

# Alma and Moon Lakes 2019-2020 Study Results

## Water Quality

- There have been no trends (positive or negative) in phosphorus or chlorophyll concentrations in either lake over the time period for which data are available
- Phosphorus and chlorophyll fall into the excellent and good categories for Wisconsin's deep seepage lakes
- Water clarity (Secchi disk depth) has declined in recent years despite no measured increase in algal abundance; this is believed to be due to an increase in *dissolved organic matter* (DOM), which stains the water a tea-like color. Higher precipitation in recent years is creating more DOM and delivering more DOM to our lakes.
- Secchi disk depths still fall within the excellent category for Wisconsin's deep seepage lakes

## Watershed

- The watersheds for both of these lakes remain largely undeveloped, primarily comprised of upland forests. Maintaining this natural land cover is essential for maintaining the water quality of these lakes.
- Watershed modeling indicated that the phosphorus concentrations measured in these lakes are expected, and there are no significant sources of unaccounted phosphorus (e.g., septic systems) entering these lakes

## Aquatic Plants

- While these lakes still support a high-quality native aquatic plant community, the overall occurrence of aquatic plants has declined by over 30% when compared to 2010
- This decline in vegetation is believed to be the result of higher water levels which have increased by over 3.0 feet since 2010
- With higher water, there is decreased light availability in deeper areas of these lakes, and these areas can no longer support aquatic plant growth
- This is not concerning as this is due to natural water level fluctuations
- The northern wild rice in Moon Lake was found to have decreased markedly since 2010, likely due to higher water levels. It will likely increase in occurrence when water levels decline in the future.
- Green arrow-aryum was located in Engle Bog. There is debate as to whether or not this plant is considered native or not. It has been in Engle Bog since at least 2006, and it does not appear to be causing problems. Recommend continued monitoring of this population to see how it behaves into the future. No other non-native species were located.

## Immediate Shoreland Zone

- Majority of the shorelands around these lakes contains little to no development, which provide habitat and buffering against incoming pollutants
- Being seepage lakes with small watersheds, these lakes are more susceptible to smaller changes within the watershed
- Continued shoreland development is likely the biggest threat to these lakes, and efforts should be taken to protect natural shorelands and restore developed shorelands to protect habitat and water quality.