

Where's the fire? Using in-situ observations from the NOAA/NASA FIREX-AQ campaign to validate small fire in the central and southern U.S.

Eileen Rintsch¹, Jessica L. McCarty¹, Robert A. Francis¹, Justin J. Fain¹, Amber J. Soja^{2,3}, Emily Gargulinski², Elizabeth Wiggins³

¹ Department of Geography and Geospatial Analysis Center, Miami University, Oxford, OH, USA , jmccarty@miamioh.edu

² National Institute of Aerospace, Hampton, VA, USA

³ NASA Langley Research Center, Hampton, VA, USA

Introduction

Many global fire emission inventories are driven by satellite-based active fire detections. This can exclude small fires from emission inventories.

Objectives

To compare ground-verified cropland and rangeland fires with satellite-based active fire detections. Further, to improve satellite-based estimates of small fires in agroecosystems.



Harvested wheat field burning in western Kansas, near Oklahoma. Image: J.L. McCarty.

Methods

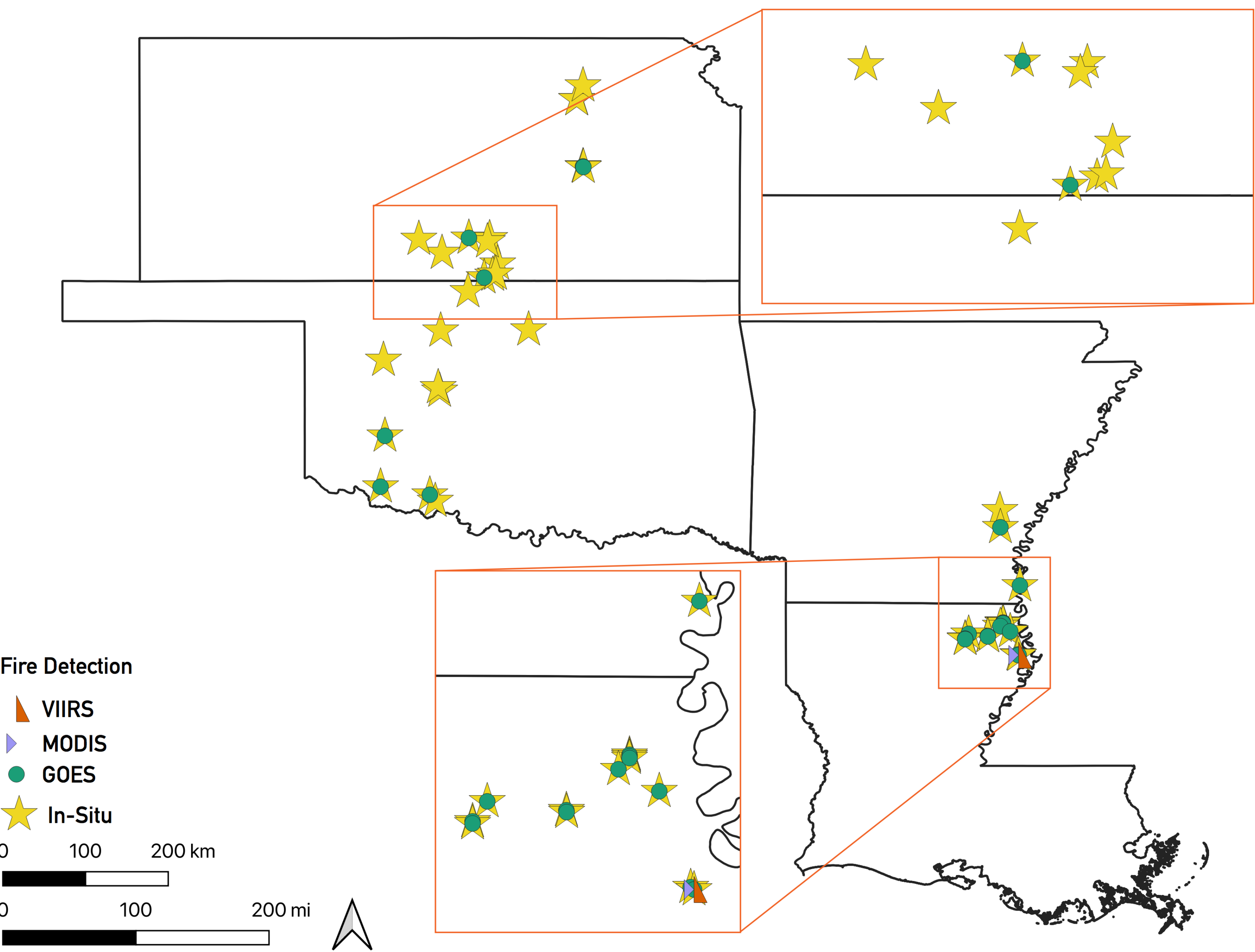
MODIS, VIIRS, and GOES-R active fire data were combined with 30 m U.S. Dept. of Agriculture Cropland Data Layer to assign land use. Active fires were compared to fires and fuels validated during NOAA/NASA FIREX-AQ campaign in the central U.S.



