National Aeronautics and Space Administration
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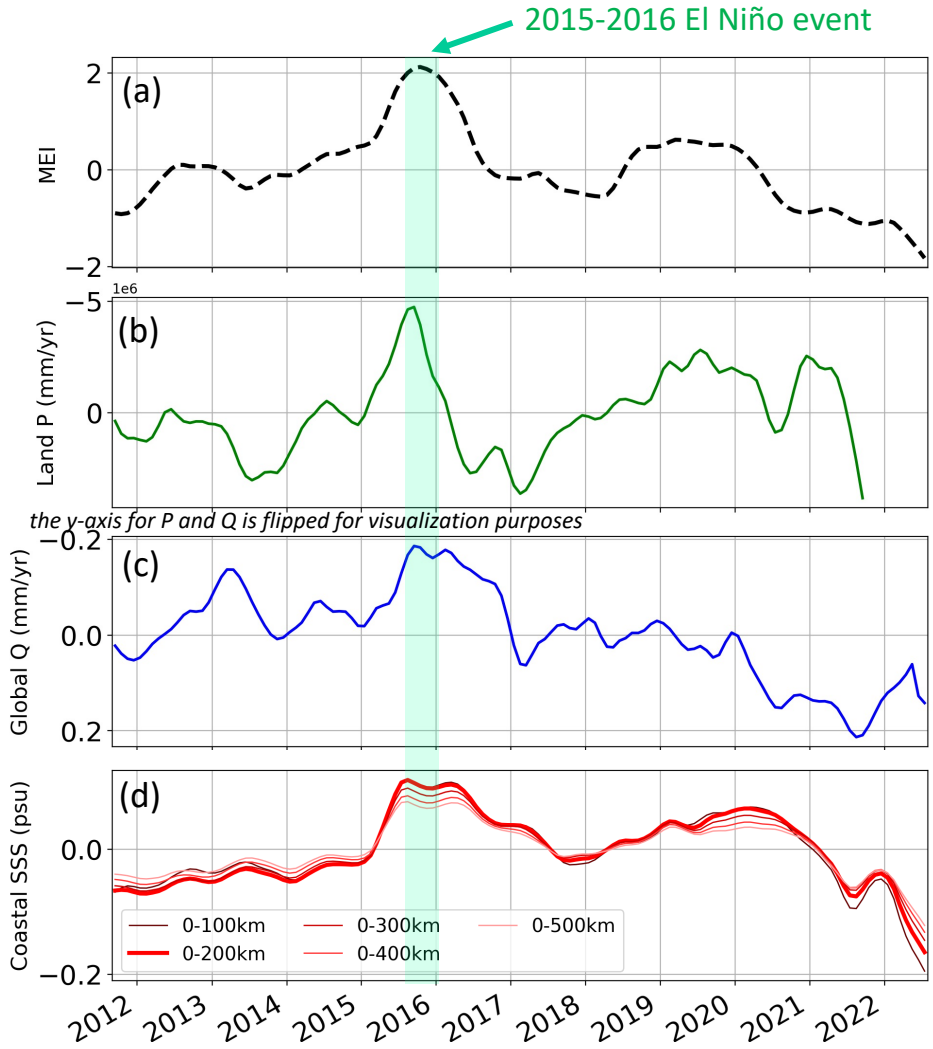
The Salinity of Coastal Waters as a Bellwether for Global Water Cycle Changes *(Fournier et al., 2023)*



Interannual time series of (a) ENSO Index, (b) global land precipitation, (c) global river discharge, and (d) global coastal SSS (excluding polar regions)

Problem:

Monitoring the global water cycle has been extensively done from a land or open ocean perspective. However, the coastal ocean is a place that actually is extremely rich in providing signals of change for the global water cycle. An obstacle to monitoring the coastal oceans is that the observational capacity for river discharge has traditionally been reliant upon a sparse, aging in situ observing network, including a sparsity of river gauges.

Finding:

Satellite sea surface salinity (SSS) year to year variations near the coast are strongly correlated with global water cycle variability driven by El Niño Southern Oscillation (ENSO) (figure) via modulation of precipitation on land and subsequent river runoff.

Significance:

As the climate warms, the global water cycle is expected to change, with complex impacts for land hydrology and its influence on the coastal ocean. This makes the coastal ocean a prime candidate for monitoring signals of global change. **Aggregated global coastal SSS could be used as a proxy for detection of changes in the large-scale cycling of water between the oceans and continents that are expected.**

Fournier, S., Reager, J.T., Chandanpurkar, H.A., Pascolini-Campbell, M., and Jarugula, S. (2023). The salinity of coastal waters as a bellwether for global water cycle changes. Geophysical Research Letters, 50, e2023GL106684. https://doi.org/10.1029/2023GL106684

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