



CO Hands–on Activity:

*Hands-on activity II: Downloading L2 AIRS data
&
Visualizing L2 AIRS data (a time-consuming
alternative to using IDL or Matlab to make pretty
plots)*

AIRS Online Visualization and Analysis

AIRS Global 1.0° x 1.0° Daily Level-3 Products

To build on the success of the previous version of the Giovanni online analysis tool, this Giovanni-3 interface has been redesigned to improve visualization and analysis of the AIRS Global 1.0° x 1.0° daily Level-3 Products. By choosing various data services below, users can create area plots, time series plots, Hovmöller diagrams and animations or compare different flavors of AIRS Level-3 data. Results can be downloaded either in HDF or ASCII format. Please check [data availability](#) to ensure a successful run.

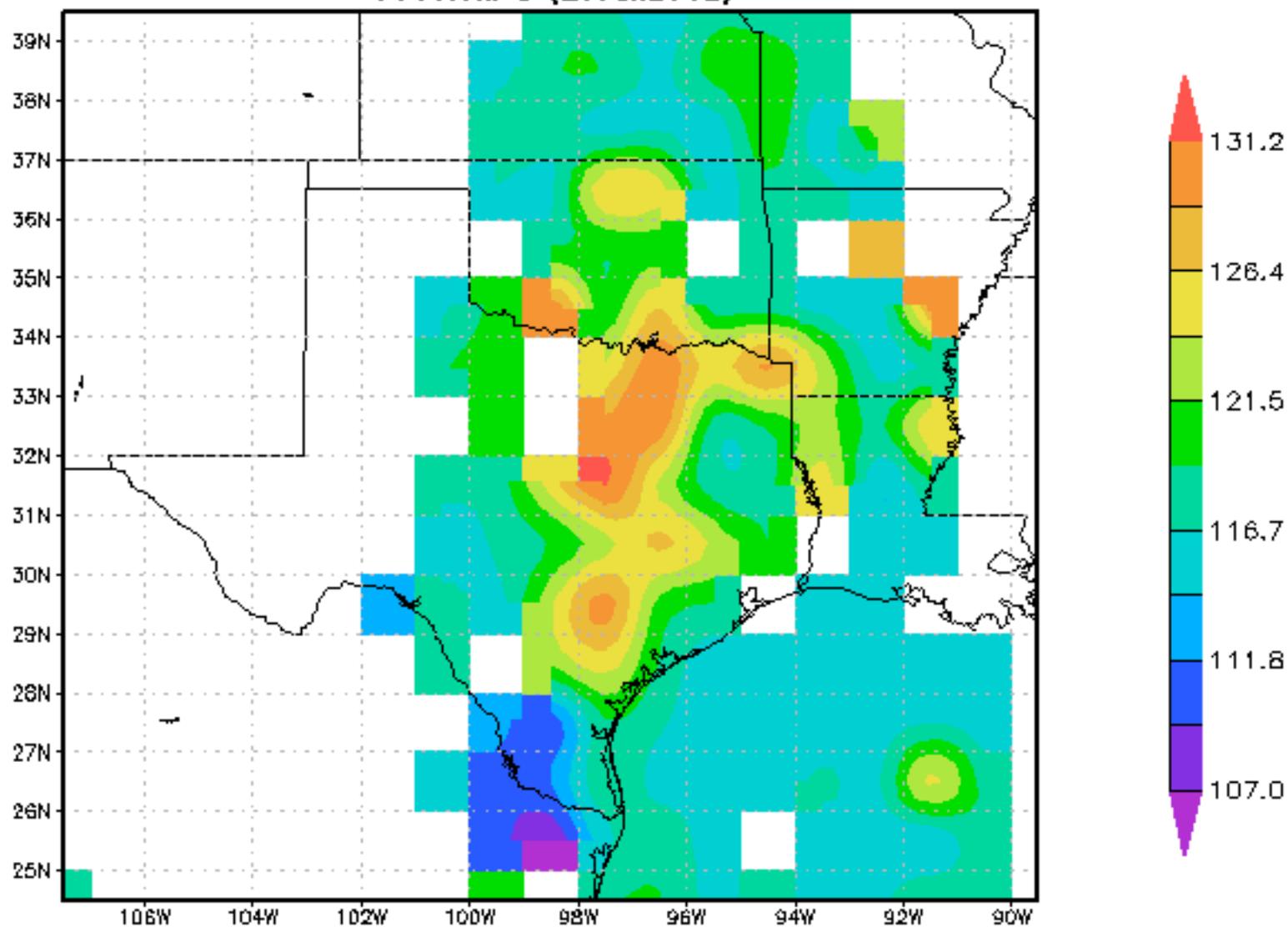
Select:

Spatial

Cursor Coordinates:

Area of Interest: West: North: South: East:

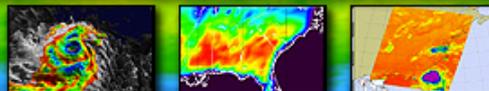
AIRX3STD.005 CO volume mixing ratio ascending (CO_VMR_eff_A) [$10E-9$ vmr]
@905.0hPa (23Jun2012)





AIRS

Atmospheric InfraRed Sounder



+ DATA HOLDINGS

+ DOCUMENTATION

Additional Features

- + News
- + Notices
- + Software Tools
- + Science Focus
- >> Gallery**
- + Applications
- + Instruments
- + Links
- + FAQ

ALERTS

AQUA debris avoidance maneuver

reported on Oct 25, 2013

AIRS+AMSU Version 5 Level 2 processing has been terminated

You are here: [GES DISC Home](#) » [AIRS](#) » [Additional Features](#) » [Gallery](#) » AIRS Global Image Gallery

AIRS Global Image Gallery

Temporal Order Option

You may view global image by selecting Parameter(s) on a given day using the selection boxes below. Images may not be available on some days.

Year: Month: Day:

Parameters

- 11 micron Brightness Temperature from AIRIBRAD Daytime
- 11 micron Brightness Temperature from AIRIBRAD Nighttime
- Visible-NIR false-color composite from AIRVBRAD
- Granule Coverage Map from AIRXAMAP Ascending Node
- Granule Coverage Map from AIRXAMAP Descending Node
- Granule Coverage Map from AIRXAMAP North Pole
- Granule Coverage Map from AIRXAMAP South Pole



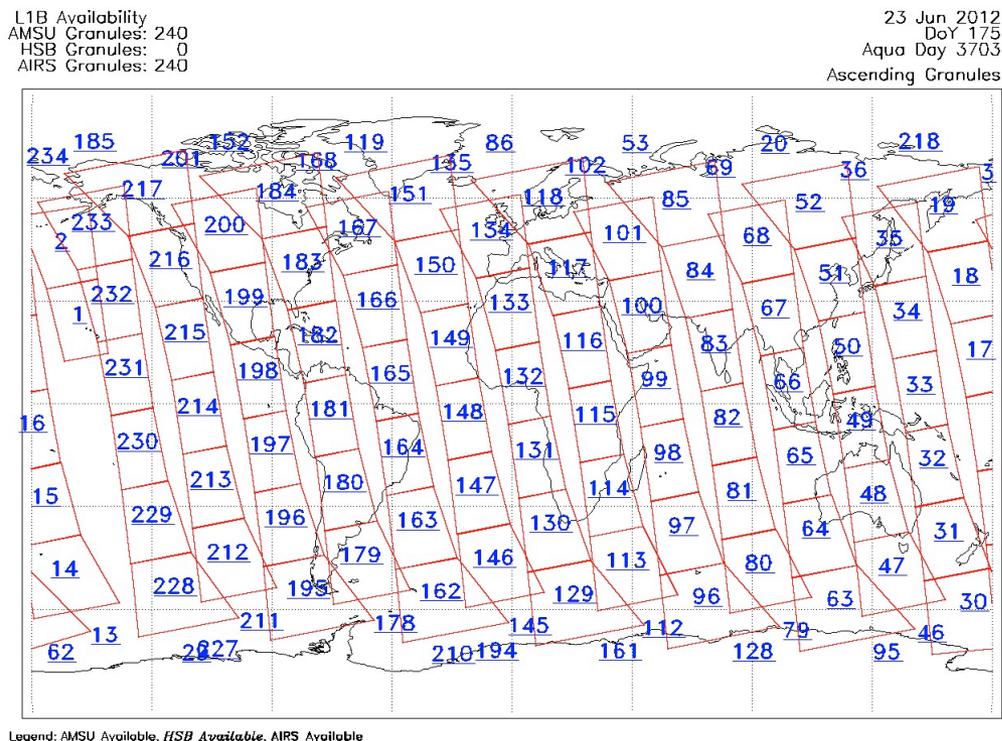
To View historical Level 2 AIRS data (i.e. NOT available on NRT anymore) we first look up what 'granules' are available for the date(s) we're interested in.

