HAQAST Highlights:

What Works and What Doesn't in Linking NASA Data with Health and Air Quality Communities

HAQAST

NASA

Dr. Tracey Holloway, NASA HAQAST Team Lead

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NELSON INSTITUTE FOR Environmental Studies
UNIVERSITY OF WISCONSIN–MADISON

ATMOSPHERIC AND OCEANIC SCIENCES

HAQAST

NASA HEALTH AND AIR QUALITY APPLIED SCIENCES TEAM

Connecting NASA Data and Tools with Health and Air Quality Stakeholders

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haqast.org

HAQAST is a collaborative team that works in partnership with public health and air quality agencies to use NASA data and tools for the public benefit. Here you can learn about our team, partnerships, and newsworthy achievements. You can also find short tutorials for NASA's open-access satellite tools.

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

13 NASA Health and Air Quality Applied Sciences Team Members (HAQAST)

- **Tracey Holloway** (Team Lead, UW-Madison)
- **Bryan Duncan** (NASA GSFC)
- **Arlene Fiore** (Columbia University)
- **Minghui Diao** (San Jose State University)
- **Daven Henze** (University of Colorado, Boulder)
- **Jeremy Hess** (University of Washington, Seattle)
- **Yang Liu** (Emory University)
- **Jessica Neu** (NASA Jet Propulsion Laboratory)
- **Susan O'Neill** (USDA Forest Service)
- **Ted Russell** (Georgia Tech)
- **Daniel Tong** (George Mason University)
- **Jason West** (UNC-Chapel Hill)
- **Mark Zondlo** (Princeton University)

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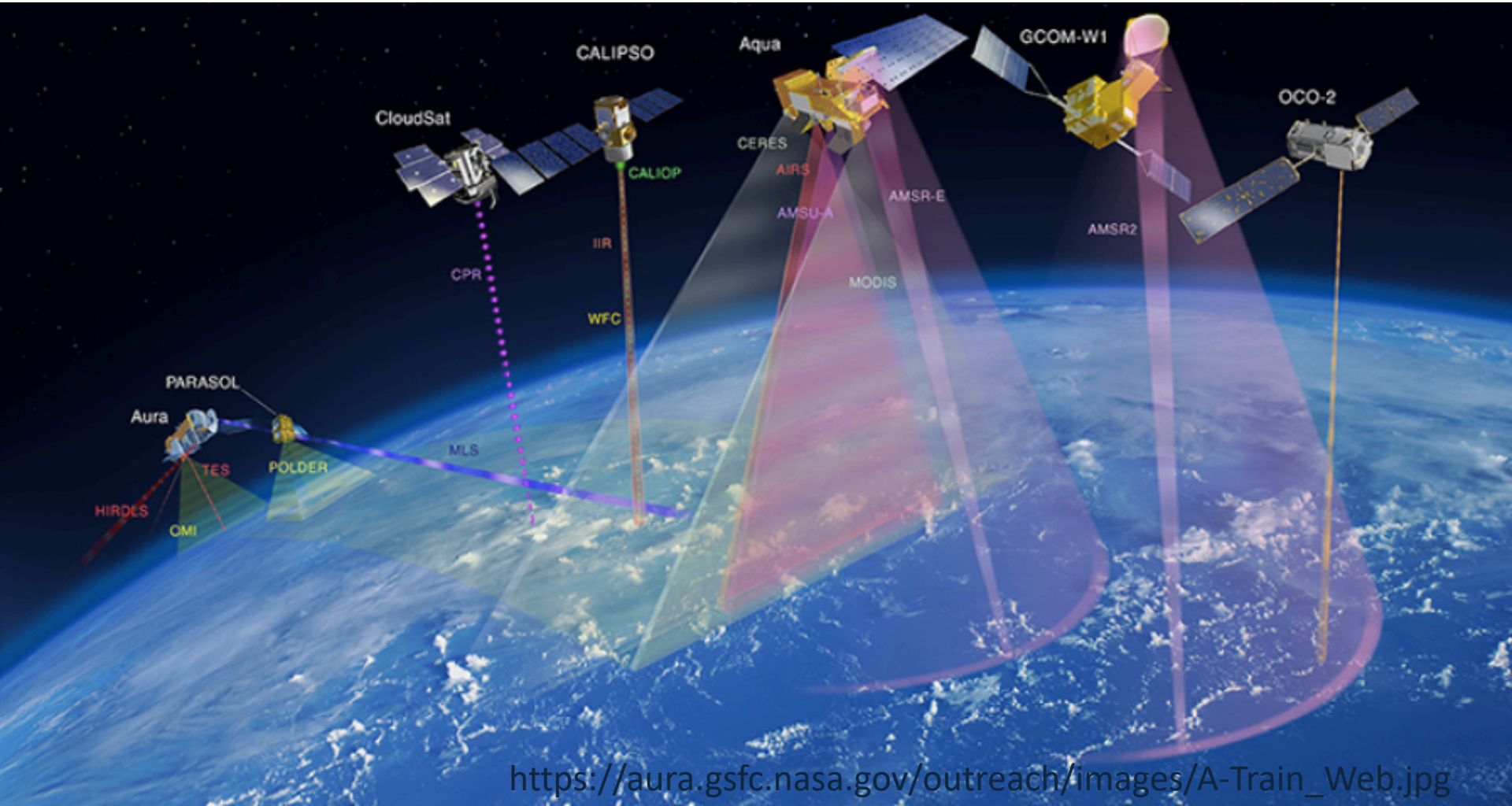
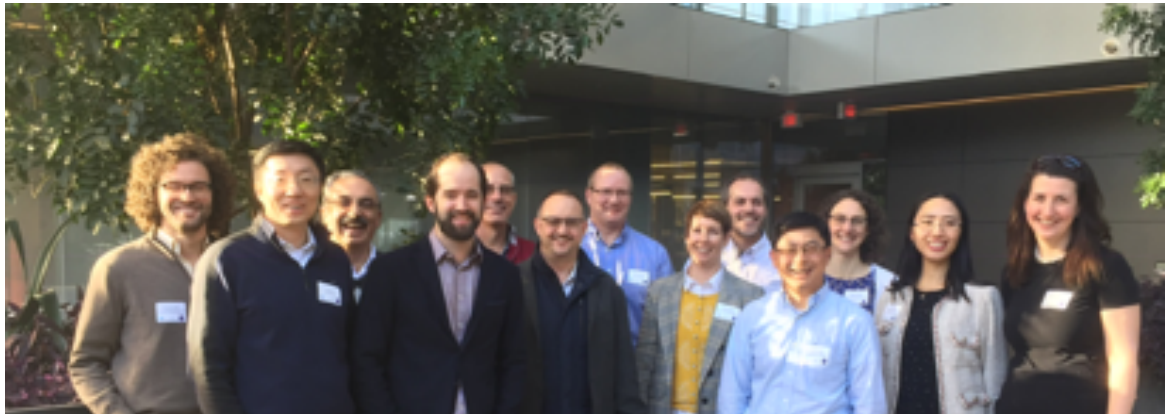


