## Modeling the Dynamics of the Modular Causeway System to Improve Debarkation Site Construction and Throughput

Project Summary: The Modular Causeway System (MCS) provides a means to rapidly move cargo from deep draft vessels to shore during Joint Logistics-Over-the-Shore (JLOTS) operations using floating platform sections that are joined together in different configurations with unique capabilities. Current guidance states

Figure 1: Concept of the MCS Trident Pier model platform

that all MCS configurations must cease operation at sea state three due to unsafe heave that may produce structural damage. This guidance is not well suited to the siting and operation of Trident piers as the interaction between a pier and near-shore flows can produce large variations in the pier response depending on the local environmental conditions. Operating periods, installation time, and throughput volumes are therefore difficult to anticipate in advance of and during MCS Trident pier deployment. An improved understanding of MCS section behavior can allow planners to better anticipate limitations, select debarkation locations, and maximize the throughput of MCS Trident piers. This proposal seeks to develop a high-fidelity, computational model for the MCS that will provide planners with precise knowledge of Trident pier behavior under various operating conditions to better quantify system limitations and support improved throughout, operational time, and debarkation selection.
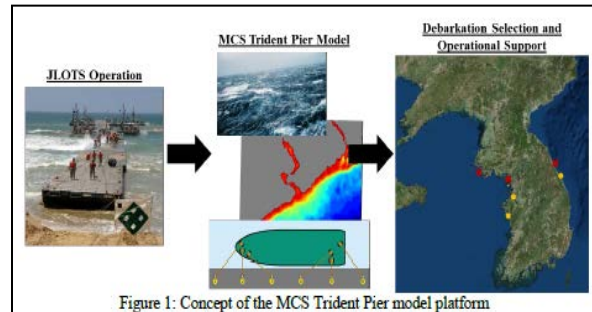
Benefit: Deliverables of this effort will include:

• A database of pre-computed models which relate anticipated environmental conditions and pier configurations to performance metrics and safety factors

• A web-based user interface to allow easy exploration of pre-computed results without modeling expertise such that users can determine those cases most similar to a desired course-of-action (COA)

• Model templates for future use in extension to new scenarios, hardware, and other MCS configurations

Duration of project: FY18-FY20

Participants: U.S. Army Corps of Engineers-Engineer Research and Development Center (USACE-ERDC)

Project advocacy (funding or otherwise): ERDC