



STAR

Center for Satellite
Applications and Research

formerly ORA — Office of Research and Applications



NOAA Products Validation System (NPROVS)

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NOAA/NESDIS

Center for Satellite Applications and Research
(STAR)

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(IM System Group)

**IGARSS 2011
NPP Users Workshop**

May 10-11, 2011



NOAA Products Validation System (NPROVS)

Routine

day to day

soundings products monitoring at STAR

(characteristic differences)

using

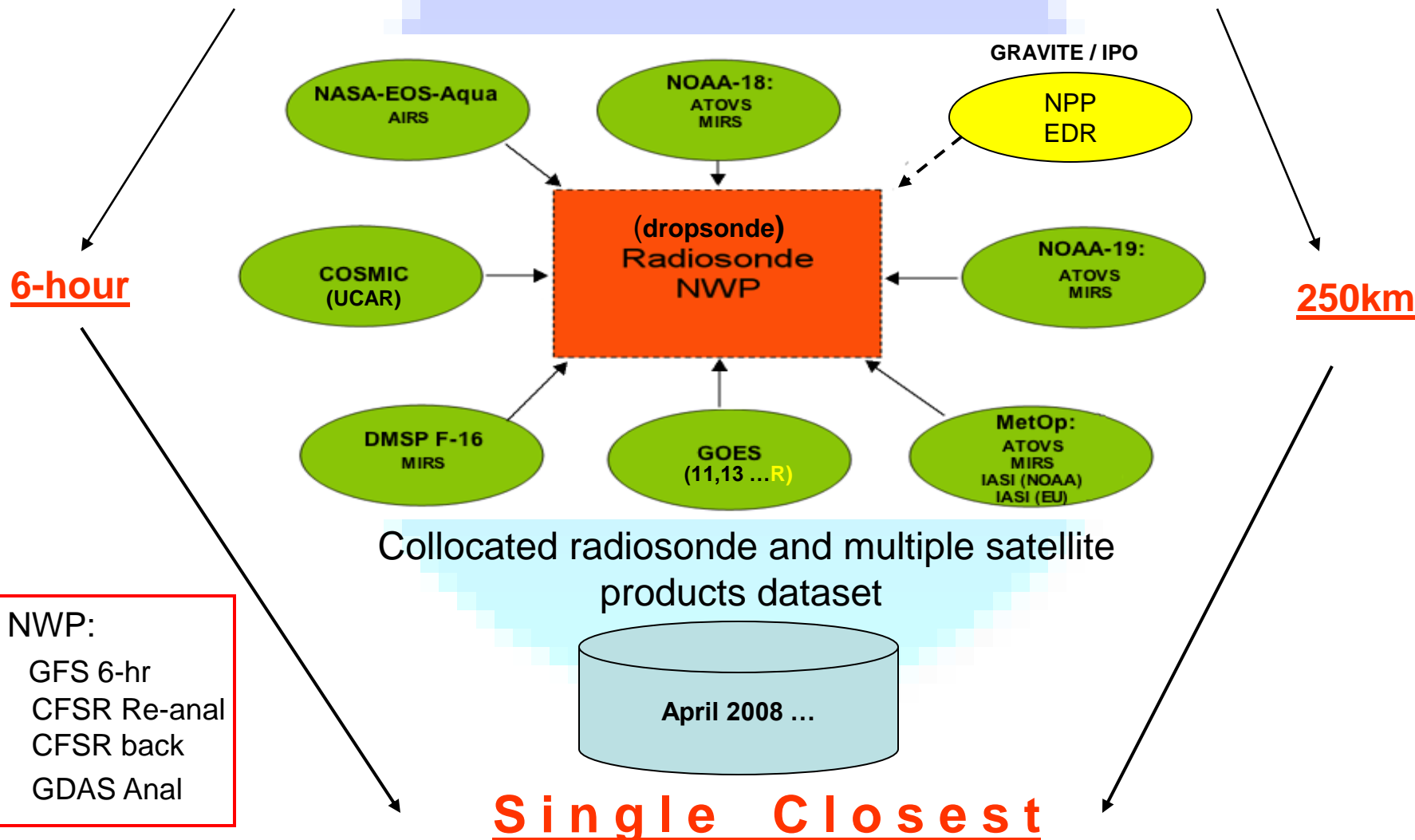
conventionally available observations

* first ever routine GOES vs POES

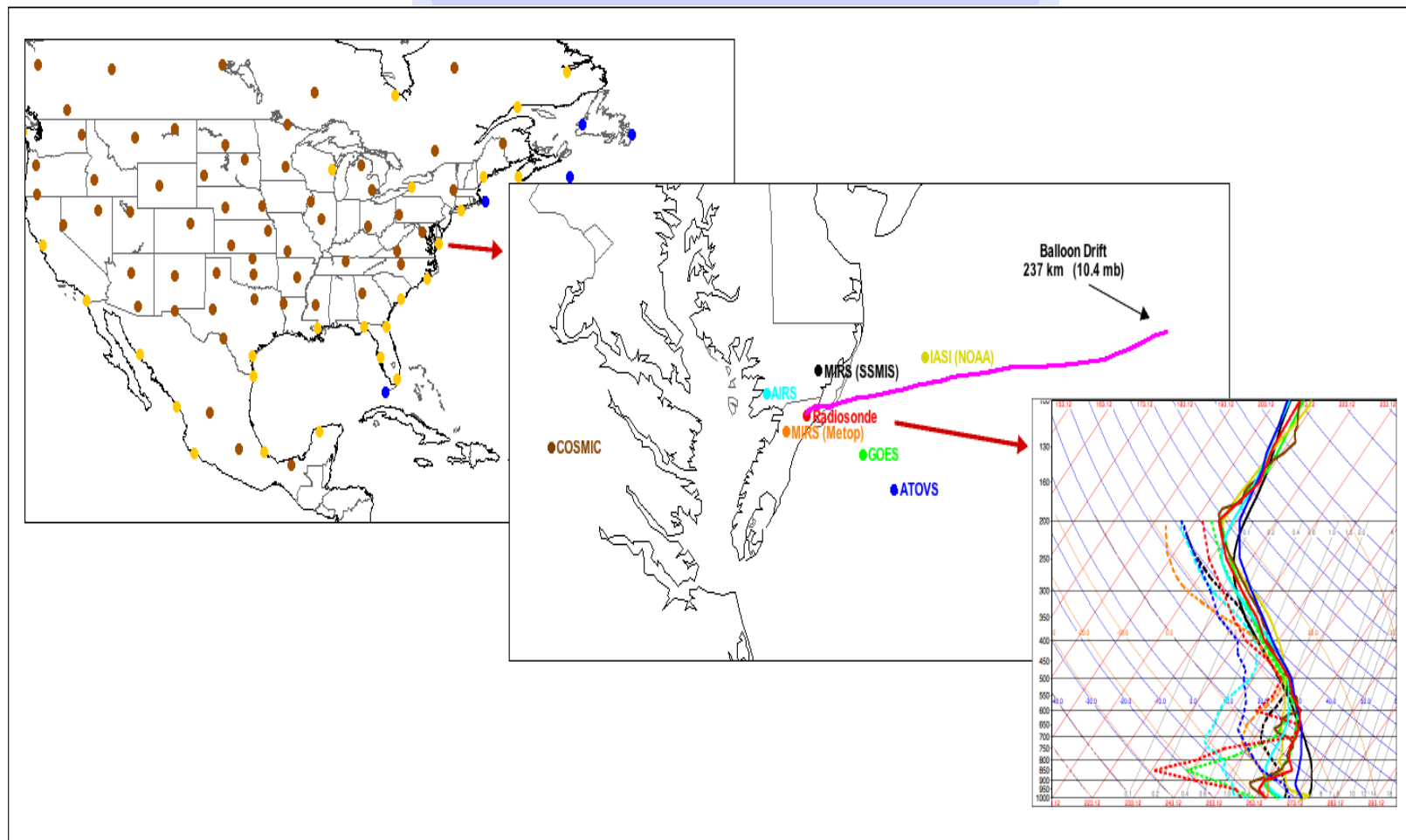


NOAA Products Validation System (NPROVS)

Centralized Radiosonde and Collocation Processing



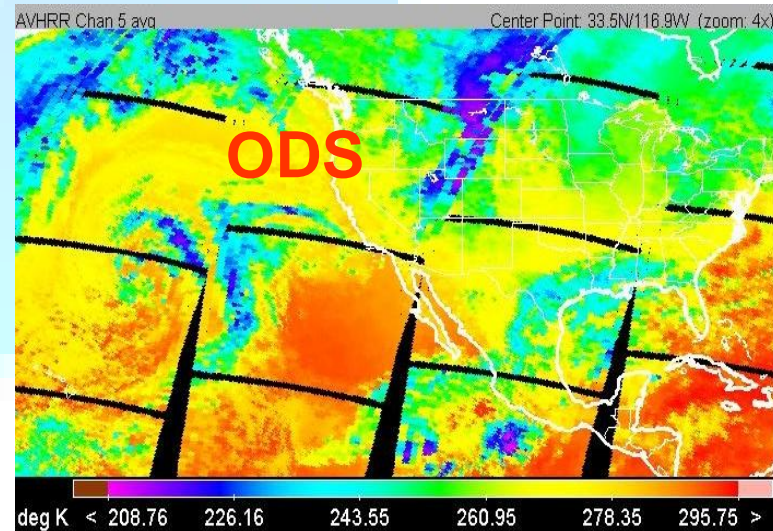
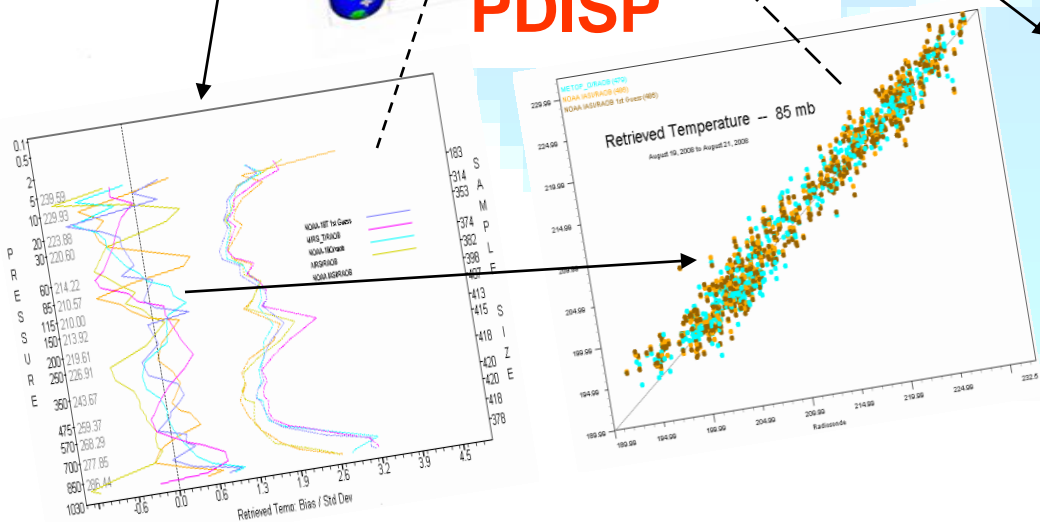
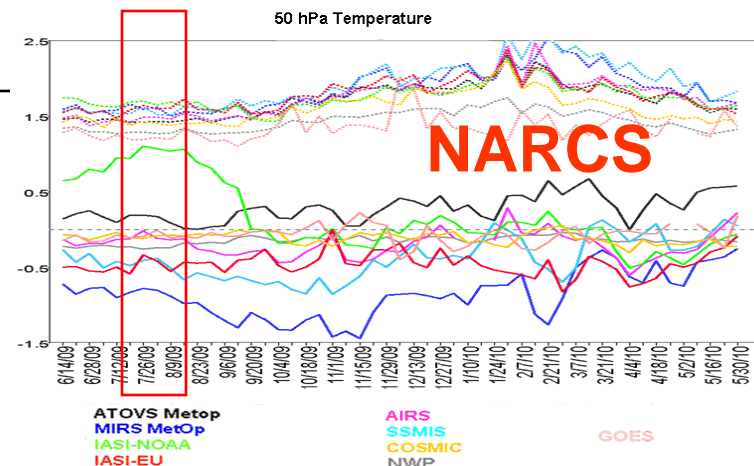
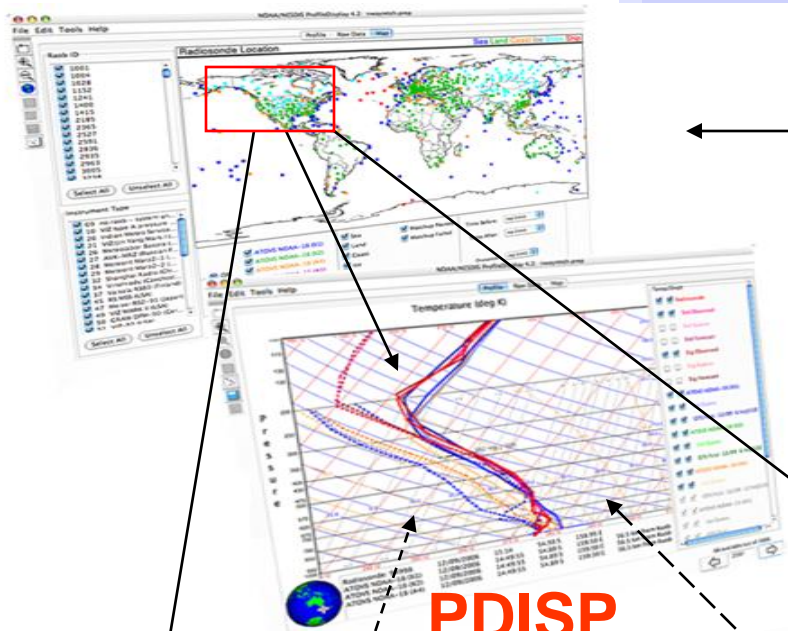
NPROVS - PDISP



... distribution of collocated satellite products around radiosonde



NPROVS- Environmental Data Graphical Evaluation (EDGE) Analytical Interface





NPROVS -EDGE

PDISP: display and analysis of collocated data

Profile | Sub-selection | Raw Data | Vstat | Scatter Plot

Radiosonde

Terrain: Land Coast Ship
 Island/Inland Land Coast

Clouds: Clear Partly Cloudy
 Cloudy Fog Missing

Raob Time: 10:00 0z 0z 0z

Ver Extent: Good/Bad

Superad: Good/Bad

Dewpoint: Good/Bad

Climate: Good/Bad

Water: 0 1 2 3+

Inversion: 0 1 2+

NCEP QC Flag: Yes/No

Noep Radcor: No Yes

Onsite Radcor: None Solar & IR
 Solar Missing

GRUAN: No Primary Primary*
 Secondary Secondary*

SUAN-250: No Yes

Radiosonde Location 2841(705) available out of 7500

Coast Land Island Coast Island Inland Ship Dropsonde

Group Availability / QC / Cloud / Terrain / Day/Night

ATOVS METOP	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-18	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS METOP	Yes	Pass	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS NOAA-18	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
AIRS AQUA	Yes	Pass	Clear/Cloudy	Sea/Non-Sea	Day/Night
COSMIC UCAR	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
IASI NOAA	Yes	Pass	Clear/Cloudy	Sea/Non-Sea	Day/Night
IASI EUMETSAT	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
GOES	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS SSMIS	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-19	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS NOAA-19	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS METOP TEST1	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS METOP TEST2	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-19 TEST1	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-19 TEST2	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS METOP TEST	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS NOAA-19 TEST	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS SSMIS TEST	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night

Collocation Closeness

Time Window: From / To

no limit no limit

Distance Window: From / To

0 km no limit

Space Time

Raob Station ID

- 01001
- 01004
- 01028
- 01152
- 01400
- 01415
- 02185
- 02365
- 02527
- 02591
- 02836
- 02935
- 02963
- 03005
- 03238
- 03354
- 03693
- 03743
- 03808
- 03882
- 03918
- 03963
- 04018
- 04220
- 04270

Site id

Instrument Type

- 120 Not vacant
- 121 Not vacant
- 122 Not vacant
- 123 Vacant
- 124 Vacant
- 125 Vacant
- 126 Not vacant
- 127 Not vacant
- 128 Not vacant
- 129 Not vacant
- 130 Not vacant
- 131 Vacant
- 132 Not vacant
- 133 Vacant
- 134 Vacant
- 135 Vacant
- 136 Not vacant
- 137 Not vacant
- 138 Vacant
- 139 Vacant
- 140 Vacant
- 141 Vacant
- 142 Vacant
- 143 Vacant
- 144 Vacant

