ABSTRACT

TITLE:	Analysis and Interpretation of Offshore Hazards in Arctic Waters of Alaska
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ABSTRACT: Bathymetric surveys of the seafloor in search of structures, geological or manmade, that may pose a threat to maritime navigation and the construction of pipelines and platforms for oil and gas production are conducted in arctic coastal waters of Alaska. These structures, also termed 'hazards,' vary from shallow shoals and scours to ship wreckage. As part of my internship with TerraSond, multibeam sonar equipment was used to determine efficient navigational routes in the Bering Strait and the occurrence and migration of strudel scours in coastal waters of the North Slope of Alaska for a proposed pipeline route. These structures known as strudel scours form from erosional processes brought on by off-coast fluvial runoff during the yearly spring flooding on arctic sea ice which surrounds arctic deltas. Surveys conducted as long as 50 years ago (McManus, 1963) are compared and analyzed with surveys conducted in 2015 (TerraSond Ltd.) to discern the movement of a massive shoal known as the Prince of Wales Shoal in the Bering Strait. TerraSond also conducted surveys in the Beaufort Sea focusing on strudel scours, which were compared and analyzed with surveys conducted in the late 1990's (Coastal Frontiers, 1997-1999). The bathymetric data collected by TerraSond in the Bering Strait were remarkably analogous to the bathymetric data acquired by McManus in 1960, differing by only a tenth of a fathom in most sections of the shoal within the survey area. However, the strudel scour surveys conducted in the Beaufort Sea of the North Slope of Alaska yielded different findings. Average water depth of strudel scours observed from the 2015 TerraSond surveys (1.9 m) indicate the shoaling of strudel scours in the survey area relative to data from the 1997-1999 Coastal Frontiers surveys (2.3 m). Further monitoring of strudel scours in the Beaufort Sea is crucial for efficient construction and maintenance plans for a pipeline in the region, with focus on the processes of transgression.