Funding for this work provided by NASA Grant number 80NSSC18K0685.

Take Home Message

41% of small fires during FIREX-AQ campaign were not detected by GOES, VIIRS, and MODIS.



If GOES detections excluded, approximately 5% of the ground verified fires are detected by MODIS and VIIRS active fire products.

Field crew (McCarty, Rintsch, Francis) found more *fires* than DC-8 or satellite products.

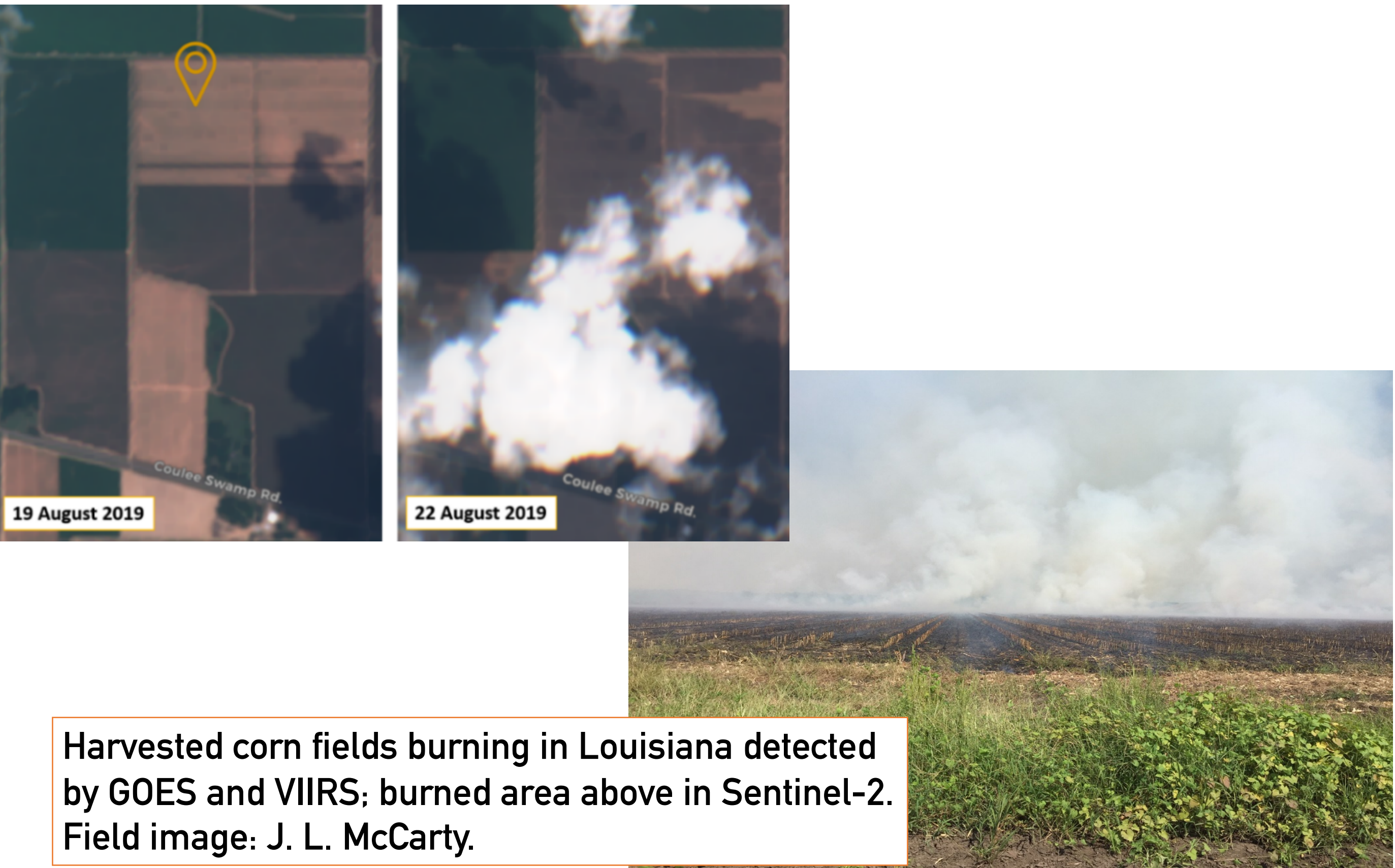


Rintsch collecting fuel samples pre-prescribed rangeland burn, tallgrass prairies of Kansas. Image: J. L. McCarty.

Data Collection

Fire locations were collected during August 2019 NOAA/NASA FIREX-AQ field campaign in southern Great Plains and Mississippi Delta of the U.S. Data processing completed in R Studio.

Satellite	VIIRS	MODIS	GOES
Spatial Resolution	375 m	1 km	2 km
Polar Orbiting	Yes	Yes	No



Harvested corn fields burning in Louisiana detected by GOES and VIIRS; burned area above in Sentinel-2. Field image: J. L. McCarty.

FIREX-AQ team in front of DC-8 in summer 2019; Image courtesy of NASA.

