



2010

**Situating Climate Security, The  
Department of Defense's Role in  
Mitigating Climate Change's Causes  
and Dealing with its Effects; Strategic  
Insights; v. 9, issue 2 (Fall 2010) pp. 13-25.**



Calhoun is a project of the Dudley Knox Library at NPS, furthering the precepts and goals of open government and government transparency. All information contained herein has been approved for release by the NPS Public Affairs Officer.

**Dudley Knox Library / Naval Postgraduate School  
411 Dyer Road / 1 University Circle  
Monterey, California USA 93943**



## Situating Climate Security

### *The Department of Defense's Role in Mitigating Climate Change's Causes and Dealing with its Effects*

**Daniel Clausen and Michael Clausen**

#### **An Emerging Security Focus: Climate Security**

A new concern is circulating among policymakers, think tanks, and scholars: securing the planet's climate. For those who debate what counts as "national security," the question over whether climate change should be framed as a security issue has been argued along well-worn lines. For those who seek a more expansive definition of security, one that reaches beyond military threats, the threat of climate change is another reason why the lines of security need to be re-drawn. For those who see the inclusion of climate change as a threat to the notion of security as the protection of the state in a competitive international system, widening the term to encompass climate change threatens to draw attention away from traditional threats (future peer competitors like China and a resurgent Russia) and the "new nontraditional" threats (rogue states and transnational terrorism). At the most basic level, the inclusion of environmental threats in a security paradigm risks confusing national security with foreign policy and global politics. As this article will show, however, in many ways this debate has already become obsolete. Since the issuance of the 2007 Intergovernmental Panel on Climate Change (IPCC) estimates, the publication of a bevy of key reports by respected think tanks, and most recently the latest Defense Department *Quadrennial Defense Review* (QDR) and the *National Security Strategy* (NSS), climate security has increasingly become recognized as a legitimate object of national security thinking.<sup>[1]</sup>

In this essay we will examine three issues: the emerging threat of climate change as it is currently known through climate change models, the way climate security is increasingly being internalized in the U.S. national security community, and the tasks the DoD can undertake to mitigate the causes of climate change and deal with its effects. We will mostly draw on the wealth of research done by academics, think tanks, and government officials since the issuance of the IPCC 2007 synthesis report—most prominently the 2010 Department of Defense *QDR*. In addition to these influential reports,<sup>[2]</sup> our analysis will also use concepts developed by the Copenhagen School of "securitization studies."<sup>[3]</sup> This approach offers important insights into how and why issues move beyond normal politics to become vital issues of security. The key insight of the Copenhagen School is that there is no externally valid definition for "security" or "national security," but rather, that the meanings of these terms are always defined through the interactions politicians, external contexts, and audiences who support definitions of security. In a

somewhat paradoxical sense, while the struggle over the meaning of “security” is political, the reason the status of the “security” label is sought is because it takes issues beyond the fray of normal politics. The label of “security” is an important political asset because it raises an issue above normal debates and gives the issue an aura of unquestioned priority.

Unlike other security issues that are largely defined and debated within well-known national security institutions, to date the threat of climate change has primarily been defined by an epistemic community outside of the national security community. This epistemic community’s concern has typically been global, not national. For this reason, climate security has frequently been framed as an international *political* problem—one that requires bargaining, institution-building, and information-sharing, not the support of the military. That being said, the problem has gained and should continue to gain credibility as a security issue for a number of important reasons. The first is that framing climate change as a security concern elevates the issue above normal political conversations. Given current knowledge of the threat of climate change to global political stability, the issue clearly warrants increased attention. The second reason is that because the effects of climate change threatens to intensify many of the issues the defense community currently deals with, planners will need to become increasingly aware of the deep connections between environmental breakdowns, political institutions, and potential threats. The third reason is that the military has an important role to play in mitigating the causes of climate change. As the Department of Defense (DoD) increases its cooperation with other agencies on research and development, works to develop a more energy efficient fighting force, and lowers its carbon footprint at bases around the world, it will also play an important role in driving technological innovation that could help stop the environmental pollution that fuels climate change.

