

Estimating Biomass Burning Emissions using VIIRS Nighttime Satellite data

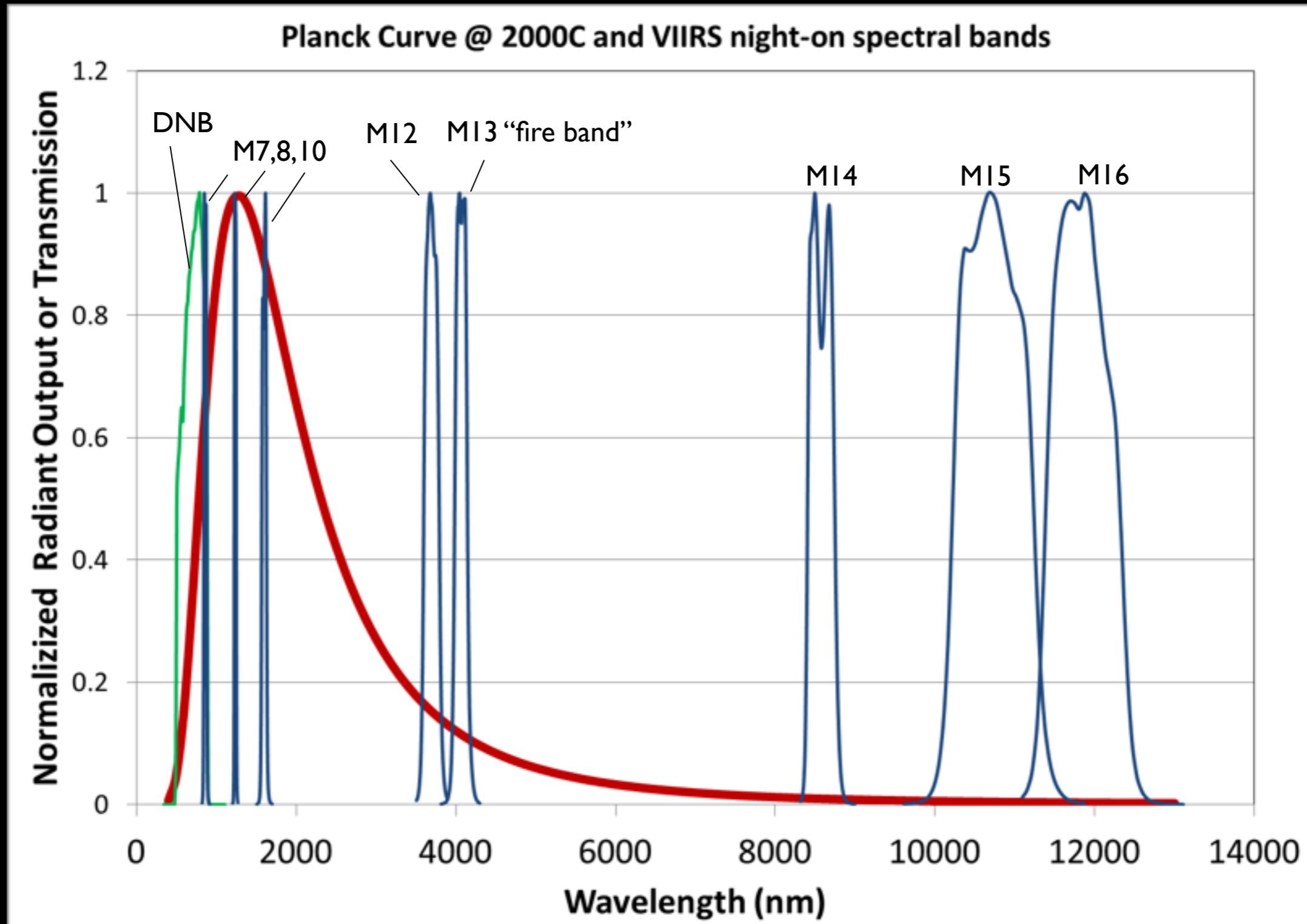
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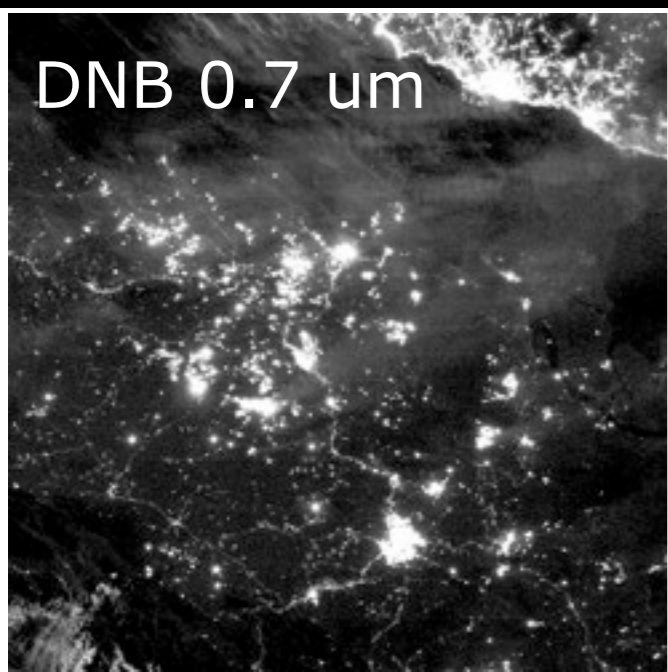
Supported by



