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CHESAPEAKE BAY: Feds, states make concerted effort in light of grave conditions

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The health of the Chesapeake Bay is foundering despite agencies' best efforts to date. But a number of legislative plans are in the works in key states to address declining oyster populations, fertilizer pollution and air pollution.

As the bay continues its decline -- marked by deteriorating of water quality, invasion by non-native aquatic plants, shore erosion and dwindling marine life -- experts and agencies may have to revise their best-case scenarios, according to a 20-year EPA veteran and environmental historian Kent Mountford. Complete restoration can become impossible, as severely damaged ecosystems often demonstrate a characteristic known as hysteresis, wherein changes become irreversible over time. Like a piece of Silly Putty, the bay may not be able to return to its previous form after decades of manipulation.

A group of 25 scientists earlier this month spent two days examining this possibility. The Chesapeake Research Consortium, a nonprofit group chartered by the state of Maryland to study the watershed, examined other systems -- such as the San Francisco Bay -- that are considered on the brink or have passed a threshold of no return. It found clear parallels to the Chesapeake.

Rich Batiuk, assistant director for U.S. EPA's Chesapeake Office, said, "We need to start informing people that bringing [the bay] back is going to take a different set of actions" than those that brought about its current state.

A boost in state funding

The Chesapeake Bay Foundation earlier this month backed a bill in the Maryland Legislature that would generate \$130 million per year by charging a series of taxes on new development projects in the state. The bill proposes dividing the state into rural areas and designated growth zones and would assess a series of local taxes against developers working in the rural areas.

The revenue would be placed into a state fund that would pay to stop farm pollution runoff from entering the bay. The fund would support farmers in efforts such as planting cover crops and buffer strips between fields, waterways and manure sheds.

Jenn Aiosa, a scientist with CBF, said the group was "very optimistic" about the bill's chances. Gov. Martin O'Malley (D), the Planning and Agriculture department heads, state House Environmental Matters Committee Chairwoman Maggie McIntosh (D) and state

House Speaker Michael Busch (D) are among the tax's supporters, she said. O'Malley spokesman Sasha Leonhardt confirmed the governor's support.

In Virginia, meanwhile, the General Assembly has passed H.B. 1710 that would authorize issuance of up to \$250 million in bonds for Chesapeake Bay sewage treatment facilities.

Water quality market considered

To reduce nitrogen pollution, which stimulates algae growth and subsequent dead zones, EPA and six states are working on a cap-and-trade system for wastewater plant releases. Batiuk said the plan would encompass the 467 facilities deemed significant by EPA.

When the system goes into effect around 2014 or 2015, plants will have to comply with caps set by Delaware, Maryland, Pennsylvania, Virginia and West Virginia, as well as Washington, D.C. The caps will determine limits for nitrates and phosphates and will be based on projected growth patterns.

Busch's spokeswoman Alexandra Hughes noted that 30 percent of all runoff into the bay is produced via air pollution, so actions by lawmakers this year could also have a positive effect on the bay.

On Tuesday, the Maryland Senate passed the "Clean Cars Act," intended to cut the state's auto emissions by 30 percent by 2016. The state House has passed it as well, and O'Malley has vowed to sign it.

The "Clean Cars Act" would mandate raising average fuel efficiency for new vehicles sold in the state to 43 miles per gallon starting in model year 2011. The current average for cars is 27.5 mpg and for light trucks and SUVs it is 22.2 mpg. Automakers would have to reduce emissions an average of 30 percent across their entire fleets.

Car dealers would also have to have a certain percentage of hybrid vehicles on their lots, including some with zero emissions. Motorists would not be able to bypass the rules by registering cars bought in another state, but they would not have to retrofit older cars.

Restoring the oyster industry a priority

To restore the decimated oyster population, which used to provide essential filtering action and build natural reefs in addition to being a food source, researchers are exploring multiple options.

Busch and O'Malley are backing a budget proposal that would repopulate some oyster beds, and O'Malley is also planning to request funds to continue depositing concrete from the old Woodrow Wilson Bridge into the bay to create artificial reefs, a process that began in September.

The Virginia Marine Resources Commission last month approved a plan to spend \$2 million on seeding public oyster beds with spat from private growers, training commercial anglers to become oyster farmers, and developing a commercial market for cow-nosed ray meat. As much of a danger to bay oysters as the parasitic diseases MSX and Dermo, the cow-nosed ray eats oysters and disturbs sensitive bay grasses, and it has no natural predators in the bay, so humans are being encouraged to consume them.

The spat technique involves oyster seeds from about a dozen hatchery-raised or wild oyster larvae that are attached to single shells and placed in bay tributaries where, in clusters, they are less susceptible to the cow-nosed rays and other hazards.

Also, a Maryland/Virginia/Army Corps of Engineers joint effort to restore oyster levels to those seen from 1920-70 is in progress, with a draft environmental impact statement due out in May or June. The collaboration is aimed at coming up with a number of possible paths to restoration, including introducing non-native oysters.

The potential issues that could arise from the introduction of Asian oysters are that they do not build reefs for other marine life, as the native *Crassostrea virginica* does, and they don't have natural predators in the bay.

Ken Paynter of the University of Maryland's Center for Environmental Science and the Paynter Labs pointed out that what works in one part of the bay may not work in another. Salinity is a big factor, with water near the southern end of the bay much saltier than elsewhere and more susceptible to diseases. And while salinity causes native oysters to die, non-natives fare much better -- in Virginia, they have grown to three times the size of *Crassostrea virginica*, while in Maryland they are only 10 percent larger than natives.

To combat MSX and Dermo, researchers are using healthy seeds from hatcheries and attempting to breed more-resistant native varieties. They grow the spat downriver, then transplant them further upriver to oyster reefs. While they grow more slowly in less-saline waters, they have increased survival rates, Paynter said.

A decade of research has convinced Paynter that restoration of the native population is possible, but he warned that "we have to think carefully about what we mean when we say 'restore.'" It may not be feasible to restore the population to the point of satisfactory water clarity, he said.

Most of the projects in the works are years away from fruition, so it will certainly be decades before they can be used as evidence of the bay's restoration. Apart from the concerted efforts by federal and state agencies and non-governmental organizations, the will of the general public to stem the rising tide of development and cut down on polluting activities "remains to be seen," EPA's Batiuk said.