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Introduction

“Today, no nation can find lasting security without addressing the climate crisis. We face all kinds of threats in our line of work, but few of them truly deserve to be called existential. The climate crisis does.”

—US Secretary of Defense Lloyd J. Austin

WHILE ATTENDING A LEADERSHIP SUMMIT on climate change in 2021, US Secretary of Defense Lloyd J. Austin called the climate crisis an existential threat, one that no nation can ignore if it wants to achieve lasting security. Roughly thirty years earlier, when I became the first deputy undersecretary of defense (environmental security) in US history, you would have been hard-pressed to find a military leader who worried as much about the stability of the planet as about the aggressions of our enemies. Indeed, through much of the twentieth century, the environment was at best a secondary consideration for much of the military. Our leaders were, after all, occupied with other matters, from deterring a nuclear attack by the Soviet Union to confronting terrorism. As a major global power, America needs the most capable,

best-equipped, and best-trained fighting force in the world. Few could argue with our nation's military prowess, yet that effectiveness often came at a high cost to the planet. From dropping Agent Orange on the battlefield to dumping toxic chemicals on our soil, actions by the US military have had long-lasting health and environmental consequences at home and abroad. And yet, today, environmental stewardship is integral to the US military's activities.

This stunning turn has enabled the military to keep pace with a changing world. Our armed forces are now working actively to understand and reduce the risks from environmental degradation and a changing climate. And beyond our borders, militaries around the world have become climate leaders, establishing ambitious emissions goals, building installations that can stand up to the extreme weather of a warming world, and designing revolutionary clean energy technologies. At a moment when global climate leadership is desperately needed, our military has built on its past and stepped up to become a guiding light toward a more sustainable future.

What happened in the thinking of America's civilian leaders and military officers? Did the nation's generals go to bed one night as warfighters and wake up the next morning as environmentalists? Hardly. Instead, the idea of environmental security—the notion that our safety depends on a stable, healthy planet—is now deeply connected with concepts of mission and military readiness, across the administrations of both parties. This transformation occurred slowly at first but has accelerated as environmental challenges have increased. And it is still evolving today.

In some ways, military leaders have always been acutely aware that the state of the natural environment affects security. For generals to launch a ground offensive, they must know every detail of the terrain. Sending naval ships into battle similarly requires a sophisticated understanding of oceanography. Likewise, accurate weather forecasting has played a decisive role in many of history's pivotal battles, including the famous D-Day landings that helped put an end to World War II.

But for too long, environmental protection remained a blind spot for our military. How could defense officials be expected to worry about a few chemicals or the fate of polar bears when they were charged with saving human lives and defeating adversaries? The prevailing view among the uniformed military when I arrived at the US Senate Committee on Armed Services in the 1980s was that environmentalists simply did not understand the threats facing our nation or what was required to keep us safe.

Yet even in those early days, cracks began to form in the seemingly impenetrable wall constructed between national security and environmental protection. As the Cold War came to a close and the nation shuttered its nuclear bomb-making plants, the US Department of Defense (DOD) was forced to deal with decades of contamination—and, as I've often said, my career went from weapons to waste. Similarly, as groundbreaking environmental laws and regulations were enacted, including protections for endangered species on military bases, DOD had to figure out how to conserve natural resources while training the world's most elite fighters.

Slowly but surely, if not uniformly, attitudes began to change. The mere fact that in the 1990s, I was appointed to serve as the first deputy undersecretary of defense (environmental security) demonstrated that both the military leaders and the civilian officials they answered to were beginning to recognize that military readiness and environmental protection could go hand in hand. We cleaned up military bases, protected species' vital habitats, and shared these practices with nations around the world. Of course, there were naysayers: soldiers, sailors, generals, and plenty of civilians who thought environmental protection was mission creep that distracted our forces from their core job of defending the nation. But the progress was undeniable. The military's new awareness was not only good for trees and turtles; it was also good for the health and safety of our troops and the communities they served.

Then, in the early 2000s, we started confronting a new foe, one unlike

any the world had ever seen, one that had been gathering strength for decades: climate change. From extreme storms to rising seas to drought and wildfire—and the political conflict and violence fueled by these stressors—climate change is a major international security threat. In fact, as I put it in 2007, it is a “threat multiplier,” making every fragile state more vulnerable and every conflict more dangerous.¹

In many ways, the military’s environmental awakening in the 1980s and 1990s was excellent training to confront a warming planet. Our leaders had always relied on scientific evidence, and as health and environmental conditions changed, they adjusted military operations and training structures in response.

However, when the nation’s generals first learned about climate change, it was considered a theory, one that was hotly contested in the media, if not in the scientific community. Moreover, this threat went far beyond any environmental challenge the military had faced before. It wasn’t a matter of replacing harmful chemicals with benign alternatives or working around a sensitive habitat. Climate change would fundamentally shift the world’s geopolitics, demanding new diplomatic strategies, new energy strategies for powering the force, and new approaches for protecting bases from natural disasters.

Today, we face the global threat of a rapidly changing climate that is reshaping our security environment. How do military leaders view this threat? How has their thinking evolved? What are their contingency plans? Where do they see the coming conflicts?

I can answer these questions because I’ve been on the front line of this fight for my entire professional life. I’ve debated generals in budget battles, asking that a small portion of our massive defense spending be used to address environmental threats. I’ve negotiated conflicts between environmental activists, who, understandably, want safe, healthy communities, and our armed forces, who, equally understandably, do not want to compromise military readiness.

