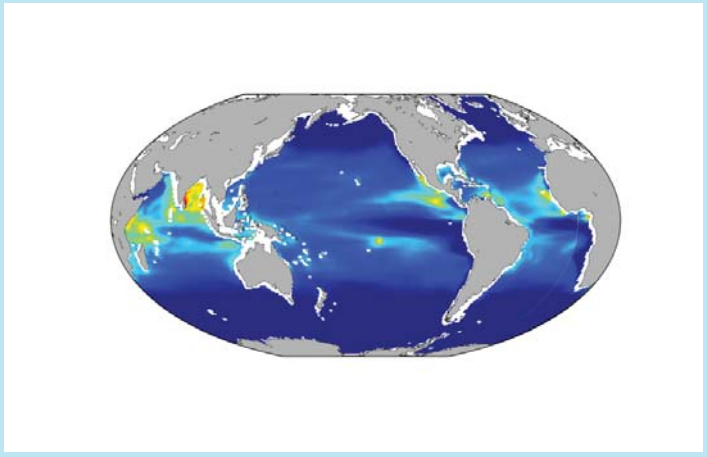
Volume 3, Issue 3
Fall 2014
GESTAR Newsletter
http://gestar.usra.edu/

Getting Familiar with Phytoplankton

A paper by Watson W. Gregg and **Cecile Rousseaux** was recently published in Journal of Geophysical Research-Oceans titled "Decadal trends in global pelagic ocean chlorophyll: A new assessment integrating multiple satellites, in situ data, and models", doi:10.1002/2014JC010158. Gregg and Rousseaux "document trends globally for the period 1998–2012 by integrating three diverse methodologies: ocean color data from multiple satellites, bias correction methods based on in situ data, and data assimilation to provide a consistent and complete global representation free of sampling biases." One of their major findings is that "all of the Northern Hemisphere basins (north of 10° latitude), as well as the Equatorial Indian basin, exhibited significant declines in chlorophyll. Trend maps showed the local trends and their change in percent per year." On the NASA Goddard You Tube channel, there is an accompanying video to this paper titled "Phytoplankton Levels Dropping" (http://youtu.be/Ao8Q6NZqe3g?list=PL56E41EA9A09368F2). The video includes an interview with Dr. Rousseaux, who describes the important role of phytoplankton, and provides one of many important takeaways: "There is a decline of ~1% per year in total phytoplankton between 1998 and 2012."

Almost simultaneously, another paper titled "The Power of Three" appeared in International Innovation in early October 2014 that addressed an earlier 2014 article by Rousseaux and Gregg published in the journal Remote Sensing titled "Interannual Variation in Phytoplankton Primary Production at A Global Scale", doi:10.3390/rs6010001. The Power of Three" discusses their findings from the Remote Sensing article as well as Rousseaux's and Gregg's research methods and discoveries at NASA Goddard Space Flight Center. Specifically, the focus is on the cross-platform usage of modeling (NOBM –NASA Ocean Biogeochemical Model) plus in situ data and satellite data. And, as Rousseaux and Gregg mention in this latest article, "There is still much to improve, such as representing small-scale variability and understanding the interactions between the oceans, land and atmosphere … ."



While the two publications in JGR-Oceans (2014) and Remote Sensing (2014) each address phytoplankton, the first one focuses more on how the phytoplankton concentration has decreased in the northern hemisphere. The paper in Remote Sensing discusses Rousseaux's and Gregg's novel accomplishment of being the first to produce estimates of how much carbon per phytoplankton group is produced on a global scale. The four phytoplankton groups currently being studied are diatoms, coccolithophores, chlorophytes and cyanobacteria; future studies will include additional groups. Prior to these findings, scientists had estimates of the total production by phytoplankton but had not determined which phytoplankton group produces what. One term used throughout "The Power of Three" is "primary production". When it comes to primary production on Earth, that refers to the overall total production of organic carbon (trees, phytoplankton, etc.), and approximately

