

Virginia's Public Policy and Environmental Management

In the 1960s, Virginians faced a wide variety of environmental problems, from the pollution of air and water to the decline of wildlife and other living resources. For example, fish in the James River were contaminated due to the illegal disposal of a chemical called Kepone. People could not swim in the Potomac River or the James River due to inadequate sewage treatment. The bald eagle and peregrine falcon became nearly extinct due to bio-accumulation of the pesticide DDT.

On April 22, 1970, America celebrated the first Earth Day. After the public recognized mounting environmental problems, Congress passed major laws and established the U.S. Environmental Protection Agency (EPA). Some of the major laws included the Clean Air Act, Clean Water Act and Safe Drinking Water Act, all of which were designed to protect human health and ecosystems.

EPA and state agencies develop environmental regulations that further define the laws, based on scientific knowledge and state-of-the-art pollution control technology. These rules are amended as new science-based information becomes available and standards for pollution limits are revised.

While environmental problems still persist, most Virginians now live in an age when the risk of human exposure to potentially harmful pollutants has dropped significantly.



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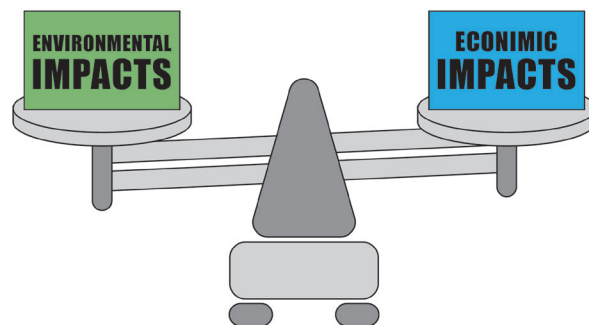
Natural Resource Management

Improved environmental quality in many areas is a result of scientific investigation, public policy, private efforts, new technology, and environmental laws. Environmental laws passed by Congress and the Virginia General Assembly place limits on the amount of pollution that can be discharged into the land, air, or water and the number of animals harvested by hunting and fishing. Research by scientists into the fate of pollutants and how ecosystems function has helped set better environmental policy. Participation of individuals, communities, and private groups also helped foster environmental protection. An example of this type of public participation is the Chesapeake Bay Program, a cooperative effort by state and federal governments, private industries and citizen groups to restore the quality and ecological integrity of the Chesapeake Bay (Bay).

Much of Virginia's environment, including the Bay, has been altered over the last 400 years by people plowing, planting, cutting trees, and building cities, roads, dams, or reservoirs. Some of these alterations have immediate and obvious environmental problems (clearing a forest or building a dam, for example), while other effects are more subtle and long-term (e.g., introduction of a competing species, loss of a species, change in water quality). It is the job of environmental managers to constantly weigh the costs, or consequences, of all management actions against the benefits to society.

Management Challenges and Tools

Natural resources management involves setting goals and making choices that benefit people while preserving a clean, healthy environment. Everyone has a unique perspective and, as a result, some management options, such as limiting when or where people can harvest fish or raise livestock can lead to conflicts among different members of society.



Today, computer models and geographic information systems help managers assess the effects of various management options and scenarios, and project the cumulative impacts of individual actions (e.g., the effect of one more car per household, or one less pound of trash generated per household). Much emphasis is being placed on sustainable development, or ways of benefitting from using resources without using them up. Scientists are also looking at new ways of reusing and disposing waste. For example, sometimes waste byproducts from one industry can become the raw materials for another. Sawdust can be turned into paperboard, and used tires can be repurposed for mulch or asphalt paving.

Climate change is a new challenge

While significant progress has been made cleaning up pollution and protecting the environment, a new challenge for natural resource managers has emerged—climate change. Climate change is unique because it is triggered by human activities around the world and it has global impacts. While most scientists agree that climate change is occurring, public policy and strategies for adapting and mitigating the effects vary. Uncertainty of the rate and nature of the change, and projected costs to address for adaptation and control measures.

Climate change studies include: 1. Long-term observation – including, increasing global temperature and atmospheric carbon dioxide concentration, sea level rise attributed to warming ocean temperatures and ice melting; and 2. Computer models that predict future trends about climate change consequences. There is significant scientific confidence in observed data based on advanced monitoring and analytical tools, but complex climate models are estimates. They cannot be verified and the results and predictions about future consequences vary.