In the 2000s, I convened a group of venerated military leaders to examine climate change as a threat multiplier. Their voices would cut through the political noise and show the world that an unstable climate puts global security and our national defense in serious peril. Indeed, the field of climate security sprang from the initial work of these leaders, known as the CNA Military Advisory Board, and then sprouted into a thriving international community of practice led by the Center for Climate and Security, the Climate and Security Advisory Group, and, later, the International Military Council on Climate and Security.

In the following pages, I share their stories and my own. We will travel to the top of the world, where collapsing permafrost and retreating sea ice in the Arctic are transforming trade and intersecting with growing competition among Russia, China, and other nations. We will follow military leaders to Africa and the Middle East, where they witnessed how violent extremist groups are weaponizing water and manipulating vulnerable communities who are already hit hard by climate change. In the Indo-Pacific region, we will see how the military is working to counter China's growing influence while actively supporting allies whose very sovereignty is threatened by sea level rise and a lack of fresh water. In Latin America, we will examine our own role in the mining of critical minerals—pursuits that can undermine already fragile states, whose citizens are migrating north. And on the home front, we will track the military's efforts to cut our tether to fossil fuels and prepare our bases for the raging storms to come.

I wrote this book to help readers understand the severe security threats that climate change presents and the hard choices that our military must make to defend against them. By putting you in the room and on the battlefield with generals and other military leaders, I hope to convey not only the complexity and danger of these risks but also the opportunity that the military is seizing. With the right strategies, from transforming the energy systems that power our tanks and aircraft to partnering with

allies to improve weather forecasting, we can prepare our forces and our families for the most existential threat of our time.

It is not a straightforward task; there will continue to be doubt and disagreement about how best to protect ourselves in a dangerous world, where climate is one of many compounding factors. Yet it would be a dereliction of duty to turn away from this fight—and the military leaders with whom I have spent my career have no intention of doing so. They are already making tremendous progress, and there is still so much more to do. I make recommendations in the final chapter about how to further integrate climate into national security, from improving predictive capability to transforming energy use for a warming world.

Finally, I want to celebrate the individuals who have put their careers and their lives on the line to defend our nation in a warming world: The young officer in Afghanistan who inspects fuel trucks entering his base, knowing full well that the next one could contain explosives. The US Navy commander who leads her ships to provide aid in the aftermath of Superstorm Sandy. The admiral who is willing to tell a skeptical US Congress that climate change is among the most serious dangers he faces.

Experiences such as these have taught our armed forces the imperative of resilience in the face of an unprecedented global threat. Against all odds, and in defiance of all stereotypes, the military has become one of the world's strongest forces in the fight against climate change, and not solely for the sake of the climate. The military's focus is about ensuring it can continue its primary mission: to protect and defend the nation. In today's multipolar world, with US forces engaged around the globe, protecting America and gaining the upper hand against adversaries means being climate-smart.

To understand how we got here, we need to begin with the Cold War, as we will do in the next chapter.

CHAPTER 1

From Weapons to Waste

ARRIVING FOR MY FIRST DAY at the Russell Senate Office Building was like entering a museum as a child. The space was grand, with large marble columns and high ceilings, but the furnishings were bureaucratic government-issued: deep fake-leather couches and old wooden desks with mismatched chairs. A female receptionist politely ushered me in, but her stare seemed to confirm my fear that I didn't belong here. I was shown to an empty desk in a musty back room and told I could work there until the whole office was renovated months later.

It was September 1987, and I had just been hired as the youngest and one of the first female professional staff member of the US Senate Committee on Armed Services, chaired by the Senate's authority on defense, Senator Sam Nunn of Georgia. Walking into my first staff meeting, I really knew I was out of place. When the staff director, Arnold Punaro, asked me to introduce myself, the one person I had already met piped up that he was pleased to introduce "Sherri Wasserman" to the committee. Punaro said, "Well, Sherri, aren't you married now?" I nodded: indeed, my wedding had been just the month before. Punaro replied, "Well,

then your name is Sherri Goodman.” I was so flummoxed that I couldn’t utter a word. It wouldn’t have mattered if I had managed to explain that my legal name was now Sherri Wasserman Goodman. The staff director’s pronouncement was sufficient: as a married woman, I would have my husband’s name. It was as simple as that.

I was an unlikely hire for Punaro and the Senate Armed Services Committee in more ways than one. Punaro was a retired marine, with portraits of Confederate generals hanging in his office. I was the daughter of Holocaust refugees, raised in New York and educated at colleges and universities in New England. In some ways, I had gotten used to being one of the few women in the room. In 1977, I had joined the second class of women to enter the formerly all-male bastion of Amherst College, where I fell in love with diplomatic history and international affairs. It was during a year at the London School of Economics and Political Science that I met several officials from the US Department of Defense (DOD) at a conference: encounters that would send me down a path that ultimately led to room 222 at the Russell Senate Office Building. I thought I was launching my career in nuclear weapons and arms control; little did I know that this would become a gateway to pioneering the fields of environmental security and, later, climate security.