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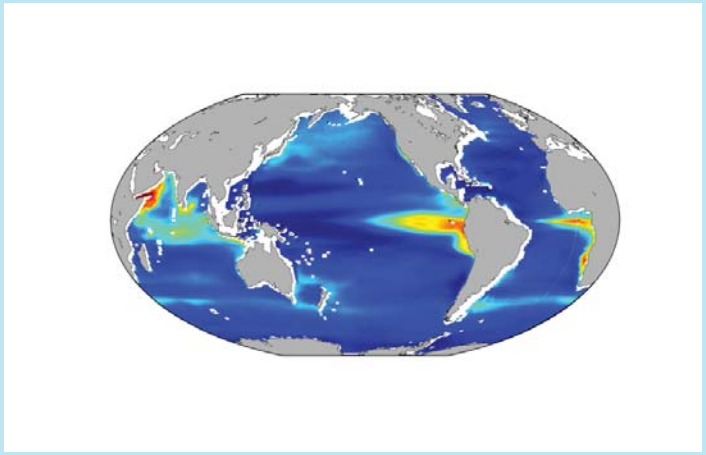


"Primary production by cyanobacteria (top) and diatoms (bottom)." Images provided by C. Rousseaux.

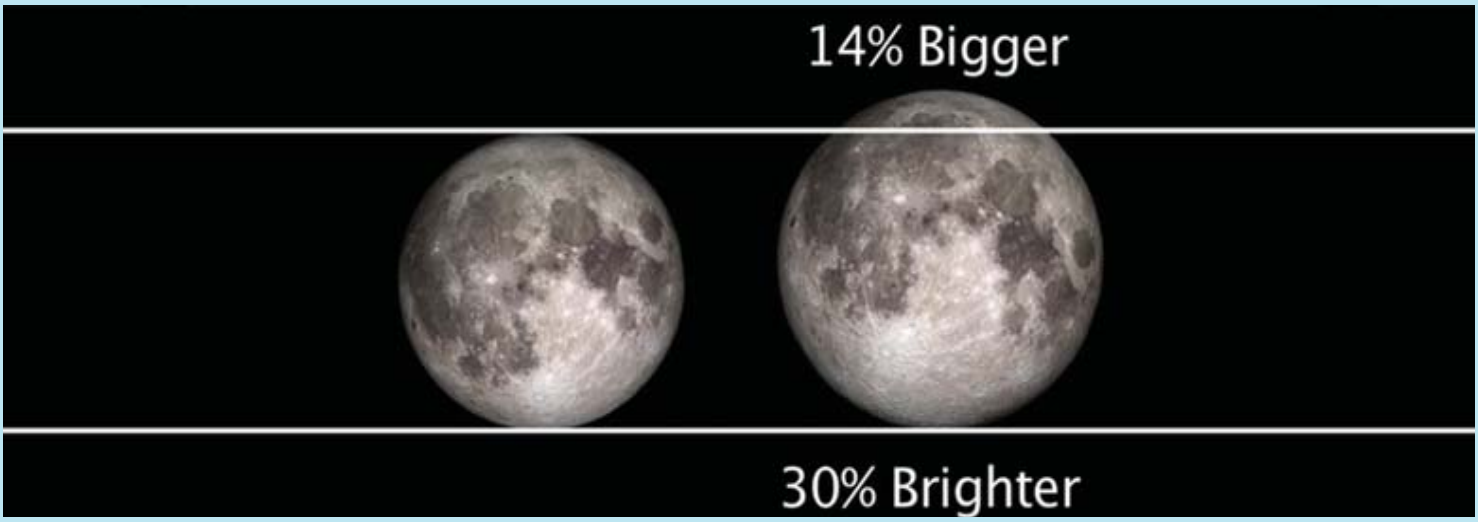
Volume 3, Issue 3
Fall 2014
GESTAR Newsletter
http://gestar.usra.edu/

(Phytoplankton, cont'd)

50% of this comes from the oceans. Rousseaux explains that "primary production in the oceans is phytoplankton absorbing light and nutrients and converting that into organic carbon; by determining how much primary production, [we] can tell how tropic level will live on this organic carbon. Higher amounts of organic carbon means more zooplankton and whales can be fed and survive." About half of the primary production comes from very large phytoplankton called diatoms, which demand many nutrients and feed fish well. Conversely, cyanobacteria are small and live in a low nutrient environment, but produce a lower amount of organic carbon. "Phytoplankton … represent the first level of the food chain," says Rousseaux; therefore, studying the effects of climate variability on phytoplankton groups benefits all levels of the food chain.

