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

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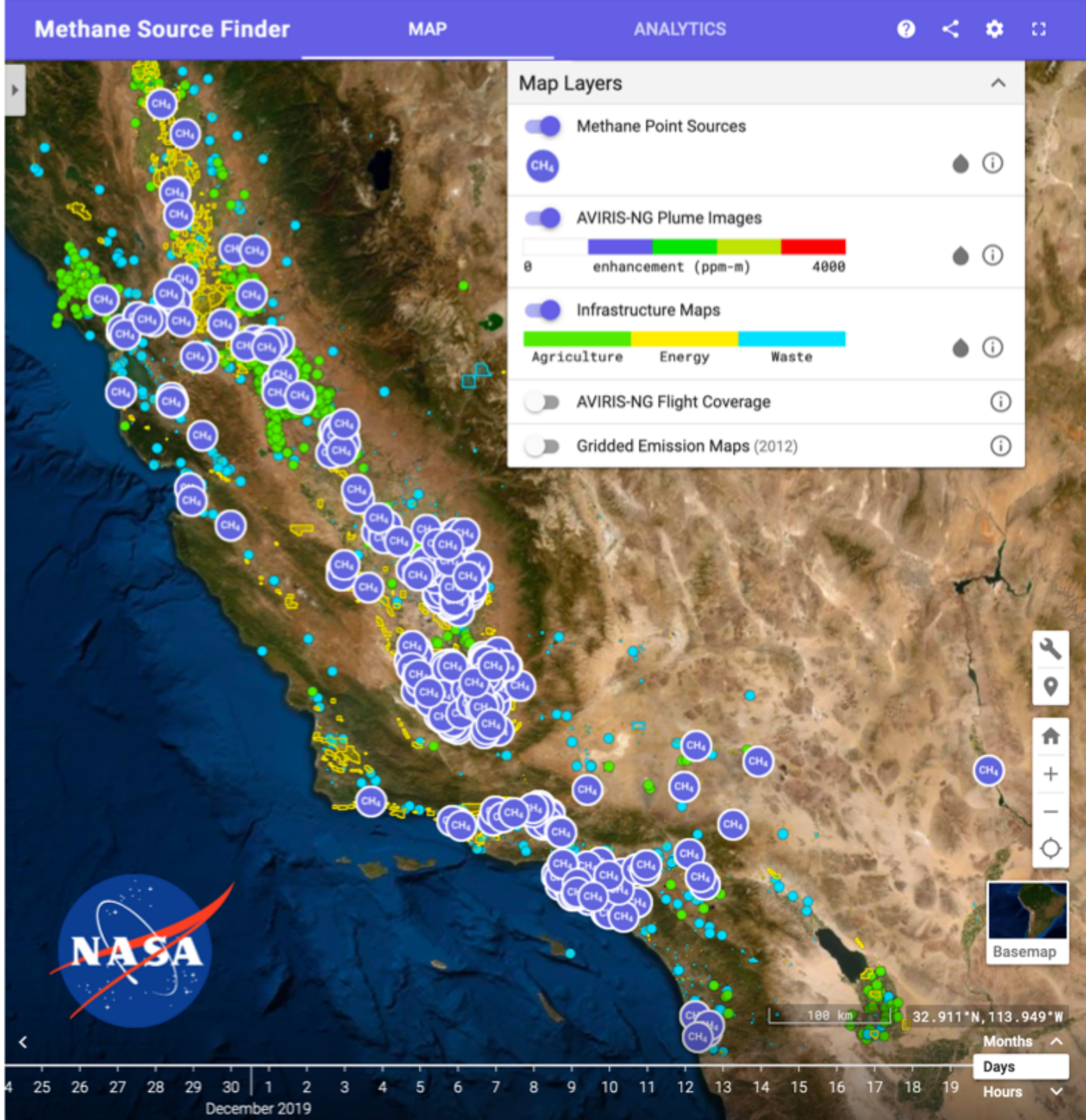
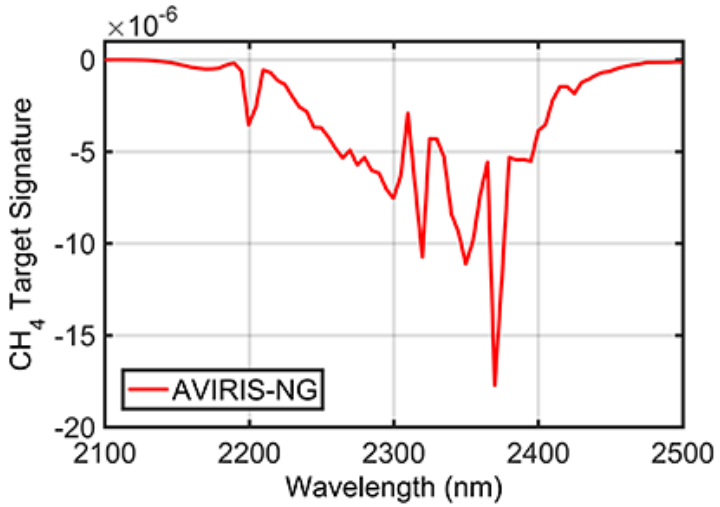


