Activity: Water Resources Investigations

Subactivity: Cooperative Water Program

	2007 Actual	2008 Enacted	2009 Fixed Costs & Related Changes (+/-) [a/]	2009 Program Changes (+/-) [b/]	2009 Budget Request	Change From 2008 (+/-)
Cooperative Water Program ($000)	64,345	62,849	+1,170	-1,734	62,285	-564
Total FTE [c/]	*725*	*715*	*0*	*-6*	*709*	*-6*

a/ Fixed cost increases for this subactivity total $1,480, of which $1,170 is budgeted and $310 is absorbed. A technical adjustment is proposed as part of a budget restructure that moves funding for global change activities into a new integrated budget activity titled Global Change.

b/ Changes for this subactivity include a reduction of -$293 for travel. The impact of this change is described in the General Statement that begins on page A-1.

c/ The 2008 decrease of 10 FTE is matched by a decrease ranging from -10 to -20 FTE in the reimbursable program, for a total decrease ranging from -20 to -30 FTE. The 2009 decrease of 6 FTE is matched by a decrease ranging from -6 to -12 FTE in the reimbursable program, for a total decrease ranging from -12 to -18 FTE.

Summary of 2009 Program Changes for Cooperative Water Program

Request Component	($000)	FTE
• Cooperative interpretive studies	-1,441	-6
• Travel reduction	-293	0
TOTAL Program Changes	**-1,734**	**-6**

Justification of 2009 Program Changes

The 2009 budget request for the Cooperative Water Program is $62,285,000 and 709 FTE, a net program change of -$1,734,000 and -6 FTE from the 2008 Enacted level.

Cooperative Interpretive Studies **(-$1,441,000 / -6 FTE)**

This decrease was originally proposed in the 2008 President's budget to offset the $1,400,000 increase proposed for the National Streamflow Information Program and other higher priority USGS programs. In 2009, the decrease would result in about 20 fewer interpretive studies of water resources issues that are conducted through the Cooperative Water Program, starting with studies that were scheduled to conclude at the end of 2008.

Since the cooperators provide about two-thirds of the funding for the program, the content of projects is determined in consultation with those cooperators, and specific focus areas are often not known until workplans and joint funding agreements are established during the fiscal year. Thus, the USGS cannot say which specific studies would be stopped in 2009. However, likely topical areas to be reduced include —

- Water quality issues such as determining the effects of land use practices on water quality,
- Water availability and use,
- Wetlands, lakes, reservoirs, and estuaries,
- Water resources issues in the coastal zone, and
- Environmental effects on human health.

Program Performance Change

	2005 Actual	2006 Actual	2007 Actual	2008 Plan	2009 Base Budget (2008 Plan + Fixed Costs)	2009 Pres. Budget	Program Change Accruing in 2009	Program Change Accruing in Outyears
					A	B=A+C	C	D
End Outcome Goal 1.4: Resource Protection: Improve the understanding of national ecosystems and resources through integrated interdisciplinary assessment								
# systematic analyses & investi-gations delivered to customers	138	137	338	323	323	303	-20	0
Total Projected Cost ($000)	23,460	23,460	33,800	32,300	32,300	30,300	-2,000	--
Projected Cost per scientific report or other product (whole dollars)	170,000	170,000	100,000	100,000	100,000	100,000	100,000	--
Comments	Decreases in 2008 and 2009 are due to a reduction in the number of interpretive cooperative studies resulting from decreases in funding. Actuals for 2007 are higher than the target due to transition from the old WRD Reports Tracking System to the new enterprise-wide IPDS, which tracks status of scientific products for the entire USGS. More authors are complying with requirements to enter all scientific publications and other products into the system. Since the transition to IPDS was made in the middle of the year, the increased compliance rate results in exceeding the target for the water programs. Targets for 2008 have been revised based on increased compliance in reporting completion of publications and other products, and unit projected costs have been adjusted accordingly. Cost per scientific product is an average that includes the cost of writing, editing, peer review, and publication of each product, as well as the cost of the studies from which the products are derived. Reimbursements from other Federal agencies are included in the calculation, and for the Cooperative Water Program non-Federal matching funds are included, but the portion of funding housed in the Enterprise Information Activity (associated with the Enterprise Publishing Network) is not included.							

