

## Global warming's threat to Bay habitats described

By Staff and Wire Reports

A leading Bay researcher told a Senate subcommittee in February that global climate change was not only "a real phenomenon" but that it posed a serious threat to the Chesapeake and Mid-Atlantic habitats.

Roger Mann, director for research and advisory services at the Virginia Institute of Marine Science, said likely climate change scenarios for the region indicate that the Bay's dead zone will worsen, striped bass—which are already suffering from disease—will be further stressed, and oyster restoration projects may become more difficult.

"The addition of climate change to the mix of stressors already affecting valued habitats and endangered species will present a major challenge to the future conservation of U.S. ecological resources," Mann said in testimony before a Senate Environment and Public Works subcommittee hearing on global warming and wildlife.

It was one of a series of recent hearings conducted by various congressional committees as lawmakers wrangle with more than a half-dozen approaches to reducing the flow of heat-trapping "greenhouse" gases from power plants, cars and factories.

"The debate has clearly shifted from a battle over the science to fighting over the scope and design of the solution," said Jason Grumet, executive director of the National Commission on Energy Policy, a private bipartisan advocacy group on the country's future direction on energy.

The release in February of a United Nations report affirming that human activities, mainly burning fossil fuels, are largely to blame for a dangerous warming of the Earth, will likely spur continued climate debate in Congress.

Compiled by scientists in 113 nations, the report says global warming is very likely caused by humans, meaning it is a 90 percent certainty. By the year 2100, it is predicted that temperatures will rise about 3–7 degrees Fahrenheit and sea levels to go up 7–23 inches.

The last U.N. report five years ago said it was "likely," or 66 percent probable, that people had caused global warming over the last 50 years.

Yvo de Boer, the top U.N. climate official, said the findings "leave no doubt as to the dangers mankind is facing and must be acted upon without delay. Any notion that we do not know enough to move decisively against climate change has been clearly dispelled."

Regionally, Mann said that model projections indicate the Mid-Atlantic will get 5–11 degrees warmer in summer months over the next century. Future precipitation patterns are less certain, he said, but are likely to include more extreme rainfall events.

Mann warned that biological communities that occupy various habitats from the Bay to the Appalachian mountains evolved together over thousands of years, and that the rapid rate of climate change threatened to unravel their complex interactions, sometimes with profound effects.

"If there is a single message that I leave with you today, it is that destabilizing the relationships between just a few of these contributing species can have a domino-like effect resulting in large and deleterious impacts on the entire community," he told the subcommittee.

As the result of climate change, critical parts of food webs could become decoupled, with blooms of

phytoplankton no longer corresponding with the presence of the zooplankton which eat them and, in turn, become food for fish—a situation that has been observed in lakes in the Pacific North-west. As a result, he said, “fish go hungry.”

Long-standing patterns could be disrupted, such as the timing of shorebird migrations which need to arrive along the Mid-Atlantic Coast at the same time horseshoe crabs are laying eggs to eat and survive during their energy draining flight. “These bird populations face literal life and death situations,” Mann said.

Sea water holds less oxygen as it gets warmer, Mann said, creating an increasingly stressful environment for many species.

Improving oxygen levels in the Bay is one of the key goals of the Bay restoration effort. But the situation would likely get worse in deep areas of the Chesapeake, which already routinely suffer from oxygen-depleted “dead zones” in summer months because of high nutrient loads and poor water mixing between top and bottom layers of the Bay.

“We know the dead zone is getting bigger each year and all the projections associated with global warming scenarios predict an increase in its size,” Mann said.

That causes ripple effects as oxygen-starved areas become off-limits for species that normally seek refuge in deeper, cooler water. Instead, they have to move into warm, shallow water where they are more stressed.

That could be bad news for striped bass, which already suffer from high infection rates of mycobacteriosis, a chronic wasting disease that is most severe in fish that appear stressed, often resulting in ugly sores. “Warmer waters, we suspect, bring increases in the numbers of fish characterized by large skin lesions,” he said.

Mann said that warmer temperatures would also threaten eelgrass, the dominant species of underwater grass in the lower Bay, where it is already near the southern edge of its range. He noted that eelgrass suffered a widespread die-off in 2005, which was blamed on warm temperatures. Eelgrass is thought to be critical for the early life stages of blue crabs, but there is no ideal species to take its place.

“The prospect for displacement of the native eelgrass by the more temperature-tolerant widgeon grass is not comforting in that widgeon grass is more ephemeral in nature,” Mann said.

Warmer temperatures would also make restoration of the native oyster, *Crassostrea virginica*, more problematic as the two diseases that have plagued the oyster for the past four decades, MSX and Dermo, are more virulent at higher temperatures.

“Very large investments have and are being made to restore the Bay's oyster resource and the industry that it supports,” Mann said. “The added challenge of increased disease prevalence and intensity makes this task yet more difficult.”

### **Various sources contributed to this story**

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