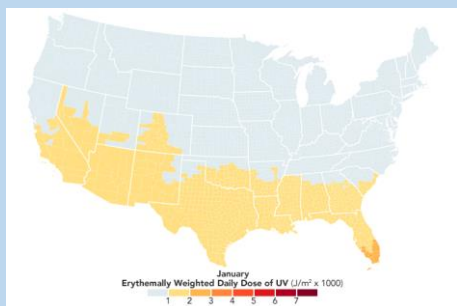
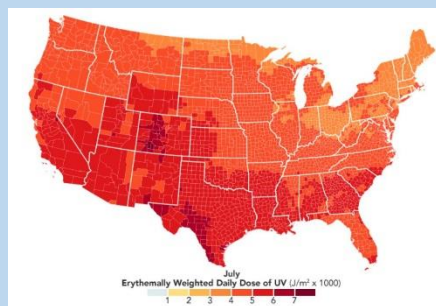


## NASA EARTH OBSERVATORY HIGHLIGHTS RISK OF SUNBURN ACROSS THE UNITED STATES

In August 2019, the NASA Earth Observatory's [Image of the Day](#) showcased the risk of sunburn across counties in the contiguous United States. This image highlighted the partnership of the NASA Applied Sciences Program and the Centers for Disease Control and Prevention (CDC) to create this first publicly available map of ultraviolet (UV) radiation. Available on the CDC's [National Environmental Public Health Tracking Network](#), this dataset (2005–2015) delivers information about health issues related to environmental factors. By understanding how much UV radiation falls over each county each month, public health officials, city planners, and the public can take proactive steps to minimizing risk of UV radiation exposure and hence reducing risk of skin cancer.



January 2015. Photo credit: NASA Earth Observatory



July 2015. Photo credit: NASA Earth Observatory

## HAQ TEAM CONDUCTS 11<sup>TH</sup> ANNUAL PROGRAM REVIEW

In September 2019, the NASA HAQ Team, led by **Sue Estes (U. of Alabama, Huntsville)**, coordinated the 11<sup>th</sup> annual HAQ Applications Program Review with approximately 35 attendees in Rapid City, SD. Presentations were shared by NASA-funded researchers (ROSES, GEO EO4HEALTH), HAQAST, CDC partners, and a survivor of West Nile virus. Invited speakers presented on Communications, Prizes/Challenges, VALUABLES, and NASA Training and Capacity Building.



Overlooking Badlands National Park, L. Judd and J. Haynes stand beside the educational display on the threat of air pollution. Photo credit: S. Gupta



Attendees at the HAQ Applications Program Review 2019. Photo credit: S. Gupta

## HEALTH AND AIR QUALITY APPLICATIONS APPLIED SCIENCES PROGRAM

haQ

**JOHN HAYNES**

PROGRAM MANAGER  
HEADQUARTERS

**SUE ESTES**

SENIOR ASSOCIATE  
U. of ALABAMA- HUNTSVILLE

**HELENA CHAPMAN**

AAAS S&T POLICY FELLOW  
HEADQUARTERS



## HAQAST 6 MEETING FEATURES TALKS ON AIR QUALITY AND PUBLIC HEALTH APPLICATIONS FROM INVESTIGATORS AND STAKEHOLDERS

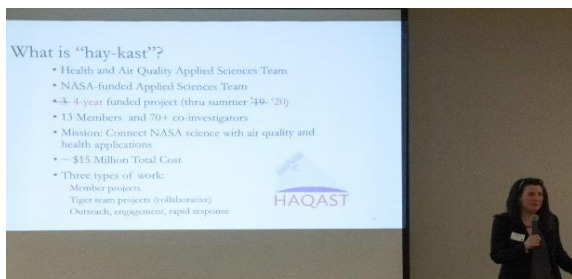
In July 2019, the NASA Health and Air Quality Applied Sciences Team (HAQAST 6) semi-annual meeting, held in Pasadena, CA, was hosted by JPL (Host: **Jessica Neu, HAQAST PI**). A total of 115 in-person attendees and 194 online participants (Facebook platform) participated in this [three-day conference](#), which comprised of two days of presentations by scientists and other stakeholders and one day of workshops. Presentations from stakeholders included the National Institute of Environmental Research (Korea), LADCO, WESTAR/WRAP, UNICEF, Utah Moms for Clean Air, World Resources Institute, among others. NASA supported the travel of 20 stakeholders from 18 organizations. Workshops included townhall and roundtable discussions, visualizing satellite data in Giovanni, examining the utility of satellite data in health assessments, and science communication. The meeting [agenda](#) provided high-impact updates by presenters and facilitated dialogue on strategies to strengthen collaborations between air quality management and the public health sector. The evening poster session provided opportunities for continued networking, with 18 submissions, including the HAQ Team poster, *Using Satellite Data for Applications in Public Health Practice*.



