



# Improving spatial and temporal resolution of fire activity through a comprehensive treatment of satellite fire detection efficiency and diurnal cycles



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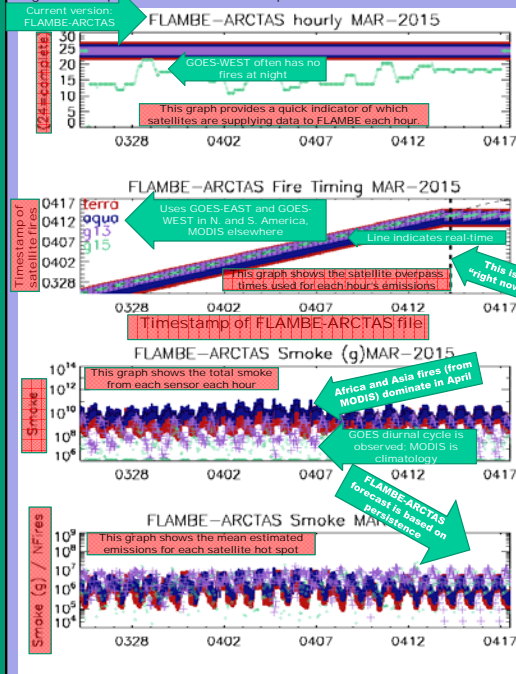
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3) National Research Council, Monterey, CA, USA

## 1. FLAMBE: Globally consistent smoke emissions for aerosol modeling

The Fire Locating and Monitoring of Burning Emissions (FLAMBE) system ingests satellite fire detections in near real time and produces global hourly estimates of smoke emissions from open biomass burning. The FLAMBE hourly emissions are publicly available from NRL. This is an example of the diagnostic output used to monitor the operational FLAMBE model.



## 7. Relevant Papers and Resources

NRL Aerosol webpage: <http://www.cerimr.navy.mil/aerosol-web>

Papers about the FLAMBE emissions model:

Reid JS, Hyer EJ, et al. (2009) Global Monitoring and Forecasting of Biomass-Burning Smoke: Description of and Lessons from the Fire Locating and Modeling of Burning Emissions (FLAMBE) Program. IEEE Journal of Selected Topics in Applied Earth Observations and Remote Sensing 2(3), 144-162.

Papers about satellite fire detections:

Hyer EJ, Reid JS, Prins EM, Hoffman JR, Schmidt CC, Miettinen JT, Giglio L (2013) Patterns of fire activity over Indonesia and Malaysia from polar and geostationary satellite observations. Atmospheric Research 122, 504-519.

Miettinen J, Hyer E, Chis AS, Kwok LK, Liew SC (2013) Detection of vegetation fires and burnt areas by remote sensing in Insular Southeast Asian conditions: current status of knowledge and future challenges. International Journal of Remote Sensing 34(12), 4344-4366.

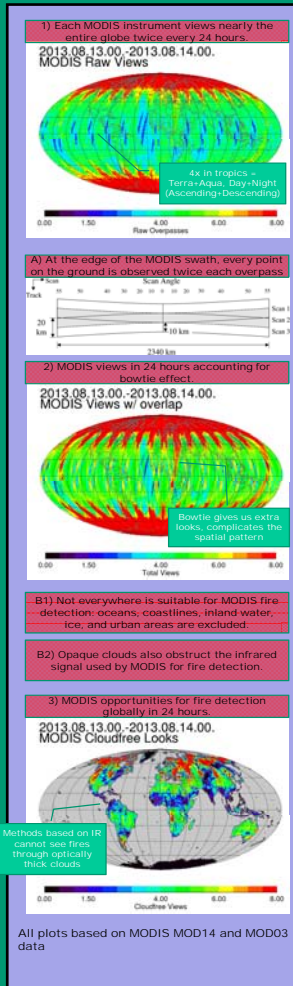
Peterson D, Wang J (2013) A sub-pixel-based calculation of fire radiative power from MODIS observations: 2. Sensitivity analysis and potential fire weather application. Remote Sensing of Environment 129, 231-249.

