Climate Change Impacts on Fire Activity in the US

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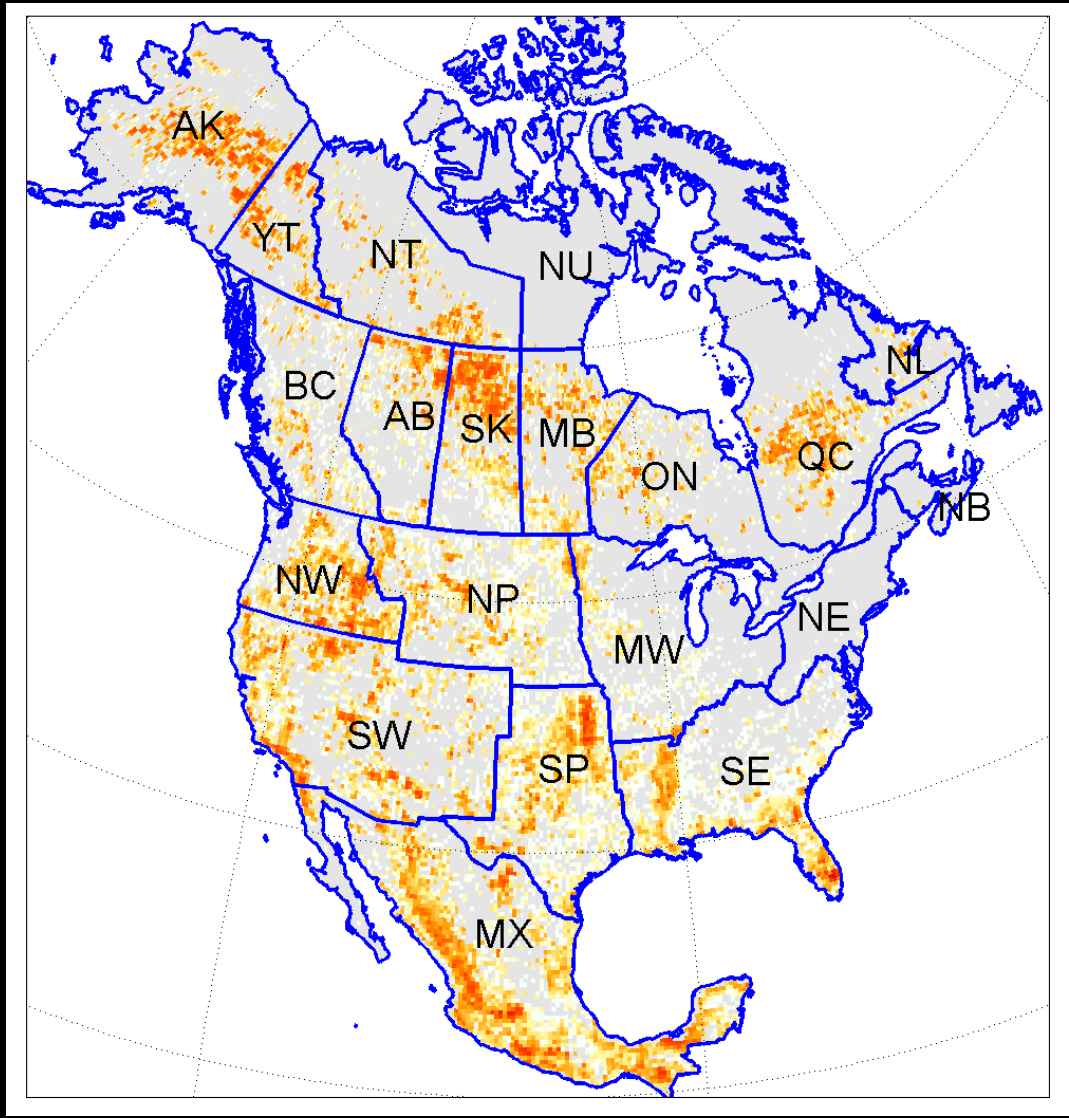
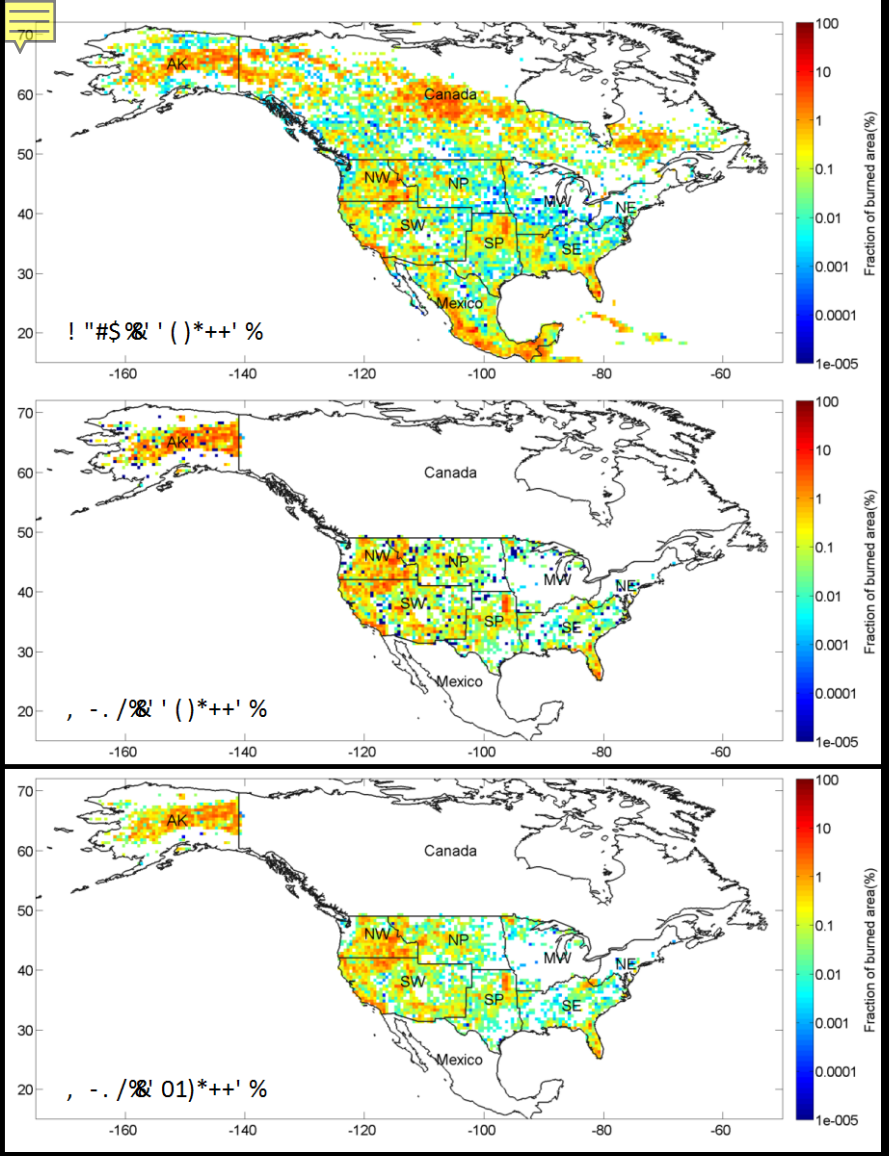
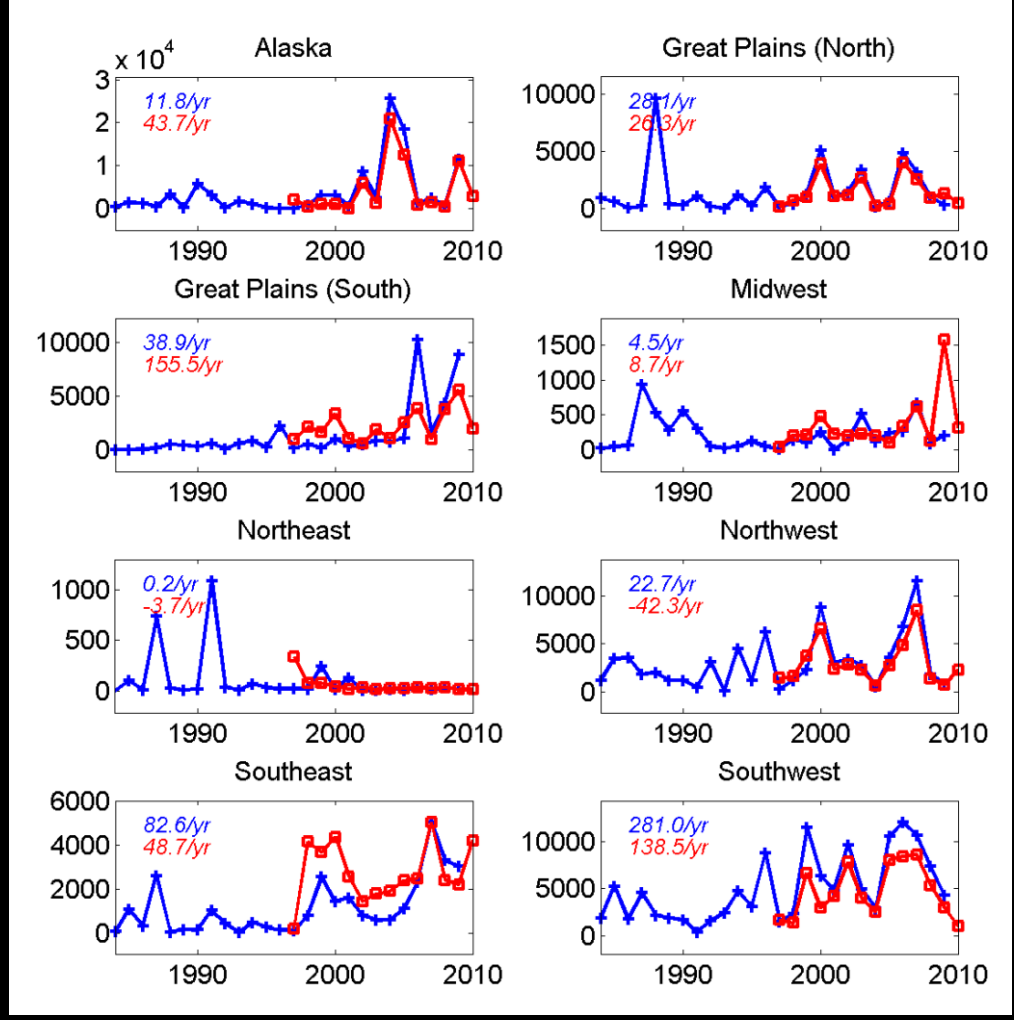
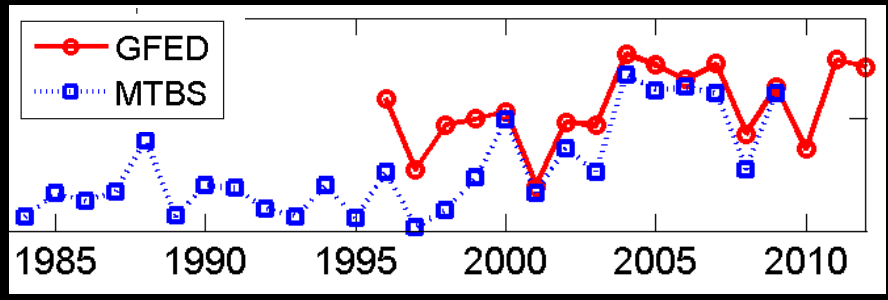


