer treatment plants, industrial, CSO and storm water discharge facilities. Much of the data collected by the IEC is also used to support other collaborative efforts, including the Ad Hoc Monitoring Committee of the Harbor Estuary Program.

Delaware River Basin Commission –John Yagecic, Supervises the DRBC Standards & Monitoring Section. He provided a general overview of the commission and its responsibilities before addressing for [DRBC monitoring programs](#) and the way DRBC uses water quality data. The commission has broad authority for water supply, pollution control, flood protection, watershed management, recreation, hydroelectric power and other responsibilities, but water quality is the principal focus of their monitoring programs.

The principal reasons that DRBC monitors water quality include assuring compliance with water quality standards, defining “existing water quality” at boundary and interstate control points, monitoring the “salt front” for reservoir operations and water supply intake protection, and to track new and emerging threats to water quality. In addition to their standard water quality measures, the DRBC has designated “special protection waters” in which they want to assure there is “no measurable change” in existing water quality, except toward natural conditions in the waters considered to have exceptionally high scenic, recreational, ecological or water supply values. John pointed out that defining “existing water quality” and “no measurable change” for regulatory purposes requires significant, high-quality data.

John also described the Commission’s use of USGS data from six continuous recording stations to support the management of the “salt line” below the water supply intake. The DRBC has developed an automated e-mail alert system for monitoring water quality which has been operating since 2006. It retrieves real-time observations from seven USGS monitoring stations and generates an e-mail alert if those observations are outside the relevant water quality criteria.

Susquehanna River Basin Commission –Jennifer Hoffman, Chief of the SRBC Monitoring & Assessment Section, provided an interesting [overview](#) of their interstate program, which integrates water quality and quantity monitoring funded by the three member states (MD, NY and PA), EPA (Section 106 grants) and the Chesapeake Bay Program. They operate approximately 1300 stations since 1984 with added emphasis on the interstate boundaries.

The SRBC conducts a broad range of regulatory monitoring functions that cover low flows, project operation and passed by flows protection. SRBC is also conducting a series of six basin surveys in cooperation with Trout Unlimited and local watershed organizations that begin with an assessment of the larger scale watershed followed by emphasis on selected smaller watersheds. This supplements their large-scale river assessment at about 25 sites using EPA River assessment protocols. The SRBC is also conducting a variety of focused assessments, including a study of Whitney Lake (in NY), to document flow augmentation impacts on water quality and biological indicators, and a Paxton Creek storm water project to help several PA communities enhance and demonstrate watershed storm water management programs.

SRBC also conducts a sediment and nutrient monitoring program at six sites since 1984 and is adding sites in cooperation with the Chesapeake Bay program, PA DEP and USGS. Another special project is the flood forecast and warning system operated with assistance from the NWS, USGS, Corps, and the emergency management and environmental protection agencies for New York, Pennsylvania and Maryland.

Interstate Commission on the Potomac River Basin –Joe Hoffman, the ICPRB Executive Director, described the structure and responsibilities of the ICPRB and their reliance on data from USGS, the four member states (MD, PA, VA, WV) and the District of Columbia for the management of water supplies, the protection of river health and to support their active public outreach program.

Joe described the heavy demand for water supplies placed on the river, approximately 450 MGD on the average, increasing to 600 to 700 MGD during the summer, with the peak 1-day demand reaching 741 MGD in 1999. There are not many reservoirs in the Potomac River Basin, which requires more careful operational management. Because drought conditions occur relatively often, the ICPRB conducts an annual drill to practice load shifting among reservoirs. During the late summer and fall, flows in the Potomac River are especially dependent upon groundwater and the Commission monitors approximately 20 USGS wells that provide real-time data. The Commission updates its demand forecast every five years and is involved in several special projects, ranging from habitat restoration for American Shad to the rain barrel program and workshops that promote public awareness and water use efficiency.

During the question and answer session that followed the use four presentations, the Cooperators and USGS discussed sampling protocols used by the interstate organizations and opportunities to share data more effectively.

SUSTAINABILITY OF THE MULTI-PURPOSE MONITORING NETWORKS

Overview –Rick Kropp, Director of the USGS New Jersey Water Science Center, provided an [overview](#) of the issues facing water managers and the state councils that have been organized to provide a forum for planning and coordination among local state interstate and federal agencies.

