Using Earth Observations to Support Regional and National Environmental Health Surveillance

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HAQAST1

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The Emory Team

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- Yang Liu (PI, Emory): remote sensing, exposure modeler
- Howard Chang (Emory): biostatistician
- Matt Strickland (UNR): epidemiologist
- Heather Holmes (UNR): atmospheric chemist

- Collaborators
  - Heather Strosnider, Centers for Disease Control and Prevention
  - Kirk Bol, Colorado Department of Public Health and Environment

Proposed Project 1

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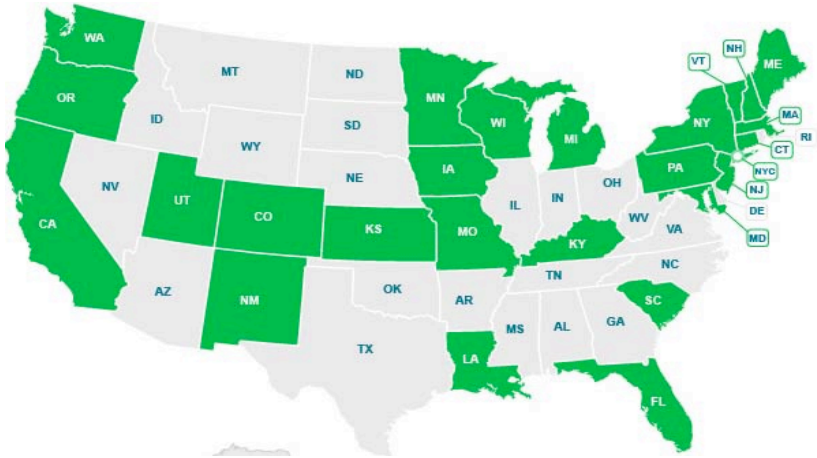
Partner Agency: CDC NCEH

Objective: a national scale epidemiologic study to link age-specific ED visits with air pollution exposure derived from NASA Earth observations and model simulations

Deliverables: Tracking-style Environmental Public Health Indicators and Measures based on our results (e.g., county-level asthma health risks)



http://ephtracking.cdc.gov

Data and Methods

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- Age specific, county-level daily counts of ED visits from 17 Tracking states
- Exposure inputs: PM2.5 and O3 from EPA AQS, IMPROVE, 12 km CMAQ simulations, and satellite AOD data
- Exposure modeling: a Bayesian data fusion framework to combine all the inputs for accurate daily PM2.5 and O3 level estimates and model errors.
- Epi modeling: a Poisson time-series model for single-county estimates, then Bayesian pooling.

Proposed Project 2

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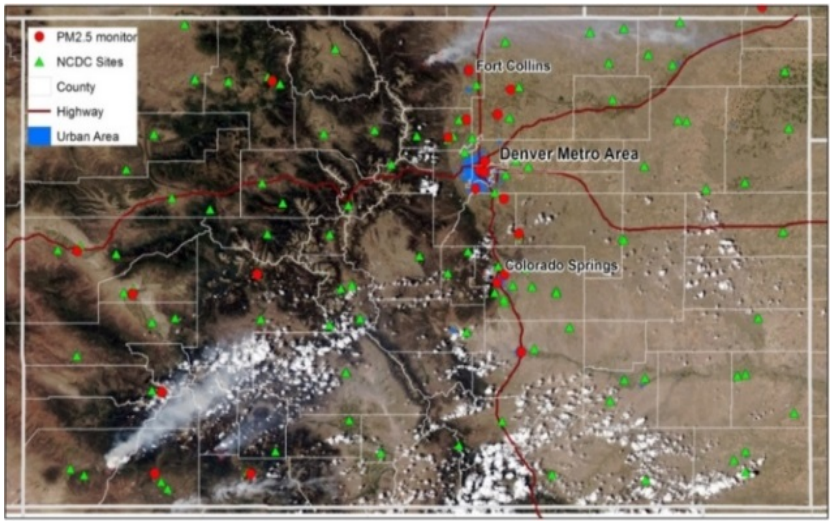
Partner Agency: Colorado DPHE

Objective: a regional study to improve population exposure estimates related to wildfire smoke, and to determine whether increased wildfires contribute to ED visits and acute hospitalizations during the fire seasons in Colorado.

Deliverables: (1) C-R functions of various health endpoints during the fire season, (2) gridded estimates of health impacts due to wildfires in Colorado



Data and Methods

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- ICD-9 coded ED data from CDPHE at 4 km resolution.
- Exposure inputs: PM2.5 and O3 from EPA AQS, IMPROVE, 4 km CMAQ simulations, and satellite AOD / fire data
- Exposure modeling: a Bayesian data fusion framework to combine all the inputs for accurate daily PM2.5 and O3 level estimates and model errors.
- Epi modeling: conditional logistic regression for this case-crossover analysis.