

New Variables and Functions on Giovanni to Enhance Service at GES DISC for NASA Sounder Data Users

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NASA Sounder Science Team Meeting

Greenbelt, MD

October 25, 2017

Outline

- New plot functions on Giovanni
 - overlay map plot, shapefile for plot and average
- New AIRS variables on Giovanni
 - AIRS-only products, multi-year monthly mean surface temperature and anomaly
- User cases with new functions and variables on Giovanni
 - Comparison of AIRS+AMSU vs AIRS-only product
 - Multi-year Monthly Mean Surface Temperature and Anomaly time series plot with Region Of Interest (ROI) using shapefile
- AIRS V6 L2 and L3 worldwide users in last 12-month

Giovanni: Time Averaged Overlay Map

File Edit View History Bookmarks Tools Help

Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/#service=TmAvOvMp&starttime=2016-01-01T00:00:00Z&endtime=2016-01-31T23:59:59Z&data=

EARTHDATA Data Discovery DAACs Community Science Disciplines

GIOVANNI The Bridge Between Data and Science v 4.23 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

MODIS OPeNDAP server continuing problem ... [1 of 3 messages] [Read More](#)

Select Plot

Maps: Time Averaged Overlay Map
 Comparisons: Select...
 Vertical: Select...
 Time Series: Select...
 Miscellaneous: Select...

Maps Choices

- Time Averaged Map
Interactive map of average over time at each grid cell
[Details...](#)
- Animation
Map animated along the chosen timeline for each grid cell
** Limited to 365 time steps*
[Details...](#)
- Difference of Time Averaged
Difference of two time averaged variable maps
[Details...](#)
- Time Averaged Overlay Map
Interactive Overlay map of average over time at each grid cell
[Details...](#)
- User-Defined Climatology
Quasi Climatology Map
[Details...](#)

Ozone (8)

Surface Temperature (4)

Platform / Instrument

AIRS (32)

Spatial Resolutions

Temporal Resolutions

daily (32)

monthly (32)

Portal

Select Region (Bounding Box or Shape)
Format: West, South, East, North

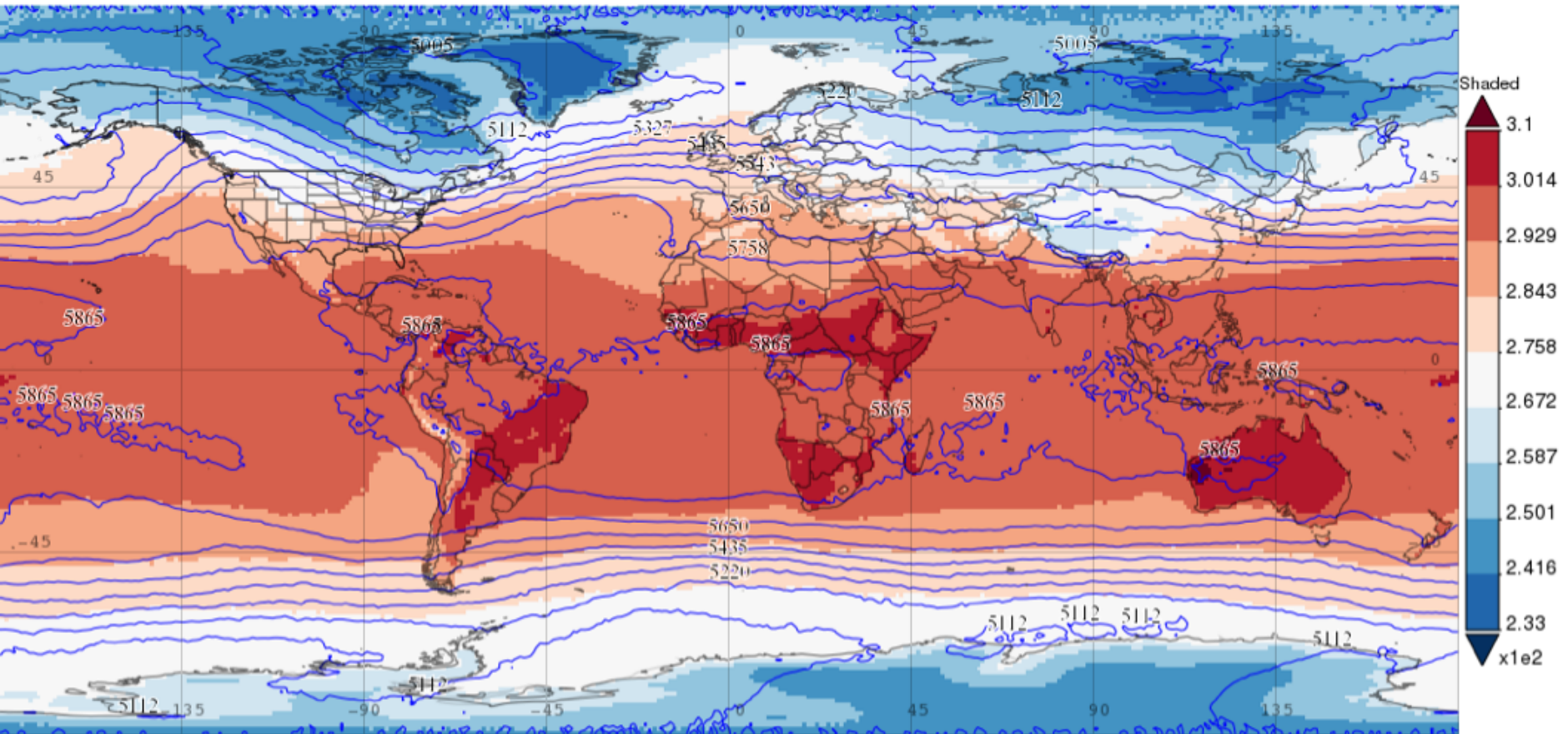
Variables: 32 of 1737 Total Variable(s) included in Plot: 2

	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units	Vert. Slice
Air temperature at surface (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	K	-
Water Vapor (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	kg/m2	-
Water Vapor (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	kg/m2	-
Relative Humidity at Surface (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	percent	1000 hPa
Relative Humidity at Surface (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	percent	1000 hPa
Air temperature at Surface (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	percent	-
Air temperature at Surface (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	percent	-
<input type="checkbox"/> Air temperature at surface (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	K	-
<input type="checkbox"/> Tropopause Temperature (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	K	-
<input type="checkbox"/> Tropopause Temperature (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	K	-
<input type="checkbox"/> Relative Humidity at Surface (Daytime/Ascending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	percent	-
<input type="checkbox"/> Relative Humidity at Surface (Nighttime/Descending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	percent	-
<input type="checkbox"/> Tropopause Temperature (Daytime/Ascending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	K	-
<input type="checkbox"/> Tropopause Temperature (Nighttime/Descending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	K	-
<input type="checkbox"/> Water Vapor Mass Mixing Ratio (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	kg/m2	-

Help Reset Feedback **Plot Data**

Giovanni: 500hPa GH Overlay on T, Jan. 2016

CONTOUR: Geopotential Height (Daytime/Ascending) monthly 1 deg. @500hPa [AIRS AIRX3STM v006] m over 2015-Jan
SHADED: Air temperature at surface (Daytime/Ascending) monthly 1 deg. [AIRS AIRX3STM v006] K over 2015-Jan



Giovanni: Shapefile

File Edit View History Bookmarks Tools Help

Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/

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GIOVANNI The Bridge Between Data and Science v 4.23 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

MODIS OPeNDAP server continuing problem ... [1 of 3 messages] [Read More](#)

Select Plot

Maps: Time Averaged Map Comparisons: Select... Vertical: Select... Time Series: Select... Miscellaneous: Select...

Select Date Range (UTC) YYYY-MM-DD HH:mm to YYYY-MM-DD HH:mm
Valid Range: 1948-01-01 to 2018-12-31

Select Region (Bounding Box or Shape) Format: West, South, East, North

Select Variables

Disciplines

- Aerosols (183)
- Atmospheric Chemi...
- Atmospheric Dynam...
- Cryosphere (15)
- Hydrology (1000)
- Ocean Biology (43)
- Oceanography (47)
- Water and Energy C...