Context:

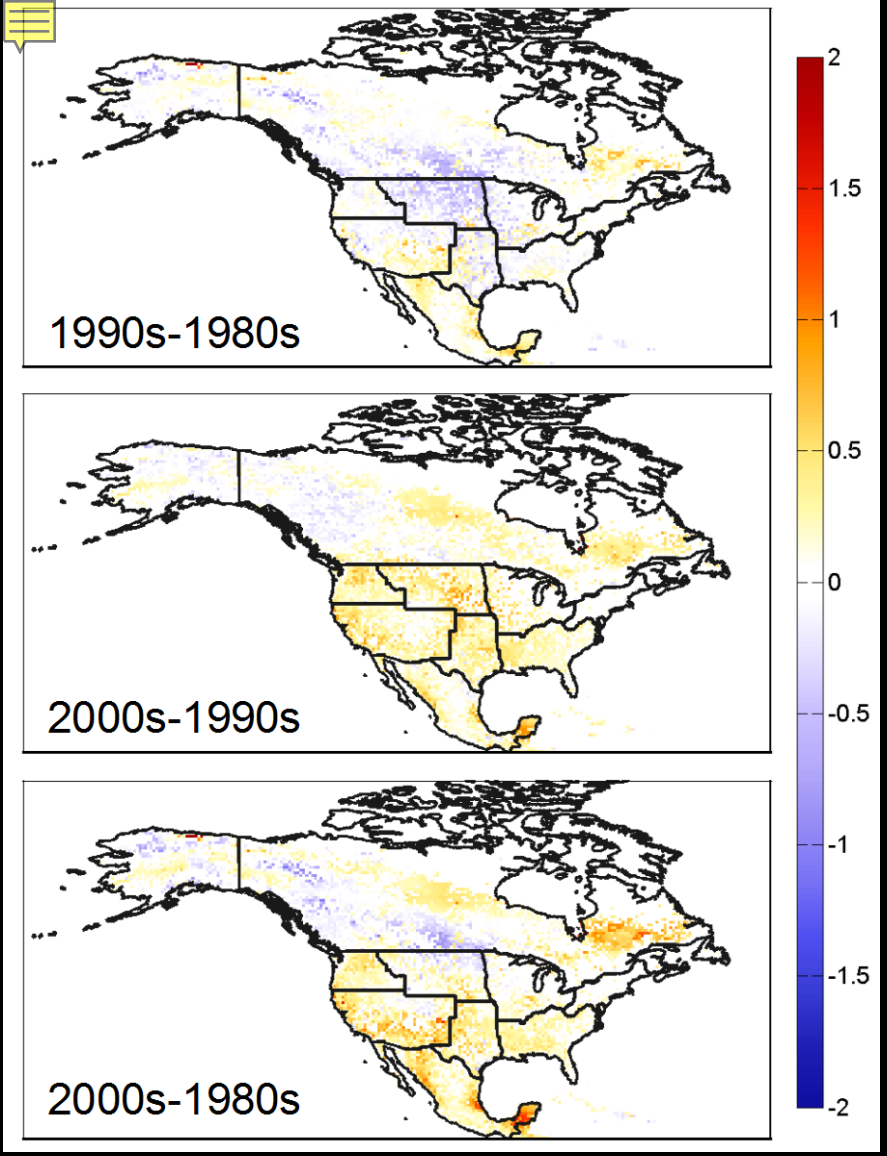
- US Fire Suppression >$3B yr^{-1}
- Growing Wildland-Urban Interface
- Dynamic Fire Policy Landscape
- Increase in Climate-driven Fire Risk

