



Jet Propulsion Laboratory
California Institute of Technology

AIRS Education and Public Outreach

NASA Souder Science Team Meeting

Nov 3-5, 2010

Sharon Ray, AIRS Outreach Lead



New AIRS Web Site Launched 9.13.10

AIRS Public Web Site - What's New

- Ads on the Home page that point to our carbon dioxide data, daily near-real-time maps, and our "Ask AIRS" query form
- Image and video highlights on the Home page
- Expanding menus in the left navigation column to find pages faster
- Three new sections on Weather, Climate, and Composition
- Updated News Archive
- Updated People section
- New Feedback web page (see the link in the web page footer)
- Latest Publications



~ 3700 visits/month 11,500 page views

45% search engines
the rest from direct traffic & referring sites

~ 2600 blogs
Nov 2009, ~ 1100 blogs

AIRS in ~ 2600 Blogs



OURvoices
StarTribune.com Staff Blogs

Home News Local Sports Lifestyle Entertainment Opinion Multimedia Classifieds CarS

Welcome | Log in | Member Center Search: GO  Manage subscri

Paul Douglas on weather Text

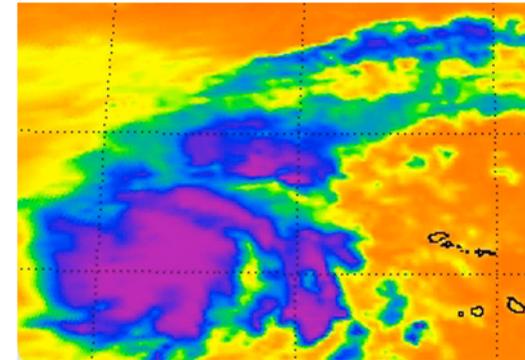
Look for daily posts here from **Paul Douglas**. Douglas is a nationally respected meteorologist, with over 30 years of television and radio experience. A serial entrepreneur, Douglas continues to seek out new ways to expand on new media and almost limitless on-line opportunities. As

Home | Blogs

Severe Storm Watch - Flood Watch (and a Sunday worth waiting for)

Posted by Paul Douglas
Last update: September 22, 2010 - 11:49 AM

0 Comments + Add comment  Print  Share



Tropical Storm Lisa. So far in 2010: 14 tropical depressions - 12 of those grew to tropical storm strength, 6 went on to become full-fledged hurricanes with sustained winds higher than 74 mph. "Lisa" is still out in the eastern Atlantic, NASA is using a low-orbiting satellite with a special "AIRS" sensor, the Atmospheric Infrared Sounder, which measures the temperatures of clouds. In the last 24 hours the tops of thunderstorms near the center of the storm cooled (to -94 F), hinting at additional intensification - in all probability Lisa will become the 7th named hurricane of the season. More from NASA [here](#).



Study Seeks To Explain The Parting Of The Red Sea.
Disclaimer: I do not believe everything can be explained by science (I happen to believe that miracles are possible - I've seen them in my own life and the lives of others). That said - I stumbled upon [this article](#) that tries to provide a meteorological explanation for what Moses may have encountered some 3,000 years ago, documented in the Book of Exodus. Hmmm.



AIRS Animation of Russian Wildfires Featured on NYT's Dot Earth Blog

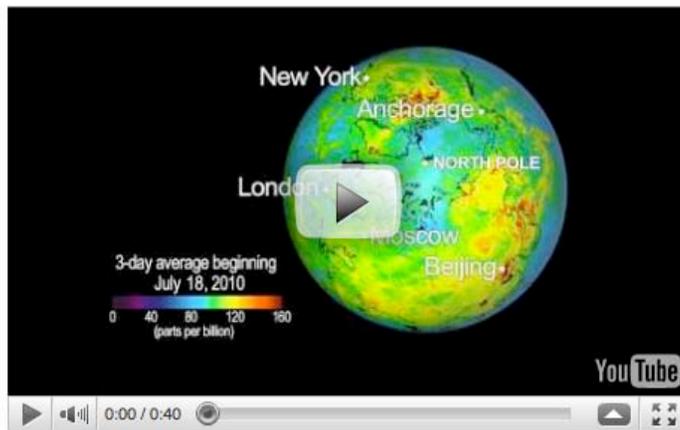


Nine Billion People. One Planet.

August 11, 2010, 9:23 PM

NASA Tracks Pollution Flow from Russian Fires

By ANDREW C. REVKIN



NASA has released video showing the pall of pollution spreading from the wildfires in and around Russia. (Here's a [satellite-generated map of the fires](#).) The animation was [created using data from the Atmospheric Infrared Sounder instrument](#) on NASA's Aqua satellite. The colors reflect levels of carbon monoxide at an altitude of about 18,000 feet, with the gas providing an indirect indicator of other emissions.

Comments (26) E-mail This Print Share

- The New York Times *Dot Earth* is a blog where Andrew Revkin reports on natural resources, the environment, climate change and sustainability.
- Visualization of AIRS CO from Russian wildfires, July 18 to August 10, 2010 makes the blog.
- *Europe Today* on the BBC World Service interviews Ed Olsen about the AIRS CO animation
- Widespread, international coverage

[Green Tech - CNET News](#)

Aug 12, 2010 ... Data from the Atmospheric Infrared Sounder (AIRS) on NASA's Aqua spacecraft allows a comparisons of air quality over the Russian Federation ... [news.cnet.com/greentech/](#) - 4 minutes ago

NASA Video [Shows Global Reach of Pollution from Fires - Science ...](#)

Aug 12, 2010 ... The data are from the Atmospheric Infrared Sounder (AIRS) instrument on NASA's Aqua spacecraft. AIRS is most sensitive to carbon monoxide at ...

