



The sun sets on the Blackwater National Wildlife Refuge in Maryland. Photo by Raymond Gehman/Corbis

Marsh on the Move

Maryland's coastal marsh is migrating inland—and land managers are trying to clear the way.

by Sharon Oosthoek

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Biologist Matt Whitbeck leans against the rail of a wooden platform and looks across the seemingly immutable marshlands of Maryland's Blackwater National Wildlife Refuge. The waist-high grasses beneath his feet are rooted in a four-meter layer of peat and silt built up over nine centuries. Monarch butterflies fly in lazy circles. A stand of pines rises in the distance.

There is nothing here to suggest this is an ecosystem on the move, but Whitbeck knows better. The marsh is migrating inland—running from the sea level rise and land subsidence that are eating away at the coastline.

“[The marsh] has persisted for centuries, but in the last 70 years, this habitat has been moving across the landscape at great speed,” says Whitbeck, the US Fish and Wildlife Service's (USFWS) lead biologist at the refuge.

At the interface of sea and land, coastal marshes are among the most biologically diverse and productive habitats in the world. Not only are they a fount of ocean life, they protect coastal communities from storms, and act as natural filters that trap and treat polluted runoff.

Maryland's land managers are concerned about the fate of the Blackwater marsh, an ecosystem that could be squeezed out of existence. But rather than trying to resist the overwhelming forces of climate change and coastal erosion, these scientists are testing an innovative approach to protecting the state's marshes.

“We're not trying to fight nature anymore,” says Bhaskaran Subramanian, the head of Maryland's shoreline conservation program. “We're trying to roll with her.”

Instead of building hard sea walls, or taking other engineering approaches to buffer the coastline, the Maryland team is clearing a path for the marsh to move inland.

The refuge's land managers are mapping future marsh habitat by examining land elevation, tidal range, subsidence, sedimentation, erosion rates, and sea level rise. Wherever possible, they're working to keep predicted corridors clear of human development that could get in the way of the marsh's inland march.

Two summers ago, they even removed hardwoods and pines from a five-hectare parcel of land in the refuge. The trees were standing in the way of the marsh's predicted path. As a bonus, removing the trees also eliminated perches for avian predators of rare marshland birds—removing a source of pressure on those struggling species. These trees would have died anyway as saltwater moved inland, says Whitbeck, but by clearing the way early they hope to help the marsh's migration.

No one is expecting a smooth journey, says landscape ecologist Mike Slattery, the USFWS coordinator for its Chesapeake Bay Program. For instance, there may be places where the marsh's retreat runs up against existing human development. "We may try to hedge nature's bets in these places and divert it around development," says Slattery.

But if they don't do something, the marshland's fate is clear.

Since the Industrial Revolution, Chesapeake Bay, which includes the Blackwater refuge, has lost more than 60 percent of its historic wetland area. Vast swaths of former marshland are now open water, a change that has wiped out the fish and shellfish nurseries on which the area's commercial and recreational fishers depend. This new watery world has also drowned important habitat for bald eagles, rare salt marsh sparrows, and the endangered Delmarva fox squirrel.

The Maryland land managers' plan is still in a pilot phase, but if all goes well, they hope to share their learning with other coastal land managers.

"If we can understand exactly where this landscape is going, we'll be able to preserve species we care about," says Slattery.

Sharon Oosthoek is a freelance journalist who writes about science and the environment. Her work has appeared in *New Scientist*, *The Globe and Mail*, *Canadian Geographic*, *cbc.ca*, and *Science News for Students*. She lives in Toronto where she hears the call of the coast in her dreams.

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