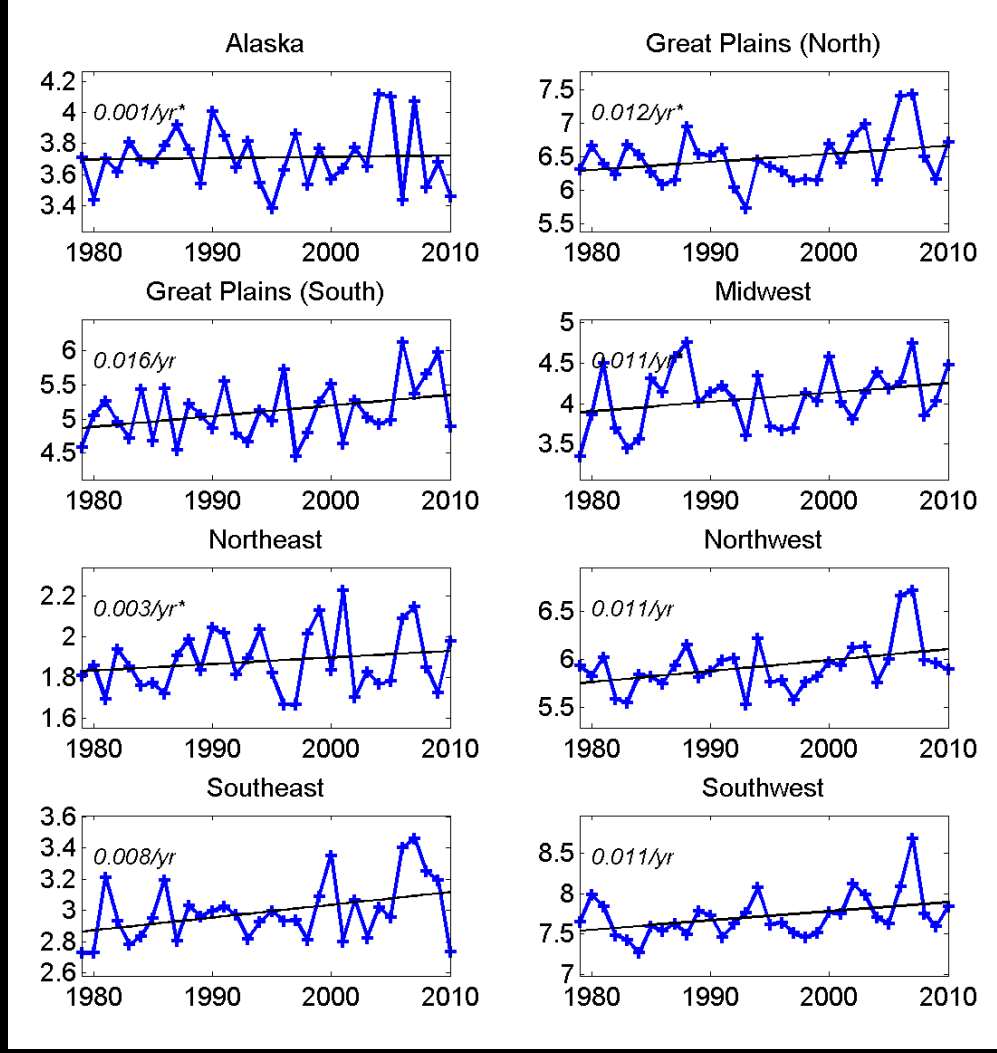






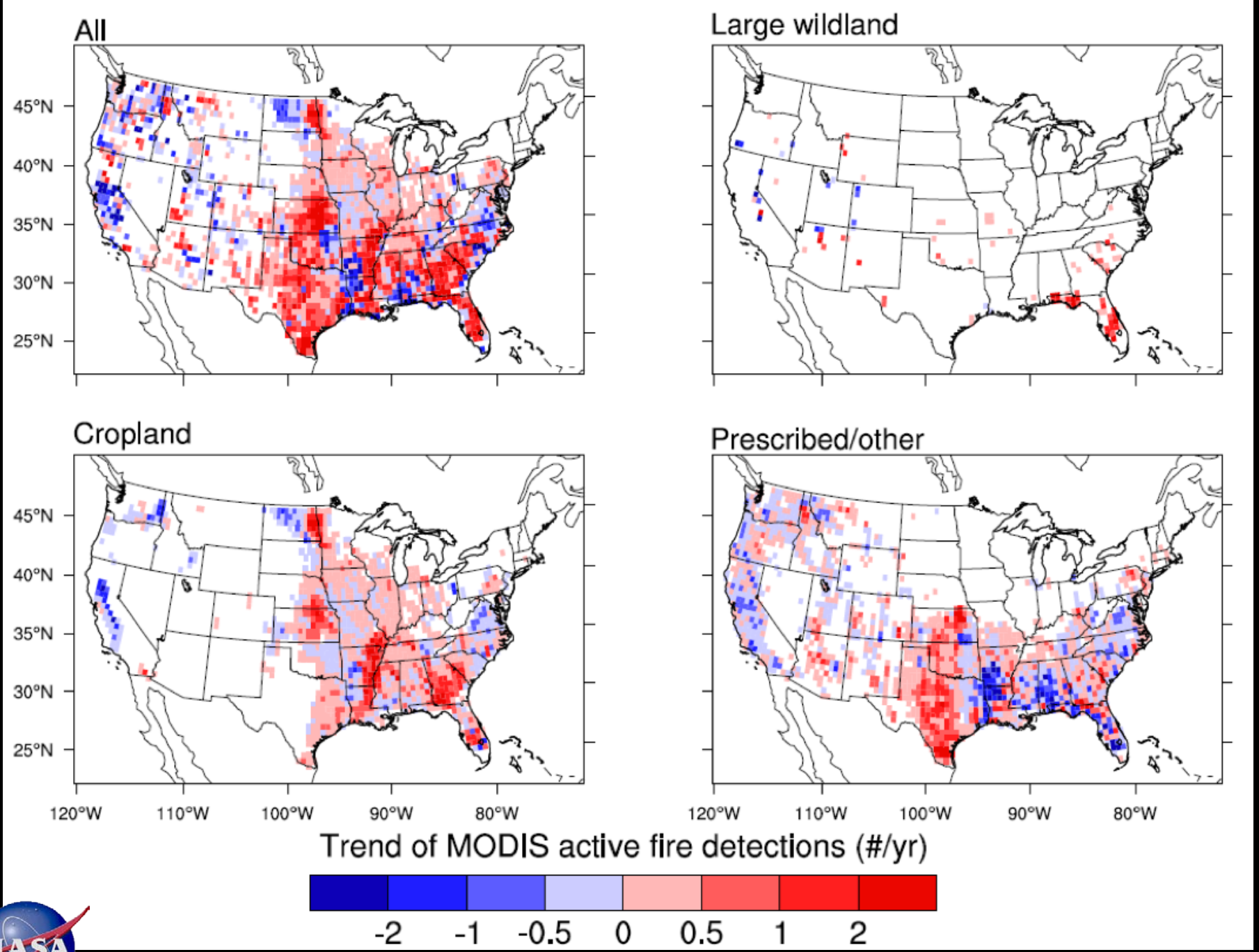
Morton et al., 2012



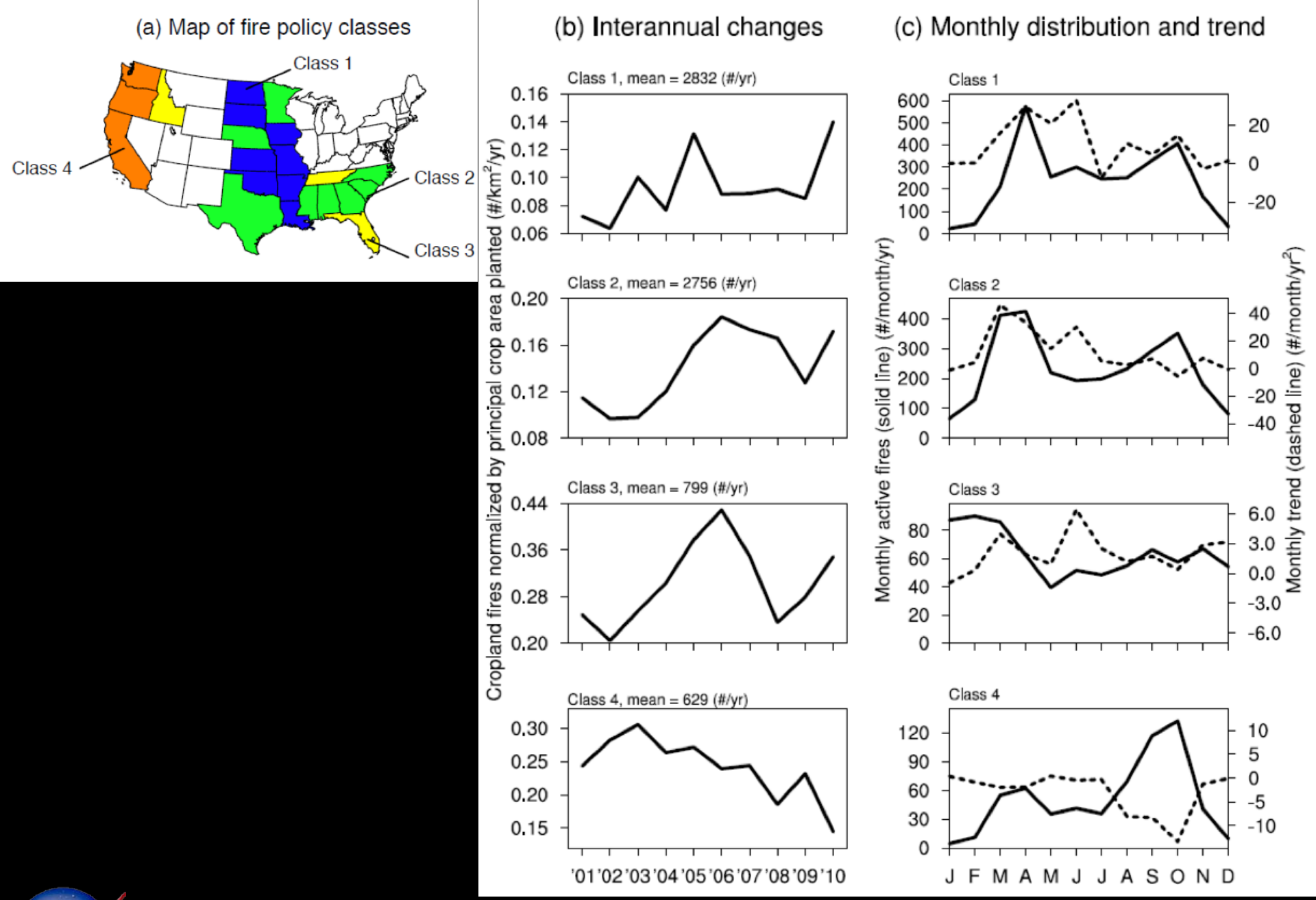


Potential Evaporation (PE) during the fire season also shows a positive trend during the satellite era.

