**Poster Presentation**
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# Pan-Arctic modeling of permafrost DOC and its lateral transport and evasion in a global land surface model

**Bowring, Simon P.K.* (1); Lauerwald, Ronny (2); Guenet, Bertrand (1); Ciais, Philippe (1)**
1: Laboratoire des sciences de climat et de l'environnement (LSCE), Gif-sur-Yvette, France; 2: Department of Engineering and Mathematics, Laver Building, University of Exeter, UK

The modelled production, transport and atmospheric release of dissolved organic carbon (DOC) from high-latitude permafrost soils into inland waters and the ocean is explicitly represented for the first time in the land surface component (ORCHIDEE) of a CMIP6 global climate model (IPSL). This work merges two models that are able to mechanistically simulate complex processes for 1) snow, ice and soil phenomena in high latitude environments, and 2) DOC production and lateral transport through soils and the river network, respectively, at 0.5° to 2° resolution. We present results for the Pan-Arctic and Eurasia, with a focus on the Lena River basin, and show that soil DOC concentrations, their riverine transport and atmospheric evasion are reasonably well represented as compared to observed stocks, fluxes and their respective seasonality. Surface warming caused by anthropogenic climate change can be reasonably expected to destabilize permfrost stores via microbial or hydrological mobilization following thaw, and as the permafrost line migrates pole-ward over time (Schuur et al., 2015). Most global climate models do not represent the unique permafrost soil environment and its respective processes. This significantly contributes to uncertainty in estimating their responses, and that of the planet at large, to warming. The riverine component of this ‘boundless carbon cycle’ is likewise little-recognised in global climate modelling (Regnier et al., 2013). Hydrological mobilisation to the river network results either in sedimentary settling or atmospheric ‘evasion’, the latter amounting to 480-850TgC $yr^{-1}$ globally (Lauerwald et al., 2015). Potential feedbacks owing to such a response are of particular relevance, given the magnitude of the permafrost carbon pool. Our work aims at filling in these knowledge gaps, and the response of these DOC-related processes to thermal forcing.

Poster Session (see poster session schedule)