Pfiesteria Fact Sheet

Beginning in October 1996, and again in the spring and summer of 1997, fish with unusual and disturbing deep, bloody lesions were reportedly being taken from the Pocomoke River, located on Maryland's lower Eastern Shore. Since that time, the Maryland Departments of Natural Resources, Environment, Agriculture and Health & Mental Hygiene have been engaged in an active interagency investigation of the situation and its potential causes. Samples taken during the first fish kill in early August 1997 indicated that a potentially toxic estuarine microorganism (*Pfiesteria piscicida*) was active in its toxic form during that time. In response to this kill and associated concerns about the human health impacts of *Pfiesteria*, State and local health officials closed a portion of the Pocomoke River on August 7, 1997. Subsequently, *Pfiesteria* was identified as the cause of additional fish kills and fish with lesions found in Maryland's lower Eastern Shore tributaries, King's Creek and the Chicamacomico River, which were also closed. In addition, ongoing studies by Maryland physicians of the linkage between *Pfiesteria* and human health impacts have identified a number of health effects in people exposed to fish kills and fish with lesions on the Pocomoke River.

Pfiesteria piscicida is a microscopic estuarine dinoflagellate protozoan. Scientists are actively studying the organism and there is still much that we do not know about it. We do know that *Pfiesteria piscicida* and possibly other related, but unnamed, organisms (referred to as "*Pfiesteria-like*") have caused large fish kills in a number of nutrient enriched tributaries of Chesapeake Bay in Maryland and coastal estuaries in North Carolina. Laboratory research with this organism indicates that it can exist in as many as 24 different life stages. Like many other dinoflagellate (free swimming) microorganisms, *Pfiesteria piscicida* can survive for long periods in sediments in a cyst or spore form. Under certain conditions, *Pfiesteria piscicida* experiences a large population increase, or "bloom". During a bloom, in the presence of large concentrations of fish in calm, shallow waters, this organism can change into a free-swimming form that produces a toxin that causes deep, ulcerative lesions in fish and can kill large numbers of fish. The free swimming form of *Pfiesteria piscicida* which produces the toxin only exists for a very short period of time during the fish kill. In its other more common forms, *Pfiesteria piscicida* may spend its entire life feeding harmlessly on bacteria and algae. While it is currently not well understood what environmental factors induce *Pfiesteria piscicida* to change into its toxic form, it has been shown in the laboratory that blooms of the free swimming toxic form are induced by nutrient enrichment and the presence of large amounts of fresh fish excreta.

The exact chemistry and biology of the toxin is unknown; however, it is known that *Pfiesteria piscicida* itself is **not** an infectious agent; it does **not** spread from fish to fish or from fish to humans. The toxin is very short-lived in water. In fact, samples must be taken during an active kill or lesion event in order for *Pfiesteria piscicida* to be identified.

- *Pfiesteria piscicida* and *Pfiesteria*-like species are thought to exist naturally in most estuaries along the Gulf and East Coast of the U.S., as far north as Delaware Bay. *Pfiesteria piscicida* has been linked to fish kills in Maryland and North Carolina.
- The toxic form of *Pfiesteria piscicida* was identified in water samples taken from the Pocomoke River during the two August fish kills and in subsequent events in King's Creek and the Chicamacomico River. *Pfiesteria piscicida* has not been linked to fish kills in Chesapeake Bay prior to this.
- Many other situations can also result in fish kills, including a lack of dissolved oxygen in the water (due to algae blooms), sudden environmental changes (e.g., salinity, temperature, etc.), or a sewage or chemical spill.

Human Health Effects

- Currently, reports of illness thought to be related to water exposure are to be reported to local health departments who are forwarding the information to the Department of Health and Mental Hygiene (DHMH) for epidemiological analysis.

- Evaluations by a team of university doctors indicate that symptoms of exposure to the toxin include a burning sensation immediately after contact with water where the toxic form of *Pfiesteria* is active, possible respiratory irritation and and/or loss of short-term memory.

Safe Swimming and Fishing

- It is generally safe to swim and fish in coastal waters.
- After swimming in any natural surface water, bathe or shower.
- After fishing or handling fish, wash hands with soap and water.
- Do not swim, fish or engage in recreational activities that involve water contact in waters under a Public Health Advisory or Closure Order.
- Do not swim in areas experiencing a major fish kill (hundreds of dead fish).

Fish, Crab & Shellfish Consumption

- Healthy looking fish, crabs, and other seafood are safe to eat. There is no evidence of food borne illness related to *Pfiesteria piscicida*.
- As always, do not eat fish that were dead, dying, or had deep ulcers into the flesh when taken from the water.
- Completely wash and cook fish.

For Additional Information try http://www.dnr.state.md.us/bay/hab/pfiesteria.html, or
For Health Related Issues, contact
Your County Health Department, **or**
DHMH, Epidemiology & Disease Control Program, 410-767-6677, **or**
Maryland Department of the Environment, Environmental Risk Assessment Program, 1-800-633-6101, ext. 3906

Fish lesions or to report fish with lesions call...
Maryland Department of Natural Resources, 1-888-584-3110

To report a fish kill call...
Maryland Department of the Environment
1-866-633-4686

Maryland Department of the Environment
1800 Washington Blvd
Baltimore, MD 21230
410-537-3000 • 1-800-633-6101