I was fortunate to arrive at the Senate Armed Services Committee armed with good degrees and powerful professional connections. (At Harvard Law School, I had been classmates with Elena Kagan, now a justice of the US Supreme Court.) My mentors had unparalleled national security bona fides, and they were willing to ask hard questions and level criticism when it was due. When I was in college, a deputy undersecretary of defense for policy, Walter Slocombe, suggested I write my thesis on President Jimmy Carter’s failed effort to deploy the neutron bomb, known as the weapon “that kills people and leaves buildings standing,” into the arsenal of the North Atlantic Treaty Organization (NATO). That became my first book, *The Neutron Bomb Controversy*:

A Study in Alliance Politics.¹ Later, at Harvard, I studied with a former undersecretary of the navy, Robert J. Murray, who was leading a project that examined the “waste, fraud, and abuse” in defense contracting that became notorious during President Ronald Reagan’s military buildup in the mid-1980s. That research led me to a critical examination of DOD’s contracting practices and my first law review publication.² I learned during those years that you don’t need to be an activist to create change; you can challenge the status quo by well-reasoned analysis from within the walls of the establishment.

Perhaps it was this willingness to think critically that Arnold Punaro responded to during my interview with him. He later told me that, while he usually never hired anyone without fifteen years of experience, I had impressed him. For Senator Nunn, my unusual perspective was an asset rather than a liability: there was a “gap in oversight” of the US Department of Energy’s weapons complex, and they needed someone who would “challenge the basic assumptions” and not just “come in and salute.”³ He told me, “We wanted someone with a fresh pair of eyes and a big brain.”⁴ This turned out to have been the real reason Senator Nunn and Punaro tasked me with overseeing the nation’s nuclear weapons plants. For many years, I’ve been half-joking that I got that assignment because no one else wanted it, but Punaro told me I shouldn’t sell myself short. Looking back now, I can see that the man who identified me by my husband’s name called out a trait I often observe in young women but had failed to recognize in myself. I doubted my own abilities, even when others praised them.

In this case, the praise came from an authoritative source. Senator Nunn had ascended to chair of the Senate Armed Services Committee after the 1986 midterm elections, when Democrats recaptured the Senate six years into Ronald Reagan’s presidency. At forty-nine, Nunn was already legendary in defense circles. Elected to the Senate in 1972, he was known for his deep knowledge of and affection for America’s



Figure 1-1. Senator Sam Nunn, Robert Murray, and Sherri Goodman, Pentagon, 1996 (photo credit: author's personal collection)

military. Nunn traced his political lineage to the congressional defense barons Senator Richard Russell and Congressman Carl Vinson, both of Georgia, who had ruled the roost as chairs of the Senate Armed Service Committee and the US House Committee on Armed Services. Indeed, Senator Nunn was a grandnephew of Congressman Vinson and the latest in a long line of defense-oriented Southern Democrats, whose chief power and purpose was protecting our troops and ensuring they were trained and equipped to fight America's wars.

Senator Nunn, however, prided himself on not being a rubber stamp for either the military or the president. The Senate Armed Services Committee largely exercises its power through the annual National Defense

Authorization Act, which directs policy and programs for defense spending and is one of the few major legislative vehicles passed each year by Congress. In this role, Senator Nunn wanted to be recognized for his independence and integrity. And he had plenty of both. He worked hard to learn the defense budget and to show the military leaders that when he held them to account, he did so with their best interests in mind.

Senator Nunn's formative experiences had taken place in the shadow of the Cold War's major nuclear crises, particularly the Cuban Missile Crisis, during which, as a twenty-four-year-old congressional staffer, he found himself on a delegation at NATO. Those early days gave him a visceral knowledge of the dangers of nuclear weapons, and he devoted most of his life to preventing the horrors they could inflict. I was now that young staffer, witnessing new threats posed by the nuclear age and charged with keeping them in check.

Since World War II, the United States had built dozens of nuclear reactors and related processing plants to make the fissile materials needed for nuclear warheads. These weapons were, after all, the centerpiece of the Cold War with the Soviet Union. As the only superpowers with nuclear capabilities, the two nations were locked in a precarious pact of mutual assured destruction (MAD): a deliberate balance of nuclear weapons that was supported by facilities scattered across remote parts of the United States and the Soviet Union.

Now I was responsible for overseeing the billion-dollar budgets that the Senate Armed Services Committee would annually authorize to fund these plants. And that meant one of my first assignments was to visit them, often in the middle of nowhere. In the high desert of eastern Washington, I toured the reactors cranking out fissile materials for nuclear weapons and met the engineers and other workers who were putting their lives and health on the line every day. I visited the Rocky Flats plutonium-processing plant outside Denver, where plutonium pits were fabricated, and was warned not to enter the infamous "glovebox"

building, where plutonium parts were assembled, because I was of “childbearing age.”

If it was too dangerous for me to make even a short visit, what did that mean for the workers inside, slipping their hands into extended rubber gloves through a glass wall to manipulate plutonium parts for nuclear warheads? Within months, the Federal Bureau of Investigation was conducting overflights of Rocky Flats, leading to criminal charges against the plant for safety and health violations. Pit production halted not long after I visited the plant, in 1989, and it never reopened.

Reimagining Safety

At first, it seemed that my job was to oversee a functioning set of facilities churning out the raw materials for weapons needed to ensure Americans were safe from the Soviet nuclear threat. But the more I learned, the more questions I had. What if that “safety” also endangered the lives of the people working in the plants and those beyond its walls? I was hardly the only one with these concerns. And they were put in stark relief by improvements made in civilian nuclear power (but not defense) plants after the partial meltdown at the Three Mile Island nuclear facility.

