Enhancements to NASA’s Land Atmosphere Near–real-time Capability for EOS (LANCE):

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Abstract

NASA’s Land, Atmosphere Near–real-time Capability for EOS (LANCE) supports application users interested in monitoring a wide variety of natural and man-made phenomena. Near–Real–Time (NRT) data and imagery from the AIRS, AMSR2, MISR, MLS, MODIS, OMPS, OMI and VIIRS instruments are available much quicker than routine processing allows. Most data products are available within 3 hours of satellite observation. NRT imagery are generally available 3-5 hours after observation. This article describes the LANCE and the enhancements made to the LANCE over the last year. These enhancements include the addition of NRT products from AMSR2, MISR, OMPS and VIIRS. In addition, the selection of LANCE NRT imagery that may be interactively viewed through Worldview and the Global Imagery Browse Services (GIBS) has been expanded.

What is LANCE?

LANCE provides global imagery and data for Near Real–Time Applications from AIRS, AMSR2, MISR, MLS, MODIS, OMI, OMPS and VIIRS.

LANCE provides data and imagery in support of applications such as: Air–Quality – Dust storms – Fires – Vegetation for agricultural monitoring – Floods – Ash Plumes – Dust storms – Smoke Plumes – Sea ice for shipping – Severe Storms

LANCE was established in 2009, building on the success of MODIS Rapid Response. LANCE is a component of EOSDIS, NASA’s Earth Observing System Data and Information System. It is a virtual system that leverages existing science-led processing and data centers.

LANCE NRT Products

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Product Category</th>
<th>Management Category</th>
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<tbody>
<tr>
<td>MODIS CO</td>
<td>Near-Surface CO Concentration</td>
<td>1-2-Minute</td>
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<tr>
<td>MODIS CO</td>
<td>Column CO Concentration</td>
<td>15-60 Minutes</td>
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<tr>
<td>OMPS CO</td>
<td>Near–Surface CO Concentration</td>
<td>15-60 Minutes</td>
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<tr>
<td>OMPS CO</td>
<td>Column CO Concentration</td>
<td>15-60 Minutes</td>
</tr>
<tr>
<td>OMPS NO2</td>
<td>Near–Surface NO2 Concentration</td>
<td>15-60 Minutes</td>
</tr>
<tr>
<td>OMPS NO2</td>
<td>Column NO2 Concentration</td>
<td>15-60 Minutes</td>
</tr>
</tbody>
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What’s new in LANCE?

• Planned products from MOPITT

Near–real–time data from the Measurements Of Pollution in the Troposphere (MOPITT) instrument will be added to LANCE in 2017. MOPITT measures CO from the surface to the upper troposphere, which is a chemically reactive gas that has a lifetime of approximately one month. Primary sources of CO include biomass burning (for example, forest fires) and fossil fuel burning, which can have large temporal fluctuations. Near–real–time (NRT) CO products are useful for air quality forecasting and in field campaign planning.

• New products from AMSR2, MISR, OMPS and VIIRS

AMSR2 Data from AMSR2, an instrument on the Japanese GCOM-W1 satellite, is providing a research-quality global dataset for the climate research and weather forecasting community. In 2016, 4 additional NRT products have been made available through LANCE.

<table>
<thead>
<tr>
<th>AMSR2 NRT Products Added to LANCE in 2016</th>
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<tr>
<td>Description</td>
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<tr>
<td>NRT AMSR2 Daily L3 SST and 25 km EASE–Grid SST Temperature</td>
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<tr>
<td>NRT AMSR2 Daily L3 SST and 25 km EASE–Grid SST Brightness Temperature</td>
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<tr>
<td>NRT AMSR2 Daily L3 SST and 25 km EASE–Grid SST Chlorophyll</td>
</tr>
<tr>
<td>NRT AMSR2 Daily L3 SST and 25 km EASE–Grid Surface Wind Speed</td>
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This completes the suite of AMSR2 NRT products. As the AMSR2 standard quality products are released from NASA, the expedited (NRT) products from LANCE may be updated to reflect algorithm improvements.

MISR

NRT Level 2 MISR Winds products are now available through LANCE. MISR NRT Winds will be used to improve numerical weather prediction. These products include LB2 Imagery, cloud tracked winds, and will include aerosol properties.

OMPS

Data from the Ozone Mapping and Profiler Suite (OMPS) aboard the Suomi National Polar–orbiting Partnership (Suomi NPP) are the newest NRT products to be made available through LANCE. The specific products are:

• NMTD3 - OMPS Nadir Mapper Total Column Ozone and Aerosol Index
• OMPS2 - OMPS Nadir Mapper Near–Real–Time Sulfur Dioxide
• OMPS NO2 - OMPS Profiler Ozone Profiling

All three products will provide continuity from OMI.

OMPS Nadir Mapper Level 3 Daily Total Ozone for 21 October 2016. Purple and blue colors (as seen in Antarctica) indicate the regions with the highest total ozone concentrations. Red and orange indicate regions with the lowest total ozone concentrations. Changes over time are indicated by different shades of red and orange. Source: Data from NASA's Suomi NPP. Image from OMPS.

Accessing LANCE Data and Imagery

All LANCE data can be downloaded via FTP and/or HTTPS using links provided from https://earthdata.nasa.gov/lance.

The following applications also make LANCE products available:

• Earthdata Search: Users can search for data by keyword and filter by time or space, https://search.earthdata.nasa.gov

• Global Imagery Browse Services (GIBS): Provides global imagery layers to Worldview through publicly accessible and standards compliant imagery services. Users can add GIBS to their own web mapping interface or client, https://earthdata.nasa.gov/gibs

• Worldview: Users can interactively browse and download full resolution imagery. Underlying HDF data granules can also be downloaded from within the app, https://earthdata.nasa.gov/worldview

OMPS Nadir Mapper near–real–time data products do not have the extensive processing required for use in scientific research, they are valuable tools for monitoring the health of the ozone layer, evaluating ultraviolet (UV) radiation intensity, and determining power outages caused by the flooding on August 15, 2016. The bottom–left image shows a normal night, the bottom–right was taken the night of the flood.

Contact information: support@earthdata.nasa.gov

LANCE http://earthdata.nasa.gov/lance

For More Information:

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http://ntrs.nasa.gov/search.jsp?R=20160014712 2019-07-23T16:02:35+00:00Z