

# Creating Environmental Security? The Impact of the Military on the Environment

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## Course Description

### Overview and Objectives

What are the environmental impacts of military activity and war? How does military activity contribute to environmental degradation and how does resource and environmental conflict undermine peace? This module examines these issues and looks at environmental roles for the military -- positive and negative -- and the usefulness of analyzing environmental issues in terms of "national security." By the end of this session students should have an understanding of the environmental and health impacts of the production, storage and use of weapons in peacetime and war. Students should be able to speak to the debate surrounding environmental security, and environmental aspects of current issues such as continued nuclear testing, decisions to use military force, close military bases, and environmental aspects concerning the size and function at military.

This module is designed as a two-week module for the arms control, peace studies, environmental studies, etc session, three classes a week, organized in the following way: 1 Overview, 2- Nuclear Weapons Issues, 3- Military Toxics, 4-Impact of War, 5-Environmental Security, 6-A discretionary session for reports, student projects, quizzes, videos, debates, discussion on local issues, etc. A selected bibliography is included. (Due to the timeliness and importance of this topic it is suggested that the selected bibliography be placed in the library.)

### Topic Outline -- The Impact of the Military on the Environment

- I. Overview -- the impact of the military on the environment in peacetime and war, and the role of the military in environmental protection
- II. Nuclear Weapons Issues -- environmental impacts of production, testing, disposal and use of nuclear weapons
- III. Military Toxics -- contamination of land and water from conventional military activity
- IV. War -- the 1991 Gulf War as a test case of wartime impacts
- V. Environmental Security -- the debate on redefining national security; the contribution of environmental problems to conflict between nations; are there military solutions to environmental conflicts?
- VI. Discretionary session

### I. Overview

#### Objectives

From groundwater pollution to destruction of the ozone, students completing this module should be familiar with the range of military impacts on the environment and be able to evaluate the role of the military in environmental protection. Students should begin to formulate their own answer to President Eisenhower's warning that "the problem in defense is how far can you go without destroying from within what you are trying to defend from without.

#### Readings

"Special Report on the DoD and the Environment," Defense '92, July/August 1992. A series of five articles by U.S. Department of Defense officials describing the military's environmental programs from recycling to conservation and hazardous material management to pollution prevention. (from American Forces Information Service, 601 Fairfax St., Rm 311, Alexandria, VA 22314-2007.)

Miller, John M. "Hidden Wars: The Militaries' War on the Environment." *Nonviolent Activist*. November/December 1992. 4 pp. Overview of the impact of militarism on the environment in war and

peace. (From, PO Box 150753, Brooklyn, NY 11215.)

Renner, Michael G. "Assessing the Military's War on the Environment." in Brown, Lester, et. al. *State of the World 1991*. New York: W.W. Norton. 1991. 20 pp.

Thorough evaluation of environmental damage and resource use by the world's militaries.

Questions: Describe some of the ways that military activity contribute to degradation of the air, soil and water? Cite specific examples? How far should the military go to accommodate environmental concerns? What effect would this have on it's traditional missions? What aspects of military culture work against its ability to deal with environmental issues? How does the military's use of resources degrade the environment and contribute to conflict?

## II. Nuclear Weapons Issues

### Objectives

Some of the longest-lasting and most expensive environmental problems were created by the cold war accumulation of nuclear weapons. This section will acquaint students with the environmental consequences of the manufacture, testing, disposal and use of nuclear weapons. Students should be able to discuss the environmental and health hazards of nuclear weapons (e.g. the release of iodine isotopes into the atmosphere, strontium 90 into the Columbia river, groundwater contamination, etc.) They should begin to form their own opinion about the consequences of nuclear weapons use and production.

### Readings

Shulman Seth. *The Threat at Home Confronting the Toxic Legacy of the Military*. Chapter. 10. "Hanford, Washington: 'Sacrifice Zone.'"

