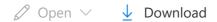
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1 of 18 Next



Abstract Details

AOGS 1st Annual Meeting > Ocean and Atmospheres > Biogeochemical Fluxes of CH4 in Ma Ecosystems of India >

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Title: Biogeochemical Fluxes of CH4 in Mangrove Ecosystems of India

Abstract:

Coastal environments are found to account for 75% of the oceanic tr emissions to the atmosphere, which contribute to about 2% of the glo atmospheric emission. There has been intense interest in understandi methane and nitrogen cycles in wetland ecosystems because high inp organic matter into wetland soils, along with oxic surface and anoxic subsurface zones, potentially allow them to play a critical role in the biogeochemistry of wetlands. Concerns about global climate change a 1% yr-1 increase in CH4 concentration in the troposphere have focus much research on the emission, production, oxidation and transport c from wetlands. Although most studies of methanes source strengths wetlands have been focused on inland freshwater wetlands, where the largest fluxes have been found to occur, methane fluxes from coastal marshes have been scantly documented. Mangroves have been rated long time as a minor methane source, but recent reports have shown polluted mangroves may emit substantial amounts of methane (Purva Ramesh, 2000). We have measured annual CH4 emission rates of 10 year-1 from the mangroves stands of Avicennia marina. Mangroves growing under different salinity gradients (freshwater to saline water) the same mangrove swamp showed distinct CH4 emission pattern, wi higher emissions from the freshwater dominated area. The present st provided the first insight into the quantification of CH4 flux from unpo and polluted coastal wetland ecosystems of India. Our results show th significant amount of CH4 and N2O are produced in coastal sediments bears a strong inverse relationship with salinity and sulfate concentra the unpolluted coastal wetlands. However, concurrent increase in CH4 emission even at high sulfate levels suggest that either the natural environmental forcing factors such as high sulfate and salinity cease t an effect on CH4 production and emission or other non-competitive substrates exist in these wetlands promoting the coexistence of the methanogens and the sulfate reducers. We have also established that methane emission is mediated by the pneumatophores of Avicennia. consistent with the methane concentration in the aerenchyma that de on average from 350 ppmv in the cable roots to 10 ppmv in the emer part of the pneumatophores. However, the number of pneumatophore varied seasonally with the minimum number during the monsoon, red methane emissions largely. Hence, CH4 emission was controlled via the pneumatophores and by the water level. In addition, ebullition from b