

Can massive scleractinian corals be used to reconstruct short-term environmental disturbances?

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Massive scleractinian corals provide high-resolution, continuous archives of ocean chemistry. Their wide distribution around the (sub)tropic zones makes corals a powerful resource for researchers. Most studies have focused on reconstructing physicochemical processes with temporal resolutions limited to annual seasonality. Shorter-term environmental variations or disturbances, however, are more challenging to identify due to the difficulty in constraining timescales (daily-weekly resolutions). Intra-annual variations in extension rates make spatially pinpointing events difficult, whilst vital effects and signal averaging during geochemical analyses mask and distort the original signal. To better constrain timescales, we conduct targeted LA-ICP-MS trace element analyses of skeletal features (columella, theca, septa and dissepiments) on coral core samples subjected to volcanic ashfall to determine which feature provides the highest temporal resolution. Massive colonies of *Siderastrea siderea* were cored from the northwest fringing reefs of Barbados, Lesser Antilles, 15 months following the April 2021 eruption of La Soufrière, St. Vincent. Ash is reported to have resided in the coastal environment for several weeks. Our results will provide important information concerning which skeletal feature to analyse to better identify and reconstruct short-term environmental disturbances in the massive Caribbean coral *Siderastrea siderea*.