Geophysical Research Abstracts
Vol. 16, EGU2014-4589, 2014
EGU General Assembly 2014

Planned burning vs. wildfire impact on soil methane flux – implications for forest fire management

Benedikt Fest (1), Tim Wardlaw (2), Stephen Livesley (3), and Stefan Arndt (1)

(1) Department of Forest and Ecosystem Science, The University of Melbourne, Richmond, Australia (bfest@unimelb.edu.au), (2) Forest Research & Development Branch, Forestry Tasmania, Hobart, Australia, (3) Department of Resource Managment and Geography, The University of Melbourne, Richmond, Australia

Soils in forests ecosystem represent the largest land based methane sink and therefore provide an important ecosystem service. Fire can alter soil properties linked to soil methane uptake potential but this has rarely been studied to date. We measured soil methane flux in a dry-sclerophyll eucalypt forest (Victoria, Australia) that had different planned burning frequency treatments applied (every 3 and 10 years) in the last 27 years. We also studied soil methane flux along a wildfire chronosequence spanning over 200 years (Tasmania, Australia). Our data show that planned fires and wildfires had contrasting effects on methane uptake of the forest soils. The repeated planned burning treatments did not alter methane flux patterns of forest soil. In the wildfire chronosequence the methane uptake capacity of the forest soil was closely related to structural changes during stand development likely linked to stand water use, with drier forest stands having greater methane uptake. Our data demonstrate that unmanaged wildfire can have substantial impact on the methane sink capacity of forest ecosystems in Australia while the less intense planned fires have little effect. The effects of fire were more related to changes in stand structure rather than impacts of fire on soils per se.