Inst

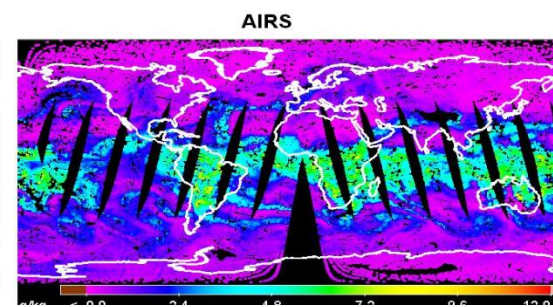
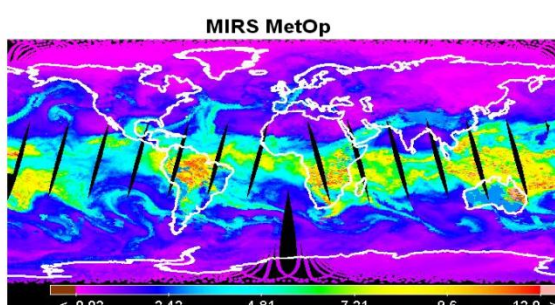
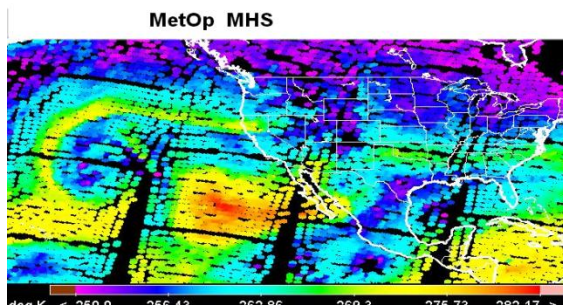
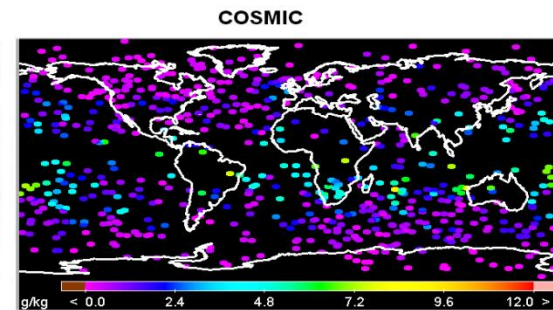
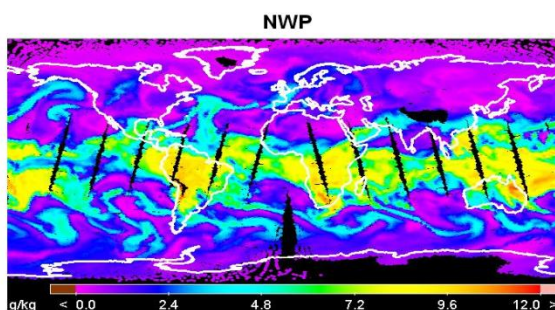
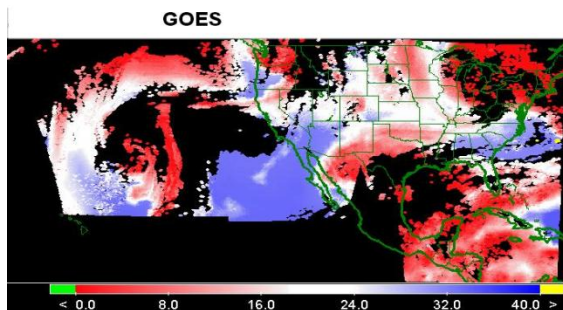
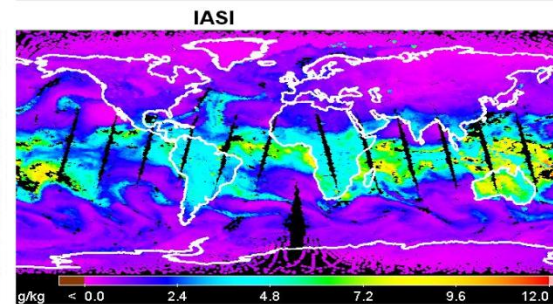
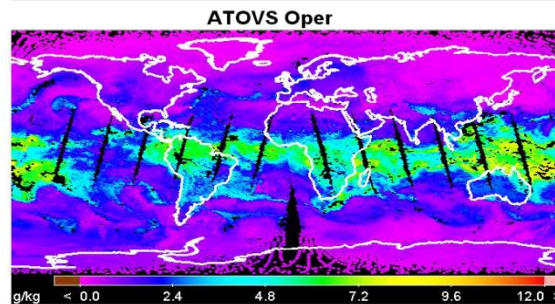
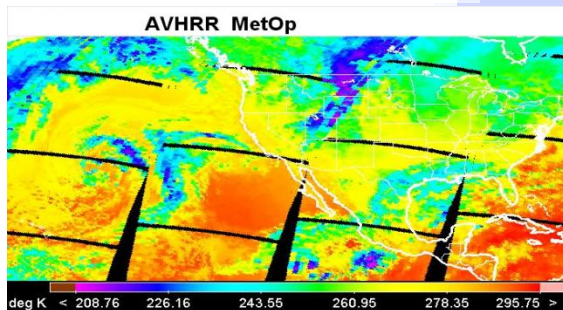
7/18/2009 14Z 7/24/2009 14Z Turn All On

2841 (705) / 7500



NPROVS - EDGE

ODS: orbital products display



Daily H2O Vapor @ 850mb

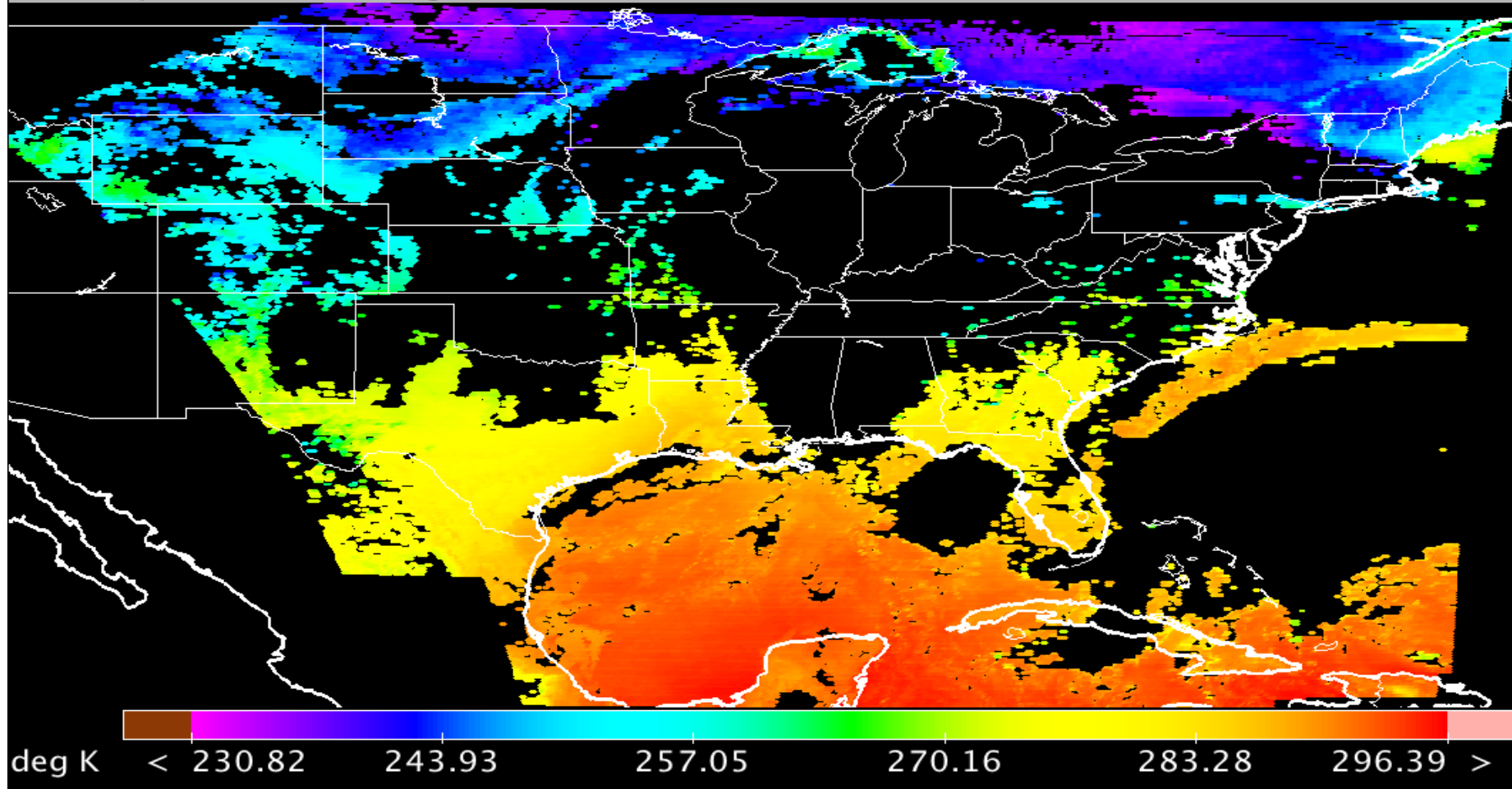


GOES ODS

GOES GDDF Test

Feb 13, 2007 11Z to Feb 13, 2007 12Z

TBO Btemp Channel 9 (G09) [deg K]





Raw data as stored on product data record

IASI Satellite Data - NOAA IASI/RAOB

Retrieval QC Flag	0
Data Frame	87
Scan Line	13
Field Of View	14
View Angle	-5.0
Solar Zenith Angle	70.31
Satellite Height	822.3
Surface Height	787
Land Fraction	1.0
MW Surface Class	5
Surface Pressure	941.8
Skin Temperature	265.59
MIT Skin Temperature	273.26
1st Guess Skin Temperature	272.67
MW Surface Emissivity	0
Column Averaged CO2	384.6
Number Of Cloud Layers	2
Cloud Top Pressures	702.7 / 708.8
Cloud Top Fractional Coverage	0.13 / 0.67

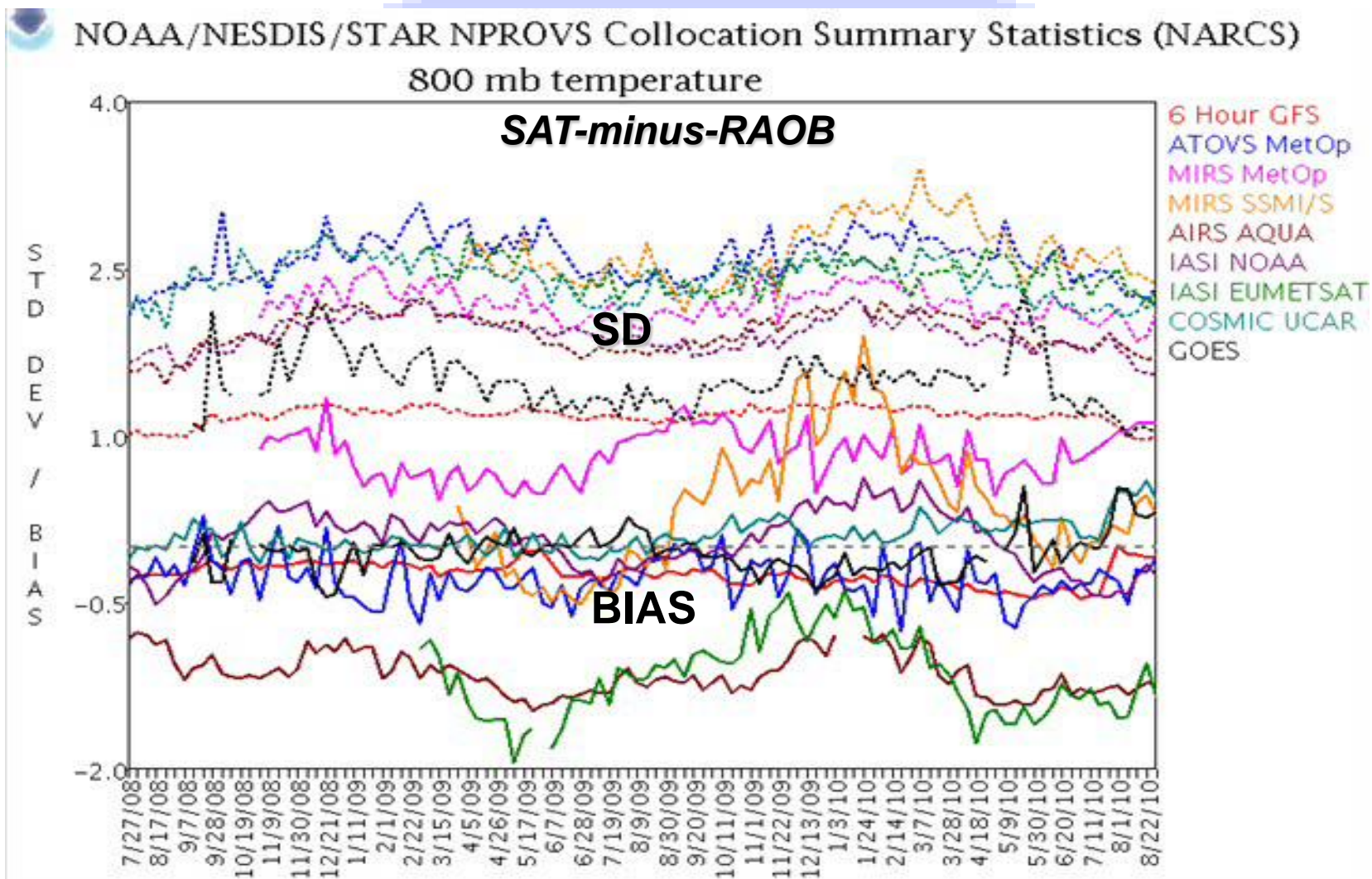
Level	Level Data							
	Pressure	Eff Pressure	Temp	MIT Temp	FG Temp	WVMR	MIT WVMR	FG WVMR
80	596.3	585.8	257.45	255.29	257.93	0.3037	0.1016	0.3429
81	617.5	606.8	259.06	257.03	259.64	0.3632	0.1026	0.4132
82	639.1	628.2	260.56	258.73	261.21	0.4326	0.1034	0.5072
83	661.1	650.1	261.98	260.42	262.71	0.5177	0.1102	0.627
84	683.6	672.3	263.48	262.14	264.25	0.61	0.1254	0.7637
85	706.5	695.0	265.01	263.57	265.79	0.6766	0.1408	0.8764
86	729.8	718.1	266.46	264.46	267.25	0.707	0.1571	0.933
87	753.6	741.6	267.82	265.42	268.62	0.619	0.1886	0.8339
88	777.7	765.6	268.75	266.34	269.56	0.5399	0.2264	0.7416
89	802.3	790.0	268.89	267.26	269.7	0.567	0.2785	0.7941
90	827.3	814.8	268.6	268.17	269.43	0.6926	0.4217	0.9902
91	852.7	840.0	268.62	269.1	269.43	0.8249	0.5861	1.2027
92	878.6	865.6	268.89	270.26	269.71	1.0108	0.8266	1.3978
93	904.8	891.6	269.23	271.39	270.07	1.253	1.0982	1.6471
94	931.5	918.1	269.76	272.48	270.65	1.5625	1.4102	1.9598

Raw data is always available for displayed for PDISP and ODS ...



