

Tracking tropical cyclonic activity using trace metals in coral skeletons

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Abstract

Tropical cyclones are one of the main sources of damage in tropical regions. Narrowing uncertainties in tropical climate prediction is an economical and social need that could partially be addressed by the development of robust paleoclimatic records of past cyclones. The specific objective of this project is to obtain high-resolution trace element measurements in order to investigate whether the trace element chemistry of *Porites* coral skeleton from Fiji record the passage of tropical cyclones. I plan to resample three coral cores from Fiji at very high resolution (one sample every 50 μm) using Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA ICP-MS) for rapid high-resolution analysis of Mg, Sr, U, and P in the coral skeleton. I will evaluate the sensitivity at which tropical cyclone induced sea surface temperature cooling (cold wake) and tropical cyclone induced-upwelling activity is observed in the coral skeletal Sr/Ca, U/Ca, Mg/Ca, and P/Ca. If tropical cyclone passages can be determined by looking at trace metal variability in coral skeletons, this method could be applied to coral cores all over the Pacific and Atlantic regions to provide information on the frequency of past hurricanes for those specific regions.