This paper will begin by recounting how climate change has evolved as an object of national security thinking and discourse, beginning from the 1980s and stretching to the current “Climategate” issue. It will then examine the research climate change scientists and national security-oriented think tanks have done in terms of formulating plausible scenarios with a special focus on the way climate change has been defined as a “threat multiplier.” The paper will then examine the role the DoD can play in mitigating the causes of climate change. In addition to building the intellectual framework for understanding the three points outlined above, this paper will also attempt to leave the reader with an appreciation of the tensions between climate change as a security issue (an issue worthy of being elevated as a national priority) and climate change as an issue for military planners in the DoD.

### **The Rise of Climate Change as an Object of National Security**

Since the 1980s, the issue of climate change has been on and off the political agenda—to say nothing of its framing as a national security issue. After James Hansen (then director of NASA’s Goddard Institute of Space Studies) famously asserted in 1988 that climate change was near certain,<sup>[4]</sup> speculation and research began on the linkages between national security, climate change, and environmental degradation. That same year the IPCC was created under the

guidance of the UN Environmental Programme (UNEP) and World Meteorological Organization (WMO) to represent the consensus of scientists on the issue of climate change. It wasn't until the 1990s, however, that the Strategic Environmental Research and Development Program (SERDP) was created within the DoD to address issues of environmental concern. This corresponded with a gradual rise in policy statements placing the environment and environmental degradation within the sphere of national security. The 1991 *National Security Strategy* features a brief section on the environment that mentions issues of food security, ozone depletion, water supply, deforestation, biodiversity and treatment of wastes, in addition to the problem of climate change.[5] In addition, a Global Environmental Affairs Directorate at the National Security Council and an Office of Environmental Security led by a Deputy Undersecretary of Defense were established to address the rising interest in the connections between the environment and security. Around this same time, the idea that environmental scarcity could fuel a future anarchy of ungovernable spaces was first elaborated in the scholarship of Thomas Homer-Dixon and then popularized by Robert Kaplan in his famous 1994 article for the *Atlantic Monthly*, [6] an article that was widely circulated among policymakers. This popular speculation would lead to the creation of the new subfield of environmental security and a flurry of new initiatives for securing the environment within the Clinton administration. Thus, the 1997 *National Security Strategy* reflected Kaplan's concerns of resource scarcity fueling an increasing number of post-modern conflicts.[7]

Despite a growing awareness of climate change, the issue remained largely neglected. The Kyoto Protocol of 1997, though signed by the United States, was never sent to the Senate for ratification. Bipartisan resistance to the protocol centered on its failure to address pollution from rising industrial powers like China and India. While the Pentagon did commission one report in 2003 that garnered some media attention, the issue remained largely undervalued as a national security priority.[8] Even though interest was growing in some circles of the defense community about the linkages between environmental degradation and conflict, without national leadership these projects remained largely on the backburner. As the national security community dealt first with the immediate threat of Al Qaeda and addressing gaps in homeland security, then wars in Afghanistan and Iraq, and then rising nuclear threats from Iran and North Korea, the issue of climate change was neglected both as a political issue and as a security concern.

Since 2007, however, there has been a dramatic rise in the attention paid to climate change both as an international political issue and as a mounting security threat. That year both Al Gore and the IPCC won the Nobel Peace Prize for their work in raising awareness of the issue. The IPCC's 2007 synthesis report judged that the evidence for climate change is "unequivocal"[9] and that the evidence that human generated greenhouse gases are the cause of increased temperatures is "very likely" (over 90 percent).[10] That year also saw the issuance of an influential report by the Center for Naval Analysis (CNA) backed by retired generals framing climate change as "threat multiplier." [11] In addition, the Triangle Institute for Security Studies hosted a conference that addressed the impacts of climate change on national security.[12] Following these influential reports, several other studies and volumes were published, along with a National

Intelligence Assessment[13] issued by the Office of the Director of National Intelligence.

