

Statement of

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Mr. Chairman and Members of the Subcommittee, thank you for the opportunity to appear before you today to discuss the Administration's 2015 budget request for the USGS, and in particular, for water resources.

Water is key to protecting our quality of life for now and for future generations. Because competition for water resources is increasing and reaching critical levels in many areas of the United States, the public and decision-makers need to have relevant, timely, and trustworthy information about water quantity and quality. Science provides information and tools to meet this need.

For more than 135 years, the U.S. Geological Survey (USGS) has earned a sterling reputation for providing decision-makers with objective, unbiased scientific results and technical excellence, both of which are hallmarks of the USGS water programs. As the primary Federal science agency for water information, the USGS monitors and assesses the amount and characteristics of the Nation's freshwater resources, assesses sources and behavior of contaminants in the water environment, and develops tools to improve management and understanding of water resources. USGS science information and tools allow first responders, the public, water managers, planners, and policy-makers to contribute to the wise use, development, and conservation of the Nation's water resources for the benefit of present and future generations.

The overall Fiscal Year 2015 budget request for the USGS is \$1.1 billion, an increase of \$41.3 million from the 2014 enacted level. The request supports a balanced science investment portfolio that is essential to a healthy science agency and a strong and resilient Nation. Investments in research and development within the USGS will promote greater understanding in managing the Nation's water resources and will support U.S. economic growth and innovation.

## **USGS Science that Focuses on Water Resources**

The Fiscal Year 2015 budget request for the USGS Water Resources Mission Area is \$210.4 million, an increase of \$3.1 million above the 2014 enacted level. The 2015 USGS budget request reflects a careful prioritization of science investments to promote the understanding of freshwater availability and use; enhance groundwater monitoring; support a national streamflow information program; and continue monitoring and assessing the quality of the Nation's water, including the outcomes of the investments the Nation is making in water-quality improvements.

I will provide a few examples of USGS water science at work to support the national economy, reduce risk from natural hazards, and provide a solid scientific foundation for decisions.

### **Response to the California Drought**

California currently is experiencing one of its worst droughts on record. Federal, State, Tribal, and local agencies already are facing difficult decisions that involve complex tradeoffs among water users. The USGS is working to provide the best available science for California decision makers and managers trying to mitigate effects of the current drought and plan for future water shortages. In FY 2014, the USGS is planning to spend approximately \$30 million on California water-related science that is directly applicable to informing management response to the drought. A portion of this comes from funds Congress appropriates directly to the USGS; however, the majority of the funding is contributed by other Federal, State, and local partners. These partners rely on the USGS to deliver high quality, timely, and objective scientific results.

The USGS is providing real-time surface-water quality and quantity data from more than 500 USGS monitoring sites in California. These data are used by other agencies to manage water flows and deliveries throughout the State. The USGS also has developed the capability to track wastewater treatment plant releases as they flow through the Delta in order to help partners better understand the impacts of those discharges during these unprecedented low flows. Along with monitoring changes in groundwater levels and water quality throughout the State, which is important for safe drinking water and agricultural use, the USGS is monitoring land-surface levels to detect potential land subsidence associated with increased groundwater pumpage during drought conditions. The USGS also is updating existing USGS groundwater flow models for the Central Valley to predict the effects of various groundwater withdrawal scenarios on potential land subsidence. To assist the California Department of Water Resources with their runoff calculations, researchers are providing soil moisture data. Through the use of satellite imagery, USGS scientists are able to compare current and past snow coverage, reservoir water levels, and fallowed field coverage to share with partners. Our researchers also are developing and using computer models to understand the likelihood and potential ramifications of future droughts. All of this science is designed to assist decision making during the drought crisis and provide a valuable public service.

### **Response to Colorado Floods of 2013**

The Northern Colorado Front Range experienced historical and widespread floods and landslides in September 2013 that caused fatalities and extensive damage to buildings, highways, and infrastructure. The USGS spent approximately \$1.62 million in support of science to address the Colorado floods and wildfires. As with the USGS drought response, the funding for this was done with a combination of appropriated dollars from Congress and funding from other Federal, State, and local partners. The science provided by USGS was used by the emergency response community and can be a source of information for building future resilient communities.

