



Is the world burning less?

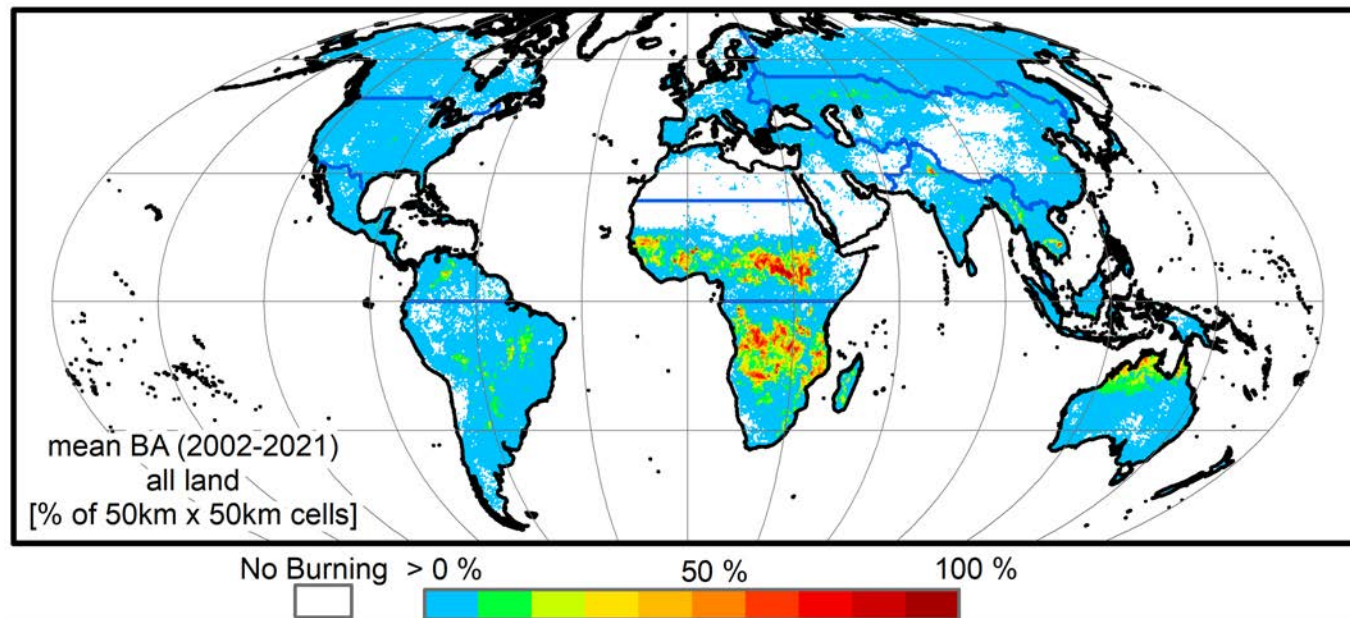
Disentangling decadal trends, inter-annual fire variability and product uncertainties, through harmonization of the NASA MODIS and VIIRS fire product record



Luigi Boschetti (UI), David Roy (MSU) and Louis Giglio (UMD)

- MODIS provides the only consistent, 20+ year global burned area record.
- The harmonized MODIS / VIIRS burned area time series will provide the first ever global fire record covering the 30 years conventionally required for climate analysis.

on average 2.7 % of the land surface burned each year



(paper in preparation)



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Science June 2017

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RESEARCH ARTICLE



A human-driven decline in global burned area

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SCIENCE • 30 Jun 2017 • Vol 356, Issue 6345 • pp. 1356-1362 • DOI: 10.1126/science.aal4108

2,921 521

Burn less, baby, burn less

Humans have, and always have had, a major impact on wildfire activity, which is expected to increase in our warming world. Andela *et al.* use satellite data to show that, unexpectedly, global burned area declined by ~25% over the past 18 years, despite the influence of climate. The decrease has been largest in savannas and grasslands because of agricultural expansion and intensification. The decline of burned area has consequences for predictions of future changes to the atmosphere, vegetation, and the terrestrial carbon sink.



