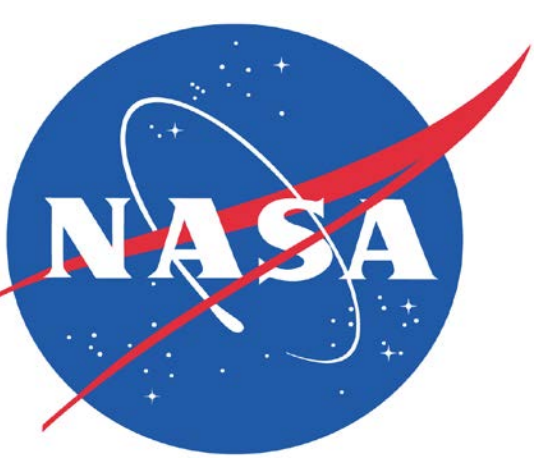


AIRS-only Product in Giovanni for Exploring Up-to-date AIRS Observations and Comparing with AIRS+AMSU Product

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

Users are invited to take advantage of Giovanni to explore the 15-year long AIRS Version 6 products at GES DISC: <https://giovanni.gsfc.nasa.gov/>

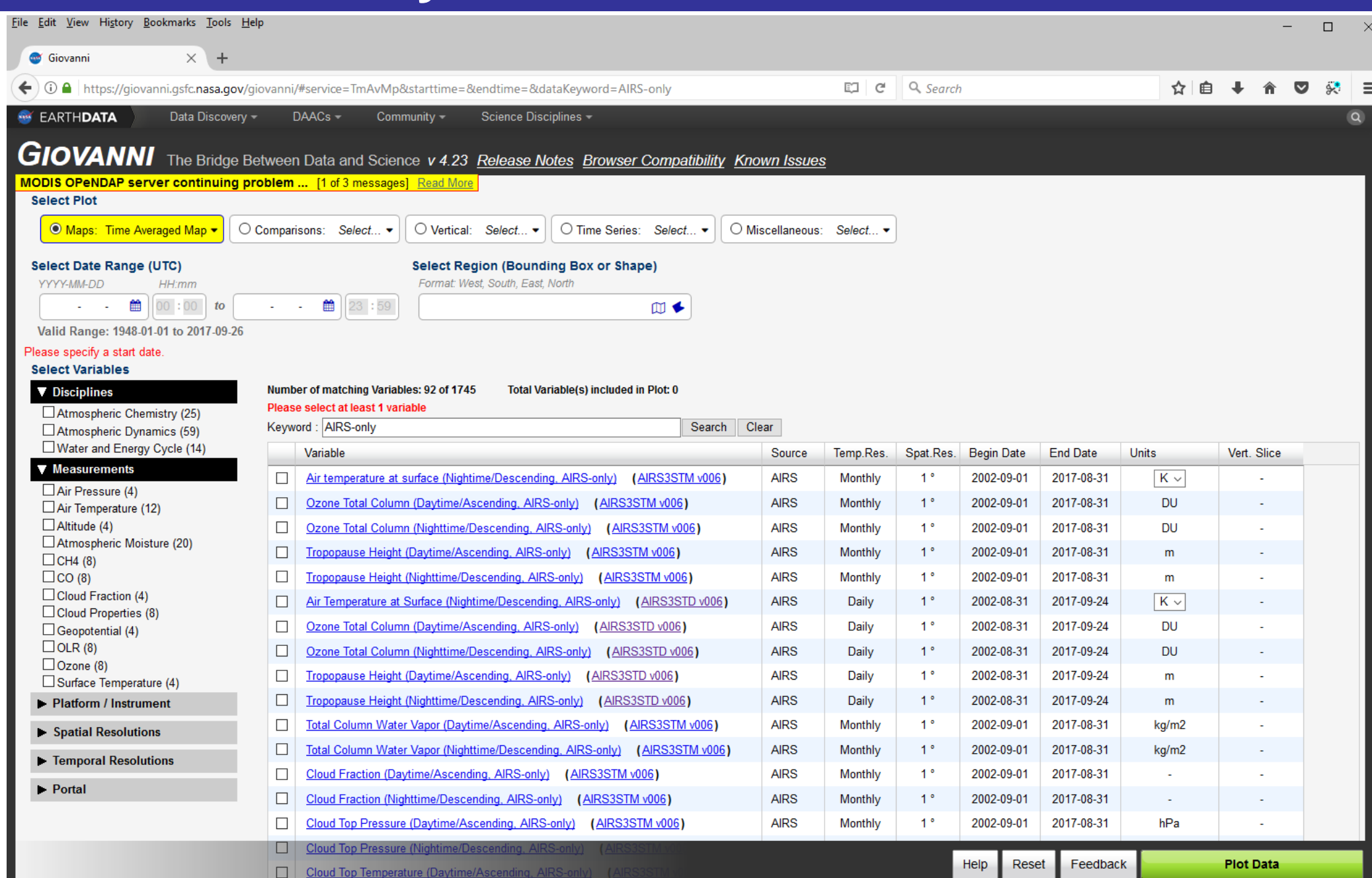
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Abstract

