

We Can't Afford to be Wrong

A 5-Teams (5T) View of the US Military's Approach to Climate Change

by William K. Gordon, Marcel C. Minutolo, David M. Saunders, and Scott R. Winn

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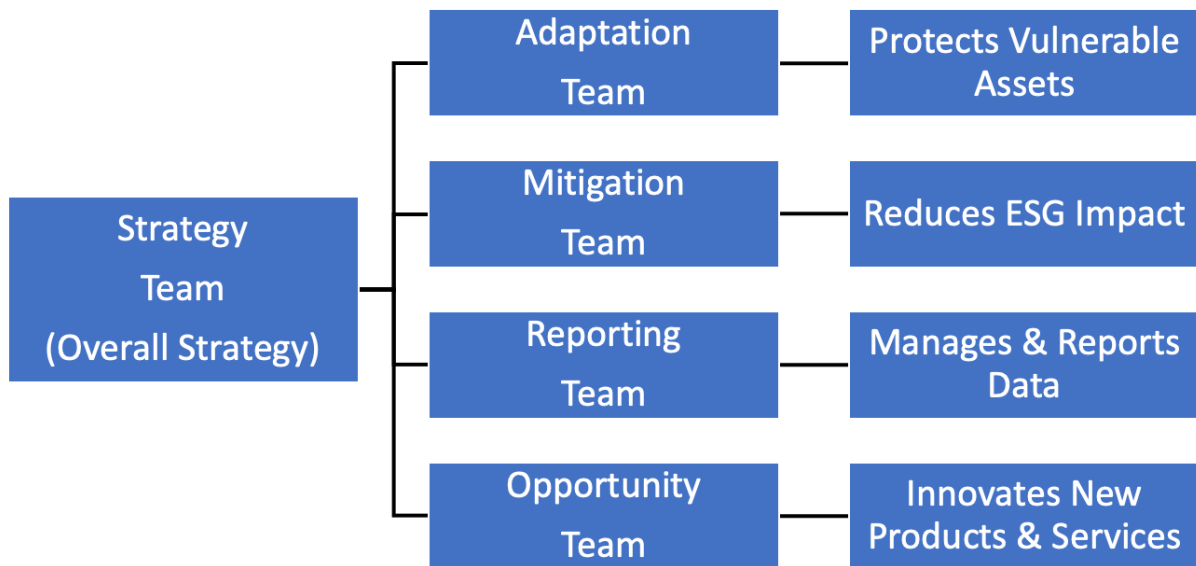
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In business, when firms are wrong, they can fix it next quarter; but, for the Department of Defense, there is no next quarter. As technology has helped researchers analyze and understand changes in global temperatures over the last several hundred thousand years, evidence shows global temperatures are warming due to the emission of greenhouse gases from the burning of fossil fuels. While reactions to this news range from acceptance to denial, there is no debate that costs associated with severe weather have increased significantly. The International Chamber of Commerce (2024) estimates that extreme weather events have cost the global economy more than \$2 trillion over the last decade. One organization taking major steps to address climate change is the United States Military, which is engaged in activities intended to sustain its ability to defend our country as the world gets warmer.

[“Climate change is a national security issue, and for the national security community, that declaration is not controversial — it's fact”](#) -Deputy Secretary of Defense Kathleen Hicks (Garamone, 2023, para. 4).

We use the 5-Teams (5T) Model to observe and analyze some of these activities. 5T suggests the use of five teams to address climate risk: (1) a **strategy team** to set direction; (2) an **adaptation team** to identify risks from climate hazards; (3) a **mitigation team** to build a resilience plan that lowers carbon emissions; (4) a **reporting team** to disclose the environmental, social, and governance (ESG) effort; and, (5) an **opportunity team** to answer the question “how can we increase stakeholder value by turning this adversity to our advantage?” The teams and how they interact are illustrated in figure 1.

5T Model – Team Focus



The 5T model and Team Focus

The 5T Approach

Depending on the size of the organization, each of these teams could have one or more members, and individuals may be asked to serve on more than one team. Organizations with LEAN, Six Sigma, and/or problem-solving teams are well suited to tackle climate risk projects.

