

# Water Action Volunteers

## 2015 Total Phosphorus Monitoring Program

Pfeiffer (Grady) Lake Outlet to Pigeon Lake at Lakeshore Road

Dennis Krueger



### Monitoring Site Quick Facts

SWIMS Station ID	10043366
WBIC	293300
County	Waupaca
Watershed	Pigeon River
Watershed Area	116.32 sq miles
Total Stream Miles	146.47
Downstream Waterbody	Pigeon Lake

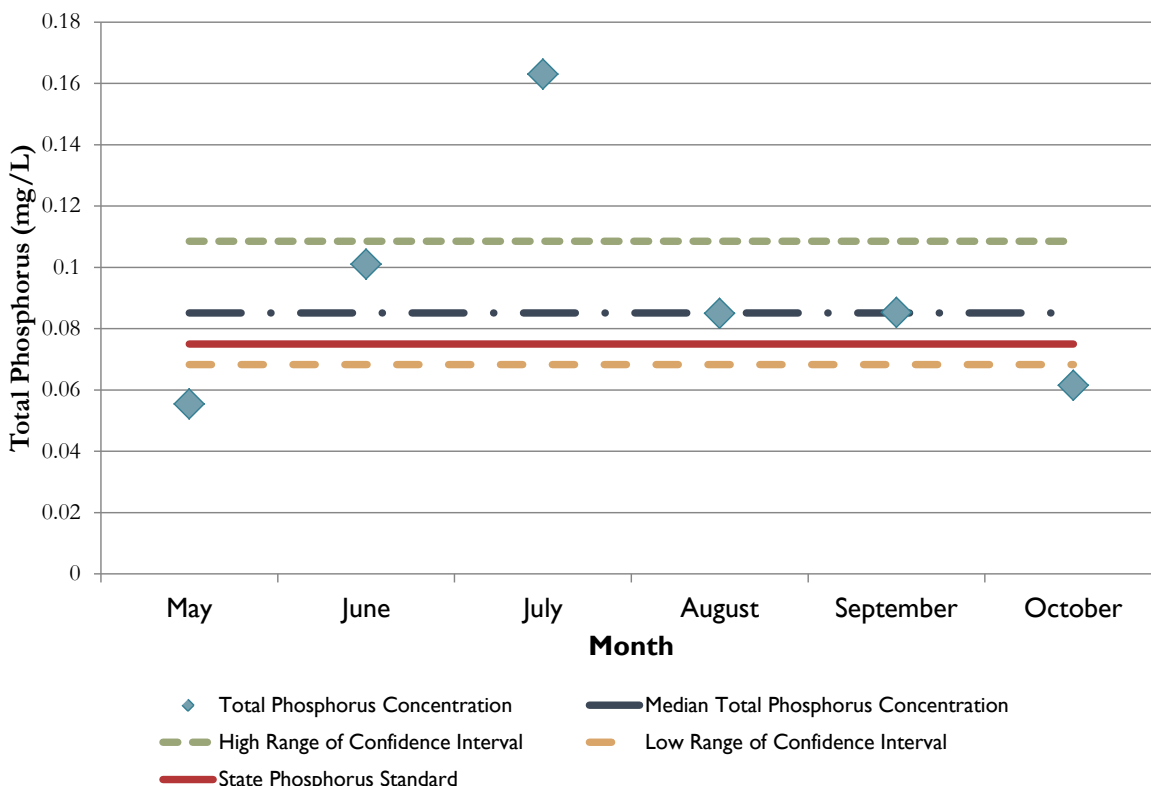
### 2015 Monitoring Results

Minimum TP Value	0.0554 mg/L
Maximum TP Value	0.163 mg/L
Median TP Value	0.085 mg/L
No. Samples > 0.075mg/L	4



Map Legend ★ - Sampling Location for 2015

### Total Phosphorus Concentration per Month



Many of Wisconsin's water quality standards require multiple visits to make an assessment decision. Every year, several stream sites are monitored and the field data collected during each visit are used to "flag" problem waters. In the next year, follow up monitoring is carried out on the "flagged" waters where the data suggest there is an impairment, but there are insufficient data to make that determination based on the State's minimum data requirements. In 2015, Water Action Volunteers stream monitors who live nearby the recommended follow up sites were asked to assist in the monitoring process by collecting water samples to be analyzed for total phosphorus at the Wisconsin State Lab of Hygiene.



# Why Phosphorus?

Phosphorus is an essential nutrient responsible for plant growth, but it is also the most visible, widespread water pollutant in Wisconsin lakes. Small increases in phosphorus levels can bring about substantial increases in aquatic plant and algae growth, which in turn can reduce the recreational use and aquatic biodiversity. When the excess plants die and are decomposed, oxygen levels in the water drop dramatically which can lead to fish kills.

Additionally, one of the most common impairments in Wisconsin's streams is excess sediments that cover stream bottoms. Since phosphorus moves attached to sediments, it is intimately connected with this source of pollution in our streams. Phosphorus originates naturally from rocks, but its major sources in streams and lakes today are usually associated with human activities: soil erosion, human and animal wastes, septic systems, and runoff from farmland or lawns. Phosphorus-containing contaminants from urban streets and parking lots such as food waste, detergents, and paper products are also potential sources of phosphorus pollution from the surrounding landscape. The impact that phosphorus can have in streams is less apparent than in lakes due to the overall movement of water, but in areas with slow velocity, where sediment can settle and deposit along the bottom substrate, algae blooms can result.

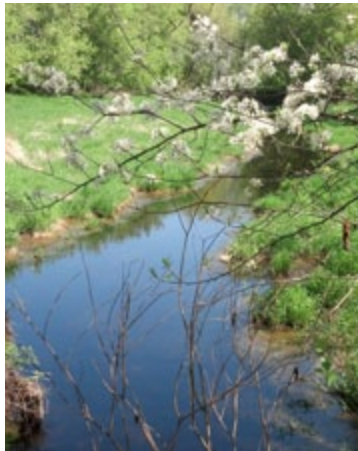


Photo credits to Matt Berg, David Seligman, Linda Warren, Adrian Konell, and Lindsey Albright (front)

## Volunteer Monitoring Protocol

To assess in stream phosphorus levels, WAV volunteers collected water samples that were analyzed for total phosphorus (TP) at the State Lab of Hygiene during the growing season (May through October). Following Wisconsin Department of Natural Resources (WDNR) methods, six phosphorus water samples were collected at each monitoring site - one per month for each of the six months during the growing season. The water samples were collected approximately 30 days apart and no samples were collected within 15 days of one another.

A stream site is considered "impaired" if: 1) the lower 90% confidence limit of the sample median exceeds the state TP criterion of 0.075 mg/L or 0.1 mg/L or 2) there is corroborating WDNR biological data to support an adverse response in the fish or macroinvertebrate communities. If there is insufficient data for either of these requirements, more data will need to be collected in subsequent years before an impairment decision can be made. A site is designated as a "watch water" if the median total phosphorus concentration falls within the confidence limit and a site is considered to have "met criteria" if the upper limit of the confidence interval does not exceed the criterion.



## PROJECT PARTNERS