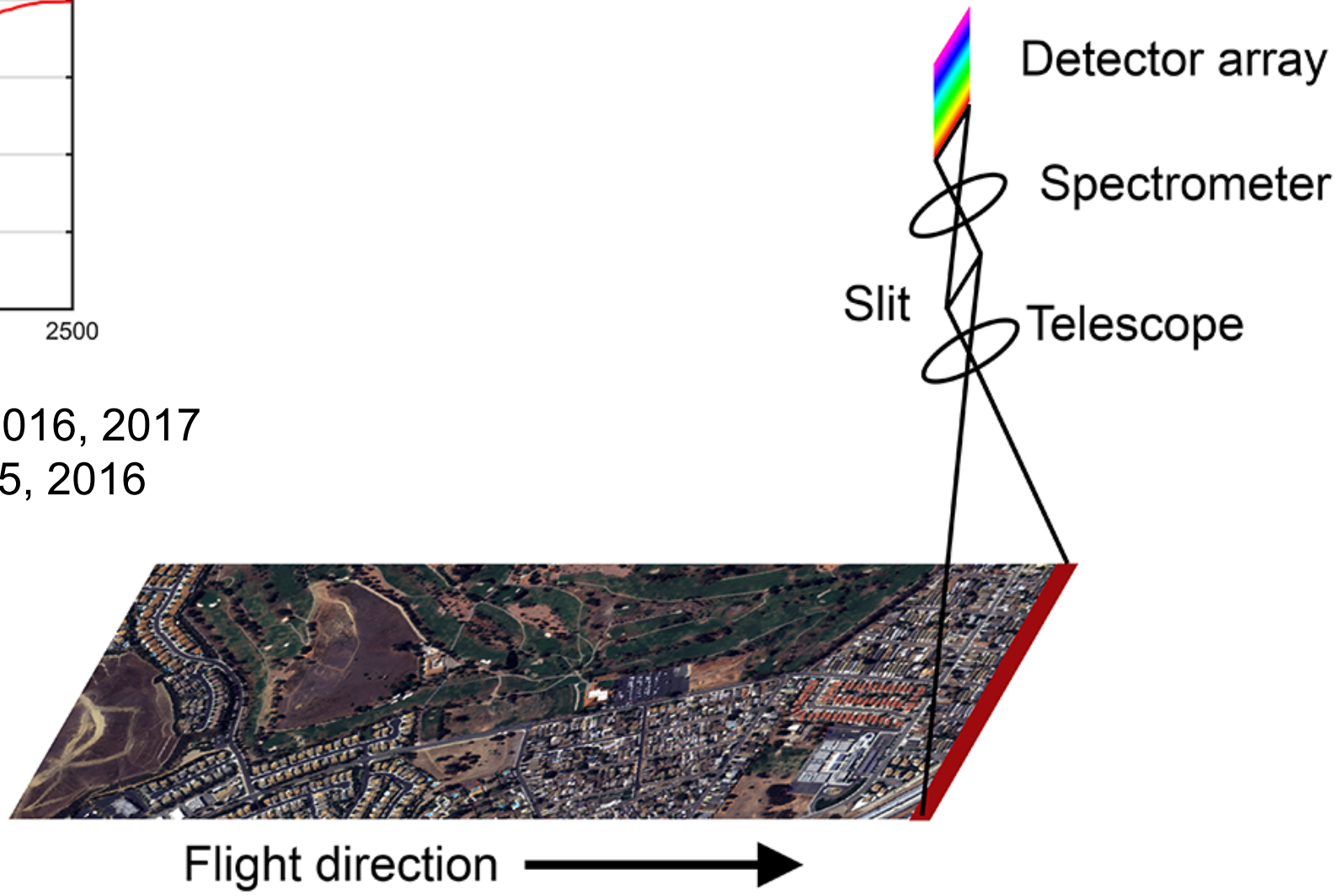
Methane Source Finder data portal

- Publicly available: https://methane.jpl.nasa.gov/
- Developed under NASA's ACCESS and CMS programs to explore CH_4 data
- Data includes:
  - Remote sensing (AVIRIS-NG imaging spectrometer CH_4 plume results; Thorpe et al., 2017)
  - Surface monitoring (in situ towers for CH_4 flux inversions for the LA basin; Yadav et al., 2019)
  - Bottom up CH_4 emissions inventories (EPA)
  - Infrastructure database (potential CH_4 sources; Carranza et al., 2018)
- Goals:
  - Provide CH_4 dataset to a diverse range of stakeholders to improve understanding of regional CH_4 emissions
  - Provide opportunities for mitigation

