JPSS DPA Program Planning Meeting
Sea Surface Temperature (SST) EDR Team

Sasha Ignatov

SST EDR Lead

September 21, 2012

Outline

- Overview of Data Products
- Team Membership
- FY12 Accomplishments and Scientific Advances
- Issues, Challenges, Setbacks
- Changes in Strategy due to funding constraints
- FY-13 Schedule and Milestones
- Path Forward (FY-14 thru FY-17)
- Summary

Overview of Data Products

EDR	Name	Algorithm	QF?	Validation
SST	Skin SST	Empirical Regression vs. buoys minus 0.17K	Identical to Bulk SST QFs	Against buoy SST Against ship based radiometers, if available
SST	Bulk SST	Empirical Regression vs. buoys	Yes	Against Buoy SST

In SST EDR files, skin SST layer is identical to bulk, with a constant 0.17K offset.

SST Team has proposed to:

- **Report only skin SST as a separate layer**
- **Instead of reporting bulk SST as a layer, write 0.17K offset as an attribute**

Working with NJO Program Scientist, Mitch Goldberg, to implement

SST Team Membership

EDR	Name	Organization	Funding	Tasks
SST	**Ignatov**	STAR	NJO	JPSS Algorithm & Cal/Val coordination STAR SST Lead
SST	Dash Liang Xu Stroup Kihai Petrenko Bouali	STAR/CIRA STAR/CIRA STAR/GST STAR/STG STAR/GST STAR/GST STAR/CIRA	NJO	SST Quality Monitor (SQUAM); Monitoring IR Clear-sky Radiances Oceans for SST (MICROS) In Situ Quality Monitor (*i*Quam) Technical Liaison; Data support; ACSPO codes IDPS SST code, ACSPO, Match up Cloud Mask, SST retrievals Destriping MODIS/VIIRS L1b & SST
SST	**May**, McKenzie Willis, Cayula	NAVO	NJO/Navy	NAVO SEATEMP SST, Cal/Val VIIRS Cloud Mask feedback
SST	**Evans** **Minnett** Kilpatrick	U. Miami	NJO	Uncertainty characterization; Instrument artifacts; SST Val vs. drifters; Skin SST Val with shipboard radiometers; skin to sub-skin conversion (skin effect, diurnal heating); RTM
SST	**Arnone**, McBride, Fargion	USM NRL UCSD	NJO Navy USM UCSD	SST Algorithm Analyses, SST improvements at slant view zenith angles/swath edge SST/Color Coordination
SST	**LeBorgne** Legendre	Meteo France	Meteo France	Processing VIIRS and Cal/Val using O&SI SAF heritage; Comparisons with AVHRR/SEVIRI

