

# Northeast Lakeshore Total Maximum Daily Load

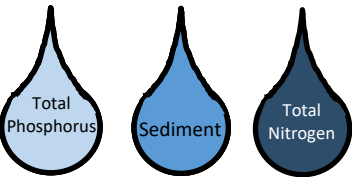
## Stream monitoring and data analysis efforts



### Water Chemistry Monitoring

#### Monitoring Parameters

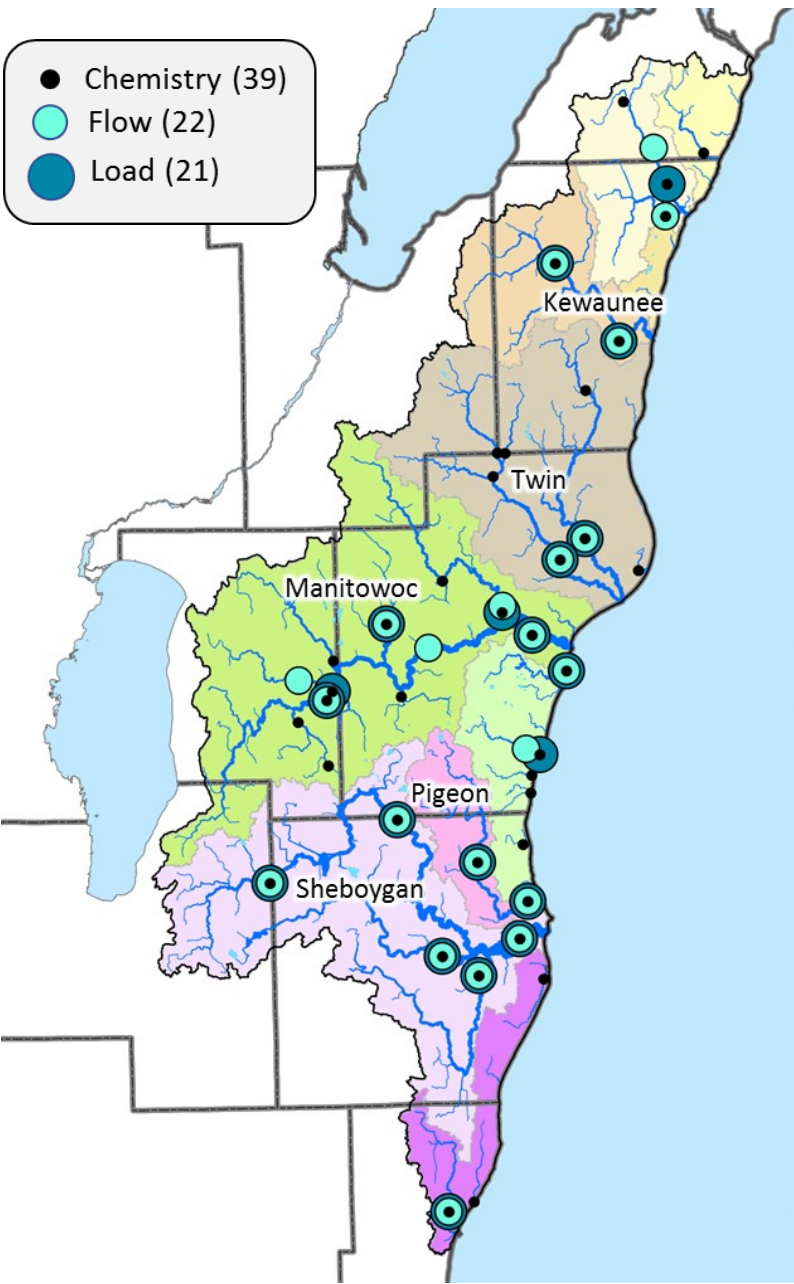
All chemistry locations were monitored for the following parameters:



A subset of locations were also monitored for dissolved phosphorus and three additional forms of nitrogen

6,359 samples collected between 2017 and 2019

#### Monitoring Locations



### Flow Monitoring

#### 1 - Stage and Flow Measurements

Stage (water level) is measured hourly with a pressure logger. WDNR installed and maintained pressure loggers at 19 sites. The elevation of the logger must be surveyed periodically to adjust for any movement (pictured right).



