



**US Army Corps
of Engineers®**
Engineer Research and
Development Center

U.S. Army Centrifuge Research Center

Purpose Centrifuge modeling offers researchers the ability to look into the future. Long-term behaviors can be accurately simulated in a short model test time.

The [U.S. Army Centrifuge Research Center](#), located at the ERDC [Geotechnical and Structures Laboratory](#), provides researchers an economical approach for evaluating alternative designs, investigating complex problem areas, and validating numerical methods with instrumented physical models. Commissioned in 1995, the centrifuge supports research investigations in the fields of geotechnical, structural, coastal, hydraulic, and environmental engineering, in addition to blast and infrastructure protection. Studies are possible under a wide range of climatic conditions.

Addition of this facility has significantly enhanced the capabilities of researchers to address needs in physical modeling that span the full range of engineering applications. The facility is available for use by both government and non-government researchers. Further information on potential partnering mechanisms for application of centrifuge modeling is available upon request to the ERDC-GSL centrifuge research team ([email link](#)).

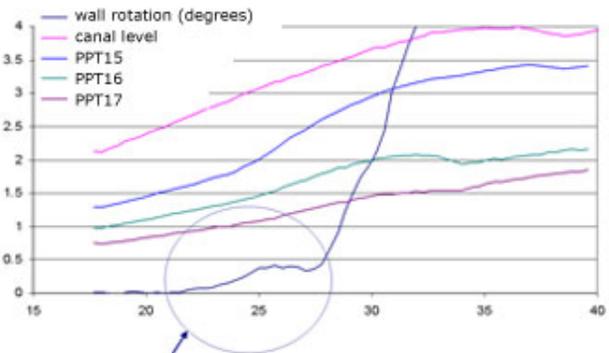
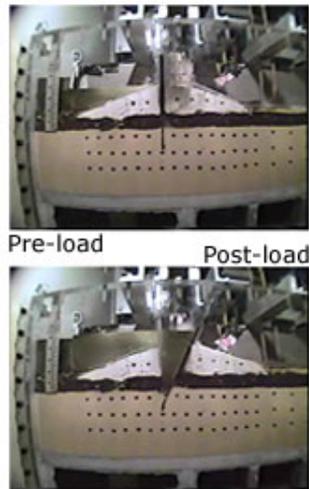
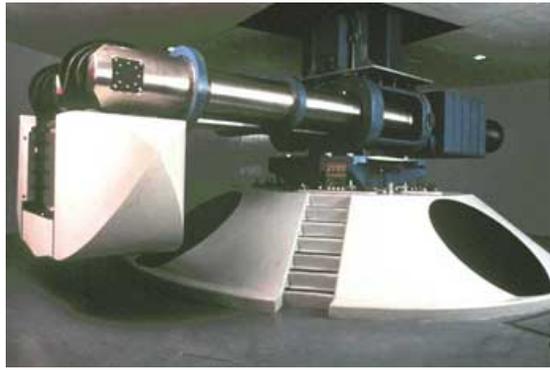
Specifications The U.S. Army centrifuge is designed to carry a maximum payload of 8.8 tons on its 1.3-m by 1.3-m platform. The radius of the centrifuge arm from center of rotation to the platform base is 6.5 m. The range of gravity to which a model can be subjected is 1 g to a maximum of 350 g's.

The [envelope of performance](#) for the centrifuge is shown on the Centrifuge Research Center's Web site. Any combination of mass and gravity is permitted as long as it is within the performance envelope. At the maximum payload of 8.8 tons, the maximum gravity permitted would be 150 g's. At the maximum gravity of 350 g's, the maximum payload permitted would be 2 tons.

The Center maintains a variety of [specialized laboratory equipment and instrumentation](#) that is made available to the modeler, including rigid rectangular containers, rigid circular containers, blast chambers, rigid rectangular containers with clear side, flexible rectangular containers, and shaker.

Benefits Centrifuge modeling allows users to investigate a wide range of field problems under laboratory conditions and to generate data quickly, economically, and accurately in order to solve real-world problems.

Success Stories During the period November 2005 through May 2006, the Centrifuge Research Center was heavily involved in efforts pertaining to evaluation of the levees in New Orleans, LA, as a consequence of damage suffered during Hurricane Katrina. This work was part of the overall evaluation effort by the Interagency Performance Evaluation Team (IPET) formed by the U.S. Army Corps of Engineers. Physical centrifuge modeling of the failed levee sections at 17th Street Canal, London Avenue Canal, and unfailed sections of Orleans Canal were modeled.



Crack opening phase, marked by start of wall rotation and pore pressure rise around the toe of the sheet pile (ERDC London South)

Complete results can be found at the IPET Web site (a military-restricted site):
<https://ipet.wes.army.mil/>

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