During the floods, the USGS immediately sent in field crews to measure flood flows, flag high water marks to measure stream height and movement, and install temporary streamgages where permanent structures were damaged due to heavy water flows; conducted ground and areal field work to locate and characterize the nature, timing, and extent of the landslides, sampled contaminated sediment and waters, worked with FEMA to plan and execute a high-resolution mapping data collection over the flooded region, and evaluated ongoing landslide hazards caused by the rainfall event.

Afterward, the USGS installed an early warning system in Waldo Canyon that includes a real-time camera, streamgaging station and precipitation gage, and there are plans to install a second gage in Williams Canyon soon. USGS has also done storm water-quality sampling following the fire, and additional sampling is planned for this spring. Scientists from the USGS have also been involved touring the affected areas and collecting data for use in sediment models. All of our science can be put to use for helping communities be able to address these types of natural hazards to prevent them from becoming disasters.

### **Streamgages—A Vital National Resource**

The USGS streamflow information program is a vital national resource and provides the scientific foundation for protecting, managing, and sustaining surface water that is safe and available for drinking and for other uses, including for irrigation, energy, industry, recreation, and ecosystem health. The Fiscal Year 2015 budget request includes \$35.1 million for the USGS National Streamflow Information Program (NSIP), a \$1.4 million increase above the Fiscal Year 2014 enacted budget. The NSIP currently is funded at about 27 percent of the amount authorized for full implementation of the program. The increase of \$6 million in the 2014 Omnibus appropriation will allow expansion of the network in 2014 and improve the availability of streamflow information.

The USGS measures water levels at more than 8,000 streamgages nationwide; those data are converted to streamflow information by sophisticated software and stream-geometry data collected by hydrographers. The streamflow information is available to everyone, including the public and emergency responders, in real time. These data are used, for example, to minimize loss of life and property from water hazards, including floods, droughts, and debris or mud flows. Additionally, consistent, long-term, high-quality streamflow information is essential for design of water infrastructure such as dams, irrigation systems, water and wastewater-treatment plants, culverts and bridges; the establishment of jurisdictional floodplains; and the regulation of water quality.

There are many components to a successful streamflow information program. The physical streamgage instruments are placed in a river or stream to measure water levels and enable the

computation of streamflow. Stream channels are continuously changing, especially during floods and droughts, and those changes greatly affect, and may diminish, the reliability of the streamflow estimates. Therefore, USGS scientists go to the streams routinely, especially during floods, to calibrate the streamgage. Critical to all of this is the underlying database operations and maintenance. Information from the database is placed on the Internet in near real-time for speedy access for decision making related to routine water supply operations, emergency flood fighting, urgent drought response; the public also relies on this information for various uses, including recreational planning.

Of the 8,000 USGS streamgages, about 3,100 meet targeted, long-term Federal priorities established by the NSIP. The NSIP streamflow information network is designed to meet Federal responsibilities associated with forecasting floods; monitoring flows across international, interstate, and tribal borders; tracking flow in major river basins; and assessing long-term climatic, land use, and man-made impacts on streamflow and water quality in different environmental settings across the Nation.

The remaining 5,000 streamgages in the current USGS network help address national priorities related to hazard mitigation and water availability for human and aquatic system health. Specifically, these streamgages facilitate decisions, operations, and responsibilities by localities, States, Tribes, and other Federal agencies, including management of reservoirs, drinking-water intakes, groundwater pumping, and water-quality permitting. These streamgages also fill in network gaps by monitoring a broader area that cannot be covered by the Federally-supported NSIP streamflow information network. Such robustness also is critical to support statistical modeling that allows estimation of streamflow at ungaged locations. Much of the USGS streamgage network depends on partner funding—currently about two-thirds comes from about 850 local, State, tribal, and Federal partners. USGS appropriated funding comes from different line items including NSIP, Cooperative Water Program, National Water Quality Assessment Program, Hydrologic Networks Program, and the National Research Program, all of which fund specific streamgages for individual program objectives.

Next month, the Nation will commemorate the 125<sup>th</sup> anniversary of the USGS streamgaging program at the site where the first USGS streamgage was established—Embudo, New Mexico. This is where early USGS scientists worked out the fundamentals of the streamgaging methodology that is still in use today. We are proud of our rich history and the long-term, consistent data that we provide to keep the Nation safe.

