The Giovanni News
July 2013
GODDARD EARTH SCIENCES DATA & INFORMATION SERVICES CENTER

From the Editors

Welcome to the "reboot" of *The Giovanni News*. After a publishing hiatus, during which it was determined that creating a longer multi-article newsletter was a little too time-intensive, we decided to make *The Giovanni News* a shorter monthly newsletter. Each issue will generally include the following: a highlighted recently-published research paper; an update on Giovanni-4 development progress; a special image or a highlighted data set; and information on recent or upcoming presentations about Giovanni.

We would also like to know, via email feedback, if it would be acceptable to the members of the mailing list if we send out short summaries of our homepage News articles that are about Giovanni. In the past, we have not done this, preferring to use other mailing lists, and we have presented some of those News articles in *The Giovanni News* as well. It would be expected that there would be 5-10 messages a month, including the monthly newsletter.

Also, you can all act as news reporters – if you see anything of interest that you think we should know about, please send us a message about it. We don't see everything that is relevant and pertinent to our community.

Finally, we are working on a Giovanni contest. Information will be sent about that in July, and you can distribute this information to any other individuals and groups as you see fit.

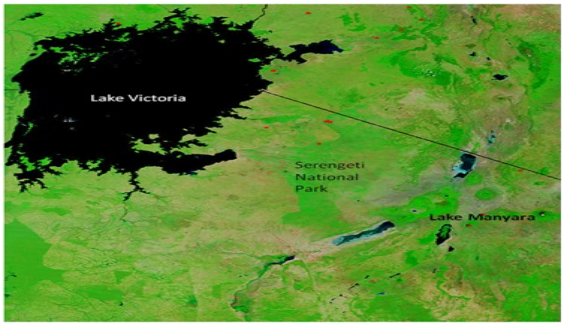
Regards,
Jim Acker and Wainie Youn,
The Giovanni News Editors

June Research Highlight: Remote Sensing Analysis of Lake Dynamics in Semi-Arid Regions: Implication for Water Resource Management. Lake Manyara, East African Rift, Northern Tanzania

Dorothea Deus and Richard Gloaguen (2013) Water, 5, 698-727, doi:10.3390/w5020698.

In this paper, the authors describe how remote sensing can be used to monitor water resources, specifically inland lakes, in remote semi-arid regions. The example analyzed for this paper is Lake Manyara, in northern Tanzania. Lake Manyara is a highly variable saline lake that at times has dried up completely. Several Moderate Resolution Imaging Spectroradiometer (MODIS) data products are used, including surface reflectance, evapotranspiration, and land surface temperature. Giovanni was used in this research to provide the TRMM 3B43 V7 monthly rainfall estimate data product. The authors describe the use of a Modified Normalized Difference Water Index (MNDWI) to determine the water area of the lake in remotely-sensed imagery. They created a water balance model for April 2001 – December 2009, and evaluated the lake area monthly with respect to the model variables. The variability of the lake surface area is directly tied to rainfall, and thus the lake area reaches minimum levels during the hot dry months and maximum levels during the cooler rainy months. The driest periods, with the lake nearly disappearing, occurred in 2005 and 2011. The general lake surface area has exhibited a decreasing trend since 2000.

Note: A paper by Jan Verbesselt, presenter at the 2012 Gregory G. Leptoukh Online Giovanni



MODIS false color image of northern Tanzania and Kenya, showing the location of Lake Manyara in the northern East Rift Valley. Lake Manyara is near the famed Serengeti National Park and Lake Victoria. The straight black line is the border between Tanzania and Kenya.

In this Issue

Recent Giovanni Presentations

An idyllic "holler" in the Shenandoah Mountains became a laboratory from June 17-21 as teachers from Virginia's Hampton Roads area partnered with National Aeronautics and Space Administration (NASA) scientists and education professors in the DUST Project, a NASA Innovations in Climate Education (NICE) project managed by Hampton University. Dianne Robinson and Barbara Maggi of Hampton University acted as the Project's Director and Manager, respectively. The workshop took place at Graves Mountain Lodge in Syria, Virginia, adjacent to the mountains of Shenandoah National Park.