In addition to these publications, Dr. Rousseaux has had three proposals accepted for funding. Most recently, her ROSES proposal titled "Phytoplankton composition algorithms for PACE (Pre-Aerosol, Cloud, Ocean Ecosystem)" (PI: C. Rousseaux, Co-I: Watson W. Gregg) was selected for funding. Additionally, she is a Co-I on two funded proposals: "Combining Data Assimilation with an algorithm to Improve the Consistency of VIIRS Chlorophyll: Toward a Multidecadal, Multisensor Global Record" (PI: W.W. Gregg), and "GEOS-Carb II: Delivering Carbon Flux and Concentration Products Based on the GEOS Modeling System" (PI: Lesley Ott , Co-Is: David Baker, George Collatz, Watson Gregg, Stephan Kawa, Tomohiro Oda, Steven Pawson, Cecile Rousseaux, James Wang, and Brad Weir; collaborator: Andrea Molod).

Supermoon Summer



To understand a supermoon, first know that the moon does not orbit the Earth in a perfect circle. At varying times throughout the year, the moon can be at its closest to the Earth (perigee) or farthest away (apogee). When a moon is full and at perigee, we see a supermoon. During summer 2014, there were three supermoons: July 12th, Aug 10th, and the final one on Sept 9th. Out of these three, the full moon on August 10th was the closest, and according to scientist Noah Petro, "will be larger and brighter than your average full moon". According to an article on the NASA Goddard Scientific Visualization Studio page, which features visualizations of the supermoon by **Ernie Wright** and produced by **David Ladd** (titled "Supermoon 2014", http://svs.gsfc.nasa.gov/index.html), there can be as many as six or seven supermoons every year, but not all can be seen. For more information, check out the following link from the SVS, "Supermoon Live Shot", which provides two interviews, one each with scientists Noah Petro and Michelle Thaller, who discuss the August 10, 2014 supermoon and the LRO (Lunar Reconnaissance Orbiter) mission: http://svs.gsfc.nasa.gov/vis/a010000/a011600/a011620/index.html.

Volume 3, Issue 3
Fall 2014
GESTAR Newsletter
http://gestar.usra.edu/

Weather Station at Morgan State University

On September 3rd, **Richard Damoah** and others from Morgan State and WeatherBug installed a weather station on Morgan State's campus. This fall, Dr. Damoah is teaching a course in meteorology, and the weather station will provide data to encourage discussion among the students as well as provide opportunities for MSU faculty to develop projects utilizing the data. According to MSU's press release: "this weather station will record temperature, precipitation, barometric pressure, sky cover, wind speed and direction, and relative humidity", among other things. Some of the other benefits to the students will be learning "how to use professional weather station equipment and sensors, real- time tracking of approaching weather systems, and comparison of data collected to real-time satellite and radar imagery; recognizing weather patterns including short- and long-term trends for all areas of weather data." This weather station eventually will be used in conjunction with MSU's other station at the Patuxent Environmental and Aquatic Research Laboratory (PEARL), located in St. Leonard, MD.

WeatherBug weather station; Richard Damoah (center) will utilize this in his meteorology course at MSU.

New Hires

GESTAR welcomes the following members:

Osas Aimufua (Intern; see GESTAR Spring 2014 newsletter)
Ashley Davis (A/P and Travel Auditor, Columbia)
Piotr Domaszczynski
Kelly Elkins
Manika Gupta
Edward Nowottnick
Tom Oda
Yan Soldo

Moving On

Tyler Chase
Jiun-Dar Chern (ESSIC/UMCP)
Katie Lewis
Beth Maginnis
Didier Rault
Jason Sippel (IMSG/NOAA)
Silvia Stoyanova

Mark your calendars for the GESTAR All-Hands Meeting!
Monday, November 24, 2014, 3:00 - 5:00 pm
Building 33, H114
Refreshments & Food will be provided.