https://aura.gsfc.nasa.gov/outreach/images/A-Train_Web.jpg

HAQAST AQAST



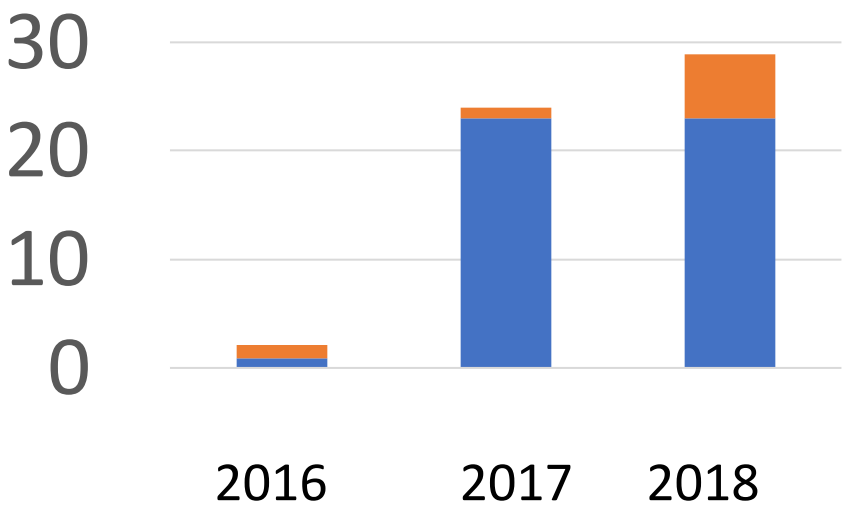
Works: Team

The team structure fundamentally changes outcomes.

