

Synergistic applications of new data and technology to characterize the health impact of smoke PM_{2.5}

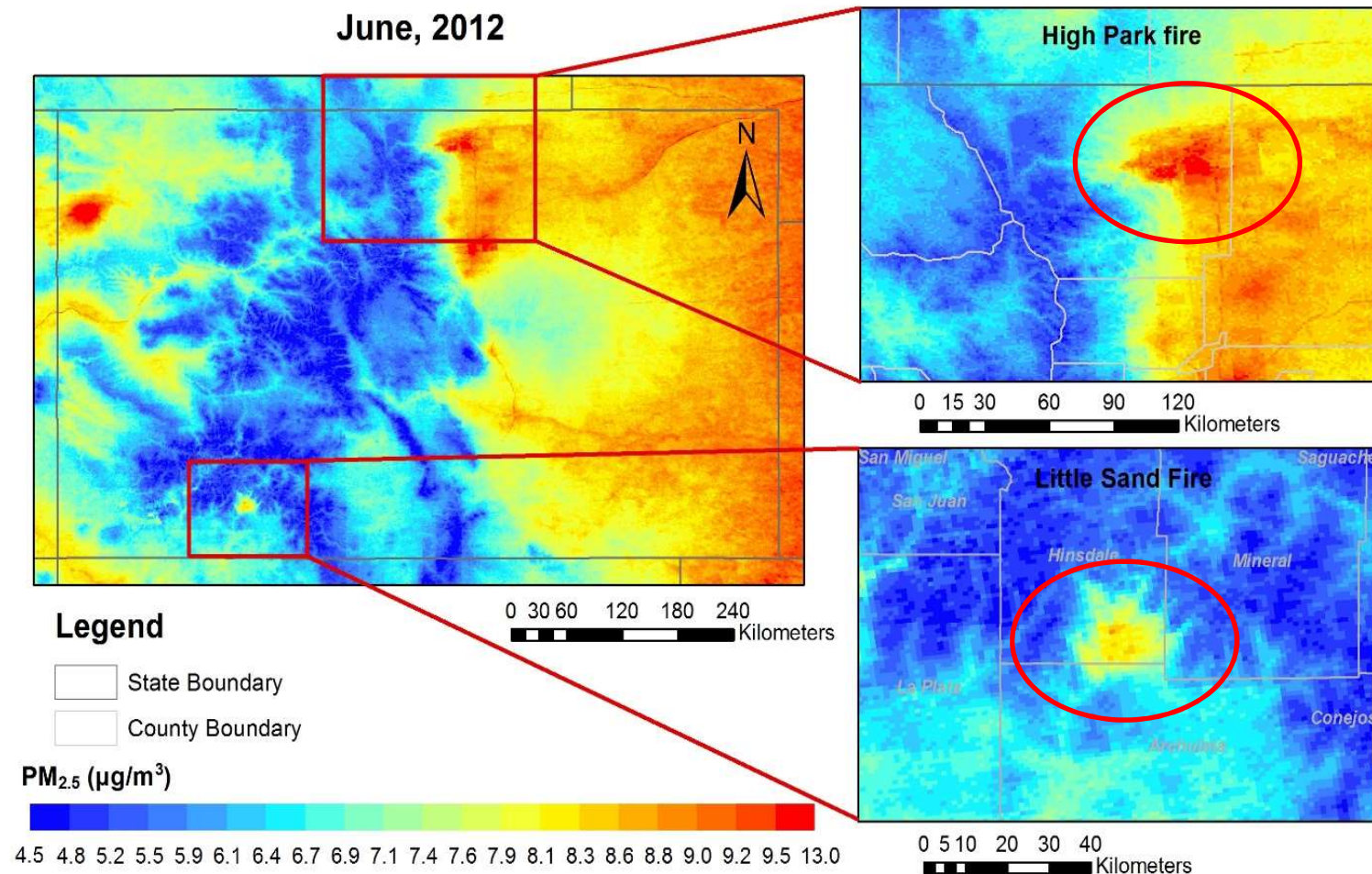
Yang Liu and Jennifer Stowell

- Wildland fires often start in remote locations far away from regulatory monitors
- Chemical Transport Models alone often can't estimate the spatiotemporal patterns of smoke due to imperfect emissions, complex terrain, coarse resolution, and chemistry
- Translating knowledge from field campaigns into models will take time

Satellite remote sensing can be used together with CTM simulations to characterize smoke distribution



