Thursday, October 11
Poster Session 4
10:30–12:00

Poster 36

OPTICS AND ACOUSTICS FOR NEAR-BED PARTICLE CHARACTERIZATION AND QUANTIFICATION OF TURBULENCE

Sediment fate and transport models are often utilized to address questions related to the environmental impacts of remediation efforts, the likelihood of natural recovery, and potential impacts of extreme events. In order to effectively implement these models, bed erosion and deposition rates must be accurately parameterized. These processes are dependent on physical forcings, the suspended sediment distributions, and sediment properties such as bulk density, settling velocity, and biogeochemical composition. We deployed in-situ acoustical and optical instrument platforms coordinated with laboratory experiments to measure the flow and physio-biogeochemical characteristics of sediment in a turbulent, current- and wave-driven shallow estuarine environment. Results show that in different flow environments, turbulence can act to resuspend relatively dense, inorganic particles or disaggregate less dense, organic flocculates. The field and laboratory observations of the sediment characteristics will inform a high-resolution large-eddy simulation (LES) model that resolves details of the turbulent, sediment-laden boundary layer. The suite of data obtained from the field observations, laboratory experiments, and LES model will be used to understand the relationship between particle size distributions and turbulence in wave-driven estuarine environments and how these dynamics affect and are affected by biogeochemical properties of the suspended particles.

Grace Chang, Integral Consulting Inc., gchang@integral-corp.com, https://orcid.org/0000-0002-5771-9636
Frank Spada, Integral Consulting Inc., fspada@integral-corp.com
Galen Egan, Stanford University, gegan@stanford.edu
Joe Adelson, Stanford University, joe.adelson@gmail.com
Kurt Nelson, Stanford University, knelson3@stanford.edu
Oliver Fringer, Stanford University, fringer@stanford.edu