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FROM FRESH- TO MARINE WATERS: THE FATE OF DISSOLVED ORGANIC MATTER IN THE LENA DELTA REGION, SIBERIA

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The connectivity between the terrestrial and marine environment in the Arctic is changing as a result of climate change. This is influencing both freshwater budgets and the supply of carbon to sea. This study characterizes the composition of dissolved organic matter (DOM) within the Lena Delta region across the fresh water-marine gradient. Six fluorescent components (four humic-like; one marine humic-like; one protein-like) were identified by Parallel Factor Analysis, with a clear dominance of humic-like signals in fresh waters. At higher salinities there was an increased autochthonous contribution. Colored DOM (CDOM) and dissolved organic carbon (DOC) were highly correlated and, as a response to the hydrographical forcing, the region displayed a pseudo-conservative behavior of DOM in relation to salinity at marine-influenced sites; and a non-conservative behavior with evidence of considerable removal of DOM (up to 54%), likely driven by photodegradation and sorption/flocculation, at sites influenced by the Lena River plume. The latter mixing curve was split into three mixing regimes with regard to different amount and reactivity degree of DOM and to the factors driving DOM variability: 1) the low salinity regime (salinity<10) with high concentrations of DOM, dominated by highly reactive terrigenous contribution and characterized by rapid removal; 2) the intermediate regime (10<salinity<25) exhibiting lower concentrations of DOM and a decreased contribution and reactivity of terrigenous compounds; and 3) the high salinity regime (salinity>25) showing the lowest DOM and an increased contribution of less reactive compounds, displaying a pseudo-conservative behavior, with relatively low removal/addition processes controlling the dilution of DOM.