Measurements

- Aerosol Index (3)
- Aerosol Optical Dep...
- Air Pressure Anoma...
- Air Pressure (51)
- Air Temperature Anoma...
- Air Temperature (87)
- Albedo (21)
- Altitude (8)
- Angstrom Exponent (17)
- Atmospheric Moisture (114)
- Black Carbon (5)

Select a Shape...

- Countries (source: [HIU, US State Department](#))
- Land Only file (source: [GES DISC](#))
- Sea Only file (source: [GES DISC](#))
- US States (source: [TIGER/Line, US Census Bureau](#))
- Watersheds (source: [Major Hydrological Basins, FAO \(United Nations\)](#))

Search Clear

45°00'S
135°00'W 90°00'W 45°00'W 00°00'E 45°00'E 90°00'E 135°00'E

Help Reset Feedback **Plot Data**

Countries
Land/Sea
US States
Watersheds

Giovanni: Amazon Watershed

File Edit View History Bookmarks Tools Help

Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/#service=TmAvMp&starttime=&endtime=&shape=watersheds/sh

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GIOVANNI

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Select Plot

Maps: Time Averaged Map Comparisons: Select... Vertical: Select... Time Series: Select... Miscellaneous: Select...

Select Date Range (UTC) **Select Region (Bounding Box or Shape)**

YYYY-MM-DD. HH:mm

to

Format: West, South, East, North

Watersheds Amazon;

Valid Range: 1948-01-01

Select Variables

Amazon

Disciplines

- Aerosols (183)
- Atmospheric Chemi...
- Atmospheric Dynam...
- Cryosphere (15)
- Hydrology (1000)
- Ocean Biology (43)
- Oceanography (47)
- Water and Energy C...

Measurements

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- Air Pressure (51)
- Air Temperature Anom...
- Air Temperature (87)
- Albedo (21)
- Altitude (8)
- Angstrom Exponent (17)
- Atmospheric Moisture (114)
- Black Carbon (5)

30°49' S, 172°15' E

45°00' N

00°00' N

45°00' S

135°00' W 90°00' W 45°00' W 00°00' E 45°00' E 90°00' E 135°00' E

Search Clear

Help Reset Feedback **Plot Data**

New AIRS variables on Giovanni

- 92 variables from AIRS-only products
 - 46 from daily AIRS3STD and 46 from monthly AIRS3STM
- Multi-year monthly mean surface temperature and anomaly
 - 14-year (09/2002 to 08/2016) arithmetic mean of surface air and skin temperature from monthly product AIRX3STM
 - Anomaly is the difference between a selected month and the multi-year monthly mean, done by http service

Giovanni: 92 AIRS-only Variables

File Edit View History Bookmarks Tools Help

Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/#service=TmAvMp&starttime=&endtime=&dataKeyword=AIRS-only

EARTHDATA Data Discovery DAACs Community Science Disciplines

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Select Plot

Maps: Time Averaged Map
 Comparisons: Select...
 Vertical: Select...
 Time Series: Select...
 Miscellaneous: Select...

Select Date Range (UTC)

YYYY-MM-DD HH:mm

- : to - :

Valid Range: 1948-01-01 to 2017-09-26

Please specify a start date.

Select Region (Bounding Box or Shape)

Format: West, South, East, North

Select Variables

Number of matching Variables: 92 of 1745 Total Variable(s) included in Plot: 0

Please select at least 1 variable

Keyword:

Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units	Vert. Slice
<input type="checkbox"/> Air temperature at surface (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	K	-
<input type="checkbox"/> Ozone Total Column (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	DU	-
<input type="checkbox"/> Ozone Total Column (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	DU	-
<input type="checkbox"/> Tropopause Height (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	m	-
<input type="checkbox"/> Tropopause Height (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	m	-
<input type="checkbox"/> Air Temperature at Surface (Nighttime/Descending, AIRS-only) (AIRS3STD v006)	AIRS	Daily	1°	2002-08-31	2017-09-24	K	-
<input type="checkbox"/> Ozone Total Column (Daytime/Ascending, AIRS-only) (AIRS3STD v006)	AIRS	Daily	1°	2002-08-31	2017-09-24	DU	-
<input type="checkbox"/> Ozone Total Column (Nighttime/Descending, AIRS-only) (AIRS3STD v006)	AIRS	Daily	1°	2002-08-31	2017-09-24	DU	-
<input type="checkbox"/> Tropopause Height (Daytime/Ascending, AIRS-only) (AIRS3STD v006)	AIRS	Daily	1°	2002-08-31	2017-09-24	m	-
<input type="checkbox"/> Tropopause Height (Nighttime/Descending, AIRS-only) (AIRS3STD v006)	AIRS	Daily	1°	2002-08-31	2017-09-24	m	-
<input type="checkbox"/> Total Column Water Vapor (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	kg/m2	-
<input type="checkbox"/> Total Column Water Vapor (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	kg/m2	-
<input type="checkbox"/> Cloud Fraction (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	-	-
<input type="checkbox"/> Cloud Fraction (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	-	-
<input type="checkbox"/> Cloud Top Pressure (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	hPa	-
<input type="checkbox"/> Cloud Top Pressure (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	hPa	-
<input type="checkbox"/> Cloud Top Temperature (Daytime/Ascending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	K	-
<input type="checkbox"/> Cloud Top Temperature (Nighttime/Descending, AIRS-only) (AIRS3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	K	-

AIRS-only
 AIRS3STD
 AIRS3STM

Giovanni: Multi-year Monthly Mean Surface Temperature and Anomaly

Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/#service=TmAvMp&starttime=2002-09-01T00:00:00Z&endtime=2016-07-31T23:59:59Z

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Select Plot

Maps: Time Averaged Map Comparisons: Select... Vertical: Select... Time Series: Select... Miscellaneous: Select...

Select Date Range (UTC)

MM HH:mm -09 - 00:00 to -07 - 23:59

Valid Range: 2002-09-01 to 2016-08-31

Select Region (Bounding Box or Shape)

Format: West, South, East, North

Select Variables

Disciplines

- Atmospheric Dynamics (4)

Measurements

- Air Temperature Anomaly (2)
- Surface Temperature Anomaly (2)

Platform / Instrument

Spatial Resolutions

Temporal Resolutions

Portal

Number of matching Variables: 4 of 1745 Total Variable(s) included in Plot: 4

Keyword: AIRGX3STMMA Search Clear

	Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
<input checked="" type="checkbox"/>	Multi-year Monthly Mean (2002-2016) of Air temperature at surface (Daytime/Ascending) (AIRGX3STMM v006)	AIRS	Monthly	1°	2002-09-01	2016-08-31	K
<input checked="" type="checkbox"/>	Multi-year Monthly Mean (2002-2016) of Air temperature at surface (Nighttime/Descending) (AIRGX3STMM v006)	AIRS	Monthly	1°	2002-09-01	2016-08-31	K
<input checked="" type="checkbox"/>	Multi-year Monthly Mean (2002-2016) of Surface Temperature (Daytime/Ascending) (AIRGX3STMM v006)	AIRS	Monthly	1°	2002-09-01	2016-08-31	K
<input checked="" type="checkbox"/>	Multi-year Monthly Mean (2002-2016) of Surface Temperature (Nighttime/Descending) (AIRGX3STMM v006)	AIRS	Monthly	1°	2002-09-01	2016-08-31	K
<input type="checkbox"/>	Anomaly of air temperature at surface (Daytime/Ascending) (AIRGX3STMMA v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	K
<input type="checkbox"/>	Anomaly of air temperature at surface (Nighttime/Descending) (AIRGX3STMMA v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	K
<input type="checkbox"/>	Anomaly of Surface Temperature (Daytime/Ascending) (AIRGX3STMMA v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	K
<input type="checkbox"/>	Anomaly of Surface Temperature (Nighttime/Descending) (AIRGX3STMMA v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	K

AIRGX3STMM
AIRGX3STMMA

Responsible NASA Official: Long Pham
Web Curator: M. Hegde
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Powered By: NCAR

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Help Reset Feedback Plot Data

Use Case

- Comparison of AIRS+AMSU with AIRS-only product using Giovanni

Total Column Water Vapor Daytime Monthly

Jan. to Dec. of year 2015

Giovanni: Comparison Function

The screenshot shows the Giovanni web interface with the 'Comparisons Choices' dropdown menu open. The 'Map, Correlation' option is selected. The table below lists the variables included in the plot.