[www.redorbit.com/news/science/1903949/nasa_video.../index.html](#) - 51 minutes ago

Research.gov - [NASA Instrument Tracks Pollution from Russian Fires](#)

[The Atmospheric Infrared Sounder \(AIRS\) instrument on NASA's Aqua spacecraft is tracking the concentration and transport of carbon monoxide from the Russian ...](#)

[www.research.gov/rgov/anonymous.portal?_... - 1 hour ago](#)

The Hindu : News / [International : Wildfires in Russia, Canada ...](#)

[NASA's Aqua satellite](#), equipped with an atmospheric infrared sounder (AIRS), has noted a change in the concentrations of carbon monoxide at an altitude of ...

[www.thehindu.com/news/international/article566562.ece - 1 hour ago](#)

[m-Wildfires-Covers-Earth- 151874.shtml - 5 hours ago](#)

MORE...



AIRS Animation of Russian Wildfires Featured on NYT's Dot Earth Blog



**NASA's AIRS Instrument
Sees Spread of
Wildfire Pollution
across the Globe**

The image shows a satellite in orbit above the Earth. The satellite is gold and has several solar panels. The Earth below is shown with a color-coded map of wildfire pollution, with red and orange areas indicating high concentrations of smoke and aerosols. The text is overlaid on the left side of the image.



AIRS Animation of Russian Wildfires Featured on NYT's Dot Earth Blog

Some comments on the animation:

Lou Grinzo
Rochester, NY
August 12th, 2010
8:20 am

Wow, that's quite a visual. It's almost as if, you know, we're all living on the same, finite planet. Go figure.

[mmswedish](#)

August 12th, 2010
10:23 am

Yup, Lou #6, as if we live on the same planet. I am increasingly aware that most of 'my' people do not know how the earth works. **Why are we not taught ecology beginning in kindergarten? Why do we not learn how our planet and the ecosystems in which we are embedded actually work?** I have a very strong feeling that **our culture would be dealing with the ecological crises we are facing now quite differently if they understood this – innately – from childhood.**



AIRS in New NCEP Reanalysis

NEWS ARCHIVE

Data from AIRS Included in New Coupled Global NCEP Reanalysis

September 23, 2010

The August 2010 issue of *BAMS*, the *Bulletin of the American Meteorological Society*, carries as its cover story the announcement that a new coupled global NCEP Reanalysis for the period of 1979 to the present is now available at much higher temporal and spatial resolution for climate studies.

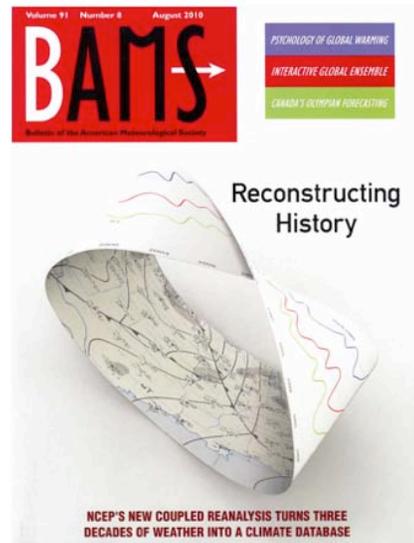
Reanalysis is a method of constructing a high-quality climate data record that combines past observations from different sources to produce a picture of how Earth's weather and climate has evolved over time. Climate models require validation of the way they represent both weather and climatology; the typical variations associated with seasons and other climate variations. Climate model developers and users often use reanalysis developed by weather forecast and climate prediction centers as a form of validation.

This latest NCEP/NOAA comprehensive coupled climate analysis is a "replacement" for what was commonly referred to as the NCEP/NCAR reanalysis.

While the former reanalysis extended back to the 1950's, the new reanalysis is expected to be far superior in terms of the advances made since the 1995 time frame when the previous reanalysis was constructed. The new product includes a better model, higher resolution, more data input, better assimilation methodology, and an ocean and atmospheric analysis done in concert.

Notable is that nearly all the sources are from operational satellite systems, with one of the exceptions being the inclusion of data from AIRS, the Atmospheric Infrared Sounder on NASA's Aqua Satellite.

Duane Waliser, Chief Scientist of the Earth Science and Technology Directorate at NASA's Jet Propulsion Laboratory observes, "It is a credit to the AIRS mission to create products that contribute to weather forecast quality and to resources heavily used for climate analysis and climate model validation."



[The NCEP Climate Forecast System Reanalysis](#)

[BAMS](#), *Bulletin of the American Meteorological Society*

Acronyms

NCEP: [National Centers for Environmental Prediction](#)

NOAA: [National Oceanic and Atmospheric Administration](#)

NCAR: [National Center for Atmospheric Research](#)

- Notable is nearly all the data sources are from operational satellite systems, with one of the exceptions being the inclusion of data from AIRS
- Feature written by Sharon Ray and Duane Waliser for AIRS web site, and featured on Climate web site


GLOBAL CLIMATE CHANGE
 NASA's Eyes on the Earth


A blog hosted by Dr. Amber Jenkins

Climate change chronicles from NASA

September 24, 2010
posted by Dr. Amber Jenkins
7:16 PST

Comments (0)

A clearer picture
AIRS data a valuable asset

AIRS, the Atmospheric Infrared Sounder onboard NASA's Aqua Satellite, is helping produce a clearer picture of how Earth's weather and climate has evolved over time. Information about our atmosphere collected by AIRS, and by other satellite systems, has been used to build a new, high-quality climate data record that has just been released by the National Centers for Environmental Protection (NCEP) and the National Center for Atmospheric Research (NCAR). The data span from 1979 to the present and are of higher precision.

