Tulane University to lead $3.2 million project assessing how sea-level rise will impact 1,800+ military installations worldwide

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The U.S. Department of Defense has awarded Tulane University a $3.2 million grant to lead a team of climate scientists and engineers who will evaluate dangers from sea-level rise for the more than 1,800 military installations across the globe. (Photo courtesy iStock)

Sea levels have been rapidly rising along the world's coastlines over the past several decades, creating havoc in the form of flooding, coastal erosion and increased impacts due to extreme weather events.

To help the United States military gauge its exposure and vulnerability, the U.S. Department of Defense (DoD) Strategic Environmental Research and Development Program (SERDP) has awarded a $3.2 million grant to Tulane University to lead a team of climate scientists and engineers who will evaluate dangers from sea-level rise for the more than 1,800 military installations across the globe.

"With rising seas and sinking lands, many military installations worldwide are at risk of losing land to the ocean in the future," said Sönke Dangendorf, PhD, the David and Jane Flowerree Early Career Professor in the Tulane Department of River-Coastal Science and Engineering. "As the national security of the United States depends critically on the functionality of these installations, they need to be prepared for changing exposure and vulnerability in a changing climate."

Dangendorf will serve as the principal investigator (PI) of the study, leading a team that includes researchers from the University of Central Florida, Virginia Tech University and California Polytechnic State University.

Dangendorf said that one of the major challenges for vulnerability and exposure assessments at any given location is the lack of consistent observational data.

"While along the U.S. coastline we are generally well equipped, the installations outside the U.S. mainland often lack observational data," he said. "As sea levels vary significantly between locations, a simple mathematical transfer to the location of interest becomes challenging."

The interdisciplinary team will overcome this challenge by merging newly recovered tide gauge data and a variety of different geophysical ocean and Earth models in a hybrid modeling approach to support the Defense Regional Sea Level Scenarios Database. Every location will have at least 60 years of data for determining sea-level hazard, and thus provided with more accurate and robust information about historical sea-level change at any given site worldwide, he said.

"Over the last two decades, there has been a tremendous increase in the understanding of sea-level changes and the underlying processes," Dangendorf said.

“We have more complete observations, models of individual physical processes have become more precise, and the computational power now allows handling of big data.”

He said the team is not only doing science for pure scientific progress but to provide useful information to stakeholders. He added that while the information provided by the research will be tailored to DoD needs and locations, the approach will generate a database supporting a wide range of global climate resilience efforts.

Researchers collaborating on the project are D. Qiang Sun, a research scientist at Tulane, Thomas Wahl, PhD, of the University of Central Florida, Manoochehr Shirzaei, PhD, of Virginia Tech and Stefan Talke, PhD, of Cal Poly.

The research will be funded through the SERDP grant No. RC23-3707.

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