The basic concept of dust in Earth's atmosphere was used at the workshop as the theme for developing teaching methods on the subjects of climate and climate change, for many different grade levels. Teachers at the workshop were shown, for example, how to demonstrate the accumulation of glacial ice in an ice core with layers of colored marshmallows and M&M candies (the latter representing ash from volcanic eruptions). Corn starch tossed in the air and illuminated by a laser pointer showed how satellite-borne laser instruments detect dust clouds in the atmosphere. At these and previous DUST Project workshops, NASA scientists from the Jet Propulsion Laboratory and Goddard Space Flight Center have given presentations on the various satellites that observe dust and other atmospheric aerosols; the health effects of dust; how dust in the atmosphere reflects and scatters radiation from the Sun; and even how the atmospheric effects of huge volcanic eruptions and a massive asteroid impact led to the demise of the dinosaurs.

One of the key elements of DUST Project workshops is the NASA Giovanni data system, which provides easy access to several different satellite data products that can detect dust in the atmosphere. James Acker of the NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) showed the teachers how Giovanni generates time-series data plots to detect the occurrence of Sahara dust storms, and then how the system can be used to create and modify data maps showing the extent and movement of these storms as they are transported over the Atlantic Ocean. At this year's workshop, teachers examined Moderate Resolution Imaging Spectroradiometer (MODIS) data for the year 2006, and found a major dust storm occurred in March 2006. MODIS images of this dust storm are available from the NASA Earth Observatory.

(published on the NASA GES DISC homepage on June 24, 2013)

Giovanni-4 Development Update

The Giovanni-4 development team is currently working on the integration of North American Land Data Assimilation System (NLDAS) data and Global Land Data Assimilation System (GLDAS) data, as well as Atmospheric Infrared Sounder (AIRS) data.

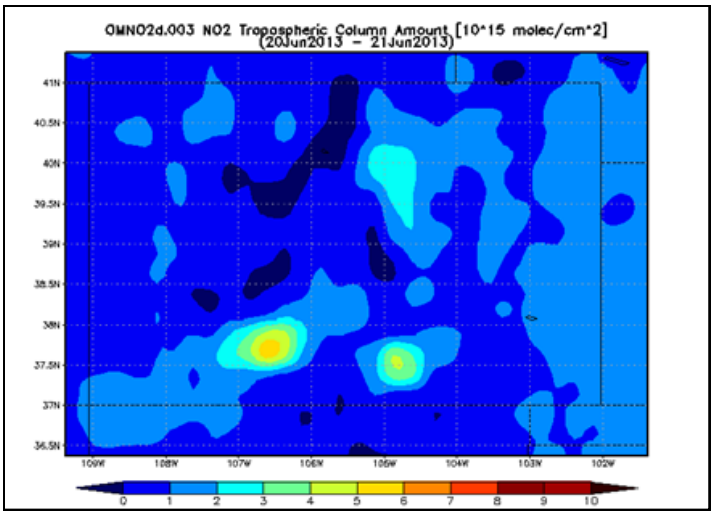
Here are the release notes for Version 4.2, the current public release at http://giovanni.gsfc.nasa.gov/giovanni/

New in Giovanni 4.2

- Added Data Variables
- Daily Rainfall Estimate from TRMM_3B42
- SeaWiFS Aerosol Optical Depth at 412, 490, 510, 670, and 865 nm
- Plot Options for Interactive Map
- Improved performance for Interactive Scatter Plot
- Various Bug Fixes

Giovanni Image of the Month - Fires in Colorado

The Ozone Measuring Instrument (OMI) nitrogen dioxide (NO_2) data product indicates where fires are burning, or where pollution from combustion of fossil fuels is taking place. Two wildfires in Colorado occurring in late June could be observed in the OMI NO_2 data product.



The Giovanni image, averaged over June 20-21, shows tropospheric NO_2 generated by the West Fork fire near Del Norte, Colorado. An astronaut photograph of the smoke from these fires as seen from the International Space Station is also shown (below right). The smaller area of elevated NO_2 in the June 20-21 (~ 37.75N, 106W) image likely corresponds to the smaller plume of smoke in the photograph, the "Wild Rose" fire. To the north of the fire signatures, NO_2 emanating from the city of Denver is persistently observed.

OMI NO_2 and Aerosol Index data are processed at NASA Goddard and archived at GES DISC as part of NASA EOS Aura/OMI project. The Dutch-Finnish-built OMI instrument is part of the NASA EOS Aura satellite payload. The OMI instrument is managed by KNMI and the Netherlands Agency for Aerospace Programs (NIVR).

NASA Giovanni:
The view from space informs viewpoints on the ground