Duane Waliser, Chief Scientist of the Earth Science and Technology Directorate at NASA's Jet Propulsion Laboratory commented on the news: "It is a credit to the AIRS mission to create products that contribute to weather forecast quality and to resources heavily used for climate analysis and climate model validation."

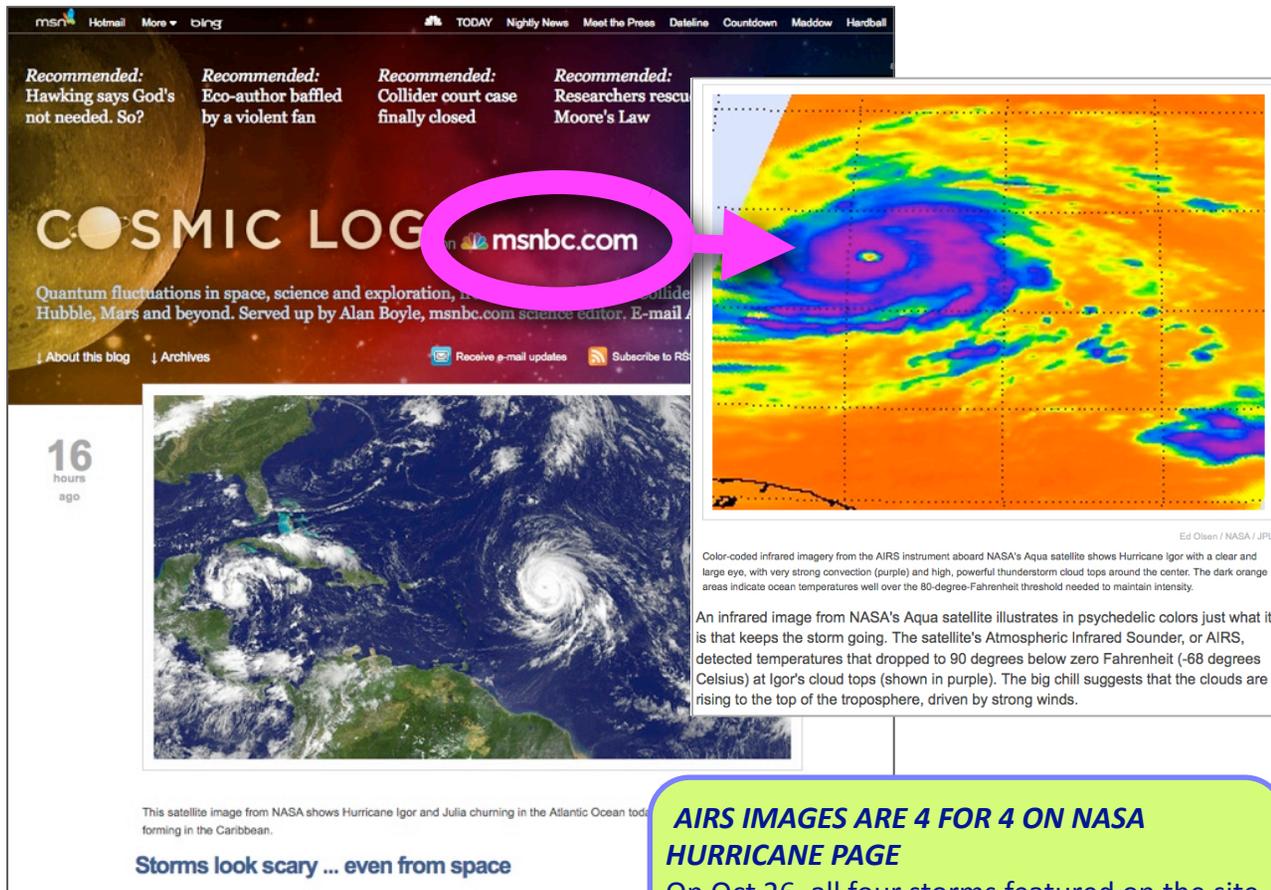
For more information, visit the AIRS website.

[Back to the Blog](#)



Amber Jenkins is a science writer and communicator for NASA's Jet Propulsion Laboratory (JPL). Born and raised in England, she is a physicist turned communicator whose journey has taken her from London to Chicago, San Francisco and now the environs of L.A. She has a Ph.D. in particle physics from Imperial College London and a First Class Master's degree in natural sciences from Cambridge University, Mass.

NASA Hurricane Coverage Continues - AIRS Continually Supplies Images



Recommended: Hawking says God's not needed. So? Recommended: Eco-author baffled by a violent fan Recommended: Collider court case finally closed Recommended: Researchers rescue Moore's Law

COSMIC LOG [msnbc.com](#)

Quantum fluctuations in space, science and exploration, Hubble, Mars and beyond. Served up by Alan Boyle, msnbc.com science editor. E-mail

16 hours ago

This satellite image from NASA shows Hurricane Igor and Julia churning in the Atlantic Ocean together forming in the Caribbean.

Storms look scary ... even from space

Color-coded infrared imagery from the AIRS instrument aboard NASA's Aqua satellite shows Hurricane Igor with a clear and large eye, with very strong convection (purple) and high, powerful thunderstorm cloud tops around the center. The dark orange areas indicate ocean temperatures well over the 80-degree-Fahrenheit threshold needed to maintain intensity.