Policy opinions include:

- Greenhouse gas emissions are partially responsible for the man-made component of climate change. Global deforestation is another contributing factor.
- Reducing carbon emissions may slow down global warming, but the extent is unknown and reduction cannot reverse climate change.
- Costs to control or reduce emissions are high and a healthy economic system is critical.
- The nature of climate change presents a huge challenge for government agencies at the local, state and federal level. American technology, ingenuity and commitment are reasons to believe innovative strategies will emerge to address the challenge.



Virginia has adopted carbon reduction and renewable energy policies to address climate change and reduce the amount of greenhouse gases going into the atmosphere.

Pollution Prevention

When natural resources are used to make goods, usually some “waste” is created in the process. Think about it: Even when you make a glass of fresh lemonade, you have the rinds leftover to discard. Pollution prevention is a way of thinking about managing waste. By reducing or eliminating pollutants before they are created, we can minimize the cost of disposal and protect the environment at the same time. For example, the final cost to clean-up contamination from Avtex Fibers in Front Royal was over \$150 million and took over 25 years to complete.

Companies have come to realize that they can substitute less toxic raw materials with more environmentally-friendly ones while saving money and reducing their impact on the environment. They may also discover a way to recycle byproducts and re-use them during production processes. Businesses that use efficient, well-maintained equipment are saving raw materials and preventing waste-producing spills and accidents along the way. By keeping strict track of their inventory, companies can prevent waste and loss from products expiring or decomposing.

Pollution Prevention at Work

Across the state, hundreds of schools, private organizations and businesses have adopted environmental management systems and stewardship initiatives to prevent pollution.

- The UCI Road World Championships, held in Richmond in 2015, composted or recycled 76 percent (87,812 pounds) of its waste during the nine-day long event.
- Colonial Circuits (Fredericksburg) has saved \$25,000 per year in water and sewer fees by installing a wastewater recycling system that removes heavy metals and organics. The metals are then recycled rather than disposed as hazardous waste.
- Through a comprehensive environmental management system, Nestle in Danville reduced its energy consumption, food and nonfood wastes, and saved more than \$500,000 annually.
- At Coors Brewing Company in Elkton, the wastewater treatment process was altered by adding an anaerobic treatment process followed by an aerobic process, which reduced the emissions of volatile organic compounds into the air by 95 percent and eliminated the need for ammonia and phosphoric acid.
- Boaters who use Wormley Creek Marina in Yorktown must sign a “protecting the environment” agreement and use the dock-side sewage pump-out station as well as other “clean” practices.
- Steel paint drums and other metal used for aircraft carriers at Newport News Shipbuilding are recycled instead of being sent to a landfill.
- At NASA Langley Research Center in Hampton, hazardous wastes from laboratories have been reduced by 70 percent through solvent replacements, best management practices and materials reuse.

These examples illustrate the goals of cost-effective pollution prevention. Industries may never be able to eliminate waste production, but they can try to reduce it. If that is not possible, they can strive to reduce the toxicity of the waste, while conserving natural resources and raw materials by preventing spills and accidental losses.

The Virginia Department of Environmental Quality’s (DEQ) Office of Pollution Prevention encourages businesses and other organizations to adopt pollution prevention methods. The office works with Virginia Green to reduce the environmental impacts of the state’s tourism industry. In return for their efforts, tourist sites are offered incentives, such as technical assistance and recognition.



The General Assembly is permitted to further conservation policies by entering into public-private partnerships or partnerships with federal agencies, such as EPA.

Environmental Stewardship in Public Policy

Unfortunately, sometimes voluntary programs are not sufficient in preventing environmental degradation or remediating pollution. Even when individuals and businesses want to practice environmental stewardship, they are unable to do so without government intervention. Government involvement may be needed if the public disagrees on how (or whether) to address an issue. Virginia has many agencies that cooperate to both encourage and enforce environmental policies and laws.

Article XI of Virginia's Constitution says the policy of the Commonwealth is "to preserve, protect and conserve the state's natural and historic resources." When government needs to get involved in reducing or cleaning up pollution, it can pass laws that ban or limit the quantity of pollution and punish companies that produce more than the legal limit. In Virginia, DEQ issues permits to each polluter—giving them permission to produce a certain amount of pollution—and enforces the limits if companies don't comply.

The task of government of regulating pollution is difficult. First, air and water pollution can travel long distances, affecting residents in communities far from where the pollution was created. Second, solutions to preventing and cleaning up pollution requires cooperation between various types of professionals and levels of government. Natural resource managers, scientists and policy makers from local, regional, state and federal agencies often coordinate research and management programs to balance regulatory actions and voluntary efforts that citizens and businesses can adopt.