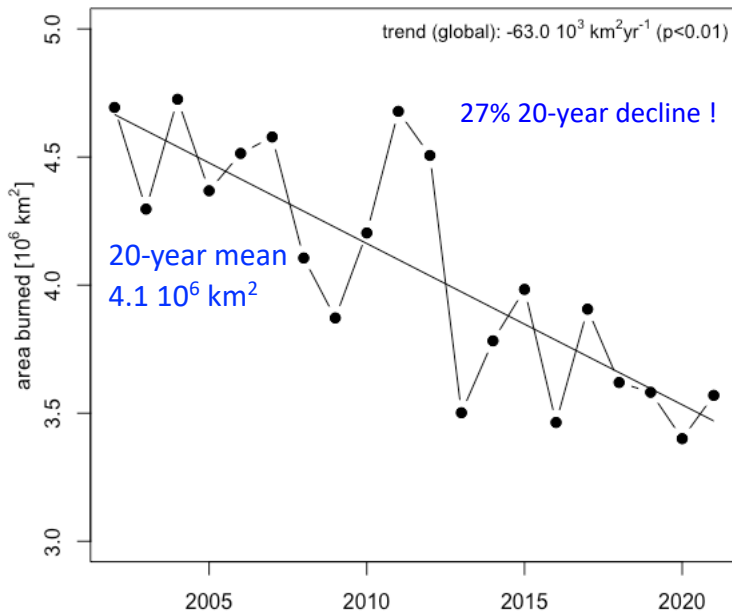
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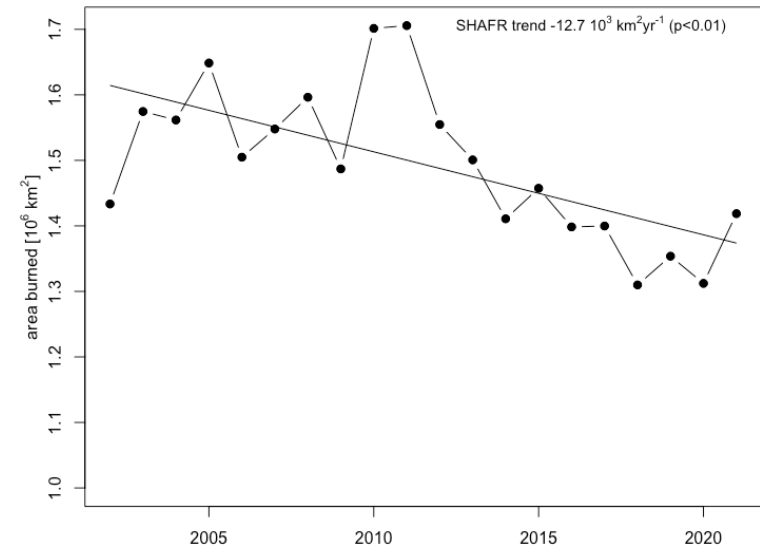
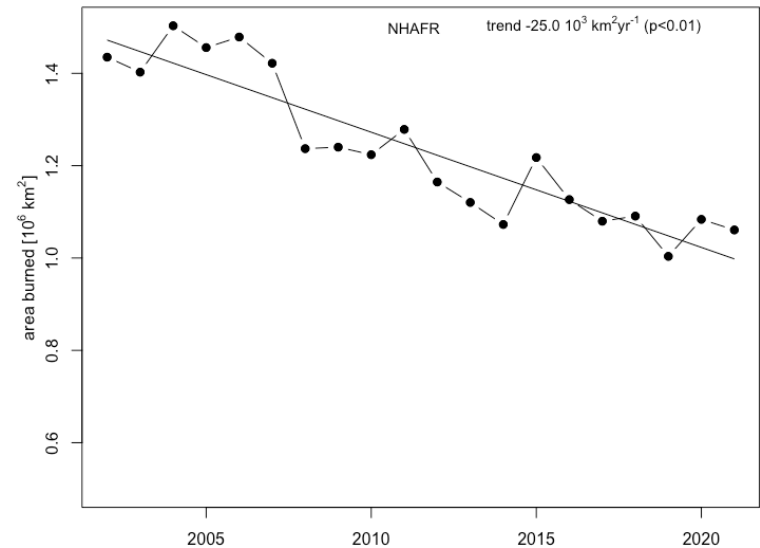
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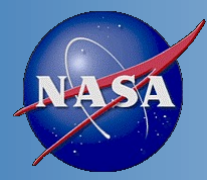
The decline continues!

