Where now for forest trace gas research?

Vincent Gauci
Birmingham Institute of Forest Research, University of Birmingham, Birmingham, United Kingdom of Great Britain and Northern Ireland (v.gauci@bham.ac.uk)

Forests play an important role in the exchange of radiatively important trace gases with the atmosphere. The past decade has seen remarkable growth in interest in this research area with studies yielding ever-greater insight into both the importance of these exchanges and the fundamental processes of exchange in ecosystems that are vulnerable and highly responsive to agents of global change. I will provide an overview of previous studies that are now global in coverage, which have shown that in both temperate and tropical wetland and upland forests, tree stems constitute significant surfaces of exchange of both methane (CH4) and nitrous oxide (N2O). Considering studies spanning diverse forest biomes across the full latitudinal range of forest extent, leads to emergent questions that this new and developing pan-disciplinary coalition of researchers are increasingly well able to address. Given that forests are both sensitive and highly responsive to agents of global change at a range of scales, there is a need to further characterise the fundamental functioning of exchange processes in forests e.g. with respect to hydrology, climate and the biology of microbes and the trees and soils they inhabit. Such insight will help with planning the next generation of integrative studies, at scale, to enable the role of forests in trace gas cycling in a changing world to be characterised.