

## **YOUTH CORNER**

### **Comparing Nutrient Pollution, Nitrogen and Phosphorus, in Yucatan Peninsula Sinkholes from 2018-2021**

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Sinkholes serve as the major supply of potable water and are important tourist destinations in the Yucatan Peninsula. Tourism and recreational activities surrounding sinkholes, in conjunction with improper wastewater treatment, can lead to nutrient pollution from nitrogen (N) and phosphorus (P). Nutrient pollution in the water consumed from these sinkholes can lead to detrimental effects on the population. Further, changes in levels of tourism due to COVID-19 provide opportunities to analyze and compare pollution during the 2018-2021 time period which witnessed a drop and subsequent resurgence of tourism. We analyze three sinkholes: one that is primarily used by tourists from Cancun, another by the local population, and one that is not used recreationally to identify the following sinkhole characteristics: nutrient input, depth profiles of N & P concentration, and speciation (nitrate, nitrite, ammonium, phosphate).

Then, we quantify and compare these characteristics with calculated equilibrium values obtained from chemical and physical parameters (pH, total dissolved solids, oxidation-reduction potential, temperature, dissolved oxygen, and major anion/cation concentrations). We built a thermodynamic model to determine when nutrient input is polluting the sinkhole. Equilibrium values of nutrient pollution concentration in sinkholes can help detect potential sources of contamination, which could help local authorities and tourists in pollution risk control.

