Improving Smoke Modeling for Exposure Assessment Using New Satellite Products

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Goal
Daily estimates of ground-level PM$_{2.5}$ at high spatial resolution for exposure assessment

Method
Model fire emissions and pass to chemical transport model (CMAQ)

Improvement
Use 5-minute time resolution of GOES-16 fire product to improve temporal allocation of emissions
GOES-16 Fire Radiative Power (FRP) captures overnight blowup
GOES-16 FRP allows for tracking of plume injection height
GOES-16 is improving our ability to model smoke exposure

Thank you!

Susan O’Neill – USFS – HAQAST Tiger Team PI, BlueSky modeling
Chris Schmidt – NOAA – GOES-ABI fire product algorithms
Stephen Reid and Yiqin Jia – BAAQMD – CMAQ modeling
NASA FEER group – FRP-driven emission estimates
Sofiev et al. (2012) – FRP-driven plume injection height methods

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Plume top is not the whole story

Atlas Fire, East of Napa
October 9, 2017

What fraction of the emission are lofted beyond the first model layer?

For smoke that is lofted, what is the plume bottom?