

A BRIEF HISTORY OF ENVIRONMENTAL POLICY

Human Control / Impacts		Public Health	Resource Conservation	Industrial Regulation	Civil Soc / Governance	Economics / Ecology
5x10⁵ BCE	Fire domesticated by <i>homo erectus</i>					
4x10⁵ BCE	<i>Homo sapiens</i> evolve from <i>homo erectus</i>					
10,000 BCE	Domestication of dogs, goats Wheat and rye cultivated in Fertile Crescent					
7000 BCE	Pottery is invented					
5000 BCE	Copper first smelted					
3500 BCE	Earliest Mesopotamian cities, irrigation systems Bronze is invented First animal-drawn plows					
2500 BCE		Babylonian and Israeli cities enforce strict hygiene laws Mohenjo Daro culture (Pakistan/India) invents underground sewers				
1750 BCE					Code of Hammurabi is first written law	
1500 BCE	Glass vessels first made in Mesopotamia					
1400 BCE	Iron smelting is invented					
650 BCE						Coined money first minted
350 BCE		Roman aqueducts are built	At Aristotle's urging, several Greek city-states protect forests and regulate wood use			In <i>Ethics</i> , Aristotle argues price should represent "intrinsic worth" to humans Paper money in China
1000 CE			Many European feudal states restrict hunting of wild game to nobles			

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1300s	Sawmill is invented	The Black Plague decimates Europe; cities begin enforcing strict hygiene laws	German and French forest laws attempt to protect valuable timber supplies	England limits coal burning to preserve London air quality		Aquinas' <u>Summa Theologica</u> calls loaning on interest (usury) "un-Christian"
1600s	Hooke discovers plant cells	Paris builds Europe's first large-scale sewage system	France strengthens its <u>Forest Codes</u> Pennsylvania settlers required to preserve 1 in 5 forested acres		<u>Treaty of Westphalia</u> ends the Thirty Years' War and gives rise to territorial nation-states	
1700s	Tull invents seed drill Watt steam engine invented	Citizens petition to remove tannery waste from Philadelphia's commercial center Typhus epidemic kills thousands in London Jenner develops smallpox vaccine	Early closure of the heath hen hunting season in New York		Hundreds of Bishnois Hindus die trying to protect trees from the Maharaja of Jodhpur	Quesnay's <u>Tableau Economique</u> calls land source of wealth Smith's <u>The Wealth of Nations</u> establishes the <i>Classical School</i> Bentham, Mill et al develop <i>Utilitarianism</i> Malthus writes his <u>Essay on Population</u>
1800-1820		First modern sewer built in London	US Navy Secretary authorized to reserve timber lands Massachusetts bans hunting of two threatened species			Ricardo develops the theory of <i>comparative advantage</i>
1830-1849	Deere invents steel plow	The <u>UK Public Health Act</u> is passed after cholera kills 62,000	Arkansas Hot Springs becomes the first national reservation <i>US Department of the Interior</i> is established		<i>Scottish Rights of Way Society</i> founded	Dupuit establishes <i>willingness to pay</i> as a measure of value Marx writes <u>The Communist Manifesto</u>
1850-1884	Chromosome and DNA discovered Mendel describes <i>Laws of Heredity</i> Marcus invents gasoline-powered automobile First hydroelectric dam	New York city rules all homes must be connected to sewers Pasteur develops germ theory of disease	<i>US Geological Survey</i> is formed <i>US Division of Forestry</i> established (becomes <i>US Forest Service</i> in 1905)	<u>UK Alkali Act</u> enacted to reduce pollution by the chemical industry First US municipal air pollution control laws	The <i>American Society for the Prevention of Cruelty to Animals</i> is founded <i>American Forests</i> is founded	Darwin publishes <u>Origin of the Species</u> Jevons, Walras, et al establish the <i>Neo-Classical School</i> Häckel writes on <i>ecology</i> Seuss coins <i>biosphere</i> Forbes develops <i>ecosystem</i> concept