Volume 3, Issue 3
Fall 2014
GESTAR Newsletter
http://gestar.usra.edu/

Carbon Tetrachloride (CCl4) in the Atmosphere

An article featuring **Qing Liang**'s research on CCl4, Carbon Tetrachloride, titled "Ozone-Depleting Compound Persists, NASA Research Shows" was featured on the front page of NASA Goddard's web site: http://www.nasa.gov/press/2014/august/ozone-depleting-compound-persists-nasa-research-shows/index.html. Dr. Liang discovered the existence of large amounts of CCl4 in the Earth's atmosphere; CCl4 was regulated along with other CFCs under the Montreal Protocol. CCl4 is contributing to the growth of the ozone hole, and the mystery is in determining the source of this compound. "In addition to unexplained sources of CCl4, the model results showed the chemical stays in the atmosphere 40 percent longer than previously thought. The research was published online in the Aug. 18 issue of Geophysical Research Letters." The NASA Goddard article is accompanied by a video "Ozone-Depleting Compound Persists", which features both Dr. Liang and Dr. Paul Newman, available at http://youtu.be/_Aw8c-0CBZQ. Additionally, this research was selected as a Code 614 Monthly Highlight for August 2014, "Solving the CCl4 budget mystery using surface observations", by Qing Liang and Paul Newman (see third highlight): http://science.gsfc.nasa.gov/sed/content/uploadFiles/scihi_atmos_ppt/2014_8_highlights.pdf.

In other news, Dr. Liang is involved in two proposals that have been selected from the ROSES 2013 ACCDAM: Atmospheric Composition Campaign Data Analysis and Modeling), one as a Co-I and one as PI: 1) An examination of the global budget of carbon tetrachloride (CCl4) using observations and models, PI: Paul A. Newman (610), Co-Is: Qing Liang, Eric Fleming, Eric Nash (all 614), Collaborators: Elliot Atlas, Steven Wofsy, Peter Bernath, James Elkins, Geoff Toon; 2) Convective transport of chemical compounds from the surface to the upper troposphere and lower stratosphere: timescale, efficiency, and climate impact, PI - Qing Liang (614), Co-I: Thomas Hanisco (614).

Awards Ceremonies

The official 2014 Hydrospheric and Biospheric Sciences (HOBI) Annual Awards Ceremony was held on August 26th. Among the awardees was **Ludovic Brucker** (Code 615), who was recognized for Scientific Achievement: "For his excellent and innovative work advancing microwave research over the cryosphere from multiple sensors and through field work."

The following day, August 27th, the Annual 610AT (ESD-Atmospheres) Contractor Performance Awards Ceremony was held, and three GESTAR scientists were recognized:

Tom Kucsera: Outstanding Performance – Technical Support: "For outstanding support of global modeling, satellite data retrieval, data analysis and management, and IT administration."

Xiaowen Li: Outstanding Performance – Science: "For her outstanding scientific research is using sophistic microphysical processes to improve our understanding of the interactive processes between cloud, precipitation and aerosols."

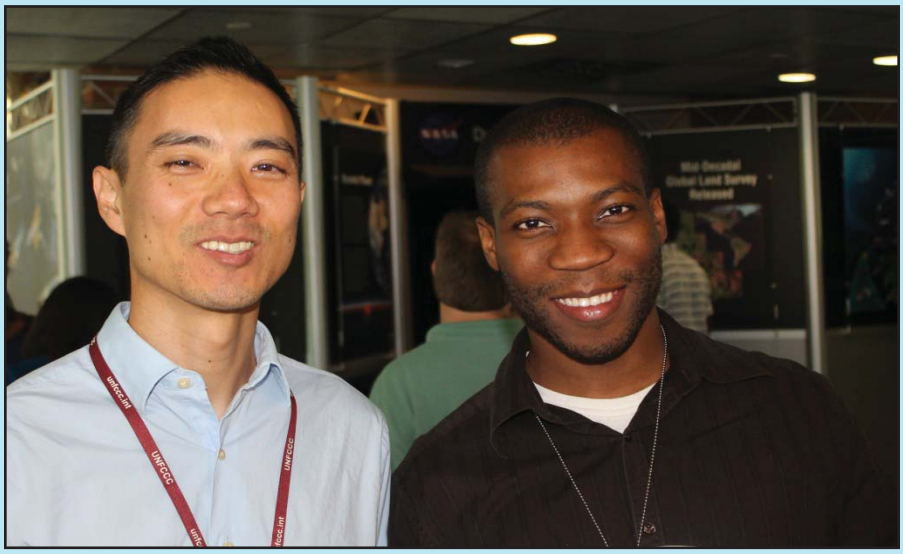
Hiren Jethva: Best Senior Author Publication: "For the development of a remote sensing approach to retrieve optical depth of aerosols above clouds using MODIS visible observations."

On Thursday, October 30th, at the NASA Headquarters Honor Awards Ceremony, **Allison Leidner** was recognized with a Special Service Award, "For her leadership role in support of NASA's involvement in the Third National Climate Assessment for the U.S. Global Change Research Program". The Special Service award recognizes Headquarters contractors (individuals or teams) who have made significant contributions to the mission of Headquarters or to the welfare of Headquarters employees. The third NCA was released in May 2014. For more information on the National Climate Assessment, please visit http://nca2014.globalchange.gov/.