The role of secrecy in hiding from the public the dangers at the U.S. Department of Energy's Hanford Nuclear Reservation, Washington, the producer of plutonium for U.S. nuclear weapons program (e.g. leaking waste storage tanks and airborne emissions). The dilemmas involved in closing the facility "as is" (leaving "a nuclear sacrifice zone") vs. paying the full cost of clean up.

IPPNW and The Institute for Energy and Environmental Research. *Plutonium: Deadly Gold of the Nuclear Age*. Cambridge, MA: International Physicians Press, 1992. 178 pp. Chapter 7, "Warhead Dismantlement and Plutonium Disposal."

Explores the pros and cons of various methods for disposing of plutonium from nuclear warheads from monitored surface storage and geologic disposal to launching plutonium into the sun. (from IPPNW, 126 Rogers St., Cambridge, MA 02142)

Lerager, James. "Second Sunset," *Sierra Club Magazine*. March-April 1992. p.60.

As 40 years of Soviet nuclear testing came to an end, the full extent of its impacts are revealed.

Schneider, Keith. "Valley of Death: Late Rewards for Navajo Miners." *New York Times*. May 3, 1993 pg. 1.

Bureaucratic delays in compensating Navajo uranium miners for any of the thirteen types of cancer developed as a result of exposure to uranium mining or nuclear testing.

United Nations. *Nuclear Weapons: A Comprehensive Study*. Disarmament Study Series #21.

Document # AI451373. Sales No. E.91.1X.12. New York. United Nations. 1991. Forward by Secretary General; Chapter 6, "Effect of Use of Nuclear Weapons and Consequences of Nuclear War" (Sections A, B, & E- Para.340-350.)

Description of the effects of nuclear explosion (thermal radiation blast, nuclear radiation, electromagnetic pulse, nuclear radiation and fallout.) and climatic effects including nuclear winter and destruction of the ozone layer.

### Questions

How has nuclear weapons production, testing, and use contributed to the degradation of the environment? Cite specific examples of contamination of the atmosphere, soil and water. What are some

of the differences and similarities in the problems created by nuclear weapons production in the former USSR & U.S.? What are the pros and cons of different methods of disposing of the plutonium from nuclear warheads?

### III. Military Toxics

#### Objectives

The military is a heavy user of fuels, solvents, heavy metals, paint strippers and explosives, all which have created major pollution problems. Students will be able to discuss the environmental impacts of peacetime military activity, especially from the production, storage, maintenance and training in the use of conventional and chemical weapons.

Readings Shulman Seth. *The Threat at Home: Confronting the Toxic Legacy of the U.S. Military*. Boston: Beacon Press. 1992. Chapters 1, 3 & 4.

Chapter 1, "Minefields in the Heartland," raises issues concerning clean up vs. closing a contaminated military site, in this case the Jefferson Proving Ground, Indiana, where unexploded ordnance is the main problem. Chapter 3, "Toxic Time Bomb," shows mishandling of toxic substances, such fuel and solvents. Chapter 4, "A Roadside Attraction," describes the U.S. Army's Aberdeen Proving Ground, storage area for chemical weapons where highly-explosive materials and nerve gas agents complicate clean up efforts.

Shulman, Seth. "Operation Restore Earth." *E Magazine*. March-April, 1993.

Details efforts to bring the U.S. military more fully under environmental law and to hold the military accountable for environmental clean up.

Goodno, James. "The Toxic Tragedy of Subic Bay." *E Magazine*, March-April 1993.

Since the U.S. Navy was forced to leave its base in the Philippines, Filipinos interested in developing the site have played down the problems of hazardous wastes and other pollution, while the U.S. has said it won't pay for clean up.

U.S. Department of Defense, *Defense Environmental Restoration Program (DERP)*, Annual Report to Congress for Fiscal Year 1991 or later. (February 1992 is Document #ADA 244196) Annual summary of the status of domestic contaminated military bases and sites with descriptions of clean up programs. (This should be in the library as a necessary reference work for U.S. students to be able to investigate possibly contaminated sites near their communities. Available from National Technical Information Service (NTIS), 800-553-6847.)

