

The Landsat Legacy Continues

At Goddard's Sciences & Exploration Directorate Poster Party, held on January 30, 2013, LDCM Project Scientist Dr. Jim Irons gave a presentation on the Landsat Data Continuity Mission (LDCM), the latest in the continuing series of Landsat satellite observations. The accompanying hyperwall presentation, produced by Matt Radcliff (GESTAR), conveyed the scope of the Landsat mission and emphasized some of the important findings and applications that have resulted from the data acquisition. Landsat, which recently celebrated its 40th anniversary, is an ongoing mission that has been tracking, obtaining, and disseminating data and images used to monitor the impact of human and natural causes on the Earth's surface. These repetitive satellite measurements provide a continuous and thorough view of the Earth that would be otherwise unobtainable. In the video, "Landsat: Making a Difference, One User at a Time" (recently featured in the Goddard Film Festival), edited by GESTAR's Silvia Stoyanova and Matt Radcliff, representatives from two companies explain how Landsat data provides information that they can apply to their business operations (<http://svs.gsfc.nasa.gov/vis/a010000/a011000/a011097/>). Landsat data also informs policymakers, land use planners, and disaster response unit members, among others. Information acquired touches upon every facet that affects economy and society on local, regional and global scales. On February 11, 2013, the legacy continued when the Landsat Data Continuity Mission (LDCM) successfully launched from Vandenberg AFB in California; after its launch, it will be known as "Landsat 8". Eric Sokolowsky (GST) provided hyperwall support at the launch.

Further insight as to how LDCM operates is provided in the visualization "Landsat Data Continuity Mission (LDCM) Orbits", by lead animator Cindy Starr (GST), which shows how the satellite will orbit the Earth 14 times per day and cover the entire globe every 16 days. In particular, she demonstrates the Earth and the satellite layer with transparency, giving a clear view of the swaths of coverage over time. The video can be accessed here: <http://svs.gsfc.nasa.gov/vis/a000000/a003900/a003939/>.

Other uses of Landsat data have been portrayed in videos by Matt Radcliff, who primarily provides extensive support to the Landsat/LDCM mission. For example, he produced several videos about the use of Landsat data in monitoring the recovery of forests after devastating wildfires, monitoring the rate of growth of grapevines in Napa Valley, and observing the vast tracts of trees being harvested for lumber. For the recent LDCM launch, Matt produced images of LDCM and Landsat 7 observatory for use in outreach materials. He also produced a video that gives an overview of the LDCM, which was used in TV broadcasts related to the LDCM launch. This video can be viewed on YouTube (http://www.youtube.com/watch?v=q_Umv3aAdcA) or on Goddard's SVS site (<http://svs.gsfc.nasa.gov/vis/a010000/a011100/a011166/>). Landsat data is beamed to the USGS EROS in South Dakota, where the archives are stored. This continuing mission provides a review of the past, an examination of the present, and the ability to plan for and impact the future. Congratulations to all on the successful launch of LDCM/Landsat 8.

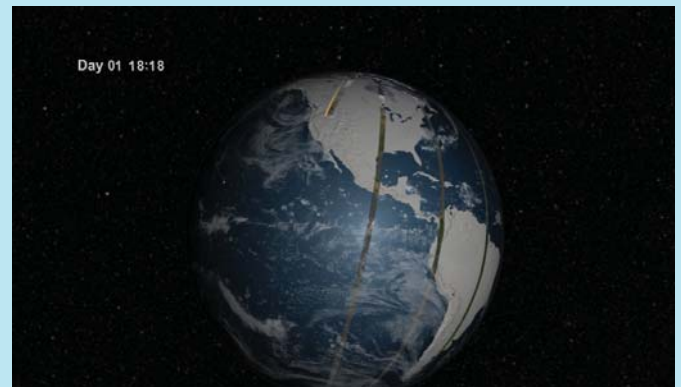


Image from "LDCM Orbits" on the Goddard Scientific Visualization Studio; lead animator, Cindy Starr (GST); producer, Matthew Radcliff (USRA); scientist, James R. Irons (NASA/GSFC).

