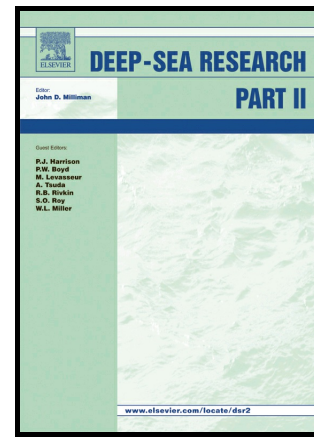


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of the California Undercurrent

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Lagrangian Observations of the Along-slope Path of the California Undercurrent

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Abstract

The flow of the California Undercurrent (CUC) along the continental slope and its interaction with deeper offshore waters is studied using trajectories of 53 isobaric RAFOS. The floats were launched off central California and data collected between 1993 and 2009. The mean pressure for the float measurements was 382 dbar. The trajectories were broken into 126 segments of continuous alongshore drift over the continental slope. Poleward drift occurred 88% of the time. The mean length of the poleward (equatorward) drift segments was 262 km (98 km) and the exit time for these distances was 32.3 ± 2.3 days (16.1 ± 2.2 days). Five poleward drift segments exceeded 500 km in length; the longest segment stretched from Central California to Central Oregon, a distance of 966 km.

Locations where floats left or joined the along-slope flow occurred at most latitudes between 35.5°N to 42.5°N ; here the mean rate at which floats left (joined) along-slope drift was 5.3 (3.5) per 50 km of coastline each year. Locations favored for leaving the Undercurrent included the northern edge of the Gulf of the Farallones (37.5°N) and between Cape Mendocino and Cape Blanco (41.5°N - 42°N). A location favored for joining the Undercurrent was the northern edge of the Santa Lucia Bank (35.5°N). No floats were observed to join the alongshore flow immediately north of Cape Mendocino (40.5°N - 41°N).

Longer (>290 day) float missions often included offshore excursions into the Northeastern Pacific Ocean. Thirty-one westward excursions of the Undercurrent were observed with a mean duration of 88 days and a mean offshore distance of 199 km. The character of the excursions varied but included offshore and onshore transport in jets, cyclonic and anticyclonic eddies, and interaction with cold filaments. The longest excursion lasted 587 days and extended 1007 km to the west.

Abbreviations:

CUC, California Undercurrent ; CC, California Current; MUC, Mediterranean Undercurrent

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