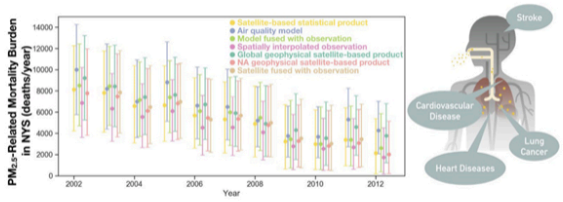
- Increased visibility of work and resources to end-users
- Culture to support and promote collaborations and synergies
- Growth of two-way dialogue
- Increased collaborations to meet stakeholder needs
- Rapid spin-up of high-value activities

Major Accomplishments

- Steady increase in output metrics: Publications, stakeholders engaged, meeting attendees, meeting satisfaction, social media followers, etc.
- Team Meetings every 6 months + sessions a conferences – Webinars Feb/Mar 2020
- High-profile successes
- Active collaborations in team
- Engagement with related NASA initiatives

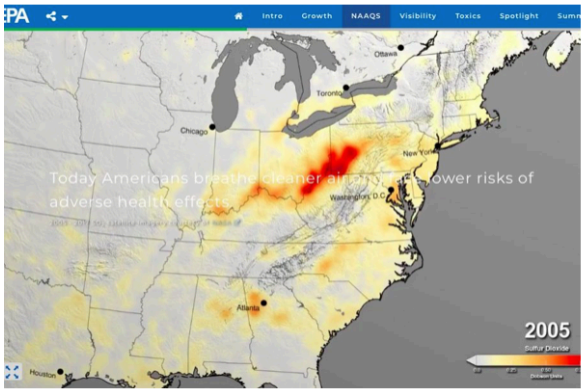


HAQAST publications by calendar year
Multiple PIs involved; **single PI involved**



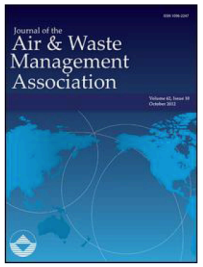
FIORE FINDS LOWER AIR POLLUTION IN NEW YORK STATE IS SAVING LIVES

Columbia University highlights Arlene Fiore's study on how reduced PM2.5 in New York State led to a decrease in mortality between 2002 and 2012.



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 SO2 from satellite data.



Taylor & Francis
Taylor & Francis Group

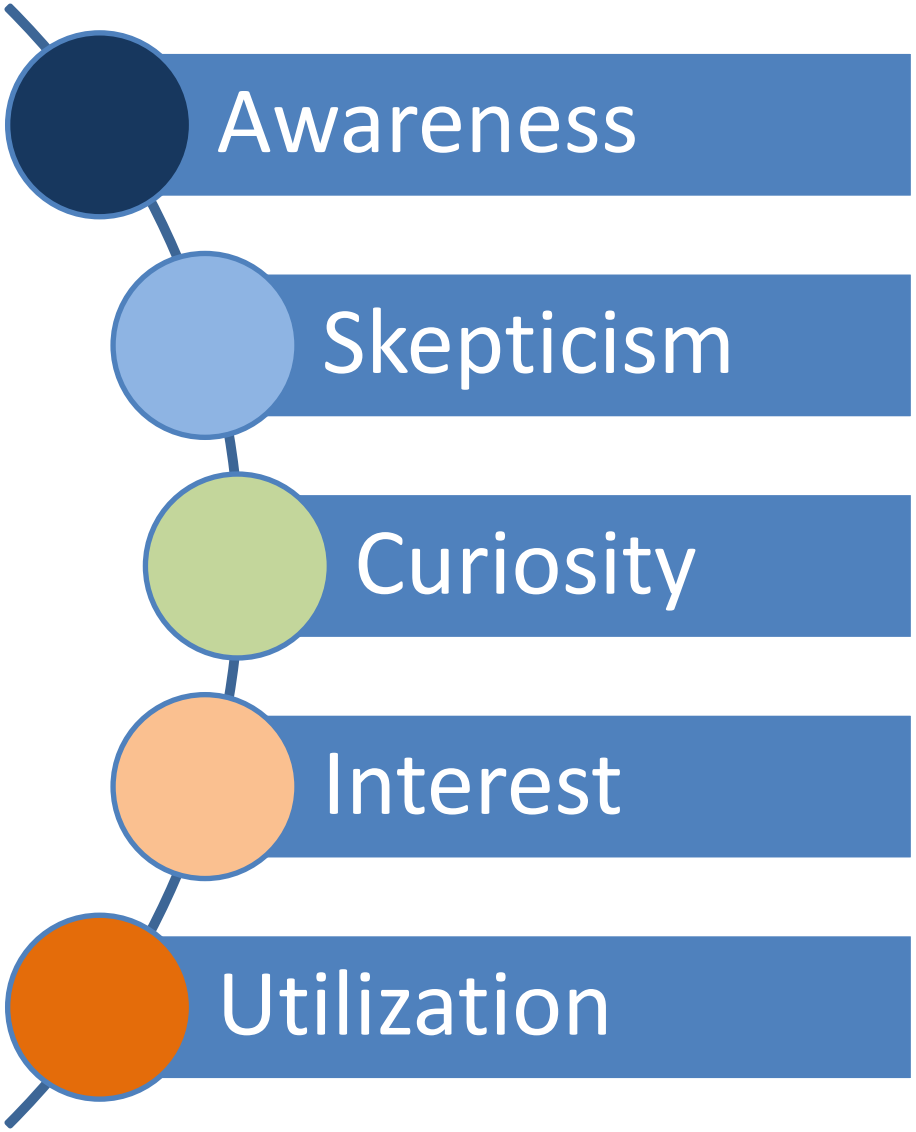
Journal of the Air & Waste Management Association

