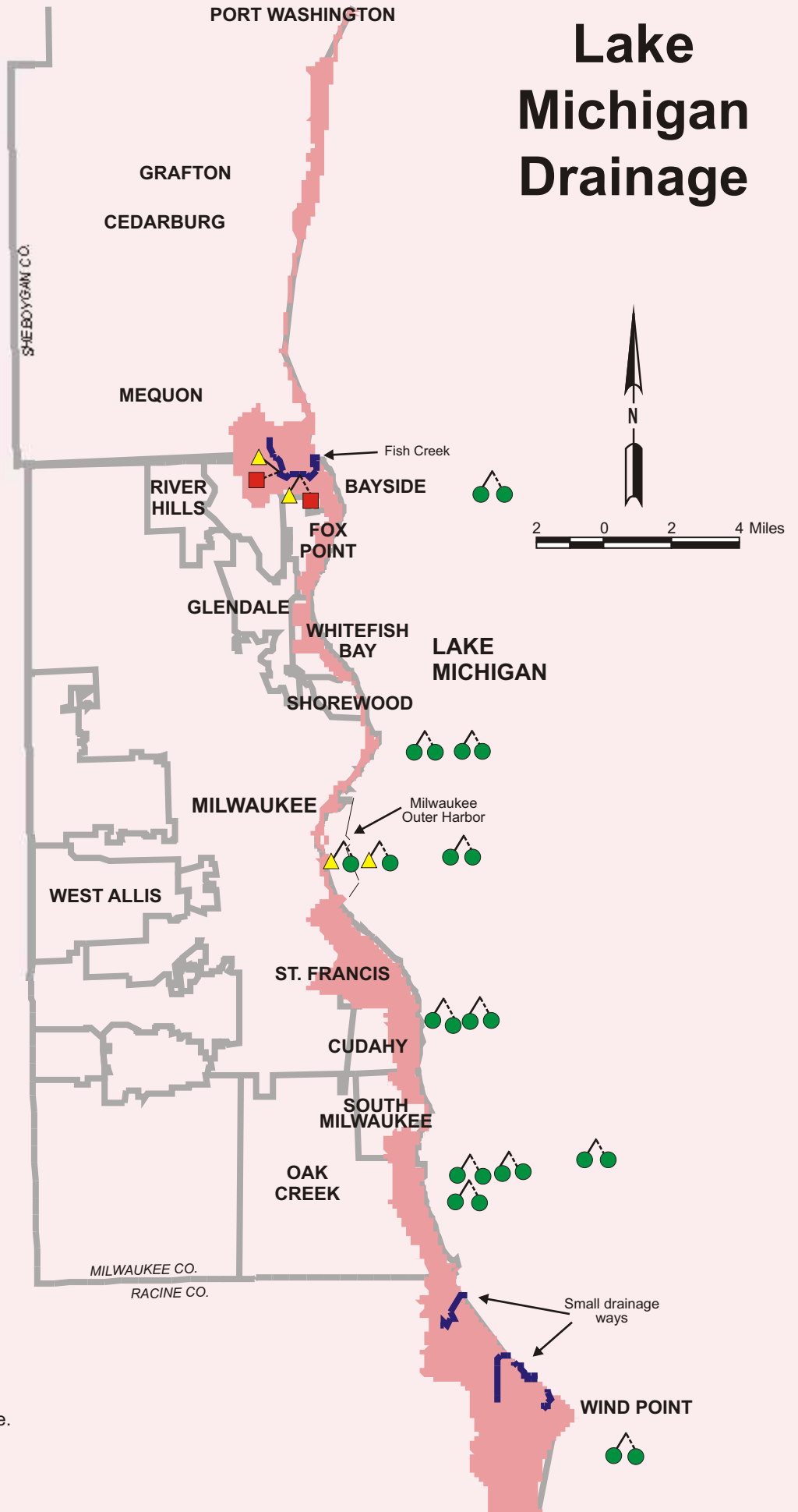


# Nutrients Map

## Lake Michigan Drainage



..... Total Phosphorus  
 — Total Nitrogen

- Meets Water Quality Criteria at least 85% of the time.
- ▲ Meets Water Quality Criteria between 50% and 85% of the time.
- Meets Water Quality Criteria less than 50% of the time.

# Nutrients

The abundance and types of phytoplankton (microscopic plant) found within Lake Michigan are highly variable, depending on the time of year, area of the lake, and availability of phosphorus and other nutrients. The increase in phosphorus loading to the lake has resulted in man-made changes to phytoplankton communities, especially in nearshore areas.

Another factor that affects water quality is the amount of **nutrients** in the water. Two of the major nutrients found in water are **phosphorous and nitrogen**, and both are necessary for living things to be healthy and grow. However, too much of these nutrients can cause excessive aquatic plant growth or algae blooms.



Algae blooms can decrease the amount of oxygen in the water, resulting in too little oxygen for fish and other aquatic animals to survive. These blooms can also create noxious odor problems once they begin to die off.

The concentration of nutrients and the form they are found in changes continually. How and why they change depends on a variety of complex factors. The total input of nutrients varies with land use and other factors. For example, during the summer, nutrient input may increase due to fertilization of cropland or lawns and gardens. During the autumn, high rainfall causes the increased wash-off of organic matter such as leaves, twigs, grass, and other debris. Because decomposition of this organic matter releases nutrients, it constitutes an important source of nutrient loading to waterways and Lake Michigan.

Urban stormwater runoff contains high nutrient levels too. Nutrients in stormwater runoff come from lawn and garden fertilizers, pet and other animal wastes, organic leaf material, and soil from construction sites. This stormwater runoff enters the waterways every time it rains.

Municipal and industrial discharges as well as sewer overflows also are contributors of nutrients to our waterways. Phosphorous and nitrogen are abundant in the waste material treated at the local or regional wastewater treatment plants. If a sewer overflow occurs, some of this untreated waste, high in nutrients, is released into our waterways.

Rural and agricultural areas also contribute to nutrient increases through failing septic systems, livestock feedlot operations, poor manure spreading techniques, fertilizing practices, and increased erosion from plowed surfaces or unstable stream banks. The EPA's recommended nutrient criteria for the eco-region, that includes the Lake Michigan Drainage area, is 1.59 mg/L for nitrogen and 0.08 mg/L for phosphorus. These are only recommended criteria that have not as yet been adopted or put into law.

In past several years the green algae "Cladophora" has been washing up along the western Lake Michigan shoreline and beaches in ever-increasing abundance. Storms and wave action cause the algae to break loose from rocks and wash up on shore. As the algae decays in the sun, foul and unpleasant odors are released. It is unknown at this time whether the increase in this algae's abundance is related to nutrients inputs, low water levels, the presence of zebra mussels or a combination of all three. Nutrients along the nearshore waters in the Lake Michigan Drainage area generally meet Water Quality Criteria at least 85% of the time except in Fish Creek and two tested locations in Milwaukee's Outer Harbor.

## Nutrient Stats

