## Greenhouse Gas Fluxes in an Active Delta Across a Sediment Organic Matter Gradient

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The goal of this project is to evaluate GHG fluxes, including nitrous oxide, carbon dioxide, and methane, in an active delta across a sediment organic matter gradient, which is due to different delta evolutionary stages. These values are significant because they contribute to the continuous effort to qualitatively describe the biogeochemistry of wetlands, especially those in Louisiana, impact on greenhouse gas emissions. I hypothesized that if there is more organic matter, then GHG fluxes will increase because microbes use organic matter for energy to perform reductions and seasonality will create GHG flux variation along an organic matter concentration gradient because warmer temperatures increase biological reactions. Measurements were taken at two sites on Mike Island within Wax Lake Delta. One site was identified as the high organic matter site at the older, northern end of the island and the other site was classified as the low organic matter site on the southern, newer part of the island. LICOR trace gas analyzers were used to take continuous measurements of each gas. Other supplementary measurements include surface and porewater samples that are analyzed for nutrients ($NO_2$, $NO_3^-$, $NH_4^+$, $PO_4^{-3}$), pH, conductivity, salinity, and temperature as well as redox conditions. The preliminary results support a significant difference between summer and winter for both carbon dioxide and methane. In the summer, carbon dioxide averaged 5.22 $\mu molm^{-2}s^{-1}$and 1.25 $\mu molm^{-2}s^{-1}$ in the winter. Methane averaged 590.32 $nmolm^{-2}s^{-1}$ in the summer and 40.02 $nmolm^{-2}s^{-1}$ in the winter. Overall, exclusively by month, there was no difference in emissions between sites except in September, October, and March.