Strategy Team

The planet's changing climate has a significant effect on Defense Department missions, plans and installations. DoD is elevating climate change as a national security priority, integrating climate considerations into policies, strategies and partner engagements

(U.S. Department of Defense. 2024).



Damaged aircraft in destroyed hangar at Baton Rouge, LA following Hurricane Rita. Photo by CPT Marcel Minutolo, taken while on duty performing relief operations following Hurricane Katrina in 2005.

The [Army Climate Resilience Handbook](#) (ACRH) begins this way: “In recent years, Department of Army (DA) installations have suffered billions of dollars in damage due to extreme weather events, such as the intense precipitation in 2015 at Ft. Benning; flash flooding at Ft. Hood in 2016; wildfire at Ft. Carson in 2018; and hurricane at Ft. Bragg in 2018. Department of Defense (DoD) damages include flooding at Offutt Air Force Base (AFB) in 2019; and increasingly frequent “sunny day” (chronic) tidal flooding at Naval Station Norfolk. These extreme weather events impact installation infrastructure, training, and readiness-to-deploy” (Pinson et al., 2020, p. 1).

In the first step of the process, the ACRH suggests developing a “climate resilience plan.”

This includes:

- Describing the vision and objectives in helping the organization meet its overarching strategy;
- Choose the boundaries of the plan;
- Describe current and planned changes to the organization;
- Document the organizational profile;
- And, describe the current profile.

A colleague at the American Society for Quality (ASQ) recommends reading Michael T. Klare's [All Hell Breaking Loose: The Pentagon Perspective on Climate Change](#). Chapter 1 of the book begins with an extraordinary exchange between a US Senator and a Navy Admiral. The Senator, from a state with strong ties to the oil and gas industry, took the position that climate change is a “hoax.” The Admiral, “a ramrod straight graduate of Annapolis, who has been commanding ships for decades, was not to be intimidated. [...] No, he explained, climate change was transforming the security environment” (Klare, 2019, p. 16). The Admiral said several billion people live in the Asia-Pacific region, “about 80% of them are within 200 miles of the coast” (p. 17) and are becoming increasingly vulnerable to rising seas and extreme storm events. Raising the question, “what’s going to happen when they all want to move” (p. 18)? The book goes on to explain how climate risk has become a national security risk.

Given the mission of the US Military, it is no surprise the DoD has invested significant resources in understanding the impact of climate change on its ability to project power globally. Toward that end, the DoD is implementing a strategy for how it will continue to operate effectively in the future. Perhaps the most publicly visible part of this strategy is the DoD climate

resilience portal on the internet (<https://www.climate.mil/>). The portal contains various news reports, links to DoD organizations, and resources intended to clarify the DoD's position on climate change, reduce complexity, and disseminate scientifically credible information. The portal is an authoritative source of information with clear guidelines to follow. Likewise, the 5T Model encourages business leaders to explain in clear terms the business risk and the strategy to lower that risk.

Adaptation Team

The Defense Department is actively engaging a two-pronged approach to confront climate change by avoiding the unmanageable while at the same time managing the unavoidable, according to one DOD climate official (Olay, 2024, para. 1).

Given extreme weather events, the challenge of preparing for both known and unknown events is what may be called a *wicked problem* (Camillus, 2015). Organizations do not have the luxury of pausing operations while planning for future problems; they must operate and anticipate at the same time. While operations deal with the present, future issues are the focus of the 5T Adaptation Team.

One tool that the ACRH recommends during this process is a *Nuisance Impact Table*. The Nuisance Impact Table identifies the type of **nuisance** that the organization may be exposed to (e.g. flood), the **impact** that it may have on operations, the **frequency** of occurrence, the **trend**, and the **actions** to be taken.