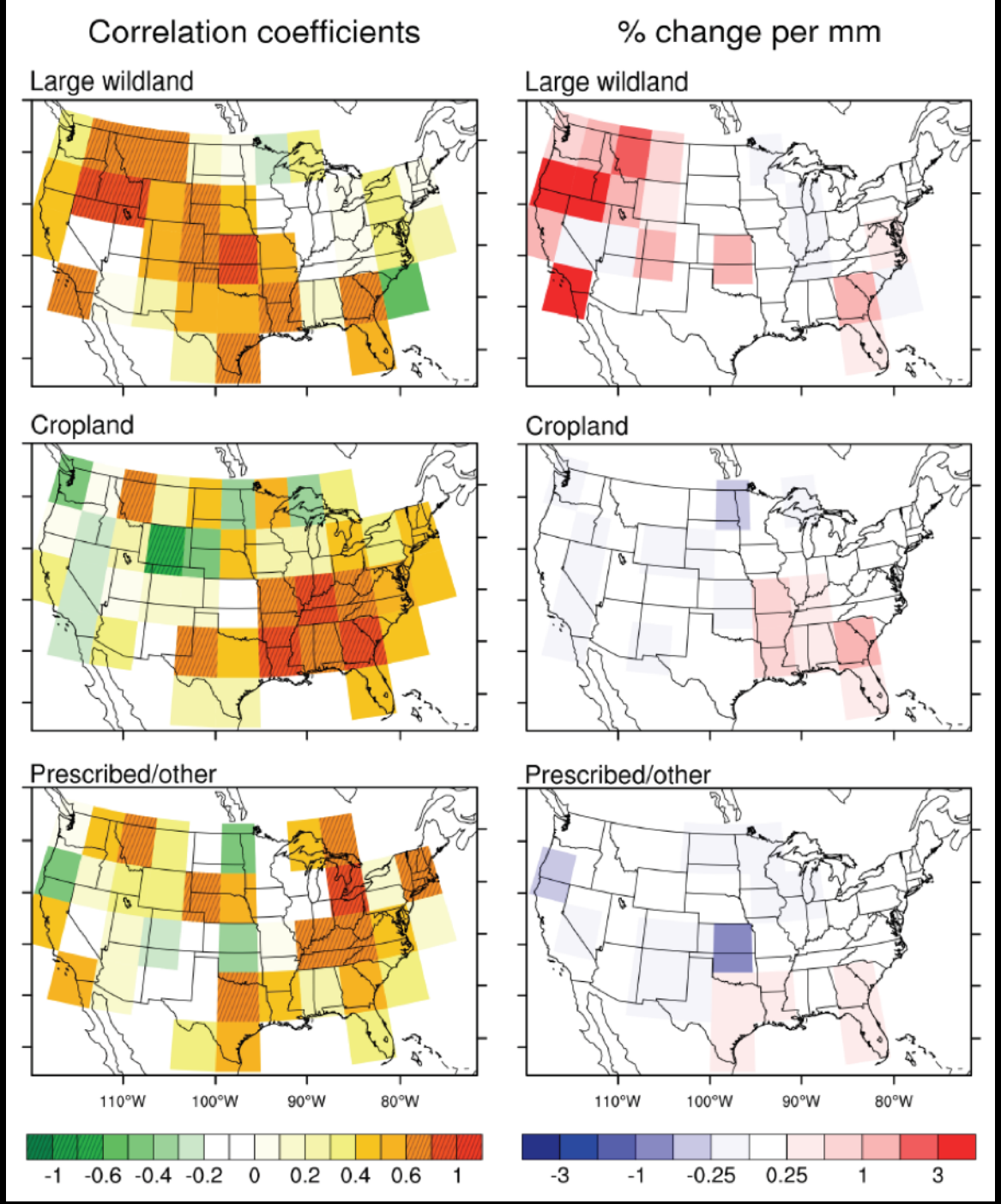
Morton et al., 2012



Lin et al., 2014 *JGR-B*

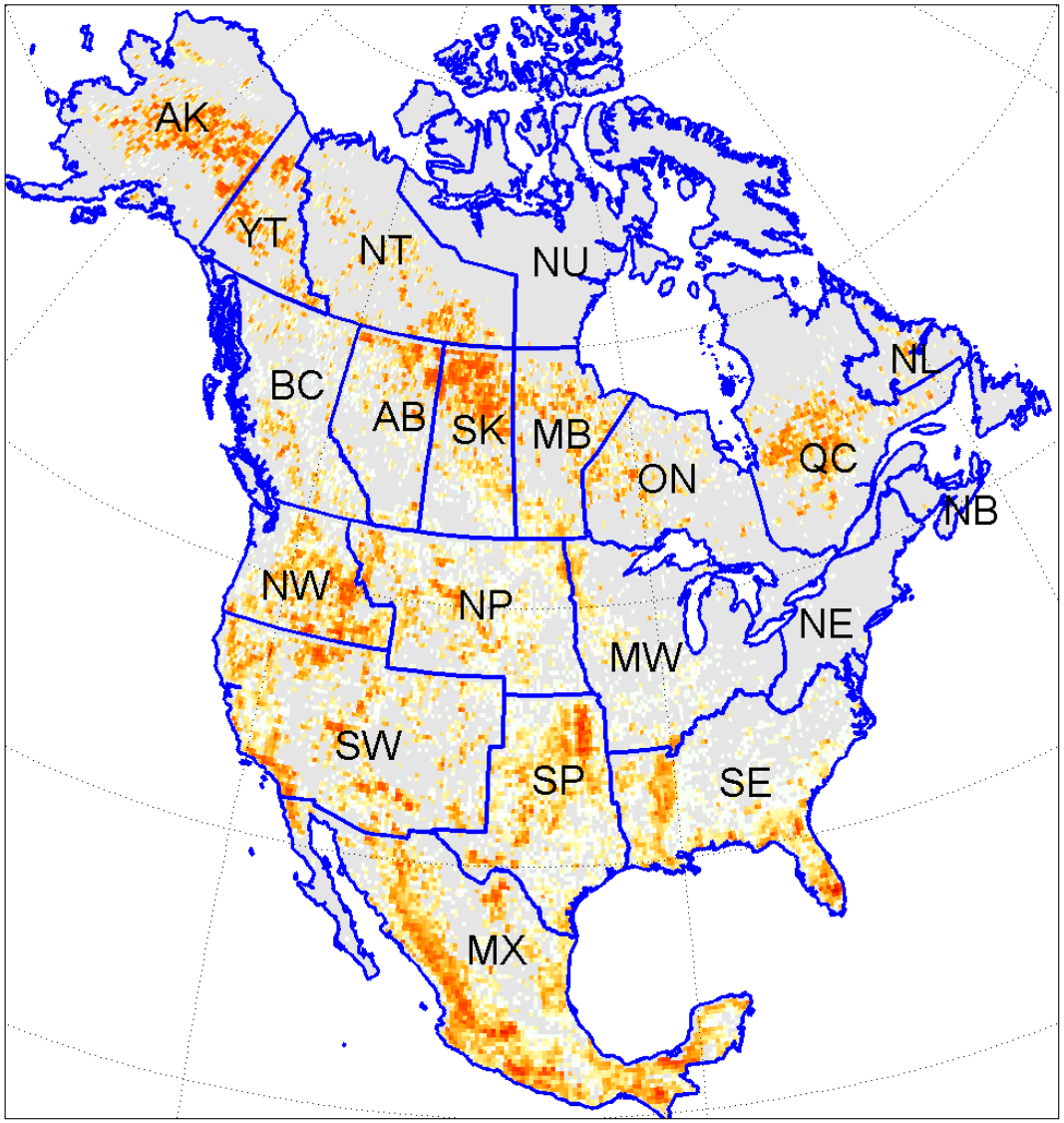


