Abstract Title: **Investigation of seismic signatures during overtopping of an experimental levee**

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Understanding the health and condition of dam and levee systems provides critical information for enhanced decision-making, ultimately safeguarding both life and property. Long-term monitoring through seismic sensing could provide information on the state of a levee system at any given time when visual inspection is not feasible due to costs or logistics. Seismic methods have shown promise in the detection of internal erosion due to piping (Planes et al. 2016, 2017). The current investigation looks at the seismic response during levee failure due to overtopping. Analysis includes monitoring changes in frequency content, as well as seismic interferometry. Seismic interferometry is a cross-correlation method that gives the Green’s function convolved with the ambient source wavelet between two sources. The result of the cross-correlation can be used to determine changes in group velocity within the Fresnel zone between receivers. Noise sources were analyzed, and pairs of sensors were chosen that were in alignment with the major ambient source. Changes of between 5 to 20 dB were noted in sensors close to the overtopping and are consistent between tests of overtopping of different sections. These results were consistent with pressure gauge measurements in the upstream reservoir. Results are compared to the location of scouring from the overtopping.

**References**

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