WV Water Gaging Council –Russ Campbell, is the chairman of the West Virginia Water Gaging Council (and works for the WV Conservation Agency). He presented historical [overview](#) of funding decisions that led to the loss of both stream gages and groundwater monitoring wells in West Virginia. Until about 1980, they were building a network of almost 130 streamgages and about 35 observation wells. State budget pressures in the 2002-03 fiscal year presented a threat to another 20 of their 70 remaining streamgages, which brought matters abruptly to the attention of stakeholders statewide in both the public and private sectors. A workshop was held in February 2003, bringing their stakeholders up to speed and into the decision process, leading to an MOU signed in 2005 by 11 organizations to establish a collaborative advisory committee.

The WV Water Gaging Council was given responsibility to design, prioritize and find funding for surface water, ground water and precipitation gaging networks. In 2008, this Council was expanded to include 2 more members, so that it now engages 5 state agencies, 4 federal agencies (including the USGS), the WV

Water Research Institute, 2 NGOs and one interested corporation. The Council meets quarterly and the collaborative attention of diverse, statewide stakeholders to the expansion, improvement and funding of their network represent a large step forward in ensuring the integrity of their monitoring network.

MD Water Monitoring Council (MWMC) –Dan Boward is the Executive Secretary for the MWMC and is employed by the Maryland Department of Natural Resources. He [described](#) the 15 year history of coordination that the MWMC has provided, beginning in 1994. Their 12 member steering committee is comprised of state, federal, local, university, NGO and private sector representatives, and promotes quality-assured procedures for collecting, analyzing, assessing and managing water data. The Maryland Council relies on two standing committees, one for monitoring and assessment and the other for data management issues. The principal products they have developed include a website, various publications and a series of workshops (paid for with registration fees) on topics that include streamgage monitoring, integrated water monitoring, groundwater observations, vernal pool assessment and water supply issues.

In 1997, they organized a workshop concerning the streamgage network, which resulted in an expansion of the network from about 70 to about 115 gages. Currently, MD Cooperators contribute about \$1.25M (74%), the USGS-CWP contributes about \$365K (21%) and the USGS-NSIP contributes the remaining 5%. In 2002, they conducted a groundwater monitoring workshop that produced a report with maps showing existing and needed monitoring site locations. For the groundwater network, their Cooperators are contributing about \$261K (59%) and the USGS-CWP is contributing about \$179 (41%).

In 2005, when faced with a significant risk of state budget cuts, the Council rallied assistance from many agencies and public support to minimize the loss of monitoring sites. In 2008, the Corps was contemplating substantial budget cuts that would eliminate many streamgage stations and the Council provided an important forum for persuading the Corps to sustain their funding. For 15 years, this Council has provided an effective forum for communication and coordination, raising public awareness and support, and for building partnerships and shared commitment necessary to sustain an adequate monitoring network.

NJ Monitoring Coordination Council –Leslie McGeorge co-chairs the NJMCC with Rick Kropp and works for the NJ Department of Environmental Protection as Administrator of their Water Monitoring and Standards Division. She described the [development of the NJMCC](#) in 2003 using MD’s Council as an example. The New Jersey Council addresses water quality and quantity, including surface and groundwater and coastal resources. Their Council is comprised of 30 members representing state, federal, interstate, regional and local agencies, university, water supply authorities and volunteer monitoring interests who participate in an informal, consensus-driven process.

To get their Council started, they sought a \$15K grant from EPA, which supported their efforts for almost 5 years. They conducted a workshop in 2006 and are currently working on development of a searchable database, the Delaware Basin monitoring pilot project, and coordinated participation in the Integrated Ocean Observing System (IOOS).

During the question and answer period, we discussed various funding mechanisms (including requirements that permit holders support the cost of monitoring), the value of organizing a Monitoring Council along watershed boundaries (instead of state boundaries), and ways for keeping high-level officials engaged in and supportive of this collaborative coordination process.