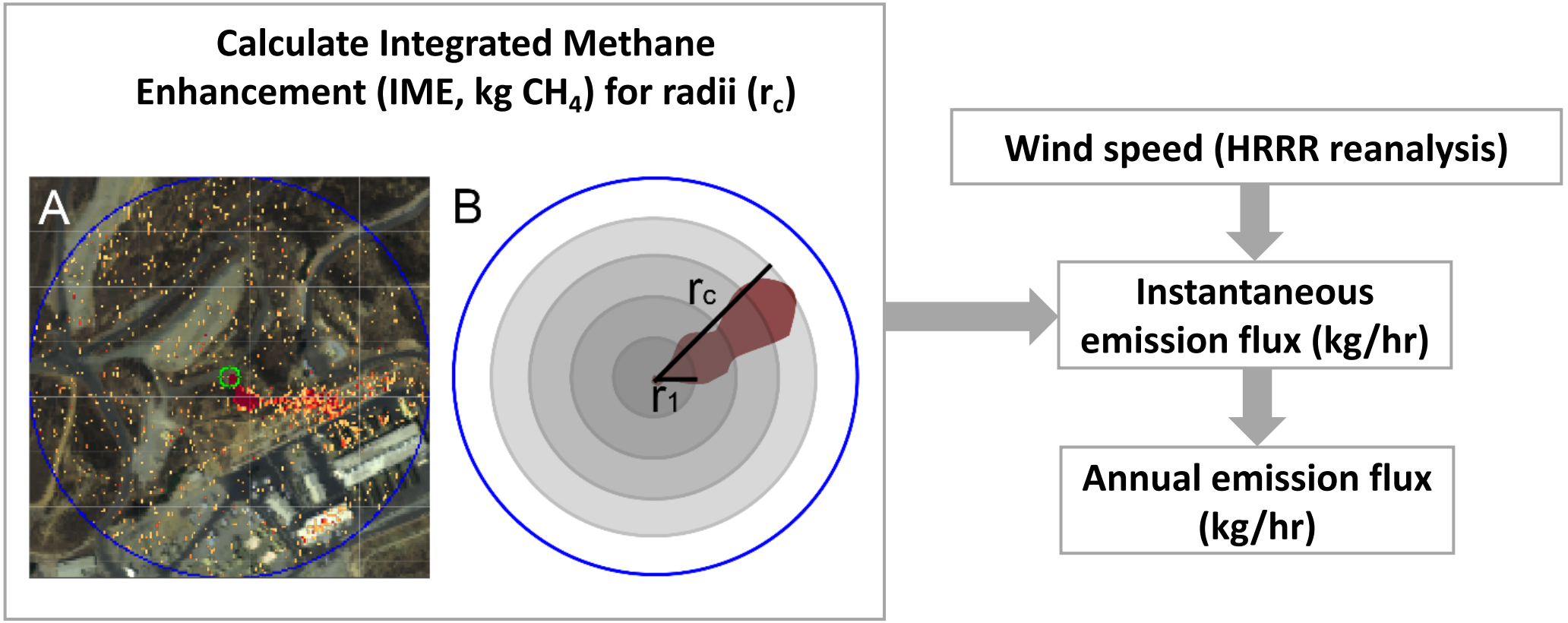
AVIRIS-NG for CH_4 plume mapping



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



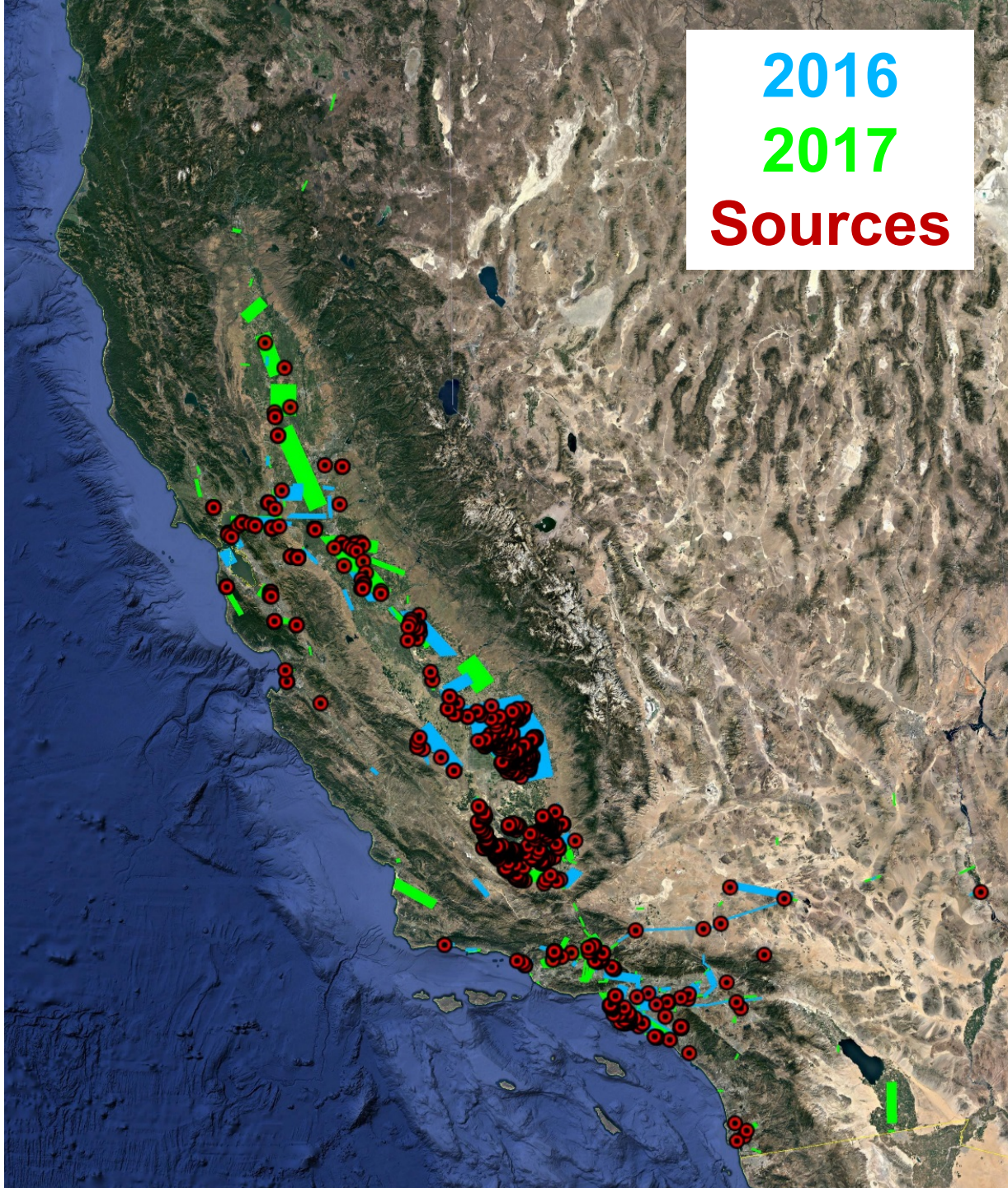
AVIRIS-NG for CH_4 emission flux quantification