For example June 23rd, 2012

We can do this by going FIRST to the AIRS Global Image Gallery:

http://disc.sci.gsfc.nasa.gov/daac-bin/airs/airs_gallery.pl

For June 23, 2012:
Granule: 199

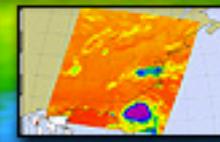
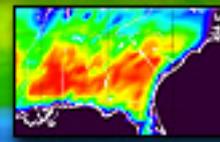
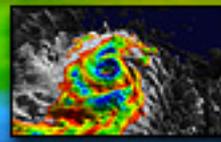


Now I know which granules I want I can download the Level 2 data!



AIRS

Atmospheric InfraRed Sounder



Product Information and access to data can be found here:

<http://disc.sci.gsfc.nasa.gov/AIRS/data-holdings/by-data-product-V6>

Take you to the **GES-DISC Mirador** search engine. There is the option to convert to Net CDF format

AIRS Level-2 Products (Version 5): without-HSB // AIRS IR Only // with-HSB

| Data Product | Description | Spatial Resolution | Temporal Coverage | Average Item Size (Mb) | GES DISC Data Access |
|--------------------------|---|--|-------------------------|------------------------|------------------------|
| AIRX2RET | L2 standard retrieval product using AIRS IR and AMSU, without-HSB | 45 km @ nadir; 28 atm pressure levels; 14 pressure layers for H2O related variables... | 2002-08-30 - present | 2.3 | Search |
| AIRS2RET | L2 standard retrieval product using AIRS IR-only | 45 km @ nadir; 28 atm pressure levels; 14 pressure layers for H2O related variables... | 2007-05-31 - present | 2.3 | Search |
| AIRH2RET | L2 standard retrieval using AIRS IR and AMSU, with-HSB | 45 km @ nadir; 28 atm pressure levels; 14 pressure layers for H2O related variables... | 2002-08-30 - 2003-02-05 | 2.3 | Search |

Goes to a product summary page with links to the Instrument and product documentation

Level 2 AIRS2RET and Level 3 AIRS3STD are the standards daily products

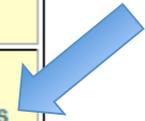
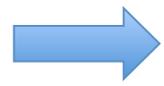
HSB is a humidity sensor that failed in 2003

AMSU is a temperature sounder

AIRS Level-3 Products (Version 5): without-HSB // AIRS IR Only // with-HSB

| Data Product | Description | Spatial Resolution | Temporal Coverage | Average Item Size (Mb) | GES DISC Data Access |
|--------------------------|---|--|-------------------------|------------------------|------------------------|
| AIRX3STD | L3 daily gridded standard retrieval product using AIRS IR and AMSU, without-HSB | 1°x1°; 24 atm pressure levels; 12 pressure levels for H2O related variables. | 2002-08-30 - present | 71 | Search |
| AIRS3STD | L3 daily gridded standard retrieval product using AIRS IR-only | 1°x1°; 24 atm pressure levels; 12 pressure levels for H2O related variables. | 2007-06-01 - present | 54 | Search |
| AIRH3STD | L3 daily gridded standard retrieval product using AIRS IR and AMSU, with-HSB | 1°x1°; 24 atm pressure levels; 12 pressure levels for H2O related variables. | 2002-08-30 - 2003-02-05 | 75 | Search |

| Data Product | Description | Spatial Resolution | Temporal Coverage | Average Item Size (MB) | GES DISC Data Access |
|--------------|---|--|-------------------------|------------------------|----------------------------|
| AIRX2RET | L2 standard retrieval product using AIRS IR and AMSU, without-HSB | 45 km @ nadir; 28 atm pressure levels; 14 pressure layers for H2O related variables... | 2002-08-30 - present | 3.9 | DataAccess |
| AIRS2RET | L2 standard retrieval product using AIRS IR-only | 45 km @ nadir; 28 atm pressure levels; 14 pressure layers for H2O related variables... | 2002-08-30 - present | 3.9 | DataAccess |
| AIRH2RET | L2 standard retrieval using AIRS IR and AMSU, with-HSB | 45 km @ nadir; 28 atm pressure levels; 14 pressure layers for H2O related variables... | 2002-08-30 - 2003-02-05 | 3.9 | DataAccess |
| AIRI2CCF | L2 cloud-cleared radiances using AIRS IR and AMSU, without-HSB | 45 km @ nadir | 2002-08-30 - present | 13.6 | DataAccess |
| AIRS2CCF | L2 cloud-cleared radiances using AIRS IR-only | 45 km @ nadir | 2002-08-30 - present | 13.6 | DataAccess |
| AIRH2CCF | L2 cloud-cleared radiances using AIRS IR and AMSU, with-HSB | 45 km @ nadir | 2002-08-30 - 2003-02-05 | 13.6 | DataAccess |
| AIRX2SUP | L2 support product using AIRS IR and AMSU, without-HSB | 45 km @nadir; 100 atm pressure levels or layers | 2002-08-30 - present | 21.2 | DataAccess |
| AIRS2SUP | L2 support product using AIRS IR-only | 45 km @nadir; 100 atm pressure levels or layers | 2002-08-30 - present | 21.2 | DataAccess |
| AIRH2SUP | L2 support product using AIRS IR and AMSU, with-HSB | 45 km @ nadir; 100 atm pressure levels or layers | 2002-08-30 - 2003-02-05 | 21.2 | DataAccess |



