HOLOCENE DISPERSAL OF YUKON RIVER SEDIMENTS IN THE BERING SEA AND IMPLICATIONS FOR INTERPRETATION OF ANCIENT EPICONTINENTAL SHELF SEDIMENTS

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The Bering epicontinental shelf, an area nearly equal in size to Alaska, has a sedimentation pattern that, if later preserved in the rock record, will be difficult to interpret. The Southeastern part (Bristol Bay) appears to be wave dominated, grading outward from coarse-grained sediments at the shoreline to fine-grained sediments at the shelf edge. The Northeastern part (Chirikov Basin and Norton Sound) appears to be current dominated with large regions of non-deposition in Chirikov Basin south of Bering Strait. Significant amounts of Holocene sediments from the Yukon River have bypassed Chirikov Basin to be deposited northward in the Chukchi Sea.

Lag gravels remain exposed near the margin of Chirikov Basin where currents have prevented deposition of Holocene Yukon silt and where the transgression of the Holocene shoreline has reworked bedrock or glacial moraines deposited during earlier low sea levels. Currents also have inhibited deposition of Holocene Yukon silt over the sheet of fine-grained, transgressive sand found in the center of Chirikov Basin. The transgressive Pleistocene glacial debris, alluvial debris, and freshwater mud and peat. Modern mud with varying amounts of ice-rafted pebbles is accumulating in some depressions in the same region.

Holocene sediments from the Yukon River form thin deposits (tens of centimeters) in parts of central Norton Sound and form thick deposits (several meters) off the present subdelta and around the margins of Norton Sound. These deposits typically contain thin horizons with shells and pebbles and thin sand interbeds that are flat laminated, low-angle cross laminated, and ripple marked. The coarser grained interbeds are interpreted to be lag deposits of storm storm waves and associated storm surge currents that have reworked the shallow seafloor of Norton Sound ($\leq$20 m deep) and have carried the finer grained resuspended sediment northward from the Bering Sea.

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Well-preserved sedimentary structures are present only in the shallowest water near the fringe of the present Yukon subdelta; there the number of lag deposits is highest, and low salinity may inhibit benthic faunal activity. Elsewhere in the Northeast Bering Sea, bioturbation has destroyed nearly all the wave- and current-formed sedimentary structures.

The distribution of sediments off western Alaska has important implications for interpretation of ancient epicontinental shelf sediments. Some parts of an epicontinental shelf, for example Bristol Bay, may exhibit classical gradation from coarse to fine deposits offshore, whereas other parts, like Chirikov Basin, may display a complex moasic of gravel, sand, and mud lenses that are unrelated to shoreline sources. Sediment thickness, like sediment grain size, may show no relation to source. Thick accumulations of Holocene sediment apparently from the Yukon River, are present far from the source and cover extensive areas of Chukchi Sea north of non-depositional areas in Bering Sea; however, thin accumulations occur in places close to the present delta. Transgressive sand and gravel layers may be extremely thin over large regions like margins of Chirikov Basin. Offshore epicontinental shelf sediments in a low-energy region like Northern Bering Sea may lack physical sedimentary structures, except in areas where unusual conditions inhibit faunal activity.