**The Quest for a Novel Paleosalinity Indicator: Did Tsunami Events Generated by an Extraterrestrial Bolide Cause a Change in Salinity in the Hudson River Circa 2300 BP?**

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**ABSTRACT**

The project aims to determine if tsunami events triggered by an extraterrestrial impact caused a change in salinity levels in the Hudson River circa 2300 BP. In the process of ascertaining such changes, scolecodonts (jawbones of polychaete annelids) exhibiting various amounts of iodine have been found to positively correlate with Hudson River salinity levels, making these microfossils useful proxies for future paleosalinity studies. Salinity is vital to estuarine ecosystems and can be intrinsically connected to climate, since increased precipitation leads to decreased salinity levels. Furthermore, air-water interactions can be influenced by salinity, since regions high in salinity will have low dissolved oxygen concentrations due to a decrease in vertical mixing. If one were to learn that tsunamis influence salinity levels, then scolecodonts could serve as a useful salinity indicator in the future to study this phenomenon.

**INTRODUCTION**

Evidence has been found for a megatsunami event that occurred circa 2300 BP in the New York-New Jersey region and may have reached elevations of approximately 60 meters above sea level near the coast. If such a catastrophe were to take place today, it would affect millions of lives in the NY-NJ area.

**METHODS**

**RESULTS**

Iodine concentrations have been found to be higher in marine samples with 16.1% of the scolecodont consisting of iodine from All-124-GC1, as compared to 13.2% of the scolecodont consisting of iodine in the estuarine sample of CD01-02 and to 2% in the modern-day upriver sample (RS05-05).

**CONCLUSION**

Increased erosion and run-off from the surrounding regions can cause increased salinity, whereas more rainfall decreases the salinity levels. Salinity is vitally important for the well-being of an estuarine ecosystem. It has been proven that salinity is inversely correlated with dissolved oxygen levels, so that regions high in salinity will have low dissolved oxygen concentrations due to a decrease in vertical mixing (Stewart 2005). Such a characteristic can influence the type of species that can survive in specific regions, as well as indicate where the freshwater combines with the saltwater in the estuary. This project has shown that scolecodonts offer another record of paleosalinity. Coupling this work with future research on tsunami influences could lead to a better understanding of the implications of natural hazards on ecosystem health. By finding a sharp contrast between the marine and estuarine cores, this study has revealed another possible paleosalinity indicator with scolecodonts for future water quality testing that could prove invaluable to scientists in the coming years.

**REFERENCES**


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