What makes nighttime VIIRS data so great for detection of combustion sources?



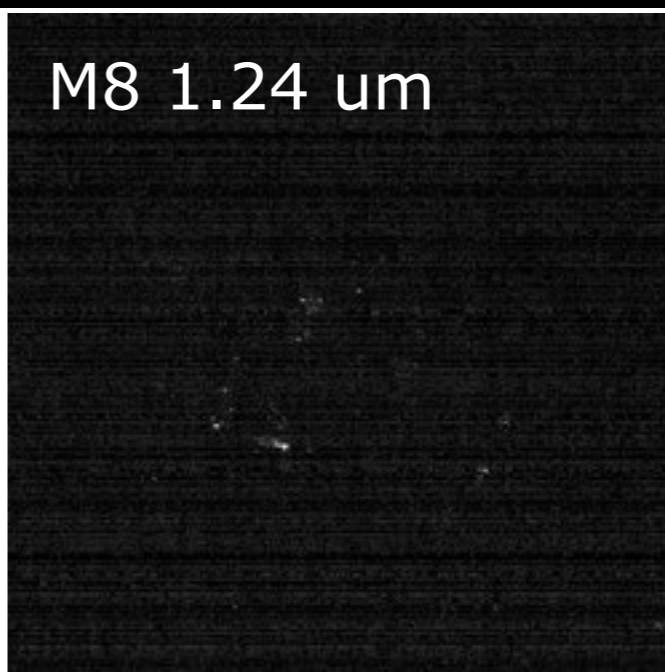
DNB 0.7 μm



M7 0.865 μm

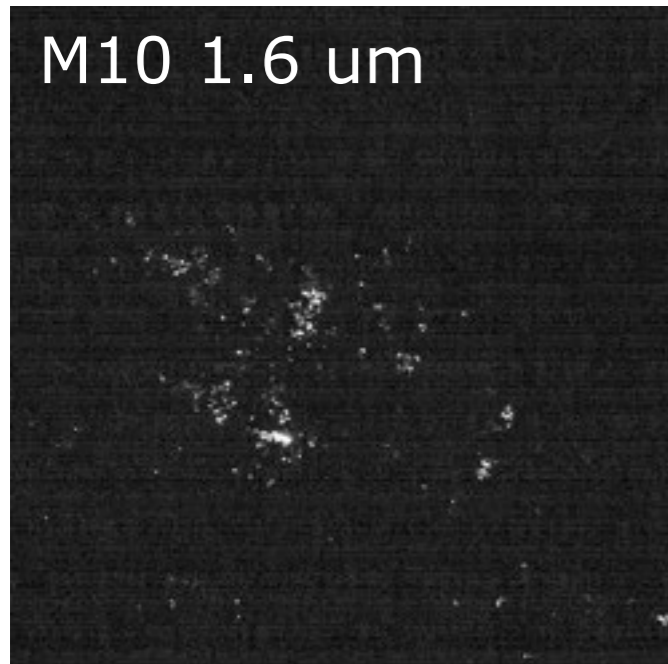


M8 1.24 μm

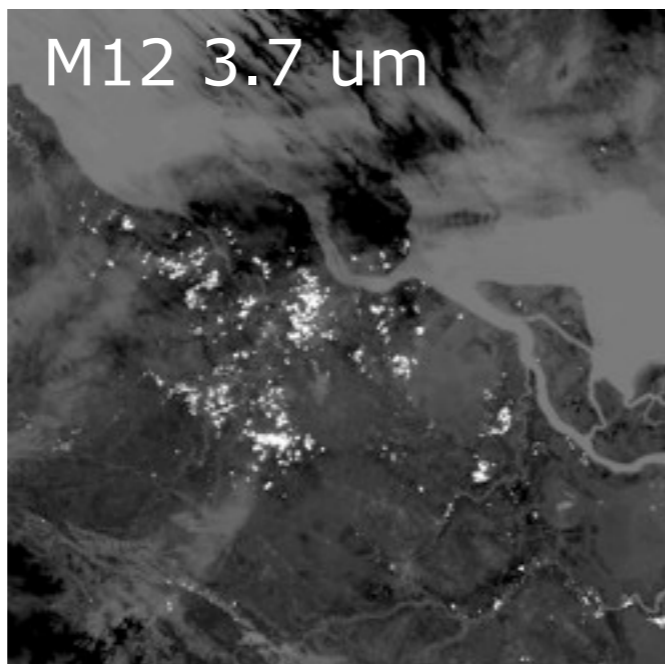


