A sudden appearance of dead fish in a lake or pond causes considerable concern and alarm for most people. Our first reaction is to suspect poisoning of the waterbody. Most fish kills, however, result from natural events, although people can influence their frequency and severity. Fish kills usually result from too little oxygen in the water. South Florida receives between 150 and 200 fish kill reports each year. While some result from spills or illegal discharges of toxic substances, most kills occur when oxygen dissolved in the water drops to levels insufficient for fish survival.

For a dissolved oxygen or DO-related fish kill to occur, a combination of environmental conditions transpire simultaneously. Weather patterns, water temperature, depth and quality, amount and type of plant growth, fish community structure, along with the presence of viruses and bacteria are all factors that are necessary to trigger a fish kill. Lakes, ponds, and canals located in residential areas are particularly vulnerable to DO related fish kills. Developed areas create runoff that contain high amounts of nutrients from septic tanks.

In addition, street and yard drainage that enters waterbodies can cause water quality problems. High levels of nutrients from fertilizers applied to lawns, golf courses and farms cause aquatic plants to thrive.

Ponds with high nutrient levels produce dense growths of microscopic plants called algae. When sunlight is

available, algae use nutrients and product oxygen through the process of photosynthesis. Most oxygen available to fish comes from algae. During nightime and cloudy weather, low sunlight causes algae to switch from photosynthesis to respiration, consuming oxygen needed by fish. During severe events, fish can suffocate from low DO.

Most frequently, however, fish become stressed during a low DO period and become susceptible to viral or bacterial infections.

Most times, fish can tolerate temporary lags in DO levels. Fish kills occur when several contributory factors occur simultaneously such as prolonged cloudy weather, drought conditions, overcrowded fish populations, excessive algae or other plant growths and high water temperatures.

Most DO-related fish kills occur in the warmer months from May through September, although winter cold fronts can also trigger DO lags. A typical scenario occurs when fish are observed at the water surface appearing to gasp for breath. Fish usually continue to die from viral or bacterial infections for 3-4 days. Most of the time, this occurs after a period of rainy or cloudy weather.

During the spring, kills involving only one species can occur and these are caused from stress brought on by spawning activities. Along coastal areas of Florida, surface and groundwater inflows of saltwater can kill freshwater fishes. Herbicide spraying of problem aquatic plants often results in fish kills. Overspraying can have toxic effects; however, more commonly, the decay of the vegetation uses oxygen at a rapid rate.

Application of pesticides to control lawn and crop insects can enter a pond during heavy rains and cause a fish kill.

Fish kills can only be prevented by maintaining good water quality. Clean-up of fish kills occurring in private residential lakes and canals are generally the responsibility of the property owner or homeowners association, Governmental agencies generally do not have the resources available to undertake the task of removing dead fish, however some city-maintained lakes are often cleaned up by city crews. Concerned individuals can report fish kills to the DPEP, especially if they suspect that a kill is a result of toxic spills. Discussions with pond owners often lead to determinations of cause. DPEP's biologists can provide recommendations to prevent future kills.

On site investigations are done on waterbodies with public access and when environmental laws have been broken. Should anyone suspect that a fish kill be a result of unnatural causes, they should call the DPEP at **(954) 519-1499.**