

## Princeton AP Env.Science 2017 reading

*Conservation is a great moral issue, for it involves the patriotic duty of ensuring the safety and continuance of the nation. —Theodore Roosevelt*

This chapter contains the odds and ends about cultures, societies, and other topics that will be tested on the AP Environmental Science Exam, for which there are no specific headings in the course outline.

By now, you've probably almost completed a course in AP Environmental Science, which means that you realize that what's good for the environment is usually good for people because we live in an ecosystem on Earth just as all other plants and animals do. At this point, the idea of pursuing environmentally thoughtful courses of action, through government policy as well as our day-to-day actions, must seem like a great idea, right? Well, if environmental protection is good, why do we often get the message that it will cost us more, that people will lose jobs, or that it will infringe on our liberties in some way? The answer is that, to a certain extent, all of these things will happen. However, the health of humankind is dependent on the health of the earth, and often certain sacrifices must be made for the greater good of the earth.

In this chapter, we will first review the importance of sustainability. We will then move on to discuss public policy making, give you a brief history of environmental activism in the United States, and then go through the important acts and amendments that you'll need to know for the test. We'll wrap up the chapter with a discussion of green taxes—and then we'll be done. Let's begin!

### THE IMPORTANCE OF BEING SUSTAINABLE

To environmentalists, sustaining environmental quality usually means working in the biotic and abiotic environments in a way that ensures they are capable of functioning sustainably. However, along with maintaining a sustainable environment, maintaining the health and happiness of the human species would also be a part of most environmentalists' goals for Earth. The human species cannot exist in a non-sustainable environment; after all, humans are part of a larger ecosystem, just as all other species of living things are. Our advantage, however—or rather, our responsibility—lies in the fact that we are the most technologically advanced and capable species on the planet. We are also the ones causing the most damage.

As environmentally literate, reasonable citizens, we know that we're sometimes obliged to make choices that may not make everyone happy, but we strive to make choices that will ultimately benefit the greatest possible number of people.

The United States comprises only about 5 percent of the world population but consumes about 40 percent of the world's total resources, including about 30 percent of the world's energy resources. If every country consumed global resources to this extent, we would need more resources to live than Earth can supply. This is because most of the resources that we rely upon are limited—recall the fossil fuels we burn, the way that we use water, and the rate at which we produce and dispose of waste.

### Public Policy

The exploitation of public resources has been the motivation behind environmental policy at the international, national, state, and local level for as long as public policies have been made. Strictly speaking, policy is defined as a plan or course of action—as of a government, political party, or business—intended to influence and determine decisions, actions, and other matters.

While policies that we make as a nation are usually fairly easy to enforce—because they often have our collective best interests as a nation in mind—international policy, as is established through the United Nations (UN), is only achievable and realistic if the affected countries all cooperate with decisions that are made

collectively. For example, in the 1994 International Conference on Population and Development (which was sponsored by the UN), one of the goals agreed on by the participants at the conference was to enroll 90 percent of all boys and girls in primary school by 2010. However, this policy can be put into action only if the countries that signed the agreement are to carry out the necessary steps.

There are ways in which the UN can attempt to force countries to follow mandates that are agreed on by the majority; these include withholding borrowing power through the World Bank; trade rules; and withholding aid. However, there are often certain environmentally significant countries that don't belong to the UN, didn't sign whatever agreement is at issue, or that just don't have the infrastructure to enforce the objective—however worthy. Additionally, international agencies often don't have the power to control what happens inside a particular country.

Much more effective are international policies that are put into effect through treaties that the countries involved have all agreed to; their governments have all ratified the treaty. Obviously, policies that countries agree to are most often ones that benefit these countries in some way, so it isn't too surprising that they are more readily enforced. In other words, international laws that are not agreeable are not usually followed because they don't provide countries with incentives. Moreover, it is not possible to punish countries that don't follow these policies.

As we touched upon above, it's understandably much easier to enforce laws and policies in the United States than it is for us to police the other nations of the world. In the United States, state and local laws have an effect on the environment, but if there is a conflict between state or local law and federal law, most times federal law will take precedence. However, in some cases states have legislated controls that are even stricter than those the federal law requires. In these cases, the state laws are the ones enforced, rather than the more lenient federal law. Additionally, some laws are passed and enforced regionally, because of particular geographic needs; one example of this is the difference in water laws to the east and west of the Mississippi River.

