EGU22-9760
https://doi.org/10.5194/egusphere-egu22-9760
EGU General Assembly 2022

Transport and Composition of Terrestrial Organic Matter at the Sediment-Water Interface of the Kara, Laptev and East Siberian Shelf Seas

Lina Madaj[1], Kirsi Keskitalo[1], Örjan Gustafsson[2,3], Tommaso Tesi[4], Igor Semiletov[5,6,7], Oleg Dudarev[5,7], Jannik Martens[2,3], and Jorien Vonk[1]

[1]Vrije Universiteit Amsterdam, Amsterdam, Netherlands
[2]Stockholm University, Stockholm, Sweden
[3]Bolin Centre for Climate Research, Stockholm, Sweden
[4]National Research Council, Institute of Polar Sciences, Bologna, Italy
[5]Pacific Oceanological Institute, Russian Academy of Sciences, Vladivostok, Russia
[6]International Arctic Research Center, University of Alaska Fairbanks, Fairbanks, USA
[7]National Research Polytechnic University, Tomsk, Russia

Around 65% of the Arctic coastline consists of permafrost soils which are currently thawing on an accelerating rate due to rising global air temperatures. The uncontrolled and rapid thaw of permafrost soils leads to increased coastal erosion and input of large amounts of organic carbon (OC) into the coastal ocean. Here, the OC can either be degraded (leading to production and emission of greenhouse gases that strengthen climate warming) or be sequestered over short or long timescales (attenuating climate warming). A major proportion of permafrost-derived OC quickly settles upon coastal release and therefore the sediment-water interface is the crucial zone for determining the trajectory of thawed OC and whether it deposits or remains in suspension. However, there is little data available from these so-called flocculation (i.e. nepheloid) layers, particularly in the Arctic shelf seas.

Here, we investigate the composition of suspended sediment within the flocculation layer at the sediment-water interface as well as the shallow surface sediments to shed light on the degradation state and fate of terrestrial OC, and additionally, characterize its lateral and vertical variability upon transport offshore. All samples were collected during ISSS-2020 expedition in late summer (Sept-Oct) of 2020 onboard *R/V Akademik Msistlav Keldysh* in the Kara Sea (n=2), Laptev Sea (n=8), and East Siberian Sea (n=4). We present first results of elemental, isotopic, and sedimentological analyses of suspended and surface sediments (C/N values, $\delta^{13}C$, $\Delta^{14}C$, surface area). With these data, we want to better understand how transport and degradation processes of terrestrial OC vary across the vast Siberian shelves.