DoD Climate Assessment Tool

WHAT IS THE DoD CLIMATE ASSESSMENT TOOL?

A CAC-enabled, web-based collection of scientific climate data to support research, analysis, and decision making about exposure to historical extreme weather and reasonably foreseeable climate effects.

WHAT IS THE PURPOSE OF THE CLIMATE TOOL?

Enables Military Departments and their installation personnel to deliver consistent exposure assessments and identify regions or installations for additional climate-related studies.

HOW WILL THE TOOL SUPPORT ANALYSIS AND DECISION MAKING?

The tool uses data from past extreme weather events (e.g., hurricanes, tornado tracks) and the effects of future changes in sea levels, riverine flooding, drought, heat, land degradation, energy demand, and wildfires to produce hazard indicators. The data supports a screening-level assessment of installation vulnerability expressed as a combination of exposure (designated by the tool) and sensitivity. This high-level assessment is useful for long-term planning and informed decision making. In the report accompanying the tool, an example installation illustrates the concept of sensitivity with different types of military assets (e.g., airfields, piers, training and testing areas).

The Climate Assessment Tool provides an important component towards understanding an installation's vulnerability to climate-related hazards. Other crucial vulnerability considerations include validating climate-related impacts through additional site-specific analysis; determining potential mission impacts; and conducting detailed engineering studies to assess which adaptation strategies may be effective to reduce risk. Using the Climate Assessment Tool as part of a comprehensive analysis will help the Department determine where best to apply resources to improve climate adaptation and resiliency.

Vulnerability is determined by three components—**exposure**, **sensitivity**, and **adaptive capacity**:

Exposure is the degree to which an installation, due to its location, may be susceptible to a climate or weather phenomenon (e.g., Is the installation located in a flood-prone region?)

Sensitivity is the degree to which an installation could be affected by a climate or weather phenomenon (e.g., Are assets located in flood hazard areas? Are assets already elevated above the flood hazard area? How much damage could be caused to important assets?)

Adaptive capacity is an installation's existing ability to address the potential impacts (e.g., Can important assets be relocated out of the flood hazard area? Do redundant capabilities exist to cover the most important installation functions?)

DoD Climate Assessment Tool Use To Date

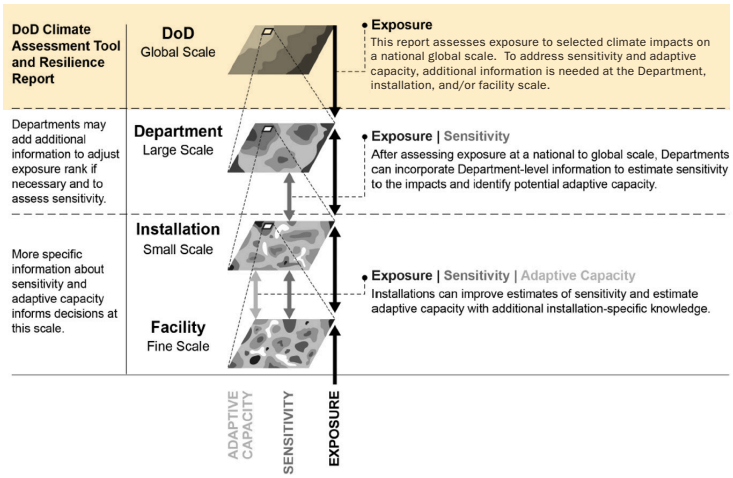
- Number of installation users is growing with currently over 300 users
- Rate of use for site assessments has increased sevenfold; 180 completed in the first year, 1210 completed in the last three months
- Data included in the Secretary of Defense's Advana Dashboard, a centralized data and analytics platform providing DoD users with data and tools to support policy and decision making
- DoD energy and sustainability teams beginning to use the tool's exposure information for decisionmaking

Climate Assessment Tool Users	Impacts on Decision Making
Installation-level Planners and Engineers	■ Analyze an installation's exposure or susceptibility to climate and extreme weather events. ■ Use this information to help inform planning and land use recommendations, and support resilient design, engineering, and construction. ■ Add separate geographic information system (GIS) layers (e.g., flooding) available for Military Department-specific GIS systems used at the installation level.
Military Department Headquarters	■ Identify regions or installations for focused attention, such as performing detailed studies to determine mission impacts and strategies to mitigate exposure.
DoD Leadership	■ Compare exposure across the Department to answer questions from Congress. ■ Inform investment and policy decisions.

Below are examples of how the tool provides installation-specific data and mapping, as well as visualization of global trends.

