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## **Multiple Glacial Advance and Retreat Cycles Preserved in Yakutat Bay, Southern Alaska: Potential for Constraining Cordilleran Ice Sheet and Southern Alaskan Climate Histories**

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Determining the timing and extent of past advances of temperate tidewater glaciers can be difficult. However, identifying and constraining such advances in the sedimentary record is necessary for understanding local, regional or global climate change. Disenchantment and Yakutat Bays fronting the Hubbard Glacier, southern Alaska, were the focus of two geophysical surveys in 2004. These studies aimed to more accurately determine the history of sediment fluxes, advances and retreats of Hubbard Glacier, and how these processes may relate to climatic oscillations. One survey collected high-resolution, deep-tow boomer (Huntec) sub-bottom profiles and piston cores, whereas the other survey recorded a high-resolution, deeper penetrating (ca.3600ms vs. ca.100ms TWT with boomer), single GI-gun profile up Yakutat and Disenchantment Bays as well as swath maps with associated Chirp profiles, and jumbo piston cores. Together, the data provide a better understanding of Late Quaternary to Holocene sedimentation of the area. The Huntec record is valuable when evaluating Holocene sedimentary fluxes and processes. Several facies occur within the record, which have been interpreted as representing sediment debris flows and turbidity currents. This record also demonstrates the extent and frequency of large scale flooding events within the bay, such as those recorded in 1986 and 2002. Multiple glacial advance/retreat sequences have been interpreted from the GI-gun profile. Each sequence is primarily recognized by an unconformity (Glacial Erosion Surface) that is commonly overlain by 3 seismic facies. The basal ice-contact facies, which also commonly include morainal bank forms, has low-amplitude, chaotic reflections. The middle facies has slightly stratified to hummocky reflections interpreted as ice-proximal facies. The upper facies has highly stratified, continuous, high frequency reflections representing ice-distal conditions. Two or more retrogressive retreat sequences occur up-fjord from, and are younger than, the major morainal bank complex at the mouth of Disenchantment Bay, dated from land evidence as having been deglaciated by ca. AD 1465. This AD 1465 morainal bank sequence is thicker than the up-fjord retrogradational sequences, and itself appears to rest on an older erosional surface. The older erosional surface may be associated with the morainal bank at the entrance to Yakutat Bay, which from land evidence is the maximum Holocene advance position of Hubbard Glacier dated at ca. AD 1308.