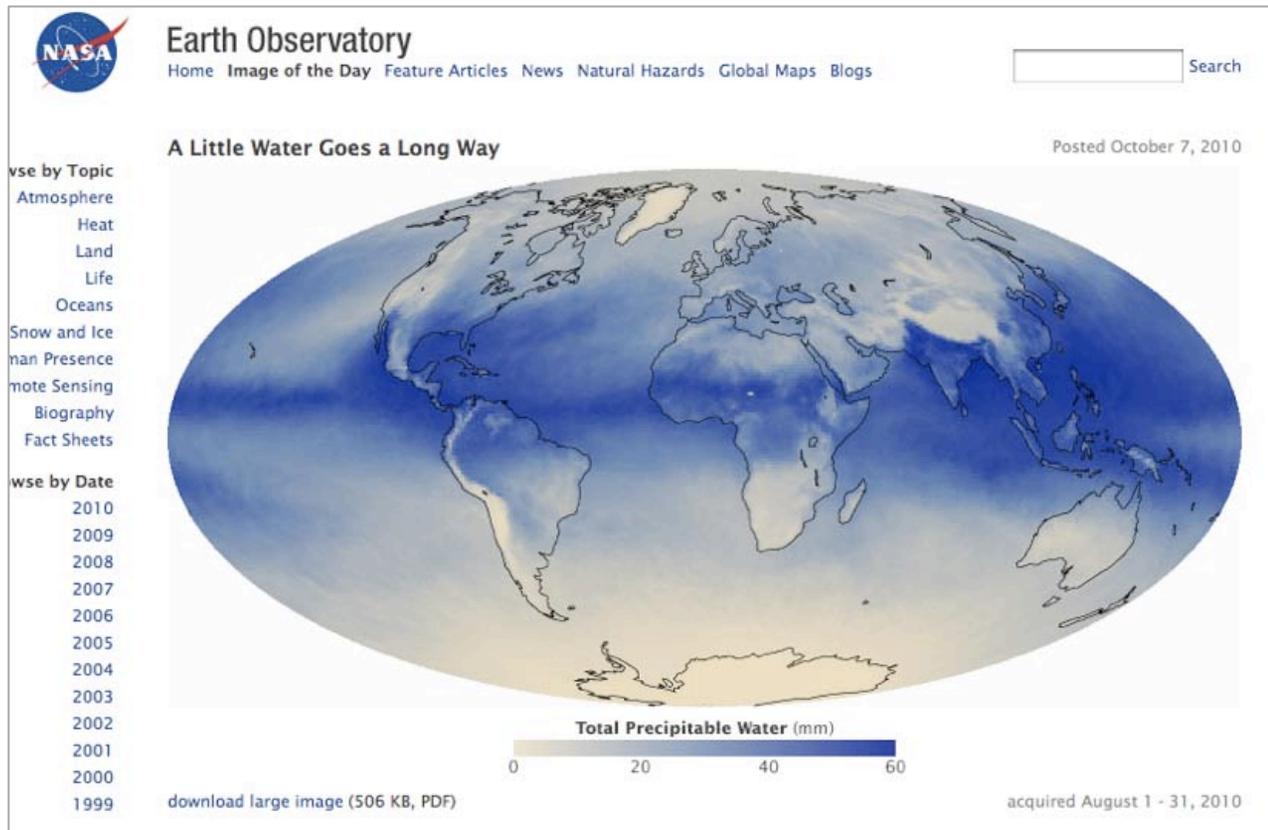
An infrared image from NASA's Aqua satellite illustrates in psychedelic colors just what it is that keeps the storm going. The satellite's Atmospheric Infrared Sounder, or AIRS, detected temperatures that dropped to 90 degrees below zero Fahrenheit (-68 degrees Celsius) at Igor's cloud tops (shown in purple). The big chill suggests that the clouds are rising to the top of the troposphere, driven by strong winds.

AIRS IMAGES ARE 4 FOR 4 ON NASA HURRICANE PAGE

On Oct 26, all four storms featured on the site (CHABA, RICHARD, GIRI, MEGI) use AIRS images as the headline picture.

- Hurricane Igor story titled “Stunning NASA Infrared Imagery of Hurricane Igor Reveals a 170 Degree Temperature Difference!” written by Rob Gutro of the NASA Hurricane Page
- Story was picked up by **more than 130 outlets, including MSNBC, USA Today and NPR.** Rob was also interviewed by Fox News NYC about NASA coverage of Igor.
- Time series created from MODIS and AIRS images receives widespread news coverage, including tweet by CNN’s Rick Sanchez.

AIRS in New NASA Water Cycle Fact Sheet



- New NASA Water Cycle Fact Sheet written by Steve Graham, Claire Parkinson, and Mous Chahine features AIRS water vapor imagery
- AIRS water vapor image included in a feature story titled “A Little Water Goes a Long Way” in NASA’s Earth Observatory

AND SPREADING THE WORD...

Astronaut and former Terra Project Scientist, Peter Sellers, used AIRS animations of carbon dioxide in a talk at the National Air and Space Museum on September 15th.

the earth observer

The Earth Observer

September - October 2010

Volume 22, Issue 5

51

in the news |

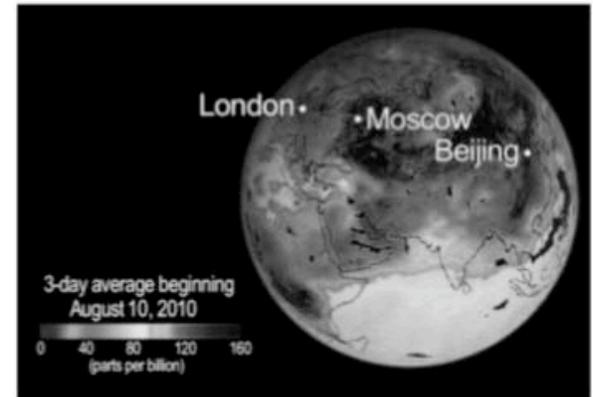
NASA Data Shows Global Reach of Pollution from Russian Fires

Alan Buis, NASA Jet Propulsion Laboratory, Alan.buis@jpl.nasa.gov

A series of large wildfires burning across Western and Central Russia, Eastern Siberia, and Western Canada has created a noxious soup of air pollution that is affecting life far beyond national borders. Among the pollutants created by wildfires is carbon monoxide (CO), a gas that can pose a variety of health risks at ground level. CO is also an ingredient in the production of ground-level ozone, which causes numerous respiratory problems. As the CO from these wildfires is lofted into the atmosphere, it becomes caught in the lower bounds of the mid-latitude jet stream, which swiftly transports it around the globe.