NPROVS - EDGE

NARCS: long term summary of sampling, sat-minus sonde





NPROVS Web Site

<http://www.star.nesdis.noaa.gov/smcd/opdb/poes/NPROVS.php>



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» [ATOVS Cloud and Radiation Products](#)

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 - [Vertical Statistics](#)
 - [Monthly Trends](#)
 - [Long-Term Trends](#)
- [User Interface](#)
 - [ProfileDisplay](#)
 - [NARCS](#)

» [Documentation](#)

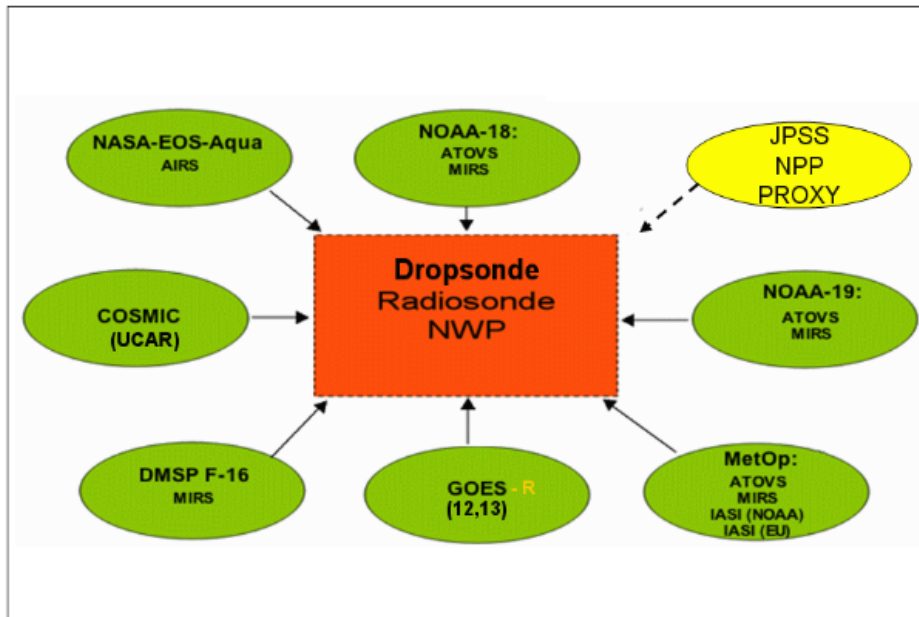
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OPDB Site-Specific Search Tool:
[sitemap](#) • [advanced](#)

STAR / SMCD / OPDB - NOAA Products Validation System (NPROVS)

NPROVS Overview

NPROVS routinely (daily) compiles datasets of collocated radiosonde, dropsonde and appended numerical weather prediction (NWP) data with the following satellites and sounding (temperature and moisture) product suites:





PDISP

(common denominator sampling)



NPROVS -EDGE

PDISP: display and analysis of collocated data

Profile | Sub-selection | Raw Data | Vstat | Scatter Plot

Radiosonde

Terrain: Land Coast Ship
 Island/Inland Land Coast

Clouds: Clear Partly Cloudy
 Cloudy Fog Missing

Raob Time: 10:00 0z 0z 0z

Ver. Extent: Good/Bad

Superad: Good/Bad

Dewpoint: Good/Bad

Climate: Good/Bad

Water: 0 1 2 3+

Inversion: 0 1 2+

NCEP QC Flag: Yes/No

Noep Radcor: No Yes

Onsite Radcor: None Solar & IR
 Solar Missing

GRUAN: No Primary Primary*
 Secondary Secondary*

SLAN-250: No Yes

Radiosonde Location 2841(705) available out of 7500

Coast Land Island Coast Island Inland Ship Dropsonde

Group Availability / QC / Cloud / Terrain / Day/Night

ATOVS METOP	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-18	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS METOP	Yes	Pass	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS NOAA-18	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
AIRS AQUA	Yes	Pass	Clear/Cloudy	Sea/Non-Sea	Day/Night
COSMIC UCAR	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
IASI NOAA	Yes	Pass	Clear/Cloudy	Sea/Non-Sea	Day/Night
IASI EUMETSAT	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
GOES	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS SSMIS	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-19	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS NOAA-19	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS METOP TEST1	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS METOP TEST2	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-19 TEST1	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
ATOVS NOAA-19 TEST2	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS METOP TEST	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS NOAA-19 TEST	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night
MIRS SSMIS TEST	Yes or No	Pass/Fail	Clear/Cloudy	Sea/Non-Sea	Day/Night

Collocation Closeness

Time Window: From / To

Distance Window: From / To

0 km no limit

Raob Station ID

- 01001
- 01004
- 01028
- 01152
- 01400
- 01415
- 02185
- 02365
- 02527
- 02591
- 02836
- 02935
- 02963
- 03005
- 03238
- 03354
- 03693
- 03743
- 03808
- 03882
- 03918
- 03963
- 04018
- 04220
- 04270

Instrument Type

- 120 Not vacant
- 121 Not vacant
- 122 Not vacant
- 123 Vacant
- 124 Vacant
- 125 Vacant
- 126 Not vacant
- 127 Not vacant
- 128 Not vacant
- 129 Not vacant
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- 138 Vacant
- 139 Vacant
- 140 Vacant
- 141 Vacant
- 142 Vacant
- 143 Vacant
- 144 Vacant

7/18/2009 14Z 7/24/2009 14Z Turn All On

2841 (705) / 7500

Raob

SAT

Space Time

Site id

Inst



PDISP Sampling Options for Display/Statistics

- **Radiosonde (dropsonde)**

- Terrain (land,coast,ship,island)
- Cloud amount
- Synoptic time (0,6,12,18)
- *Day/nite (coming soon)*
- *Superadiabatic*
- *Moisture profile shape*
- *UT/LS ... supsicous moisture*
- *T inversions (surface, aloft)*
- *Rad Correction (site, NCEP)*
- *Sampling network (GCOS,GRUAN)*
- *Site id*
- *Instrument type*
- *Time period*
- *Region*

- **Satellite**

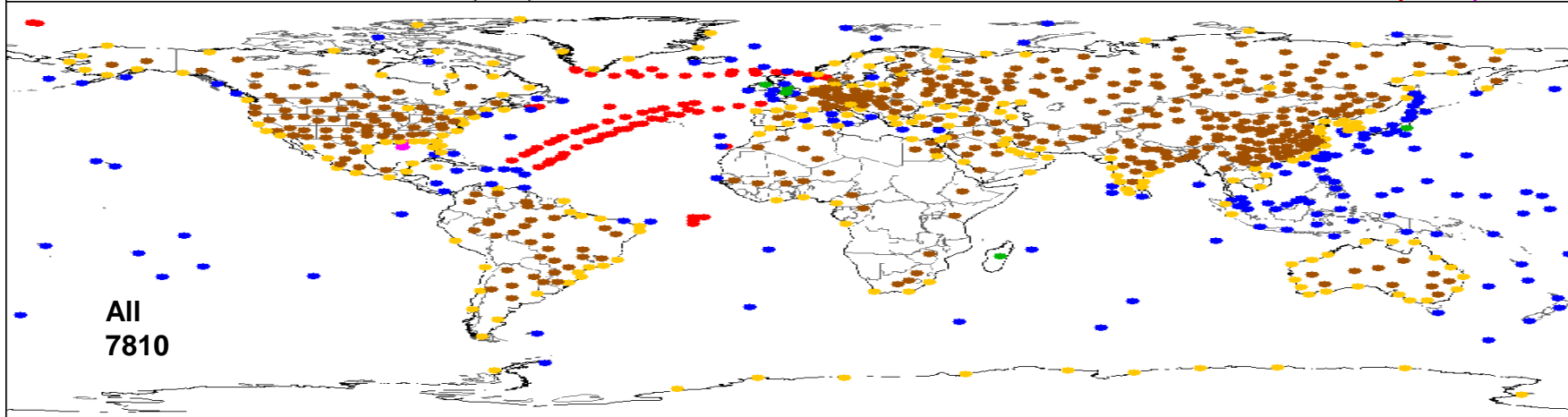
- Product system (ATOVS, IASI, COSMIC...)
- QC flag
- Clear, partly cloudy, cloudy
- Sea, nonsea
- Day, night
- Time window increments
- Space window



PDISP Sampling Option Examples

NOAA/NESDIS/STAR Satellite/Radiosonde Collocations

Radiosonde Location 7810(797) available out of 7810 Coast Land Island Coast Island Inland Ship Dropsonde

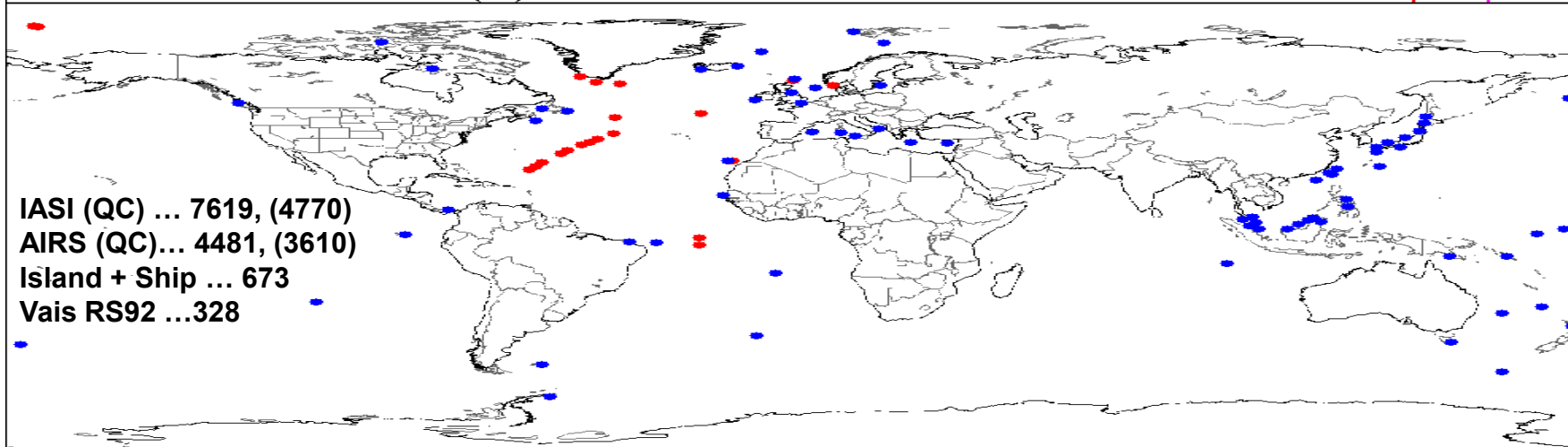


All
7810

May 28, 2011 (14z) to June 3, 2011 (13z)

NOAA/NESDIS/STAR Satellite/Radiosonde Collocations

Radiosonde Location 310(80) available out of 7810 Coast Land Island Coast Island Inland Ship Dropsonde



IASI (QC) ... 7619, (4770)
AIRS (QC)... 4481, (3610)
Island + Ship ... 673
Vais RS92 ...328

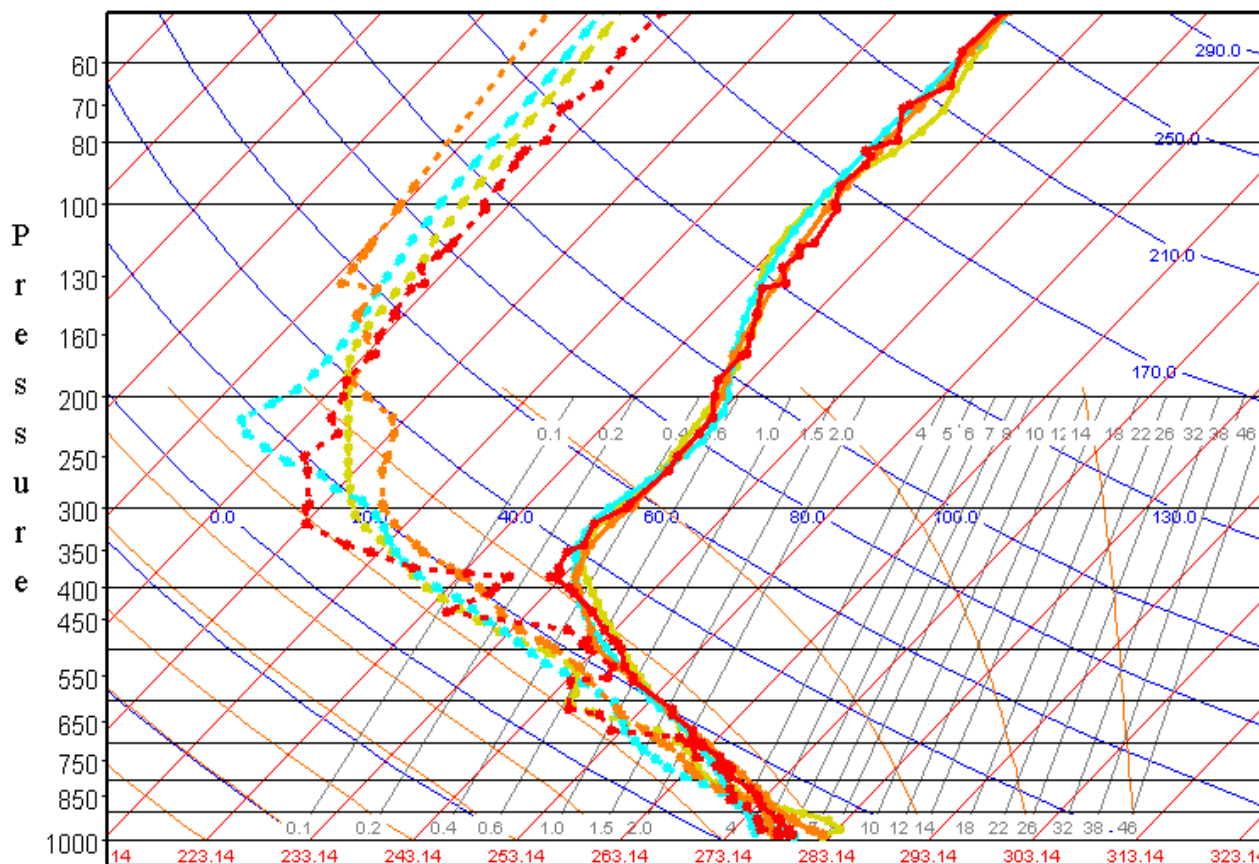
May 28, 2011 (14z) to June 3, 2011 (13z)



PDISP Displays Individual Collocation

NOAA/NESDIS/STAR Collocated Profile Display

Temperature (deg K)



	Temp	DewT
RAOB	_____	_____
Forecast	_____	_____
AIRS AQUA	_____	_____
IASI NOAA	_____	_____

IASI
GFS
AIRS
Raob

Vertical Density Options:

- Original *
- ATOVS/GOES 40
- IASI / AIRS 100
- GDAS 26
- NPP 30 Layers



Radiosonde 03005 (80)	5/28/2011	23:23	60.13 N	1.17 W	
AIRS AQUA (0)	5/29/2011	02:07:12	59.95 N	1.69 W	34.9 km from Raob
IASI NOAA	5/28/2011	21:38:52	60.10 N	1.47 W	16.8 km from Raob



PDISP Vertical Statistics (VSTATS) Interface

Vstat Profile Selection

Description:

Baseline System:

Use 42 pressure levels
 Use 100 pressure levels
 Use 26 pressure levels

Compute Stats For:

<input checked="" type="checkbox"/> RAOB	<input type="checkbox"/> Radcor	<input checked="" type="checkbox"/> Forecast	<input type="checkbox"/> Re-Analysis
<input checked="" type="checkbox"/> ATOVS METOP	<input type="checkbox"/> Fcst Analysis		
<input type="checkbox"/> ATOVS NOAA-18	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS METOP	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS NOAA-18			
<input type="checkbox"/> AIRS AQUA	<input type="checkbox"/> First Guess	<input type="checkbox"/> MW-Only	
<input type="checkbox"/> COSMIC UCAR	<input type="checkbox"/> GFS Forecast	<input type="checkbox"/> Raw Dry	
<input checked="" type="checkbox"/> IASI NOAA	<input type="checkbox"/> MIT	<input type="checkbox"/> First Guess	
<input type="checkbox"/> IASI EUMETSAT			
<input checked="" type="checkbox"/> GOES	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS SSMIS			
<input checked="" type="checkbox"/> ATOVS NOAA-19	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS NOAA-19			
<input type="checkbox"/> ATOVS METOP TEST1	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> ATOVS METOP TEST2	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> ATOVS NOAA-19 TEST1	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> ATOVS NOAA-19 TEST2	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> MIRS METOP TEST			
<input type="checkbox"/> MIRS NOAA-19 TEST			
<input type="checkbox"/> MIRS SSMIS TEST			

