Coastal Acoustic Tomography in Lake Biwa, Japan

*John Wells[1], Hiroki Uchida[1]

1. Dept. Civil Eng., Ritsumeikan University

We will present results from a test of Coastal Acoustic Tomography (CAT) in Lake Biwa, Japan in November 2017. Three 5 kHz transducers were deployed along a 10.2 km line from the West Shore of the lake to Takeshima. Acoustic travel times between transducers are computed from correlograms of the emitted "M11" quasi-random code with the received signal. Small but consistent differences in travel times between reciprocal paths were observed, whence we estimate path-averaged currents along the dominant acoustic path on the order of 5 cm/s, which is not inconsistent with expected magnitudes at this site. For the temperature profile in November, ray paths pass almost entirely below the thermocline. To our knowledge this is the first reported estimate of currents by Acoustic Tomography in a lake.
In the latter part of the presentation, plans for a followup three-month test scheduled to start in late July 2018 will be presented. We solicit suggestions for designing this and future tests to best contribute to understanding of Continental-Coastal Ocean interactions.

Keywords: Acoustic Tomography, Differential travel times, Measurement of deep currents

