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## Water vapor release from biomass combustion

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**Abstract.** We report on the emission of water vapor from biomass combustion. Concurrent measurements of carbon monoxide and carbon dioxide are used to scale the concentrations of water vapor found, and are referenced to carbon in the biomass. The investigated fuel types include hardwood (oak and African musasa), softwood (pine and spruce, partly with green needles), and African savanna grass. The session-averaged ratio of H<sub>2</sub>O to the sum of CO and CO<sub>2</sub> in the emissions from 16 combustion experiments ranged from 1.2 to 3.7, indicating the presence of water that is not chemically bound. This non-bound biomass moisture content ranged from 33% in the dry African hardwood, musasa, to 220% in fresh pine branches with needles. The moisture content from fresh biomass contributes significantly to the water vapor in biomass burning emissions, and its influence on the behavior of fire plumes and pyro-cumulus clouds