You are here: [Keyword Search](#)

Keyword **Projects** **Science Areas**

Keyword: AIRS2RET Time Span: 2012-07-04 To: 2012-07-04
 Location: (24.89,-126.04),(51.94,-73.6) [Update Map](#) [Search GES-DISC](#)



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 Imagery ©2012 - Map data ©2012 - Terms of Use

[Advanced Search](#)

Data Sets Results 1 - 1 of 1 for AIRS2RET (1 seconds)

-More Services (e.g. http download, format conversion, subsets etc) are available for the data set(s). Whenever you add files to the shopping cart, you will be presented with options for selecting a service and service parameters for any data set which has these services.

AIRS Aqua Level 2 Standard physical retrieval (AIRS-only) (AIRS2RET)

[View Files](#) [Info](#) [Data Calendar](#)

Approx. 16 files found (Avg Size: 2.075 MB)
 Parameters: SKIN TEMPERATURE, SURFACE AIR TEMPERATURE, AIR TEMPERATURE, TROPOPAUSE, PRECIPITABLE WATER, WATER VAPOR, OXYGEN COMPOU...
 Spatial Resolution: 50 km x 50 km
 Temporal Resolution: 6 Minutes

[Select All](#) [Reset](#) [List Selected Files By Time](#) [See Timeline View](#) [Add Selected Files To Cart](#)

NASA Search Results
 (Number of files found may not be entirely accurate)
 Page: 1

| <input type="checkbox"/> Select All in Page | Start Time |
|--|---|
| <input type="checkbox"/> AIRS.2012.07.04.214.L2.RetStd_IR.v5.0.14.0.G12187114451.hdf (2.06 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 21:23:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.213.L2.RetStd_IR.v5.0.14.0.G12187114451.hdf (2.05 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 21:17:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.212.L2.RetStd_IR.v5.0.14.0.G12187114454.hdf (2.05 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 21:11:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.197.L2.RetStd_IR.v5.0.14.0.G12187114418.hdf (2.07 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 19:41:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.196.L2.RetStd_IR.v5.0.14.0.G12187114402.hdf (2.12 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 19:35:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.181.L2.RetStd_IR.v5.0.14.0.G12187114340.hdf (2.13 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 18:05:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.180.L2.RetStd_IR.v5.0.14.0.G12187114355.hdf (2.10 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 17:59:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.179.L2.RetStd_IR.v5.0.14.0.G12187114334.hdf (2.15 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 17:53:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.164.L2.RetStd_IR.v5.0.14.0.G12187113502.hdf (2.06 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 16:23:23 (Day) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.118.L2.RetStd_IR.v5.0.14.0.G12187103555.hdf (1.95 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 11:47:23 (Both) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.103.L2.RetStd_IR.v5.0.14.0.G12187113355.hdf (2.06 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 10:17:23 (Night) Metadata |
| <input type="checkbox"/> AIRS.2012.07.04.102.L2.RetStd_IR.v5.0.14.0.G12187113353.hdf (2.04 MB) One Click Download: HDF (Quality Screened) HDF (FTP) HDF (HTTP) NetCDF OPeNDAP | 2012-07-04 10:11:23 (Night) Metadata |

Quality Screened = Filters all data variables based on the science team recommendations

To view AIRS CO on Google Earth. Files have to be converted to KMZ. In this case we will use **Panoply** to export CO Total Column images as KMZ.

Before exporting make sure the color scale is the same, i.e the same Data min and max. Here I'm choosing a data range from 1.0×10^{18} to 3.0×10^{18} molecules/cm²

CO > 2.5×10^{18} molecules/cm² is very high!

This is tedious work!

