HAQAST 2018-2019 Update

HAQAST4, Madison, WI, July 2018

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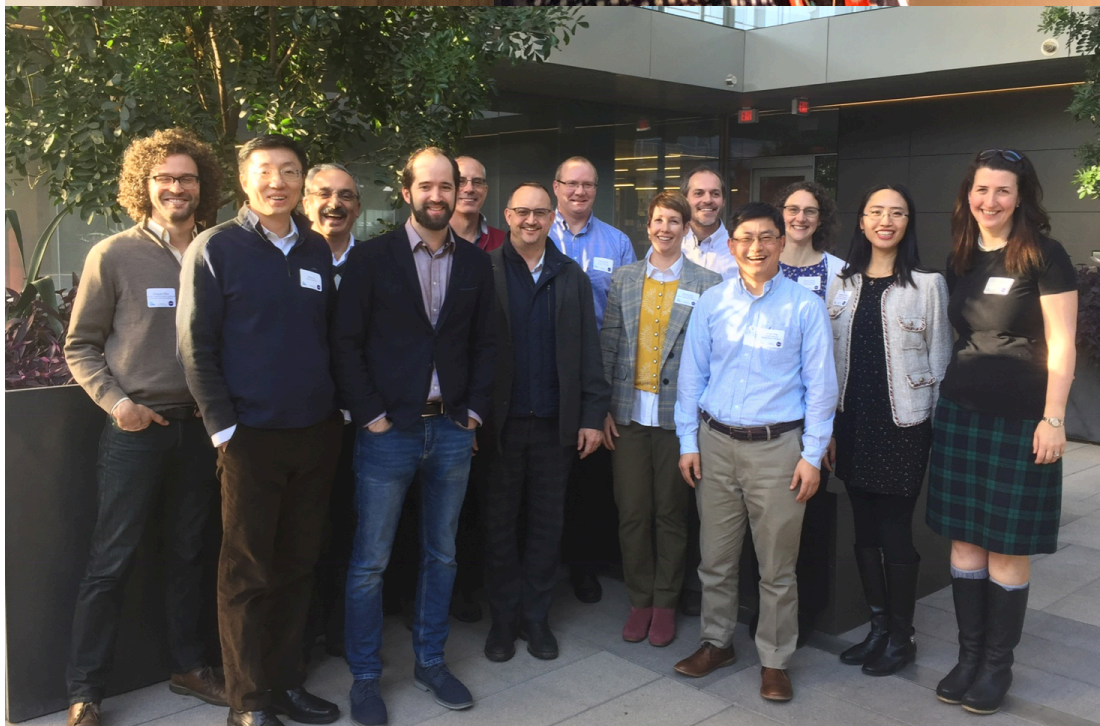
What is “hay-kast”?

- Health and Air Quality Applied Sciences Team
- NASA-funded Applied Sciences Team
- ~~3~~ 4-year funded project (thru summer ~~’19~~ ‘20)
- 13 Members and 70+ co-investigators
- Mission: Connect NASA science with air quality and health applications
- ~ $15 Million Total Cost
- Three types of work:
  - Member projects
  - Tiger team projects (collaborative)
  - Outreach, engagement, rapid response