Most importantly, the notion of climate change as a security issue has now captured the attention of political and military senior leadership. Whereas the 2006 *Quadrennial Defense Review* made no mention of climate change or environmental security, the DoD 2008 *National Defense Strategy* acknowledged both that “climate pressures may generate new security challenges” and the need to “tackle climate change.”[14] Riding this new wave of engagement with the issue of climate change, the latest 2010 DoD *QDR* and *NSS* devote entire sections to the subject. The *QDR* addresses the full range of effects that climate change is likely to have on the security environment, and what needs to be done to tailor future force structure, mitigate the DoD’s carbon footprint, and help spur new technological developments in clean energy;[15] the *NSS* meanwhile emphasizes the risk climate change poses to national security and the need for a broad shift toward an energy efficient economy. As the 2010 *NSS* states: “The danger from climate change is real, urgent, and severe.”[16]

The “Climategate” incident of winter 2009, where over a thousand emails and other documents were made public through a server breach of the University of East Anglia’s Climate Research Unit (CRU), has served as a major publicity blow to those hoping to establish a wider consensus on combating climate change. Even though the incident has done little to undermine the scientific consensus on the reality of anthropogenic climate change, the scandal has done much to undermine public confidence in climate change science, and thus, undermine the U.S. domestic consensus for pursuing robust policies to lower greenhouse gasses. An independent committee set up by the University of East Anglia has largely exonerated the beleaguered CRU and its director, though it has noted that the unit should be more open in the future.[17] The longer term concern is that incidents like “Climategate” will continue to foster a siege mentality within the scientific community that encourages scientists to guard data and restrict openness. These practices would only continue to feed conspiratorial attitudes toward the scientific community engaged in climate change research.

### **Estimates, Scenarios, and the Special Role of the Scientific Epistemic Community**

It is not an insignificant point that many of the recent reports and scholarship that connect climate change to national security point to climate change’s already perceptible influences—from the increased likelihood of hurricanes, to the spread of desertification in parts of Africa, to increased tension over scarce water resources in the Darfur region of the Sudan. As Buzan, Waever, and de Wilde write about past attempts to frame environmental issues as security threats: “Environmental issues often point to an unspecified, relatively remote future and therefore involve no panic politics.”[18] The vagueness of environmental predictions often conflicts with a national security culture that privileges threats that are certain, proximate, and grounded in an understanding of the international system as a competition among states.

While most reports on climate change note the ambiguity involved in modeling environmental systems, the consensus among scientists is that not only is climate change verifiable, but

predictions up until this point have been too conservative. Because of the ambiguities involved in modeling environmental systems, one group of scholars (a combination of former government officials and Brookings Institute, Center for Strategic and International Studies, Center for Naval Analyses, and Center for New American Security scholars) has purposely used the word *scenarios* rather than prediction to describe their approach.[19] These authors argue that because climate change involves a complex relationship of interlinked variables that are difficult to predict—demography, energy policy, technological change, and their interactions with complex ecological systems—one should not dwell on the most likely scenario, but rather, examine a range of plausible ones. This logic applies not only to rate of climate change but also to its effects. As many scholars have pointed out, the linkages among environmental stress, environmental shocks, and trends such as political violence, migration, and the spread of disease are difficult to theorize with precision.[20]

Currently, the average obtained from IPCC climate change scenarios projects that over the next twenty to thirty years the earth's average temperature will rise by 1.3 degrees Celsius. This scenario assumes that there are no trigger effects or feedback loops, and thus, extrapolates largely from trends known to date.[21] While the geographical impact of climate change will vary, in the next twenty to thirty years vulnerable regions will face prospective food shortages, droughts, and flooding. Among the possible implications of these environmental changes will be pandemics, political instabilities, and potential energy and food shocks. These ecologically-induced crises could destabilize entire regions, feeding terrorist movements and sparking interstate and civil conflicts. What is significant about this scenario is that it has been described as inevitable.[22] Though climate change may bring some benefits to the United States in the form of near term increases in agricultural yields,[23] these benefits will be offset by irregular weather patterns and political and economic losses from the failure of poorer countries to cope with climate change.

