

UPPER MISSISSIPPI RIVER BASIN STATES CWP COOPERATOR'S ROUNDTABLE SUMMARY

NOVEMBER 1-2, 2007

FIVE FLAGS HOLIDAY INN, DUBUQUE, IA

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Summary: In cooperation with the Upper Mississippi River Basin Association, the Interstate Council on Water Policy and the US Geological Survey organized the first Cooperative Water Program (CWP) Cooperator's Roundtable for the five Upper Mississippi River Basin States in Dubuque, IA. This roundtable was the fourth in a series of regional stakeholder meetings, 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 reception and exploration of the National Mississippi River Museum and Aquarium were very enjoyable and the meeting concluded with a discussion (and ranking) of ideas for building a stronger Cooperative Water Program with USGS.

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 letters to Interior Secretary Kempthorne urging full implementation of the National Streamflow Information Program (NSIP) and continuing increases to the CWP budget.

Mike Wells welcomed the participants on behalf of the UMRBA Board of Directors; Mike is also the Deputy Director of Missouri Department of Natural Resources and a member of the ICWP Board of Directors.

Each of the five USGS Water Science Center Directors introduced themselves and described some of the science posters on display during the Roundtable.

- Rob Middlemis-Brown, Director of the Iowa Water Science Center;
- Robert Holmes, Director of the Illinois Water Science Center;
- Jeff Stoner, Director of the Minnesota Water Science Center;
- Mike Slifer, Director of the Missouri Water Science Center; and
- Charlie Peters, Director of the Wisconsin Water Science Center.

Historical Background and Significance of the USGS Streamgaging Network: Bob Hirsch, Associate USGS Director for the Water Discipline, described the long history of the Cooperative Water Program (CWP), dating back into the late 19th Century and its specific funding designation within the USGS budget starting in the 1920s. Today, there are about 1400 Cooperators nationwide, who participate directly with USGS in support of one or more streamgaging stations or water resource investigations.

Approximately 170 of those Cooperators, or 12.5% of the national total, are located in the five Upper Mississippi River Basin (UMRB) states.

Bob also highlighted several reasons why the CWP is especially important to the USGS:

- the CWP partnership with other water agencies provides approximately 60% of all the funding available to USGS for streamgaging (in the 5 UMRB states, the USGS budget provides approximately \$6.5M and the Cooperators add another \$10.3M for both data collection and interpretive studies);
- the collaboration with the CWP Cooperators in data collection and interpretive investigations provides the opportunity to anticipate future issues and opportunities and the data, science and models that will be needed by resource managers;
- the Cooperators' expertise and professionalism motivates USGS to sustain high levels of relevance to water resource management challenges and cost efficiency.

When Cooperators partner with the USGS, they have access to the water discipline experts, of course, but also to experts in sedimentology, biology, geology and analytical techniques. The USGS Hydrologic Instrumentation Facility (in Bay St. Louis, Mississippi) also supports the CWP. At that facility, new techniques and equipment for measuring streamflow, groundwater movement, water quality, etc, are subjected to extensive testing under a wide variety of circumstances before the equipment is put to use in the field.

Unfortunately, the loss of streamgages with long records (>30 years) is pushing up toward 150/year again, after getting a little extra funding in the first years of this decade. The Interior Department was able to help the CWP this year, within the "continuing resolutions" adopted by Congress instead of an FY-07 appropriations bill; the CWP received an additional \$1.5M and the National Streamflow Information Program (NSIP, a subset of about 3,100 gages that serve specific national purposes within the larger set of 7,400 stations nationwide) received an additional \$2.8M. The President's budget request for FY-08 would reduce CWP funding from about \$64M to about \$62M, and the Congress is still working on these budget plans: the House bill would reduce the CWP budget by \$1M and increase the NSIP budget by \$5M and the Senate Appropriations Committee would sustain the CWP at its current level (approximately \$64M) and increase the NSIP budget by \$2.3M (to about \$19M).

Bob also discussed several other developments of interest to the water community and importance to the USGS water science programs, including a report produced by a federal interagency Subcommittee on Water Availability and Quality (referred to as the [SWAQ report](#)), which identifies water concerns that warrant greater attention among federal agencies and programs. As our national population and economy expand and its communities and land uses develop, this report identifies three primary challenges, all of which bear significantly on the future for both the CWP and the NSIP:

- to measure and account for water resources;
- to develop methods that will allow expansion of fresh water supplies while using existing supplies more efficiently; and
- to develop and improve predicative water management tools.

