

# Methane Source Finder: A web-based data portal for exploring methane data

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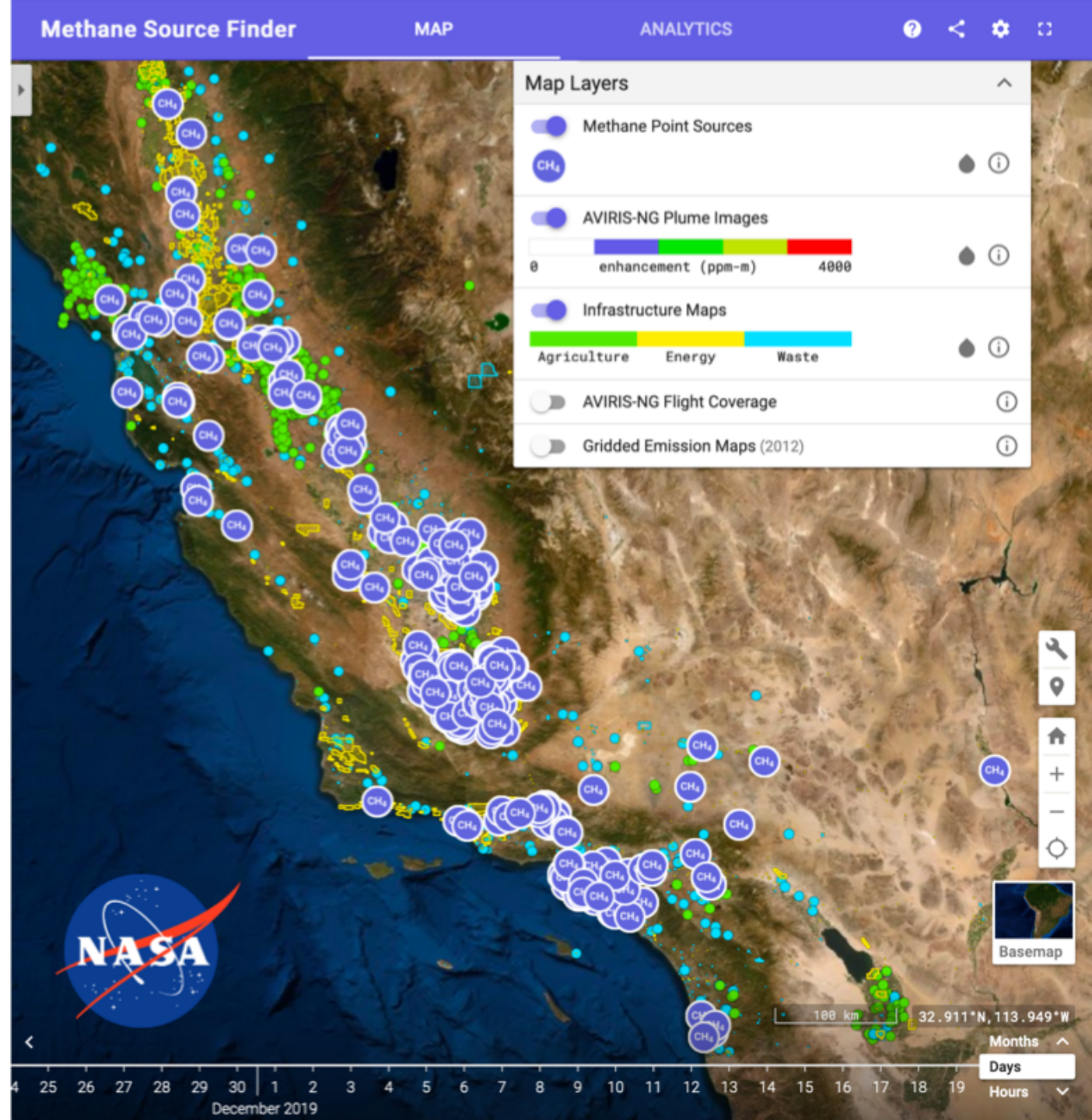
