

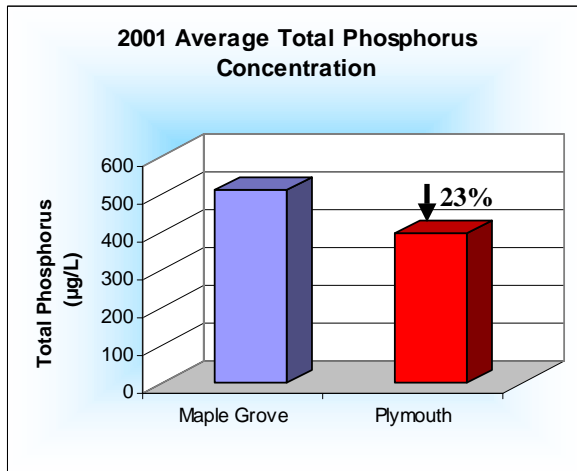
# 2001 Lawn Runoff Study – First Year Summary

## Study Design

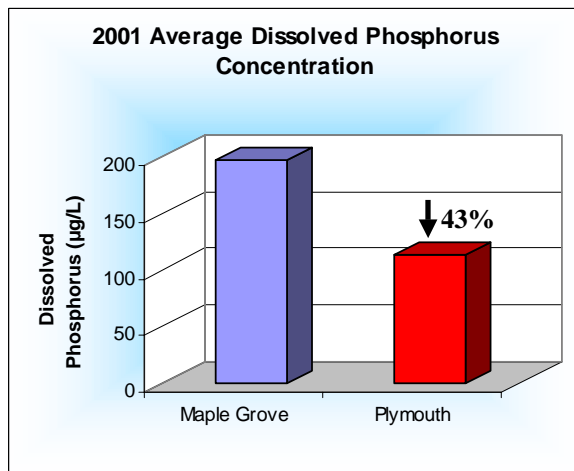
The Three Rivers Park District monitored six small watersheds in 2001. Three of these watersheds were located in Plymouth where the use of fertilizers that contain phosphorus was restricted, and three were located in Maple Grove which had no such restrictions. These watersheds were carefully selected to include one newly developed area, one middle-aged, and one older neighborhood within each of the cities. All of these watersheds were located within 6 miles of each other to minimize differences in precipitation patterns, soil types, and aerial loading of phosphorus. Automated sampling equipment was installed at the outlet from each of these watersheds to collect detailed flow information and water samples.

## Preliminary Results

The graphs below summarize the sample data collected in 2001. The average *total phosphorus* concentration was lower in runoff from the Plymouth sites than in runoff from the Maple Grove sites (**Graph 1**). This difference was even more pronounced in the observed *dissolved phosphorus* concentrations (**Graph 2**). (Nearly all of the phosphorus in lawn fertilizers is in the same form as that measured by the dissolved phosphorus lab analysis).



Graph 1



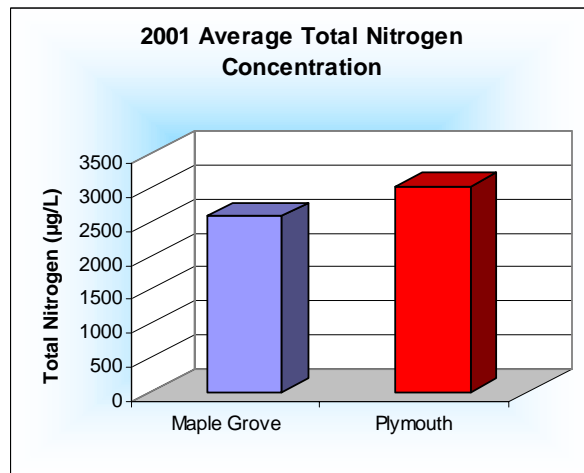
Graph 2

Water samples collected from these sites were also analyzed for *total nitrogen*. Graph 3 summarizes the results of those analyses. The average total nitrogen concentration was slightly higher in runoff from the Plymouth sites than from the Maple Grove sites.