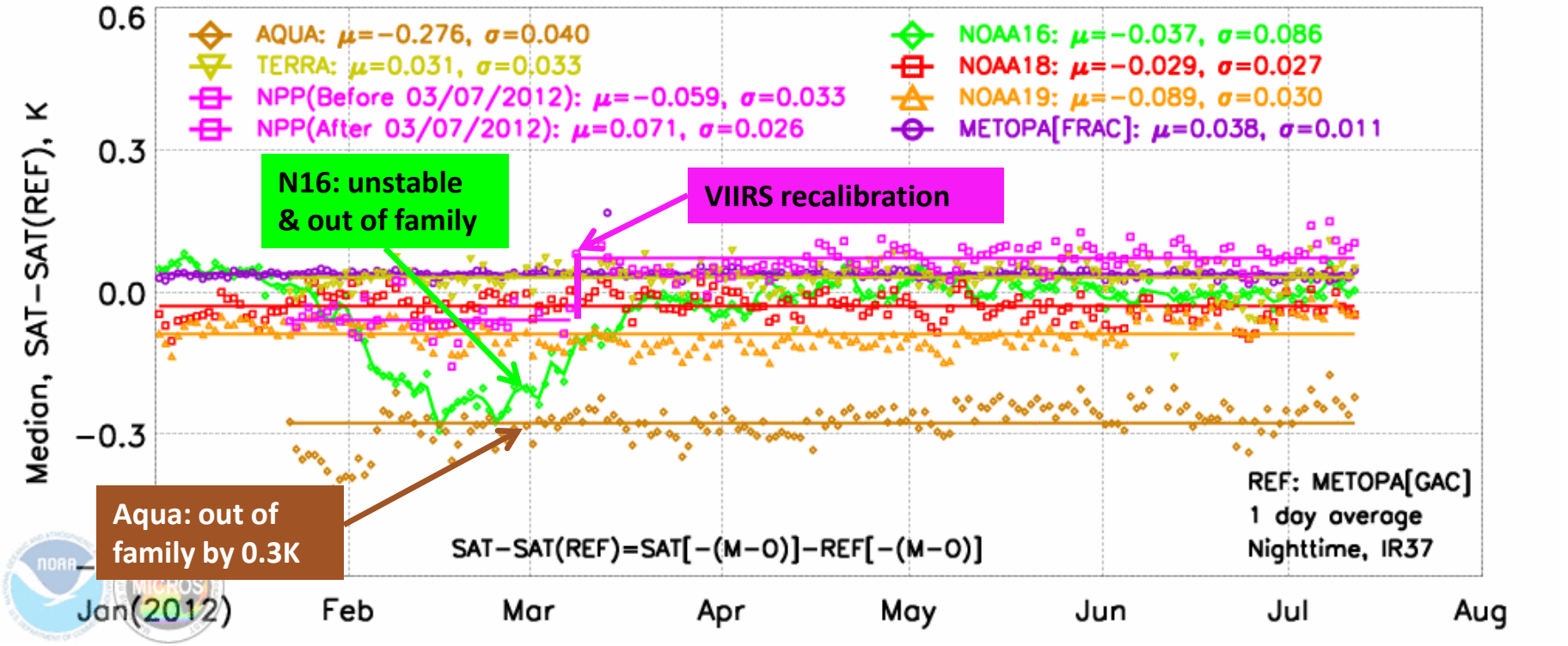
FY-12 Accomplishments: STAR

1) Processing global VIIRS global Radiances & SSTs in NRT from 22 Jan 2012 – pr
2) Feedback to SDR – Monitoring VIIRS Clear-Sky Ocean Radiances in MICROS www.star.nesdis.noaa.gov/sod/sst/micros/
   - Set up global NRT VIIRS and Terra/Aqua MODIS ACSPO processing and MICROS monitoring
   - Showed that VIIRS BTs are stable and consistent with AVHRRs
   - Analyzed warm-Up Cool-Down exercise (6K warmer BTs)
   - Analyzed PRT coefficients change on 7 Mar 2012 – all BTs warmer by 0.14K
3) Feedback to VCM – Monitoring IDPS and ACSPO SSTs in SQUAM http://www.star.nesdis.noaa.gov/sod/sst/squam/
   - Added IDPS and ACSPO (VIIRS and MODIS) SSTs in SQUAM
   - Monitor for stability/consistency with community AVHRR/MODIS SSTs
4) Sustained monitoring *in situ* SST www.star.nesdis.noaa.gov/sod/sst/iquam/
   - QC in situ data; Monitor on the web; Serve QC'ed data for Cal/Val
5) Performed VIIRS striping analyses, compared with MODIS
6) Evaluated 3 NGAS ASFs: found non-functional; tweaked STAR heritage tools for VIIRS
7) Suggested fixes to SST EDR, submitted DRs, worked on Redesign
8) Published/Presented VIIRS SST

Monitoring of VIIRS, MODIS, and AVHRR Radiances in MICROS

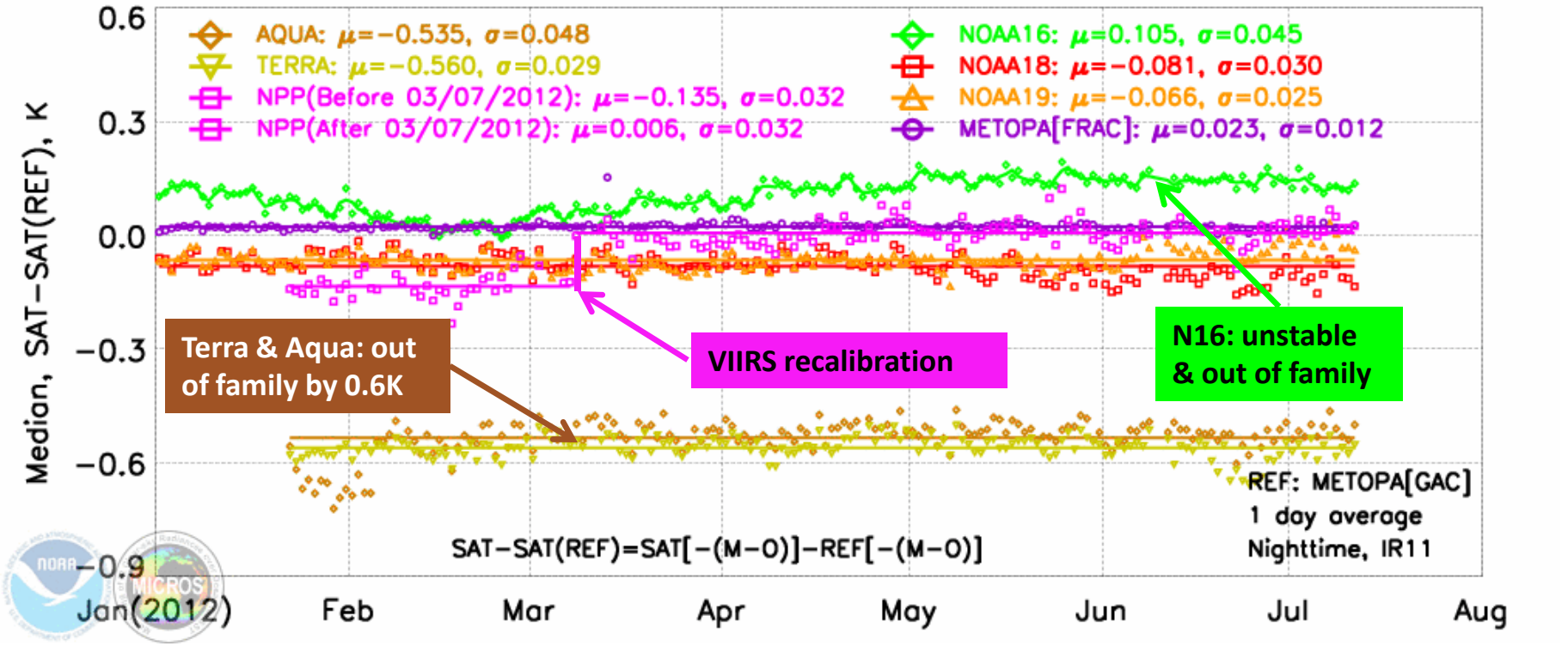
www.star.nesdis.noaa.gov/sod/sst/micros/

