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The monitoring and maintenance of earthen dams is an ongoing and critical process to ensure the integrity of these structures, and prevent failure and the potential consequences. Overtopping and flooding account for around 30% of dam failure, with foundation defects and slope instability accounting for about 30% as well, and nearly 20% of U.S. dam failures have been attributed to piping and seepage. All earthen dams have some degree of seepage, resulting from water percolating slowly through the dam and its foundation. If this becomes uncontrolled it can lead to rapid failures in dam integrity, with seepage typically occurring around dam infrastructure, through animal burrows, and cracks in the dams. Many monitoring procedures rely on visual cues, noticing areas of seepage or wet patches on the dam, regions where vegetation is greener, etc. or from point source monitoring wells or drains, or invasive drilling or trenching procedures. Geophysical methods present non-invasive, high resolution, spatially continuous survey and monitoring tools enabling a cost-efficient and rapid evaluation of seeps or monitoring structures over time. We present a case study involving the use of a suite of geophysical methods, including electrical resistivity which is well suited to such applications with the resistivity of materials being highly dependent on soil moisture, for monitoring and seepage investigations on an earthen dam structure in California.