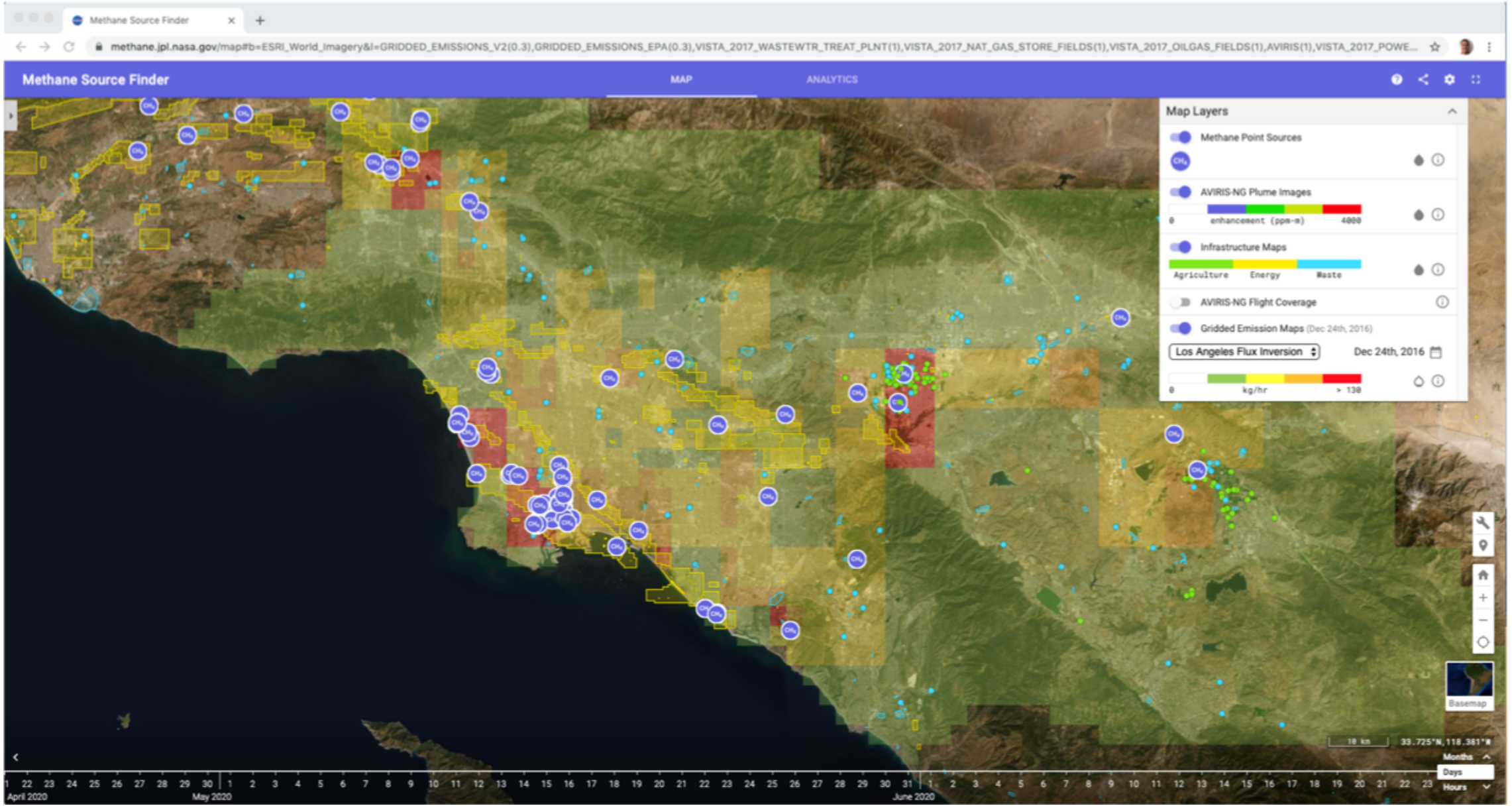
Duren et al., 2019

California Methane Survey

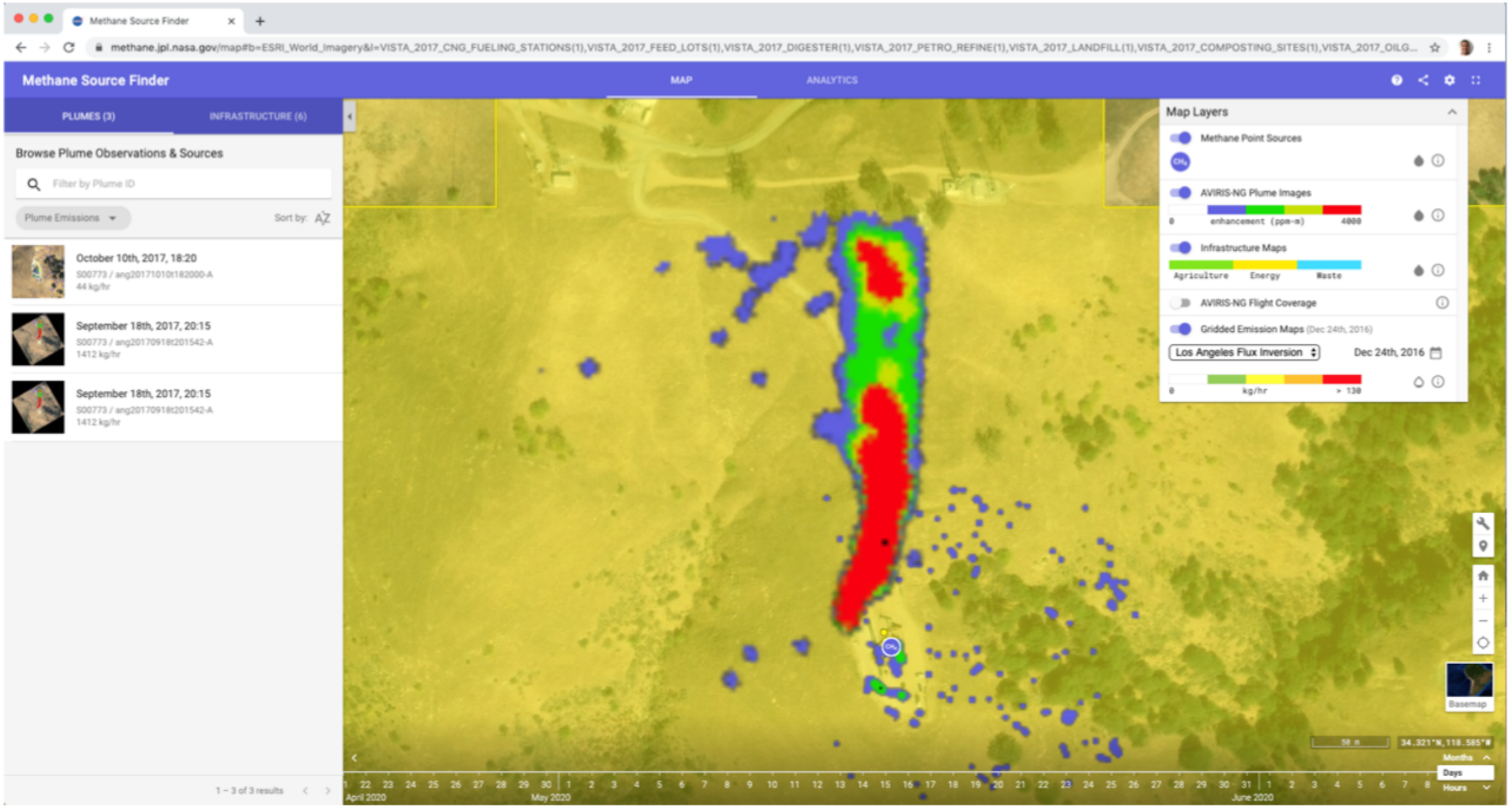
- AVIRIS-NG flights funded by the California Air Resources Board (CARB) and California Energy Commission (CEC)
- Targeting CH_4 hotspots from the energy, agriculture, and waste management sectors



