

Best Practices and Guidance for Engaging with Military Installations for Climate Resilience in Defense Communities



Photos: (top left) Sarah Spiegler, (bottom left) Matt Bilskie, (left) Matt Bilskie

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HOW TO USE THIS GUIDANCE

Defense communities are those towns, cities, and regional areas that are home to military installations. Often, but not always adjacent, they support the installation in many ways and are economically tied to the installation's military missions. Military leadership collaborate with state, regional and local government, and private organizations to ensure military readiness and support families throughout the community. Climate resilience, the ability for a community to anticipate, prepare for, respond, recover and adapt to hazards such as more frequent and intense storms, extreme heat and drought, flooding, and other disruptions, has become an increasingly important concern for defense communities. Climate resilience challenges in the community, for example flooding on roads leading to an installation's entry gate, can also threaten the resilience of the military mission. To increase resilience, communities are conducting vulnerability studies and planning projects to address climate-induced vulnerabilities. Projects include but are not limited to building or retrofitting utilities and stormwater infrastructure, protecting against shoreline erosion, and evaluating critical infrastructure, many of them incorporating natural and nature-based infrastructure.

This guidance provides best practices for developing projects with the military to assist defense communities and those working with them to build climate resilience. Sea Grant coastal resilience specialists, extension agents, and other professionals across the country were surveyed to understand the barriers to engagement with military installations and defense communities. The results from that study were used to develop the guidance. Additional information and refinements have been added in response to a series of reviews from professionals both within Department of Defense (DoD) and those that work closely with installations. The significant barriers addressed in this guidance include a lack of information and understanding of DoD and the command structure, commands. Information about points of contact follow [general rules of thumb](#), but each of the military forces and installations will be different. In addition, each installation will vary in its relationship to the local community, the climate hazards they face, and the mission it is supporting which may frame how personnel engage in climate resilience and respond to outreach.

Military installation resilience is defined as “the capability of a military installation to avoid, prepare for, minimize the effect of, adapt to, and recover from extreme weather events, or from anticipated or unanticipated changes in environmental conditions, that do, or have the potential to, adversely affect the military installation or essential transportation, logistical, or other necessary resources outside of the military installation that are necessary in order to maintain, improve, or rapidly reestablish installation mission assurance and mission-essential functions” (U. S. Code [10 USC § 101\(e\)\(8\)](#)).

GETTING TO KNOW DOD AND YOUR INSTALLATION

DEPARTMENT OF DEFENSE

The [Department of Defense](#) is the United States' largest government agency, with over 2.91 million service members and civilians in their workforce, 4,800 sites in over 160 countries and a \$752.9 billion national defense budget (2022). The mission of the agency is to provide the military forces needed to deter war and ensure our nation's security. The Department is led by a civilian secretary of defense, deputy secretary, and other leaders in the Office of the Secretary of Defense (OSD) that are responsible for policy development, planning, resource management and program evaluation.

THE U. S. MILITARY FORCES

The United States has [seven military forces](#):

- [Army](#), the largest and oldest military service, provides ground troops to protect the United States and serve primarily on land and in the air. The [Army Corps of Engineers](#) (USACE) is a separate branch whose mission is to deliver vital engineering solutions to secure the Nation, energize the economy and reduce disaster risk. Within the USACE are military missions that include installation construction, and civil works missions that include flood risk management, navigation, and environmental regulation.
- [Marine Corps](#) (USMC), a component of the Department of the Navy, maintains amphibious and ground units for contingency and combat operations.
- [Navy](#) protects the United States at sea: on, above, and below the water.
- [Air Force](#) supports all aspects of airpower to fly, fight and win.
- [Space Force](#), a component of the Air Force, conducts global space operations to protect U.S., and allied interests in space.
- [Coast Guard](#) has missions in maritime law enforcement, disaster response, and transportation management. In wartime, the DoD has authority over the Coast Guard, which is housed within the Department of Homeland Security during peacetime.
- [National Guard](#), comprised of the Army National Guard and the Air National Guard, fulfills many support missions including combat missions, domestic emergencies, and humanitarian efforts. National Guard is not one of the 6 "armed forces" (also commonly called "military services") per 10 U.S. Code § 101 and has both state and federal functions.

There are three general categories of military people: active duty (full-time), reserve and National Guard forces (usually work a civilian job, but can be called to full-time military duty), and veterans/retirees (past members of the military). Members of the Army are called soldiers, members of the Navy are sailors, Marines Corps members are marines and Air Force members are airmen.