Lin et al., 2014 *JGR-B*

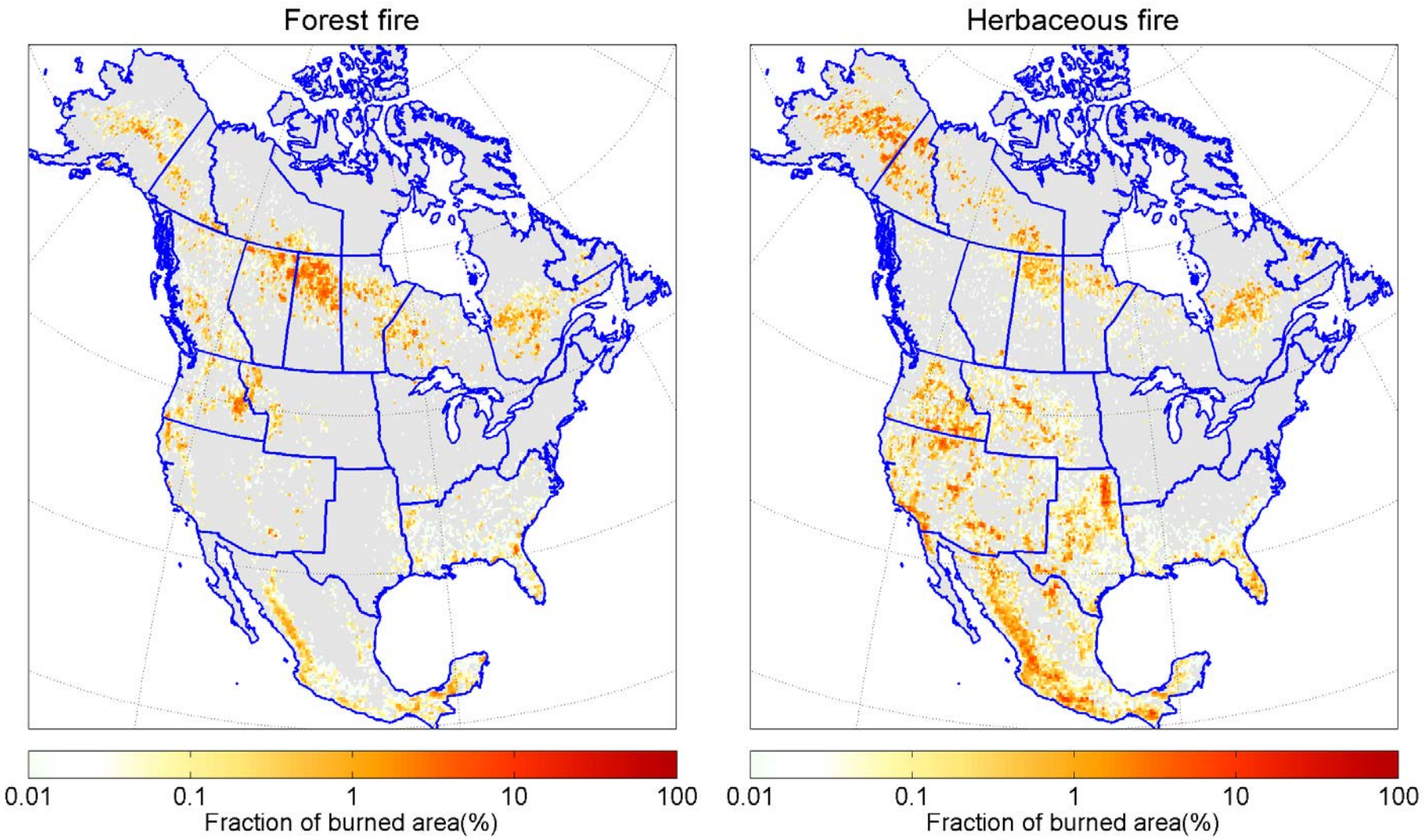


Lin et al., 2014 *JGR-B*

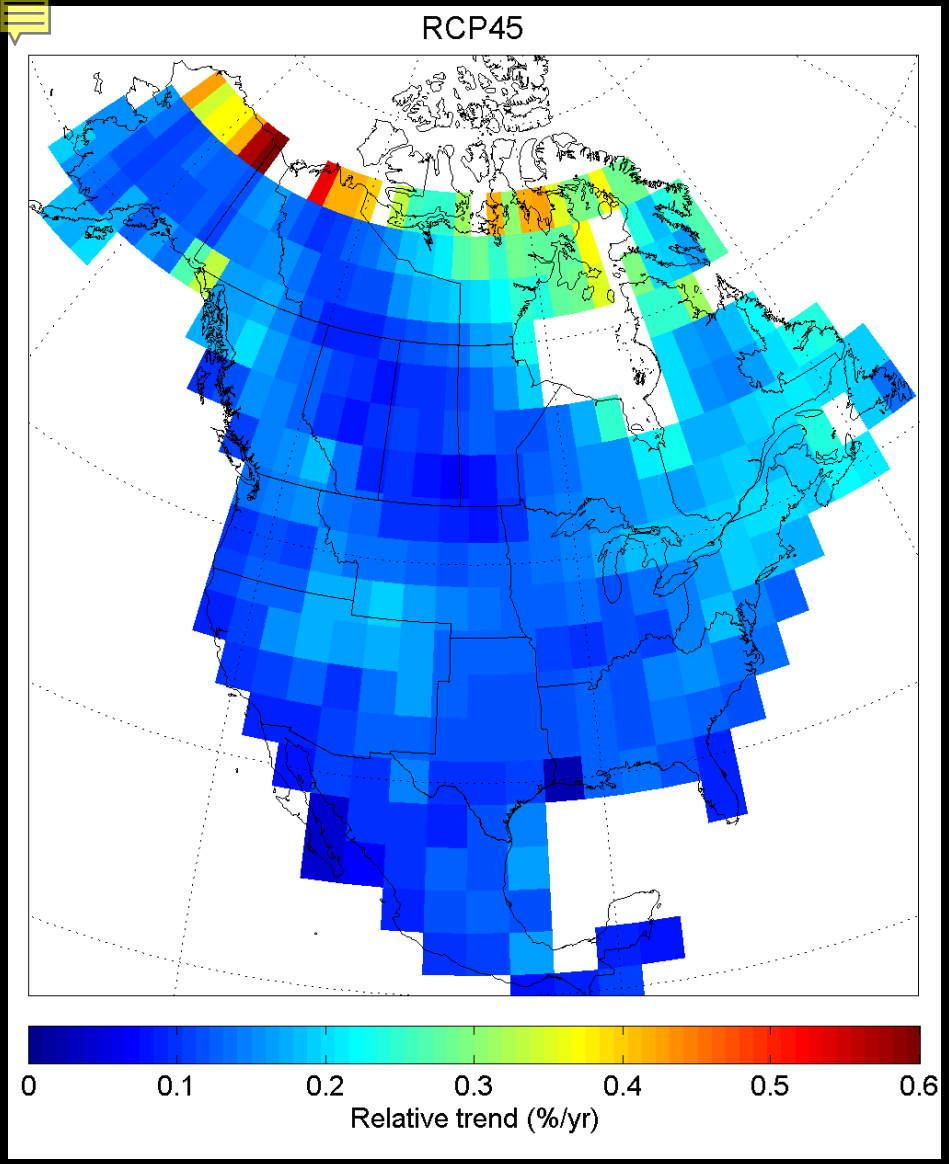
GFED4 annual burned area