Landsat is a joint program of NASA and USGS; for more information, visit landsat.usgs.gov or nasa.gov/landsat.

POSTER PARTY SEASON!

2012 AGU Fall Meeting, San Francisco, CA, Dec 3-7, 2012

At this year's AGU meeting, GESTAR members presented approximately 25 posters and gave about 15 oral presentations. **Ritesh Gautam**, **Pawan Gupta**, and two others were co-conveners of a session held December 3rd and 4th on "Aerosols over South Asia", which was well attended. A total of 59 abstracts were submitted to this session with three scheduled oral sessions and a poster session with scientists from around the world. **Rick Lawford** led a Town Hall meeting on the GEOSS Water Strategy, and **Erica McGrath-Spangler** was a student paper award judge.

AMS Annual Meeting, Austin, TX, Jan 6-10, 2013

A few GESTAR members traveled to Austin for the AMS meeting; several GESTAR scientists were lead or co-authors on poster presentations. The following are a sample of the posters presented (*indicates author was in attendance, bold indicates GESTAR authors):

ICESat-2: A next generation laser altimeter for space-borne determination of surface elevation, by **Kelly Brunt**, S. L. Farrell and V. M. Escobar.

Quantifying the semi-direct effect of smoke aerosol over southern Africa using the NASA GEOS-5 Incremental Analysis Update (IAU), by **Cynthia A. Randles**, P. R. Colarco and A. da Silva.

UV-CDAT Re-sharable Analyses and Diagnostics (U-READ): a framework to create and share UV-CDAT plugins, by Charles Doutriaux, A. Chaudhary, H. Krishnan, K. Marvel, T. P. Maxwell, J. Painter, **Gerald L. Potter***, and D. Williams.

Aerosol Indirect Effect on Tropospheric Ozone via Lightning, by Tianle Yuan, L. Remer, H. Bian, R. Albrecht, **Jerald Ziemke**, K. Pickering, L. Oreopoulos, S. Goodman, H. Yu, and D. Allen.

Assessment of the Community Land Model version 04 snow model output estimates, by **Ally M. Toure***, M. Rodell, Z. L. Yang, **Yan Zhang**, Y. Kwon, and H. Beaudoin.

Estimates of Lightning NO_x Production from OMI NO₂ Observations during DC3, by Kenneth Pickering, E. Bucsela, K. A. Cummings, **Lok N. Lamsal**, **Edward A. Celarier**, W. H. Swartz, and N. A. Krotkov.

Assimilation of SMOS Observations for science development of the SMAP Level 4 Surface and Root-Zone Soil Moisture Product, by Rolf H. Reichle, **Gabriëlle J.M. De Lannoy**, W. T. Crow, R. D. Koster, J. Kimball, and Q. Liu.

Assimilation of geostationary satellite land surface skin temperature observations into the GEOS-5 global atmospheric modelling and assimilation system, by **Clara Draper***, R. H. Reichle and Q. Liu.

Development and Validation of Observing System Simulation Experiments at the NASA Global Modeling and Assimilation Office, by **Ronald M. Errico**, R. Yang, **Nikki Prive**, K. S. Tai, R. Todling, M. Sienkiewicz, and J. Guo.

The Effect of Revised Soil and Vegetation Properties on Simulated GEOS-5 Land Surface Hydrology, by **Gabriëlle J.M. De Lannoy**, R. H. Reichle, R. D. Koster, and S. Mahanama.

Globally estimating root mean square errors in remotely sensed soil moisture, by **Clara Draper***, R. H. Reichle, R. de Jeu, V. Naeimi, R. Parinussa, and W. Wagner.

Volcanic aerosol contributions to the decadal stratospheric aerosol trend, by Mian Chin, **Thomas Diehl**, **Qian Tan**, N. A. Krotkov, W. Reed, and J. P. Vernier.