Two movies were created using continuously updated data from the *Eyes on the Earth 3-D* feature on NASA's global climate change website: climate.nasa.gov. They show three-day running averages of daily measurements of CO present at an altitude of 18,000 ft (5.5

km), along with its global transport. The data are from the Atmospheric Infrared Sounder (AIRS) instrument on NASA's Aqua spacecraft. AIRS is most sensitive to CO at this altitude, which is a region conducive to long-range transport of the smoke. The abundance of CO is shown in parts per billion, with the highest concentrations shown in yellows and reds. The first movie, centered over Moscow, highlights the series of wildfires that continue to burn across Russia. It covers the period between July 18–August 10, 2010. The second movie is centered over the North Pole and covers the period from July 18–August 10, 2010. The second movie, centered over the North Pole and covers the period from July 18–August 10, 2010. The second movie, centered over the North Pole and covers the period from July 18–August 10, 2010.



Aerosol Optical Depth at 550 nm [unitless]

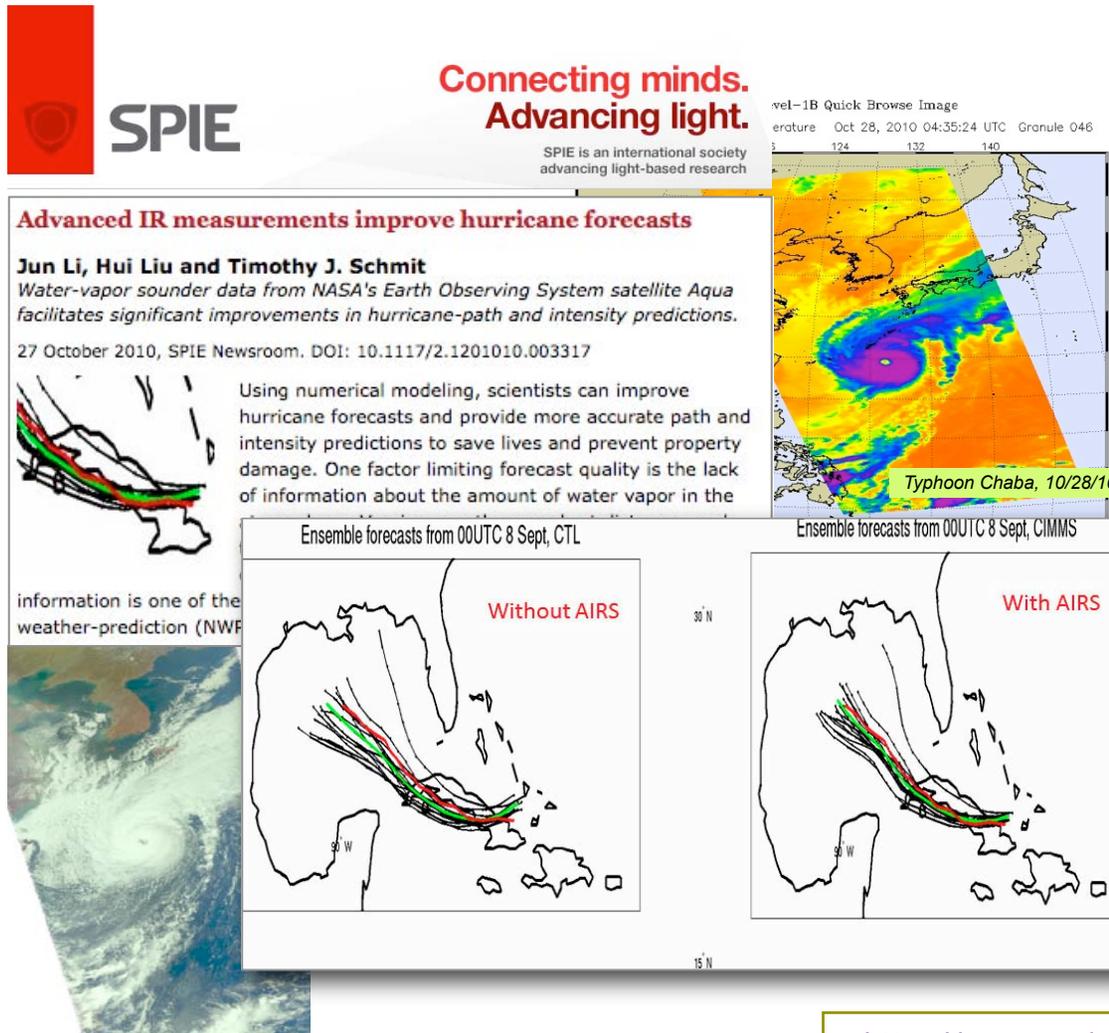
Kudos

Moustafa T. Chahine [Jet Propulsion Laboratory (JPL)—*Atmospheric Infrared Sounder (AIRS) Team Leader for Aqua*] was recently elected to the Lebanese Academy of the Sciences. From the AIRS Team, “Dr. Moustafa Chahine, AIRS Science Team Leader, was elected a Full Member of the Lebanese Academy of Sciences (Academie des Sciences du Liban). His election carried the citation: ‘For his leadership in the theoretical modeling and space observation of Earth and planetary Atmospheres.’ A press release will follow on the Academy’s webpage at: www.asliban.org/Announcements.html.” The staff at the *The Earth Observer* and the entire scientific community congratulate Chahine on his accomplishment!