East of the Mississippi River, water laws are based on the principle that the upstream consumers control the water but, by law, cannot impede or reduce its flow or change its quality. A number of lawsuits based on this premise have been filed and are currently pending. One example is the diversion of water from the Apalachicola-Chattahoochee-Flint (ACF) and Alabama-Coosa-Tallapoosa (ACT) river basins. The state of Georgia would like to divert water from these basins to supply the growing needs of the urban area of Atlanta. The states of Alabama, Tennessee, and Florida, which are downstream from the diversion, are concerned about the flow and quality of water that will reach them if this diversion project is carried out. This controversy is still in the court system.

While we're on the topic, Atlanta is a good example of a city whose ecological footprint is far larger than the resources that are available on the land it occupies. (Remember that an ecological footprint is the amount of resources available to support a population and absorb its wastes.) City lawmakers are rightfully concerned about water shortages in the near future.

On the other hand, water laws west of the Mississippi are based on water rights. West of the Mississippi, it's held that the person who first files a claim on a water resource has rights to the use of the water. The amount of water an individual with a water right has claim to each year is determined by water flow that year (and also by how much water the individual wants!). But, regardless of the amount of water present or the place where the right was claimed, the oldest person who made the water claim gets to use his share of water before anyone else can partake. Obviously, water rights in the West do not require sharing, as they do in the East.

## **Environmental Policy in the United States—A Short History**

Although the first laws of the United States, such as those contained in the Constitution, do not mention the environment specifically, the Bill of Rights includes the Fifth Amendment, which prohibits the taking of private property for public use without just compensation. This has been interpreted to include the “preventing of serious public harm” by those who wish to take private property and do something on it that will affect the environment or those around them in a negative way. Basically, this means that your neighbor cannot decide to build a small nuclear power plant on his residential property because this would violate zoning laws.

Early laws did not mention the environment because when these laws were written, there was so much land and so many resources in the United States that it was unimaginable that they could ever be in danger of being used up. In fact, many early laws, such as the Homestead Act of 1862, encouraged the settlement and exploitation of western lands. Others, such as the Mineral Lands Act of 1866, encouraged the use of resources, and, unfortunately, this exploitative act is still in effect for many mining regulations. A few years later, the General Mining Act of 1872 was a federal law created to systematically oversee and control prospecting and mining for economic minerals, such as gold, platinum, and silver, on federal public lands.

Shortly after the Civil War, as people continued to migrate to the West, it was realized that the United States did not have an endless supply of land or resources. In fact, in order to preserve some of the lands in the West that were being very quickly settled, the first national park, Yellowstone National Park, was established in 1872. Further legislative action in 1891 created the forest reserves, which made these lands off limits to logging in order to protect the land from being overharvested and to maintain the existing watersheds. This legislation marked the beginning of the federal government assuming an environmentally protective role.

### **Political and Cultural Activism**

During this time period there were several men who stood out as early environmental activists, including Henry David Thoreau (1817—1862). Thoreau’s book, *Walden*, describes his retreat from society and the quiet years that he spent living on Walden Pond studying nature.

Another important writer and scientist of this time period was George Perkins Marsh (1812—1939), whose book *Man and Nature* helped the American public understand that there are limits to natural resources. His plan for the conservation of resources is the basis for many of the resource conservation principles that we try to adhere to today. Another early environmental advocate was John Muir, a nature preservationist who founded the Sierra Club in 1892. He led a campaign for the protection of lands from human exploitation and advocated low-impact recreational activities such as hiking and camping; these ideas did not become popular until the 1960s.

As far as political leaders, arguably the most environmentally active president in the history of the United States was Theodore Roosevelt (1858-1919). Roosevelt was interested from an early age in the workings of the environment and even began his own natural history museum as a child. Interestingly enough, that collection became a part of the founding collection for New York’s American Museum of Natural History.

Roosevelt’s term as president has been called the **Golden Age of Conservation** because of the many environmentally friendly laws and policies he put into effect. During his presidency (1901-1909), he increased area of national forest lands by 400 percent (up to 194,000,000 acres), establishing 150 new national forests and adding area to others. He established the first 51 bird reserves, signing the first one into existence by asking his advisors, “Is there any law which prohibits me from declaring this island a bird refuge?” When his advisers determined that there was not, he signed the bill with gusto, announcing, “Very well, then, I so declare it.” Additionally, he established five national parks, including the Grand Canyon, four national game preserves, eighteen national monuments (established under the 1906 Antiquities Act), twenty-four reclamation projects, and seven conservation commissions.