#### Questions

How much progress has the U.S. military made in identifying and cleaning up polluted military sites? What is the extent of contamination and estimated clean up costs at a nearby military site? How can environmental problems affect the ability to convert a military base to civilian uses? What role can citizen groups and local governments have in holding the military accountable for its pollution? What liability should a nation have for pollution created by its military outside its borders? How would you investigate possible pollution at a [nearby] military bases?

### IV. War

#### Objectives

This section uses one war, the 1991 Gulf War, to give students an understanding of the environmental impacts of war and international legal efforts to regulate these impacts. Students should understand some of the debate surrounding the environmental impacts of the gulf war and the usefulness.

#### Readings

Bloom, Saul, John M. Miller & Philippa Winkler. *Hidden Casualties II: Environmental, Health and Political Consequences of the Persian Gulf War*. San Francisco: North Atlantic Books; London: Earthscan Publications. 1993. Chapters 2 (Oil Spills), Chapter 4 (Desert Impacts), Chapter 8 and Appendix 3 (International Law).

This is an anthology of in-depth interviews, articles and background papers. Chapter 2 examines the impacts of the major oil spills on habitats of the Persian Gulf. Chapter 4 looks at the effects on the deserts

from military activity, depleted uranium, unexploded ordinance and spilled oil. In Chapter 8 the impacts of the war on international law is debated by international legal experts and the United Nations, while Appendix 3 includes relevant excerpts from international treaties. (From ARC/Arms Control Research Center, 942 Market St., Ste. 202, San Francisco, CA 94102).

United Nations Environmental Program, "Updated Scientific Report Environmental Effects of the Conflict between Iraq and Kuwait," (UNEP/GC.17/Inf.9) March 8, 1993.

This documents summarizes the UN's findings on the environmental impacts of the oil fires and oil spills during the 1991 Gulf War.

#### Questions

In light of the Gulf War, does international law on war & environment need strengthening? What weight should the potential environmental consequences have in decisions to go to war? Should environmental concerns influence the choice of targets and weapons used in war? How can environmental destruction in war affect post-war civilian health and reconstruction?

### **V. Environmental Security**

#### Objectives

The security of nations and global security can be threatened as much by environmental and other problems as by military threats. Conflicts over nonrenewable resources, such as oil, and environmental decline of renewable resources, such as water and arable land, have contributed to armed conflict. This section will expose students to a range of perspectives in the debate on the relationship of the environment and security. Students should be able to form an opinion about the usefulness of examining environmental problems using traditional concepts of national security -- where states seek advantages vis a vis each other -- and be able to discuss the relationship between conflicts over resources and military conflict.

#### Readings

Deudney, Daniel. 1991. "Environment and Security: Muddled Thinking." *Bulletin of the Atomic Scientists*, Vol.47, No. 3. pp. 22-28.

Argues that defining environmental threats as threats to national security detracts from their solution. Response to Peter H. Gleick (see next item).

Gleick, Peter H. "Environment and Security: The Clear Connections." *Bulletin of the Atomic Scientists*, 1990. Vol.47, No. 3. pp. 17-21.

Argues that the link between the environment and national security is clear, because resources are strategic goals, often targets of attack, and used as military tools.

Homer-Dixon, Thomas F., Jeffrey H. Boutwell and George W. Rathjens. "Environmental Change and Violent Conflict." *Scientific American*. February 1993. pp. 38-45.

How scarcities of renewable resources contribute to social instability and civil strife.

Vesilind, Priit J. "Water, The Middle East's Critical Resource". *National Geographic*. Vol. 183, No. 5 May 1993.

From Turkey to Egypt, wars have been a major reason for impeding the supply of clean water for drinking, irrigation and other uses.

#### Questions

How can conflict over resources, such as oil or arable land, lead to military escalation and war? Cite examples from actual conflicts. Can cooperation over environmental problems issues lead to cooperation in other areas such as arms control and disarmament? What are the drawbacks in using military force to address severe environmental problems with cross border impacts? Analyze the environmental aspects of an active conflict? How important were these in causing or exacerbating the conflict?