Assessment of Trans-Pacific Dust Transport and Its Contributions to North America based on Satellite Measurements, by Hongbin Yu, L. Remer, M. Chin, H. Bian, **Qian Tan**, T. Yuan, and **Yan Zhang**.

AeroCenter Poster Party, GSFC, Greenbelt, MD, Jan 22, 2013

At the annual AeroCenter poster party, scientists, fellow researchers, and staff were on hand to view posters of various aerosol research that were displayed in the Atrium, Bldg. 28. Several GESTAR scientists were lead or co-authors of many posters:

T. Eck, "Observed Enhancements in Aerosol Optical Depth in the Vicinity of Cumulus Clouds during DISCOVER-AQ".
S. Gassó and Omar Torres, "Using MODIS Aerosol Optical Depth in the Retrieval of Aerosol Absorption by the OMI Two Wavelength".

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X. Pan, “Aerosol Distribution over South Asia: Satellite Observations and AeroCom Multi-models Simulations”.

A. M. Sayer, et al., “Comparison between NPP-VIIRS aerosol data products and the MODIS Aqua ‘Deep Blue’ Collection 6 dataset over land”.

P. McBride, et al., “Determining the effective radius variability in the cloud transition zone”.

C. Randles, P. Colarco, and A. da Silva, “A novel approach to improving estimates of the direct and semi-direct effect of biomass burning aerosol: The NASA GEOS-5 Incremental Analysis Update (IAU)”.

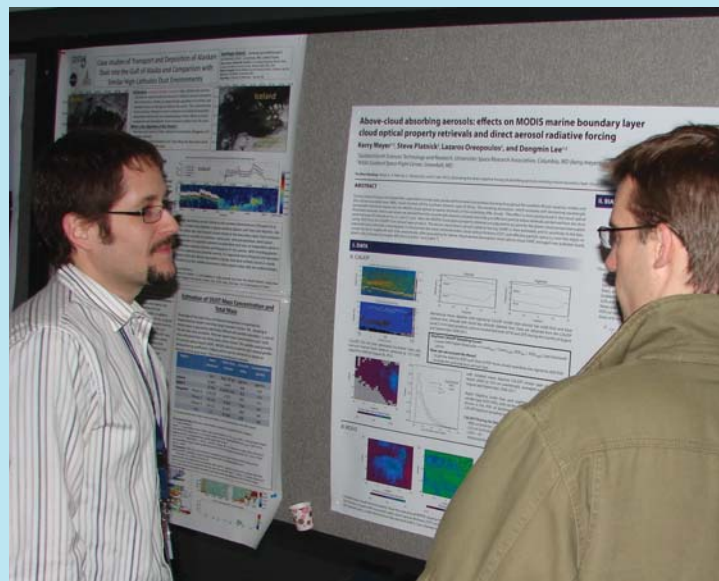
H. Jethva, “Absorbing Aerosols above Clouds: Detection, Retrieval, and Radiative Forcing from Satellite-based Passive Sensors”.

D. Lee, Y.C. Sud, L. Oreopoulos, K.-M. Kim and W. K. Lau, “Aerosol effects on the Asian monsoon as simulated by McRAS-AC operating in GEOS-5”.

G. Wen, et al., “Improvement of MODIS Aerosol Retrieval Near Clouds”.

W. Yang, et al., “Shape-dependent settling of Saharan dust over the Atlantic, evidence from CALIOP depolarization data”.

K. Meyer, “Above-cloud absorbing aerosols: effects on MODIS marine boundary layer cloud optical property retrievals and direct aerosol radiative forcing”.



Kerry Meyer (GESTAR/USRA) discusses his research at the SED Poster Party.