The accident was the worst in the history of the US nuclear power industry.⁵ It started at 4:00 a.m. on March 28, 1979, when a pressure relief valve in the Unit 2 Reactor at Three Mile Island, Pennsylvania, failed to close. While no one died as a direct result of the accident, two million people were exposed to small amounts of radiation and 140,000 people evacuated the area.⁶ After that partial meltdown—the only nuclear disaster on US soil—civilian nuclear power plants underwent substantial reforms. The US Nuclear Regulatory Commission increased its safety oversight of civilian reactors to ensure such an incident could never happen again.⁷

These reforms, however, did not extend to the nuclear weapons complex. Defense reactors produced plutonium and tritium for nuclear

bombs, not power for homes and businesses. Their operators answered to a less rigorous safety authority at the US Atomic Energy Commission and, later, the US Department of Energy (DOE), whose priority was producing warheads in the arms race with the Soviet Union. Indeed, the nuclear weapons facilities operated as if many of the nation's environmental laws did not apply. Local opposition to these facilities had been building for years, fueled by concerns about polluted water and sloppy safety practices. Then, in 1986, the Chernobyl nuclear disaster brought further scrutiny of US defense reactors.⁸ If a meltdown could happen outside Kiev, could it also happen at the Savannah River Site in South Carolina or on the banks of the Columbia River in Hanford, Washington?⁹

By the fall of 1988, the *New York Times* was running front-page stories almost every week about safety lapses at the nation's nuclear weapons plants.¹⁰ From the first of October to the end of December, eighty-five stories on the issue appeared in the paper, with headlines such as "Accidents at a U.S. Nuclear Plant Were Kept Secret Up to 31 Years" and "Chronic Failures at Atomic Plant Disclosed by U.S. High Rate of Shut-downs."¹¹ As one *Times* reporter recounted, "Our editors haven't been this psyched about a story since the Pentagon Papers."¹²

With hard copies of newspapers appearing on their desks every morning, members of Congress started paying attention. It was my job to report each new concern at nuclear weapons plants to the Senate Armed Services Committee, including to my direct boss, Senator Nunn, whose Savannah River Site, where many Georgians worked, was among those chronicled. With each successive story, the senators asked more questions. The committee held hearings on the issue, and my career went "from weapons to waste." Senator Nunn directed me to draft legislation creating a new oversight mechanism for these nuclear weapons plants. I got my first lesson in legislative politics when I went up against another committee that also claimed jurisdiction

on this bill—the formidable US Senate Committee on Governmental Affairs.

Senator Nunn knew that it was time for better oversight of the nuclear weapons complex, and having the Armed Services Committee write the legislation would both preserve the committee's prerogatives and ensure that the committee that funded these facilities stayed in control. However, another member of the Armed Services Committee and the chair of the Senate Governmental Affairs Committee, Senator John Glenn of Ohio, and his senior staff had other ideas. One of the National Aeronautics and Space Administration (NASA)'s original seven Mercury astronauts, Glenn was considered a national hero.¹³ His home state also had nuclear weapons facilities, including a uranium-processing facility in Fernald, where local citizens were already raising alarms about the safety of working at the plant. Senator Glenn believed strongly that the nuclear weapons plants should be governed as the civilian power plants were. And his staff director was eager to take on a battle with my staff director because they had clashed on other matters in the past.

The legislative battle lines were drawn: the Governmental Affairs Committee sought jurisdiction over the legislation that Senator Nunn had directed me to draft. That set me up against Steve Ryan, an experienced prosecutor then serving as general counsel to the Governmental Affairs Committee. Ryan would later become one of the go-to lawyers in Washington, DC, for congressional investigations, including by representing Michael Cohen, President Donald Trump's personal lawyer. At the time, Ryan reported to his staff director, Leonard Weiss, a nuclear engineer who had been the chief architect of the Nuclear Non-Proliferation Act of 1978. They were both pushing for as rigorous a regulation of the nuclear plants as they could convince a majority of the members to adopt. My marching orders were to give very little to their demands, regardless of how much they yelled at me, which was not infrequently. I often felt on the verge of being outwitted by more experienced staff,

but eventually, after months of negotiating, we landed on a compromise: what is today called the Defense Nuclear Facilities Safety Board.¹⁴

Like many legislative battles, ours ended in a territory where no one was entirely happy. The safety board would be part of the executive branch and provide recommendations for the nuclear plants to the US president and the secretary of energy. But it would not provide for the formal “notice and comment” regulation that the Nuclear Regulatory Commission conducted of civilian nuclear power plants. That type of regulation would have moved oversight from the executive branch to an independent regulatory body, which neither the Armed Services Committee nor the Reagan administration wanted: the Armed Services Committee wanted to tighten the safety processes within DOE while retaining the committee’s ability to conduct oversight and provide funding as its principal sources of leverage. As it turned out, with the Cold War waning and the Soviet Union collapsing, many of these plants, such as Rocky Flats, eventually closed down. DOE reorganized the closed facilities into an Environmental Management program, consisting of many Superfund sites, part of a vast cleanup program with separate management, leaving only a small set of plants still operating within the oversight of the new board.

Little did I know that I had arrived at the tail end of the nuclear weapons production era. In 1988, the secretary of energy declared that the United States was “awash in plutonium,” meaning there was no need to produce more.¹⁵ This statement, along with the growing safety and environmental risks, became the nail in the coffin for the nation’s nuclear weapons complex. In my first few years on the committee staff, I even witnessed one of the last underground nuclear weapons tests in the country. Accompanying members of the Nuclear Weapons Council, I traveled to an expansive control room in the middle of the Nevada desert. As the explosion rocked the terrain several miles away, all we felt was a slight shake.

