

# Ongoing and Proposed Research in the Burns Bog Ecological Conservancy Area

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## Abstract

The Burns Bog Ecological Conservancy Area (BBECA) in Delta, Canada protects the largest raised peat bog on the West Coast. After decades of peat harvesting, the BBECA was established in 2005 with the aim of restoring ecosystem health and enhancing the water and carbon storage capacity of the bog. Water and carbon (CO<sub>2</sub> and CH<sub>4</sub>) flux measurements began in 2014, when the CA-DBB flux tower was installed in a beakrush-sphagnum ecosystem undergoing active restoration via ditch blocking. The CA-DB2 tower was installed in 2019 in a pine-sphagnum-low-shrub ecosystem undergoing passive restoration. Flux chamber and a pore water sampling has also been conducted in the BBECA in recent years, and a temporary flux tower will be installed in a pine-sphagnum-woodland ecosystem for the 2023 summer season. There is a wealth of data available and we are seeking to make the best possible use of it. We are proposing to apply the CLASSIC model to the BBECA in order to help Metro Vancouver determine the best management practices for the BBECA. We seek to estimate water and carbon budgets for the bog in its current state and test the potential efficacy of future restoration strategies such as dike construction and seedling removal.

## Introduction

### About the BBECA

```
import geopandas as gpd
import matplotlib.pyplot as plt

BBECA = gpd.read_file('BB_Layers/ECOSYS_REV_TEM.shp')

Towers = gpd.read_file('BB_Layers/Towers.shp')
```

```

Towers.loc[Towers['Name']=='Sapling_NoTreatment', 'Name']='BBS'

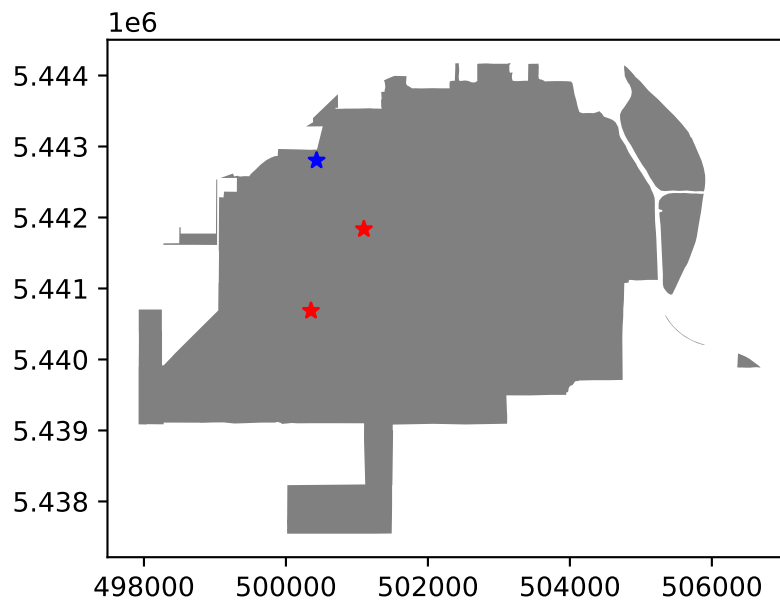
fig, ax = plt.subplots()

BBECA.dissolve().plot(ax=ax, color='grey')
Towers.loc[Towers['Name']=='BBS'].plot(ax=ax,
    marker='*', color='b')#, s=50, label = 'Short-term EC Stations')
Towers.loc[Towers['Name']!='BBS'].plot(ax=ax,
    marker='*', color='r')#, s=50, label = 'Long-term EC Stations')

```

<Axes: >

Map of the BBECA



## Ecosystems

```

fig, ax = plt.subplots()
BBECA['Area'] = BBECA.area
Ecosystems = BBECA[['Area', 'ECO']].groupby('ECO').sum()

Ecosystems['Pct'] = Ecosystems['Area']/Ecosystems['Area'].sum()

```

```

Ecosystems['Type'] = Ecosystems.index
Ecosystems.loc[Ecosystems['Pct']<.01, 'Type']='Other'

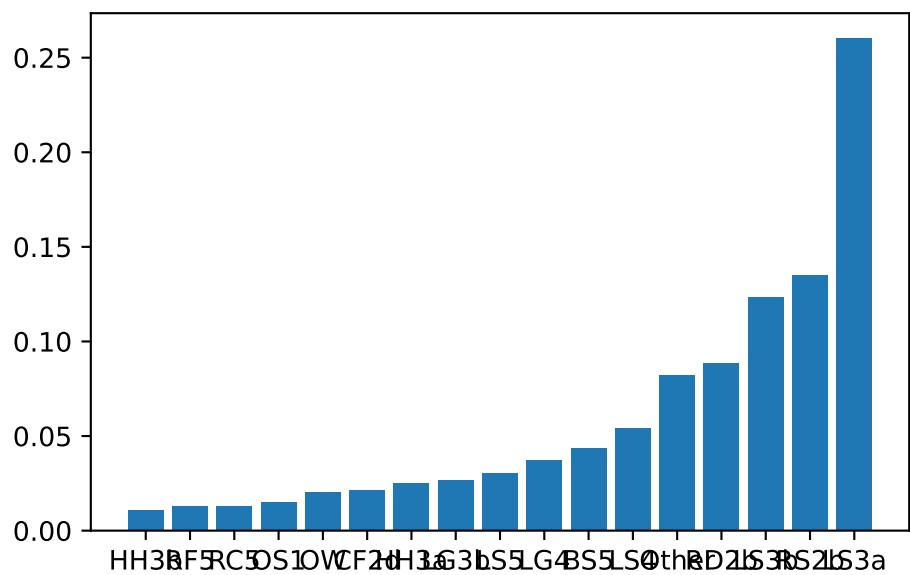
Ecosystems=Ecosystems.groupby('Type').sum()

Ecosystems = Ecosystems.sort_values(by='Pct')
ax.bar(Ecosystems.index,Ecosystems['Pct'])

print(Ecosystems)

```

Type	Area	Pct
HH3b	3.185275e+05	0.010669
RF5	3.835525e+05	0.012848
RC5	3.880024e+05	0.012997
OS1	4.526952e+05	0.015164
OW	6.020364e+05	0.020166
CF2d	6.403003e+05	0.021448
HH3a	7.555477e+05	0.025308
LG3b	8.032896e+05	0.026907
LS5	9.020582e+05	0.030216
LG4	1.119278e+06	0.037492
BS5	1.299031e+06	0.043513
LS4	1.614699e+06	0.054086
Other	2.451430e+06	0.082114
RD2b	2.635845e+06	0.088291
LS3b	3.686075e+06	0.123470
RS2b	4.025041e+06	0.134824
LS3a	7.776664e+06	0.260489



## Restoration Activities

Two flux towers

BB1 {Img}

BB2 {Img}

## Modelling Fluxes