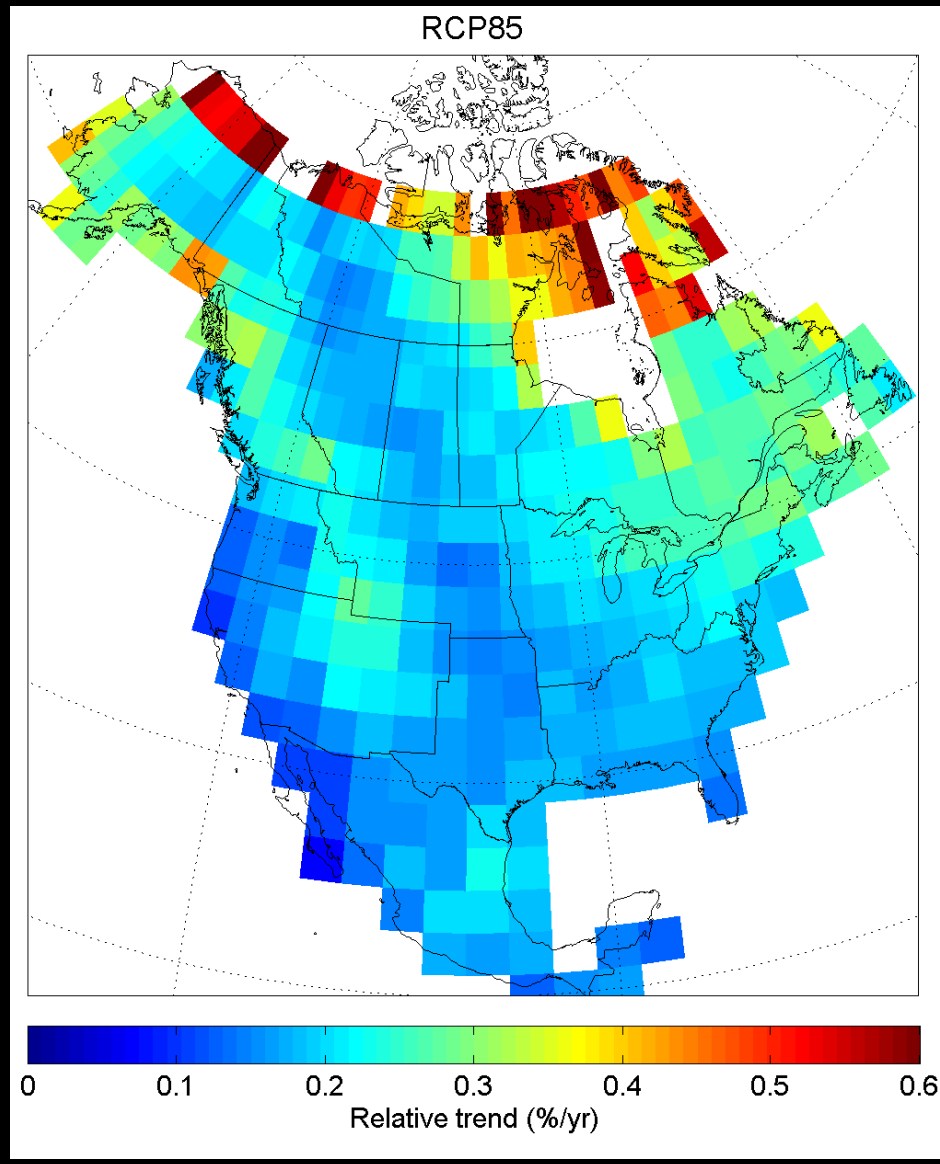


Wang et al., in prep.

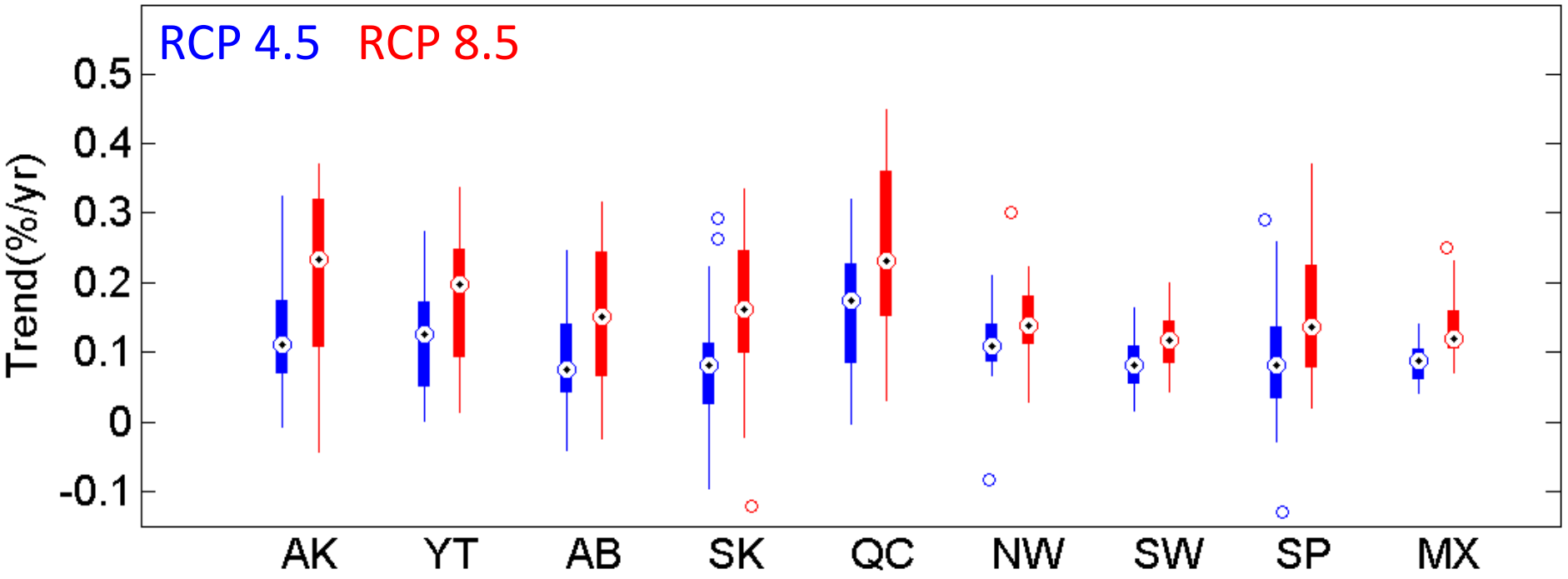


Wang et al., in prep.