In Panoply

1. Import HDF file
2. Go into Data fields Subdirectory
3. Click on 'CO_total_column' Name to bring up image.
4. Go to 'Scale' tab - Set either a defined scale so it is consistent with other dates, i.e. Min = 1.0×10^{18} Max = 3.0×10^{18} , or click on 'Always fit to data'
5. Click on File -> Export KMZ -> save to directory of your choice.
6. Go back to #1. and go for each HDF file.

Sources

Create Plot Combine Plot Open Dataset

Datasets Catalogs Bookmarks

| Name | Long Name | Type |
|----------------------------------|---|------------|
| AIRES.2012.07.04.197.L2.QCSUB... | AIRES.2012.07.04.197.L2.QCSUBS2RET.v5.0.14.0.G1218711441... | Local File |
| coremetadata | coremetadata | — |
| coremetadata.1 | coremetadata.1 | — |
| L2_Standard_atmospheric&sur... | L2_Standard_atmospheric&surface_product | — |
| Data Fields | L2_Standard_atmospheric&surface_product/Data Fields | — |
| all_spots_avg | all_spots_avg | [lon][lat] |
| AMSU_Chans_Resid | AMSU_Chans_Resid | [lon][lat] |
| CC1_noise_eff_amp_f... | CC1_noise_eff_amp_factor | [lon][lat] |
| CC1_Resid | CC1_Resid | [lon][lat] |
| CC_noise_eff_amp_fa... | CC_noise_eff_amp_factor | [lon][lat] |
| CCfinal_Noise_Amp | CCfinal_Noise_Amp | [lon][lat] |
| CCfinal_Resid | CCfinal_Resid | [lon][lat] |
| CldFrcStd | CldFrcStd | [lon][lat] |
| CldFrcStd_orig | CldFrcStd_orig | [lon][lat] |
| CldFrcStd_qcmask | CldFrcStd_qcmask | [lon][lat] |
| CldFrcStdErr | CldFrcStdErr | [lon][lat] |
| Cloud_Resid_Ratio | Cloud_Resid_Ratio | [lon][lat] |
| CO_dof | CO_dof | [lon][lat] |
| CO_eff_press | CO_eff_press | [lon][lat] |
| CO_Resid_Ratio | CO_Resid_Ratio | [lon][lat] |
| CO_total_column | CO_total_column | [lon][lat] |
| CO_total_column_orig | CO_total_column_orig | [lon][lat] |
| CO_total_column_qc... | CO_total_column_qcmask | [lon][lat] |
| CO_trapezoid_layers | CO_trapezoid_layers | [lon][lat] |
| CO_verticality | CO_verticality | [lon][lat] |
| CO_VMR_eff | CO_VMR_eff | [lon][lat] |
| CO_VMR_eff_err | CO_VMR_eff_err | [lon][lat] |
| CO_VMR_eff_orig | CO_VMR_eff_orig | [lon][lat] |
| CO_VMR_eff_qcmask | CO_VMR_eff_qcmask | [lon][lat] |
| demgeoqa | demgeoqa | [lon][lat] |
| dust_flag | dust_flag | [lon][lat] |
| EmisMWStd | EmisMWStd | [lon][lat] |
| EmisMWStdErr | EmisMWStdErr | [lon][lat] |

Variable "CO_total_column"

```
float CO_total_column(GeoTrack=45, GeoXTrack=30);
:_FillValue = -9999.0f; // float
```

Steps #2, #3

CO_total_column in svc_AIRES.2012.06.23.199.L2.RetSt

CO_total_column

CO total column ()

