Winter conditions alter the character and reactivity of dissolved organic carbon at the soil-stream interface

Panneer Selvam, Balathandayuthabani; Laudon, Hjalmar; Berggren, Martin

2013

Link to publication

Citation for published version (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

• Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
• You may not further distribute the material or use it for any profit-making activity or commercial gain
• You may freely distribute the URL identifying the publication in the public portal

Take down policy
If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.
Dissolved organic carbon (DOC) is a major driver of greenhouse gas evasion from inland waters and its concentrations have systematically increased in northern aquatic systems in recent years. Studies have revealed that longer and colder winters result in higher DOC concentrations in boreal riparian soils and in streams during the subsequent spring and summer. However, little is known about the climate change influence on the character of DOC and on its reactivity. We conducted a study of riparian soils in northern Sweden, involving three different experimental plot-scale treatments: less soil frost (insulated), more soil frost (exposed; snow removal) and control. To understand the DOC character and reactivity, soil solution samples were analyzed using fluorescence parallel factor modeling, specific UV absorbance, plus bio- and photo-degradation experiments. DOC from soils with reduced frost had distinct chemical properties and was less biologically reactive compared to DOC from the other soils. Our study suggests that change in climate to milder winters not only leads to lower DOC export, but also to lowered reactivity of the DOC that is exported from shallow riparian soils.