Assessing Health Impacts of Air Pollution at the Community Scale

A webinar presented by the
NASA Health and Air Quality Applied Sciences Team

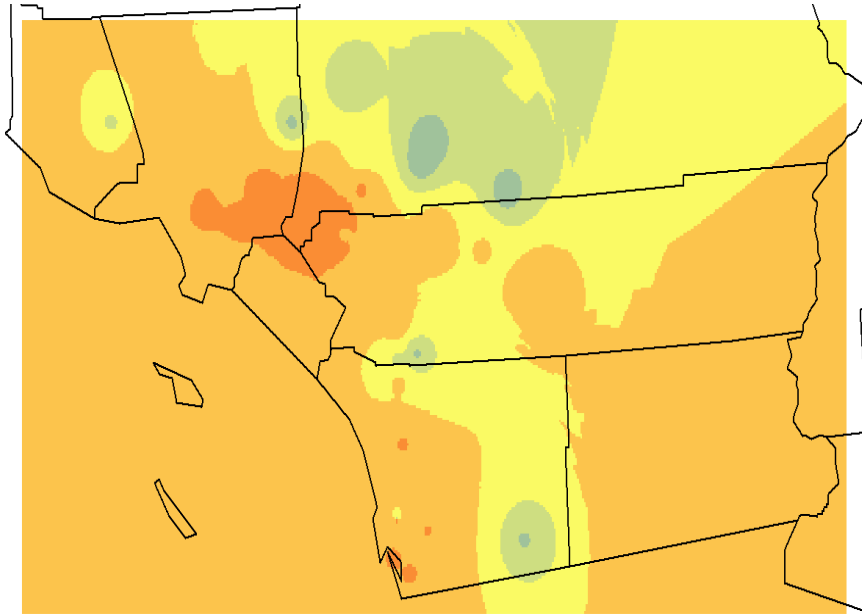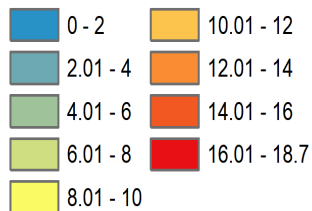September 28, 2018
2:00-3:00 pm ET

http://sites.bu.edu/haqast-highrestt/research/

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Example: Los Angeles CA region PM$_{2.5}$

Interpolation from regulatory monitors

Satellite-based estimate

Mean Annual Observed PM

▣ 0 - 2	▣ 10.01 - 12
▣ 2.01 - 4	▣ 12.01 - 14
▣ 4.01 - 6	▣ 14.01 - 16
▣ 6.01 - 8	▣ 16.01 - 18.7
▣ 8.01 - 10	
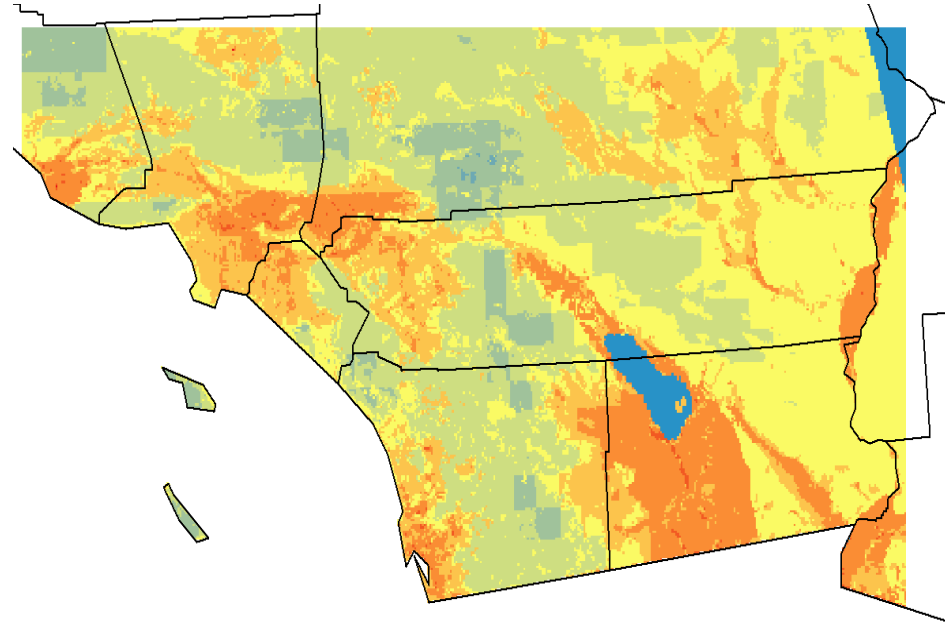
Mean Annual Predicted PM

