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COVID-19 impacts on California methane point source emissions

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In the summer of 2020, the AVIRIS-NG airborne imaging spectrometer surveyed California's Southern San Joaquin Valley and the South Bay (Los Angeles County) to identify anthropogenic methane point source plumes, estimate emission rates, and attribute sources to both facilities and emission sectors. These flights were designed to revisit regions previously surveyed by the 2016-2017 California Methane Survey (Duren et al., 2019) and to assess the impact of COVID-19 on emissions across multiple sectors. For the region flown by both the California Methane Survey (summer, fall 2016-2017) and the California COVID campaigns (summer, fall 2020), total emissions from point sources from the IPCC sectors for Energy Industries and Oil & Natural Gas were 34% lower during the 2020 flights. However, emission trends varied across different sectors. For the Energy Industries sector, there was a 19% decrease driven by reductions in refinery emissions consistent with a drop in production during 2020, which was offset in part with increases from powerplants. For the Oil & Natural Gas sector, emissions declined 35% and significant variability was observed at the oilfield scale. Emissions declined for all but the Buena Vista and Cymric oilfields with an observed relationship between production and emissions. These results indicate that imaging spectrometer surveys can characterize changes in anthropogenic emission profiles over time, including those associated with disruptive events like COVID-19.