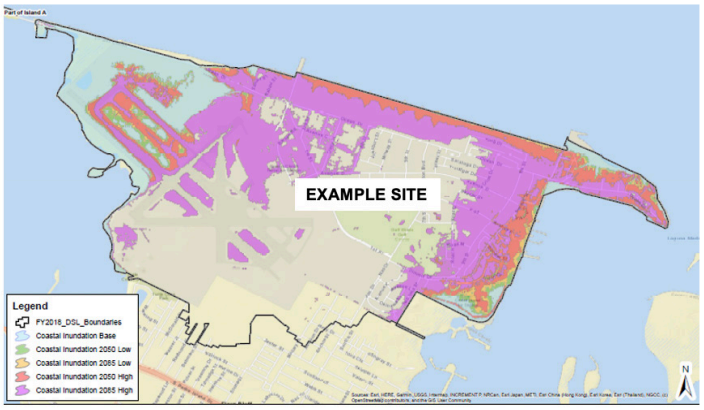
Variation between DoD Global and Installation-specific Assessments and Reporting

Climate exposure occurs on different scales. On a global scale, trends such as hurricanes, warming global average temperatures, and changing sea level are evident. More apparent at smaller scales are impacts such as soil moisture, precipitation effects, temperature effects, and local relative sea-level rise that can affect ecosystems and social systems important to how installations and facilities function.



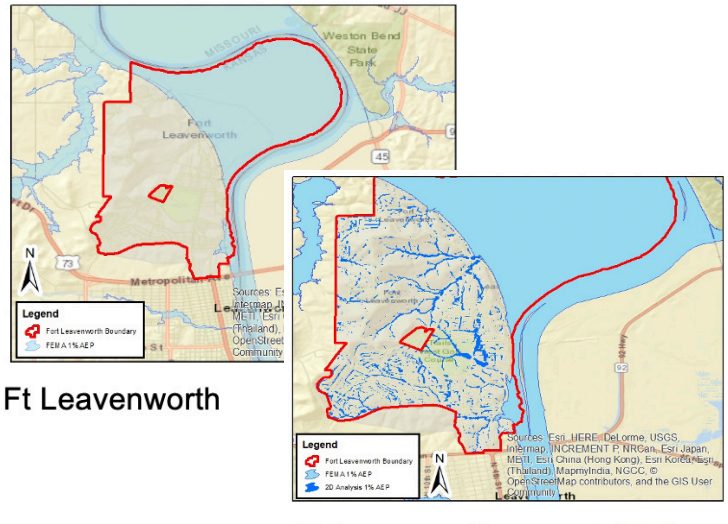
Installation-level Flood Mapping

GIS shapefiles are available for local, installation-level mapping of coastal and riverine flooding. The maps provide planners and engineers with the percent of installation area inundated.



Installation-level Flood Mapping

The tool provides flood plain maps using a combination of Federal Emergency Management Agency and U.S. Army Corps of Engineers data to depict the flooding exposure on tributaries and rivers.

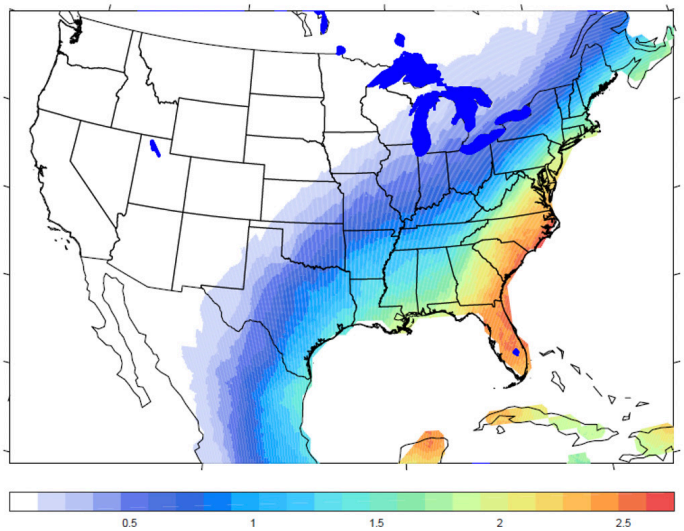


Ft Leavenworth

Ft Leavenworth merged

Historical Extreme Weather Events across the United States

The tool incorporates historical data on landfalling tropical storms between 1948 and 2018 across the United States into an extreme weather indicator.



The Climate Assessment Tool will generate reports at the Military Department or installation level to help DoD understand and manage exposure from climate-related hazards.

Department of Defense Climate Exposure Report: Summary of exposure information for 1391 global DoD installations and related sites. Contains examples of resilience measures and rough order magnitude of costs. The report enhances DoD leadership awareness of climate exposure and supports adaptation planning.

Military Department Summary Report: High-level exposure analysis and report for each Military Department.