Bob co-chairs the SWAQ and described its ongoing consideration of a "national water census," based in part on a 2002 report to Congress on a conceptual plan for a National Assessment of Water Availability and Use and a recent pilot project assessing water availability and use in the Great Lakes region.

Overview of the Cooperative Water Program from the National Perspective: Ward Staubitz is the National Coordinator of the CWP. His [presentation](#) described the national scope and purpose of the CWP, showing that it 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 1,424 participating in 2007 with a combined streamgaging program budget of about \$131M from the following sources:

- federal funds for the CWP and NSIP (\$43M);
- federal funds from other agencies, including the Corps, Reclamation and BLM (\$28M); and
- state, tribal and local agency funds (\$60M)

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 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 focused on 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 from the National Perspective: Mike Norris is the National Coordinator of the NSIP. His [presentation](#) added a sense of the progress that USGS streamgaging programs have made, showing that about 90% of the active streamgaging stations are providing real-time data today. Shifting priorities and variation in some of the Cooperators' budgets during the 1990s caused sufficient concern over the nationwide loss of long-record gages that Congress authorized USGS to implement its design for a National Streamflow Information Program (NSIP) 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)

Approximately 3,200 of the 7,500 active gages operated by USGS within the CWP and NSIP meet one or more of those five national needs. Federal funds appropriated for the NSIP in 2006 were sufficient to provide full support for 352 stations and partial support for another 266 stations, as illustrated on page 34 of the [meeting book](#); this means that more than 2,500 of the 3,200 NSIP gages (i.e., about 80%) are supported with a combination of Cooperator and USGS funds. Approximately 185 of those 7,500 active streamgages were at risk of discontinuation, adding to the set of more than 1000 discontinued since 2000 (shown on another map included in the meeting book). Only 6 streamgages within the 5 Upper Mississippi River Basin states appeared to be on the "threatened list" at the time of this Roundtable and, from a national perspective, the Missouri River Basin faces the greatest challenge due to cutbacks in funding by the Corps of Engineers and Bureau of Indian Affairs.

The capability of our combined streamgage network to meet the five essential, national goals has declined in recent years as a result of an increasing instability in the network caused by a loss of critical

streamgages due to the way the streamgaging programs are funded. New issues, public interest and new technologies have increased the demand for streamflow information.

Mike summarized efforts undertaken by USGS in response to Cooperators' concern over the cost of the USGS streamgaging programs. Budget data from four USGS Water Science Centers were compared with data from the Washington Department of Ecology, the Colorado Division of Water Resources and the Lower Colorado River Authority to identify the reasons for differences in their program cost and, hopefully, to identify the most efficient ways to reduce the cost of CWP services without reducing quality or customer satisfaction. USGS found it to be very difficult to compare data compiled from the different agencies' budget and accounting systems; that complexity was amplified by the difference and variety of purposes that the USGS and non-federal programs are intended to serve.

Full implementation of the NSIP is estimated to cost \$117M; this would cover the reactivation of about 970 discontinued streamgages, installing 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 NSIP network of about 4,780 streamgages is estimated to cost \$108M/year.

Cooperative Monitoring Network in the Upper Mississippi River Basin States: The [presentation materials](#) for this session were very useful and are available on-line. They included presentations regarding surface water, water quality, ground water, and an example from the State of Illinois.

Surface Water -Gary Johnson is a Supervisory Hydrologist in the Illinois WSC. Gary set the stage with a description of the monitoring network that USGS has developed for the five states and the observation that every plan for sustainable management of water resources and protection of our communities requires accurate, long-term hydrologic data, careful interpretation of that data, and ways to share the resulting information.

Data from the CWP and NSIP streamgages, water quality stations and ground water wells carries extra value as a result of the USGS' national standards and protocols for streamgage installation, maintenance, data collection and quality control in processing it. Decision makers, managers and others rely on high-quality data with sufficient consistency (over many years and from one location - or region - to another) to support more reliable application, interpretation and extrapolation where alternatives in areas without adequate measurements must be evaluated. USGS regularly provides these data on-line in real-time and in annual data summaries.