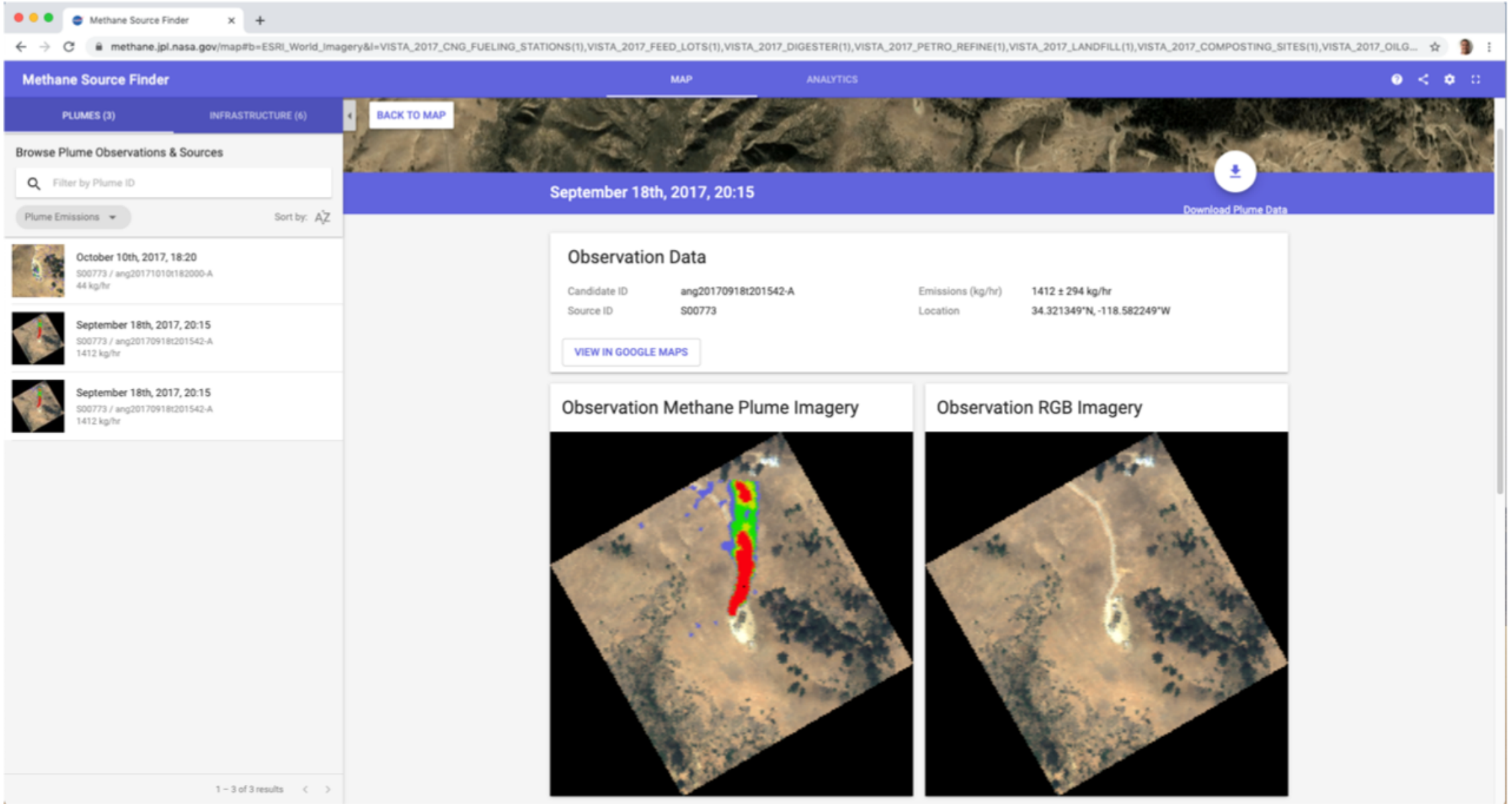
Methane Source Finder: LA Basin CH_4 hotspots