▣ 0 - 2	▣ 10.01 - 12
▣ 2.01 - 4	▣ 12.01 - 14
▣ 4.01 - 6	▣ 14.01 - 16
▣ 6.01 - 8	▣ 16.01 - 18.7
▣ 8.01 - 10	
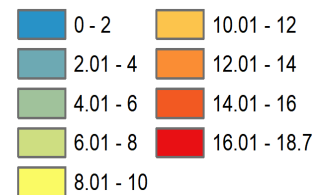
Source: Yang Liu, Emory Univ.

Why might high resolution data be useful to health practitioners?

- Support urban-scale urban epidemology studies

- Assess current health burdens at the neighborhood scale using health impact assessment methods

- Identify pollution hot spots, and target needed source reductions

- Track progress in achieving air quality-related health improvement goals

- Quantify health co-benefits of carbon mitigation strategies, identifying climate solutions that will bring the greatest health benefits

Objectives of the NASA HAQAST "Hi-Res Tiger Team Project" (July 2017-June 2018)

1. Assess the value of low-cost sensors for supporting $PM_{2.5}$ exposure and health assessments at the local scale

2. Generate hi-resolution $PM_{2.5}$ concentration maps using 1 km aerosol optical depth (AOD) measured from space, along with surface measurements and land use data

3. Optimize "BlueSky" high resolution smoke dispersion modeling for wildfire PM impacts using 1 km AOD and surface measurements.

4. Compute high resolution health impacts of $PM_{2.5}$ based on outputs from above objectives.

Today's Agenda

Introduction and Project Overview:

> **Dr. Patrick Kinney,** *Professor, Environmental Health, Boston University School of Public Health; Principal Investigator*

Using NASA Earth Science Products to Estimate Fine Scale Patterns of Air Pollution:

> **Dr. Yang Liu,** *Associate Professor, Rollins School of Public Health, Emory University; Co-Investigator*

Assessing Health Impacts at Fine Spatial Scales in Cities:

> **Dr. Susan Anenberg,** *Associate Professor, Environmental and Occupational Health, George Washington University; Co-Investigator*
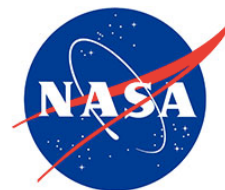
Case Study: Assessing sources and impacts of air pollution in California's Imperial Valley:

> **Dr. Frank Freedman,** *Adjunct Faculty, Department of Meteorology and Climate Science, San Jose State University; Principal Investigator*
>
> **Dr. Akula Venkatram,** *Professor, Department of Mechanical Engineering, University of California Riverside; Co-Investigator*

Question and Answer Session with Attendees

HAQAST Participants

- Pat Kinney (Boston University) and Frank Freedman (San Jose State Univ) – Co-Leads
- Mohammad Al-Hamden (NASA)
- Susan Anenberg (George Washington Univ.)
- Arlene Fiore (Columbia Univ.)
- Daven Henze (Univ. of Colorado – Boulder)
- Jeremy Hess (Univ. of Washington)
- Yang Liu (Emory Univ.)
- Susan O'Neill (US Forest Service)
- Daniel Tong (George Mason Univ.)
- Akula Venkatram (UC Riverside)
- Mark Zondlo (Princeton Univ.)

External Partners

- **Massachusetts Department of Environmental Protection**
  - Thomas McGrath, Chief, MassDEP Air Assessment Branch
- **Boston Department of the Environment**
  - Carl Spector, Director
- **Harvard School of Public Health**
  - Petros Koutrakis, Professor
- **New York City Department of Health and Mental Hygiene**
  - Iyad Kheirbek, Director, Air Quality Program
- **Queens College**
  - Holger Eisl, Barry Commoner Center for Health and the Environment
- **South Coast Air Quality Management District**
  - Sang-Mi Lee (Planning, Rule Development & Area Sources)
- **California Department of Public Health**
  - Paul English (California Environmental Health Tracking Program)
  - Jeff Wagner (Environmental Health Laboratory Branch)
- **California Air Resources Board**
  - Cynthia Garcia (Research Division)
- **Wildland Fire Air Quality Response Program**
  - USFS and NPS Leadership