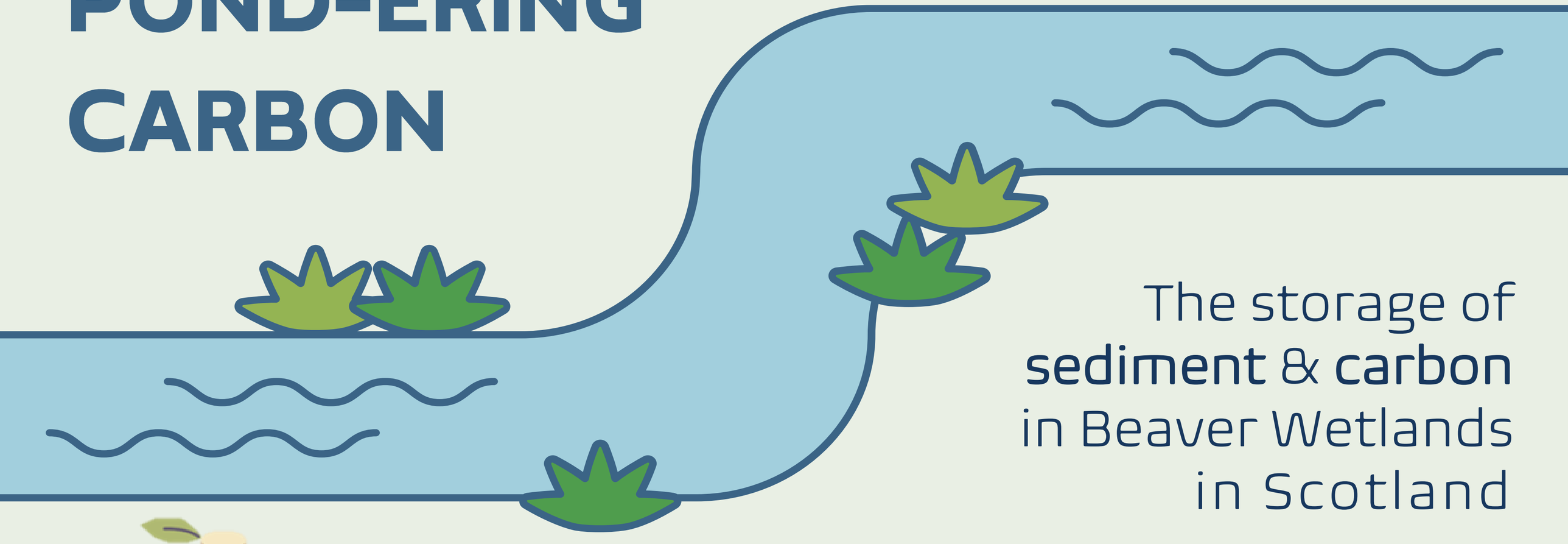
IAPETUS2 Doctoral Training Partnership

UNIVERSITY of STIRLING

POND-ERING CARBON



The storage of **sediment** & **carbon** in Beaver Wetlands in Scotland

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Dr Alan Law, Dr Amy Pickard,
Dr Scott Davidson,
Dr Anna Belcher, Dr Adrian Bass,
Dr Van Biervliet, Alex Maxwell

Spatial variation

temporal data

management of land

global budgets

A. Larsen, J.R. Larsen, S.N. Lane

Dam builders and their works: beaver influences on the structure and function of river corridor hydrology, geomorphology, biogeochemistry and ecosystems

Earth Sci. Rev., 218 (2021), Article 103623,

D.R. Butler, G.P. Malanson

Sedimentation rates and patterns in beaver ponds in a mountain environment

Geomorphol. Biogeomorphol. Terrest. Freshw. Syst., 13 (1995), pp. 255-269, 10.1016/0169-555X(95)00031-Y ↗

R. Levine, G.A. Meyer

Beaver dams and channel sediment dynamics on Odell Creek, Centennial Valley, Montana, USA