Other public policy strategies include: 1. Taxing fossil fuels make it more expensive to produce pollution; 2. Subsidizing energy-efficient or pollution control equipment and appliances and giving tax breaks or rebates to companies or consumers that choose to buy them; 3. Providing grants and loans for specific problems or equipment upgrades; 4. Issuing credits to facilities (e.g., Regional Greenhouse Gas Initiative [RGGI]). There are advantages to each of these choices and policymakers – including legislators – weigh the costs and benefits carefully.



Individual actions, like neighborhood cleanups, can help prevent pollution.

When it comes to enforcing environmental laws and implementing public policy, a number of state agencies have environmental management responsibilities (see each chapter for more general information or visit their websites for mission statements and specific duties).

- The [Virginia Department of Agriculture and Consumer Services](#) promotes the economic growth and development of Virginia agriculture, provides consumer protection and encourages environmental stewardship.
- The [Virginia Department of Conservation and Recreation](#) promotes and protects the conservation and enjoyment of Virginia's diverse and unique environment and cultural legacy, including natural habitats, parks, clean water, dams, open space and access to the outdoors.
- [DEQ](#) is the agency responsible for clean air, clean water, proper waste management, environmental impact assessment and pollution prevention. Industries and public facilities, such as waste treatment plants, must get permits from DEQ to discharge pollutants into the air, land or water. DEQ's engineers inspect permitted facilities, monitor the air and water, and ensure that such facilities comply with the environmental standards set forth in existing laws and regulations.
- The [Virginia Department of Forestry](#) manages and protects Virginia's forests from fire, insects and disease. Healthy, sustainable forests support wildlife, recreation and the forest industry.
- The [Virginia Department of Wildlife Resources](#) is charged with managing Virginia's wildlife, aquatic species and habitats, and promoting outdoor recreation, including hunting and fishing, wildlife watching and boating.
- The [Virginia Marine Resources Commission](#) manages marine resources, including tidal waters, habitats and saltwater fisheries for sustainable commercial use and recreational enjoyment.
- The [Virginia Department of Health](#) protects public health by preventing the transmission of disease through food, milk, shellfish, water and sewage. The agency regulates drinking water and commercial shellfish waters. VDH is also active in minimizing human health risks from environmental emergencies.
- The [Virginia Department of Mines Minerals and Energy](#) manages both renewable and non-renewable energy generation in Virginia, while protecting the lives and health of people during and after resource extraction. The agency regulates coal and mineral mining, natural gas extraction and encourages energy efficiency, renewable energy as well as use of alternatively fueled vehicles.
- The [Virginia Department of Historic Resources](#) is the State Historic Preservation Office. It fosters the stewardship and use of Virginia's significant historic architectural, archaeological, and cultural assets through the agency's research, surveys, tax incentives and registry programs.

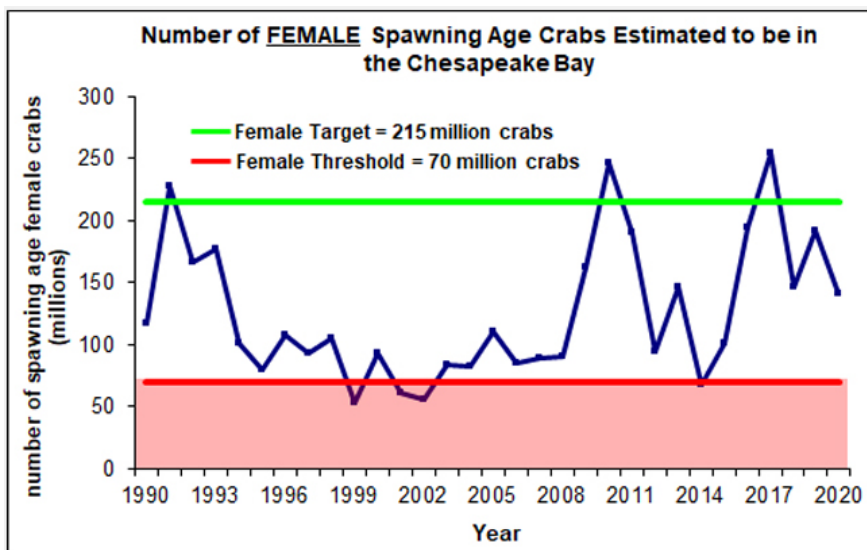
A Case in Point

One of the guiding principles of resource management is the idea of maximum sustainable yield. Maximum sustainable yield management raises many public policy and environmental issues. At its core is the following question: How can we manage a fishery (or other population) in such a way to maintain the livelihoods of the fishermen and provide a product in high demand, while at the same time prevent depletion of a species?

