Gulf of Alaska

Overview

The Gulf of Alaska is located off the southern coast of Alaska and the western coast of Canada (Figure 1). The coast is deeply indented by fjords and other inlets and has a broad continental shelf. The region is influenced by the cold Subarctic Current.



Figure 1. Bathymetry of the Gulf of Alaska [Smith and Sandwell, 1997]

Observations

There has been some scientific study of internal waves in the Gulf of Alaska. Elachi and Apel [1976] describe internal waves observed in aircraft based SAR imagery acquired near the edge of the Malaspina Glacier in August on 1975 (Figure 7). Satellite imagery shows internal wave activity in the Shelikof Strait, Cook Inlet, Prince William Sound, Yakutat Bay, around Kodiak Island and along the continental shelf break near Middleton Island.

Overall the waves appear to be fine scale, with lead wavelengths on the order of 300 to 500 meters. Due to the relatively high latitude of the Gulf, internal wave activity is expected to take place primarily during the northern summer and early fall (June though September) when solar heating develops a thermocline or melt water from glaciers or sea ice creates a layer of fresh water over the denser salt water.

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
			1	2	8	9	16	4			

Table 1 - Months when internal waves have been observed in the Gulf of Alaska (Numbers indicate unique dates in that month when waves have been noted)

References

- Elachi, C. and J.R. Apel, 1976, Internal Wave Observations Made with an Airborne Synthetic Aperture Radar. *Geophys. Res. Lett.*, 3, 647-650.
- Smith, W. H. F., and D. T. Sandwell, Global seafloor topography from satellite altimetry and ship depth soundings, Science, v. 277, p. 1957-1962, 26 Sept., 1997. http://topex.ucsd.edu/marine_topo/mar_topo.html

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Figure 2. SEASAT (L-band, HH) SAR image of internal waves in the Shelikof Strait, Alaska acquired on 22 August 1978 at 1656 UTC (Rev 811). Imaged area is approximately 100 km x 100 km. [Image courtesy of NASA JPL]



140[°]W

135[°]V

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62°N -



Figure 3. SEASAT (Lband, HH) SAR image of internal waves in Cook Inlet, Alaska acquired on 17 July 1978 at 0548 UTC (Rev 289). Imaged area is approximately 200 km x 100 km. [Image courtesy of NASA JPL]

145[°]W

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Figure 4. RADARSAT-1 (C-band HH) SAR image of internal waves in Prince William Sound, Alaska acquired on 11 June 1998 at 0307 UTC. Imaged area is 41 km x 41 km. Image is contiguous with Figure 5. ©CSA 1998 [Image courtesy of the NOAA Alaska SAR DEMO Imagery Manual, http://orbitnet.nesdis.noaa.gov/orad/sar/sar_manual.PDF]





Figure 5. RADARSAT-1 (C-band HH) SAR image of internal waves in Prince William Sound, Alaska acquired on 11 June 1998 at 0307 UTC. Imaged area is 45 km x 45 km. Image is contiguous with Figure 4. ©CSA 1998 [Image courtesy of the NOAA Alaska SAR DEMO Imagery Manual, http://orbitnet.nesdis.noaa.gov/orad/sar/sar_manual.PDF]





Figure 6. RADARSAT-1 (C-band HH) SAR image of internal waves near Middleton Island in the Gulf of Alaska acquired on 22 August 1998 at 0306 UTC. Imaged area is 100 km x 100 km. ©CSA 1998



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Figure 8. SEASAT (L-band HH) SAR image of internal waves near Yakutat Bay Alaska acquired on 8 August 1978 at 1438 UTC (Rev 552). Imaged area is approximately 100 km x 100 km. [Image courtesy of NASA JPL]



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