Note: Projected costs may not equal program change as these are full costs, which may include funds from other sources and (or) use averages.

Column A: The level of performance and costs expected in 2009 at the 2008 President's budget level plus funded fixed costs. Reflects the impact of prior year funding changes, management efficiencies, absorption of prior year fixed costs, and trend impacts, but does not reflect the proposed program change.

Column D: Outyear performance beyond 2009 addresses lagging performance — those changes occurring as a result of the program change (not total budget) requested in 2009. It does not include the impact of receiving the program change again in a subsequent outyear.

Program Overview

As the primary Federal science agency for water-resource information, the USGS monitors the quantity and quality of water in the Nation's rivers and aquifers, assesses the sources and fate of contaminants in aquatic systems, develops tools to improve the application of hydrologic information, and ensures that its information and tools are available to all potential users.

For more than 100 years, the Coop Program has been a highly successful cost-sharing partnership between the USGS and water-resource agencies at the State, local, and tribal levels. This partnership provides support for a majority of the USGS National hydrologic data network, including 4,500 stream gages, 10,000 ground-water observation wells, and 2,500 water-quality monitoring sites directly supported through the Coop Program. The Coop Program has been successful because it —

- Combines Federal and non-Federal resources in addressing many of the Nation's most pressing water resource issues, resulting in shared benefits and cost savings to both the Federal Government and the States,
- Conducts studies across the country in each of the 50 States, Puerto Rico, and U.S. Trust Territories, allowing the USGS to form a national picture of important water-resources issues and potential solutions,
- Uses standardized methods of data collection and analysis across the country, so that information can be aggregated into National databases, results of studies are comparable from one State to another, and knowledge gained from one study has transfer value to understanding the hydrology in other parts of the country,
- Helps resolve inter-jurisdictional disputes by assessing conditions at State boundaries and by assuring all parties that the data and results of investigations are objective and are equally available to all parties, and
- Combines the utilization of USGS offices within the State with the much larger national infrastructure of the USGS. This infrastructure includes the National Water Quality Laboratory, the National Water Information System, the National Research Program (which provides new methods and consultation on difficult scientific issues), instrumentation testing facilities, and a national system of quality assurance.

In addition to providing information responsive to State or local needs, the Coop Program provides information that supports the activities of many Federal agencies. Some of these activities are —

- Forecasting floods,
- Managing surface-water supplies,
- Monitoring hydroelectric power production,
- Setting waste disposal limitations,
- Regulating industrial discharges,
- Designing highway structures,
- Measuring the downstream transport of pollutants or nutrients,
- Determining total maximum daily loads,
- Evaluating mine permits,
- Planning and evaluating land reclamation,
- Evaluating fish habitat,
- Quantifying Indian water rights, and
- Quantifying Federal reserved water rights.

The goals of the Coop Program support the Department's strategic plan, specifically the goal of improving the understanding of national ecosystems and resources through integrated interdisciplinary assessment. In conjunction with NSIP, Hydrologic Networks and Analysis, and an array of reimbursable projects funded by partner agencies, the Coop Program contributes to

the outcome measures and PART program performance measures shown in the table at the end of this section.

This program effectively leverages Federal appropriations, working with State, local, municipal, and Tribal officials to develop a program that responds to both local and national needs and attracts more than two non-Federal dollars for each Federal dollar appropriated. In 2007, non-Federal cooperators provided $163.2 million to match USGS funding of $64.3 million, well above the one-to-one match required by provisions of the annual appropriations act.

2009 Program Performance

The 2009 budget request for the Cooperative Water Program subactivity is $62,285,000 and 709 FTE, a net program change of -$1,734,000 and -6 FTE from 2008 Enacted.

