NASA Health and Air Quality

remote sensing for public health

volume 12 & 13
may & june 2017

Photos by Shobhana Gupta

The CEOS Working Group on Capacity Building & Data Democracy organized a One Earth One Health Workshop at the Earth Observation Summit 2017 in Montreal, Canada. Presentations and scenario-based small group break-out sessions addressed HAQ topics including identifying current and potential EO products, applications, and services to support public health efforts. Meeting presentations can be accessed here.

upcoming:

Webinars and Seminars:

Goddard Applied Sciences Seminar Series: Climate Change, Resilience and Migration
August 23, 2017

GOES-R Series Virtual Course
August 30-November 1, 2017

ARSET Webinar Training: Introduction to Remote Sensing of Harmful Algal Blooms
September 5-26, 2017

ARSET In-Person Training: Satellite Remote Sensing of Air Quality
September 19-21, 2017
Riverside, CA

Solicitations:

Federal Funding Opportunity for FY18 from NOAA Climate Program Office
Applications due August 14, 2017

Meetings:

Health and Air Quality Working Group Meeting at GSFC
August 14, 2017
Greenbelt, MD

NASA Health and Air Quality Applications Program Annual Review
September 12-13, 2017
Reno, NV

GEO-XIV Plenary
October 23-27, 2017

Operationalizing One Health: Observe, Analyze, Communicate
1:30 pm - 4 pm, October 23, 2017

GEO Health CoP meeting
1 pm - 4 pm, October 24, 2017
Washington, DC

haQ

HEALTH AND AIR QUALITY APPLICATIONS
APPLIED SCIENCES PROGRAM

JOHN HAYNES
PROGRAM MANAGER
HEADQUARTERS

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ALI OMAR
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SPOTLIGHT

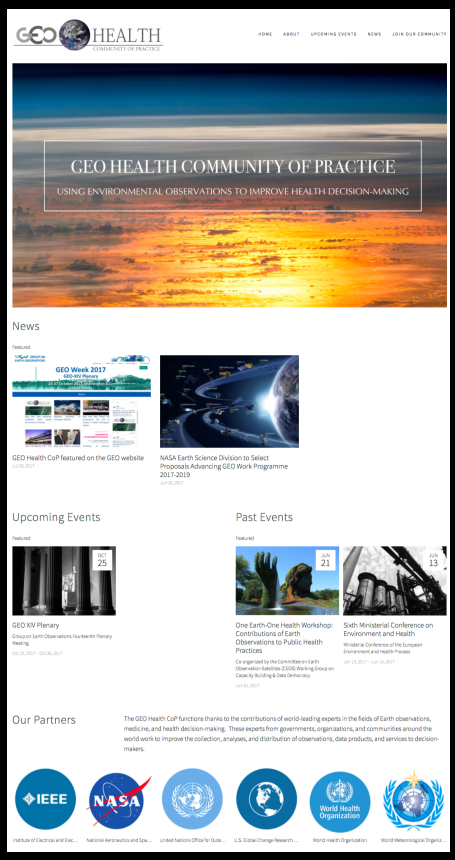
GEO HEALTH COMMUNITY OF PRACTICE LAUNCHES NEW WEBSITE

The GEO Health Community of Practice (CoP) is a global network of governments, organizations, and observers. It seeks to use Earth observations to improve health decision-making at the international, regional, country, and district levels.

The CoP leadership is dedicated to enhance communications and collaboration within the group, and to engage relevant professionals, public health managers and environmental researchers, worldwide. To that end, the CoP hosts membership-wide calls inviting members to share their on-going regional or global initiatives of interest.

Additionally, the CoP leadership has launched a new website (http://www.geohealthcop.org/) to communicate significant news and events of interest.

An in-person meeting of the CoP is planned for October 24, 2017, 1pm-4pm as a part of the GEO XIV Plenary in Washington, D.C.



NASA EARTH SCIENCE APPLIED SCIENCES PROGRAM 2016 ANNUAL REPORT IS HERE!