1.1E+18 1.4E+18 1.6E+18 1.8E+18 2.1E+18 2.3E+18

Data Min = 1.1E+18, Max = 2.3E+18

Step #4

Plot Array 1

Scale

Scale Range: Min.: 1.1498e+18, Max.: 2.925e+18 Center on 0 Fit to Data

Units: 1

Scaling Factor: 10^0

Divisions, Major: 5, Minor: 2

Color Table: panopoly GCT Invert colors

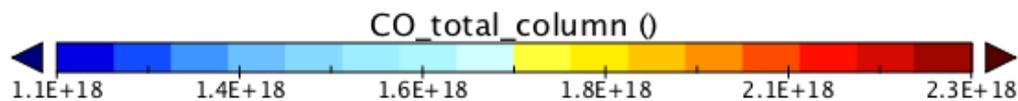
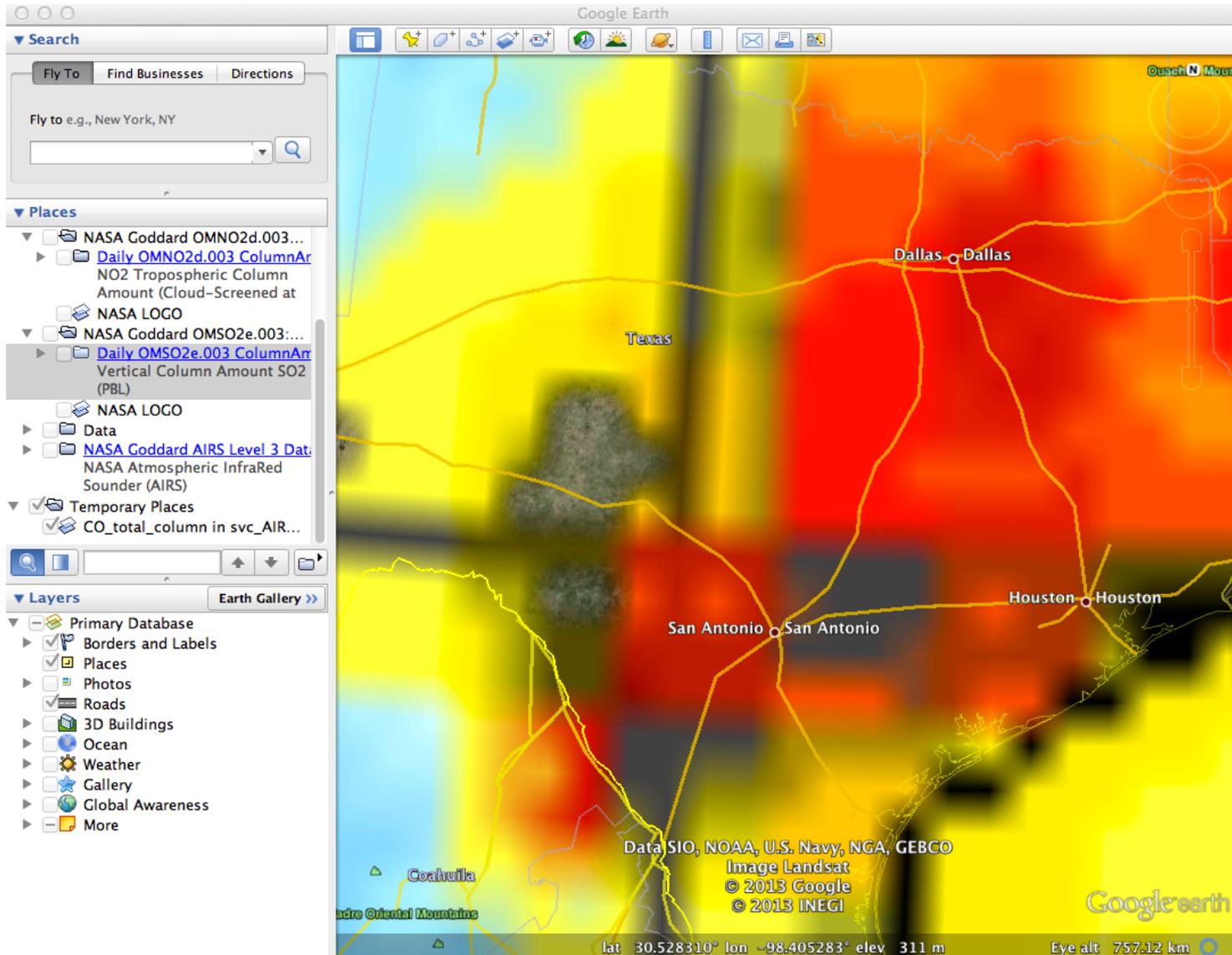
Fill Color: Outlier Shape: Triangle

Scale Caption: Default Other: SCALE CAPTION

Tick Label Format: %1E, Size: 11

Caption Location: Above colorbar

Once all the HDF files have been exported as KMZ – NOW we can open Google Earth and upload all those files!



