Expanding 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) is a virtual system that provides near real-time EOS data and imagery to meet the needs of scientists and application users interested in monitoring a wide variety of natural and man-made phenomena in near real-time. Over the last few years: near real-time data and imagery from MOPITT, MISR, OMPS and VIIRS (Land and Atmosphere) have been added; the Fire Information for Resource Management System (FIRMS) has been updated and LANCE has begun the process of integrating the Global NRT flood and Black Marble products. In addition, following the AMSU-A2 instrument anomaly in September 2016, AIRS-only products have replaced the NRT level 2 AIRS+AMSU products. This presentation provides a brief overview of LANCE, describes the new products that are recently available and contains a preview of what to expect in LANCE over the coming year. For more information visit: https://earthdata.nasa.gov/lance

LANCE Near Real-Time Products

<table>
<thead>
<tr>
<th>Instrument</th>
<th>Platform</th>
<th>Product Categories</th>
<th>Average Latency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atmosphere Infrared Sounder (AIRS)</td>
<td>Terra</td>
<td>Radiances, Temperature, Water Vapor Profiles, Clouds, and Aerosol Loadings</td>
<td>75-140 minutes</td>
</tr>
<tr>
<td>Advanced Microwave Scanning Radiometer 2 (AMS)</td>
<td>Terra</td>
<td>Radiometric, Resolved Precipitation, Total Precipitable Water (TPW), Ocean Wind Speed (OWS), Ocean Skin Temperature (OST), Soil Moisture, Snow Water Equivalents (SWE), Sea Ice Concentrations, and Sea Ice Thickness</td>
<td>75-150 minutes**</td>
</tr>
<tr>
<td>Multi-angle Imaging SpectroRadiometer (MISR)</td>
<td>Terra</td>
<td>Cloud motion vectors (CMV), Precipitable Water (PW)</td>
<td>90-120 minutes</td>
</tr>
<tr>
<td>Moderate-Resolution Imaging Spectroradiometer (MODIS)</td>
<td>Terra</td>
<td>Ocean Color, Sea Surface Temperature, and Sea Ice</td>
<td>75-140 minutes</td>
</tr>
<tr>
<td>Cloud Marble and Profiller Scanner (SPoRT)</td>
<td>Terra</td>
<td>Near-Surface Temperatures, Skin Temperature, and Cloud Top Pressure</td>
<td>60-120 minutes</td>
</tr>
<tr>
<td>Visible Infrared Imaging Radiometer Suite (VIIRS)</td>
<td>NPP</td>
<td>Clouds, Aerosols, Ocean Color, Land Surface Reflectance, and Ocean Color</td>
<td>150-180 minutes</td>
</tr>
</tbody>
</table>

**Latency excludes daily Land Surface Reflectance; Latency excludes Level 3 products.

New Products in NASA LANCE

**MOPITT** Global carbon monoxide (CO) data from the MOPITT (see table 1) are the newest near real-time products available through LANCE. Global CO concentrations vary through activities such as seasonal agricultural burning as well as from natural events such as wildfires and volcanic eruptions. Higher atmospheric CO concentrations can increase levels of ground-based ozone and affect oxygen transport in the blood which can lead to health problems, so these data provide a vital resource for forecasting air quality and atmospheric chemistry.

**MISR** NRT imagery from MISR (see table 1) is now available through the Global Imagery Browse Services (GISB) and Worldview. The imagery are available for the nadir, four fore and four aft views provided by MISR’s nine cameras. That’s looking at the earth from 9 different angles in two different band combinations - a total of 38 imagery products! The NRT MISR data have been available for over a year in LANCE.

**OMPS** Data from the OMPS (see table 1) will be available through LANCE in 2017. The specific products are: Total Column Ozone and Aerosol Index (NMD03), Sulfur Dioxide (NMD02) and Ozone Profile (NPP-D03-12). All three products will provide continuity from OMI.

FIRMS

The Fire Information for Resource Management System (FIRMS) is being updated. FIRMS distributes global active fire data, in easy to use formats, from VIIRS (375m) and MODIS (1km). The data are available as SHP, TXT and KML as well as via an email alert service, web services and a web mapping interface. The updated version of FIRMS just released in beta is available for testing and feedback on https://firms2.modaps.eosdis.nasa.gov/. Additional features will be added in 2018.

**SPoRT** The Fire Information for Resource Management System (FIRMS) is being updated. FIRMS distributes global active fire data, in easy to use formats, from VIIRS (375m) and MODIS (1km). The data are available as SHP, TXT and KML as well as via an email alert service, web services and a web mapping interface. The updated version of FIRMS just released in beta is available for testing and feedback on https://firms2.modaps.eosdis.nasa.gov/. Additional features will be added in 2018.

**SPoRT**

**Science vs. NRT Data**

In order to generate data products within 3 hours of observation time, a number of changes have been made to the standard processing approach to expedite the availability of input data sets. Characterizations of the differences between science and near-real-time products reveal some minor differences, but overall the agreement is high. More information on the differences can be found at https://earthdata.nasa.gov/earth-observation-data/near-real-time/near-real-time-versus-standard-products

**Accessing LANCE Data and Imagery**

For more information and links to data: https://earthdata.nasa.gov/lance

Emerald Lake

Lightning Imaging Sensor (LIS)

In February 2017 the US was placed on the International Space Station (ISS) for a two – four year mission. Data from the LIS will be made available from LANCE with a 2 minute latency using the ISS Low Rate Telemetry channel. The ISS LIS was originally built as the flight spare for NASA’s EOS Tropical Rainfall Measuring Mission (TRMM). The data will be used by a number of NASA operational partners, including the NWS Pacific Region, NWS Ocean Prediction Center, the NWS Aviation Weather Center, and the NOAA National Hurricane Center.