A Critical Laboratory Evaluation of LISST-100 for Measurement of Particle Size Spectra

J W Gartner*, R T Cheng*, and P F Wang**

***Water Resources Division**
U. S. Geological Survey
Menlo Park, CA 94025

****SPAWAR, US Navy, San Diego, CA, 92152**

ABSTRACT

LISST-100 (Sequoia Scientific, Inc.) is an instrument designed for in-situ measurement of particle size spectra. The instrument uses the principle of laser diffraction to measure volu content of suspended particles in each of 32 logarithmically spaced size classes from 1.25 t microns. The LISST-100 was critically evaluated in the laboratory to examine its capabili resolving (1) particle size distribution, and (2) total volume (mass) concentration of test samples. In order to simulate field conditions, a test chamber was designed that utilizes the full laser p length of the instrument and allows for continuous mixing of particle suspensions. The sma volume of the test chamber minimizes the amount of polymer standard needed for each sa analysis. Suspensions of single sized polymer particles (5, 20, 50, 100, and 140 micron combinations of single sized particles, and a size distribution (1-40 microns) at vario concentrations were analyzed in the laboratory using the test chamber. Results from the analy were interpreted using vendor software. Mean particle size was correctly determined by LISST-100 for all samples of single size particles. The instrument correctly identified peak mixtures of single-sized particles and the distribution of particles within a size range. Chang volume concentration were correctly identified as a percent change. An instrument calibra constant was determined from linear regression for determination of total mass concentration field samples.

An abstract presented at AGU 1998 Fall meeting, special session on Dynamics of Sediment-Laden Flows.