### **VI. Discretionary Session**

Prepared by Subcommittee on the Military and Environment of the Undergraduate Prototype Committee, United Nations/International Association of University Presidents Commission on Arms Control Education. Judy Lowe, Chair (PeaceAction, 4 High Point Rd., Westport, CT 06880; 203-259-0072; fax: 203-259-1282); John M. Miller (International Clearinghouse on the Military and the Environment/ARC, PO Box 150753, Brooklyn, NY 11215; 718-788-6071; e-mail: [fbp@igc.apc.org](mailto:fbp@igc.apc.org)); Dr. Pat Kenoyer, SL (635 E. 12 St. #6K, New York, NY 10009; 212-674-2542).

Please send comments and suggestions to Judy Lowe.

## **Impacts of the Military on the Environment**

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This bibliography is to assist in teaching a module on this subject designed for a two week session, three classes a week, organized in the following way 1 - Overview, 2- Nuclear Issues, 3- Military Toxics, 4- Impact of wars, 5-Environmental Security (redefining national security, can the military save environmental problems, allow environmental problems create connect between nations), 6-A discretionary session for reports, student projects, quizzes, videos, discussion on local issues, etc. Please send additions and corrections to International Clearinghouse on the Military and the Environment/ARC, PO Box 160763, Brooklyn, NY 11216 USA; e-mail: [fbp@igc.org](mailto:fbp@igc.org)

### Overviews

Calhoun, Martin. "Defending the Environment? The Record of the U.S. Military." *Defense Monitor*. Vol. XVIII, No. 6. 1989. 8 pp.

Overview of U.S. activities including environmental hazards of nuclear, chemical, biological weapons production, also problems connected with testing, transporting toxic materials, space pollution, military base pollution, use of resources and more. From Center for Defense Information, 1500 Massachusetts Ave. NW, Washington, DC 20005.

Cheney, Richard. "The DoD Environmental Ethic." Speech before Western Association of Attorneys General, Jackson Hole, WI, August 4, 1989. *Defense Issues*. Vol. 4 No. 32. 3 pp.

*Disarmament Times*. "Militarism and the Environment." March 1992.

Special double issue. Available from NGO Committee on Disarmament, 777 UN Plaza, New York, NY 10017.

GRIP. *Les conflits uerts: la deterioration de l'environnement, source de tensions majeures*. 1992. 200 pp.

Chapters on major environmental problems, environmental causes of conflicts, the impacts of the military on the environment and possible remedies. Heavy stress on North-South conflict. From GRIP- Institut de recherche et d'information sur la paix et la securite, 33 Rue Van Hoorde, B-1030 Bruxelles. Also available, a wall chart: Ces conflits verts qui nous menacent en l'an 2000.

Miller, John M. "Hidden Wars: The Militaries' War on the Environment." *Nonviolent Activist*. November/December 1992. 4 pp.

Overview of the impact of militarism on the environment in war and peace. From International

Clearinghouse on the Military and the Environment/ARC, PO Box 150753, Brooklyn, NY 11215.

Kimball, D., et al. *Covering the Map: A Survey of Military Pollution Sites in the United States*. Washington, DC: Physicians for Social Responsibility and Litchfield, ME: Military Toxics Project. May 1993. 200 PI)

State by state survey of military polluted sites in the U.S. Combines Department of Energy data on nuclear weapons production contamination with information from the Department of Defense. From PSR, 1000 16th St., NW, Suite 810, Washington, DC 20036.

Renner, Michael G. "Assessing the Military's War on the Environment." in Brown, Lester, et. al. *State of the World 1991*. New York: W.W. Norton. 1991. 20 pp.

Thorough evaluation of environmental damage and resource use by the world's militaries.

\_\_\_\_\_. "War on Nature." *World Watch*, Vol.4 No. 3. 1991. pp. 18-25.

