U.S. Coastguardman watches as crew boat departs from *Ardenne Venture* after annual exam to ensure it complies with U.S. and international regulations prior to operating in U.S. waters and ports, San Diego, California, August 3, 2012 (U.S. Coast Guard/Henry G. Dunphy)

The U.S. Government's Approach to Environmental Security

Focus on Campaign Activities

By George E. Katsos

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This article continues the discussion on human security's[1] seven relevant dimensions: economic, food, health, environmental, personal, community, and political.[2] Complementing previous *Joint Force Quarterly* installments on health and food security,[3] the following describes the U.S. Government's approach to environmental security with a focus on combatant commander campaign activities.

Populations rely on a healthy physical environment, primarily land, water, and air. Certain threats to the environment, whether from pollution, contamination, natural resource depletion, or climate

change, know no borders and their hazardous effects can harm farming, fishing, and herding practices that sustain human life. While human ambitions may inflame threats to the environment, population movements can overwhelm institutional capacity and generate the need for external intervention. Along with poor governance and environmental neglect, these challenges affect overall political stability, human security, and the global economy, making environmental security a pillar of national security. A former National Intelligence Director highlighted the connection between stability and security in the environmental context, "Unpredictable instability has become the new normal . . . extreme weather, climate change, environmental degradation, rising demand for food and water, poor policy decisions and inadequate infrastructure will magnify . . . instability."[4]

To better understand environmental security, two examples highlight U.S. Government perspectives. The first is a report that describes environmental security as a process whereby solutions to problems contribute to national security objectives and cooperation among stakeholders to prevent threats before they affect national security.[5] Another is a Department of Defense (DOD) policy that defines environmental security as a program that enhances readiness by institutionalizing the Department's environmental, safety, and occupational health awareness, making environmental security an integral part of daily activities.[6] For purposes here, environmental security includes protecting human populations, wildlife, mammals, and ecosystems from and curbing harmful practices that contribute to environmental degradation.[7] With the government's increasing role as a security provider and growing political focus on human security, the U.S. military will most likely support an expanding role to protect national interests against threats to environmental security. In the following sections, research and informal discussions form the following analysis: history of U.S. policy and international initiatives, executive branch strategy and organizational roles, and military campaign activities in support of environmental security efforts.

Legislative Actions and International Engagement

U.S. environmental law beginnings can be linked to the *Rivers and Harbors Act of 1899*,[8] which protected navigable areas from negative human practices such as discharge or fill-in matter processing without a permit. Since 1946, Congress generated multiple environmental protection measures such as laws on clean air,[9] clean water,[10] protection of land,[11] protection and preservation of life forms,[12] and the disposal or recovery of hazardous waste.[13] Two laws that significantly affect Federal Government approaches are the *National Environmental Policy Act of 1969*,[14] which requires detailed statements of environmental effects for all major Federal actions significantly affecting the environment, and the *Endangered Species Act of 1973*,[15] which protects species from extinction. Also worth mentioning is the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*[16] and *Pollution Prevention Act of 1990*,[17] which provide for hazardous material cleanup and pollution prevention enforcement through efficiencies and cost effectiveness, respectively. These measures combine to protect humanity and domestic ecosystems and curb harmful environmental practices both at home and abroad.

The United States also provides international assistance for global environmental initiatives within developing countries. Under President Barack Obama, U.S. participation in the Global Climate Change Initiative (GCCI)[18] aimed to integrate changing climate considerations into U.S. foreign assistance through a range of bilateral, multilateral, and private-sector mechanisms. Efforts include the promotion of sustainable and climate-resilient societies, fostering of low-carbon economic growth, and reduction of greenhouse gas emissions from deforestation and land degradation. The United States also participates with international organizations such as the United Nations (UN) and other regional organizations (for example, the North Atlantic Treaty Organization) to achieve environmental objectives.[19]

In 1988, the U.S. Government supported the establishment of the UN Intergovernmental Panel on Climate Change to identify political and economic impacts of human-induced climate change and provide scientific options for adaptation and mitigation.[20] More recently, the Environmental Protection Agency (EPA) signed a memorandum of understanding with the UN Environment Programme to provide a framework for cooperation activities to protect human health and the environment.[21] The EPA also works with Environmental Canada under the Canada-U.S. Joint Inland Pollution Contingency Plan to cooperate on pollutant release measures that can cause environmental harm along the shared inland border.[22] While the United States ratified the UN Framework Convention on Climate Change treaty in 1992, the President did not endorse the subsequent 1998 Kyoto Protocol to limit greenhouse gases, whether economically not feasible, politically unacceptable, or factually impalpable to the United States. In addition, although the United States did not ratify the 1994 UN Conference on the Law of the Sea, it does follow laws protecting the marine environment.[23] For a better understanding of how the government supports agreements, legislative actions, and forms of international engagement, the following reviews the executive branch's approach to environmental security.