Another plausible scenario, explored by Leon Fuerth,[24] assumes that various tipping points and feedback loops are activated, and thus, that the earth's climate increase more rapidly. In this scenario, methane released from melted ice sheets, the decline in carbon absorbing forestry, and the rate of rapid industrialization lead to double the climate change increase predicted in the first scenario—temperatures increase over the next twenty years by 2.6 degrees Celsius instead of the expected 1.3 degrees. Water scarcities increase, crop yields decline rapidly, coastal regions are subject to drastic flooding, and global fisheries decline as a result of coral bleaching and ocean acidification.[25] These multiple ecological breakdowns strain political institutions (especially in the less developed world), leading to mass migration, intra and interstate conflict, and possibly the resurgence of virulent fascist ideologies.[26] As many scholars have stressed, however, because of the many complex systems involved in predicting these events—both ecological and political—speculation on the consequences of abrupt climate change are at best useful stories for understanding what is at stake.[27]

## Seeing Climate Change through its Effects: Climate Change as a “Threat Multiplier”

Currently, much of the national security literature designates climate change as a “threat multiplier.”<sup>[28]</sup> The idea is that climate change’s impact on ecosystems will cause critical food and water shortages, spur mass migration, and strain governments’ capacities and credibility, thus leading to more conflict and anarchy—especially in those countries that lack the resources to deal with these effects. According to this research, the first victims will likely be states that lack reserve capacities in capital, scientists, engineers, or flexible political institutions able to adjust to the effects of climate change.<sup>[29]</sup> This is not to reinforce stereotypes of the poor in the Global South as the inevitable seed of world anarchy—to suggest as much would in any case ignore the source of much carbon pollution.<sup>[30]</sup> Though there is currently a wealth of research challenging these neo-Malthusian assumptions of easy connections between environmental scarcities and violent conflict,<sup>[31]</sup> the saliency of the environment-conflict linkage will likely increase as the severity of environmental shocks increases. As current environmental security thinking suggests: because of this threat of expanded ungovernable spaces, the United States will need to continue to secure U.S. energy supplies, most likely through increased stability operations in unstable areas of the world where energy is abundant, and expand capabilities for guarding sea lanes in newly opened up areas of the Arctic Ocean.<sup>[32]</sup>

Analysts who examine the threat of climate change to U.S. security often point out that potential ecological catastrophes threaten the “resilience of the international community,”<sup>[33]</sup> creating dangerous imbalances between nations that have the capacity to deal with climate change and those that do not. While some might quibble that some of this language conflates global justice with the United States’ vital security interests, the connection is analytically useful for a number of reasons. As weak states become afflicted by environmental stresses, the United States will have to face the possibility of a rapid surge in migration, the spread of pandemics, and the breakdown of political stability in energy rich countries and countries that are becoming increasingly embedded in the global economy, thus affecting the economic security of U.S. citizens.

There is a growing consensus that the impact of climate change will continue to strain the United States’ credibility as a global security provider, peace broker, and disaster relief provider. As the United States and other countries try to attenuate the impact of climate change on their own soil, security scholars are worried that the United States and the world will lose established levels of international cooperation—the current state of the international community as such. This loss of cooperation could affect U.S. efforts to uproot terrorism, stop nuclear proliferation, and confront rogue regimes. Because the United States is the per capita leader in greenhouse gas emissions, the United States may also be seen as a legitimate target for groups that are most affected by climate change, thus intensifying terrorist recruitment. In addition, these threats need not come from transnational groups subject to U.S. border patrol and other surveillance techniques. Instead, threats to U.S. economic infrastructure could come from “homegrown” eco-terrorist groups who see U.S. pollution as the ultimate threat to Gaea.<sup>[34]</sup>

Though accurate and analytically useful, the term “threat multiplier” could also lead to some dangerous gaps in understanding how to respond to climate change. The idea of climate change as a threat multiplier leads the defense community to focus more on responding to the outcome of climate change (an intensified environment of threats defined in the usual terms of disaster relief, increased terrorism, rogue and collapsed states) than attenuating its causes—greenhouse gas emissions.[35] As the current *QDR* illustrates, however, the DoD has taken proactive steps toward lowering its carbon footprint and establishing programs that spur important technological developments in energy efficiency and alternative fuels.