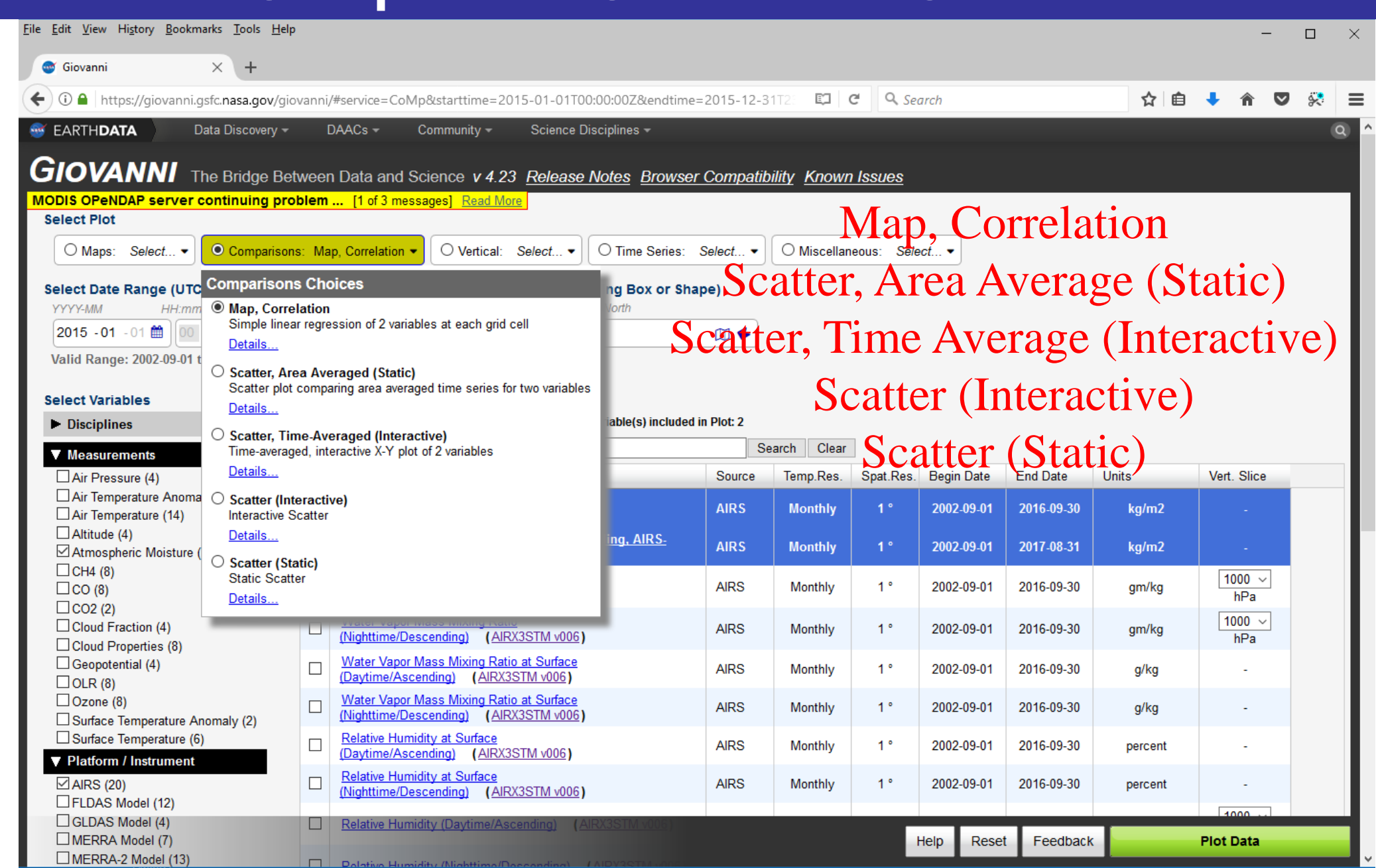
The NASA Goddard Earth Sciences Data and Information Services Center (GES DISC) has been the home of processing, archiving, and distribution services for the Atmospheric Infrared Sounder (AIRS) mission since its launch in 2002 for global observations of the atmospheric state. Giovanni, a Web-based application developed by the GES DISC, provides a simple and intuitive way to visualize, analyze, and access vast amounts of Earth science remote sensing data without having to download the data. Most important AIRS variables, including temperature and humidity profiles, outgoing longwave radiation, cloud properties, and trace gases, are available in Giovanni.