Roosevelt also appointed the first chief of the United States Forest Service in the history of the United States, Gifford Pinchot (1865-1946). Pinchot applied the principles of sustainable harvest and multiple-use to wildlife protection, recreation, and resource extraction.

As you're probably well aware, the 1960s were a turbulent time in U.S. history, when the baby boomers born after World War II began to come of age and express their opinions to the world. The book *Silent Spring*, written by Rachel Carson in 1962, awoke in many Americans an awareness of the state of the environment. The air was dirty, the water was polluted, and hazardous wastes were collecting in landfills all over the country. Also at this time, the Apollo space missions allowed Americans to see planet Earth from afar for the first time, and this popularized the term "spaceship Earth." Paul Ehrlich's 1968 book *The Population Bomb* warned of the myriad problems that would arise along with the quickly increasing human population, and an entertainer named John Deuschendorf took the stage name of John Denver and began to popularize the environmental movement through song.

A multitude of environmental laws and policies were initiated during the presidency of Richard Nixon. For example, the first Earth Day was celebrated on April 22, 1970. Also in 1970, Nixon signed into law the National Environmental Policy Act (NEPA); this act created the Council on Environmental Quality and required the submission of an environmental impact statement before any major federal action could be taken. One of Nixon's major environmental contributions was to consolidate two agencies that had environmental responsibilities into a bureau called the Environmental Protection Agency (EPA). Finally, two major legislative actions were enacted in this new era of environmental awareness in the United States. The first was the Clean Air Act of 1963, which we have mentioned many times in these pages, and the second was the Clean Water Act (introduced in 1972).

There is your brief history of environmental activity and activists in the history of the United States. On the following pages, we'll highlight some other important environmental laws that you should be aware of for this exam. The ones in bold are those that have had a particularly significant impact. Make flashcards of all of these, as well as the Clean Air Act of 1963 and the Clean Water Act, so that you know them cold for test day!

### **Some Major Environmental Policy Acts**

As you just learned, a few pieces of legislation helped form the environmental policy of the United States. The table below shows some of the legislation important in U.S. environmental policy. If you want to see specific laws that deal with particular problems like endangered species, clear water, or mine pollution, go back to those chapters!

<b>Date</b>	<b>Name of Legislation</b>	<b>What it Did</b>
1970	National Environmental Policy Act	Created the Council on Environmental Quality that resulted in the creation of the Environmental Protection Agency (EPA) from the consolidation of various environmental agencies. It also mandates that federal agencies prepare environmental impact statements.
1983	International Environmental Protection Act	Authorized the president to assist countries in protecting and maintaining wildlife habitats and in developing sound wildlife management and plant conservation programs. Special efforts should be made to establish and maintain wildlife sanctuaries, reserves, and parks; enact and enforce anti-poaching measures; and identify, study, and catalog animal and plant species, especially in tropical environments.

1990	Pollution Prevention Act	Designed to promote source reduction (stop pollution from being produced).
1990	Environmental Education Act	Established the Office of Environmental Education within the Environmental Protection Agency to develop and administer a federal environmental education program.

### Relevant U.S. Pesticide Laws

In the United States, three agencies are responsible for regulating pesticides used on food crops: the Environmental Protection Agency (EPA), the Food and Drug Administration (FDA), and the Department of Agriculture (USDA). The EPA controls the sale and use of pesticides under the Federal Insecticide, Fungicide, and Rodenticide Act, which calls for the registration (licensing) of all pesticide products. The EPA studies risks to humans and the environment from pesticides. Under the Federal Food, Drug, and Cosmetic Act, the EPA sets acceptable pesticide level limits in foods sold in the United States regardless of where it was grown. The FDA and USDA enforce use and allowable levels regulated by the EPA and have the authority to destroy any shipments found to be in violation of EPA limits.

In 1996, Congress passed the Food Quality Protection Act. This allows the EPA to set limits on combined pesticide exposures. This act determined that by 2006 the EPA had to reassess allowable pesticide levels on food and include a safety factor of 10 where complete information was not available on pesticide levels affecting children.

