

Dispersion Model Downscaling of Satellite-Derived PM2.5 Grids

HAQAST Core Project

Frank Freedman (San Jose State University)

Mohammad Al-Hamdan (USRA)

Akula Venkatram (UC Riverside)

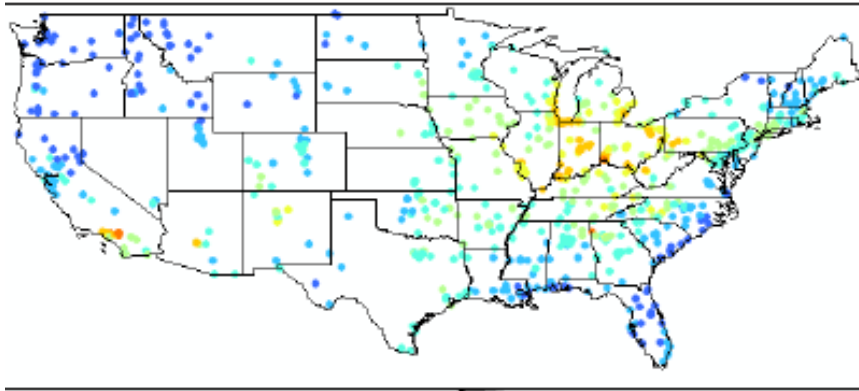
Sen Chiao (San Jose State University)

Stakeholders Meeting

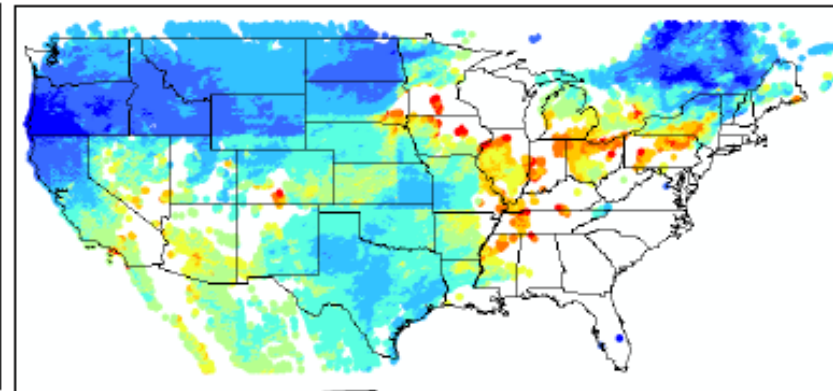
Emory University (Atlanta, GA)

November 4, 2016

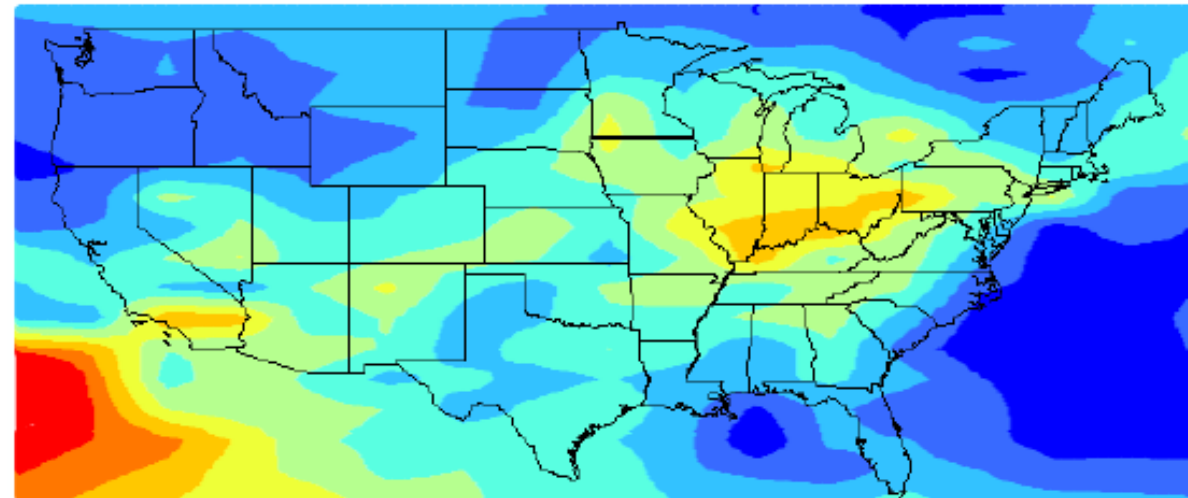
EPA AQS PM2.5



NASA MODIS-Estimated PM2.5



Example
July 14, 2003



PM2.5 (ug/m3)