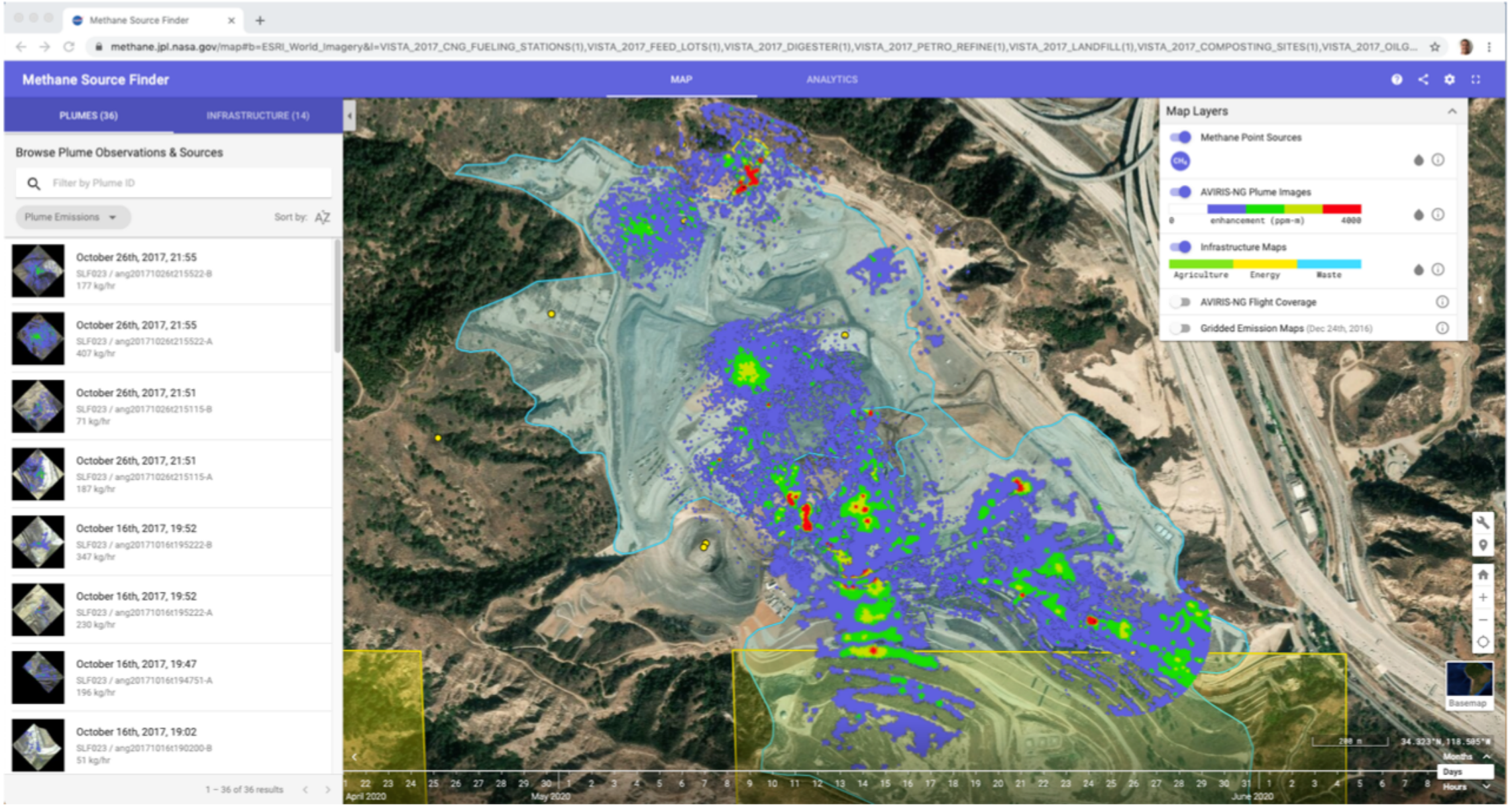
LA Basin CH_4 from energy sector



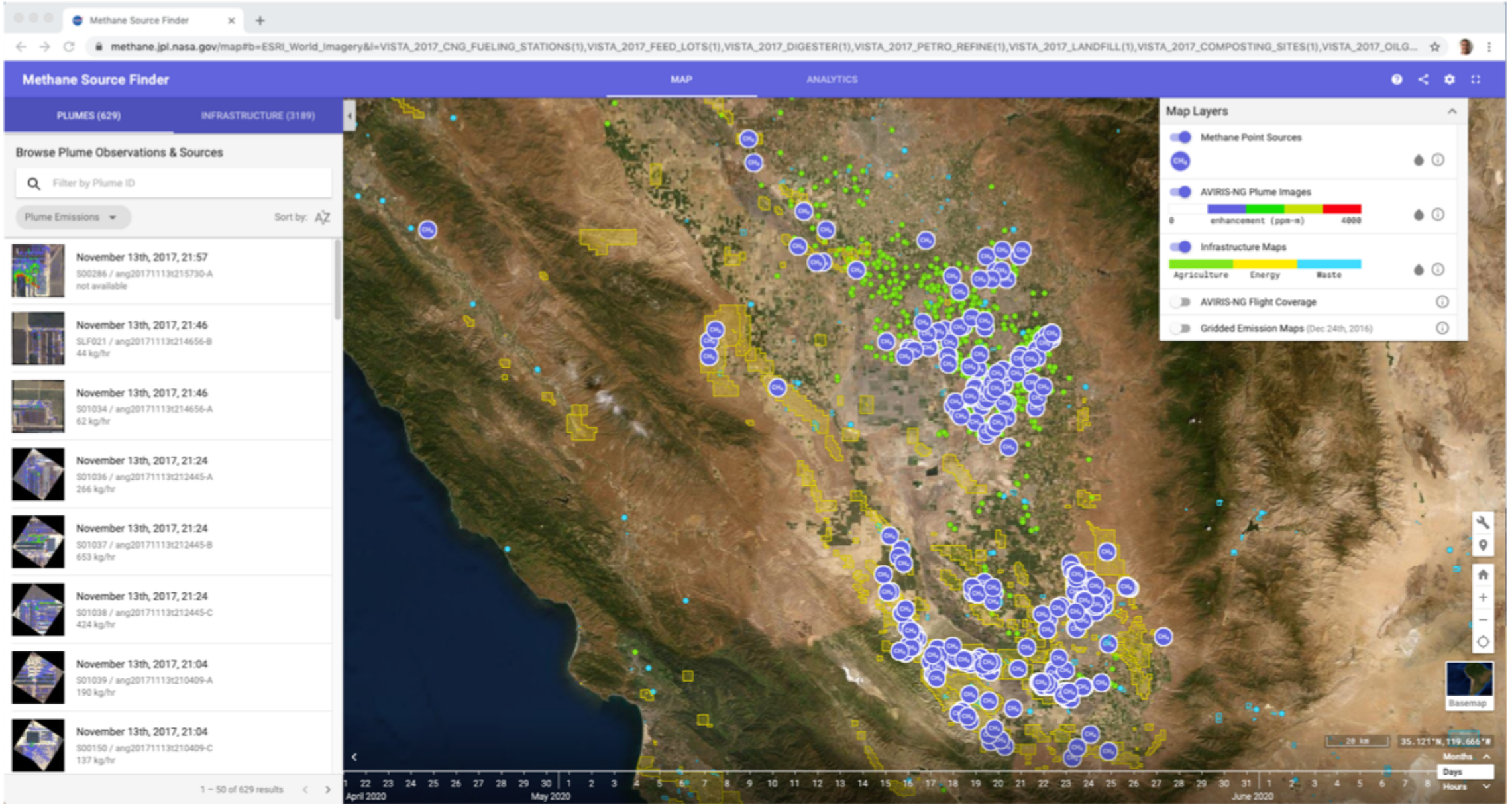
LA Basin CH_4 from energy sector



LA Basin CH_4 from landfill



San Joaquin Valley CH_4 emissions



San Joaquin Valley CH_4 from energy sector

San Joaquin Valley CH_4 from dairy digester