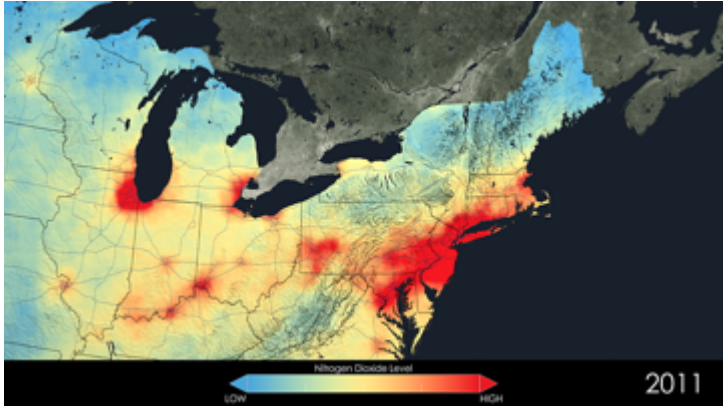
ISSN: 1096-2247 (Print) 2162-2906 (Online) Journal homepage: https://www.tandfonline.com/loi/uawm20

Methods, availability, and applications of $PM_{2.5}$ exposure estimates derived from ground measurements, satellite, and atmospheric models

Minghui Diao, Tracey Holloway, Seohyun Choi, Susan M. O'Neill, Mohammad Z. Al-Hamdan, Aaron Van Donkelaar, Randall V. Martin, Xiaomeng Jin, Arlene M. Fiore, Daven K. Henze, Forrest Lacey, Patrick L. Kinney, Frank Freedman, Narasimhan K. Larkin, Yufei Zou, James T. Kelly & Ambarish Vaidyanathan

Works: Meeting users where they are





Potential Monitoring Site Purposes

A Role for Remote Sensing?

