

Holocene sea-level changes and earthquakes around Bering Glacier

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Field investigations during 2003 comprised reconnaissance sampling of Holocene sediments at sites ranging from the Grindle Hills to Seal River and the collection of contemporary diatom samples from Vitus Lake and Seal River. Laboratory analyses concentrated on the contemporary diatom samples, a series of sites along Seal River where we sampled organic layers intercalated with minerogenic units and exposures on the west coast of Taggland showing well-preserved shells of *Penitella penita* bored into outcrops of the Yakataga Formation.

Contemporary diatoms of Vitus Lake and Seal River

Analysis of 17 samples recorded 97 diatom species. They show a spatial zonation between Seal River and Vitus Lake, and also a vertical zonation from lake level to marsh adjacent to Vitus Lake. This contemporary dataset will help interpret fossil sequences in the future.

Sediment exposures along Seal River

We concentrated on two exposures, SR03/1 which is within 200 m of the open ocean, and SR03/4 which is in the overflow channel close to Vitus Lake. Diatom and radiocarbon analyses of SR03/1 shows a relatively stable environment, with a small but consistent marine and brackish influence for the period ~2700 yr BP to ~300 yr BP. During this period relative sea level was lower than present. Prior to ~300 yr BP the marine and brackish influence shows a sharp, temporary decline. This may represent episodic land uplift but we have insufficient data to be sure at this stage. The section at SR03/4 indicates relative water level ~0.5 m higher than present within the last 50 years. This may be evidence of land movements during or after the 1964 earthquake.

West Taggland

Molnia & Post (1995) dated shells of *Penitella penita* from a small exposure at lake level to 4860 yr BP. We found a larger section with *in situ* samples, bored into rock exposures, from ~0.1 m below lake level to ~3.5 m above lake level. Given the sub-tidal growth range of this species these represent relative sea level above present. Radiocarbon dating of samples across the elevation range -0.1 to +3.5 m will indicate whether they record a stable, rising or falling sea level during the mid-Holocene.