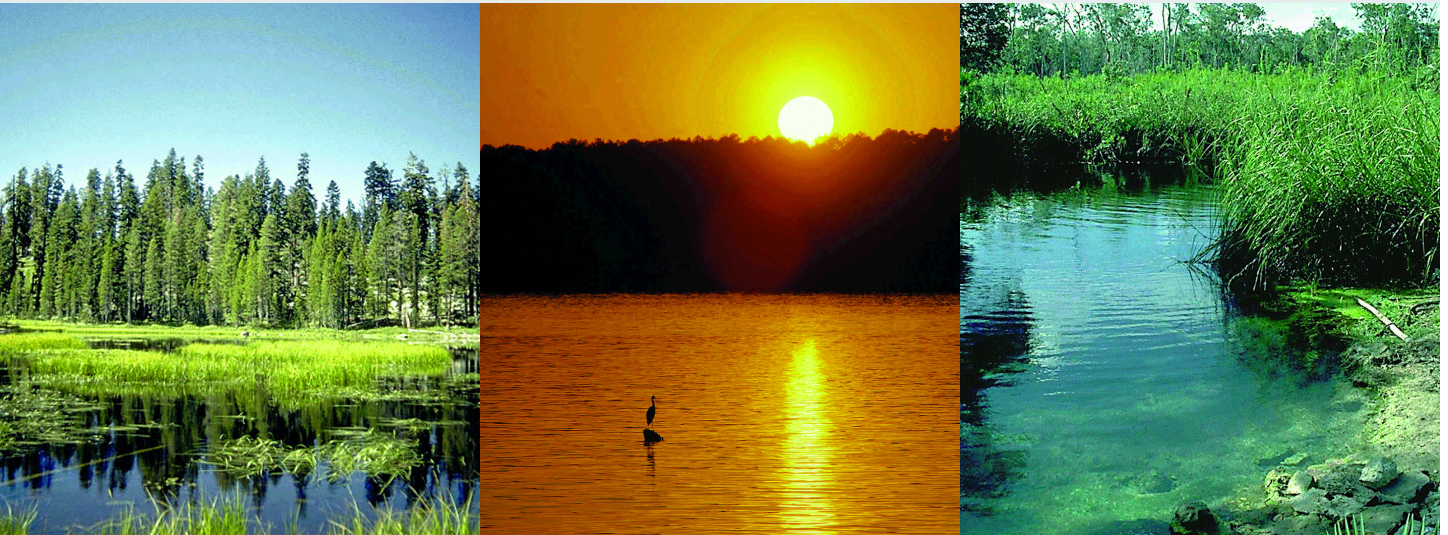


What You Should Know About *Pfiesteria*



This booklet provides information about some issues related to Pfiesteria. This booklet and our telephone interview with you will consider these issues because they are important to the economy of the Mid-Atlantic Region.

Please carefully consider the information in this booklet before our telephone interview. You may also like to have it nearby during our telephone interview.

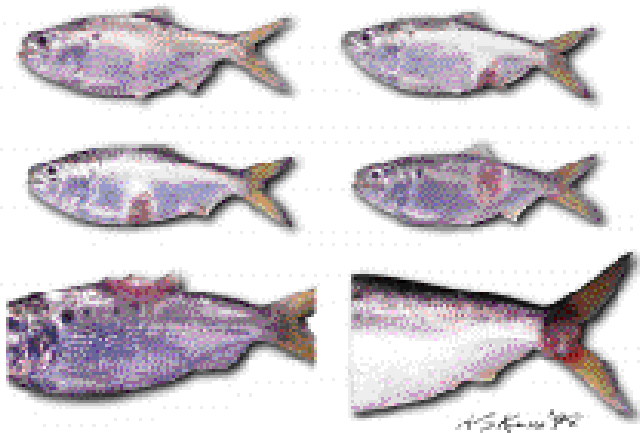
What is *Pfiesteria*?

Pfiesteria (fis-teer-ee-ah) is a potentially toxic organism that has been associated with fish kills in coastal waters from Delaware to North Carolina. A fish kill is a situation in which many fish -- more than a few dozen -- die within hours or days.

Discovered in 1988, *Pfiesteria* has a 24 stage life-cycle. A few of these stages can produce toxins that affect fish. *Pfiesteria* is microscopic algae that is a natural part of the environment.



How Does *Pfiesteria* Affect Fish?



