Internship Opportunity

Up to three summer internships are available to develop, build, test, and deploy low-cost water-level sensors in the coastal ocean. Students will help put together off-the-shelf components, program the instrumentation, perform calibration tests, install/deploy instrumentation, and analyze/quality assure data. Preferred qualifications include experience working with electronics (e.g. Arduinos or similar), programming experience, and/or practical experience with tools and building things; however, suitable students without this background will be considered. The student(s) will be paid $3500 for the summer and will be part of an inaugural cohort of marine-science students funded by the Santa Rosa Creek Foundation Summer Research Program. Additional on-campus activities will expose students to the scientific research process. Under-represented students are encouraged to apply. If interested, please send a short cover letter and a resume to Stefan Talke at stalke@calpoly.edu by May 7th, 2021.

Additional Project information

In marine environments, engineers often don't have enough data, leading to un-optimal designs to coastal infrastructure issues and potentially mal-adaptation to evolving problems such as sea-level rise. A major reason for data limitation is that instruments are expensive (often >$10-50k) and challenging to deploy. In the proposed project, 2-3 engineering students will develop economical water level sensors (<$350 each) and determine whether ocean waves, tides, and other types of surface water variability can be measured from a local pier (either Morro Bay or Cal-Poly Pier). Based on a previously built prototype (Figure 1), the gauge uses off the shelf, temperature compensated ultra-sonic sensors (from MatBotix) to measure the air-gap between the sensor and the water surface at up to 2Hz. Data will be measured by a data-logger, and controlled by an Arduino (or similar). Students will also explore building cheap GNSS/GPS sensors for measuring vertical land motion and tides. The design of instrument components like marine-safe housing and solar power , will be explored. Battery requirements for different measurement routines will be assessed. Lab and pier facilities are expected to be available; if COVID-19 restrictions prevent in-person work, the project will pivot to a virtually-based program that emphasizes how to process and analyze wave and tide data, including archival records from the US National Archives.

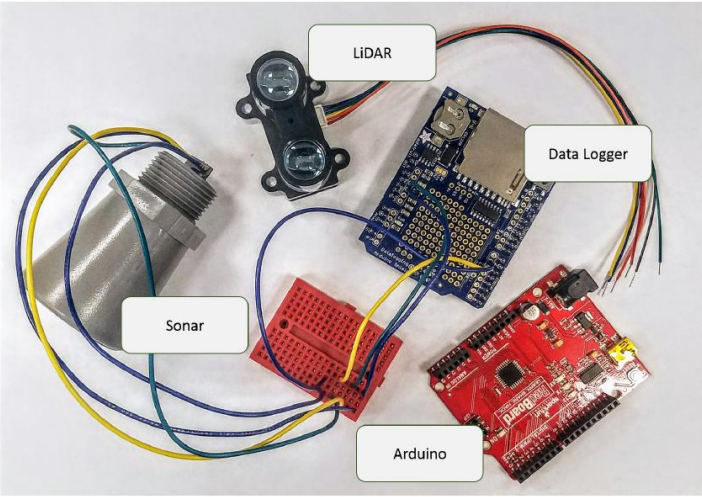

Figure 1: Diagram of tide gauge equipment