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Dry summer linked to higher fish kills in Md.

Experts say explosion of toxic algae likely affecting aquatic life in Chesapeake Bay

By Tom Pelton | Sun reporter
September 16, 2007

An unexpected result of this summer's drought was an explosion of toxic algae linked to at least 15 fish kills in the Chesapeake Bay since July, according to a University of Maryland scientist.

The microscopic organism, called karlodium, is a peculiar bean-shaped predator with two whip-like arms. It thrives in the salinity that results when there is little rainfall and more ocean water

enters the bay, said Allen Place, a biochemist at the University of Maryland Biotechnology Institute.

Multiplying into dense masses in hot weather, "karlo" stains the bay the color of reddish coffee. It's sometimes called "mahogany tide" (a nickname given to several kinds of algae). The critter -- part plant, part animal -- oozes a toxin that eats holes in gill cells, causing the organs to fail and fish to suffocate.

Toxic algae Largest fish kills associated with karlodium this summer:

Place said this was the worst summer in memory for karlodium blooms in the Chesapeake. As many as 300,000 menhaden, perch and croaker were likely killed by algae in a tributary to the Potomac River around July 1. In Anne Arundel County, the algae's toxins were found in the water of Marley Creek along with 26,000 dead fish around July 31, and in Deep Cove Creek with 21,000 dead fish Aug. 9. There have been a dozen similar incidents in the bay in recent months.

"This was a very productive year for karlodium, and the fish kills were collateral damage," Place said. "The bay has too much nutrient [pollution] going into it, so we have too much algae."

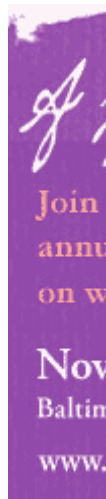
Harmful algal blooms of various kinds are becoming more common in oceans worldwide as a growing human

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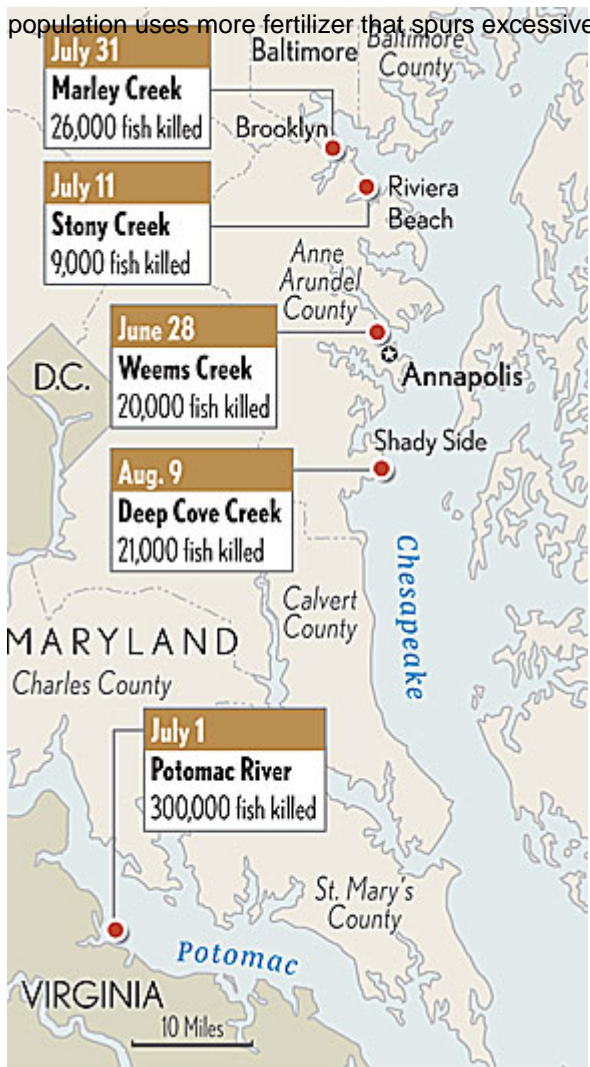
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Source: Dr. Allen Place
Karlodinium Veneticum

growth of the primitive aquatic organisms, according to a report by Professor Patricia M. Glibert of the University of Maryland Center for Environmental Science.