Nighttime DD's @3.7 µm (Ref=Metop-A GAC)



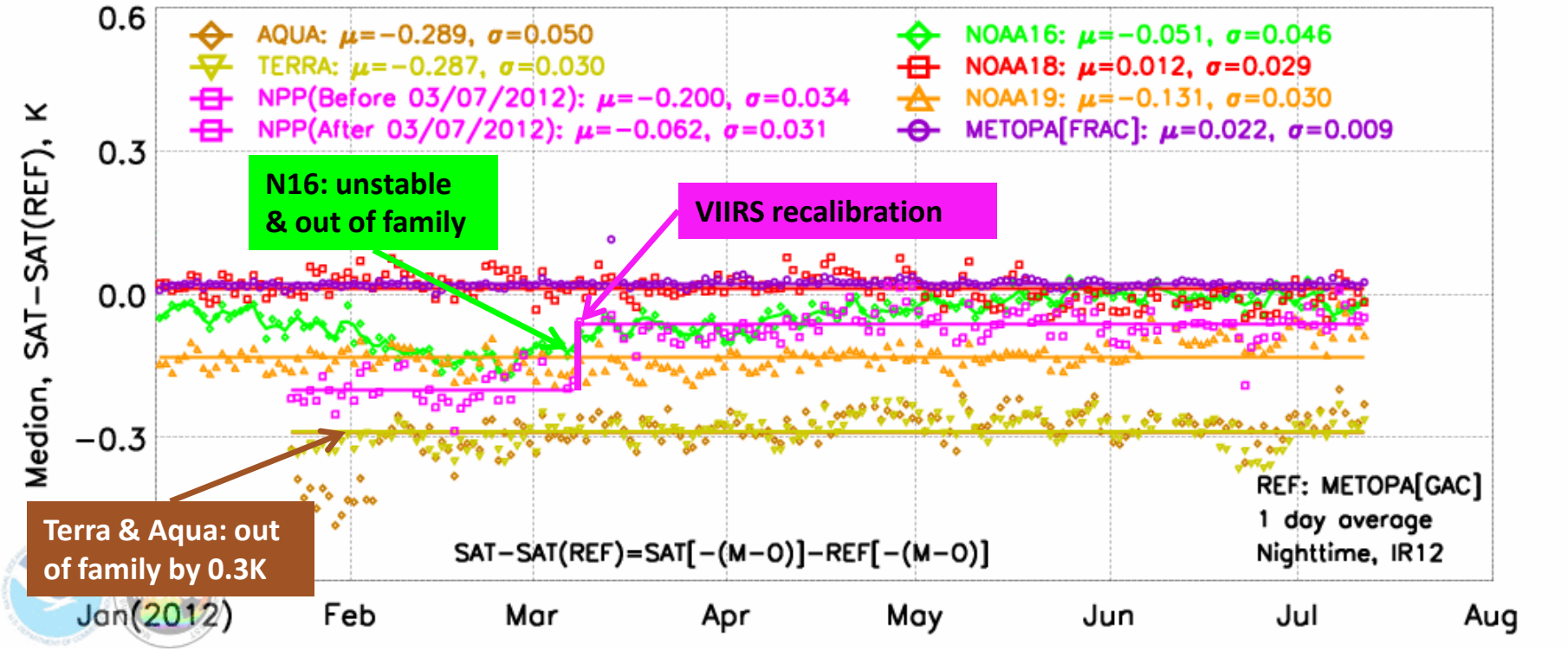
- All AVHRRs (except N16), Terra/MODIS, and VIIRS: consistent to within ±0.08K
- Aqua and Terra MODIS inconsistent by 0.3K : Calibration problem
- Aqua/MODIS out of family by 0.3K (CRTM coefficients in error)
- VIIRS Cal Change 7 Mar 2012 reset BT@M12 by +0.13K; In-family

Nighttime DD's @11 µm (Ref=Metop-A GAC)



- All AVHRRs (except N16) and VIIRS are consistent to within ±0.05K
- Terra and Aqua/MODIS out of family by 0.6K (error in CRTM coefficients)
- Cal Change 7 Mar 2012: Reset BT@M15 by +0.14K; Now better in family