Geomorphology, Discontinuities in Fluvial Systems, 205 (2014), pp. 51-64, 10.1016/j.geomorph.2013.04.035 ↗

Assessing controls on sedimentation rates and sediment organic carbon accretion in beaver ponds

J.C. Rees [a] ✉, K.B. Lininger [a], J.D. Landis [b], C.E. Briles [c]

C.J. Westbrook, D.J. Cooper, B.W. Baker

Beaver assisted river valley formation

River Res. Appl., 27 (2011), pp. 247-256, 10.1002/rra.1359 ↗

E. Wohl

Landscape-scale carbon storage associated with beaver dams

Geophys. Res. Lett., 40 (2013), pp. 3631-3636, 10.1002/grl.50710 ↗

A. Puttock, H.A. Graham, D. Carless, R.E. Brazier

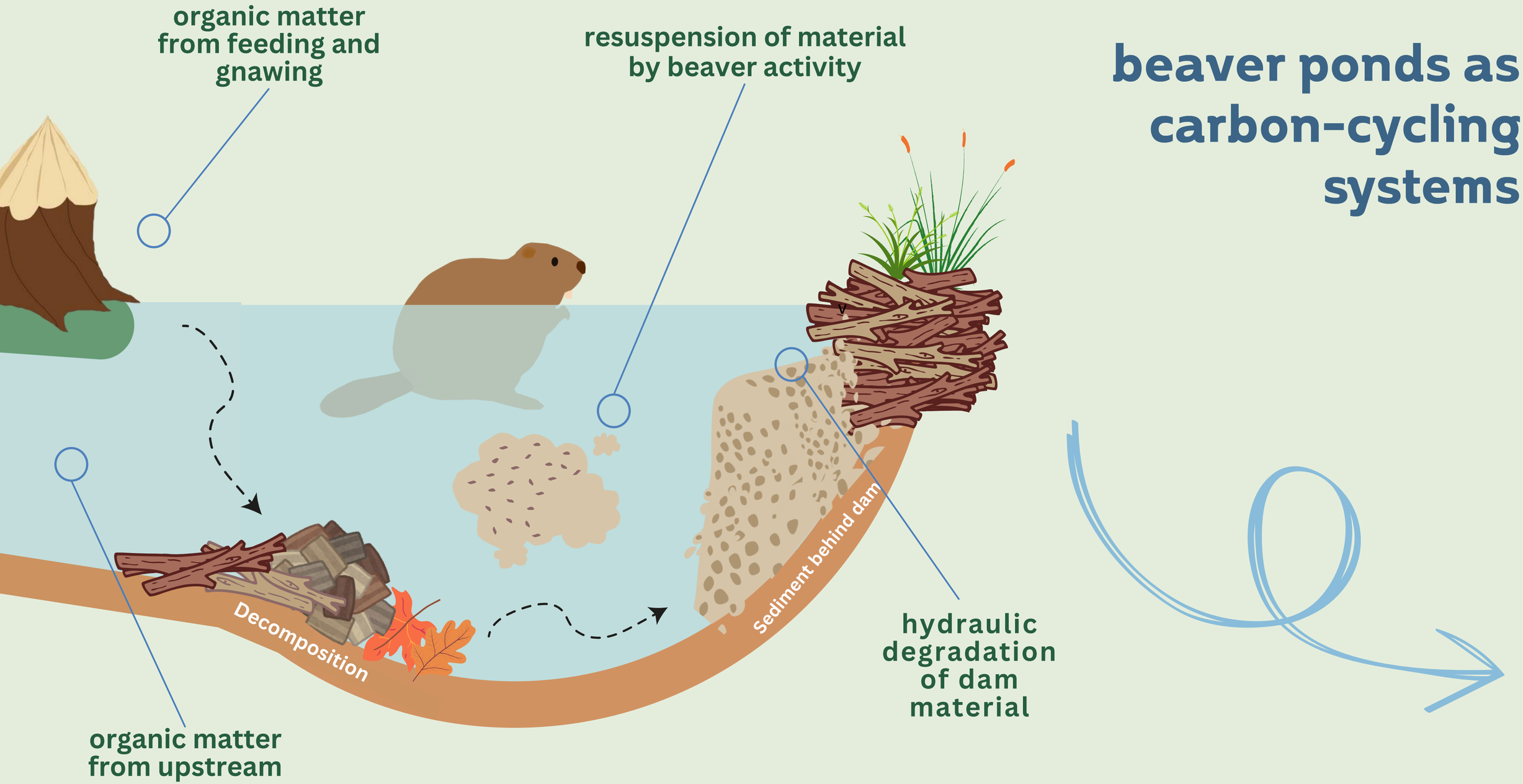
Sediment and nutrient storage in a beaver engineered wetland

