Methane Emissions across Aquatic Systems - From Headwater Streams to the Open Ocean

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Aquatic systems are an important, but poorly constrained, source of methane (CH_4) to the atmosphere. The coastal ocean in particular has been insufficiently represented in global methane budgets and assessments like the IPCC 5th report. Here, we present a new meta-analysis of CH_4 emissions from the coastal ocean including inner estuaries, salt-marshes, mangroves, seagrass meadows, tidal flats, aquaculture ponds, coral reefs and the continental shelf. Coastal ocean emissions will be compared to those of the open ocean, and inland systems, including headwater streams, terrestrial permafrost thawing, rivers, lakes, natural ponds, reservoirs, non-tidal freshwater wetlands, and rice paddies. The main factors controlling CH_4 emissions in different aquatic ecosystems, and research gaps, will also be discussed.