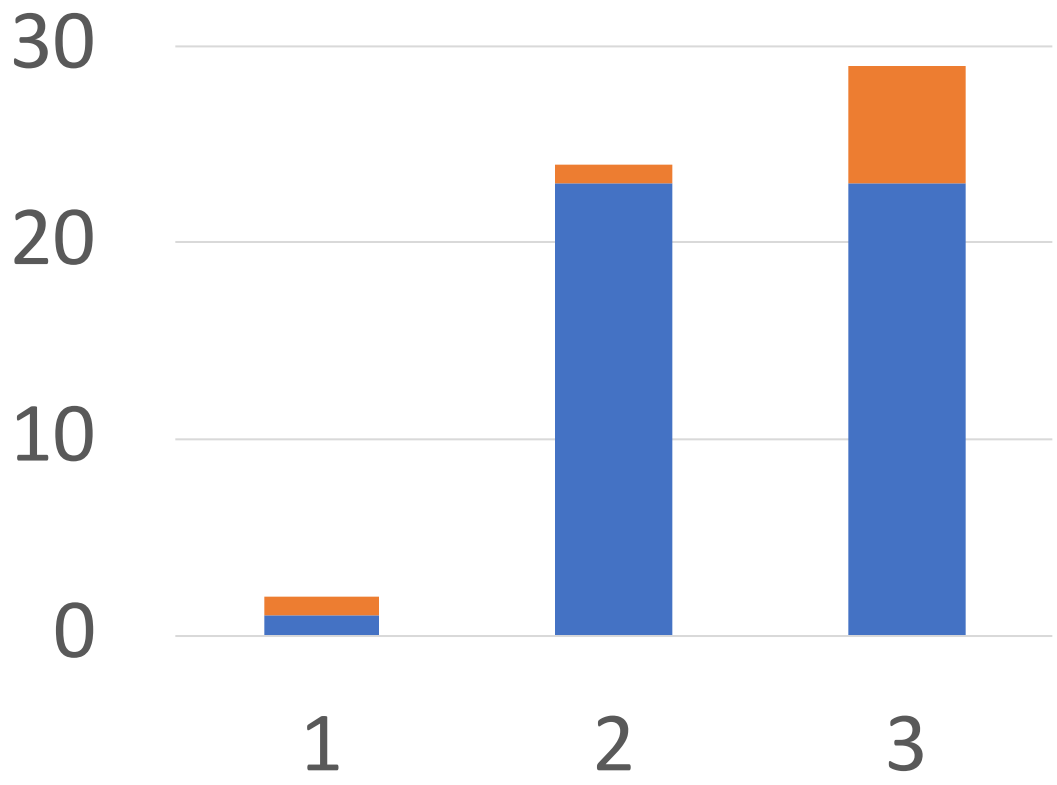
Major Accomplishments

- Steady increase in output metrics: Publications, stakeholders engaged, meeting attendees, meeting satisfaction, social media followers, etc.
- Team Meetings in Madison (7/18); Phoenix (1/19); Pasadena (7/19)
- Sessions at AGU/DC (12/18); AMS/Phoenix (1/19)
- High-profile research successes
- High-Impact Tiger Teams
- Engagement with related NASA initiatives



Steady Increase in Output Metrics

- 31 publications, 2018 - ~5/19
- 300+ attendees engaged in regular meetings
- 4000+ Twitter followers @NASA_HAQAST
- 26,000 pageviews of HAQAST.org; 8000 users from May ‘18 – May ‘19
- 4 New Tiger Teams Launched engaging 45+ organizations

