

Protecting Lakes and Streams

Pristine waters and undisturbed shorelines add beauty and diversity to the landscape and enhance recreational opportunities throughout the year.

In undisturbed watersheds, nature purifies water flowing into lakes and streams. When we alter watersheds to clear land and build houses, we impair the process of natural purification. Consequently, we must all assume responsibility for maintaining water quality.

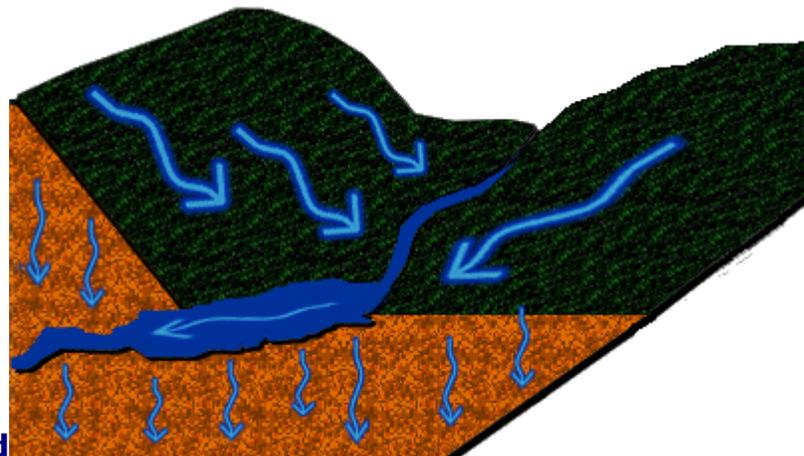
This document explains how lakes and streams are affected by our use of land and how we can protect water quality for our own future and for generations to come.

What Is a Watershed?

A watershed consists of all the land which contributes water to a lake - it involves far more than just the shoreline. To outline watershed boundaries, connect the points of highest elevation around a lake on a topographic map. Water falling within this "catchment basin" flows by gravity, in streams and groundwater, to the lake.

"Any substance within the watershed which can be transported by water eventually reaches the lake and affects water quality. It is not only shoreline use, but activities anywhere within a lake's watershed which affect water quality."

EVERYTHING MUST GO SOMEWHERE, Barry Commoner, 1971



A lake's watershed

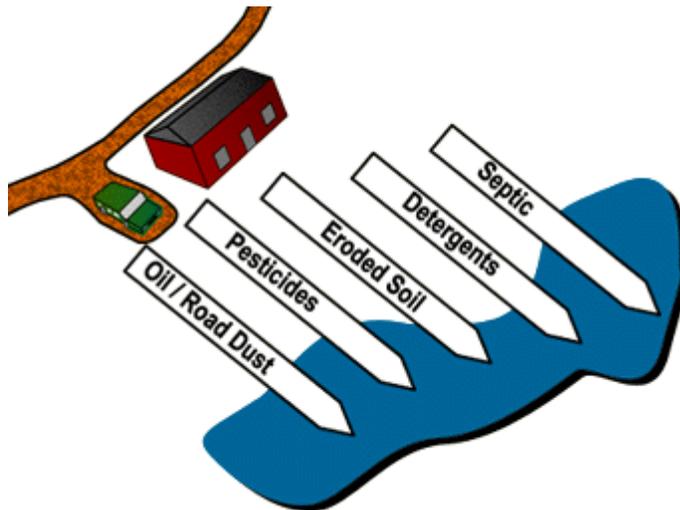
The consequences of even distant land uses eventually drain into the lake, although often indirectly through brooks and streams.

The Phosphorous Factor

Excessive phosphorus is the primary cause of degraded lake water quality. Phosphorus is a fertilizer. It promotes plant growth in lakes, just as it does in home gardens. In lakes, however, the crop is algae, and sometimes aquatic plants, rather than garden vegetables.

Every lake can receive a limited amount of phosphorus from the watershed without unwanted effects on water quality. However, if the amount of phosphorus flowing into the lake increases and stays above normal, the lake will become overfertilized and produce excessive amounts of algae.

A significant source of phosphorus in some areas is eroded soil washed into the lake due to lack of appropriate vegetation.