VIIRS Nighttime
Data
Riau, Indonesia
June 19, 2013

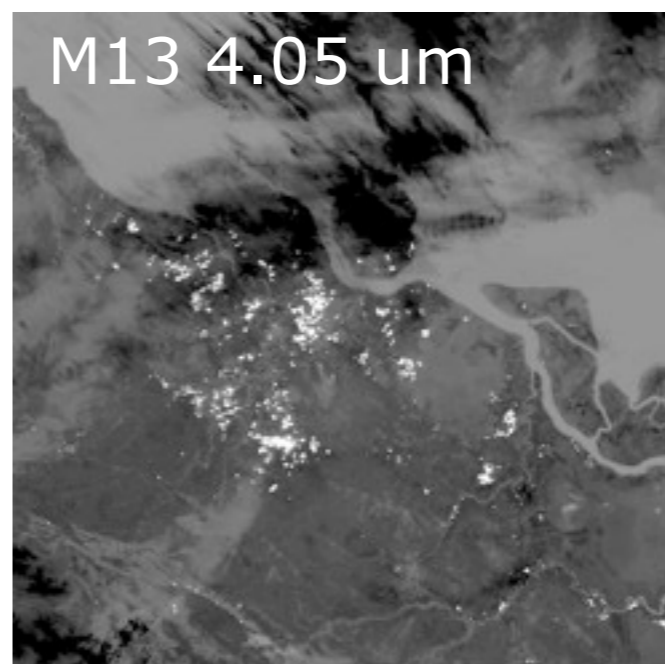
M10 1.6 μm



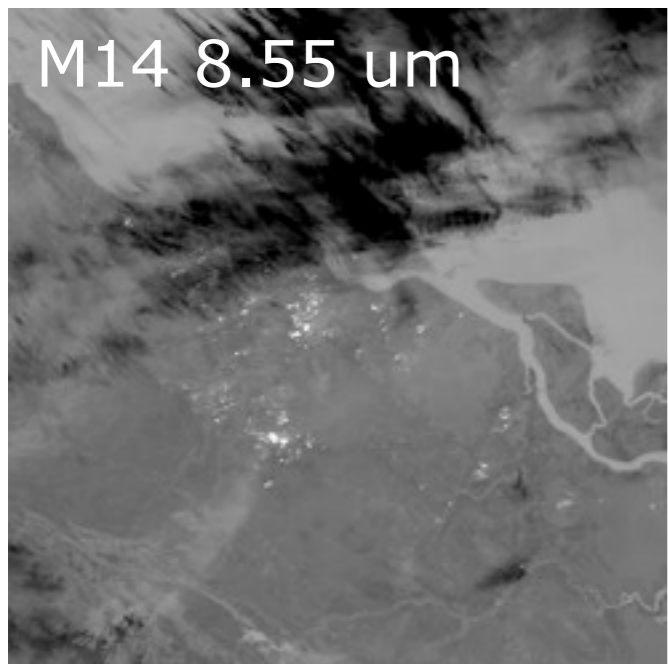
M12 3.7 μm



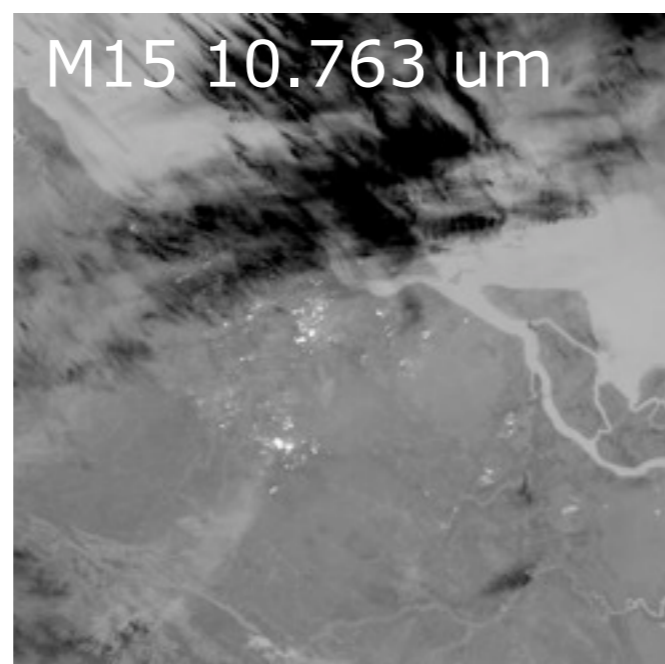
M13 4.05 μm