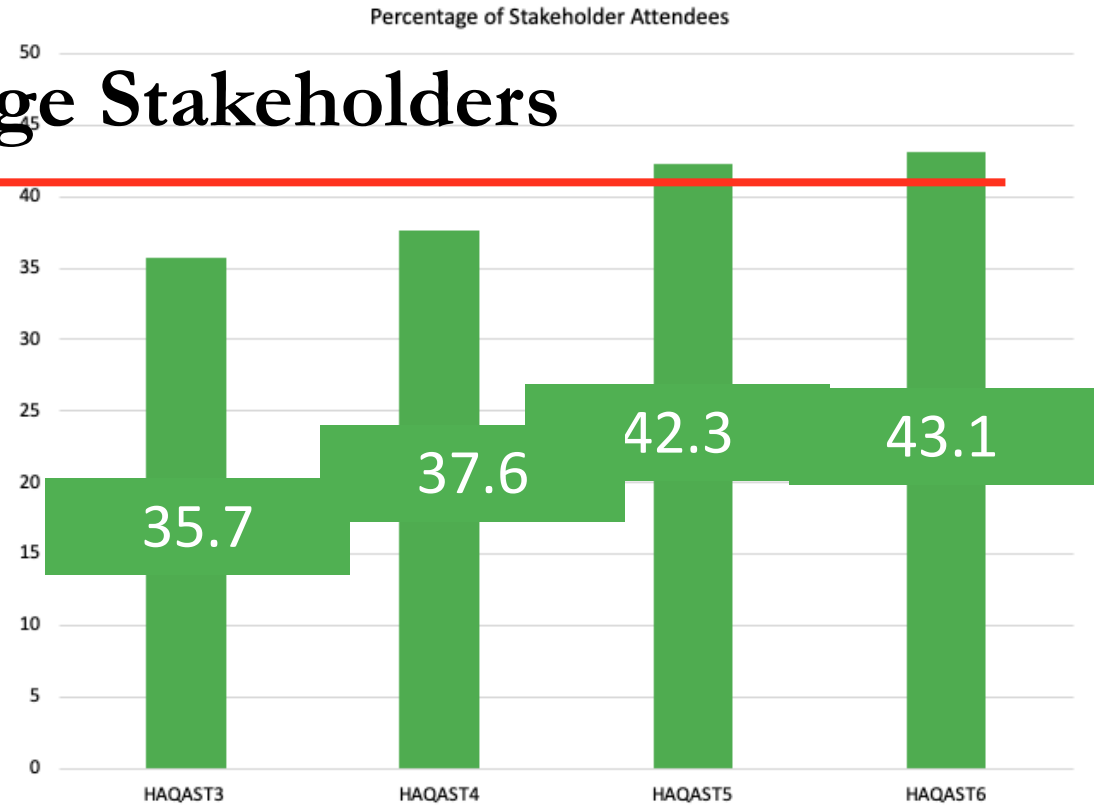


HAQAST publications by calendar year

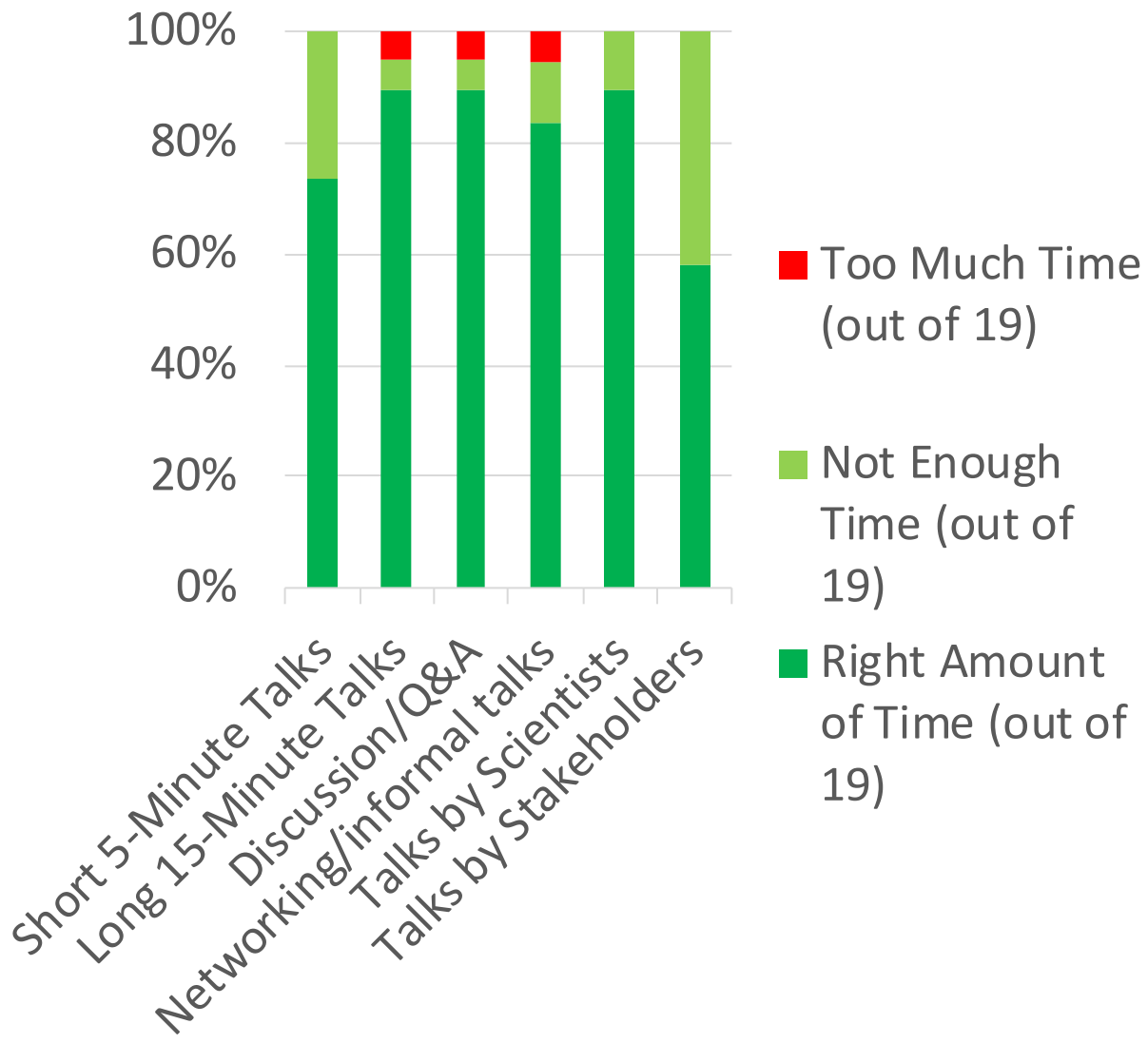
Multiple PIs involved; **single PI involved**

