

Ongoing and Proposed Research in the Burns Bog Ecological Conservancy Area

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Burns Bog Ecological Conservancy Area

Protects a raised ombrotrophic peat bog in Delta, BC.

- 50+ years of peat harvesting & development
 - BBECA established in 2004
- Restoration practices include:
 - Ditch blocking
 - Seedling removal

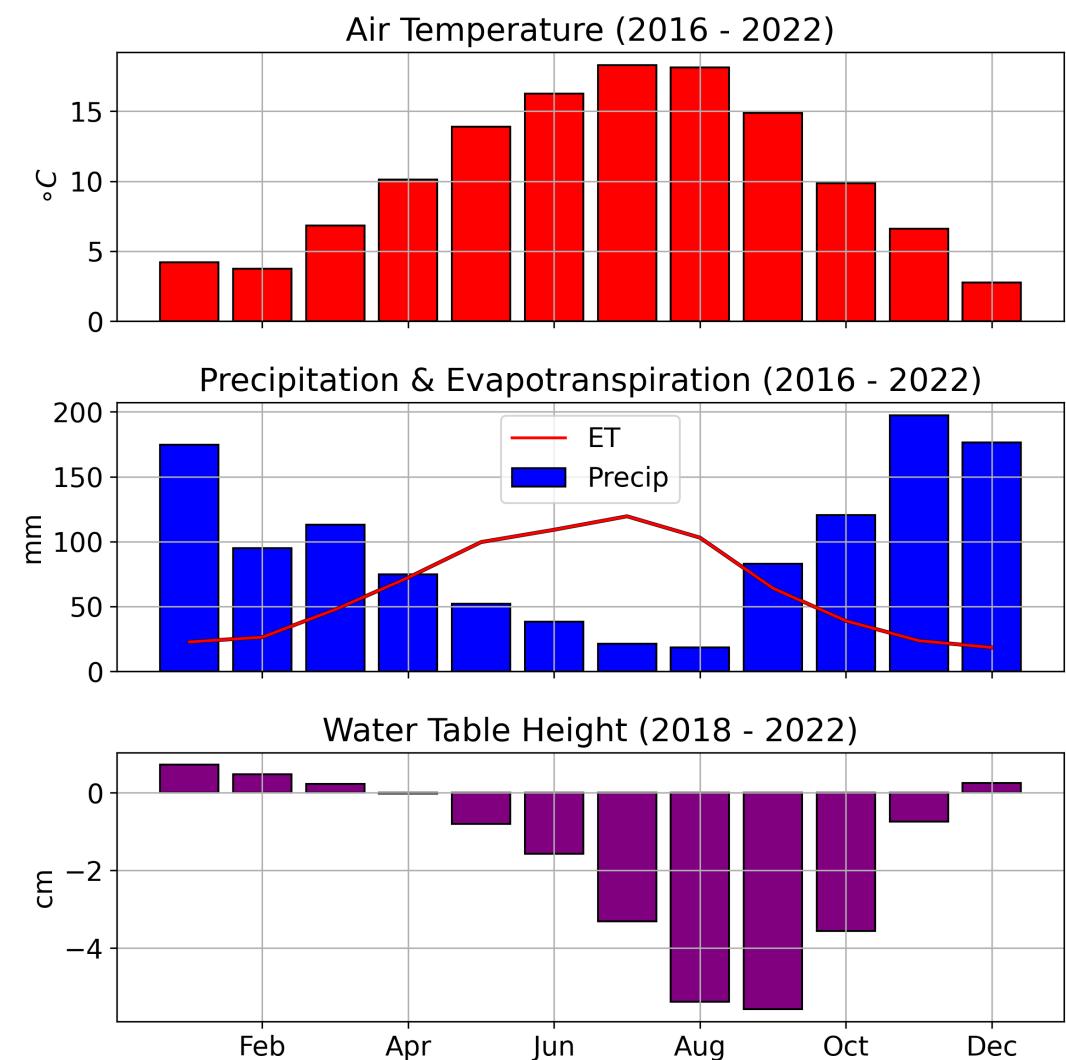


Climatology

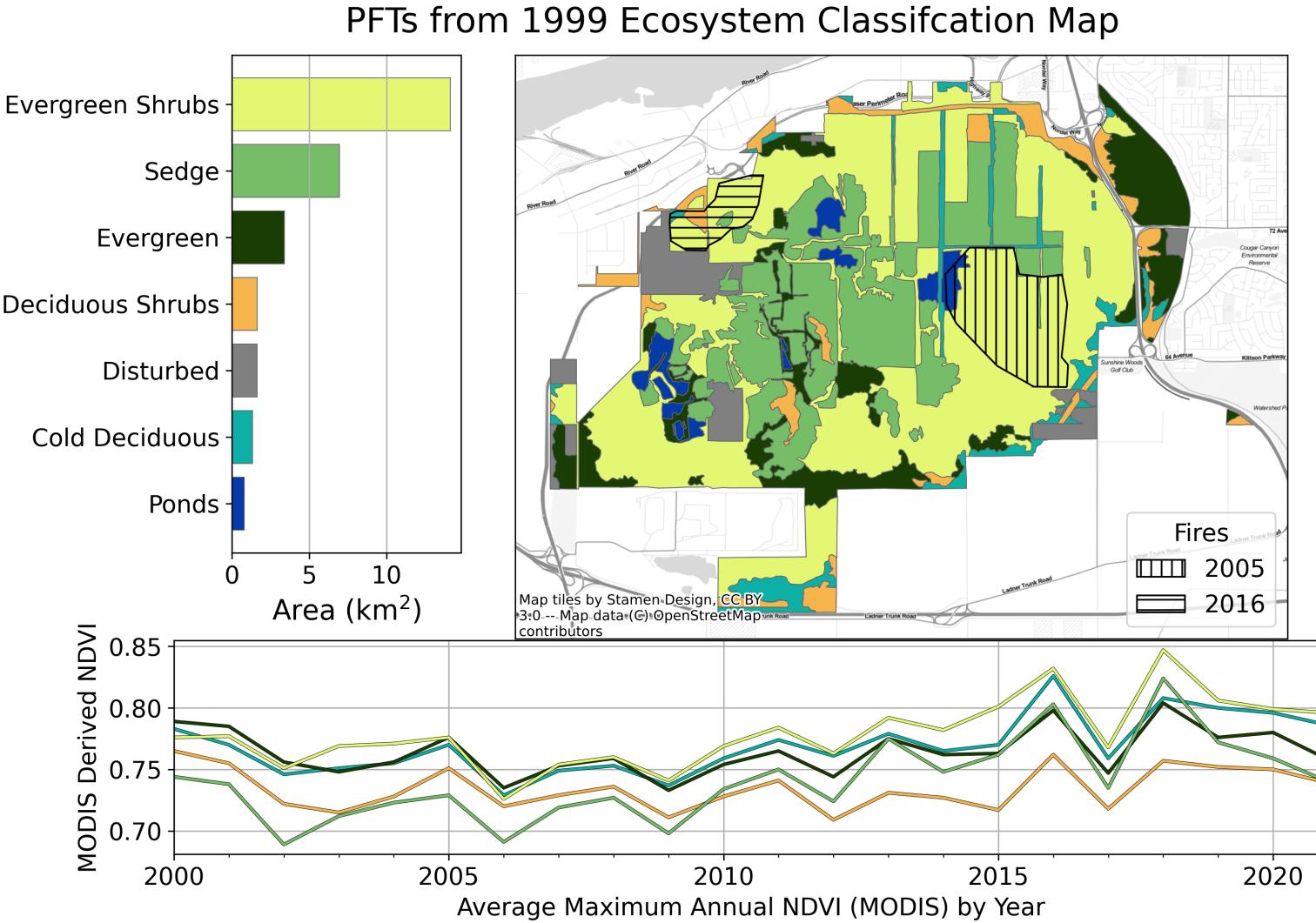
Mean air temperature is 10.5 C.

Average annual precipitation and evapotranspiration are 1160 mm and 750 mm.

- Summer: droughts, heatwaves, & fires
- Winter: flooding



Ecosystems in the BBECA



Flux Measurement Sites



BB1

Beakrush-sphagnum ecosystem undergoing active restoration.

- Harvested from 1957 to 1963
 - Ditch-blocking began in 2007
 - EC station established in 2015
- Net-neutral C fluxes between 2016 and 2021
 - CO₂ uptake offset by CH₄ emissions



BB2

Beakrush-sphagnum/pine-sphagnum ecosystem passively rewetting.

- Harvested from 1930 to 1948
 - EC station established in 2019
- Net C source in 2020
 - Net CO₂ & CH₄ emission



Comparing Management Strategies

Preliminary analysis: ditch blocking reduces radiative forcing.

- How would CLASSIC handle these two sites?



BBS

Assessing impact of seedling removal on C fluxes in a Pine-sphagnum ecosystem.



BBS

Chamber measurement
comparing treatments.

