STATEMENT OF

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U.S. DEPARTMENT OF THE INTERIOR

BEFORE THE

HOUSE COMMITTEE ON RESOURCES

SUBCOMMITTEE ON WATER AND POWER

February 25, 2004

Good afternoon, Mr. Chairman and Members of the Subcommittee. Thank you for the opportunity to speak to you on behalf of the U.S. Geological Survey (USGS) regarding our scientific contributions to the stewardship of the Nation's water resources.

I come before you today to present the Administration's proposal for the budget of the USGS for fiscal year (FY) 2005. The FY 2005 budget will emphasize core USGS science programs that focus on water resources and water availability, natural hazards, biology, information technology, and projects that support science on the Department of the Interior (DOI) landscape. The FY 2005 USGS budget request is $919.8 million in current appropriations, a decrease of $18.2 million from the FY 2004 enacted level. The FY 2005 President's budget preserves the Survey's scientific excellence in providing research results and resource monitoring data in the earth science fields of geography, geology, biology, and water.

125th ANNIVERSARY OF THE USGS

This year marks a significant milestone in the history of the USGS. On March 3, 2004, we will celebrate the 125th anniversary of the creation of the USGS by the Organic Act of the 45th Congress. In this anniversary year, we will celebrate the traditions that have shaped us, the mission that has guided us, the people who have made the science great, and the technology that will lead us into the future.

FY 2005 WATER RESOURCES PROGRAM OVERVIEW AND PRIORITIES

The FY 2005 budget for the USGS Water Program proposes $202.7 million to continue water resources work. This includes a technical adjustment of $4.0 million to centralize USGS-wide enterprise information functions and a shift in responsibility in funding for the Water Resources Research Institutes by having them assume the very small contribution that USGS provides to their total funding. In 2003, the Institutes raised $19.00 for every $1.00 USGS gave them. Other programmatic changes within our Water Program include an increase of $1.4 million for research

into the water quality in the Klamath Basin, and $800,000 to implement a new five-year initiative concerned with water availability and use as part of the DOI Water 2025 initiative.

In FY 2005, the USGS will focus research on the Klamath River basin in southern Oregon and northern California, where water supply is currently inadequate to meet demands for irrigating 250,000 acres of farmland, sustaining habitat in several critical wildlife refuges, and maintaining in-stream flows and lake levels in order to protect three threatened and endangered fish species. In the Klamath Basin, where water is in extremely short supply, it is particularly important that seasonal runoff forecasts are very accurate. In this regard, we are working closely this year with the Natural Resources Conservation Service and the Bureau of Reclamation (BOR), to improve seasonal flow forecasts by incorporating ground-water conditions into the forecast model. The FY 2005 budget requests $1.4 million dedicated to improving the quality and quantity of water entering Agency and Upper Klamath Lakes, to model hydrodynamics and heat transport in the Lakes, and to monitor nutrient loadings and algal ecology. An additional $1.4 million is requested for biological studies to focus on the ecology of two endangered sucker species in Upper Klamath Lake, Oregon. This information will improve the forecasts of resource-management decisions being made by BOR, U.S. Fish and Wildlife Service (FWS), National Marine Fisheries Service, and Klamath Tribes. The total USGS FY 2005 request for Klamath studies is $3.7 million, a $2.8 million increase over 2004. The total Administration request for Klamath is $105 million, including $67.2 million contributed by Interior Bureaus.

In related studies with California's North Coast Regional Water Quality Control Board, the USGS has documented the data needs for water-quality models of the Klamath River between Upper Klamath Lake and the Pacific Ocean. The models would be used to develop the total maximum daily load (TMDLs) for temperature, nutrients, and dissolved oxygen, the role of natural and anthropogenic source loadings for temperature, dissolved oxygen, and nutrients. A key consideration is protection of fall-run salmon, including the endangered Coho, in the Lower Klamath River.

As part of the DOI Water 2025 Initiative and in partnership with BOR, there is also an increase of $800,000. This increase would fund studies to assess ground-water availability and use, develop improved methods for characterizing aquifers, and provide scientific information that will help water-resource managers meet water supply needs while preserving biological resources.

Over allocation, competitive demands for water such as agriculture and recreation, endangered species habitat, Native American tribal rights, and environmental concerns underscore the heightened need for using science and technology to understand and manage our Nation's water resources. The USGS will coordinate with the DOI Water 2025 initiative and will build upon the USGS and BOR partnership on the Watershed and River System Management Program. This program has already resulted in models that improve the efficiency of water system operations. The USGS provides the science related to atmospheric and watershed processes, while the BOR provides the engineering expertise related to river, reservoir and irrigation management. This partnership has resulted in a coupling of USGS watershed models with BOR operations models.

