Managing hydrology can reduce methane emissions of high-emitting freshwater marshes by half (generally) making them present-day net greenhouse gas sinks

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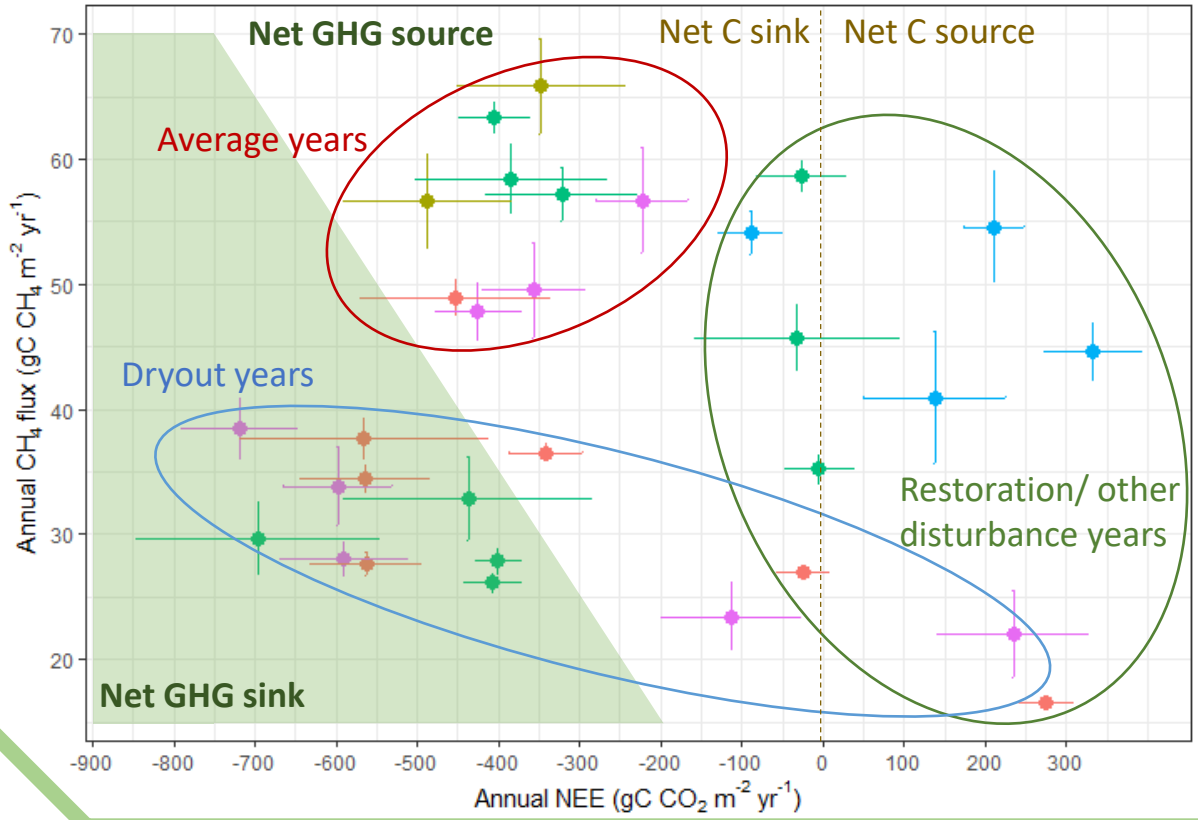
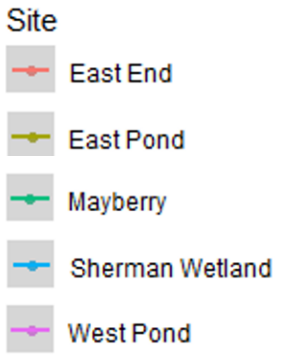
- Can greenhouse gas (GHG) emissions be reduced by lowering methane (CH_4) emissions using **dryout events**?
- Quantify dryout impacts on carbon fluxes using **random forest models** (gap-fill dryout periods)
- Annual CH_4 emissions were up to **48 % lower with dryout events**
- Severe water drawdowns (e.g. 2019, 2020) negatively affected the net carbon exchange (NEE) increasing ecosystem respiration (ER) and in some cases reducing productivity (GPP)
- When NEE was **not** affected by the dryout, the GHG emissions were **reduced by 450 gCO_2eq**.
- When NEE was reduced, it counteracted the GHG reduction benefits from lower CH_4 emissions

Annual methane to net carbon uptake balance





Profile

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Modelled non-dryout vs. measured dryout fluxes