Volume 3, Issue 3
Fall 2014
GESTAR Newsletter
http://gestar.usra.edu/

Summer Interns Social

On July 29th, NASA Goddard Space Flight Center's codes 610HB and 610AT hosted a Summer Social for summer interns. Following an introduction by Dr. Jim Irons, who began his NASA career as an intern, scientists introduced their interns who briefly spoke on their research. Among the interns were **Kelechi Nwachuku** of Morgan State University who works with **James Wang** (code 614), and **Ozaveshe "Oz" Daniyan** of Morgan State University who works with **Batuhan Osmanoglu** (code 618). **Marcus Harcum**, a recent graduate from Morgan State with his degree in Electronics Engineering, also works with Dr. Osmanoglu. **Andrew Holt**, a visiting video producer from Morgan State, spent his summer working with **Jefferson Beck** in Code 130 and supporting Goddard Multimedia.



A graduate student majoring in Industrial and Systems Engineering, Kelechi is conducting research in carbon cycle science. Specifically, he is modeling atmospheric carbon dioxide and processing airborne and ground-based CO2 measurement data sets for evaluation of the model simulations.

At left: James Wang and Kelechi Nwachuku
Photo: A. Houghton

Oz, who is entering his senior year, is working on image formation for synthetic aperture radar. He is creating "a program which will take characteristics of a satellite (location, direction) and output the location which the antenna is pointed on Earth's surface." In addition to writing code for general purposes, his other tasks include developing the EcoSAR and DBSAR websites and formatting data from past flights.

Marcus (not pictured) also works on the EcoSAR project, assisting with processing the GPS data to track the position of the antennas. Andrew (not pictured) spent time working in the Goddard TV Studio and with the multimedia staff.

Above: Batu Osmanoglu, Oz Daniyan, and Lola Fatoyinbo
Photo: A. Houghton

Volume 3, Issue 3
Fall 2014
GESTAR Newsletter
http://gestar.usra.edu/

Education & Public Outreach

Science Jamboree

On July 17th, Code 600's Science Jamboree took place at NASA Goddard Space Flight Center in Building 28. **Cecile Rousseaux** was the lead organizer for the Global Modeling and Assimilation Office (GMAO) display. A display, consisting of ~30 highlight slides from various teams as well as a movie, was created to highlight some of the exciting research conducted at GMAO. Several GESTAR scientists working at GMAO (**Brad Weir, Manuela Girotto, Min-Jeong Kim, Yury Vikhliaev** and **Daniel Holdaway**) helped out to present the display throughout the day. The event was a success with people from different backgrounds meeting to discuss their research and latest findings. It was an opportunity for younger scientists to get to know the variety of research done in Code 600 as well as an opportunity for everyone to develop connections with other scientists.

NASM Event

On September 13th, the National Air and Space Museum on the National Mall celebrated National Aerospace Week with their "A Century of Women in Air and Space Family Day". At this informal event, **Erica McGrath-Spangler** (GMAO) volunteered to help staff the Women at NASA booth. She discussed NASA Earth science and achievements while distributing outreach materials from the GMAO, GPM, Aura, and Landsat missions, among others. This is NASA's third year participating in this event.

Maniac Talk

GESTAR thanks the following individuals who gave talks over the past months (note, all speakers are from NASA GSFC, unless otherwise specified): **Henning Leidecker** (March); **Anne Thompson** (April); **James Garvin** (May); **Aprille Joy Ericsson** (June); **Jack Kaye, NASA HQ** (July); **P. K. Bhartia** (August); **Brian Dennis** (September); **Jim Irons** (October). The last speaker of the year will be John Mather, so mark your calendar for Wednesday, November 19th. To view videos of prior speakers, please visit the Maniac Talk site. The 2015 schedule will be posted as soon as information is available. GESTAR thanks **Charles Gatebe** and **Bill Hrybyk** for their ongoing efforts with this series.

