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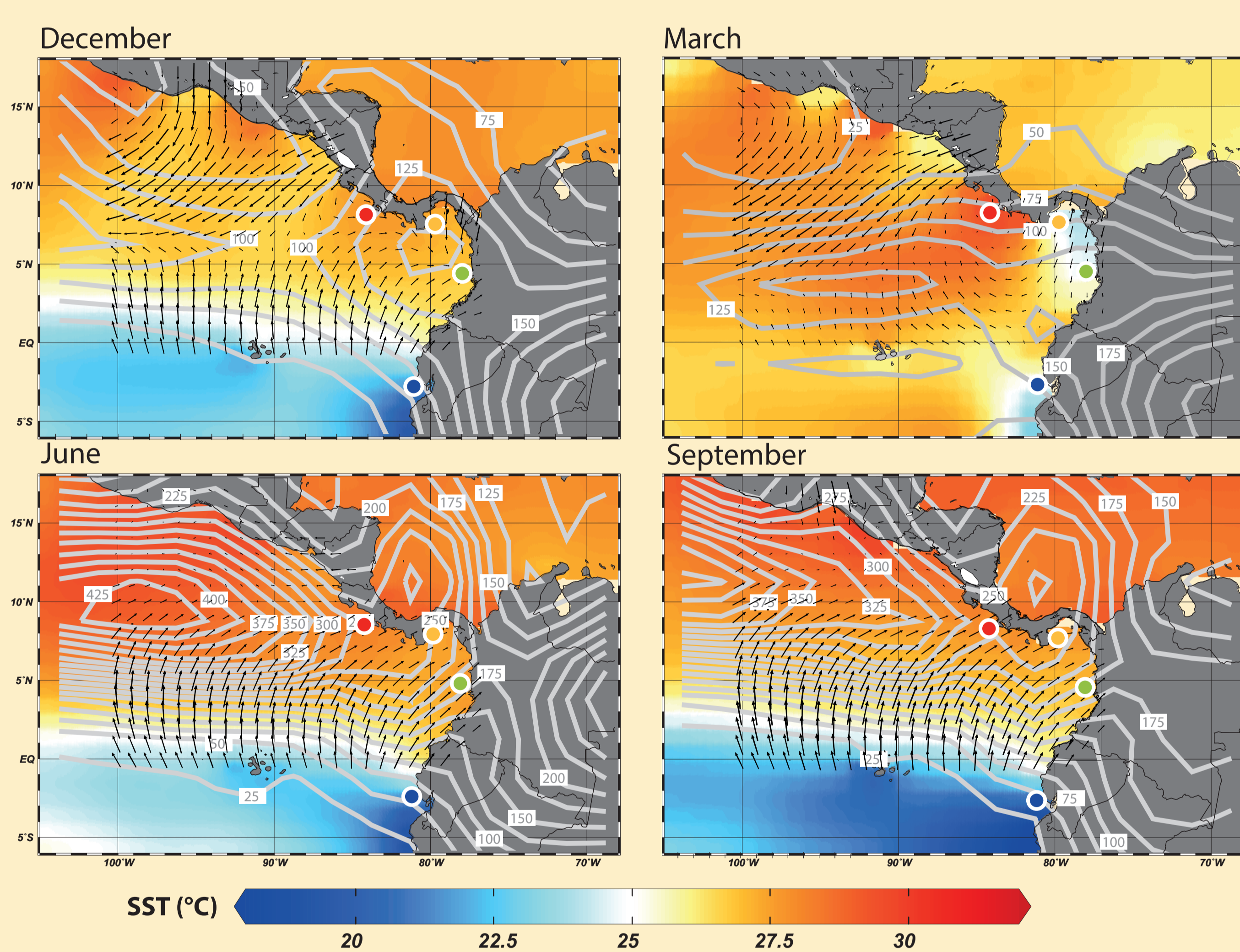
Holocene hydrological changes in the Eastern Equatorial Pacific

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Abstract - The Eastern Equatorial Pacific region is marked by extreme latitudinal gradients in sea surface temperature and precipitation regimes, varying from the hyperhumid warm pool region North of Panama Basin to the hyperarid coast of southern Ecuador and northern Peru. In between those two regions lies a fresh pool, with the lowest mean and strongest seasonal cycle of sea surface salinity. The fresh pool building and erosion at the seasonal and interannual timescales are associated with changes in atmospheric circulation that cannot be easily tracked back in time. Yet, major changes in the central American monsoon intensity and in the El Niño/Southern Oscillation occurred during the Holocene, but it is still unclear if both climate phenomena have varied independently or if they were intrinsically tied to each other. We will present preliminary results of a multiproxy study performed on a latitudinal transect of marine sediment cores to track changes in riverine runoff and hydrological parameters such as sea surface temperature and salinity during the Holocene. Those results will allow refining how the fresh pool dynamically responds to regional ocean-atmosphere-land interactions under natural climate variability.

Regional climatology - The Eastern Equatorial Pacific region is characterized, at the seasonal timescale, by a strong link between SST, local wind patterns and precipitation intensity, all of which varying in synchrony with changes in the strength of the equatorial front



Colours: Sea Surface Temperatures (WOA 2013)
Arrows: wind fields (COADS)
Grey Lines: isohyets (NCAR Reanalysis, mm/month)
MD02-2529: Leduc et al., 2007; Leduc et al., 2009, unpublished
MD02-2531: unpublished
KN176-2 JPC32: Pahnke et al., 2007
M772-069: unpublished

Main challenges:

- Different proxy carriers (alkenones and foraminifer) may not sample the same season and/or water depth
- Land-ocean interactions could obscure marine and terrigenous-derived hydroclimate
- Contrasting local signals indicate that the regional paleohydrological patterns are more complex than previously thought

Next steps (coming soon):

- Obtain better age models on the sedimentary sequences
- Measure (increase resolution) on selected cores (oxygen and hydrogen isotopes)

References:

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Regional paleohydrology - preliminary results

