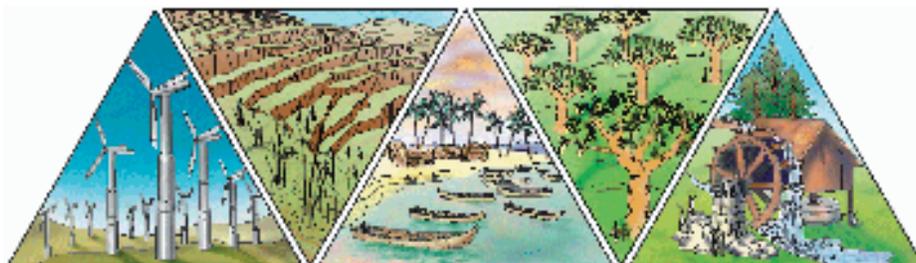# BERKELEY WORKSHOP ON ENVIRONMENTAL POLITICS

BIBLIOGRAPHIES

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WAR, MILITARIZATION, AND THE ENVIRONMENT

AN ANNOTATED BIBLIOGRAPHY

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AN ANNOTATED BIBLIOGRAPHY

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INTRODUCTION

The frequency of armed conflicts around the world has risen substantially during the past 50 years. During the last decade there were more than three times as many ongoing conflicts than at any given time during the 1950s and twice as many compared with the 1960s (Kane 1995; Collier 2000). In the last decade, there were 58 major armed conflicts in 45 locations (UNDP 2003) that dramatically impacted humans and the natural environment. Since 1990, armed conflicts have killed as many as 3.6 million people (UNDP 2003) and injured millions more through direct violence and the destruction of environmental and infrastructural life supports. Civilians regularly account for more than 90% of deaths and injuries, and children for at least half of civilian casualties of violent conflicts during contemporary times (UNDP 2003). A noteworthy, often hidden casualty of militarization and war is the natural environment. As ecologists and geologists return to conflict-scarred landscapes, long-term environmental tragedies begin to accompany the immediate human tragedies of war. Oftentimes wars have been fought in the context of preexisting environmental degradation or intensive natural resource extraction, leading some researchers to inquire into the complex environmental causes of war.

In collective response to warfare's environmental consequences, the international community has sought environmental protection through the apparatus of the United Nations. International environmental mandates in relation to warfare seek to codify existing customary national and international laws addressing acts of war (Caggiano 1993; Parsons 1998; Yuzon 1995). The policy supporting these provisions is drawn from widespread concern for the protection and long-term viability of the natural and human environments, much of which arose out of the highly visible environmental consequences of the latter stages of the Viet Nam War where massive chemical defoliation caused rapid environmental change (Westing 1984; Parsons 1998). The 1977 Protocol I Additional to the Geneva Conventions of 1949 makes international provisions for the protection of the environment during times of war. Notably, it lacks provisions for international environmental protection standards during peacetime preparations and pre-conflict mobilizations toward war, activities that have been implicated by some to be warfare's most camouflaged environmental casualties (Ross 1994). Although the Protocol I expresses strong concerns for the impacts on the environment in times of armed conflict, it and other international protections are repeatedly challenged by the political economies of military-industrial complexes in many developed countries, the elite-military ties in many southern nations, and the interconnection of these with the global weapons economy.

Several specific provisions in the Geneva Conventions, the international law of war, address the continuously developing policy concern of environmental protection during wartimes. In the Gen-

eral Provisions, Chapter 1, war is defined broadly as "situations of armed conflict," and such conflicts need not be officially declared "war" to be subject to these provisions. Article 54(2), which aims to protect the human food supply in relation to the environment, states:

> It is prohibited to attack, destroy, remove or render useless objects indispensable to the survival of the civilian population, such as foodstuffs, agricultural areas for the production of foodstuffs, crops, livestock, drinking water installations and supplies and irrigation works, for the specific purpose of denying them for their sustenance value to the civilian population or to the adverse Party, whatever the motive, whether in order to starve out civilians, to cause them to move away, or for any other motive.

While the language here is forceful, the natural environment is only a consequential benefactor, its utilitarian properties being valued foremost. Going further in protection of the environment for its own sake, Article 35(3) on the "Method and Means of Warfare" addresses the foreseeable impacts of armed conflict that a "belligerent" actor must consider, stating

> [i]t is prohibited to employ methods or means of warfare which are intended, or may be expected, to cause widespread, long-term and severe damage to the natural environment. (Plant 1992)

This section either prohibits or restricts the use of certain weapons that are excessively damaging to the environment, stating that the use of defoliants, herbicides, daisy cutter bombs, or conventional bombs to remove forest or other kinds of plant cover must be "reasonable" and not "overly injurious" to the environment (Plant 1992).

Obstacles to the rule of international law in this particular realm include, among other complexities, various political and economic elements of maintaining national militaries and the international organization of security. The structure of the United Nations Security Council maintains five permanent national members, also the world's five largest weapons producers and exporters (Bloom et al. 1994). The recent trends in military activity, consumption, trade, and spending reveal some explicit interests and alliances: an average of 2.9% of each nation's Gross Domestic Product was spent on defense in 1996 (UNDP 1998); the UN's Human Development Report (1993) estimates that developing countries spend an average of only one-tenth of their national budgets on human development priorities, their average military expenditures meanwhile continuously increasing to around 170% of combined health and education expenditures; most modern wars take place in developing countries supplied with weapons from developed countries (Tansey 1994); between 1994 and 2001, the value of arms transfers from developed to developing nations comprised 68% of the total (Grimmett 2002); it has been estimated that global petroleum consumption for military purposes is about 6 percent of the total world consumption, or almost one-half of the total consumption of all developing countries combined (Tolba and El-Kholy, 1992); during peacetime nearly 85 percent of the total energy used by the United States government goes toward maintaining the largest military in the world (UNEP 1991). In part because of these trends, some scholars are skeptical of international laws about war and environment. Rather, they warn that such global efforts are a means to hegemonic control of southern regimes and southern resources by powerful states disguised as concerns for the natural environment and human rights (Dalby 1999).

This annotated bibliography reviews a collection of books, papers, and reports that contribute unique theses and conclusions about the environmental causes and consequences of war and militari-

zation around the world. A full accounting of written works on this subject is certainly far too vast to include here, and the authors have chosen carefully those works that together represent a majority of thoughtful and rigorous analytical positions. The remainder of the document is divided into six sections, some of which are further subdivided. "Environmental Causes, Environmental Consequences" contains a discussion of the unifying themes of this bibliography and situates the authors' relative analytical positions. "The Nature of Language and the Language of Nature" is an explanation of the multiple and often conflicted employment of environmental terminology in the literature. "War and Militarization: Conflict, Security, and Scarcity" clarifies and historicizes additional terms related to warfare. "Problematizing Environmental Causes of War" outlines the salient environmental security literature, and the critical response to this literature by diverse scholars who also explore relationships between environment and violence. "Unforseen Consequences of War and Militarization" identifies the literature concerned with, on the one hand natural, and on the other social consequences of war and militarization. The remainder of the document is an alphabetical list of annotated citations.

ENVIRONMENTAL CAUSES, ENVIRONMENTAL CONSEQUENCES

The concept unifying this bibliography is the common notion that it is imperative for scholars, policymakers, and humankind in general to consider the natural environment in theorizing and observing the forces that bring about war and warfare's resultant processes: in summary, regardless of how and why, it is clear that the environment is of tremendous importance in matters of war and militarization. Beyond this notion, the authors broadly concern themselves with either environmental *consequences* of war and militarization or environmental causes of war and militarization; and the conclusions they draw, theoretical and empirical, stretch broadly across an intellectual spectrum. Many of the scholars concerned with assessing the consequences of war and militarization on natural habitats, wildlife, and the human environment conclude that environmental degradation from warfare has been great in the recent past and is becoming increasingly worse with the use of modern weapons (Falk 1984, 1988; Bloom et al. 1992). However, some draw the conclusions that war zones (Martin & Szuter 1999; Keely 1996) and military training grounds and apparatuses (Butts 1994; also see Woodward 2001) provide valuable wildlife habitat, and that defense institutions are best situated to protect environmental services and amenities (Butts 1999). Still others conclude that the military appropriation of the environment as a security concern threatens not only the environment (Woodward 2001; Peluso 1993; Ross 1994) but also poor people in the global South (Deudney 1991; Ross 1994; Peluso 1993; Neuman 2003; Timura 2001; Dalby 1999; Barnett 2001; Peluso and Watts 2001).

The authors concerned with the environmental causes of war collectively contend that nature poses some biophysical imperatives and constraints that are wholly independent of social forces. Beyond this accord, there is vast disagreement, and the extent to which environmental processes contribute to violent social outcomes is largely subjective. Critical voices remind us that as societies define and redefine environment, nature, and culture, "the environment" becomes more and less important in triggering violent conflict: scientific knowledge about environment-conflict linkages is fabricated in part by what questions we choose to ask, how we choose to categorize environmental and social processes, and whether we choose to account for multiple environmental, political, and cultural histories. This bibliography combines works from academia, civil society, national government agencies and international bodies, which together offer compelling ideas about how the past, present and future have been and are being shaped by ideas about war, militarization, and their environmental attributes. The authors represented here hail from a variety of disciplinary and professional backgrounds, and provide a diversity of intellectual contributions to the theme. The literature addresses a number of compelling interrogations.

- Does our historical moment represent a unique configuration of the relationship between war and the natural environment?

- Can international law protect the environment during times of armed conflict?

- Are contemporary social and political forms manifesting violent conflict responding to a period of globally scarce natural resources?

- Is modern warfare more or less environmentally destructive than historical or potential forms of warfare?

- Are the causes and consequences of war on the natural and human environments so complex and multifaceted that generalizations are misleading and violent events ought to be considered unique?

- Are socio-biological explanations of the causes of war incompatible with political-economic explanations?

- Does transforming the environment into an international security issue make for green militarism or a militarized environment?

These provocative and difficult questions begin to be addressed here, yet their answers are anything but clear. The hows and whys of environment-conflict linkages are marked by irony and obscured by controversy, however they are simultaneously enriched by the profusion of debate surrounding them.

THE NATURE OF LANGUAGE AND THE LANGUAGE OF NATURE

The meanings of "environment" are multiple and contested in contemporary usage. Historicized discourses of environmental degradation and stewardship, from the scientific to the ethical, are frequently invoked to achieve political ends; and environmentalisms range from the quasi-religious to the global managerialist to the human rights concerns of Environmental Justice. Likewise, contested notions of "war," "violence," and "militarization" spin tangled and emotionally charged webs of meaning. Often, discourses arising within politically powerful social groups undermine conflicting yet relevant positions of the less powerful. In an effort to provide a comprehensive exploration and explication of the literature addressing war, militarization, and the environment, we provide a brief discussion of the intricacies and complexities involved in defining these and other terms used frequently by the authors cited herein.

Broadly, "**environment**" refers to the conditions under which any person or thing lives or is developed and the sum-total of influences which modify and determine the development of life or character (Oxford English Dictionary), or more generally, that which surrounds and influences. This vision of environment as the external surroundings that determine the development of life is applied broadly to living things inclusive of humans, and it invokes ageless debates over "nature v. nurture." This notion of environment appeals to a sense of holism and inclusivity.

However, "**nature**" or "**wilderness**," and more recently "**ecosphere**," in common parlance, are also used synonymously with "natural environment," including the material world, its collective objects and phenomena (Oxford English Dictionary), the world of living things and the outdoors (American Heritage Dictionary), and unmanufactured features and products of the earth itself, as contrasted with those of human civilization (Oxford English Dictionary). In this model of the world, Nature and Culture are distinct realms. Kate Soper (1995) among other contemporary philosopers questions the commonplace notion of nature and related terms and concepts, explaining that the use of "nature" and "wilderness" to refer to all that is not human carries inherent problems and implicit assumptions. Referring to Marx's position in Capital in which the idea of "nature" as that which we are not, which we are external to, and which ceases to be fully "natural" once we have mixed our labor with it, Soper cautions that this radical division cannot be sustained, arguing that it is nearly impossible to define "nature" independently of how it is thought about, talked about, and culturally represented. She argues that an object of nature cannot be discussed separately from its social and cultural double, and Nature cannot be understood apart from human practices. Paul Wapner (2002) contends that postmodern critics have aptly demonstrated that "nature" is not simply a given, physical object but a social construction—an entity that assumes meaning within various cultural contexts and is fundamentally unknowable outside of human categories of understanding. Furthermore, when social groups claim an objective "knowledge" of nature, they effectively exert control over others. An attempt to view nature as separate from culture presumes an essentialist position from which to divide objects of human origin and those of non-human origins. The several authors represented in this bibliography who write on human activity in the environment, specifically with regard to violent conflict and militarization, help to blur the distinction between nature and culture, and recognize that how humans perceive nature, wilderness, and the environment shapes—and is shaped by—our cultural practices and social institutions. As Simon Dalby (2002:133) puts it, "[w]e are planet Earth, and as a species we have the ability to change the ecology of the planet."

The distinction between the essentialist dichotomy "natural" and "manmade" has become particularly blurred through recent scholarly works of political ecologists and biogeographers which highlight the long history of human alteration of nearly every environment on Earth, and the historic and continual alteration and management of so-called pristine natural environments by rural and indigenous peoples (e.g. Cronon 1983, Fairhead & Leach 1995). The failure of this essentialist dichotomy is exemplified in common attempts by various authors to categorize agricultural ecosystems as either nature or culture. The same problem arises in categorizing genetically modified organisms. Contemporary environmental protection efforts often focus on "wilderness" preservation, conservation, or restoration, especially in the United States, and "wilderness" is generally defined as being exclusionary of permanent human inhabitants (see US Wilderness Act of 1964). However, as Wapner (2002) notes, "many in the developing world argue that one person's wilderness is another person's home" (see also Leach & Mearns 1996). Scholars in ecology and related disciplines regularly refer to the "natural environment" as exclusive of humans. For clarity this bibliography takes the "natural environment" as referent to the workings of the world without explicit acknowledgement of human presence or influence, and therefore the (unqualified) "environment" or the "human environment" are taken by default to be inclusive of humans, their cultural practices, and their social institutions.

Cultural anthropologists Jordan and O'Riordan (1997) identify four dominant voices in environmental discourses. While these are not rigid constructions, they represent a useful heuristic. "Cornucopian" writers see nature as robust and benign, their management style is non-interventionist and laissez-faire, and economic growth is seen to bring about technical solutions to resource scarcity (Haas 2002). "Malthusians" see nature as precarious, unforgiving, vulnerable and scarce, where population growth and resource usage ought to be tightly managed by the state (Haas 2002). "Sustainable Development" writers see nature as resilient within a context of some range of parameters that are themselves dynamic (Holling 1978; Clark and Munn 1986; Holdren 1991). Finally, radical and postmodern views see nature as "capricious" and "unrelated to discourses about it or to social efforts to regulate it," (Haas 2002) and focus on the social context of scarcity where redistributive policies are favored policy responses. Many of the authors represented here fit loosely into one or more of these dominant discourses, and often their assumptions and conclusions about the relationship between warfare and environment derive as much from their worldview as their analysis.

In the context of violent conflict or war, "environment" and "nature" are perceived through multiple perspectives and practices. There are several important ways that these word-concepts are invoked, used, deployed, thought about, imagined, and discussed. Each approach helps define, shape, and ultimately generate and regenerate what comes to be thought of as nature and environment in the context of violence and armed conflict. Moreover, dissimilar and often contested discourses exist alongside relationships between actors of unequal social power. As Haas (2002) observes, "[t]hese discourses persist not because they are accurate, but because they are politically embedded." Critical authors represented here identify winners and losers when various environmental discourses are invoked (Neumann 2003; Peluso 1993; Timura 2001; Deudney 1999; Dalby 2002; Woodward 1998, 2001). Finally, listed below are several ways that "environment" and "nature" emerge as conceptual tools in the selected texts, complete with brief discussions of the controversies and complexities that arise with their use.

The environment is a local or regional ecosystem, or a living earth, which suffers as a result of human practices of war. Through this lens, the environment becomes an overt or covert casualty of armed

conflict and war. The 1999 United Nations Convention on Environmental Modification Techniques and the 1977 Additional Protocol I to the Geneva Conventions of 1949 make targeting the natural environment an international war crime unless required for direct and critical military advantage, meanwhile acknowledging that legal but unfortunate "collateral environmental damage" may occur as a byproduct of war. Also illegal is the deployment of chemical or biological weapons against humans or the environment. The extent to which environmental harm can be accurately scientifically assessed, however, is far from clear. One important problematic in assessing the environmental consequences of war is the vast lack of environmental data, baseline and otherwise, throughout much of the world. Furthermore, even when data are available, the notion of static, ahistoric "baseline" environmental conditions is a vastly imprecise and contested concept. Most scholars agree, however, that despite a lack of data, war punishes environments as much as the people who depend on those environments.

The environment is a weapon used against the survival of human populations. Through this lens, political groups use the environment in military or paramilitary tactical efforts often termed "environmental warfare" or "environmental terrorism." Environmental warfare operates within the larger objective of war: to defeat the enemy's military forces or capacity (Westing 1984; Chalecki 2002). Both nations with highly and poorly developed national environmental protection institutions have been guilty of environmental warfare, and, some argue, environmental terrorism. Environmental terrorism targets the environment specifically (Chalecki 2002). However, terrorism proper is a somewhat inconsistently defined concept. According to the Encyclopaedia Britannica, terrorism refers to the systematic use of violence to create a general climate of fear in a population to achieve political goals when direct military victory is not possible. The United States Federal Bureau of Investigation (FBI) definition states: "Terrorism is the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives." The Foreign Relations and Intercourse title of the United States Code (22 Section 2656) states: "Terrorism means premeditated, politically motivated violence perpetuated against non-combatant targets by sub-national groups or clandestine agents, usually intended to influence an audience." However "environmental terrorism" is subtly defined and redefined, the insinuation by the aforementioned accounts that it is necessarily spectacular may help obscure the sometimes less visible environmental destruction that takes place via "normal" militarization of national defense apparatuses (see Ross 1994). Furthermore, the exclusion of national states by defining terrorists as necessarily "sub-national" in the U.S. Code definition discursively redeems particularly the U.S. government from acts of environmental terrorism during the Viet Nam War.

The environment is something to be protected through national and international military forces, or through sub-national guerilla tactics. "Eco-terrorism" and "eco-tage" (Westing 1984) refer to the destruction of built environments and technologies that are seen by some as threatening to the natural environment and/or to the survival of humans on the planet. Advocates of "environmental security" (Homer-Dixon 1999; Gleick 1991; Baechler 1999; Butts 1994, 1999; Allenby 2000; Dyer 2001; Gleditsch 1997) see environmental scarcity as a threat to national and international security, and their solutions generally consist of global-managerial approaches to protecting renewable environmental resources from human activity. These ameliorations are to be imposed by international development institutions. In contrast, critical theorists argue that environmental protection is often only a guise for the domination of disempowered social groups. Military institutions invoke environmen-

talist discourses (Woodward 2001) that not only legitimate their presence in the countryside, but construct themselves as stewards of the natural world. This "greening of the military" (Ross 1994) actually threatens environments through its downplaying of military environmental offenses during peacetime. Militaries are also increasingly enforcing wildlife park boundaries in developing nations (Neumann 2003) to the detriment of disempowered human populations whose human rights are habitually violated, and international conservation organizations are similarly "coercing conservation" (Peluso 1993) in the name of wildlife protection.

The environment is a scarce resource over which human populations fight to control. Through this lens, the environment is scarce and thus valuable in supporting the biological and social activities of human populations. Implicit in this perspective is a lack of intrinsic value or other culturally unique ways of understanding Nature. Generally, the authors in the Environmental Security section of this bibliography interpret "environment" as "natural resources," where nature is not so much a casualty of war but rather the source of scarce renewable (Homer-Dixon 1999; Baechler 1999; Allenby 2000) and nonrenewable (Baechler 1999) natural resources whose scarcity is causal of war and violent conflict. Barnett (2001), Timura (2001), and Dalby (2002) take a position critical of the above that utilitarian "natural resources" are necessary but insufficient components of a comprehensive definition of "environment," and each author contributes what might constitute alternative, comprehensive notions of environmental security.

The environment is an uninhabited and uninhabitable landscape. From this perspective the environment is sacrificed to military activity. Valerie Kuletz (1998) maps the landscape of the American Southwest revealing numerous geographic regions of military occupation and sacrifice. Central to her analysis of the siting of a high-level radioactive waste repository is the idea that certain landscapes are characterized by the U.S. government as "wastelands" or "badlands," resulting in what Kuletz identifies as collective "deterritoriality"—the loss of commitment by modern nation-states to particular lands or regions (p7). Seth Shulman (1992) describes the process through which landscapes become zones of sacrifice (p93). Writing about the Hanford Nuclear Reservation, Shulman discusses the Department of Energy's (DOE) classification of highly contaminated remote areas as "sacrificial zones": areas where the federal government has determined that environmental contamination is so great and the site is so remote that the costs of cleanup outweigh the benefits.

The environment is a human home. This perspective of the environment situates humans in and dependant upon the natural world. Throughout our discussion in the in this bibliography and in the texts reviewed is an implicit understanding that humans cannot exist without the natural environment. The earth is the only human home. Harney describes this connection through the metaphors in Shoshone beliefs and rituals (1995). He expresses this connection as the foundation of all life. Similarly, Kuletz describes this connection by noting various ways it is forgotten and ignored in US policy, practices, and values (1998).