- Temporary EC installation *May

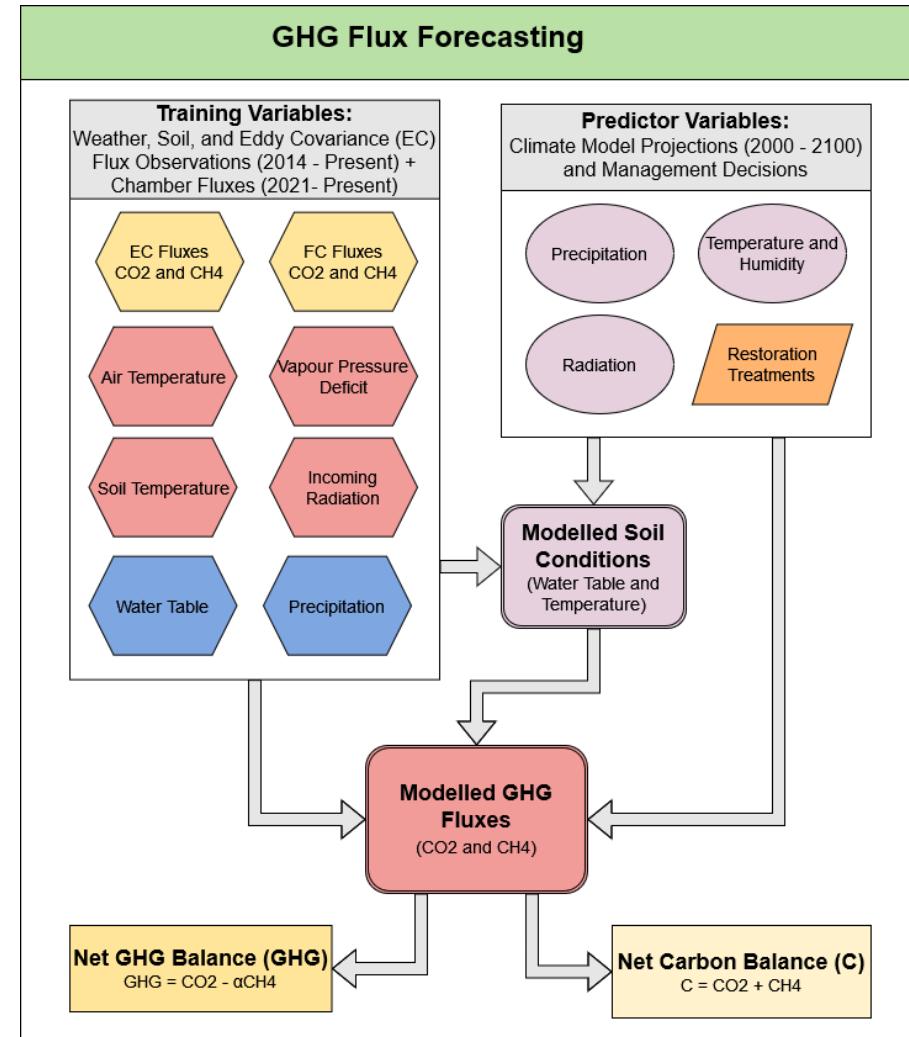


Planned Research

Modelling Fluxes

Modeling impacts of change on carbon and water fluxes

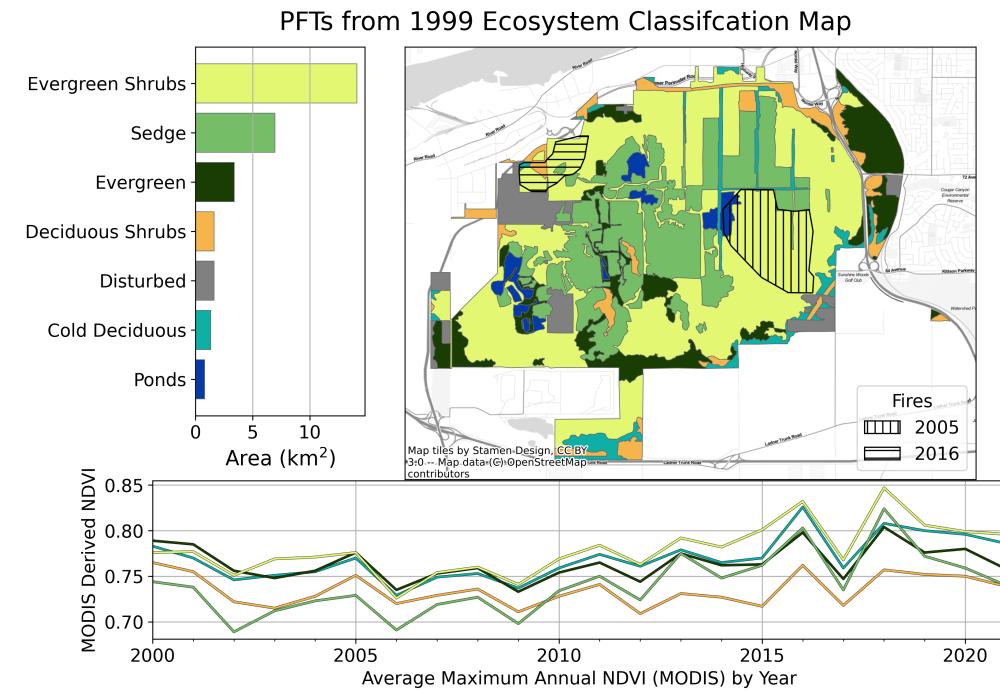
- Test management scenarios
 - Optimize C sequestration
- Refine spatial inventory of BBECA Ecosystems



Spatial-Temporal Upscaling

Refine spatial inventory of BBECA
Ecosystems

- Compare CLASSIC to machine learning approaches



GHG fluxes from Prairie Pothole wetlands

In collaboration with Ducks Unlimited Canada, we are measuring GHG fluxes from wetlands in the Prairie Pothole region of Canada (Manitoba).



Hogg



Young

GHG fluxes from Prairie Pothole wetlands

Despite both looking like typical marshes, they have VERY different CH_4 fluxes driven by differences in sulfate between the sites. This could be an interesting case study for CLASSIC.