INTERPRETIVE STUDIES & STRATEGIC ISSUES

Water Supply Planning: Cathy Curran Myers is the Deputy Secretary for Water Management in Pennsylvania’s Department of Environmental Protection. She reviewed the historical development of water supplies within the Delaware River Basin and the controversial influence that growing demand in New York City has had throughout this large, multistate basin. She also noted the public health pressures

that major urban developments, including New York and Philadelphia, posed for water managers over the past 200 years.

Noting the complexity of water quality and water allocation decisions as they become intertwined with ecological flows public health protection, recreation activities and now climate change, Cathy used several examples to illustrate the critical role that USGS plays (with their water data and science programs, in supporting collaborative solutions. One good example is the Schuylkill Action Network, in which the Philadelphia Water Department has helped engage a broad range of stakeholders throughout the watershed, including municipal, agricultural, environmental, power generation and industrial interests. Facing water supply and water quality constraints, this collaborative effort identified several innovative solutions, such as the use of a mine for water storage. The USGS was essential in providing the data and interpretive studies needed to design and gain support for this plan, and in avoiding a “dueling consultants” distraction from the decision process, which saved the water supply customer (Exelon) enough money that they were able to make a substantial contribution to the funding of the Schuylkill Action Network activities. The ability to support more innovative solutions to water supply, storm water control and water quality improvements requires data and science to assure regulators and diverse stakeholders in a public process that the proposal will really work.

Flood Forecast & Warning: Peter Ahnert is the Hydrologist-In-Charge at the National Weather Service Mid-Atlantic River Forecast Center. His responsibilities for issuing [hydrologic forecasts](#) during flood events are heavily dependent upon USGS and CWP Cooperators streamgage data, as well as data characterizing reservoir operations, precipitation patterns, storm tracks, etc. He described extensive collaboration with USGS, the Corps of Engineers, the SRBC, DRBC and other Cooperators and he reviewed the variety of useful, real-time products that the River Forecast Centers produce and their uses.

Ground Water: Karl Muessig is the State Geologist for New Jersey and works in the NJ Department of Environmental Protection. Karl described the variety of [groundwater studies](#) that NJ DEP needs USGS data to complete, including the support of groundwater hydrology models, regional water supply assessments (including recharge and conjunctive use), and water quality provisions for a wide range of concerns (including radionuclides and pharmaceuticals). Because their communities are approaching full utilization of available water supplies, the state is undertaking a comprehensive water supply assessment of uses and sources, and threats like saltwater intrusion into drinking water aquifers represent a growing concern. The NJ DEP has developed an increased appreciation for these studies based on anticipation of future issues (e.g. carbon sequestration) that have not presented significant opportunity or concern in the past.

Ecological Flows: Colin Apse is the Deputy Director of The Nature Conservancy’s Eastern US Freshwater Program. He described an [analytical process](#) that TNC has developed for relating current hydrology with watershed and ecosystem characteristics in an effort to assess flow alteration impacts and estimate ecological flow needs. TNC calls this process “Ecological Limits of Hydrologic Alteration” or “ELOHA.” Since there has been such a wide variety of water related ecological concerns that arise in water management and policy decisions, TNC recognized a need for an efficient process for identifying ecological flows, representing “adequate conditions for all native species enough of the time” (as opposed to “optimal conditions” or “minimum flows”). He indicated that, while maintaining the streamgage network is a big challenge, existing networks should be expanded strategically to provide better representation, especially for unregulated small watershed sites. He also indicated that improvements USGS is making in its tools for daily flow modeling and the integration of state water use data will be essential in the improvement of decision support capabilities. He recognized the progress that Virginia DEQ is making with an HSPF model for water supply planning in conjunction with the Chesapeake Bay Program and suggested the Massachusetts “Sustainable Yield Estimator” may prove to be another worthy tool.

Expanding WQ Monitoring Capabilities: Bob Tudor is the Deputy Executive Director of the Delaware River Basin Commission, which John Yagecic described earlier. Bob described the role of interstate organizations in addressing the [use and protection of shared waters](#), and focused on DRBC's interest in coordination and cooperation among the various federal agencies and between federal, interstate, state and local agencies to develop the knowledge and solutions for real problems at the local and watershed scale. The DRBC is supporting a pilot project for the National Water Quality Monitoring Council (NWQMC) and helping to develop a Mid Atlantic Coastal Ocean Observing Regional Association (MACOORA). Also, using small allocations of funding and commitments of staff expertise from a broad range of state and federal agencies and programs, the DRBC is beginning to develop a broader collaborative planning framework that it calls Delaware estuary-to-Watershed-to-Ocean Observing System (or “DEWOOS”). In these efforts, Bob illustrated the importance of relations with USGS scientists in both their Water Science Centers and Headquarters, which help extend the science links between data and models for river systems, atmospheric systems, ocean systems, etc., and are essential in linking the various regulatory and policy development opportunities.

