

Forest manipulation experiment reveals divergent controls on the sources and age of lateral DOC and CO₂ export

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1 Introduction

1.1 General Context

- Lateral C export is a significant fraction of watershed C balance.
- Forested catchments contain a large OM storage (Ledesma et al. 2013)
- LCE and NEE are connected over long timescale, by hydrology (Öquist et al. 2014)

1.2 Research Question

What are the controls over the sources and age of lateral CO₂ and DOC export in forested catchments? Can a forest manipulation experiment (forest clearcut and ditch cleaning) inform us on the controls of these C sources?

1.3 Hypothesis

The CO₂ source and age is more closely linked to the forest C sink (A. Campeau et al. 2019), so clearcutting the forest should have an impact on C sources and age

The DOC source and age is linked to discharge (Audrey Campeau et al. 2017) or water table position (A. Campeau et al. 2019), so changes in watershed hydrology, caused by clear-cutting and draining, should change the source and age of DOC.