

PROJECT TITLE: Carbon fluxes associated with Beaver activity in the River Tamar catchment

Supervisors:

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Project keywords: (River catchment, carbon, carbon sequestration, beavers, chemistry, nutrients, ecosystem engineer, nature-based solution)



Extent of the River Tamar catchment (yellow), approximate position of River Tamar (red dashed line)



Wetlands created by beaver activity

Proposed start date: 4th July 2022

Project description

During this project you will make measurements of dissolved, particulate and gaseous carbon to investigate how it is stored and released by wetlands created by beaver activity. Your objectives will be to collect samples and make measurements upstream, downstream and within areas of beaver activity to assess how carbon storage is impacted in this highly dynamic ecosystem.

After a week of personal research and introductions to the team and laboratories you will take part in fieldwork to collect samples of water, soils/sediments and air. This will involve extended periods of time working in wetlands and alongside rivers and the estuary of the Tamar.

Over the next few weeks, collected samples will be analysed via CHN and IRMS to determine: particulate carbon and nitrogen content; dissolved organic carbon and carbon dioxide. Dissolved nutrient concentrations will be measured via colourimetry.

Once all data is available you will be able to investigate how carbon and nutrients in river water are modified by beaver activity and will be expected to report your results in an appropriate manner which can include poster or report.

The research group have regular weekly meetings to which you will be invited to attend and at which you could make your final presentation at the end of the project.

Work schedule:

1 week: Desk work at PML

2 weeks: Field work

4 weeks: Lab work

1 week: Report, presentation or poster work

Candidate requirements

This project is suitable for somebody with a background in environmental sciences and who has some knowledge and experience of analytical chemistry.

Background reading and references

Thompson, S. A., Vehkaoja, M., Pellikka, J. and Nummi, P. Ecosystem services provided by beavers *Castor* spp. *Mammal Review*. 51, 1 (2020)

Nummi, P., Vehkaoja, M., Pumpanen, J. and Ojala, A. Beavers affect carbon biogeochemistry: both short-term and long-term processes are involved. *Mammal review*. 48, 4 (2018).

Puttock, A., Graham, H. A., Caless, D. and Brazier, R. E. Sediment and nutrient storage in a beaver engineered wetland. *Earth Surface Processes and Landforms*. 43, 11 (2018)