

# RESTORATIVE LAKE SCIENCES NEWS

Winter Newsletter

November 2013

## 2013: A Re-cap

The 2013 field season was very busy with field scientists surveying nearly 60 lakes throughout Michigan in nearly every county. RLS was also contacted by the Bear Gulch Reservoir in California, Lake Desair in Wisconsin, and Frenchman's Bay in Ontario for scientific guidance and study. The lake mapping software proved to be an effective tool for monitoring the efficacy of lake weed treatments and will be upgraded and used again on all lakes in 2014. Scientists from RLS published scientific articles in the Michigan Riparian and presented lake research at state and national conferences. RLS now has a full-size water quality laboratory complete with high-contrast microscopes and chlorophyll analysis equipment for measuring algal communities in our lakes. RLS continues to work closely with the MDEQ on aeration and bio augmentation research and has partnered with MSU to study the mechanisms behind the technology that may lead to a patent for sediment reduction. Read on for more useful lake info and updates!

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*“2013 was a record year for RLS with the addition of more scientists and the pursuance of novel research with MSU on aeration and microbial bio augmentation”*

*- Jennifer Jermalowicz-Jones  
Owner, Water Resources Director*

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## Quick Lake Question:

Q: What is the foam on my lake when winds are high?

A: The foam is not likely from detergents or pollutants but rather dissolved organic matter or (DOM) that results from organic materials in the water column that when agitated by winds and current create a frothy foam on the surface. It is more commonly observed in the fall than in summer.



Photo of Dickerson Lake in Montcalm County, Michigan

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- Aeration Research Update
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- Zebra Mussel Cure



South Basin of Austin Lake, Kalamazoo County, MI

## Maple Lake Aeration: Reducing Algal Blooms & Improving Water Quality

Maple Lake suffers from massive loads of nutrients and sediments since the Paw Paw River runs through the lake and delivers these loads at varying rates dependent upon rainfall and runoff. The objective of the aeration program in the lake was to reduce the need for chemical algaecides by reducing algal blooms and also improving water quality.

The technology has attained these goals and expansion of the system is recommended.

## Austin Lake Success Story

The sediment deposits in the South Basin of Austin Lake are between 2-50 feet thick and were found to be very high in organic content and in ammonia and nitrogen. The objective of the aeration system placed into the South Basin in 2012 was to reduce the sediment (muck) deposits and reduce ammonia nitrogen. Data collected by RLS scientists in 2013 indicate that much muck reduction has occurred (data to be presented to the Austin Lake Governmental Lake Board next year), and nuisance aquatic vegetation has also been reduced.

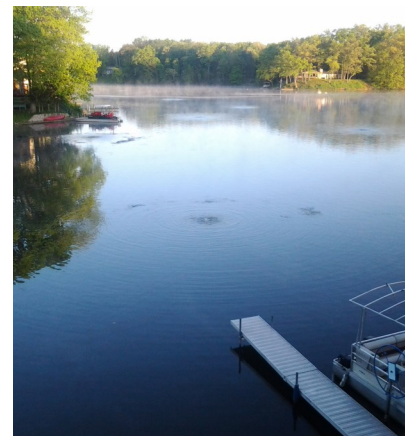
The residents on the South Basin desired a technology that would demonstrate effective results and be ecologically friendly. To date, the Lake Board has held numerous tours to groups of lake enthusiasts who want to learn more about aeration and bio augmentation. Bio augmentation includes the use of beneficial bacteria (microbes) that work with the aeration to reduce muck.

Stay tuned for more updates on this ground-breaking research!

## Fast Facts on Aeration:

Aeration is not meant to reduce mineral or sand deposits as it requires highly organic sediments for muck reduction. In many cases it also requires the use of microbes to “augment” or boost natural sediment bacteria to break down muck in the presence of aeration-supplied oxygen.

RLS is the only firm to have worked on 12 aeration projects in Michigan and also be actively involved in research on the mechanism, establishing the company as the leading expert in aeration/bio augmentation management.



