PP33D-1547 Characterizing the spatial distribution and chemistry of geologic carbon input to the Eastern Tropical North Pacific before and after the last ice age

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Abstract
The observation of extremely low radiocarbon content / old radiocarbon ages (>4000 years old) in the intermediate-depth ocean during the last ice age draws attention to our incomplete understanding of ocean carbon cycling. For example, glacial-interglacial seawater ^{14}C anomalies near the Gulf of California have been explained by both the advection from a ^{14}C-depleted abyssal source and local geologic carbon flux.
To provide insight to this the origin of the seawater ^{14}C anomalies, we have produced several new records of glacial-interglacial intermediate water (i.e., ^{14}C, $\delta^{11}B$, $\delta^{18}O$, and $\delta^{13}C$) in waters that are "upstream" and "downstream" of the Gulf of California. These observations plus geochemical modeling allow us to: (1) Answer whether the old seawater ^{14}C ages are advected or produced locally; (2) Identify the approximate chemical make-up of this carbon; and (3) Consider the role of known sedimentary processes in this carbon flux to the ocean. (Note that several sites have age model controls based on terrestrial plant ^{14}C ages, providing more confidence in our results.)
Our new measurements and modeling indicate that the well-established >4000-year-old seawater 14C anomalies observed near known seafloor volcanism in the Gulf of California are not present "upstream," indicating that this carbon flux results from a "local" geologic carbon. Furthermore, based on our new benthic foraminifera $\delta^{11}B$ measurements, this local carbon flux does not appear to affect seawater pH. Finally, we suggest several potential geologic carbon source(s) that could explain the anomalously old seawater ^{14}Cages, the relatively unremarkable changes in seawater $\delta^{13}C$, and the essentially negligible change in seawater pH.

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