The Executive Branch

The President's National Security Strategy articulates overarching policy goals that can involve environmental security approaches.[24] Subsequent strategies and plans such as the U.S. Agency for International Development (USAID) Climate Change and Development Strategy and 2013 Climate Action Plan support the National Security Strategy by linking environmental security objectives such as reducing greenhouse gases to political objectives.[25]

Another tool the President uses to establish overarching policy is authoring

an executive order. In 1970, one order directed a national approach on environmental issues by establishing the independent EPA. It also created the National Oceanic and Atmospheric Administration (NOAA) under the Department of Commerce.[26] Other notable orders were developed over the last 40 years: *Federal Compliance with Pollution Control Standards* ensures necessary actions are taken for the prevention, control, and abatement of environmental pollution with respect to Federal facilities and activities;[27] *National Oil and Hazardous Substances Pollution Contingency* and its National Contingency Plan (NCP) provide organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous materials;[28] *Environmental Effects Abroad of Major Federal Action* provides Federal agency officials with responsibility for authorizing and approving actions of pertinent environmental considerations;[29] and *Planning for Federal Sustainability in the Next Decade* revokes or replaces four previous orders and other public environmental laws.[30] Most recently in 2017, *Promoting Energy Independence and Economic Growth* sponsors clean and safe development of our nation's vast energy resources; however, it also revokes a previous order to prepare the United States for the effects of climate change.[31]

The President also articulates specific national security policy through Presidential directives. Over the last 15 years, the following directives set conditions for improving environmental security and national strategy development: *U.S. Global Development Policy* emphasizes environmental security through the GCCI;[32] *National Preparedness* replaces a previous directive to better synchronize whole-of-government responses to threats that include the environment; *Implementation of the National Strategy for Countering Biological Threats* supports biodefense directives;[33] *Critical Infrastructure Resilience* revokes a previous directive that replaced another and identifies administrative sectors such as Food and Agriculture, Health Care and Public Health, Water and Waste Systems, and Nuclear Reactors, Materials, and Waste;[34] and *U.S. Security Sector Assistance* supports building partner capabilities in addressing common security issues.[35] To analyze the breakdown of Federal environmental security efforts, the following overview captures them in three categories: significant, additional, and remaining.

Significant Efforts. Both the Department of State and EPA play significant roles in achieving global U.S. Government environmental security objectives. The State Department manages foreign affairs and conducts diplomacy for the President, which can result in foreign aid, security assistance, and economic development support to other nations. For State, USAID coordinates and integrates economic development and disaster assistance expertise and resources abroad. For purposes of this discussion, USAID is categorized as an entity under the State Department as they both share one Cabinet Secretary.[36] Three strategic documents that provide organizational guidance on environmental security are the Quadrennial Diplomacy and Development Review, State and USAID Joint Strategic Plan, and USAID Global Climate Change and Development Strategy.[37] As the principal lead for governmental security-sector assistance, State oversees policies, programs, and activities to engage with, help build and sustain the capacity of, and enable foreign partners to address their own common security challenges, including environmental security.[38] State also arranges financial climate change initiative assistance so that USAID's Office of U.S. Foreign Disaster Relief Assistance can administer and implement GCCI programs.[39] For responses to domestic challenges, State manages international contributions of support.

The EPA is a non-Cabinet, standalone government agency managed by a Presidential-appointed administrator who attends related Cabinet meetings. The EPA develops national environmental policies, regulations, and enforcement regimes to safeguard air, land, water, and ecosystems from harmful substances, pollutants, or contaminants. Under the NCP, the EPA leads on-scene U.S. Government efforts to remove and mitigate oil spills and the release of hazardous materials on land. The EPA also works closely with state regulators and industry stakeholders to coordinate development, implementation, and enforcement of new and existing environmental standards. Additionally, the EPA manages environmental science and technology programs such as the Strategic Environmental Research and Development Program (SERDP) through a memorandum of understanding with DOD and the Department of Energy (DOE). Per the Department of Homeland Security (DHS), the National Response Framework (NRF) identifies the EPA as the lead agency for Emergency Support Function (ESF) #10—Oil and Hazardous Materials Response.[40]

