Health and Air Quality Applications Team Meeting

John A. Haynes, MS
Program Manager, Health and Air Quality

Applied Sciences Program
Earth Science Division
Science Mission Directorate
NASA
Washington, DC USA

jhaynes@nasa.gov
Earth Science Instruments on ISS:
RapidScat, CATS, LIS, SAGE III (on ISS), TSIS-1, OCO-3, ECOSTRESS, GEDI, CLARREO-PF
NASA’s Earth Science Division

Research

Flight

Applied Sciences

Technology
Discovering and demonstrating innovative and practical uses of Earth observations in organizations’ policy, business, and management decisions.

Applications
Prove-out, develop, and transition applications ideas for sustained uses of Earth obs. in decision making.

Capacity Building
Build skills and capabilities in US and developing countries to access Earth observations to benefit society.

Mission Planning
Identify applications early in mission lifecycle and integrate end-user needs in mission design and development.

http://AppliedSciences.NASA.gov
NASA Applied Sciences Architecture

**Results of NASA Earth Science Research**
- Technology
- Missions / Observations
- Data and Archives
- Research and Analysis
- Models / Predictions

**Societal Needs**
- Management Decisions
- Policy Decisions
- Forecasting
- Response & Recovery

**Applied Sciences Program**
Applications Areas

Emphasis in 4 Applications Areas

- Health & Air Quality
- Water Resources
- Disasters
- Ecological Forecasting

Support opportunities in 5 additional areas

- Agriculture
- Climate
- Weather
- Energy
- Oceans
Why Health & Air Quality?

Potential Health Effects of Climate Variability and Change

- CLIMATE CHANGE (Natural and Human-Caused)
  - Regional Weather Changes
    - Heat Waves
    - Extreme Weather
    - Temperature
    - Precipitation

- Air Pollution Levels
- Contamination Pathways
- Transmission Dynamics

- Health Effects
  - Heat-related Illnesses and Deaths
  - Extreme Weather Events-related Health Effects
  - Air Pollution-related Health Effects
  - Water- and Food-borne Diseases
  - Vector- and Rodent-borne Diseases

- Moderating Influences*

- Research
- Adaptation Measures**
Global Emerging Diseases*

* Modified from Morens et al. 2004 Nature 430:242
New Environmental Threats

This visible image of the Gulf oil slick was taken on May 9, 2010, at 19:05 UTC (3:05 p.m. EDT) from MODIS aboard NASA's Aqua satellite. Crude oil brings volatile organic compounds into the air which can react with nitrogen oxides to produce ozone.
Objectives:

- NASA’s Health & Air Quality Applications Area supports the use of Earth observations in air quality management and public health, particularly regarding infectious disease and environmental health issues.

- The area addresses issues of toxic and pathogenic exposure and health-related hazards and their effects for risk characterization and mitigation.

- The area promotes uses of Earth observing data and models regarding implementation of air quality standards, policy, and regulations for economic and human welfare.

- The Health & Air Quality Applications Area also addresses effects of climate change on public health and air quality to support managers and policy makers in their planning and preparations.
Technical:
• The portfolio is technically performing very well.

Budget/Cost:
• Continue to carry a high burden of uncosted funds. Associates are working diligently with PIs to uncover issues at their particular institutions. Many times this appears to be an issue of “invoice lag” between NASA and the institution. However, significant progress has been made; ~67% reduction in FY14 AND ~47% reduction in FY 15 uncosted from one year ago.

Schedule:
• Overall the portfolio has a good track record for remaining on schedule, with NCEs mainly occurring in some AQAST projects.

Performance:
• Overall performance of the portfolio meets or exceeds expectations.

Overall:
• The Health and AQ program is performing satisfactorily.
Health and Air Quality: Portfolio

Project Portfolio – 12 Active Projects in July 2016**

ARL 1-3: 3 projects
ARL 4-6: 9 projects
ARL 7-9: 0 projects

Mean: ARL 4
Median: ARL 4
Mode: 4

Performance since July 2015:
50% of projects increased by at least 1 ARL. 25% of projects increased by 2 ARL.

**16 additional projects are AQAST, which do not report ARLs. However, major accomplishments were reported in the past year in the AQAST portfolio.
Major News Items in the ESD/ASP

» AQAST close-out meeting and brownbag at HQ on April 29.
» TEMPO Applications Workshop held in Huntsville, AL, on July 12-13.
» GEO Plenary XIII: Nov. 9-10 in St. Petersburg, Russia
» Revitalized GEO Health Community of Practice underway!
» NASA H/AQ Applications Newsletters are being published.
» New AQAST and Applied Sciences Videos:
  – Satellite Data and Energy Analysis: https://www.youtube.com/watch?v=vtqU_y70I5E
  – Satellite Data and Air Quality Management: https://www.youtube.com/watch?v=4VFm_00kGdE
  – Mosquito Meets MODIS: https://www.youtube.com/watch?v=ag-Zo0izSNg

• Personnel

• Sandra Cauffman joins SMD as the Deputy Division Director of the Earth Science Division.
• AAAS S&T Policy Fellow Shobhana Gupta continuing another year (through August 2017).

