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Trying to reverse decline of Barnegat Bay

Nitrogen-fed algae have choked much of the underwater vegetation on which sea life thrives. Scientists are trying to turn it around.

By Sandy Bauers
Inquirer Staff Writer

BARNEGAT BAY, N.J. - A small powerboat slows and stops in mid-bay, over what is - or perhaps was - the largest sea grass meadow in the state.

Chris Huch slides over the side and dives to the shallow bottom, coming up with a handful of slimy brownish gunk.

"You can barely see grass," he says.

Fellow researcher Mike Kennish nods, frowning.

Kennish has been describing this to audiences big and small.

Sea grass is just the beginning of the picture he paints.

The Barnegat Bay-Little Egg Harbor estuary, once a legendary protein factory that pumped out mountains of clams, oysters, scallops and fish, is in a heap of trouble.

The problem is nitrogen. For decades, increasing amounts of the basic chemical have been accumulating here, setting off a cascade of change.

Nitrogen is a key component of fertilizer, and it has the same effect in water that it does on land: It makes plants grow. In the bay, it causes algae blooms so thick that they shade - and kill - the sea grass beds below.

Grass drives the bay's ecosystem - everything from crabs to flounder. Shellfish have declined precipitously. Finfish numbers may be starting to decrease.

Yet the new water chemistry has made the bay hospitable to stinging jellyfish called sea nettles. And so on.

"I call it insidious, an insidious decline," Kennish says.

The bay's plant life gorges on an estimated 1.8 million pounds of nitrogen a year. Most comes from runoff into streams and groundwater. But a surprising 40 percent drops from the air, blown eastward from power plants and vehicles that burn fossil fuels up to hundreds of miles away.

Once nitrogen gets into the bay, it can't really get out. The lengthy, narrow barriers known as Long Beach Island and Island Beach State Park are breached by just two inlets, so there's minimal flushing. Water stays for an average of 70 days.

If the villain in this story is nitrogen, one of the heroes is Michael J. Kennish.



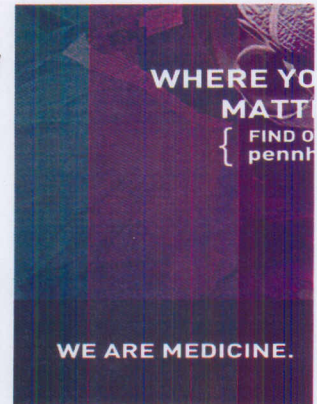
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Marine biology student Chris Huch hands researcher Mike Kennish dying sea grass he retrieved from the bottom of the bay.

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The Rutgers University marine scientist - with a boyish smile, earnest manner, and runner's lean frame - has spent three decades watching, and documenting, Barnegat's downhill slide.

Now the science has become so compelling that Kennish, who is affiliated with the university's Institute of Marine and Coastal Sciences, has abandoned the usual role of dispassionate researcher and begun stumping for the bay's survival.

He says it makes his life meaningful. And he feels there's a lot on the line.

"If we don't fix the bays, it comes back to haunt us," he says.

Barnegat could be a kind of poster bay for what has become a nationwide issue.

Excess nutrients - "a silent but deadly form of pollution," in the words of Ben Grumbles, a water administrator at the U.S. Environmental Protection Agency - have been blamed at least in part for problems in nearly two-thirds of the nation's coastal estuaries.

Of 99 estuaries analyzed in a report on the issue last month, 15, Barnegat among them, topped out at "highly eutrophic," or overnourished, says Suzanne Bricker, an oceanographer at the National Oceanic and Atmospheric Administration and the study's lead author.

A major source of all the nutrition that comes from the land, washing down the streams, is lush lawns, researchers say.

Land near the South Jersey Shore has only a thin layer of topsoil, making it difficult to grow grass.

In what Kennish calls a "cycle of craziness," people fertilize heavily, then water heavily, which flushes the fertilizer into streams and storm drains.

Rampant population growth exacerbates everything.

Trees absorb, and obviously use, lots of nitrogen, so when forests are cut down for buildings, that balance is lost.

Among the other things that happen in such a complex system, development compacts the earth, resulting in more nitrogen-laden runoff instead of a slow absorption, keeping the nitrogen where plants can use it.

Kennish and his colleagues figure the Barnegat Bay-Little Egg Harbor watershed - virtually all of Ocean County - could be developed to a density of about 20 percent and be OK.

In 1972 it was 19 percent. Now it is 37 percent, and still growing.

Kennish started seeing problems in the bay in the 1980s.

Recurring brown tides, blooms of a particular alga that is brown, began in 1995.

The larger algae - the sea lettuce that boys throw at their sisters playing in the ocean - grows in vast mats. Besides the excess shade, it sinks and smothers life on the bottom when it dies. Decomposition robs the water of vital oxygen.

From 2004 through 2006, researchers calculated a 50 to 80 percent loss of sea grass biomass, akin to cutting down every other tree in a forest.

Once, the shellfishery supported 900 clambers; now, just nine. One, Joe Rizzo, began farming clams instead of clamming "on the wilds."

By last summer, researchers couldn't locate a single scallop.

Sea nettles showed up in 2000. Now, they are so pervasive that some bay beaches are all but unusable; boaters even hesitate to jump in for a swim.

"A day at the beach shouldn't have to include meat tenderizer and vinegar" - a home remedy for the stings - says Cindy Zipf, executive director of the advocacy group Clean Ocean Action.

Rutgers began studying various facets of the bay more than a century ago, back "when oysters were plentiful," Kennish says. (They all but disappeared in the 1950s.) Some of its best marine scientists cut their teeth here.

"We're studying it to death," says Zipf, "but watching it die."

She and other advocates say it's time for action.

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Education is one step. Save Barnegat Bay, with 1,700 member households and businesses, has launched a campaign. Enough with the fertilizer.

Al Clericuzio, horticultural consultant with Rutgers Cooperative Research and Extension of Ocean County, who has been preaching the ills of nitrogen for a decade, is targeting the county's 98 senior communities.

In an end-of-life quest for perfect lawns, he says, they and the lawn companies they hire are among the biggest fertilizer "misusers" around.

Other efforts have sprung up. The Barnegat Bay Shellfish Restoration Program wants to reclaim the bay by re-*clamming* it, and is farming millions of baby clams to plant in the fall. The critters filter algae.

Many say government must step in with regulations. Ultimately, Kennish and others want to see the state establish nutrient limits and devise a plan to meet them.

Also on the to-do list for the bay: managing stormwater better, conserving open space, working to slow the airborne influx of nitrogen, and, *somehow*, curbing development.

"We need a building moratorium," says longtime clammer Walter L. Johnson 3d, who now plies other waters. "The feds need to step in."

William deCamp Jr., executive director of Save Barnegat Bay, says the estuary has the potential to emerge as a national laboratory because its problem is so integrally linked with sprawl. "It really makes it an interesting challenge, because I don't know that anyone has conquered this problem."

Will it all work? Can Barnegat Bay be saved?

Kennish, typically straightforward, says it has to. "People say, 'So what.' But it can get very very bad, where it gets to be azoic, without animal life." Like the Dead Sea.

"It can get worse than it is."

Read more about the bay and the fight for its future at <http://go.philly.com/earth>

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