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Structure of the Alaskan Gyre in August 2014

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Hydrographic data (CTD casts to 500 dbar, shipboard ADCP) were collected between Dutch Harbor, Alaska, and Trinidad Head, California, from 28 July to 8 August, 2014, on R/V Point Sur. The section crossed the Alaska Gyre as well as the transition zone between the subpolar and subtropical gyres along the West Coast of the United States. Near surface, freshest waters (S<31.5) were found on either end of the section, marking the flow of the Alaska Stream at the western boundary and fresh waters associated with North American rivers near the eastern boundary. The westward flow of the Alaska Stream was confined to the western 500 km of the section. Immediately to the east of the Stream, stratification changed little for the next 500 km before isopycals sloped downward to the east over the next 1000 km (to depths near those observed at the western boundary) marking westward and northward flow around the Alaskan Gyre. The transition zone was marked by a pycnostad between 26.4 and 26.8 kg/m3 as well as by a sharp front at the eastern edge of the nearsurface salinity minimum and an associated mesoscale anticyclonic anomaly which extended throughout the observed 500 m water column.

At the eastern boundary, flow patterns were resolved from surface to bottom (∼3000 m) using both CTD and LADCP measurements. The observed pattern of flow was complex although coastal upwelling and poleward flow of California Undercurrent waters over the upper portion of the continental slope occurred.

Oxygen, transmissivity and fluorescence patterns are also discussed. Nearsurface current and salinity patterns are compared with satellite measurements.