

## **Production and Accumulation of Organic Carbon in the Southern California Current Region**

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The California Current is subject to decadal scale variability in terms of both physical (i.e. stratification, temperature regimes) and biological (e.g., abundance of anchovies versus sardines) parameters. Identification of such long-term trends has been facilitated by the rich dataset maintained by the California Cooperative Fisheries Investigations (CalCOFI) program, which was inceptioned in 1949. Recent CalCOFI observations have demonstrated an increase in biological productivity (Kahru M, et al., Deep-Sea Res II, 2012), a shoaling of the nitricline and euphotic zone (Aksnes and Ohman, 2009) and an increase in offshore wind stress curl-derived upwelling (Rykaczewski and Checkley, 2008). To study the effects of climate variability on carbon stocks in the Southern California Current the research presented here combines total carbon observations and measured hydrographic variables.

Preliminary assessments of organic carbon data indicate that particulate organic carbon (POC) in the Southern California Bight is 5-20% of the total organic carbon (TOC) pool, peaking within 100km of shore in spring due to upwelling-induced biological productivity. Recently produced TOC appears to be quickly remineralized within the surface layers (i.e. depth <150m or potential density <26.0 kg m<sup>-3</sup>) down to the background TOC concentrations of 40-50  $\mu\text{M C}$ . With the support of pCFC-12 water mass age estimates, the more recently produced organic carbon appears to be remineralized at a rate of 1-15  $\mu\text{mol C yr}^{-1}$  depending on the season and region in CalCOFI, while breakdown of the highly reactive carbon pool could contribute up to as much as 50% of oxygen utilization (as carbon equivalents). Given the importance of eastern oceanic boundary systems for the global carbon cycle we aim to delineate the role of climate variability, if any, in controlling the size of the dissolved and suspended organic carbon reservoir. Partitioning of net community production into these reservoirs has important implications as they may be available for horizontal transport away from sites of production and also serve as fuel for a range of ecosystem components.