In Florida, red tides of algae irritate people's lungs and kill sea mammals. Off Long Island, N.Y., and other areas, brown tides of algae stunt the growth of clams. In Australia, primordial algae-like organisms blister the skin of fishermen.

The karlodium in the Chesapeake Bay poses no risk to human health, said Place. But the toxin produced by the algae makes it harder for fish to breathe, which can be deadly in the summer when oxygen levels in the bay drop because of warm weather and decaying organisms, Place said.

Place believes it was karlodium -- not another toxic algae, pfiesteria -- that caused the highly publicized fish kills that temporarily shut down the Pocomoke River a decade ago. Karlodium had a different name back then, gyrodinium, and it was also found in the water with the dead fish. Both varieties of algae are similar, in that they thrive by eating other algae that multiply when fertilizer pollution overwhelms a waterway.

But karlodium doesn't cause the kind of temporary memory loss reported by as many as 31 watermen and other people on the Pocomoke River a decade ago. And so Place's theory leaves unanswered the question of what triggered these human health problems -- a subject that is still being debated. Another researcher, JoAnn Burkholder of North Carolina State University, maintains that it was pfiesteria that caused both the fish kills and memory loss.

Charles Poukish, a program manager at the Maryland Department of the Environment, said he believes that Place may be right about both the large number of karlodium blooms in the Chesapeake this summer and the cause of the fish kills in the Pocomoke River a decade ago.

Poukish and his colleagues have been

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Religio

High Cultu
It's g

working with Place to study the cause of the approximately 120 kills that left 100,000 fish



What is it?

An algae that stains water the color of coffee

Where is it?

In the Chesapeake

Bay and oceans worldwide

What does it look like?

Karlodinium look like microscopic beans - about 10 times larger than bacteria - with two flagella

What does it eat?

Other algae, called cryptophytes, that multiply in warm water with lots of fertilizer pollution

How does it kill fish?

It emits a toxin that eats holes in the gill cells of fish, making it impossible for them to breathe. Also, when the algae die, their rotting bodies consume oxygen, which can suffocate fish

Are they a threat to people?

No, only fish

How can they be stopped?

Cut down on nutrient pollution from sewage plants, farm fertilizer and urban runoff

dead in Maryland's portion of the bay since June. Place is also studying a kill of 200,000 to 300,000 fish found floating in the Mattox Creek tributary of the Potomac River in Virginia.

This year's fish kill was the highest in the Chesapeake since 2004, although this summer didn't come close to the 180 fish kills in 2001, said Poukish. For all fish kills --as opposed to those specifically linked to karlodinium -- this summer was only slightly higher than the average of about 110 a year during the past 20 years.

Normally, about one or two fish kills a year are associated with karlodinium, although the definite cause is often hard to prove, said Place. This year, at least 15 of the kills happened in waters with the toxic algae -- suggesting a significant jump, Place said. "It is so far a unique year," Place said.

Poukish said it's difficult to say whether the karlodinium killed more fish this year than in the past because the algae was not closely studied until recent years.

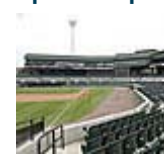
But he said the root cause is clear: The bay is suffering from too much nutrient pollution running off farm fields, from sewage plants and urban areas. "No question about it, we are seeing more and more algae blooms as the bay has become more enriched over time," Poukish said.

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Sources: Maryland Department of Natural Resources and Dr. Allen Place

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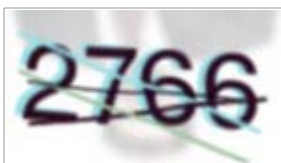
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