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Evaluating the oceanic release of “old carbon” from the Eastern Tropical Pacific during the Last Deglaciation

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We present reconstructions of radiocarbon activity (Delta 14C) of surface (planktonic foraminifera) and intermediate (benthic foraminifera) waters in the Eastern Tropical North Pacific (ETNP) over the past 40,000 years. A previous study, Marchitto et al. (2007) revealed the presence of ’old carbon’ at intermediate depths off NW Mexico, which they suggest is related to ocean CO2 degassing during the last deglaciation around the Younger Dryas (10.8 - 13 ka BP) and the Heinrich 1 (15.5 - 16.8 ka BP) events. In our study, using the new record from Core MD02-2519, we specifically address the issue of match the timing of the presence of "old carbon" at intermediate depths in relation to the two spates of accelerated CO2 release recorded in ice cores during the last deglacial period. We show that these radiocarbon signatures were also recorded in the 14C signatures of sea-surface dwelling planktonic foraminifera and organic matter. This may strongly suggest that the upwelling of the eastern Pacific may have been an important locus of CO2 release from the ocean during the last deglaciation. Additionally, we also evaluate whether such events are recorded in older millennial events in the core, which are not associated with significant oceanic degassing of CO2 (e.g. H2 and H3 events) by making similar paired 14C dates across these intervals.