Methane Source Finder facilitates stakeholder engagement

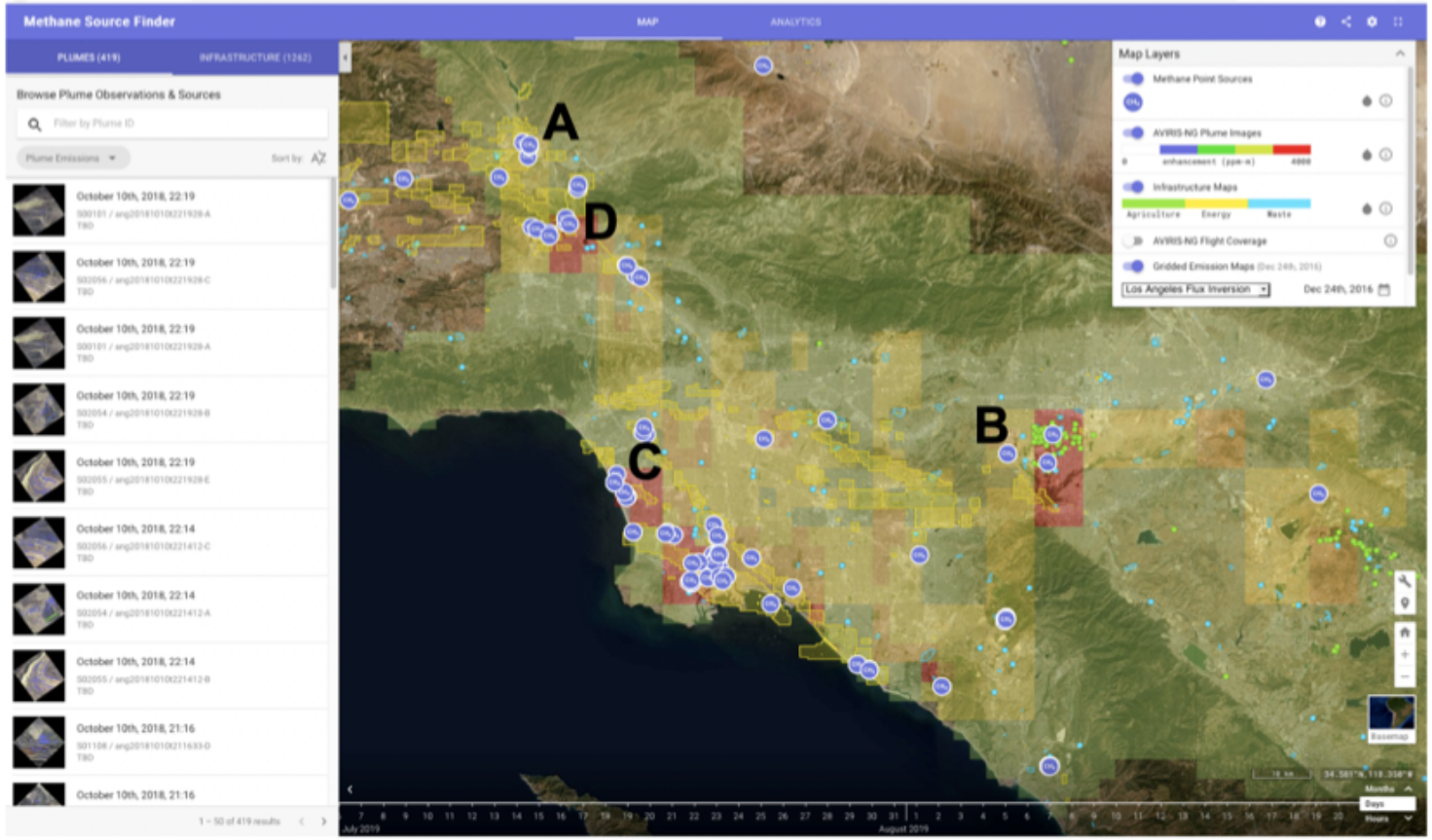
CA Methane Survey

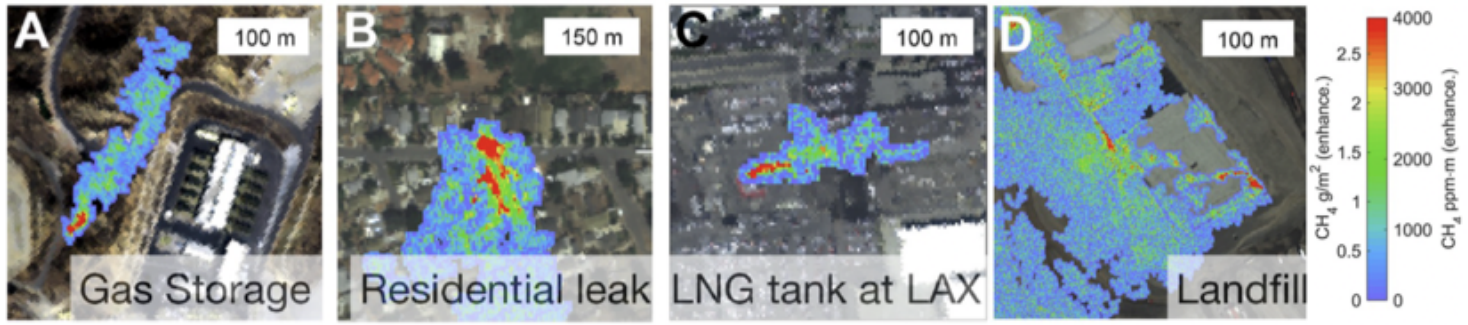
Energy sector

Waste management sector

Dairy groups

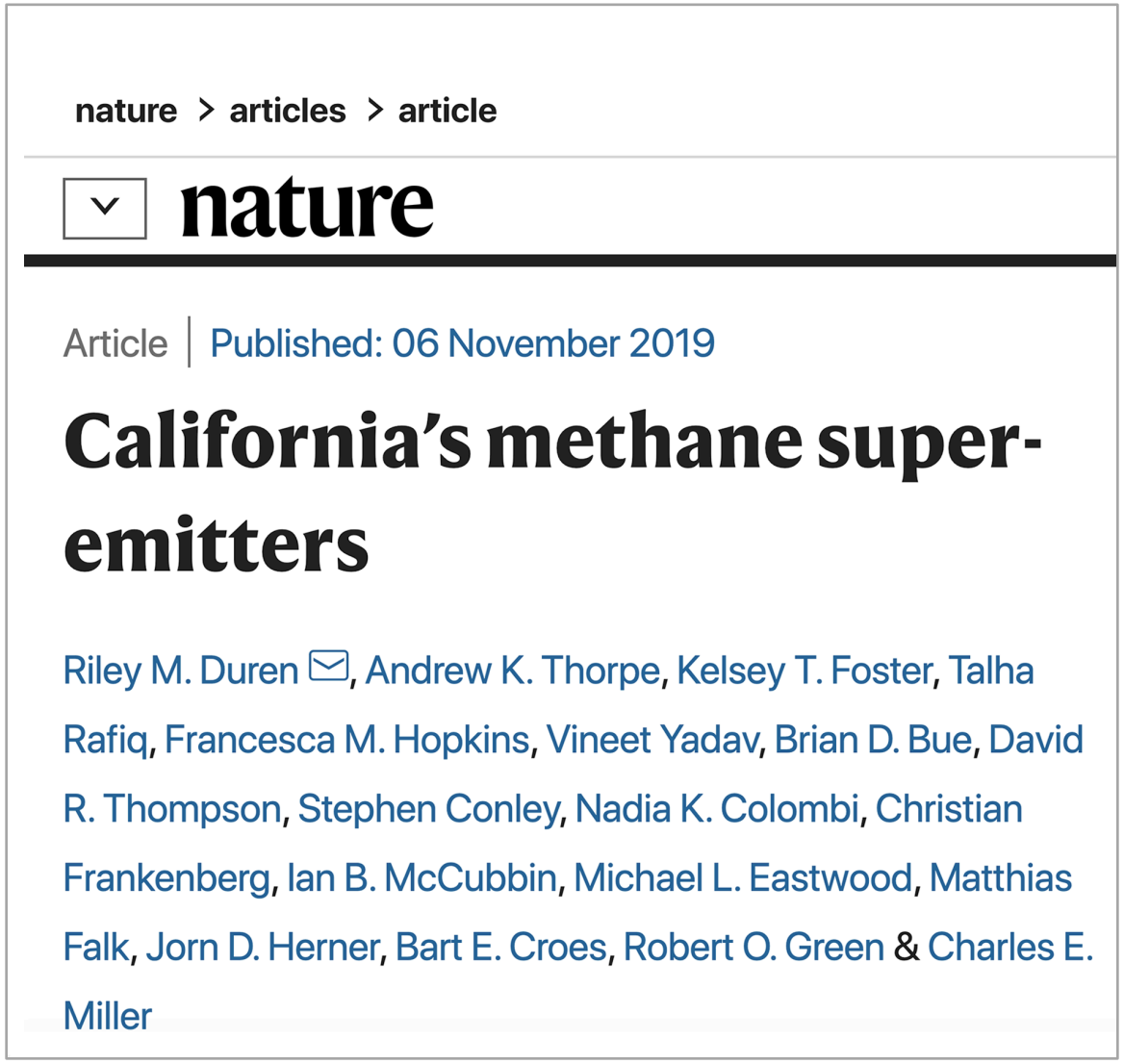
Methane Source Finder facilitates mitigation



