

Recent ten years of rapid coastal retreat in the Baydaratskaya Bay region of Kara Sea, Western Siberia

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Recent years of climate change in the Arctic have known to influence significant increase in rates of the proximal coastal erosion. Yet, little is known about how the erosion of permafrost coasts is subject to the surrounding environments. The Kara Sea coast in Western Siberia is least studied in the permafrost coasts, while the Kara Sea hosts more than 25% of the total length of Arctic coasts. In particular, detailed investigations in the Baydaratskaya bay area of Kara Sea are important because the major pipeline system transporting gases from the Yamal peninsula to Europe is crossing the bay. Here, we report rates of coastal retreat in the Baydaratskaya bay during 2005--2016, examined through integration of GPS mapping, geothermal measurements, drone images, and satellite images. In the Baydaratskaya bay area, a rapid retreat rate of more than 3 m per year on average over the studied duration is found, which is higher than previously observed in the Kara Sea region. Preliminary analyses suggest that this high rate is associated with active erosion predominantly due to storm/wind activities and a recent temperature rise over the studied period. This may lead to greater quantities of near-shore sediments and organic carbon flowing into the ocean.

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