

# Estimated Benefits of a Fully Implemented U.S. Geological Survey National Streamflow Information Program for the Nation

## ... from the National Streamflow Information Program

This Fact Sheet is one in a series that highlights information or recent research findings from the USGS National Streamflow Information Program (NSIP). The investigations and scientific results reported in this series require a nationally consistent streamgaging network with stable long-term monitoring sites and a rigorous program of data collection, quality assurance, management, archiving, and synthesis. NSIP produces multipurpose, unbiased surface-water information that is readily accessible to all.

One goal of the U.S. Geological Survey's National Streamflow Information Program (NSIP) is to provide a national 'backbone' streamgauge network with about 4,780 federally funded streamgages selected to provide streamflow information to meet national needs. These national-need streamgages would be supplemented with partnership-funded streamgages to help fulfill the need for local, state, and regional streamflow-information. National streamflow-information needs are defined in NSIP as follows:

- Streamflow forecast locations of the National Weather Service (NWS) and the National Resource Conservation Service (NRCS);
- Interstate compacts, court decrees, international treaties, and major national and state-line crossings;
- Major river basin outflows to downstream basins, estuaries, oceans, and Great Lakes;
- Watersheds mostly unaffected by diversion and regulation to evaluate the responses to climate, land, and water use; and
- USGS major water-quality programs.

To fully implement NSIP for the nation would require \$116.8M in one-time costs and \$108.6M annually (in 2006 dollars). These one-time costs include reactivating 971 discontinued streamgages, installing 433 new streamgages, flood hardening streamgages used by the NWS for flood forecasts, and updating real-time telemetry on all streamgages for the nation. The annual costs are for operation and maintenance of the 4,780 NSIP federal-goal streamgages, to cover the fixed costs of the entire network for the nation, regional assessments of streamflow information, additional data collection and analysis during and following floods and droughts, improved streamflow-information delivery, and development of new equipment and techniques to measure streamflow more accurately, reliably, and at less cost.

### **Savings to Current Streamgaging Partners for the nation**

The USGS currently (2007) operates about 7,620 continuous-record discharge streamgages for the nation, of which 2,951 were selected to be part of the NSIP federal-goal streamgauge network. Currently, 2,350 of these 2,951 streamgages are funded through the Cooperative Water Program (CWP) and 601 are fully funded by NSIP. If NSIP were fully funded for the nation, all 2,951 of these streamgages would be completely federally funded (as would 1,829 additional streamgages not currently operated by the USGS). In addition, for the 4,669 existing streamgages (and for any future/new streamgages) that would remain funded through the CWP, the cost of operation would be about 40 percent less than the current costs because NSIP would cover the infrastructure costs of all streamgages operated across the country. These infrastructure costs are costs of the streamgaging network that are for

the most part independent of the number of streamgages operated and cover such items as salary for management and supervision of the network, maintenance and updates of the database, and administrative support of the program. These changes would translate into a savings to current funding partners nationally of about **\$20.75M per year** for full federal funding of the 2,350 existing NSIP national needs streamgages not already NSIP funded and **\$17.68M per year** savings due to the infrastructure costs being covered for the 4,669 streamgages that would remain cooperatively funded for a total savings to funding partners for the nation of about **\$38.43M per year** (accounts for the USGS CWP contribution in existing funding – see Appendix for computations).

### **Additional Benefits to the nation of a fully implemented NSIP**

In addition to the fiscal benefits discussed above, users of streamflow information for the nation also will benefit from NSIP based on the other enhancements the program will provide. These enhancements will include the following:

1. A total of 4,780 streamgages would be operated and maintained for the nation funded entirely by federal funds (total network for the nation is now about 7,400 streamgages; an equivalent of 632 are fully funded by NSIP). Many, if not all, of the existing (and future new) streamgages not funded by NSIP would remain funded through the Cooperative Water Program at a 50-50 cost share, but at a cost approximately 40 percent less than today.
2. Developments in data input and analyses techniques, as well as investments in other new software and hardware for the National Water Information System (NWIS) database will enhance data delivery to provide more accurate and timely streamflow information.
3. Enhanced data acquisition and analyses during and after floods and droughts will provide a better understanding of these hydrologic extremes for better predictions in the future.
4. Regional assessments of the streamflow information will provide better estimates of streamflow at locations distant from streamgages and also information as to where to place new streamgages to optimize the streamgaging network. This information will also be central to the NSIP goal of being able to predict streamflow characteristics at any point on any stream in the nation. These assessments will also provide insight to any trends in streamflow caused by changes in land use, water use, or climate.
5. Research and development will provide better equipment and techniques to measure and understand streamflow.

## Appendix — Computations for National Partner Savings from USGS NSIP

### 1. Full Federal funding for existing NSIP streamgages not already funded by NSIP:

2,350 streamgages X \$14,475 = \$34.02M per year; USGS partners currently (2007) pay about 61 percent to the USGS's 39 percent —  $\$34.02\text{M} \times 0.61 =$  **\$20.75M/year partner savings**

### 2. Reduced cost per streamgage because infrastructure costs covered:

$\$14,475/\text{streamgage} \times 0.40 = \$5,790$  reduction in per streamgage costs;

Cooperative Water Program partners currently pay 61 percent, so their share of these savings =  $0.61 \times \$5,790 = \$3,532$ . Savings =  $(4,669 \text{ CWP funded streamgages} - 526 \text{ OFA funded streamgages}) \times \$3,532 =$  **\$14.63M per year**;  $526 \text{ OFA funded streamgages} \times \$5,790 =$

**\$3.05M per year**;  $\$14.63\text{M} + \$3.05\text{M} =$  **\$17.68M per year**

3. **Total savings** =  $\$20.75\text{M} + \$17.68\text{M} =$  **\$38.43M per year**