Earth Surf. Process. Landf., 43 (2018), pp. 2358-2370, 10.1002/esp.4398 ↗

The role of Eurasian beaver (*Castor fiber*) in the storage, emission and deposition of carbon in lakes and rivers of the River Ob flood plain, western Siberia

Roberto Cazzolla Gatti [a] ✉, Terry V. Callaghan [a e], Inna Rozhkova-Timina [a], Anastasia Dudko [b], Artyom Lim [a], Sergey N. Vorobyev [a], Sergey N. Kirpotin [a], Oleg S. Pokrovsky [c d]

beaver ponds as carbon-cycling systems




Bamff Wildland
Bamff Wildland Boundary
Pond Extents
0
250
500 m

sediment cores

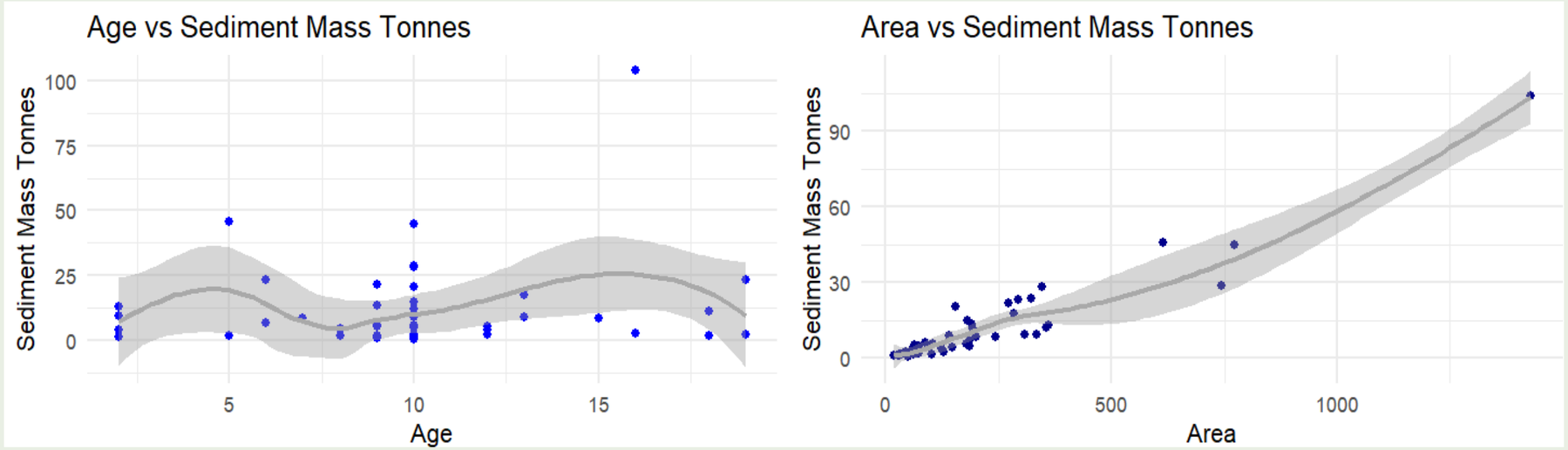
initial results

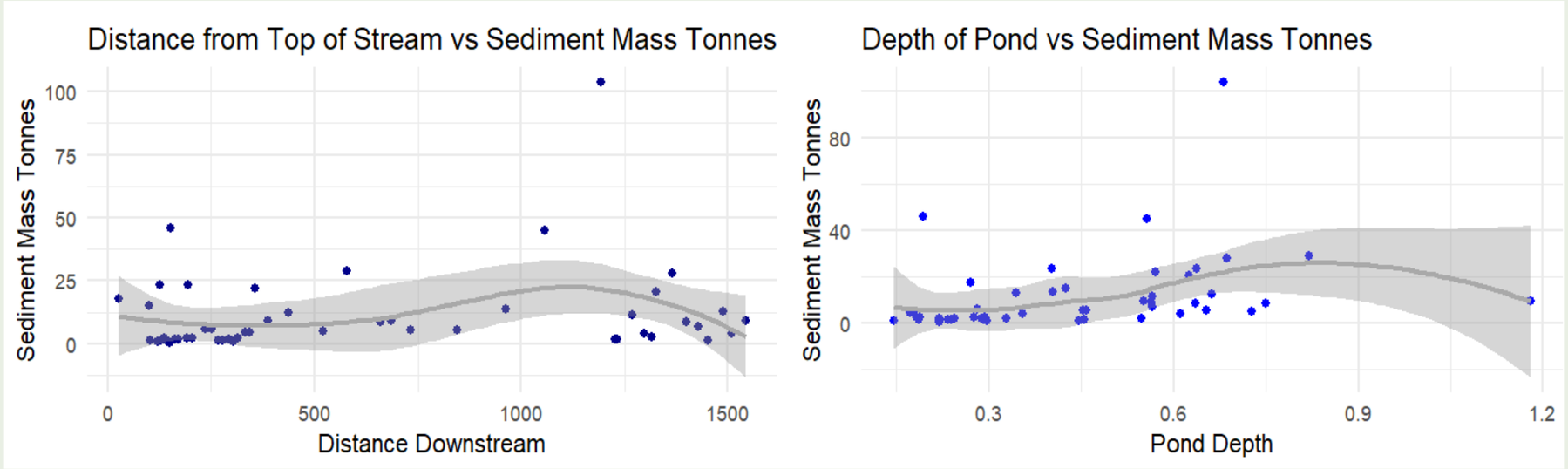
549 tonnes of sediment

150 swimming pools

3 tonnes of nitrogen

50 tonnes of carbon



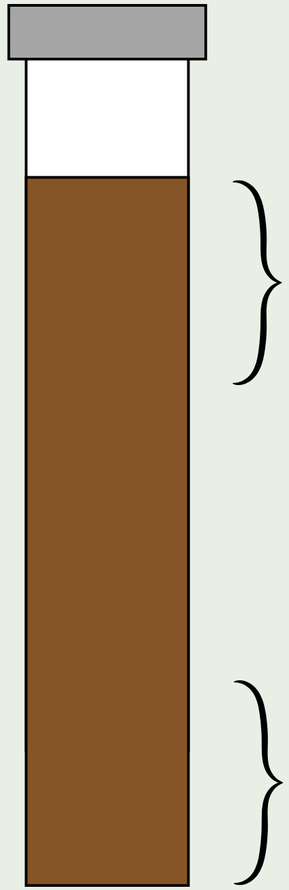


average age ~10 years

average size ~220m

initial results

carbon content doesn't differ significantly between horizons but does differ through time