AIRS is an instrument suite comprised of a hyperspectral infrared instrument (AIRS) and two multichannel microwave instruments, the Advanced Microwave Sounding Unit (AMSU) and the Humidity Sounder for Brazil (HSB). As HSB ceased operation in the very early stages of the AIRS mission, the AIRS project operates two parallel retrieval algorithms: one using both IR and MW measurements (AIRS+AMSU) and the other using only IR measurements (AIRS-only), which covers most of the mission duration. The AIRS+AMSU product is better quality, and the variables in Giovanni are from this product. However, generation of the AIRS+AMSU product has been suspended since the AMSU instrument anomaly occurred in late September 2016. To continue exploring up-to-date AIRS observations, the same set of variables from the AIRS-only product have been added to Giovanni by the GES DISC. This will also support comparison of AIRS-only with AIRS+AMSU retrievals. In this presentation, we demonstrate the visualization of the AIRS-only product and plots/statistics of comparison with AIRS+AMSU product using Giovanni.

92 AIRS-only Retrieval Variables in Giovanni

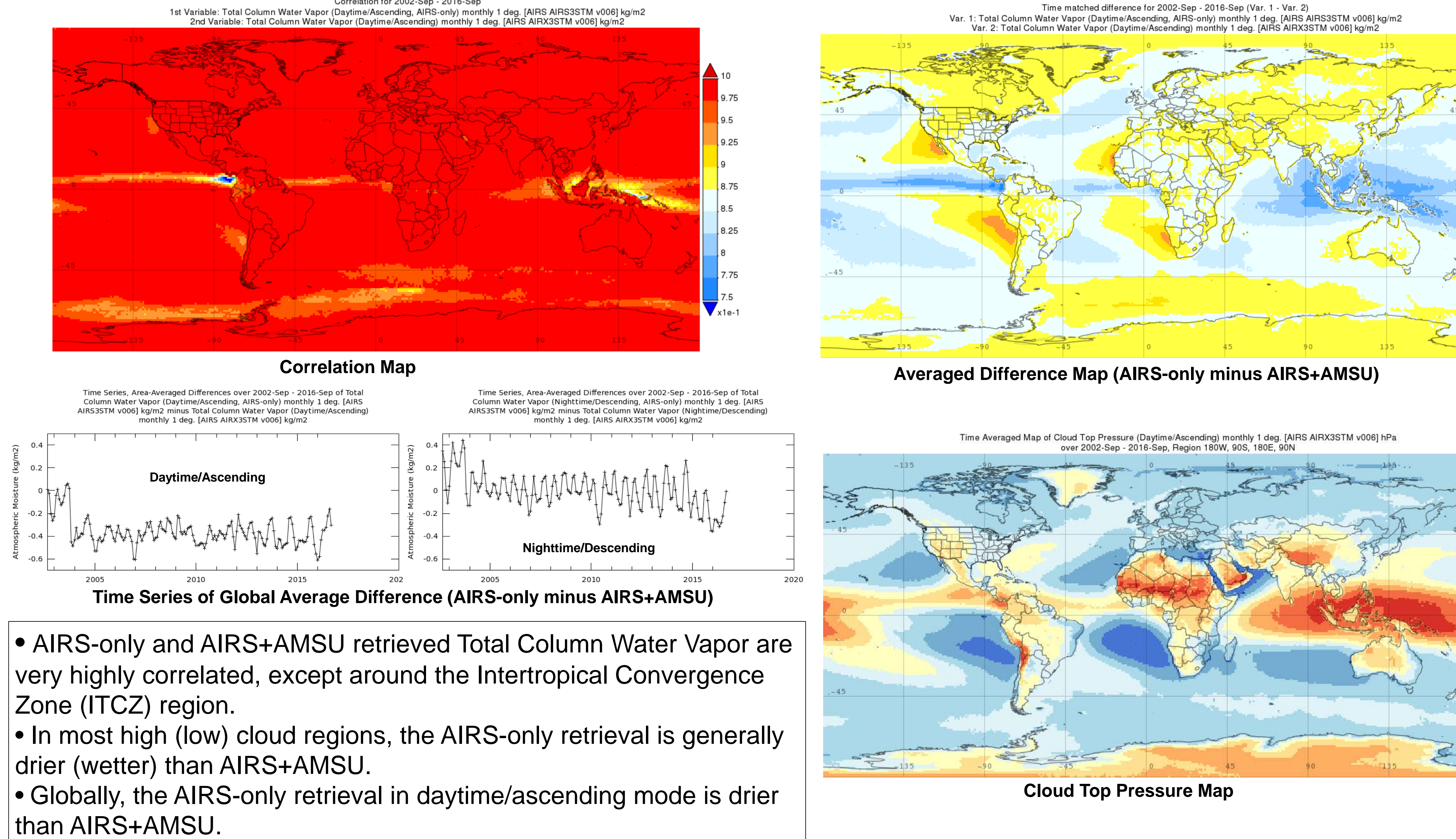


Comparison Services in Giovanni



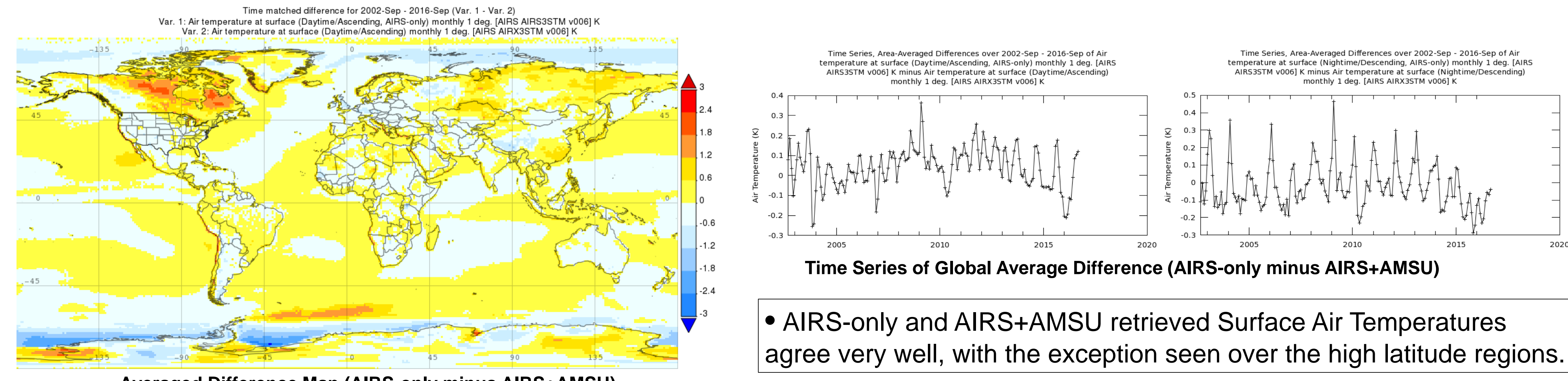
Comparing AIRS-only with AIRS+AMSU Retrieval Product using Giovanni