Additional Efforts. Other departments make substantial contributions to U.S. Government environmental security efforts. DHS provides domestic security and coordinates Federal crisis response and recovery efforts through the Federal Emergency Management Agency (FEMA). DHS also supports environmental security through cross-border protection and prepares for mass migration in the Caribbean through exercise participation.[41] Per the NCP and through the U.S. Coast Guard, DHS leads on-scene U.S. Government domestic efforts to remove and mitigate oil spills and hazardous materials released into waters and adjoining shorelines. The Coast Guard also has a National Response Center that tracks reporting of oil spills and other chemical releases.[42]

The Commerce Department's environmental objectives focus on understanding and predicting changes to the environment due to the frequency and severity of extreme weather events.[43] Under NOAA, Commerce provides access to comprehensive oceanic, atmospheric, and geophysical data, and delivers scientific solutions.[44] NOAA also deploys scientific support teams for pollution response within the United States and monitors coastal tidal gauges.[45]

Sailor surveys healthy reef off coast of Guantanamo Bay to assess and compare possible effects of recreational diving on ecosystem, Naval Station Guantanamo Bay, Cuba, November 23, 2015 (U.S. Navy/Charles E. White)

DOD supports environmental security efforts primarily through its military workforce. In support of capacity-building activities abroad, DOD contributes to engagement and prevention programs, surveillance and response systems, and develops missions, resource requirements, and operational considerations posed by current and projected climate variations.[46] Organizational policies also establish environmental security standards on issues such as low-level radiation waste practices and environmental restoration as well as inform commander environmental programs.[47] DOD also participates in SERDP,[48] provides temporary power generation and grid repair,[49] conducts homeland defense, and provides Defense Support To Civilian Authorities (DSCA) through research, preparation, surveillance, and response efforts.

The Department of Agriculture develops markets, protects natural resources through conservation, and manages the Forest Service and Natural Resources Conservation Service. Its workforce supports the health and vitality of the agricultural sector that depends on clean air, land, soil, and water, as well as environmentally sound practices.[50] In support of crisis response, the Department of Agriculture is delegated by DHS in the NRF to lead ESF #4—Firefighting to protect the public, property, and the environment.[51]

The Energy Department provides assistance and information regarding energy supply and system damage that covers infrastructure, environmental management, civilian radioactive waste management, and hydroelectric power. It also ensures sound management of the disposition of the national nuclear arms complex and participates in SERDP.[52] Under the National Nuclear Security Administration, DOE responds to radiological and nuclear emergency events with scientific and technical expertise.[53] For domestic crisis response, DOE facilitates the restoration of damaged energy systems and components as the lead coordinator for ESF #12—Energy.[54] DOE also manages the Nation's Strategic Petroleum Reserve.[55]

Remaining Efforts. Other departments maintain domestic capabilities and may have equity in support of global environmental security efforts. The Department of the Interior manages the Nation's public lands, minerals, national parks, and has the responsibility of western water resource management and conservation of natural resources.[56] The Department of Transportation works to increase energy efficiency, reduce greenhouse gas emissions, conserve water resources, eliminate waste, and prevent transportation services and facility pollution.[57] The Department of Health

and Human Services via the Centers for Disease Control and Prevention and Food and Drug Administration coordinates environmental health expertise in preparation of and during public health emergencies.[58] The Department of Justice enforces Federal pollution abatement laws to protect the environment,[59] and the Treasury Department implements GCCI activities through international organizations.[60] Furthermore, the National Aeronautics and Space Administration (NASA) is an independent agency that tracks and characterizes orbital debris in space.[61]

As U.S. Government departments continue to develop their own strategies to achieve national environmental security objectives, the future is uncertain on how the government will plan for a robust international workforce response that includes environmental relief for massive population movement and critical public infrastructure failure.[62] For interoperability and educational reasons, non-DOD organizations should keep a watchful eye on their portrayal in and participation in the development of U.S. military joint doctrine—the core foundation of military workforce best practices.

Military Campaign Activities

Threats and their hazardous effects can increase the risk of instability and conflict, requiring security institution involvement. DOD is one security institution that supports environmental security efforts when directed to do so, but it also relies on stable physical environments for maximum interoperability. In support of government activities, combatant commanders integrate environmental considerations, such as compliance and protection, into plans and missions to prevent and mitigate environmental degradation and other negative effects. However, this may not always be feasible due to competing operational interests that commanders must assess, such as the inherent right of self-defense or combat.

