



How much Carbon Monoxide was emitted by the Peat Fires in Indonesia in 2015?

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Large fires erupted in Indonesia during the 2015 El-Niño event, which emitted a substantial amount of carbon monoxide (CO). This CO was observed from space by the MOPITT and IASI satellite instruments. We estimate CO emissions over Indonesia and Papua during this fire event based on each of these two satellite datasets, using the inverse modelling framework TM5-4DVAR. Despite differences in measurement technique, vertical sensitivity, spatial coverage, and observed total columns, estimated CO emissions based on MOPITT and IASI have a similar spatial pattern and evolution in time. We find total posterior CO emissions of 112 Tg during mid-August to mid-November using MOPITT data, 20% lower than the IASI-based estimate of 138 Tg.

The estimated CO emissions for each sub-region of Indonesia and Papua are significantly adjusted compared to prior estimates from emission inventories. These prior estimates use space-based observations of Fire Radiative Power (FRP) or burned area to quantify emissions. We show that due to cloud cover and persistent peat burning, large uncertainties are associated with these estimates. We therefore advocate the use of CO satellite data to better constrain fire emission magnitudes and timing.