VIIRS Nightfire (VNF)

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The Payne Institute for Public Policy
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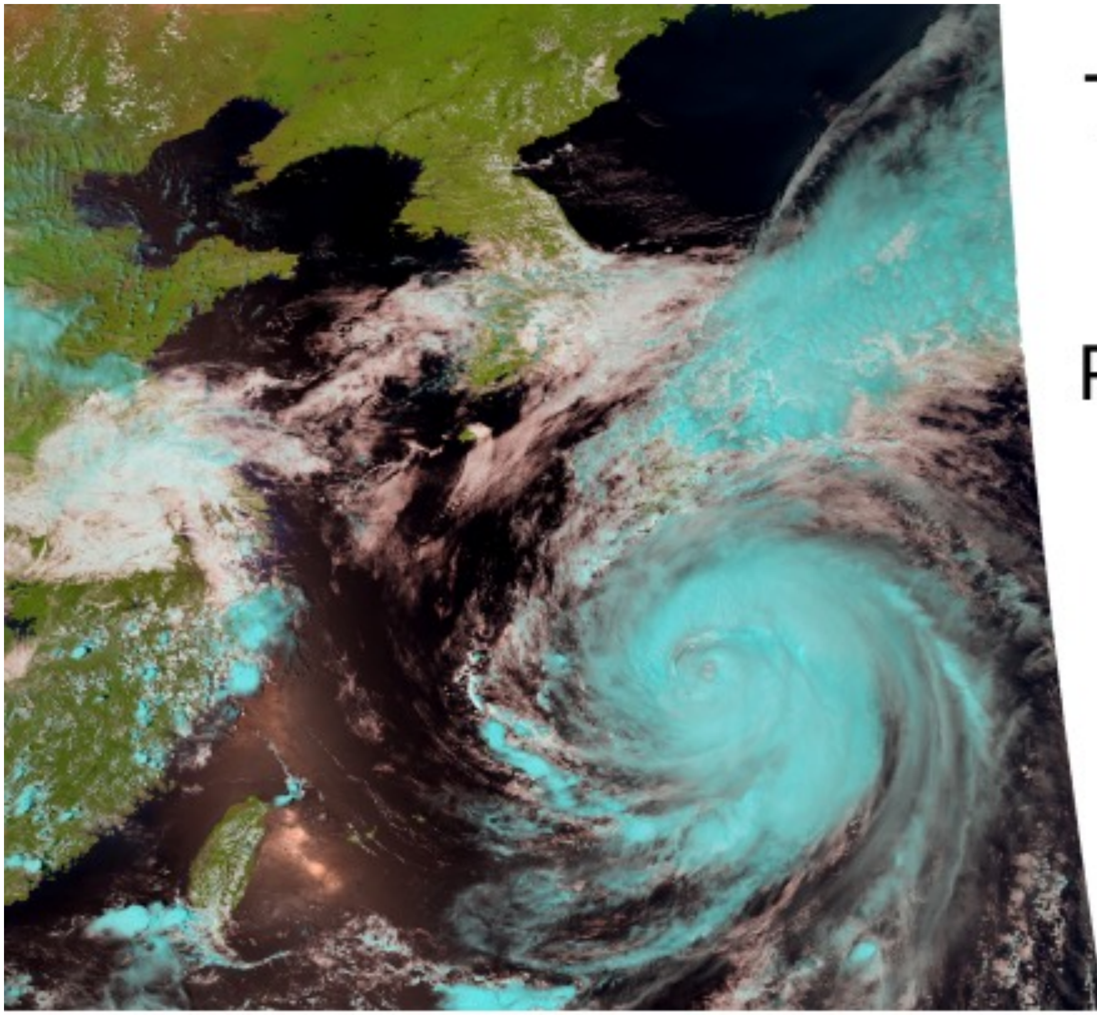
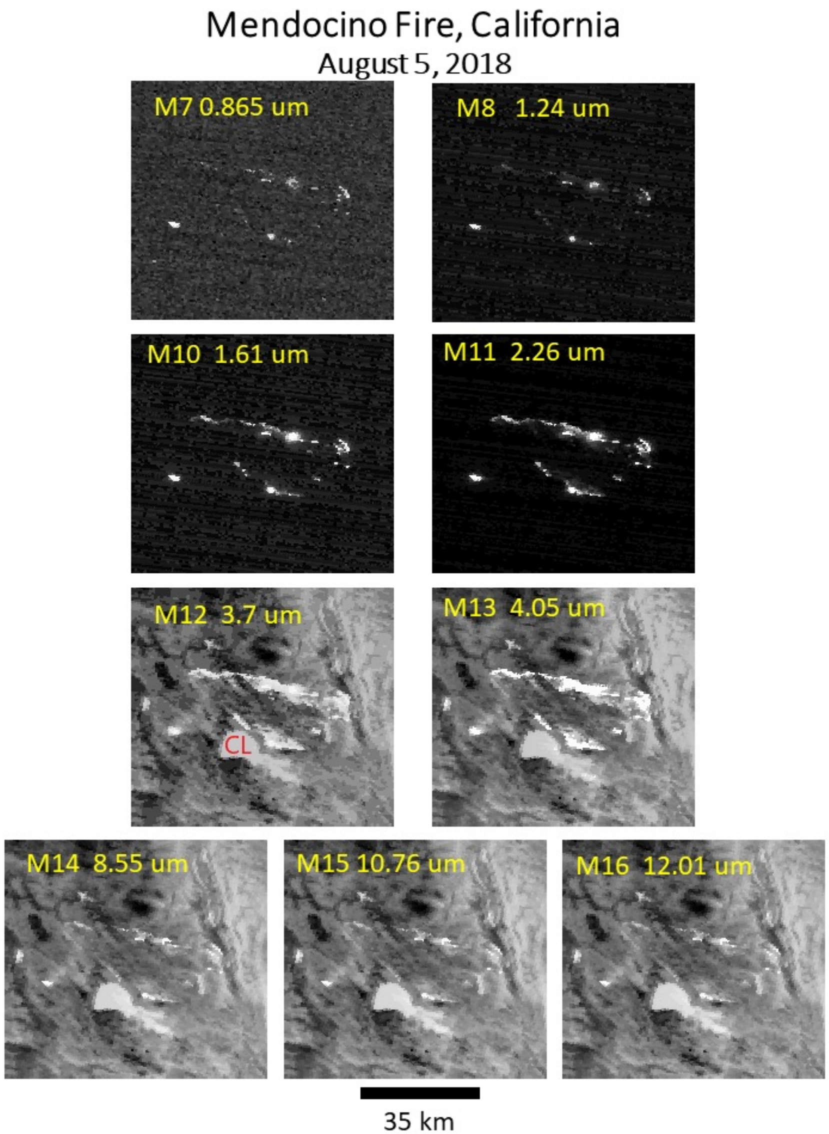
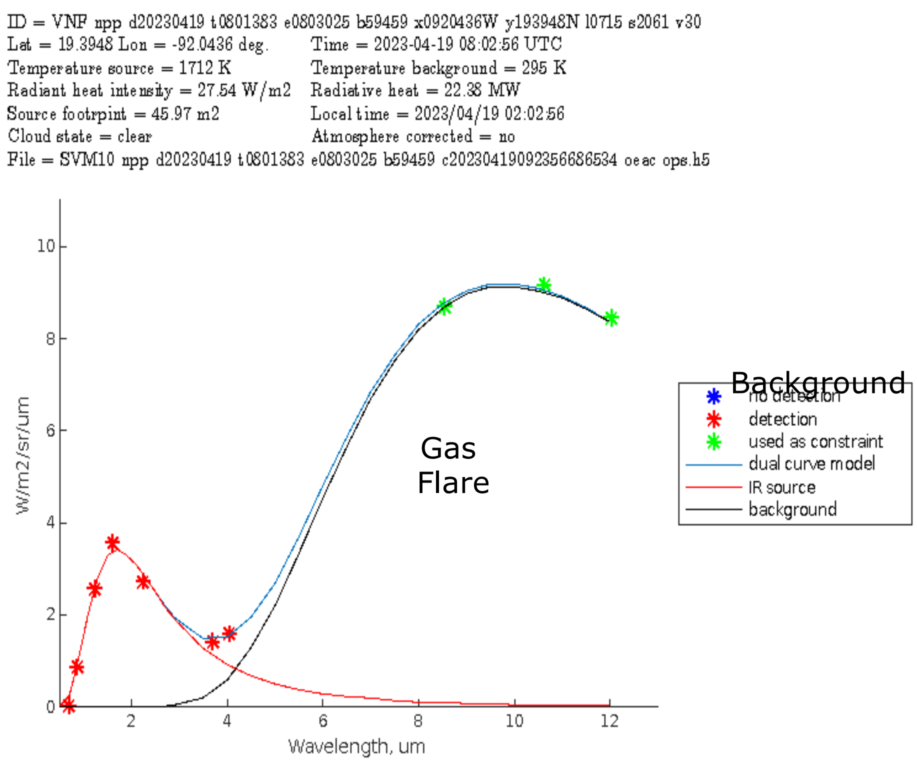