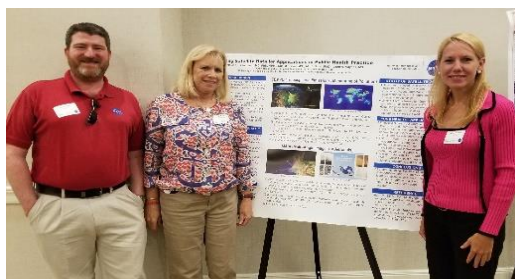
HAQAST members. Photo credit: P. Bazan



Panelists at HAQAST6. Photo credit: P. Bazan



Presentation by T. Holloway. Photo credit: H. Chapman



J. Haynes, S. Estes, and H. Chapman (Left to Right) at the poster presentation. Photo credit: P. Bazan

## NASA INVESTIGATORS IN THE NEWS

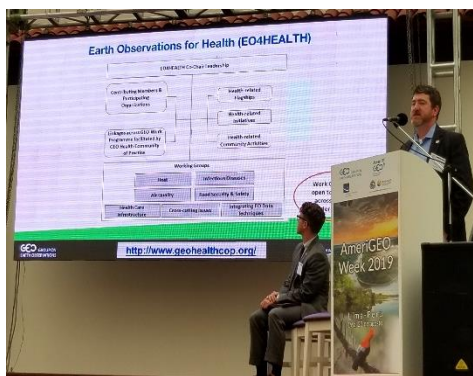
**Susan Anenberg (George Washington U.), Bryan Duncan (NASA Goddard), Stephanie Schollaert Uz (NASA Goddard), and Brendan McAndrew (NASA Goddard/SSAI):** [ClimateBits: Unhealthy Air](#): As a collaboration between NASA Goddard and HAQAST members, this video explains how air pollution negatively affects population health. Earth observation data (NASA Terra, Aqua, Aura, and Suomi NPP provide PM2.5 estimates) and computer models of global air pollution patterns are combined with health data to assess the impact on population health.

**Rajesh Kumar (National Center for Atmospheric Research):** [NASA Data Strengthens U.S. Air Quality Warnings](#): R. Kumar and team incorporated satellite data of aerosol optical depth (every three hours) into the NOAA National Air Quality Forecast Capability (NAQFC). With an estimated 38% improvement in the accuracy of reported particulate pollutants in NAQFC tests, these changes contribute to daily Air Quality Index forecasts created by the U.S. EPA.

**Richard Stumpf (NOAA) and Barbara Kirkpatrick (Gulf Of Mexico Coastal Ocean Observing System):** [Red-tide Respiratory Forecast at Three Sanibel Beaches](#): R. Stumpf and team used data from NASA Terra and Aqua satellites, ESA Sentinel-3 satellite, and HABscope smartphone app (video uploads by trained citizen scientists) to develop a [24-hour Experimental Red Tide Respiratory Forecast](#) (updated every three hours) along Florida's Gulf Coast.

## AMERIGEO WEEK 2019

In August 2019, the NASA HAQ Team participated at **AmeriGEO Week 2019**, held at the National Aerospace Research and Development Commission (**Comisión Nacional de Investigación y Desarrollo Aeroespacial, CONIDA**), the headquarters of the Peruvian Space Agency, in Lima, Peru. With more than 90 attendees, this event highlighted the GEO Work Programme activities and initiatives in the Americas Region, sharing updates and plans to enhance the use of Earth observation data for sustainable development. The **agenda** covered various topics, including *Strengthening Partnerships and Advancing Decision-making in the Americas* and six Work Sessions: *Advancing the Sustainable Development Goals Agenda*; *Agriculture Biodiversity and Ecology*; *Water*; *Foundational Tasks*; *Disasters*; and *New Opportunities and Collaborations*. The **New Opportunities and Collaborations** session offered an overview and three project updates of **Earth Observations for Health (EO4H)**: *Introduction to EO4HEALTH (John Haynes, NASA HQ)*, *Environmental Determinants of Enteric Infectious Diseases (Jim Nelson, Brigham Young U.)*, *Geospatial Surveillance for Vector-borne Disease (Jack Malone, Louisiana State U./A&M College)*, and *Early Warning System for Malaria Risk in the Amazon (Andres “Willy” Lescano, Cayetano Heredia U.)*. In the concurrent poster presentation session, **J. Haynes** and **Helena Chapman (NASA HQ)** presented the **GEO Health Community of Practice** poster. At the conclusion of this event, health as a cross-cutting discipline was adopted into the AmeriGEO priorities.