Map, Correlation
Simple linear regression of 2 variables at each grid cell
[Details...](#)

Scatter, Area Averaged (Static)
Scatter plot comparing area averaged time series for two variables
[Details...](#)

Scatter, Time-Averaged (Interactive)
Time-averaged, interactive X-Y plot of 2 variables
[Details...](#)

Scatter (Interactive)
Interactive Scatter
[Details...](#)

Scatter (Static)
Static Scatter
[Details...](#)

Source	Temp.Res.	Start Date	End Date	Units	Vert. Slice
AIRS	Monthly	2002-09-01	2016-09-30	kg/m2	-
AIRS	Monthly	2002-09-01	2017-08-31	kg/m2	-
AIRS	Monthly	2002-09-01	2016-09-30	gm/kg	1000 hPa
AIRS	Monthly	2002-09-01	2016-09-30	gm/kg	1000 hPa
AIRS	Monthly	2002-09-01	2016-09-30	g/kg	-
AIRS	Monthly	2002-09-01	2016-09-30	g/kg	-
AIRS	Monthly	2002-09-01	2016-09-30	percent	-
AIRS	Monthly	2002-09-01	2016-09-30	percent	-

Buttons: Help, Reset, Feedback, Plot Data

Giovanni: Comparison of AIRS+AMSU vs AIRS-only

File Edit View History Bookmarks Tools Help

Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/#service=CoMp&starttime=2015-01-01T00:00:00Z&endtime=2015-12-31T23:59:59Z

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Select Plot

Maps: Select... **Comparisons: Map, Correlation** Vertical: Select... Time Series: Select... Miscellaneous: Select...

Select Date Range (UTC) YYYY-MM HH:mm
 2015 -01 -01 00:00 to 2015 -12 -31 23:59
 Valid Range: 2002-09-01 to 2016-09-30

Select Region (Bounding Box or Shape)
 Format: West, South, East, North

Select Variables

► Disciplines

▼ Measurements

- Air Pressure (4)
- Air Temperature Anomaly (2)
- Air Temperature (14)
- Altitude (4)
- Atmospheric Moisture (20)
- CH4 (8)
- CO (8)
- CO2 (2)
- Cloud Fraction (4)
- Cloud Properties (8)
- Geopotential (4)
- OLR (8)
- Ozone (8)
- Surface Temperature Anomaly (2)
- Surface Temperature (6)

▼ Platform / Instrument

- AIRS (20)
- FLDAS Model (12)
- GLDAS Model (4)
- MERRA Model (7)
- MERRA-2 Model (13)

Number of matching Variables: 20 of 1745 Total Variables, if included in Plot 2

Keyword: Search Clear

	Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units	Vert. Slice
<input checked="" type="checkbox"/>	Total Column Water Vapor (Daytime/Ascending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	kg/m2	-
<input checked="" type="checkbox"/>	Total Column Water Vapor (Daytime/Ascending, AIRS-only) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2017-08-31	kg/m2	-
<input type="checkbox"/>	Water Vapor Mass Mixing Ratio (Daytime/Ascending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	gm/kg	1000 hPa
<input type="checkbox"/>	Water Vapor Mass Mixing Ratio (Nighttime/Descending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	gm/kg	1000 hPa
<input type="checkbox"/>	Water Vapor Mass Mixing Ratio at Surface (Daytime/Ascending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	g/kg	-
<input type="checkbox"/>	Water Vapor Mass Mixing Ratio at Surface (Nighttime/Descending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	g/kg	-
<input type="checkbox"/>	Relative Humidity at Surface (Daytime/Ascending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	percent	-
<input type="checkbox"/>	Relative Humidity at Surface (Nighttime/Descending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	percent	-
<input type="checkbox"/>	Relative Humidity (Daytime/Ascending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	percent	1000 hPa
<input type="checkbox"/>	Relative Humidity (Nighttime/Descending) (AIRX3STM v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	percent	1000 hPa

Help Reset Feedback **Plot Data**

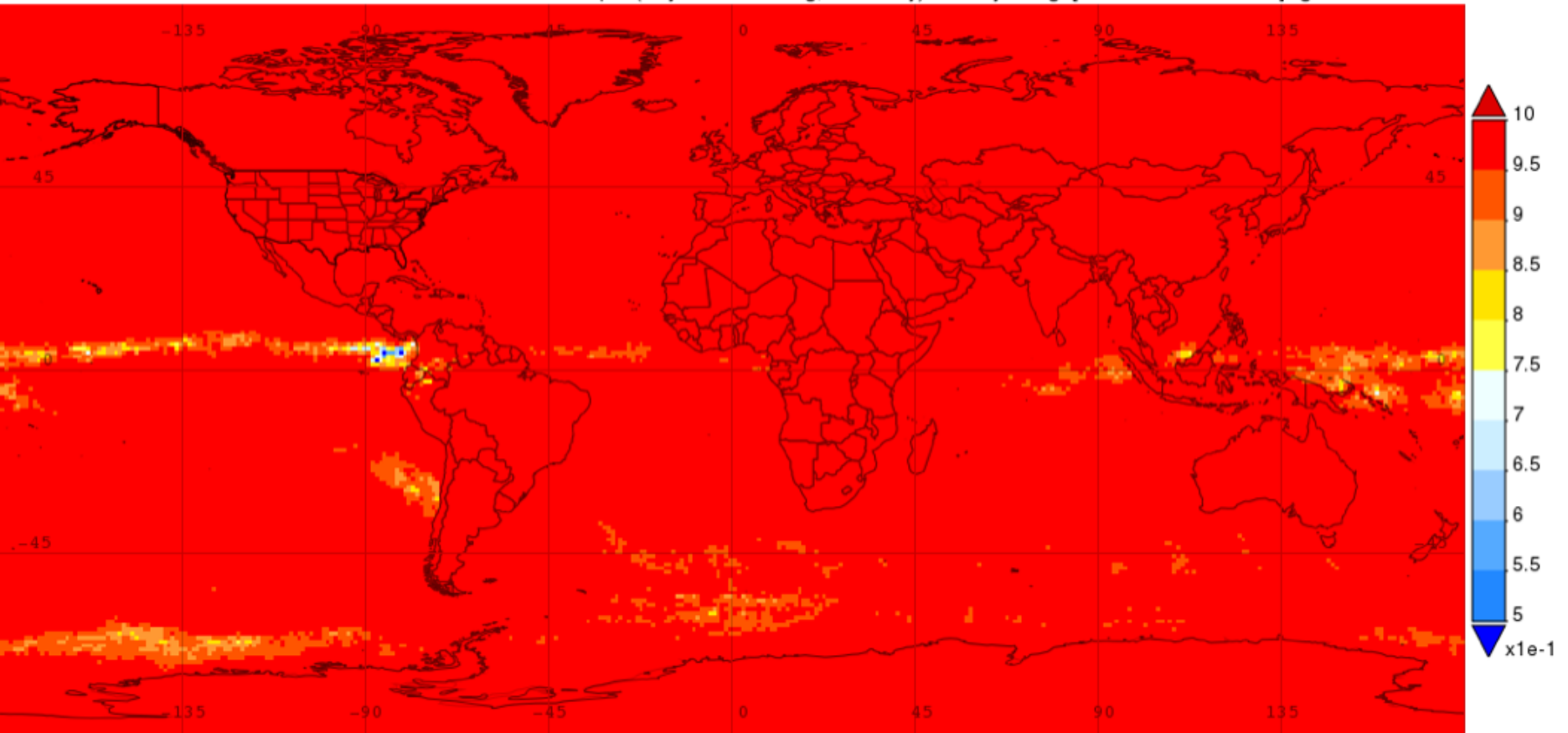
Monthly Total Column Water Vapor
 Daytime Jan to Dec. of year 2015

