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| Project Title: Rapid and non-destructive assessment of levees for strength and liquefaction resistance |
| <p>Project Abstract (Brief Description): In 2013, the American Society of Civil Engineers (ASCE) gave the levee system in the United States an overall rating of D-. This rating is based in part on information from the National Levee Database (NLD) which is comprised of approximately 14,700 miles of levees operated by the U.S. Army Corps of Engineers (USACE). These levees are more than 55 years old on average and were originally designed to protect farmland from flooding; however, due to urban sprawl and changes in land use, over 14 million people now live or work behind these structures. Unfortunately, only 8% of these levees are found to be in acceptable condition, while about 69% are minimally acceptable, and 22% are rated as unacceptable. In the coming decades, continued deterioration, urban development, and an increase in extreme weather events will test these structures to and beyond their capacity, leading to a significant increase in risk. To prevent failures in these structures, ASCE estimates more than \$100 billion is needed to repair and rehabilitate the levee system.</p> |
| <p>Describe Implementation of Research Outcomes (or why not implemented):</p> <p>A comprehensive literature review has been compiled which identified main levee failure mechanisms, the corresponding defects associated with these failures mechanisms, and the non-destructive geophysical methods that have been used to detect these defects. A small earthen dam has been identified and tested using surface wave methods and resistivity in association with Natural Resource Conservation Service (NRCS). Data processing is near completion for the dam. The results will be used to establish the data processing and preliminary statistical framework. Lab work has also been conducted to understand the relationship between resistivity, density, and water content.</p> |
| <p>Impacts/Benefits of Implementation (actual, not anticipated)</p> <p><i>To be determined upon conclusion of the project:</i></p> |
| Web Links: martrec.uark.edu |
| Budget (Funding) Amounts & Source(s) (US DOT +Match(s) =Total Costs): \$109,469 MarTREC + \$128,670 U of A Start Up Funds = \$238,139 |
| Project Start and End Dates: 01/01/2015-06/30/2017 |
| Principal Investigator(s) and Contact Information: Clinton Wood Ph. D and Michelle Bernhardt Ph.D |
| Principal Investigator Institution (University): University of Arkansas |