Wang et al., in prep.



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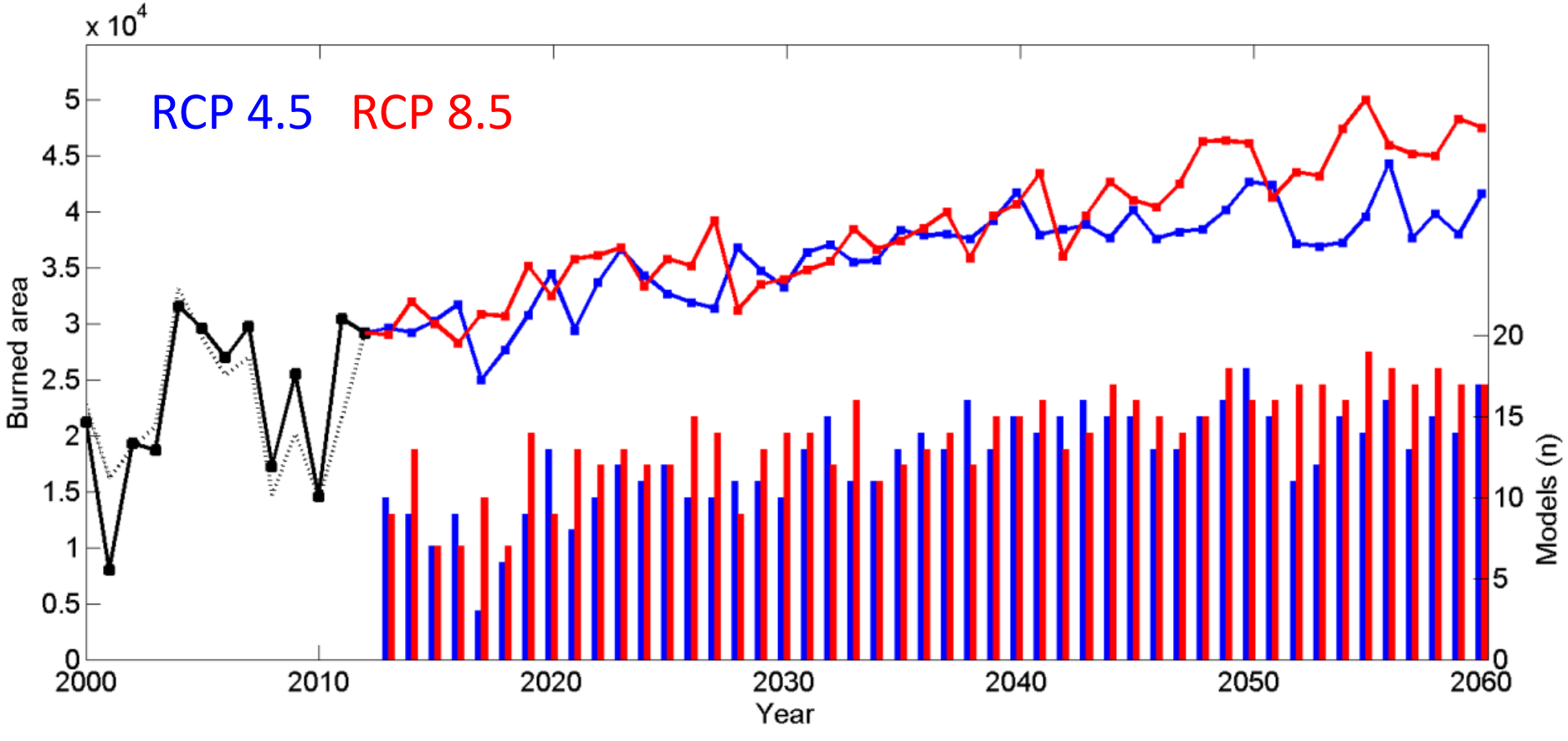

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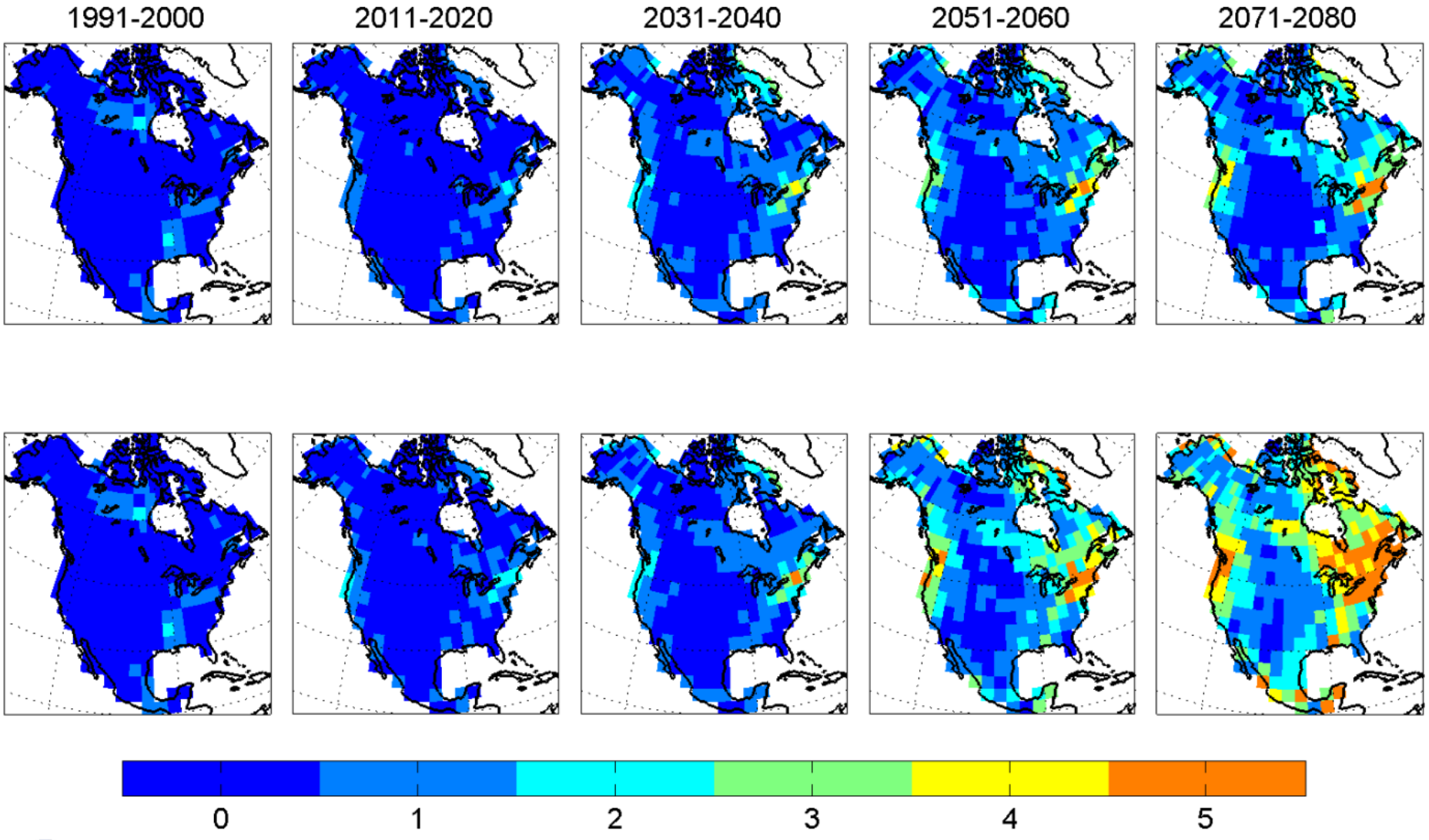

Wang et al., in prep.