Total Column Water Vapor, Monthly, 09/2002 to 09/2016, AIRS-only vs. AIRS+AMSU



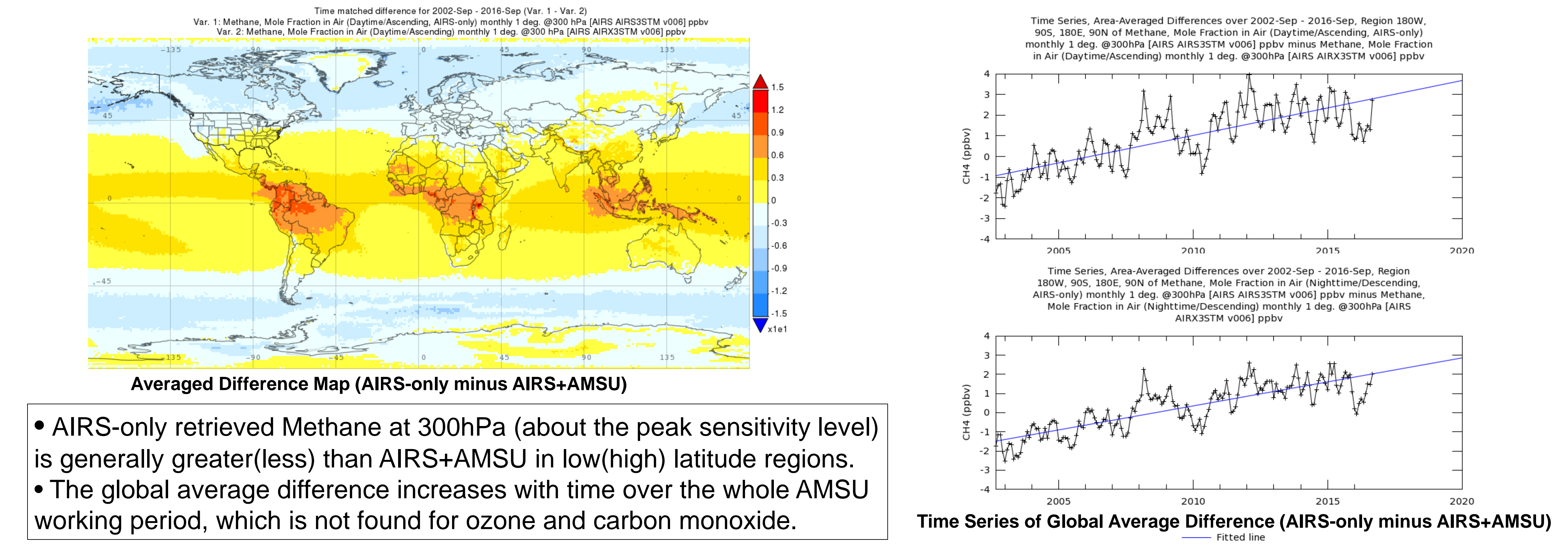
- AIRS-only and AIRS+AMSU retrieved Total Column Water Vapor are very highly correlated, except around the Intertropical Convergence Zone (ITCZ) region.
- In most high (low) cloud regions, the AIRS-only retrieval is generally drier (wetter) than AIRS+AMSU.
- Globally, the AIRS-only retrieval in daytime/ascending mode is drier than AIRS+AMSU.

Air Temperature at Surface, Monthly, 09/2002 to 09/2016, AIRS-only vs AIRS+AMSU



- AIRS-only and AIRS+AMSU retrieved Surface Air Temperatures agree very well, with the exception seen over the high latitude regions.

