

Tapped lakes as sediment traps in an Arctic delta

JESSE WALKER¹ & MOLLY McGRAW²

1 Department of Geography, Louisiana State University, Baton Rouge, Louisiana 70803, USA

hwalker@lsu.edu

2 Department of Sociology, Southeastern Louisiana University, Hammond, Louisiana 70402, USA

Abstract Lakes within the Colville River delta in northern Alaska, USA, vary in size from small ponds created by ice-wedge growth to thaw lakes that are as much as three kilometres long and ten metres deep. As the river migrates, lake edges are breached and the lakes are drained. Such lake tapping is aided by permafrost thaw and ice wedge melt and, in the case of the larger lakes, by wave action within them. Once a lake is tapped, it drains rapidly creating a deep scour hole at its entrance and from then on it is subject to the varying stages and discharge of the river. During flooding, when the river is transporting its largest amount of sediment, the tapped lakes become settling basins and rapidly fill. The Colville River delta has lakes in all stages from freshly breached to those that are now being destroyed by channel migration.

Key words delta; lake; flooding; erosion; deposition; Colville, Alaska; Arctic