



Global fire history and related carbon budget for the 20th century

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Vegetation fires can have both direct (combustion) and long term indirect effects on the carbon cycle. Every fire influences the ecosystem carbon budget for many years, as a consequence of internal reorganization, decomposition of dead biomass and regrowth. However, it's hard to get fire data at the global level before the satellite era, so many assumptions were made on the historical global carbon budget due to vegetation fires.

We present here a reconstructed fire history, at a 1x1 degree resolution along the 20th century based on historical statistics and assumptions on fire trends. We explain how we faced differences in statistics terminology, statistics mismatch, and absence of data to produce a database for the 1990's and how we worked backwards to reconstruct the fire history. This reconstruction was based on published data when available. Where it was not, we extrapolated from land use practices, qualitative reports and local studies, such as tree ring analysis.

We estimate that an average 608. 106 ha burned at the end of the 20th century, mostly in savannas, and that temperate and boreal forests experienced a significant decrease as a consequence of fire suppression policies since the 1930's. on the contrary, burnt areas exponentially increased in the tropical forest since the 1970's. We deduced from this database the global trend of fire CO₂ emission from biomass burning along the 20th century, and the potential present carbon sink from

biomass reconstruction.