Peterson D, Wang J, Ichoku C, Hyer E, Ambrosia V (2013) A sub-pixel-based calculation of fire radiative power from MODIS observations: 1. Algorithm development and initial assessment. Remote Sensing of Environment 129, 262-279.

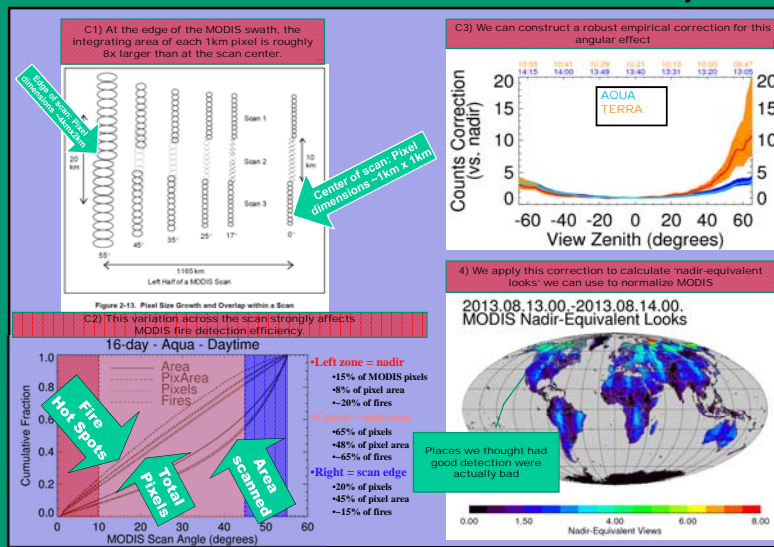
Papers about fire prediction:

Peterson D, Hyer E, Wang J (2013) A short-term predictor of satellite-observed fire activity in the North American boreal forest: Toward improving the prediction of smoke emissions. Atmospheric Environment 71, 304-310.

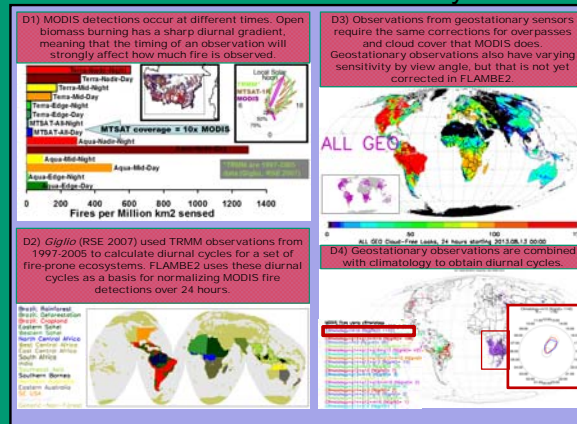
## 2. MODIS Coverage Correction



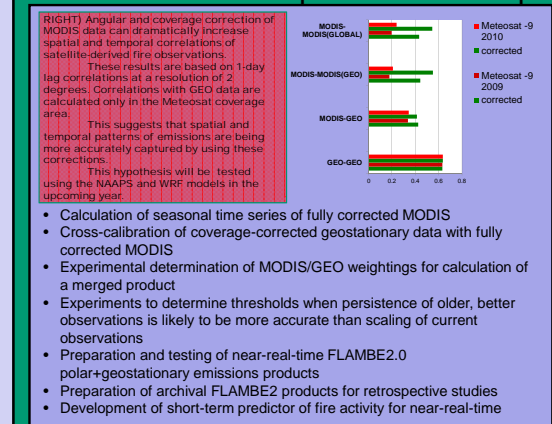
## 3. Correction for MODIS Detection Efficiency



## 4. Calculation of Diurnal Cycle



## 6. FLAMBE2 Development: Next Steps



## 5. MODIS observability