2002-2022 data is showing a persistent, statistically significant decline in area burned with the majority concentrated in Africa



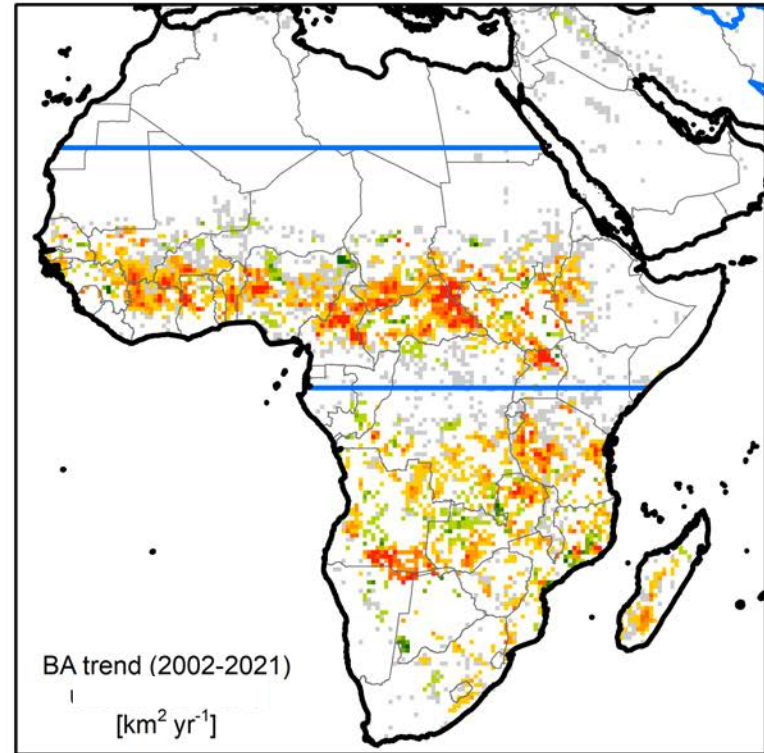
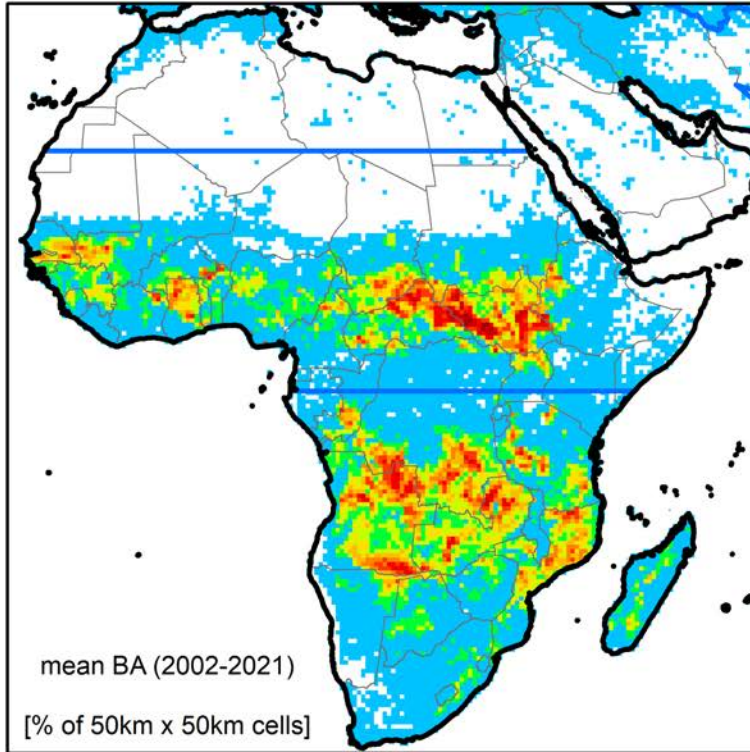
(paper in preparation)





