



## **Sub-tidal Circulation in a deep-silled fjord: Douglas Channel, British Columbia (Canada)**

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Douglas Channel, a deep fjord on the west coast of British Columbia, Canada, is the main waterway in Kitimat fjord system that opens to Queen Charlotte Sound and Hecate Strait. The fjord is separated from the open shelf by a broad sill that is about 150 m deep, and there is another sill (200 m) that separates the fjord into an outer and an inner basin. This study examines the low-frequency (from seasonal to meteorological bands) circulation in Douglas Channel from data collected from three moorings deployed during 2013-2015, and the water property observations collected during six cruises (2014 and 2015). Estuarine flow dominates the circulation above the sill-depth. The deep flows are dominated by a yearly renewal that takes place from early June to September, and this dense water renews both basins in the form of gravity currents at 0.1 - 0.2 m/s with a thickness of 100 m. At other times of the year, the deep flow structures and water properties suggest horizontal and vertical processes and support the re-circulation idea in the inner and the outer basins. The near surface current velocity fluctuations are dominated by the along-channel wind. Overall, the circulation in the meteorological band is a mix of the estuarine flow, direct wind driven flow, and the baroclinic response to changes to the surface pressure gradient caused by the wind driven currents.