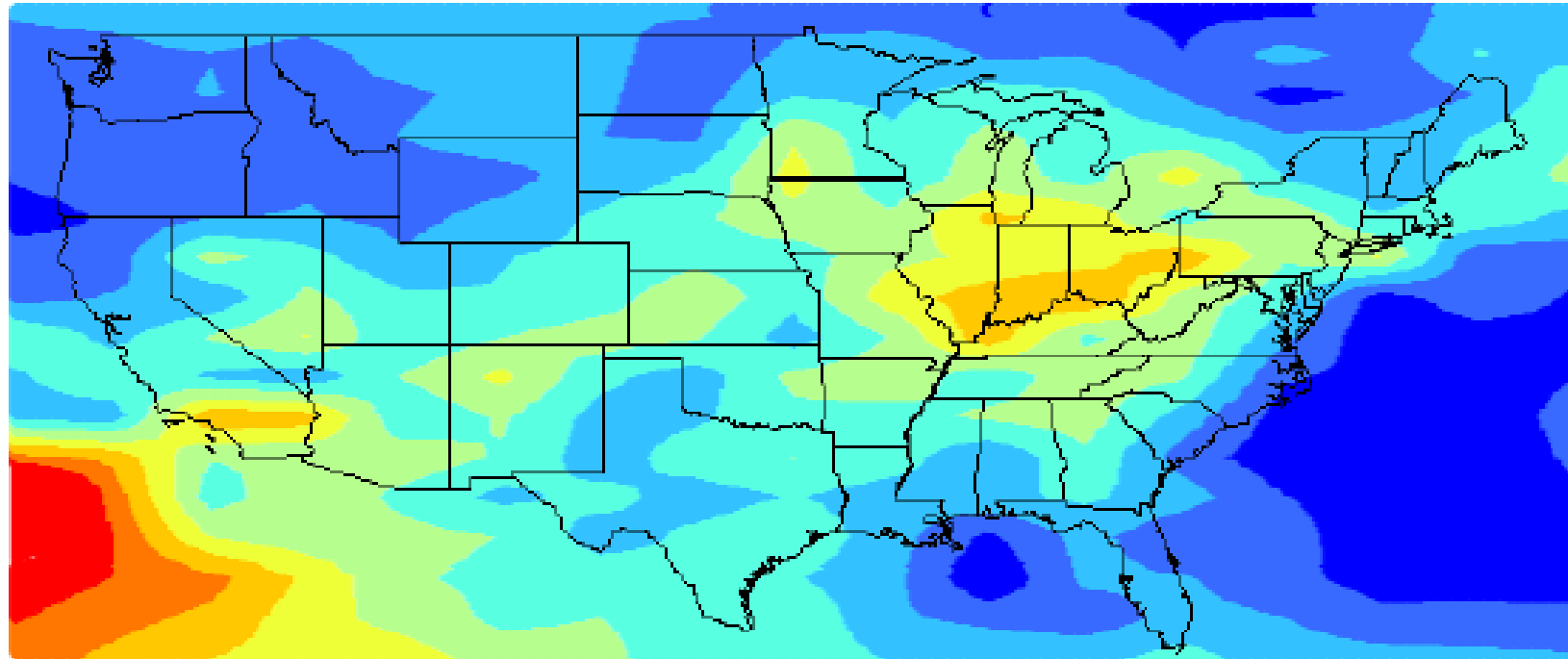
- 0 - 1.3
- 1.4 - 5.4
- 5.5 - 9.6
- 9.7 - 13.7
- 13.8 - 17.8
- 17.9 - 22.0
- 22.1 - 26.1
- 26.2 - 30.2
- 30.3 - 34.4

Prepared By:
Dr. Mohammad Al-Hamdan
USRA at NASA/MSFC
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(Al-Hamdan et al., *Geocarto Int.*, 2014; Al-Hamdan et al., *JAWMA*, 2009)