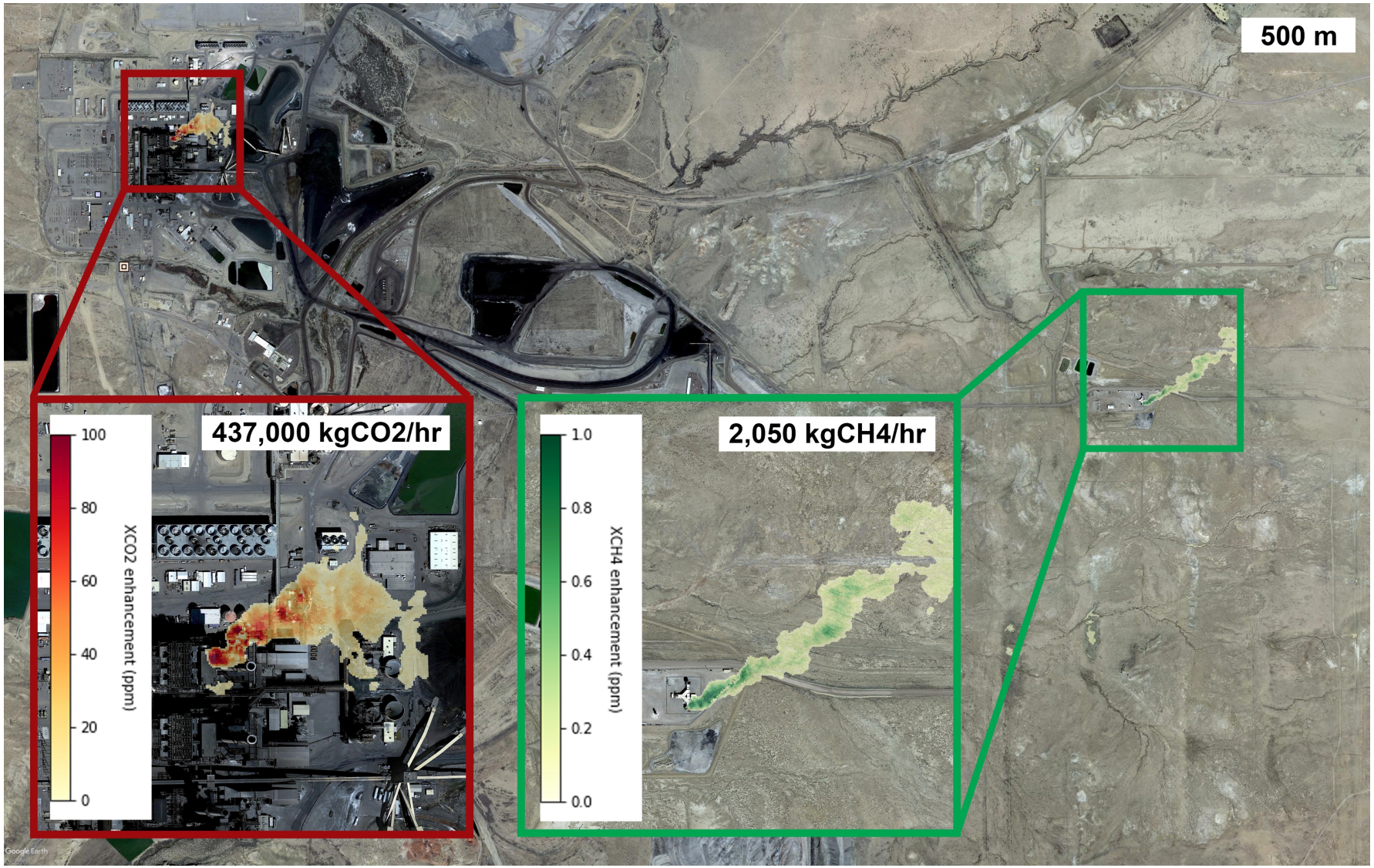


California Methane Survey scientific findings

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 $TgCH_4\ yr^{-1}$ (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)



Future work: AVIRIS-NG CO_2 and CH_4 (complete carbon footprint)



Cusworth et al., in prep