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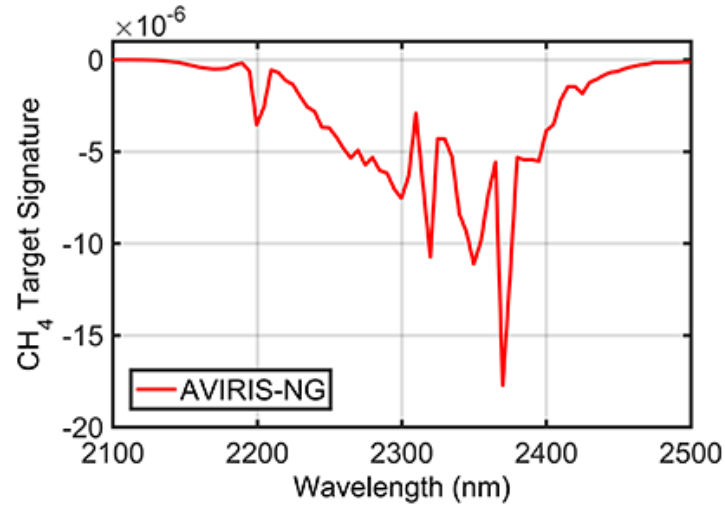
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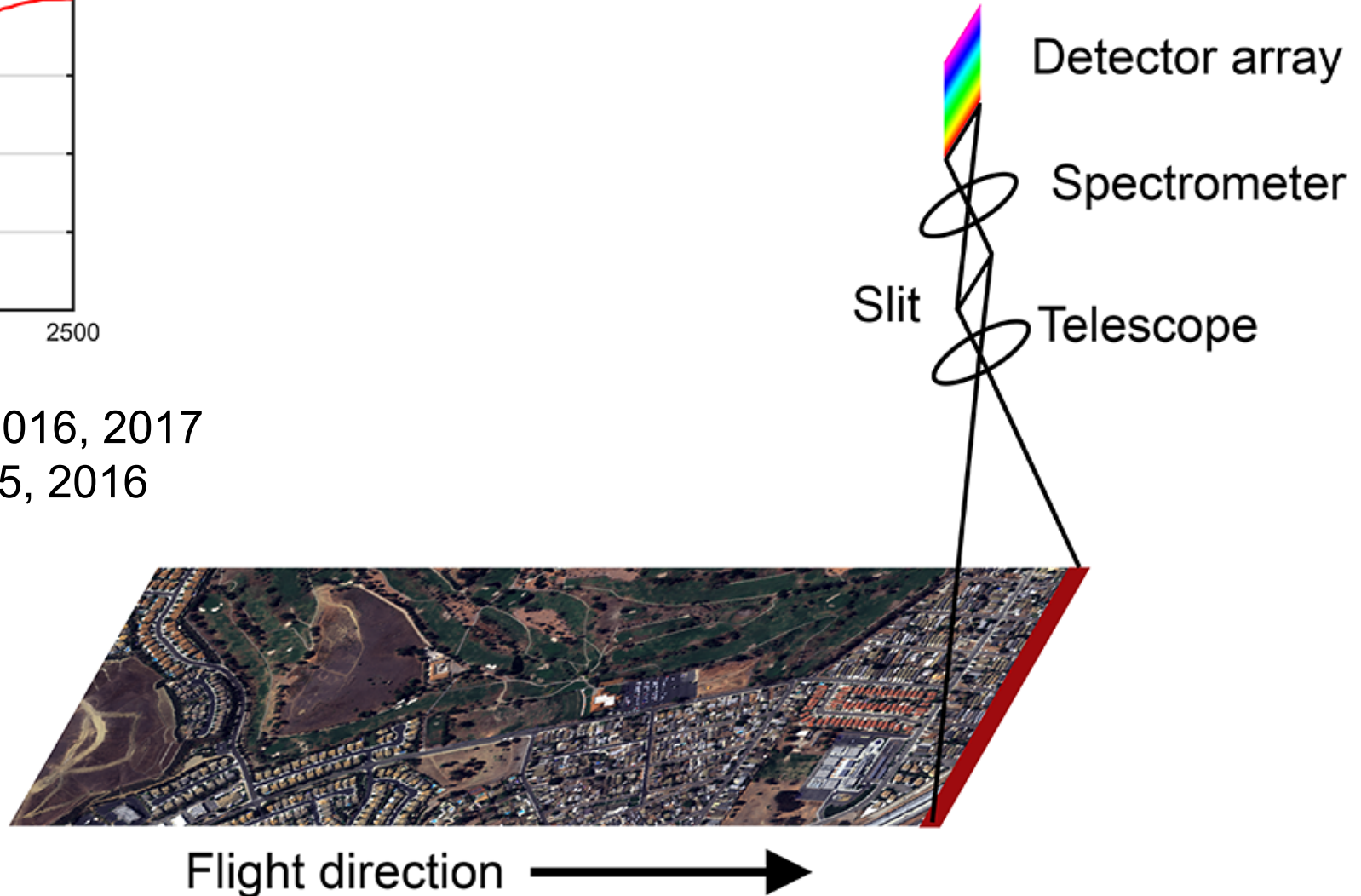
# Methane Source Finder data portal

