

## Dissolved Oxygen Titration on Mooningwanekaaning (name for Madeline Island in Ojibwe)

By Toben Lafrancois, Northland College

I fell in love with science and Lake Superior simultaneously at a high school outdoor science course on Madeline Island Lagoon several decades ago (Edgewood High School Field Science, out of Madison, WI). One of my favorite memories was titrating for dissolved oxygen hourly over a 24-hour period to compare the lagoon and the lake—complete with northern lights to help keep me awake. It was an honor to come full circle with the Bayfield Middle School Alternative Education class taught by Jeff Theune.



The outing where this photo (*top right*) was taken was sponsored by the Rivers2Lake Program when I was their teacher mentor in 2017. I also brought along my Wisconsin Sea Grant supported underwater photography team, the Zaaga'igan Ma'iinganag (Lakewolves in Ojibwe) to teach underwater photography and explore connections between nature, resources and culture. We were collecting water samples to titrate for dissolved oxygen levels when I snagged this unique snapshot of a student working at the interface of the tannic lagoon and Lake Superior.

Rivers2Lake uses the Lake Superior watershed and the St. Louis River, its largest U.S. tributary, as a foundation for educator and student learning. The program provides extended training, mentoring and resources to teachers to help them create interdisciplinary hands-on outdoor experiences for students. The Rivers2Lake Program is funded by a grant from the National Oceanic and Atmospheric Administration, sponsored by the Lake Superior National Estuarine Research Reserve. The program is a collaboration between many partners and schools. Check it out: <http://rivers2lake.org/>

### Quarry Bay Mussels, by Toben Lafrancois

This photo (*at right*) was taken at a depth of 6 meters in Quarry Bay of Stockton Island in the Apostle Islands National Lakeshore on 2 August 2017. A native unionid mussel (*Pyganodon grandis*) is serving as the substrate for a pupating caddisfly larvae (unidentified, background) and an invasive zebra mussel (*Dreissena polymorpha*, foreground) during a National Park Service funded mussel survey of the Apostle Islands National Lakeshore.



Zebra mussels are currently found in low densities while native unionids are relatively common in these precious nearshore waters of Northern Wisconsin. In the past, many assumed that Lake Superior was too mineral poor and / or too cold to support zebra or quagga mussels. This research effort was a collaboration of the National Park Service Dive Team, Toben Lafrancois of Northland College, and Mark Hove and Michael McCartney of the Minnesota Aquatic Invasive Species Research Center. Photography on this project was made possible by Zaaga'igan Ma'iinganag, a Wisconsin Sea Grant supported underwater photography program.