US Army Corps of Engineers
Engineer Research and Development Center

Remote Monitoring and Sensing of CW Flood Control Infrastructure

Need

Marchand levee failure

Across the nation, U.S. Army Corps of Engineers (USACE) projects prevent flooding and storm damage. In both the daily and seasonal operation of hundreds of USACE projects, national requirements for water supply and opportunities for recreation and environmental stewardship are also balanced. The nation expects the USACE to guarantee that its existing projects will function as designed and provide for sustained performance and life safety. It is also anticipated that new projects will incorporate the most advanced knowledge and capabilities in planning, design, construction, operation, and maintenance. Inspection and monitoring of these projects and their geotechnical properties are important for safe operation and ensuring public safety.

Approach

Sand boils at levee toe

The goals for this project are to investigate, develop, and improve USACEs ability to conduct remote monitoring and sensing of flood control infrastructure. Geophysical methods are a favored technology and have been targeted by the research to examine internal erosion in order to image and better understand seepage pathways in the foundation and the embankment. This research path will identify important metrics that can be applied in risk based studies involving the reliability of levee and embankment structures. The use of ground based and airborne geophysical methods are favored because of their non-destructive capability at problem locations. Targeted methods are electrical resistivity and satellite interferometry. Application of these methods are typically followed up by focused geotechnical evaluations for detailed site characterization and remediation. An important component of this research is to identify signatures at known problem sites. Additionally, the use of UAV/UAS technologies is another favored method to conduct high resolution imaging of sand boil delineation in remote areas.

Outcomes

MS River levee slide

Development of procedures and protocols to assess problem structures and segments in the flood protection system. Research results will include improvements to geotechnical models for levees and embankment stability, measuring important geotechnical properties in these structures, environmental factors, and other geotechnical modeling applications.

New research needs are continually submitted by USACE FRM Communities of Practice to focus future research investigations and products. Statements of Need can be submitted by USACE on the R&D Gateway

(https://gateway.erdc.dren.mil/son/index.cfm?Cop=Flood&Option=Start).

More Information

https://wiki.erdc.dren.mil/index.php?title=Remote_Sensing_and_Monitoring_of_Civil_Works_Structures