Designing Meetings to Engage Stakeholders

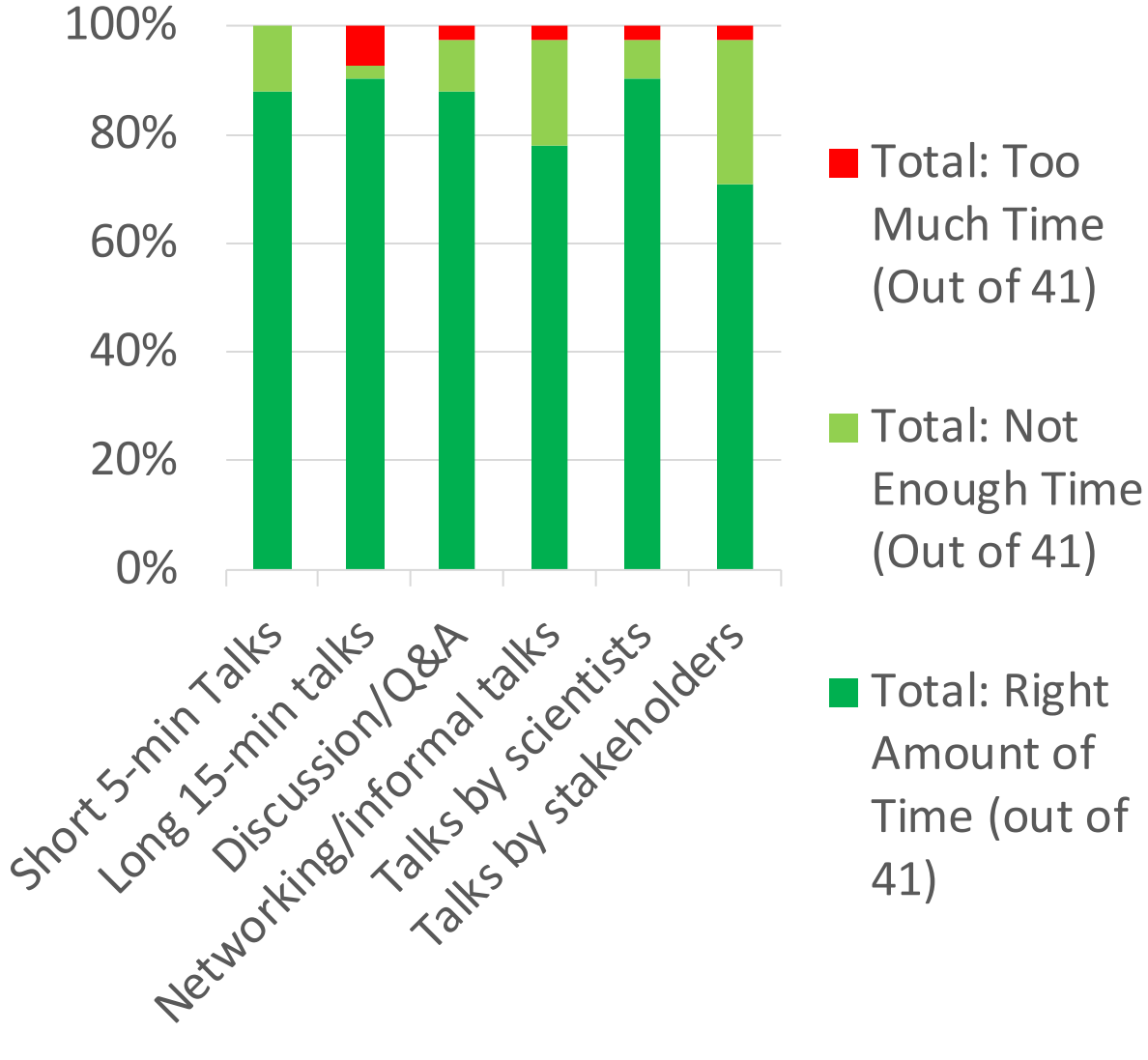
- Novel format of topical panels, with 75% of all talks limited to 5-minutes, 1/3 time for Q&A
- Based on past survey results, we have:
  - Increased the proportion of stakeholder/scientist talks.
  - Funded stakeholders to attend the meeting.
  - Prioritized talks by stakeholders (every stakeholder who requests a talk is given a talk; we also solicit stakeholder talks).