DISCOVER-AQ: The Final Flight Campaign

DISCOVER-AQ (Deriving Information on Surface Conditions from Column and Vertically Resolved Observations Relevant to Air Quality) is a five-year project "to improve the use of satellites to monitor air quality for public health and environmental benefit. The goal is for scientists to be able to make better air quality forecasts, more accurately determine the sources of pollutants in the air, and determine the fluctuations in emissions levels" (source: DISCOVER-AQ website). Improved understanding of data should lead to more effective actions when addressing air pollution problems. The final field campaign for DISCOVER-AQ wrapped up this past summer in the Denver, Colorado region, with a total of 18 science flight days. While fire and smoke had some impact during this campaign, for the most part, smoke transport was mainly confined to the northern parts of Colorado, and had little effect overall. DISCOVER-AQ flight deployments originally began in Baltimore-Washington, DC (July 2011), followed by San Joaquin Valley, California (January 2013), Houston, Texas (September 2013), and concluded in Denver, Colorado (July 2014). **Melanie Follette-Cook, Charles Gatebe** and **Matt Kowalewski** all participated in this final campaign and contributed to this article. (Note, see GESTAR's Summer 2014 newsletter, which featured a DISCOVER-AQ slide by Dr. Follette-Cook from the Young Scientist Forum.)

When asked why these four specific regions, Matt explained that they were selected "for multiple reasons, the first being to determine if there was local value to having NASA perform measurements. One of the goals was to provide local air

(continued on page 7)

(DISCOVER-AQ, cont'd)

quality agencies and researchers the chance to validate their ground measurements with high-end NASA capabilities, … capabilities that include the instrumentation as well as the models developed at NASA and the people who run them. The second reason for selecting multiple parts of the country is that each has unique atmospheric characteristics." Melanie elaborated: "The choices for each campaign location involved three main components. We needed a region that (1) was in violation of the O3 (MD, TX, CO) or PM2.5 (CA) air quality standard, (2) had established agencies and AQ monitoring networks, and (3) had local partnership opportunities." Each of these four regions had different characteristics that made them interesting studies; that is, each had different land/surface features that resulted in unique dynamic elements (e.g., the bay breeze in MD, the bay/sea breeze in TX, and different orographic forcings in the San Joaquin Valley (CA) and in Colorado). In addition, there was a wide variety in emissions sources between regions (e.g., transportation and power plants (MD), agriculture (CA), petrochemical industry (TX), and transportation, power plants, industry, and oil and gas drilling/exploration (CO)."

Matt stated that data from all four deployments will be compared, specifically "air, ground and satellite observations for a given location, as well as the chemistry and dynamics between the regions (Baltimore/DC, California, Houston and Colorado)". Melanie added that they "want to look at the spatial and temporal variability of each species and how they differ between regions. These will be functions of the different chemical and dynamical regimes within each unique study region. Ultimately, DISCOVER-AQ aims to characterize how the surface, which is very difficult to measure by satellite, relates to the tropospheric column, which is more easily measured. The relationship between the two is not linear, and will differ between and within regions."

CAR (Cloud Absorption Radiometer), an airborne sensor, is one of two instruments that were introduced in the Colorado DISCOVER-AQ campaign (the other being the Fast Ethane Spectrometer). CAR detects and measures scattered light and surface radiance that is reflected off of surfaces. According to Charles, "it measures surface conditions with better accuracy than any other airborne sensor." CAR will help to correct for effects on aerosol optical depth (AOD) from satellite sensors and land-based sensors by analyzing the data collected from the sensor." The idea is that data collected from flight paths complement the data gathered from ground measurement sites. "CAR also will provide information on surface BRDF (bidirectional reflectance-disturbance function), a measurement of how light is reflected off of opaque or hazy surfaces." The CAR is located in the nose of the P-3B aircraft, which flies at low altitudes; the B200 Air (NASA LaRC) aircraft flies at higher altitudes. Both aircraft flew in all four campaigns. Charles provided a detailed explanation of testing the use of CAR data within the MODIS aerosol retrieval: "MODIS measures TOA (top of the atmosphere) reflectance, and TOA reflectance = atmosphere reflectance + surface reflectance. Estimating surface albedo is difficult over land. So, CAR measurements will help constrain surface reflectance to get a better estimate of atmospheric aerosols, not only in Colorado but in other regions and/or globally." Matt, who was lead systems engineer on GCAS, added that "The GEOCAPE Airborne Simulator (GCAS) flew on the high-altitude B200 aircraft measuring atmospheric trace gases, pollutants that can cause health issues if near the ground. By providing a regional, time-dependent view of these pollutants throughout the day, GCAS links together the multitude of ground measurements scattered throughout the region, and relates the satellite measurements to the ground sites. GCAS airborne measurements also help to validate satellite tropospheric observations. Satellite instruments typically have trouble accurately measuring the lower atmosphere; having airborne measurements of these altitudes helps improve space-based data."