Sciences & Exploration Directorate Poster Party, GSFC, Greenbelt, MD, Jan 30, 2013

The 6th Annual (Code 600) SED New Year’s Poster Party was held Wednesday afternoon, January 30, 2013. This Poster Party brings together Earth and Space Scientists from across the Directorate, along with invited presenters from AETD (Code 500), to display their posters from 2012 meetings. The Poster Party showcases the breadth and depth of science across the directorate. Prizes were awarded in the following categories: “Best Poster Title”, Mark Loeffler; “Best Science Story”, Doug Morton; “Best Graphic Design”, Brent Garry; “Best Science as Food”, the Fermi cake team.

Three students from Morgan State University’s SCMN, Teresa Alexander, Stephanie Goldman, and Quintece McCrary, along with MSU’s Dr. Christine Hohmann, Associate Professor, Biology, (*see image at left*) attended the SED Poster Party, reviewed the presentations, and met and mingled with some of the GESTAR scientists and staff. The students were curious about opportunities at NASA Goddard and discussed their research interests (physics, biology, and bio-engineering, respectively); two of the students are currently undergraduates and one is at the post-graduate level.



Attendees from Morgan State University at the SED Poster Party.

NASA-MSU Networking Event

On January 31, 2013, MSU's School of Computer, Mathematical and Natural Sciences (SCMNS) hosted a networking event at Morgan State University. NASA speakers included **Dr. Bill Corso**, Director, GESTAR; Mr. Torry Johnson, Asst. Deputy Director, Hydrospheric and Biospheric Sciences and Vice-Chair, African American Advisory Committee (AAAC); Ms. Janie Nall, Goddard lead for minority education; and, **Dr. Steve Ungar**, GESTAR scientist. Also in attendance were GESTAR scientists **Xiaowen Li**, **Mei Han**, and **Ron Errico**. The program, which included 15 brief talks by Morgan State University faculty members, was followed by a Q&A session and concluded with a short reception.

MSU goes to Annapolis

On February 28, 2013, Morgan State University showcased its innovation in research at the annual Morgan Innovation Day in the Presidential Conference Center West Room at the Miller Senate Office Building in Annapolis, MD. Among the many participants, two GESTAR scientists, **Juan Carlos Jusem** and **Jinzheng Peng**, attended this event to discuss their research.

GESTAR Scientists at MSU Seminar Series

On Thursdays, Morgan's SCMNS holds its Interdisciplinary Seminar Series at 3:45pm in Dixon 125/Travelers Auditorium. In February and March, three GESTAR/MSU scientists were guest speakers: Feb 21st, **Dr. Ronald Errico**; Feb 28th, **Dr. Jason Sippel**, and Mar 7th, **Dr. Matthew Burger**. The series runs through May 2, 2013. For further info, please contact Monique Harris at monique.harris@morgan.edu.

GESTAR welcomes New Hire

Please welcome *Tiexi Chen*, who will be working with Qinyuan Zhang.

Reminder: if your contact information changes, please update your GESTAR webpage and email your new information to Amy Houghton at ahoughton@usra.edu.

Congratulations to Award Recipients

Congratulations to GESTAR scientists who were recent recipients of Goddard awards:

Weidong Yang – awarded for Best First-Authored Paper by the Climate and Radiation Laboratory;

Yan Zhang – awarded for Outstanding Science Support/Achievement by the Climate and Radiation Laboratory;

Mircea Grecu – awarded for Exceptional Scientific Achievement by the Mesoscale Atmospheric Processes.

Maniac Talk & GESTAR Forum

Thanks to Gail Skofronick-Jackson for kicking off the 2013 season of Maniac Talks with her presentation, "Falling Snow Detective".

(Note: there were no speakers in Dec 2012 or Feb 2013.)

The next speaker will be Anne R. Douglass, Code 614, on Wednesday, March 27th, Bldg. 33/H114, at 12pm. Visit the Maniac Talk website for a list of upcoming speakers as well as an archive of past speakers: <http://maniactalk.gestar.usra.edu/>.

The GESTAR Forum is a monthly assembly held in 33/A128, 12pm. Please contact *Mircea Grecu* or *Charles Gatebe* if you are interested in presenting or discussing a topic at the Forum.