Frame from *Eyes on the Earth 3-D* feature showing carbon monoxide (CO) concentrations on August 10, 2010. The

SPIE Feature Story: Advanced IR Measurements Improve Hurricane Forecasts



Connecting minds. Advancing light.

SPIE is an international society advancing light-based research

Advanced IR measurements improve hurricane forecasts

Jun Li, Hui Liu and Timothy J. Schmit
Water-vapor sounder data from NASA's Earth Observing System satellite Aqua facilitates significant improvements in hurricane-path and intensity predictions.

27 October 2010, SPIE Newsroom. DOI: 10.1117/2.1201010.003317

Using numerical modeling, scientists can improve hurricane forecasts and provide more accurate path and intensity predictions to save lives and prevent property damage. One factor limiting forecast quality is the lack of information about the amount of water vapor in the atmosphere.

Ensemble forecasts from 00UTC 8 Sept, CTL (Without AIRS)

Ensemble forecasts from 00UTC 8 Sept, CIMMS (With AIRS)

Typhoon Chaba, 10/28/10

- SPIE technical article features research by Jun Li, Hui Liu and Timothy J. Schmit
- Atmospheric-water-vapor information is a key parameter needed in the regional numerical-weather-prediction (NWP) model for accurate hurricane forecasting.
- Today's hyperspectral IR sounders such as AIRS, IASI provide unprecedented global, vertical atmospheric temperature and moisture distributions with high accuracy.
- Through an advanced retrieval technique, critical information can be extracted from AIRS radiance measurements by assimilation of the spatial and vertical water-vapor distribution around a hurricane into a regional NWP model, thereby improving path and intensity forecasts.

<http://spie.org/x42479.xml?highlight=x2420&ArticleID=x42479>

Upcoming Stories

- Bjorn Lambrigtsen - AIRS Data used to help forecast effort in GRIP Campaign
- Julie Wallace - Applications of AIRS Data
- Hengchun Ye
- Nick Nalli





AIRS in Education - 2 Partnerships

My NASA Data

- Makes NASA Earth science data accessible to K–12 and citizen scientist communities
- Data and lessons can be used with existing curriculum and enable students to practice science inquiry and math or technology skills using real measurements of Earth system variables and processes.
- Lin Chambers and team have incorporated AIRS CO₂ data into the MY NASA educational framework. Data is now available.



ESSEA – Earth System Science Education Alliance & GES DISC (GIOVANNI)

- A NASA, NSF and NOAA-supported program implemented by the Institute for Global Environmental Strategies (IGES) to improve the quality of geoscience instruction K-12 teachers. 40+ institutions participate, with over 3,000 teachers having completed an ESSEA course as of fall 2009.
- ESSEA is based on a series of online courses for teachers that are offered by participating institutions. These institutions and faculty receive training, technical support, the ability to create and share their own course modules, and join an active community of Earth system science educators.

- 2 educational modules will be built around AIRS data
- *Water vapor module* will focus on water vapor feedbacks increasing the warming effect of CO₂ in the mid-troposphere.
- *CO₂ module* will focus on discovery of the southern hemisphere CO₂ belt.
- *SO₂ data* will be incorporated into existing volcano educational models.
- ESSEA will take advantage of the GIOVANNI real-time animation tool and the Eyes On The Earth web application.