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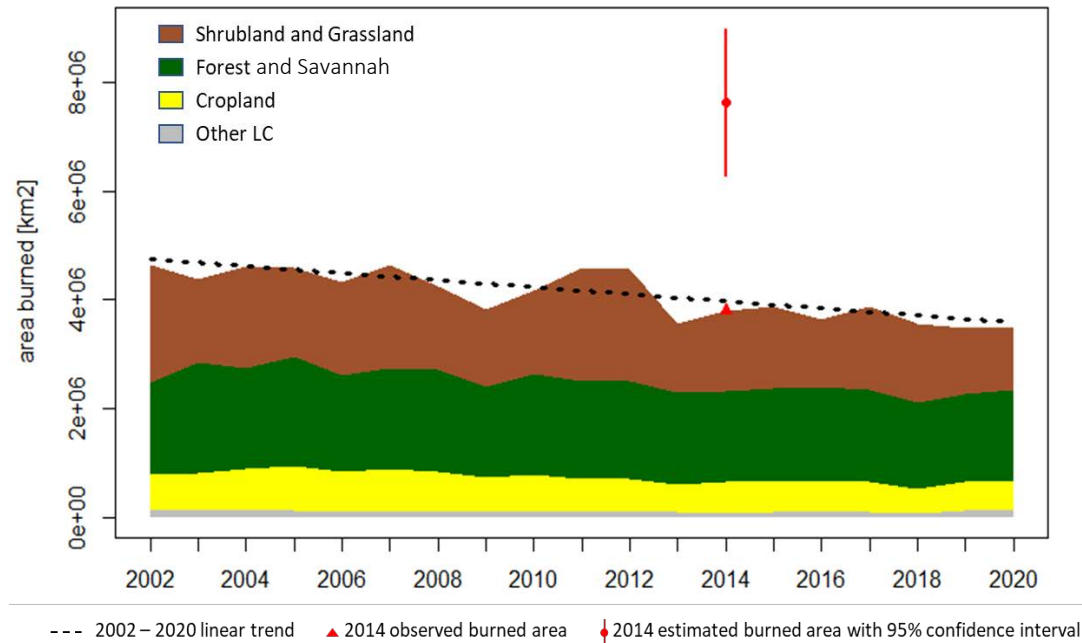