Goddard Film Festival

The 4th Annual Goddard Film Festival, curated by **Genna Duberstein**, was held January 11, 2013 with two showings in the auditorium of Building 3. Producers and audience members cast their votes for favorite videos, and "Laser Comm: That's a Bright Idea" received the highest amount of votes.

You can check out several of the videos from the festival at the following link:

<http://www.nasa.gov/centers/goddard/news/features/2013/film-fest.html#backtoTop>.



Recent Publications

- Arsenault, K.A., P. H. Houser, and G.J.M. De Lannoy (2012), Evaluation of the 11 years Terra MODIS snow cover fraction product over Colorado and Washington state, *Hydrological Processes*, doi:10.1002/hyp.9636.
- Gautam, R., N. C. Hsu, K. M. Lau, and T. J. Yasunari (2013), Satellite observations of desert dust-induced Himalayan Snow Darkening, *Geophysical Research Letters*, 40, doi:10.1029/2012GL054737 (in press).
- Gautam, R., N. C. Hsu, T. F. Eck, B. N. Holben, S. Janjai, T. Jantarach, S. C. Tsay, and K. M. Lau (2013), Characterization of aerosols over the Indochina peninsula from satellite-surface observations during biomass burning pre-monsoon season, *Atmospheric Environment*, doi:10.1016/j.atmosenv.2012.05.038 (in press).
- Gong, J., and D. L. Wu (2013), View-angle dependent AIRS Cloudiness and Radiance Variance: Analysis and Interpretation, *J. Geophys. Res.*, (in press).
- Ham, Y.-G., J.-S. Kug, J.-Y. Park, and F.-F. Jin (2013), Sea surface temperature in the north tropical Atlantic as a trigger for El Nino/Southern Oscillation events, *Nature-Geoscience*, doi:10.1038/ngeo1686. (Note, Dr. Yoo-Geun Ham gave a talk related to this paper at the GMAO Seminar Series on Feb 26 at Goddard.)
- Huang, X., J. N. S. Cole, F. He, G. L. Potter, L. Oreopoulos, D. Lee, M. Suarez, and N. G. Loeb (2013), Longwave Band-By-Band Cloud Radiative Effect and Its Application in GCM Evaluation, *J. Climate*, 26, 450-467, doi: <http://dx.doi.org/10.1175/JCLI-D-12-00112.1>.
- Kurtz, N., J. Richter-Menge, S. Farrell, M. Studinger, J. Paden, J. Sonntag, and J. Yungel (2013), IceBridge Airborne Survey Data Support Arctic Sea Ice Predictions, *EOS, Trans. AGU*, 94 (4), doi: 10.1002/2013EO040001.
- Lee, D., L. Oreopoulos, G. J. Huffman, W. B. Rossow, and I.-S. Kang (2013), The Precipitation Characteristics of ISCCP Tropical Weather States, *J. Climate*, 26, 772-788. doi: <http://dx.doi.org/10.1175/JCLI-D-11-00718.1>.
- McGrath-Spangler, E. L., and A. S. Denning (2013), Global seasonal variations of midday planetary boundary layer depth from CALIPSO space-borne LIDAR, *J. Geophys. Res. Atmos.*, 118, doi:10.1002/jgrd.50198 (available online).
- Reichle, R., G. J. M. De Lannoy, B. A. Forman, C. S. Draper, and Q. Liu (2013), Connecting Satellite Observations with Water Cycle Variables Through Land Data Assimilation: Examples Using the NASA GEOS-5 LDAS, *Surveys in Geophysics*, doi:10.1007/s10712-013-9220-8.
- Roman, M., C.K. Gatebe, Y. Shuai, Z. Wang, F. Gao, J. G. Masek, T. He, S. Liang, and C. B. Schaaf (2013), Use of in situ and airborne multiangle data to assess MODIS- and Landsat-based estimates of surface albedo, *IEEE Transactions on Geoscience and Remote Sensing*, (in press).
- Rousseaux, C.S., T. Hirata and W.W. Gregg (2013), Satellite views of global phytoplankton community distributions using an empirical algorithm and a numerical model, *Biogeosciences Discuss.*, 10, 1083-1109, doi:10.5194/bgd-10-1083-2013.
- Sahoo, A K., G.J.M. De Lannoy, R. H. Reichle, and P. R. Houser (2013), Assimilation and downscaling of satellite observed soil moisture over the Little River experimental watershed in Georgia, USA, *Advances in Water Resources*, 52, 19-33, doi:10.1016/j.advwatres.2012.08.007.
- Sinyuk, A., B. N. Holben, A. Smirnov, T. F. Eck, I. Slutsker, J. S. Schafer, D. M. Giles, and M. Sorokin (2012), Assessment of error in aerosol optical depth measured by AERONET due to aerosol forward scattering, *Geophys. Res. Lett.*, 39, L23806, doi:10.1029/2012GL053894.

