

Agenda for WebEx on LISST, Mon Jan 30, 12PM to 4pm (or 5 at latest) EST

The development of LISST technology by Sequoia Scientific Inc for in-situ deployment has provided major advances in environmental particle size distribution (PSD) measurement (Andrews, et al, 2011). PSD and concentration data at high spatial and/or temporal resolution will open new doors for research on sediment transport mechanics and watershed processes. The USGS is particularly interested in this tool, and several LISST devices are now in use by USGS offices. However, several important problems were discovered or highlighted in the summer/fall of 2011. Guidance is needed soon for users of this equipment, and critical issues/questions need answers soon.

Purpose:

The purpose of this workshop is to obtain a clear statement of some issues in using the LISST-SL and LISST-Streamside that were discovered over the last 2 years, and especially summer of 2011. We would like to clearly show the manufacturer our results so they can address the issues, whether the fix involves software, firmware, hardware, or simply qualification of what is being measured. This is informal and generally confidential with USGS and Sequoia. The discussion will not be construed to necessarily represent vetted findings regarding LISST performance; but we do want to get to the nitty gritty of its performance and limitations.

Major Points of Discussion:

1. The instrument particle-size limits will not measure a substantial, variable, fraction of sediment in most fluvial systems. This affects volumetric particle concentration (VPC) SSC, and PSD. PSD is a method-based definition, and one must qualify the method when discussing it. Gravimetric, laboratory PSD would not be expected to be the same as volumetric, insitu PSD; although they should be highly indicative of one-another. Thus, the instrument-based limitation of measured PSD for most streams containing particles outside the measured range, is not a question of functionality or success of the technology. But it must be evaluated or calibrated for each stream. It may be possible to quantitatively adjust the LISST measured PSD for the unmeasured fractions of sediment. If so, a method needs to be provided, preferably by Sequoia. In any case, this is a very important limitation of the instrument and must be highlighted to users, as it has not been to date.
2. Whether you adjust for the unmeasured fraction or not, the LISST measured concentration does not appear to indicate the volumetric particle concentration (VPC) as literally defined and understood. This is clearly and definitively shown in the many data sets on multiple rivers collected by the LISST-SL last year, and in one river for the LISST-Streamside. The error in the reported VPC by the list appears to vary from 200 to 500 percent, roughly. Presumably this is a software issue, because the SSC~VPC 'fit' is very good. Are these problems limited to the SL and Streamside, or common to 100X as well?
3. Operational issues continue to be inadequately addressed. For many of these we simply need some guidance. For example: the LISST-Streamside – how does one dewater it when freezing temperatures approach? Is there a way to continuously down load data?

Agenda (TIMES LISTED IN EST)

12:00 – Welcome and Intro - Landers

12:10 – Sequoia Scientific

12:45: Tim Straub

1:15 Chris Curran

1:45 Mark Landers

2:00 Marinna Martini

2:15-2:30 break

2:30-4:00 discussion of key problems