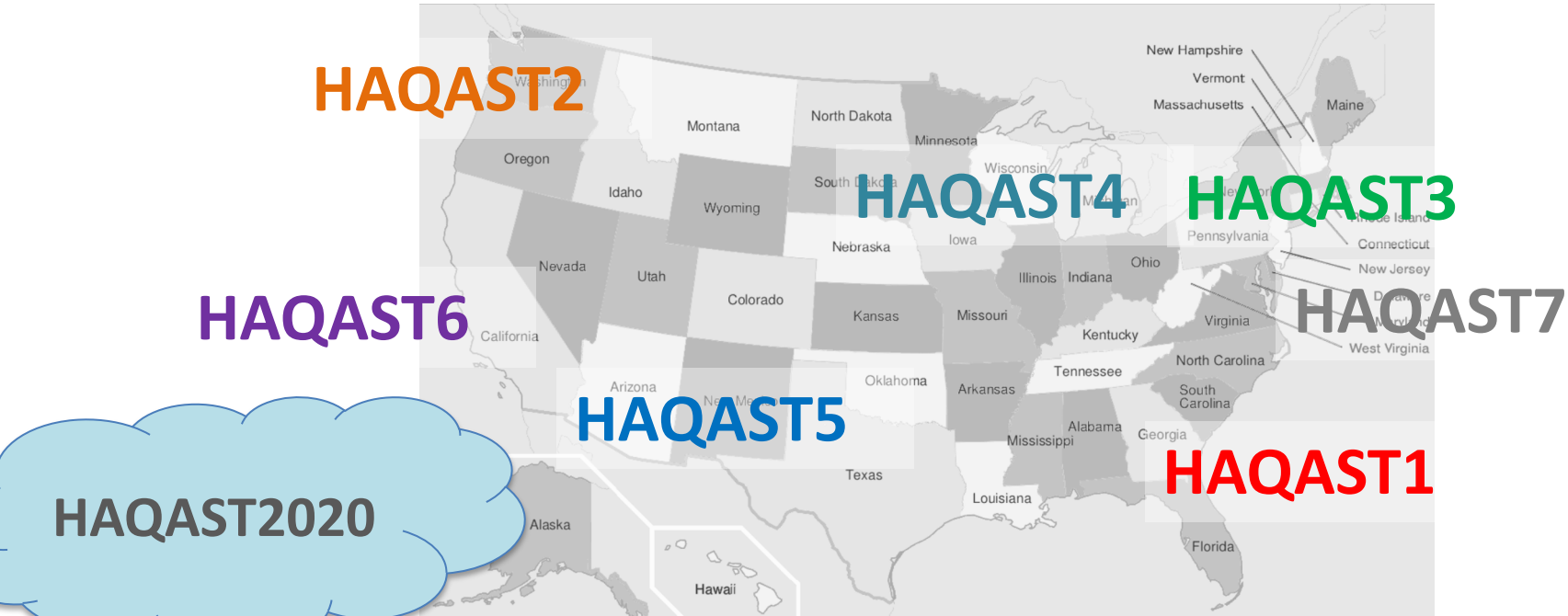
1. To Determine Compliance with National Ambient Air Quality Standards (NAAQS) — **Not Now**
2. To Develop Regional Pollution Trends in Urban and Rural Areas — **Yes**
3. To Evaluate the Effects of Population, Land Use and Transportation on Air Quality — **Yes**
4. To Evaluate Air Dispersion Models — **Yes**
5. To Provide Air Quality Information to the Public — **Yes**

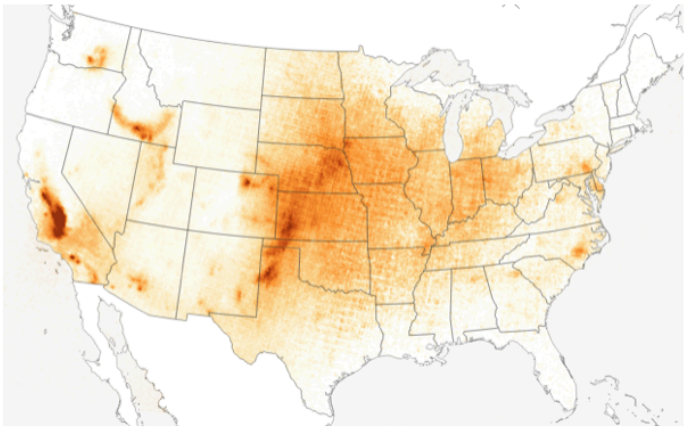
Adapted from a slide of Bart Sponseller, WI DNR (remote sensing added)

Meeting Users Where They Are

- Meeting location
- Travel $
- Streaming + Webinars
- Phone meetings

- Priorities of orgs/people
- Political realities
- Asking questions
- Data formats



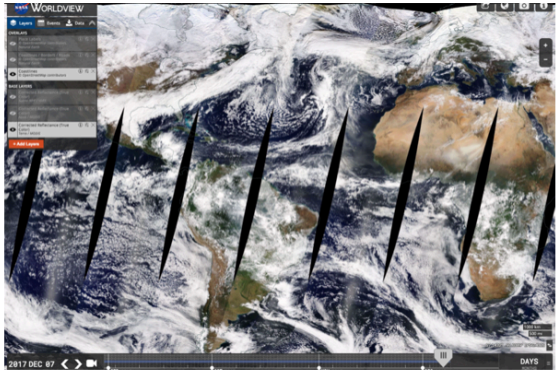


ZONDLO SHOWS HOW AGRICULTURE BREATHES

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

TONG COMMENTS ON MASSIVE DUST STORMS

Daniel Tong's commentary on the health impacts of massive dust storms in Arizona featured in Sierra magazine.