Topical areas that will receive special attention in 2009 include the following:

Water availability — The availability of water to meet the needs of growing communities, agriculture, energy production, and critical ecosystems continues to be a nationwide challenge. The Cooperative Water Program provides essential hydrologic information needed to assess the quantity of water available to communities to support water supply planning and allocation to a wide range of users. In 2008 and 2009, the Coop Program will support thousands of streamgages and ground-water observation wells that define the availability of surface and ground waters, and will conduct numerous hydrologic investigations needed to evaluate the quantity of available ground water. A recent example of this work includes completion of a sophisticated computer ground-water flow model of the Virginia Coastal Plain, an important water supply for more than 2 million people. This work includes detailed characterization of the newly discovered Chesapeake Bay Impact Crater and its influence on the regional ground water system. For more information, see *http://va.water.usgs.gov/projects/va089.html.*

Linkage to Water for America Initiative

Although the Coop Program requests no funds in 2009 for the Department's Water for America initiative, which addresses issues of water availability, the program remains supportive of initiative goals and will assist in information transfer to State, local, and tribal agencies. In 2008, the matching funds that these non-Federal agencies provide to the CWP support the operation of over 4,000 streamgages, 10,000 ground-water observation wells, a total of 700 hydrologic investigations, and the national water use database.

Drinking water — Providing clean, safe drinking water to citizens is a high national priority, and the Coop Program works with State and local governments to assess the quality of the Nation's drinking water supply. In 2008, the USGS will work with the California Water Resources Control Board to continue an assessment of 116 of California's priority ground-water basins. With many partners, the USGS is developing an understanding of natural and human factors that affect ground-water quality, providing early indications of potential water-quality problems, and contributing to the long-term management and protection of ground-water resources affecting one in eight Americans. For more information, see *http://ca.water.usgs.gov/gama/.*

Ecosystem needs — One of the most pressing ecosystem questions that the Nation faces is how to preserve and enhance the quality of aquatic and riparian ecosystems in the face of increasing pressure to withdraw surface water and ground water. Through the Coop Program the USGS is working with State and local agencies to evaluate the instream flow requirements of aquatic ecosystems. This effort entails the development of both new information and new techniques. A recent notable example includes the USGS effort to develop a hydroecological

integrity assessment process for New Jersey, which should provide a prototype for broad applicability nationwide. A report describing this new tool can be found at *http://www.fort.usgs.gov/products/publications/21598/21598.pdf.*

All three of these priority areas will receive attention in both the data collection portion of the program and the interpretive studies portion of the program. The Coop Program includes three major components:

Data Collection Activities

(Estimates for 2007, $34.8 million; 2008, $34.1 million; 2009, $34.1 million)

Cooperatively funded hydrologic data collection activities are underway in every State, Guam, Puerto Rico, and the U.S. Virgin Islands. Over the past few years, the Coop Program has provided sole support or partial support for well over half of the sites where the USGS collects data on surface-water levels and flow, ground-water levels, and ground-water quality. In addition, the Coop Program supports collection of data on surface-water quality, which is becoming increasingly important to the States as they monitor total maximum daily loads (TMDLs), to comply with the requirements of the Clean Water Act.

All these data provide resource managers with the information they need to determine the suitability of water for various uses, identify trends in water quality, and evaluate the effects of various stresses on the Nation's ground water and surface water resources. Much of the data collected at USGS monitoring sites is provided free of charge on the Internet. This includes historical data, as well as real-time data, which are generally less than 4 hours old. The real-time data are used routinely by emergency management agencies, State and municipal agencies, businesses, irrigators, and recreational boaters and fishers.

Use of Cost and Performance Information

A synthesis of results from reviews of the water science centers confirmed that salary load is increasing across the Nation and is having a major impact on operations. This impact is keenly felt in the streamgaging, operations, with costs growing 4-6 percent per year, resulting largely from increasing personnel costs. The impact is also significant for the Coop Program, which is the largest program component in most WSCs.

Over the years the Coop Program has maintained about a 50:50 balance between data collection and interpretive studies. To maintain the requisite level of data collection to support stakeholder needs, the USGS has reduced the number of new research hires and combined research resources among science centers to ensure that the right skill mix is available to conduct interpretive studies.