External lesions observed on menhaden sampled suspected to be associated with Pfiesteria.

Photo Source: Andy Kane

Pfiesteria usually is in its non-toxic form, feeding on algae and bacteria in coastal rivers. Scientists believe that *Pfiesteria* only becomes toxic in the presence of a large number of fish. *Pfiesteria* cells then change form and stun the fish with a powerful toxin. The toxins are believed to cause lesions or sores.

Pfiesteria is NOT an infection like bacteria or viruses. Fish are NOT killed by an infection of *Pfiesteria*. Fish are killed by the toxins *Pfiesteria* releases, or by other infections once the *Pfiesteria* toxins have caused sores to develop. Fish may also die from *Pfiesteria* toxins without developing sores.

How Long Do Toxic *Pfiesteria* Outbreaks Last?

Toxic outbreaks of *Pfiesteria* are typically very short, no more than a few hours. After an outbreak, *Pfiesteria* cells change back into non-toxic forms very quickly, and the *Pfiesteria* toxins in

the water go away within a few hours. However, *Pfiesteria*-associated fish sores or fish kills may continue for days or even weeks.

Is *Pfiesteria* the Only Cause of Fish Sores and Fish Kills?

Pfiesteria is only one cause of fish kills. Other causes include a lack of dissolved oxygen in the water, changes in water salinity or temperature, sewage or chemical spills, red or brown tides, infections, and other environmental changes.

In addition, there are many possible causes for fish sores other than *Pfiesteria*. These include physical injury in nets or traps, bites by other fish or birds, poor water quality, and viruses or bacteria.



Dead menhaden and other fish.
Photo Source: Pamlico Rapid Response Team

Where Has *Pfiesteria* Been Found?



Pfiesteria has been found in coastal waters from Delaware Bay to North Carolina. It has not been found in freshwater lakes, streams, or other inland waters.

Pfiesteria has been associated with major fish kills at many sites along the North Carolina coast, particularly the New, Neuse and Tar-Pamlico Rivers. *Pfiesteria* has been associated with fish kills in the Chicamacomico and Manokin Rivers and King's Creek in Maryland, and the lower Pocomoke River in Maryland and Virginia. *Pfiesteria* has been associated with fish sores in Maryland, Virginia, and North Carolina.

What Causes Toxic *Pfiesteria* Outbreaks?

Scientists generally agree that a large number of fish is required to make *Pfiesteria* become toxic. However, other factors may contribute to toxic *Pfiesteria* outbreaks. Pollutants are thought to help *Pfiesteria* grow by stimulating the growth of algae that *Pfiesteria* feeds on. Excess nutrients

such as nitrogen and phosphorus are common pollutants in coastal waters. The main sources of nutrient pollution in coastal areas are sewage treatment plants, septic tanks, runoff from cities, suburbs and farms, and air pollutants that settle on the land and water.

Can Pfiesteria Cause Human Health Problems?

Any human health problems associated with *Pfiesteria* are from its release of toxins into coastal waters. Preliminary evidence suggests that exposure to waters where toxic forms of *Pfiesteria* are active may cause memory loss, confusion, and a variety of other symptoms including respiratory, skin, and gastrointestinal problems. It has been shown that similar human

health effects can be caused by exposure to *Pfiesteria* toxins in laboratories.

Pfiesteria is not a virus, fungus, or bacteria. It is not contagious or infectious, and cannot be "caught" like a cold or flu. There is no evidence that *Pfiesteria*-associated illnesses are associated with eating finfish or shellfish.

Is Pfiesteria Related to Red and Brown Tide?

A few species of algae can become harmful to marine life and to people under certain conditions. Scientists call such events "harmful algal blooms." Brown tides, toxic *Pfiesteria* outbreaks, and some kinds of red tides are all types of harmful algal blooms.

Who Should I Contact to Report Fish Sores or Fish Kills?

A few fish with sores or even a few dead fish are not cause for alarm. However, if you notice a lot of fish — more than a few dozen — that are dead or dying, have sores, or showing other signs of disease, please contact your state's *Pfiesteria* hotlines:

- Delaware 1-800-523-3336
- Maryland. 1-888-584-3110
- North Carolina. 1-888-823-6915
- Virginia. 1-888-238-6154



This survey is being conducted by the Survey Research Laboratory at East Carolina University for researchers at East Carolina University, University of Delaware, University of Maryland, and the Virginia Institute of Marine Sciences.