While many terms describe DOD environmental security, this discussion refers to them as *campaign activities*. Under military investments, campaign activities revolve around mutual agreements and commitments to promote long-term regional stability. Within limited military deployments, campaign activities include crisis response and contingencies that meet defined short-term requirements such as protecting civilians. For large-scale military missions, campaign activities are more complex, standalone, and longer.[63] Operational and tactical commanders also develop tasks in support of organizational policies and campaign activities through command environmental programs to mitigate negative environmental effects and harmful practices generated by military forces that affect local ecosystem, wildlife, mammal, and human survival. The following sections categorize campaign activities that counter negative effects and reform existing practices within three physical elements of the operational environment: air, land, and water.[64]

Air. Air quality affects civilian populations and military personnel, as well as technological equipment, instruments, and communication systems. Pollutants such as carbon dioxide and other gases, radioactive material, or manufactured pathogens released into the air can harm air quality and deposit hazardous materials in other locations (for example, through air plumes, acid rain).[65] Conditions created by severe weather climates and ozone depletion also can negatively affect clean air. These hazards can generate effects that produce smog, inflame wildfires, and increase ultraviolet radiation that harm human health and create uninhabitable environments. DOD campaign activities include foreign humanitarian assistance (FHA), disaster relief, and DSCA.

In 2011, DOD personnel under U.S. Pacific Command (USPACOM) supported U.S. Government efforts in Japan to conduct radiation reconnaissance monitoring and mitigation for the Fukushima nuclear reactor response.[66] In support of government relief against deliberate contamination, DOD personnel in 1991, under U.S. Central Command, assisted the Kuwaiti government's oil-refinery fire mitigation efforts. Oil fires were perpetrated by retreating Iraqi military forces and were intended to impede allied military advances and interoperability as well as damage the Kuwaiti economy.[67] In 2016, DOD personnel gathered air samples in an allied Iraq and trained government forces to assist to control oil well and sulfur plant fires ignited by terrorists.[68] At home, DOD—through U.S. Northern Command (USNORTHCOM) or USPACOM—leads homeland defense efforts against external threats, such as weapons of mass destruction, delivered through and disseminated into the air. DOD also conducts campaign activities to build institutional capacity of foreign forces against ecoterrorism (commonly known as environmental terrorism). Additionally, combatant commands integrate extreme weather-driven scenarios into exercises to maintain U.S. military readiness capabilities and interoperability with foreign forces.[69]

For disaster preparation and building partner capacity efforts, DOD personnel, under USNORTHCOM and U.S. Southern Command (USSOUTHCOM), provide courses and conferences[70] as well as hazmat response training with countries such as Mexico and others in Central America, respectively.[71] DOD also assists in domestic environmental security efforts. In 2017, in support of response and recovery efforts for Hurricane Harvey, DSCA focused on assisting state and local authorities in stemming toxic airborne emissions from dozens of damaged petrochemical plants and refineries around the Houston area.[72] For curbing harmful practices, DOD strives to mitigate air pollution emissions through the transition of fossil fuel usage to more biofuel in ships, aircraft, and vehicles.[73] Additionally, DOD conducts basecamp cleanup, develops alternatives to burning waste in open pits, protects endangered species and wildlife, safeguards natural and cultural resources, and practices noise abatement.

Land. The quality of land affects the livelihood and survival of civilian populations as well as the interoperability and protection of military personnel. Pollution and contamination from human practices can intensify land or soil

degradation. Activities such as deforestation, overgrazing, poor sanitation, over salinization, certain types of landfill, and chemical or biological release can lead to desertification, combustible vegetation wildfires, smog and smoke, increased greenhouse gases, severe weather climates, famine and drought, crop failure, poverty, natural resource depletion, unusable and inaccessible terrain, inability to produce foodstuff, and topsoil and vegetation absorption of foreign materials.

In 2011, in support of U.S. Government efforts to the Japanese government, DOD personnel under USPACOM participated in foreign consequence management in the form of radiological response at and around the Fukushima nuclear reactor.[74] Japan continues to clean up and store hazardous material from the accident on land today.[75] Besides disaster relief, DOD provides support against deliberate land degradation perpetrated by retreating forces such as critical industrial infrastructure destruction and scorched earth policies. Pollutants on land can also seep into the ground and contaminate fresh underground water supplies.[76] DOD also trains host-nation security forces on pollution and spill prevention, conservation, and environmental restoration.

