Biomass burning emissions since the pre-industrial and into the future; progress and challenges

Guido van der Werf[1] and Margreet van Marle[2]

[1]Wageningen University and Research, Meteorology and Air Quality, Wageningen, Netherlands (guido.vanderwerf@wur.nl)
[2]Deltares, Delft, the Netherlands

Fires impact a suite of radiative forcing agents but fire is one of the most challenging sources of emissions to model due to a large degree of stochasticism and a wide range of climatic and human influences that can both increase and decrease the occurrence of fires. Although many Earth system models now account for fires, there is still a need for a coherent and consistent community dataset to intercompare and constrain models. We developed a historic dataset combining satellite data over the past two decades with proxy data and fire models for use in CMIP6. Since then, new satellite data has indicated that global burned area may be much higher than previously thought and several regional datasets have shed light on the question whether fire emissions are now higher or not than in the pre-industrial era. We show how the latest insight and developments will be used to construct an updated fire emissions dataset for CMIP7, and show which fire categories carry the largest uncertainty, both for the past and into the future.