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1885-1899	Arrhenius speculates on CO ² and climate change	Chicago develops the first comprehensive US city sewer system Nicolle invents typhus vaccine	US Census declares the "end of the American frontier" <i>Yosemite, Sequoia</i> and <i>General Grant National Parks</i> established		<i>Sierra Club</i> founded <i>Massachusetts Audubon Society</i> founded	Marshall interprets <i>marginal utility theory</i> in formal mathematics
1900-1915	Sutton and Boveri propose chromosome theory of inheritance Haber process to synthesize ammonia	First international health organization is established in Paris Construction of Baltimore sewer begins	<u>US Lacey Act</u> regulates interstate wild game traffic First <i>US National Bird Preserve</i> is named on Pelican Island, Florida	US-Canada pollution agreement negotiated between t US and UK	<i>American Scenic and Historic Preservation Society</i> founded <i>Smoke Prevention Association of America</i> founded	Pareto and Walras develop <i>general equilibrium theory</i> Grey formalizes <i>optimal resource consumption</i> <i>Ecological Society of America</i> founded
1916-1925			<i>US National Park Service</i> is established <u>Migratory Bird Treaty</u> signed with Canada	<u>US Oil Pollution Act</u> prohibits near-shore discharges	<i>Save the Redwoods League</i> founded <i>National Parks Association</i> founded	Soddy argues that <i>thermodynamics</i> limit economic productivity Pigou on taxing <i>negative externalities</i>
1926-1945	Stihl invents gas chainsaw Muller identifies genetic mutations due to radiation Bosch invents industrial-scale ammonia production Hoover Dam is first mega-dam to be constructed Weil et al create first sustained nuclear reaction	Fleming discovers penicillin US National Institute of Health established	<i>US Civilian Conservation Corps</i> formed, dissolved within a decade		<i>Wilderness Society</i> founded <i>National Wildlife Federation</i> founded <i>Planned Parenthood</i> founded	Elton on <u>Animal Ecology</u> Clements and Weaver publish <u>Plant Ecology</u> Keynes' <u>General Theory</u> on <i>aggregate demand</i> Kaldor and Hicks on <i>welfare economics</i> Lindeman develops <i>energetics</i> methodology
1946-1955	First artificial insemination Watson and Crick identify DNA's helical structure	World Health Organization formed Centers for Disease Control and Prevention founded to fight contagious disease CDC establishes applied epidemiology program	<u>International Whaling Convention</u> signed First <i>UN Conference on the Environment</i>	<u>US Federal Water Pollution Control Act</u> <u>US Air Pollution Control Act</u>	<i>Defenders of Wildlife</i> founded <i>International Union for the Protection of Nature</i> forms Osbourne writes <u>Our Plundered Planet</u> <i>The Nature Conservancy</i> founded	Hottelling uses <i>travel cost</i> to establish <i>amenity values</i> Gordon's economic theory of <i>common property resources</i> Arrow and Debreu's <i>general equilibrium</i> proof Odum writes textbook <u>Fundamentals of Ecology</u>

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1956-1960	FDA approves oral birth control and IUDs	Earliest known HIV case	<u>Antarctic Treaty</u> established wildlife and scientific preserve <i>UN Conference on the Law of the Sea</i> generates series of related treaties	<u>US Water Pollution Control Act</u> California imposes first car emissions standards <u>US Clean Water Act</u>	<i>First International Geophysical Year</i>	Eckstein promotes <i>cost-benefit analysis</i> for resource policy In the <u>Problem of Social Cost</u> , Coase claims property rights lead to <i>internalization</i>
1961-1965	Brenner et al discover RNA Green Revolution begins		<i>US National Wilderness Preservation System</i> established	<i>International Clean Air Congress</i> held in London <u>US Clean Air Act</u> funds research and cleanups <u>US Water Quality Act</u> <u>US Solid Waste Disposal Act</u>	<i>World Wildlife Fund</i> founded Silent Spring First World Parks Conference in Seattle	Barnett and Morse's <u>Scarcity and Growth</u> on future availability of natural resources Davis, et al begin developing <i>contingent valuation</i> methods
1966-1970	Torrey Canyon spills 80,000 tons of oil off Cornwall's coast	First case of HIV in US	<u>US Endangered Species Preservation / Conservation Acts</u> <u>US Wild and Scenic Rivers Act</u> <i>UN Biosphere Conference</i>	<u>US Air Quality Act</u> funds pollution control planning Sweden establishes first national environmental protection agency <u>US National Environmental Policy Act</u> <u>US Clean Air Act</u>	<i>Environmental Defense Fund</i> founded <i>Club of Rome</i> founded <i>Friends of the Earth</i> founded <i>Natural Resources Defense Council</i> founded First <i>Earth Day</i>	Boulding's <i>Spaceship Economics</i> argues for radical recycling Hardin's <u>Tragedy of the Commons</u> Daly writes <u>On Economics as a Life Science</u> Dales on <i>tradable pollution permits</i> Ayres and Kneese on <i>materials balance</i> and <i>externalities</i>
1971-1972	Berg creates recombinant DNA		<u>Ramsar Convention on Wetlands</u> is signed <u>US Coastal Zone Management Act</u> <u>US Marine Mammal Protection Act</u> <u>World Heritage Convention</u> signed	<u>US Federal Water Pollution Control Act</u> <u>US Ocean Dumping Act</u> <u>US Toxic Substances Control Act</u>	<i>Greenpeace</i> founded <i>UN Conference on the Human Environment</i> held in Stockholm <i>UN Environment Program</i> established First bottle recycling bill passes in Oregon <u>Limits of Growth</u>	Georgescu-Roegen argues the <i>Laws of Thermodynamics</i> ultimately limit growth Nordhaus and Tobin on <i>accounting for environmental quality</i> Meadows et al write <u>Limits to Growth</u> Simon's theory of <i>bounded rationality</i>