### **The Case for Prevention—The DoD’s Role in Mitigating the Causes of Climate Change**

The DoD is currently the single largest emitter of greenhouse gases in the United States. In 2007, the DoD spent some \$12.6 billion on petroleum, consuming some 395,000 barrels of oil or about as much as the total consumption of Greece.[36] Because current economic models suggest that the opportunity to mitigate the worst impacts of climate change cheaply is declining drastically,[37] it is essential that the DoD continue to make strides toward becoming more energy efficient. In this regard, the U.S. military has been proactive in promoting energy efficient technologies, eliminating waste at major facilities,[38] recovering waste that has renewable energy content,[39] increasing the amount of solar technology it uses on buildings and equipment, employing smart grid technology, and integrating renewable energy sources and hybrid energy sources into energy plans.[40] While these strategies are commendable, recent reports argue that the defense community should attempt to reduce energy consumption by twenty percent by the year 2025.[41] Greater energy efficiency will not only help to mitigate the causes of climate change, but will also shorten logistical supply lines (thus freeing up units for combat operations), and deprive illiberal oil-rich regimes and the terrorists they support of funding.[42]

As the 2010 *QDR* states, the DoD will increase the rate at which energy efficient technologies reach end users.[43] These technologies include solar powered military mobile command centers which use a combination of solar power, improved fuel cells and batteries, and new quantum dots and other semi-conductor technologies that improve solar panel efficiency on vehicles and bases.[44] In addition, the Environmental Security and Technology Certification Program uses military installations as a test bed for innovative technologies coming from DoD and Department of Energy laboratories and the private sector.[45] The DoD has invested in non-carbon power sources such as solar, wind, geothermal, and biomass energy at domestic installations and in vehicles powered by alternative fuels, including hybrid power, electricity, hydrogen, and compressed natural gas. The Nellis Air Force base, with its 140-acre solar array, serves as another sterling example of what the military is doing to cut down on its greenhouse gas emissions.[46] By 2016, the Air Force will be positioned to use 50 percent of its aviation fuel via an alternative fuel blend that is greener than conventional petroleum fuel. This will eventually pave the way for commercial aviation to follow.[47]

Though these programs should be applauded, there is still much to be done. These disparate

programs will need to be synthesized into an integrated energy strategy under the DoD's Director of Operational Energy Plans and Programs.<sup>[48]</sup> By cutting down on energy consumption and moving toward renewable and hybrid forms of energy, the military will "ultimately address the long-standing irony of fueling our defense establishment from a system that threatens our nation's security."<sup>[49]</sup> Energy efficiency will also serve as a "force multiplier" by reducing the number of combat forces diverted to protecting energy supply lines, which are vulnerable to both conventional attacks and disruptions.<sup>[50]</sup>

### **Towards a Conclusion: Dealing with the Uncertain Future**

For some, securing the planet's climate may continue to sit uncomfortably with traditional threats (most notably peer competition from rising states) and the new nontraditional threats (rogue nations and terrorism) to national security. As discussed earlier, part of this discomfort comes from a tradition of seeing national security threats as issues of violence from outside the state, and as seeing these issues as separate from issues of global justice and political institution building. As skeptics would rightly note, the most important steps toward mitigating the causes of climate change reside outside of purview of the security community—in the realm of domestic policy and international diplomacy. Thus, from this view, following up on the Copenhagen Accords, moving toward an international cap and trade system, and restructuring the nation's energy infrastructure should be the most vital initiatives, not adding another issue to the already bloated plate of security practitioners.