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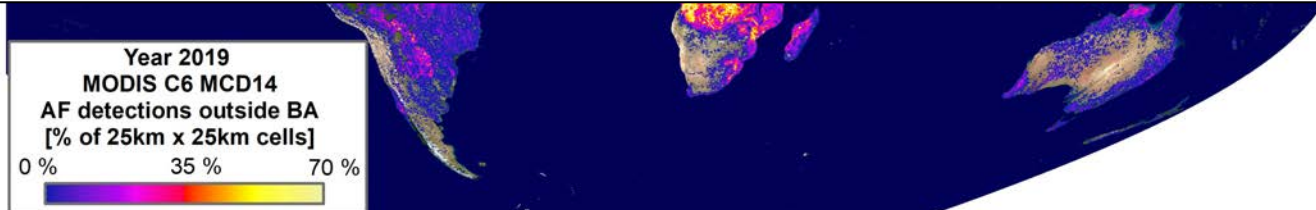
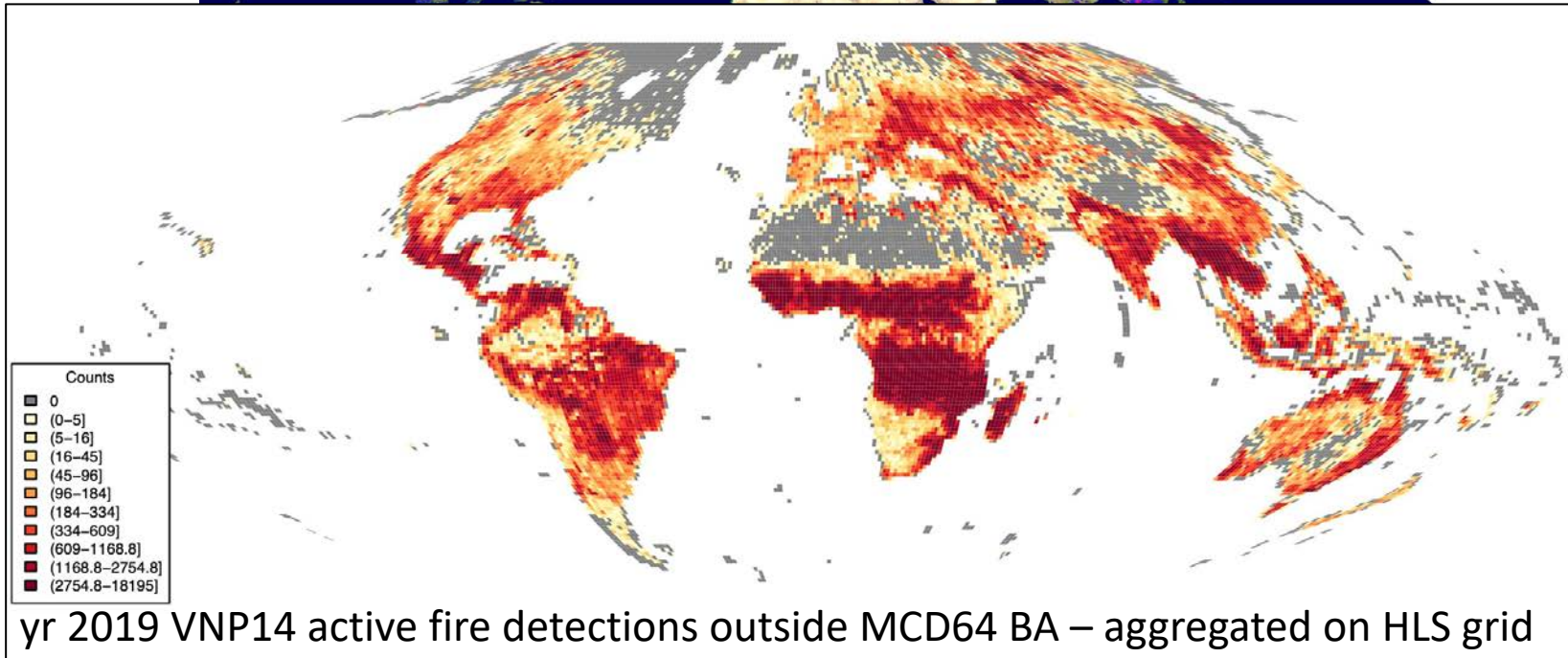
CEOS Stage 3 validation of the MODIS burned area product with L8 reference data (558 image pairs) shows a large bias due to missing small burns. The bias has similar magnitude as the decline reported.

Is the world really burning less? Or are the burned areas becoming smaller leading to a lower detection rate at the MODIS resolution?



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Project Objectives and Tasks

- Quantify the discrepancy between active fire counts and burned area detections in the MODIS and VIIRS product record.
- Generate reference L8 / S2 burned area time series at representative locations, leveraging on LCLUC/MuSLI funding (Roy PI).
- Derive an unbiased 25-year 0.25° harmonized MODIS/VIIRS time series, with uncertainties, calibrated using the L8/ S2 reference burned area
- Detect burned area trends and interannual variability, identify if observed trends are significant relative to inter-annual fire variability and to the uncertainties.

Critical delay: Collection 2 VIIRS burned area product not available yet - Global 1 year test currently evaluated

Code prototyped and preliminary results for all tasks with MODIS MCD64/MO(Y)D14 and VNP14.

L8S2 reference locations will be selected as soon as C2 VNP64 is available for three consecutive years