Yet the fight over regulation of the nuclear sites was a transformative experience. I learned the power that committees such as the Armed Services Committee had to shape the direction of vast agencies. A decision made in a single committee room could have profound implications for DOD and DOE, whose work went to the heart of America's national security. I also learned how power in the Senate is wielded. Passing major legislation in the Senate requires garnering support from many different quarters, and Senator Nunn and his staff director, Arnold Punaro, were master legislative tacticians. They knew that coalitions are not always created by party affiliation. When it came to regulating the nuclear weapons complex, for example, members did not vote red or blue but on the basis of whether they had nuclear plants in their districts.

Maybe most importantly, I learned that even a carefully constructed national defense strategy can be overturned by real-world events, such as a nuclear disaster. As the military saying goes, "No plan ever survived first contact with the enemy." In this case, the enemy was "safety" being defined too narrowly. Public opinion would not support a defense strategy that protected Americans from foreign powers but threatened their health and safety at home. I would watch this movie—the convergence of the environment and the military—many times during the course of my career.

Innovating Environmental Technology for Defense

As Senator Nunn thought about the growing environmental problems at the nation's now mostly defunct nuclear weapons facilities, he returned to an idea that had motivated his own career: the talent and commitment of public servants across the defense enterprise, from our uniformed military to the scientists and engineers in DOD and nuclear weapons labs. Senator Nunn made a point of visiting our national labs on a regular basis to keep abreast of key scientific and technological developments by the people who were "smarter than him." The highly

regarded Los Alamos National Laboratory in New Mexico, Lawrence Livermore National Laboratory in California, and Sandia National Laboratories in New Mexico and California were created as part of the Manhattan Project to develop nuclear weapons. Some of the nation's most talented scientists flocked to these labs during the Cold War in the way that scientists today want to work in the tech meccas of San Francisco, Seattle, and Boston. These defense labs, at both DOD and DOE, were the place to be for the best and brightest physicists and engineers in the nuclear age, such as Robert Oppenheimer.

Now that the Cold War was over, Senator Nunn reasoned, their talent could be put to equally good use in addressing the nation's environmental challenges. And Senator Nunn had an eager partner in this endeavor: Senator Al Gore of Tennessee. Al Gore was a young and ambitious senator in the 1980s, having already made a run for the presidency in 1988. He had carved out his congressional profile in technology and environmental leadership. After joining the US House of Representatives, Gore held the first congressional hearings on climate change and cosponsored hearings on toxic waste. In 1990, he presided over a three-day conference with legislators from over forty countries, which sought to create a Global Marshall Plan, designed to help developing countries grow economically while still protecting the environment.¹⁶

Gore was also a member of the Senate Armed Services Committee and one of the early advocates on this committee of considering environmental matters at both DOD and DOE. Senator Nunn and Senator Gore joined forces to create the first Strategic Environmental Research and Development Program (SERDP) for the military. The SERDP Council is composed of officials from DOD, DOE, and the US Environmental Protection Agency (EPA); advisors from the President's Science Advisor and NOAA Administrator; and representatives from state government and nongovernmental organizations.

The program would, among other priorities, develop technologies

for the toughest environmental problems the federal government faces, from radioactive and hazardous waste in the 1980s and 1990s to per- and polyfluoroalkyl substances (PFAS), the “forever chemicals” found at both military and civilian locations today. It has also developed technologies to remove unexploded ordnance from ranges, and it has trained almost half of the country’s experts in wildland firefighting, a specialty that has become increasingly important as forest fires have grown into a national crisis.¹⁷

Little did Senators Nunn and Gore know when they created this program in 1990, with just \$25 million in federal funding, that it would grow to lead the environmental technology revolution. They also did not know, nor did I, that this program would become the engine of environmental technology development so crucial to my work in the 1990s at DOD. There, I was in charge of cleaning up over one hundred bases listed as Superfund sites and needed to ensure that DOD was complying with the nation’s major environmental laws.

Unusual Partnerships

While I was dealing with defunct nuclear plants, a young US Air Force officer was having his own environmental moment. In 1987, Tom Morehouse, who would later become my first military assistant, was an engineer at the Air Force Research Laboratory at Tyndall Air Force Base in Florida. He was tasked with improving chemical agents used to fight fires. Morehouse was sitting at his desk when an EPA official, Steve Anderson, walked up and informed him, “What you’re doing is destroying the ozone layer.”

Until that moment, Morehouse had not considered the environmental impact of his work. Anderson walked him through the science of how the chemical halon destroys ozone. “I was persuaded that there was something there, and it became obvious to me that the people who

sell halon had done an extremely good job on selling it for purposes for which it was not required,” Morehouse told me years later.¹⁸

The bulk of the air force’s halon was used for training and testing rather than firefighting. Once Morehouse began looking at alternatives that were less damaging to the ozone layer, he found that the air force needed halon for only about 5 percent of the prior uses.¹⁹ It also didn’t need to flood entire rooms; the military could use halon in a more targeted way to manage fires. “Basically, our research showed that this was not a good story for halon, in terms of the size of the market as it existed at that time.”²⁰

Anderson was so impressed by the research that he asked Morehouse to present it at the negotiations on the Montreal Protocol on Substances that Deplete the Ozone Layer. It was the beginning of a friendship and professional partnership that has lasted for thirty-five years. Morehouse and Anderson have coauthored numerous peer-reviewed articles on alternatives to halons, and Morehouse’s groundbreaking work helped lead the air force, and later DOD, to develop better substitutes for destructive chemicals.