CO_VMR_eff – CO Volume Mixing Ratio Layers

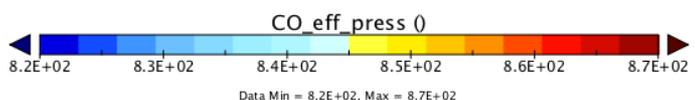
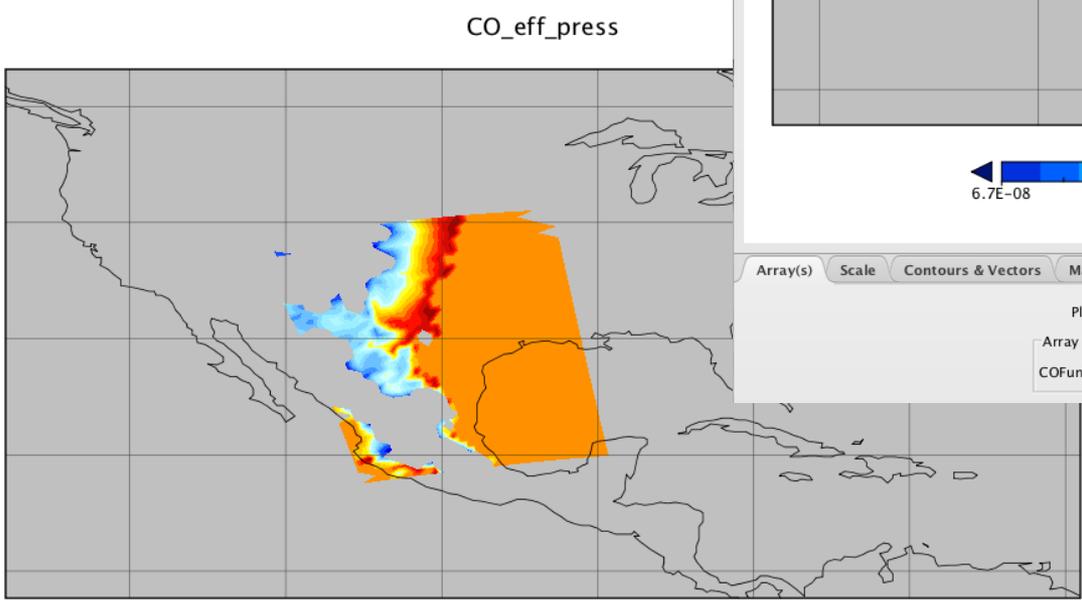
Associated pressure levels

| Name | Long Name | Type |
|------------------------|------------------------|------------|
| clrolr | clrolr | [lon][lat] |
| clrolr_err | clrolr_err | [lon][lat] |
| clrolr_orig | clrolr_orig | [lon][lat] |
| clrolr_qcmask | clrolr_qcmask | [lon][lat] |
| CO_dof | CO_dof | [lon][lat] |
| CO_eff_press | CO_eff_press | [lon][lat] |
| CO_Resid_Ratio | CO_Resid_Ratio | [lon][lat] |
| CO_total_column | CO_total_column | [lon][lat] |
| CO_total_column_orig | CO_total_column_orig | [lon][lat] |
| CO_total_column_qcmask | CO_total_column_qcmask | [lon][lat] |
| CO_trapezoid_layers | CO_trapezoid_layers | — |
| CO_verticality | CO_verticality | [lon][lat] |
| CO_VMR_eff | CO_VMR_eff | [lon][lat] |
| CO_VMR_eff_err | CO_VMR_eff_err | [lon][lat] |
| CO_VMR_eff_orig | CO_VMR_eff_orig | [lon][lat] |
| CO_VMR_eff_qcmask | CO_VMR_eff_qcmask | [lon][lat] |
| demgeoqa | demgeoqa | [lon][lat] |
| dust_flag | dust_flag | [lon][lat] |
| emisIRStd | emisIRStd | [lon][lat] |
| emisIRStd_orig | emisIRStd_orig | [lon][lat] |
| emisIRStd_qcmask | emisIRStd_qcmask | [lon][lat] |
| emisIRStdErr | emisIRStdErr | [lon][lat] |
| EmisMWStd | EmisMWStd | [lon][lat] |
| EmisMWStdErr | EmisMWStdErr | [lon][lat] |
| freqEmis | freqEmis | [lon][lat] |
| ftptgeoqa | ftptgeoqa | [lon][lat] |
| glintgeoqa | glintgeoqa | — |
| glintlat | glintlat | — |
| glintlon | glintlon | — |
| GP_Height | GP_Height | [lon][lat] |
| GP_Height_MWOnly | GP_Height_MWOnly | [lon][lat] |
| GP_Surface | GP_Surface | [lon][lat] |
| GP_Tropopause | GP_Tropopause | [lon][lat] |
| H2O_verticality | H2O_verticality | [lon][lat] |
| H2OMMRSat | H2OMMRSat | [lon][lat] |
| H2OMMRSat liquid | H2OMMRSat liquid | [lon][lat] |