High Levels of Audience Satisfaction



HAQAST4, July 2018, Madison, WI



HAQAST5, January 2019, Phoenix, AZ

Year 3 Progress Update, Tracey Holloway

Integrating Satellites into Health & AQ Management

- Connect OMI HCHO with EPA National Air Toxics Assessment
  - Reports submitted to EPA, paper in prep with EPA co-authors; Paper in review comparing surface HCHO with OMI HCHO
- Supporting model evaluation with satellite data
  - Ongoing development of WHIPS & guidance docs, updated for HCHO and AOD;
- Novel applications of satellite data
  - 2 papers published linked OMI NO2 to economic growth (global cities & Kazakhstan)

Regular talks to stakeholder communities; Guidance documentation on haqast.org; videos; Twitter @NASA_HAQAST

Tiger Team Yr2 Participation

- Fiore Regional Haze TT
  - Comparing methods of calculated AOD in CMAQ with MODIS data and AERONET.
- Anenberg Global Indicators.
  - Co-I Jonathan Patz evaluating whether the impact of traffic reduction policies in global cities can be discerned from OMI NO_2 data

3 new papers published

2 papers submitted

4 in prep

New for HAQAST6! Friday Workshops

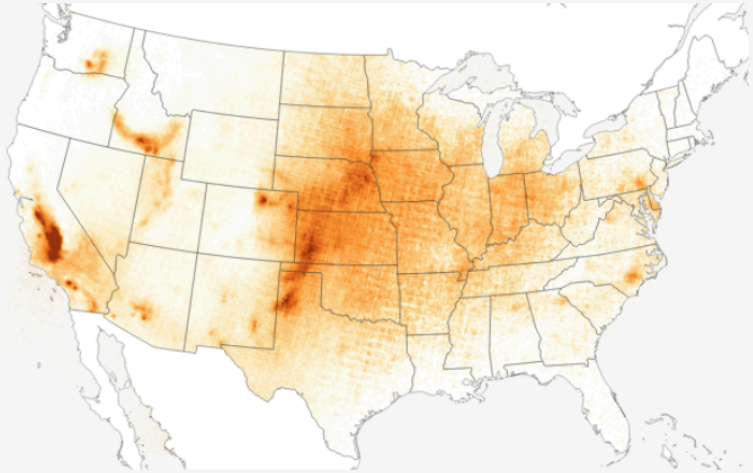
- **Satellite Data for Air Management: State, Local, and Tribal Air Quality Needs.**
- **Visualizing Satellite Data: How to Use NASA's Giovanni Data Visualizer.**
- **Communicating your Science for Maximum Impact.**