Nighttime DD's @12 µm (Ref=Metop-A GAC)



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- Terra and Aqua/MODIS out of family by 0.3K (error in CRTM coefficients)
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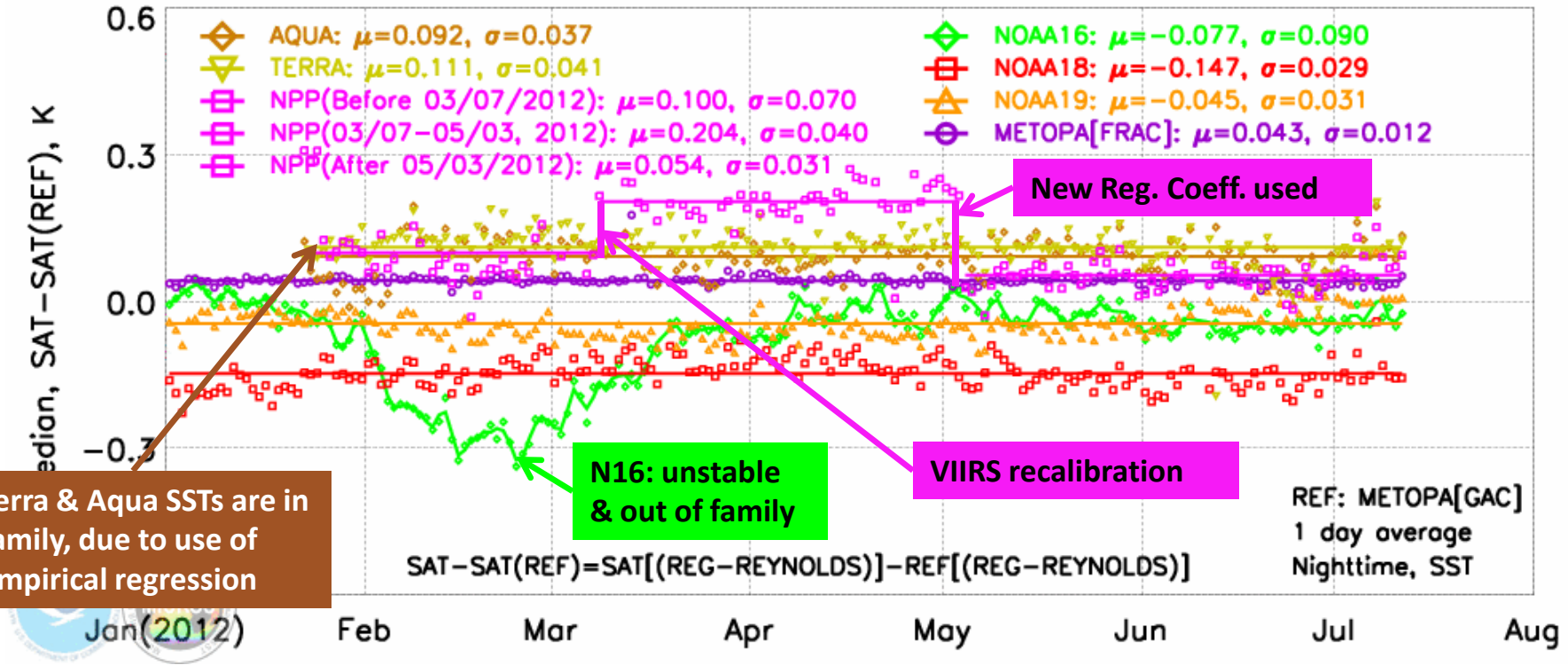
Nighttime DD's ACSPO SST (Ref=Metop-A GAC)