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1973-1975		<u>US Safe Drinking Water Act</u>	<u>CITES Treaty</u> signed <u>US Endangered Species Act</u>	<u>International Treaty to Prevent Pollution from Ships</u> signed <u>US Hazardous Waste Transportation Act</u>	<i>Worldwatch Institute</i> founded <i>Council of Asilomar</i> founded to discuss future of recombinant genetics	Schumacher publishes <u>Small is Beautiful</u> OECD Economics Unit develops the <i>polluter pays principle</i>
1976-1979	First <i>in vitro</i> fertilization of a human being Human growth hormone cloned and patented	WHO declares smallpox is effectively eradicated	<u>US Federal Land Policy Management Act</u> <u>US National Forest Management Act</u> <u>US Soil and Water Conservation Act</u> <u>Endangered American Wilderness Act</u>	EPA has authority to regulate leaded gas <u>US Resource Conservation and Recovery Act</u> <u>US National Energy Act</u> <u>Long-Range Transboundary Air Pollution Treaty</u> signed	<i>The Land Institute</i> founded in Kansas <i>Green Belt Movement</i> founded in Kenya First <i>Blue Angel</i> eco-labels are awarded <i>Love Canal Homeowners Association</i> founded	Daly proposes a <u>Steady-State Economics</u> as an alternative to perpetual growth Dasgupta and Heal unite growth theory in <u>Economic Theory and Exhaustible Resources</u> Lovelock writes <u>Gaia: A New Look at Life on Earth</u>
1980-1982	First transgenic animal	World Health Assembly calls for a <i>Global Strategy of Health for All</i> by 2000 Interferon cloned Genetically engineered insulin first sold Onset of AIDS epidemic	<u>World Conservation Strategy</u> guides many developing nation conservation plans <u>US Endangered Species Act</u> amended	<u>US Superfund Act</u> directs the EPA to clean up toxic waste <u>The Global 2000 Report to the President</u>	<i>Citizens Clearinghouse for Hazardous Waste</i> founded <u>UN World Charter for Nature</u> <i>World Resources Institute</i> founded	Siebert's <i>ecospace</i> describes ecological sources and sinks
1983-1987	Monsanto develops first antibiotic-resistant GMO Frostban is first field-tested GMO	First International AIDS Conference in Atlanta AZT trials to control AIDS	<u>UN Convention on the Law of the Sea</u> signed <u>International Tropical Timber Agreement</u> signed	<u>Vienna Convention for the Protection of the Ozone Layer</u> signed <u>US-Canada Agreement on the Transboundary Movement of Hazardous Wastes</u> <u>Montreal Protocol</u> on Ozone-Depleting Chemicals	UN World Population Conference in Mexico <u>US Emergency Planning and Community Right to Know Act</u> <i>Third World Network</i> founded	Solow on <i>allocation of renewable resources across generations</i> <u>Ecological Modeling</u> special issue on <i>Ecological Economics</i> Martinez-Alier writes <u>Ecological Economics</u>
1988	Transgenic mouse is first patented life form		UNEP convenes <i>Ad Hoc Working Group of Experts on Biological Diversity</i>	<i>Intergovernmental Panel on Climate Change</i> established <i>World Conference on the Changing Atmosphere</i> in Toronto		<i>International Society of Ecological Economics</i> founded