Shulman, Seth. T714 Threat at Home: *The Threat at Home: Confronting the Toxic Legacy of the U.S. Military*. Boston: Beacon Press. 1992. 254 pp.

Well-written account focusing on the domestic legacy of toxic waste, nuclear contamination and unexploded ordnance at U.S. military bases and nuclear production facilities.

Sidel, Victor W., M.D. "Farewell to Arms: The Impact of the Arms Race on the Human Condition," *PSR Quarterly*, Vol. 3 No.1. pp. 18-26. 1993.

Discusses the health consequences of the environmental impacts of nuclear and conventional arms and of impacts of military spending.

Strategic Studies Institute, "SSI Special Report: Strategic Outreach Conference Report, The Army and the Environment," July 24-25, 1990. 23 pp. From Strategic Studies Institute, U.S. Army War College, Carlisle Barracks, PA 17013.

U.S. Council on Environmental Quality (CEQ). *Environmental Quality: 23rd Annual Report*. Washington, DC: GPO. 1993.

Includes a summary of Department of Defense environmental programs on see pp. 39-46. From CEQ, 722 Jackson Pl. NW, Washington, DC 20503.

Westing, Arthur. *Warfare in Fragile World* A Stockholm International Peace Research Institute (SIPRI) book. London: Taylor & Francis. 1980.

Pioneering study of the impact of war and other military activity on various ecosystems.

Westing, Arthur and Malvern Lumsden. *Threat of Modern Warfare to Man and His Environment: An Annotated Bibliography*. Reports and papers in the social sciences No. 40. Paris:UNESCO. 1978. 25 pp.

Nuclear Issues Albright, David, et al. "Facing Reality: The Future of the U.S Nuclear Weapons Complexn. National Council. on the Department of Energy's Nuclear Weapons Complex. 1992. Comprehensive post-Cold War policy analysis and set of recommendations for the entire complex. Available from Nuclear Safety Campaign, 1924 North 34 St. #407, Seattle, Washington, 98103.

Dahlberg, John-Thor. "The Atom Sows Crop of Sadness." *Los Angeles Times*. Sept, 2 1992. p. 1. First of a three part series on the environmental effects of Soviet nuclear programs. Continued Sept. 3 &4.

Del Tredici, Robert. *At Work in the Fields of the Bomb*. New York: Harper & Row.1987. 192 pp.

Photographs and commentary on the U.S. nuclear weapons complex.

Ehrlich, Anne H. and John W. Birks, eds. *Hidden Dangers: Environmental Consequences of Preparing for War*. San Francisco: Sierra Club Books. 1990

Anthology on nuclear and chemical weapons production and use.

Eriksen, Viking Olver. *Sunken Nuclear Submarines*. Oslo:Norwegian University Press. 1990. 177 pp.

Submarine accidents and their environmental impacts.

Fetter, Steve and Frank von Hippel. "The Hazard from Plutonium Dispersal by Nuclear-Warhead Accidents." *Science & Global Security*. Vol. 2, No. 1. 1990. pp. 21-41.

Geiger, H. Jack, et. al. *Dead Reckoning: A Critical Review of the Dept. of Energy's Epidemiologic Research*. Washington, DC: Physicians for Social Responsibility. 1992. 96 pp.

An investigation of the DOE's efforts to calculate the health effects of nuclear weapons production.

Gray, Peter. "How the Grassroots are Pulling up the Roots of the Arms Race." *Nuclear Times*. Autumn/Winter 1992. pp. 76-80.

Greenpeace International. *Testimonies: Witnesses to French Nuclear Testing in the South Pacific*. Greenpeace Test Ban Campaign. August 1990.

Account of French atmospheric and underground nuclear test at Moruroa and Fangataufa atolls. Available from Greenpeace, 1436 U Street, NW, Washington, D.C. 20009.