Most of the USGS data collection stations serve multiple purposes and many are funded, wholly or in part, through joint-funding agreements. Normally, these stations, though funded by various organizations, are operated as part of an integrated network rather than as stand-alone entities. For this reason, cooperating organizations are billed on the basis of average station cost, rather than actual cost, which rarely can be precisely known. This procedure benefits these organizations and the USGS in at least two ways: administrative costs are reduced because financial transactions are simplified, and definitive cost information is available to all parties for planning purposes at the beginning of the fiscal year. This arrangement also ensures that data collection in remote areas or areas which may be otherwise problematic (due to vandals, extreme flooding, lightning strikes) during a given period of time do not become so expensive that they must be dropped from the network.

Interpretive Studies

(Estimates for 2007, $23.2 million; 2008, $22.7 million; 2009, $22.1 million)

In addition to data collection activities, the Coop Program supports about 750 hydrologic studies each year. Water resource studies define, characterize, and evaluate the extent, quality, and availability of water resources. The results of these investigations are published and provided to State agencies, which use them as the basis for managing the water resources for which they are responsible. Also, these investigations provide information that can be synthesized and applied to a variety of hydrogeologic and climatic settings across the Nation, greatly expanding the usefulness and transferability of USGS study results nationwide.

Technical Support

(Estimates for 2007, $6.3 million; 2008, $6.1 million; 2009, $6.1 million)

The USGS has a long tradition of providing national and regional technical support for its geographically distributed water resources studies. This support provides quality control to assure the technical excellence of water resources field programs and provides a structured way of transferring new technology to USGS investigative and data activities that are primarily conducted in Water Science Centers in each State. Technical support also includes a formal way of establishing priorities for water resources research by the USGS and provides a mechanism to make water resources information available to other agencies, the scientific community, and the public.

Updates to 2008 Program Performance Targets

Performance targets for 2008 have been updated from those portrayed in the 2008 President's budget. These updates reflect enacted funding levels for 2008 and other changes described in the "Comments" rows of the performance tables.

Program Performance Overview

There are no performance measures that can be tied exclusively to the Coop Program; however, in conjunction with the NSIP, Hydrologic Networks and Analysis, and an array of reimbursable projects funded by 800 partner agencies, the Coop Program contributes to all the measures listed below.

End Outcome Goal 1.4: Resource Protection: Improve the understanding of national ecosystems and resources through integrated interdisciplinary assessment									
End Outcome Goal End Outcome Measure / Intermediate or PART Measure / PART Efficiency or other Outcome Measure	**2004 Actual**	**2005 Actual**	**2006 Actual**	**2007 Plan**	**2007 Actual**	**2008 Plan**	**2009 Pres. Budget**	**Change from 2008 Plan to 2009**	**Long-term Target 2012**
GPRA End Outcome Measures									
% targeted science products that are used by partners for land or resource management decisionmaking **(SP)**	85%	90%	93%	≥90%	93%	≥90%	≥90%	0	≥90%
Intermediate Outcome Measures and Bureau and PART Outcome Measures Ensure availability of long-term environmental and natural resource information, data, an systematic analyses needed by land and resource managers for informed decisionmaking									
% of proposed streamflow sites currently in operation that meet one or more Federal needs (denominator = 4,425) **(PART)**	64% (2,832)	61% (2,700)	62% (2,742)	62% (2,742)	62% (2,742)	64% (2,845)	65% (2,895)	+1% (+50)	55% (2,450)
Comments	The change in 2008 is a result of the proposed increases for NSIP streamgage operations and Hazards Assessment and Mitigation. The change in 2009 is a result of the Water for America initiative.								
Contributing Programs	NSIP, Hydrologic Networks and Analysis, Cooperative Water Program (USGS and State/local contributions), reimbursements from other Federal agencies.								
% of U.S. with ground-water quality status and trends information to support resource management decisions **(PART)**	0	39%	58%	51%	68%	70%	70%	0	70%
Comments	Target for 2007 was exceeded because sampling from out years was shifted into 2007 in anticipation of not being able to afford it in future years, as this type of work grows more expensive while future budgets will likely remain level. Change in 2008 planned (not due to budget changes).								
% of U.S. with ground-water availability status and trends information to support resource management decisions **(PART)** (denominator = 65 principal aquifers)	5% (3.5)	7% (4.5)	8% (5.5)	9% (6)	9% (6)	11% (7)	12% (8)	+1% (+1)	12% (8)
Total Projected Cost ($000)	***UNK***	***1,575***	***1,925***	***2,100***	***2,100***	***2,625***	***3,000***	***+375***	***--***