However, as this essay has attempted to show, such easy separations between domestic policy, international diplomacy, and national security no longer make sense. Though climate change has previously been neglected as a national security concern, security planners are now starting to conceive of innovative programs for dealing with both the causes of climate change and its potential dire effects. One of the key areas the DoD will need to focus on—energy efficiency and innovations in energy efficient technologies—should be the least controversial since it also overlaps with key strategic goals in the war on terror. Even for those skeptical of climate change, it is clear that an energy efficient military will deprive illiberal states of support and starve the terrorist networks they support of resources,<sup>[51]</sup> also freeing the United States of dependence from other countries.

This is not to argue that climate change politics—or even technological change or climate change research—needs to be militarized; but rather, that securing the world's climate should be a security priority on par with countering nuclear proliferation, terrorism, and rogue regimes. Though some would prefer to keep the categories of environment and security separate, the language of security is essential for mobilizing public attention and support. In the end, however, the foundation of an effective climate security strategy will remain an international carbon regime that limits the emissions of the most polluting powers through a carbon cap and trading system. While much of the impetus lies in foreign policy maneuvering, the elevated position climate security now shares—and should continue to share—with other threats to national security should go a long way toward legitimizing more stringent efforts to limit greenhouse

emissions both domestically and internationally.

### **About the Authors:**

Daniel Clausen is currently a PhD student in International Relations at Florida International University. He is a graduate of the University of Miami with a BA in English and American Studies. He completed an MA degree in Strategic Studies from APUS-American Military University.

Michael Clausen is a United States Coast Guard Officer, Lieutenant Junior Grade, and is currently attending Harvard University's extension program in Environmental Management. He has a Master's degree in Organizational Management and a BA in Sociology. In addition to his academic credentials, he has a wealth of experience in environmental management and pollution investigation with the Coast Guard.

### **References**

1. For an excellent annotated bibliography with links to climate security research, see: Diana Simpson, *Climate Change and National Security: Bibliography*. (AL: Maxwell AFB, April 2008), <http://www.au.af.mil/au/aup/bibs/climate.htm>; in addition, please see the International Studies Association brief on the subject for a comprehensive reading list: Simon Dalby. "Environmental Security and Climate Change." *The International Studies Encyclopedia*. Ed. Denmark, (Robert A. Blackwell Publishing, 2010); see also: John T. Ackerman. "Climate Change, National Security, and the Quadrennial Defense Review." *Strategic Studies Quarterly* (Spring 2008): 56-96.
2. The authors owe a debt of gratitude to the wealth of insight provided by the Center for Strategic and International Studies (CSIS), the Center for New American Security (CNAS), the Center for Naval Analysis (CNA), the Strategic Studies Institute of the U.S. Army War College (SSI), the Triangle Institute for Security Studies (TISS), and the Pew Center for Global Climate Change.
3. Barry Buzan, Ole Wæver, and Jaap de Wilde. *Security: A New Framework*. (Boulder: Lynne Rienner, 1998).
4. Kurt M. Campbell and Christine Parthemore, "National Security and Climate Change in Perspective" in *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*, ed. Kurt M. Campbell. (Washington, D.C.: Brookings Institute Press, 2008), 4.
5. White House. *National Security Strategy*, (1991).