Harwell, M.A. and Hutchinson, T.C., *Environmental Consequences of Nuclear War*, SCOPE 28. Vol. II., Ecological and Agriculture Effects, 2nd edition. Published on behalf of the Scientific Committee on Problems of the Environment (SCOPE) of the International Council of Scientific Unions (ICSU). Chichester: Wiley & Sons. 1990, 523 pp.

Hersey, John. *Hiroshima*. New York: Knop 1946.

International Physicians for the Prevention of Nuclear War (IPPNW). *Radioactive Heaven and Earth: Health and Environmental Effects of Nuclear Weapons Testing, On and Above the Earth*. Cambridge: IPPNW. 1990.

IPPNW and The Institute for Energy and Environmental Research. *Plutonium: Deadly Cold of the Nuclear Age*. Cambridge, MA: International Physicians Press. 1992. 178 pp.

Explores the risks involved in the production, storage and use of plutonium whose only use is for weapons and electricity production., from IPPNW, Roger~ St., Cambridge, MA 02142.

Lerager, James. "Second Sunset". *Sierra Club Magazine*. March-April 1992. p. 60.

Forty years of Soviet nuclear testing come to an end and the people bear witness to a cold, cruel war.

May, John. *The Greenpeace Book of the Nuclear Age: The Hidden History/ The Human Cost*. New York: Pantheon. 1989.

Nuclear accidents and incidents, civilian and military.

National Council on the Department of Energy's Nuclear Weapons Complex. "Facing Reality: A Citizen's Guide to the Future of the U.S. Nuclear Weapons Complex." Sept. 1992.

A 21-page summary of "Facing Reality." See Albright, et al. above,

Pitcock, et al., *Environmental Consequences of Nuclear War, SCOPE 28. Vol. I: Physical and Atmospheric Effects*. 2nd edition. Chichester: Wiley & Sons. 1990. 359 pp.

Radioactive Waste Campaign (RWC). *Deadly Defense: Military Radioactive Landfills*. New York: RWC. 1988. 169 pp.

Survey of radioactive contamination and citizen action at nuclear weapons sites. RWC, 7 West St., Warwick, NY 10990.

Schell, Jonathan. *The Fate of the Earth*. New York: Knopf. 1982. 244 pp.

Schneider, Keith. "Valley of Death: Late Rewards for Navajo Miners." *New York Times*. May 3, 1993 pg. 1.

Bureaucratic delays in compensating Navajo uranium miners for any of the thirteen types of cancer developed as a result of exposure to uranium mining or nuclear testing.

Swahn, Johan. "The Long-Term Nuclear Explosives Predicament: The Final Disposal of Militarily Usable Fissile Material in Nuclear Waste from Nuclear Power and From the Elimination of Nuclear Weapons." Goteborg: Technical Peace Research Group, Institute of Physical Resource Theory. 247 pp. (Chamers University of Technology). 1992.

Union of Concerned Scientists. "The Biggest Cleanup in History." *Nucleus*, Winter 1989. p. 5.

Easy-to-read map and chart of U.S. nuclear weapons plants.

United Nations. *Study on the Climatic and Other Global Effects of Nuclear War*. Disarmament Study Series #18. Rep. of the Secretary-General, United Nations, New York, 1989, 61 p. Sales no. E.89.IX. I., A/431351.1989.

U.S. Congress, Office of Technology Assessment. *Complex Cleanup: Environmental Legacy of Nuclear Weapons Production*. OTA-0-484. Washington, DC: Government Printing Office (GPO). February 1991. 212 pp.

U.S. Congress Office of Technology Assessment. "The Effects of Nuclear War." Washington, DC: GPO. May 1979.

Notable for what is not studied. Environmental effects are dealt with in the chapter, "Other Long-Term Effects." pp. 109- 115.

U.S. Department of Energy. *Environmental Restoration and Waste Management Five-Year Plan*, Student Edition. DOE/EM-0083P. September 1992. 17 pp.

Weingartner, Erich. *The Pacific: Nuclear Testing and Minorities*. London: Minority Rights Group. January 1991. 36 pp. from 379/391 Brixton Rd., London SW9 7DE, U.K.