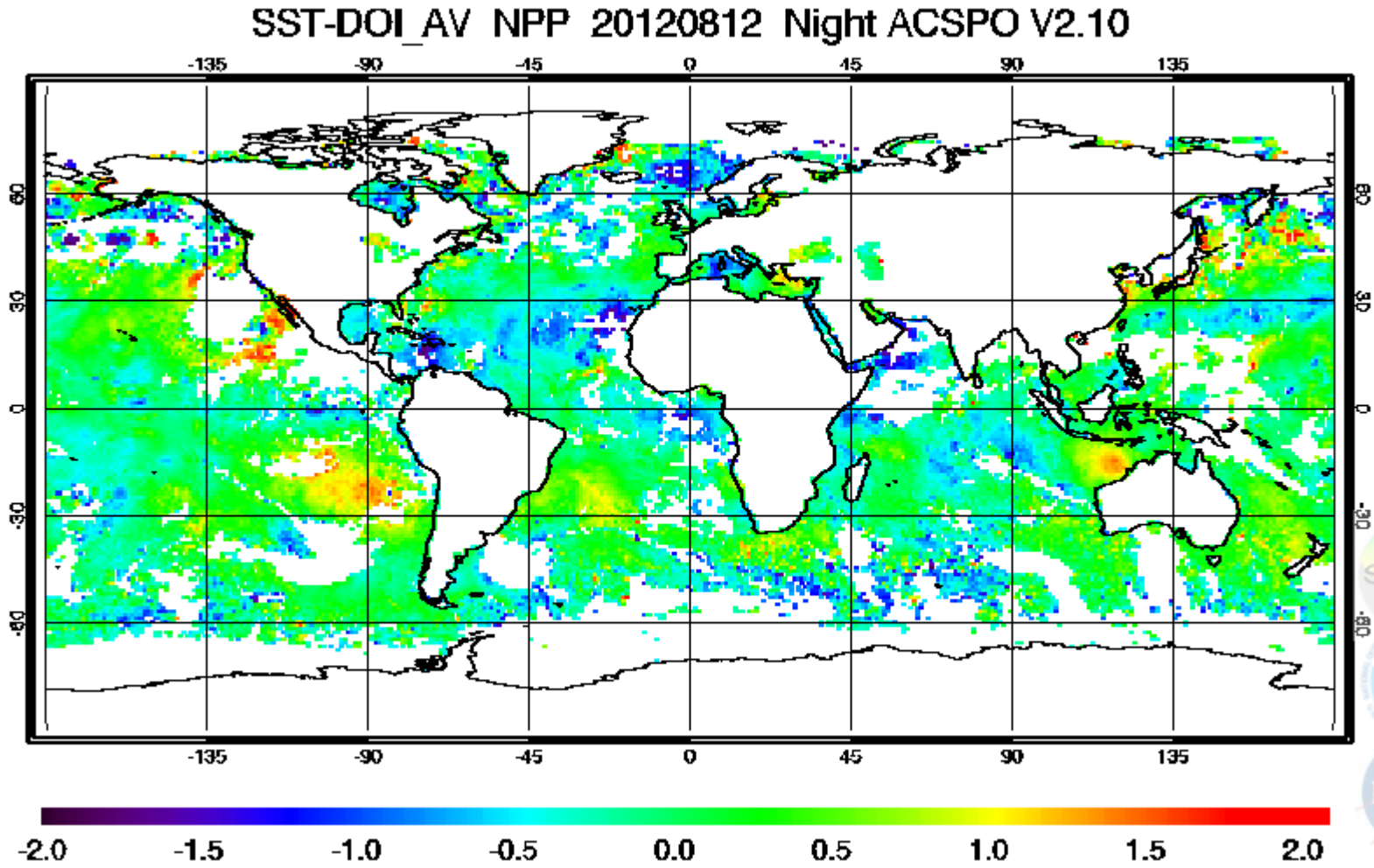


- All AVHRRs (except N16), MODISs and VIIRS are consistent to within ±0.13K
- VIIRS Cal Change 7 Mar 2012: SST +0.10K & Out of family
- New regression coefficients on 3 May 2012: SST -0.15K & back in family

Monitoring of ACSPO and IDPS SSTs in SST Quality Monitor (SQUAM)