NASA WORLDVIEW VIDEO TUTORIAL NOW AVAILABLE

Watch HAQAST's NASA Worldview video tutorial, produced by the NASA HAQAST Communications Team

2018 Tiger Teams | 2017 Tiger Teams

1. USING SATELLITE REMOTE SENSING TO DERIVE GLOBAL CLIMATE AND AIR POLLUTION INDICATORS

Susan Anenberg

Team Lead: HAQAST investigator Susan Anenberg

Partners: Lancet Commission on Pollution and Health, University College London/Lancet Countdown, and the Health Effects Institute/State of Global Air

HAQAST Members and Collaborators: Jeremy Hess, Bryan Duncan, Arlene Fiore, Daven Henze,

Works:

Tiger Teams (funded in-team collaborations)

2018 Tiger Teams | 2017 Tiger Teams

1. DEMONSTRATING THE EFFICACY OF ENVIRONMENTAL REGULATIONS IN THE EASTERN U.S.

Bryan Duncan

Jason West

Team Leads: HAQAST members Bryan Duncan and Jason West

Partners: Mid-Atlantic Regional Air Quality Management Association, the Maryland Department of the Environment, the EPA, the Centers for Disease Control/National Center for Environmental Health, the Northeast States for Coordinated Air Use Management, and the Connecticut Department of Energy & Environmental Protection

HAQAST Members and Collaborators: Mark Zondlo, Ted Russell, Yang Liu, Arlene Fiore, Lok Lamsal, Daniel Tong, and Daven Henze also contribute to this team

AIR QUALITY AND HEALTH BURDEN OF 2017 CALIFORNIA WILDFIRES

Susan O'Neill

Team Lead: HAQAST member Susan O'Neill

Partners: BAAQMD, NOAA, the USFS Fire & Aviation Management Program, EPA, Sonoma Technology Inc., the National Park Service, Princeton University, the University of Washington, and the University of California, Davis

HAQAST Members and Collaborators: Daniel Tong, Talat Odman, Minghui Diao, Jason West, Pat Kinney, Brad Pierce, Jessica Neu, and Sim Larkin also contribute to this team

Innovative Tiger Team Structure

How to promote collaboration among the team and allocate resources to top problems…

… while structuring a competitive process to ensure rigorous vetting of ideas?

HAQAST Supports 2 Types of Projects: Individual & Tiger Team

SUSAN O'NEILL PRODUCED A VIDEO PRESENTATION OUTLINING SMOKE TOOLS AND INFORMATION FOR USE DURING WILDFIRES

Watch O'Neill's video on tools and information for use during wildfires

NY TIMES HIGHLIGHTS DUNCAN & WEST'S WORK

The New York Times drew on Bryan Duncan and Jason West's Tiger Team work estimating health benefits of cleaner air in the US from 1990 to 2010.