## **Military Toxics**

Broder, John M. "U.S. Military Leaves Toxic Trail Overseas," *Los Angeles Times*. June 18, 1990. p. 1.

Bukowski, Grace, et al. *Uranium Battlefield Home & Abroad Depleted Uranium Use by the U.S. Department of Defense*. Reno: Citizen Alert (PO Box 5339, Reno, NV 89513). March 1993. 166 pp.

A report on the use of Depleted Uranium (DU) by U.S. military in armor-piercing projectiles and armor construction. This report looks at the environmental and health threat from production and use of this low-

level radioactive material. Special emphasis is given to DU's use during the Gulf War.

Burke, W.K. "Wasted Dollars, Wasted Lives: A Look Inside the Environmental Industrial Complex." *E Magazine*. May/June 1993.

Detailed account of the failure of environmentally sound technologies to be used in clean up of super fund sites.

Doty, Paul. "The Challenge of Destroying Chemical Weapons". *Arms Control Today*. October 1992. pp. 25-29.

Feshbach, Murray and Alfred Friendly, Jr. *Ecocide in the USSR: Health and Nature Under Siege*. New York: Basic Books. 1992. see especially pp. 170- 179.

Findlay, Trevor. *Green Vs. Peace? The Johnston Atoll Controversy*, Working Paper No. 81, Peace Research Centre, Australian National University, Canberra, 1990. 18 pp.

Argues that many environmental concerns about chemical weapons incineration are misplaced.

General Accounting Office. *Hazardous Waste: Management Problems Continue at Overseas Military Bases*. Washington, DC: GAO. Order #GAO/NSIAD 91 -231.

Goodno, James B. "Bye-bye Subic Bay-Hello Toxic Mess." *E Magazine*. March/April 1993.

Closing the naval base, logistical hub of the U.S. Seventh fleet in the Philippines

Grael, Thane, "Dishonorable Discharges-The Military's Peace-Time War on Planet Earth." *E Magazine*. July/August 1990. p. 43, 4 pp.

Heininen, Lassai, ed. "Arctic Environmental Problems." Tampere, Finland: Tampere Peace Research Institute.

Occasional Papers no. 41. 1990. 127 pp.

This paper looks into various environmental threats, including military presence in northern waters.

Innes, Richard and Claudia A. McMurray. "Cleaning Up Our Act." *Proceedings*. October 1991. p. 65-67.

U.S. Navy actions to comply with domestic environmental law.

Ledogar, Stephen J, "Destruction of Weapons Systems Under Multi-lateral Arms Control Agreements," *Disarmament- A Periodic Review by the United Nations*. Volume XIV No.4, 1991 pp 115-122.

Problems, environmental and others, in destroying chemical weapons. Available from United Nations, Sales Section, Room DC2-853, United Nations, New York, NY, 10017.

National Toxic Campaign Fund (NTCF);. *The U.S. Military's Toxic Legacy: A Special Report on America's Worst Environmental Enemy*. Boston:NTCF. January 1991. 127 pp.

Analysis of toxic contamination at U.S. military bases and contractors and proposed solutions. From: NTCF, 1168 Commonwealth Ave., Boston, MA 02134.

National Governors' Association (NGA)-National Association of Attorneys General Task Force on Federal Facilities. *From Crisis to Commitment: Environmental Cleanup and Compliance at Federal Facilities*. Washington, DC: NGA. January 1990. 23 pp.

The need for state involvement in regulating the environmental compliance of federal facilities within their borders.

Physicians for Social Responsibility (PSR), *Military Toxins Fact Sheet*. 1992.

List of contaminated military bases, highlighting Superfund sites; available from PSR, 1000 16th St. NW, Suite 810, Washington, DC 20036.

Siegel, Lenny. *Operation Ozone Shield The Pentagon's War on the Stratosphere*. Boston: NTCF. February 1992. 15 pp.

Analyzes U.S. military's use of ozone depleting CFCs and proposes changes in policy.