• NASA Health/AQ Sessions at the following conferences:
  – AMS Annual Meeting (January 2016)
  – National Water Quality Monitoring Conference (May 2016)
  – ATS Annual Meeting (May 2016)
  – AWMA Annual Meeting (June 2016)
  – Upcoming at ASTMH, APHA (Hyperwall), and AMS!
President Obama Explains How Pollution Affects our Planet Using Aura Satellite and OMI Data

- On Apr 12, Dnews shared a one minute video on YouTube of President Obama discussing how the Aura satellite and OMI data track global pollution trends and the state of the Earth’s atmosphere.
- The President noted that emissions of nitrogen dioxide have dropped in the U.S. and Europe over the last 25 years by up to 50% thanks to rules protecting the air.
- Obama also highlighted how the satellite imagery helps see what actions are working and where additional international efforts are needed.

Video of President Obama’s speech during which he discusses OMI data. One minute, 12 seconds https://www.youtube.com/watch?v=LKe5FdKInJs

Dnews is a Discovery Channel initiative focused on unusual “mind-bending stories and perspectives.”
Fundamentals of Satellite Remote Sensing for Health Monitoring

Participants: 351 individuals, representing 273 organizations from 47 countries and 40 US states

• Session One: Fundamentals of Remote Sensing for Health Applications
  – June 2
  Presenter: Pawan Gupta, USRA; Maury Estes, UAH

• Session Two: How NASA is Using Remotely Sensed Data to Study Health Issues
  – June 9
  Presenter: John Haynes, NASA HQ

• Session Three: Using Remote Sensing Data for Public Health: CDC-NASA Collaboration
  – June 16
  Presenters: Ambrish Vaidyanathan and Arie Manangan, CDC

• Session Four: Using Satellite Data for the Prediction and Detection of Harmful Algal Bloom Outbreaks
  – June 23
  Presenter: Richard Stumpf, NOAA National Centers for Coastal Ocean Science

• Session Five: Mapping and Forecasting Mosquito-Borne Disease Risk
  – June 30
  Presenter: Michael C. Wimberly, South Dakota State University
Health and Air Quality Applied Sciences Team (HAQAST)

Tracey Holloway - Team Lead (University of Wisconsin-Madison)
Bryan Duncan (NASA Goddard Space Flight Center)
Arlene Fiore (Columbia University)
Frank Freedman (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 (University of North Carolina, Chapel Hill)
Mark Zondlo (Princeton University)
In Memoriam: Molly Macauley

A strong, tireless voice and advocate for remote sensing

Addressed the economics of space and the value of Earth observations

Countless papers, articles, editorials, books, book chapters and committees

d. 8-July-2016
The FY17-21 budget is executable and balanced, informed by and consistent with Decadal Survey and national Administration priorities:

- advances Earth system science
- delivers societal benefit through applications development and testing
- provides essential global spaceborne measurements supporting science and operations
- develops and demonstrates technologies for next-generation measurements, and
- complements and is coordinated with activities of other agencies and international partners

Funds operations and core data production for on-orbit missions in prime and extended phases, in keeping with 2015 Senior Review recommendations/decisions. Funds NASA portal for Copernicus and other international missions, increasing DAAC capability to host added NASA missions.

Completes high priority missions: SAGE-III/ISS, ICESat-2, CYGNSS, GRACE-FO, SWOT, TEMPO, RBI, OMPS-Limb, TSIS-1 and -2, CLARREO Pathfinder, Jason-CS/Sentinel-6A, NISAR

Develops (for launch beyond budget window): PACE, Landsat-9, Landsat-10, Jason-CS/Sentinel-6B

Continues all originally planned Venture Class solicitations/selections on schedule

Conducts limited Decadal mission studies, pending release of the 2nd ESAS Decadal Survey

Supports non-flight elements: Research, Applied Sciences, and Technology Development

Provides support to National Climate Assessment, USGCRP, international coordination activities (CEOS and GEO), USGEO, Carbon Monitoring System, data-related activities (CDI, BEDI, GCIS) in support of the Administration’s climate initiative, and GLOBE

Provides support for HECC, JPL Post-retirement, Directed R&T
**ESD Budget: FY17 Request/Appropriation**

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<tr>
<th>ESD Total</th>
<th>FY16 (op plan)</th>
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<td>FY16 PBS</td>
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<td>FY17 PBS</td>
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- *ESD budget jumps significantly in FY17 – then becomes consistent with FY16 PBR for the out years*
President’s FY17 Budget Request

» Re-establishes funds for full SERVIR Applied Sciences Team FY16-18; expands Team in FY19-21 for increase to 6 SERVIR hubs by 2018

» Increases funding for Applications Areas (via internal re-allocation)

» Implements Snow & Water Availability focused activity for Western States

» Implements Food Security Consortium

» Implements Disaster Response Plan for increased preparation-based approach

» Continues activities to develop techniques to quantify social and economic benefits from Earth science applications

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<th>Applied Sciences Program</th>
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<td>Water Resources</td>
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<td>Disaster Applications &amp; Response Team</td>
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<td>Wildfires (through FY17)</td>
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<td><strong>Capacity Building</strong></td>
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<td>SERVIR (joint with USAID)</td>
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<td>ARSET, Applied Remote Sensing Training</td>
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<td>DEVELOP</td>
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<td><strong>Satellite Mission Planning</strong></td>
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<td>Early Adopters, Apps. Workshops</td>
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<td>Socioeconomic Impact Analyses</td>
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<td>Community Utilities (ESIP, NEX, etc.)</td>
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<td>GEO and USGEO Support</td>
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Questions:
John Haynes, Program Manager
Health & Air Quality Applications
NASA Headquarters / Earth Science
JHaynes@nasa.gov

http://AppliedSciences.NASA.gov