MODIS-derived PM2.5

Example: July 14, 2003



PM2.5 (ug/m3)

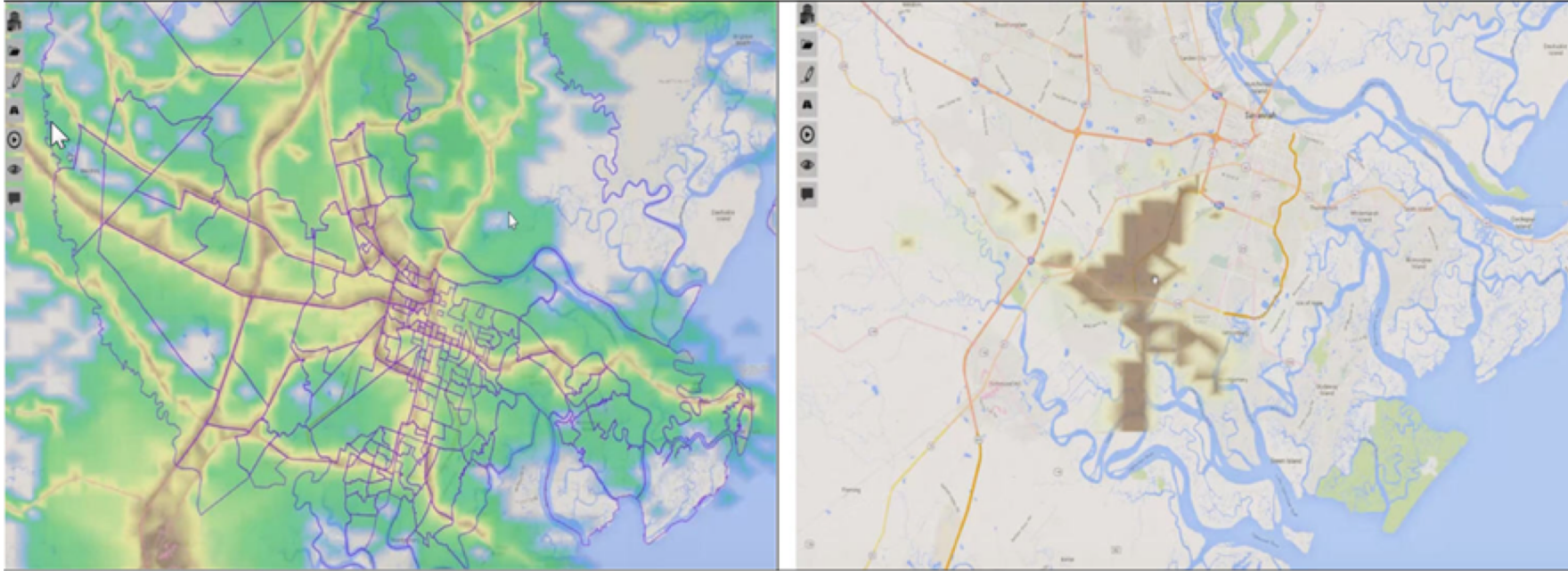
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- 10-km resolution
- Daily over period 2003 – 2011
- Available at CDC WONDER (down to county level)
- <https://wonder.cdc.gov/nasa-pm.html>

C-TOOLS

(Example screenshot, C-LINE line source model)



- Downscaling based on “C-TOOLS” dispersion models
- Simplified, more computationally efficient internal framework
- User-friendly web-based interface
- Geared towards health and public policy users
- <https://www.cmascenter.org/c-tools/>

HAQAST Core Project

Goal

Web platform for end-users to generate PM2.5 fields and time-series data anywhere in the U.S. at local scale from 2003 – current.

Deliverables

- **D1:** Update MODIS-derived 10-km PM2.5 grids quarterly (2003 – present)
- **D2:** Web platform to compare PM2.5 grids w related gridded fields (NASA, CMAQ, NOAA)
- **D3:** Web platform to downscale fields (C-MOD; C-TOOLS version of AERMOD)
- Focus on California for development phase.

End Users

- BAAQMD & SCAQMD: Various operational needs
- Health Researchers: Epidemiological time-series generation
- Others ...