- Publicly available: <https://methane.jpl.nasa.gov/>
- Developed under NASA's ACCESS and CMS programs to explore CH<sub>4</sub> data
- Data includes:
  - Remote sensing (AVIRIS-NG imaging spectrometer CH<sub>4</sub> plume results; Thorpe et al., 2017)
  - Surface monitoring (in situ towers for CH<sub>4</sub> flux inversions for the LA basin; Yadav et al., 2019)
  - Bottom up CH<sub>4</sub> emissions inventories (EPA)
  - Infrastructure database (potential CH<sub>4</sub> sources; Carranza et al., 2018)
- Goals:
  - Provide CH<sub>4</sub> dataset to a diverse range of stakeholders to improve understanding of regional CH<sub>4</sub> emissions
  - Provide opportunities for mitigation

# AVIRIS-NG for CH<sub>4</sub> plume mapping

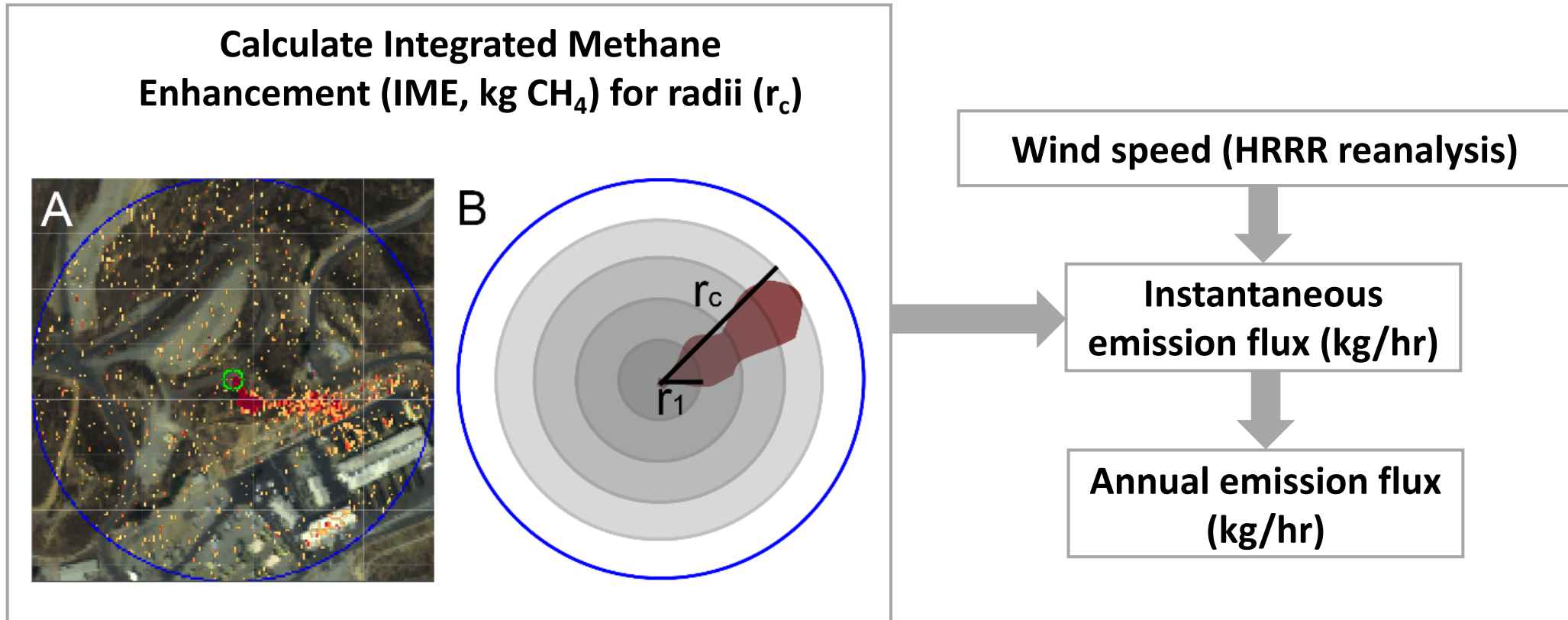


Thorpe et al., 2014, 2016, 2017  
Thompson et al., 2015, 2016





# AVIRIS-NG for CH<sub>4</sub> emission flux quantification

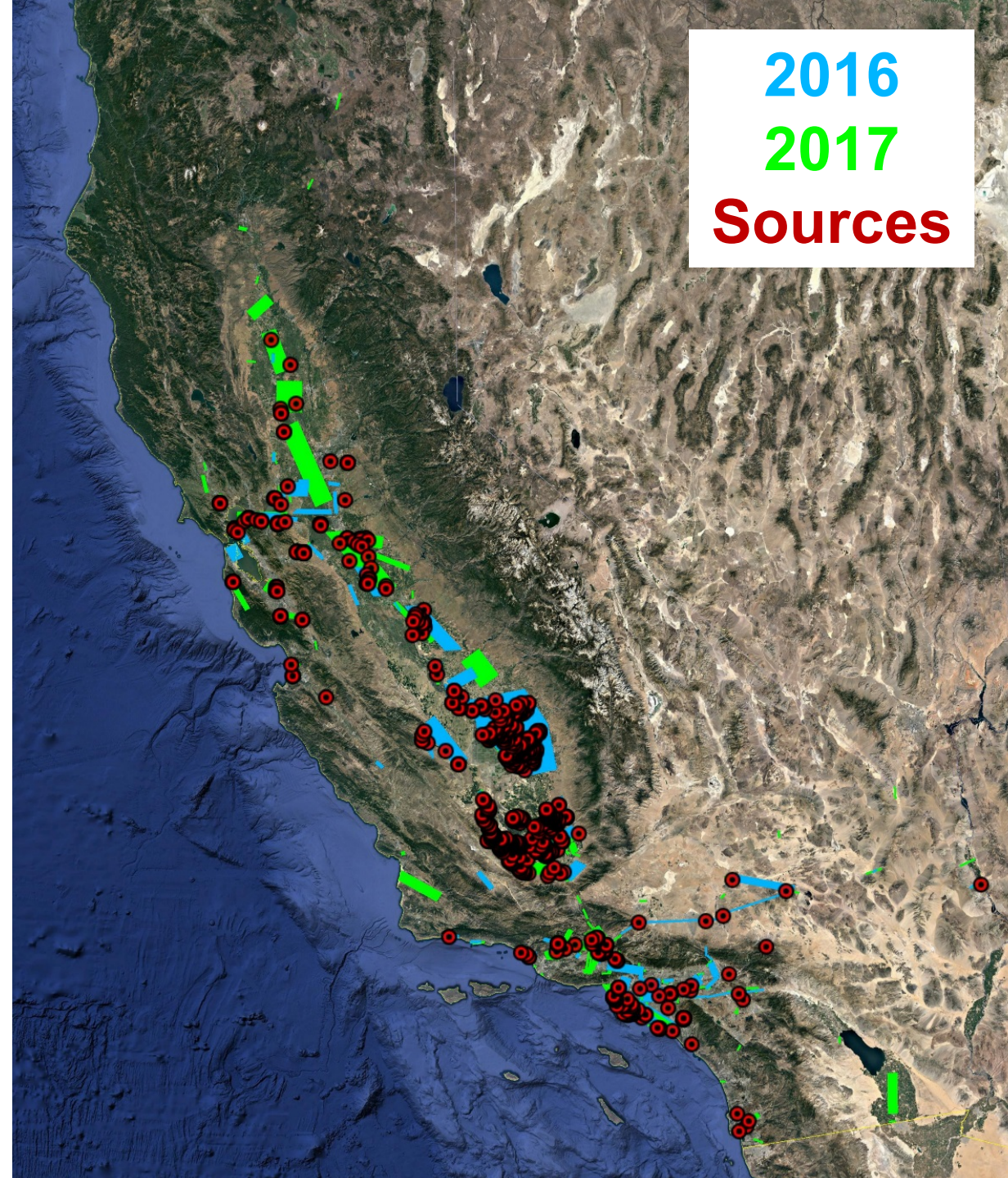


Duren et al., 2019



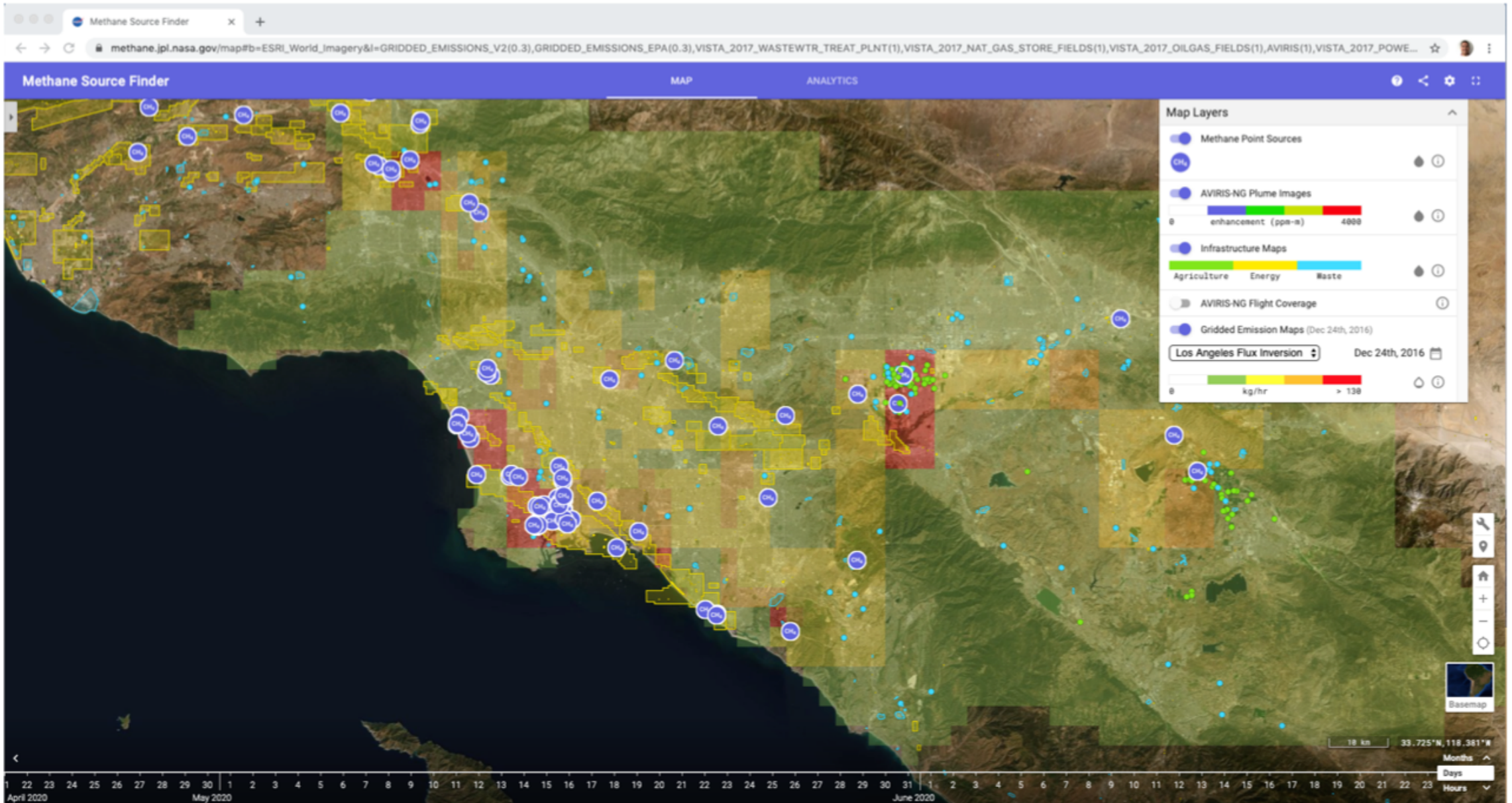
# California Methane Survey

- AVIRIS-NG flights funded by the California Air Resources Board (CARB) and California Energy Commission (CEC)
- Targeting CH<sub>4</sub> hotspots from the energy, agriculture, and waste management sectors

