USGS National Streamflow Information Program – 2008 Update

The National Streamflow Information Program (NSIP) provides the Nation with streamflow information to help protect life and property from floods and to manage our water resources and aquatic environments. The USGS national streamgaging network is supported by four funding sources: the USGS Cooperative Water Program, the USGS NSIP, other Federal agencies (primarily the Corps of Engineers and Bureau of Reclamation) and 800 State and local funding partners (figure 1). The last two sources currently account for over 70 percent of the USGS streamgaging network funding.

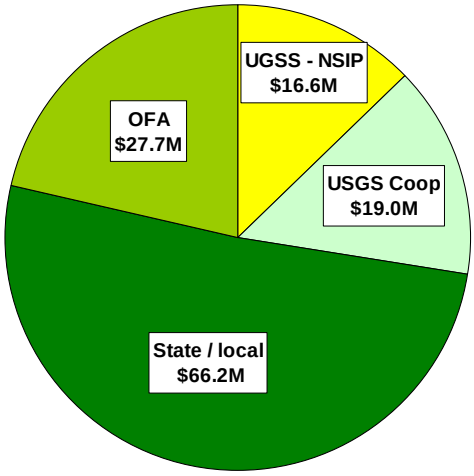

Figure 1. Funding for USGS Streamgages, FY 2007 Total = $129.5M

In 2006, the USGS operated about 7,500 streamgages. The number of active streamgages had been rising slightly since 1997 (figure 2), but has fallen for the last two years by nearly 160 streamgages. Because the streamgaging network depends heavily on partner interests and funds, there are often significant year-to-year changes in individual streamgages in operation causing instability in the network. While the network grew slightly in some parts of the Nation, other areas had significant numbers of important long-term streamgages being discontinued due to a lack of cooperator funds. Currently, there are nearly 200 streamgages in 31 States either at risk of being discontinued or that already have been shut down since October 2006 . The USGS has been unable to locate other funding partners to support these streamgages and has inadequate funds in the NSIP to maintain them. Not only are there a large number of streamgages being discontinued in some areas, but those streamgages can also account for a substantial percentage of the network in that area. There is a vast amount of information accumulated through the records of these streamgages. The longest period of record for these at risk streamgages is 97 years, with many others having 70 to 90 years of record. For a complete list of the currently at risk streamgages, see the USGS web page: http://water.usgs.gov/osw/lost_streamgages.html.

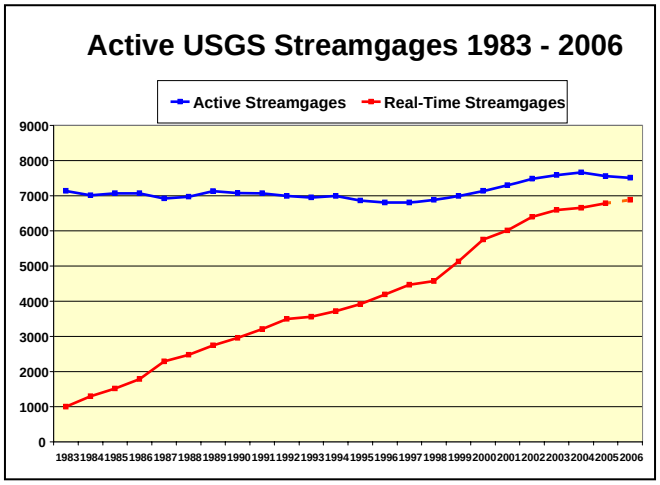

Figure 2. USGS Streamgages 1983 - 2006

Network instability has important implications because the loss of long record streamgages reduces the potential value of streamflow information for infrastructure design applications and environmental assessments. Long records of streamflow are vital to the characterization of regional hydrologic conditions (for purposes of water supply planning and flood hazard assessments) as well as for documenting and understanding changes that occur in streamflow due to changes in land use, water use, groundwater development, and climate. From 1996 to 2006, 778 critical streamgages with 30 or more years of record were discontinued. The

increase in NSIP funding in 2001 reduced substantially the loss of these critical streamgages, from an average of over 75 lost per year to just 24 lost in 2001. However, in FY 2005 and 2006, nearly 200 critical long record streamgages were discontinued.