Giovanni: Correlation Map Plot

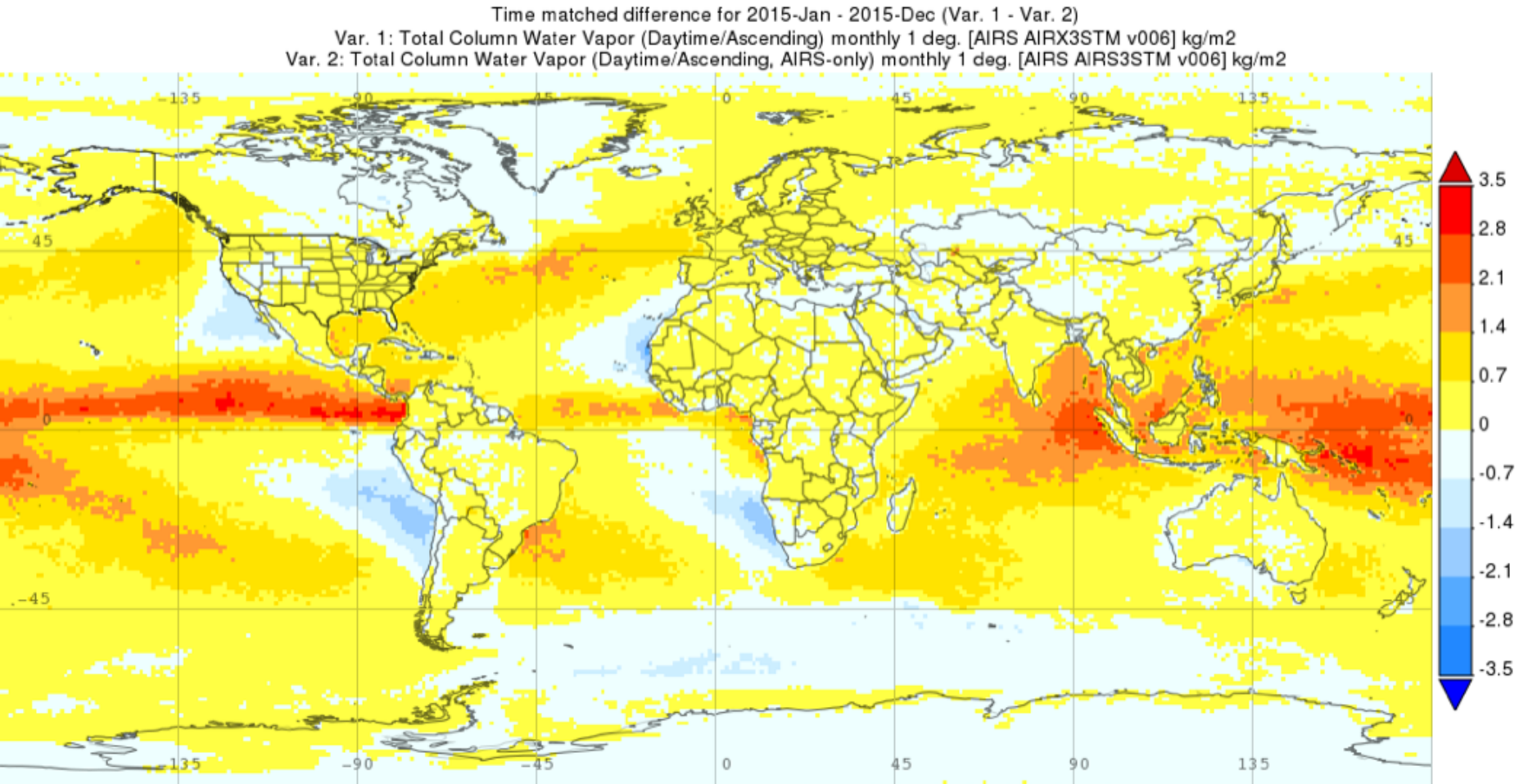
AIRS+AMSU vs AIRS-only

Correlation for 2015-Jan - 2015-Dec

1st Variable: Total Column Water Vapor (Daytime/Ascending) monthly 1 deg. [AIRS AIRX3STM v006] kg/m²
2nd Variable: Total Column Water Vapor (Daytime/Ascending, AIRS-only) monthly 1 deg. [AIRS AIRS3STM v006] kg/m²

