

Investigating the role of salinity in the mercury concentration in coral aragonite

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Abstract:

We propose a pilot project to investigate whether the mercury [Hg] concentration in *Porites* corals is sensitive to surface ocean salinity changes. Equilibrium geochemical calculations indicate that Hg ions have strong affinities with Cl⁻ ions and that the concentration of free (non-complexed) mercury ions [Hg⁺⁺] in seawater depends on Cl⁻ ion concentration or salinity. Preliminary annual average [Hg⁺⁺] data from corals in Fiji over the period 2004-1977 measured on a 15 year old Teledyne Leeman Labs' Hydra AA mercury analyzer indicate that mercury levels in *Porites* coral skeleton are near detection limits for this instrument, but reveal an increasing [Hg] trend that is consistent with the predicted trend with respect to salinity (lower Hg concentration as salinity increases). Here we are proposing to measure Hg in corals from Fiji, Tonga and Indonesia on a new Thermo-Fisher iCap-Q ICP-MS now at LDEO. This instrument is capable of measuring Hg (and other bivalent metals) in the 0.1ppt range or better. We already have corals from the three sites and each site has large annual and/or interannual variability in salinity as well as verified salinity time-series data for calibration. This project would be undertaken by Ms. Logan Brenner, a new LDEO graduate student.