

Assessment of coastal erosion and flooding hazard in the Beaufort Sea coast

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Abstract

Arctic permafrost coasts are major carbon (Schuur et al., 2015) and mercury pools (Schuster et al 2018) and represent about 34% of Earth's coastline, with large sectors affected by high erosion rates (Fritz et al, 2017), increasingly affecting coastal communities. Year-round reduction in Arctic sea ice is forecasted and by the end of the 21st century, models indicate a decrease in sea ice area from 43 to 94% in September and from 8 to 34% in February (IPCC, 2014). An increase of the sea-ice free season duration will further expose coasts to wave action, with changing climate also modifying the contribution of terrestrial erosion (Fritz et al., 2015, Ramage et al 2018, Irrgang et al 2018). Within the project NUNATARYUK, we are updating the mapping of the Arctic coast and assessing the hazard exposure of communities, with the Beaufort Sea as a case-study. The surveying methodology includes: i. a high resolution update of the coastline mapping and change rates using Pleiades (CNES) satellite acquisitions from 2018, ii. a survey using RTK-UAV aerial imagery of long-term monitoring sites from the CanadaUS border to King Point, as well as sites in Amundsen Bay, and iii. ultra high-resolution surveys of coastal settlements using RTK-UAV in collaboration with communities aiming at improving coastal hazard assessment (e.g. Tuktoyaktuk and Paulatuk). This presentation shows the updates from this integrated coastal assessment with the field data from the summer of 2019.