

## Why GAO Did This Study

DOD manages a global real-estate portfolio with an almost \$1.2 trillion estimated replacement value. Since 2010, DOD has identified climate change as a threat to its operations and installations. In January 2019, DOD stated that the effects of a changing climate are a national security issue with potential impacts to the department's missions, operational plans, and installations. GAO was asked to assess DOD's progress in developing a means to account for potentially damaging weather in its facilities project designs.

GAO examined the extent to which DOD has taken steps to incorporate resilience to extreme weather and climate change effects into (1) selected installation master plans and related planning documents, and (2) selected individual installation facilities projects.

GAO reviewed DOD documents related to increasing climate resilience, conducting installation master planning, and designing facilities projects. GAO visited or contacted a non-generalizable sample of 23 installations that had been associated with one or more climate vulnerabilities.

## What GAO Recommends

GAO is making eight recommendations, including that the military departments work together to update master planning criteria to require an assessment of extreme weather and climate change risks and to incorporate DOD guidance on the use of climate projections into facilities design standards. GAO also recommends that DOD issue guidance on incorporating climate projections into installation master planning and facilities project designs. DOD concurred with all eight of GAO's recommendations.

View [GAO-19-453](#). For more information, contact Diana Maurer at (202) 512-9627 or [maured@gao.gov](mailto:maured@gao.gov).

## CLIMATE RESILIENCE

### DOD Needs to Assess Risk and Provide Guidance on Use of Climate Projections in Installation Master Plans and Facilities Designs

#### What GAO Found

Department of Defense (DOD) installations have not consistently assessed risks from extreme weather and climate change effects or consistently used projections to anticipate future climate conditions. For example, DOD's 2018 preliminary assessment of extreme weather and climate effects at installations was based on the installations' reported past experiences with extreme weather rather than an analysis of future vulnerabilities based on climate projections. Fifteen of the 23 installations GAO visited or contacted had considered some extreme weather and climate change effects in their plans as required by DOD guidance, but 8 had not. For example, Fort Irwin, California, worked with the U.S. Army Corps of Engineers to improve stormwater drainage after intense flash flooding caused significant damage to base infrastructure. By contrast, Joint Base Pearl Harbor-Hickam, Hawaii, did not include such considerations in its plans, although it is located in an area subject to tropical storms and where further sea level rise is anticipated.

Flooding at Naval Station Norfolk, Virginia



Source: U.S. Navy. | GAO-19-453

GAO also found that most of the installations had not used climate projections, because they lack guidance on how to incorporate projections into their master plans. Not assessing risks or using climate projections in installation planning may expose DOD facilities to greater-than-anticipated damage or degradation as a result of extreme weather or climate-related effects.

Eleven of the 23 installations we reviewed had designed one or more individual facilities projects to increase the resilience of the facilities to extreme weather and climate change effects. However, project designs generally did not consider climate projections, according to installation officials. These officials told us that DOD lacks guidance on how to use climate projections that involve multiple future scenarios and different time periods. Until DOD updates its facilities design standards to require installations to consider climate projections in project designs, identify authoritative sources for them to use, and provide guidance on how to use projections, installation project designers may continue to exclude consideration of climate projections from facilities project designs, potentially making investments that are planned without consideration of climate-related risks.