Managers

Air Quality & Health Stakeholder Engagement

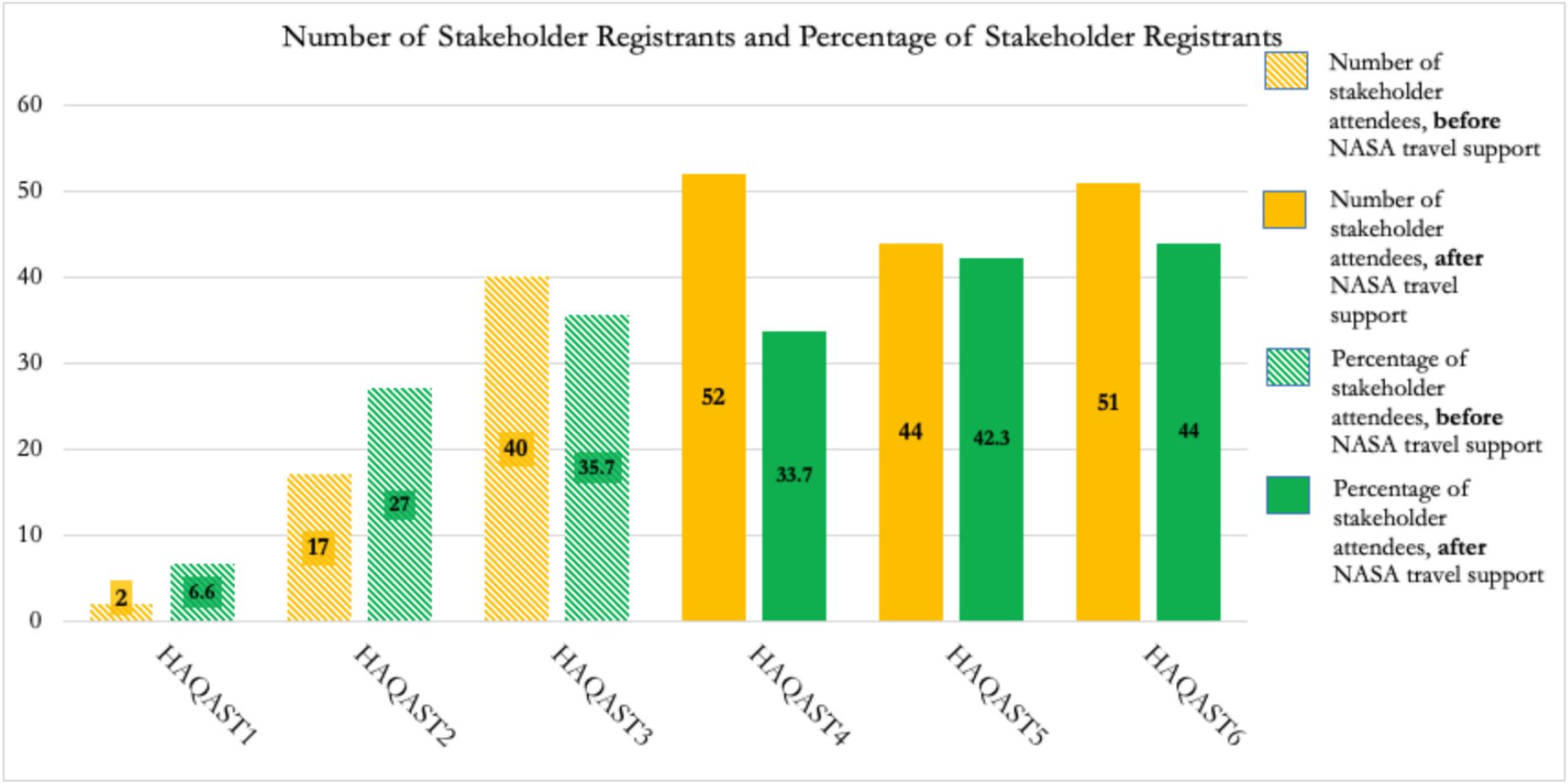
https://airquality.gsfc.nasa.gov

NASA's **Applied Sciences Program (ASP)** sponsors a number of efforts to facilitate the use of NASA satellite data and computer models by the various stakeholder communities, such as air quality, health, disasters, and food security. One of these efforts is the Health & Air Quality Applied Sciences Team (**HAQAST**), which has enabled many projects. Here we list just a few projects that have been enabled, at least in part, by HAQAST members. Visit the **HAQAST** website to learn of many other projects.

Works:
Meetings structured for dialogue

Designing Meetings to Engage Stakeholders

- 75% 5-minute talks
- 25% 15-minute talks
- 1/3 time for Q&A
- Lots of networking
- High proportion of stakeholder/scientist talks.
- Funded stakeholders to attend the meeting.