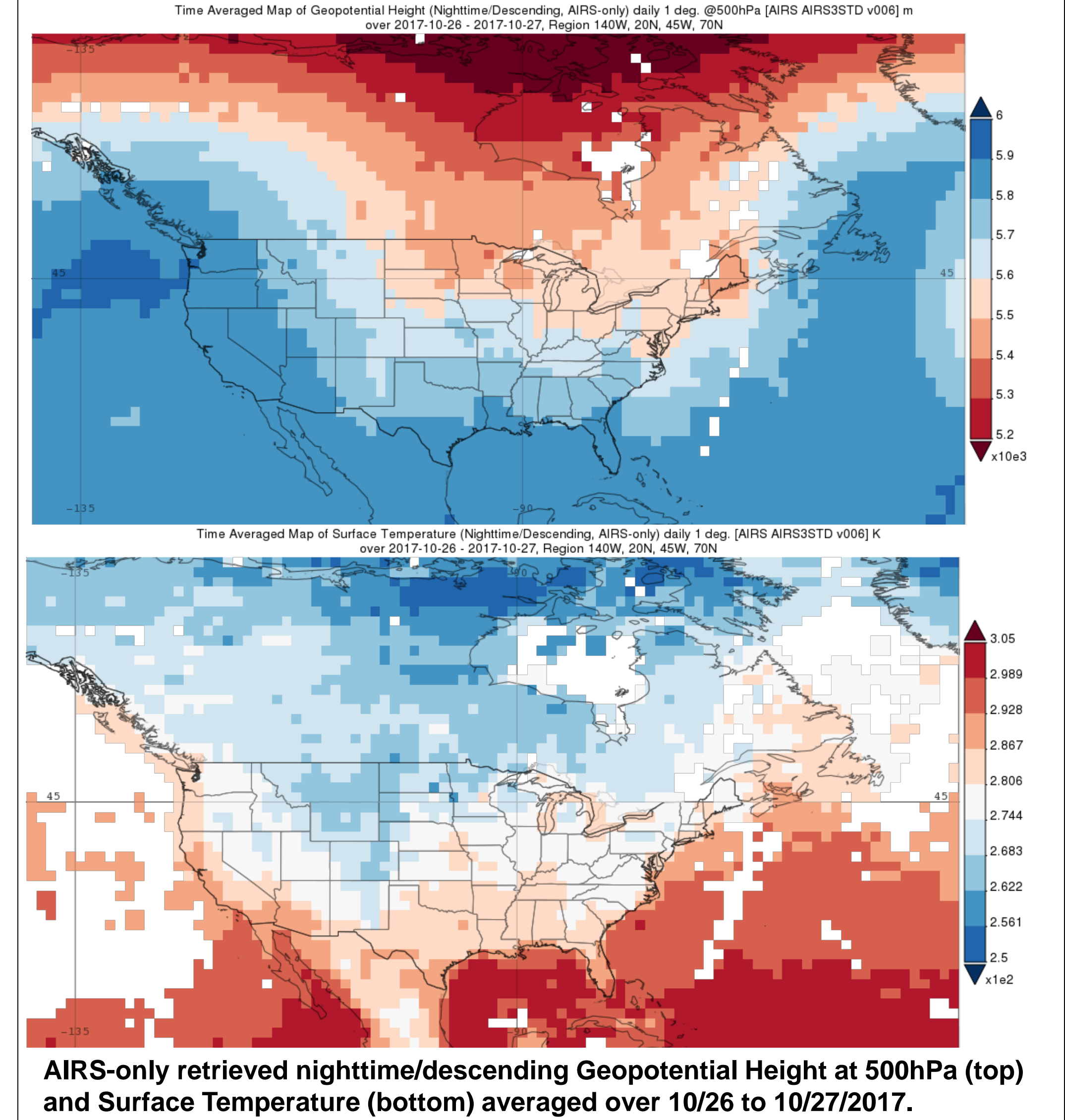
Methane at 300hPa, Monthly, 09/2002 to 09/2016, AIRS-only vs AIRS+AMSU



- AIRS-only retrieved Methane at 300hPa (about the peak sensitivity level) is generally greater(less) than AIRS+AMSU in low(high) latitude regions.
- The global average difference increases with time over the whole AMSU working period, which is not found for ozone and carbon monoxide.

Up-to-date AIRS-only Observations in Giovanni

The first snowstorm of the 2017 season in the upper Midwest and western Great Lakes occurred October 26-27. It was generated after a low-pressure system originating in the Canadian Rockies swept eastward across these regions. Over 10 inches of snow was reported in some areas of Minnesota.



Summary

- 92 of the most often used variables from the AIRS-only retrieval product were deployed in Giovanni to allow exploration of up-to-date observations following the loss of AMSU signals in late September of 2016, and also for supporting comparison of the AIRS-only with the AIRS+AMSU retrieval.
- AIRS-only and AIRS+AMSU retrievals are generally very highly correlated and agree well, with some regional exceptions.
- In most high (low) cloud regions, the AIRS-only retrieval is drier (wetter) than AIRS+AMSU.
- The global average difference (AIRS-only minus AIRS+AMSU) of retrieved Methane at 300hPa (about the peak sensitivity level) increases with time over the whole AMSU working period, which is not found in ozone and carbon monoxide retrievals.
- These comparison findings and comparison services in Giovanni can help the NASA AIRS Science Team for the development and validation of retrieval algorithm.

Contact Information

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