## **USGS Groundwater Resource Assessments**

Groundwater is the primary source of drinking water for approximately half of the Nation's population, provides about 40 percent of the irrigation water necessary for the Nation's agriculture, sustains the flow of most streams and rivers, and helps maintain a variety of aquatic ecosystems. Continued availability of groundwater is essential for the economic health of our Nation. The USGS provides objective scientific information to assess and quantify availability and sustainability of the Nation's groundwater resources. The results of those efforts are used in decision making by resources managers, regulators, other government agencies, and individuals in the public and private sectors.

The Fiscal Year 2015 budget request for the USGS Groundwater Resources program is \$11.4 million, an increase of \$2.5 million above the 2014 enacted level. The increase will enable the USGS to expand implementation of a National Groundwater Monitoring Network, as authorized under the SECURE Water Act of 2009. The network will bring monitoring data from the USGS together with data from States and other partners.

Modest steps have been taken to develop a groundwater monitoring program nationwide. The National Groundwater Monitoring Network is a collaborative monitoring network among Federal, Tribal, State, and local agency data providers. So far, pilot projects have been successfully completed in Minnesota, Texas, Illinois, Indiana, New Jersey and Montana; the proposed FY15 funds will allow the USGS to expand this effort to other States.

The FY 15 Groundwater Resources Program budget also will support the program's ongoing regional assessments of groundwater availability in the Nation's major aquifers. The USGS is in the process of conducting assessments of about 30 regional aquifers nationwide to quantify current water resources, evaluate how those resources have changed over time, and provide tools to forecast how much water will be available in the future. In 2014, five multi-year, regional water resource assessments and related data collection are taking place—the Northern Atlantic Coastal Plain Aquifer System from Long Island, NY, to North Carolina, relied on by eleven million people or 41 percent of the people in that area; the Williston and Powder River Basins in Montana, North Dakota, South Dakota, and Wyoming, where the aquifer is an alternative water source for development of some of the Nation's most rapidly expanding oil and natural gas production; the Hawaiian Volcanic-Rock Aquifers, which are the main and most reliable source of drinking water on the Hawaiian Islands; the Ozark Plateaus Aquifer System of Arkansas, Kansas, Missouri, Oklahoma, which is the primary source of freshwater for most public supply systems and most rural water users in the area; and the Glacial Aquifer System, which includes all or parts of 25 Northern States from Maine to Washington and Alaska, where the glacial deposits are the source for the largest withdrawals for public and domestic supply in the United States. Completed assessments include Columbia Plateau Regional Aquifer System; Mississippi Embayment Regional Aquifer; Great Basin Carbonate and Alluvial Aquifer System; Central Valley Aquifer; North and South Carolina Atlantic Coastal Plain Aquifer System; Denver Basin Aquifer; and the Middle Rio Grande Basin.

Through this program, the USGS also will support the continued evolution of the USGS Modular Groundwater Flow Model, or MODFLOW, the most widely used groundwater flow model in the world, which is used worldwide to solve practical problems related to the management of groundwater. New features are being added to the model to incorporate advancements in the understanding of groundwater hydrology, respond to changes in user needs, and take advantage of constantly increasing computer power. Several studies of coastal aquifers in Florida, Massachusetts (Cape Cod), and the Northern Atlantic Coastal Plain apply this new capability.

## **Water Census**

When it comes to water availability, you can't manage what you don't measure. Last year, the USGS issued a report, [\*Progress Toward Establishing a National Assessment of Water Availability and Use\*](#), which fulfilled a Congressional requirement for the Secretary of the

Interior to report on progress made in implementing the national water availability and use assessment program, also referred to as the National Water Census. The Fiscal Year 2015 USGS budget request for Water Census overall is \$14.5 million, of which \$13.5 million is in the USGS Water Mission Area and is disbursed throughout multiple programs.

Growing populations, increased energy development, and the uncertain effects of a changing climate magnify the need for an improved understanding of water use and water availability. However, no comprehensive and current national assessment of water resources exists. And States, which have the primary responsibility for gathering and managing information about water supply and use, do not have a consistent way of reporting information in categories such as thermoelectric, irrigation, public supply, industrial, mining, self-supply domestic, livestock and aquaculture. The Water Census will quantify water supply and demand consistently across the entire country, fill in gaps in existing data, and make that information available to anyone who needs it—a huge step forward on the path toward water sustainability.