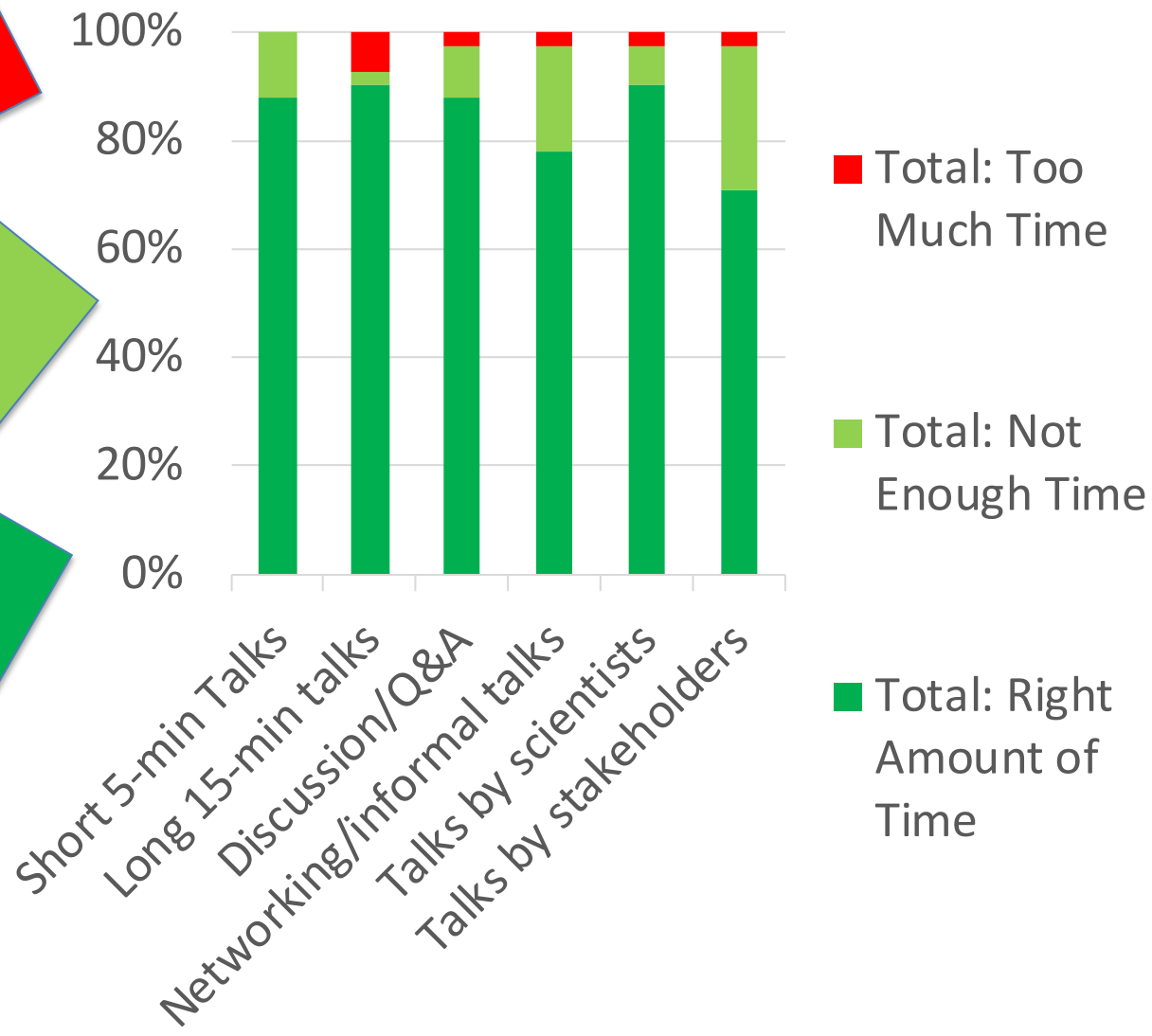

Number of Stakeholder Registrants and Percentage of Stakeholder Registrants
60
50
40
30
20
10
0
2
6.6
17
27
40
35.7
52
33.7
44
42.3
51
44
HAQAST1
HAQAST2
HAQAST3
HAQAST4
HAQAST5
HAQAST6
Number of stakeholder attendees, before NASA travel support
Number of stakeholder attendees, after NASA travel support
Percentage of stakeholder attendees, before NASA travel support
Percentage of stakeholder attendees, after NASA travel support

Audience Satisfaction

"ding" on 15-min talks

Some: Hungry for more!

Most: Happy!



Doesn't work very well

Expecting partners to embrace the unknown

→ First, build excitement, easy wins; then, invite deeper engagement.

Presenting research for research's sake

→ Focus on relevance to audience(s) and issues they care about; avoid jargon

Cold-calling new partners

→ Build relationships with meetings (phone, in-person) and one-on-one conversations

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ABOUT | PEOPLE | PROJECTS | NEWS | TOOLS AND RESOURCES | MEETINGS | CONTACT

- Getting Started
- Download Data
- Tools
- NASA ARSET Training
- AQAST 2011-2016
- Links to Health and Air Quality Community
- Glossary

Tutorials and webinars can be found here.

Daegan Miller, Ph.D.

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Communications & Digital Media

haqast.org