

On the Strength of the California Current: A Record from the Southern Baja California Margin

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Abstract

To characterize the strength of the flow of the California Current, we searched in the southern Baja California continental margin, the southernmost site affected by its relatively cool and less saline waters. We retrieved several cores from a silled basin, also known as Cuenca San Lazaro or Soledad, located at 25° 10'N) with a sea-floor depth of 540 meters. This basin collects biogenic sediments that record the variations in the strength of the cooler flow of the California Current from the north and of the warmer tropical waters from the south. The laminated nature of the record preserves information with an annual to interannual periodicity of the dynamics of this boundary. It is precisely during El Niño years when records show the strongest sea surface temperature anomalies for the whole North American coast, comparable in size only to the equatorial thermal anomalies. This thermal contrast is also a marked feature in the annual variations of the SSTs for this site, one of the highest observed seasonal thermal contrast off the North American shores affected by the current. Our study site is further characterized by high levels of primary productivity, mostly a consequence of the advection of the cold nutrient-rich California current waters and associated upwelling processes, which are responsible for the production and high export of organic matter, opaline and calcite shells to the sea-floor. Here we present some preliminary results based on the fluxes of planktic foraminifera and the paleotemperature determinations derived from the alkenone biomarker in organic extracts from the sediment, known as the U_{37}^k reconstruction method.