Our Research in the News

- HAQAST Lead Tracey Holloway was featured in *Nature* journal's Career Q&A section, in which she shared the origin story of the Earth Science Women's Network, and her efforts to turn the network into a non-profit organization. **Nature**.
- Tracey Holloway describes to podcast listeners the rise in air pollution resulting from air conditioners on hot days. **Scientific American**.
- HAQAST's Arlene Fiore identifies Asian air pollution as a culprit in raising ozone levels in western United States. **NPR All Things Considered**, **NPR**.

Photo courtesy of NPR

- The global human health impact of diesel emissions was amounted to 38,000 deaths/year, as calculated by scientists including HAQAST's Daven Henze. **The Guardian**.
- Data from NASA's AIRS instrument identifies hotspots of ammonia over agricultural centers in the United States, Europe, China, and India. **EOS**.
- NASA partnered with the city of Rio de Janeiro to combine satellite observations, climate projections, and ground data to help cities better anticipate geophysical hazards and adapt to climate change. Officials met at NASA GISS to discuss topics eg. sea level rise, urban heat islands. **EOS**.

Photo courtesy of NPR

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NASA'S GLOBE PROGRAM RELEASES MOSQUITO HABITAT MAPPER ON THE GLOBE OBSERVER APP

The Mosquito Habitat Mapper will support citizen scientists to map, count and identify mosquito larvae found in breeding sites. GLOBE Observers will be able to augment broad scale satellite-based research with highly targeted local ground-based observations.

NASA GLOBE PROGRAM INVITES CITIZEN SCIENTISTS TO PARTICIPATE IN GROUND TRUTHING STUDIES

The GLOBE observer's AEROSOL Campaign for Schools 2017, allows students to measure aerosol optical thickness (AOT) using a sun photometer! These observations have proven to improve MODIS satellite observations of aerosols over the Dutch and Belgian coastline.

Images from www.globe.com

The Surface Temperature Field Campaign allows GLOBE observers to investigate how surface cover affects surface temperature, inspiring comparisons between paved and unpaved or grassy areas, urban and rural areas, and areas close to or far from water bodies.

[1] Boersma, KF, de Vroom, JP (2006). Validation of MODIS aerosol observations over the Netherlands with GLOBE student measurements. *JOURNAL OF GEOPHYSICAL RESEARCH-ATMOSPHERES*, 111(D20), D20311.

publications

Response of Power Plant Emissions to Ambient Temperature in the Eastern United States
Abel D et al
Environmental Science and Technology

Impacts and mitigation of excess diesel-related NOx emissions in 11 major vehicle markets
Annaberg SC et al
Nature

The influence of vegetation, mesoclimate and meteorology on urban atmospheric microclimates across a coastal to desert climate gradient
Crum SM et al
Journal of Environmental Management

Integrating Environmental Monitoring and Mosquito Surveillance to Predict Vector-borne Disease: Prospective Forecasts of a West Nile Virus Outbreak
Davis JK et al
PLOS: Current Outbreaks

A comparison of smoke estimation methods and their association with wildfire smoke and cardiopulmonary-related hospital admissions during the 2012 Washington wildfires
Gan RW et al
GeoHealth

Spatial and Temporal Estimates of Population Exposure to Wildfire Smoke during the Washington State 2012 Wildfire Season Using Blended Model, Satellite, and In-Situ Data
Lassman W et al
GeoHealth

Preparing for Extreme Heat in New York State
Muscatiello N and Hilts AS
University at Albany - Public Health Live!

Intensified dust storm activity and Valley fever infection in the southwestern United States
Tong D et al
Geophysical Research Letters

resources
for our community

HUMAN HEALTH AND ADAPTATION: UNDERSTANDING CLIMATE IMPACTS ON HEALTH AND OPPORTUNITIES FOR ACTION
Synthesis paper by the UNFCCC

It's a HAB HAB HAB HAB World!