Streamgages are used in support of a wide variety of applications:

- NWS flood forecasts and warnings;
- Drought monitoring;
- Agricultural and drinking water supply monitoring;
- Lake/reservoir planning and operation;
- Hydroelectric power generation;
- Wastewater effluent discharges;
- Urban hydrology studies;
- Hurricane surge monitoring;
- Coastal and riparian habitat protection;
- Navigation; and
- Recreation.

Gary described a variety of traditional and newer streamgaging technologies (including acoustic doppler, hydroacoustic and radar equipment) and described the extensive efforts required to safely maintain these stations and the rating curves needed to assure accuracy throughout the monitoring network. Too often, however, streamgage measurements are shut down and the continuity of their record is interrupted because of inadequate financial support.

The number of long-term streamgaging stations operated by USGS across the nation and in these five UMRB states is illustrated below:



	IA	IL	MN	MO	WI
Continuous Record Sites	142	189	106	197	182
Partial Record Sites	87	22	99	39	106
Total	229	211	205	236	288

Water Quality -Dale Blevins, Supervisory Hydrologist in the Missouri WSC, focused on the water quality network in the five states. Dale described the continuous and periodic water quality (WQ) sampling sites, showing maps of their locations in the five UMRB states and illustrating the technologies that USGS employs ([presentation materials](#), beginning with slide #36). The most significant WQ concerns in the UMRB states varies, in terms of top priorities for the selection of sampling criteria and locations, but they include monitoring the presence and concentrations of agricultural fertilizers, chemicals and waste, urban runoff and sewer overflow contaminants (greases and oils, bacterial and viral pathogens, *etc*), the suite of “emerging contaminants” (including hormones, antibiotics, fragrances and other substances that waste treatment plants do not remove completely), mercury and other human health and ecological risks.

Most Significant WQ Issues	IA	IL	MN	MO	WI
Agricultural Organic Chemicals		X			
Biofuels Crop Conversion	X				
Climate Change Effects			X		
Emerging Contaminants (hormones, pharmaceuticals, antibiotics)	X	X	X	X	X
Human Health Risks					X
Managing Nitrates, Pesticides & Waste from Animal Feeding Ops	X				
Mercury Cycling					X
Nutrient Enrichment		X	X	X	X
Sediment		X	X	X	X
Source Water Protection			X		
Temperature				X	
Urban “Combined Sewer Overflows” (CSOs)				X	
Continuous Sampling Sites	7	3	7	18	9
Periodic Sampling Sites	14	5	31	96	60
Total Sites	21	8	38	114	69

The water quality monitoring network continues to be expanded in Minnesota, Missouri and Wisconsin supported with federal funding drawn principally from the NASQAN and NAWQA programs and the Cooperative Water Program. Sampling and analytical technologies, of course, are also improving rapidly and enhancing the source detection and management options available to Cooperators. The SPARROW model developed by USGS is providing many new management options at the local and watershed scales and plays a significant role in assessing nutrient control strategies throughout the Upper Mississippi River Basin in the efforts to reduce anoxic conditions in the Gulf of Mexico.

Ground Water -Chuck Dunning, Ground Water Specialist in the Wisconsin WSC, described the monitoring of groundwater in the Upper Mississippi River Basin states. Although the measurement techniques and purposes are common among these five states, there is greater variation in the extent of the ground water monitoring network than for the surface flow and water quality elements. Those differences are illustrated in the [presentation slides](#) (starting at slide #57). Increasingly, solute-transport models are used to simulate subsurface migration and behavior of ground water contaminants. Water level data of sufficient duration and frequency of measurement are needed to calibrate and evaluate the reliability of the flow component of these models before realistic simulations of contaminant transport can be made.