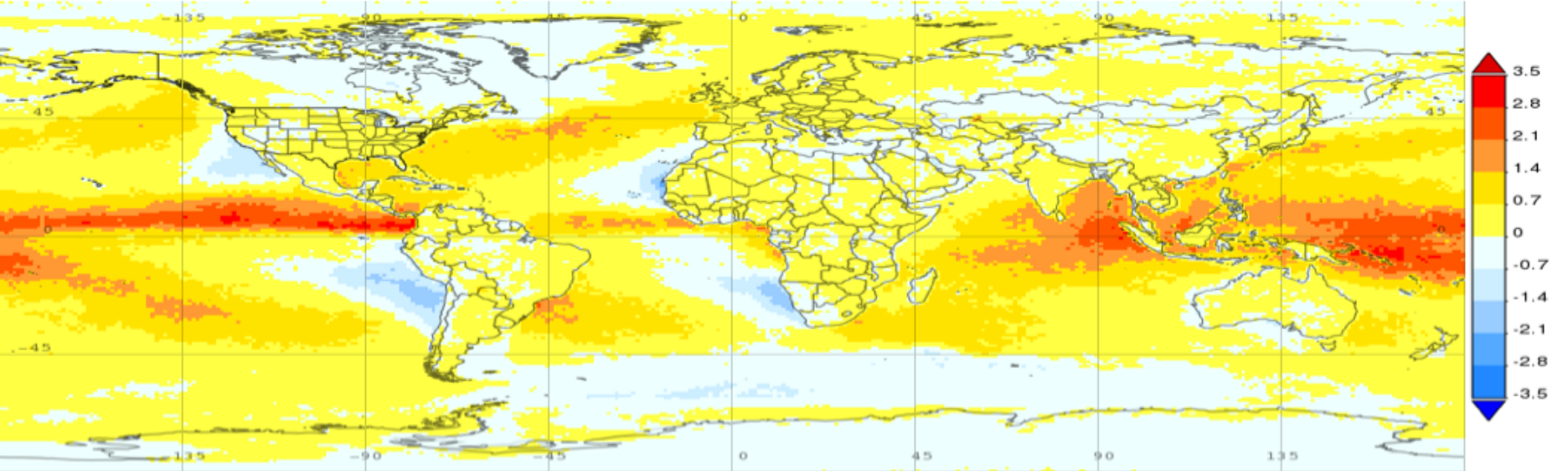


Giovanni: Time Matched Difference Plot AIRS+AMSU vs AIRS-only

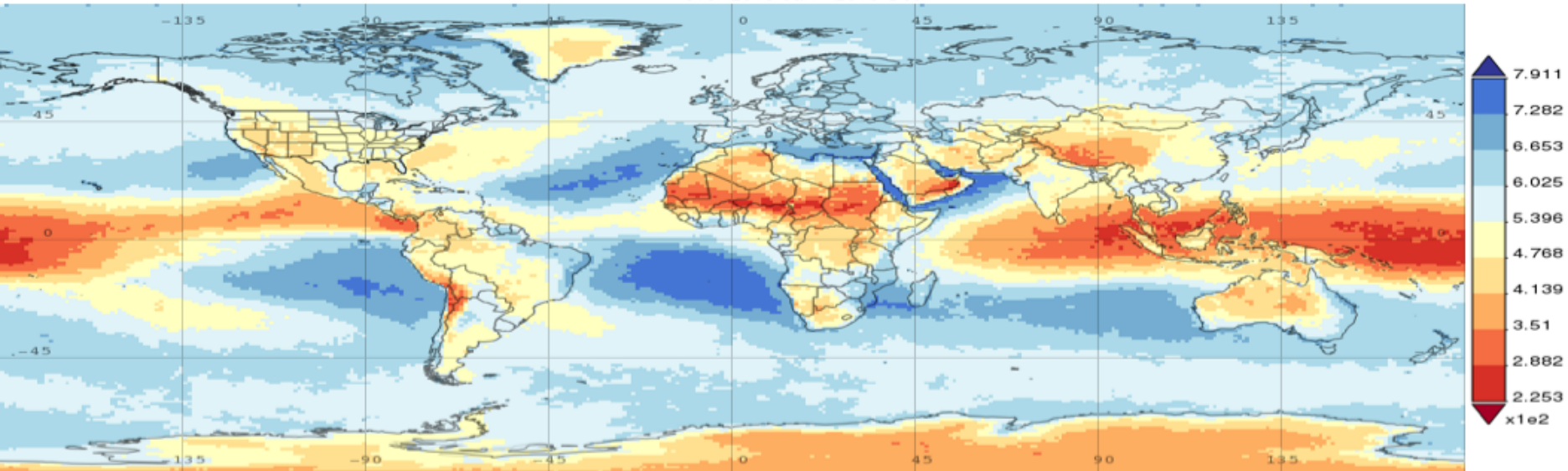


high clouds regions: IR-Only drier than AIRS+AMSU
low clouds regions: IR-Only wetter than AIRS+AMSU

Time matched difference for 2015-Jan - 2015-Dec (Var. 1 - Var. 2)
Var. 1: Total Column Water Vapor (Daytime/Ascending) monthly 1 deg. [AIRS AIRX3STM v006] kg/m²
Var. 2: Total Column Water Vapor (Daytime/Ascending, AIRS-only) monthly 1 deg. [AIRS AIRS3STM v006] kg/m²



Time Averaged Map of Cloud Top Pressure (Daytime/Ascending) monthly 1 deg. [AIRS AIRX3STM v006] hPa
over 2015-Jan - 2015-Dec



Giovanni: Time Averaged **Interactive** Scatter Plot AIRS+AMSU vs AIRS-only

File Edit View History Bookmarks Tools Help

Giovanni - Data Selection

https://giovanni.gsfc.nasa.gov/giovanni/#service=TmAvSc&starttime=2015-01-01T00:00:00Z&endtime=2015-01-31T...

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Select Plot

Maps: Select...
 Comparisons: Scatter, Time-Averaged (Interactive)
 Vertical: Select...
 Time Series: Select...
 Miscellaneous: Select...

Select Date Range (UTC) **Select Region (Bounding Box or Shape)**

YYYY-MM HH:mm Format: West, South, East, North

2015 -01 -01 00:00 to 2015 -01 -31 23:59 -110,0,-70,10

Valid Range: 2002-09-01

Select Variables

Select a Shape...

Disciplines

- Aerosols (183)
- Atmospheric Chemi...
- Atmospheric Dynam...
- Cryosphere (15)
- Hydrology (1000)
- Ocean Biology (43)
- Oceanography (47)
- Water and Energy C...

Measurements

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- Air Pressure (51)
- Air Temperature Anomaly (2)
- Air Temperature (87)
- Albedo (21)
- Altitude (8)
- Angstrom Exponent (17)
- Atmospheric Moisture (114)
- Black Carbon (5)
- Buoyancy (2)
- CH4 (46)

81°40'N, 43°35'E

45°00'N

00°00'N

45°00'S

135°00'W 90°00'W 45°00'W 00°00'E 45°00'E 90°00'E 135°00'E

110W - 70W, 0 - 10N
Jan 2015

Search Clear

	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
	AIRS	Monthly	1°	2002-09-01	2016-09-30	kg/m2
TM	AIRS	Monthly	1°	2002-09-01	2017-08-31	kg/m2

Help Reset Feedback **Plot Data** Go to Results

https://giovanni.gsfc.nasa.gov/giovanni/#

Giovanni: Time Averaged **Interactive** Scatter Plot AIRS+AMSU vs AIRS-only

File Edit View History Bookmarks Tools Help

Giovanni - Scatter, Time-Ave X +

https://giovanni.gsfc.nasa.gov/giovanni/#service=TmAvSc&starttime=2015-01-01T00:00:00Z&endtime=2015-01-31T00:00:00Z Search

EARTHDATA Data Discovery DAACs Community Science Disciplines

GIOVANNI

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MODIS OPeNDAP server continuing problem ... [1 of 3 messages] [Read More](#)

Browse History

- 7. Scatter, Time-Averaged (Interactive)**
 - User Input
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- 6. Scatter, Time-Averaged (Interactive)
 - User Input
 - Plots
 - Plot Options
 - Downloads
 - Lineage
- 5. Scatter, Time-Averaged (Interactive)
 - User Input
 - Plots
 - Plot Options
 - Downloads
 - Lineage
- 4. Scatter, Time-Averaged (Interactive)
 - User Input
 - Plots
 - Plot Options
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 - Lineage
- 3. Scatter, Time-Averaged (Interactive)
 - User Input
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 - Plot Options
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 - Lineage
- 2. Scatter, Time-Averaged (Interactive)
 - User Input
 - Plots
 - Plot Options

Drag bounding box on plot to subset data

2015-01
Latitude: 0.5 to 9.5
Longitude: -109.5 to -70.5
Regression: $y = 0.9028x + 3.093$, R: 0.9797, N: 400

Total Column Water Vapor (Daytime/Ascending, AIRS-only) monthly 1 deg. [AIRS AIRS3STM v006] kg/m2

Total Column Water Vapor (Daytime/Ascending) monthly 1 deg. [AIRS AIRX3STM v006] kg/m2

Highcharts.com

Drag bounding box on map to subset data

Corresponding Pair Data for Lon: -101.04167175293, Lat: 5.900015258789:
x: 47.070, y: 43.984

Cursor Lon: -101.2917 Lat: 5.9000

Reset Map and Chart

[Acknowledgment Policy](#) Help Feedback Back to Data Selection

Use Case

- Multi-year Monthly Mean Surface Temperature and Anomaly time series plot with ROI using shapefile

Multi-year Monthly Mean Surface Temperature time series plot over Global, Land, and Sea

Surface Air Temperature Anomaly inter-annual seasonal (DJF) time series plot over California from 2008 to 2016

Giovanni: Time Series

The screenshot shows the Giovanni web interface with the following elements:

- URL:** <https://giovanni.gsfc.nasa.gov/giovanni/#service=ArAvTs&starttime=2002-01-01T00:00:00Z&endtime=2016-12-31T23:59:59Z>
- Navigation:** EARTHDATA, Data Discovery, DAACs, Community, Science Disciplines.
- Header:** GIOVANNI The Bridge Between Data and Science v 4.23 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)
- Message:** Time series area statistics temporarily unavailable ... [1 of 2 messages] [Read More](#)
- Select Plot:** Maps, Comparisons, Vertical, **Time Series: Area-Averaged**, Miscellaneous.
- Select Date Range (UTC):** YYYY-MM-DD HH:mm to YYYY-MM-DD HH:mm. Range: 2002 - 01 - 01 00 : 00 to 2016 - 12 - 31 23 : 59. Valid Range: 1948-01-01 to 2017-10-25.
- Select Region:** Format: West, S...
- Select Variables:** Disciplines (Aerosols, Atmospheric Chemistry, etc.) and Measurements (Aerosol Index, Aerosol Optical Depth, etc.). Number of matching Variables: 0 of 1776. Please select at least 1 variable. Keyword: [input field].
- Time Series Choices (pop-up):**
 - Hovmoller, Longitude-Averaged**
Longitude-averaged Hovmoller, plotted over the selected time and latitude ranges
[Details...](#)
 - Hovmoller, Latitude-Averaged**
Latitude-averaged Hovmoller, plotted over the selected time and longitude ranges
[Details...](#)
 - Area-Averaged Differences**
Time series of area averages of differences between two variables at each spatial grid point
[Details...](#)
 - Area-Averaged**
Time series of area-averaged values
[Details...](#)
 - Seasonal**
Seasonal (inter annual) time series
[Details...](#)
- Footer:** Help, Reset, Feedback, **Plot Data**