WAR AND MILITARIZATION: CONFLICT, SECURITY, AND SCARCITY

Violence takes forms as diverse as physical, symbolic, political and economic (Peluso & Watts 2001, 24-25), and **war** can be conceived as a particular case of violence that is at once organized, perceived as legitimate by a significant number, and institutionalized in a specific though dynamic way in a certain society. War is often defined, especially in the international relations literature, as a state of open and declared armed hostile conflict between nations, states, or rulers, or between parties in the same nation, and which is characteristic of modern industrial society. It is usually distinguished from regional or local violent conflict. However, to make a distinction merely by its geographic scale or degree of "modernity" ignores many other important distinctions that can be made between various violent conflicts. Violent conflicts of different physical scales may actually be more similar than is frequently acknowledged, especially with the global nature of the weapons economy (Nordstrom 1997).

Military writers usually confine the term "war" to hostilities in which the contending groups are sufficiently equal in power to render the outcome uncertain for a time. "Pacifications," "expeditions," or "explorations" are terms are used in situations of armed conflict between powerful states and so-called "primitive" peoples. Armed conflicts with small states are often called "interventions" or "reprisals," and armed conflicts with internal groups are "rebellions" or "insurrections" (Encyclopaedia Britannica). The analysis of war is often divided into disciplinary categories including philosophical, political, economic, technological, legal, sociological, and psychological. These distinctions indicate the varying foci of interest and the different analytical categories used by the theoretician. However, most of the intellectual concepts are simplifications because war is an extremely complex social phenomenon that cannot be explained by any single factor or through any single approach (Encyclopaedia Britannica). For our purposes, war may be defined broadly as any institutionalized, legitimated, organized, violent, and sustained conflict.

War does not exist apart from its required partnership with "**militarization**." Militarization refers, in part, to the expansion or maintenance of military forces in preparation for war or in defense readiness. War is not a prerequisite for peacetime or "normal" militarization, but many scholars point to the pervasiveness of militarization as a lubricant for frequent political decisions to engage in war in lieu of diplomacy (e.g. Sidel 2000). Military activity in contemporary times has also been transformed rhetorically into "peacekeeping," where the role of defense apparatuses are as much peacekeepers as war makers. Jeremy Black (2001) takes both the concept and the observed actions of "peacekeeping" as essentially equivalent to war, thus termed so as to make military action appear more acceptable, which may ironically influence further violent conflict by emulation. Militarization also describes the political economy of defense ministries and departments across the globe. Wallensteen and colleagues (1985:1) note that in 1985 the total world budget for military systems was nearly $300 billion, or about $75 per member of the human race. The end of the Cold War brought substantial decreases in military spending for many nations, and global military expenditures declined until 1998. Real expenditures began increasing in 1998 and rose sharply in 2002 in response to the events of September 11, 2001, dominated by the US, which accounts for 75% of the increase. Current real expenditures are still 16% below Cold War peak levels in 1988, but further increases are planned in the US through 2009. Global military expenditures account for 2.5% of world GDP (SIPRI 2003).

Militarization also refers to the action of making military in character or style, specifically the transformation to military methods or status (OED), and "**militarism**" is explained as a quality of many modern cultures. Eric Carlton (2001) posits that militarism is not simply a group of institutions established by social groups to prepare for and defend themselves against an enemy. Rather, militarism—as it is experienced in modern societies—is a way of life, or a culturally cohesive way to view human interaction. According to Carlton, the culture of militarism is a phenomenon of certain societies at particular historical moments. Within these societies, militarism becomes fundamental to the organization and nature of social structures, and the expansion or maintenance of military forces becomes part of the main peacetime activities of the military culture. Military culture is dedicated to achieving, either by persuasion or coercion, forms of control, both domestic and international. Wallensteen and colleagues (1985:1) caution that the impact of this form of social order is detrimental to human-, animal-, and ecosystem-level environments. According to these authors, in the process of global militarization, the "environment," defined broadly, is sacrificed for military preparedness, for imminent threats, for the needs of security, for testing weapons, and ironically for peace.

"**Security**" is a relatively new concept, created in the 16th century. At its most basic level, security refers to the maintenance of the status quo (Lipschutz 1995). In the bulk of pre-critical international relations literature (Dalby 2002), security is defined in terms of the nation state, where nations are discrete, uniform social and territorial compartments, and the state is the provider of security. However, along with economic "globalization" and the increased recognition of transnational environmental problems in recent decades, numerous scholars have remarked that national sovereignty is being steadily eroded; large-scale environmental problems are unbound by convenient geopolitical borders (Litfin 1998). Jon Barnett (2003) notes that a general sense of security derives from being protected from exposure to danger. Soroos (1997: p.236) defines security as "the assurance people have that they will continue to enjoy those things that are most important to their survival and well-being." More recent concepts of security have attempted to enclose the concerns of entities other than the nation such as "human security" and "environmental security." Kofi Annan, Secretary-General of the United Nations, has urged the international community to understand security in more than military terms; human security "must encompass economic development, social justice, environmental protection, democratization, disarmament, and respect for human rights and the rule of law." (Annan 2001). In a nuanced critique of the human security concept, Simon Dalby contends that "[d]iscussions of global security are premised on the modern assumptions that the state is the provider of security, that legal systems uphold individual human rights, that the latter have been universalized to provide a benchmark for political conduct globally, and that—implicit to much of the conventional security discourse—modernity has to be extended to the poor and backward parts of the world for the greater benefit of all." (Dalby 2002:157) Dalby hopes that this type of thinking might "shift the referent objects of security from the state to the human individual…without presupposing the identity of these individuals as neoliberal citizen consumers embedded in a mesh of claims to universal rights" (156) to which conventional geopolitical thought has succumbed. Writings on environmental security have proliferated in the last decade, and many of the critical authors represented here are similarly skeptical of environmental security.

Until the 19th century, the noun "**scarcity**" usually expressed an episode of shortage, a period of insufficiency. Today's economic term "scarcity" is an invention of modern society, before which no one had formally suggested that unlimited desire was a natural quality of human beings (Achter-

huis 1993). Only at the end of the 19th Century did the concept of scarcity, building on the earlier writings of Thomas Hobbes, begin to signify a general condition of humankind (Achterhuis 1993). Hobbes characterized society as in a perpetual state of scarcity or war, with its concomitant competition, fear and envy. John Locke also described the threat of scarcity as a state of war. Locke expanded this notion in writing about scarcity as an economic fact of life, a perpetual relation between man and nature, where nature fails to provide enough for all (Achterhuis 1993). Therefore, scarcity becomes the original condition of mankind, and economic growth and expansion are the logical solutions to the threat of scarcity (Achterhuis 1993). Today, the concept of scarcity is the theoretical foundation of economics, where the scarcity of commodities drives the market's allocation mechanism. Scarcity is used as an economic term defined as the absence of the quantity of a particular good or service sufficient to meet demand at a zero price. Common property is only made economically scarce through enclosure, or the creation of property rights. According to neoclassical economic theory, people naturally come into conflict over scarce resources. Ronnie Lipschutz (1997) explains that scarcity is not a product of "nature" but rather a "consequence of control, of ownership, of property, of sovereignty, of markets."

The word scarcity is also frequently used in a geographic or temporal sense to denote the opposite of abundance in a particular time or location, a local or time-sensitive shortage. However, a thing can be both geographically or temporally abundant and economically scarce. Consider diamonds in Botswana, for example, which are an abundant resource in the region, but a scarce commodity in the international marketplace. This difference highlights the critical distinction between relative and absolute scarcity. Absolute scarcity is the primary concern of "limits-to-growth" thinking, where the earth contains finite amounts of renewable and nonrenewable resources whose exhaustion threatens the survival of all life, and particularly human life. Relative scarcity occurs in a particular location, and is a result of the geographical distribution of and demand for resources. However, neoclassical economic theory asserts that absolute scarcity cannot occur in well-functioning markets and that all scarcity is relative (see Lipschutz 1997). This claim is based on the theory that critical scarcities cause high prices that signal producers to find cheaper alternatives or to develop new technologies.

That there are multiple meanings carried by the terms contained herein, and thus multiple intended uses of the same, is important in understanding the following dialogues and debates.

PROBLEMATIZING ENVIRONMENTAL CAUSES OF WAR

Environmental Security

The motivation of environmental security literature is to urge governments and societies to recognize environmental degradation as a threat to national and international security (Conca 1994). Through empirical studies and statistical methods of correlation and regression, environmental security scholars generally begin their analyses with the notion that under certain circumstances, environmental degradation can be a causal force in violent conflict (Baechler 1999). The origin of environmental security thinking was in the context of the long summer drought of 1988, amidst alarmist reports of tropical forest destruction, and renewed concern about global climate change and stratospheric ozone depletion (Dalby 2002). Suddenly, the environment became a large component of international and national security debates. In 1989 Norman Meyers and Jessica Tuchman Mathews published articles linking environment and security in *Foreign Policy* and *Foreign Affairs* respectively suggesting that resources and population issues ought to be foreign policy priorities and that conceptualizations of security ought to be reformulated; Michael Renner's Worldwatch paper of that same year also linked environment and security (Dalby 2002). Neville Brown, Peter Gleick, Arthur Westing, Josh Karliner, and Gwyn Prins followed by publishing papers and books linking environment, violent conflict, and international security in widely circulating journals and by well-known publishing companies. These first environmental security scholars' concerns fit largely within a realist international relations framework (Barnett 2001). Peace researchers also jumped on the environmental security wagon, arguing that the security concept ought to be extended to help "defend" the environment (Mische 1992).

Projects and authors critical of this school were less common and poorly funded compared with its advocates through the1990s during which time a multitude of alarmist reports, large projects, books, and scholarly papers devoted to linking the environment and security were produced. Most notable in this group are Robert Kaplan, Günther Baechler, and Thomas Homer-Dixon, who all continue to publish increasingly nuanced versions of their original theses to date. With the praise and encouragement of high-powered policymakers in Washington, some of the latter, more sophisticated environmental security work incidentally helped to make the environment fill the post-Cold War "security gap" as an institutional substitute for the "Evil Empire" (Hartmann 2001; Dalby 2002). While some writers see this as a boon for environmental protection, others see it as ultimately threatening.

The papers reviewed in this bibliography represent a range of viewpoints from environmental security scholars during the 1990s through the beginning of the 21st Century. Allenby (2000) takes environmental security to be primarily a national-level policy concern, where resource throughput efficiency and environmental quality concerns ought to be integrated into government and industrial functions. Most scholars, however, contribute to thinking about the environment in the realm of international and intra-national conflict. Nils Petter Gleditsch (1997) contends that the relationship between environmental degradation and violent conflict is mediated by regime type, and he concludes that the presence of democracy makes environmental degradation less likely and decreases the likelihood of war. Paul Collier and Ian Bannon (2003) propose that developing nations highly dependent on natural resources are likely to engage in violent conflict. Peter Gleick (1991) proposes that environmental security ought to seek a better understanding of the threats of resource problems

to security, rather than a redefinition of international or national security to include environmental concerns as other scholars have suggested. Thomas Homer-Dixon (1999) proposes that renewable resource scarcities and population pressures interact in complex ways with national political economies in the developing world to result in violent conflict. Gunther Baecheler (1999) responds to some of the critiques of this school in proposing modifications to the current social-scientific methodological and analytical approaches to understanding environmental causes of violent conflict, including the incorporation of biophysical complexity into natural-social models.

Critical Environment and Violence Studies

> Are the goods and services of the natural world so fundamentally woven into the fabric of human society that their depletion, disruption, or diminution alters the basic terms on which societies exist and human beings interact? Does human society exercise such control over nature that environmental problems can also be controlled, and nature itself managed and manipulated to serve human purposes? Or, as we suggest here, is there a complex relationship between the two, in which multiple linkages and feedbacks play themselves out in a hundred different ways, producing a thousand possible outcomes and blurring the very distinction between the natural and the social?

> Lipschutz and Conca 1993

A paper by Daniel Deudney (1991) that appeared as a debate with Peter Gleick in the *Journal of Atomic Scientists* might be read as the first in-house critique of environmental security thinking. Deudney argued against an uncritical marriage of the words, claiming in response to national environmental security advocates that environmental problems are often diffuse and long-term while wars are concentrated and violent, and thus means of mobilizing populations against identified antagonists are significantly dissimilar to the kinds of social changes needed to deal with environmental difficulties (Dalby 2002).

Scholars representative of what might be called "critical environmental security" or "critical environment and violence studies," find fault with several aspects of recent research in the environmental security school. Some critics argue that the concept concentrates power over the environment and natural resources into the jurisdiction of departments and ministries of defense (Dalby 1994; Haas 2002), and rhetorically helps justify political and military interventions in the developing world (Conca 1994; Deudney 1991). Fundamentally, some authors critique environmental security as being (pejoratively) "Malthusian" in basis (Peluso & Watts 2001; Hartmann 1994) and others as derivative of a (pejoratively) "geopolitically realist" security studies, seeing only the nation state as the object of analysis meanwhile obfuscating social-natural complexities and various other important scales of social relations (Dyer 2001; Barnett 2001). Methodologically, environmental security is critiqued on the basis of the social science-based claims that are made in its name, particularly with respect to the environment-conflict thesis (Lipschutz 1997; Le Billon 2001; Dalby 2002; Haas 2002; Timura 2001; Hartmann 2001). And one critic defines the discourse and practice of environmental security as exclusionary, in terms of addressing only the concerns and histories of certain social groups meanwhile alienating others, particularly Third World and women scholars (Hartmann 2001).

Some critics inquire into whether including environment in national security concerns results in a legitimate greening of the military or in a dangerous militarization of the environment (Käkönen 1994). Dalby (1994) warns that the military understanding of security is one of "force and imposed

solutions, secrecy, power and surveillance" and a model that "privileges certainty and stability over the possibilities of change, and political order over the messy uncertainties of democratic practice." Peter Haas (2002) claims that although one of the initial tactical motivations behind the first environmental security literature was to get the environment onto the US foreign policy agenda, the concept was appropriated by the Pentagon and consequently most of the available funding went toward cleaning up military bases rather than to other purposes deemed "environmental security" priorities. Writing from a peace studies perspective, Ken Conca (1994) suggests that the notion of "security" in terms of environment erects rigid boundaries in defining environmental problems and envisioning solutions, potentially precluding nonviolent efforts.

Ken Conca (1994) critiques the concept of environmental security as a means by which the north "cloak[s] its interventionist intentions toward the south in environmental rhetoric," Deudney (1991) warns against the appropriation of military metaphors by environmentalists, claiming that their use undermines the goal of environmental preservation and, specifically, that the notion of "environmental conflict" may become a self-fulfilling prophecy. Hugh Dyer (2001) suggests that enclosing environmental concerns into international relations and security studies conflates environmental and security concepts, "potentially doing violence to both." In a critique of Robert Kaplan's treatment of African conflict, Simon Dalby (1999) warns that "apocalyptic visions of political disintegration" obscure more than they reveal if framed as being unrelated to global patterns of poverty and underdevelopment. In a later work, Dalby (2002) contends that critical notions of environmental security, in contrast, will take long histories into account, remarking that "the domination of nature is the history of European imperialism and the conquest of most of the rest of the earth in search of human and natural resources to fuel the growth of European power and wealth" (126).

Betsy Hartmann (2001) notes the success of the environmental security project in exclusively western policymaking circles and cites its tendency to exclude the concerns of—and thus contributions from—Third World and women scholars. Nancy Peluso and Michael Watts (2001) argue that "Malthusian causal arguments based on unqualified notions of population growth or scarcity ultimately justify violence by states against their own people." Betsy Hartmann (1994), an ardent critic of Malthusian thinking, claims that "in the collective psyche of the national security establishment, population growth is now becoming a great scapegoat and enemy, a substitute for the Evil Empire."

Hugh Dyer (2001) is critical of geopolitical realism in environmental security studies. He contends that replacing the nation-state with an environmental security referent may be useful in reformulating notions of security, arguing that it is possible to move from an anthropocentric (and nationalistic) to an eco-centric perspective in which the global environment becomes the object referent of security. Jon Barnett (2001) extensively reviews and critiques the environmental security concept, finding fault also with its logic of geopolitical realism, and in the military appropriation of the concept. He simultaneously finds utility in the concept, and helps redefine it to encompass the notion of "human security" from environmental contingencies. In a later work (2003) Barnett explores possible connections between climate change and security, including national security considerations, human security concerns, military roles, and in discussion of the widely held assumption that climate change might trigger violent conflict.

Ronnie Lipschutz (1997) critiques the environmentally deterministic approach sometimes

taken in the environmental conflict and security literature using examples based on "water wars" and population in an attempt to "denaturalize" the discourse and "bring the political back in." Philippe Le Billon (2001) posits a resource-dependence hypothesis of violent conflict—as counter-posed with conventional notions of resource scarcity or abundance—highlighting the social construction, materiality, and geography of natural resources, and demonstrating that a resource's desirability, location, concentration, and mode of production influence both the nature and the likelihood of resource conflicts. Critical theorists are skeptical of environmental security advocates' tendency to use scientific hypothesis testing as an applicable method to reveal root causes of violent conflict. Not only are many of these methodological designs flawed from a scientific perspective but several authors question whether hypothesis testing in itself is an appropriate framework, where both history and interpretation are important normative concerns throughout security studies (Dalby 2002: 153). Peter Haas (2002) claims that, while environmental security scholars continue to search for environmental causes of violence, the empirical record of wars fought over resources is actually quite meager. Christopher Timura (2001) in a critical analysis of three of Homer-Dixon's core case studies on environmental conflict finds that across the three, although environmental scarcity played locally specific roles in contributing to violence, ineffective land titling bureaucracies, bureaucratic redundancy, and corruption were pervasive and conflicts developed between groups that differed in economic or political power. Also conflicting valuations of land and legal pluralism over land tenure contributed to violent conflict in each case; thus the more direct roots of violence were political. Timura's analysis implicates several phenomena including economic liberalization programs and political decentralization, where even an increase in democratic institutions are only as strong as individuals' ability to gain access to the legal mechanisms that provide them. Michael Ross (2003) analyzes the environment-conflict thesis in detail, finding that oil increases the likelihood of conflict; "lootable" commodities like gemstones and drugs do not make conflict more likely to begin, but they tend to lengthen existing conflicts; and that there is no apparent link between legal agricultural commodities and civil war. Betsy Hartmann (2001) critiques Homer-Dixon's work as being methodologically flawed: where his findings of environmental scarcities as causal of violence are foregone (and thus non-scientific) conclusions. Marvin Soroos (1992) and Alan Richards (2002) whose analytical contributions might be collectively termed "political economy of renewable resources" inadvertently challenge conventional environmental security by demonstrating the advantages of their historical narrative approaches compared with an arguably oversimplified hypothesis testing methodology. Finally, according to some critics, the concept of environmental security is quite often defined so broadly as to be analytically obtuse (Fairhead 2001; Dalby 2002).

UNFORESEEN CONSEQUENCES OF WAR AND MILITARIZATION

Biodiversity

While most writers agree that war has devastating impacts on humans and the natural environment, a few scholars contend that not all of war's effects should be seen as environmentally damaging. Jeffrey McNeely (2000) asserts that while biodiversity is degraded through hunting and habitat destruction by armies, the actions of refugees, and "scorched earth" tactics during war, positive impacts are also known, including war zones acting as wildlife buffer zones (Martin and Szuter 1999), and the spectacle of war's environmental impact stimulating vigorous governmental action. Dudley and colleagues (2002) cite numerous environmental impacts of war, focusing especially on megafauna, and these authors dispel Martin and Szuter's (1999) theory that war creates wildlife refuges in the no man's lands that arise during conflict. Arthur Westing (1984) gives a detailed account of the use and ecological impacts of herbicides in South Viet Nam by the United States military during the Second Indochina (Viet Nam) War.

Nuclear Weapons and Depleted Uranium Munitions

Weapons have for centuries impacted the natural environment during times of armed conflict, but according to Richard Falk (1984) it is since World War II and the emergence of high-technology warfare that the global environment has been fundamentally threatened by violent conflict. Falk (1988) indicates that weapons of war are now able to produce the unconditional destruction of the global environment—he explains that political denial of the potential and real environmental consequences and the continuing dedication to nuclear arms demonstrates the "corpus of attitudes towards the nuclear arms race, nuclear proliferation and nuclear war" (1988:51). The operative central tenet is the willingness of governments to employ whatever methods are needed to successfully undermine the opposition and realize their goals. Victory-at-all-costs thinking has made the development, testing, use and disposal of nuclear weapons and depleted uranium munitions a pervasive and unfortunate reality.

Whether in consideration of the testing and deployment of nuclear arms or the siting of radioactive waste disposal areas, the natural environment is central to continued debates about building, maintaining, and disposing of nuclear weapons arsenals. The environmental debate about engendering an end to nuclear arms proliferation after the Cold War was centered around the concept of "nuclear winter," proposed by Stanford ecologist Paul Ehrlich and colleagues (1993). The test and use of nuclear weapons—which began with a test bomb at the New Mexico Trinity Site and the bombing of Japan during WWII (Ishikawa and Swain 1981), and continued with decades of aboveground and underground testing—has made profound impacts on natural and human environments around the globe (Ayres 1965; Gallagher 1993; Izrael et al 2000; Miller 1986; Chugoku Newspaper 1992). Storage and disposal of nuclear weapons and radioactive wastes requires natural resources, spaces, and biological activities to be sacrificed for time frames beyond one hundred thousand years. In debates over the siting of deep geological radioactive waste repositories, the environment and its properties are central (Kuletz 1998, Jacob 1990). The destruction of nuclear weapons—in line with international disarmament agreements such as the Strategic Arms Reduction Talks Treaty—poses a continued environmental threat (Guruswamy and Grillot 2001). The literature makes apparent

that national and international conversations about radioactive weapons are inextricably linked with debates about their observed and potential environmental consequences.

