



Improving AIRS NRT Imagery for the Enhancement of Visualization Services in LANCE

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NASA/Goddard EARTH SCIENCES DATA and INFORMATION SERVICES CENTER (GES DISC)

Users are invited to take advantage of AIRS NRT products at LANCE:
<https://earthdata.nasa.gov/earth-observation-data/near-real-time/>
download-nrt-data/airs-nrt and GES DISC: <https://disc.gsfc.nasa.gov/>

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Abstract

The NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) has been the home of processing, archiving, and distribution services for data from the Atmospheric Infrared Sounder (AIRS) mission since its launch in 2002. AIRS provides data enabling global observations of the atmospheric state. The GES DISC provides service to both AIRS standard products and Near Real-time (NRT) products. The AIRS NRT product is one important element in the Land, Atmosphere Near real-time Capability for EOS (LANCE).

The LANCE processing of the AIRS NRT product and the generation of the imagery are performed at the GES DISC. The AIRS NRT imagery are generated by mosaicking and mapping the available AIRS 6-minute retrieval granules to a global cylindrical projection. The images are constantly refreshed when new granules are produced. The AIRS NRT Viewer and LANCE Worldview provide visualization services to online users for AIRS NRT imagery. The imagery include atmospheric temperature, humidity, precipitation, Dust Score, CO, and SO₂.

The AIRS Applications Development Team at NASA JPL developed a new orbit-based algorithm and software to improve the AIRS NRT imagery. The GES DISC is collaborating with the AIRS Applications Development Team for the implementation of the new algorithm and software. The improvements include image quality, new color palettes, and variable changes. In this presentation, we detail the improvements and demonstrate visualization of the new imagery.

AIRS NRT Products

- L1B version 5**
 - AIRBRAD_NRT: IR geolocated radiances
 - AIRBRAD_NRT_BUFR: 324-channel subset of IR geolocated radiances in BUFR format
 - AIRVBRAD_NRT: Vis/Near-IR geolocated radiances
 - AIRABRAD_NRT: AMSU-A1 & AMSU-A2 combined, geolocated & calibrated brightness temperatures
 - AIRIBQAP_NRT: IR quality assurance subset
 - AIRVBQAP_NRT: Vis/Near-IR quality assurance subset

- L2 version 6 using AIRS IR-only**
 - AIRS2RET_NRT: standard retrieval product
 - AIRS2CCF_NRT: cloud-cleared radiances
 - AIRS2SUP_NRT: support product

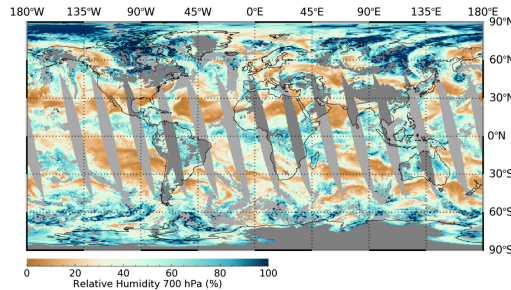
AIRS NRT Imagery

- VIS radiances (false color map)
- Total Column CO
- Prata_SO₂
- Dust score
- Precipitation
- Air Temperature and Relative Humidity at 850 hPa, 700 hPa, 600 hPa, 500 hPa, and 400 hPa

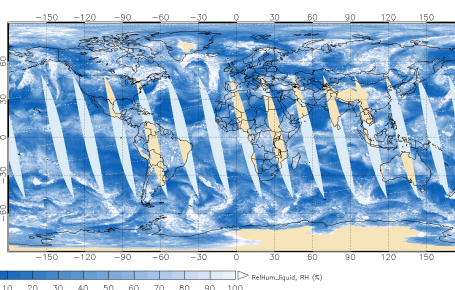
Improvements to AIRS NRT Imagery – Coming Soon

Change mosaic algorithm from granule-based to orbit-based for better image quality; new color palettes. Enhanced imagery forward processing is running in test mode at the GES DISC.

