Siberian Arctic inland waters emit mostly contemporary carbon
East Siberian Arctic lowlands

- Inland water carbon concentrations, emissions to the atmosphere, and isotopic composition measured

- Arctic peat tundra in Yedoma region (loess deposited carbon that can be >50,000 years old)

- Radiocarbon ($^{14}$C) used on DOC, POC, CO$_2$ and CH$_4$ to determine contemporary vs. pre-aged carbon
Carbon = mostly contemporary

- Age gradient from modern (post-1950 CE) to ancient (29,355 ± 2967 yBP)
  ponds > fluvial > small lake > thermokarst lake > Yedoma meltwater (youngest > oldest)

- All $^{14}$C forms correlated
  CO$_2$ and CH$_4$ generally younger than DOC and POC
  Higher carbon concentrations tended to be younger
**CO₂ and CH₄ emissions**

- Modelled contributions of soil carbon sources show contemporary sources dominate (modern to basal peat)

- **Study landscape a net carbon sink** (Aug 2016)
  - $-876.9 \pm 136.4$ Mg C
    - Contemporary inland waters = $17.0 \pm 10.9$ Mg C
    - Pre-aged inland waters = $3.5 \pm 2.3$ Mg C

Inland water carbon emissions more sensitive to changes in contemporary carbon turnover than release of pre-aged carbon
Want to read further?

• **Manuscript**
  https://doi.org/10.1038/s41467-020-15511-6

• **Twitter thread**
  @JoshuaFDean
  https://twitter.com/JoshuaFDean/status/1245711926010806273

• **Article on “The Conversation”**
  *Arctic climate change – it’s recent carbon emissions we should fear, not ancient methane ‘time bombs’*