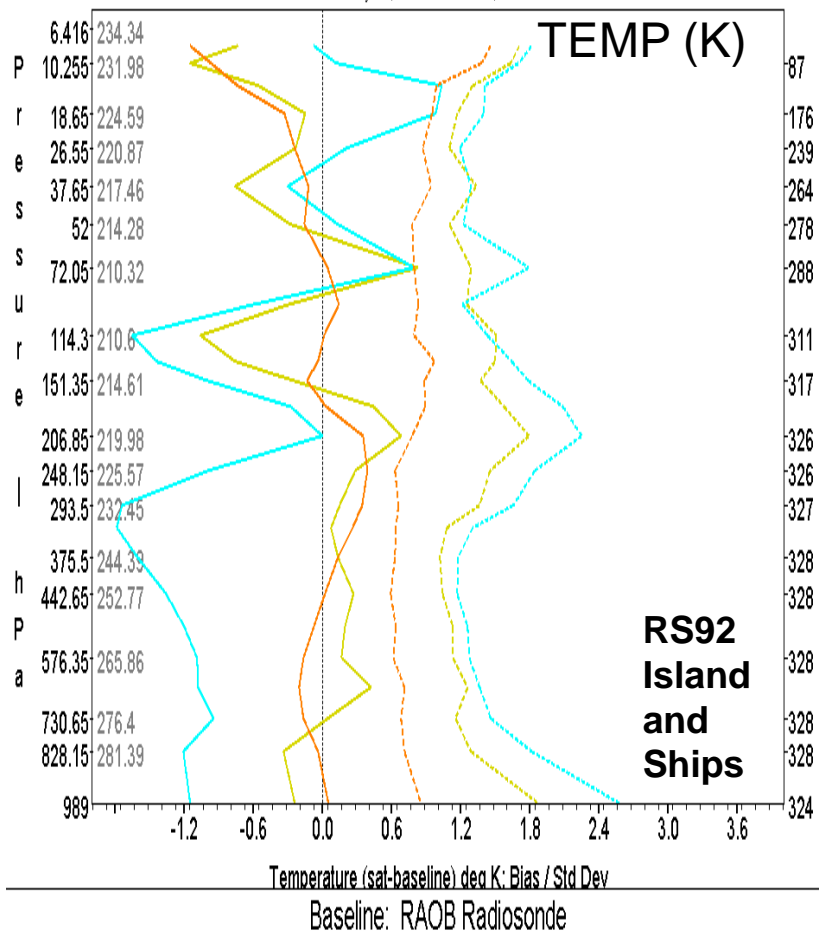
OK Cancel



PDISP_VSTATS

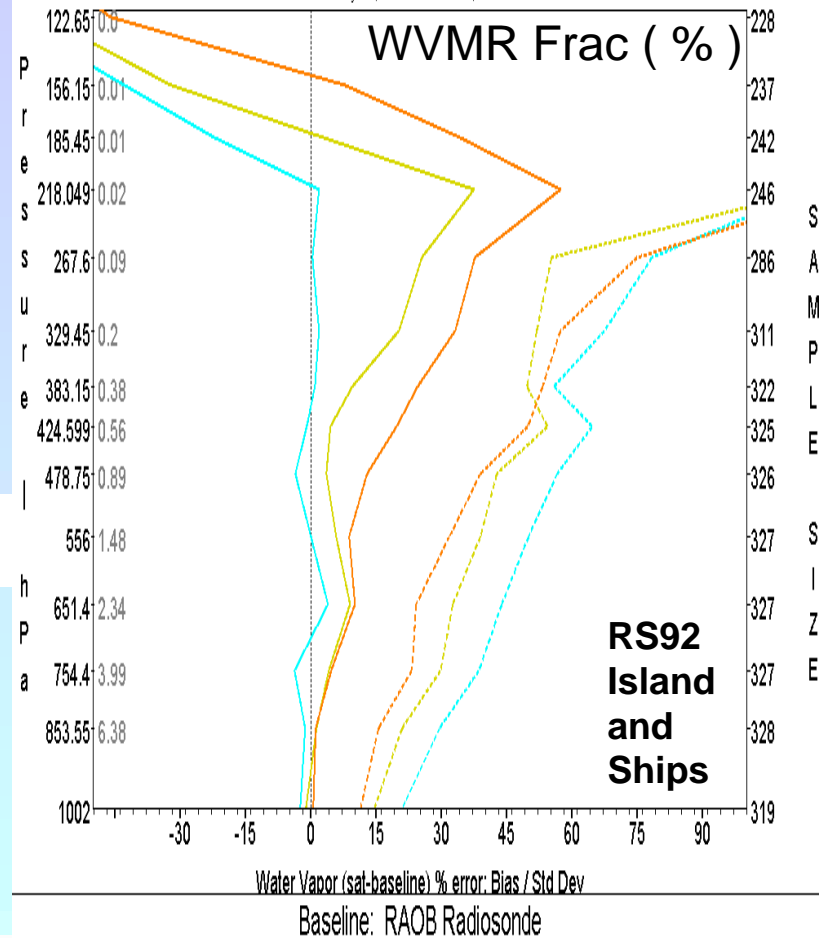
NOAA/NESDIS/STAR Vertical Accuracy Statistics

May 28, 2011 to June 3, 2011



NOAA/NESDIS/STAR Vertical Accuracy Statistics

May 28, 2011 to June 3, 2011



RAOB Forecast

AIRS AQUA

IASI NOAA

RAOB Forecast

AIRS AQUA

IASI NOAA

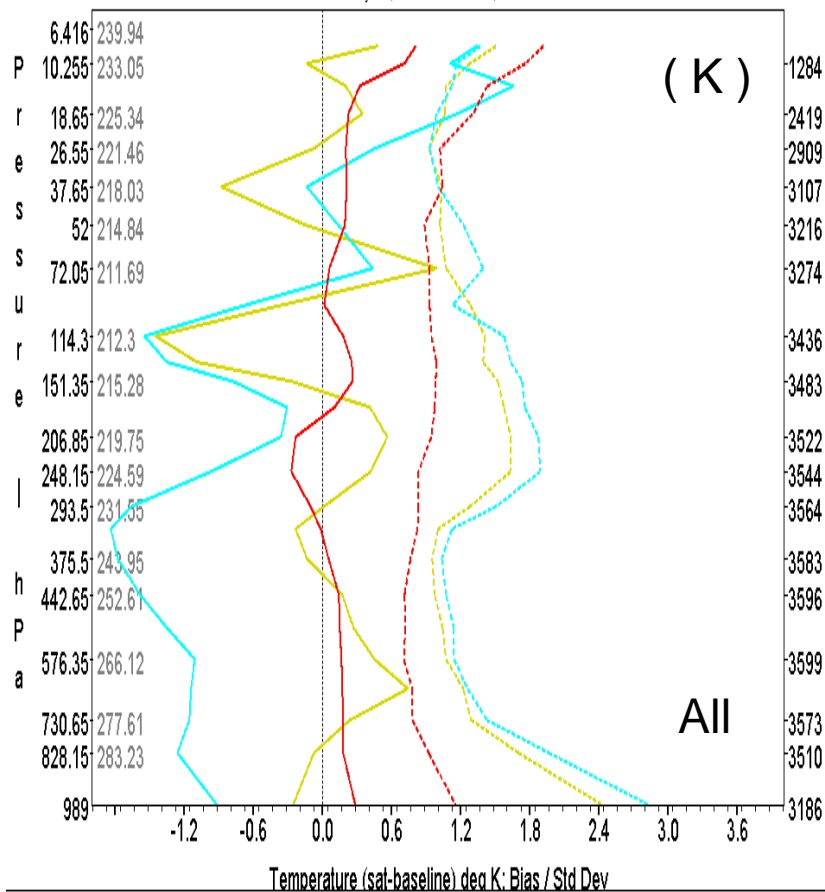
(X)-minus-Raob



PDISP VSTATS

NOAA/NESDIS/STAR Vertical Accuracy Statistics

May 28, 2011 to June 3, 2011



Baseline: RAOB Forecast

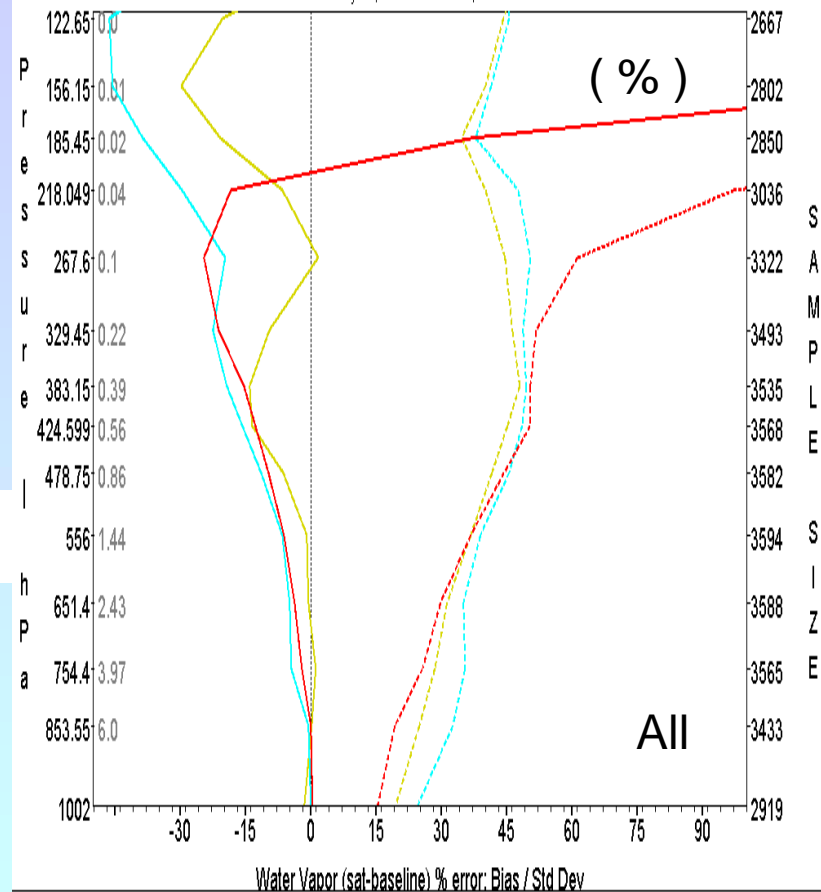
RAOB Radiosonde

AIRS AQUA

IASI NOAA

NOAA/NESDIS/STAR Vertical Accuracy Statistics

May 28, 2011 to June 3, 2011



Baseline: RAOB Forecast

RAOB Radiosonde

AIRS AQUA

IASI NOAA

(X)-minus-GFS



PDISP Scatter Plot Interface

Scatter Plot Selection
✕

Description:

Baseline System: RAOB Radiosonde ▼

- Use 42 pressure
- Use 100 pressure
- Use 26 pressure

RAOB Radiosonde

RAOB Radcor

RAOB Forecast

RAOB Re-Analysis

RAOB Fcst Analysis

ATOVS METOP

ATOVS METOP 1st Guess

ATOVS NOAA-18

All values must be present

Compute Stats For:

<input type="checkbox"/> RAOB	<input type="checkbox"/> Radcor	<input checked="" type="checkbox"/> Forecast	<input type="checkbox"/> Re-Analysis
<input checked="" type="checkbox"/> ATOVS METOP	<input type="checkbox"/> Fcst Analysis		
<input type="checkbox"/> ATOVS NOAA-18	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS METOP	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS NOAA-18			
<input type="checkbox"/> AIRS AQUA	<input type="checkbox"/> First Guess	<input type="checkbox"/> MW-Only	
<input type="checkbox"/> COSMIC UCAR	<input type="checkbox"/> GFS Forecast	<input type="checkbox"/> Raw Dry	
<input checked="" type="checkbox"/> IASI NOAA	<input type="checkbox"/> MIT	<input type="checkbox"/> First Guess	
<input type="checkbox"/> IASI EUMETSAT	<input type="checkbox"/> 1st Guess		
<input checked="" type="checkbox"/> GOES	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS SSMIS			
<input checked="" type="checkbox"/> ATOVS NOAA-19	<input type="checkbox"/> 1st Guess		
<input type="checkbox"/> MIRS NOAA-19			
<input type="checkbox"/> ATOVS METOP TEST1	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> ATOVS METOP TEST2	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> ATOVS NOAA-19 TEST1	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> ATOVS NOAA-19 TEST2	<input type="checkbox"/> 1st Guess	<input type="checkbox"/> GFS Fcst	
<input type="checkbox"/> MIRS METOP TEST			
<input type="checkbox"/> MIRS NOAA-19 TEST			
<input type="checkbox"/> MIRS SSMIS TEST			