Conclusions & Next Steps

By 2060:

1. Changes in climate-driven fire risk increase projected burned area for forest (97%, 142%) and herbaceous cover types (79%, 111%).
2. The landscape of fire risk expands to areas that are less fire prone under current climate.
3. Extreme events amplify fire risk in key US burning regions.

- Analysis of daily climate and burned area data: what are the controls on fire start, spread, termination?
- How do climate projections influence the seasonality of US fires?
- How do projected increases in burned area alter US fire emissions?
- What are the impacts of fuels management for forest carbon storage and future fire risk?

References & Links

- Morton DC, Collatz GJ, Wang D, Randerson JT, Giglio L, Chen Y. (2012). Satellite-based assessment of climate controls on US Burned Area. *Biogeosciences Discussion*, 9: 7853-7892, doi:10.5194/bgd-9-7853-2012. http://www.biogeosciences-discuss.net/9/7853/2012/bgd-9-7853-2012.html
- Lin H-W, McCarty JL, Wang D, Rogers BM, Morton DC, Collatz GJ, Jin Y, Randerson JT. Management and climate contributions to satellite-derived active fire trends in the contiguous United States. Journal of Geophysical Research: Biogeosciences, in press.
- http://globalfiredata.org
- http://mtbs.gov

Projected changes in fire season length:

Regions	RCP45		RCP85	
	Start	End	Start	End
Alaska	-5	1	-8	2
Northwest	-12	3	-15	4
Newfoundland and Labrador	-6	5	-8	6
Northwest Territories	-4	1	-6	2
Nunavut	-5	2	-7	3
Quebec	-5	9	-7	11
Saskatchewan	-4	3	-7	5
Yukon	-6	1	-8	2

RCP 4.5, RCP 8.5

6, 10

15, 19

11, 14

5, 8

7, 10

14, 18

7, 12

7, 10

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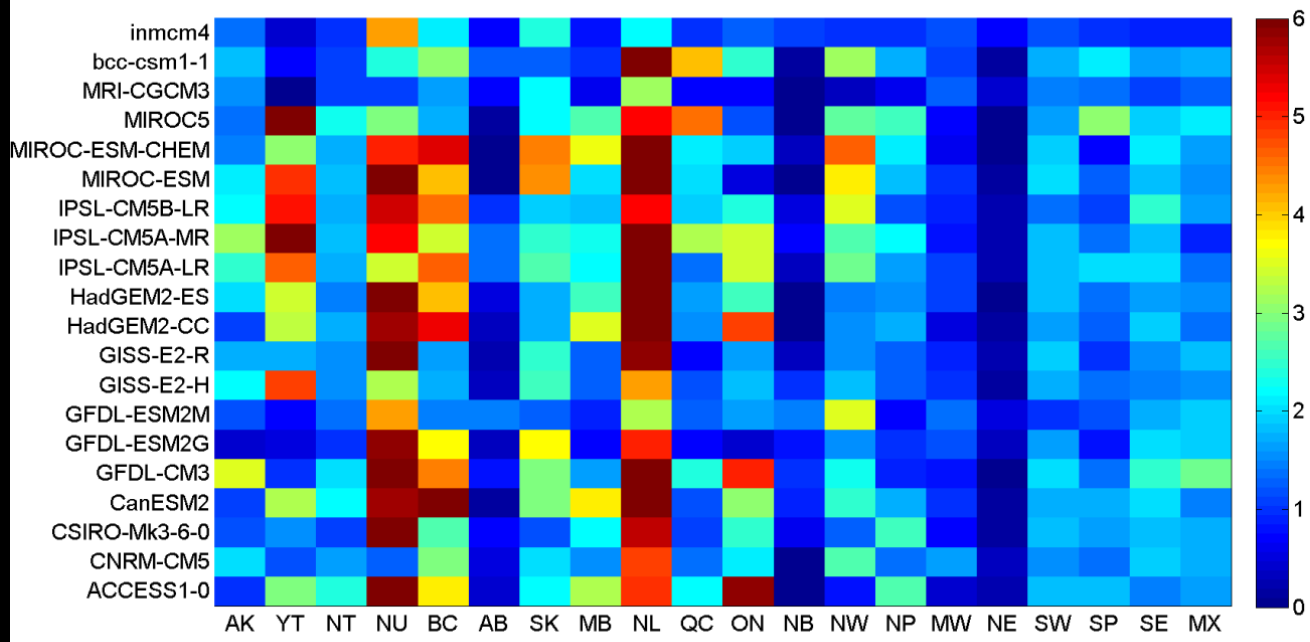

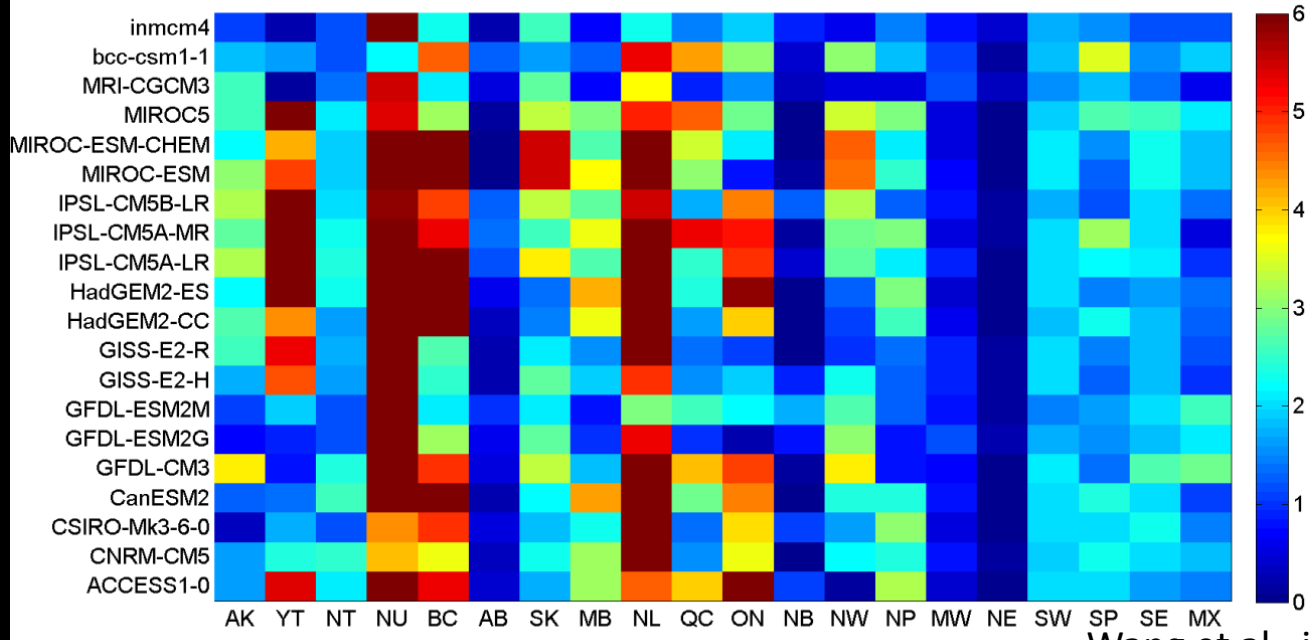

Wang et al., in prep.