TOP

Subsample from top 5cm

1.672%

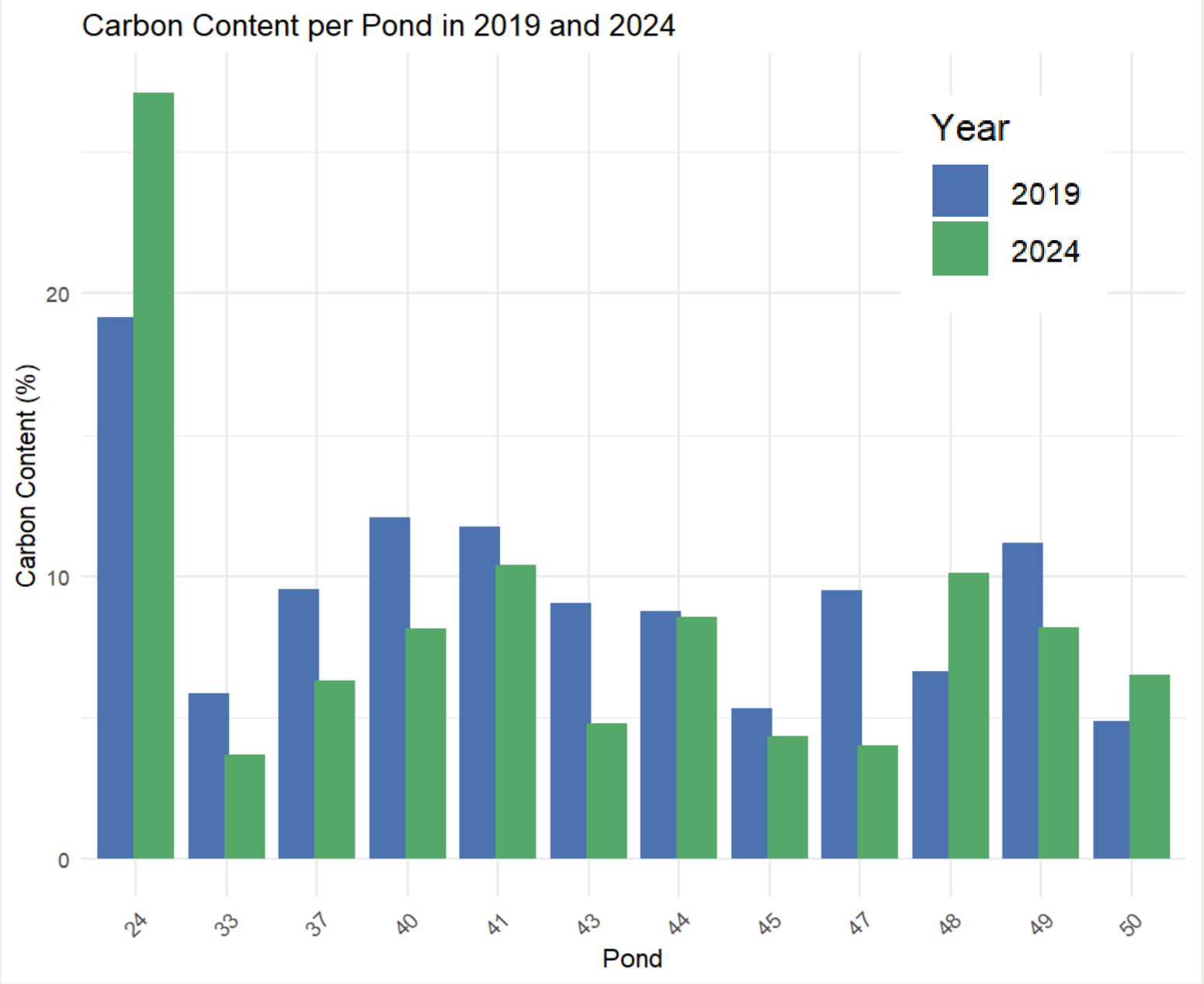
average C

BOTTOM

Subsample from bottom 5cm

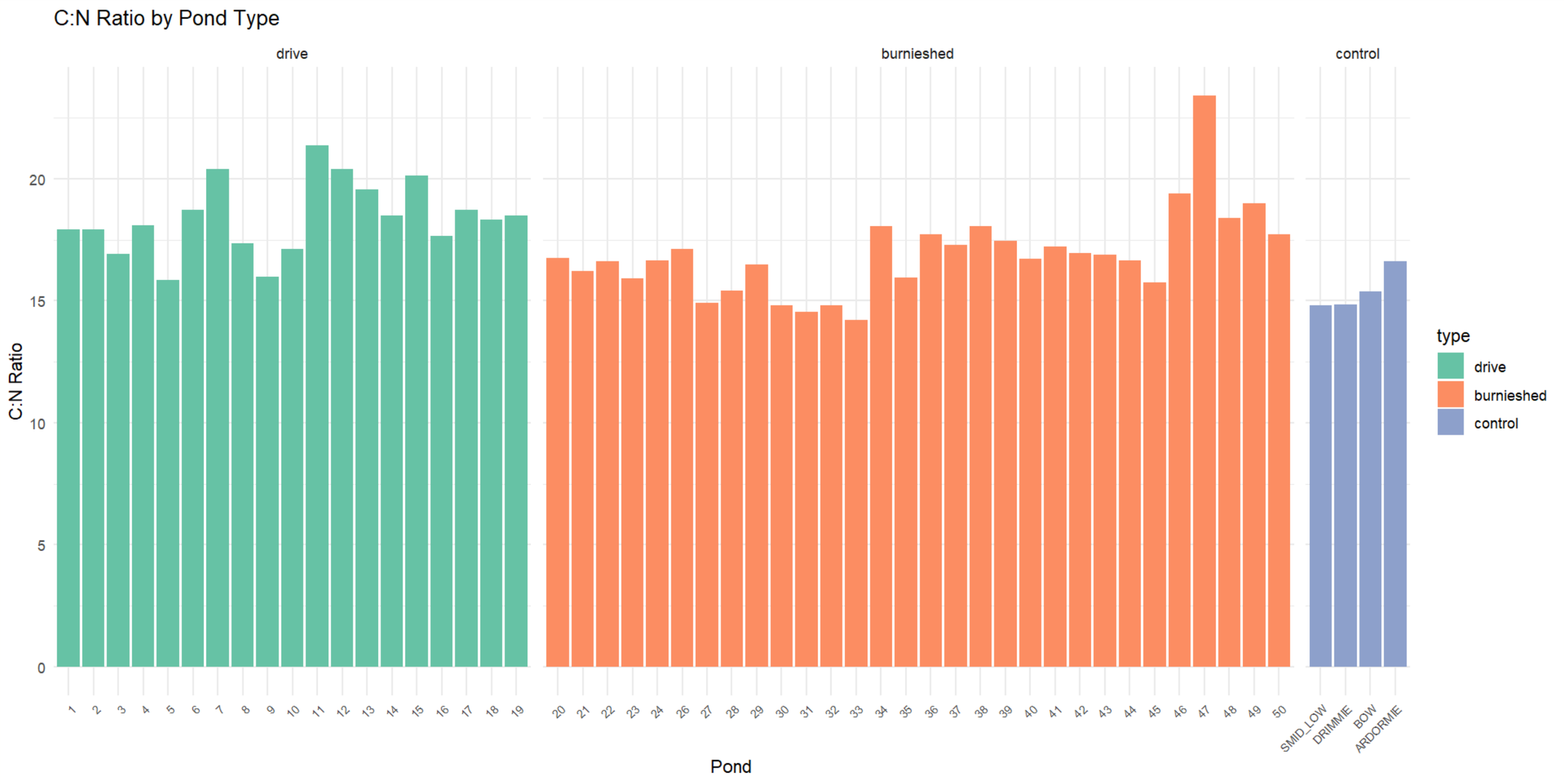
