



^{210}Pb as a tracer of shelf-basin transport and sediment focusing in the Chukchi Sea

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Activities of dissolved, particulate, and sedimentary ^{210}Pb were measured in the shelf-slope region of the Chukchi Sea. Samples were collected as part of the Shelf-Basin Interactions (SBI) Phase II process study (6 May–15 June, 2002) along three shelf-basin transects identified as West Hanna Shoal, East Hanna Shoal, and Barrow Canyon. Distributions of ^{210}Pb and suspended particulate matter indicate efficient removal of ^{210}Pb over the shelf by particle scavenging. Low ^{210}Pb activities measured throughout the halocline of the Canada Basin are attributed to shelf scavenging and subsequent advective transport into the interior basin. Additionally, ^{210}Pb inventories were used to construct a water column-sediment budget of ^{210}Pb and determine regions of particle export and deposition on the continental shelf and slope. Sediment focusing calculated with this ^{210}Pb budget was observed throughout the shelf-slope region, particularly in shallow (~ 100 m) shelf waters at Barrow Canyon. Despite elevated concentrations of suspended particulate matter in Barrow Canyon, the ^{210}Pb budget does not indicate that sediment transport occurred from the West and East Hanna Shoals into Barrow Canyon. The implication is that particles and associated organic matter produced in the Chukchi Sea are retained in shelf sediments on a decadal timescale.