End Outcome Goal 1.4: Resource Protection: Improve the understanding of national ecosystems and resources through integrated interdisciplinary assessment									
End Outcome Goal End Outcome Measure / Intermediate or PART Measure / PART Efficiency or other Outcome Measure	**2004 Actual**	**2005 Actual**	**2006 Actual**	**2007 Plan**	**2007 Actual**	**2008 Plan**	**2009 Pres. Budget**	**Change from 2008 Plan to 2009**	**Long-term Target 2012**
Projected Cost per regional ground-water availability project (national average) (whole dollars)	***UNK***	***350,000***	***350,000***	***350,000***	***350,000***	***375,000***	***375,000***	***375,000***	**--**
Comments	Change in 2008 results from decrease proposed for the Cooperative Water Program. Measure indicates the number of regional ground-water evaluation projects (status and trends in ground-water availability) that coincide with total number of the Nation's 65 principal aquifers, as designated in the National Atlas. Average cost per project is $350,000–$375,000, though actual costs range from <$100,000 to >$500,000 per project, depending on the scope and location of the study. Project costs include salaries, travel, training, vehicles, supplies, report production, and printing.								
Contributing Programs	Cooperative Water Program, Ground-Water Resources Program								
% of States with Web-based Streamflow statistics tools to support water management decisions **(PART)** (denominator = 50 States)	4%	10% (5)	14% (7)	20% (10)	18% (8)	26% (13)	26% (13)	0	30% (15)
Comments	Target not met in 2007 because the bureau did not receive an approved budget or an apportionment until halfway through the fiscal year, delaying progress on implementation of the Streamstats web application. By the end of the first quarter of 2008, progress on this measure has already exceeded the 2007 year-end target and is well on the way to achieving the 2008 target.								
Contributing Programs	NSIP, Hydrologic Networks and Analysis, Coop Water Program.								
Intermediate Outcome Measures and Bureau and PART Outcome Measures Ensure the quality and relevance of science information and data to support decisionmaking									
X% of studies validated through appropriate peer review or independent review **(SP)**	100%	100% (138)	100% (137)	100% (137)	100% (338)	100% (323)	100% (303)	0 (-20)	100% (276)
PART Efficiency and Other Output Measures									
# systematic analyses & investigations delivered to customers	UNK	138	137	137	338	323	303	-20	276
Total Projected Cost ($000)	***UNK***	***23,460***	***23,460***	***23,290***	***33,800***	***32,300***	***30,300***	***-2,000***	**--**
Projected Cost per scientific report or other product (whole dollars)	***UNK***	***170,000***	***170,000***	***170,000***	***100,000***	***100,000***	***100,000***	***100,000***	**--**