The testing and use of depleted uranium (DU) munitions in recent armed conflicts has sparked a debate about the impact of depleted uranium on natural environments and human populations. During the first Gulf War, British and American troops used large amounts of DU tank penetrators against Iraqi troops. In the form of tank penatrators, depleted uranium munitions explode on impact, sending thousands of ignited uranium particles into the stratosphere. In addition to this exposure, at the conclusion of the war American and British military forces failed to clean their battlefields, in effect abandoning 950 thousand rounds of these munitions over a wide geographic area. Akira Tashiro (Chugoku Shimbun 2001) argues that DU munitions used in the Gulf War caused extensive harm to the local Iraqi population and to Gulf War veterans. Since the war, DU munitions have been used in several national and international conflicts resulting in widespread uranium contamination (Chugoku Shimbun 2001). In response to the extensive use of DU munitions, the United Nations Environmental Programme (UNEP) evaluated the environmental contamination in Kosovo, Serbia, Montenegro, Bosnia, and Herzegovina. As a result of these investigations, UNEP produced desk studies on the varied geographical environmental impacts of DU weapons, delineating the available scientific evidence of water, soil and air contamination. The UNEP team found differing impacts on the environment depending on the medium, and although most impacts were "mild" to "moderate" it is clear that the use of DU munitions has the potential be cumulative, as does the use of nuclear weapons.

In debates over nuclear arms, one observation is evident: the modification of the atom has altered the natural and human environments in previously unexpected ways to society. As some of the authors in this compilation are at pains to make clear, the mining, manufacture, use, and disposal of radioactive materials by a handful of nation-states has been a global environmental experiment (Jacob 1990). The results of these activities is yet unknown. Little is understood about the behavior of radioactive materials in the environment over hundreds of thousands of years (Blowers, et al. 1991). Scientists and other experts agree that atomic materials are generally harmful to living things (Walker 1992), although the extent to which they will be harmful in the long term is a mystery. Just as the explosion at Trinity was a test of a hypothesis, the future of nuclear weapons, embodied in the storage and disposal of high-level nuclear waste, is a test of current scientific knowledge about the behavior of modified radioactive materials and their impacts on natural and human-made environments.

Militarized Environments

Does the appropriation of environmental protection by defense apparatuses constitute "green" militaries or militarized environments (Käkönen 1994)? Conceptually, the "guilty-until-proven-innocent" logic of military law is identical to the precautionary principle, the latter being invoked regularly by advocates of environmental protection. Kent Butts (1994, 1999) argues that military protection is good for the environment, and that with its technical and organizational superiority in the realm of government agencies, militarization of the environment constitutes an appropriate and expedient response to environmental degradation at home (in the United States) and overseas. Hans-Peter Gasser (1995), Rymn Parsons (1998), Arthur Westing (2002), and John Quinn and colleagues (2002) similarly contend that the appropriation of environmental concerns into military training and operations manuals and procedures constitutes a full or partial internalization of environmental

protection during wartime. Scholars critical of these views identify ways in which the environment becomes dangerously militarized through the appropriation of environmental concerns by defense apparatuses. Militarization of the environment takes several forms: from global surveillance (Diebert 1999), coercive conservation (Peluso 1993), and fighting wars for biodiversity (Neumann 2003), to questions of environmental managerialism versus ecofacism (Byers 1994; Diebert 1999), and thinly veiled military environmental rhetoric (Ross 1994; Woodward 1998; Kuletz 1998). Together, these authors identify both the perceived social benefits and the often violent social consequences of the presence of a military hand in environmental protection.

Through the use of powerful linguistic images, conservationists involved in national park designation in Kenya frame the militarization of biodiversity protection as the prosecution of a "just war," and consequently legitimate human rights violations, as narrated by Roderick Neumann (2003). Nancy Peluso (1993) and Simon Dalby (1999) explore northern discourses of "global environmental imperatives" (Dalby 1999) whereby human rights in the former case, and southern sovereignty in the latter, are consistently violated. "Military environmentalist discourses" serve to portray the military establishment as environmentally proactive, thereby dissipating concern over military environmental trespasses (Woodward 1998). Similarly, in the United States media's treatment of the environmental spectacles committed by the nation's most ardent enemy at the time, Saddam Hussein, attention is drawn away from the military's degradation of the environment during peacetime while casting the U.S. military in the role of valiant environmental defender (Ross 1994). Valerie Kuletz (1998) challenges governmental claims of authority—based on science, technology, legal mandates, and prior use—that attempt to legitimate occupation and contamination of indigenous lands. Victor Sidel (2000) argues that intense military preparedness, rather than preventing war, is a lubricant for warmaking and environmental degradation during peacetime. Ronald Deibert (1999) provides a critique of employing military technologies toward environmental ends, citing their fundamental incompatibility and warning of military encroachment on public surveillance satellites.

WORKS CITED

Achterhuis, Hans. 1993. Scarcity and Sustainability, in Sachs, Wolfgang Ed. *Global Ecology: A New Arena of Political Conflict.* London, New Jersey: Zed Books.

Additional Protocol I to the Geneva Conventions of 1949. 1977. See Glen Plant (1992).

Annan, Kofi. 2001."Towards a Culture of Peace." Letters to future generations. UNESCO http://www.unesco.org/opi2/lettres/TextAnglais/AnnanE.html Accessed December 2003.

Allenby, B.R. 2000. Environmental security: Concept and implementation. *International Political Science Review* 21(1): 5-21.

American Heritage Dictionary online. Accessed September 2003.

Ayres, R.U. 1965. *Environmental Effects of Nuclear War.* New York: Hudson Institute.

Baechler, Günther. 1999. Environmental Degradation and Violent Conflict: Hypotheses, Research Agendas and Theory-building, in Suliman, Mohamed Ed. *Ecology, Politics and Violent Conflict.* New York: Zed Books.

Barnett, Jon. 2001. *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era. L*ondon, New York: Zed Books.

Barnett, Jon. 2003. Security and climate change. *Global Environmental Change* 13:7-17.

Beer, Francis A. 1981. *Peace Against War.* San Francisco: W.H. Freeman and Company.

Biswas, Asit K. 2000. Scientific assessment of the long-term environmental consequences of war, in Jay E. Austin and Carl E. Bruch, Eds. *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* Cambridge: Cambridge University Press.

Black, Jeremy. 2001. *War in the New Century.* London, New York: Continuum.

Bloom, Saul, John M. Miller, James Warner and Philippa Winkler. 1994. *Hidden Casualties: Environmental, Health and Political Consequences of the Persian Gulf War.* Berkeley: North Atlantic Books. p 294.

Blowers, et al. 1991

Butts, Kent Hughes. 1994. Why the military is good for the environment, in Käkönen, Jyrki Ed. *Green Security or Militarized Environment.* Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Butts, Kent Hughes. 1999. The Case for DOD Involvement in Environmental Security, in Deudney, Daniel H. and Richard A. Matthew. *Contested Grounds: Security and Conflict in the New Environmental Politics.* Albany: State University of New York Press.

Byers, BA. 1994. Armed forces and the conservation of biological diversity, in Jyrki Käkönen Ed. *Green Security or Militarized Environment.* Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Caggiano 1993

Carlton, Eric. 2001. *Militarism: Rule without Law.* Burlington: Ashgate.

Chalecki, Elizabeth. 2002. A New Vigilance: Identifying and Reducing the Risks of Environmental Terrorism. *Global Environmental Politics* 2(1): 46-64.

Chugoku Newspaper. 1992. *Exposure: Victims of Radiation Speak Out.* Tokyo. Kodansha International.

Chugoku Shimbun. 2001. *Discounted Casualties: The Human Cost of Depleted Uranium.* Japan. The Chugoku Newspaper.Clark, William C. and R.E. Munn Eds. 1986, *Sustainable Development of the Biosphere.* Cambridge: Cambridge University Press, quoted in Haas 2002.

Collier, P. 2000. *Economic causes of civil conflict and their implications for policy.* Washington DC: World Bank, quoted in Dudley et al. 2002.

Collier, Paul and Ian Bannon. 2003.

Conca, Ken. 1994. In the name of sustainability: Peace studies and environmental discourse, in Käkönen, Jyrki Ed. *Green Security or Militarized Environment.* Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Cronon, William. 1983. *Changes in the Land: Indians, Colonists, and the Ecology of New England.* New York: Hill and Wang.

Dalby, Simon. 1994. The politics of environmental security, in Käkönen, Jyrki Ed. *Green Security or Militarized Environment.* Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Dalby, Simon. 1999. Threats from the South? Geopolitics, Equity, and Environmental Security in Deudney, Daniel H. and Richard A. Matthew Eds. *Contested Grounds: Security and Conflict in the New Environmental Politics.* Albany: State University of New York Press.

Dalby, Simon. 2002. *Environmental Security.* Minneapolis, University of Minnesota Press.

Dawkins, Richard. 1989. *The Selfish Gene.* Oxford, New York: Oxford University Press.

Deudney, Daniel H. 1991. Environment and Security: Muddled Thinking, *Bulletin of the Atomic Scientists,* 47(3).

Deudney, Daniel H. 1999. Environmental Security: A Critique, in Deudney, Daniel H. and Richard A. Matthew Eds. *Contested Grounds: Security and Conflict in the New Environmental Politics.* Albany: State University of New York Press.

Diebert, Ronald J. 1999. Out of Focus: U.S. Military Satellites and Environmental Rescue in Deudney, Daniel H. and Richard A. Matthew Eds. *Contested Grounds: Security and Conflict in the New Environmental Politics.* Albany: State University of New York Press.

Dudley, Joseph P., Joshua R. Ginsberg, Andrew J. Plumptre, john A. Hart, Liliana C. Campos. 2002. Effects of War and Civil Strife on Wildlife and Wildlife Habitats. *Conservation Biology* 16(2): 319-329.

Dyer, Hugh, 2001. Environmental security and international relations: the case for enclosure. *Review of International Studies* 27: 441-450.

Ehrlich, Paul R. et al. 1993. Long-Term Biological Consequences of Nuclear War. *Science* 222: 1293-99.

Encyclopaedia Britannica online. Accessed September 2003.

FBI, Federal Bureau of Investigation. 2000. Counterterrorism: FBI Policy and Guidelines, as found at www.fbi.gov/contact/fo/jackson/cntrterr.htm quoted in Chalecki 2002.

Fairhead, James and Melissa Leach. 1995. False forest history, complicit social analysis: Rethinking some West African environmental narratives. *World Development* 23(6): 1023-1026.

Falk, Richard. 1984. Environmental disruption by military means and international law in Westing, Arthur Ed. *Environmental Warfare: A Technical, Legal, and Policy Appraisal* London, Philadelphia: Taylor & Francis.

Falk, Richard. 1988. "Nuclear Weapons" in *Arms Control, Disarmament and International Security.* Claremont, Ca: Regina Books.

Fujimura, Joan. 1992. Crafting Science: Standardized Packages, Boundary Objects and "Translation," in Andrew Pickering, Ed. *Science as Practice and Culture.* Chicago: University of Chicago Press.

Gallagher, Carole. 1993. *America Ground Zero: The Secret Nuclear War.* United States, DEKR Corp.

Gasser, Hans-Peter. 1995. For Better Protection of the Natural Environment in Armed Conflict: A Proposal for Action. *American Journal of International Law* 89(July): 637-644.

Gleditsch, Nils Petter. 1997. Environmental Conflict and the Democratic Peace in Gleditsch, Nils Petter Ed. *Conflict and the Environment.* Dordrecht: Kluwer Academic Publishers.

Gleick, PH. 1991. Environment and Security: the Clear Connections. *Bulletin of the Atomic Scientists* 47(3).

Grimmett, Richard F. 2002. *Report for Congress (received through the CRS web): Conventional arms transfers to developing nations, 1994-2001.* Order Code RL31529.

Guruswamy and Grillot 2001. *Arms Control and the Environment.* New York: Transnational Publishers

Haas, Peter M. 2002. Constructing Environmental Conflicts from Resource Scarcity *Global Environmental Politics* 2(1): 1-11.

Hartmann, Betsy. 1994. Population Fictions: The Malthusians Are Back in Town. *Dollars & Sense* 195: 14-19.

Hartmann, Betsy. 2001. Will the circle be unbroken: A critique of the project on Environment, Population, and Security, in Peluso, Nancy Lee and Michael Watts Eds. *Violent Environments.* Ithaca and London: Cornell University Press.

Harney, Corbin. 1995. *The Way It Is: One Water, One Air, One Mother Earth.* Nevada City: Blue Dolphin Publishing.

Holdren, John. 1991. Population and the Energy Problem. *Population and Environment* 12(3): 231-255 quoted in Haas 2002.

Holling, C.S., Ed. 1978 *Adaptive Environmental Assessment and Management.* New York: Wiley, quoted in Haas 2002.

Homer-Dixon, Thomas F. 1999. *Environment, Scarcity, and Violence.* Princeton: Princeton University Press.

Ishikawa, E. and D. Swain. 1981. *Hiroshima and Nagasaki, the Physical, Medical, and Social Effects of Atomic Bombings.* New York: Basic Books.

Izrael et al. 2000. Nuclear Explosions and their Environmental Contamination in book title: *Nuclear Test Explosions: Environmental and Human Impacts.* West Sussex, England: John Wiley & Sons.

Jacob Gerald. 1990. *Site Unseen: The Politics of Sitting a Nuclear Waste Repository.* Pittsburgh, Pa: University of Pittsburgh Press.

Jasanoff, Shiela. 2001. Judicial fictions: The Supreme Court's quest for good science *Society* 38 (4): 27-36.

Jordan, Andrew and Tim O'Riordan. 1997. Social Institutions and Climate Change. CSERGE Working Paper, GEC 97-15, quoted in Haas, Peter M. 2002. Constructing Environmental Conflicts from Resource Scarcity *Global Environmental Politics* 2(1).

Käkönen, Jyrki. 1994. *Green Security or Militarized Environment.* Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Kane, H. 1995. *The hour of departure: forces that create refugees and migrants.* Paper 125. Washington DC: Worldwatch, quoted in Dudley et al. 2002.

Keely, Lawrence H. 1996. *War before civilization.* New York: Oxford University Press, quoted in McNeely 2000.

Kuletz, Valerie. 1998. *Tainted Desert: Environmetal and Social Ruin in the American West.* New York: Routledge.

Leach, M. and R. Mearns. 1996. *The lie of the land: Challenging received wisdom on the African environment.* Oxford: James Currey.

Le Billon, Philippe. 2001. The political ecology of war: natural resources and armed conflicts. *Political Geography* 20: 561-584.

Lipschutz, Ronnie D. 1995. On security, in Lipschutz, Ed. *On Security* New York: Columbia University Press. 1-23.

Lipschutz, Ronnie D. 1997. Environmental Conflict and Environmental Determinism: The Relative Importance of Social and Natural Factors, in Gleditsch, Nils Petter Ed. *Conflict and the Environment.* Dordrecht: Kluwer Academic Publishers.

Lipschutz, Ronnie D. 2003. Which Resources Will Matter? Geopolitics, Economics, and Conflict, paper forthcoming at the American Bar Association Annual Meeting. August.

Lipschutz, Ronnie and Ken Conca. 1993. A Tale of Two Forests, in Lipschutz, Ronnie L. and Ken Conca Eds. *The State and Social Power in Global Environmental Politics.* New York: Columbia University Press.

Litfin, Karen T. 1998. Satellites and Sovereign Knowledge: Remote Sensing of the Global Environment, in Litfin, Karen T. Ed. *The Greening of Sovereignty in World Politics.* Cambridge, London: The MIT Press.

Martin, Paul S. and Christine R. Szuter. 1999. War Zones and Game Sinks in Lewis and Clark's West. *Conservation Biology* 13(1): 36.

McNeely, Jeffrey A. 2000. War and Biodiversity: An Assessment of Impacts, in Jay E. Austin and Carl E. Bruch, Eds. *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* Cambridge: Cambridge University Press.

Miller, Richard. 1986. *Under the Cloud: The Decades of Nuclear Testing.* New York: The Free Press.

Mische, Patricia. 1992. Security through defending the environment: citizens say yes, in E. Boulding, Ed. *New agendas for peace research: Conflict and security reexamined.* Boulder, Co.: Lynne Rienner.

Muradian, Roldan and Joan Martinez-Alier. 2001. Trade and the environment from a 'Southern' perspective *Ecological Eocnomics* 36(2): 281-297.

Nordstrom, Carolyn. 1997. *A different kind of war story.* Philadelphia: University of Pennsylvania Press.

Neumann, Roderick P. Moral and Discursive Geographies in the War for Biodiversity in Africa. Forthcoming in *Political Geography.*

Oxford English Dictionary online. Accessed September 2003.

Parsons, Rymn James. 1998. The Fight to Save the Planet: U.S. Armed Forces, "Greenkeeping," and Enforcement of the Law Pertaining to Environmental Protection During Armed Conflict.

Georgetown International Environmental Law Review. 10 (Winter): 441- 500.

Peluso, Nancy Lee. 1993. Coercing Conservation: the Politics of State Resource Control, in Lipschutz, Ronnie L. and Ken Conca Eds. *The State and Social Power in Global Environmental Politics.* New York: Columbia University Press.

Peluso, Nancy Lee and Michael Watts, Eds. 2001. *Violent Environments.* Ithaca, London: Cornell University Press.

Plant, Glen Ed. 1992. *Environmental Protection and the Law of War: a 'Fifth Geneva' Convention on the Protection of the Environment in Time of Armed Conflict.* London: Belhaven Press.

Quinn, John P., Richard T. Evans, Michael J. Boock. 2002. United States Navy Development of Operational-Environmental Doctrine, in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* New York: Cambridge University Press.

Richards, Alan. 2002. *Coping with Water Scarcity: The Governance Challenge.* San Diego: Institute on Global Conflict and Cooperation of the University of California. Policy Paper #54 (October)

Ross, Andrew. 1994. *The Chicago Gangster Theory of Life: Nature's Debt to Society.* London, New York: Verso.

Sidel, Victor W. The Impact of Military Preparedness and Militarism on Health and the Environment, in Jay E. Austin and Carl E. Bruch, Eds. *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* Cambridge: Cambridge University Press.

SIPRI (Stockholm International Peace Research Institute). 2003. *SIPRI Yearbook 2003: Armaments, disarmament and international security.* Oxford: Oxford University Press.

Shulman, Seth. 1992. *The Threat at Home: Confronting the Toxic Legacy of the U.S. Military.* Boston: Beacon.

Soper, Kate. 1995. *What is Nature?* Oxford, Cambridge: Blackwell.

Soroos, Marvin S. 1992. Conflict in the Use and Management of International Commons, in Käkönen, Jyrki Ed. *Perspectives on environmental conflict and international politics.* London: Pinter Publishers Limited.

Soroos, Marvin S. 1997. "The Canadian-Spanish 'Turbot War' of 1995: A Case Study in the Resolution of International Fishery Disputes," in Gleditsch, Nils Petter Ed. *Conflict and the Environment.* Dordrecht: Kluwer Academic Publishers.

Tansey, Geoff, Kath Tansey, and Paul Rogers, Eds. 1994. *A World Divided: Militarism and Development after the Cold War.* London: Earthscan, quoted in Dalby 1999.

Timura, Christopher T. 2001. "Environmental Conflict" and the social life of environmental security discourse. *Anthropological Quarterly* 74(3): 104-113.

Tolba, MK, OA El-Kholy et al. (eds). 1992. *The world environment 1972-1992: Two decades of challenge.* London: Chapman and Hall (on behalf of the United Nations Environment Programme).

UNDP. 1993. *Human Development Report.* Published for the United Nations Development Programme. New York: Oxford University Press.

UNDP. 1998. *Human Development Report.* Published for the United Nations Development Programme. New York: Oxford University Press.

UNDP. 2003. *Human Development Report 2003. Millennium Development Goals: A compact among nations to end human poverty.* Published for the United Nations Development Programme. New York: Oxford University Press.

United Nations Environmental Program. 1991. *Depleted Uranium in Kosovo: Post-Conflict Environmental Assessment.* Switzerland: United Nations Environmental Program.

United Nations Convention on Environmental Modification Techniques. 1999.

US Code: Title 22 Foreign Relations and Intercourse; Section 2656.

US Wilderness Act of 1964 (16 U.S.C. 1131-1136, 78 Stat. 890) -- Public Law 88-577

Walker 1992

Wallensteen, Peter; Johan Galtung & Carlos Portales. 1985. *Global Militarization.* London: Westview Press.

Wapner, Paul. 2002. The Sovereignty of Nature? Environmental Protection in a Postmodern Age. *Internatioal Studies Quarterly* 46: 167-187.

Westing, Arthur H. 1984. *Herbicides in War: the long-term ecological and human consequences.* London, Philadelphia: Taylor & Francis.

Westing, Arthur H. 2002. In Furtherance of Environmental Guidelines For Armed Forces During Peace and War, in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* (Project by the Environmental Law Institute) New York: Cambridge University Press. Pages 171-189.

Woodward, Rachel. 1998. "It's a Man's Life!": soldiers, masculinity and the countryside. *Gender, Place and Culture* 5(3): 227-300.

Woodward, Rachel. 2001. Khaki conservation: an examination of military environmentalist discoursed in the British Army. *Journal of Rural Studies* 17: 201-217.

Yuzon, Ensign Florencio J. 1996. Deliberate Environmental Modification Through the Use of Chemical and Biological Weapons: "Greening" the International Laws of Armed Conflict to Establish An Environmentally Protective Regime. *American University Journal of International Law & Policy.* 11: 793-846.

Allenby, B.R. 2000. Environmental security: Concept and implementation. *International Political Science Review* 21(1): 5-21.

Allenby, prominent in the field of Industrial Ecology, takes environmental security to be primarily a national policy concern, and posits that significantly more sophisticated policy structures will be required in the future to deal with a world characterized no longer by political blocs, but by fragmented nations with their concomitant fragmented interests. He emphasizes the need for very long-term policies to address global environmental change. He analogizes human institutions with natural systems, citing the work of teleological evolutionary forces in each. One of these institutional evolutionary trajectories is the environmental policy change from compliance to strategic; in other words, from environment as external to operations—whether they be military, industrial, or social—to environment as an integral component of operations, through all stages of planning and execution.