Now that the DISCOVER-AQ mission has flown its last deployment, we wondered what the possible impacts of the mission might be. Matt: "From a measurement point of view, it will enhance local monitoring quality and accuracy, but a major impact would be on the modeling side." Melanie: "The hope is that DISCOVER-AQ will increase our understanding of the lowest layer of the atmosphere (the boundary layer) and its relationship to the column. This will aid the measurement community in developing future satellite retrieval algorithms. The modeling community will also benefit by the extensive evaluation opportunity this varied and unique dataset provides."

Recent Publications

Alyaari, A., J.-P. Wigneron, A. Ducharne, Y. Kerr, W. Wagner, **G.J.M. De Lannoy**, R. H. Reichle, A. Al Bitar, W. Dorigo, P. Richaume, and A. Mialon (2014), Global-scale comparison of passive (SMOS) and active (ASCAT) satellite-based microwave soil moisture retrievals with soil moisture simulations (MERRA-Land), Remote Sensing of Environment, 152, 614-626.

De Lannoy, G.J.M., R.D. Koster, R.H. Reichle, S.P. Mahanama, and Q. Liu (2014), An Updated Treatment of Soil Texture and Associated Hydraulic Properties in a Global Land Modeling System, Journal of Advances in Modeling Earth Systems, doi:10.1002/2014MS000330, in press.

Draper, C., R. Reichle, **G. De Lannoy**, and B. Scarino (2014), A dynamic approach to addressing observation-minus-forecast mean differences in a land surface skin temperature data assimilation system, Journal of Hydrometeorology, doi:10.1175/JHM-D-14-0087.1.

Ebmeier, S. K., **A. M. Sayer**, R. G. Grainger, T. A. Mather, and E. Carboni (2014), Systematic satellite observations of the impact of aerosols from passive volcanic degassing on local cloud properties, Atmos. Chem. Phys., in press.

Gregg, W.W. and **C.S. Rousseaux** (2014), Decadal Trends in Global pelagic Ocean Chlorophyll: A New Assessment Combining Multiple Satellites, In Situ Data, and Models, Journal of Geophysical Research, accepted. (http://onlinelibrary.wiley.com/enhanced/doi/10.1002/2014JC010158).

Kaku, K. C., J. S. Reid, N. T. O'Neill, P. K. Quinn, D. J. Coffman, and **T. F. Eck** (2014), Verification and application of the extended Spectral Deconvolution Algorithm (SDA+) methodology to estimate aerosol fine and coarse mode extinction coefficients in the marine boundary layer, Atmos. Meas. Tech. Discuss., 7, 2545–2584, www.atmos-meas-tech-discuss.net/7/2545/2014/,(accepted), doi:10.5194/amtd-7-2545-2014.

Lagomasino, D., R. Price, J. Hererra-Silveira, F. Wilhelm-Miralles, G. Merediz-Alonso, and Y. Gomez-Hernandez (2014), Connecting groundwater and surface water sources in a groundwater dependent coastal wetland: Sian Ka'an Biosphere Reserve, Quintana Roo, Mexico, Estuaries and Coasts, doi:10.1007/s12237-014-9892-4.

Lagomasino, D., R. Price, D. Whitman, P. Campbell, and A. Melesse (2014), Estimating estuarine hydrogeochemistry using leaf and satellite reflectance in two coastal mangrove communities, Remote Sensing of Environment, doi:10.1016/j.res.2014.02.022.

Liang, Q., P. A. Newman, J. S. Daniel, S. Reimann, B. D. Hall, G. Dutton, and L. J. M. Kuijpers (2014), Constraining the carbon tetrachloride (CCl4) budget using its global trend and inter-hemispheric gradient, Geophys. Res. Lett., 41, 5307–5315, doi:10.1002/2014GL060754.

Lin, N.-H., **A. M. Sayer**, S.-H. Wang, A. M. Loftus, T.-C. Hsiao, G.-R. Sheu, N. C. Hsu, S.-C. Tsay, and S. Chantara (2014), Interactions between biomass-burning aerosols and clouds over Southeast Asia: Current status, challenges, and perspectives, Environ. Poll., in press, doi:10.1016/j.envpol.2014.06.036.