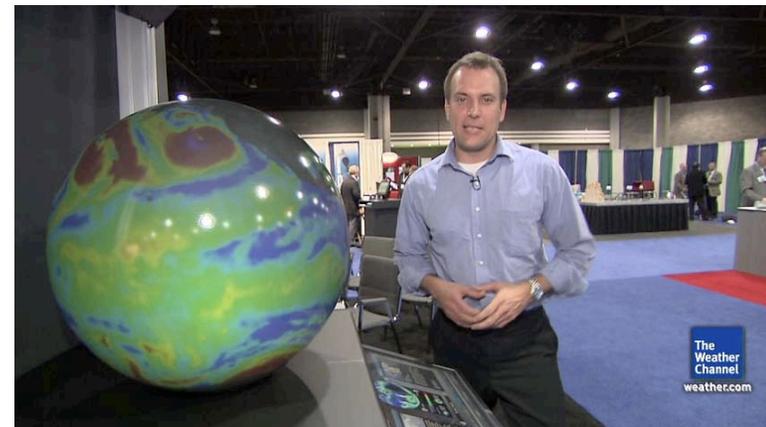


New Hi-Def Time Series Data Sets Large Magic Planet and Science on a Sphere

Hi all,

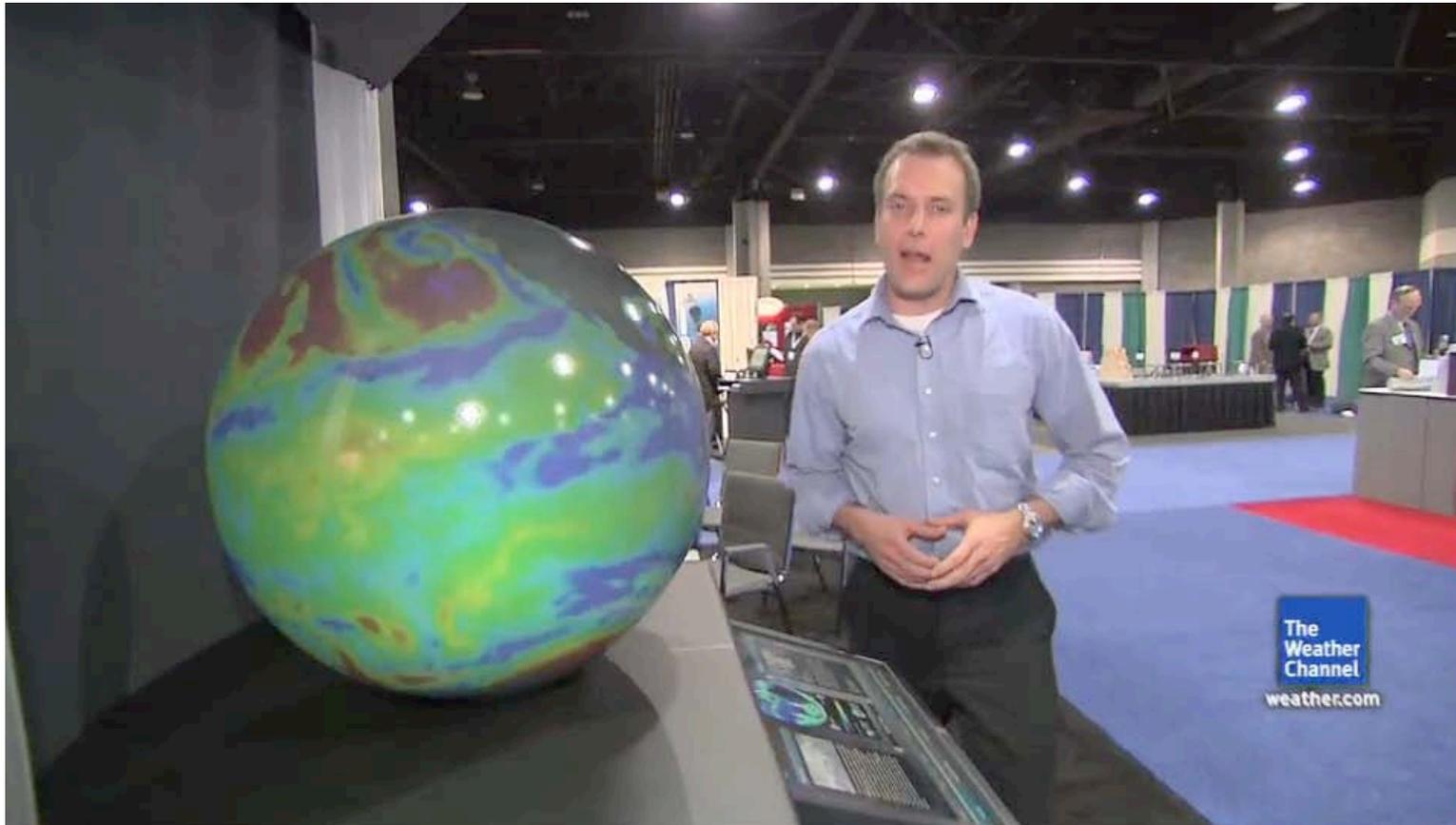
Our Dynamic Planet contents was being captured and aired by the Weather Channel at the recent annual AMS event, BIG thanks to Steve Graham's dedication to keeping content with latest data, and many thanks to Kevin Ward (NEO project), Marit Jentoft-Nilsen (EOS), Mark Malanoski (EOS), Vicky Weeks (Goddard TV), Sharon Ray (EOS/AIRS) data support to make this content rich inspiring showcase. Here is the link to the video was aired on Friday, Jan. 22, 7:55 am on Weather Channel.