Blue crabs are keystone species in the Chesapeake Bay – their health is fundamental to Bay ecology. Crabbing is multi-million-dollar-a-year industry and a mainstay for commercial fishermen in Virginia and Maryland. Sustaining this fishery has wide-reaching economic and ecological benefits. Scientists and regulators work together to ensure that harvests are limited to keep the population at sustainable levels. The number of blue crabs in the Bay varies significantly from year-to-year.

Many variables affect crab populations, including the amount harvested, ocean currents, predation and habitat conditions—such as pollution and temperature—which necessitates constant attention to maintain sustainable yield. While scientists at the Virginia Institute of Marine Science study the effects of each variable, the Virginia Marine Resources Commission (VMRC) enforces limits on harmful practices, such as dredging and overharvesting. Managers must monitor populations and adjust harvests as needed. In addition to harvest limits, governments work to improve water quality and habitat, including planting sea grasses and reducing pollution in the Bay.

In 2014, after the number of female blue crabs dropped below the “safe” or sustainable level of 70 million crabs, the VMRC lowered their harvest level by 10 percent. The harvest that year was a record low while red drum—a fish that eats juvenile crabs—increased substantially, necessitating VMRC’s action.



While the population of adult female crabs decreased from 191 million in 2019 to 140 million in 2020 and is below the target of 215 million, it is still twice the minimum safe level.

Additional Resources

- [DEQ Office of Pollution Prevention](#)
- [EPA](#)
- [Chesapeake Bay Program](#) (a federal-state partnership working to restore the Bay estuary, its tributaries and the lands around them)
- [Virginia Green Ribbon Schools](#)

Fundamental Learnings Related to Public Policy and Environmental Management:

- Natural resources can be harmed or damaged by pollution.
- Environmental problems, including pollution, result from the overuse or misuse of natural resources (air, water, forests, etc.).
- The environment has a limited capacity to cycle or disperse pollutants. Some pollutants, such as organic wastes, decompose in weeks or months into harmless components. Other materials, such as plastics, decompose after many years, and still others (chemicals such as PCBs and radioactive materials) persist as toxic compounds and may never decompose.
- Environmental management seeks to identify all the costs or potential impacts of the alteration of the environment and weigh them against the benefits to society. Some management options, such as harvest restrictions, can lead to conflicts among different members of society.
- Preventing pollution costs less financially and environmentally than cleaning up after it has occurred.
- New technologies (both equipment and processes) can improve environmental quality and be cost-efficient.
- Government has adopted and enforced various environmental laws and regulations. It also provides incentives for voluntary actions to protect or enhance the environment.
- Environmental policy is based on either law and regulation or voluntary action (people compelled to act either by law and regulation or through their own initiative.)

In essence, public policy and environmental management can be considered two sides of the same coin that rolls along the pathway of human development. Like any coin, the more hands it touches along the way, the higher its yield.



New laws commit Virginia to getting its electricity from clean energy sources like wind and solar by mid-century, set limits on carbon emissions from power plants and addresses recurrent flooding that may occur from climate change and sea level rise.

Environmental Professionals in Virginia

Many state, federal and public agencies and organizations are responsible for environmental protection. Search the Internet for to find out what these environmental professionals and where they work:

Professional Title	Name	What They Do	Agency/Organization Name or Regional Office	Website and E-mail
Environmental Permit Engineers				
Extension Agent				
Forester				
Game Warden				
Recycling Director				
Litter Prevention Coordinator				
Soil/Water Conservation Technician				
Park Ranger				
Sanitation/Health Officer				
Sustainability Officer				
Biologist				
Hydrologist				
Land Use Planner				

Our Community and the Environment

Often the solutions to environmental concerns can best be found in your own community. To find help look for the departments and people who handle environmental matters. In large cities and towns, local governments often have a directory of agencies or departments that specialize in environmental protection. Small counties and towns usually have centralized environmental offices you can find on the Internet.

City/County:

Website:

Service/Department	Responsible Person	What They Do	Phone Number and E-mail
Emergency Response			
Health			
Parks and Recreation			
Planning and Zoning			
Public Safety			
Sewer			
Solid Waste			
Park Ranger			
Water			

Places to Visit

There are also many facilities and places in your community that help you learn about and address environmental concerns. Make a list of names and where they are located:

Place	Organization Name	What It Offers	Address	Web Address
1.				
2.				
3.				
4.				
5.				