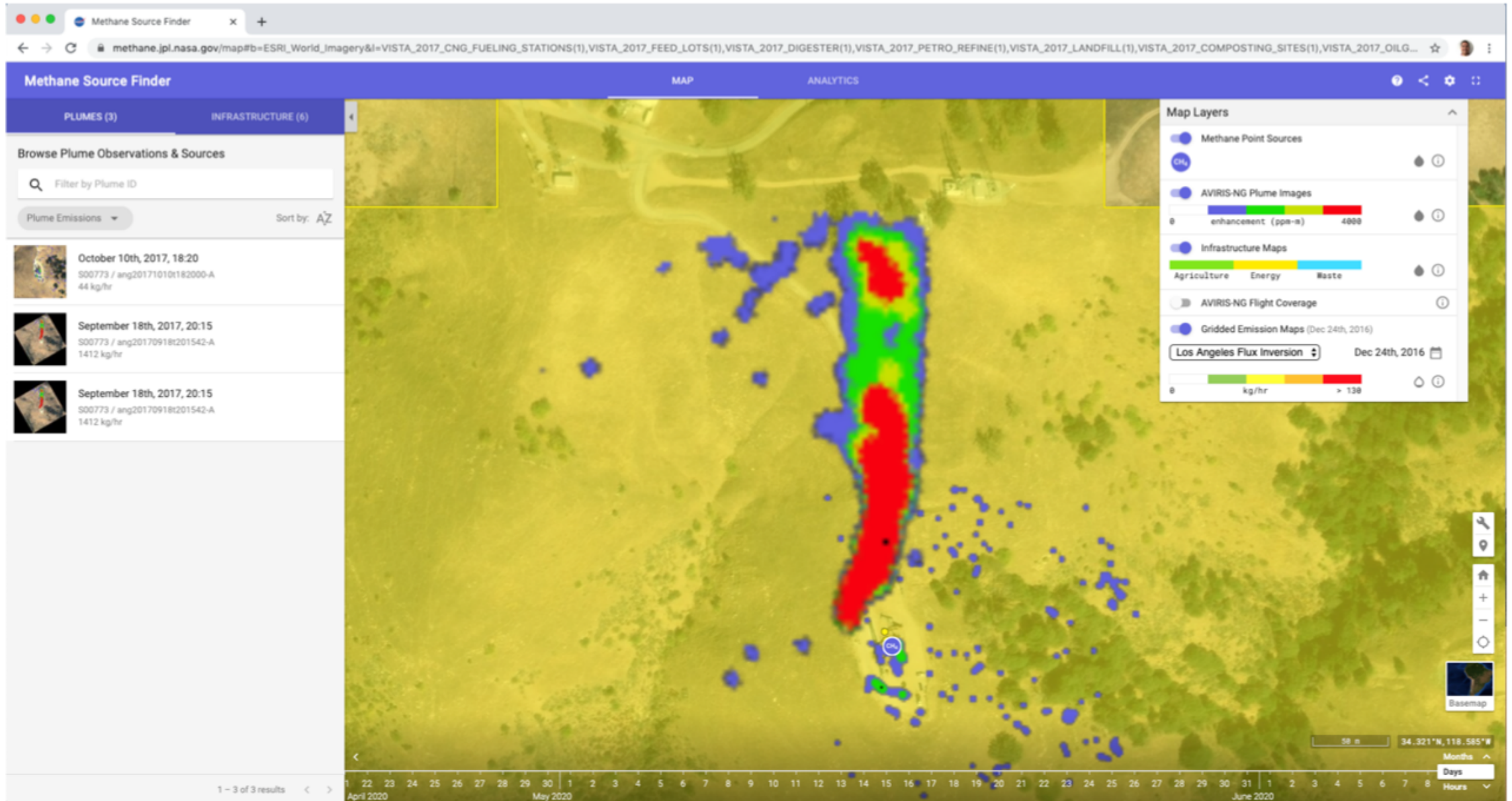




# Methane Source Finder: LA Basin CH<sub>4</sub> hotspots

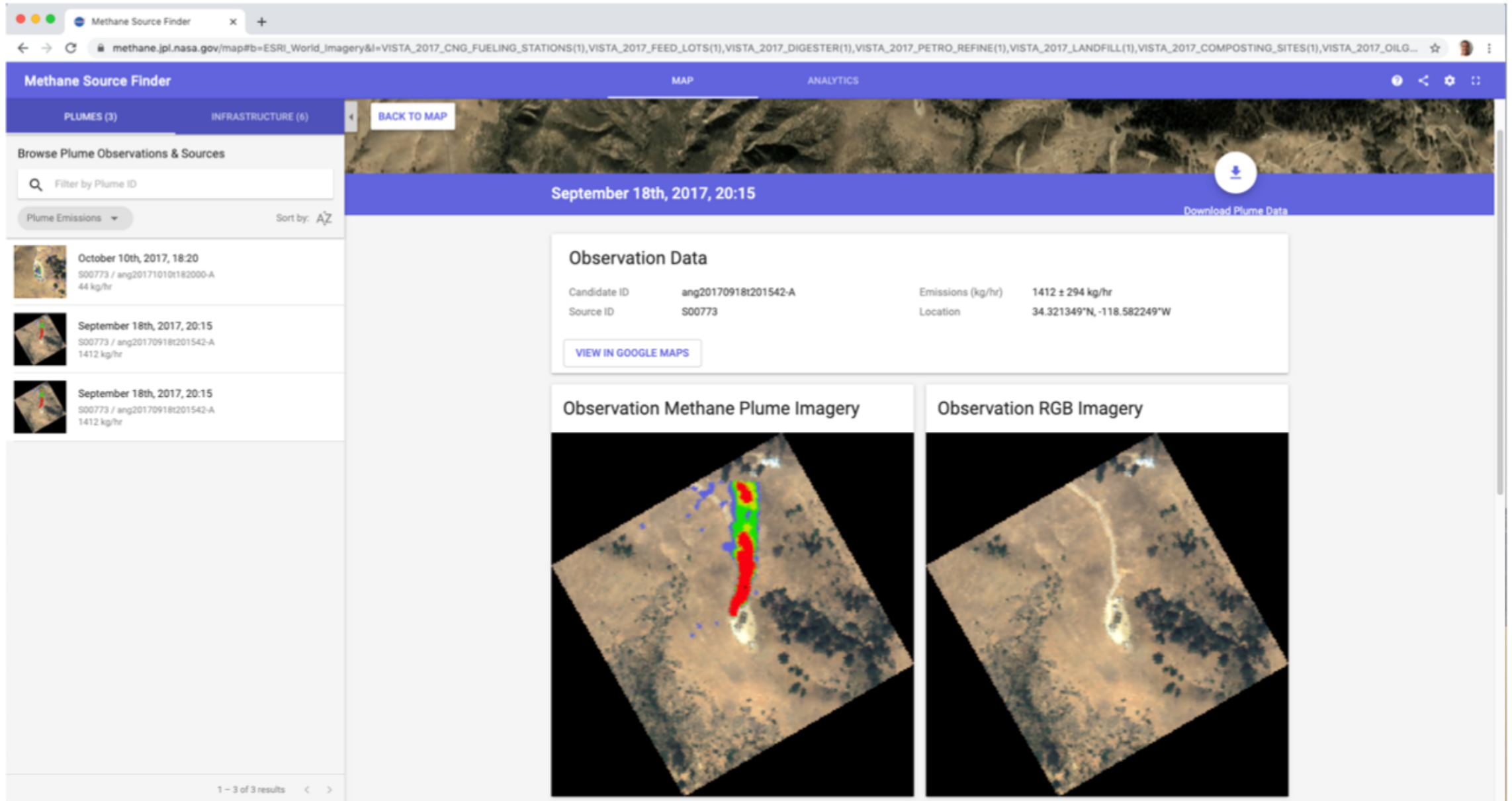


# LA Basin CH<sub>4</sub> from energy sector

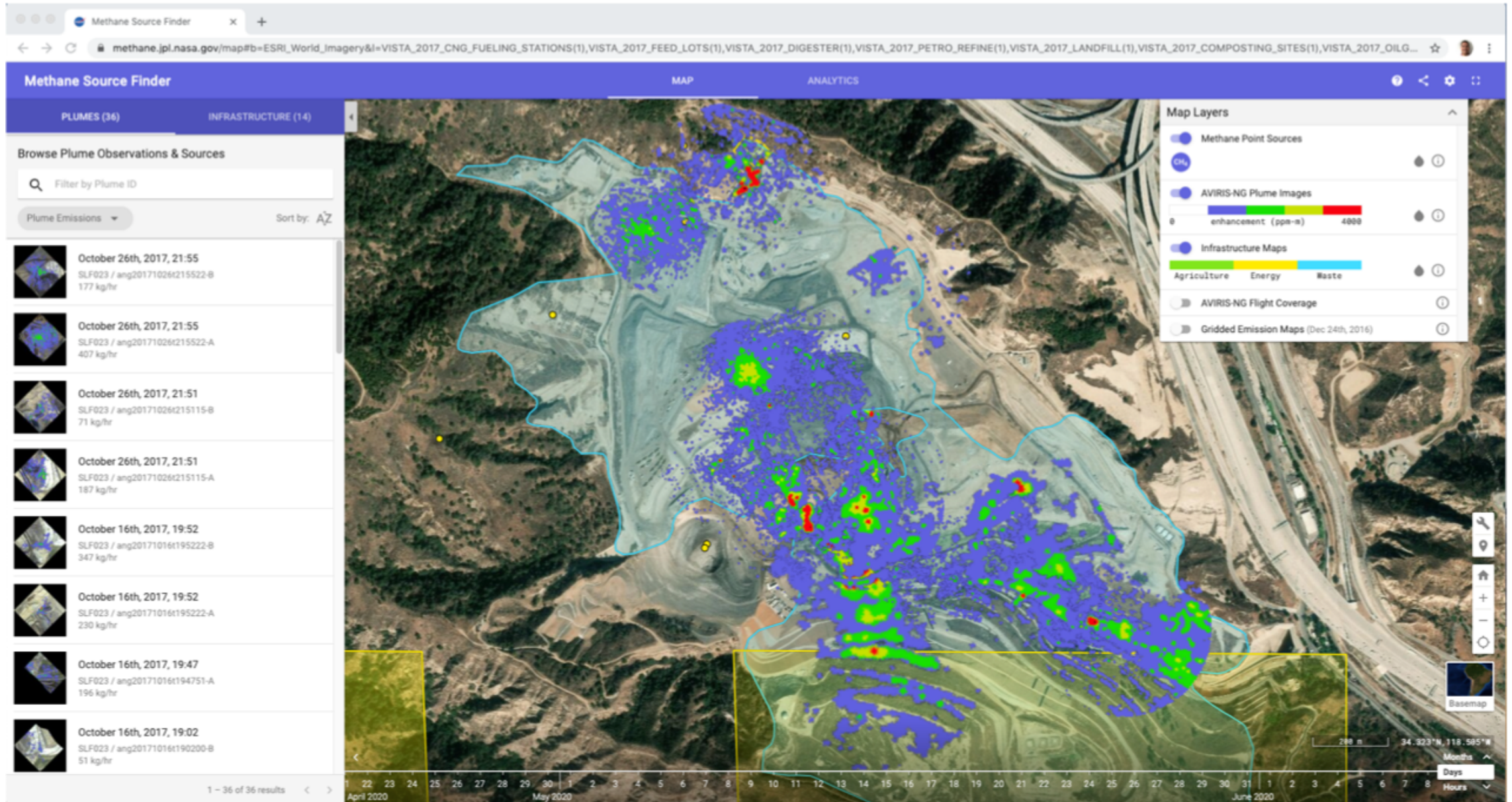




# LA Basin CH<sub>4</sub> from energy sector

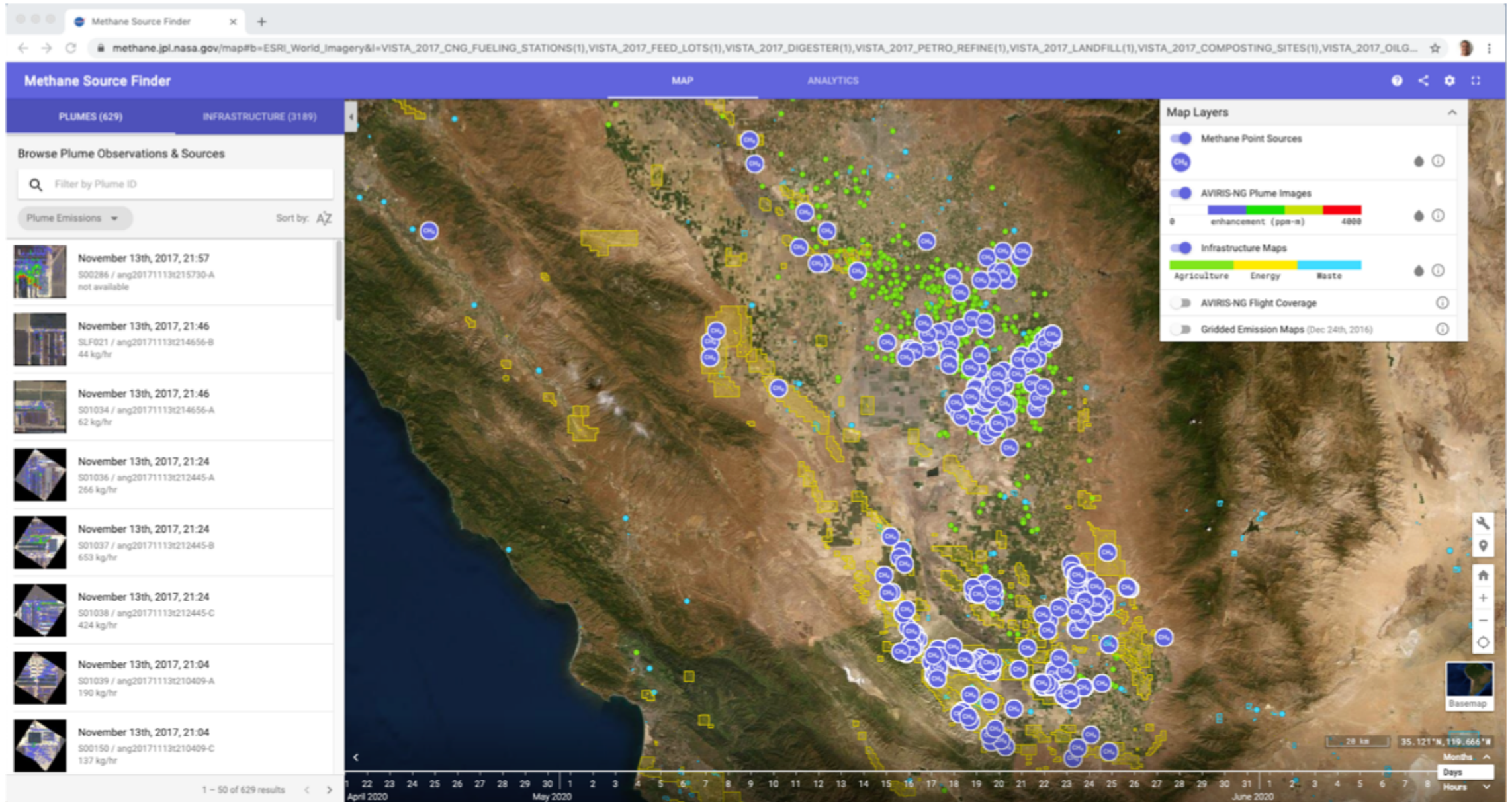


# LA Basin CH<sub>4</sub> from landfill





# San Joaquin Valley CH<sub>4</sub> emissions





# San Joaquin Valley CH<sub>4</sub> from energy sector



# San Joaquin Valley CH<sub>4</sub> from dairy