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Relationships among high river discharges, upwelling events, and bowhead whale (*Balaena mysticetus*) occurrence in the central Alaskan Beaufort Sea

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Abstract

Aerial surveys for bowhead whales have been conducted with a relatively consistent methodology over the Alaskan Beaufort Sea since 1989. Sightings of bowhead whales in the central Alaskan Beaufort Sea in September 1997 and September 2014 were unusual in that hundreds of whales were observed within a few kilometers of local barrier islands. We compare bowhead whale sightings, river discharge data, wind records, and satellite imagery to argue that the large numbers of bowhead whales observed nearshore in September 1997 and 2014 resulted from favorable feeding conditions established by high river discharges and prior upwelling events. These results are then generalized in a simple binary-based mechanistic framework that links the relevant physics to occurrences of observed and potential feeding opportunities for

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