COMMAND STRUCTURE AND COMMUNICATIONS

The military forces are divided into operational (supported) and administrative (supporting), commands. Operational commands are divided into subordinate units (such as divisions or fleets), while an administrative command supports the operational command(s) by providing functions such as infrastructure, training, and quality of life programs. An operational command is a tenant at an installation, which is managed by an administrative command.

Chain of command is an integral part of military life, and a basic knowledge is critical when communicating with the military. In general, military personnel give orders only to those directly below them in the chain of command and receive orders only from those directly above them. Command relationships between service members depend on their rank/grade, their unit, and their job responsibilities within the hierarchy. Rank structure depends on whether the service member is an officer or enlisted. Rank is used when addressing service members (much like a Mr. or Dr.). Officers are the leaders, managers, and decision-makers. Enlisted personnel make up over 80% of the active-duty force and are trained in a specialty. For more information about ranks/grades within the forces, see <https://www.military.com/join-military/military-ranks-everything-you-need-know.html>

The DoD has a large civilian workforce that is integral to the military forces. Many of the DoD programs and installation units that work with communities are staffed by civilian personnel. Many of the community planners and natural resource managers located at an installation are civilian personnel, often with military experience before their current role. Civilian personnel may supervise or be supervised by an active-duty service member, but regardless must follow the appropriate chain of command.

MILITARY INSTALLATIONS

Military installations are facilities directly owned and operated by one of the military service branches and shelters military equipment and personnel, provides for training, testing and/or operations. Installations may serve multiple military service branches (Joint Base or Joint Training Center) or have multiple subdivisions of a single branch as tenants. Installations may have housing, and provide food service, shopping, recreation and entertainment for residents and visitors. The military also have academies/colleges. Some common types of installations:

- Army: Fort, Depot, Camp, Airfield, Arsenal, Proving Ground, Weapons Range, Missile Range, Demolition Range, Ocean Terminal, Support Facility, Training Center, Ammunition Plant
- Navy: Base (NB), Air Station (NAS), Submarine Base (NSB), Weapons Station (NWS), Air Weapons Station (NAWS), Support Activity (NSA), Air Reserve Base (ARB), Surface Warfare Center (NSWC), Shipyard (NS), Construction Battalion Center (NCBC)
- Marine Corps: Base (MCB), Air Station (MCAS), Recruit Depot (MCRD), Logistics base (MCLB), Air Ground Combat Center (MCAGCC), Warfare Training Center, Bombing Range
- Air/Space Force: Base, Station, Field, Bombing Range

Every military installation has at least one operational mission, and sustainment of that mission to ensure “readiness” is every installation commander’s primary concern. Successful climate resilience planning and project development involving a military installation must relate to mission readiness, which is a consistent priority despite base command or other personnel changes that may happen during the life cycle of a project.

Conservation of natural resources is also a DoD imperative. DoD owns and manages 27 million acres of land—more than two times all state parks combined. There are four times as many endangered species per acre on DoD land than anywhere else, and 75 species are found only on DoD land. It is for this reason that Congress required in the Sikes Act (26 U.S. Code § 670) that every DoD facility conserve those resources and sustain them through an Integrated Natural Resource Management Plan (INRMP), typically prepared by the facility’s Natural Resource Manager. (Some facilities also have a Cultural Resource Manager and a Cultural Resource Management Plan.) The resource conservation role at each installation is secondary to mission readiness, but proper resources management can avoid unnecessary workarounds and training delays. There is an evolving understanding of the connection of natural resources and climate resilience to mission readiness that should be appreciated in developing a collaborative team necessary for a successful project. Management of natural resources is a key tool for resilience planning, and resilience is now being incorporated into the understanding of the mission.

Several programs in the Office of the Assistant Secretary of Defense (Energy, Installations and Environment) work with defense communities to assist with resilience planning and may fund infrastructure and natural infrastructure projects when there is a connection to mission sustainment. Among the programs that partner with communities are the Readiness and Environmental Protection Integration ([REPI](#)) program, which focuses on land-use and natural resources, and the Office of Local Defense Community Cooperation ([OLDCC](#)) (formerly known as OEA, the Office of Economic Adjustment) which assists states and local governments to maximize the support of the military mission. Both are discussed in more detail [below](#). While the OSD programs provide resources that can influence a military installation’s decisions about responding to climate resilience challenges, the primary function of the programs is to support the military installation commanders in their goals for their installations and military mission readiness as it relates to external influences. How military installations engage with defense communities to address climate resilience will depend on many different factors.