In an effort to lay the definitional foundation for some of these more sophisticated national policies, Allenby proposes a three-part test to determine whether an environmental issue is best understood and addressed within a national security framework. First, the environmental impacts must be substantial enough to be considered by the usual operational definition of national security. Second, the links between the environmental threat and the relevant impacts should be relatively certain and proximate. Third, the national security apparatus (e.g. Department of Defense in the United States) must be institutionally and culturally the most capable of mounting an effective response. While he claims that his approach to national environmental security policy can be equally applied to any national state, it is fairly clear that Allenby speaks exclusively to policymakers in Western democracies. He appears to assume a rational choice theoretic framework in international relations and foreign policymaking, underscoring the virtues of efficiency and cost-benefit assessment of welfare.

What follows is a framework for national environmental security policy within which the nation state is the discrete object of analysis. His analysis exemplifies the notion of environment as equivalent to renewable resources that nations at once degrade and depend upon plus scarce nonrenewable resources over which nations fight. Implicitly, the environment is neither a human home, nor a cultural artifact, and it lacks intrinsic value. A combination of institutional efficiency and strategic environmental science-based technological development are put forth as optimistic solutions to future national environmental security threats.

Baechler, Günther. 1999. Environmental Degradation and Violent Conflict: Hypotheses, Research Agendas and Theory-building, in Suliman, Mohamed Ed. *Ecology, Politics and Violent Conflict*. New York: Zed Books.

Baechler is one of the premier environmental security scholars, having published widely and having lead the enormous ENCOP (Environment and Conflict Projects) study from 1992-1996. Here, as elsewhere, he begins with the motivation that under certain conditions environmental degradation may cause violent conflict. Despite this normative conjecture, his chapter is a compelling and fairly complete and unbiased discussion of some of the social scientific methodological

debates and future challenges in linking environment and violent conflict. He addresses the critics of the social scientific methodology employed by environmental security scholars, both defending the important first attempts and noting the need for models to incorporate multivariate and nonlinear processes, actor-oriented approaches, and comparative outcomes of nonviolent conflict. Criticizing the critics, he contends that it is insufficient for skeptics to justify their criticism merely by stating that there is inherent complexity in environmental and social processes; for as he notes, one would be foolhardy to argue with this broad claim.

Additionally, Baechler addresses the definitional dilemma in establishing causal roles to "natural" and "human" processes. He proposes several different models of environmental change and violence, noting that how proximity of causation and causal linkages are defined changes the outcome of the models. Despite his helpful discussion about definitional issues, he fails to recognize that definitional problems arise also in the boundary work of making categories such as his independent variables "physical conditions, economic conditions, social conditions, cultural conditions, and political conditions." As a final note, Baechler's work might be considered the most riddled with security metaphors, repeatedly employing the term "trigger mechanisms" and other violent connotations.

Barnett, Jon. 2001. *The Meaning of Environmental Security: Ecological Politics and Policy in the New Security Era.* London, New York: Zed Books.

Barnett's excellent critical overview of the origins and trajectories of environmental security thinking offers a thoughtful contribution toward redefining this concept. He problematizes the discourses and offers the intellectual histories of both "environment" and "security." Critical of the environment and security literature, Barnett reveals his perception of one of its fatal underlying assumptions: that the goal of security as privileging the nation state is unchallenged, and results in "the further colonization of domestic society by realism's ultimately violent logic." (p48) He discusses the reclamation of the security concept by various nonmilitary authors, contributing his own ideas about reclaiming the notion of environmental security for future critical scholarship.

Barnett might be considered one of the few highly critical voices situated within the environmental security camp. He finds fault with the military appropriation of the concept, and the preclusion of cooperative outcomes that the military appeal to national security sometimes entails; however he simultaneously finds utility in the concept, and helps redefine it to encompass the notion of "human security" from environmental contingencies.

Barnett, Jon. 2003. Security and climate change. *Global Environmental Change* 13:7-17.

ABSTRACT

Despite it being the most studied and arguably most profound of global environmental change problems, there is relatively little research that explores climate change as a security issue. This paper systematically explores the range of possible connections between climate change and security, including national security considerations, human security concerns, military roles, and in discussion of the widely held assumption that climate change might trigger violent conflict. The paper explains

the ways in which climate change is a security issue. It includes in its discussion issues to do with both mitigation and adaptation of climate change.

SUMMARY

Barnett advances the argument that climate change is a security issue, and as such his is a voice fairly situated within the new wave of environmental security literature. His notion of environmental security is not in reference to violent conflicts arising from environmental scarcities; it is one of freedom from harm or uncertainty. He identifies island and low-lying nations as most obviously vulnerable to the environmental change posed by climate change, and thus identifies climate change as a security issue for certain communities and countries, and the United Nations Framework Convention on Climate Change as a critically important security treaty. According to Barnett, the security of additional nations may be indirectly affected if they choose or are obliged to intervene as negotiators or peacekeepers, and through disruptions to trade. Barnett is cautions about the link between climate change and violent conflict, citing the dearth of evidence and wealth of uncertainty about causal links between the two, and notes that future violent conflicts—at least between states—appear unlikely. However, developed nations face a challenge of adaptation, where certain physically vulnerable and underdeveloped nations face a challenge of survival. The intra-state vulnerabilities that developing nations face are far greater than developed nations due to their lack of institutional resilience for contending with contingency. He develops a "strength of states" argument similar to Gleditsch (1997) where regime type, environmental quality, and internal conflict are correlated. He addresses familiar themes such as migration and identity conflicts, and contends with the resource scarcity-abundance question (see LeBillon 2001). He addresses the immense contribution to climate emissions by militaries, and he adopts the United Nations Development Programme concept of "human security" as germane to his notion of a redefinition of environmental security. He addresses the inherent conflict between north and south, polluter and affected, and finally the rhetorical, political, and methodological problems with the environmental security concept itself. For all its troubles, Barnett identifies its utility: security communicates gravity, encapsulates danger, recasts danger as a threat to state sovereignty which stimulates national action, and serves as an integrative concept linking multiple notions of security (human, national, international). Also, the identification of insecurities brings to the fore issues of justice and the global political economy. He claims that a climate-change-security discourse could better resist appropriation from conventional national security thinking as its key concerns will be rooted in respectable science rather than conjecture.

Biswas, Asit K. 2000. Scientific assessment of the long-term environmental consequences of war, in Jay E. Austin and Carl E. Bruch, Eds. *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* Cambridge: Cambridge University Press.

Biswas' discussion includes the vast environmental consequences of all aspects of war making, bringing together the direct, indirect, short- and long-term, intentional and collateral, institutional and material consequences through an interdisciplinary approach. He begins by noting some of the changes in land-use patterns due to craters, landmines, and other remnants of war, and he outlines the potential impacts of biological, chemical, and nuclear weapons use. He discusses pollution of air and water, and more fundamentally, resource consumption due to military readiness and mobilization.

In discussing the hazardous materials generated by war efforts, he notes the institutional difficulty in assessing impacts.

> Because of the secrecy invariably associated with military activities, the types and quantities of hazardous wastes generated, appropriateness of the practices currently used for their disposal, and the overall environmental and health impacts of hazardous waste management processes are virtually unknown.

Biswas critiques the scientific and policy-making communities in not having produced, to date, a "detailed, comprehensive, and authoritative study on the short-, medium-, and long-term environmental impacts of a single war anywhere in the world"; and he continues to explain the scientific reasons why this is the case. These include methodological constraints such as the environmental impact assessment (EIA), which is an entrenched institution, yet the extent to which it effectively predicts medium- to long-term environmental impacts is unknown. Site-specificity, complexity of nonlinear systems, and the absence of long-term monitoring and evaluation are further constraints. Moreover he identifies the lack of funding and thus lack of scientific "interest" in developing countries where most wars take place. These obstacles in Biswas' view must be overcome in order to address the growing concerns about the impacts of war on the environment.

Butts, Kent Hughes. 1994. Why the military is good for the environment, in Käkönen, Jyrki Ed. *Green Security or Militarized Environment*. Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Kent Butts is a strategic analyst at the U.S. Army War College. Here he makes the argument that the institutional capacity of the U.S. Department of Defense (DoD) renders it uniquely situated to address environmental problems, compared with other private and public organizations. He sees the military's toxic legacy not as evidence to the contrary, but as similar to any other large landholding organization. While the debate rages on over whether environmental problems ought to be considered national security threats, he pragmatically points out that the (Clinton) administration and Congress (during Clinton) do consider the environment a national security issue. Since many of the military's technologies and procedural efficiency are well-suited to particular environmental problems domestically and globally, Butts relates that the following are already funded and ongoing:

- Using DoD and DoE nuclear weapons research supercomputers for modeling and comparing environmental data related to global warming;

- Transferring military program, advanced energy technology to the civilian sector;

- Utilizing defense resources to gather oceanographic and atmospheric data related to global warming;

- Using DoD research and development funds for environmental research programs.

The sheer size of DoD landholdings, according to the author, makes it one of the largest "environmental managers" in the United States. DoD lands thus provide a "buffer against development" because they are subject to strict state and federal procedures and regulations and the oversight of natural resource agencies. He goes on to give evidence through cases of successful environmental protection and regulatory compliance, analyzing the various divisions within the DoD that play unique roles.

Butts, Kent Hughes. 1999. The Case for DOD Involvement in Environmental Security, in Deudney, Daniel H. and Richard A. Matthew. *Contested Grounds: Security and Conflict in the New Environmental Politics.* Albany: State University of New York Press.

Kent Butts suggests that preemptive military action can prevent or reduce growing international environmental threats characterized by a cross-border component (e.g., clean air, desertification, and natural resource access). Such environmental problems contribute to international tension and conflict, and thus constitute a threat to U.S. national interests. Butts claims that the U.S. military is well suited to respond to environmental problems generally: both in restoring domestic environments, and in international environmental interventions. In defense of historical environmental transgressions by the U.S. military, he claims that it has of late "taken great strides" to address environmental security issues by mitigating domestic environmental problems and in promoting international biodiversity and conservation.

Internationally, Butts cites population growth as causal of resource depletion, subsequently threatening "the legitimacy of newly democratic governments" and creating pressures for governments to "seek solutions at the expense of their neighbors." Butts contends that domestic militaries in poor countries are frequently better organized, better trained and more technologically sophisticated than are comparable government organizations, thus nations ought to employ their domestic militaries in such environmental battles as anti-poaching control. Environmental issues are defined narrowly here, in terms of pollution and wild game numbers.

Butts' vision of military involvement in environmental issues includes national militaries drawing on the technical, training, and managerial expertise of the US Department of Defense to address hazardous waste assessment and mitigation design, environmental threat monitoring, water resource management, the teaching of natural resource conservation practices, disaster relief planning and training, and management of weapons of mass destruction disposal.

Byers, BA. 1994. Armed forces and the conservation of biological diversity, in Jyrki Käkönen Ed. *Green Security or Militarized Environment.* Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Byers poses the questions 1) What is the "optimum balance" between local community control and management by regional, national, or international institutions for conserving biodiversity resources? 2) Is the use of armed force to protect biodiversity an example of so-called "ecofascism"? Byers presents the current debate between conservationists and those who warn of the political power wielded by conservationists against the poor to be sometimes simplistic and polarized. He suggests a middle ground to "reconcile approaches to sustainable development" emphasizing both ecological and social factors. His basic assumption, that economic development is the most important means by which the world's poor can be helped, is made clear. He quotes sociobiologists and ecological economists about human carrying capacity, and shows an extremely simplistic and biased view of rural "poachers" in the American West recounting a history where the Army "protected" Yosemite from "local mismanagement" and "unsustainable exploitation" because of pressure from urban elites in the East.

Caggiano, Mark J.T. 1993. The Legitimacy of Environmental Destruction in Modern Warfare: Customary Substance over Conventional Form. *Boston College Environmental Affairs Law Review* 20 (Spring): 479-506.

> The success of efforts to prosecute President Hussein for "ecocide" will depend in large part on whether his deeds are actionable under existing international law, customary and conventional. (479)

Caggiano, editor of the Boston College Environmental Affairs Law Review, begins his article with a discussion of the 1991 Gulf War. He explains that toward the end of the conflict, Iraqi soldiers set 732 oil wells on fire in Kuwait at the direction of President Hussein in what Caggiano refers to as environmental terrorism. The environmental damage was enormous: each day the fires released 86 billion watts of heat. The fires created hundreds of miles of smoke that covered Kuwait, Qatar, Bahrin, the United Arab Emirates, Iraq, Iran, Oman and Yemen. They consumed 4,600,000 barrels of oil per day and released 1,900,000 metric tons of carbon dioxide, 20,000 metric tons of sulfur dioxide and 12,000 metric tons of soot into the air daily. The cleanup of the oil fires took thirty-four countries eight months to complete. The impact on the global environment was great and the long-term damage is still unknown.

Caggiano discusses international law concerning this environmental destruction using a bifurcated framework: conventional and customary law. Conventional law is based on treaties, conventions, and protocols between nation-states. Conventional law of war includes the Law of the Hague, the Law of Geneva, the Environmental Modification Convention, and Protocol I to the 1949 Geneva Convention. This body of law is independently agreed upon by nations under which they have certain obligations and rights. Legal scholars liken conventional law to the law of contracts. Customary law is quite different: it is not formal, well defined or agreed upon collectively. It is rather the common practice engaged in by a group of nations in a region over a long period of time.

Caggiano applies this bifurcated view of law to discuss the legality of the environmental destruction in the Persian Gulf War. He argues that both areas of international law apply to the Gulf War and that they constitute a case for criminal charges against the Iraqi regime. The main problem Caggiano identifies in effecting this process is the global community's failure of action against Iraq. His conclusion offers ways to bring the Iraqi regime and similarly situated regimes into the international courts of justice.

The Chugoku Newspaper. 1992. *Exposure: Victims of Radiation Speak Out.* Tokyo. Kodansha International.

Three years after the Chernobyl disaster, journalists from Hiroshima's daily paper, The Chugoku Newspaper, began to document cases of radioactive contamination across the globe. The journalists visited a wide range of sites in order to capture the complete life cycle of radioactive materials. They visited sites and populations in nations that use or have used radioactive materials. In the United States, sites exposed to radioactive contamination include: the plutonium manufacturing facility in Hanford, Washington, the decommissioned nuclear reactor at Three Mile Island, uranium mines on Navajo reservations in the four corner states, the Oak Ridge nuclear weapons complex in Tennessee, and the United States air base in Thule, Greenland. In the Soviet Union, the reporters

visited Semipalatinsk a town near the atomic bomb test site on the plains of Kazakhstan, the site of the Chernobyl explosion, and the site of the Ural Nuclear Disaster at the Kyshtym weapons facility. The journalists also visited test locations of the world's major nuclear powers. They discuss Britain's, France's and India's manufacture and testing of nuclear weapons.

Identifying the activities of nuclear weapons manufacture and the generation of nuclear power by powerful nation-states as an inherently destructive contest, the journalists portray the human suffering associated with these activities. In visiting various sites around the world, they connect seemingly different human contexts and experiences: the pursuit of nuclear power by nation-states generates individual and collective human suffering. In the conclusion of this volume, they propose alternative futures and paths for individual nation-states to pursue. The authors of Exposure propose that Japan take a leading role in the weapons reduction talks at the United Nation General Assembly. The journalists proclaim their belief that a world movement against nuclear arms production and use can develop if enough countries unite and work together. They argue that the effects of nuclear weapons are universally felt, so the most effective way to deal with the problem is through collective action. Finally, the volume provides an excellent table entitled "Radiation and Its Victims" which traces radioactive exposures back to the 15th century. The Appendix provides lists and definitions of terms used in the context of radioactive materials.

The Chugoku Shimbun. 2001. *Discounted Casualties: The Human Cost of Depleted Uranium. Japan.* The Chugoku Newspaper.

Hiroshima-based reporter Akiro Tashiro compiled stories of people exposed to the effects of depleted uranium (DU) ammunitions. Tashiro's aim is to provide anecdotal evidence of the powerful impact of DU ammunitions on people and their lives. Primarily looking at the use of DU ammunitions by the United States and United Kingdom, Tashiro questions the oft-cited claim that depleted uranium is less "radioactive" than natural uranium and has no impact on human or ecosystem health.

Tashiro begins his book with stories of United States military personnel who have experienced serious and debilitating illnesses since their return from the 1991 Gulf War. He also interviews people who live around DU manufacturing plants and testing grounds and have experienced serious medical problems. Tashiro shows the blinding reliance of the United States government on radioactive materials and nuclear energy. In the United Kingdom, similar stories of military illnesses are told. Tashiro visits Kuwait and Iraq to tell the story of the people who occupy DU contaminated landscapes. He ends the text with a discussion of the post-conflict environments of Yugoslavia. The story he weaves reveals the devastating environmental health impacts of depleted uranium around the globe.

Collier, Paul and Ian Bannon Eds. 2003. *Natural Resources and Violent Conflict: Options and Actions.* Washington D.C.: The World Bank Group Publications.

Collier and Bannon discuss the connection between resource dependence and violent conflict. Their research reveals that developing nations most dependent on the sale of primary natural resources are more likely to experience violent conflict. The fragile economies are vulnerable and unstable in times of civil war. The text is a collection of essays by various scholars exploring the connection between resource-dependent nations and the frequency of violent conflict. The contributors

consider the risks of corruption, secessionist movements, and rebel financing. They also consider the roles played by governments, the development community, and national populations. They offer an agenda for global action to diminish the likelihood of civil war, suggesting practical approaches for the international community to adopt.

Conca, Ken. 1994. In the name of sustainability: Peace studies and environmental discourse, in Käkönen, Jyrki Ed. *Green Security or Militarized Environment*. Aldershot, England and Brookfield, Vermont: Dartmouth Publishing Company Limited.

Conca situates his critique of the environmental security discourse within the growing recognition of the intimate links between the control and manipulation of environments and the control and manipulation of people. Conca writes from a peace studies perspective, and notes the invigoration of the peace studies arena via the incorporation of environmental concerns. He cautions, however, that if definitions of ecological soundness, particularly "ecological security," do not include peace and justice as criteria, then "not all of the prescribed pathways to ecological soundess will be equally peaceful or just." He notes, also, that there is no compelling reason for a global ecological sustainability effort to prevent further concentrations of wealth and power that already characterize global society.

Metaphorically and institutionally, Conca claims, the notion of "security" erects rigid boundaries in defining environmental problems and envisioning solutions, potentially precluding nonviolent efforts. Also, the underlying image of scarcity common throughout the environmental security literature carries with it both an association of the environment with a marketable commodity and the Malthusian metaphor of human carrying capacity.

In proposing solutions to the global environmental dilemma, Conca calls for north-south alliances like the efforts in protest of the unjust lending practices of the World Bank and other multilateral institutions.

Dalby, Simon. 1999. Threats from the South? Geopolitics, Equity, and Environmental Security in Deudney, Daniel H. and Richard A. Matthew Eds. *Contested Grounds: Security and Conflict in the New Environmental Politics*. Albany: State University of New York Press.

> Most of the wars of the last half century have occurred on the territories of the underdeveloped states, and continue to be fought with weapons supplied from the arms industries of northern states. (Tansey et al, cited in Dalby 1999)

Simon Dalby composes a "southern critique," positing that northern states employ the so-called "global environmental imperative" and its concomitant fears of environmental disaster to "limit southern development, or to control its political arrangements," namely cheap labor and resources for the north. Furthermore, in its recent efforts to frame environmental matters in terms of security, attention is "diverted away from 'internal' matters of consumption and resource usage in the developed states where a small minority of the world's population consumes a disproportionate amount of world resources, and produces huge quantities of pollution and greenhouse gases."

Dalby's answer to the self-imposed and environmental-security-inspired question "threats from

the south?" is an emphatic "no." He reorients northern environmental security concerns, and situates them in a larger and historical political economy to show that rhetorical threats from the south are tools for managerial power, and that the real global threats derive from the north itself. From the legacy of colonial resource extraction to massive resource consumption, Dalby offers this southern perspective of northern environmental politics veiled as "global" environmental concerns.

Dalby, Simon. 2002. *Environmental Security.* Minneapolis, University of Minnesota Press.

Dalby is professor of geography and political economy at Carleton University in Ottawa and a regular contributor to academic dialogues in the realm of environmental security. This latest book is a critical work on competing notions and discourses of environmental security and, in his words, an explication of the themes of "eco-imperialism." Dalby critically analyzes discourses of danger and security, emphasizing that since security has been largely about maintaining the dominant political and economic systems of the twentieth century, it is important to analyze how these systems and discourses have contributed to or overseen the destruction of nature and to challenge their specifications of danger and definitions of security (xxvii). He maintains that because geopolitical thought and security discourse remain enmeshed in colonial vocabularies (184), simply inserting environment into traditional formulations of security fails to question both whether ecological thinking might have fatal consequences for the security concept itself, and how it might challenge the very geopolitical identities rendered secure by conventional practices of national security policies (121). Through his insertion of colonial legacies and much-neglected indigenous and gendered narratives into conventionally a-historical accounts of environmental insecurities, Dalby exposes how, ironically specifications of security primarily contribute to rather than safeguard against endangerment and insecurity. Security "should be understood as a highly contested signifier that invokes numerous specifications of danger and legitimates practices of violence while simultaneously frequently promoting a modern liberal subjectivity on the bases of this violence." (154) "Insecurity and its converse, a metaphysics of domination...perpetuate all sorts of insecurities." (169) When the identity of modernity is taken for granted in security studies, Dalby argues, sustaining security means expanding state control and increasing abuses of local resources toward supplying an ever-expanding production system (157). It is these very disruptions and dislocations that render numerous constituencies insecure. He critiques much of environmental security thinking, defined approximately as brainchild and extension of conventional geopolitics and security studies, as administering triage rather than seeking to understand fundamental causes (154).

