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General Plan:

We would like to compare several variables. The main 3 are the abundance of the Round Goby, the water temperature, and the abundance of native fish species (sculpin, and logperch but we'd love to look at more if we have time) that occupy a similar niche. We want to find out if the temperature is affecting the abundance of these 3 species and if the presence of the round goby is having an effect on the native species. We hope this will help understand the threats faced by native species and whether they are more threatened by the round goby or by the temperature, or both. The study area was Lake Ontario so that's what we plan to focus on.

Null Hypotheses:

Temperature does not have a different effect on the abundance of native species (sculpin, logperch, etc.) compared to the round goby because the round goby is not less sensitive to temperature changes.

The abundance of the round goby has no effect on the abundance of native species because it does not outcompete native species.

Alternative Hypotheses:

Temperature has a different effect on the abundance of native species (lake trout, smallmouth bass, etc.) compared to the round goby because the round goby is not less sensitive to temperature changes.

The abundance of the round goby has an effect on the abundance of native species because it outcompetes native species.

Predictions:

If the temperature increases then the round goby will be positively affected, and the native species will be negatively affected.

If the round goby abundance increases then the native species abundance will decrease.

Description of datasets:

(TrawlCatch_SpringPreyfishBottomTrawl.csv) Lake Ontario April Prey Fish Bottom Trawl Survey, 1997-2022

TrawlCatch_SpringPreyFishBottomTrawl contains the specimens collected from 1997-2022 from Lake Ontario using trawl fishing. Round Goby is a benthic fish so we expect trawling to provide an accurate representation of their abundance. **Columns of importance include water temperature, species name, latitude, longitude, lifestage, n(number of species collected), and weight.** Using this dataset, relative population densities of various species can be determined. We will use this to assess the abundance of the round goby in different locations as well as the native species and we will see how they change with temperature. If we have extra time we may consider the size of the fishes measured, and their lifestage.

Link: <https://www.sciencebase.gov/catalog/item/62f4fd46d34eacf53973a841>

Citations:

Weidel, B.C., Holden, J.P., Goretzke, J., Connerton, M., and Gutowsky, L., 2022, Lake Ontario April Prey Fish Bottom Trawl Survey, 1978-2022: U.S. Geological Survey data release, <https://doi.org/10.5066/P97DZ1AS>.