Project Highlight

The city of Newport worked with University of Rhode Island, Naval Station Newport and two other communities to conduct a Military Installation Resilience Review, funded by OLDCC. University of Rhode Island provided state-of-the-art storm models to analyze vulnerabilities and developed a decision-support tool for real-time preparedness and long-term planning. This project will be used in the development of evacuation plans and the prioritization of projects to make the installation and community better prepared for sea level rise and increasing storm impacts.

INFORMATION SOURCES

DoD hosts <https://installations.militaryonesource.mil/> in support of military families who are moving to new locations. You can use this resource to locate installations by state and service. Most pages provide basic information about the installation and a link to the installation website. Alternatively, you can access the installation website directly and learn about the history, mission, and the tenant commands located on the installation. Many of the websites will feature information about the base commander and sometimes the commanders of the units assigned to the installation.

To better understand how the installation is working with the community to confront compatible use, natural resources, and climate resilience issues, it may be helpful to search for a “Joint Land Use Study (JLUS)”, “Compatible Use Study,” “Compatible Use Plan,” or “Military Installation Resilience Review

(MIRR).” These DoD-funded planning studies are led by community partners such as the adjoining city, county, or regional planning entity in cooperation with their installation. The goals for JLUS and a Compatible Use Study are to identify existing and future incompatible development that may be a threat to the mission of the installation and to plan for the stability of connections, such as transportation routes between the community and the installation. MIRRs focus on climate and environmental threats shared by the community and installation(s) and ways to increase resilience to reduce threats to the mission.

Installations sometimes make their INRMP available to the public and can be found on the internet or requested from installation natural resources staff. These plans may also have useful information about natural systems on the installations, such as wetlands management issues and flooding.

Installations participating in the REPI program each have a fact sheet with information about their REPI program and benefits to installation missions. The fact sheets are listed and linked at the bottom of this page: [REPI Fact Sheets](#)

POINTS OF CONTACT

HOW INSTALLATIONS WORK WITH COMMUNITIES

Military installations work closely with their defense communities and recognize that communities are physically, economically, and socially connected. Installations work with communities to address infrastructure needs, natural resource issues, climate resilience and many other critical concerns that need to be addressed off-base to ensure installation sustainability and mission readiness. Much of this work is accomplished through partnerships with state and local governments, NGOs, community organizations and private entities through programs with the OLDCC, REPI and other units.

BEST PRACTICES FOR MAKING CONTACT

Reaching out to installation personnel may be as easy as going to the installation website and finding a “contact us” form or a phone number for the community affairs office. If you are working with a Navy or Marine Corps installation, you should start by contacting the Community Plans and Liaison Officer (CPLO). If you are contacting an Air Force Base, you will want to speak with a Community Planner and if you are working with an Army installation, you will want to start with the Army Compatible Use Buffer (ACUB) manager, who executes the REPI program, or the Director of Public Works if they don’t have an ACUB program. If the installation has a REPI program, look in the bottom right corner of the factsheet for a phone number to connect you with the appropriate staff member. [REPI Fact Sheets](#)

Representing the DoD, the REPI program also supports the Sentinel Landscapes Partnership, with the U.S. Department of Agriculture and the Department of Interior. The areas designated as Sentinel Landscapes are where natural and working lands are well suited to protect defense facilities from incompatible uses by connecting landowners with voluntary state and federal assistance programs that incentivize protecting natural and agricultural/forestry resources. Each of these landscapes has a coordinator organizing the partners at a local level and can help connect to the right people at the

installations within their landscape. Go to <https://sentinellandscapes.org/> where each landscape has a page with a coordinator listed.

CLIMATE CHANGE AND DOD

CLIMATE ADAPTATION AND RESILIENCE INITIATIVES WITHIN DOD

Since 2014 DoD has identified climate change as a critical national security issue and threat multiplier, and a top management challenge. It is DoD policy, as of 2016, that all operations, planning activities, business processes, and resource allocation decisions include climate considerations. Each of the branches of the military has been working to identify climate vulnerabilities to their installations and incorporate resilience into installation planning and procedures. In 2019, DoD [reported](#) on its assessment of the significant vulnerabilities from climate change to each of the 79 installations examined. Among the threats to mission readiness that have been identified are vulnerabilities in the water, energy, and transportation infrastructure due to flooding, desertification, wildfire, and other climate driven hazards. In 2021, DoD released several documents to help advance climate adaptation and resilience including a [Climate Risk Analysis](#) and a [Climate Adaptation Plan](#) that updates the 2014 Climate Change Adaptation Roadmap.