List only plottable variables

Vertical Level 8 is associated with pressures between 820 – 870 hPa

CO_eff_press in svc_AIRS.2012.06.23.199.L2.RetSt



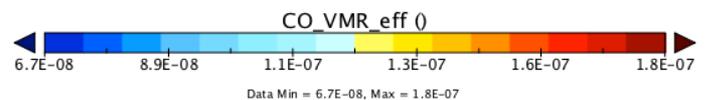
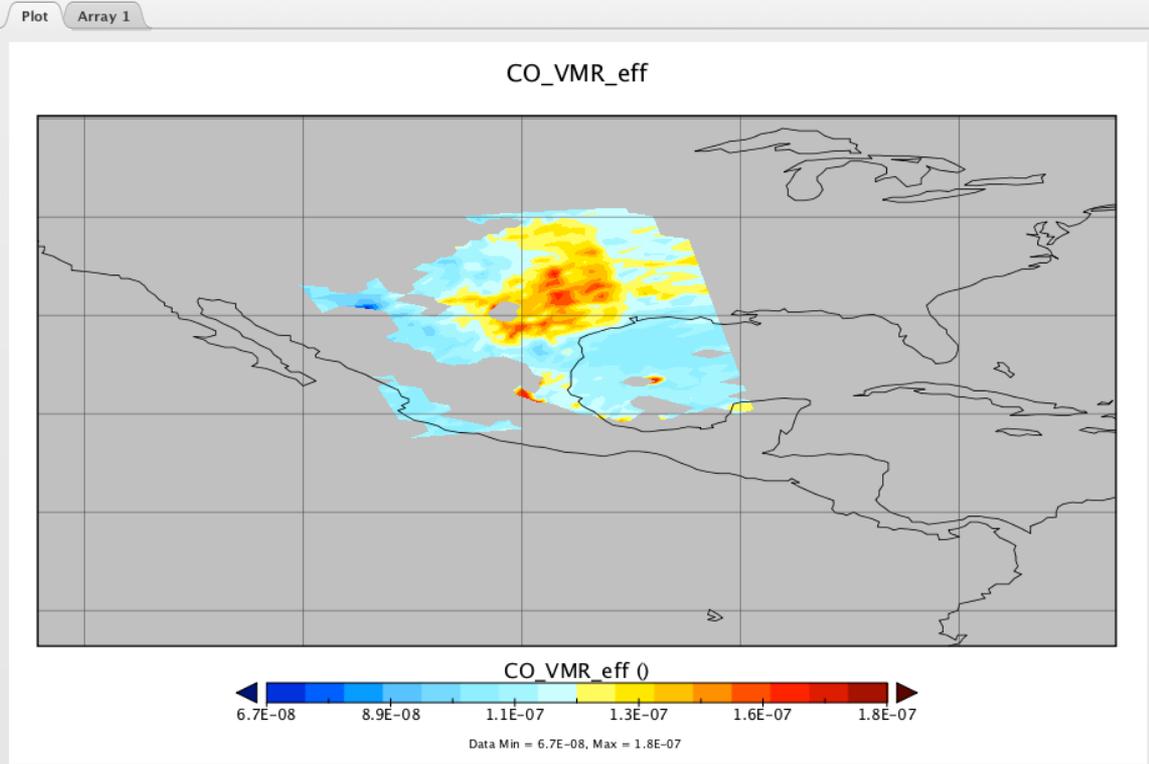
Array(s) Scale Contours & Vectors Map Labels

Plot Map of Array 1 Only Interpolate

Array 1: CO_eff_press

COFunc: 8 of 9 = 8 of 9

CO_VMR_eff in svc_AIRS.2012.06.23.199.L2.RetSt 2



Array(s) Scale Contours & Vectors Map Labels

Plot Map of Array 1 Only Interpolate

Array 1: CO_VMR_eff

COFunc: 8 of 9 = 8 of 9

Summary of Websites and Tools

Websites:

GIOVANNI

http://gdata1.sci.gsfc.nasa.gov/daac-bin/G3/gui.cgi?instance_id=AIRS_Level3Daily

AIRS Near-Real Time (NRT) Products and Images (PNG, GeoTIFF, KMZ)

<http://disc.sci.gsfc.nasa.gov/nrt/data-holdings/airs-nrt-products/>

AIRS Global Image Gallery (To select granules for downloading)

http://disc.sci.gsfc.nasa.gov/daac-bin/airs/airs_gallery.pl

AIRS Level 2 Data Products

http://disc.sci.gsfc.nasa.gov/AIRS/data-holdings/by-data-product/data_products.shtml

Tools:

Panoply (Convert HDF → KMZ)

Google Earth