- **How to Use NASA Data for Exceptional Event Analysis**
- **Satellites and Health Assessments: Best Practices and Future Opportunities**
- **Looking Back to Move Ahead: A Roundtable Discussion on HAQAST and Ideas for the Future**

Meeting Adjourns at Noon

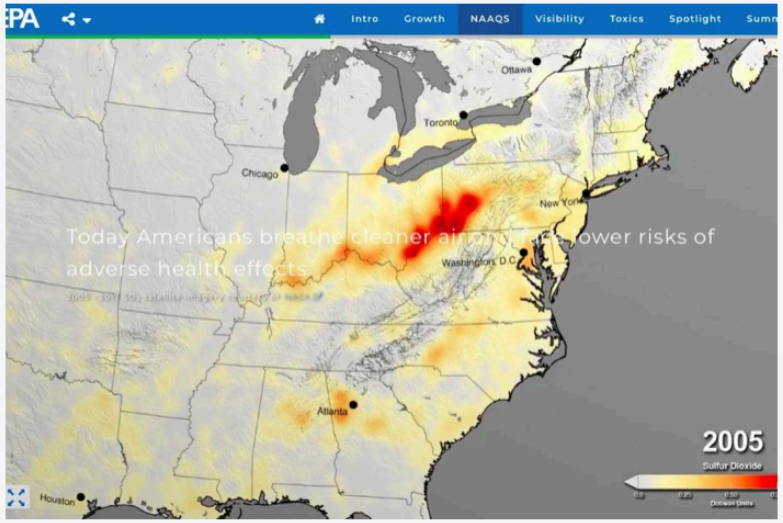
[HAQAST Member Meeting Immediately Follows, 12:00 – 2:00PM]

Publication Highlights



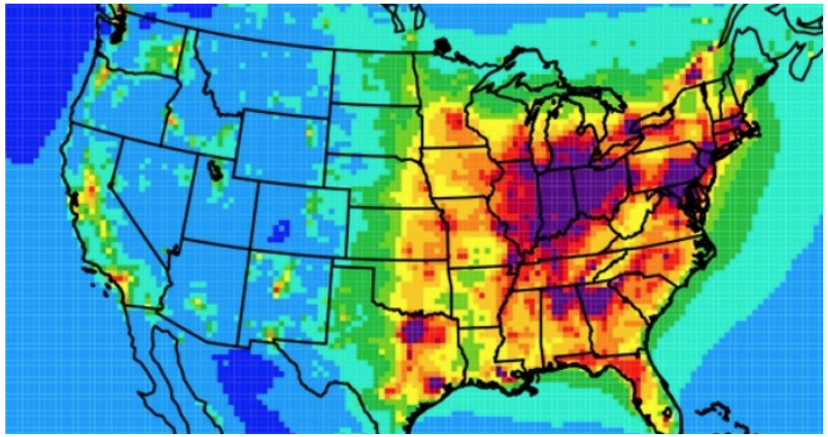
ZONDLO SHOWS HOW AGRICULTURE BREATHES

Mark Zondlo's work on the seasonal rhythm of NH3 profiled by NASA's Image of the Day.



HAQAST'S WORK INCLUDED IN THE 2018 EPA AIR TRENDS REPORT

Our team's work, especially that of Bryan Duncan, is included the the 2018 EPA Air Trends Report. New this year are animations of SO_2 from satellite data.



