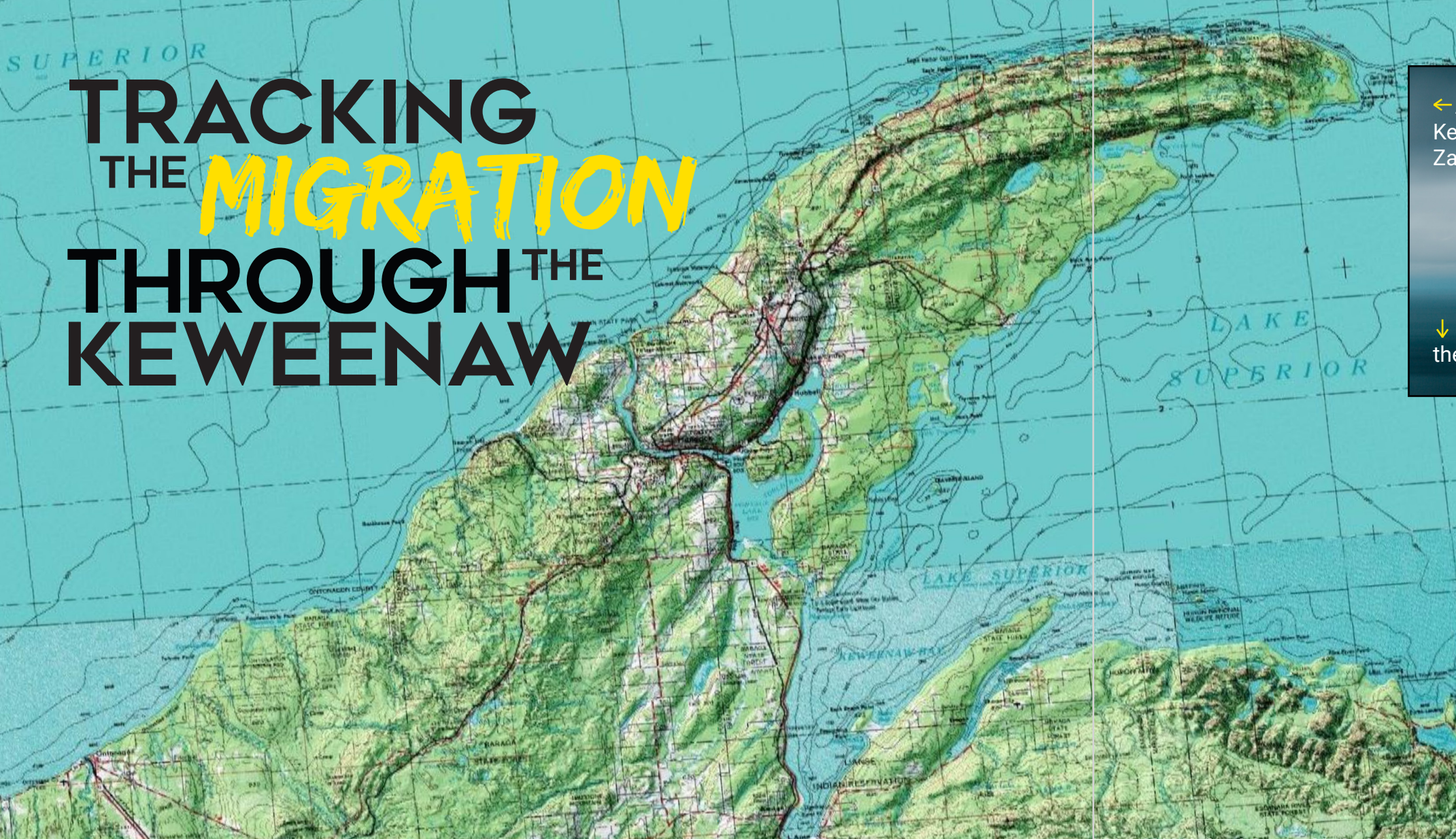


# TRACKING THE MIGRATION THROUGH THE KEWEENAW



← A topographical map of the Keweenaw Peninsula created by Zach Schuch.

↓ One of Zach's maps illustrating the migration of stamp sand.

main whitefish and lake trout spawning areas.

Zach is trying to help prevent this from happening by mapping the migration of the sands now and predicting where it will migrate to in the future. Zach uses remote sensing software technology to locate where the stamp sands are on the earth. Stamp sands have a fairly unique spectral response. There are satellites that orbit the earth and they reflect back a certain value on the electromagnetic spectrum. Since there are different values reflected back by different land features, Zach can easily use the unique

spectral response from the stamp sands and see where they are at. Once the stamp sands are located, Zach uses GIS software to digitize all of those located spots. Then he creates maps of where the stamp sand locations are and puts a legend on them and a scale on them so they look like a good cartographic project. With this GIS technology scientists and students like Zach Schuch can find and predict where the stamp sands will migrate to.

They think know the migration is due to the currents within the lake pushing the stamp sand buildup down the shoreline. Zach assumes that eventually the stamp sand will migrate to the eastern shoreline of the L'Anse region.

There have been several courses of action to try and stop the migration of the sands, but none seem to figure out how to stop them completely. One of the ways they have tried stopping the sands is by planting trees and vegetation into the stamp sand, but because of harmful heavy metals and low density of the sands, the trees and vegetation will not hold. Since the '30s the advances in mining technology allow companies to reprocess the stamp sand to reclaim its small mineral content. Also, because stamp sand is so coarse another way the state repurposes it is by using the stamp sand in road salt. One of the main ways most of the stamp sand migration from the Gay, Michigan area is being stopped is by the Traverse River break wall. Unfortunately, the break wall will only hold for so long.

That is where researchers and students like Zach Schuch come in. They are at the forefront on stopping this migration. Zach is one of many protecting the pristine shoreline and habitat of the Keweenaw Peninsula. 🗺️

**GIS technology** has come a long way from its birth in the '90s. There are many ways the technology is used to analyze the earth's features from social analysis to demographic analysis to physical analysis and many more. Physical analysis is being heavily utilized by researchers to analyze the Gay, Michigan coastline.

In his senior year at Northern Michigan University, Zach Schuch is using the GIS technology to map out the stamp sand migration throughout the Keweenaw Peninsula. Specifically, focusing his study on the Gay Region. Stamp sand is a coarse sand rock material that is a product of ore in stamp mills. In this case, it is from copper stamp mill in Gay, Michigan.

In 1898, Mohawk Stamp Mill was constructed in the small company owned town Gay, Michigan and closed in 1932. How the Mohawk Mill extracted copper was by crushing ore-bearing rock to separate the copper from the waste fragments. In this process, the mill used an excessive amount of water to separate the metal and ore from the waste rock. Lake Superior was its source of water due to how close the mill was located to the lake. After the waste rock is separated, the mill dumped the stamp sand back into Lake Superior and the Keweenaw waterways. During that mining time, there was approximately 500 billion kilograms of waste materials associated to ore

mining dumped into the waterways and the lake.

Due to all of the stamp sand in Lake Superior and the Keweenaw waterways the beaches and habitats within and around the area are heavily affected and contaminated. The stamp sand is very hazardous to all wildlife and human health, because of the traces of heavy metals found within the rock. Due to the migration of the stamp sand pristine Lake Superior shoreline will be slowly be affected in the near future. Zach states, "if the (stamp) sands keep working down the shoreline and down into the bay, they will cover at least 60% of the Buffalo reef in 10 years." The Buffalo Reef is significant in being one of the

## Gay, Michigan Stamp Sand Location