6. Thomas Homer-Dixon, "On the Threshold: Environmental Changes as Causes of Acute Conflict" *International Security* 16: 2 (1991): 76-116; Robert Kaplan "The Coming Anarchy" *The Atlantic Monthly*. (February 1994), <http://www.theatlantic.com/doc/199402/anarchy>.
7. White House. *National Security Strategy*. (1997), <http://www.fas.org/man/docs/strategy97.htm>.
8. Peter Schwartz and Doug Randall. *An Abrupt Climate Change Scenario and its Implications for United States National Security*. (CA: Jet Propulsion Laboratory Pasadena, October 2003), [www.edf.org/documents/3566\\_AbruptClimateChange.pdf](http://www.edf.org/documents/3566_AbruptClimateChange.pdf).
9. Intergovernmental Panel on Climate Change. *Climate Change: Fourth Assessment Report* (AR4). (WMO/ UNEP, 2007), 30, [http://www.ipcc.ch/publications\\_and\\_data/publications\\_ipcc\\_fourth\\_assessment\\_report\\_synthesis\\_report.htm](http://www.ipcc.ch/publications_and_data/publications_ipcc_fourth_assessment_report_synthesis_report.htm).
10. Ibid, 39.
11. Center for Naval Analysis (CNA). *National Security and Climate Change* (2007). <http://securityandclimate.cna.org/>.
12. For video recordings of the presentations at this conference, please see: <http://sanford.duke.edu/centers/tiss/ClimateChangeVideo-Recording.php>.
13. Thomas Finger. *National Intelligence Assessment on the National Security Implications of Global Climate Change to 2030*, (Office of the Director of National Intelligence, 2008). [http://www.dni.gov/testimonies/20080625\\_testimony.pdf](http://www.dni.gov/testimonies/20080625_testimony.pdf).
14. Department of Defense (DoD). *Quadrennial Defense Review* (2010), 5.
15. Ibid, 84-88.
16. White House. *National Security Strategy* (2010), 47.
17. *Economist*. "Science Behind Closed Doors." July 8, 2010.
18. Buzan, Waever, and de Wilde (1998), 83.
19. Jay Gullede. Three Plausible Scenarios of Future Climate Change, *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*. ed. Kurt Campbell. (Washington, D.C.: Brookings Institute Press, 2008), 50-51.

20. See Homer-Dixon (1991); Colin Kahl. *States, scarcity, and civil strife in the developing world*. (Princeton: Princeton University Press, 2006); CNA (2007); Carolyn Pumphrey. Introduction. *Global Climate Change: National Security Implications*. ed. Carolyn Pumphrey. (Strategic Studies Institute/ Triangle Institute for Security Studies, 2008), <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?PubID=862>.
21. John Podesta and Peter Ogden. Scenario 1: Expected Climate Change over the Next Thirty Years. *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*. Ed. Kurt Campbell. (Washington, D.C.: Brookings Institute Press, 2008): 97-132; Finger 2008; Kurt Campbell, Jay Gullledge, J.R. McNeill, John Podesta, Peter Ogden, Leon Fuerth, R. James Woolsey, Alexander T.J. Lennon, Julianne Smith, Richard Weitz, and Derek Mix. *The Age of Consequences: The Foreign Policy and National Security Implications of Global Climate Change*. (Center for Strategic and International Studies/ Center for American Security. November, 2007).
22. Podesta and Ogden (2008), 97; Campbell et al (2007), 42.
23. Finger (2008).
24. Leon Fuerth. Scenario 2: Severe Climate Change over the Next Thirty Years. *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*. Ed. Kurt Campbell. (Washington, D.C.: Brookings Institute Press, 2008): 133-154.
25. Fuerth (2008), 133-135; Campbell et al (2007), 42-43.
26. Fuerth (2008), 143; Ken Booth. *A Theory of World Security*. (Cambridge: Cambridge Press, 2007).
27. For more on the difficulty of predictive analysis and climate change, please see: Joshua Busby “Who Cares about the Weather?: Climate Change and U.S. National Security”, *Security Studies*, 17: 3 (2008): 468-504.
28. CNA (2007); DoD (2010), 85, refers to climate change as an “accelerant of instability or conflict”
29. Cambell and Parthemore (2008), 14; Homer-Dixon (1991).
30. This is a point that cannot be stressed enough. As Peluso and Watts argue, much of the literature on environmental security often recreates the world’s poor as the threat to civilization; while I would suggest this is at best a thematic shadow that haunts the literature, environmental security scholars should be clear whenever possible to acknowledge the sources of economic insecurity for the poor. For a fuller discussion, see Nancy Peluso and Michael Watts. “Violent

Environments” Eds. Nancy Peluso and Michael Watts. *Violent Environments*. (Ithaca: Cornell University Press, 2001): 3-38