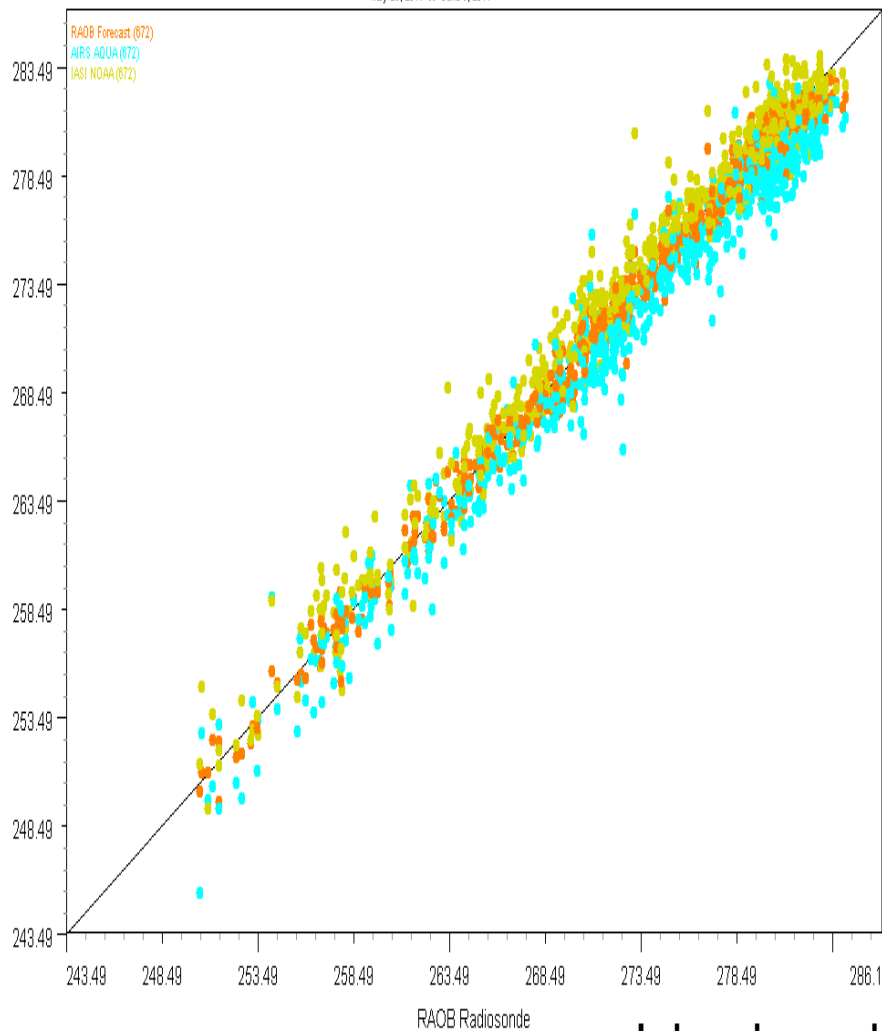


PDISP Scatter Plot

NOAA/NESDIS/STAR Scatter Plot

Retrieved Temperature (deg K) - 850.55 mb

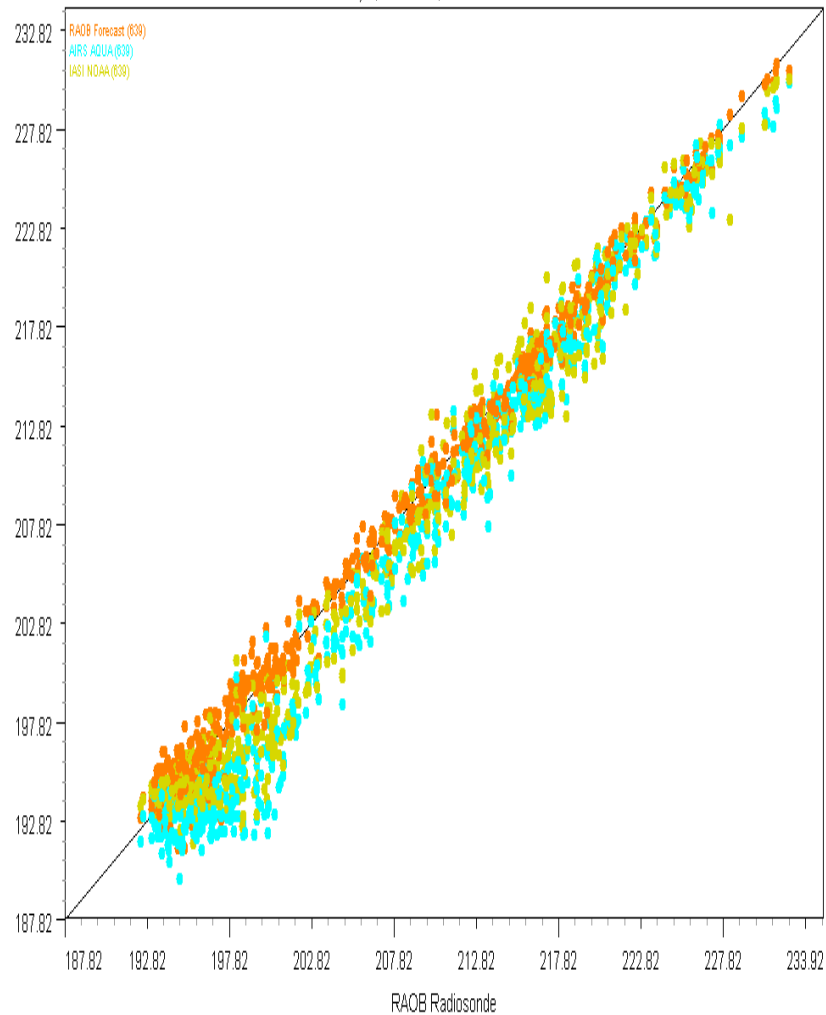
May 28, 2011 to June 3, 2011



NOAA/NESDIS/STAR Scatter Plot

Retrieved Temperature (deg K) - 1143 mb

May 28, 2011 to June 3, 2011



Islands and Ships vs **GFS**

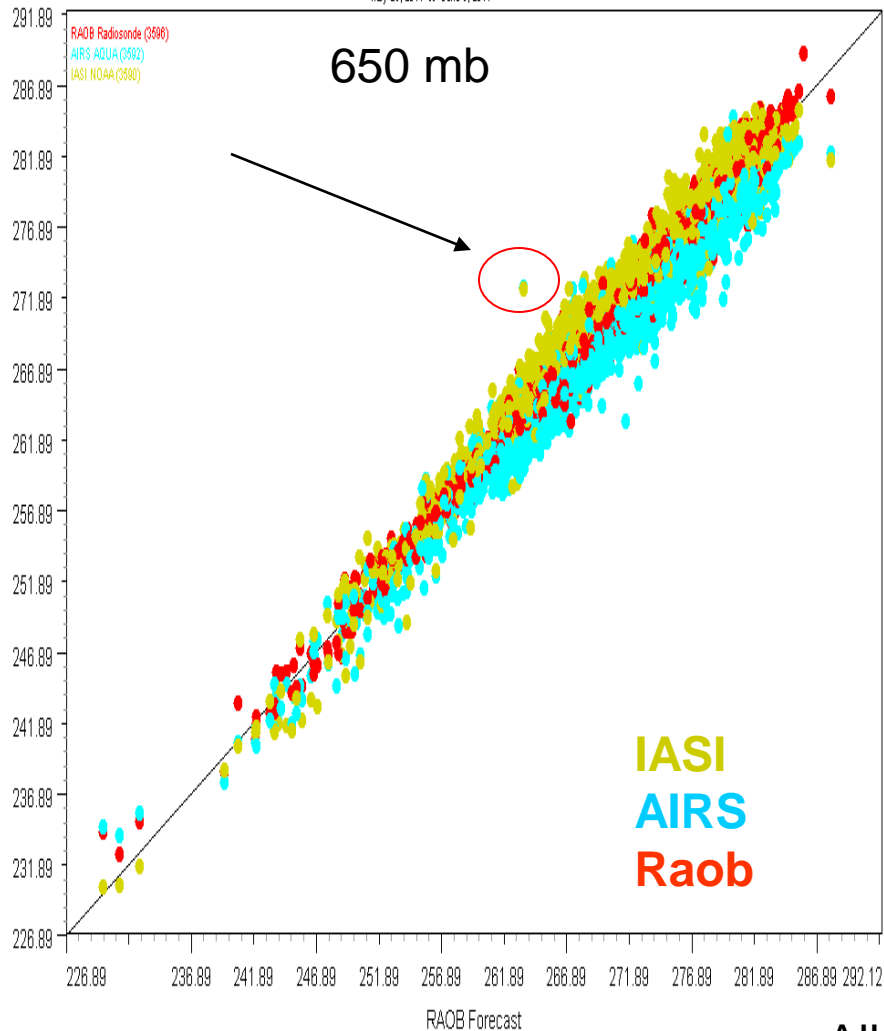


PDISP Scatter Plot

NOAA/NESDIS/STAR Scatter Plot

Retrieved Temperature (deg K) -- 650.55 mb

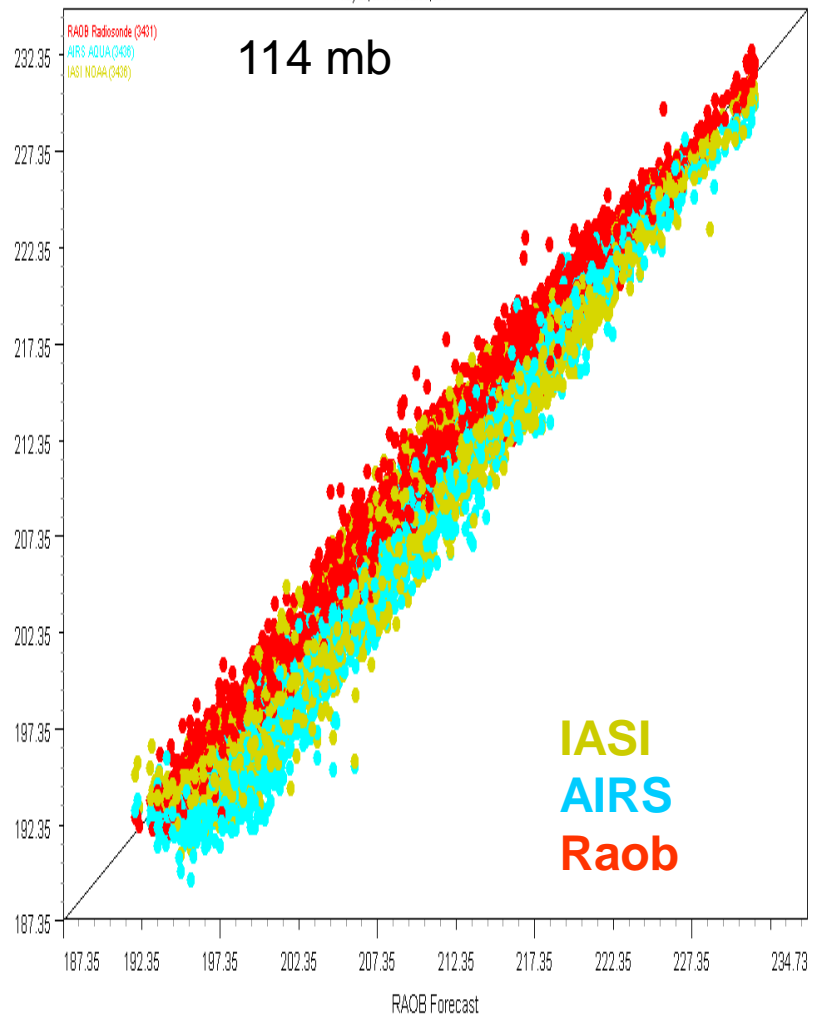
May 28, 2011 to June 3, 2011



NOAA/NESDIS/STAR Scatter Plot

Retrieved Temperature (deg K) -- 114.3 mb

May 28, 2011 to June 3, 2011

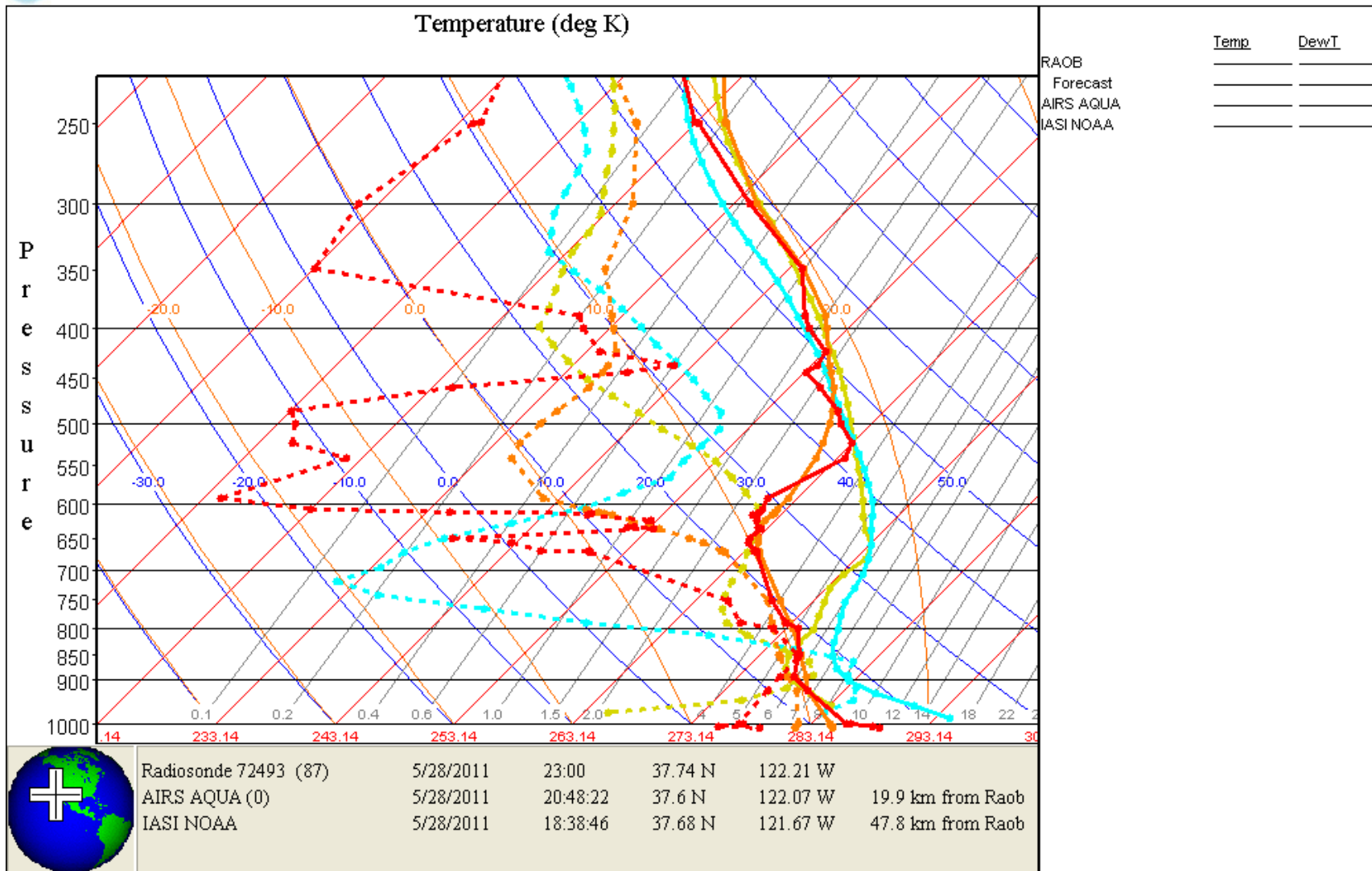


All vs **RAOB**



Scatter Plot Outlier

NOAA/NESDIS/STAR Collocated Profile Display



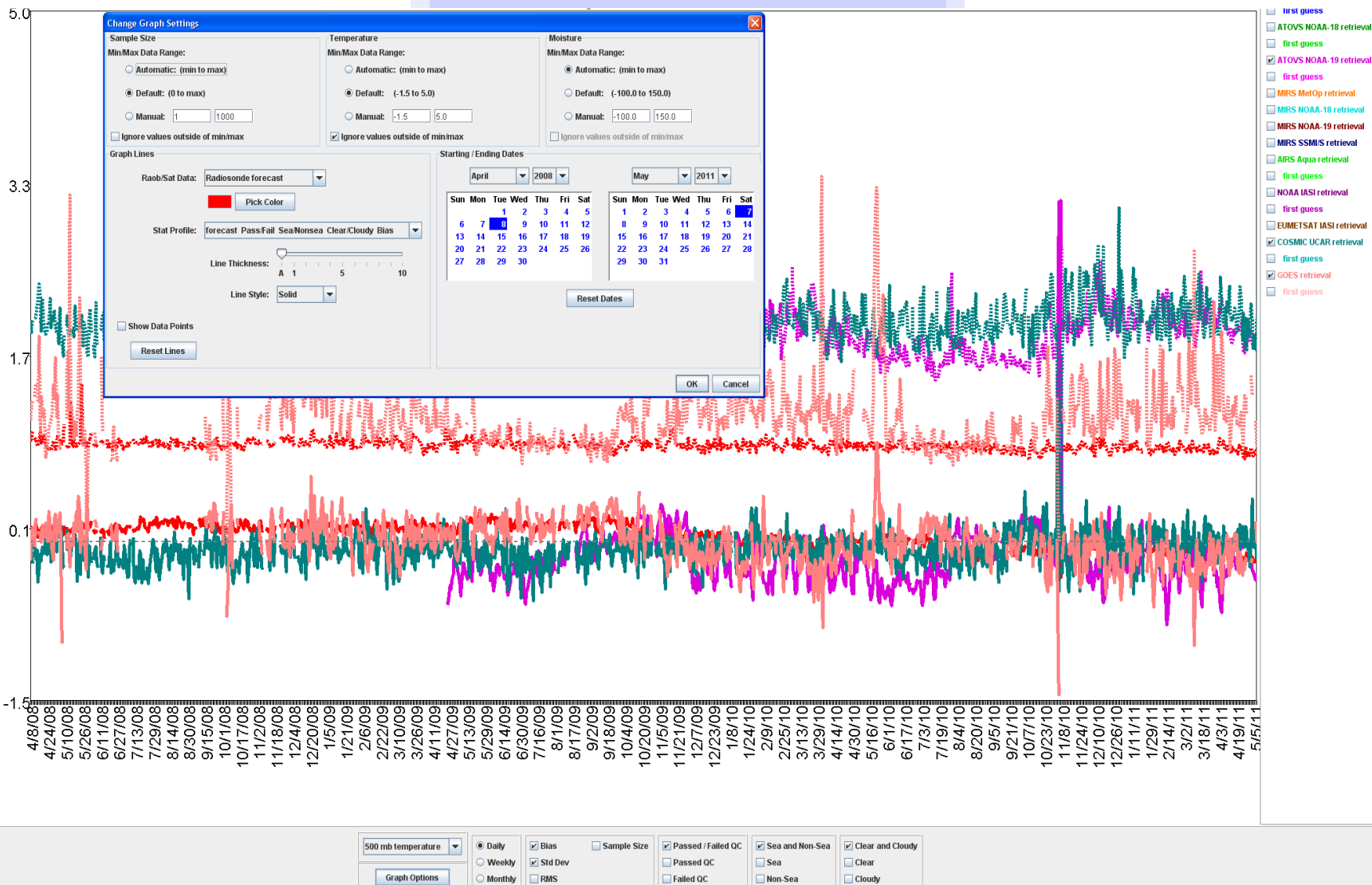


NARCS

(independent sampling)



NARCS Interface





NARCS User Interface

Change Graph Settings

Sample Size

Min/Max Data Range:

Automatic: (min to max)

Default: (0 to max)

Manual:

Ignore values outside of min/max

Temperature

Min/Max Data Range:

Automatic: (min to max)

Default: (-1.5 to 5.0)

Manual:

Ignore values outside of min/max

Moisture

Min/Max Data Range:

Automatic: (min to max)

Default: (-100.0 to 150.0)

Manual:

Ignore values outside of min/max

Graph Lines

Raob/Sat Data:

Stat Profile:

Line Thickness:

Line Style:

Show Data Points

Starting / Ending Dates

April 2008 May 2011

Sun	Mon	Tue	Wed	Thu	Fri	Sat
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

Sun	Mon	Tue	Wed	Thu	Fri	Sat
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

- 500 mb temperature
- 10 mb temperature
- 50 mb temperature
- 100 mb temperature
- 150 mb temperature
- 200 mb temperature
- 300 mb temperature
- 500 mb temperature
- 700 mb temperature