What was unique about this collaboration? It marked one of the first times that military research was used to both improve defense capabilities and address a global environmental problem. Such partnerships would become increasingly crucial as environmental threats compounded, making ozone protection seem like a relative cakewalk. By the time I arrived at DOD six years later, in 1993, the military would be on the front lines of even more dire environmental challenges.

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CHAPTER 2

The Birth of Environmental Security

IN 1993, AT AGE THIRTY-FOUR, I was appointed deputy undersecretary of defense (environmental security). I was not only one of the youngest senior staff members at the Pentagon, not to mention one of the few women, but also the first person to hold the position. There is no denying that I take pride in that “first,” yet I also recognize it was a battlefield promotion. In those days, not many people had experience with both military and environmental issues, and my work on the US Senate Committee on Armed Services was ideal training for the newly created role.

My early days at the Pentagon were almost more intimidating than the ones at the Senate six years earlier. Here I was at the heart of America’s national security enterprise. Armed guards stood sentry at the entrance. Photos of the president, the secretary of defense, and the chairman of the Joint Chiefs of Staff stared out at visitors as they passed through security. Men and women, though mostly men, in dress uniforms scurried around the vast halls carrying important folders of decision memorandums called “packages.”

My office was on the third floor of what is known as the E-ring, along the perimeter of the five-sided labyrinth. That location, just down the hall from the office of the secretary of defense, may have been chosen for a reason. While I wasn't the first person at the US Department of Defense (DOD) to oversee environmental programs, the new title of deputy undersecretary meant higher stature, more staff, and greater authority. I would have a seat at the most senior tables in defense decision-making. The new position sent a strong message about the incoming administration's commitment to sustainability. While Bill Clinton had centered his successful 1992 presidential campaign on economics, his choice of Al Gore as running mate showed he was also serious about environmental conservation. In addition to Gore's environmental work on the Senate Armed Services Committee, he had written a best-selling book, *Earth in the Balance*, and would become the environmental conscience of the administration. Both men were determined to make the environment a priority throughout the government—including in DOD.

While Clinton and Gore elevated environmental issues in the administration, they were not just Democratic issues. In the 1990s, protecting the planet had yet to become the partisan plank it is today. Indeed, during the 1992 campaign, former Republican president George H. W. Bush had made a point of speaking at the United Nations Conference on Environment and Development in Rio de Janeiro, Brazil (the Earth Summit), declaring it a historic gathering. The event galvanized international action on environmental and development issues and established the United Nations Framework Convention on Climate Change (UNFCCC), the foundational treaty for international climate negotiations. President Bush embraced the Earth Summit's critical mission, remarking, "The Chinese have a proverb: If a man cheats the Earth, the Earth will cheat man. The idea of sustaining the planet so that it may sustain us is as old as life itself. We must leave this Earth in better condition than we found it."¹

His speech reflected the emerging international consensus that the state of the environment is a security issue. The end of the Cold War and the birth of the modern environmental movement set the stage for this new understanding. As I saw firsthand, the military no longer needed to build new nuclear weapons to fend off Russia, but it did need to deal with many decades of contamination from installations and past deployments. Yet the changes at DOD went further than cleaning up pollution. Growing environmental awareness and tougher enforcement of environmental laws also reshaped virtually every dimension of the military's activities, from training and education to the way we buy weapons systems to environmental considerations in overseas deployments.

It's important to remember that at the time, most media coverage of environmental issues in defense was extremely negative, with many health and environmental organizations criticizing lax military practices. "Military pollution at both DOD and DOE facilities will remain one of the nation's most critical problems for years to come," stated Physicians for Social Responsibility in a report issued just after I entered office.² While many of my DOD colleagues would have taken issue with that statement, they did see the need for a forward-looking strategy. As I stated in one of my first congressional testimonies, "The administration recognizes that the post-Cold War era requires a new approach to solving DOD's environmental problems. . . . Our national security can and must include protection of the environment."³

By the time I arrived at the Pentagon in early 1993, the battlefield had been prepped, so to speak. The outgoing administration had already elevated the environment to a global security concern, and the incoming Clinton-Gore administration wanted to deepen those efforts. At first, this ran headlong into DOD's traditional notion that environmental considerations were at best secondary to military activities and often were just a plain old nuisance; environmentalists, in this view, simply did not understand or appreciate the military and its mission. Fortunately,

I had some champions of environmental change at the highest levels of DOD, including the secretary and deputy secretary of defense and their senior advisors, Rudy de Leon and Larry Smith. Their advice was particularly helpful when I found myself in bureaucratic hot water.

A Budget Battle for the Environment

I had been working at the Pentagon for less than six months when I attended my first budget meeting chaired by my boss, John Deutch, the hard-charging undersecretary of defense for acquisition, technology, and logistics. In the early 1990s, we often gathered in a windowless SCIF (sensitive compartmented information facility), not always because we were discussing classified information but because the undersecretary and his staff controlled attendance at this secure conference room. I was a young, small-statured woman in a room full of six-foot-tall, mostly White men with chests full of ribbons.

It didn't help that I was overseeing a newly elevated portfolio at the Pentagon—DOD's environmental programs—and many of my colleagues were skeptical. Very skeptical. My portion of the budget, admittedly, was a minuscule fraction of the money devoted to buying big weapons systems; supporting the world's largest research and development initiatives; and moving logistics, such as ammunition, food, and other supplies, to troops at the front. In other words, I didn't expect the discussion to focus much on environmental spending. Still, it was very important to me and the secretary of defense; it was the primary reason I was serving as the first deputy undersecretary of defense (environmental security).