The Climate Adaptation Strategic Framework in the DoD 2021 Climate Adaptation Plan outlines five lines of effort, with specific focus areas and four cross-cutting enablers that will ensure the Department can operate under changing climate conditions (continuous monitoring, innovation, climate literacy and environmental justice). The lines of effort that most apply to defense communities are Resilient Built and Natural Infrastructure and Enhance Adaptation and Resilience through Collaboration. Through DoD programs such as REPI, OLDCC, and Sentinel Landscapes, defense communities play an important part in the DoD climate resilience plan.

While national security concerns make it difficult for many installations to share details about their climate resilience vulnerabilities, all installations have been directed to use tools, such as the Defense Climate Assessment Tool (DCAT), developed by the USACE, to screen exposures to climate hazards and guide further studies, plans, and ultimately investments in resilience. Defense community climate vulnerabilities can be the focus of an OLDCC-sponsored Military Installation Resilience Review (see below) and use location-appropriate tools or resources to determine threats and vulnerabilities and develop recommendations for addressing them.

FUNDING CLIMATE RESILIENCE PLANNING AND PROJECTS IN DEFENSE COMMUNITIES

DoD recognizes that mission readiness can depend on the management of threats that occur external to the installation. For example, encroachments, pressures from off the installation that adversely affect the military's use of its training and testing grounds, can be caused by incompatible development near facilities, habitat loss that causes environmental restrictions, and climate change impacts. To protect military missions from off-installation threats, DoD programs provide financial assistance and cost-share to defense communities through several mechanisms. Resilience planning programs operate under 10 U.S. Code § 2391- military base reuse studies and community planning assistance, while conservation/

restoration programs use 10 U.S.C. §2684a, which allows for agreements between DoD and community partners to address encroachment, and the Sikes Act (16 U.S.C. §670c-1), which is the basis for the maintenance and improvement of natural resources. Natural infrastructure solutions such as restoring hydrology, prescribed burning and living shoreline projects achieve both natural resource and climate resilience goals and can be funded by DoD in defense communities under these authorities.

Project Highlight

Naval Weapons Station Earle in Monmouth County, NJ, and the surrounding communities were devastated by Hurricane Sandy in 2012. To improve installation and community resilience, the Navy has partnered with Monmouth County, Monmouth University, New Jersey state government and NGOs to support natural infrastructure for storm surge protection, beach nourishment, living shorelines, stormwater management, groundwater recharge and wildfire mitigation.



NWS Earle received FY20 REPI Challenge funding to execute a variety of resiliency initiatives across 1.6 million acres.

One DoD office that leverages these authorities to maximize support of the military mission is the [REPI program](#). REPI supports partnership programs that protect and conserve natural resources, by the establishment of conservation easements on natural and working lands near the installation and through partnerships with governments or NGOs engaged in nature resource management. More recently, the REPI program has been addressing climate change impacts, which are a significant encroachment threat. Through the REPI program, partners can work with the installation to implement off-base natural infrastructure projects in the community. Partnerships among state, local, regional governments, NGOs and other partners are critical to building climate resilience in communities. Projects that address both community and military installation climate resilience concerns can be cost-shared with DoD through the REPI program. For more details and examples, see the [REPI Resilience Primer](#).

The [OLDCC's Military Installation Sustainability](#) programs help state and local governments better understand, analyze, and plan actions necessary to maintaining the community as well as the military mission and provide them technical and financial assistance to enable planning that addresses encroachments including from climate change. This program supports the Compatible Use Study (previously called Joint Land Use Studies or JLUS) and Installation Resilience Review. These studies are designed to comprehensively understand concerns and opportunities near installations and develop a responsive strategy for implementing actions to address those threats. Recommendations from these studies are used to help guide community development and infrastructure investments that preserve military readiness while supporting continued economic development and climate resiliency of the community.

[OLDCC's Defense Community Infrastructure Pilot \(DCIP\)](#) program provides funding to state and local governments designed to address specific infrastructure needs in a community that support a military installation, installation resilience and military family quality of life. Community infrastructure projects are transportation projects, community support facilities (e.g. schools, hospitals, police, fire and emergency response) and utility infrastructure (e.g. water, stormwater, telecommunications, electric, gas) that are located off the installation, support the installation and are owned by a state or local government or a not-for-profit member-owned utility service. Many bases will share a variety of infrastructure with the surrounding community, so resilience projects for utility upgrades will qualify as well, with the military partners paying for a portion related to the percentage of services received. Projects need to be endorsed by the installation and construction ready. Resilience projects can include conventional, nature-based or hybrid infrastructure projects.