The federal funding for USGS programs supporting streamgaging is shown in Figure 3. NSIP received a $2.7M funding increase in 2007 and a $3.5M increase in 2008, including a $1.5M Congressional add-on. These increased funds will help stabilize and modernize the streamgaging network. The Cooperative Water Program (CWP) received a $1.5M increase in 2007 and a $2.2M decrease in 2008. The graphs in Figure 3 show the funding trends for these two programs over the past decade. The NSIP is currently funded at only about 20 percent of planned full funding.

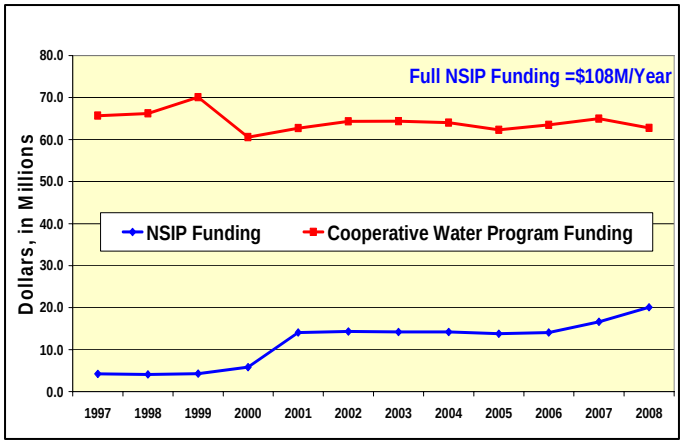

Figure 3. USGS Streamgage Funding

The USGS continues to make great advances in upgrading streamgages with near real-time data delivery capabilities (figure 2). About 92 percent of all USGS streamgages have telemetry (satellite, radio, or phone) and are now able to deliver data to users in near real-time via the World Wide Web. NSIP is also investing resources into long-term improvements in the overall delivery of streamflow information to users. These improvements include: database enhancements to streamline the computational process and to improve user's access to real-time and historical streamflow information, new assessment methods to define trends and estimate streamflow at ungaged locations, and research and development to measure streamflow more accurately, less expensively, and more safely. Some specific advances recently incorporated into the USGS streamgaging program include: (a) the use of non-contact radar sensors to measure river stage in special conditions; (b) the use of acoustic Doppler velocimeters (ADV) and acoustic Doppler current profilers (ADCP) to measure streamflow more quickly, more accurately, and under extreme flow conditions and in difficult measuring locations; (c) the use of new software (the Graphical Ratings and Shift Application Tool (GRSAT)) to develop and maintain rating curves, enhancing streamflow data quality and reducing labor hours; (d) upgrades to high data rate satellite radios at over 2,500 streamgages. For more information on recent improvements, see "U.S. Streamflow Measurements and Data Dissemination Improve", EOS, v. 85, No. 21, May, 2004 or http://water.usgs.gov/osw/pubs/EOS-Streamflow.pdf and "Recent Improvements to the U.S. Geological Survey Streamgaging Program", FS2007-3080 (http://pubs.usgs.gov/fs/2007/3080/).

The National Academy of Sciences review of the USGS's plan for the NSIP (located at http://www.nap.edu/books/0309092108/html) concluded the NSIP was "a sound, well conceived program that meets the nation's needs for streamflow measurement, interpretation, and information delivery" (The National Academia Press, 2004, Assessing the National Streamflow Information Program).

The National Hydrologic Warning Council recently completed an independent, two phase, cost/benefit analysis of the USGS streamgaging program. Phase one discussed the wide range of uses of USGS streamflow information. Their second phase analysis, which focused on flood protection benefits only, showed that "…the benefit clearly exceeds the estimated cost of operating and maintaining the network." The reports describing their results can be found at the National Hydrologic Warning Councils webpage: http://nhwc.udfcd.org/publications.htm.

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