The Visible Infrared Imaging Radiometer Suite (VIIRS) primary mission is weather.



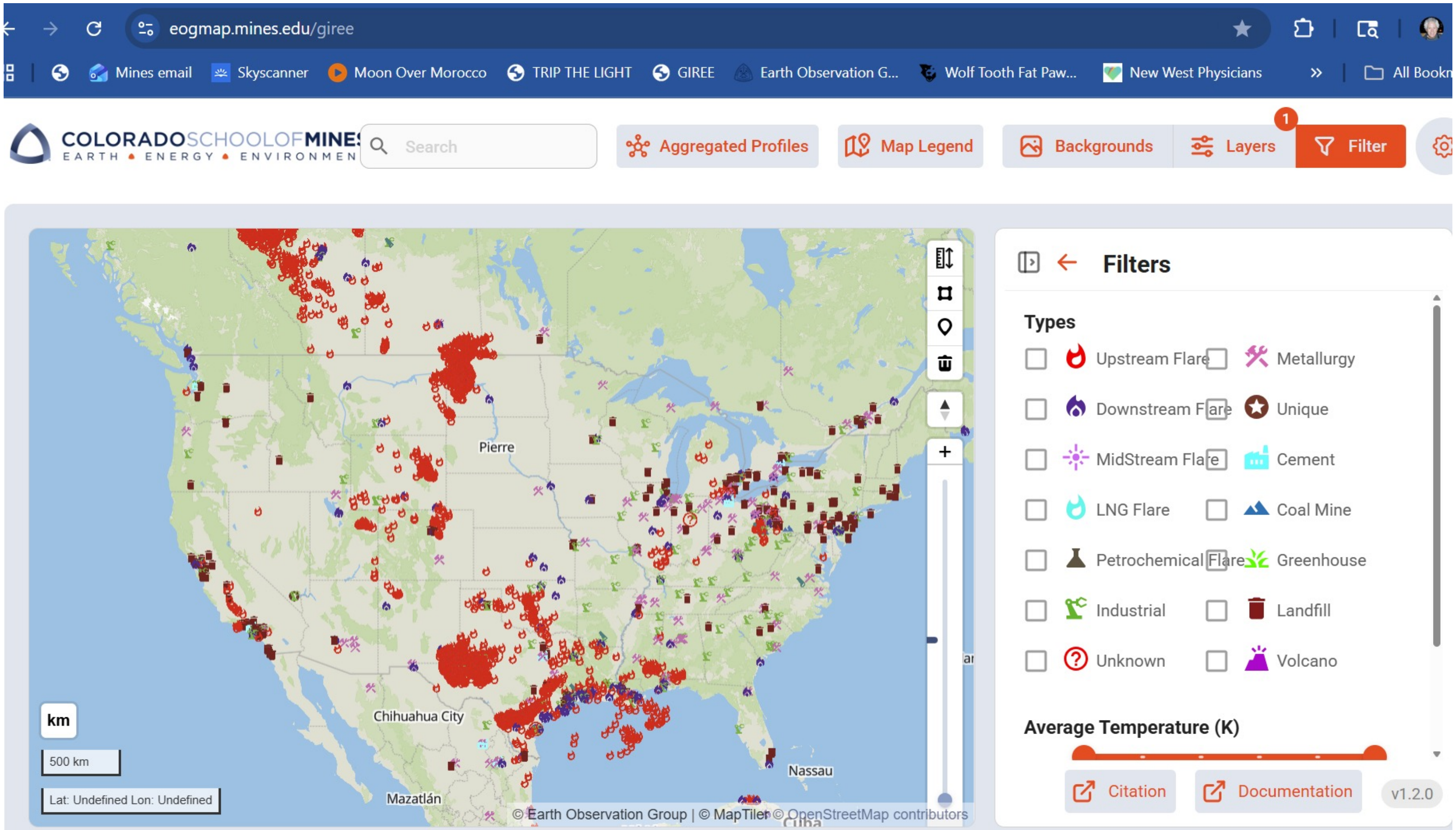
VIIRS is unique in collecting data in four near and shortwave infrared channels at night. These channels are designed for daytime imaging. At night – they serve as super-detectors for infrared emitters!