Aeration “rings” on Maple Lake, Van Buren County, MI



## Fascinating Freshwater Phenomena:

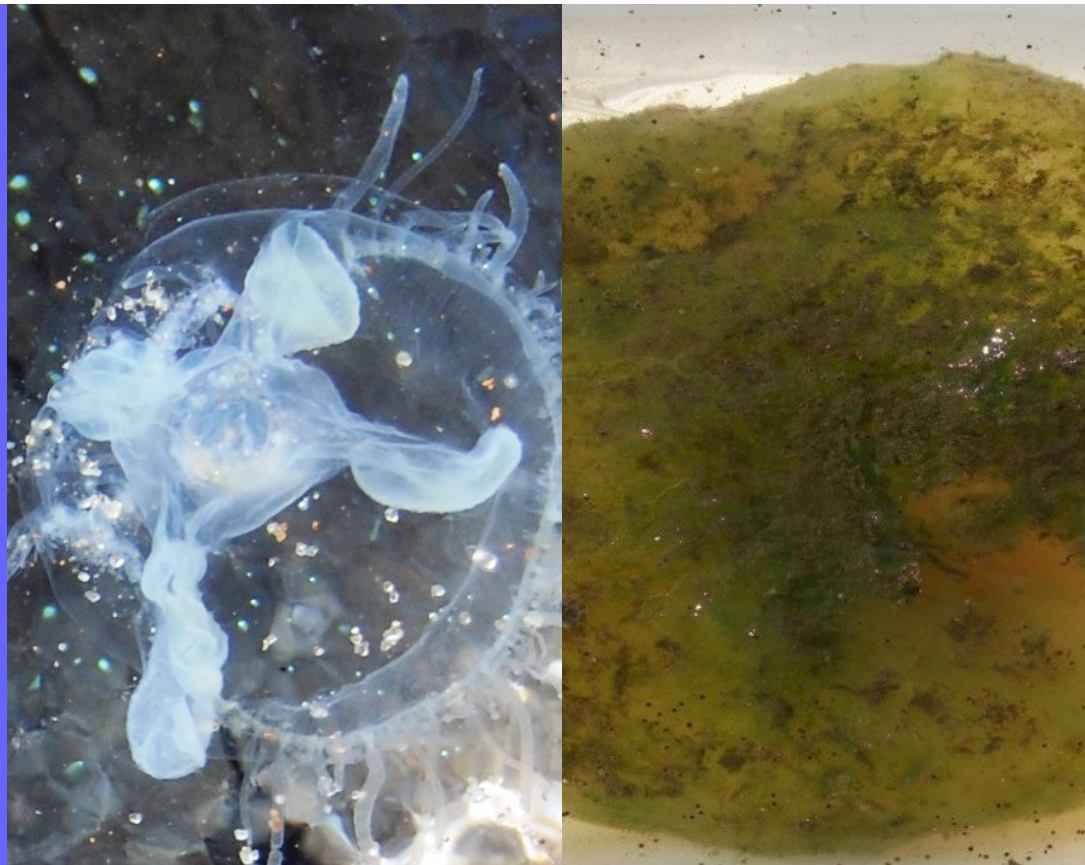
## Freshwater Jellyfish & Bryozoans

Hundreds of lakes in Michigan and across the US have both of these natural and harmless aquatic critters which are both in the animal kingdom.

Freshwater Jellyfish and Bryozoans are usually indicators of good water quality as they require waters high in dissolved oxygen and low in pollutants.

Read the entire article on these phenomena in the winter issue of the Michigan Riparian, a publication of the Michigan Lake and Stream Associations.

A copy of the article will be available on the RLS website this winter.



A Freshwater Jellyfish (Left) and Bryozoans (Right). Photo of Jellyfish from Doug Pearson

## Freshwater Jellyfish & Bryozoans

Many lakes with good water quality in Michigan and the US have one or both of these organisms which are both actually “animals”. The Bryozoans are like freshwater corals and appear as green “blobs” of many different sizes. Some colonies grow to be 4-foot blobs such as the colony found floating in Newport News, VA. Colonies of *Pectinatella magnifica* (the scientific name) feature a surface layer of adjoining “rosettes” each with 12-18 animals or “zooids” around a central jelly-like mass that is 99% water. The colonies can be free floating or attached to a piling or other submerged object. . The large sample shown above was collected from Magician Lake in Van Buren County.

Freshwater Jellyfish are harmless and quite beautiful to look at and also differ greatly in size. The sample shown above was collected in Dewey Lake in Cass County. In Michigan, there are records of the jellyfish dating back to the 1800’s, according to MDNR Fisheries Division Manager Jay Wesley (Ameling 2012). The jellyfish prefer standing water rather than currents. So, they generally are not seen in fast-flowing streams or rivers. These jellyfish eat tiny, microscopic animals called zooplankton that are found throughout the water.

# RLS Conducting Zebra Mussel Treatment Product Evaluation in 2014

The scientists at RLS will be working with Marrone Bio Innovations based in California, pending EPA approval for use in open waters and MDEQ approval for evaluation use in Michigan. The product called Zequanox® is a natural biocide that effectively kills all stages of zebra and quagga mussels in open waters (and in pipes). The biocide is the naturally occurring strain of bacteria called *Pseudomonas fluorescens* which is found in waters and soils around the globe.

The product has not been shown to have detrimental impacts to native lake biota (such as clams). RLS will be monitoring the biocide impacts by measuring the natural state of all native benthic (bottom-dwelling) biota both prior to and after treatment and measuring the density of zebra and quagga mussels prior to and after treatment as well.

## Contact Us:

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