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Observations of Seiches in the Yellowstone Caldera

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As part of the Plate Boundary Observatory (PBO), six integrated observatories consisting of some combination of borehole strainmeters, borehole seismometers, GPS, tiltmeters, pore pressure, thermal measurements and meteorological data were installed in the Yellowstone area.
Strong but intermittent multi day signals with periods of 11 to 14 minutes are observed in a strainmeter installed within 200 m of the Lake Yellowstone shoreline. This is hypothesized to be a seiche in Lake Yellowstone which is strongly coupled to hydrologic system. In this presentation we examine the correlation between strain, barometric pressure, wind speed, and rainfall across the Yellowstone PBO network and compare the frequency content of strain signals recorded during the summer to those recorded during the winter when the lake is covered with ice. Analysis of this unique, integrated, data set may allow the differentiation of a seiche signal across Yellowstone lake from regional meteorological effects.