Hovmoller, Longitude-Averaged
Hovmoller, Latitude-Averaged
Area-Average Difference
Area-Averaged
Seasonal/monthly (inter-annual)

Giovanni: Time Series of Multi-year Monthly Mean Surface T Daytime Jan. to Dec. Global Averaged

Giovanni - Data Selection

https://giovanni.gsfc.nasa.gov/giovanni/#service=ArAvTs&starttime=2002-01-01T00:00:00Z&endtime=2016-12-31T23:59:59

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MODIS OPeNDAP server continuing problem ... [1 of 3 messages] [Read More](#)

Select Plot

Maps: *Select...* Comparisons: *Select...* Vertical: *Select...* **Time Series: Area-Averaged** Miscellaneous: *Select...*

Select Date Range (UTC) **Select Region (Bounding Box or Shape)**

MM HH:mm -01 - 00:00 to -12 - 23:59
Valid Range: 2002-09-01 to 2016-08-31

Select Variables

Number of matching Variables: 0 of 1755 Total Variable(s) included in Plot: 1

Keyword:

Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
<input checked="" type="checkbox"/> Multi-year Monthly Mean (2002-2016) of Surface Temperature (Daytime/Ascending) (AIRGX3STMM v006)	AIRS	Monthly	1°	2002-09-01	2016-08-31	K

Select a Shape...

Giovanni: Time Series of Multi-year Monthly Mean Surface T Daytime Jan. to Dec. Land Only

Giovanni - Data Selection

https://giovanni.gsfc.nasa.gov/giovanni/#service=ArAvTs&starttime=2002-01-01T00:00:00Z&endtime=2016-12-31T23:59:59

GIOVANNI The Bridge Between Data and Science v 4.23 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

MODIS OPeNDAP server continuing problem ... [1 of 3 messages] [Read More](#)

Select Plot

Maps: Select...
 Comparisons: Select...
 Vertical: Select...
 Time Series: Area-Averaged
 Miscellaneous: Select...

Select Date Range (UTC)

MM HH:mm -01 - 00:00 to -12 - 23:59

Valid Range: 2002-09-01 to 2016-08-31

Select Region (Bounding Box or Shape)

Format: West, South, East, North

Land Only file Land Only 1800x3600 0.1 x

Select Variables

Number of matching Variables: 0 of 1755 Total Variable(s) included in Plot: 1

Keyword: Search Clear

	Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
<input checked="" type="checkbox"/>	Multi-year Monthly Mean (2002-2016) of Surface Temperature (Daytime/Ascending) (AIRGX3STMM v006)	AIRS	Monthly	1 °	2002-09-01	2016-08-31	K

Disciplines

- Aerosols (183)
- Atmospheric Chemistry (79)
- Atmospheric Dynamics (394)
- Cryosphere (15)
- Hydrology (1000)
- Ocean Biology (49)
- Oceanography (50)
- Water and Energy Cycle (1068)

Measurements

- Aerosol Index (3)
- Aerosol Optical Depth (84)
- Air Pressure Anomaly (1)
- Air Pressure (51)
- Air Temperature Anomaly (2)
- Air Temperature (88)
- Albedo (21)
- Altitude (8)
- Angstrom Exponent (17)
- Atmospheric Moisture (114)
- Black Carbon (5)
- Buoyancy (2)
- CH4 (16)
- CO (21)
- CO2 (2)
- Canopy Water Storage (6)
- Chlorophyll (11)
- Cloud Fraction (32)

Land Only 1800x3600 0.1 x 0.1 deg

Help Reset Feedback **Plot Data** Go to Results

Giovanni: Time Series of Multi-year Monthly Mean Surface T Daytime Jan. to Dec. Sea Only

Giovanni - Data Selection

https://giovanni.gsfc.nasa.gov/giovanni/#service=ArAvTs&starttime=2002-01-01T00:00:00Z&endtime=2016-12-31T23:59:59

EARTHDATA Data Discovery DAACs Community Science Disciplines

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MODIS OPeNDAP server continuing problem ... [1 of 3 messages] [Read More](#)

Select Plot

Maps: *Select...* Comparisons: *Select...* Vertical: *Select...* **Time Series: Area-Averaged** Miscellaneous: *Select...*

Select Date Range (UTC) **Select Region (Bounding Box or Shape)**

MM HH:mm 01 - 00 : 00 to 12 - 23 : 59

Format: West, South, East, North

Sea Only file Sea Only 1800x3600 0.1 x 0.1

Valid Range: 2002-09-01 to 2016-08-31

Select Variables

Number of matching Variables: 0 of 1755 Total Variable(s) included in Plot: 1

Keyword: Search Clear

Variable	Source	Temp. Res.	Spat. Res.	Begin Date	End Date	Units
<input checked="" type="checkbox"/> Multi-year Monthly Mean (2002-2016) of Surface Temperature (Daytime/Ascending) (AIRGX3STMM v006)	AIRS	Monthly	1 °	2002-09-01	2016-08-31	K

Disciplines

- Aerosols (183)
- Atmospheric Chemistry (79)
- Atmospheric Dynamics (394)
- Cryosphere (15)
- Hydrology (1000)
- Ocean Biology (49)
- Oceanography (50)
- Water and Energy Cycle (1068)

Measurements

- Aerosol Index (3)
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- Air Pressure Anomaly (1)
- Air Pressure (51)
- Air Temperature Anomaly (2)
- Air Temperature (88)
- Albedo (21)
- Altitude (8)
- Angstrom Exponent (17)
- Atmospheric Moisture (114)
- Black Carbon (5)
- Buoyancy (2)
- CH4 (16)
- CO (21)
- CO2 (2)
- Canopy Water Storage (6)
- Chlorophyll (11)
- Cloud Fraction (32)

Sea Only 1800x3600 0.1 x 0.1 deg

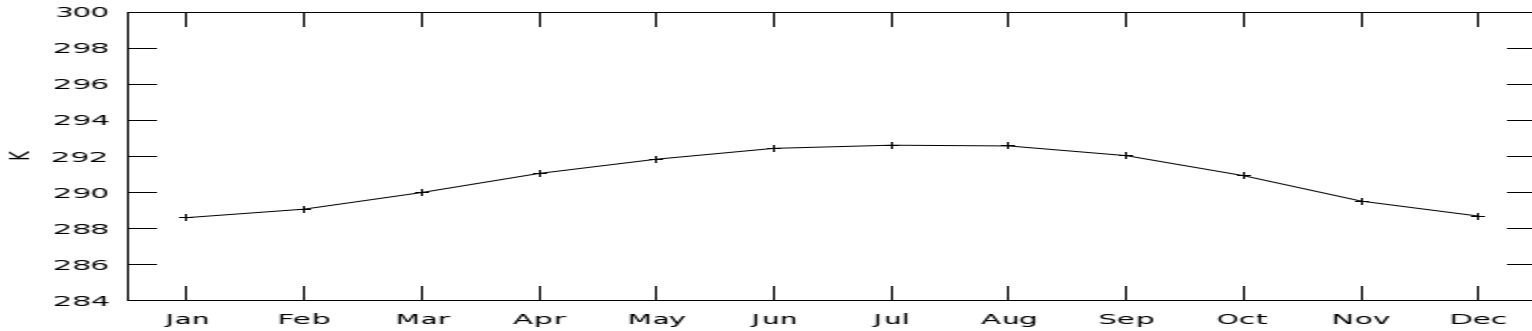
00°49'N, 37°15'W
45°00'N
00°00'N
45°00'N