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SUPPLEMENT

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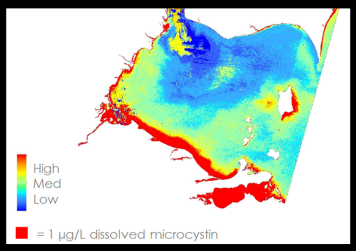
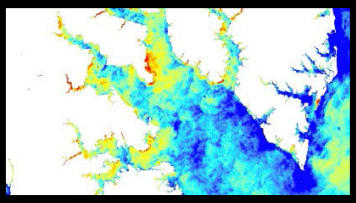
DEVELOP: Tomorrow's Scientists take on today's HABs

UTILIZING SATELLITE AND HYPERSPECTRAL IMAGERY TO IDENTIFY ANNUAL AND SEASONAL TRENDS OF HARMFUL ALGAL BLOOMS AND RESULTING WATER QUALITY IN LAKE ERIE'S WESTERN BASIN



Landsat 8 OLI, Aqua MODIS, NASA Glenn Research Center's aircraft HSI, Glenn Hyperspectral Imager II, and corresponding in situ data were utilized to monitor and predict HAB events. The Cyanobacteria Index (CI), Floating Algae Index (FAI), Normalized Difference Turbidity Index (NDTI), and PHYDOTax algorithms were correlated with in situ data to determine the most effective method of cyanobacteria detection and prediction.

EARTH OBSERVATIONS TO MONITOR THE EXTENT OF HARMFUL ALGAL BLOOMS IN CHESAPEAKE BAY WATERSHED



Photos courtesy of NASA DEVELOP

Landsat 8 Surface Reflectance data (USGS Earth Explorer) and MODIS imagery (NOAA CoastWatch) were cross-calibrated to create a regression model that calculated concentrations of chlorophyll. Calculations were verified with in situ measurements from the Virginia Estuarine and Coastal Observing System. Imagery produced with the Chlorophyll-a calculation model will allow assessments of timing, magnitude, duration and frequency of HABs in Virginia's Chesapeake watershed, and predictions of environmental and water quality conditions that favor bloom development.

FIRST NASA ARSET TRAINING FOCUSED ON HABS!

Photo courtesy of NASA Earth Observatory

Introduction to Remote Sensing of Harmful Algal Blooms
September 5-26, 2017

The training will review data products from missions including Landsat OLI, MODIS, VIIRS, Sentinel-2, with the following learning objectives for attendees:

- Identify NASA's Earth Science remote sensing data products for the identification and monitoring of HABs
- Describe how coupled remote sensing and modeling approaches are used in decision support tools
- Use a selection of NASA Earth Science data tools to monitor HABs.

SERVIR HELPS GUATEMALA IMPROVE WATER QUALITY IN LAKE ATITLAN

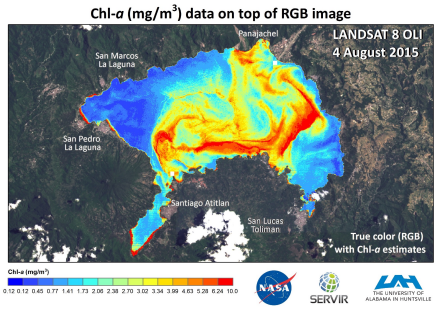


Photo courtesy of NASA SERVIR

In 2009 Lake Atitlan, a popular tourist destination in Guatemala experienced the worst algal bloom recorded. SERVIR helped Guatemalan authorities monitor and analyze satellite data to inform environmental managers and the general public about the event. Information shared by NASA sparked action by the Guatemalan government to clean up the lake.

Since then, NASA images have continued to be significant tools for Guatemalan authorities to monitor Lake Atitlan, and respond to algal growth, as occurred in August, 2015. Data from NASA satellites, such as Landsat, EO-1, and Terra/ASTER are allowing end users to monitor the bloom progress in a timely manner, and complement on-site analyses.

Cyanobacteria Assessment Network (CyAN)

A multi-agency project among NASA, NOAA, USGS and EPA to develop an early warning indicator system using historical and current satellite data to detect algal blooms in U.S. freshwater systems.

Research supports federal, state, and local partners in their monitoring efforts to assess water quality to protect aquatic and human health.

The project aims to:

- Create a useful, uniform approach for early identification of algal blooms using data from Sentinel-3, Sentinel-2, Landsat and future NASA missions.
- Develop an information dissemination system for expedient public health advisory postings, using mobile applications and EPA's EnviroAtlas.
- Better understand connections between health, economic, and environmental conditions to cyanobacteria and phytoplankton blooms.