Nuisance Impact Table

Nuisance Hazard	Impact	Frequency	Trend	Actions Taken
Black Flag Heat Days	Training, Cooling Infrastructure	Annual (Jun-Sep)	Increasing in frequency (local weather data).	Added 2 shade structures near rifle range A. Info distributed regarding indoor temp settings for all infrastructure.
50-Year Flood Events	Training, Backup Generators, Depot & Boat Launch Access, Base Housing (Quality of Living)	Every two or three years (Mar-May)	Increasing. Now receiving 50-year events every couple of years.	Raised electrical equipment off ground in buildings 1004-1007 at depot. Move depot generator when storms are imminent. Spray for mosquito control post storm.
Stormwater Flooding	Training, Backup Generators, Building Access, Base Housing, Fuel Storage Facility	Annual (Mar-Sep)	There have always been stormwater flooding events on the base. Not sure of trend at this time.	Ditch dug out in rifle range after every storm event to drain field. Generators moved out of flood risk (most of the time). All electrical components elevated in infrastructure at the Fuel Storage Facility. Spray for mosquito control post events.

Source: Pinson et al., 2019, p. 31

The ACRH also contains examples of impact descriptions: “A 100-year flood event occurred in April 2019. This flood event impacted 10 facilities on the base, which led to the destruction and removal of 4 buildings and the planned construction of 4 new facilities. Two backup generators were flooded out and had to be replaced. The depot was flooded, and six vehicles and five vessels were destroyed. The installation’s construction and training missions ceased during the flood event and for 10 days after during the recovery effort...” (Pinson et al., 2019, p. 35).

The ACRH provides more examples of adaptation:

- Enhanced coastal defenses in Norfolk, Virginia, home to the largest naval base in the world. These coastal defenses include raising sea walls, improving drainage systems, and restoring natural barriers like wetlands.
- At bases in overseas locations like Guam, the Army has reinforced buildings and infrastructure to withstand the increased frequency and intensity of typhoons.
- The Air Force is coping with increased demand for resources to fight wildfires.

- Military officers are being given the opportunity to attend graduate school in security, policy, and technology-related programs.

Taking action to educate leaders as well as find ways that technology can help the DoD adapt to climate change is another example of the work a 5T Adaptation Team can do to help their organization.

Mitigation Team

Since 2010, the Department of Defense has acknowledged that the planet's changing climate has a dramatic effect on our missions, plans and installations. The department will immediately take appropriate policy actions to prioritize climate change considerations in our activities and risk assessments [in order] to mitigate this driver of insecurity -Secretary of Defense Lloyd Austin, in 2021 (Assistant Secretary of Defense for Energy, Installations, and Environment, 2024)

Mitigation is about lowering negative environmental, social, and governance impacts. In order to help subordinate units, the Department of Defense provides the Sustainable Management System (SMS) Technical Center of Expertise (<https://www.sms.erdcdren.mil>). The SMS provides technical tools to inventory product components, determine carbon content, and take action to lower carbon footprint.

One example is “PAVER™ (The Pavement Maintenance Management System), which uses inspection data and a Pavement Condition Index (PCI) rating from zero (failed) to 100 (excellent) for consistently describing a pavement's condition and for predicting its needs many years into the future” (Colorado State University, n.d.). This is an important part of the DoD’s mitigation strategy because the concrete industry is a [significant source of greenhouse gases](#). (Ramsden, 2020, para. 3).

Reporting Team

The Department of Defense provides an annual report to Congress: the [Energy Resilience and Conservation Report](#) (Assistant Secretary of Defense for Energy, Installations, and Environment, 2024). This report provides insight into the complexities of metrics and reporting, for example: “While energy use per square foot is a useful metric for buildings with various sizes and purposes, the development of a single metric able to capture the rates of energy use across, to name a few, tactical generators, wheeled and tracked vehicles, rotary winged aircraft, fixed-wing aircraft, surface ships, and unmanned systems, is a significant challenge” (p. 5). It goes on to explain, “a training mission by a C-17 airlift aircraft will have dramatically different fuel use per unit of activity compared to a DDG-51 class destroyer maneuvering in the Red Sea or an unmanned aerial system conducting surveillance for a Combatant Command” (p. 5).

In civilian operations, there are different reporting requirements, including the [complexities of reporting](#) Scope 1 (direct GHG emissions), Scope 2 (grid-related emissions), and Scope 3 (indirect GHG emissions). Understanding the US Military’s approach to reporting is educational for business managers faced with similarly complex reporting requirements. Reporting requirements will vary by industry and the reporting frameworks adopted.