Daily

Weekly

Monthly

Bias

Std Dev

RMS

Sample Size

Passed / Failed QC

Passed QC

Failed QC

Sea and Non-Sea

Sea

Non-Sea

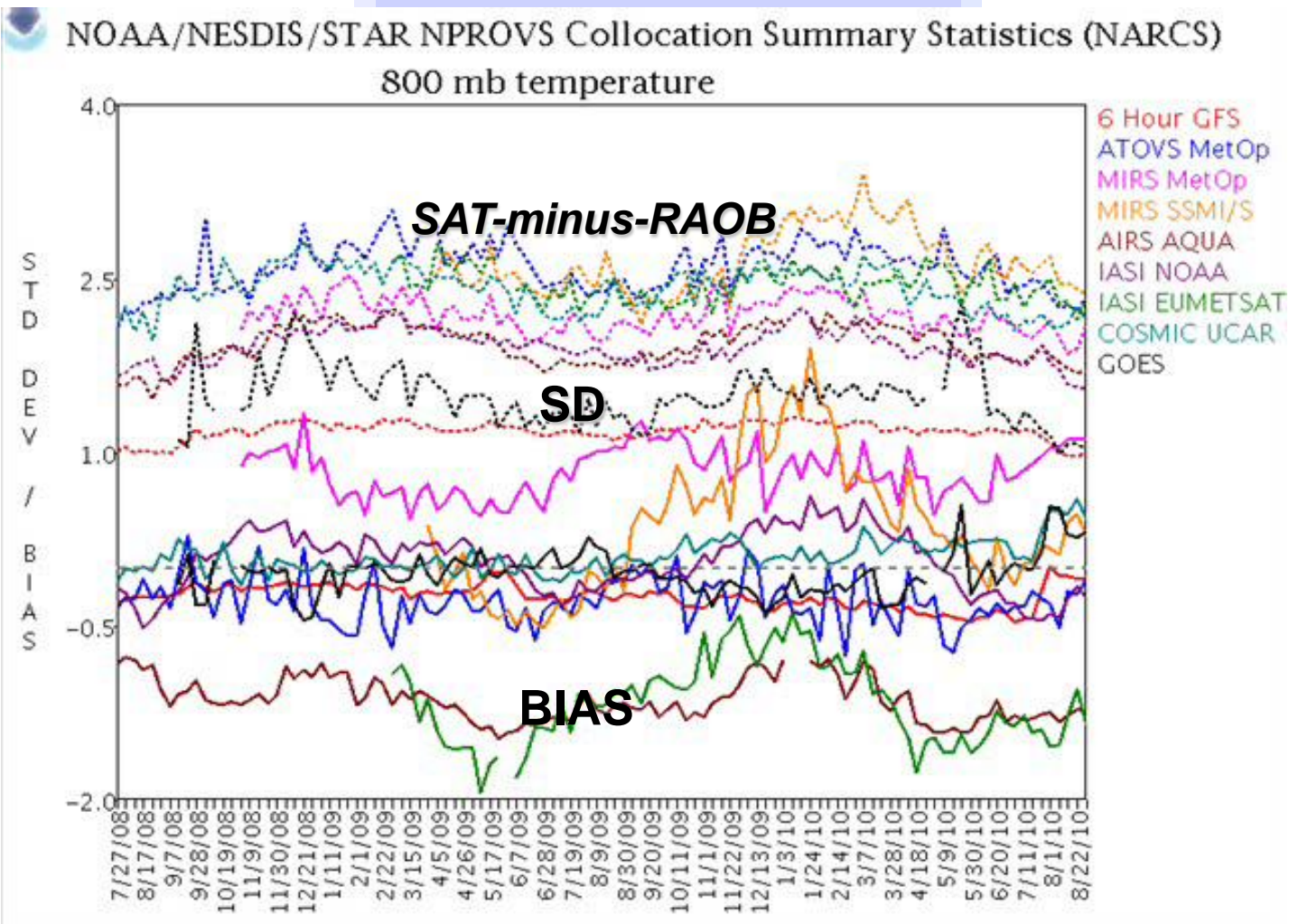
Clear and Cloudy

Clear

Cloudy



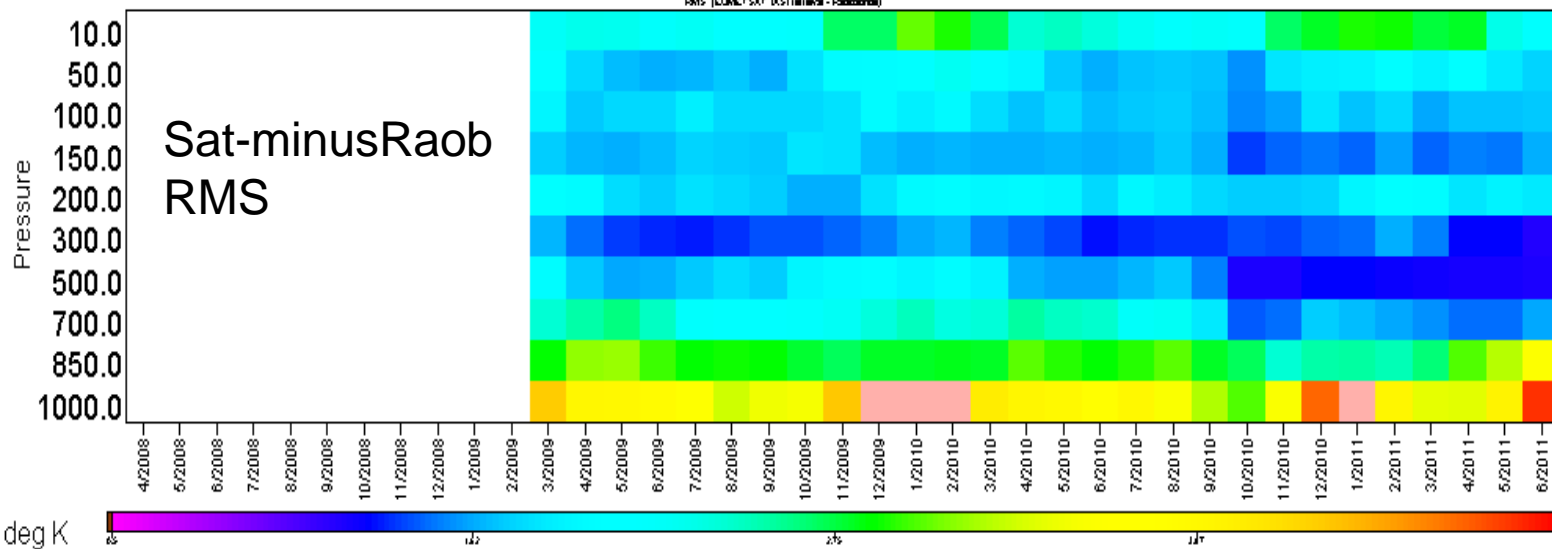
NARCS (independent samples)



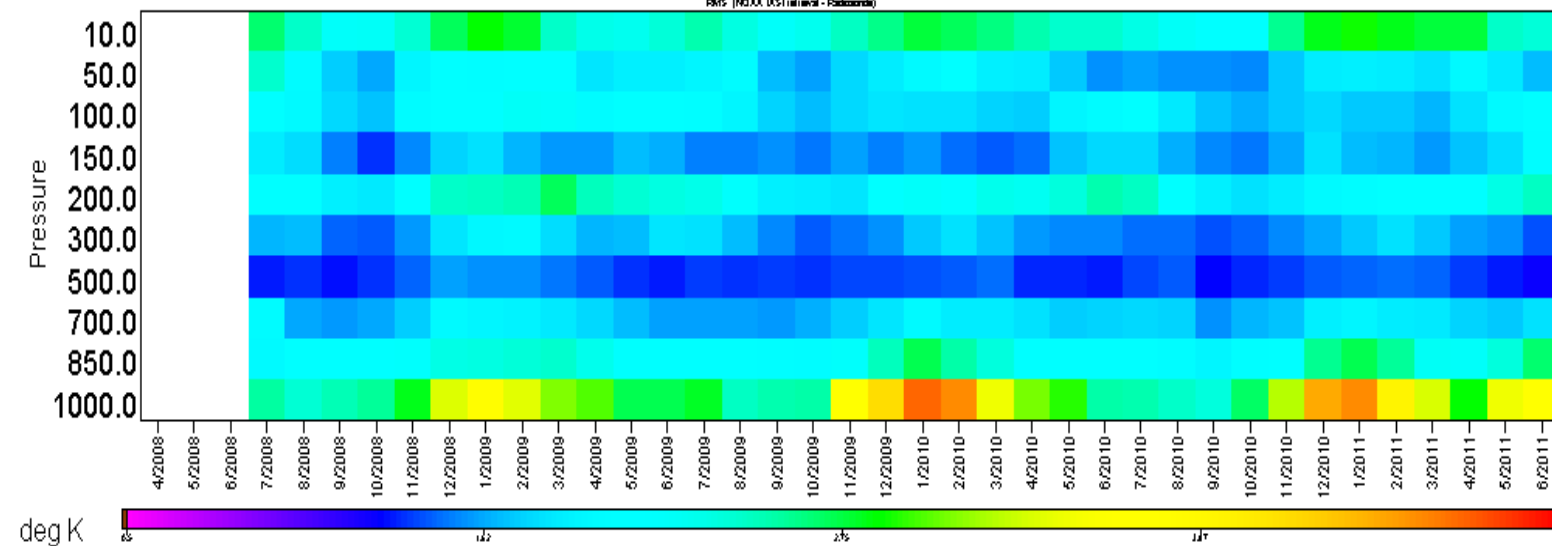


NARCS

RMS (EUMETSAT IASI) (interval - Paiksonde)



RMS (NOAA IASI) (interval - Paiksonde)



new NARCS multi-level interface



Upgrades / Expansions / Research

- JPSS / NPP / EDR's
- **Levels to layers; T and Precipitable water**
 - **40 TOVS; 100 IASI; 26 NWP; 30/20 layers**
- **CFSR, Forecast and Analysis @ Raob**
- WMO / CIMO Radiosonde Inter-comparisons
- **AEROSE**
- **Concordiasi Dropsonde Experiment (Oct-Dec 2010, NCAR, Jun Wang)**
- Ground GPS (ESRL, JCSDA ... S. Gutman)
- COSMIC (UCAR, JPL)
- Raob Radiation Correction Analysis w NWS
- **GCOS Reference Upper Air Network (GRUAN)**
- **Surface Data (Bob Yu, GOES-R ...)**



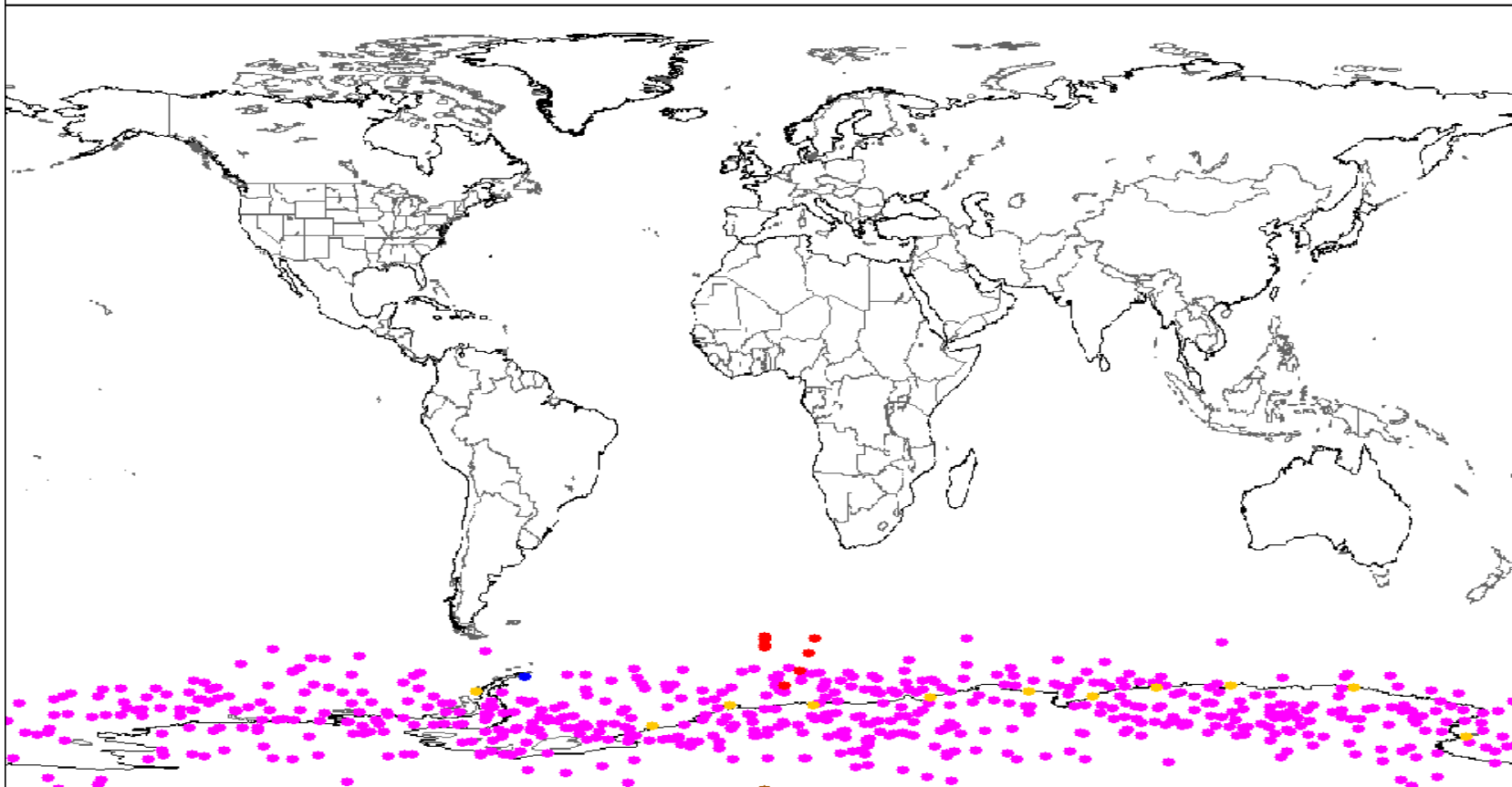
ConcordIASI

NOAA/NESDIS/STAR Satellite/Radiosonde Collocations

Radiosonde Location

1814(17) available out of 1814

Coast Land Island Coast Island Inland Ship Dropsonde



September 22, 2010 (22z) to December 10, 2010 (12z)

Drops and Raobs



STAR

Center for Satellite Applications and Research

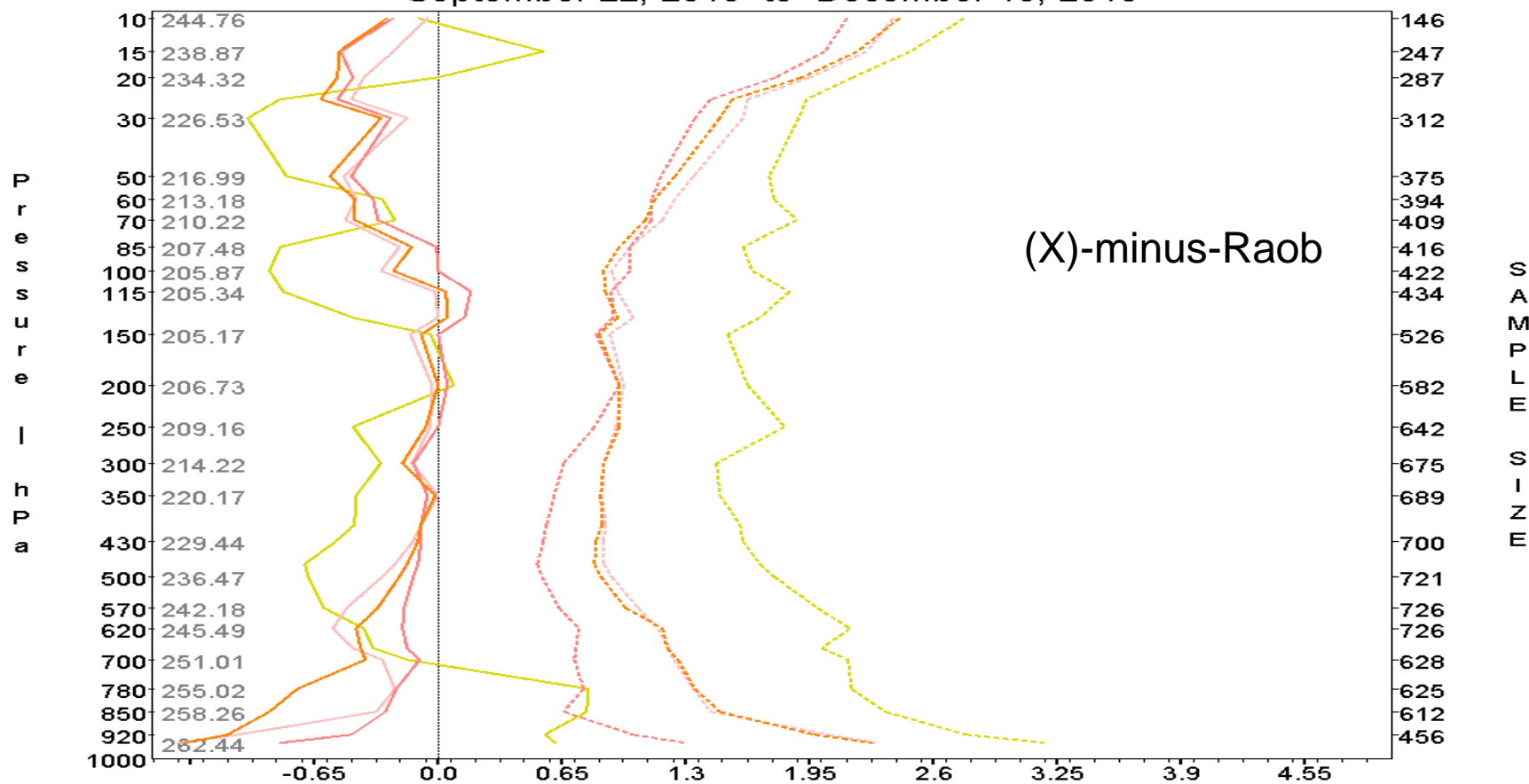
formerly ORA — Office of Research and Applications