Typical sources of phosphorus and other contaminants generated by a home on a lake

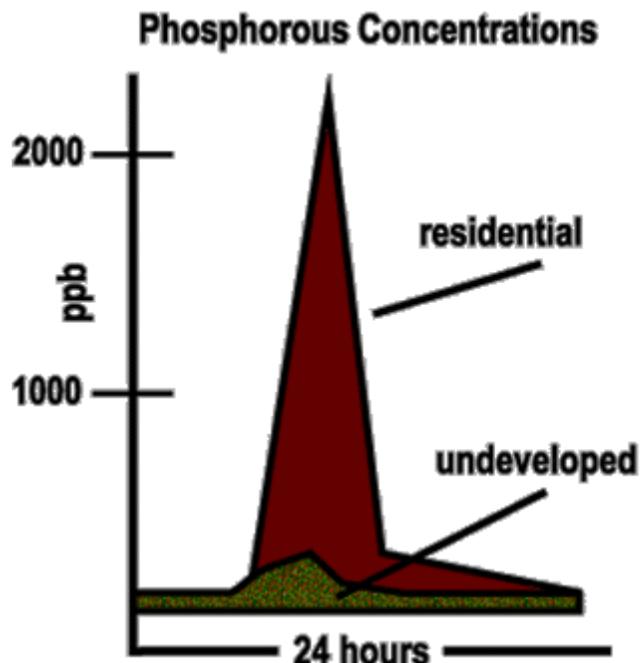
Link to Land Development

Dramatic changes occur when forest land is cleared and developed, especially when the natural vegetation buffer along shorelines and stream banks is removed. Without vegetative cover to catch and store rainfall, more water reaches the ground quickly. Paved areas and buildings reduce the amount of soil to absorb water. As a result surface water accumulates quickly in developed watersheds and runs off in much greater volume than it did prior to clearing and development.

The increase in surface runoff accelerates the erosion of soil. Since sediment carries phosphorus, soil erosion is a significant source of phosphorus in developed watersheds. Also, phosphorus is more easily washed from the smooth surfaces common in developed watersheds, such as driveways and cleared waterfronsts and hillsides.

It has been scientifically shown that the increased volume of water running off developed land contains much higher amounts of phosphorus than runoff from undisturbed woodland. This phosphorus comes from eroded soil, lawn fertilizers, road dust, grass clippings, yard debris, pet droppings, motor oil, effluent from failing septic systems, and other sources.

A recent study in Maine found that even careful development of woodland into two acre house lots caused a **two to ten-fold increase** in phosphorus concentrations **in storm water runoff alone**. (Sewage was not a factor, since all houses were connected to a system that carried sewage away from the watershed to a treatment plant).



This chart compares storm water runoff from a residential development and runoff from adjacent forest for only one storm. The residential development gave up seven times as much phosphorus!

Algae - Unwelcome Visitor

Algal blooms turn water a cloudy green or brown, deplete the water's oxygen supply, and have an unpleasant smell. They alter wildlife habitat, reduce the recreational appeal of the lake and depress property values.



Water and phosphorous flow easily off cleared land. A densely vegetated buffer strip retains and filters water, and removes phosphorus.

What You Can Do

You should preserve or mimic as many natural processes in the watershed as possible so that nature can accomplish its water purification task:

- **Leave natural buffer strips of trees and other vegetation along banks of lakes and streams.**
- **Avoid disturbing natural soil by extensive site clearing, paving, etc.**
- **Direct surface runoff into natural depressions where water can seep into the ground slowly.**
- **Minimize the use of harmful chemicals.**
- **Generally, do nothing to a lake that you would not do to your own swimming pool or drinking water supply.**

Shoreline Alterations

You should contact your county conservation district before undertaking any of the following activities on or near a shoreline:

Placement of sand or any other materials

Dredging or removal of any lake bottom material

Dock construction

Construction of retaining walls along the shoreline

Construction of piers, pilings or other structures

Any other encroachment in the lake

Application of any chemicals to the water

Mechanical plant control

Installation of bottom barriers for aquatic plant control

Changes to wetlands