Why Multispectral? To get the Planck Curves!

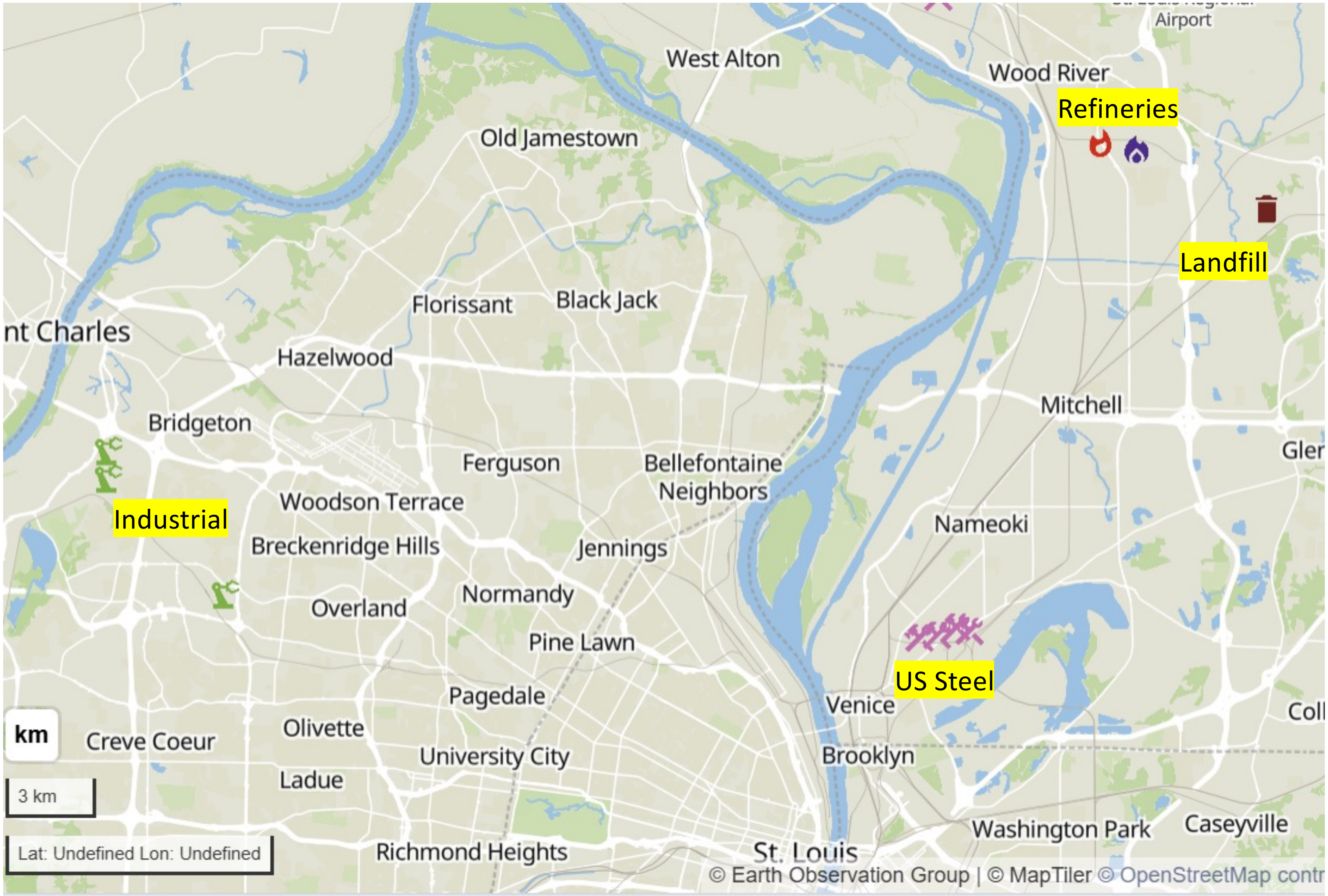


- Temperature from Wein's Displacement Law .
- Source area from emissivity term in Planck's Law with pixel footprint size.
- Radiant heat (MW) from the Stefan-Boltzmann Law.