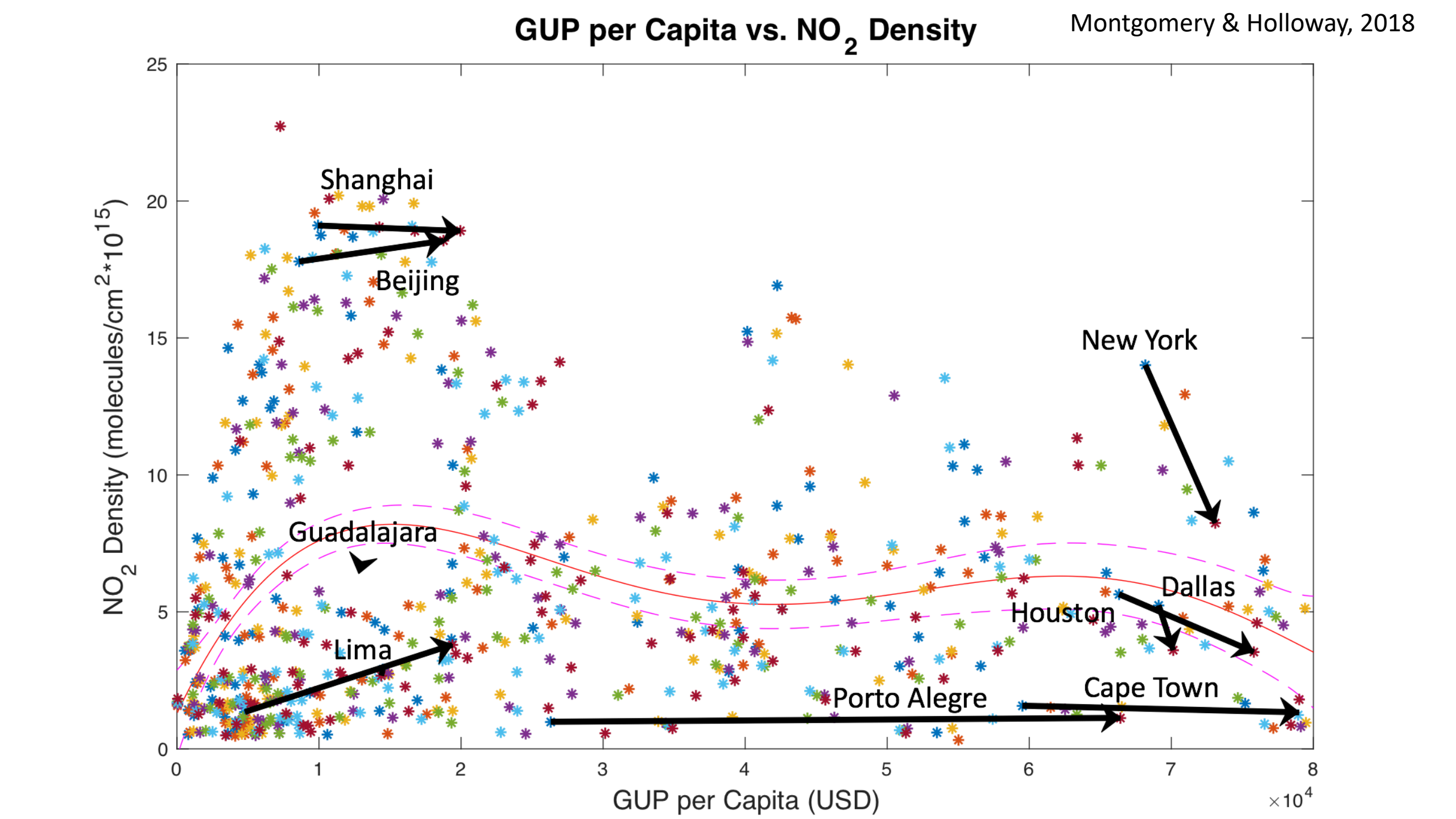
HUMAN IMPACT OF CLEAN AIR POLICIES

Jason West and Susan Anenburg's work was recently profiled by NASA for their efforts to help air quality managers and policymakers solve clean air problems using NASA data and products.

Nitrogen Dioxide Data to Show A Relationship Between Air Quality Changes & Economic Growth Globally

Satellites offer an unprecedented opportunity to evaluate patterns and trends in air pollution, especially in regions with few or no ground-based monitors.

We evaluate the 100 most populous cities worldwide, comparing the OMI nitrogen dioxide (NO_2) vertical column densities from the Aura satellite to population, gross urban product (GUP), and emissions estimates. We find a positive relationship between GUP and NO_2 for 38 of the 56 low-income cities, where NO_2 increases with GUP, and a negative relationship for the 7 high-income cities, where NO_2 decreases with GUP.