135°00'W 90°00'W 45°00'W 00°00'E 45°00'E 90°00'E 135°00'E

Help Reset Feedback **Plot Data** Go to Results

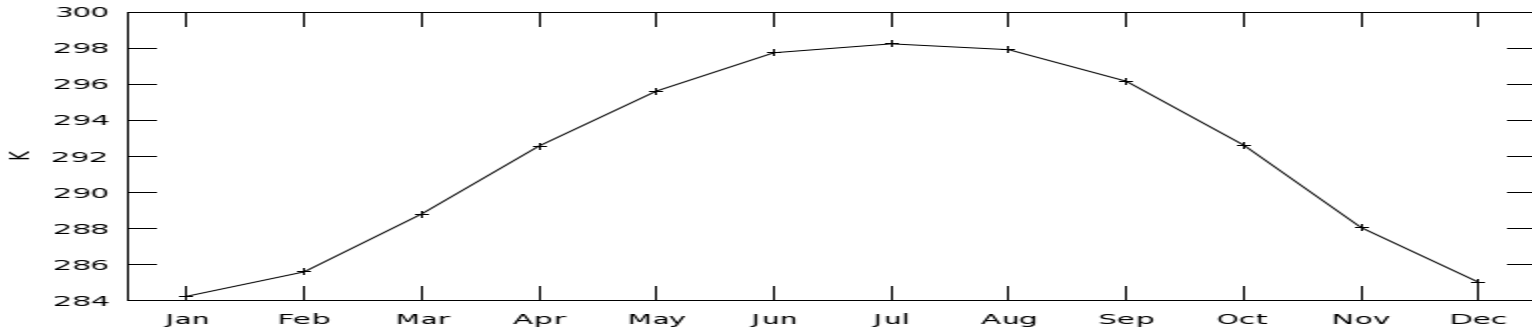
Global, Land, Sea Surface Temperature

Time Series, Area-Averaged of Multi-year Monthly Mean (2002-2016) of Surface Temperature (Daytime/Ascending) monthly 1 deg. [AIRS AIRGX3STMM v006] K over Jan - Dec



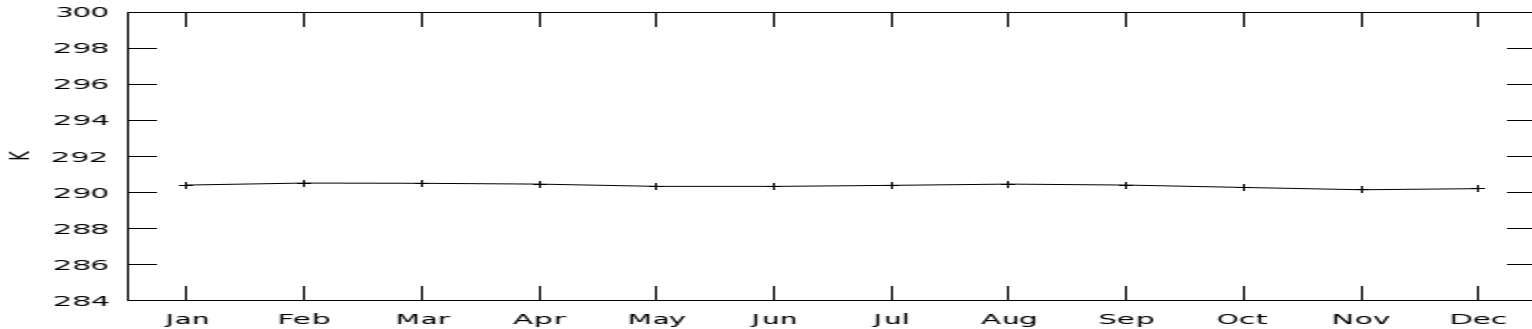
Global

Time Series, Area-Averaged of Multi-year Monthly Mean (2002-2016) of Surface Temperature (Daytime/Ascending) monthly 1 deg. [AIRS AIRGX3STMM v006] K over Jan - Dec, Shape Land Only 1800x3600 0.1 x 0.1 deg



Land

Time Series, Area-Averaged of Multi-year Monthly Mean (2002-2016) of Surface Temperature (Daytime/Ascending) monthly 1 deg. [AIRS AIRGX3STMM v006] K over Jan - Dec, Shape Sea Only 1800x3600 0.1 x 0.1 deg



Sea

Giovanni: Surface Air Temperature Anomaly inter-annual seasonal (DJF) time series plot over California from 2008 to 2016

Giovanni

https://giovanni.gsfc.nasa.gov/giovanni/#service=InTs&starttime=2008-01-01T00:00:00Z&endtime=2016-12-31T23:59:59Z&seasons=DJF&

EARTHDATA Data Discovery DAACs Community Science Disciplines

GIOVANNI The Bridge Between Data and Science v 4.23 [Release Notes](#) [Browser Compatibility](#) [Known Issues](#)

Time series area statistics temporarily unavailable ... [1 of 2 messages] [Read More](#)

Select Plot

Maps: *Select...* Comparisons: *Select...* Vertical: *Select...* **Time Series: Seasonal** Miscellaneous: *Select...*

Select Seasonal Dates
Month or Season and YYYY range.
DJF 2008 to 2016

Select Region (Bounding Box or Shape)
Format: West, South, East, North
US States California;

Select months or seasons [X] 6-09-30 Select seasons or months

Months Seasons

- DJF
- MAM
- JJA
- SON

Number of matching Variables: 0 of 1776 Total Variable(s) included in Plot: 1

Keyword: Search Clear

Variable	Source	Temp.Res.	Spat.Res.	Begin Date	End Date	Units
<input checked="" type="checkbox"/> Anomaly of air temperature at surface (Daytime/Ascending) (AIRGX3STMMA v006)	AIRS	Monthly	1°	2002-09-01	2016-09-30	K

