CLIMATE SYSTEM SCIENCE
Analysis, Modeling, and Prediction of Earth's Climate System

AT A GLANCE

WHAT IS IT?
Climate system science researches the past, present, and future of Earth's climate. This includes investigating the interactions between weather and climate, and the impacts of climate change on extreme events in the operating environment.

WHY DOES IT MATTER?
Climate conditions have major impacts on national and international security. Climate science is essential for predicting climate impacts on operations and installations.

WHAT IS NPS' ROLE?
NPS scientists analyze, model, and predict Earth's climate system, especially in areas of importance for national security. NPS works with partners to improve climate related operational decision support in the tropics, Arctic, and around the globe.

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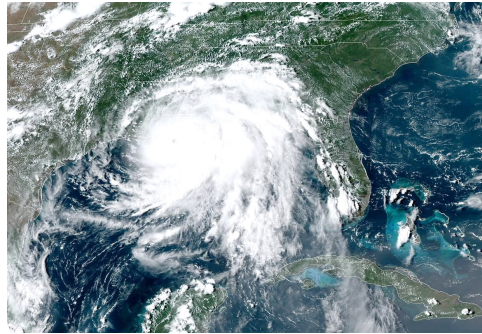
NPS conducts R&D and education to better understand and predict Earth's climate system and the applications of climate science to national security:

- **Climate and National Security Operations:** Climate conditions strongly affect the operations of DoD and its allies and adversaries. For example, winds, waves, atmospheric and oceanic temperatures, and sea ice impact the operations of ships, aircraft, submarines, sensors, and weapons. NPS research and education are focused on using climate system R&D to improve operational planning and outcomes in a constantly changing physical environment.

- **Climate System Analysis and Prediction:** Key elements of climate science R&D are the collection and analysis of environmental data, the creation of models, and the development of skillful predictive systems. NPS scientists and students conduct this R&D on global, regional, and local scales, with an emphasis on DoD relevant environmental variables and areas. For example, NPS R&D analyzes and predicts tropical cyclones, Arctic sea ice, coastal winds and waves, sea level, extreme temperature and rainfall events, and the atmospheric and oceanic factors that determine the performance of radar, laser, and acoustic systems.

- **Climate Science and National Security Applications:** NPS climate system scientists and students partner with DoD and other organizations to transition the results of their R&D to operational use. For example, they transition advanced data sets, analysis systems, prediction models, and decision support tools into use at DoD operational centers. These operational applications provide national security decision makers with improved information on environmental risks and opportunities. This information is used to improve strategic to tactical level planning of national security operations, the analysis of operational outcomes, and the development and testing of sensors and weapons.

NPS climate system research and education are focused on improving the planning and outcomes of security operations.