Dalby suggests reading ecology as a "profoundly subversive way of challenging the taken-for-granted categories of international security" (125) where ecological metaphors extend to a sense of interconnected securities and adaptive political systems. A common, interconnected security rather than national or compartmentalized security is Dalby's alternative vision. Highly critical of modernist geopolitics that privilege the nation state as the referent object, he identifies precisely this mode of thinking as prefiguring intrastate conflict. Dalby identifies that recent recognition of globalization and the non-conformability of environmental problems to geopolitical borders contributes to his offering of an ecological mode of thinking about security, including recognizing natural limits, acknowledging the interconnectedness of things, envisioning humanity as embodying rather than inhabiting Earth, expecting complexity in natural-social systems, and recognizing evolutionary change.

In discussion of "human security" as proposed by the United Nations, Dalby hopes that this type of thinking might "shift the referent objects of security from the state to the human individual…without presupposing the identity of these individuals as neoliberal citizen consumers embedded in a mesh of claims to universal rights" (156). Dalby's vision of an honestly "ecological" security is both nuanced and fundamental where security is embodied in the ecological sustainability of the planet. However, his suggestion for reconceiving security in terms of ecological metaphors is not developed to the point of grappling with (even acknowledging) debates in the primary ecological literature, drafting policy measures, or proposing future research agendas, and in this sense is something of a utopia. He poses fundamental security questions about the future of civilizations and the future of the Earth and suggests two extreme futures, one an ecological future, and the other a tragic extension of modernity.

"Is what is most valuable a viable planetary biosphere for a civilization (or civilizations) that lives well within the ecological possibilities of a small planet? Or is the planet to be used as a resource base to construct a technological, but very definitely colonial, future with a continuation or acceleration of all the inequities and political violence that this has so far engendered?" (183)

Thus, Dalby implores environmental security scholars to seriously consider the question "security for whom?"

Deudney, Daniel H. 1991. Environment and Security: Muddled Thinking, *Bulletin of the Atomic Scientists*, 47(3).

Deudney cites examples of resource wars throughout recent history, but argues that claims of resource wars (also known as the environment-conflict thesis) are diminishing in plausibility over time. Historical examples of resource wars include Hitler's goal of resource autonomy through imperialist expansion, the Japanese invasion of Southeast Asia in facing Western embargoes and its lack of indigenous fuel and minerals, and the United States' fear of shortages and industrial stagnation which helped fuel east-west conflict over Third World nations.

In modern times, "the robust character of the world trade system means that resource dependency is no longer a major threat to a nation's military security and political autonomy… Iraq's invasion of Kuwait fits the older pattern but was based upon a truly exceptional imbalance between power (Iraq had the fourth-largest military force in the world) and wealth (Kuwait had the third-largest oil reserves and a tiny military)."

He blames environmentalists for linking national security to the environment instead of realizing that the emergence of global environmental problems calls into question the very foundation of national sovereignty and national security. He argues that environmental activists who employ military metaphors in appealing to the public for support ("war on pollution," etc.) undermine, in the long-term, their own goals of environmental preservation; he claims that in this way the environment-conflict thesis, while it is a weak thesis in modern times, may develop attributes of a self-fulfilling prophecy.

Deudney, Daniel H. 1999. Environmental Security: A Critique, in Deudney, Daniel H. and Richard A. Matthew Eds. *Contested Grounds: Security and Conflict in the New Environmental Politics.* Albany: State University of New York Press.

Deudney critiques the environmental security concept as being premised on an absolute scarcity of future resources argument. He questions what the paradigm of a "green" transformation of society should be, noting that while the appropriation of the security metaphor helped the military to maintain activity and funding in the post-Cold War era, the metaphor may prove damaging for the greening of society. He makes three claims about the counterproductive character of the environmental security concept: first that it is analytically misleading because the traditional focus of security on interstate violence is incompatible with defining environmental problems and solutions, where the credible threat of military appropriation of environmental protection is "eco-totalitarianism." Second, the privileging of the nation system and its bedfellow nationalism could be counterproductive to both global and local environmental efforts. Third, environmental degradation is unlikely to cause interstate wars.

Furthermore, he contends, most environmental degradation is not caused by the preparation for and practice of war, thus, even if we were to eliminate these, environmental degradation would remain. The main sources and solutions are found outside the domain of the traditional national security system. Metaphorically, Deudney explains, wars require victory and a return to peace, and "such a cycle of passivity and arousal is not likely to make much of a contribution to establishing enduring patterns of environmentally sound behavior." In a critique of framing environmental degradation in terms of the security metaphor, the metaphor's inconsistency is articulated in the notion that "we have met the enemy, and the enemy is us."

Diebert, Ronald J. 1999. Out of Focus: U.S. Military Satellites and Environmental Rescue in Deudney, Daniel H. and Richard A. Matthew Eds. *Contested Grounds: Security and Conflict in the New Environmental Politics.* Albany: State University of New York Press.

Diebert's is a critique of employing military technologies toward environmental ends. He begins by noting that control over information technologies has long been an important source of social power. He tells the brief history of investment in surveillance technologies, acknowledging the context of Cold War hostilities and citing the millions of dollars spent by the U.S. and the USSR militaries. Diebert poses his thesis questions,

> Should the military be given a role in environmental rescue? What are the risks of redirecting military expertise toward the environment? Are environmental problems and military solutions compatible?

While it is unclear precisely what is meant by "environmental rescue" one might presume that it is his peculiar metaphor used to refer to protection of the natural environment from a perceived anthropogenically destructive fate.

Diebert compares the institutions that have emerged for military and civilian approaches to satellite reconnaissance, and his argument becomes transparent: "the case of U.S. satellite reconnaissance offers a clear illustration of the perils of redirecting military expertise toward the environment."

While environmentally dedicated satellite surveillance systems are proliferating rapidly, Diebert cautions that these are not autonomous and may be appropriated by the military for the purposes of "national security." During the Gulf War, the U.S. Air Force became the single largest consumer in the world of commercial satellite imagery, and these data were used to program "smart bombs."

As far as military systems go, scientists may request data for scientific inquiry "blindly" with intelligence officials determining whether or not to grant access, and much data remains classified. There is "extensive institutionalized secrecy" associated with military systems, and Diebert warns of the possibility of "deception or manipulation of data to serve national security interests that might not coincide with environmental research and protection." This technological military hegemony helps throw the question of "good" vs. "bad" science (see Jasanoff 2001) further into obscurity.

Dudley, Joseph P., Joshua R. Ginsberg, Andrew J. Plumptre, John A. Hart, Liliana C. Campos. 2002. Effects of War and Civil Strife on Wildlife and Wildlife Habitats. *Conservation Biology* 16(2): 319-329.

This paper focuses on the effects of war and civil strife on animal wildlife, especially megafauna. The authors dispel the theory that war creates refuges for wildlife in the "no man's lands" created during conflict (see Martin & Szuter 1999; McNeely 2000), and assert that "any potential benefits of human warfare for wildlife populations will be transient at best and overwhelmed in the long term by the debilitating after-shocks of war on environments, economies, and civil society." The remainder of the paper contributes little original material, but gives a reasonable integration of key findings of many other works which contribute to the assessment of war's impact on the environment from a biological-scientific perspective; particularly useful is a summary table of several major works and their findings, however, it should not be considered a compendium.

Dyer, Hugh, 2001. Environmental security and international relations: the case for enclosure. *Review of International Studies* 27: 441-450.

Dyer understands environmental security as essentially a reformulation of International Relations studies, where historically, the nation state was the unit of reference for notions of security. He explores the deficiencies of this referent, specifically its inability to recognize threats from or effect policy on global environmental change, and contends that an environmental security referent may be useful in reformulating notions of security. He argues that it is not inconceivable to move from an anthropocentric to an eco-centric perspective in which the global environment becomes the object referent of security, although how this is to be achieved is left to the imagination. The problem he identifies in enclosing environmental concerns into international relations and security studies is in conflating environmental and security concepts, "potentially doing violence to both." Yet he remains convinced that a "fulsome conception of security must surely encompass whatever presents us with an apparent sense of insecurity, as environmental change clearly does."

Dyer problematizes the concepts of security, environment, and sovereignty, and raises the question of what is to be secured, and from whom? He juxtaposes social groups with the environment to better locate the object under threat: social groups or the environment. He notes that national

interests vary greatly in the environmental security context, since security in this sense is related to environmental impacts that are uneven. An interesting final remark is made about the challenge this concept might pose to traditional academic disciplinary categories, noting that "[i]f coping with processes of change is more important than preserving time-bound and space-bound conditions, then the meaning of security, with its preservationist connotation, is directly challenged." As a final note, he warns of the potential of the environment to become another tool of hegemonic power.

Gallagher, Carole. 1993. *America Ground Zero: The Secret Nuclear War.* United States, DEKR Corporation.

> The contemplation of things as they are, without error or confusion, without substitute or imposture, is in itself a nobler thing than a whole harvest of invention. (xxiii)

Gallagher, a photojournalist, focuses her research on the impacts of America's "secret nuclear war" with peoples downwind of the Nevada Test Site. Her text combines individual stories about the lives of people living downwind of the Nevada Test Site with images of the "sacrificed" landscapes. Gallagher seeks to connect the autobiographical history of people in the American Southwest with the geographical and military histories of the landscape. Her historical narrative is constructed through a combination of words and black and white photographs. Gallagher seeks to contemplate things in the world "as they are," "horrific and beautiful." Her editorial effort in selecting stories and photographs powerfully communicates the horrific impacts of nuclear weapons on humans and the natural environment.

At the beginning of this volume, a map of the United States indicating the areas crossed by a single nuclear cloud is nearly blacked out. As the map shows, the fallout from atomic testing has touched every region of the United States. The areas most affected by testing are the Mormon towns of northern Arizona, southern Nevada, and Utah. Her photographic essay is 427 pages of stories, experiences and stark realizations about the federal government's nuclear testing program that denied life or health to thousands. In the final photographs, Gallagher portrays the image of a cowboy "bowed but not broken" paired with the images of destroyed, lifeless landscapes. She concludes with a poem about hope for the "American Eagle to straighten up and fly right."

Gasser, Hans-Peter. 1995. For Better Protection of the Natural Environment in Armed Conflict: A Proposal for Action. *American Journal of International Law* 89(July): 637-644.

Gasser, a legal scholar, provides a concise discussion of the international laws of war. He highlights that as early as 1868 in the Declaration of Saint Petersburg, nation-states agreed that there ought to be limits to what is attacked and destroyed during times of armed conflict. He traces the history of these de jure limits to the present, with particular consideration for the actions of the Iraqi armed forces during the Gulf War. Gasser considers the proposals by the Governing Council of the United Nations Environment Programme to limit and ban weapons that cause extensive harm to the environment, and the proposals by the International Conference of the Red Cross and Red Crescent for more stringent protections of the environment. Gasser concludes by asserting his perception of the need to make laws for the protection of the environment more familiar to armed forces. His ap-

pendix provides guidelines for appropriating these concerns into military manuals and instructions for the protection of the environment in times of armed conflict.

Gerber, Michele Stenehjem. 1992. *On the Home Front: The Cold War Legacy of the Hanford Nuclear Site.* Lincoln: University of Nebraska Press.

Michele Gerber, an independent researcher and writer, explores a significant part of America's nuclear legacy at the Hanford Engineer Works ("Hanford Site"). It was constructed in the early 1940's to produce plutonium for the first nuclear weapons. In this text, Gerber describes the history of the Hanford Site from the first construction activities, initial operations, World War II successes, to the late 1980s release of declassified reports of systemic environmental contamination there. The Hanford Site was one of the first nuclear facilities in the U.S. to conduct extensive environmental monitoring of the air, water, and soil releases. These documents indicate repeated releases of radioiodine causing harmful exposures to the biosphere and to the human populations in the vicinity.

The text details the selection of the enormous tract of land for the placement and construction of the plutonium and uranium-235 manufacturing facility. The plant was constructed according to meet the needs of the cold war. This means that is was quickly constructed in just over two years with limited attention given to safety and durability. Gerber explains that this failure in safety and durability standards facilitated the continuous iodine and other radioactive material releases that contaminated the local environment and populations. The most famous of the releases was "Green Run." Because of the U.S. government's myopia, the site is now on the Comprehensive Environmental Response, Compensation and Liability Act's (CERCLA) national priorities list, popularly called "Superfund."

Hanford was born in the haze of intense national secrecy. Gerber explains that secrecy in the name of national security resulted in mass deception, which calls into question the basis of U.S. democracy. The official position of the U.S. Government is indicated in a quote by Henson Moore, Former U.S. Deputy Secretary of Energy in 1989 when he said: "The way we've operated these plants in the past was: 'This is our business, it's national security, everybody else butt out…' They're not going to be operated that way anymore." Throughout the post-war years concerned residents of Richland, Washington were continuously assured of the safety of the facility and of the excellent environmental health and monitoring.

With the release of classified information upon the eve of the closure of the last reactor at the site in the late 1980s, the deliberate deception about the real health and environmental consequences was revealed. The shock and anger of the Washingtonian and Oregonian populations was widespread. Gerber discusses the aftermath of these exposures in the last chapter of her text, paying particular attention to the struggles of the local population.

Ginger, Ann Fagan. 1998. *Nuclear Weapons Are Illegal: The Historic Opinion of the World Court and How It Will Be Enforced.* New York: Apex Press.

Ann Fagan Ginger, scholar and activist for disarmament, draws together a collection of documents to discuss a little known decision by the World Court. On July 8, 1996, the Court decided the

case against the creation, threat and use of nuclear weapons. The Court's majority issued an opinion at the request of the United Nations General Assembly that: "There exists an obligation to pursue in good faith and bring to a conclusion negotiations leading to nuclear disarmament in all its aspects under strict and effective international control." The opinion was based on the court's assessment of evidence offered by individuals and nations about the harm caused by the manufacture, threat and use of nuclear weapons. Looking to the rules of international humanitarian law, the judges explained that the use of nuclear weapons violates six provisions established to prevent undue harm on military and civilian populations and the environment. Nuclear weapons were found to destabilize humanitarian institutions and laws.

In Part IV of this volume, Ginger illustrates the various actions individuals in nuclear nations have taken to help enforce the opinion of the World Court. Several government officials in the United States, Canada, Europe, United Kingdom, Norway, Australia, and Central Asia took official action in their government bodies to enact national legislation to decrease nuclear dependence and decommission nuclear weapons. Ginger points out that the World Court opinion introduced a potential new trend in the drift to peace rather than the drift to war. Her text provides excerpts from the Court transcript and the opinions of the majority and dissenting participants.

Gleditsch, Nils Petter. 1997. Environmental Conflict and the Democratic Peace, in Gleditsch, Nils Petter Ed. *Conflict and the Environment*. Dordrecht: Kluwer Academic Publishers.

ABSTRACT

Resource scarcity, and in particular the struggle for territory, is a traditional source of conflict and war. After the end of the Cold War in particular, many have suggested that environmental degradation will exacerbate scarcities and become an additional source of armed conflict. This chapter argues that although the potential for environmental conflict needs to be taken seriously, the current wave of democratization leaves room for much greater optimism. Democracies rarely, if ever, fight one another and civil war is exceedingly unlikely in established democracies. These regularities are unlikely to be reversed even in the face of environmental degradation and resource competition. On the contrary, competition for resources between democracies frequently leads to increased cooperation. In addition, democracies are—everything else being equal—likely to have more enlightened environmental policies, so that the chance of serious environmental degradation in a democracy is less than in an autocracy. This further decreases the probability that democracies will become embroiled in violent conflict internally or externally as a result of environmental degradation.

SUMMARY

Gleditsch explores the conclusions of the vast environment-conflict literature and identifies its main methodological weakness: bias in selection of cases where a positive correlation is known, and lack of a testable multivariate theory. Gleditsch focuses his ensuing argument on the "third variable": political democracy. He contends that the relationship between environmental degradation and violent conflict is mediated by regime type, and he concludes that the presence of democracy makes environmental degradation less likely and decreases the chances of war.

He finds that, all else being equal, democracies have superior environmental performance using a range of indicators from climate gases to biodiversity. He cites a common objection to the idea that democracies practice environmentally more benign policies, that they only enjoy their environmental quality at environmental cost to developing nations; yet he counters this objection by claiming that there is no systematic evidence for such a thesis (however see Muradian and Martinez-Alier 2001). He finds also that democracies rarely go to war with one another, however they participate as much in wars as countries with other regime types, initiate wars less frequently, and a substantial proportion of their war participation comes through alliances with countries already at war. Pairs of mixed regimes are more war prone than homogenous pairs. Gleditsch does not address the thesis that autocracies are equally likely to maintain peace amongst one another as democracies.

Gleick, PH. 1991. Environment and Security: the Clear Connections. *Bulletin of the Atomic Scientists* 47(3).

A prolific writer, particularly in the subject of Middle East conflicts over water, Gleick is president of the nonprofit organization the Pacific Institute, which has a division on Environment and Security and publishes the journal Global Change. This paper is part of the Gleick-Deudney debate in the Journal of Atomic Scientists.

Some scholars have called for a redefinition of international or national security to include environmental concerns, however Gleick suggests that what is necessary is a better understanding of the threats of resource problems to security. "The many models developed since [von Clausewitz's] time to explain international behavior have not considered access to resources and the degradation of global environmental services a central problem of international politics and security." Citing Jessica Tuchman Mathews, he notes that conventional geopolitics is inadequate for managing increasingly complex international situations. He critiques two polarized views of environment and security: the Deudneys who see a danger in appropriating environment into security concerns, and the Environmental Security advocates who see danger in precluding the environment from notions of security, over which military and political concerns have until now enjoyed a monopoly. He proposes a middle ground between these poles, although in such a short paper it is unclear how his view is precisely situated as unique, other than perhaps rhetorically, from his portrayal of the environmental security perspective. Unfortunately, Gleick muddles "natural resources" and "environment," substituting the former for the latter when it conveniently fits into his thesis. He cites the growing academic and political interest in the connections between natural resources and conflict as proof that the era of environmental conflict is nigh. While he acknowledges that "environmental problems cannot be isolated from underlying social, economic, and political causes," his primary goal is to highlight his notion of impending global environmental doom, and he poses solutions based in a familiar hegemonic development economics mode.

Gregory, Shaun. 1990. *The Hidden Costs of Deterrence: Nuclear Weapons Accidents.* London: Brassey's.

Shaun Gregory, scholar at the School of Peace Studies at the University of Bradford, England, injects himself into an historical debate about the safety of nuclear weapons. Gregory takes to task questions that continue to mount about nuclear weapons accidents. He defines these as accidents

which have caused, or might have caused, detonation of, or damage to nuclear weapons. Gregory draws together work from cross-disciplinary examinations of the safety and security of nuclear weapons, the causes of accidents, the dangers associated with nuclear weapons, and the data on known accidents to make a focused and rather balanced analysis of the subject matter.

This book provides a general discussion of the creation, manufacture and use of nuclear weapons, and includes impacts on the natural environment and human safety. Gregory identifies transportation as the riskiest of all behaviors associated with nuclear weapons, pointing out that most nuclear weapons accidents have occurred in transit. After assessing more than 250 nuclear weapons accidents from 1950 to 1990 in the United States, the Soviet Union, and England, Gregory concludes that the risk to human health and the environment by such accidents is substantial. He argues that armed nation-states ought to put more defense resources toward protecting the public and the environment from these accidents. He indicates a growing need to focus on those states that seek to join or have recently joined the nuclear club: Israel, Pakistan, and Iraq. Gregory suggests ways to reduce nuclear weapons accidents that include dealing with human and technological error and insecurity, updating skills and technology, and improving civilian knowledge and the institutional ability to respond to such accidents. The appendices include a detailed list of accidents involving nuclear-capable aircraft and a discussion of state-by-state accident response capability.

Haas, Peter M. 2002. Constructing Environmental Conflicts from Resource Scarcity *Global Environmental Politics* 2(1): 1-11.

This is a literature review article in which Peter Haas contributes to environmental security discourse analysis. Noting that the idea that societies' exhaustion of resources may contribute to armed conflict has been part of the economics and politics literatures for at least 130 years, Haas claims that a focus on material scarcity is a "meager part of much richer approaches to understanding conflict and cooperation more generally." His argument is that US interventions justified through environmental security claims are flawed, and "selectively invoked by policy-makers and inattentive academics in order to justify preexisting state goals." Here Haas attempts to analyze dominant environmental security discourses to illuminate the effect of tacit assumptions on people's thinking and to help debunk pernicious myths.

He identifies four dominant discourses in environmental thinking, as discussed above. He challenges the environment-conflict thesis in his observation that "The empirical record of wars fought over resources is quite meager. There are few direct or indirect cases of violence, in Homer-Dixon's work or others'. In fact, virtually no one has been killed in direct international conflicts over water or any other resource." International relations scholars, according to Haas, would expect resource scarcity to galvanize armed conflict only under highly polarized circumstances in which states are looking for a provocation to fight." The environment-conflict argument suffers, he claims, from the "neglect of markets and policy interventions that could influence distribution, poverty reduction, and poor people's ability to pay for access to resources, or invest in producing more resources."

Haas identifies the counter-productivity of one of the initial tactical motivations behind the first environmental security literature which was to get the environment onto the US foreign policy agenda: the concept was appropriated by the pentagon and consequently most of the available fund-

ing went toward cleaning up military bases rather than to other purposes deemed "environmental security" priorities.

Harney, Corbin. 1995. *The Way It Is: One Water, One Air, One Mother Earth.* Nevada City: Blue Dolphin Publishing.

> The Native people always think of the earth first, because we have been told to take care of what we got. (8)

Spiritual Leader of the Western Shoshone Nation, Corbin Harney, fundamentally questions the mining of uranium, the use of nuclear energy in general, and in particular the use of Shoshone Lands for the testing and future disposal of nuclear energy waste materials. Harney believes that these practices are fundamentally damaging the earth and the local ecosystem. In this book, Corbin argues against the practices of the U.S. government by positioning them against the traditional practices of the Shoshone people. He encourages a Shoshone vision of the desert lands rather than the white man's vision. He discusses the Shoshone belief and teachings that the earth and humans are interconnected, offering examples of Western Shoshone prayers and ceremonies to express this connection. This outspoken leader contributes this volume to address Shoshone concerns and to send a message to present and future generations.

In particular, Harney fights against the siting of the nuclear waste facility at Yucca Mountain, which is Western Shoshone traditional land. He warns of the dangers of the use of materials about which humans lack a full understanding. Readers are exposed to the Shoshone world vision, which views all of life as interconnected. This vision would preclude the human introduction of nuclear materials into a particular locale, as it will ultimately affect the entire planet. The book provides appendices of several United States government and Western Shoshone documents.

Hartmann, Betsy. 2001. Will the Circle Be Unbroken? A Critique of the Project on Environment, Population, and Security, in Peluso, Nancy Lee and Michael Watts Eds. *Violent Environments.* Ithaca and London: Cornell University Press.

Hartmann notes that the environment and security field has become a vast and well-funded academic and policy enterprise, and gives it credit for "becoming more self-reflective" in recent years since Robert Kaplan's (1994; 1996) "racialized, sexualized, and apocalyptic" contribution to the field. This self-reflection is required, she maintains, to attract Third World and women scholars to the table.

Despite her mild praise, she passes out more critiques of environmental security than compliments. Quoting James Fairhead (1997; 2001) on the concept of environmental security, Hartmann agrees that the concept conflates distinct processes (the generation of renewable resource scarcities, environmental degradation, population growth, and the social distribution of resources) into a single overarching term that is "tantamount to analytical obfuscation."

Hartmann summarizes the methodological critiques of the major projects in this field, outlining some of the built-in analytical obscurity, then presents her own critique of the presentation style and results interpretation of the research of Thomas Homer-Dixon and Jessica Blitt in Ecoviolence. She claims they use speculative evidence, assumptions about historical patterns of land use, misap-

plied soil erosion indicators, and other misappropriated received wisdom. Hartmann also contends that their work suffers from a lack of historical narrative and political economy of trade and finance, and a lack of reference to the international arms trade. Perhaps some of the cases they look at are cases of "environmental violence," but as a social scientific enterprise, she claims, their project was a failure. She critiques "ingenuity" as technocracy, and claims that the physical determinacy of its spiral of scarcity "becomes a way to nationalize persistent social and economic inequalities between and within countries."

Hartmann suggest that the "environmental entitlements" framework (Leach et al. 1997) offers a "much more complex, historical, and pluralist approach to understanding both the dynamics of local ecologies and the diverse institutions and differentiated social actors that affect and are affected by them."

Homer-Dixon, Thomas F. 1999. *Environment, Scarcity, and Violence.* Princeton: Princeton University Press.

Homer-Dixon is a prolific writer in the area of Environmental Security. He has contributed numerous books, book chapters and journal articles; from 1994-96 he was head of the Environment, Population, and Security Project, a joint effort with the American Association for the Advancement of Science; from 1994-98 he was head of the Project on Environmental Scarcity, State Capacity, and Civil Violence in partnership with the American Academy of Arts and Sciences; At the University of Toronto, he is Director of the Centre for the Study of Peace and Conflict where he is Associate Professor of Political Science.

This book presents the results of the social-scientific, empirically based set of projects mentioned above linking the causal role of "environmental scarcity" to violent intra-state conflict. Homer-Dixon uses process tracing of single cases of environmental scarcity and violence, and argues that, at early stages of research in causality, researchers ought to select cases that show a prima facie link between the variables—noting that at best such an approach can demonstrate only the plausibility of causal linkages. The author focuses on two types of violence he identifies as probable in coming decades. These are "ethnic clashes arising from population migration and deepened social cleavages due to environmental scarcity" and "civil strife (including insurgency, banditry, and coups d'etat) caused by environmental scarcity that affects economic productivity and, in turn, people's livelihoods, the behavior of elite groups, and the ability of states to meet these changing demands" (5).

He argues "that many developing countries face increasingly complex, fast-moving, and interacting environmental scarcities. These scarcities can overwhelm efforts to produce constructive change and can actually reduce a country's ability to deliver reform. Consequently, environmental scarcity sometimes helps to drive societies into a self-reinforcing spiral of violence, institutional dysfunction, and social fragmentation" (5).

He is clear to point out that environmental scarcity is just a thread in a tangled web of complex factors that contribute to violence, but contends that environmental scarcity plays some indirect causal role in effecting intrastate violence. He identifies "environmental scarcity" as scarcity of renewable resources, broadly defined, and identifies three means by which such scarcity arises: from depletion or degradation of the resource, from increased demand for it, and from unequal distribution.

He argues that, once environmental scarcity becomes irreversible, then it is, "almost by definition, an external influence on society."

The author reveals his concern for population growth as an important factor that will contribute to future violent conflicts, a claim that is quick to earn him criticism in later works by political ecologists (see Peluso & Watts 2001; Hartmann, 2001; Dalby 2002; Lipschutz 1997; Timura 2001). Homer-Dixon claims, in preemptive self-defense on this point, that analysts who place too much emphasis on ultimate causes of conflicts (political, economic, and social factors) are ignorant of the way that environmental scarcity shapes these factors through the "particular physical characteristics of the society's surrounding environment" (page 17). However it is unclear how human population growth is a "physical factor" of the environment. He uses demand-induced scarcity synonymously with population growth although demand can rise because of a number of social factors including fashion, planned obsolescence of products, "over-consumption," etc. Also, demand can shrink at the same time population grows (Hartmann).

Another of Homer-Dixon's claims that has earned him widespread recognition is his treatment of what he calls the "ingenuity" of nations to adapt to scarcity. This ingenuity includes the development of efficient markets, clear and enforced property rights, and effective government; where a lack of ingenuity combined with environmental scarcity results in a vicious cycle of violence, environmental degradation, and unaccountable governance. It is implied that Western democracies are replete with ingenuity, while poor Southern states suffer from an "ingenuity gap." Whatever the applicability of this model, critics are quick to point out the assumption that modernization and progress are shared global goals upon which much of his argument seems to rest. The implications of his conclusions appear to send the following messages to Western policymakers: human population must be controlled in the developing world; the environment must be managed through the creation of property rights, markets, and technology; and all because developing and underdeveloped nations threaten international security through a vicious circle of lack of ingenuity and environmental degradation.

Jacob, Gerald. 1990. *Site Unseen: The Politics of Siting a Nuclear Waste Repository*. Pittsburgh, Pennsylvania: University of Pittsburgh Press.

> While vast resources have been expended on developing complex and sophisticated technologies, the equally sophisticated political processes and institutions required to develop a credible and legitimate strategy for nuclear waste management have not been developed. The history of high-level radioactive waste management describes repeated failure to recognize the need for institutional reform and reconstruction. Nuclear waste policy is the legacy of an unwillingness to discard the authority and commitments of the nuclear establishment. (164)

Gerald Jacob, a political scientist, explores the reasons nuclear waste management became a national issue and how United States politics intersected the debate to redefine the problem and create a solution. The perspective he adopts in this volume on nuclear waste sets aside the technical-legal questions to focus on questions such as: How did we get to this point? Why did nuclear waste disposal become so controversial in the first place? What produced and maintained the conflicts over radioactive waste? In order to address his questions, Jacob considers the political, economic, historical and social factors that created an assemblage of forces that influenced and shaped the perception and appearance of high-level radioactive waste as a problem.

As an example of these intersections, Jacob takes up the debates surrounding Yucca Mountain. He expands what appears to be a geographic issue (i.e., whether to store waste at Yucca Mountain) and places it in a national context within which several powerful forces converge. These forces —the nuclear industry, federal government, state governments, and the public—are conflicted over the siting of the waste repository, revealing historically situated relations of power. In this struggle, the authority, organization, and priorities of the nuclear establishment are questioned, making its credibility and legitimacy problematic. The enactment of the Nuclear Waste Policy Act (NWPA), Jacob argues, was an attempt to restore authority, credibility and stability to the nuclear establishment. But the enactment of NWPA and the creation of the Department of Energy's repository process was a political failure, which became apparent in the much-debated 1987 amendments to the act. NWPA never reached its substantive or timeline mandates, and in the process, it lost scientific credibility and legitimacy. The amendments attempted to address this failure.

Jacob concludes by pointing out that the United States Department of Energy's (DOE) inability to create a credible and legitimate site selection process has meant that the program cannot be defended by Congress: the calls for reform and reconstruction are forcing a serious reconsideration of the appropriateness DOE's approach. Jacob writes that the lessons to be learned from DOE's experience offer a warning to others seeking solutions to complex problems involving the disposal of toxic materials or the siting of hazardous industrial facilities.

Komarov, Boris. 1978. *The Destruction of Nature in the Soviet Union.* London, Pluto Press.

> If Western pollution is the result of the capitalist drive for profit then Soviet pollution is the result of the bureaucracy's efforts to maintain and extend its power. (2)

Taking seriously the Soviet Union's constitutional Article 18 which states that "[i]n the interests of the present and future generations, the necessary steps are taken in the USSR to protect and…preserve the purity of air and water, and ensure production of natural wealth and improve the human environment." Komarov, a Soviet scientist, argues that the Soviet Union's bureaucratic officials have failed to fulfill their mandate to protect the environment (1). To the contrary, the government has actively destroyed millions of acres of land, rivers, and mountain ranges in the name of national security and military preparedness.

Komarov's text details the contamination of the Soviet Union's air, water and land. A good portion of the contaminants released into the natural environment are a result of military and defense activities. For example, the wide use of polychlorinated biphenyls (PCBs) for the insulation of military equipment resulted in the contamination of every water body in the USSR. The 1958 military nuclear waste explosion near Cheliabinsk resulted in the total destruction of all crops, land, and homes. The entire population of was stripped of its clothing and relocated over two hundred kilometers away. The area is now condemned and closed. As Komarov indicates, the constitutional mandates of environmental protection have been flouted by the government. He writes in the conclusion that the government does not want to hear the bad news "about nature, but the people need to hear it" (139). Thus, he was forced to print and circulate his text underground.

Kuletz, Valerie. 1998. *Tainted Desert: Environmental and Social Ruin in the American West.* New York: Routledge.

Valerie Kuletz, an anthropologist and native of the American Southwest, provides an analytical framework for viewing Euro-American constructs against those of the native populations as they converge over the siting of the nuclear repository at Yucca Mountain, Nevada. United States nuclearism settled the desert in the early part of the century, and the scars of nuclear energy and power are carved into the landscape. It is a landscape that many Americans view as empty, devoid of life, and uninhabited. This vision is a notion Kuletz aptly names the "sacrificial landscape." She argues that the categorization of desert landscapes as wastelands results from late-industrial American society's cultural imperialism, which values particular forms of productivity. This discourse of desert as wasteland facilitates the process through which the landscape is sacrificed to uranium mining, weapons storage, weapons testing, and waste disposal. The collective result of these activities is that they often change the status of the landscape from uninhabited to uninhabitable. She subsequently reveals the failures of this vision.

Kuletz compares the Euro-American perception and use of the Yucca Mountain region to the varied perceptions of the indigenous groups who claim the area as part of their traditional lives and sacred practices. She discusses the contending representations of Yucca Mountain while questioning Department of Defense (DOD) and Department of Energy (DOE) occupation. Kuletz challenges DOD and DOE claims of authority—based on science, technology, legal mandates and prior use— that attempt to legitimate their occupation. Drawing on criticism of the federal government, Kuletz centrally places Native American voices and visions about Yucca Mountain in her research, incorporating areas of debate often excluded and forgotten.

In her conclusion, Kuletz argues that Native American groups who lay claim to Yucca Mountain are invisible not only to the government and industry groups, but to the scientists who are working on nuclear waste and disposal issues. She contends that erasure is part of the modern nuclear project in the post-war era. This erasure is manifest through the bureaucratic and legal mechanism of exclusion endemic in the federal government and through the practices of environmental sciences. Native American discourses and claims to truth about Yucca Mountain lack the "symbolic capital" necessary to overcome the hegemonic discourses of the U.S. federal government.

Le Billon, Philippe. 2001. The political ecology of war: natural resources and armed conflicts. *Political Geography* 20: 561-584.

ABSTRACT

Throughout the 1990s, many armed groups have relied on revenues from natural resources such as oil, timber, or gems to substitute for dwindling Cold War sponsorship. Resources not only financed, but in some cases motivated conflicts, and shaped strategies of power based on the commercialization of armed conflict and the territorialisation of sovereignty around valuable resource areas and trading networks. As such, armed conflict in the post-Cold War period is increasingly characterized by a specific political ecology closely linked to the geography and political economy of natural resources. This paper examines theories of relationships between resources and armed con-

flicts and the historical processes in which they are embedded. It stresses the vulnerability resulting from resource dependence, rather than conventional notions of scarcity or abundance, the risks of violence linked to the conflictuality of natural resource political economies, and the opportunities for armed insurgents resulting from the lootability of resources. Violence is expressed in the subjugation of the rights of people to determine the use of their environment and the brutal patterns of resource extraction and predation. Beyond demonstrating the economic agendas of belligerents, an analysis of the linkages between natural resources and armed conflicts suggests that the criminal character of their inclusion in international primary commodity markets responds to an exclusionary form of globalization; with major implications for the promotion of peace.

SUMMARY

According to Le Billon, conflicts and natural resources can be directly related in two main ways: armed conflicts motivated by the control of resources, and resources integrated into the financing of armed conflicts. He argues that the level of dependence, conflictuality, and lootability of a resource can also increase the vulnerability to and the risk of armed conflict. His is not an environmentally deterministic position on violent conflict; rather, the deployment of violence to arbitrate resource-linked conflicts, he claims, is largely embedded in the historical pattern of social relations within and between countries…" He posits a resource dependence hypothesis of violent conflict—as counter-posed with conventional notions of resource scarcity or abundance—demonstrating that armed groups in developing countries have often secured revenues derived from natural resources such as timber, oil, and gems in response to post-Cold War declines in support, developed clientelist networks that thrived irregardless of popular legitimacy, and subsequently required continued revenues to repress heightened social unrest. His analysis highlights the social construction, materiality, and geography of natural resources, demonstrating that a resource's desirability, location, concentration, and mode of production influence both the nature and the likelihood of resource conflicts.

Lipschutz, Ronnie D. 1997. Environmental Conflict and Environmental Determinism: The Relative Importance of Social and Natural Factors, in Gleditsch, Nils Petter Ed. *Conflict and the Environment*. Dordrecht: Kluwer Academic Publishers.

ABSTRACT

Many contemporary discussions of the role of environment in the causation and escalation of violent conflict treat it in a fairly deterministic fashion. Natural resources are axiomatically taken to be scarce and therefore the object of struggle between individuals, societies, and states. The invocation of "environmental determinism" as a means of predicting resource-centered conflicts, and formulating strategies in response, is hardly a new phenomenon. The great geopoliticians of the 19th and the early 20th century engaged in similar exercises. In their work, they took little cognizance of the importance of social factors in driving conflict and thereby contributed to the emergence of competitive foreign policies that, in many ways, became self-fulfilling prophecy. In this chapter, I examine and critique this approach to "environmental conflict and security," providing two examples of deterministic discourses of environment and conflict, one based on "water wars," the other on population. Finally, I argue that most discussions of "environment and security" are rooted in these types of "naturalized" discourses and that we need to "denaturalize" such notions and pay greater attention to social factors.

Lipschutz, Ronnie D. 2003. *Which Resources Will Matter? Geopolitics, Economics, and Conflict* paper forthcoming at the American Bar Association Annual Meeting. August.

Lipschutz addresses one piece of the environment-conflict thesis (specifically with regard to nonrenewable resources) from a political economy perspective. He observes that resources are moved geographically through coercive appropriation (which is undertaken by states) or by free exchange (achieved through markets). Since it is the latter institution that is dominant in contemporary resource transfers he claims, it is unlikely that "resource wars" will become common in the future. However, oil is a unique natural resource in the sense that prices are politically determined as much as they are driven by market forces.

The majority of the paper is a discussion of petroleum resources and the global petroleum economy. The price of a barrel of oil is high relative to the cost of extraction in the vast and near-surface Middle Eastern oil wells; thus oil price per barrel to Middle Eastern producers can fall drastically without foreclosing an enormous profit, and furthermore, these producers can withhold supply to push up prices. While a country like Britain, which imposes a large tax on oil consumption, has the capacity to ameliorate oil price shocks by temporarily reducing its tax, the US has no such consumption tax. America's large share of global oil consumption (roughly 29%), combined with a lack of tax-buffering capacity, makes its economy particularly vulnerable to oil price shocks.

However, for US interests, oil prices cannot fall too low, either. Low prices preclude the possibility of many producers, those with higher extraction costs, from operating at a profit. Stable oil prices coincident with a projected increase in demand requires an increase in supply. "More oil will be produced only if there is foreign investment in the oil fields—especially Iraq's and that will not appear unless there is a stable government in Baghdad, committed to free markets" (see Cassidy, 2003).

Other so-called strategic resources do not have the same geographical concentration as petroleum. Sources of cobalt, chromium, aluminum, and other minerals "are so diversified, and markets are so fragmented, that no group of countries or corporations holds the monopoly or oligopoly position required to exercise market control, either directly or through coercion." Additionally, industrial production, and thus demand for these minerals, continues to diffuse away from the North; and the "demise of the Soviet Union eliminated the only country remotely capable of waging an international resource war against the United States, Europe, and Japan."

Lipschutz suggests a way in which we might more correctly conceive of "ore or resource wars": not by conflicts over scarce resources themselves, but through the sale of natural resources providing revenues which may be used to purchase arms and trucks from abroad. "Since the end of World War II, throughout the world, oil, diamonds, drugs and other commodities have all been the objects of violent conflict not for the international political or economic power they provide, but for the funds they can generate."

Lipschutz ends with a discussion of a different set of environmental problems surrounding renewable resources, and some suggestions for reducing the likelihood of future oil wars including various means of tapering off oil consumption in the United States.

Martin, Paul S. and Christine R. Szuter. 1999. War Zones and Game Sinks in Lewis and Clark's West. *Conservation Biology* 13(1): 36.

ABSTRACT

Historically, the no-man's land created by human warfare often protected wildlife and habitats by limiting human incursions and human population densities within disputed territories. Relatively few examples of this phenomenon have been identified in conjunction with recent and ongoing wars in developing countries, however. Modern wars and civil strife are typically associated with detrimental effects on wildlife and wildlife habitats. Most cited instances of contemporary war-zone refuges refer to military security areas that are functionally and geographically distinct from actual battlefields or areas subject to armed civil conflicts. The disappearance of the war-zone refuge effect is attributable to modern trends in the scale, intensity, or technologies associated with military conflicts and violent civil strife. Munitions and chemical agents exert both immediate and residual effects, direct and indirect, on wildlife and habitats. Over-harvesting of wildlife and vegetation in conflict zones exacerbates existing constraints on the access to natural resources, threatening both the resource base and the livelihoods of local communities dependent on these resources. Socioeconomic studies have identified causative linkages between environmental degradation and violent civil strife, with the scarcity of natural resources fostering the emergence of war and civil conflicts in developing countries. Wars and civil strife create positive feedback that reinforces and amplifies interactions between and among ecosystem vulnerability, resource availability, and violent conflict. Strong and flexible partnerships between local communities, nongovernmental organizations, and international institutions may be a critical factor in mitigating the effects of war on wildlife by helping to maintain continuity in conservation efforts during periods of political instability.

McNeely, Jeffrey A. 2000. War and Biodiversity: An Assessment of Impacts, in Jay E. Austin and Carl E. Bruch, Eds. *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* Cambridge: Cambridge University Press.

McNeely makes a social scientific assessment of war from a heavily natural sciences background, in this case resulting in a sociobiological assertion of war as an adaptive mechanism. Citing Robert Edgerton (1992), McNeely states

> It often seems that an institutional lack of capacity to adapt to change, or the inertia of vested interests in the status quo, means that societies inevitably become maladapted over time, eventually requiring a shock such as war to set them on a different course.

He cites the role of World War II in aiding recovery from the Great Depression as an apt example of this shock therapy; unfortunately he completely omits any political-economic analysis that would certainly aid a more thorough discussion. Citing scholars who write about ancient and "pre-modern" indigenous peoples (Keely 1996), he claims that in the contemporary world "war is virtually universal in human societies as a means of resolving conflicts arising from various forms of maladaptation of cultures to natural resource systems."

Into this discussion, McNeely inserts his assessment of the positive and negative impacts of war on biodiversity. Negative impacts discussed include hunting or habitat destruction by armies, the

actions of refugees, and scorched earth tactics (environmental warfare). In terms of positive impacts, he disclaims that such benefits may be short-lived. He cites war zones as wildlife buffer zones that de facto exclude would-be poachers. Additionally he claims that the spectacle of war stimulates some governments to act quickly to mitigate its environmental trespasses. And finally, endangered carnivores such as tigers, wolves, and sharks have been known to increase drastically in numbers during times of war as a result of the increased food source from human casualties.

McNeely's solution involves the notion of "parks for peace," where conservation efforts contribute to peace by making border zones cooperative wildlife sanctuaries. The curious logic is that if borders act as morally sanctioned buffers, neighbors won't fight.

Mensah, Thomas A. 2002. Environmental Damages Under the Law of the Sea Convention, in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* (Project by the Environmental Law Institute) New York: Cambridge University Press.

Thomas Mensah, former president of the International Tribunal for the Law of the Sea, writes here about the 1982 United Nations Convention on the Law of the Sea, which established the legal structure for protection and preservation of the marine environment. Mensah explains that the convention identifies the principal sources of marine pollution as: land-based operations, atmospheric releases, vessel impacts, sea-bed exploration operations, and various other equipment operating in the marine environment that cause environmental degradation. The convention lays out the rights and duties of agents participating in these activities in marine environments.

If the mandates of the Convention are violated, it does not provide precise legal rules for assessment and recovery of compensation for the damages done to the environment. Rather, select provisions establish mechanisms and procedures for the recovery of compensation and ways to assess damages. The main path provided by the Convention is through the dispute-settlement provisions that allow for recovery through a judicial process in a national or international court, depending on how the parties agree on jurisdiction. Other avenues of recovery are through insurance claims or through compensation funds. Mensah lists six criteria for states to consider when they work together to assess damage and liability to ensure compensation of a wrong. These include: a clear finding of responsibility, a consideration of vicarious responsibility, compulsory insurance, the setting of limits for compensation to be paid by insurance, limitation on liability as unacceptable, and an agreement by member states that particular judicial bodies shall have jurisdiction and produce binding decisions.

In his conclusion Mensah discusses the relevance of the Convention to times of war, noting that military water vehicles are exempted from the provisions in part. Military water- and aircraft are required to act in a manner consistent with the Convention as much as it is reasonable and practical for them to do so. Warships are further required to comply with the law and regulations of the coast state as they pass through territorial seas. Mensah writes that based on this guidance by the Convention, it may indicate that warships are liable for the damage that they cause in marine environments particularly in times of war.

Neumann, Roderick P. Moral and Discursive Geographies in the War for Biodiversity in Africa. Forthcoming in *Political Geography*.

ABSTRACT

Since 1988, several African governments have responded to declining elephant and rhino populations by issuing shoot-on-sight and shoot-to-kill orders for poachers found within national parks. As a consequence many parks and protected areas on the continent have taken on new meanings as spaces of deadly violence. Park rangers have likely killed hundreds of people caught illegally within park boundaries and war has become a common metaphor for conceptualizing and planning wildlife conservation. The violence has recently drawn the attention of African and international human rights groups who have become increasingly critical of the actions of state conservation agencies. This paper explores the moral, discursive, and geographic dimensions of the war for biodiversity and is organized around three questions. First, how is the protection of biodiversity by means of militarized defense of wild animals made the moral equivalent of war? Second, what role does discourse play in making the extrajudicial killing of African poachers more morally acceptable? Third, to what extent does the war for biodiversity have the effect of generally ratcheting up the level of violence in and around national parks? The paper combines discussions of environmental ethics and discourse theory to analyze how membership in the moral community is situational and contingent and how discursive practices can loosen moral constraints on violence in particular spatial and temporal contexts.

SUMMARY

Neumann's is a compelling treatment of the notion of biodiversity in justifying both violence against local peoples and the militarization of biodiversity protection. Violence and wartime suspension of human rights are made legitimate in the framing of the militarization of biodiversity protection as the prosecution of a "just war." Also, the personification of animals lends to the depiction of a particular treatment of animals as "savage," dehumanizing those who engage in it. Neumann identifies three sets of images and representations: the dangerously amoral and brutal poacher/Other, the compassionate and conservation-minded hunter/European, and the intelligent and social wild animal. These images serve to legitimate brutal anti-poaching policies that, from a critical viewpoint, are clear human rights violations.

Parsons, Rymn James. 1998. The Fight to Save the Planet: U.S. Armed Forces, "Greenkeeping," and Enforcement of the Law Pertaining to Environmental Protection During Armed Conflict. *Georgetown International Environmental Law Review.* 10 (Winter): 441- 500.

> The need to protect the environment against unjustified damage during armed conflict is an unmet challenge of the 20th century. The weapons of war grow ever more virulent, greatly increasing the risk of harm from incidental as well as intentional damage to the environment. The environment itself may be the most potent weapon of all, a weapon that can be manipulated by both simple and technologically sophisticated means. (442)

Parsons is a Lieutenant Commander in the U.S. Navy. Here he proposes a broad approach to changing environmentally destructive behavior during armed conflict. He writes that the environ-

ment has been used as a weapon and as a target for wartime violence since ancient times. From the time when the Spartans salted Athenian fields during the Peloponnesian War to the United States' seeding of clouds over Ho Chi Minh Trail and defoliation of large jungle tracts, the natural environment has been chalked up as part of the inevitable pillage of war. Parsons argues that international laws afford some protections to the environment during armed conflict by attempting to hold states and individuals accountable for damage caused deliberately, but he personally believes that environmental protection must reach deeper into "war machines."

Parsons suggests a new way in which non-binding instruments may work to protect the environment. He suggests that organized military states must make environmental awareness part of their military educational and training processes; this training could then be transferred to wartime operations more effectively. Parsons argues that the means to achieve this is through military manuals, the rules of engagement, and operational plans. This approach is not mandated by international law, but he claims that it could, if implemented consistently, alter behavior during armed conflict.

Peluso, Nancy Lee. 1993. Coercing Conservation: the Politics of State Resource Control in Lipschutz, Ronnie L. and Conca, Ken Eds. *The State and Social Power in Global Environmental Politics*. New York: Columbia University Press.

Peluso takes two cases to "illustrate the extremes to which coercive resource management can extend: the protection of wildlife, particularly elephants, in Kenya, and the protection of forests in Indonesia. In both cases, the state's 'protection' of valuable resources has reached virtually militaristic proportions." This coercion in the name of conservation is an example of both militarization of the environment, and a rhetorical use of environmental ideology in justifying state violence.

Peluso's "argument relates to states willing to comply with international conservation agreements or Western conservation principles and ideologies that justify its resource management practices," where states "appropriate the moral ideology of global conservation to justify state systems of resource extraction and production." She notes that oftentimes states' conservation goals and strategies are in conflict with land use by local people and their customary management practices. Ironically, these same people may have long histories of resource use having helped to shape these so-called "pristine" landscapes and "wild" habitats. A further irony is that conservation goals as framed by the international conservation community may actually be undermined by these land-use conflicts.

Peluso, Nancy Lee and Michael Watts, 2001. Violent Environments, in Peluso Nancy Lee and Michael Watts Eds. *Violent Environments*. Ithaca and London: Cornell University Press.

Violent Environments is an edited volume with contributions from scholars working in the field of Political Ecology. The book is both a rigorous critique of the school of Environmental Security, and an exercise in taking a political-ecological approach to various questions of complex linkages between environment and violence.

The first part of this essay seeks to heavily critique one of Environmental Security's most prominent scholars, Thomas Homer-Dixon, in his framework, assumptions, methods, interpretations, and in the policy implications of much of his work.

In the second part of the essay, Peluso and Watts outline a radical alternative approach to environment-violence linkages: a political ecology of violence, which relies heavily on discourse analysis, is "attentive to the power relations inherent in defining, controlling, and managing nature," and which sees the environment as an "arena of contested entitlements." The political ecologists in this volume seriously address "the causal powers inherent in Nature itself" rather than "focus solely on the overwhelming forces unleashed by capital, state, or technology on the environment." In this way, political ecology challenges both neo-Malthusian and traditional structural Marxist approaches.

These political ecologists ask why violence occurs in some places and not in others, why some factors are more important than others, and why brutal acts define some conflicts and not others. Violence is understood as physical, but also symbolic; as organized, but often also random or isolated. And occasions of violence are represented in this volume that coincide not only with environmental degradation, but also with environmental rehabilitation and protection; not only with environmental scarcity, but in cases of abundance. The implication of this work is that policy prescriptions which privilege environmental interventionism, managerialism, and technocracy will ultimately fail to heal the wounds of underdevelopment in their reproduction of the same sets of social relations which create violence and environmental degradation, and furthermore that environment-violence interactions might more accurately be studied on a case-by-case basis rather than via generalizations that make many more exceptions than rules.

Quinn, John P., Richard T. Evans, Michael J. Boock. 2002. United States Navy Development of Operational-Environmental Doctrine, in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* New York: Cambridge University Press.

The authors of this article are military personnel: John P. Quinn is from the Office of General Counsel, U.S. Navy; Richard T. Evans is a law advisor for the office of the Chief Naval Operation, U.S. Navy; Michael J. Boock is an environmental law advisor for the United States Department of Defense. These authors discuss the development, teaching and implementation of environmental considerations in military decision-making. They discuss the impetus for their operational-environmental doctrine as stemming from the U.S. Navy's interest in compliance with domestic and international law. The Navy and the Marine Corps have completely incorporated the domestic environmental laws—Clean Water Act, Marine Mammal Protection Act, Act to Prevent Pollution from Ships, and The Ocean Dumping Act—into their policy guidance for military staff through training and operations handbooks. The authors identify the potential conflicts that may arise from a commander's competing operational and environmental obligations. In the conclusion of this article, the authors list the future course of operational-environmental doctrine in the U.S. Navy: guidelines will develop and mature with time, the guidance issued by individual military services will become uniform, and the internal development of environmental protection policy will continue and perhaps outpace the current international policy.

Roberts, Adam. 2002. The Law of War and Environmental Damage, in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* New York: Cambridge University Press.

Adam Roberts, a Professor of International Relations at Oxford University, focuses his article on

the following central question: "Are international legal provisions that could restrict environmental damage from military operations adequate?" The legal provisions under investigation are included in the body of law known as "international humanitarian law." Roberts asserts that the existing legal provisions are more extensive and provide more protection than is typically thought. Although the focus is protecting human populations, their added benefit is the protection of the environment during armed conflict. He abandons the focus that other scholars have had on word count—how many times the word "environment" appears in the text. His contention is that the protection of the environment is implicit not explicit. Roberts exempts himself from considering issues of implementation and compliance stating that these are a result of political and military cultures. Rather in his chapter, Roberts takes into account the summaries and proposals resulting from major international conferences: including those in London (June 1991), Ottawa (July 1991), Munich (December 1991), Newport, R.I. (September 1995), and the International Committee of the Red Cross Conference (1992-3). Roberts also considers the history of treaties that indirectly benefit the environment.

Roberts identifies four general principles in the law of war that work to protect the environment without explicit recitation. First, the principle of proportionality in considering appropriate responses to actions of an adversary; second, the principle of discrimination which is concerned with taking great care in the selection of methods, weaponry, and targets; third, the principle of necessity which requires opponents to use only the force necessary to subdue the opponent; and fourth, the principle of humanity which prohibits the employment of any kind or degree of force not required for the purpose of partial or complete submission of the enemy with efficiency.

Roberts considers historical military treaties, protocols, and declarations that uphold these principles. The St. Petersburg Declaration on explosive projectiles denounces military objects that go beyond simply subduing the enemy. The Hague Conventions of 1899 and 1907 express the idea that the rights of belligerents to harm their enemy are not unlimited. In effect, wartime activities do have their limits and those limits are found in the principles of war. The 1925 Geneva Protocol limits the use of gas and bacteriological weapons. The effectiveness of this provision is a result of the fear of reprisal in situations of armed conflict. The 1972 Biological Weapons Convention adds to the Geneva Protocol the prohibition against not just the use of biological weapons, but also their possession. The 1949 Geneva Convention is concerned with the protection of victims of war and thus contains a large number of protections for the environment such as prohibition of "scorched earth" tactics. The 1954 Hague Cultural Property Convention establishes mandates for the protection of historical and archaeological sites and for cultural property. The 1976 Environmental Modification Convention explicitly details prohibitions against environmental modifications in time of war. The 1977 Additional Protocol I deals specifically with the question of damage to the environment. Roberts considers weapons conventions such as the 1980 Certain Conventional Weapons Convention and Protocols, 1997 Ottawa Anti-Personnel Mine Convention, the 1998 Rome Statute of the International Criminal Court as other provisions that indirectly protect the environment in times of armed conflict.

In the final section of his article, Roberts outlines some of the criticisms of the law-of-war rules highlighting U.S. attitudes and failures toward international treaties and conventions. Roberts discusses the debate within the United Nations concerning whether new provisions should be enacted or whether existing ones need further consideration. He tends to support a full consideration of the existing international conventions, treaties and protocols. His conclusion provides suggestions for the

existing debate: a focus on existing legal provisions, new agreements on specific issues, wider adherence to existing treaties, wartime application of peacetime environmental laws, investigation and assistance, wartime and postwar environmental clean-up efforts, international peacekeeping forces, and international military enforcement operations.

Richards, Alan. 2002. *Coping with Water Scarcity: The Governance Challenge.* San Diego: Institute on Global Conflict and Cooperation of the University of California. Policy Paper #54 (October)

Alan Richards, professor of Environmental Studies at the University of California, Santa Cruz, provides evidence for increasing per capita fresh water scarcity throughout the world, and offers "a simple analytical framework for thinking about the political implications of diverse strategies for managing [fresh water] scarcity." Richards contends that all responses to scarcity have both opportunities for cooperation and potential for conflict. "The implications of scarcity for conflict depend on a host of factors, some quantifiable, many not, which will impinge on decisions of how to cope with scarcity." Improving demand management or enhancing conservation is discussed as a governance problem: where decentralization may help provide solutions in some cases, and re-centralization in others. Furthermore, public perceptions about water management "will be at least as important as any 'objective' assessment of water scarcity in driving outcomes."

Richards continues with a political-economic analysis of "how governments create water shortages," outlining the typical first response of governments to increase supplies rather than focus on conservation and demand regulation, the common institutional entrenchment of water subsidies, and the troublesome task of assigning property rights in water.

Water markets in developing countries are overwhelmingly characterized by the following, according to Richards:

- Ubiquitous externalities

- Absence of infrastructure for water transfers or to measure on-farm use

- Very poorly specified property rights, and the understandable fear that engaging in any long-term trade may jeopardize whatever property right one does have

- Sharp divergence of value-systems (e.g., Islamic law vs. neo-classical economics)

- Adjudication mechanisms which are often weak, corrupt, expensive, or non-existent

- Weak or absent mechanisms for dealing with third-party effects

Conditions for success in water management include:

- Successful economic development, reducing the importance of the agricultural sector in the economy

- A relatively legitimate political democracy, with a more or less free press and with

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only moderate levels of public corruption

- A level of equity which is sufficient to ensure sufficient cooperation among various stakeholders in managing scarcity

- A distribution of rights to water which is perceived by most actors to be "fair enough"

- And a well-developed, relatively efficient, and reasonably fair mechanism for adjudicating disputes over water.

Ross, Andrew, 1994. *The Chicago Gangster Theory of Life: Nature's Debt to Society.* London, New York: Verso. (Chapter 3: The Ecology of Images)

Ross eloquently discusses the irony of the imagery reported to the American public during the (first) Gulf War, where the United States military played the role of "Captain Planet," saving fragile Gulf ecosystems from Iraqi dictator Saddam Hussein's "environmental terrorist" tactics, citing the vast oil spill as the "first photo opportunity for politically correct militarism." While the bigger-than-life environmental spectacles created by the Iraqi military took center stage, the less spectacular environmental atrocities committed by American military forces both in the Gulf Region and back home were unsuccessful in making news.

> In the long run, the most injurious effect of war coverage is that it displaces attention away from the daily economy of military activity in peacetime." This is not to say that a "peace dividend," or a grand shift of military expenditures to alternative social welfare programs during peacetime, can exist in the contemporary power milieux. "All wars after the Gulf now demand urgent ecological analysis, not just because their consequences are physically damaging, and may imperil the survival of species on the planet—but also because they are rooted in a social ecology of domination that continues to sustain the power of some humans at the cost of the majority of others.

Ross elaborates on the unreported and underreported environmental consequences of the Gulf War, those primarily committed by allied methods of warfare and militarization, and some reasons for the media neglect. The atrocities that were "less spectacular" or "casually accepted as part of war's normative effects" included B-52 carpetbombing of the fragile desert ecosystem, the garbage, sewage, and toxic waste created by allied troops, off-road vehicles and troop movement, and the vast oil lakes left after the extinction of the oil-well fires. Finally, he criticizes media underreporting of the impact on Iraqi civilian populations in the aftermath of the war which killed or rendered homeless millions, destroyed sewage infrastructure triggering malnutrition, disease, and massive die-off of livestock.

> These are stories that were not adequately told, either because of Pentagon censorship, media burnout, or, quite simply, because they require more than a sound-bite analysis and a set of atrocity images. Nothing else could compete, in media terms, with the twin spectacles of the oil spill and the burning oil wells. Consequently, the stories that did get told featured the US military (the biggest single polluter in its own country, generating a ton of toxic waste every minute in peacetime) in the Captain Planet role of combating environmental damage. Here, surely, was one of the war's more obscene aspects—the bestowing of ecological sanctity upon a military institution that makes a mockery of public review of the toxic effects of its weapon testing (especially nuclear) and production of war matériel in the USA, while national environmental laws are considered nonbinding in overseas territories.

The title of the book comes from Richard Dawkins' (1989) description of the "selfish gene" as a Chicago gangster. Ross is critical of the sociobiological assertion that traits like militarism, social competition, sexual dominance, territorialism, xenophobia, and the like are genetically encoded in humans, noting that "general theories that 'biology is destiny' bear the odious stigma of their enduring historical use as justifications for imperialism, genocide, and patriarchal domination."

Ross, Michael. 2003. What do we know about natural resources and civil war? Forthcoming in *Journal of Peace Research.*

ABSTRACT

Since the late 1990s there has been a flood of research on natural resources and civil war. I review 14 recent cross-national econometric studies, and many qualitative studies, that cast light on the relationship between natural resources and civil war. I suggest that collectively they imply four underlying regularities: first, oil increases the likelihood of conflict, particularly separatist conflict; second, "lootable" commodities like gemstones and drugs do not make conflict more likely to begin, but they tend to lengthen existing conflicts; third, there is no apparent link between legal agricultural commodities and civil war; and finally, the association between primary commodities—a broad category that includes both oil and agricultural goods—and the onset of civil war is not robust.

In the first section I discuss the evidence for these four regularities, and examine some theoretical arguments that could explain them. In the second section I suggest that some of the remaining inconsistencies among the econometric studies may be caused by difference in the ways they code civil wars, and cope with missing data. In the third and final section I highlight some further aspects of the resource-civil war relationship that remain poorly understood.

Sidel, Victor W. 2000. The Impact of Military Preparedness and Militarism on Health and the Environment, in Jay E. Austin and Carl E. Bruch, Eds. *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* Cambridge: Cambridge University Press.

Sidel argues that militarism, or intense military preparedness, causes wars rather than preventing them as so many past thinkers have claimed. And furthermore, that militarism itself causes environmental damage and human health problems related to the manufacture, testing, storage, disposal, and clean-up of weapons and war matériel. Examples he gives as evidence of militarism in the United States are the "evil empire" rhetoric of the Cold War, and the efforts to develop "war fever" that helped legitimize action in Iraq and Yugoslavia.

Sidel accuses the military-industrial complex in the United States as the culprit of a militarism that not only reduces global security from war, but also ultimately reproduces itself through a political-economic maintenance of wealth and power. He claims that "much, if not virtually all, of the environmental degradation described [in this edited volume, is] caused by wars brought about by militarism rather than on the need for self-defense or for national security."

Shulman, Seth. 1992. The Threat At Home: Confronting the Toxic Legacy of the U.S. Military. Boston, Beacon Press.

> This book was born on the shore of Basin F (man made lagoon for open air storage of 11 million gallons of toxic military waste sludge), a phosphorescent toxic lake on the outskirts of Denver, Colorado. At the time of my visit several years ago, 1988, this nearly 100-acre basin glowed ominously beneath the majestic Rocky Mountains, the centerpiece of a forsaken tract of land some believed to be the earth's most toxic square mile. (xi)

This journalist begins his alarming discussion (aimed at a popular audience) of toxic military waste with the story of a tour through the Rocky Mountain Arsenal in Colorado where U.S. Army personnel manufactured chemical weapons from World War II through the Viet Nam War: here the arsenal buildings, surrounding land, and storage facility are condemned due to high levels of contamination. "Basin F," a ninety-three acre site, is the last in a series of storage ditches for toxic waste. Schulman uses the Basin F example to explain his initial contact with U.S. military waste and the profound emotional impact it had on him. After his visit to the Arsenal, Schulman became interested in understanding the history of the site, the reasons for is construction, and the political means by which the U.S. government managed to conduct itself in such a manner. Shulman's field research culminating in this tour guide of toxic sites includes current threats of the military's toxic legacy, and the future environmental impacts of U.S. military waste around the country.

The author visits Jefferson Proving Grounds in Madison, Indiana, where the U.S. Army has tested conventional munitions since World War II on a 100-square-mile tract. Former Indiana Senator Dan Coasts has called the area "the largest contiguous contaminated area in the U.S." Schulman also attends congressional hearings where top military officials are questioned about their failure in domestic environmental protection and the Department of Defense's (DOD) mismanagement of toxic waste materials. Schulman recounts the Pentagon's own numbers showing that it generates (1990) close to 500,000 tons of toxic waste annually: an amount that could fill three thousand warehouses every year, or one warehouse every hour. Most of this waste is improperly managed and stored on thousands of U.S. military bases, resulting in extensive and pervasive environmental contamination.

Schulman provides a selection of useful materials in his three appendices: strategies for action and ways to obtain information about sites, a list of suspected side of contamination by type across the U.S., and the pertinent federal laws enacted to protect the environment. The text also provides a useful glossary of terms.

Soroos, Marvin S. 1992. Conflict in the Use and Management of International Commons, in Käkönen, Jyrki Ed. *Perspectives on environmental conflict and international politics.* London: Pinter Publishers Limited.

Soroos explores the types of conflict that typically arise in the use and management of resource domains traditionally treated as international commons: oceans, fisheries, the seabed, Antarctica, outer space (including the geostationary orbit), the atmosphere, the electromagnetic spectrum, and aquifers.

Potential for conflict over international commons has increased, according to the author, because of heavier demands on resources from population growth, industrialization, and technological

changes. The resource situations that pose international incompatibility exhibit mutually exclusive consumption, interference between uses, and/or dissimilar uses of the resource.