Improved Image (RH at 700hPa, Ascending, Nov. 16, 2018)



Current Image (RH at 700hPa, Ascending, Nov. 16, 2018)



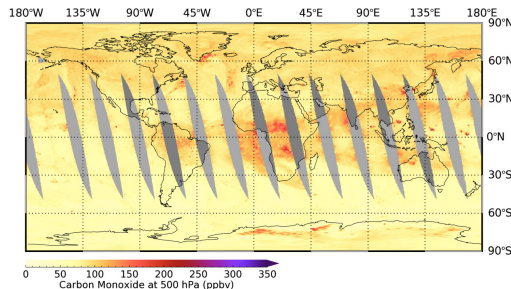
• Variable Changes

- Replace Total Column CO with CO at 500 hPa
- Keep 850 hPa, 700 hPa, 500 hPa Air Temperature and Relative Humidity (remove 600 hPa, 400 hPa)

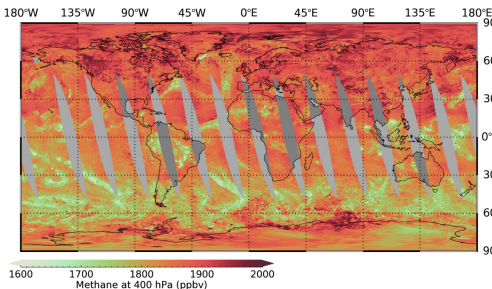
• Add New Variables

- CH₄ at 400 hPa
- Surface Air and Skin Temperature
- Surface Relative Humidity
- Total Cloud Fraction
- Cloud Top Height

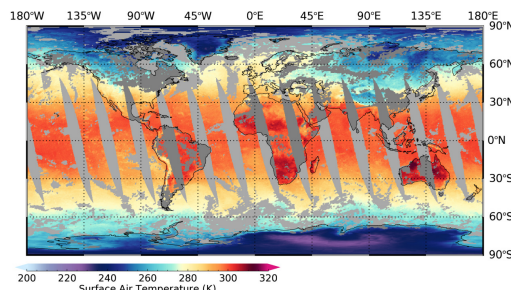
CO at 500 hPa, Ascending, Nov. 16, 2018



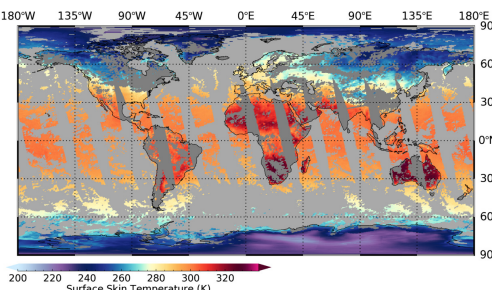
CH₄ at 400 hPa, Ascending, Nov. 16, 2018



Surface Air Temperature, Ascending, Nov. 16, 2018

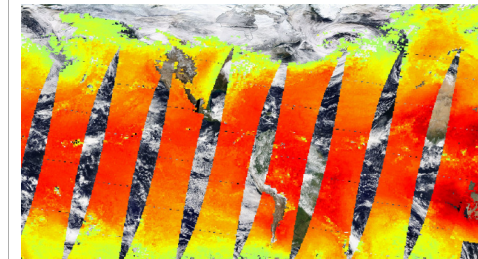
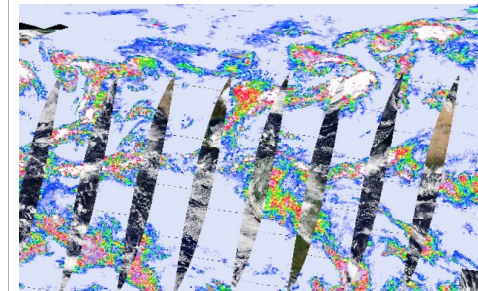


Surface Skin Temperature, Ascending, Nov. 16, 2018



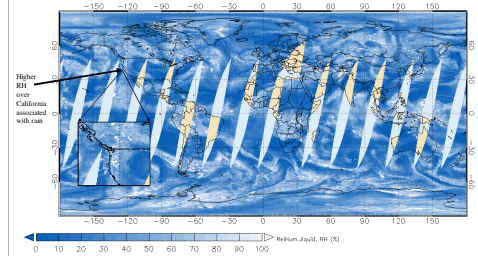
AIRS NRT Imagery in LANCE Worldview

The first snow in the eastern Mid-Atlantic for the 2018-2019 winter season occurred on November 15, 2018. The images below are Precipitation (top) and Temperature at 850hPa (bottom) from the AIRS NRT product, with MODIS true-color image as background, in LANCE Worldview.



AIRS NRT Images in GES DISC WMS Viewer

The first major rainstorm to hit northern California since Nov. 21, 2018 helped to extinguish the Camp Fire and relieve poor air quality conditions, but added hardships to the rescue work and those who have lost their homes. Below is the image of Relative Humidity at 500hPa on Nov. 21, 2018, from the AIRS NRT product in GES DISC WMS Viewer.



Contact Information

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