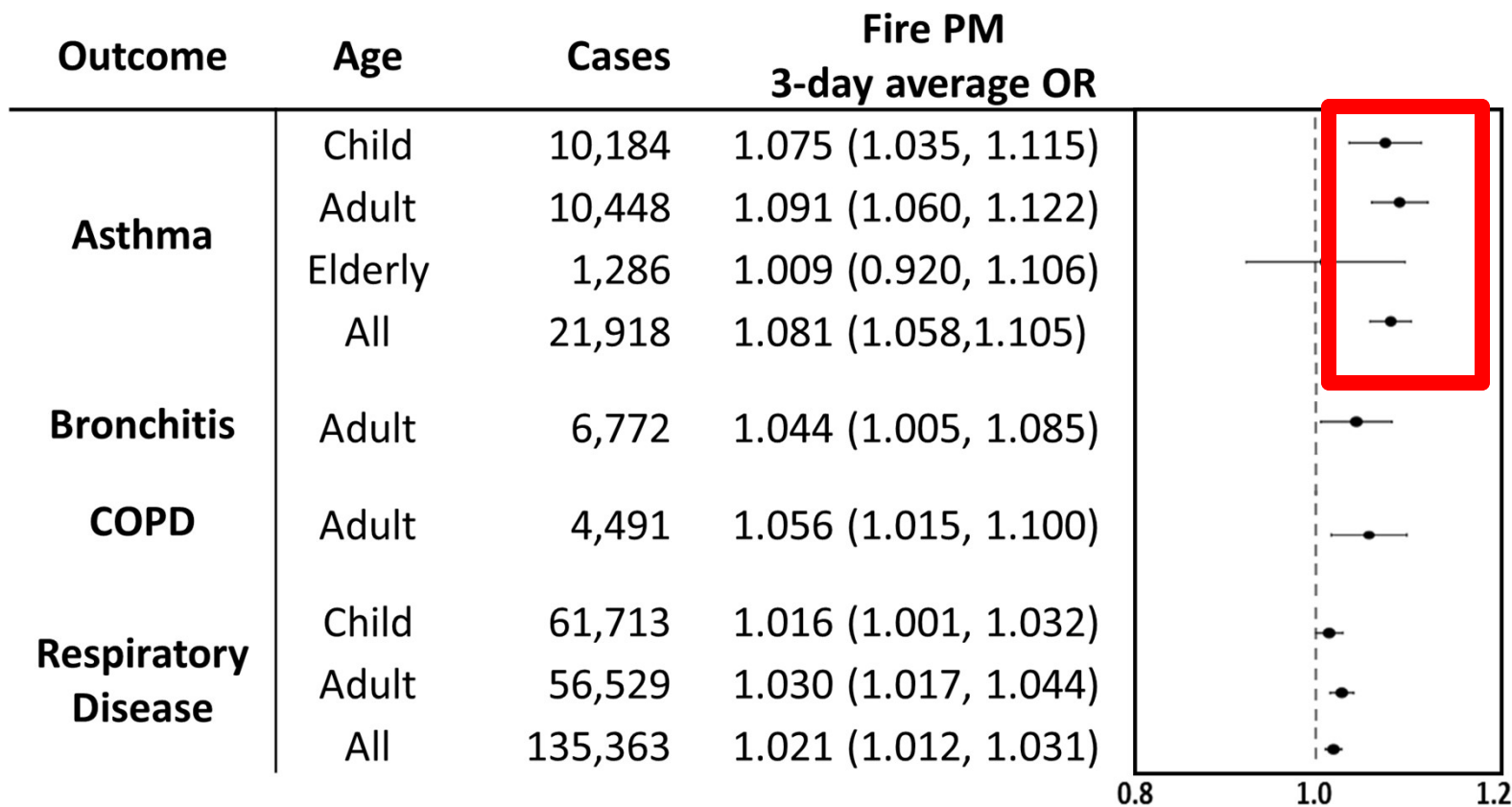
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Geng et al. 2018

Colorado study found greater health risks associated with more precise smoke exposure