## Summary

The amount of nitrogen in runoff collected from both cities was quite similar, but there was substantially less phosphorus in the runoff from the Plymouth sites than from the Maple Grove sites.

- 23% less total phosphorus
- 43% less dissolved phosphorus



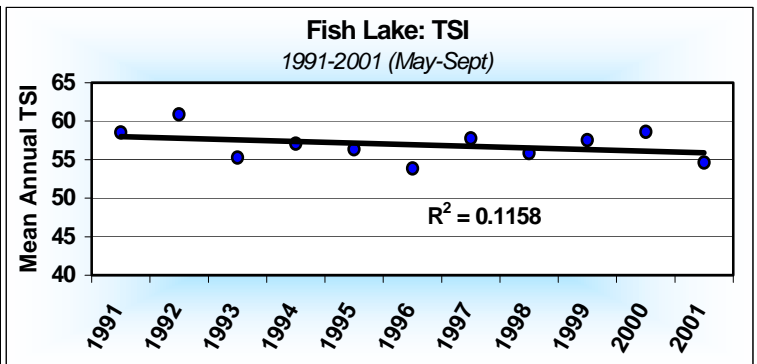
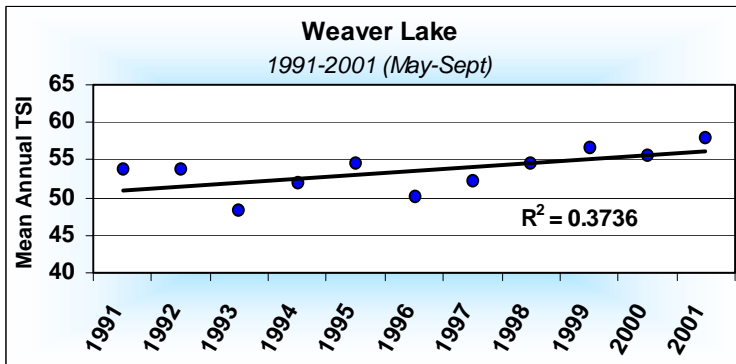
Graph 3

## Long-term Trends in Water Quality: Plymouth Lakes vs. Maple Grove Lakes

The Three Rivers Park District has monitored lakes within each of these cities for the past 10 years. The graphs below summarize the water quality trends since 1991 for four of these lakes. Fish Lake and Weaver Lake are in Maple Grove, while Medicine Lake and Parkers Lake are in the city of Plymouth. All four of these lakes receive the majority of their input water from residential runoff within their respective communities. The graphs summarize the Trophic State Index (TSI) for each lake. This index uses water clarity, phosphorus levels, and algae measurements to calculate a score from 0 to 100. A high TSI score indicates a very fertile lake with generally poor water quality. Most experts agree that a lake with a TSI score higher than 55 has some degree of impaired water quality.

### Maple Grove Lakes: Weaver and Fish

During the period from 1991 to 2001, Weaver Lake experienced a general decline in water quality and Fish Lake experienced a slight improvement in water quality. It should be noted that over \$100,000 was spent to improve several stormwater treatment ponds within the Fish Lake watershed in the mid to late 1990's.



### Plymouth Lakes: Medicine and Parkers

During the period from 1991 to 2001, Medicine Lake and Parkers Lake experienced improvements in water quality. Medicine Lake, which showed only slight improvement over the ten-year period, has been shown to experience substantial internal loading of phosphorus. Because of this internal release of phosphorus, any reductions in phosphorus loading from the watershed would take longer to have an effect on Medicine Lake's water quality. Parkers Lake experienced greatly improved water quality during the observed period with a 15-point drop in its average TSI score between 1995 and 2001. The Parkers Lake graph below shows two separate trend lines to compare the water quality trends both before and after the ordinance was enacted in 1995. As of 2001, no money had been spent on watershed improvements to reduce nutrient loading to either of these lakes.