ConcordIASI

NOAA/NESDIS/STAR Vertical Accuracy Statistics

September 22, 2010 to December 10, 2010



Temperature (sat-baseline) deg K: Bias / Std Dev

Baseline: RAOB Radiosonde

RAOB CFSR Forecast

RAOB CFSR Analysis

RAOB GFS Forecast

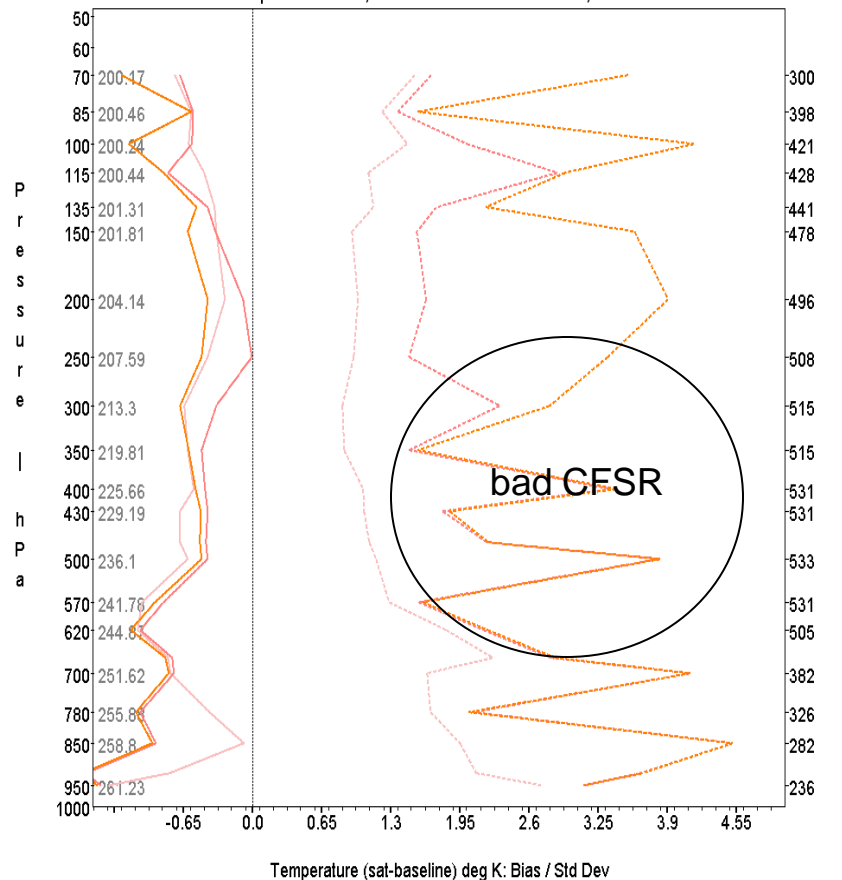
IASI NOAA



ConcordIASI

NOAA/NESDIS/STAR Vertical Accuracy Statistics

September 22, 2010 to November 12, 2010



Baseline: RAOB Radiosonde

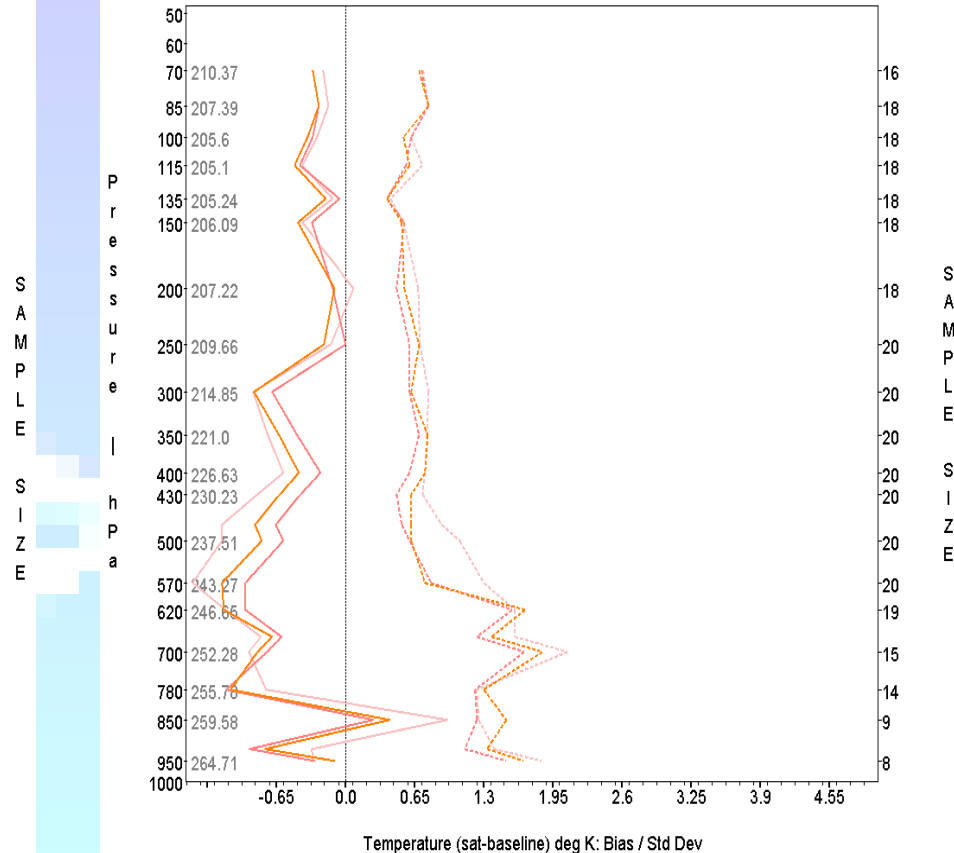
RAOB CFSR Forecast

RAOB CFSR Analysis

RAOB GFS Forecast

NOAA/NESDIS/STAR Vertical Accuracy Statistics

November 12, 2010 to December 10, 2010



Baseline: RAOB Radiosonde

RAOB CFSR Forecast

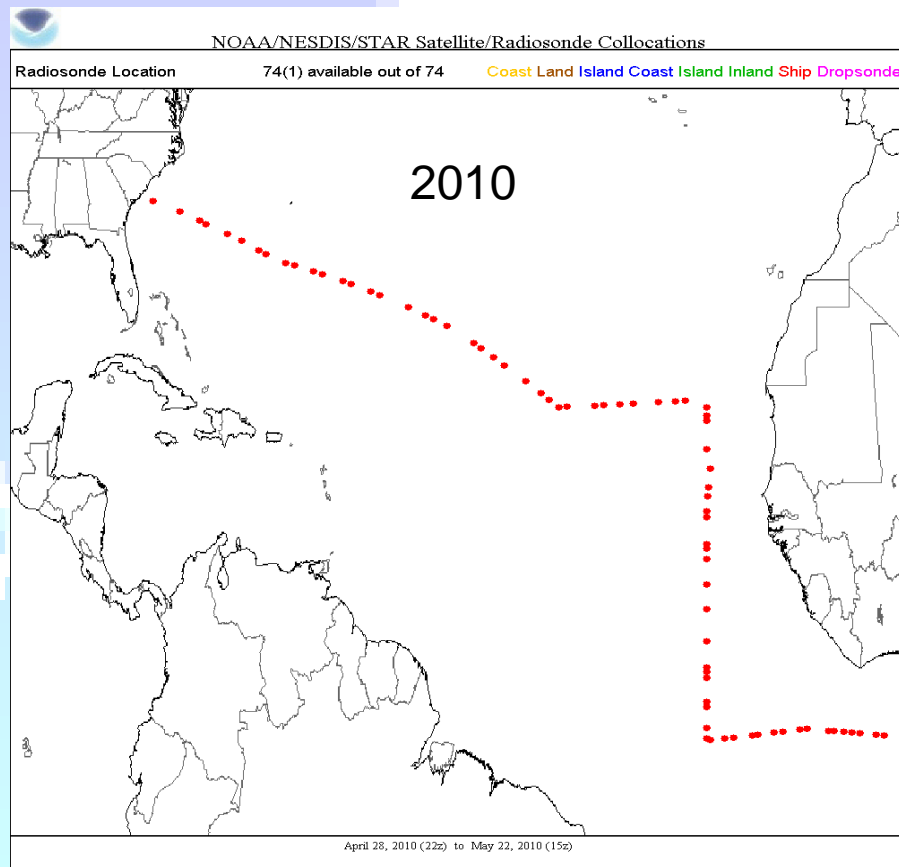
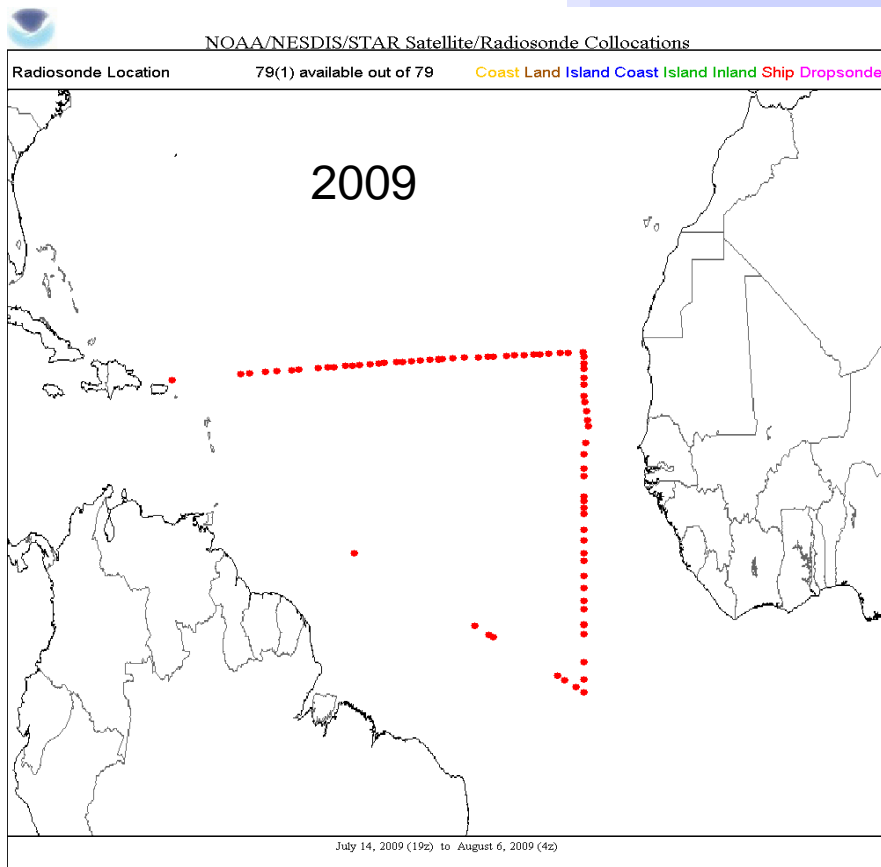
RAOB CFSR Analysis

RAOB GFS Forecast

-minus-Drop



Atlantic Aerosol and Ocean Sciences Expedition (AEROSE)

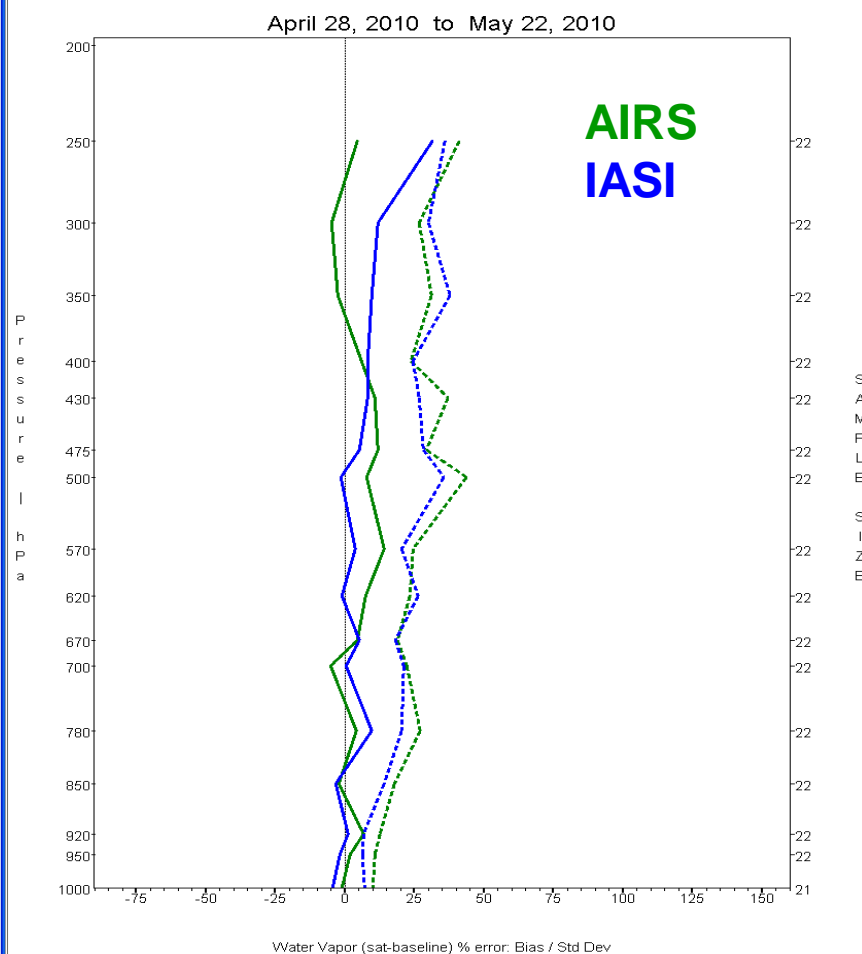
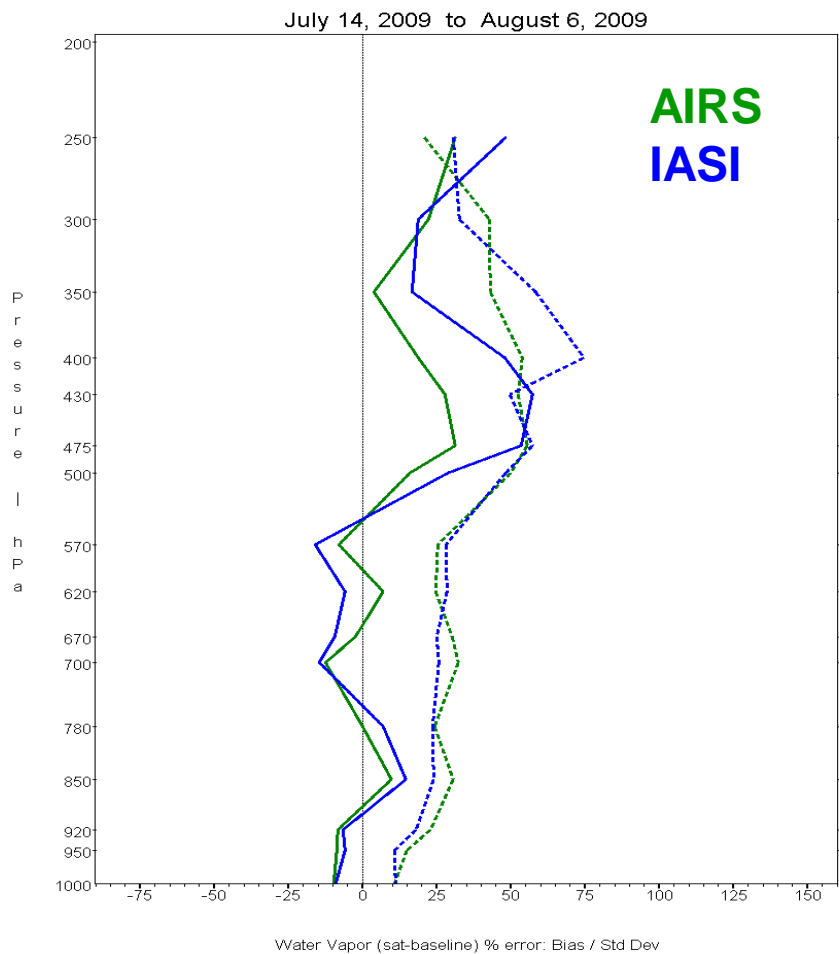