Soroos poses strategies for conflict resolution. These are:

- Bans on certain uses of a resource domain

- Limits on the amount of use of a resource domain

- Rules on how a resource domain is used

- Exclusive concessions to parts of a resource domain

- A partition of the resource domain

- And a public monopoly over the resource domain

However, conflicts can also arise from management strategies where there are variable levels of national commitment based on different biogeophysical threats.

Stone, Christopher. 2002. The Environment in Wartime: an overview, in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* New York: Cambridge University Press.

Christopher Stone, a law professor at the University of Southern California, takes a broad look at the issues surrounding the environmental consequences of war. The reason that there is a nascent and rising alarm for the environment in wartime, as Stone see it, is because of a growing international concern for the protection of the natural environment paired with military technological developments. He discusses the examples of the Second Indochina War and the Gulf War as beacons calling for a new wartime environmental awareness. Stone identifies important ethical questions for consideration in times of war. He asks whether military personnel on the ground are practically or ethically motivated—winning the war (practical), protecting the troops (practical), or preserving biodiversity (ethical). Stone admits that these types of questions constitute a Pandora's box, but contends that they must be asked in times of war.

What should we undertake to protect the environment in times of armed conflict? Stone offers examples of ineffective international treaties and resolutions: the 1980 Land Mine Protocol, Protocol I Articles 56 and 35, and the Convention on the Prohibition of Environmental Modification Techniques (ENMOD). Stone finds these existing treaties lacking not only in content, but in their enforceability. He proposes that peacetime environmental laws, by contrast, exhibit a more focused attention to structures of liability. Stone claims that new legal norms are unnecessary; the national international community ought to consider state liability under existing laws. He considers the role of ex post facto remedies, the means by which damages are to be measured and collected. He concludes with a discussion of a key factor: how to create the conditions favorable to compliance. Securing compliance with legal norms is always the central question of protection of the environment on the international level. In response to this question, Stone returns to his original ethical question of practical vs. ethical decisions of the commander of the group who must decide between protecting

his troops or protecting the environment: the more the commander can align protection of his/her troops with protection of the environment, the more compliance will result. The author points out this dilemma as a problem for policy-makers to consider, but does not provide a solution to the problem. He takes the position that it is not the duty of the commander to resolve this problem, but rather it is the duty of policy and legislative bodies to create mandates for the commander to follow.

Timura, Christopher T. 2001. "Environmental Conflict" and the Social Life of Environmental Security Discourse *Anthropological Quarterly* 74(3): 104-113.

In this article, Timura critiques the broadly cited thesis that resource scarcity causes conflict, pointing instead to the social and cultural nature of resource conflicts, including the roles that social histories, symbolically-mediated perception, and local political economies play in the outbreak of violence. He notes that the concept of "environmental conflict" is one which has become a part of the "master narrative" of environmentalism but which has enjoyed broad, uncritical application often in inappropriate contexts. He is convinced that anthropologists and the communities they work with stand to benefit from a more critical engagement with environmental discourses, specifically the un-contextualized models of environmental conflict proponents. He develops the idea of the "social life of discourse," which attempts to locate discourses, i.e. focus not just on what is being said but also on who is saying it, and where these people are standing. Timura identifies environmental conflict as a boundary object (Fujimura, 1992) that functions in part as something easily appropriated by various institutions to serve pre-existing agendas. Timura postulates that a central reason why the environmental conflict thesis has achieved "master" status is largely attributable to its vagueness, generality, and the open meanings of its core concepts. Not all voices are heard equally on this topic, and especially loud is the voice of Thomas Homer-Dixon, whose work on three cases Timura deconstructs to reveal fatal flaws: the 1996 Eldorado dos Carajas massacre in Pará, Brazil, the 1994 Guinea Fowl War in Northern Region, Ghana, and the 1994 Zapatista Rebellion in Chiapas, Mexico.

He found that across these three cases, conflicts over land developed between groups that differed from one another in the amount of economic and or political power they had, and while environmental scarcity played locally specific roles, the more direct roots of violence were political. Ineffective land titling bureaucracies, bureaucratic redundancy, and corruption also contributed to violence in each case, partly through their institutional reinforcement of existing social inequalities. Lastly, conflicting valuations of land and legal pluralism over land tenure contributed to conflict in each case. At a global scale, his analysis implicates several phenomena including economic liberalization programs and political decentralization, where even an increase in democratic institutions are only as strong as individuals' ability to gain access to the legal mechanisms that provide them.

The environmental conflict literature suffers, he claims, in part from an ignorance of anthropological literature, without which it so often obscures local details and erects grand neo-Malthusian frames, leading to incorrect conclusions.

United Nations Environment Programme. 2003. *Afghanistan: Post-Conflict Assessment.* Switzerland. United Nations Environment Programme.

United Nations Environment Programme (UNEP), a division of the United Nations in Gene-

va, sent a group of researchers to conduct assessments of the environmental stability of post-conflict (refers to both the 1970's war with the Soviet Union and the United States' invasion after September 11, 2001) Afghanistan. The UNEP field group included a 20 member team of Afghan and international scientists and experts. They visited 38 urban sites in four cities and 35 rural locations. The scope of the UNEP's assessment included issues such as pollution in urban environments, surface and groundwater resources, deforestation, waste and sanitation, air quality, and desertification. The UNEP team also accounted for the war-mangled vehicles and weapons remains. The team found that contamination from depleted uranium in the water and the air was minimal, but the soil samples, especially around weapons casings, tested significantly positive and could pose a serious threat to human health and the environment. The most dangerous levels were found near destroyed vehicles.

The report provides a description of the country—the economy, people, geography, climate, and water supply; a description of the urban environments—waste management, waste water, water supply, air quality, public facilities and industrial sites; a description of the natural resources—wetlands, forest, woodlands, protected areas, and the Wakhan Corridor; and a description of environmental governance. The report concludes with the UNEP team's recommendation for environmental management, urban services, and some specific sites. This report is useful for specific data analysis on aspects of the environment as it was affected by consistent armed conflict.

United Nations Environment Programme. 2003. *Depleted Uranium in Bosnia and Herzegovina: Post-Conflict Environmental Assessment.* Switzerland. United Nations Environment Programme.

The research report by the United Nations Environment Programme (UNEP), a division of the United Nations in Geneva, was conducted to address the dearth of information addressing the question of the environmental and health impacts of depleted uranium (DU) munitions. In the Autumn of 2000, UNEP carried out the first international assessment on the environmental behavior of DU following its use in Bosnia and Herzegovina. The 18-member team comprised experts from northern Europe and the United States. The team selected 15 sites to visit during the research mission from which 132 samples were taken. Site selection was based on number of recorded DU rounds fired, indications of DU attack, information from local authorities about sites, regions of varied ethic composition, areas which did not have landmines, sites close to residential areas and according to specific environmental conditions. The researchers found traces of DU (and heavy metals) in water, air, and soil at several of the sites in varying concentrations. A specific research goal was to assess the long-term environmental and human impacts of DU.

The UNEP team concludes that DU ammunitions cause localized ground contamination. At contaminated sites, DU levels in air, water, and soil are relatively low, and thus have a correspondingly low potential for harm to human health. Since most of the tank penetrators are lodged deep in the soil, they will break down completely within 25-30 years; however, their depth suggests future water contamination issues. The UNEP team makes 24 recommendations for the protection of the environment and human health in the event that DU ammunitions are used. The report includes detailed, site-specific reports for cities and locations in Bosnia and Herzegovina. It also provides technical and scientific information.

Warner, Sir Frederick and Rene J.C. Kirchman. 2000. *Nuclear Test Explosions: Environmental and Human Impacts.* New York: John Wiley & Sons.

Sir Frederick Warner and Rene J.C. Kirchman report the findings of the RADTEST (RADiation from nuclear TEST explosions) study which is part of the research conducted by the Scientific Committee on Problems of the Environment (SCOPE) established by the International Counsel for Science (ICSU). Here, the authors assemble information on all known nuclear weapons tests from France, China, India, and South Africa. The study focuses particularly on the environmental impacts of these tests. Scientists from several countries consider findings from atmospheric tests, under-water tests, and underground tests. They examine the environmental and human consequences of nuclear testing.

The project brings together scientists from all over the globe to collaborate in developing and disseminating environmental understanding and guidance for making policy on the testing and control of nuclear weapons. The researchers consider different nuclear weapons testing programs in different countries: fission bombs, boosted fission bombs, thermonuclear bombs, and third-generation nuclear weapons. They consider the environmental impacts of nuclear explosions focusing on tests in France, the U.S., the U.K., the former USSR, China, and India. In each case, they consider ecological impacts. The Nevada test site is discussed in detail. The scientists map paths of human exposure, estimated exposure values, and observed and potential health effects.

The text is an excellent resource for researchers seeking a detailed understanding of fundamental scientific questions concerning nuclear weapons testing. The appendix lists the type, location and date, and total energy released for each test. A comprehensive glossary of terms is provided to guide the reader through technical language.

Westing, Arthur H. 1984. Herbicides in war: past and present, in Westing, Arthur H. Ed. *Herbicides in War: the long-term ecological and human consequences*. London, Philadelphia: Taylor & Francis.

This book is a collection of reports of eight working groups from an independent "International Symposium on Herbicides and Defoliants in War: the Long-term Effects on Man and Nature" held in Ho Chi Minh City in January 1983. This collection focuses on the Second Indochina War (Viet Nam War), and the introduction by Arthur Westing summarizes. The chapters treat a variety of subjects, including plant, animal, and soil ecology, coastal, aquatic, and marine ecology, cancer, clinical and reproductive epidemiology, toxicology, cytogenetics, and dioxin chemistry.

Herbicides are considered a class of chemical weapons. In this war, the effects of the use of herbicides as weapons of war have included (as of 1984) "widespread, long lasting, and severe disruption of forestlands, of perennial cropland, and of farmlands" particularly in South Viet Nam. Crop destruction has been a method of warfare for millennia (Westing, 1981), and even chemical destruction of vegetation particularly with salt; however the large-scale use of industrial chemical herbicides (functionally, plant hormone-mimicking substances and cell dessicators) in crop and forest destruction was a first in this war. Forest destruction was generally accomplished through the use of Agent Orange [US Department of Defense code names for a 1:1 mixture of 2,4,5-T (2,4,5-trichlorophen-

oxyacetic acid) and 2,4-D (2,4-dichloro-phenoxyacetic acid)] or Agent White [code name for a 4:1 mixture of 2,4-D and picloram (4-amino-3,5,6-trichloropicolinic acid)], plant hormone-mimicking substances. Agent Blue [code name for cacodylic acid (dimethyl arsinic acid), a dessicant] was used for the destruction of rice and other crops, although Agent Orange was used for this purpose as well.

About 86% of the missions were directed against forests and other woody vegetation and 14% against crop plants. About 10% of the surface area of South Viet Nam, the hardest hit nation, was sprayed. This spraying was carried out on three vegetation types: dense inland forest, coastal mangrove swamp, and agriculture.

Ecological consequences of dense forest spraying included 10% outright tree death; crown dieback; temporary plant sterility; a largely destroyed overstory and hence a partially exposed and destroyed understory; susceptibility to fire from primary forest reduction; soil nutrient dumping as a result of defoliation and the inherent low nutrient-retention capacity of tropical soils; accelerated soil erosion; diminution of animal habitat; and a modest level of animal death directly from toxic effects of herbicides, especially birds and invertebrates.

Westing, Arthur H. 2002. In Furtherance of Environmental Guidelines For Armed Forces During Peace and War, in *The Environmental Consequences of War: Legal, Economic, and Scientific Perspectives.* (Project by the Environmental Law Institute) New York: Cambridge University Press. Pages 171-189.

Westing argues that it is important to consider the developing environmental protection policies within and about the armed forces, because their impact on the environment is significant and largely detrimental. Westing considers the acceptance of military guidelines for the protection of the environment during both peacetime and in times of armed conflict. He indicates the states that have exempted their militaries from compliance with domestic environmental legislation; these are Switzerland, the United Kingdom, Germany, and Serbia. The nineteen states holding their militaries accountable are Bangladesh, Croatia, Denmark, Finland, India, Indonesia, Iran, Malaysia, Maldives, the Netherlands, Norway, Pakistan, Poland, South Africa, Sri Lanka, Sweden, Thailand, United States, and Viet Nam. Westing claims that the creation of the United Nations Environment Program is an effort to sensitize the international community to bringing state militaries under the mandates of environmental protection norms during peacetime.

As for wartime guidelines, Westing discusses the distinction between international armed conflicts and non-international armed conflicts, noting that inadequate protections are provided for the latter compared with the former. In the case of nation-states engaged in international armed conflict, Westing iterates that such norms are, for the most part, self-imposed, illustrated by the example of the United States Navy and Marine Corps rules. As for general non-state-based norms, Westing cites the International Committee of the Red Cross (ICRC) as the custodian of the law of war. The ICRC offers its guidelines to all states through the United Nations. He concludes this discussion by emphasizing the need for states to create and incorporate these guidelines into military manuals.

Woodward, Rachel. 2001. Khaki conservation: an examination of military environmentalist discourses in the British Army. *Journal of Rural Studies* 17: 201-217.

Woodward's paper is an analysis of military environmentalist discourses that seeks to unpack "apparently innocuous or neutral-sounding statements about military activities on the defence estate, with a view to understanding their wider meaning or intent." Through a discourse-analytic methodological approach, Woodward unpacks these portrayals "in order to understand their form, their internal regulation as frameworks through which military land uses are given meaning, and the consequences of those constructions." She identifies three military environmental discourses: crater-as-habitat, paternalism in land management, and administrative rationalism in conservation.

The crater-as-habitat discourse presents military activities as both compatible with and proactive in environmental protection. An example is the portrayal of military debris as wildlife habitats such as nests for birds rather than as garbage or pollution. This type of portrayal "naturalises the Army presence in the countryside" and "establishes environmental protection as a legitimate military activity." And in so naturalizing this activity, "[t]he possibility that environmental protection and preparation for war might reside in quite fundamentally opposed moral orders is denied."

The paternalism in land management discourse portrays the natural environment of the defense estate "as a direct consequence of a specific set of land management practices and a model of land management," where environmental stewardship goes hand in hand with military real property ownership and a "military-knows-best" attitude is taken aligned with a worldview that poses property owner as right authority over land use.

The discourse of administrative rationalism in conservation, following Dryzek (1997) "operates to define what environmental protection and conservation are all about." "It sets the parameters around what environmental protection is and is not" through the use of metaphors and other rhetorical devices, assumptions about natural relationships, and the portrayal of military actors as "experts."

Woodward, Rachel. 1998. "It's a Man's Life!": soldiers, masculinity and the countryside. *Gender, Place and Culture* 5(3): 227-300.

This article explores the relationships between soldiers, masculinity and the countryside. It draws on a variety of published materials ranging from English army recruitment literature to English military autobiography. Woodward uses a post-structuralist interpretation of "rural" as a discursive construction rather than a bounded, located space for the purpose of examining the "contours of power of the socially constructed world." Likewise, after post-structuralist feminist geographers, she takes the body (or the concept of embodiment), masculinity, and femininity to be socially constructed. Many military activities draw upon specific meanings of place and particular construction of gender identities.

> We can also identify ways in which discourses of rurality are drawn upon to describe and legitimize the army's presence in the countryside, where the vast majority of military activity in Britain takes place. It is an obvious point, but the very language used to describe the basic functions of military activity in Britain locates that activity in the countryside. We talk of army camps, field training centers, battlefields. Camouflage is shades of green. The cessation of conflict

is symbolized by the metaphor of swords being turned into ploughshares. A rural inheritance informs much of the language and imagery of the modern armed forces.

Throughout the remainder of the paper, Woodward makes the argument, through the use of imagery and word of recruitment advertisements and literature, that an ideal of "masculinity" is constructed by the Ministry of Defence, and furthermore, that a masculine identity is constructed as both steward and dominator of the English countryside. Here, the relationships between the gendered body and nature, between soldier and environment, are used toward domestic and international political ends. Both the domination of nature and the location of the soldier in the countryside are engendered and naturalized.

Yuzon, Ensign Florencio J. 1996. Deliberate Environmental Modification Through the Use of Chemical and Biological Weapons: "Greening" the International Laws of Armed Conflict to Establish An Environmentally Protective Regime. *American University Journal of International Law & Policy.* 11: 793-846.

Yuzon discusses military techniques and weapons that have long-term and widespread impacts on the natural environment. Environmental modification technologies, practices, and weapons have been and are continually used by states to gain strategic advantage during armed conflicts. The author considers the example of the United States' use of incendiary weapons in Viet Nam and its attempt to manipulate weather patterns in Indo-China. Also, Yuzon discusses weapons of mass destruction, chemical and biological armaments, and other technologies that severely impact the natural environment.

Yuzon explains that international law provides environmental protection during times of armed conflict, but this protection is limited. He calls upon individual states to take responsibility for the military actions taken against foreign enemies. He calls again upon states to recognize the interdependency of human populations and the environment. He cites the Stockholm Declaration, stating 1) "mankind is a part of nature and life depends on the uninterrupted functioning of natural systems to ensure the supply of energy and nutrients;" 2) "civilization is rooted in nature, which has shaped human culture…and living in harmony with nature gives man the best opportunities for the development of his creativity." While the Stockholm Declaration is not ratified international law, Yuzon stresses that individual nation-states ought to recognize the extensive national ecological damage caused by military strategy. Yuzon ends with suggestions for alterations to the Geneva Convention on the environment that may engender respect for Stockholm's vision of environment.

International Committee of the Red Cross ("ICRC"), 19 avenue de la paix, CH 1202, Geneva, Switzerland. 41 (22) 733 20 57. www.icrc.org.

Established almost 150 years ago, the ICRC stands for the idea that, in times of war there are limits. Henry Dunant, a citizen of Geneva, confronted with the horrors of war in Northern Italy in 1854, set out to help suffering and dying soldiers. After his return to Geneva, Dunant wrote a book about his experience that influenced political figures of his time. As a result, a committee was established to aid and provide services to armed forces engaged in war. The committee sent assistance to the Austro-Prussian war, Franco-Prussian war, Eastern Crisis, Serbo-Bulgarian war and the Balkans war. Through its experiences with war, the committee became the driving force in development of international humanitarian law. It is within this emphasis on international humanitarian law that the interest and concern for the protection of the environment has emerged. The ICRC is actively engaged in shaping policy and law for the protection of the environment in times of armed conflict. Its well-organized and accessible webpage lists several press releases, articles, and books dedicated to the conversation on the protection of the environment during armed conflict. The webpage is available in English, French, Spanish, Arabic and German.

International Committee of the Red Cross. 1996. Guidelines for Military Manuals and Instructions on the Protection of the Environment in Times of Armed Conflict. Geneva. ICRC

This document is published by the International Committee for the Red Cross as a supplement to the International Conference for the Protection of War Victims in 1993. The guidelines selected by the ICRC are a summary of the existing applicable international rules for members of the armed forces in all countries and regions. The ICRC emphasizes that these rules must be known and respected by members of the armed forces when they engage in national and international conflicts. The guidelines put forward by the ICRC are not a comprehensive account of the international laws in this area, but rather, taking into account the recommendations of a group of international experts, ICRC proposes a collection of practical proposals for protection of the environment. The guidelines are intended as a tool to facilitate the instruction and training of armed forces and to promote an active interest in the protection of the environment.

The International Green Cross/Green Crescent 160a, rte de Florissant, 1231 Conches/ Geneva, Switzerland. 41 22 789 1662. webpage www.greencross.org

The International Green Cross was established by former Soviet President Mikhail Gorbachev to address the environmental legacy of wars. A particular interest of the International Green Cross is support for world-wide nuclear disarmament, addressing the legacy of nuclear and chemical weapons, assisting populations affected by chemical and nuclear weapons, and providing social and medical care to children, young people and mothers.

The mission of the Green Cross is to address the causes of environmental degradation. The

Green Cross assesses harm done to the environment in armed conflict and makes recommendations to different international groups concerning environmental damage and responsibility.

This organization's web page provides lists of events, conference materials, press releases, reports, speeches by Mikhail Gorbachev and other forms of information concerning the environment in the context of armed conflict.

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Founded in late 1996, the **BERKELEY WORKSHOP ON ENVIRONMENTAL POLITICS** emerged from a long-standing commitment to environmental studies on the Berkeley campus and from the presence of a core group of faculty whose research and scholarly interests linked environment, culture, and political economy. The workshop draws together over fifty faculty and doctoral students from San Francisco Bay Area institutions (the University of California campuses at Berkeley, Santa Cruz, and Davis, and Stanford University) who share a common concern with problems that stand at the intersection of the environmental and social sciences, the humanities and law. The Berkeley Workshop on Environmental Politics has three broad functions:

❖ to assist graduate training and scholarly research by deepening the theoretical and methodological toolkit appropriate to understanding environmental concerns in an increasingly globalized world;

❖ to bring together constituencies of local and international scholars, activists, and policy makers for transnational conversations on environmental issues; and,

❖ to bring community activists and policymakers to Berkeley as Residential Fellows, thus providing synergistic possibilities for developing new learning and research communities.

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THE INSTITUTE OF INTERNATIONAL STUDIES was established in 1955 to promote interdisciplinary research in international, comparative, and policy studies on the Berkeley campus of the University of California. The current emphasis is on the following intellectual themes: peace and security after the Cold War; environment, demography, and sustainable development; development and comparative modernities across regions; and globalization and the transformation of the global economy. The Institute has several major research programs, and provides support to Berkeley faculty and fellowships to Berkeley graduate students. Ongoing research colloquia bring together faculty, advanced graduate students, and visiting scholars for discussions. The Institute hosts distinguished visiting fellows who participate in Institute programs while in residence at Berkeley. Its public outreach programs include lectures, forums, conferences, interviews, and the *Connecting Students to the World* program. The Institute publishes *Policy Papers in International Affairs, Insights in International Affairs, Currents,* and the Globetrotter website <http://globetrotter.berkeley.edu>.