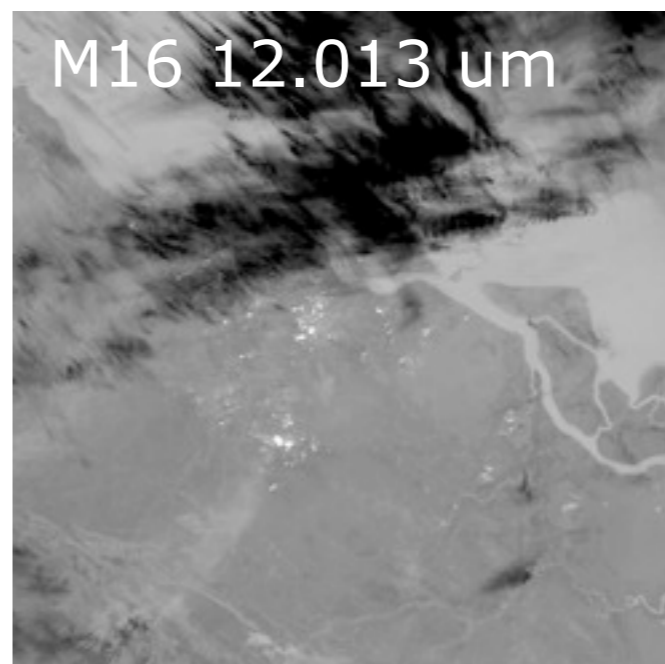
M14 8.55 μm



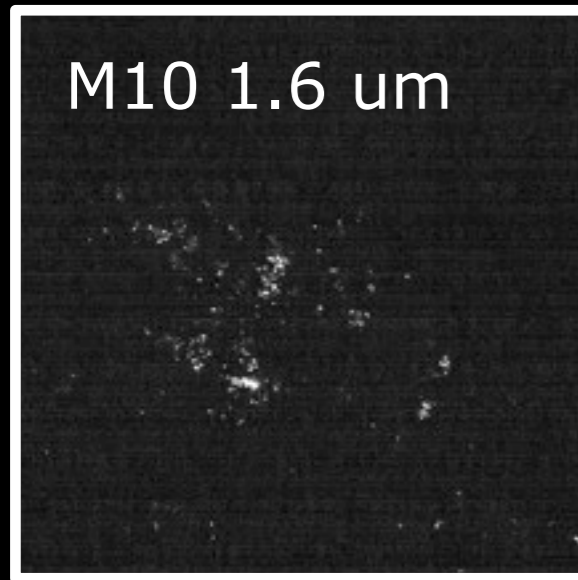
M15 10.763 μm



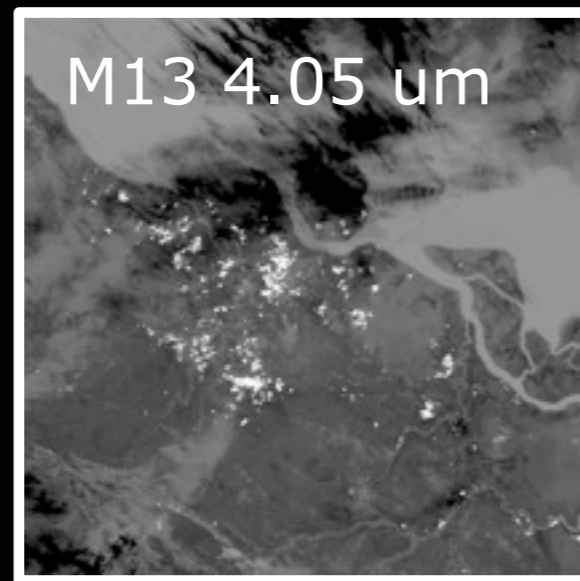
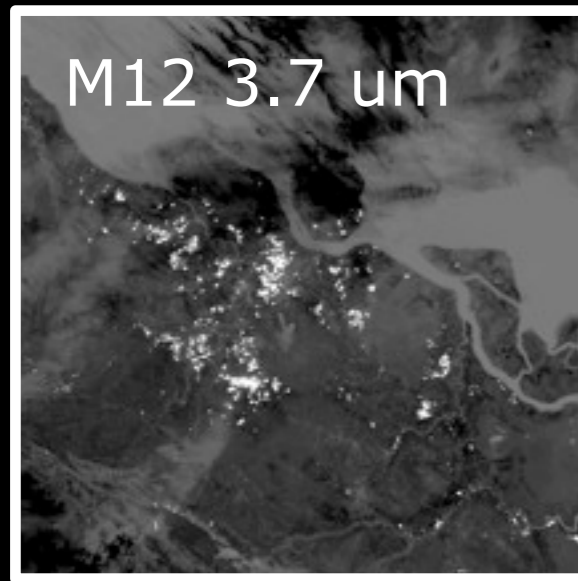
M16 12.013 μm



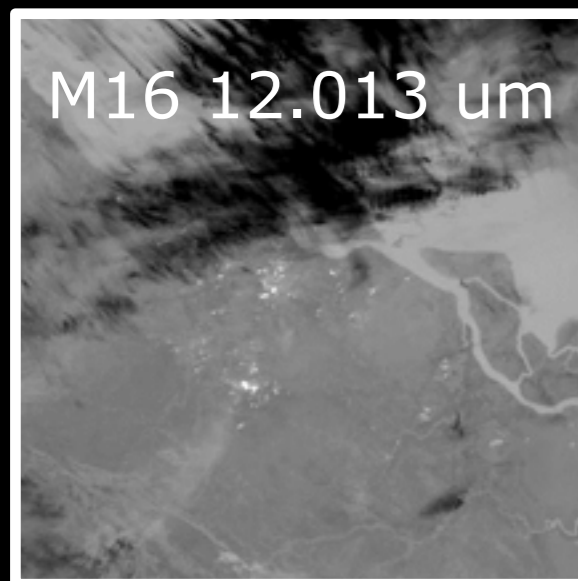
VNF has unique hot pixel detection algorithms



SWIR: M10 (1.6 um) detection threshold set based on background noise (=mean plus four standard deviations). The detected pixels are then checked for detection in M7 & M8.