79 51 AIRS 45 AIRS QC
49 IASI 38 IASDI QC
21 COSMIC
24 IASI / AIRS QC
8 IASI / AIRS / COSMIC QC

74 50 AIRS 42 AIRS QC
52 IASI 43 IASI QC
10 COSMIC
25 IASI / AIRS QC
8 IASI / AIRS / COSMIC QC



AEROSE



Baseline System: RAOB Radiosonde (620 mb / 24 / 277.05)							
	Mean	Bias	Std Dev	RMS	Neg Diff	Pos Diff	Pos Diff Rec
IASI NOAA	9.49	-2.97	14.24	14.54	-30.28	23.25	60.00
AIRS AQUA	9.58	-1.98	17.98	18.09	-30.48	36.26	36.00

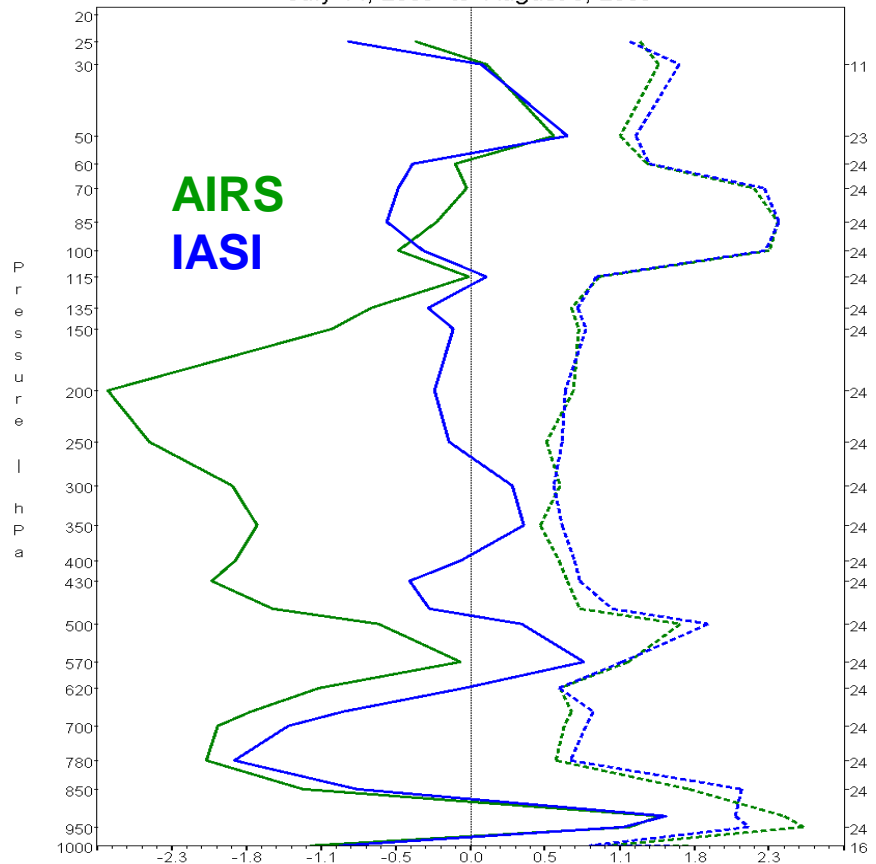
Baseline System: RAOB Radiosonde (850 mb / 22 / 9.77)							
	Mean	Bias	Std Dev	RMS	Neg Diff	Pos Diff	Pos Diff Rec
IASI NOAA	9.49	-2.97	14.24	14.54	-30.28	23.25	60.00
AIRS AQUA	9.58	-1.98	17.98	18.09	-30.48	36.26	36.00

H2O vapor Mix Ratio Fraction (%)

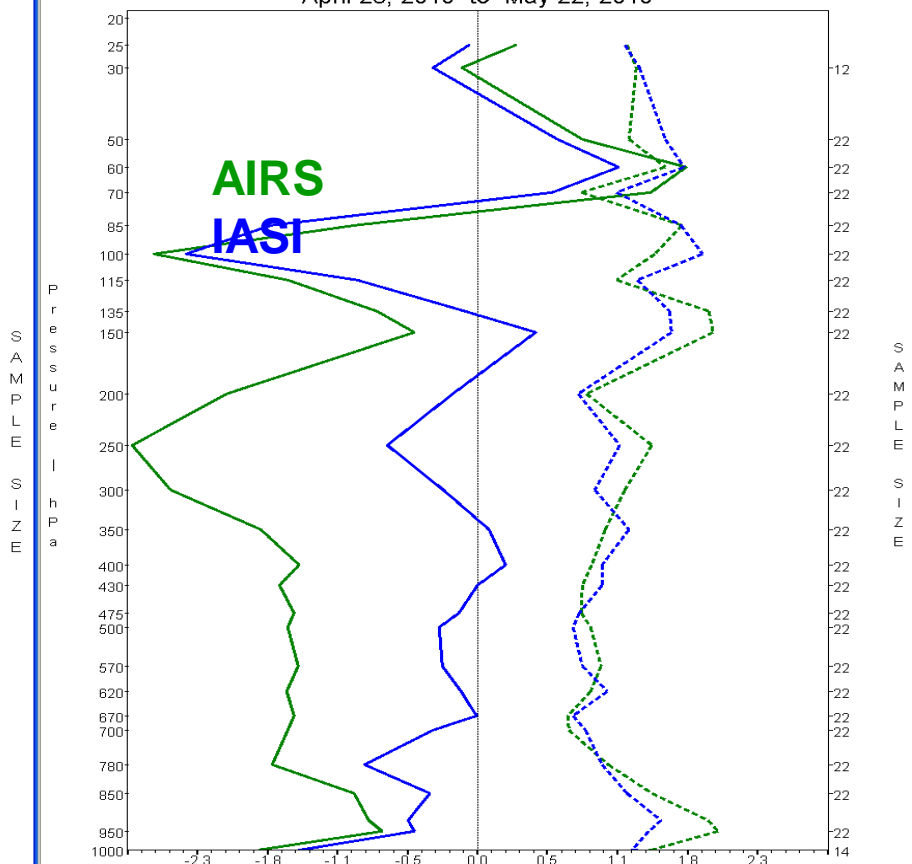


AEROSE

July 14, 2009 to August 6, 2009



April 28, 2010 to May 22, 2010



Temperature (sat-baseline) deg K: Bias / Std Dev

Temperature (sat-baseline) deg K: Bias / Std Dev

Baseline System: RAOB Radiosonde (250 mb / 24 / 232.18)							
	Mean	Bias	Std Dev	RMS	Neg Diff	Pos Diff	
IASI NOAA	232.00	-0.17	0.74	0.76	-1.56	0.96	48.00
AIRS AQUA	229.59	-2.58	0.61	2.66	-3.79	0.00	42.00

Baseline System: RAOB Radiosonde (60 mb / 22 / 204.47)							
	Mean	Bias	Std Dev	RMS	Neg Diff	Pos Diff	
IASI NOAA	205.69	1.21	1.77	2.15	-1.51	5.18	12.00
AIRS AQUA	206.27	1.79	1.61	2.41	-0.3	5.69	65.00

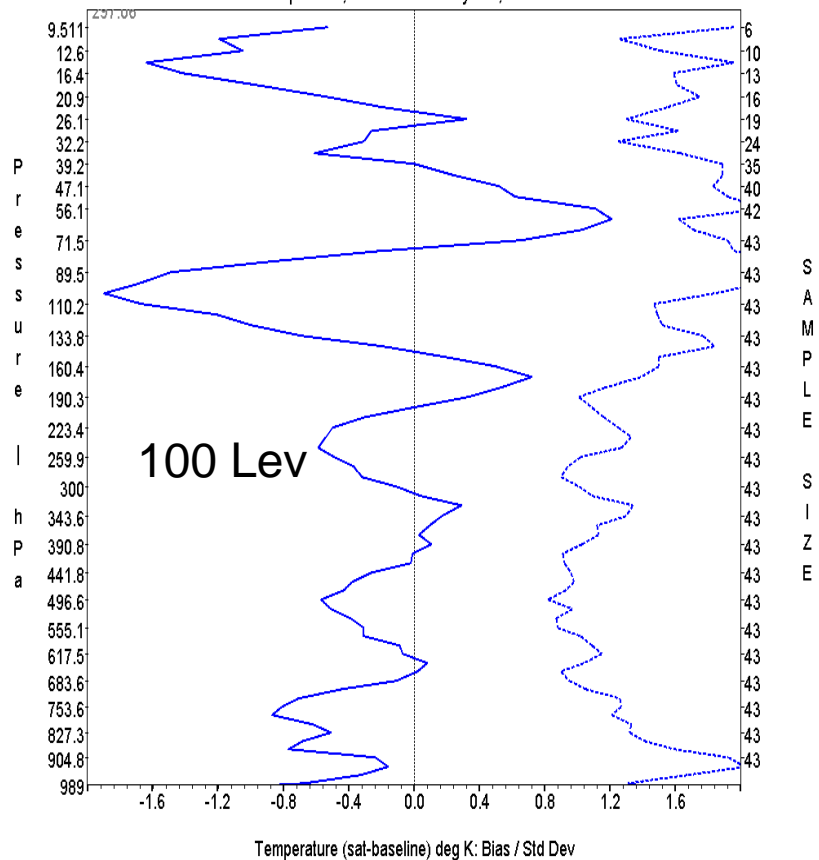
Temperature



AEROSE

NOAA/NESDIS/STAR Vertical Accuracy Statistics

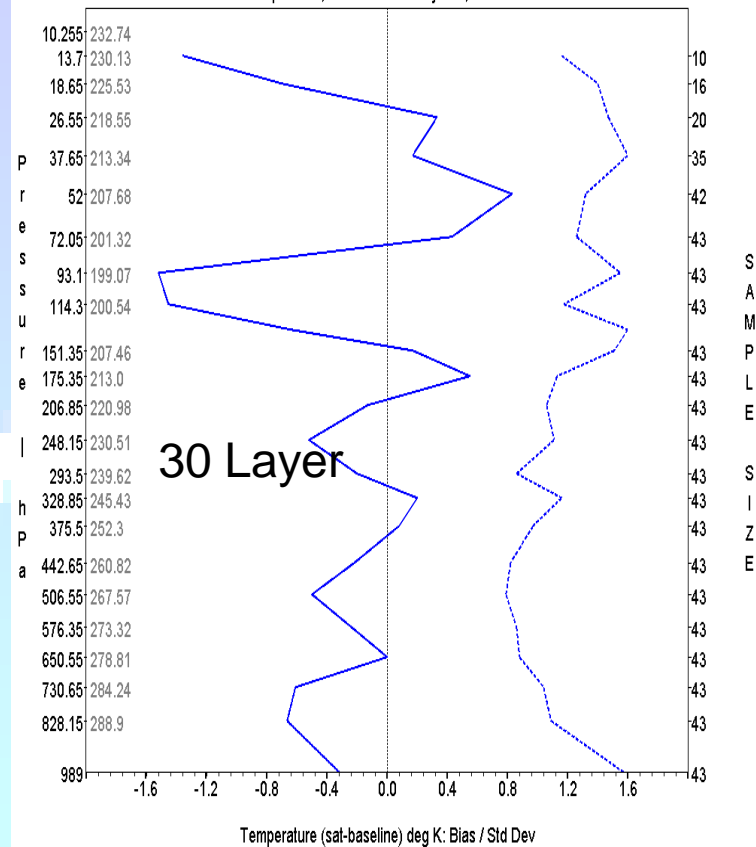
April 28, 2010 to May 22, 2010



Baseline: RAOB Radiosonde

NOAA/NESDIS/STAR Vertical Accuracy Statistics

April 28, 2010 to May 22, 2010

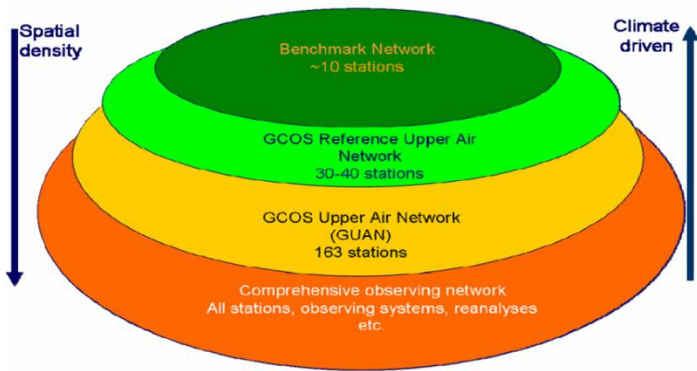
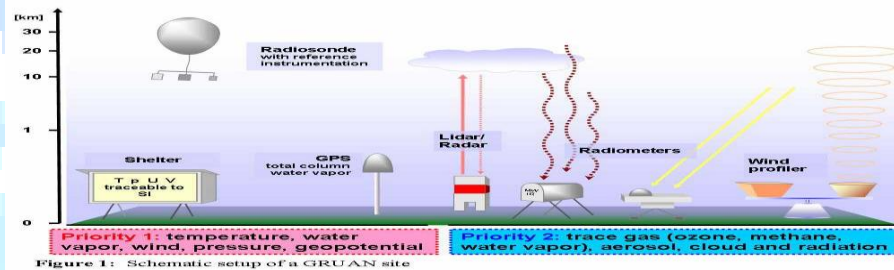
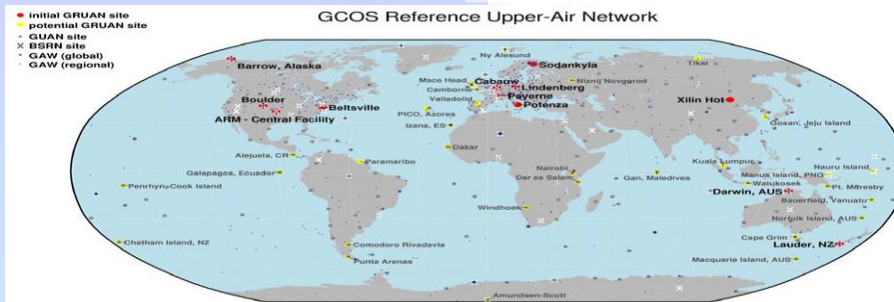


Baseline: RAOB Radiosonde

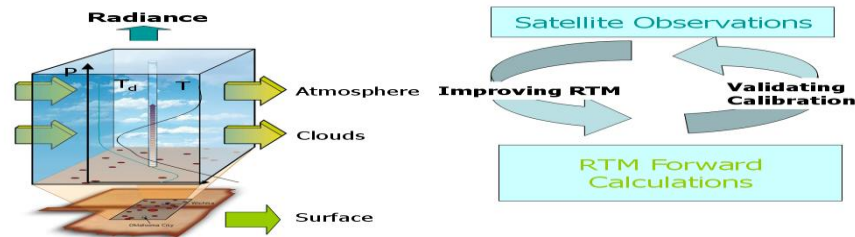
Coordination with GCOS Reference Upper Air Network (GRUAN)

(www.gruan.org)

- Working Group for Atmospheric Reference Observations (2006)
 - Lindenburg, Germany, DWD, Lead Center
 - Implementation and Coordination Meeting-3 (ICM-2) held in **March, 2011; New Zealand**
- Synergy between GRUAN and satellite validation
 - Use of reference observations for global satellite products validation
 - Use of satellites to verify site instrumentation
 - Use of reference observations for RT Model validation.



RTM Model Validation



... absolute accuracy (error bars)



Initial GRUAN stations





The GCOS Reference Upper-Air Network is tasked to:

- Provide long-term high-quality upper-air climate records
- Constrain and calibrate data from more spatially-comprehensive global observing systems (including satellites and current radiosonde networks)
- Fully characterize the properties of the atmospheric column
 - “site atmospheric state best estimates”
 - D Tobin et.al., JGR, 2006; ... ARM sites



NPROVS Web Site

<http://www.star.nesdis.noaa.gov/smcd/opdb/poes/NPROVS.php>



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POES Project

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Radiation Products

»NOAA PROducts Validation
System (NPROVS) >>

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 - Monthly Trends
 - Long-Term Trends
- User Interface
 - ProfileDisplay
 - NARCS

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STAR / SMCD / OPDB - NOAA Products Validation System (NPROVS)

NPROVS Overview

NPROVS routinely (daily) compiles datasets of collocated radiosonde, dropsonde and appended numerical weather prediction (NWP) data with the following satellites and sounding (temperature and moisture) product suites:

