



## Abstract View

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# On the Stability of the California Undercurrent off Vancouver Island

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### ABSTRACT

Recent satellite infrared imagery and hydrographic maps of the sea surface temperature of the northeast Pacific reveal a fairly regular pattern of cells or eddies that are aligned north-south about 150 km west of Vancouver Island. The wavelength of this pattern lies in the range 80–100 km. Current observations taken near the edge of the continental shelf at a depth of 200 m off Tofino, Vancouver Island, show oscillations with periods of days to about two weeks. At intermediate depths off the coast of Vancouver Island and northern Washington recently derived geostrophic flow patterns show a northward current along the continental slope (the California Undercurrent). In this paper the stability of a two-layer model of the California Undercurrent off Vancouver Island and northern Washington is considered in an attempt to explain the source of the observed spatial and temporal variations. It is shown that the model flow is baroclinically unstable, with the amplifying wave disturbances propagating northward along the continental slope. For typical vertical shears associated with the California Undercurrent, the most unstable waves have wavelengths and periods in the ranges 65–94 km and 5–10 days, respectively, in good agreement with the observed fluctuations.

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