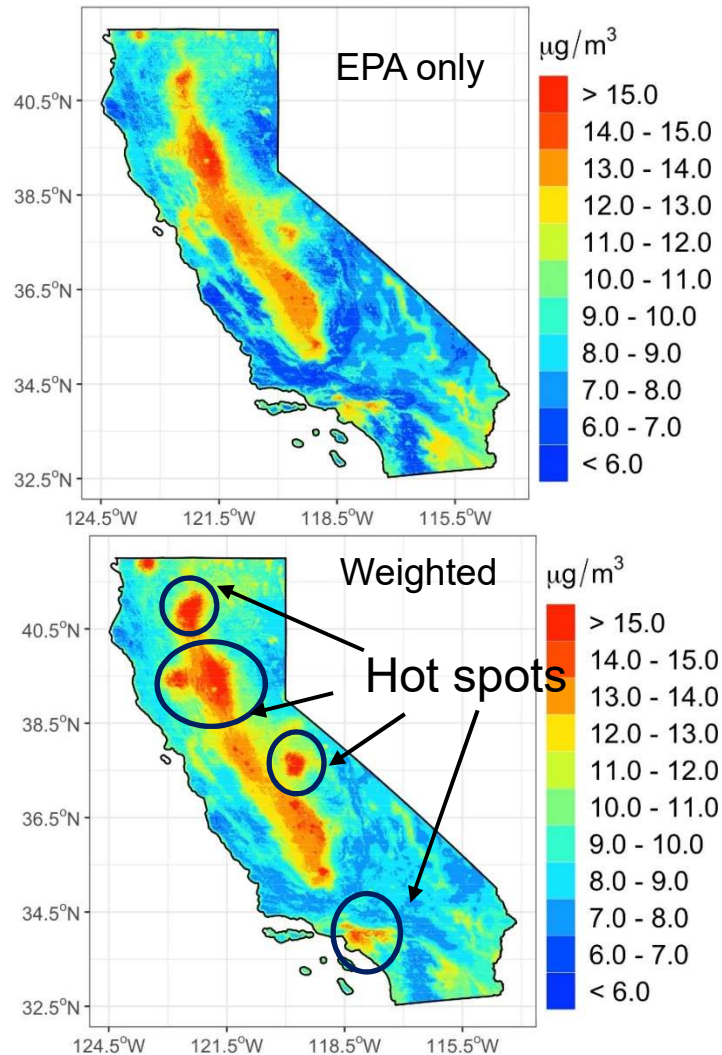
$$\text{Smoke PM}_{2.5} = \text{Satellite total PM}_{2.5} \times \frac{\text{CMAQ smoke PM}_{2.5}}{\text{CMAQ total PM}_{2.5}}$$



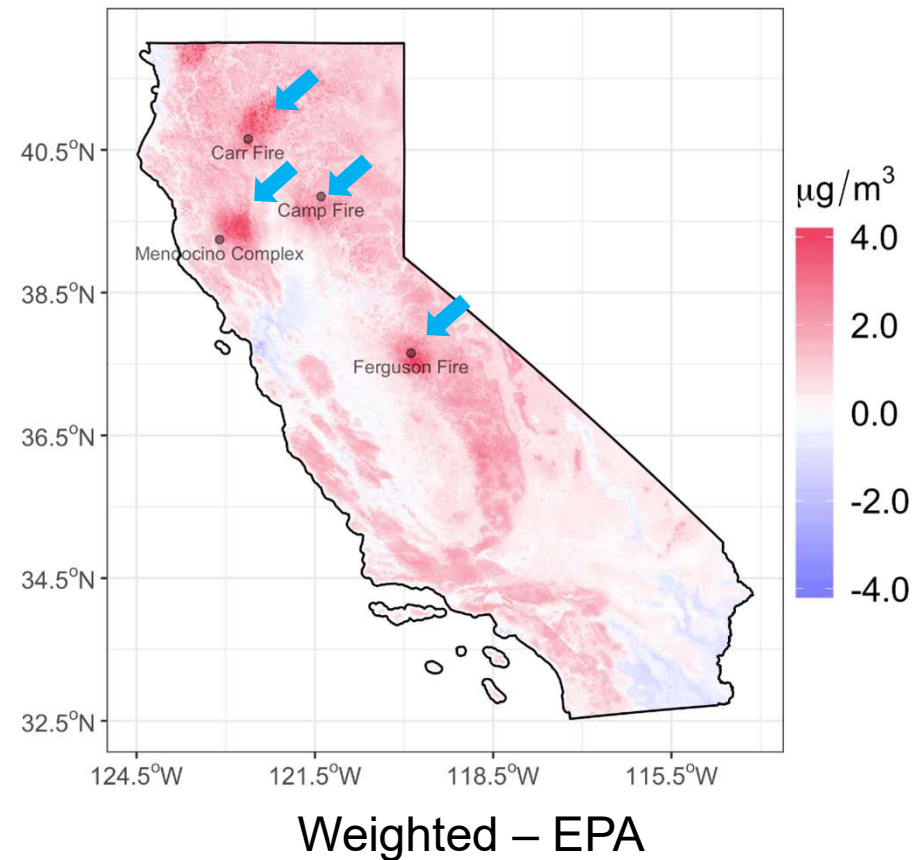
Low-cost sensors can help capture remote smoke hotspots



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Most hot spots related to fires



Bi et al. 2020