POLLUTANTS OF CONCERN

We've known about many of the pollutants that we monitor in Minnesota waters for decades. Some, such as nitrogen and phosphorus, have been an issue for a long time, and we know a great deal about how they affect the environment. Other pollutants, such as chloride, have been recognized as problems more recently, and still others we may not know about yet with the development of new products and chemicals. Our knowledge about what contaminants do in water, what affect they have on the environment and human health is constantly evolving, and highlights the challenges we face, may change down the road.

Listed are some known pollutants and their affect in our waters and environment:

NITROGEN/NITRATE

Nitrogen is a key, high-volume pollutant in state waters and its concentrations in both surface and groundwater have been increasing over time. The Minnesota Pollution Control Agency (MPCA) released a report on nitrogen pollution in 2013, indicating that agricultural fields using artificial subsurface drainage (drain tile) are a key source of nitrogen pollution. Nitrate (a form of nitrogen) in lakes, rivers, and streams is toxic to fish and other aquatic life; in drinking water, it's potentially harmful to humans. Proposed reductions in nitrogen will benefit both Minnesota waters and water downstream from us, particularly the oxygen-depleted “dead zone” in the Gulf of Mexico.

PHOSPHORUS

Phosphorus is a common element in agricultural fertilizers, manure, and organic wastes in sewage and industrial discharges. Excess phosphorus in lakes, rivers, and streams causes algae to grow. Algae-covered water is less attractive for fishing and swimming — highly valued pastimes in Minnesota and uses that are protected under the federal Clean Water Act. In addition, phosphorus can fuel toxic blue-green algal blooms, which are harmful to humans and animals.

SEDIMENT

Sediment is composed of loose particles of sand, clay, silt, and other substances. It comes from eroding soil and from decomposing plants and animals. Much of the sediment in Minnesota lakes and rivers is contaminated by pollutants, particularly phosphorus. Sediment contributes to turbidity — cloudy water that is harmful to fish and plant life — and, in large quantities, can fill in bodies of water. For instance, the upper seven miles of Lake Pepin could be completely filled in with sediment deposits over the next 100 years, if nothing is done to remedy the problem.

BACTERIA

Though there are countless numbers of bacteria, viruses, and other microorganisms in the environment, only about 10 percent — known as pathogens — are harmful. If ingested by humans, they can cause illness or even death. Fecal coliform bacteria, and its subgroup Escherichia coli bacteria, can indicate the possible presence of pathogens. Bacterial contamination in lakes and streams typically comes from human, pet, livestock, and wildlife waste. Concentrations in water tends to be lower in the forested and wetland-rich areas of northern Minnesota, and higher in agricultural and more heavily populated areas.

CHLORIDE, SULFATE, AND OTHER "SALTS"

Chlorides, sulfates, salinity, and dissolved minerals are forms of “salts” that can harm fish and plant life at high concentrations. For example, the salt applied to roads, parking lots, and sidewalks during our icy winters contains chloride, a water pollutant. When snow and ice melts and runs into lakes and waterways, the salt goes with it. **It takes only one teaspoon of road salt to permanently pollute five gallons of water.** Elevated concentrations of sulfate are a concern for wild rice. Sources include discharges from mining operations, wastewater treatment plants, and other industrial facilities. Options for treating “salty discharges” are limited and expensive, making pollution prevention and source reduction very important tools in reducing the threats posed by these pollutants.

AMMONIA

Ammonia is a form of nitrogen that is directly toxic to aquatic life. It comes from wastewater treatment plants and animal waste or air pollution and runoff from agricultural land. Water with high concentrations of ammonia allow the chemical to build up in the tissues and blood of fish, and can kill them. Environmental factors, such as pH and temperature, can affect ammonia toxicity to aquatic animals.