Shulman, Seth. "Operation Restore Earth." *E Magazine*. March-April, 1993.

Details efforts to bring the U.S. military more fully under environmental law and to hold the military accountable for environmental clean up.

Siegel, Lenny and Gary Cohen. "America's Worst Environmental Nightmare: The U.S. Military's Toxic Legacy." *New Solutions*. Winter 1991. pp. 37-47 New Solutions, P.O. Box 2812, Denver, CO 80201.

Silton, Triana. "Out of the Frying Pan...Chemical Weapons Incineration in the United States," *The Ecologist*. Vol. 23, No.1. January/February 1993. pp. 18-24.

Citizen opposition to the disposal of chemical weapons by incineration in the United States.

U.S. Army Environmental Policy Institute (AEPI). U.S. Army Environmental Strategy into the 21st Century."

Strategies to implement the U.S. Army's vision as "a national leader in environmental and natural resources stewardship for present and future generations as an integral part of our mission." From Public Affairs Office of U.S. Army Toxic & Hazardous Materials Agency, Bldg. 460, Aberdeen Proving Grounds, MD 21010-5401.

U.S. Department of Defense. *Defense Environmental Restoration Program*, Annual Report to Congress. 1986

Annual listing of the status of contaminated bases and sites and a description of clean up programs.

Weiner, Sharon K "Environmental Concerns at U.S. Overseas Military Installations." Defense and Arms Control Studies Program (DACS) Working Paper, Center for International Studies, MIT, 292 Main St., Cambridge, MA 02139. July 1992.

Wilkes. Owen. "Chemical Weapons Burnoff in Central Pacific." *Peacelink*. No.83. July 1990. pp.5-10.

Zoltan, Marc. "Toxic Waste: Poison in the Navy's backyard." *Navy Times*. January 20, 1992. p. 12-15.

## **War**

Arkin, William M., Damian Durrant, and Marianne Cherni. *On Impact: Modern Warfare and the Environment, A Case Study of the Gulf War*. Washington, DC: Greenpeace. 1991. 171 pp.

The study draws attention to the need for serious need for a serious review of the state of international law as it applies to environmental destruction in war.

Arne, Willy Dahl. "Environmental Destruction in War." *Disarmament: A Periodic Review by the United*

*Nations*. Vol. XV, No. 2, 1992.

Review of legal instruments relevant to environmental destruction in war.

Badolato, Colonel Ed. "Pollution as Ammunition." *Proceedings of the U.S. Naval Institute*. October 1991. p. 68-70.

Military actions that might have prevented the torching of oil fields in Kuwait.

Bloom, Saul, John M. Miller & Philippa Winkler. *Hidden Casualties II: Environmental, Health and Political Consequences of the Persian Gulf War*. San Francisco: North Atlantic Books; London: Earthscan Publications. 1993.

Anthology of in-depth interviews, articles and background papers from ARC/Arms Control Research Center, 942 Market St., Ste. 202, San Francisco, CA 94102.

Bouvier, Antoine. "Protection of the Natural Environment in Time of Armed Conflict." *International Review of the Red Cross*. No. 285. November/December 1991. pp. 567-578.

Cloudsley-Thompson, J.L. "The Destructive Effects of Warfare on the Desert Environment." *Environmental Awareness*. Vol. 13, No.2. 1990. pp-. 43-48.

Environmental Advisory Council (EAC). *War and Environment*. Stockholm: Environmental Advisory Council. 1981.

Papers from a conference held May 25, 1981. Chapters discuss the use of resources by the military, treaties to limit military impacts on the environment and the impacts of conventional, chemical & biological and nuclear warfare. from EAC, Ministry of Agriculture, S-103 33, Stockholm, Sweden.

Faber, Daniel. *Environment Under Fire: Imperialism and the Ecological Crisis in Central America*. New York: Monthly Review Press. 1992. 320 pp.

Reveals the roots of Central America's social and ecological crises in U.S. economic and military policy.

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