This Act also led the EPA to examine inert pesticide ingredients for the first time. These compounds, usually not listed on a label, are used to dilute or transport active chemicals. Of the 2,500 substances used for this purpose, over 650 have been identified as hazardous by local, state, and federal agencies. Over 50% have been identified as carcinogens, occupational hazards, and air and water pollutants. One example, naphthalene, is listed as a hazardous pollutant under both the Clean Air and Clean Water Acts.

### What Have We Done for Us Lately?

Although some environmental bills and amendments have been added since 1985, lately there has been a distinct anti-environmental movement influencing government actions. Large, established environmental groups, such as the Sierra Club, have declined in membership, which is an interesting litmus test of environmentalism in America. However, hope lies in the fact that new grassroots environmental organizations are currently growing throughout the United States. **Non-governmental organizations (NGOs)** like Greenpeace and the World Wildlife Fund also play a role in protecting the environment. Four environmental issues that are expected to take center-stage in the twenty-first century include

- climate change
- water shortages and water supplies
- population growth
- loss of biodiversity

Keep your eye out for discussions of these topics in the news, and listen critically to campaigning politicians to see where they stand on these issues. Such issues will prove to impact you personally in more and more ways as time goes by. The discussion of how to best reduce greenhouse gas emissions, for example, currently revolves around what's called cap-and-trade policy, an approach that provides economic incentives for limiting emissions of pollutants.

### HOW ELSE DO WE MAKE ENVIRONMENTAL PROGRESS?

Most often, the United States government has approached environmental issues by passing “command and control” laws. These laws set limits on factors, such as the amounts of pollution that are allowable from various sources, and they establish penalties for those that go over the limits. Wildlife has always been protected by similar types of legislation. There is no doubt that these laws have led to cleaner air and water, as well as the conservation of soil and other natural resources. Endangered and threatened species have also both been protected, and some extremely endangered species have even been able to recover somewhat.

However, there have always been problems with the “command and control” approach. For example, consider the Endangered Species Act. Red-cockaded woodpeckers are endangered because the open forests with big, old pine trees have been replaced by forests with younger, smaller pines. Also, periodic natural fires, which historically kept the pinewoods open have been suppressed because humans have settled in these areas. Periodic fires are needed to control the brushy understory and keep the pinewoods open. Creating yet another problem for the endangered bird, timber owners have been known to kill them in order to avoid preserving their habitat. However, it’s very hard to prove what happens to these birds—are they being exterminated by landowners, or are they simply migrating elsewhere or declining in number for other reasons?

### **Green Taxes**

There are other approaches that are more successfully used to continue environmental improvement without forcing the enactment of other types of command and control. Over time it has become clear that the act of punishing actions that hurt the environment is not nearly as effective as rewarding actions that help the environment. Since the 1970s, the United States has substantially increased taxes on labor and modestly increased taxes on income, while allowing actions that create pollution and cause resource depletion to remain largely untaxed. The result is that the tax system of the United States encourages resource depletion and discourages investments in machinery and labor. A worldwide discussion is taking place about how to move away from taxing “goods,” such as investments and employment (activities we should be encouraging), and toward taxing “bads,” like pollution, which we would like to discourage. Pollution taxes have now been embraced by a growing number of mainstream economists and policy makers, and are just one of a new group of taxes called “green taxes.”

Additionally, taxes on certain forms of consumption may occur through the “feebate” approach, in which additional fees are imposed on less sustainable products—such as sport-utility vehicles—and then pooled to fund rebates on more sustainable alternatives, such as hybrid electric vehicles.

The three main goals of green taxes are:

- the generation of revenue to correct past pollution damage and reduce future pollution
- to change behavior
- to use the funds received from pollution taxes for restoration

In this scheme, taxes serve as policy tools, as well as a way to protect the environment.

**Market permits** are also being used somewhat successfully to encourage reduction in pollutants. Market permits are cap and trade permits and they work in this way: Companies are allowed to buy permits that allow them to discharge a certain amount of substances into certain environmental outlets. If they can reduce their discharge, they are allowed to sell the remaining portion of their permit to another company. Economically speaking, it is to a company’s advantage to reduce its discharge and sell the remainder of its allowable discharge to another company. But perhaps a better idea is for the government to buy back the unused permits rather than have them sold to another industry; this would reduce the overall discharge.