CONTAMINANTS OF EMERGING CONCERN

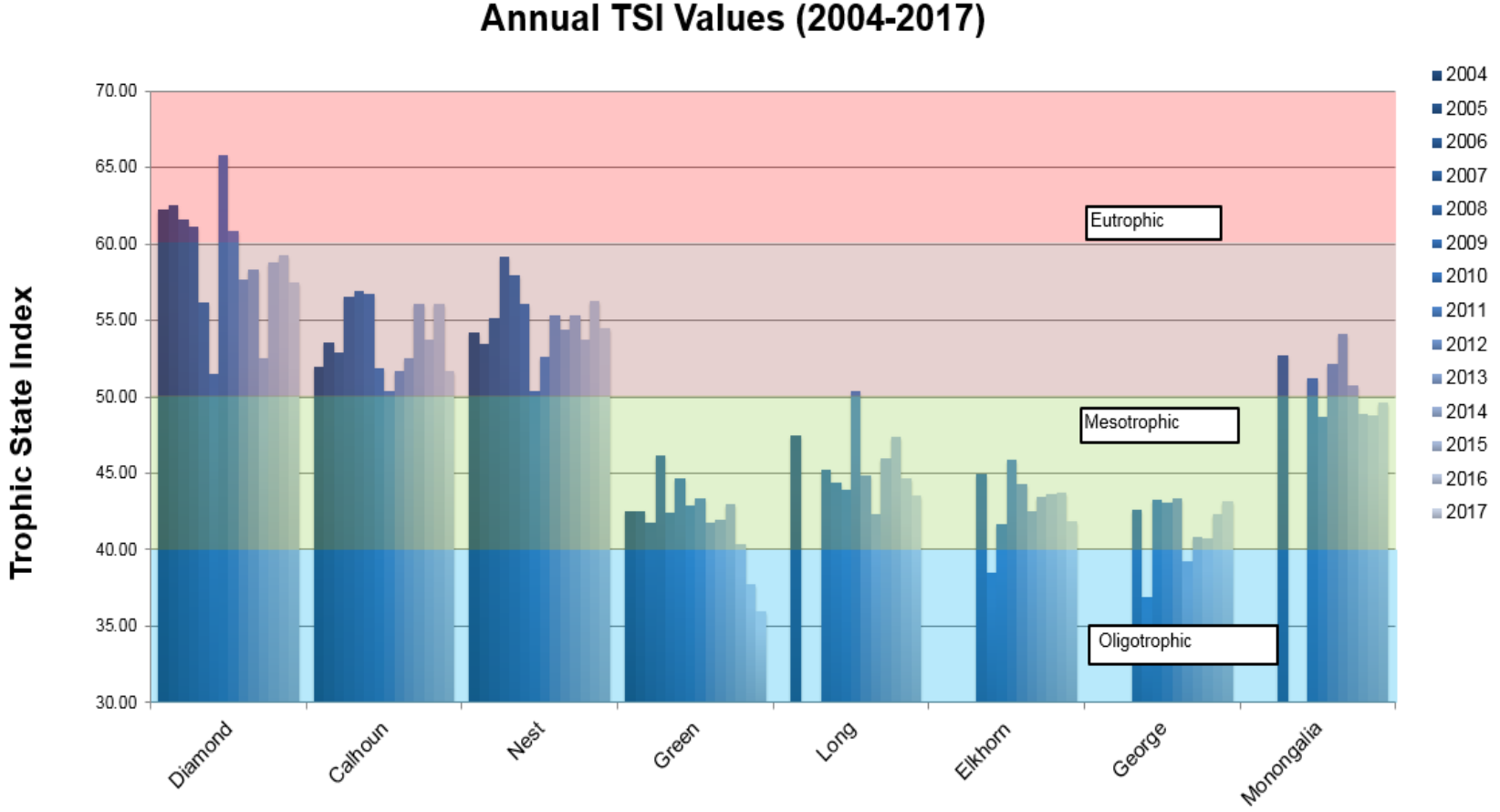
Recent studies of Minnesota’s waters show that a wide variety of unregulated chemicals, such as pharmaceuticals, fragrances, fire retardants, and insecticides, are ending up in lakes and rivers. Many of these substances have properties that can interfere with the functioning of hormones in animals and people. Some mimic the effects of hormones in animals and negatively impact growth and development. These endocrine-active compounds are not acutely toxic at the levels normally found in the environment, but over time can impact organisms at very low concentrations. Sources of these chemicals found in waters include wastewater discharges, runoff from animal agriculture, and air pollution.

Please review the Stewardship activities on page 5 to see how you can help change our land use practices and become stewards of the land.

Source: MPCA

MONITORING IN THE MIDDLE FORK

Monitoring helps us fulfill our mission of protecting and preserving water quality in the Middle Fork Crow River Watershed. The information we gather from monitoring helps us assess water quality trends and provides insight as to where to implement projects. We have a number of historic sites that allow the District to track long-term changes.



TSI 30-40 Oligotrophic – clear water, hypolimnion (Lower layer of water in a stratified lake) is oxygenated throughout the year (except in shallow lakes).

TSI 40-50 Mesotrophic – Water moderately clear, but anoxia becoming more likely in hypolimnion during the summer.

TSI 50-70 Eutrophic: Decreased transparency, anoxic hypolimnion during the summer, dominance of blue-green algae, algal scums probable, extensive aquatic plant problems possible.