

The Chesapeake Bay Ecosystem

Like a human, plant or animal, the Chesapeake Bay watershed is a complex, living system. Interconnected habitats and living things like this are called ecosystems. The Bay is a very large ecosystem. It is made up of smaller ecosystems including forests, streams and marshes. Ecosystems work through the plants and animals that live in them. In a healthy ecosystem, plants and animals can benefit each other in a cycle of energy. Plants use solar energy to grow, transforming nutrients from the decay and waste of other living things. Animals eat the plants and recycle the nutrients, through their wastes and by their death and decay, for the use of other living things. The same process occurs on the land, in terrestrial ecosystems, and in the water, in aquatic ecosystems. Ecosystems continue to thrive when the energy from the nutrients in this cycle is not wasted or lost, but is stored and recycled.

More humans in an ecosystem means more energy is diverted for our use. Residential developments replace wetlands, forests and meadows. Every day, new development is bringing new housing, shopping malls and office buildings to the Bay watershed. Producing electricity, diverting water for human uses, and building roads, houses and sewage treatment plants put stress on the ecosystem of the Chesapeake Bay. Each action, be it turning on a faucet, paving a road, or cutting down a tree, represents a change in the natural balance of the Bay's ecosystem. Actions far away from the Bay but within its watershed affect it.

Human Impact on the Chesapeake Bay



James Island State Park

Photo: L. Gutierrez

In 17th and 18th century Europe, only landowners could use natural resources, and only royalty and aristocrats were landowners. An average citizen could not cut down a tree and use it for firewood or catch a fish to eat. Early European settlers thus came to America with a strong sense that natural resources necessary to support life, like wildlife and firewood, should belong to everyone. They also believed that anyone should be able to own property. These ideas were imposed on a Native American culture that held all natural resources to be common property.

The new found freedom to make individual decisions on the use of land and resources has resulted in unintended environmental consequences. Large tracts of land were cleared for various uses, leading to loss of forests and habitat. Intensive hunting practices led to the serious decline or extinction of some species like bison, turkeys, wolves and certain fish. The cumulative effect of our land use practices is now most in evidence in the degraded condition of the Bay.

Attack of the Soil

Towns along the Bay and its rivers, like Georgetown, Bladensburg, and Port Tobacco, originally served merchant ships which came to pick up tobacco and other crops to take to Europe. Many of these towns are far upstream on the Patuxent, Potomac and other rivers. Today, we could not imagine a ship coming up this far because the rivers are now so shallow. They are shallow because of sedimentation, which means that the soil from the land washed into the rivers and filled them with sediment. When the settlers cut down forests to make tobacco and corn fields, the soil was washed into the rivers, and eventually

Pollution Solution

Many industries that rely on water for cooling like power plants and steel factories, settled in the Chesapeake Bay watershed. They heat the water before returning it to the Bay or its tributaries. This has been found to change the habitat for some fish species and contribute to the growth of algae. Excessive algae block sunlight from the Bay's underwater plants, which are needed for food for fish and wildlife. Industries along the Bay and its tributaries also produce chemicals that cause harm to animals and plants that need the water to live. And waste from people's homes, stores and offices is also treated and discharged into the Bay and its



Photo: J. McKnight

the Bay, by the rain. Urban and suburban development has also contributed sediment to the Bay. As land development has occurred, soil has continued to wash into the Bay and its rivers, covering up oysters and fish spawning areas.

Other things are carried into the Bay from these areas when it rains, like chemicals from the tar on roads; fertilizers and pesticides from lawns and farms; soap from people washing their cars; and trash that is thrown on the ground. These are called non-point source pollutants because they run off the land and do not come from particular, identifiable places.

rivers. Wastewater that is discharged into the Bay is called point-source pollution because it comes from a particular place. For many years, most people thought that enough water could dilute any kind of pollution. By the 1920's fish, crabs and oysters began to die in the Chesapeake Bay as well as other estuaries in the U.S. People became concerned. We now know that water is not a solution for pollution; now Federal, state and local governments have programs to protect and restore the Bay's water. Today, we have new technologies and informed and caring citizens to help solve pollution problems. We can recycle waste and conserve water. We restrict point source pollutants and require stormwater management in new developments to slow down rain water and help keep it from washing materials into the Bay. We have smart growth laws that help make development more compatible with the environment and we require forest conservation for areas that are disturbed by development. These measures have begun to improve the health of the Bay, but we can still do a lot more.

Plants and Animals Respond

Although the effect of our human actions on the plants and animals and their diversity is not as visible as polluted air and water, we must remember that while certain animal species can adapt to a human-dominated landscape, many species cannot. Today, elk, wolves and cougars are extinct in Maryland. Less noticeable, but no less devastating to the Chesapeake Bay ecosystem, has been the decline or extinction of plants like the atamasco lily - only one small population is left on Maryland's Coastal Plain.

We have seen, in the more recent past, a decline in rock fish (striped bass), migratory Canada geese, and canvasback ducks. A combination of overuse, habitat loss and pollution led to these declines. Allowing these resources to recover, by cleaning up their habitat and regulating hunting and fishing, has resulted in success for rock fish and is expected to help other species. And in recent years, pelicans and cormorants have made a comeback. Beaver were once extinct in Maryland and now are very common, even in residential developments.

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