Many people think that subsidies (which are giveaways or tax breaks on certain resources to encourage their use) are hurting the environment more than they're helping it; detractors think that subsidies only encourage the use of unsustainable products.

A green tax shift is a fiscal policy that lowers taxes on income, including wages and profit, and raises taxes on consumption, particularly the unsustainable consumption of non-renewable resources. Some taxes that could be lowered by the implementation of a green tax shift are payroll and income taxes, and the following is a list of taxes that could be implemented or, if currently in existence, increased:

- Carbon taxes on the use of fossil fuels
- Taxes on the extraction of mineral, energy, and forestry products
- License fees for fishing and hunting
- Taxes on technologies and products that are associated with substantial negative externalities
- Garbage disposal taxes
- Taxes on effluents, emissions, and other hazardous wastes

## **Globalization**

As you can imagine, our world is becoming more and more interconnected. Aircraft can fly around the world in about 24 hours; we have instant communication worldwide via phones, television, and the Internet. This is called globalization, and it affects society, the economy, and the environment. Positive effects can be seen in new economic opportunities, our expanded access to information, and the interactions of many societies. For example, grapes can be grown in Chile, shipped north, and be sold in your supermarket in less than a week. There are also several negative impacts of globalization. In certain parts of China, large piles of unusable electronic components have been creating water pollution problems as rainwater leaches out heavy metals. The rapid spread of emerging diseases, increased levels of air pollution and hazardous waste, and the loss of marine fish stocks are just a few more examples of globalization's negative impacts. Not to mention those grapes from Chile used an enormous amount of energy (and fossil fuel) and probably added to the pollution during their trip north!

Remember when you read about the Commons, resources owned by no one but accessible by everyone? This concept is important when we consider global access to those resources. Fresh water, clean air, ample supplies of fish, and access to fertile croplands are all examples of the global Commons. It is important to use these resources sustainably because they are the foundations for economic and social development.

Poverty and greed can cause people to use resources in an unsustainable manner and damage the environment. Cutting down important rainforest habitats to raise crops and accepting companies that generate a lot of harmful pollutants are two examples of how people's hunger for money can lead to unsustainable practices. Unfortunately, the economically disadvantaged people who allow unsustainable practices to continue are also the ones most susceptible to environmental issues brought about by climate change, and have the least amount of resources to combat the health and environmental problems that result.

International organizations such as the World Bank and the United Nations are two examples of institutions that are trying to ameliorate the poverty issue. The World Bank uses loans to reduce poverty and to help foster improvements in biodiversity, environmental policies, land management, pollution management, and water resources management. The United Nations, through its environmental program, seeks to promote international cooperation, develop regional programs to promote sustainability, and to assess global, regional, and national environmental trends.

There are several international agreements that cover pollution issues. Review some of them in the table below:

Date	Name of Agreement	What it Did
1978	Montreal Accord	Cut the emissions of CFCs that damage the ozone layer. This was amended in Copenhagen (1992) to include other key ozone-depleting chemicals.
1992	Basel Convention on the Control of the Transboundary Movements of Hazardous Wastes	169 parties aimed to protect human health and the environment against the adverse effects resulting from the generation, management, transboundary movements and disposal of hazardous and other wastes. Note that the United States has not ratified this agreement and, therefore, is not bound to abide by it.
1997	Kyoto Protocol	Required the participating 38 developed countries to cut their greenhouse gas emissions back to 5% below 1990 levels. Note that the United States has not ratified this agreement and, therefore, is not bound to abide by it.

## KEY TERMS TO KNOW

### Policy

- Golden Age of Conservation
- sustainability
- water rights
- EPA
- NGOs
  - Greenpeace
  - World Wildlife Fund
- cap-and-trade policy
- green taxes
- globalization
- market permits
- Kyoto Protocol
- Montreal Accord

### People

- Henry David Thoreau & *Walden*
- Rachel Carson & *Silent Spring*
- John Muir & The Sierra Club

### Acts

- National Environmental Policy Act
- International Environmental Protection Act
- Pollution Prevention Act
- Environmental Education Act
- Clean Air Act of 1963
- Clean Water Act