USGS Streamgaging Network

For over a century, the USGS has played a key role in monitoring the flow of our Nation's rivers. The first USGS streamgaging station was established on the Rio Grande near Embudo, New Mexico, in 1889. The USGS now operates over 7,000 streamgages nationwide. This constitutes over 90 percent of the streamgages in the Nation that provide daily streamflow records that are accessible to the public. Over the past 10 years, we have seen remarkable advances in the methods used to monitor the flow of the Nation's streams and rivers. These advances include new technologies for flow measurements, improved telemetry capabilities that enable us to deliver streamflow information in near-real time. Also increased computer and Internet capabilities that have made it possible to store and serve historical flow information for thousands of streamflow measurement sites in the United States via the World-Wide Web. We have available on-line more than 181 million individual daily streamflow values, measured at more than 21,000 locations in the United States. Some of these records are over 100 years in length. These long-term records are critical to water resource planning and serve to help water users understand the likely severity and duration of future droughts. These records are also crucial to documenting the significant changes that have been taking place in recent decades in the timing of snowmelt runoff due to climate warming.

At the end of 2003, about 86 percent of the USGS streamgaging network had some kind of near-real-time telemetry (satellite, telephone, or radio). About two-thirds of the sites are equipped with automated Data Collection Platforms (DCPs) that use satellite radio transmissions to broadcast stream stage data (along with other data) as often as every 15 minutes, 24-hours a day.

One of the strengths of the USGS streamgage network is that it can provide at any point in time a snapshot of the current hydrologic conditions across the country. For access please see: http://water.usgs.gov/waterwatch/ For example, hydrologic conditions in the West are varied at the present time. Specifically:

- Parts of the Pacific Northwest, particularly in the Cascades, are experiencing above-normal streamflow in response to winter season precipitation that has averaged 120 to 130 percent of normal.

- Much of the Southwest continues to have below-normal streamflows, a pattern that we have observed almost continuously since the summer of 2001. Below normal flows are also affecting parts of the Northern Rockies, the Central and Southern Plains, and eastern California.

- The lowest flows are occurring in Arizona, Utah, southeastern Nevada, and northeastern New Mexico. Currently, 45 percent of the streamgages in this region are reporting below-normal conditions, and 27 percent are much below normal. The snowpack in river basins in these areas is generally less than 85 percent of average. There are also significant deficiencies in reservoir storage across the entire western United States. With the exception of California, where reservoirs are only slightly below normal for this time of year, those in most States are averaging 40 to 75 percent of normal.

- Looking ahead to the spring snowmelt forecast and resulting summer streamflow, we expect that Arizona and New Mexico, and a large part of Utah, will be more than 30 percent below average.

The seriousness of the current hydrologic conditions in the Southwest cannot be overemphasized. In a region where water use exceeds renewable supply, the cumulative consequences of multi-year drought can far exceed those of a single dry year. Although many basins in the West have received near-normal amounts of precipitation thus far this winter, many others have not, particularly some where snowmelt is an important contributor to spring and summer flows of the Colorado and Rio Grande Rivers. After several consecutive years of drought conditions, even an average winter will not mitigate the water-supply deficits that have accumulated over the past four years. The situation can only be alleviated after a multi-year period of above-normal precipitation. Therefore, we should not expect drought conditions in the Southwest to end any time soon.

The most significant development in streamflow measurement in the last 10 years has been the deployment of acoustic Doppler current profilers (ADCPs). These technologies also add to our efficiency. ADCPs, using sound waves that travel through the water, are essential to studies of water quality, fish health, and salinity throughout the highly complex Sacramento-San Joaquin delta area. The plans for modifying the Bay-Delta system through the CALFED process depend on USGS innovations in flow monitoring. Also, during the summer of 2003, use of ADCPs permitted USGS field crews in Indiana to make 55 flood measurements, 2 to 3 times the number of measurements that would have been possible during the same time and with the same number of personnel using conventional current meters.

Hydrologic systems extend beyond any jurisdictional or political boundaries that can be drawn on a map. Because of the interstate nature of both surface- and ground-water resources, the Federal government plays a major role in gathering hydrologic data, forecasting, modeling and in the development of supply-enhancing technologies.

Irrigation water pumped from the High Plains Aquifer has changed the face of the High Plains, making it one of the Nation’s most important agricultural areas. The High Plains aquifer provides the water to irrigate crops on about 27 percent of the irrigated land in the United States. Additionally, the aquifer provides drinking water to 82 percent of the people who live within the aquifer boundaries. A recent USGS study (USGS Circular 1243) documents the water-level changes in the aquifer. The intense use of ground water has caused major declines in ground-water levels raising concerns about the long-term sustainability of irrigated agriculture in many areas of the High Plains. The changes are particularly evident in the central and southern parts of the High Plains, where more than 50 percent of the aquifer has been dewatered in some areas. Our plans for the assessment of water availability and water use propose that we provide similar assessments of conditions in the other important aquifers of the Nation.

Floods and Debris Flows

Water is essential, but it also has its destructive side. The 2003 fires in Ventura, San Bernardino and San Diego counties were the largest in southern California's recorded history. The fires not only brought destruction, but in their aftermath massive and deadly debris flows. Fifteen people died, one individual was missing, and hundreds were left homeless when a December 25, 2003,

storm inundated the recently burned and steeply rugged terrain. Population growth and urban development immediately downstream of these burned lands puts lives and property at high risk of floods and debris flows with each new forecast for rain.