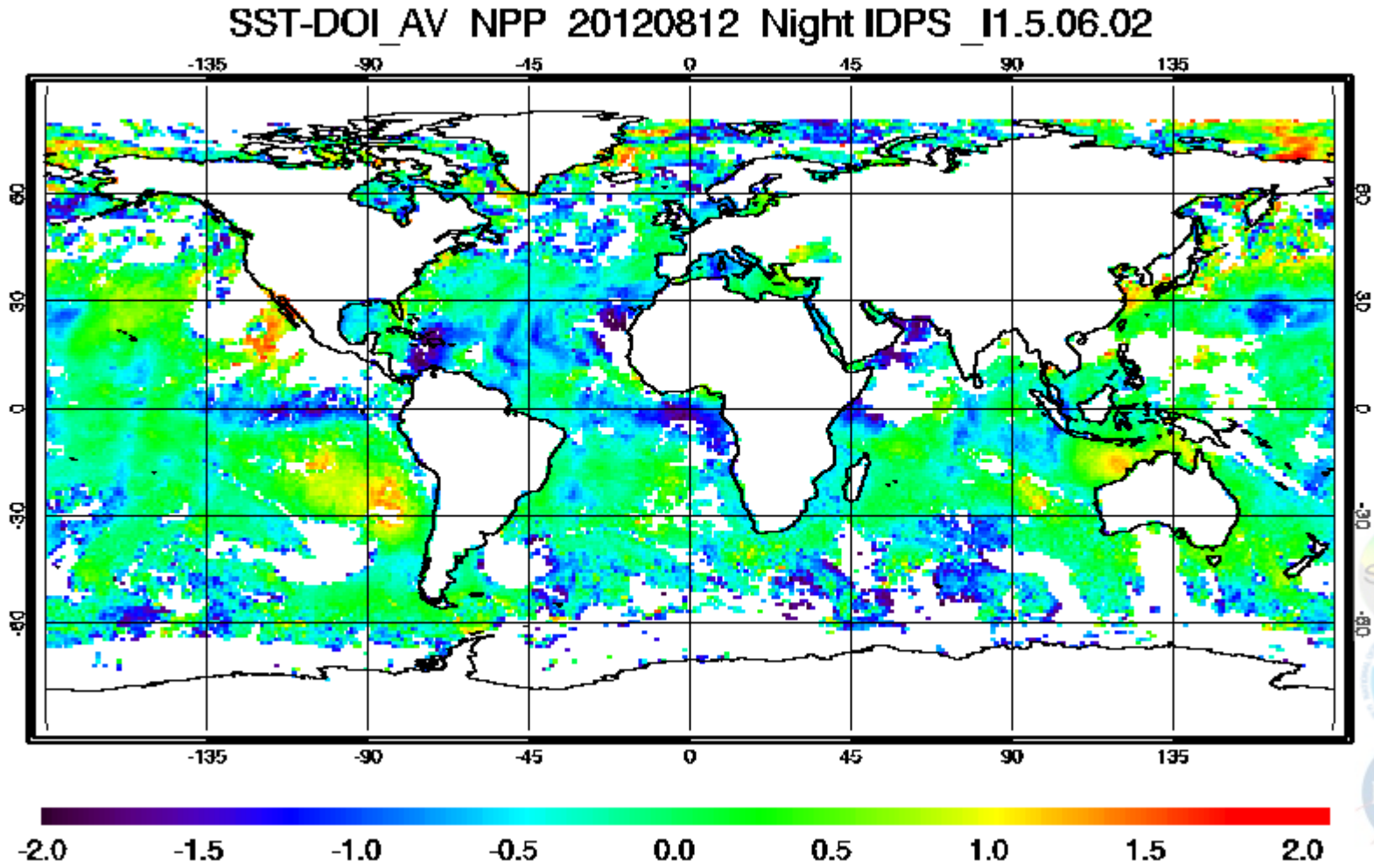
www.star.nesdis.noaa.gov/sod/sst/squam/

NIGHT: ACSPO L2 minus Reynolds L4
12 August 2012



- *Deviation from Reference SST is flat & close to 0*
- *Residual Cloud/Aerosol leakages seen as cold spots*

NIGHT: IDPS L2 minus Reynolds L4
12 August 2012



- *More Cloud leakages in IDPS than in ACSPO*
- *"Limb Cooling" – due to SST equations/coefficients*

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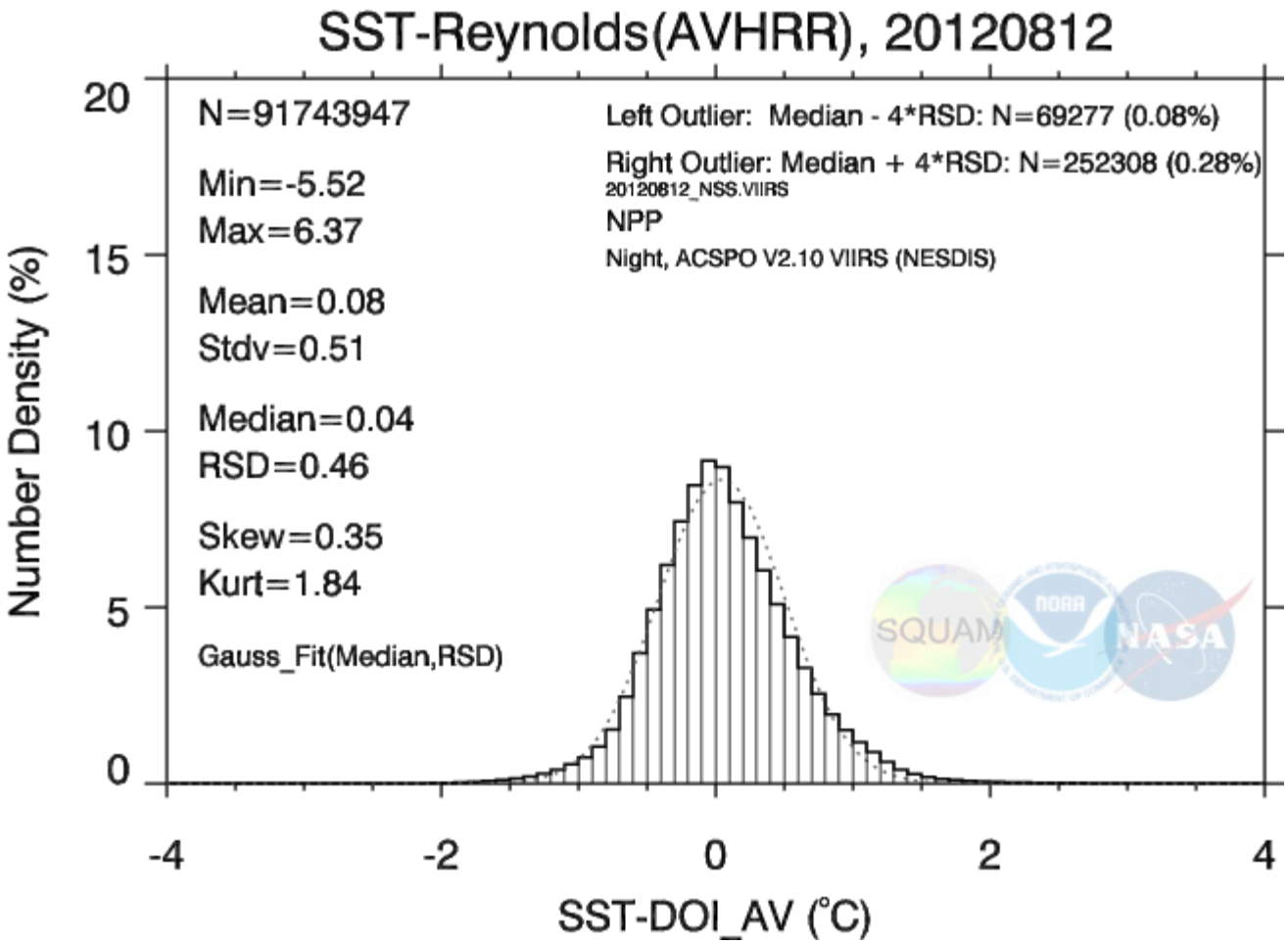

