

# Lake Papakeeche Sustainability Initiative (LaPSI)

## Mission, Vision and Activities

### 1. What is LaPSI?

LaPSI, organized in 2012, is a group of Lake Papakeeche residents who are interested in learning more about the lake, and the watershed in which it resides, from an environmental vantage point. *We are a ecology-driven lake management group.* Administratively, LaPSI operates under the direction of the PPA Board and is accountable to the Board with respect to how it conducts its work and manages its finances. The work of LaPSI is supported through several sources: (a) a lake resident donates \$2000 annually, which is matched by the PPA Board, (b) summer grants from the Institute for Scholarship in the Liberal Arts (ISLA) at the University of Notre Dame, (c) Notre Dame undergraduate student interns, and (d) miscellaneous donations. LaPSI maintains a small laboratory in the PPA Building where some of its water testing work is conducted.

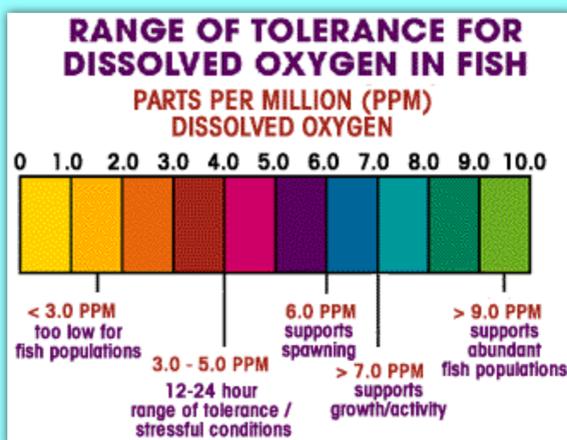
### 2. LaPSI Mission

LaPSI's mission is to promote a healthy, vibrant and sustainable ecology at Lake Papakeeche and its environs, including its greater watershed, through vigilant, up-to-date scientific study. These studies include, but are not limited to:

- (A) Scientific testing to collect, archive and communicate scientific data on lake chemical, biological, and ecological parameters;
- (B) Responsible use and application of control, conservation and preservation measures;
- (C) Consistent monitoring and assessment of aquatic and non-aquatic plants and animals;
- (D) Supporting and promoting sustainable behaviors and activities by lake residents with respect to use of the lake as a natural resource and source of natural beauty and pleasure;
- (E) Promoting the private character of the lake.

### 3. LaPSI Vision

- (A) Serve as a key information resource and advisory group to the PPA Board on the health of the Lake Papakeeche ecosystem/watershed;
- (B) Engage local, state and national individuals and groups on lake management;
- (C) Witness continuous improvement in the quality of life in, on and around Lake Papakeeche over the next decade and beyond;
- (D) Insure that Lake Papakeeche remains a desirable community for future generations of all life on the lake;
- (E) Respond to, and manage, events of nature in a scientific manner that secures and insures a viable long-term future for the lake and the diverse ecosystems it supports.

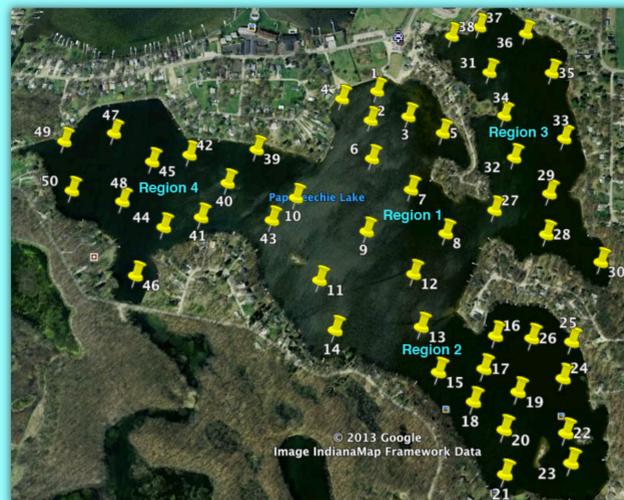


### 4. Water Testing

LaPSI is developing reliable in-house methods to evaluate water quality in Lake Papakeeche. These tests include:

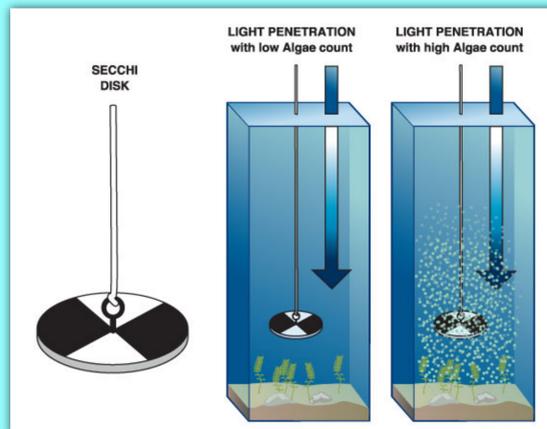
- (1) **Secchi** – used to evaluate water turbidity.
- (2) **Dissolved Oxygen and Temperature** – diagnostic of overall lake health.
- (3) **Coliform** – microbiological populations in lake water – affected by septic system release.
- (4) **Phosphate** – a nutrient that can cause excessive algal growth; partly comes from the use of lawn fertilizers.
- (5) **Nitrate** – a nutrient that can cause excessive algal growth – partly comes from agricultural sources.

These tests are conducted at specific sites on the lake as indicated on the following map. The sites are identified by their unique GPS signatures.

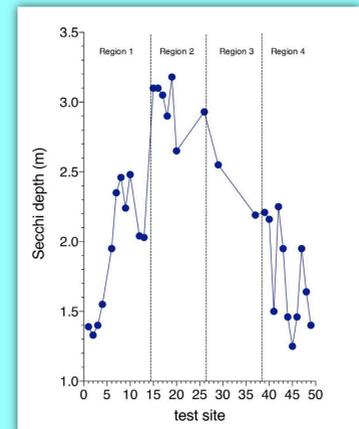


### 5. Examples of Water Test Results

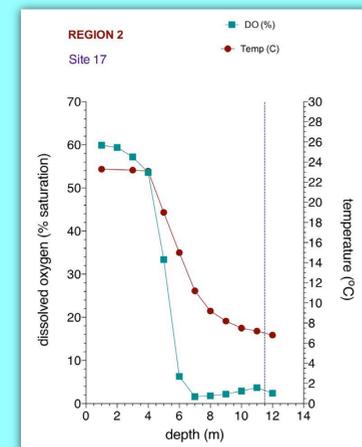
The Secchi apparatus is shown below. The disc is slowly lowered into the water until a depth is reached at which the user can no longer detect the black/white pattern. This depth is recorded as the Secchi depth.



An example of Secchi data collected on Lake Papakeeche in summer 2013 is shown below. Note that the Secchi depths vary from ~4 ft (1.3 meter) to ~11 ft (3.2 meter).

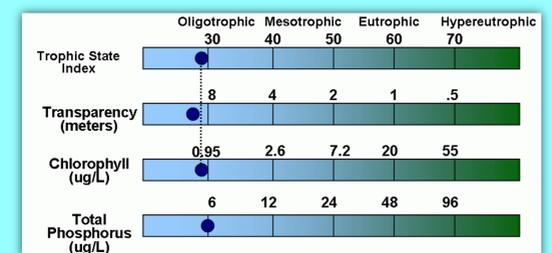


Dissolved oxygen curves show how oxygen concentrations in the lake water change with depth. An example plot taken at Site 17 in Region 2 (see map) is shown below.



### 6. Summary

Based on very limited data collected to date, the TSI (Trophic State Index) for Lake Papakeeche is ~50, indicating a mid-mesotrophic state. New data collected in summer 2014 show generally lower Secchi readings compared to summer 2013 for reasons that are unclear at present. Furthermore, preliminary data collected from several water bodies in the Tri-County Fish and Wildlife Preserve suggest higher-than-acceptable levels of nitrate in these waters, while levels in Lake Papakeeche are low. *E. coli* levels on Lake Papakeeche appear to be low; it is detected in some locations, but at levels below the thresholds considered unsafe.



A lot of work remains to be done on our lake and in the Wawasee sub-watershed to better understand our lake ecology. We are looking for citizen scientists to help with the effort – we will train you. **If you are interested in working with LaPSI, please contact Diane Tulloh at dtulloh@gmail.com or call Anthony Serianni at 574-631-7807.**