The USGS is working to understand the debris flow potential and improve predictive capabilities for future generations. The USGS began reconstructing the Christmas Day storm events beginning with the long-range weather forecasts through the actual debris flow event. USGS scientists worked to determine "peak flood flows" at six locations and installed a network of 20 rapid deployment-recording rain gages and six discharge-gaging stations in burned basins. Coupled with observations of the response of each basin to winter storms of 2003 and 2004 these records will better define the threshold for future post-fire flooding and debris-flow activity. The USGS is also verifying the debris flow maps published immediately following the fires that helped to warn of the many potential dangers.

Floods are among the most frequent and costly natural disasters. Lives are lost and damages amount to more than $5 billion annually. Three fourths of all Presidential disaster declarations are related to floods. Flood warnings and river-level forecasts are essential tools for reducing deaths, damage, and disruptions from floods. The National Oceanic Atmospheric Administration's (NOAA) National Weather Service (NWS) issues flood watches and warnings. Streamflow data from the USGS streamgaging network is crucial to their forecasting mission. It provides the historical data needed to calibrate their models and the current flow data to assure that their forecasts stay on track with developing conditions. The Director of the NWS has asked us to help him determine how our agencies might work together in the future to provide better forecasts of the kind of devastating debris flows and floods that take place in steep fire-prone landscapes. The USGS has much to offer in our abilities to monitor the soils and streams and to conduct research leading to improved models that can trigger community-warning systems. New technologies are making it easier to meet the challenges that flooding presents.

USGS CORE SCIENTIFIC RESPONSIBILITIES

Looking at the core scientific responsibilities within USGS for FY 2005, the budget will support the transition of the Geography Program toward leadership in geospatial data standards, data consistency, data integration, and partnerships for data collection, maintenance, and dissemination. The program is funded at $118.9 million and includes a $1.9 million decrease in funding for *The National Map*.

The FY 2005 President's budget provides $220.8 million for the Geology Program. The FY 2005 budget includes $500,000 for geothermal assessments and an $800,000 increase in earth observation and monitoring to expand INSAR (Interferometric Synthetic Aperture Radar) to monitor ground deformation at several of the 65 active and potentially active volcanoes in the United States. INSAR uses data from satellites to detect small changes in the elevation of the Earth's surface, stage toward a national monitoring capability, with increased tracking of the behavior of priority volcanoes, including Yellowstone Caldera in Yellowstone National Park, Three Sisters Volcano in Oregon, and several Alaskan volcanoes.

The FY 2005 budget requests $167.6 million for the Biology Program to find solutions and assist in the mitigation of biological resource problems facing Federal agencies and State, local, and Tribal governments. As mentioned previously, the budget includes increases of $1.4 million for

research into the population dynamics and behavioral ecology of suckers in Klamath basin and $1.0 million for invasive species research for innovative controls and methodologies in the Mississippi River drainage for the Asian carp, as well as research into the early detection and control of the brown tree snake on Guam and in Hawaii. Additionally, $500,000 is requested for an USGS-FWS partnership to meet crucial needs of deepwater fishery science in the Great Lakes and $250,000 is requested to begin an ecological mapping effort. The budget also proposes reductions of $7.7 million for unrequested earmarks.

The FY 2005 budget establishes an Enterprise Information organization and budget activity within the USGS to consolidate enterprise-level information technology, management, and services to enable a more effective use of resources, to ensure a higher degree of accountability, and a more consistent deployment and use of technology throughout the bureau. The activity is comprised of $46.7 million in resources transferred from other program activities, offset by a $5.3 million decrease that reflects the completion of narrowband radio conversion, and accomplishment of some certification and accreditation milestones for securing information networks and services. An increase of $2.5 million is requested to strengthen USGS information technology security and to fund disaster.gov, a government-wide disaster information system. An increase of $1.2 million is requested for implementing a Department-wide Enterprise Services Network.

CONCLUSION

Dedicated study over the125 years since our creation has made our scientific data valuable to millions of citizens. We have evolved from data gathered with picks and pack mules and wagon trains to remote sensors with real-time data access, satellite transmitted measurements, to a *Spirited* rover on Mars. The USGS partners with more than 1,400 Federal, State, and local agencies through our Cooperative Water Program to provide data and science, freely available to all, in support of water resources management.

It is not just our longevity, however, that we celebrate this year, we are also celebrating the strength of our mission, one that has endured because it is relevant and because it has given the American people and the world a wealth of data, long-term scientific understanding, and scientific tools that serve the needs of the American people.

Through the years, we have responded to the changing needs of the Nation, provided science to Interior's Bureaus to improve the effectiveness of federal resources management decision-making and expanded our traditional role of geography, geology, and hydrology to include the assessment and monitoring of our Nation's biological resources. We have seen great improvements in technological innovations in tracking and communicating the changes in our dynamic planet enabling us to expand our predictive capabilities and point the way to a future in which we live safer lives and enjoy and prosper from the preservation and use of our Nation's precious natural resources.

I thank the Subcommittee for this opportunity to speak about the scope of the USGS and how it benefits the Nation.