- *Shape close to Gaussian*
- *Domain & Performance Stats close to expected*

NIGHT: IDPS L2 minus Reynolds L4
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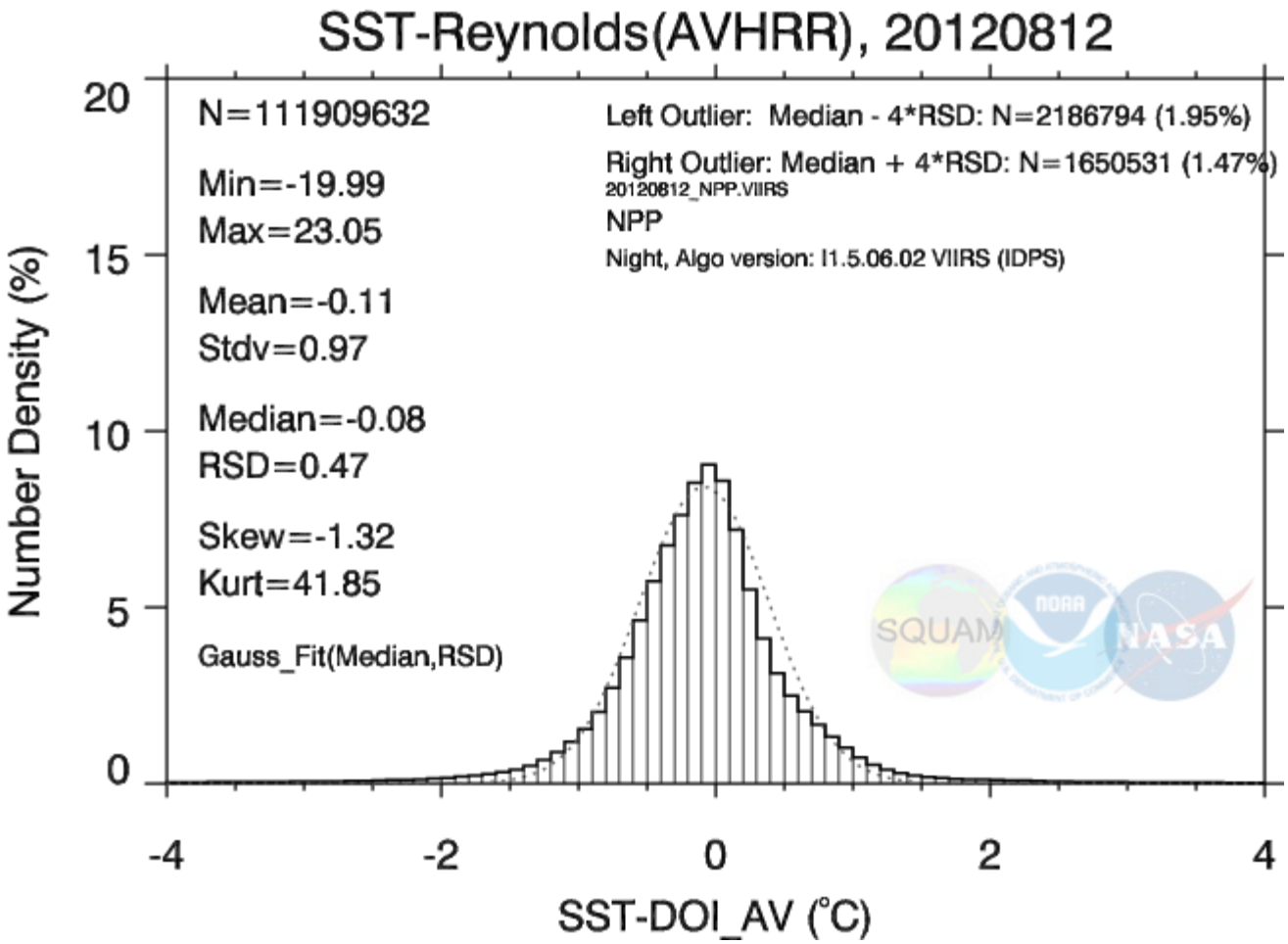


