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## The CO<sub>2</sub> balance of a boreal fen is more sensitive to drought than surrounding forests

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The boreal zone is one of the most carbon-dense biomes in the world and is comprised of a highly interconnected mosaic of forest and wetlands which are warming at a rate several times the global average with extreme weather events, such as droughts, becoming increasingly common. At the ecosystem scale, both forests and peatlands are often vulnerable to drought-induced carbon loss, however, the relative resilience of these two ecosystems within the boreal landscape is not well understood. Here we study the effect of the 2018 drought on CO<sub>2</sub> fluxes in two boreal forests and a boreal peatland within <20km radius, i.e. experiencing the same weather conditions. The peatland displayed the strongest response to the drought, with the site becoming a net annual source for CO<sub>2</sub> for the first time in 17 years, with the CO<sub>2</sub> sink slow to recover after the drought broke. In contrast, the response of the forests was mixed, a spruce/pine forest on glacial till remained unaffected by the drought, whereas a nearby pine forest, situated on drier sandy soil, responded strongly to vapour pressure deficit and declining soil moisture content, decreasing with CO<sub>2</sub> uptake weakening, but still allowing the forest to function as a CO<sub>2</sub> sink. In contrast to the bog, the pine forest CO<sub>2</sub> sink quickly recovered following the end of the drought. We conclude that boreal peatlands are likely to be the most vulnerable component of the boreal landscape to drought and that soil type is likely to play a role in regulating the response of boreal forests.