Cooperative Water Program – Priority Activities for FY14

Note: Background information on the Cooperative Water Program (CWP) and the process for developing priorities is provided on pages 2-3.

Priorities – Data Collection

- Protect long-term and real-time monitoring (streamgaging, groundwater levels, and water quality)
- Enhance hydrologic-data networks for improved hazards protection and forecasting and to support assessments of water sustainability for human and ecological needs
- Improve accessibility, management, and delivery of data

Because of the widespread importance of USGS data, Science Centers are strongly encouraged to continue to allocate CWP funding to support data collection and USGS hydrologic data networks at similar levels in FY14. The National Program will continue to track and strive for a balance between data collection and interpretative studies (assessments and research), which is currently, on average, about 60 percent data collection and 40 percent interpretative studies within Centers.

Priorities—Assessment and Research

In general, the highest CWP priorities for assessments and research are to:

- Continue water use and water availability studies that include groundwater, surface water, and other components of the hydrologic cycle
- Continue evaluations of ecological flows and effects on ecosystem services
- Support statistical analyses that allow estimates of streamflow across regions at ungaged stations
- Assess contaminants of emerging concern in drinking water
- Assess sources, transport, and delivery of nutrients, sediment, pesticides, and other contaminants in streams
- Evaluate effects of energy development (hydraulic fracturing) on water quantity and quality
- Continue development of models and decision support tools for decision making on hazards, vulnerable water supplies, human uses, and ecosystems.
- Maintain water resource monitoring and assessments on Tribal lands

Specifics are provided below, along with USGS national programs that are aligned with and supported by CWP activities (listed in parentheses).

(1) Assessments of floods and droughts

(Hazards; NSIP; Groundwater Resources Program)

- Develop dynamic mapping and assessments to track and forecast water hazards.
- Assess and forecast low and high hydrologic conditions in streams and groundwater, at monitored and unmonitored sites, to assist those who are responsible for building infrastructure, managing water supplies, and sustaining ecological health.

(2) Assessments and tracking of water use/consumptive use/water availability

(Water Census; Groundwater Resources Program; Ecosystems)

- Develop of site-specific water-use information (such as withdrawals) (as opposed to aggregate summaries by county).

- Develop consumptive water-use coefficients and (or) methodology.
- Develop regional base flow and recharge estimates that could contribute to a standardized set across a region or the Nation.
- Assess groundwater and surface water relations and water budgets from hydrologic models.
- Assess and develop models relating streamflow characteristics and hydrologic alteration on biological communities and ecosystem health.

(3) Assessments of water quality in streams and groundwater

(NAWQA; Toxics; Ecosystems)

- Contribute to national stream and river monitoring networks, including "benchmark" sites (or reference sites), agricultural/urban watersheds, large inland rivers, and coastal sites.
- Enhance real-time continuous water-quality monitoring at streams, rivers, and wells.
- Conduct watershed studies that help to assess how water moves and transports contaminants, nutrients, and sediment over the land -- that can be integrated in multi-scale efforts that track through basins, ultimately to receiving waters, like Gulf of Mexico.
- Contribute short-term trend assessments and forecasts of water-quality changes resulting from changes in management practices and land use.
- Continue long-term trend assessments and forecasts of water quality resulting from climate and land use change.
- Monitor contaminants in deep groundwater used for drinking water sources.
- Assess, model, and forecast groundwater flow and contamination in aquifers used for drinking.

(4) Assessments of possible impacts from energy development, such as hydraulic fracturing on water quantity and quality *(Energy and Minerals)*

- Continue baseline water quality and quantity measurements and assessments as natural gas exploration and production accelerate among different geologic and environmental settings across the US.
- Track and assess hydrologic processes and changes over time (in hydraulic fracturing-derived contaminants; channel morphology; biological communities).
- Maintain databases and web access to water quantity, quality and biology data.

Cooperative Water Program Background

The CWP values data collection activities *and* scientific investigations. The Program strives to maintain a balance in support of national USGS hydrologic networks and scientific investigations that inform local, State, Tribal, regional and national water issues.

Overall, CWP annually supports nearly 700 hydrologic investigations of the quality and quantity of the Nation's water resources, resulting in more than 300 publications. Key topics relate to water quantity and quality of surface water and groundwater to meet the Nation's myriad of water uses; environmental flows in streams needed to maintain ecosystem health; effects of changing land use on water availability; flood inundation and analysis of risks; sediment; and emerging contaminants in drinking water.

Data-collection activities support USGS national hydrologic-data networks, which constitute the foundation for all USGS mission areas, as well as watershed and aquifer management decisions by stakeholders across the Nation. The comprehensive,

uniform, and accurate data on surface-water, groundwater, water-quality, sediment, and water-use are required for sustaining water that is available and safe for all drinking, ecosystems, industry, agriculture, energy, and navigation, and for water-rights determination by State and Federal agencies, as well as for simulating and forecasting hydrologic conditions and events. In addition, the long-term record of water quantity and quality developed by USGS is invaluable as a baseline for detection of change and to assess human influence over time.

The CWP partially or fully supports more than 70 percent of the USGS stream gages throughout the Nation, almost 100 percent of which provide information in real-time. In addition, the CWP supports more than 9,000 groundwater observation wells, many of which provide real-time information that is critical for drought analysis and tracking, as well as about 4,000 water-quality monitoring sites (surface water and groundwater, many of which are real-time).

Development of Priorities

Priority activities for the Cooperative Water Program (CWP) support national interests and the two-part mission of the Water Mission Area (WMA), which are to minimize loss of property and life from water hazards, and sustain water availability—quantity and quality—to meet competing demands in the face of population growth, land development, and climate variability

Surveys conducted in FY12 and FY13 indicate that these priorities also reflect “on-the-ground” needs of CWP Cooperators (currently more than 1,550) and the most common water issues addressed across the Nation within 48 USGS Water Science Centers. This alignment is important as the CWP is a cost-share Program with jointly funded and planned activities that address many of the Nation’s most pressing water-resource issues—including flood and drought mitigation, water availability, safe drinking water, sustainable ecosystems, impacts of energy development, and climatic and land-use changes—while providing science relevant to local, State, and Tribal water management decisions.

Such alignment also places CWP data and activities as inherently foundational for other USGS Programs, such as providing data and analyses on water use, ecological flows, and evapotranspiration for a national Water Census. Priorities for FY14 are even more directly specified (than in past years) in order to proactively support and demonstrate the alignment of CWP with USGS national initiatives and programs. Specifically, “on-the-ground” CWP activities that can be leveraged and regionalized and (or) nationalized (synthesized), and thereby benefit multiple programs while serving CWP objectives, are prioritized.

To achieve this goal, these priorities have been developed in concert with Program Coordinators of other USGS programs.

Of utmost priority, inherent in all CWP activities, is the CWP continued commitment to broad scientific and interdisciplinary expertise; long-standing, high-quality, nationally consistent procedures and quality assurance; management and delivery of reliable, accessible, and high-quality water information; and the development of innovative assessment and data-collection tools to cost-effectively address water issues across the Nation.