At home, DOD leads homeland defense efforts against external threats such as weapons of mass destruction delivered on or from land and supports state and local efforts managed through DSCA.[77] Recently, DOD personnel under USNORTHCOM cooperated with domestic authorities on hurricanes Harvey, Irma, and Maria's response and recovery efforts to rebuild infrastructure, generate power, and institute emergency protective measures.[78] DOD also strives to reduce energy consumption and enhance energy self-sufficiency, such as drawing on local clean energy sources or using solar power during military operations to create technological and equipment efficiencies; promoting green programs and energy initiatives to reduce vehicle reliance on liquid fuels through alternative fuel usage and on-board power;[79] implementing aggressive conservation and efficiency efforts while repurposing energy through renewable fuels in buildings, facilities, and vehicles;[80] and procuring renewable energy on installations to increase resiliency in the event of commercial grid disruption.[81] DOD also monitors coastal erosion, sinking land, the effects of landfills, threatened and endangered species habitats, regulated sites, and cultural resources.[82] On basecamps and installations, commanders provide oversight of hazardous material, solid waste (garbage), wastewater, storm water, and land-farming of liquid spill management.

Water. Naval and maritime forces operate on, under, or above the water to influence results on land.[83] The quality of water is worsened by pollution or contamination from human practices.[84] While water degradation affects potable water access, aquifer protection, legal fishing, or habitats,[85] climate variations can affect frozen waters and Arctic cover resulting in rising sea levels and changing shorelines from melting ice that threaten population centers and water-based military installations. The over pumping of groundwater can also lead to scarcity and depletion.

In USPACOM, DOD personnel supported U.S. Government assistance for the Fukushima nuclear reactor accident in 2011 to mitigate radioactive water leaks from distressing local and maritime environments. In the previous year, DOD personnel under USNORTHCOM reinforced the government's Gulf of Mexico oil spill response with air and logistical support.[86] Within other geographic combatant commands, campaign activities can include building the capacity and resilience of other organizations through events such as oil spill drills[87] and sharing information and best practices to address topics on climate change, coastal erosion, water management, waste management,[88] rising sea levels, storm surges, and installation resource management. At home against deliberate contamination, DOD leads homeland defense efforts against external threats such as weapons of mass destruction delivered from, on or immediately above water. For the Arctic, rising temperatures, melting sea ice, thawing permafrost and shoreline erosion raise alarms on sea level heights and military training.[89]

While DOD is committed to ensuring safe, secure, and stable water conditions,[90] some situations warrant alarm. First, nuclear reactor accidents at sea and how to respond are real concerns. In 1982, Russia scuttled a radioactive submarine that places today's Arctic maritime environment in jeopardy from radioactive leaks under water.[91] Other examples include coastal installation vulnerabilities from normal wind and high tide flooding, less prevalent rising sea levels generated from ice shelf melting, and storm surges. On DOD's largest naval base Norfolk Naval Station, normal flooding occurs at least once or twice a month due to rising waters and land erosion (also known as sinking land).[92] For curbing harmful practices, DOD seeks to decrease sewage discharge, coastal habitat destruction, impacts to mammals and other wildlife, and clean water scarcity.[93] For alternate energy usage, DOD develops and deploys alternate powered nuclear aircraft carriers and submarines, and their escort ships use advanced biofuel. Deployed assets also perform energy conservation measures during the course of normal operations.[94]

In the remaining physical area of the operational environment known as space, DOD under U.S. Strategic Command manages the DOD Space Surveillance Network to monitor satellites and certain orbital debris. Other campaign activities include atmospheric pollution (for example, rocket launch debris and space litter) observation and its potential threat to Earth. DOD also cooperates and shares responsibilities with NASA for characterizing the contents of the satellite area in space.[95] Additionally, within the information environment, organizations throughout DOD and its U.S. Cyber Command, as well as civilian entities including the independent National Security Agency, defend against cyberspace intrusion that could generate infrastructure damage and remotely trigger catastrophic environmental releases.[96]

Populations care about and depend on clean environments. DOD support to U.S. Government environmental security

By 2025, approximately 1.8 billion people will live in countries with absolute water scarcity, with 3.4 billion people living in countries defined as water-scarce, Manatuto, Timor-Leste, March 20, 2009 (UN/Martine Perret)

efforts will lessen anxieties that inflame root causes of community dissatisfaction and put the legitimacy of governments and regional organizations into question. Although U.S. military forces participate in environmental security efforts, it does not mean that they are immune to the negative effects of the affected environment. In the 2011 Japanese Fukushima nuclear reactor incident, DOD personnel and responder ships suffered lasting contamination effects from radioactive water that emptied in the ocean.[97] While protection is a joint function previously related to military forces that now includes civilians,[98] the forms of slow, rapid, complex, and catastrophic events can lead to forced population movement and most likely generate additional U.S. Government and U.S. military assistance or intervention. To plan for and reduce instability, increase interoperability, and avoid laying the groundwork for any type of species extinction, combatant commanders and their forces should be ready to support U.S. environmental missions and continue to integrate environmental security-related risk management into normal planning processes and operations. **JFQ**

Notes

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