In the [question and answer session](#) that followed, the participants discussed the progress each of the states is making in the development and improvement of their water plans Delaware, New Jersey, Pennsylvania and West Virginia all have notable efforts under way, hoping to identify where their crucial needs are and develop options for meeting those needs.

Break-Out Group Discussion of Opportunities & Priorities: The participants divided into three groups of about 25 each to explore opportunities for both the USGS and the Cooperators to improve the CWP. The groups worked independently for about 90 minutes, one lead by Susan Weaver (PA Dept. of Environmental Protection), one lead by Jan Bowers (Chester County Water Authority) and the third by Karl Muessig (NJ Geological Survey) to respond to three questions and prioritize the results. Those questions and the combined [results](#) are available, and **the highest ranking recommendations** were as follows:

What actions should the USGS consider to improve the CWP?

- Provide reviews of interpretive studies faster, produce more informal products prior to formal report delivery; make data more easily accessible
- Promote broader recognition and use of transferable tools (e.g., StreamStats); more rapid transfer of new technologies; continue development of new technologies in the interest of cost savings
- Fully fund NSIP and return the CWP to 50:50 match
- Expand Cooperator base, identify and encourage smaller Cooperators and other users of information
- Increase effort to include Cooperators input into NSIP design and prioritization for the funding of gages
- Assign a person as liaison, single point of contact, for key regions and for science themes; develop regional inventories of skills, equipment, ability to support other Water Science Centers, e.g., Regional Workforce Study
- Stop putting headquarters’ overhead onto CWP cost (e.g., reduce “business style” accounting for projects); identify data management as an element of O&M
- Give Cooperators credit for in-kind services in CWP requirements

What action should the Cooperators consider to improve the CWP?

- Improve decision maker (Congress, state legislatures and local) awareness of USGS monitoring and interpretive science, their importance to water management and society; coordinate the message and delivery timing by as many groups as possible; make the USGS role and contributions to Cooperator decisions more visible to the public, legislators and congressional representatives; highlight the large number of (multiple) uses of the same data and studies that support different Cooperators and communities; develop opportunities with incoming Administration officials to improve interagency communication and coordination
- Highlight the importance of monitoring and interpretive studies funding in our state and local agency budgets; develop streamgage-specific line items; enhance message delivery to state legislatures; specify conditions in permits and dockets, set up trust fund to accumulate fines and judgments to support long-term operation of streamgages (e.g., Marston shale);
- Use regional Cooperator meetings to share assessment of needs, opportunities, etc; Collaborate in defining tools and products needed from USGS, and in sharing cost; actively prioritize Cooperators needs, like WV Monitoring Council; communicate more regularly among Cooperators, involve new Cooperator groups (e.g. private sector) in Cooperator base; states should identify a “point person”

How can we coordinate monitoring efforts within the region to increase the value of all the collected data for use in interpretive studies and program decisions?

- agencies should conduct a gaps analysis and communicate what is available, from who & where; coordinate the design of monitoring network among agencies at a regional scale and develop (agree on) standards for metadata and data collection to support data clearinghouse, data portal; apply consistent methods and protocols to yield comparable results; develop techniques for evaluating data and comparability to normalize data collected by different sources;
- Invest in new technologies (e.g., remote sensing, acoustic Doppler, etc);
- Identify key management systems, key objectives and related monitoring needs and data gaps; and
- Collect water use data the same way we do water availability and water quality data, for national and regional comparability.

Before the meeting adjourned, Matt Larsen responded to some of the break-out meeting results; Matt, Dave Ross (the NE Regional Executive), Ward Staubitz and Mike Norris expressed their appreciation for the time and energy that the Cooperators, the Interstate Commissions 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 the Water Science Center Directors or from the Interstate Council on Water Policy.

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