1.509%

average C



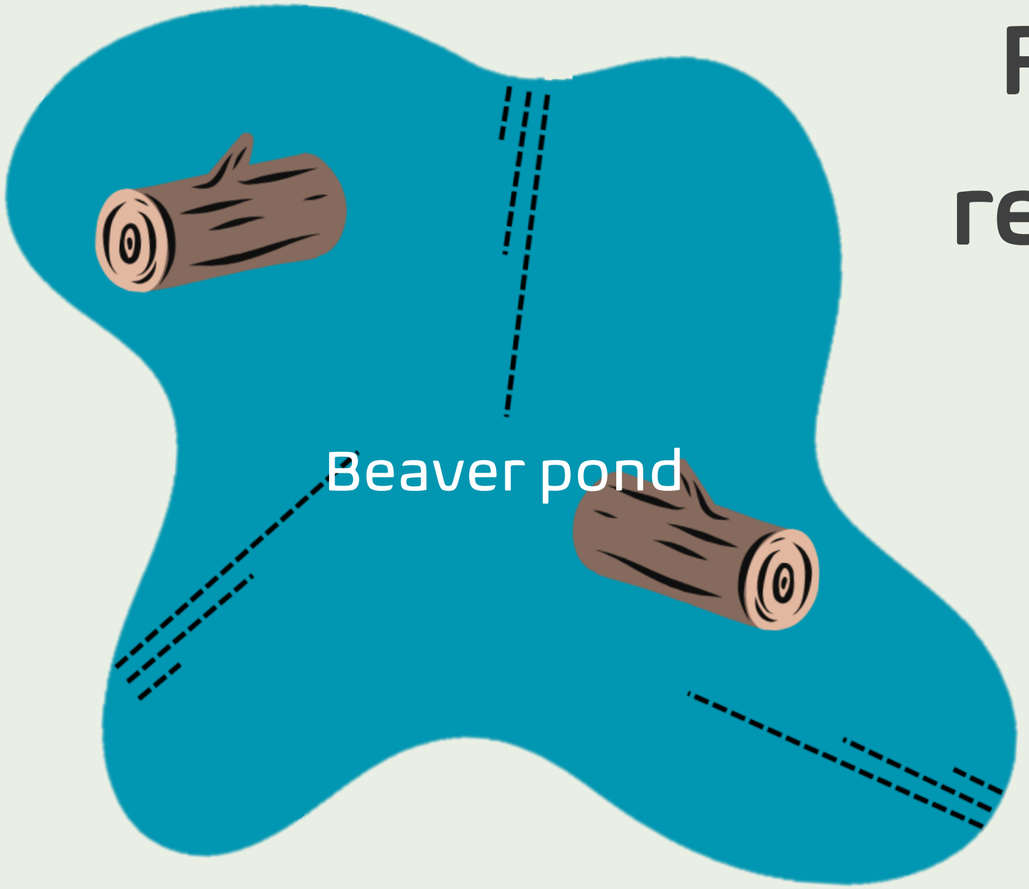
initial results

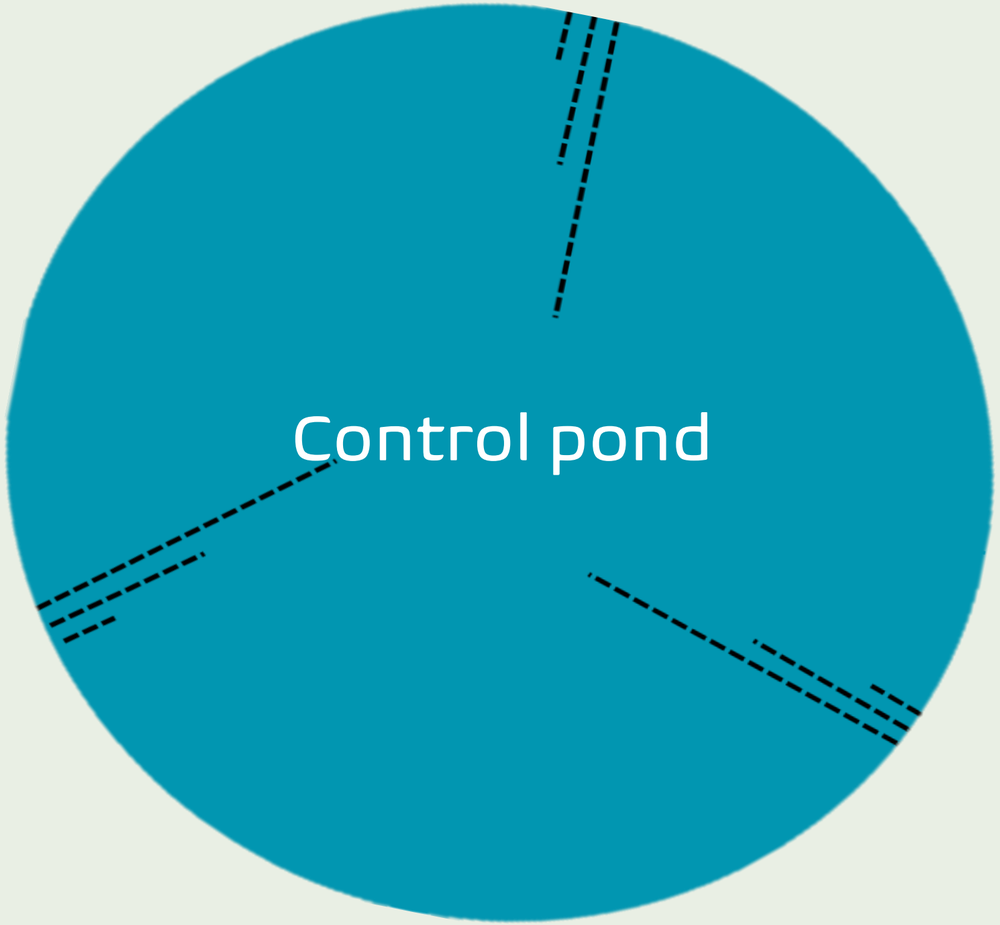
C:N ratios vary across ponds

