Water Pollution— You'd be Surprised at the Source

by Barry Lewis

Editors Note: This article is offered as an education regarding the sources of water pollution and their effects on the water we drink. It is hoped that it will provide water treatment professionals with aknowledge of the water pollution problems we all face.

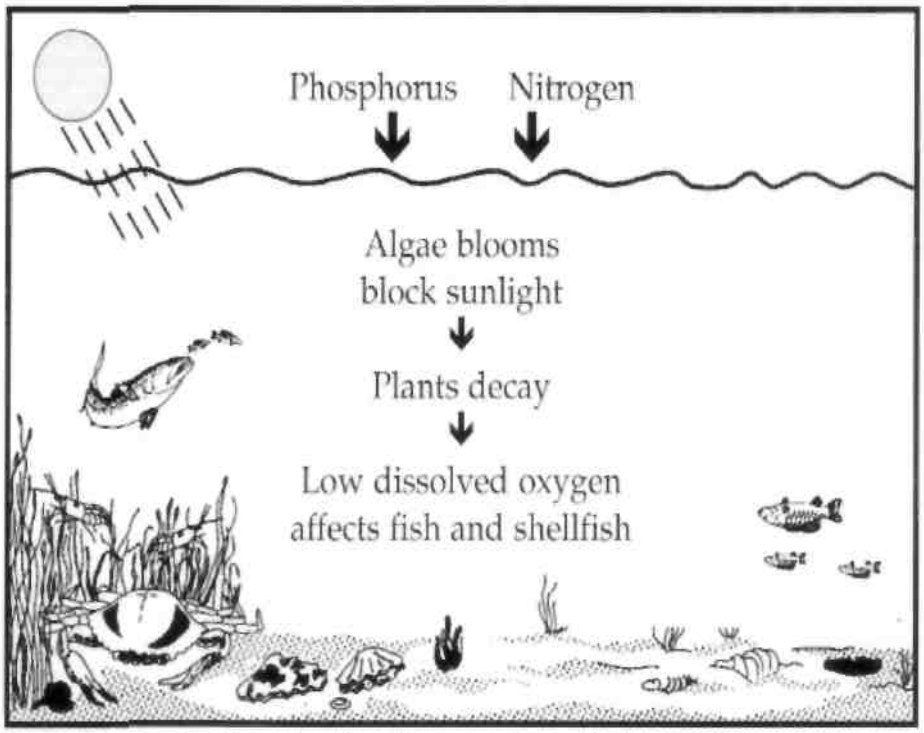
The quality of our water is one of the most significant issues facing the nation today. Poor water quality, resulting from natural imbalances or any number of direct or indirect influences, affects the entire web of life. Surprisingly, it is the less obvious discharge from diverse "nonpoint sources"—from sources such as agricultural fields, golf courses, construction sites, abandoned mines, highways, city streets, and even our own backyards—that have become the leading contributors of pollutants which affect America's rivers, streams, lakes, estuaries and bays. For more than two decades, policy makers have regulated obvious "point source" discharges to waterways through end-of-the-pipe controls, but they recently have begun to recognize that nonpoint sources also need to be brought under control.

"Government is tackling nonpoint pollution," write the governors of Michigan and Vermont in an open letter to the American people which serves as the introduction to The National Forum on Nonpoint Source Pollution report, Water: A Story of Hope. However, they add, "The task is too big to do alone. Imagine policing every backyard, every parking lot, every farm. Stopping nonpoint pollution is everybody's job."

There are many nonpoint source pollutants which can get into water and have negative effects. Siltation, the deposition of salt and suspended matter, according to the U.S. Environmental Protection Agency's (USEPA) National Water Quality Inventory Report to Congress (1992), is the biggest cause of impairment in America's rivers and streams. Silt and other suspended solids are easily washed from urban areas, logged hillsides, residential and commercial construction sites, plowed fields, strip-mines and eroded river banks and shorelines when heavy rainfall occurs. Silt can carry potentially toxic compounds into waterways and can interrupt fish respiration, suffocate bottom dwelling organisms, destroy spawning grounds and reduce the productivity of aquatic plants.

An overabundance of nutrients such as nitrogen and phosphorus is another of the most serious problems facing the nation's waters. Nutrients can come from point sources such as sewage and wastewater treatment flows, which are strictly regulated, from nonpoint sources such as agricultural and urban run-off (primarily from fertilizers and manure) and from the atmosphere.

While nutrients are essential ingredients in the food cycle and contribute to primary production of many aquatic plants, an overload of nutrients causes excessive growth of certain "nuisance" algae and other vegetation. In shallow areas, an overabundance of surface plants blocks



Excess nutrients affect the ecology of the Chesapeake Bay and other aquatic ecosystems in many different ways. (Diagram modified from USEPA National Water Quality Inventory 1992 Report to Congress).