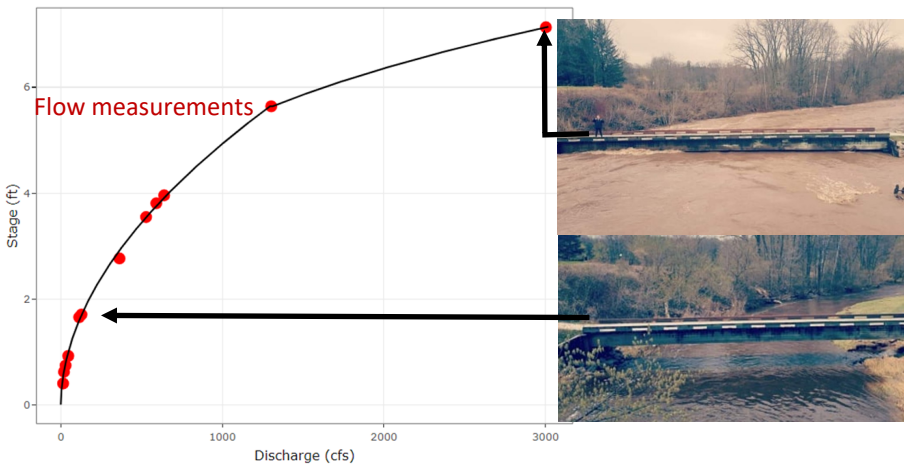
300 flow measurements, 65 used the ADCP (pictured left)

WDNR took 300 flow measurements across 19 locations. 65 of these measurements were taken with the ADCP (Acoustic Doppler Current Profiler). The ADCP allows the data collector to safely collect high flow measurements, which are critical for development of rating curves.

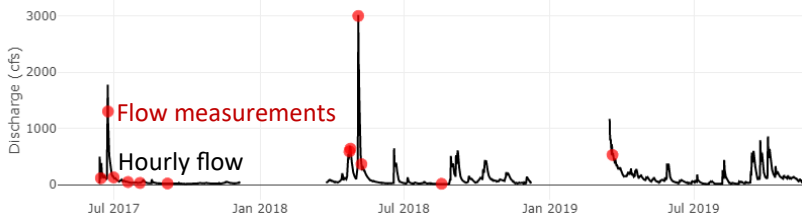
#### 2 - Rating Curves and Discharge Records

The relationship between flow and stage is unique to each site. This relationship is known as a rating curve. WDNR developed rating curves for the 19 flow monitoring sites

Rating curve for the Branch River (below). Flow measurements (in red) span a range of flow conditions. A range of flow measurements is necessary for developing a reliable rating curve



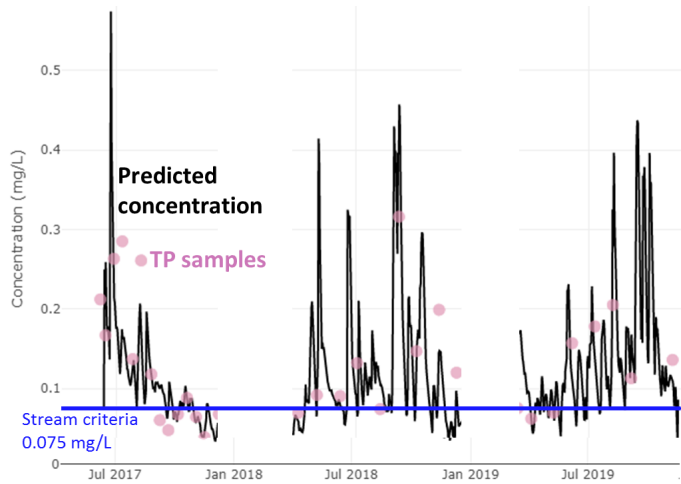
After a development of rating curves, an hourly discharge record is calculated for each site.



### Daily Concentration and Load Estimates

Using the water chemistry samples and discharge records, WDNR developed a statistical model to estimate daily concentration and daily load at 21 sites. These datasets are then used to calibrate and validate the watershed model that will provide load estimates for the sub-watersheds that were not monitored.

Daily phosphorus concentration for the Branch River, with water chemistry samples in purple



Daily cumulative phosphorus load (pounds) from the Branch River