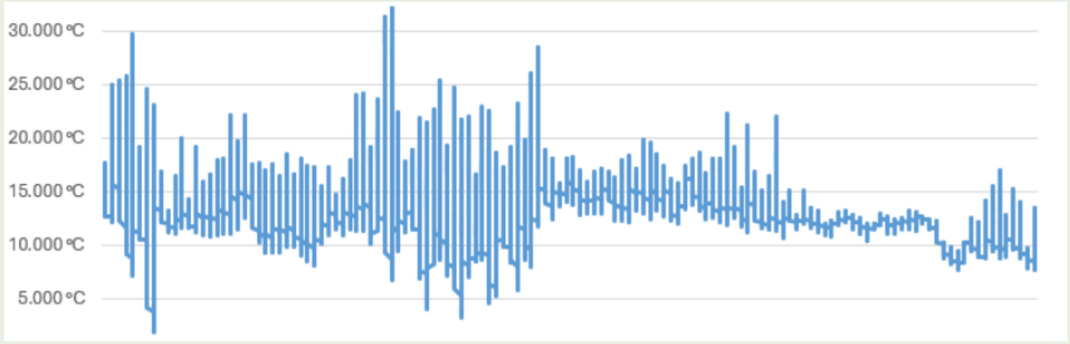


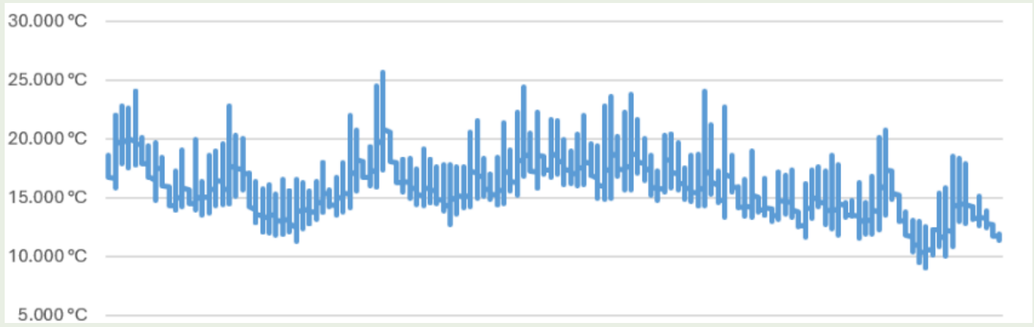
Further Research Plans

Future research









Carbon storage in beaver wetlands is **complex** and **dynamic**

More research is needed to unpack these complexities within different temporal and spatial contexts

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