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Methane fluxes from Northern coastal wetlands on the Kenai Peninsula, Alaska

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Coastal wetlands are important components in the global carbon cycle; however, little is known regarding the carbon sink and source capacity of coastal wetlands in the northern high latitudes, nor their importance in the global methane budget. In this study, we investigate methane and carbon dioxide fluxes from coastal wetlands located along the mouth of the Kenai River of Southcentral Alaska. We measured methane fluxes with a portable greenhouse gas analyzer and a custom-made gas flux chamber along four transects with varying moisture, salinity, and tidal conditions during August 2021. To better understand the drivers of these fluxes, we also collected soil samples, recorded the vegetation composition, and measured salinity at each site. Preliminary results indicate that methane fluxes are lower in areas frequently inundated by tides as compared to areas with minimal to no tidal influence. In addition, we use these data to investigate the effects of salinity and moisture on coastal wetland methane and carbon dioxide fluxes. The overarching goal of this study is to understand whether Northern coastal wetlands are likely to become carbon sinks or sources with ongoing climate change and how future sea level rise will affect the methane and carbon dioxide emissions from these ecosystems at the land-ocean interface.