The Fiscal Year 2015 budget proposes \$2.0 million for a State water-use grant program. The grant program would provide the necessary framework, resources and incentives for States to provide water supply and use information in a consistent manner, which is essential for eventually providing a uniform, trustworthy national assessment of water availability and use.

One of the initial geographic focus areas for the Water Census is the drainage basin of the Colorado River, which covers parts of seven States, delivers water to more than 30 million people, irrigates nearly 4 million acres of cropland in the United States and Mexico, and supplies hydropower plants that annually generate more than 10 billion kilowatt-hours of clean and cheap electricity. This basin, with its long-term drought and increasing competition for water, has a particularly compelling need for a Water Census.

The Water Census is part of an overarching Department of the Interior initiative known as [WaterSMART](#) (Sustain and Manage America's Resources for Tomorrow). Both the USGS and the U.S. Bureau of Reclamation have substantial responsibilities under the Department of the Interior WaterSMART initiative. Through WaterSMART, the Department is working to achieve a sustainable water strategy to help meet the Nation's water needs and the Water Census will help inform that strategy.

### **Assessing Water Quality Nationwide**

Is our water safe to drink? Can we cook or bathe with it? A safe and healthy tomorrow starts with USGS water science today. The Fiscal Year 2015 budget request for the USGS National Water Quality Assessment (NAWQA) Program is \$59.1 million, or an increase of \$231,000 above the Fiscal Year 2014 enacted budget.

Congress established the USGS National Water Quality Assessment program in 1991 to address the fundamental questions, "What is the status of the Nation's water quality, and is it getting better or worse?" Since then, the USGS has been a primary source of objective and nationally consistent data and information on the quality of the Nation's streams and groundwater.

Two of the highest priorities for the USGS Water Mission Area during the next decade are restoring and enhancing water-quality monitoring networks and continued development of water-quality models. The USGS will continue to focus on nutrients, sediment, pesticides and other contaminants in agricultural and urban settings in the Mississippi River Basin and in other important areas such as the Chesapeake Bay and the San Francisco Bay/Delta and Puget Sound.

In 2014, updated water-quality models for the Mississippi River Basin and the Eastern United States will be available along with existing models for the rest of the Nation in a new Decision Support System. This Decision Support System will provide the ability to estimate the magnitude of different sources of nutrients for any watershed or State across the United States and will allow scenario testing for potential management strategies. The updated system also will provide States, Tribes, local users, and the public the capability to evaluate nutrient sources in watersheds draining to each of the Nation's major estuaries.

During the next decade, the USGS is planning to sample about 1,400 public supply wells in different locations nationwide to better understand where and why contaminants occur at concentrations that may threaten human health. In 2015, the USGS will continue to work toward expanding the national network of long-term water-quality monitoring sites by partnering with States and other organizations in undeveloped, agricultural, and urban settings in the Mississippi and other major river basins throughout the United States. Scheduled updates and enhancements in water-quality models that estimate nutrient and sediment loads and pesticide concentrations in streams will be completed.

The USGS is the only Federal agency that monitors the status of the Nation's groundwater quality and reports on how these conditions are changing over time. If resources are sufficient, the USGS will conduct groundwater monitoring in 16 principal aquifers that collectively account for more than 75 percent of the groundwater used as a source of drinking water for the Nation. Groundwater-quality data for the California Central Valley, Coastal Lowlands of the Carolinas, Glacial, and Northern Atlantic Coastal Plain principal aquifers will be combined with flow models produced by the Groundwater Resources Program to provide a three-dimensional assessment of the amount of groundwater available and its vulnerability to contaminants derived from natural and (or) human sources, as well as an understanding of how groundwater quality will respond to changes in climate, overlying land use, and water use over time.

## **Conclusion**

For 135 years, the USGS has provided impartial scientific information to enable the public, resource managers, emergency responders, and policymakers to make informed decisions on the basis of sound information. The USGS Fiscal Year 2015 budget request represents a balanced focus on monitoring, research, and assessments while maintaining the diverse expertise necessary to respond to evolving science needs. It reflects careful and tough decisions, made within a fiscally constrained environment, to prioritize science investments that support a resilient and robust economy, while also protecting the health and environment of the Nation and its people.

This concludes my statement, Mr. Chairman. I will be happy to answer the questions you and other Members have regarding the 2015 budget proposal for USGS water resources.

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