31. The criticisms of neo-Malthusian assumptions of the easy linkage between scarcity and conflict vary by different concerns. Edited volumes such Peluso and Watts (2001) examine some of the ways environmental security narratives reinforce stereotypes of the poor (especially in the Global South) as the basis for anarchy and disorder. Another author examines the way the environment-conflict linkages can possibly justify endless interventions by the Global North into the sovereign political domains of the Global South: see Jon Barnett “Destabilizing the environment-conflict thesis” *Review of International Studies* 26 (2000): 271-288; other scholars find little empirical evidence in statistical studies to support the strong linkage between renewable resource scarcity and conflict: see Clionadh Raleigh and Henrik Urdal. “Climate Change, Environmental Degradation, and Armed Conflict”. *Political Geography* 26 (2007): 674-694; Ole Magnus Theisen. “Blood and Soil? Resource Scarcity and Internal Armed Conflict Revisited” *Journal of Peace Research* 45:6 (2008): 801-818; and Henrik Urdal. “People vs. Malthus: population pressure, environmental degradation, armed conflict revisited”. *Journal of Peace Research* 42:4 (2005): 417-434. This is just a small sample of the literature from what we term the “environmental security skeptics.”

32. Pew Center on Global Climate Change. *National Security Implications of Climate Global Change*. (August 2009). [www.pewclimate.org](http://www.pewclimate.org); DoD (2010), 84

33. Campbell and Parthemore (2008), 17.

34. See Elizabeth L. Chalecki. “Environment and Security.” *The International Studies Encyclopedia*. Ed. Robert A. Denemark. (Blackwell Publishing, Blackwell Reference Online, 2010); also, see Elizabeth L. Chalecki. “A New Vigilance: Identifying and Reducing the Risks of Environmental Terrorism”. *Global Environmental Politics* 2:1 (2002), 46–64.

35. One author for example, Anthony Patt, criticizes a recent volume that evaluates climate change as a national security problem for not focusing enough on the issue of mitigation. See, Anthony Patt. “Book Review: *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*” *Global Environmental Politics*. 9:2 (May 2009).

36. Jerry Warner and Peter W. Singer. *Fueling the “Balance”*: A Defense Energy Strategy Planner. (The Brookings Institute, 2009), 2-3.

37. Nicholas Stern. *The Economics of Climate Change*. (Cambridge: Cambridge University Press, 2007).

38. The DoD has taken proactive steps to eliminate waste at existing facilities. One way the DOD is eliminating waste in new construction is by applying the Green Building Council’s

Leadership in Energy and Environmental Design (LEED) standards. See, David Sheets. *Military Technology and Renewable Energy*. Ed. Carolyn Pumphrey *Global Climate Change: National Security Implications*. (Strategic Studies Institute/ Triangle Institute for Security Studies, 2008), <http://www.strategicstudiesinstitute.army.mil/pubs/display.cfm?PubID=862>.

39. The ability to utilize waste as energy will become especially important during disaster relief operations where waste is abundant but fuel and energy structures are scarce. According to the DoD research almost 79 percent of the waste in the field has recoverable energy content. See Sheets (2008). The waste can be turned into electricity, heat, fuels, hydrogen, methane, and JP-8.

40. DoD (2010); Sheets (2008).

41. Warner and Singer (2009).

42. Ibid; James R. Woolsey “A Partnership Deal: Malevolent and Malignant Threats”. Ed. Kurt Campbell. *Climatic Cataclysm: The Foreign Policy and National Security Implications of Climate Change*. (Washington, D.C.: Brookings Institute Press, 2008): 169-190.

43. DoD (2010), 86.

44. Sheets, 2008, 310.

45. DoD (2010), 86; Sheets (2008), 305.

46. Warner and Singer (2009), 3.

47. DoD (2010), 84-88.

48. For a similar plea, see: Peter W. Singer. “Fueling our Security: The Need for a Defense Energy Strategy” *The Washington Examiner*. (August 25, 2009), [http://www.washingtonexaminer.com/politics/Fueling-our-security\\_-The-need-for-a-defense-energy-strategy-8149899-54612187.html](http://www.washingtonexaminer.com/politics/Fueling-our-security_-The-need-for-a-defense-energy-strategy-8149899-54612187.html).

49. Warner and Singer (2009), 1-2.

50. DoD (2010), 87.

51. Woolsey (2008).