A Cooperator Perspective -The concluding presentation in this session was made by Arlan Juhl, Division of Planning Manager at the Illinois Department of Natural Resource's Office of Water Resources. Arlan described the relationship his agency maintains with USGS and the support that the CWP provides in their decisions and many local government, watershed and private decisions ([presentation slides](#)). As in all five of the states, that relationship and support is adapted to the needs of state and local agencies and supports a wide variety of decisions by organizations, businesses and individuals. They monitor 86 streamflow forecast points in and near the Illinois boundaries supported by three of the NOAA River Forecast Centers (North Central, Ohio River and Lower Mississippi), all of which depend on NSIP and CWP data. Many of the levees in Illinois were built 50-60 years ago and national review of flood protection in the aftermath of Katrina has raised many safety certification questions, which will require flood risk assessment. Until levee certification can be reviewed, real-time data and flood forecasting are vital tools in hundreds of communities (not just in this part of the country).

Illinois has over 40 ecosystem partnerships throughout the state that inform and coordinate diverse interests in watershed management. With so many public interest organizations, businesses and citizens monitoring streamflow conditions and using USGS data as an authoritative basis for planning and decision making, the reliability of the CWP and NSIP are widely appreciated. Efforts to protect erodible lands under the federal Conservation Reserve Programs and promote ecological improvements have helped to improve water quality conditions in the Illinois River Basin and monitoring these watersheds is mandated by Congress to measure the effects of these programs.

Data collection over the past 25-50 years has enabled very worthwhile research. Flood frequency analyses have been performed periodically. Equations for peak discharge have been updated when additional record became available. In-stream flow needs have been derived from flow data. Low flow statistics have been updated and take on greater credibility with each new year's data set. Streamflow records allow for the computation of baseflow and sediment transport computation has been performed when streamflow records are available.

There are other programs and projects, however, which suffer when their data demands cannot be met. Illinois and many other states are not able to collect enough data to map all the necessary floodplains with sufficient reliability. They do not have enough data to assess the effectiveness of water quality BMPs or CREP program efforts. TMDLs cannot be accurately determined in many basins without additional data, causing regulatory agencies and permittees to extrapolate and make decisions with much less certainty than they would prefer (in light of the environmental risks and capital investments at stake). More data is necessary to fully manage the interstate and regional planning initiatives of states in the Upper Mississippi River Basin.

The USGS and Illinois hold an annual Cooperators' conference that is well attended; the program agenda varies each year, but the conclusions have been fairly consistent:

1. Communication of the federal need for data needs to improve;
2. Risk management depends on having good data to assess and manage the risk; we need to clearly articulate this need better;

3. We need streamflow and stage data to sustain the integrity of our decisions and services; regardless of whether you are in Illinois or any other state, those data needs are very similar. Each USGS office is autonomous, which leads to better service for the state, but administratively leads away from collaboration –when watersheds cross statelines, we need to find ways to collaborate.

Science in Support of Water Management Decisions in the Upper Mississippi River Basin States: A Cooperator from each of the five UMRB states made a presentation on Friday morning about their resource challenges and their relation with the CWP. In addition, a USGS scientist described the value these relations hold for the nourishment of responsive and relevant expertise.

Robert Biebel, Special Projects Environmental Engineer, Southeastern Wisconsin Regional Planning Commission-- Southeastern Wisconsin Regional Groundwater Management and Water Supply Planning: A Cooperative Intergovernmental Effort. Bob presented an [overview](#) of his Commission's collaborative assessment of future water supply development options for the approximately 2 million people living in Southeastern Wisconsin. Current sources for the public water supply depend primarily on withdrawals from Lake Michigan and from regional groundwater aquifers. The growing dependence on groundwater has caused a substantial reduction (about 500') of head, alteration of flow patterns within the confined sandstone aquifers and significant public concern over the quantity and quality of future supplies and the impact on streamflow. In collaboration with Wisconsin DNR, seven counties and several water utilities in Southeastern Wisconsin, the University of Wisconsin and the USGS, they developed an inventory of their supplies and a model of their aquifer system, identified trends in regional water uses, identified additional data needs, assessed the magnitude of specific quantity and quality parameters and proposed a series of options for public discussion.

Graphical presentation of the aquifer system characteristics and pumping impacts over the past century is very effective in building public awareness and support for the selection of future supply elements and investment in the institutional changes and infrastructure needed to deliver those supplies and assure their sustainability.

Karen Kosky, Kane County, Illinois-- From Hipboots to HEC-RAS: 3 Local Stormwater Management Projects Utilizing USGS Expertise. Karen's [presentation](#) described three projects Kane County has initiated with good success involving USGS with other federal, state and local agencies to assess complicated problems and plan solutions ranging from flood risk analysis and reduction to dam removal and stream bank stabilization.