Winnie





New Hi-Def Time Series Data Sets Large Magic Planet and Science on a Sphere





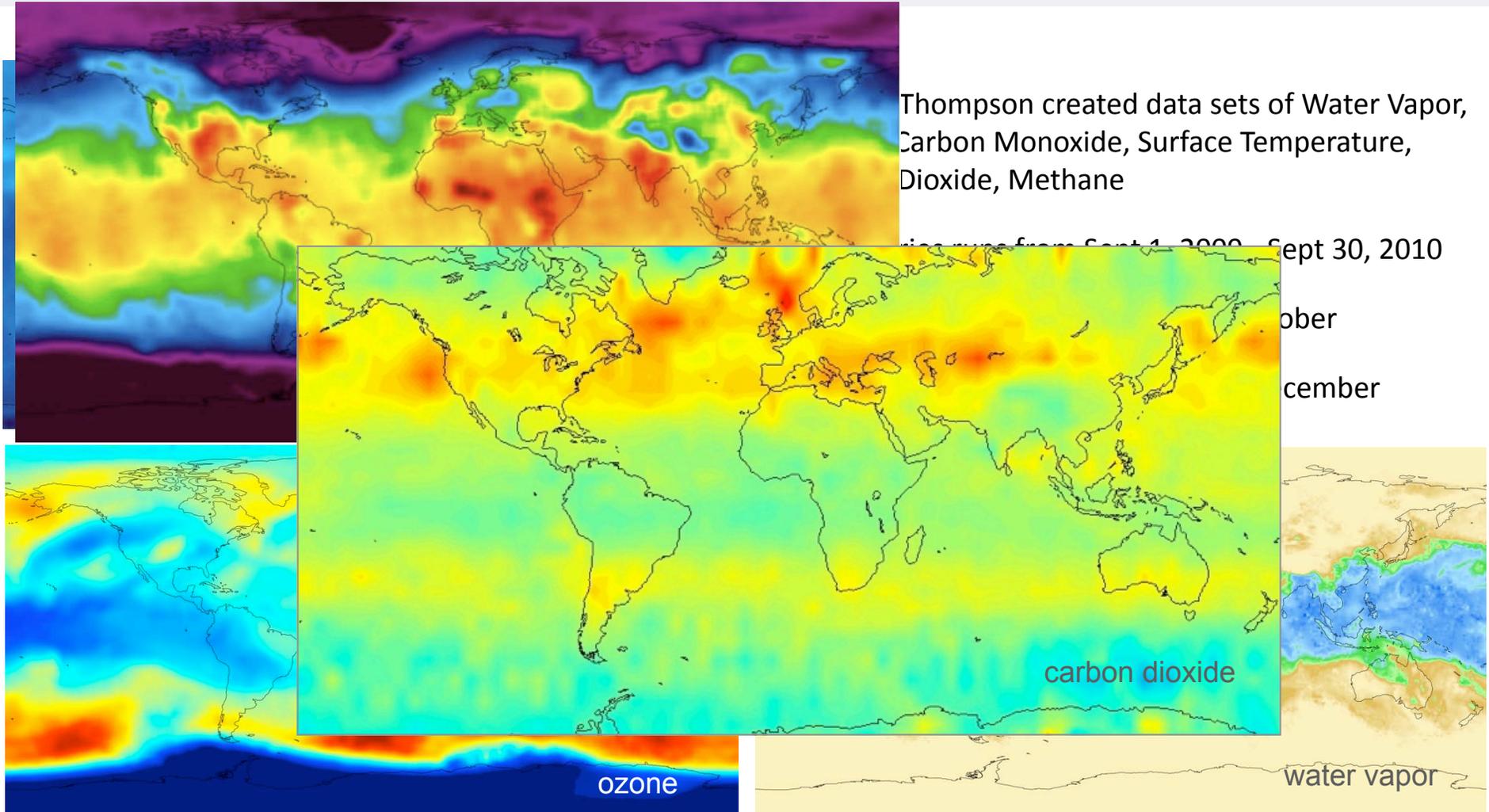
New Hi-Def Time Series Data Sets Large Magic Planet and Science on a Sphere

Thompson created data sets of Water Vapor, Carbon Monoxide, Surface Temperature, Dioxide, Methane

Time series from Sept 1, 2000 - Sept 30, 2010

October

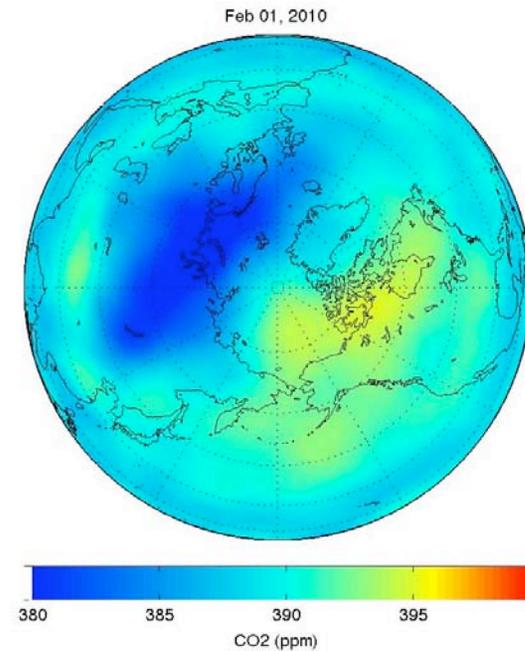
November



New Visualization - Polar CO₂

- Visualization by Lori Perkins, GSFC SVS

- Data supplied by Hai Nguyen, Ed Olsen, Amy Braverman



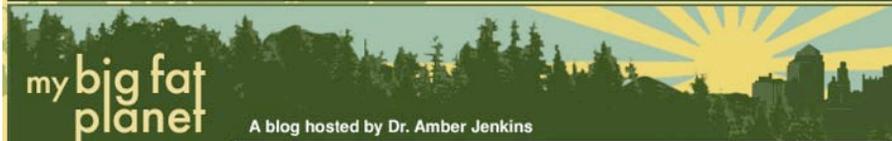
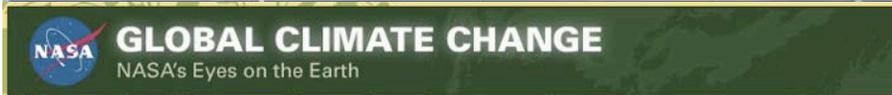
AIRS on ECO TV



- Eco Company, a national TV show aimed at teens, explores "all aspects of being green and understanding how we impact our world."
- Hosted by teens
- Eco reports on the latest technologies in energy, recycling, conservation and organics
- Interviewed AIRS scientist Dr. Ed Olsen about how the AIRS instrument in space is contributing to the study of Earth's climate, as well as questions about climate change
- 117 local television stations around the country, opening in international television markets



Public Symposium on Climate Change



Amber Jenkins is a climate change communicator working at NASA's Jet Propulsion Laboratory. In previous lives she was an atom smasher, journal editor and wannabe Shakespearean actress. [More >](#)

Climate change chronicles from NASA

Climate models, volcanoes and population control

Public interest in climate change

From Sharon Ray,
NASA Jet Propulsion Laboratory



- Held 10.16.10 at JPL, sponsored by JPL's Green Club, helped by AIRS Outreach and JPL Media

- 8 speakers, including AIRS Deputy Project Scientist Eric Fetzer

- ~ 160 attendees
- 4,149 UStream attendees (200 whole time, the rest drop in for 4-5 mins)
- House Science & Technology Committee requested presentations

... it comes to discussions of climate change, why is population control not talked about as a possible solution?"



Jet Propulsion Laboratory
California Institute of Technology



airs.jpl.nasa.gov