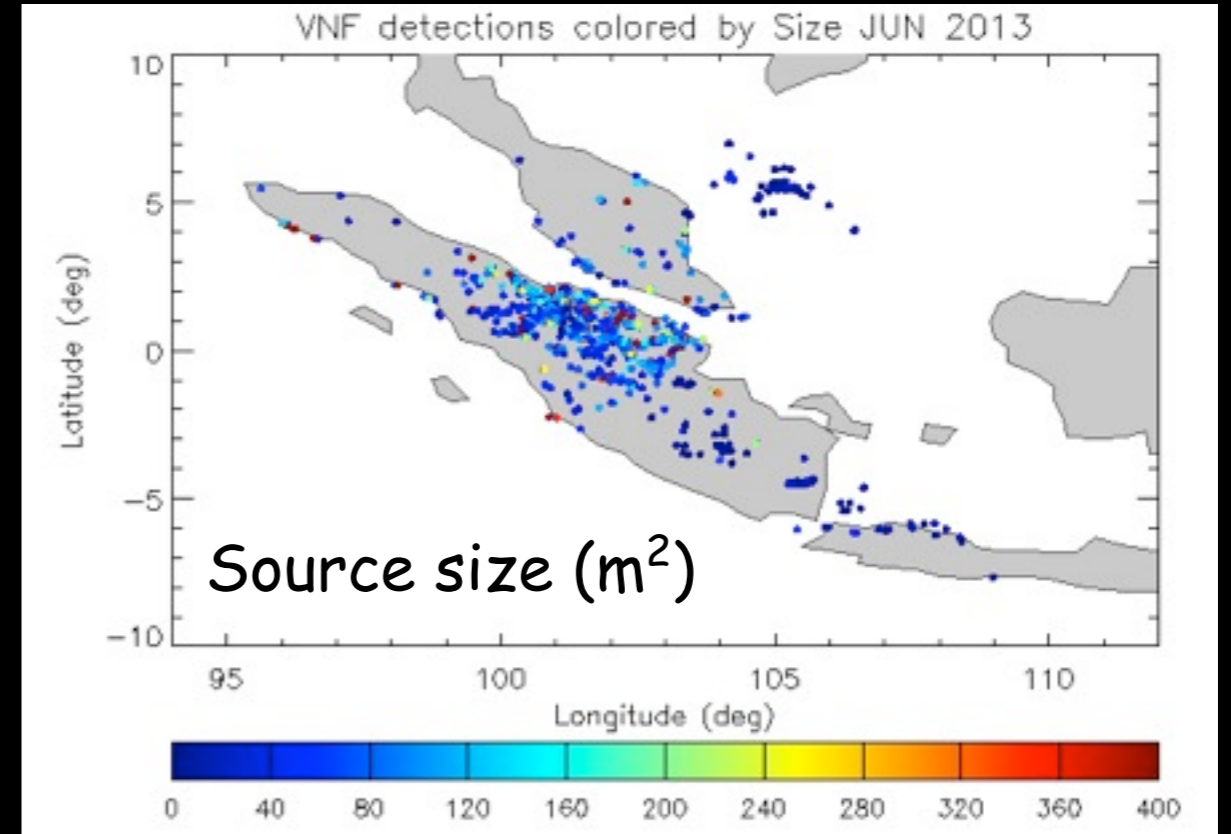
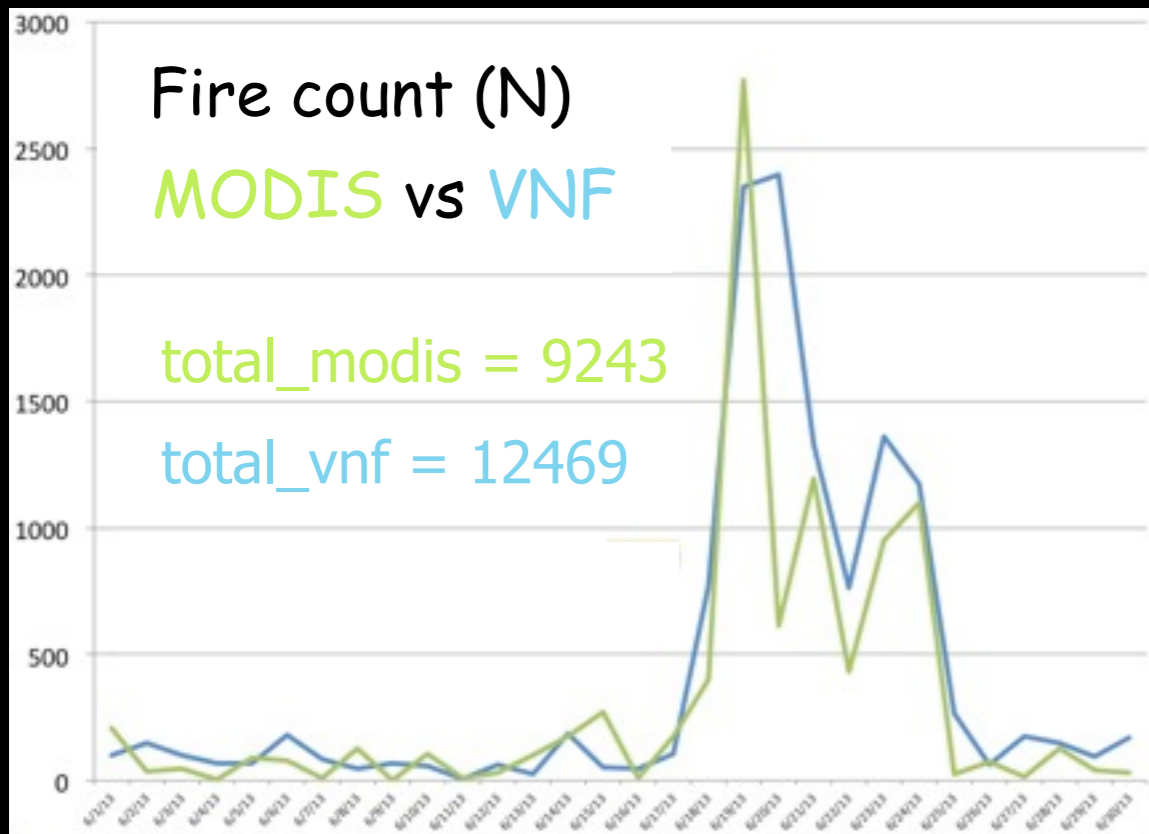
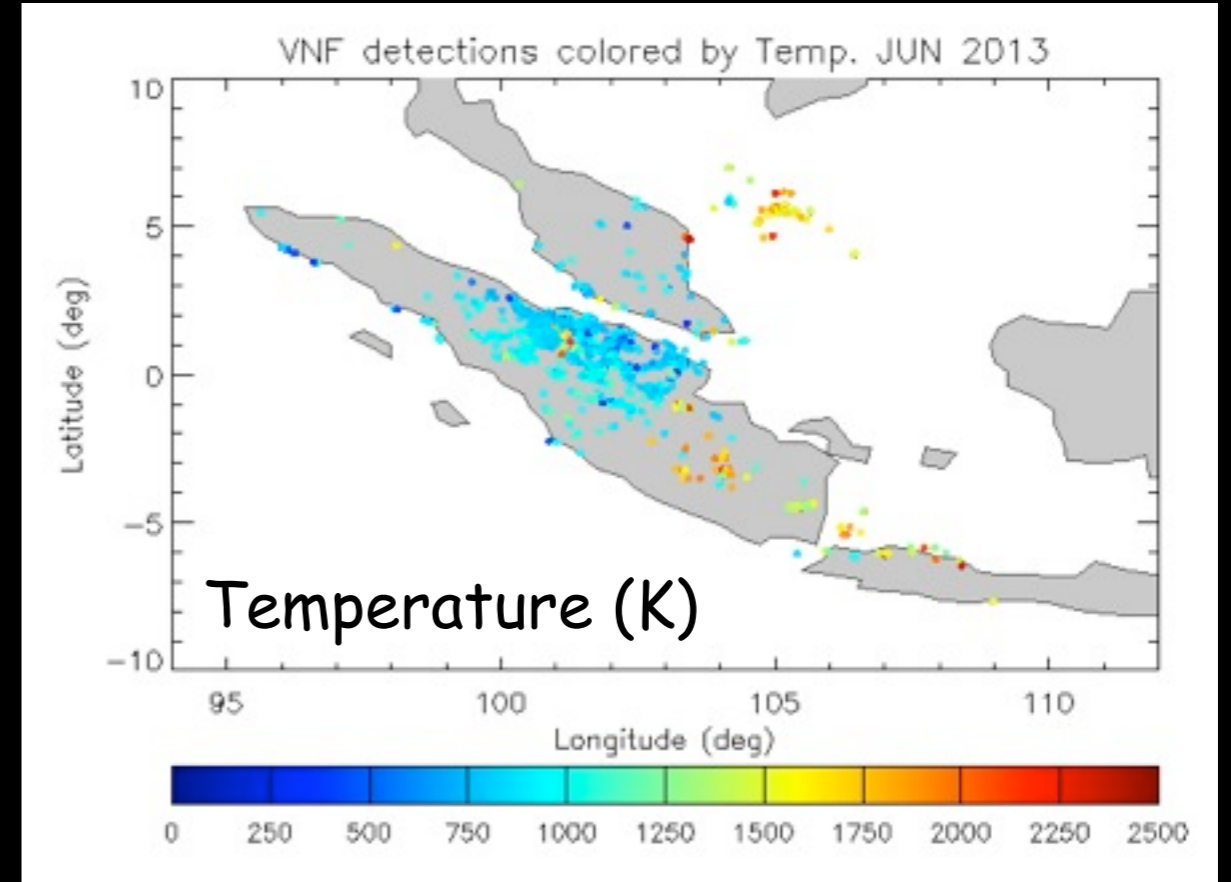
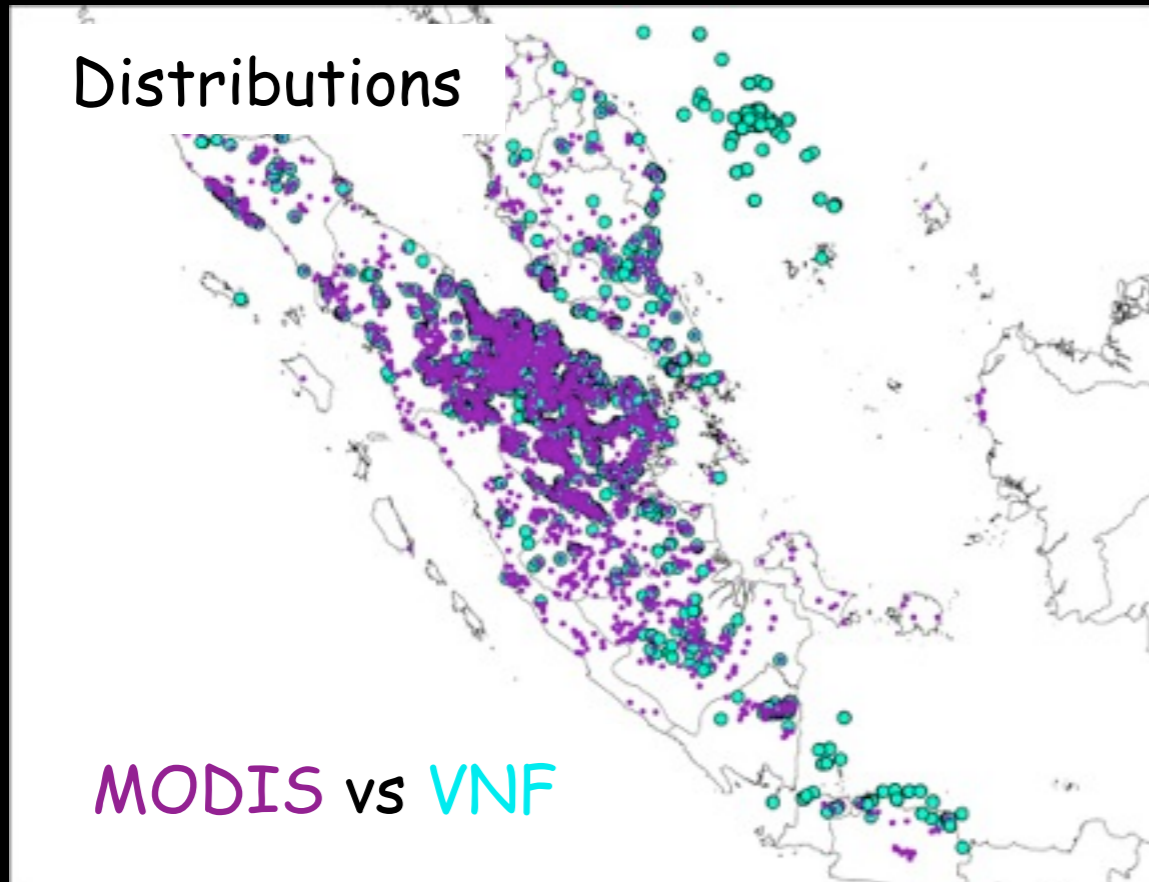


MWIR: M12-M13 (3.8 and 4 um) scattergram analysis identifies background. Hot pixels are the outliers.



LWIR: M16 (12 um) algorithm sets detection threshold as the maximum M16 radiance found for the M12/M13 background pixel set.

VNF combustion detections June 2013



TODO/References/Acknowledgment

- Burnt area estimate - Need more study using other satellite data and local data.
- The inclusion of data from local collaborators - Peat land map and other field data.
- Diurnal behavior of fire - Geostational satellites will be used to parameterize.
- Smoldering fires - Challenging just from the physics...
- Evaluation of emissions (1) - Compare to other existing fire dataset (e.g. GFED)
- Evaluation of emissions (2) - Propagate through transport models.

- VIIRS Nightfire (VNF) - Elvidge et al. (2013) Remote Sensing.
- VNF web - Google NOAA/NGDC Earth Observation Group -> VIIRS
- FINN - Wiedinmyer et al. (2011) Geo. Sci. Model. Dev.
- MODIS Hotspot/Active Fire detection - Available from EOSDIS.
- GFED - van der Werf et al. (2010) Atmos. Chem. Phys.

- TO and FCH are supported by LAPAN, Indonesia.

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