J. Haynes presents EO4HEALTH updates.  
Photo credit: H. Chapman



A. Lescano presents project updates.  
Photo credit: H. Chapman



J. Haynes and H. Chapman present the GEO Health Community of Practice poster. Photo credit: GEO

## NASA/SICA WEBINAR ON USING EARTH OBSERVATIONS FOR HEALTH

As part of the webinar series sponsored by the Central American Integration System (Sistema de la Integración Centroamericana, SICA), **Helena Chapman (NASA HQ)** presented the webinar session, *Using Earth Observation Data to Inform Health Decision-making*, about the **Earth Observations for Health (EO4HEALTH)** and wider **GEO Health Community of Practice**. This webinar described current objectives, funded projects, and collaborative activities within the seven GEO Health Community of Practice **work groups**. It also provided an open dialogue to promote collaborative efforts using Earth observation data to improve health decision-making across the Americas Region.



H. Chapman presents the NASA/SICA webinar. Photo credit: SICA

## 15<sup>TH</sup> ANNIVERSARY OF NASA/CDC COLLABORATIONS

In September 2019, the NASA Health and Air Quality Applications and the Centers for Disease Control and Prevention (CDC)'s [Environmental Public Health Tracking Network](#) coordinated the 2019 Fall Recipient Workshop to recognize the achievements of health collaborations over the past 15 years. A total of 250 (200 in-person, 50 online) people attended this three-day workshop, held in Atlanta, GA. The first day of the workshop opened with a plenary session led by **Erik Svendsen (CDC)**, **Lawrence Friedl (NASA HQ)**, **John Haynes (NASA HQ)**, and **Yang Liu (Emory U.)**, followed by presentations on these collaborations. Three plenary sessions – Air Quality, Extreme Heat and Pollen, and Harmful Algal Blooms and Vector-borne Diseases – incorporated insightful presentations by CDC staff, academic faculty, and local and state public health practitioners. The second and third days of the workshop focused on plenary lectures on the topics of communications, informatics, and program evaluation, as well as break-out sessions with participants. What an outstanding event to celebrate 15 years of success through this scientific partnership!

## UPCOMING

### Webinars:

### [Application of Satellite Observations for Air Quality and Health Exposure](#)

October 9 and 11, 2019  
Huntsville, AL

### Meetings:

### [TEMPO Health Applications Conference](#)

October 10, 2019  
Huntsville, AL

### [American Public Health Association Annual Meeting & Expo](#)

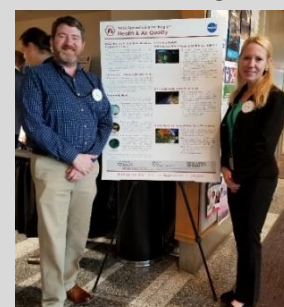
November 2-6, 2019  
Philadelphia, PA

### [American Geophysical Union Fall Meeting](#)

December 9-14, 2019  
San Francisco, CA

## NASA DEVELOP PRESENTS AESAS 2019 SHOWCASE

In August 2019, the [NASA DEVELOP Program](#) recognized the achievements of NASA DEVELOP staff, students, and partners, at the Annual Earth Science Application Showcase (AESAS 2019). Held at NASA Headquarters, DEVELOP staff presented the Summer 2019 accomplishments of 89 student participants, who completed [22 projects](#) at 12 locations, with 59 project partners. DEVELOP students highlighted their projects through oral and poster presentations. Several students were recognized for outstanding leadership, including **Celeste Gambino** (Team Lead, Southern Maine Health and Air Quality, Boston MA Node) as *DEVELOPer of the Term* and **Gertrude (Gigi) Pavur** (Team Member, Dominican Republic Disasters, Langley Node; Summer Intern 2018 in NASA Applied Sciences Program) as *SSAI Scholarship Recipient*. The [ARSET program](#) (**Elizabeth Hook, NASA Goddard**) stressed that since 2009, ARSET has provided 63 trainings (43 in-person, 20 online) focused on health and air quality. Congratulations to the NASA DEVELOP Program!



