

## THE MUSCLE BEHIND ZEBRA MUSSELS

Natives to the Great Lakes region know all too well about the problems associated with *Dreissena polymorpha*, commonly known as the zebra mussel. Zebra mussels are small, freshwater mussels that consume particles in the water through filtration. This species is native to the Caspian and Black Seas, but now can be found in concentrations all over the world. The problem that these mussels present is not in their own ecosystem, but in other areas of the world. These mussels have no natural predators in other areas of the world and quickly reproduce. According to the New Hampshire Department of Environmental Services, one female zebra mussel can produce up to one million new mussels a year.<sup>1</sup> They can attached to literally any surface, creating a huge problem for water treatment pipes, docks, boats, and buoys. With no natural predators to even out the abundant population of mussels, they begin to have a negative effect on native ecosystems. First, the mussels filter out many of the particles that the native fish species feed on. This causes the population of native species to drop drastically, having an adverse effect on the rest of the ecosystem. Zebra mussels also cause other native clams and mussels to become extinct through competition for food. One of the largest concerns considering zebra mussels pertains to their filtration of particles, allowing light to penetrate deeper into the body of water, and excreting other nutrients into it. This initially causes the temperature of the water to rise, increasing the rate of photosynthesis and subsequently feeds an algae bloom. These blooms ignite ecological devastation of an area by producing large amounts of harmful bacteria that kill the healthy bacterium, and other native species, causing the ecosystem to slowly fail and eventually parish.

The issues associated with zebra mussels are especially significant when it comes to the state of Michigan. This state, being almost surrounded by the great lakes, depends heavily on the ecosystem for its fishing, tourist, and boating industries. Since the introduction of zebra mussels, ecosystems surrounding Michigan have changed significantly. This change is mostly due to the numerous amounts of nutrients that these mussels excrete. Those nutrients allow for algae blooms that are capable of producing harmful bacteria. This bacteria resulting from the temperature change, along with competition for food, has decimated many of the native species such as clams, other mussels, salmon, and many birds. The establishment of these species around Michigan's great lakes has also allowed for these mussels to move elsewhere. Zebra mussels have now moved inland and have started changing other ecosystems on a smaller scale. This issue is especially important to Michigan because the problems caused by the overpopulation of zebra mussels is only going to get worse.

Out of all the bodies of water that Michigan has, the most affected by the invasion of zebra mussels is Lake Huron. Lake Huron is a significant place to study because it dumps into the Mississippi River system and eventually the Atlantic Ocean. It would be interesting to see if the spread of zebra mussels in other bodies of water came through Lake Huron. One place that

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<sup>1</sup> New Hampshire Department of Environmental Services, "Zebra Mussels," *Environmental Fact Sheet*, accessed February 16, 2014. <http://des.nh.gov/organization/commissioner/pip/factsheets/bb/documents/bb-17.pdf>.

has significantly been impacted by this issue is the Saginaw Bay area. According to the 2009 report by the Saginaw Bay Coastal Initiative, the water in the Saginaw Bay area has the highest concentrations of phosphorus in Lake Huron.<sup>2</sup> These high concentrations of phosphorus come from the infestation of zebra mussels. Phosphorus is one of the major components of algae blooms. It would be beneficial to explore what specific effects zebra mussels have had on the ecosystem of the Saginaw Bay Area.

### Bibliography

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<sup>2</sup> State of Michigan, "Phosphorus Committee Report," *Saginaw Bay Coastal Initiative*, accessed February 17, 2014, [michigan.gov/documents/ag/NAAG\\_San\\_Antonio\\_ab\\_edits\\_11-28-11\\_369943\\_7.pdf](http://michigan.gov/documents/ag/NAAG_San_Antonio_ab_edits_11-28-11_369943_7.pdf), 5.