GUP per Capita vs. NO2 Density
Montgomery & Holloway, 2018
Shanghai
Beijing
New York
Guadalajara
Dallas
Houston
Lima
Porto Alegre
Cape Town
NO2 Density (molecules/cm2*10^15)
GUP per Capita (USD)
×10^4
0
5
10
15
20
25
0
1
2
3
4
5
6
7
8

1st Round Tiger Team 2017-2018

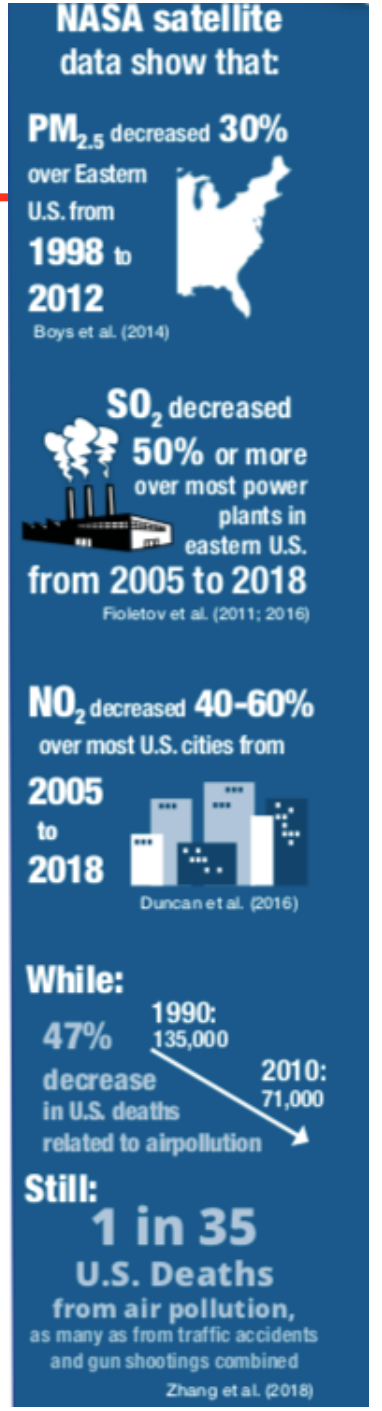
- Round 1 TTs launched summer 2017
- Competitive application process: 12 proposals reviewed by stakeholder reviewers (4 health, 4 AQ) = 4 winning TTs
- Round 1 TTs wrapped late-summer 2018

Bryan Duncan and Jason West: Demonstration of the Efficacy of Environmental Regulations in the Eastern U.S.

Arlene Fiore: Supporting the use of satellite data in State Implementation Plans (SIPs)

Pat Kinney: High Resolution Particulate Matter Data for Improved Satellite-Based Assessments of Community Health

Brad Pierce and Daniel Tong: Improved NEI NOx emissions using OMI Tropospheric NO_2 retrievals



2nd Round Tiger Teams 2018-2019

- Round 2 TTs launched late-summer 2018
- Competitive application process: 8 proposals reviewed by stakeholder reviewers (4 health, 4 AQ) = 4 winning TTs
- Round 2 TTs will wrap up late-summer 2019

Jessica Neu: Satellite-Evaluated and Satellite-Informed O_3 distributions for estimating U.S. background O_3

Arlene Fiore: Supporting the use of satellite data in regional haze planning

Susan Anenberg: Using satellite remote sensing to derive global climate and air pollution indicators

Susan O'Neill: Air Quality and Health Burden of 2017 California Wildfires

Making the Most of HAQAST6

- Ask questions and share your perspective – 1/3 of our meeting time is reserved for Q&A
- Meet new people during coffee breaks and lunch – the networking aspect of HAQAST is consistently rated as high impact.
- Explore HAQAST websites – tons of resources, examples, and how-tos (haqast.org → Tiger Teams → Links)
- What are research questions and operational structures to maximize the value of earth observations for air quality and health? This audience can make a an impact!