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1989-1991	Human Genome Project is launched	AIDS drugs first marketed First gene therapy trials on humans	<u>UN Antarctica treaty</u> prohibits mining, limits pollution and protects animal species	<u>Basel Convention</u> regulates hazardous waste transport <u>London Protocols</u> tighten ozone controls <u>US Clean Air Act</u> amendments restrict power plant emissions <u>US-Canada Agreement on Air Quality</u>	Nigeria's <i>Movement for the Survival of the Ogoni People</i> founded	<u>Ecological Economics</u> journal first published Hartwick et al develop <i>green accounting</i> techniques
1992			The <u>Statement of Principles on Forests, and Convention on Biological Diversity</u> are opened for signature at the <i>Rio Earth Summit</i>	<u>Agenda 21</u> and the <u>Framework Convention on Climate Change</u> are opened for signature at the Rio Earth Summit		Costanza and Daly on <i>natural capital</i> <i>Business Council for Sustainable Development</i> coins <i>eco-efficiency</i> at Rio
1993-1999	FDA declares GMO food is not dangerous Flavr Savr is first GMO food marketed First sheep is cloned "Terminator seeds" patented Human cells are cloned		The <u>Convention on Biological Diversity</u> enters into force US Supreme Court rules habitat alteration can be regulated Moratorium on further <u>Endangered Species Act</u> listings	US-EPA moratorium on toxic waste incineration <u>Kyoto Protocol</u> signed by 122 nations (but not ratified by Congress)	<i>National Environmental Trust</i> founded <i>Forest Stewardship Council</i> founded First GMO food bans	Wackernagel et al on <i>ecological footprint</i> Daily writes on <i>ecosystem services</i> First Ecological Economics degree and certificate programs <i>Ecological Economics Student Group</i> forms at University of Maryland
2000-2001	First GMO primate (rhesus monkey) is born First GMO human is born	<i>Global Fund to Fight AIDS, Tuberculosis & Malaria</i> established		Bush administration rejects <u>Kyoto Protocol</u>	<i>World Commission on Dams</i>	
2002-2003	Human Genome Project completed					

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This draft timeline (as of October 17, 2003) has been produced from an experimental database that integrates material from a range of environmental history sources (currently including over 1,100 entries). The database can be sorted or searched by two keyword systems (see below), as well as by date, event, source and/or full-text.

Issue keywords: agriculture, atmosphere, biodiversity, climate, conservation, civil society, culture, data source or publication, economics, environment, energy, events (e.g., births, deaths), flora or fauna, fresh or marine water, gender, government, governance, public health, industry, justice, land, law, population, natural resources, transportation, urban issues.

Geographical keywords include specific countries and regions (continents, seas or oceans); it currently references 82 geographical units.

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SELECTED SOURCES

- Costanza, R. (2003). The Early History of Ecological Economics and the International Society for Ecological Economics. Internet Encyclopaedia of Ecological Economics. Burlington, VT, International Society for Ecological Economics: 4.
- Hayes, S. P. (2001). "Toward Integration in Environmental History." Pacific Historical Review 70(1): 59-67.
- Kovarik, W. (2002). Environmental History Timeline, Radford University. 2003. Available at: www.runet.edu/~wkovarik/hist1/timeline.new.html
- Library of Congress (2002). Chronology of Selected Events in the Development of the American Conservation Movement, c.1850-1920, Library of Congress,. 2003. Available at: <http://memory.loc.gov/ammem/amrvhtml/conshome.html>
- Neuzil, M. and W. Kovarik (1996). Green Crusades: Environmental Conflict in History. 2003. Available at: www.geocities.com/RainForest/3621/hist.htm
- Pearce, D. (2002). "An Intellectual History of Environmental Economics." Annual Review of Energy and the Environment 27(1): 57-81.
- Saul, S. (2003). Matrix: Mapping History, Shiralee Saul. 2003. Available at: www.labyrinth.net.au/~saul/history
- Spiegel, H. W. (1999). The Growth of Economic Thought. Durham, Duke University Press.
- Umwelt Bundes Amt (2000). History of Environmental Protection (Germany and Worldwide), Translation: German Federal Environmental Agency. 2000. Available at: www.umweltbundesamt.de/uba-info-daten-e/daten-e/environmental-protection-in-germany.htm