digester





# Methane Source Finder facilitates stakeholder engagement

## CA Methane Survey



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT



South Coast  
**AQMD**



CALIFORNIA  
AIR RESOURCES BOARD

## Energy sector



## Waste management sector



**REPUBLIC**  
SERVICES

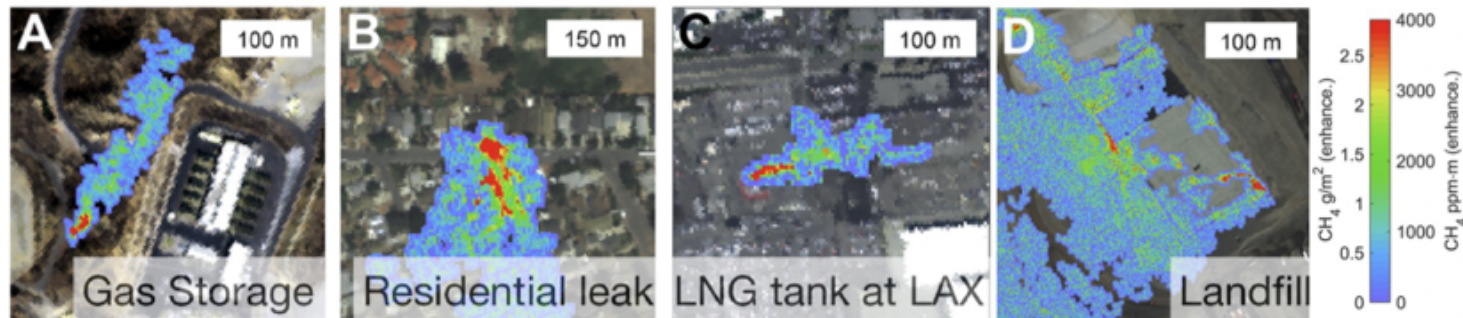
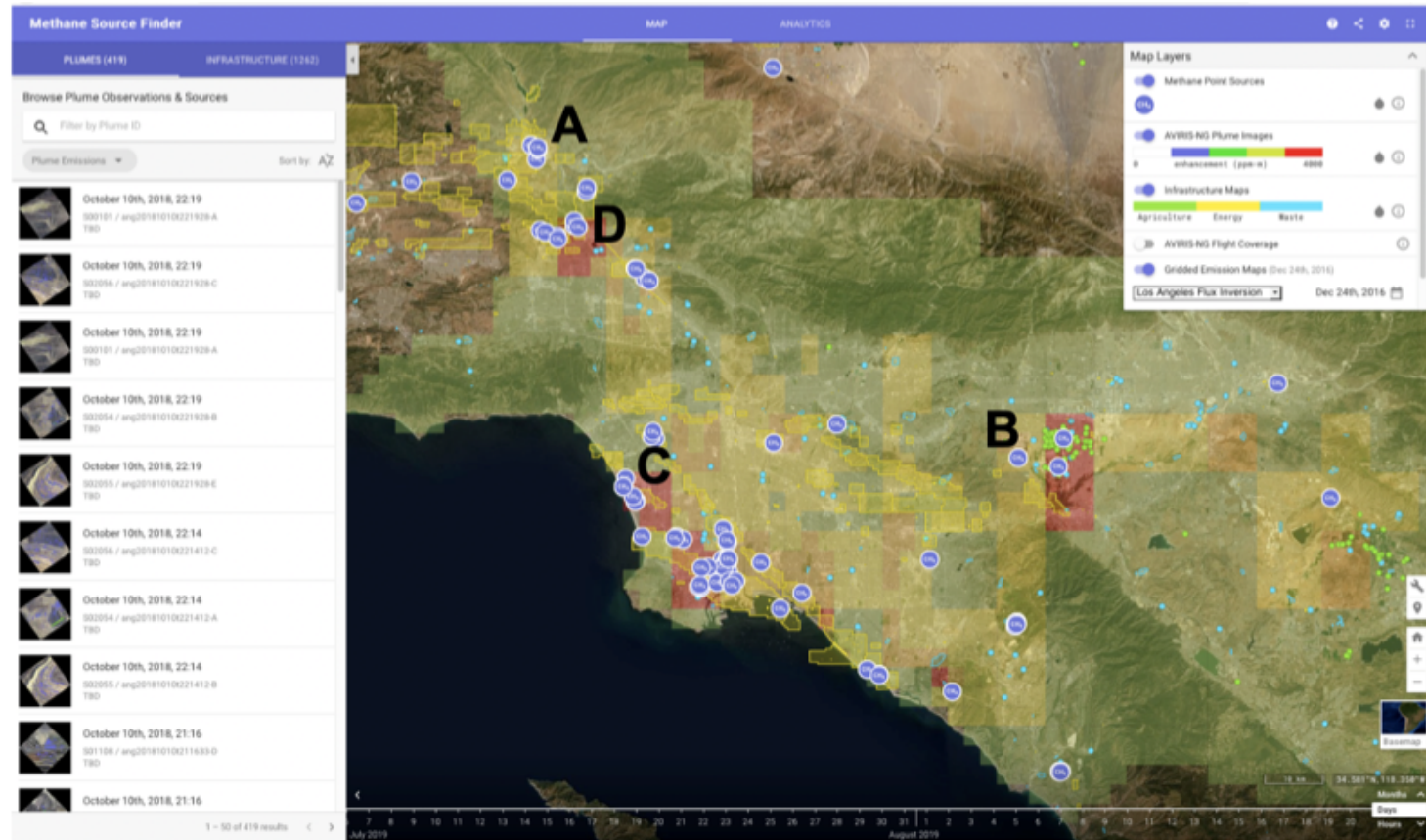
## Dairy groups



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# Methane Source Finder facilitates mitigation



# California Methane Survey scientific findings

- 1) Multiple revisits of facilities permitted assessment of persistence:
  - Oil & gas, dairy: 20-35% (mean) persistence
  - Landfills: 100% persistence
- 2) Emissions were calculated for 564 methane point sources
- 3) Estimated emissions from methane point sources in California:
  - $0.618 \text{ TgCH}_4 \text{ yr}^{-1}$  (95% confidence 0.523-0.725)
  - Equivalent to 34-46% of 2016 methane inventory
- 4) Super-emitter activity occurs in every surveyed sector (10% of point sources contributed ~60% of point source emissions)

nature > articles > article



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## California's methane super-emitters

Riley M. Duren , Andrew K. Thorpe, Kelsey T. Foster, Talha Rafiq, Francesca M. Hopkins, Vineet Yadav, Brian D. Bue, David R. Thompson, Stephen Conley, Nadia K. Colombi, Christian Frankenberg, Ian B. McCubbin, Michael L. Eastwood, Matthias Falk, Jorn D. Herner, Bart E. Croes, Robert O. Green & Charles E. Miller



# Future work: AVIRIS-NG CO<sub>2</sub> and CH<sub>4</sub> (complete carbon footprint)