Our initial focus was pollution. Congress had been putting pressure on DOD to clean up its mess since about one hundred military bases were listed on the Superfund registry of the most toxic sites nationwide. Citizens around those bases were becoming increasingly frustrated with the slow pace of progress. The Office of the Secretary of Defense, where

I worked, oversaw the cleanup program, allocating money to the US Army, US Navy, and US Air Force for specific projects. When I arrived at the Pentagon in 1993, funding for the program averaged about \$1.5 billion per year, a significant sum, but small potatoes compared both with other aspects of military spending and with what would later be required.

Before my budget meeting, the environmental staff in the three military service branches had given me spreadsheets of data detailing the cost of cleaning up a wide variety of sites containing everything from perchlorinated solvents to leaking jet fuel. I reviewed this material and assembled a budget request for the next fiscal year, FY 1995, and prepared to defend it. I practiced my script. My slides, with the budget charts and justification, were ready.

Our meeting in the cavernous SCIF was also a test for my boss, who was running his first annual budget review. If he didn't win his budget battles, the military services would continue to push him and would not take his no for an answer. I listened carefully as each service budget chief stood up and presented his "requirements" for large weapons systems. Every man (and they were all men) had decades of experience and a commanding presence. In his green uniform, an army general presented his budget for tanks and other ground vehicles. In a sharp blue suit bedecked with ribbons, the air force general laid out his spending for fighters, bombers, and space-based systems. In a polished black jacket, the navy budget chief detailed his requirements for shipbuilding and naval aviation. My boss joked with each of them as if they were old buddies.

My turn came close to the end. I stood up, with none of the swagger of my predecessors. I gingerly stepped to the front of the room. My slides appeared on the screen. I carefully explained the budget request for DOD's environmental cleanup program, based on the numbers that each of the military services had provided. One by one, each of the service budget chiefs scoffed at me and my slides, saying they had never

seen these figures before. “This isn’t in my budget.” “I haven’t validated these numbers.” They were playing a classic bureaucratic game I had yet to learn: if you don’t accept the validity of a proposed budget, you may not have to pay for it. The budget chiefs knew that the money for base cleanups had to come from somewhere; it just wasn’t going to come from their pockets. I couldn’t believe it. My environmental counterparts in the services had set me up for failure.

My boss looked at me for a way out. I explained that the staff in the military services had given me these figures. But the budget chiefs were not buying it, literally. With bigger fish to fry, my boss chose not to support my proposed budget. I was left with hat in hand and feeling very embarrassed.

The navy’s budget chief, known as the N-8, Vice Admiral Joe Lopez, who watched me go down in flames at this meeting, consoled me later with several important pieces of advice. First, “A strategy without validated funding is hallucination.” You can have a lot of good ideas, but if you can’t command the funding to put them into action, those ideas will die. In an interview for this book, Lopez conceded to me, “I wasn’t going to give up a dime.” The military was worried about budget cuts to weapons systems after the Cold War, and Lopez was feeling “strapped.” “I was only interested in ships and planes.” Reflecting back after almost thirty years, he mused: “God bless you for laying this [environmental budget] on the table, because I think all of us are a little parochial.”⁴

A second important lesson I learned is that program offices—such as the environmental staffs of the army, navy, and air force—are not always connected to the powerful budgeteers who manage defense spending. Indeed, staff members of these offices weren’t even present at the budget meeting and apparently had no idea what trade-offs the service chiefs and secretary of defense were making across the entire budget.

I was determined to never be caught flat-footed again. After that budget meeting, I set out to gain support from key DOD leaders. I knew

I'd need their trust if I hoped to make a difference. In the arcane battles of the defense budget, where money is power, this was perhaps my most important lesson. It was good to learn it early, even if I learned it the hard way.

The Politics of Cleanup

As it turned out, my initial budget battle was part of a much larger war of competing economic interests. In the case of closing military bases that were no longer needed, DOD and environmentalists found common ground. But that didn't make the politics of the closures any easier.

The military leaders had wanted to close excess facilities for years because it would help their budgets, but congressional politics had always stood in the way. What elected official would vote to close a base in their district when it meant getting rid of well-paid jobs for their constituents? After many years of failure, Congress, under the leadership of my former boss, Senator Sam Nunn, set up an independent commission to select which bases to close. The US president couldn't cherry-pick but instead had to accept or reject the entire list. Several rounds of closures had already occurred, in 1988 and 1991, with communities complaining about economic hardship.

Scores of military bases were on the 1993 list, including many in California. That meant job losses in a state with a lot of voting power—and political backlash. Senators Dianne Feinstein and Barbara Boxer, who helped deliver California for Clinton with their own election in 1992, were not happy. Nor was the rest of the California congressional delegation, most of whom had worked hard to get Clinton elected. At the White House, the hand-wringing was so loud it reverberated across the Potomac to the Pentagon.

Although Clinton considered rejecting the list entirely, that decision would have further soured his relations with the military, especially because closing bases was economically necessary. The relationship had

already been strained when, early in his administration, Clinton announced he would allow gay people to serve openly in the US military. He did not anticipate the backlash among many in the military and their supporters in Congress. The ultimate compromise, Clinton's infamous "Don't Ask, Don't Tell" policy, prohibited service members from disclosing their sexual orientation in exchange for superior officers not terminating their military service.⁵ It was awkward and uncomfortable. At the Pentagon, it was widely thought that the president had just lost a round to the military.