Flooding in 1996 on the Fox River brought public and regulatory concern to focus on the need to update floodplain hydrology and hydraulic models in the first large scale watershed modeling effort for Kane County with significant concerns raised by FEMA and the Illinois EPA and DNR. This required assessing the effectiveness of Kane County's stormwater control ordinance and designing new capability to safely detain floodwaters. Engaging the USGS in this assessment helped assure that the science behind the risk assessment, the watershed modeling and the end-user interfaces would enhance both public understanding and regulatory acceptance of the results.

The dam removal on Brewster Creek occurred on a YMCA camp property due to dam safety concerns and involved collaboration with USGS, the US Fish & Wildlife Service, Illinois DNR and EPA, the Northeastern Illinois Regional Planning Commission and the Fox River Ecological Partnership. The four acre reservoir was largely filled with sediment accumulated since 1929 and was contained by a small dam with significant structural integrity limitations. Initial plans to remove the structure appeared too costly and USGS monitoring proved invaluable in planning an experimental approach that reduced the cost by about 60%.

The third project involved a study of the Kishwaukee River Watershed in western Kane County, where projected development is substantial, flood risk assessment was needed and the study was likely to involve neighboring counties. In cooperation with the Illinois State Water Survey and the NRCS, the

USGS helped optimize the geomorphologic characterization for the hydrologic and hydraulic modeling of the larger area within the budget available.

Dick Champion, Director, City of Independence, Missouri Water Pollution Control-- NACWA, Urban Issues, and the USGS Cooperative Water Program. The management and protection of water supplies by the City of Independence has undergone significant changes, including the acquisition of a private water utility and the inheritance of stormwater control responsibilities by its municipal wastewater authority. This has increased their appreciation for the watershed perspective in managing water resources and the need for reliable measurements of both surface and groundwater.

The City is seeking to enhance the reliability of their water supplies and to achieve as much as possible through non-regulatory means. Recognizing that government agencies cannot solve all the problems alone, they have become increasingly active in the National Association of Clean Water Agencies (“NACWA,” and formerly the Association of Metropolitan Sewerage Agencies). Dick described the NACWA organization, their strategic alliance with the Water Environment Federation and their new memorandum of agreement with Ducks Unlimited as examples of their effort to advance the cause of “green infrastructure.” He urged participants to endorsing NACWA’s “Clean Water Pledge” and keep alert for the organization of the “Clean Water America Alliance!”

Mary Skopec, Iowa Department of Natural Resources-- Impacts of Agriculture on Water Quality in Iowa. The economic contributions of agricultural production are essential to the general welfare in Iowa and the DNR is committed to reversing historic environmental impacts as the state’s population continues to grow and to expect better protection of water quality, habitat and recreation opportunities. Mary’s [presentation](#) described the state’s appreciation for USGS streamgaging, groundwater monitoring and modeling capabilities as it prepares to update its statewide water plans for the first time since 1982.

As an example, Iowa has about 800,000 miles of drainage tile that improve soil moisture for cultivation. However, the hydrologic and erosive impacts to stream channels and the associated habitat have been substantial. In addition, water quality impacts from feedlots, unsewered communities and other sources are impairing the suitability of many of the state’s waters for their designated uses (e.g., drinking water, primary contact recreation, aquatic life, fish consumption, *etc*). From a national perspective, Iowa is experiencing considerably more “very bad/poor” and “bad/fair” water quality conditions than other states.

With corn prices at record levels and incentives for ethanol production increasing, Iowa State University is projecting that 1 million acres may be withdrawn from the Conservation Reserve Program, risking significant losses in water quality and habitat protection. The challenging decisions facing the state’s citizens, government agencies and political leadership in the next few years demand a clear understanding of current conditions and mitigation opportunities, as well as the potential consequences and options for additional development. In that context, the USGS Water Science Center in Iowa is assisting in the prioritization of streamgaging and groundwater monitoring network commitments and in the use of state-of-the-art modeling tools to assess current and future conditions at locations where no streamgages or monitoring wells exist.

