

Coral Skeleton $\delta^{15}\text{N}$ as a Tracer of Historic Nutrient Loading to a Coral Reef in Maui, Hawaii

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Excess nutrient loading to nearshore environments has been linked to declining water quality and ecosystem health. Macro-algal blooms, eutrophication, and reduction in coral cover have been observed in West Maui, Hawaii, and linked to nutrient inputs from coastal submarine groundwater seeps. Here, we present a forty-year record of nitrogen isotopes ($\delta^{15}\text{N}$) of intra-crystalline coral skeletal organic matter in three coral cores collected at this site and evaluate the record in terms of changes in nitrogen sources. Our results show a dramatic increase in coral $\delta^{15}\text{N}$ values after 1995, corresponding with the implementation of biological nutrient removal at the nearby Lahaina Wastewater Reclamation Facility (LWRF). High $\delta^{15}\text{N}$ values are known to be strongly indicative of denitrification and sewage effluent, corroborating a previously suggested link between local wastewater injection and degradation of the reef environment. This record demonstrates the power of coral skeletal $\delta^{15}\text{N}$ as a tool for evaluating nutrient dynamics within coral reef environments.

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