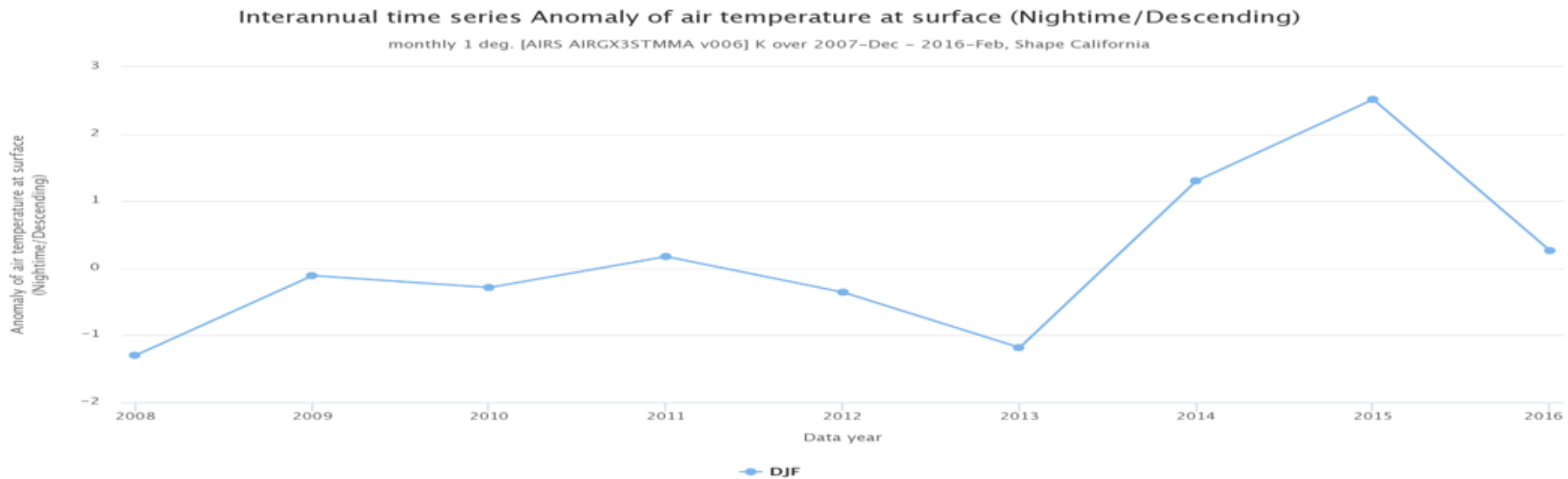
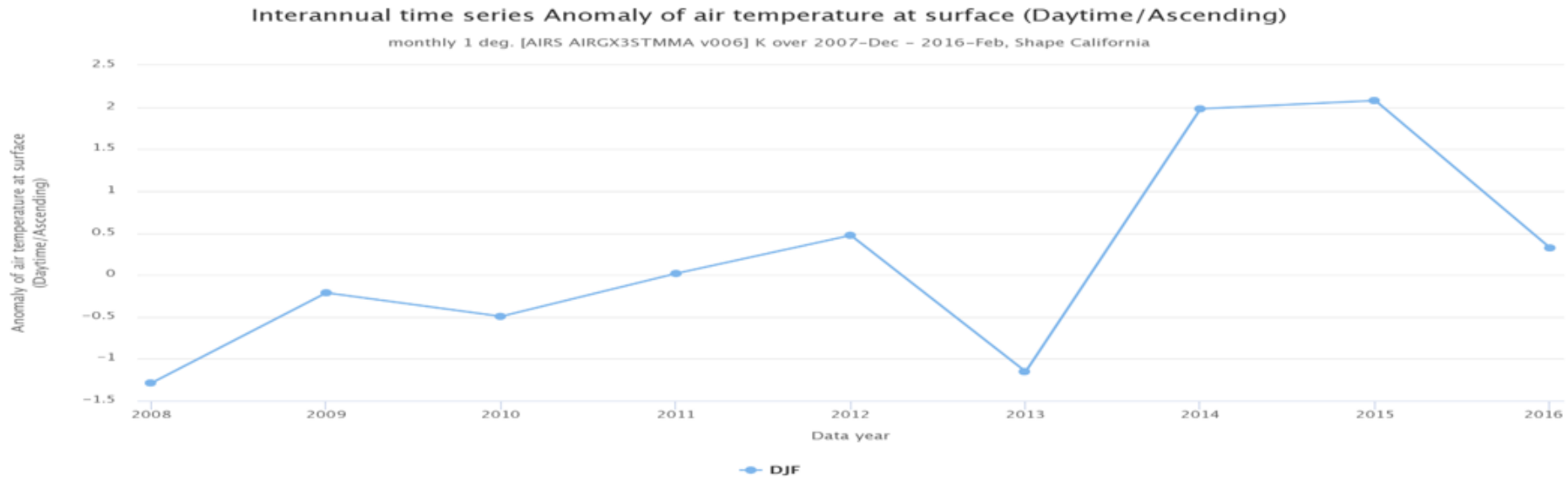
Measurements

- Aerosol Optical Depth (44)
- Air Pressure Anomaly (1)
- Air Pressure (35)
- Air Temperature Anomaly (2)
- Air Temperature (58)
- Albedo (11)
- Altitude (4)
- Angstrom Exponent (9)
- Atmospheric Moisture (71)
- Black Carbon (4)
- Buoyancy (2)
- CH4 (8)
- CO (13)
- CO2 (2)
- Canopy Water Storage (5)
- Chlorophyll (10)
- Cloud Fraction (21)

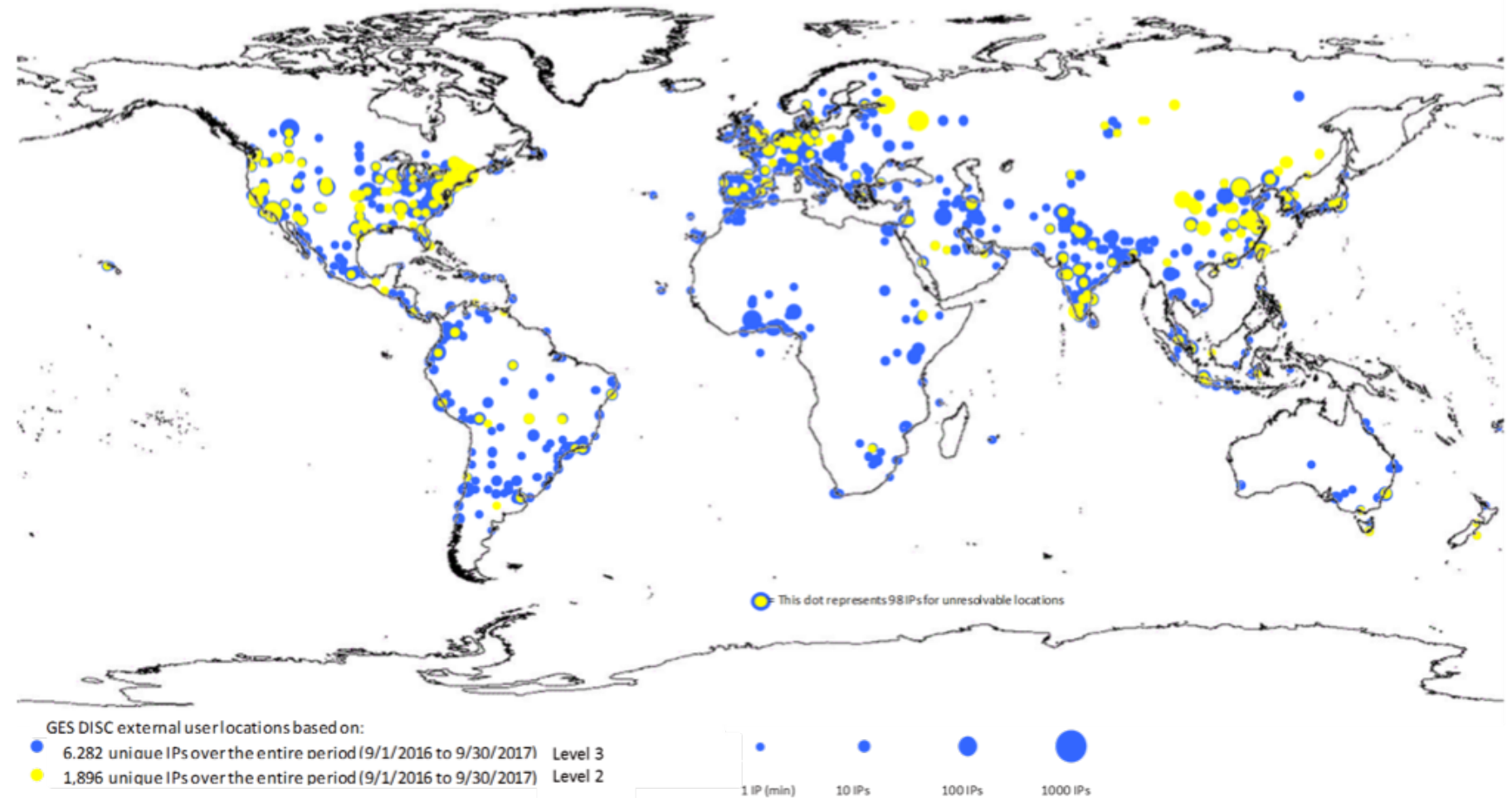
California

Help Reset Feedback **Plot Data**

Giovanni: Surface Air Temperature Anomaly inter-annual seasonal (DJF) time series plot over California from 2008 to 2016



AIRS V6 L2 (yellow) and L3 (blue) users from Sept 2016 to Sept 2017



Summary

- Overlay map plot and shapefile functions added on Giovanni
- AIRS-only products and multi-year monthly mean surface temperature and anomaly available on Giovanni
- New functions and variables give users more flexibility of analysis
- AIRS products are used worldwide

<https://giovanni.gsfc.nasa.gov/>

<https://disc.gsfc.nasa.gov/>

gsfc-help-disc@lists.nasa.gov