TIPS FOR CLIMATE CHANGE COMMUNICATION

Climate change can be a difficult or controversial topic in some communities. When communicating with installation staff about climate resilience and the potential to partner with communities, it is imperative to relate climate impacts, community resilience, and your proposed partnership to the sustainment of the military mission. DoD is developing greater capacity in climate resilience, including a focus on climate literacy among their workforce, that may facilitate climate resilience conversations in defense communities. However, some communities and installations may be unaware of the authorities that allow DoD to partner with governments and organizations to take action to support climate resilience actions that also support the military mission. A familiarity with these authorities is helpful in communicating with communities and installations.

- Partnering with service members to convey messages about climate change impacts and resilience can often be effective, since military staff may be considered trusted messengers within the community.
- Being familiar with examples, especially local or otherwise relevant examples of installation impacts and responses can be helpful. For example,
 - High tide, “sunny day” flooding at [Naval Station Norfolk in Virginia](#) affects access to the base several times a year, increasing to 280 times a year by 2050 without resilience projects.
 - Hurricane Michael damaged 100% of the buildings [Tyndall Air Force Base](#) near Panama City, Florida in 2018, almost \$5 billion in damage. It is being rebuilt as a resilient “base of the future” through a collaboration between DoD, private industry, and other federal agencies. It is emphasizing the incorporation of natural and nature-based infrastructure.
 - Drought related wildfires in 2016 and 2017 near Vandenberg Air Force Base in California caused evacuations, and burned over 10,000 acres, and disrupted training and rocket launches.
- Focus on actions that communities can undertake to deal with climate impacts and current opportunities for funding that DoD makes available each year for defense communities. Empower

communities to take steps and emphasize the co-benefits of using nature-based solutions to confront issues such as flooding. Resilience projects can improve natural resources and quality of life.

- Individuals' attitudes about climate change can be complicated and to communicate effectively, it is important to listen to community residents about their local concerns. Climate change connects to health, environmental quality, economic, and national security concerns. Focusing on local impacts such as flooding, more intense storms, drought or wildfire may be effective. Communities and individuals are different, so tailoring your message is important.

Working with military installations and defense communities requires a tailored approach and understanding the value that a military installation brings to the community is important. Equally, the climate resilience within the community is essential to the sustainment of the military mission. Working in partnership through programs supported by DoD bring value to both sides of the fence.

RESOURCES

[REPI Resilience Primer](#)

[Report on the Effects of a Changing Climate to the Department of Defense](#)

[Department of Defense Climate Adaptation Plan](#)

[U. S. Army Climate Strategy](#)

[Climate Action 2030 Department of the Navy](#)

[SERPPAS](#)

[Sentinel Landscapes](#)

[Sea Grant Coastal Resilience DoD Liaison Program](#)

[JP 1, Doctrine for the Armed Forces of the United States](#)

ACRONYMS

ACUB - Army Compatible Use Buffer program supports the Army mission by allowing installations to work with partners to protect off-base natural and working lands through conservation easements or other agreements that prevent incompatible development.

CPLO - Community Plans Liaison Officer (Navy and USMC) supports installation missions by serving as a bridge between installations and the community, local government, and private stakeholders. CPLO manages Encroachment Management programs including Air-Installation Compatible Use Zones (AICUZ)

DoD - Department of Defense

INRMP - Integrated Natural Resources Management Plan is developed by a Task Force led by installation natural resources staff and including U.S. Fish and Wildlife, state Department of Natural Resources and other federal, state or local natural resource agencies. The goal is to develop a guide for the management and stewardship of natural resources on the installation while ensuring mission sustainment. The Sikes Act requires all domestic installations to develop and implement an INRMP.

JLUS - Joint Land Use Study, former name of the Compatible Use Study (Plan or Program), a study funded by OLDCC and led by a state, local or regional government, as a cooperative program with the military installation with the goal of identifying and making recommendations for addressing existing or potential future incompatible development in the area around the installation.

MIRR - Military installation Resilience Review- a study, funded by OLDCC and led by a state, local or regional government, that assess and analyze community vulnerabilities that may affect installation missions, and make recommendations for further studies or projects to address priority areas.

OLDCC - Office of Local Defense Community Cooperation funds grants to communities to further the priorities of the National Defense Strategy by supporting the readiness and resiliency of military installations and defense communities across the country.

OSD - Office of the Secretary of Defense

REPI - Readiness and Environmental Protection Integration Program, administered by the Office of the Secretary of Defense, supports military missions by helping remove or avoid land-use conflicts, supports large landscape partnerships that advance conservation and military readiness and foster solutions through community engagement.

USACE - United States Army Corps of Engineers

USMC - United States Marine Corps

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