



TOP LEFT, NATIONAL AERONAUTICS AND SPACE ADMINISTRATION (NASA); TOP RIGHT, U.S. FISH AND WILDLIFE SERVICE (USFWS); RIGHT, ISTOCK

THE CHESAPEAKE BAY AND GLOBAL WARMING: A PARADISE LOST FOR HUNTERS, ANGLERS, AND OUTDOOR ENTHUSIASTS?

The threats posed by global warming are real. The Chesapeake Bay region is already experiencing climate changes that stress human development and natural habitats alike. Without an effective response, these trends will undo decades of conservation work, leading to major changes in the bay and fewer opportunities for hunting, fishing, and other outdoor recreation. Fortunately, solutions are available. But, for these solutions to work, the people of the bay region must call for action now.

Global Warming Jeopardizes Cherished Outdoor Traditions in the Chesapeake Bay Region

Hunting, fishing, and other outdoor traditions have been an important part of life in the Chesapeake Bay region for generations. Whether it is the thrill of reeling in a prized rockfish off Smith Point, spending a weekend hunting canvasbacks on Maryland's Eastern Shore, or digging for clams on a sandy beach, the bay's habitats provide incalculable value to the region and nation.

The Chesapeake Bay faces extraordinary new challenges brought on by global warming. Fish and wildlife in the bay region will be affected by climate changes that are already underway:

- **Warmer air and water in the Chesapeake Bay region** will alter the composition of species that can live in the bay, contribute to worsening dead zones and harmful algal blooms, enhance marine diseases, and encourage expansion of harmful invasive species.
- **Rapidly rising sea levels** will inundate coastal marshes and other important habitats that are important for fish and waterfowl and make coastal property more vulnerable.



- **More-extreme weather events, including floods, storms, droughts, and heat waves** will lead to more polluted runoff into the Chesapeake Bay, hurt water quality, and make the outdoor experience increasingly unacceptable for people.
- **Changing climate across North America** will affect breeding grounds and migration patterns for waterfowl, such that fewer birds make their way to the Chesapeake Bay each year.

The Major Investments in Chesapeake Bay Restoration Could be Lost Due to Global Warming

Over the past quarter century, billions of dollars have been invested in restoring the Chesapeake Bay watershed. Progress has been made, but global warming puts new stresses on the bay's habitats, in some cases making it harder to reach conservation goals.

Many efforts currently underway to restore and protect the Chesapeake Bay's habitats—from reducing nutrient pollution to managing coastal development—may also help fish and wildlife deal with global warming. To be successful, these conservation programs will need to consider the additional stressor of global warming, and in some cases, new initiatives will be required.

Changing the Forecast for the Chesapeake Bay: A Plan of Action

The problem of global warming is daunting. Fortunately, solutions are within reach. Key recommendations include:

Reduce global warming pollution. The forecast for wildlife can be dramatically improved if we reduce global warming pollution by 2 percent per year from today's levels. Taking steps to reduce our dependence on fossil fuels is essential.

- The U.S. Congress and the administration should place mandatory limits on the nation's global warming pollution to ensure that we meet the target of an 80 percent reduction below current levels by 2050.

Provide adequate, dedicated funding for conservation. A significant increase in funding is essential to effectively address the new challenges global warming poses for fish and wildlife.

WATERFOWL HUNTING IS AT RISK

Global warming poses a triple threat to the renowned waterfowl hunting in the Chesapeake Bay region. First, the breeding grounds for many of the bay's wintering ducks, the Prairie Pothole Region in the upper Great Plains, are expected to become much drier and produce fewer ducks. Second, some migrating waterfowl are already stopping in ice-free areas farther north and west as winters become warmer, and the trend is expected to continue. Finally, waterfowl that do migrate all the way to the bay are likely to find a loss of shallow-water wintering habitat as sea levels increase. The bottom line is that, as these trends continue, waterfowling in the Chesapeake Bay region can expect poorer hunting seasons.

- The U.S. Congress and the administration should pass a nationwide cap-and-trade bill to reduce global warming pollution, with roughly 10 percent of the revenue (from an auction of 100% of the permits) allocated for fish and wildlife conservation.
- Legislatures in Virginia and Maryland should ensure that conservation agencies



receive adequate, dedicated funding each year to meet existing conservation goals and to address the new challenge posed by global warming.

Discourage extensive coastal development and shoreline armoring. Sea-level rise will impact both habitats and human settlements, requiring careful consideration in coastal planning efforts.

- Federal, state, and local agencies that manage coastal resources should consider sea-level rise when amending their plans for coastal development, expanding open space, protecting wetlands, and other relevant activities. New development and coastal armoring, such as bulkheads, must be discouraged in ecologically sensitive coastal areas.

Account for global warming in land conservation and habitat protection efforts. Helping fish and wildlife cope with global warming requires protecting wetlands, forests, and other natural habitats from encroaching urban development while doing a better job of managing already-developed areas and farmland.

- The U.S. Congress should significantly expand funding for the conservation

BAY FISHING FACES A NEW THREAT

The Chesapeake Bay's outstanding fishing reputation has been marred in recent decades by declining catches and intermittent bans on rockfish, blue crab, oysters, and other species. Contributing factors to these problems include over-fishing, excessive nutrients, sedimentation, disease, water pollution, loss of submerged aquatic vegetation, and shoreline development. Today, global warming is also affecting the bay's aquatic habitats. Higher water temperatures favor warm-water species such as brown shrimp, black drum, spotted seatrout, grouper, and southern flounder, but they pose a threat to rockfish, Atlantic sturgeon, soft-shelled clams, winter flounder, and other species that thrive in cooler water. Sea-level rise threatens the coastal marshes and seagrass beds that many species depend on for spawning, feeding, and protection. These changes could have profound impacts on future fishing opportunities in the Chesapeake Bay.

TOP LEFT AND TOP RIGHT, USFWS; RIGHT, USGS



NWF's mission is
to INSPIRE Americans
to PROTECT
WILDLIFE for our
CHILDREN'S
FUTURE

provisions of the Farm Bill. Land conservation agencies and foundations in Maryland and Virginia should develop improved criteria for identifying ecologically critical lands and take more significant steps to preserve and expand open space.

Redouble efforts to manage storm-water runoff. Global warming is likely to lead to more extreme precipitation events, making it even harder to control storm-water runoff that brings excess nutrients, sedimentation, and pollution into the bay.

- Virginia and Maryland should increase support of non-structural approaches to storm-water management, require local agencies to consider increases in extreme precipitation events when considering new projects, and discourage construction in or near coastal and stream riparian buffers, wetlands, and other sensitive areas.



Call to Action

It will take foresight, the right investments, and determination to reduce the risks associated with global warming. Hunters, anglers, and all those who cherish the beauty and recreational opportunities offered by the Chesapeake Bay can make a difference by letting elected officials at the federal, state, and local levels know that the time for action is now. By taking steps to both reduce global warming pollution and restore the bay, we can change the forecast for the Chesapeake Bay and ensure that its economic opportunities, ecological benefits, and outdoor traditions endure for generations to come.

The full report *The Chesapeake Bay and Global Warming: A Paradise Lost for Hunters, Anglers, and Outdoor Enthusiasts?* was issued by the National Wildlife Federation in September 2007 and is available at <http://www.nwf.org/globalwarming>.