S. Cauffman, L. Rogers, and J. Haynes and H. Chapman (Left to Right) present at the DEVELOP Showcase.

Photo credits: H. Chapman and NASA DEVELOP

## VISIT TO NASA LANGLEY RESEARCH CENTER



Photo credit: H. Chapman

In August 2019, **John Haynes (NASA HQ)** and **Helena Chapman (NASA HQ)** visited NASA Langley Research Center and learned about current HAQ research and applications projects. The agenda incorporated overviews from the Science Directorate (**Rosemary Baize, Laura Rogers**), [DEVELOP](#) (**Lindsay Rogers, Kent Ross**), [TEMPO](#) and [Long Island Sound Tropospheric Ozone Study \(LISTOS\)](#) (**Jay Al-Saadi, Laura Judd**), [Ozone Water-Land Environmental Transition Study \(OWLETS\)](#) (**Tim Berkoff**), and [Aerosol and Cloud, Convection and Precipitation \(ACCP\) Study](#) (**Ali Omar**). Laboratory tours included the Atmospheric Science Data Center (**John Kusterer, Jeff Walter**) and Laser Lab (**Rory Barton-Grimsley, A. Omar**). Additional meetings were coordinated with Disasters (**Dave Borges**), [Earth Science Data Systems Geographic Information Systems Team](#) (**Brandi Quam, Matt Tisdale**), and [Prediction of Worldwide Energy Resources \(POWER\)](#) (**Paul Stackhouse**).

## PAST

### Meetings:

#### [HAQAST 6 Team Meeting](#)

July 10-12, 2019

Pasadena, CA

#### [AmeriGEO Week](#)

August 19-23, 2019

Lima, Peru

#### CDC Environmental Public Health Tracking 2019 Fall Recipient

#### Workshop

September 4-6, 2019

Atlanta, GA

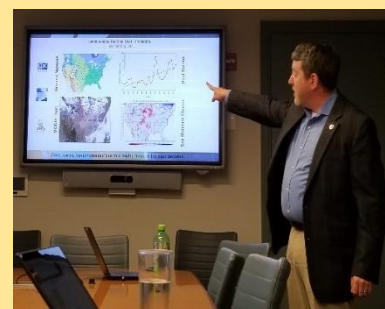
#### HAQ Annual Program Review

September 10-11, 2019

Rapid City, SD

## NASA COLLABORATES WITH AMERICAN LUNG ASSOCIATION

In August 2019, NASA Health and Air Quality Applications, the American Academy of Pediatrics, and the American Lung Association, supported the NASA webinar for the [Year of Air Pollution and Health 2019](#), held in Washington DC. **John Haynes (NASA HQ)** presented the talk, *Earth Observations Applied to a Changing World: NASA Health and Air Quality Applications*, describing a selection of environmental health projects related to air pollution, drought, extreme heat, and wildfires. A total of 20 in-person and 70 virtual participants (over 300 registered) attended the webinar, representing federal and state agencies (CA, MN, NC, NH, SC, TN, VA, WA), academic and health institutions, and air quality management agencies. This [webinar](#) offered the first NASA collaboration with the American Lung Association, with plans to continue these educational efforts on health and air quality topics.



Webinar presentation by J. Haynes.

Photo credit: H. Chapman

## PUBLICATIONS

[Social Media to Guide 'One Health' Initiatives](#) *The Clinical Teacher*. (V.J. Animasahun, **H.J. Chapman**, B.K. Oyewole)

[Particulate Matter-attributable Mortality and Relationships with Carbon Dioxide in 250 Urban Areas Worldwide](#) *Scientific Reports* (**S.C. Anenberg**, P. Achakulwisut, M. Brauer, D. Moran, J. Apte, **D.K. Henze**)

[Machine Learning-Based Integration of High-Resolution Wildfire Smoke Simulations and Observations for Regional Health Impact Assessment](#) *International Journal of Environmental Research and Public Health* (Y. Zou, **S.M. O'Neill**, N.K. Larkin, E.C. Alvarado, R. Solomon, C. Mass, **Y. Liu, M.T. Odman**, H. Shen)