This episode cost President Clinton valuable capital with the military that he could scarcely afford to squander. With the Cold War over, defense budgets were already on the decline, and now the uniformed military had another reason not to trust these young staffers in the White House. Moreover, the new secretary of defense, Les Aspin, was a policy wonk who preferred to spend his time on the strategic issues of denuclearization of the Soviet Union and global engagement. Unlike Senator Nunn, whose instincts were a good barometer of the uniformed military in that era, Aspin was more comfortable with the Ivy League professors he invited to serve as his lieutenants in the policy office of the secretary of defense.

When it came to base closures, the president knew he had little choice. Excess military facilities were reducing funding that might better be invested in the fighting tooth (training troops and buying weapons) of the armed forces. He would have to accept the list of closures and try to soften the blow to affected communities. The White House's plan involved developing a series of grants and economic programs—and I was tasked with spearheading DOD's portion of the strategy. Ultimately, we came up with measures that would support the communities' transition and save DOD about \$12 billion over five years.⁶ On July 2, 1993, Clinton announced his decision to close the military bases but flipped the script by emphasizing his "job-centered" closure plan.

To sell the plan, he flew to Naval Air Station Alameda near Oakland, California, to meet with community leaders and local officials.⁷ I was part of the team traveling with the president, and my friend at the National Security Council, Nancy Soderberg, arranged to have me join Clinton for one of his famous public jogs. I got a call late in the day from an aide who told me where to meet the president and his security detail the next morning. In my purple running shorts and cotton T-shirt, I arrived at the appointed hour. The president greeted me with a grin and chatted with me about my road to DOD during our short ride in an armored limousine. After arriving at Lake Merritt, we started off, surrounded by muscled US Secret Service agents with earpieces. Fans and friends lined the lake, many shouting “Happy birthday, Mr. President!”—this was just a few days before August 19, when he would turn forty-seven. We were nearing the end of the loop when, without warning, President Clinton sprinted off, to applause from the crowd.

It wouldn’t be the last time that day the president left me in the dust. At the public event later that morning, Clinton described his five-part plan to create jobs while closing bases. A key portion was speeding up the cleanup of contaminated lands to turn the property over to the community for development. The tension was that the studies, reviews, and remediation required by environmental laws would take many years to accomplish. When we prepared the draft of the president’s plan at DOD, I recommended we call the cleanup “commonsense” to avoid false promises about the timeline. To the White House speechwriters, however, this phrase did not convey the necessary urgency, so they simply changed it to “fast-track.”

The White House speechwriters, however, did not know how hard it had been just to broker an agreement between DOD officials and the Environmental Protection Agency (EPA) on what we had called “commonsense cleanup.” Defense officials often thought environmental regulations created more red tape than actual cleanup. Meanwhile,

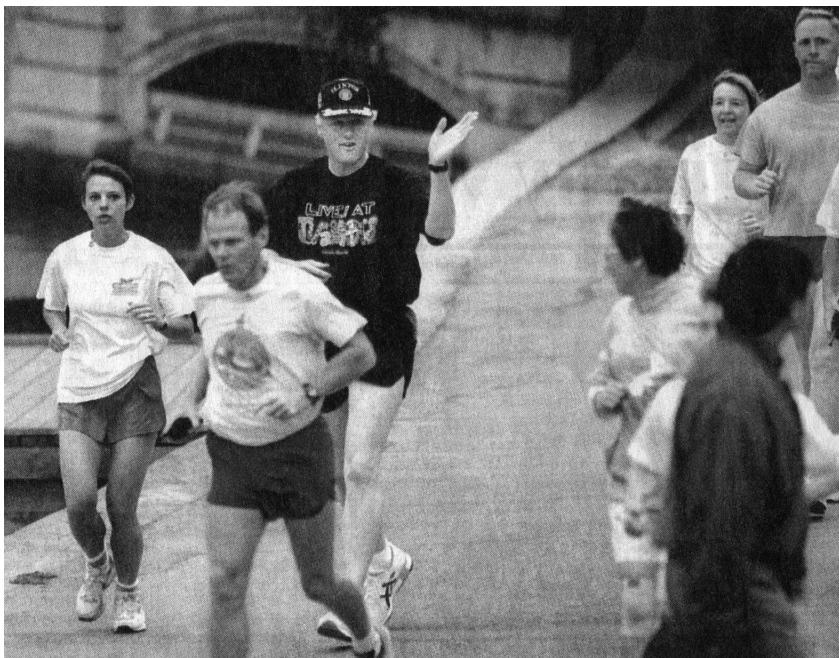


Figure 2-1. Jogging with President Bill Clinton, Oakland, California, August 14, 1993 (photo credit: author's personal collection)

many EPA officials didn't trust DOD to follow the rules necessary to protect public health. And EPA had the authority to review and approve DOD's cleanup work. So how was I, then only months into my tenure at the Pentagon, supposed to bring the warring factions together? That was where the art of multilevel negotiations came in. Although the two camps viewed each other with skepticism, both could agree that cleaning up the bases would be easier if backed by the president. With the White House expecting results, I knew I had some leverage.

Still, EPA officials were adamant that they didn't have the budget to adequately review DOD's cleanup efforts in the time required by the "fast-track" plan. So I offered to give EPA \$7 million per year from DOD's budget to speed up the process. It worked. By the time I left

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