Shannon Lotthammer, Minnesota Pollution Control Agency-- Science Support for Conditions Monitoring in Minnesota. Shannon described [Minnesota’s efforts](#) to implement a monitoring strategy adopted in 2004 that was designed to integrate data from many agencies in determining whether MPCA’s water quality protection efforts are protecting their designated uses. USGS partnership in the state’s assessment of long-term trends in pollutant loading, ground water movement and watershed dynamics (chemical, physical and biological) has been especially helpful. USGS assistance in more controversial assessments, such as the development of nutrient criteria and the assessment of conditions leading to the Interstate 35W bridge collapse highlight the extraordinary value of their Cooperator relationship.

Minnesota has committed over \$6M per year toward the implementation of its 2006 Clean Water Legacy Act, the goal of which is to “protect, restore, and preserve the quality of Minnesota’s surface waters by

providing authority, direction and resources to achieve and maintain water quality standards for surface waters as required by section 303(d) of the federal Clean Water Act.” Minnesota PCA’s budget for FY 2008-09 will enable them to fully implement their 2004 strategy for monitoring. The agency is currently developing the implementation strategy to include all major watershed loading sites, 500 stream sites and 100 lake assessments while providing support for citizen/local monitoring efforts and remote sensing programs.

James Stark, USGS Minnesota Water Science Center— The Value of CWP Cooperator Relations to USGS Scientists and Managers. The water data and science responsibilities of the USGS require extensive awareness of and adaptation to the current and future needs of citizens, program managers and political leaders at every level of government. The relationships between USGS and the Cooperators provide the connection that enables USGS to sustain that awareness and anticipate the information needed to make more intelligent water management and land use decisions, even as those decisions become more complex and public support requires greater understanding and better explanation of surface and ground water systems.

Jim described a [series of examples](#) in which USGS scientists and managers are learning from their involvement with cooperating agencies to make the results of CWP interpretive studies more useful, while making the analytical and interpretive tools more effective and easier to use and adapt. Frequently, it is the Cooperators who lead the identification of key issues and data needs and in determining the appropriate scope and objectives of the data collection and interpretive efforts. USGS is breaking new ground in many different areas of scientific research and application, including biology, sedimentology, geomorphology, seismology and geochemistry, and surface and ground water hydrology. It is the connection with Cooperators’ current needs that provides USGS with an essential opportunity for integrating the utility of these sciences. These advances show up in many ways, including new hydrologic models, better sampling and measurement techniques, the analysis of instream flow and climate change and in the presentation of real-time data on the Internet. The Cooperators also play an essential role in evaluating the usefulness of the models, reports and other products.

Anticipating more challenging issues and decision making needs in the future, USGS will depend upon these collaborative opportunities to continue assisting Cooperators in quantifying and forecasting water availability, understanding ecosystem and climate change, assessing a variety of hazards and understanding environment and human health concerns.

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 Kent Lokkesmoe (Minnesota DNR) and the other by Greg Good (Illinois EPA) to respond to two questions and prioritize the results. Those questions and the combined [results](#) are available, but and **the highest ranking recommendations were:**

For USGS consideration:

- Get back to 50% match and increase USGS funding for new work;
- Reduce HQ overhead cost;
- Enhance interagency coordination of data collection;
- Improve sediment monitoring and analysis program;
- Better recognize synergy of USGS and state monitoring programs;
- Simplify and reduce cost of reports and consider a new methods for producing reports quickly, especially for small studies;
- Stay on cutting edge, advancing the available technology, and continue technology transfer to Cooperators,
- Continue pushing for more timely release of data and information on web, final and provisional;

- Hold regular, statewide meetings with Cooperator community to review needs, opportunities, priorities;

For CWP Cooperators' consideration:

- Advocate full NSIP implementation and continuing increases for the CWP;
- Cooperators can/need to be more vocal with policy makers /influential people;
- Promote base funding for USGS to separate overhead from CWP cost share agreements;
- Improve accessibility of data for electronic transfer of information;
- Discuss streamgauge issues and priorities with more organizations and data users more often;
- Identify and promote awareness of more sources of water data; deal with funding implication;
- Help USGS avoid CWP agreements that are too small to be cost-effective;

Before the meeting adjourned, Bob Hirsch responded to some of the break-out meeting results; he and Ward Staubitz 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 Upper Mississippi River Basin Association or from the Interstate Council on Water Policy.

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