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(Recent Publications, cont'd)

Strahan, S.E., A.R. Douglass and P.A. Newman (2013), The contributions of chemistry and transport to low arctic ozone in March 2011 derived from Aura MLS observations, *Journal of Geophysical Research - Atmospheres*, 118 (1), doi:10.1002/jgrd.50181.

Sud, Y. C., D. Lee, L. Oreopoulos, D. Barahona, A. Nenes, and M. J. Suarez (2013), Performance of McRAS-AC in the GEOS-5 AGCM: aerosol-cloud-microphysics, precipitation, cloud radiative effects, and circulation, *Geosci. Model Dev.*, 6, 57-79, doi:10.5194/gmd-6-57-2013.

Tsay, S., N.C. Hsu, W. K.-M. Lau, C. Li, P.M. Gabriel, Q. Ji, B.N. Holben, E.J. Welton, A.X. Nguyen, S. Janjai, N-H. Lin, J.S. Reid, J. Boonjawat, S.G. Howell, B.J. Huebert, J.S. Fu, R.A. Hansell, A.M. Sayer, R. Gautam, et al. (2013), From BASE-ASIA toward 7-SEAS: A satellite-surface perspective of boreal spring biomass-burning aerosols and clouds in Southeast Asia, *Atmospheric Environment*, Online (in press), doi:10.1016/j.atmosenv.2012.12.013.

Verma, S., S. Payra, R. Gautam, D. Prakash, M. Soni, B. Holben, and S. Bell (2013), Characterization of aerosol properties during dust events over Jaipur, northwestern India from sunphotometric measurements, *Environmental Monitoring and Assessment*, doi:10.1007/s10661-013-3103-9 (in press).

Yang, W., A. Marshak, T. Varnai, O. Kalashnikova, and A. Kostinski (2012), CALIPSO observations of transatlantic dust: vertical stratification and effect of clouds, *Atmos. Chem. Phys.*, 12, 11339–11354, doi:10.5194/acp-12-11339-2012.

An upcoming GESTAR All Hands Meeting is tentatively planned for the end of April 2013 ... stay tuned.

NASA GESTAR conducts research collaboratively, mainly within GSFC's Earth Sciences Division, but also with Solar Systems Exploration Division, Office of Education, and Office of Public Affairs. Scientists and staff at GESTAR, in collaboration with NASA and other investigators, conceive and develop new, space-based missions; provide mission requirements; conduct research that explains the behavior of Earth and other planetary systems; and create engaging media that tell NASA's story of exploration and discovery on Earth and beyond.

The GESTAR Team: Universities Space Research Association, Morgan State University, IMSG, Johns Hopkins University, Institute for Global Environmental Strategies, and Ball Aerospace and Technologies.

Visit us at <http://gestar.usra.edu/>.

The GESTAR Newsletter is published by GESTAR/USRA. Any comments/suggestions/ideas can be forwarded to Amy Houghton, Editor at ahoughton@usra.edu.