Matsui, T., C. Ichoku, **C. Randles**, T. Yuan, A. M. da Silva, P. Colarco, D. Kim, R. Levy, **A. Sayer**, M. Chin, D. Giles, B. Holben, E. Welton, **T. Eck**, and L. Remer (2014), Current and Future Perspectives of Aerosol Research at NASA Goddard Space Flight Center, Bulletin of the American Meteorological Society, in press, doi: 10.1175/BAMS-D-13-00153.1.

Miernecki, M., E. Lopez-Baeza, Y. Kerr, R. De Jeu, **G.J.M. De Lannoy**, T.J. Jackson, P.E. O'Neill, M. Schwank, R. Fernandez-Moran, S. Bircher, H. Lawrence, A. Mialon, A. Al Bitar, and P. Richaume (2014), Comparison of SMOS and SMAP soil moisture retrieval approaches using tower-based radiometer data over a vineyard field, Remote Sensing of Environment, in press.

Rose, R., **A. Leidner**, et al. (2014), Ten ways remote sensing can contribute to conservation, Conservation Biology, in press.

(Publications, cont'd)

EOS HIGHLIGHT

An article by **Oreste Reale** and co-authors was selected for an AGU EOS Research Spotlight titled "Aerosol from Sahara weaken cyclogenesis" by JoAnna Wendel, Eos, Transactions American Geophysical Union, Vol. 95, Issue 33, page 304, 19 Aug 2014: http://onlinelibrary.wiley.com/doi/10.1002/2014EO330023/pdf. EOS Research Spotlights "highlight exciting new research from AGU journals".

The original article has the following citation: Reale, O., K. M. Lau, A. da Silva, and T. Matsui (2014), Impact of assimilated and interactive aerosol on Tropical Cyclogenesis, Geophys. Res. Lett., 41, doi:10.1002/2014GL059918.

Rousseaux, C., and W.W. Gregg (2014), The Power of Three, International Innovation, Vol. 155, Oct 2014.

Tarabalka, Y., G. Charpiat, **L. Brucker**, and B.H. Menze (2014), Spatio-Temporal Video Segmentation with Shape Growth or Shrinkage Constraint, IEEE Transactions on Image Processing, vol.23, no.9, pp. 3829-3840, doi:10.1109/TIP.2014.2336544.

Vernieres, G., R. Kovach, C. Keppenne, S. Akella, **L. Brucker**, and E. Dinnat (2014), Impact of the Assimilation of Aquarius Sea Surface Salinity Data in the GEOS Ocean Data Assimilation System, J. of Geophys. Res. Oceans, in press.

Zhang, Q., Y.-B. Cheng, A. Lyapustin, Y. Wang, F. Gao, A. Suyker, S. Verma and E. M. Middleton (2014), Estimation of crop gross primary production (GPP): fAPARchl versus MOD15A2 FPAR, Remote Sensing of Environment, 153, 1-6.

Zhang, Q., Y.-B. Cheng, A. Lyapustin, Y. Wang, X. Zhang, A. Suyker, S. Verma, Y. Shuai, and E. M. Middleton (2014), Estimation of crop gross primary production (GPP): II. Do scaled MODIS vegetation indices improve performance?, Agricultural and Forest Meteorology, in press.

BOOK: Entekhabi, D., and Co-authors (incl. **G.J.M. De Lannoy**) (2014), SMAP Handbook, JPL Publication, JPL 400-1567, NASA Jet Propulsion Laboratory, Pasadena, Calif., USA, 192 pp.

BOOK: **De Lannoy, G.J.M.**, P. de Rosnay, and R. Reichle (2014), Data assimilation of soil moisture observations, Handbook of Hydrometeorological Ensemble Forecasting (ed. Q. Duan, F. Pappenberger, J. Thielen, A. Wood, H. Cloke and J. Schaake), Springer, in press (invited).

In memory of Dr. Fred Tarantino,
USRA President, 2006-2014.

To read about Asteroid 8798 being named in his honor, please click here:
http://www.usra.edu/news/pr/2014/asteroid_Tarantino/

The GESTAR Team: Universities Space Research Association (USRA), Morgan State University (MSU), I.M. Systems Group (IMSG), Johns Hopkins University (JHU), Global Science & Technology, Inc.(GST), Institute for Global Environmental Strategies (IGES), and Ball Aerospace and Technologies.
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