Opportunity Team

Chapter 8 (Going Green, The Pentagon as Change Agent) of Klare’s book describes the challenges of “climate change, energy security, and economic stability [that] are inextricably linked” (Klare, 2019, p. 204). The chapter goes on to describe innovations in each branch of the service that can someday have civilian applications. One “energy target” was to “have half of all energy consumed at shore-based installations come from renewable on-site sources, such as

wind, solar, and geothermal. . .” (Klare, 2019, p. 208). As the Department of Defense (DoD) acquires these systems, it is expected that the marketplace will follow suit.

One example of an opportunity for the trucking industry is described as follows:

“[H2Rescue](#) is a zero-emission, fuel cell-powered emergency vehicle designed to offer critical relief in a time of emergency and natural disasters. On October 25, 2024, H2Rescue completed an 1,806-mile journey on a single hydrogen fill, setting a record in a new category. The truck is powered by an Accelera fuel cell engine and a 250kW traction motor, which results in zero emissions” (Espinosa, 2024).



Source: https://www.army.mil/article/275433/h2rescue_mission

Often, when talking about crisis and opportunity, there is a common interpretation of the Chinese character for crisis, 危機, as danger and opportunity. However, there is a subtle distinction in the meaning of the second character, 機, that may be more accurately interpreted as ‘change or inflection point’. As we rapidly approach an inflection point, the opportunity team is challenged to monetize innovation.

Conclusions

The United States Military serves as a prime example of how an organization operating on a global scale can effectively address its exposure to climate change. By recommending tools for each step and outlining the types of reports generated, it provides a comprehensive approach. Building organizational resilience to climate change is no longer optional, and quality leaders can lead this effort. Utilizing LEAN and Six Sigma methodologies, each of the 5T teams can support this crucial work.

Questions to Ponder

Hopefully, this paper has raised some questions for you and your organization.

1. What is our company's **strategy** regarding climate risk? Is it formal or informal? Is it rhetorical or substantive? What data informs the strategy? Is strategy driven by scientific data, market data (ESG), or political data?
2. How does our company **adapt** to climate hazards? Are we proactive or reactive? What climate-related losses did we suffer last year? Are our stakeholders putting increasing demand on us? Has our insurance carrier put us on notice for limits on weather events? Do we have a team reviewing [NOAA's website](#) for probabilities of floods, sea-level rise, and wildfires? Have we contacted local planning authorities to determine which roads/bridges/rail lines will be protected? How do we decide which units/locations to defend and when to retreat?
3. What progress have we made to **mitigate** our carbon footprint? Do we understand Scope 1, 2, & 3 emissions? Do we have an energy management team? As a management team, do we have a common understanding of how to mitigate our negative

Environmental, Social, and Governance impacts? Does company leadership have a common understanding of climate risk?

4. What **reporting** is required, and what is voluntary? Who handles regulatory requirements for reporting, such as [SEC climate disclosure reporting](#), [GRI disclosures](#), and, [SASB reporting](#), etc.? Do quality professionals have a seat at the table? Will we be subject to local and [state building energy standards](#) over the next 10 years? If manufacturing is exempt, do we have other buildings that must comply or pay carbon fines?
5. What **opportunities** are we missing? Does our management team know that [one billion new machines](#) will be produced over the next decade to switch from petroleum-based energy to renewable energy? Do we have an active team looking at our product and service portfolio to determine potential winners and losers? What university-based research can we explore to help us be part of the solution rather than part of the problem?

Authors' Note

Writing this article was a team effort. After spending 40 years as a quality professional, David Saunders retired, returned to school, and earned a certificate as a [climate change professional](#). Over the following three years, he developed the 5T Model and conducted more than two dozen workshops with American Society for Quality (ASQ) members.

William Gordon, Marcel Minutolo, and Scott Winn, all veterans of the U.S. Army with extensive backgrounds in military intelligence, have also had long and distinguished careers in business and academia. Together, they partnered with David Saunders to explore the question: 'What is the U.S. Military doing about climate change, sustainability, and resilience, and what can quality leaders learn from their efforts? Meeting weekly, our team uncovered resources,

documents, websites, and tools that are actively used by the US military and readily available to the business community.

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More information about the authors and their work can be found at <https://ldrship.dev/about/>

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