Daily files are in csv and kmz formats

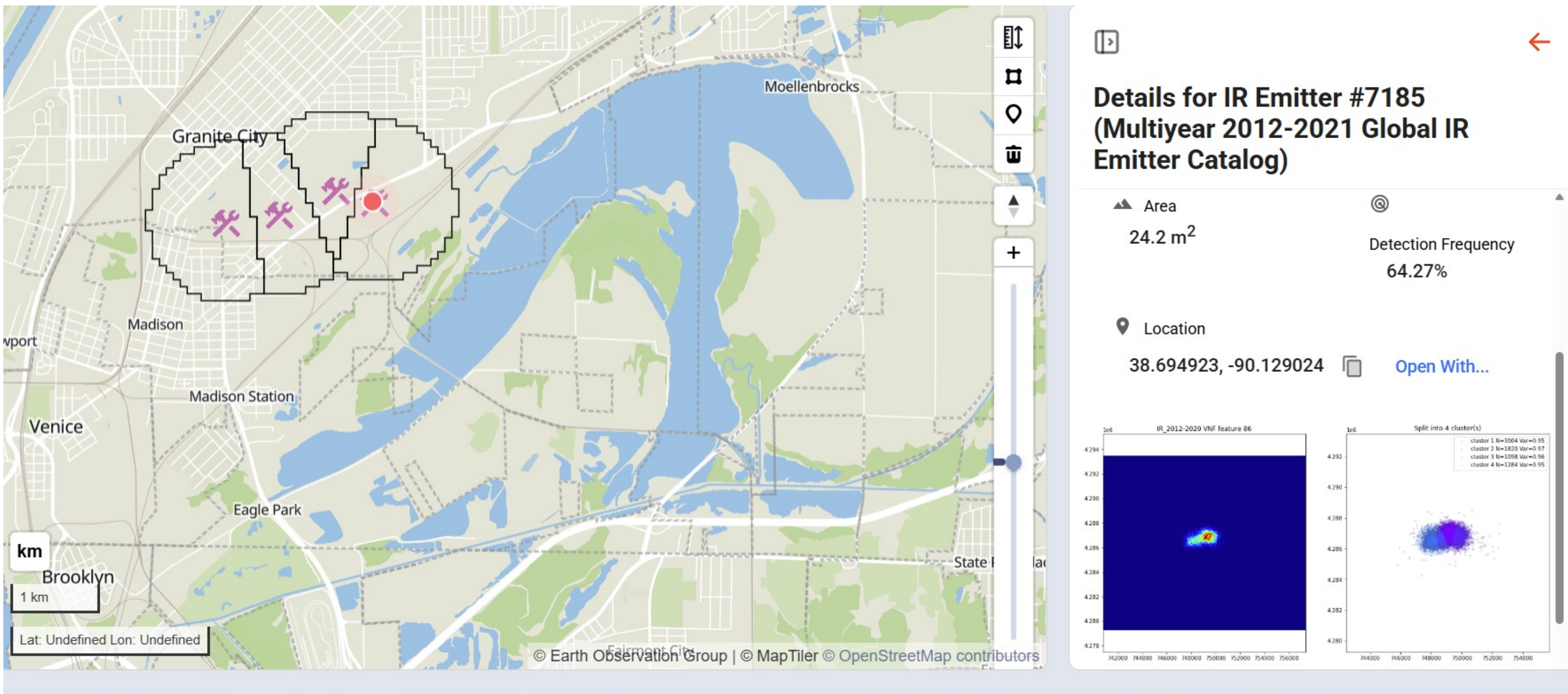


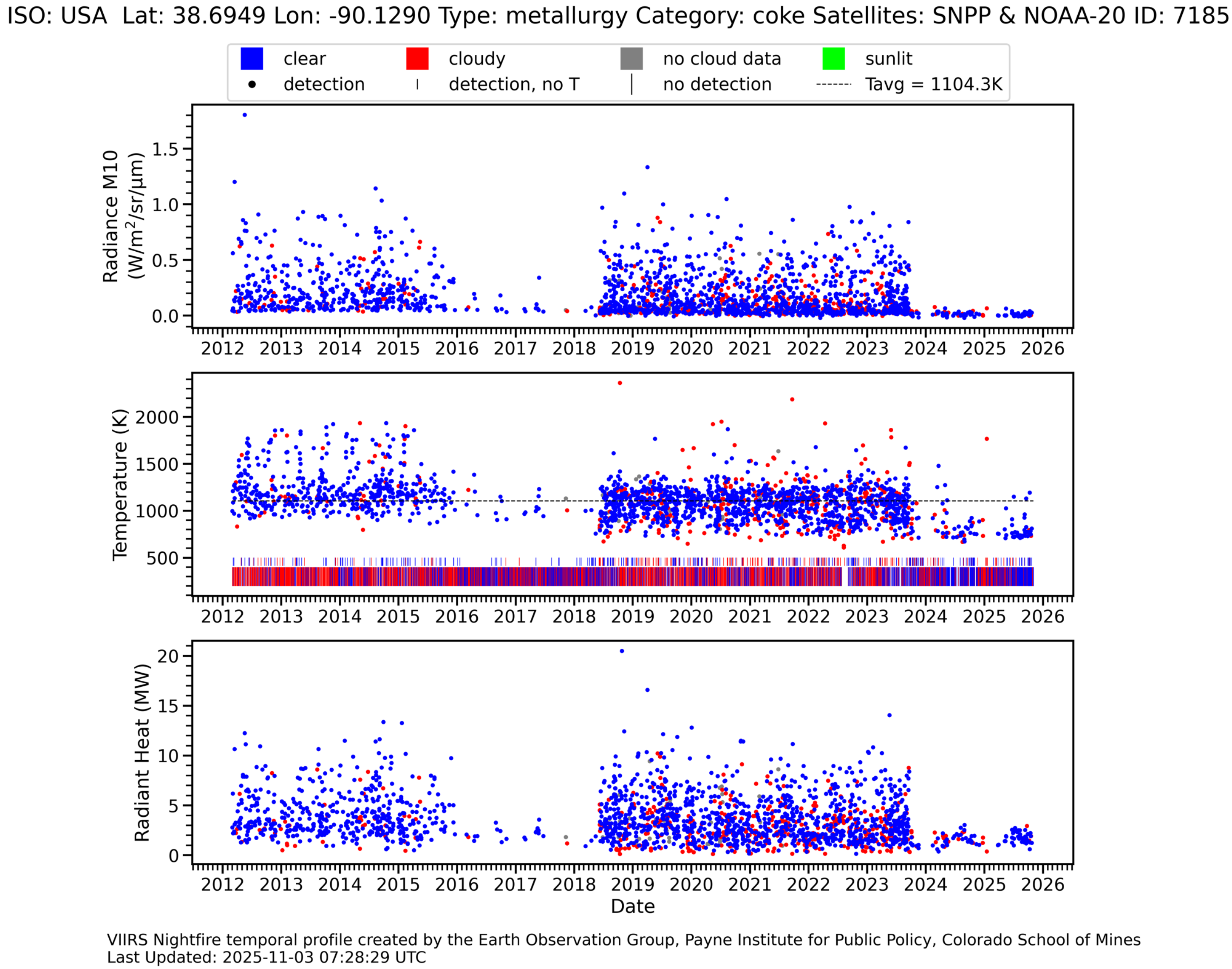
Industrial Site VNF Profiles are Available at GIREE



VNF Industrial Infrared Emitters in the St. Louis area

Granite City Steelmill





U.S. Steel, Granite City, Illinois

Summary

- EOG processes all nighttime VIIRS data (150 GB per satellite per day) in near-real time with the nightfire algorithm.
- There are two versions of VNF v.3 and v.4. V4 splits the emissions into a high and low temperature phases.,
- By filtering out biomass burning, EOG distilled eleven years of nightly VNF data to form a multiyear catalog of infrared emitters, each with a temporal profile.
- The temporal profiles can be interpreted to identify activity changes over time.
- VNF is a licensed product, free for academics.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