Geophysical Research Abstracts
Vol. 20, EGU2018-9980, 2018
EGU General Assembly 2018

Recent advances in estimating river properties using non-contact methods

Jonathan Gourley (1), Daniel Wasielewski (1), John Fulton (2), Jorge Duarte (3), Nadège Allaix (4), Sacha Garnier (4), and Pierre-Alain Ayral ()

(1) NOAA/National Severe Storms Laboratory, Norman, OK, United States (jj.gourley@noaa.gov), (2) United States Geological Survey, Denver, CO, United States , (3) Cooperative Institute for Mesoscale Meteorological Studies, University of Oklahoma, Norman, OK, United States , (4) Ecole des Mines d'Alès, Alès, France

The ANCHOR project (Automated NonContact Hydologic Observations in Rivers) was launched in 2016 to develop, test, install, and evaluate remote sensors placed above waterways in the United States. ANCHOR consists of three sub-projects: development of a bathymetry scanning LiDAR for automated retrieval of channel cross-sections, installation of 14 commercial stream stage/ velocity radars for estimating discharge, and development of an interferometric stream radar (ISRad) to resolve cross-stream surface velocity profiles and along-stream slope. The PinPoint Bathymetry LiDAR is a small, self-contained system designed to be installed on a pole, bridge, or cableway above a small stream. It points downward and scans in one dimension across the stream, from bank-to-bank. Laboratory results will be presented to quantify the instrument precision and uncertainty due to turbidity, ambient light, water depth, and bottom substrate. Comparisons will be shown between field measurements of channel cross-sections and retrievals from the LiDAR.

Several stream radars have been installed above waterways including two fast-reacting urban streams, fast-reacting natural streams, and an ephemeral stream in a natural semi-arid setting. Three of these streams are gauged with conventional, in-situ discharge instruments. Results and comparisons with the conventional instruments will be presented. The presentation will highlight the benefits of remote-sensing of stream properties as well as elucidating the challenges in instrument siting, quantifying data uncertainty, and limitations.