

# **Research Report:**

## **Federal Interagency Sedimentation Project (FISP)**

Since 1939, the FISP has conducted research, development, fabrication, and evaluation of instrumentation and methods for collection, analysis, testing, storage, distribution, and interpretation of information related to sediment and the sampling of surface waters and sediments for analysis of their chemical, biological, and physical properties. FISP developed physical sediment samplers, sampler-deployment protocols, and analytical methods that are the standards by which most Federal agencies collect sediment and water-quality samples from rivers. FISP equipment and methods are also accepted as the standards used by many State and local agencies and by many private organizations collecting sediment data in the United States; and by a number of countries and organizations around the world. As an example, samplers developed by the FISP have been adopted as standards by the American Society for Testing and Materials, and the International Standards Organization, and are used by the World Meteorological Organization to produce reference data for evaluating the performances of suspended sediment samplers developed in several foreign countries. In the 21<sup>st</sup> century, a proliferation of indirect, novel, and often unverified methods to measure sediment characteristics and transport are being proposed and developed. The FISP has expanded its traditional role to include research, development, and evaluation of indirect methods and instruments produced by others for potential acceptance. The goal of the FISP has been and is to develop and promote the use of standardized sampling and monitoring technologies and methods that produce fluvial-sediment and water-quality data that are representative, consistent, and comparable. Without such data, technically supportable evaluations of changes in the quality and content of our Nation's waters would not be possible.

New technologies and methods for indirect (surrogate) monitoring of fluvial sediment can provide much greater temporal- and spatial-data resolution with increased data quality at potentially lower costs. Use of new technologies for measuring or inferring selected fluvial-sediment characteristics and their potential use by Federal, State, and local agencies without sufficient unbiased testing and evaluation creates the potential for production of inconsistent, non-comparable, and often unreliable data as was the case before 1940. The cooperative efforts of all Federal agencies involved in sediment-data collection, analysis, and distribution are needed to ensure the integrity of the nation's sediment data and effective responses to sediment-related issues.

Listed below are select examples of recently funded sediment measurement research projects by the FISP. More information can be found on FISP's website, <http://water.usgs.gov/fisp/>

- Obtaining total bed material load using sequential bathymetric surveys
- Acoustic measurement of suspended fine particle concentrations
- Automated extraction of reservoir pre-impoundment surfaces using acoustic SONAR data
- Comparison of bed load samplers for use in gravel bed streams
- Particle size distribution measurements from digital imagery obtained with Unmanned Aerial Systems (UAS)
- Continuous measurement of bed load using a series of instrumented steel plates

- Development of a manual for the use of single- and multi-frequency hydroacoustics for monitoring suspended sediment transport
- Refining the design of the US PH-4 suspended sediment sampler for production
- Use of bed load traps for sediment measurement in wadeable streams

The FISP is funded by partner agencies, which currently include; DOI-USGS, DOI-Reclamation, DOI-BLM, DOD-USACE, USDA-ARS, USDA-FS, USEPA. These agencies contribute funds annually to the controlling agency (currently the USGS) to fund research, development, and testing activities performed by and for the FISP. The FISP technical committee, made up of representatives from contributing agencies, meets semi-annually to carry out the business of the FISP.