End Outcome Goal 1.4: Resource Protection: Improve the understanding of national ecosystems and resources through integrated interdisciplinary assessment									
End Outcome Goal End Outcome Measure / Intermediate or PART Measure / PART Efficiency or other Outcome Measure	**2004 Actual**	**2005 Actual**	**2006 Actual**	**2007 Plan**	**2007 Actual**	**2008 Plan**	**2009 Pres. Budget**	**Change from 2008 Plan to 2009**	**Long-term Target 2012**
Comments	Decreases in 2008 and 2009 are due to a reduction in the number of interpretive cooperative studies resulting from decreases in funding. Actuals for 2007 are higher than the target due to transition from the old WRD Reports Tracking System to the new enterprise-wide IPDS, which tracks status of scientific products for the entire USGS. More authors are complying with requirements to enter all scientific publications and other products into the system. Since the transition to IPDS was made in the middle of the year, the increased compliance rate results in exceeding the target for the water programs. Targets for 2008 have been revised based on increased compliance in reporting completion of publications and other products, and unit projected costs have been adjusted accordingly. Cost per scientific product is an average that includes the cost of writing, editing, peer review, and publication of each product, as well as the cost of the studies from which the products are derived. Reimbursements from other Federal agencies are included in the calculation, and for the Cooperative Water Program non-Federal matching funds are included, but the portion of funding housed in the Enterprise Information Activity (associated with the Enterprise Publishing Network) is not included.								
# real-time streamgages reporting in NWISWeb **(PART)**	5,978	6,246	6,496	6,195	6,728	6,830	6,880	+50	6,125
Total Projected Cost ($000)	***80,703***	***84,321***	***83,227***	***83,633***	***90,828***	***88,158***	***99,760***	***+725***	***--***
Projected cost per streamgage (national average) (whole dollars)	***13,500***	***13,500***	***13,500***	***13,500***	***13,500***	***14,000***	***14,500***	***14,500***	***--***
Comments	2007 targets were set before 2006 year-end actuals were known and were based on a "likely enacted" funding level that never came to pass. In addition, the USGS exceeded the target for this measure because of increased interest by partner agencies, who contributed additional funding amounts that were not anticipated when targets were set. The change in 2008 is a result of the proposed increases for NSIP streamgage operations and Hazards Assessment and Mitigation. Most of the additional streamgages in 2008 will be reactivated, rather than completely new gages. A completely new gage incurs construction costs ranging from $25,000–$30,000, plus 6 months of operation (average of about $7,000); after the first year the new streamgages reverts to the national average cost of $14,000. Cost is a national average that includes operation and maintenance, salary and transportation for technicians who perform site visits, salary for records management and validation, and a small amount for replacement of equipment when a gage is disabled by lightning strike or other event. This replacement of equipment does not include replacement of gages that are lost in large numbers during floods or hurricanes. In practice, the cost of an individual streamgage varies depending on the size of the stream, type of terrain, need for cableways or other specialized equipment at the site, and distance of each site from the nearest USGS office.								

End Outcome Goal 1.4: Resource Protection: Improve the understanding of national ecosystems and resources through integrated interdisciplinary assessment									
End Outcome Goal End Outcome Measure / Intermediate or PART Measure / PART Efficiency or other Outcome Measure	**2004 Actual**	**2005 Actual**	**2006 Actual**	**2007 Plan**	**2007 Actual**	**2008 Plan**	**2009 Pres. Budget**	**Change from 2008 Plan to 2009**	**Long-term Target 2012**
% of WRD streamflow stations with 30 or more years of record **(PART)** (denominator = number of streamgages reporting in NWISWeb)	60% (baseline)	58% (3,622 / 6,246)	62% (3,822 / 6,165)	63% (3,902 / 6,195)	59% (3,970 / 6,728)	58% (3,970 / 6,830)	62% (4,260 / 6,880)	+4%	65%
Total Projected Cost ($000)	***UNK***	***48,897***	***51,597***	***52,677***	***53,589***	***55,580***	***61,764***	***+6,184***	**--**
Projected cost per streamgage (national average) (whole dollars)	***UNK***	***13,500***	***13,500***	***13,500***	***13,500***	***14,000***	***14,500***	***14,500***	**--**
Comments	Decrease in 2007 and steady-state in 2008 are due to NSIP funding increases (reactivating or establishing new streamgages causes a drop in % of stations with 30 years of record because it increases the value of the denominator). Denominator changes every year because it reflects the number of streamgages reporting in real time in NWISWeb. For this measure, the denominator changes annually (or in some cases daily) because the measure represents the number of 30-year streamgages as a percentage of the total number of streamgages in operation. Since the total number of streamgages changes constantly throughout the year, the denominator must change if this measure is to reflect the state of the streamgaging network accurately.								