- *IDPS sample +22% larger compared to ACSPO*
- *Shape less Gaussian (negative Skew / increased Kurt)*
- *increased Min/Max, STDV/RSD & Larger fraction of outliers*

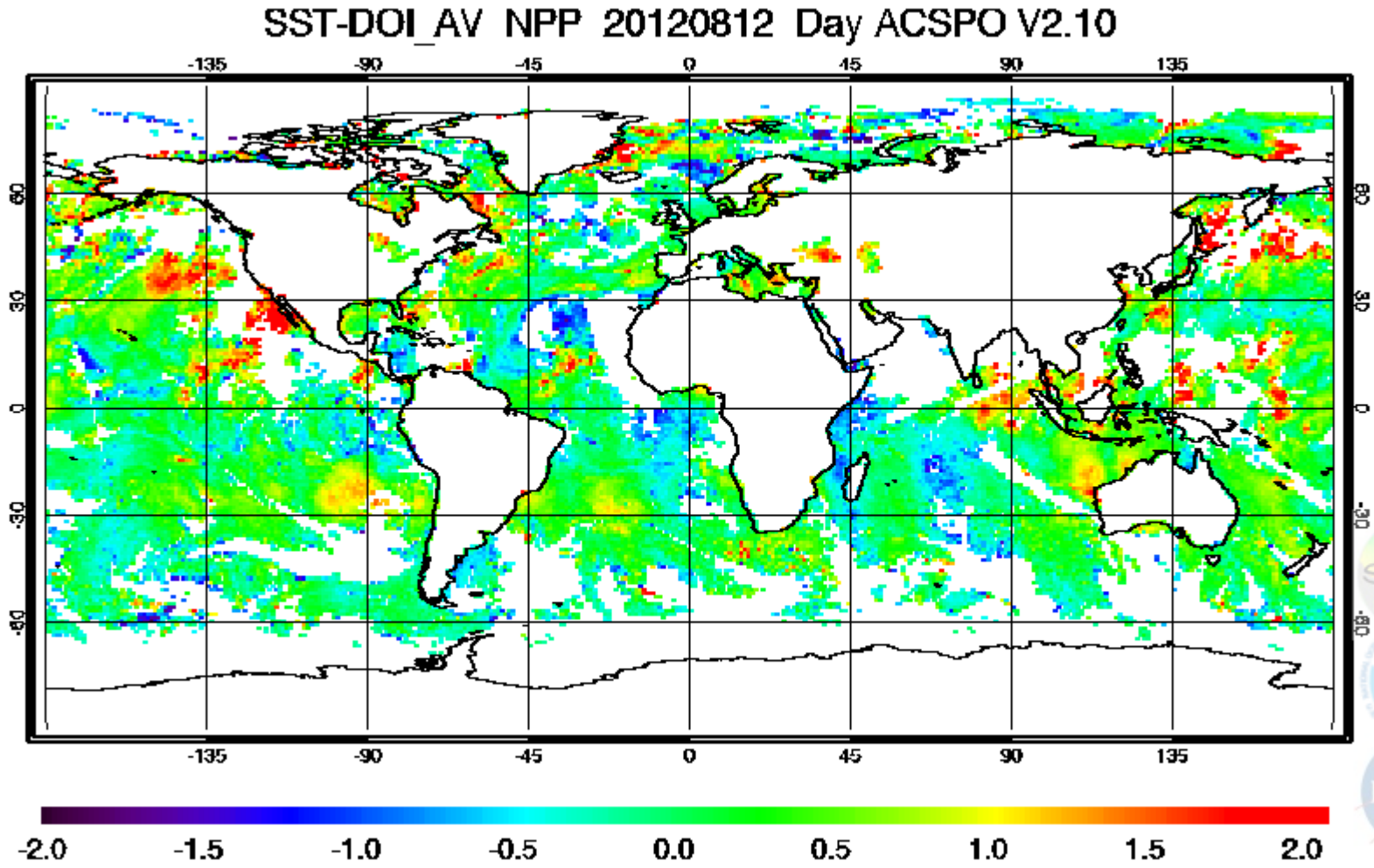
NIGHT 12 August 2012 – Summary

ΔT = "VIIRS minus Reynolds" SST (expected ~0)

	NOBS (%ACSPO)	Min/ Max	Mean/ STD	Med/ RSD	Skew/ Kurt
ACSPO	91.7M (100%)	-5.5/ +6.4	+0.08/0.51	+0.04/0.46	+0.4/ +1.8
IDPS	111.9M (122%)	-20.0/+23.1	-0.11/0.97	-0.08/0.47	-1.3/+41.9

- *IDPS SST domain +22% larger & Stats degraded, compared to ACSPO*
- *Gap between Conventional and Robust stats wider in IDPS - More outliers*

DAY: ACSPO L2 minus Reynolds L4
12 August 2012



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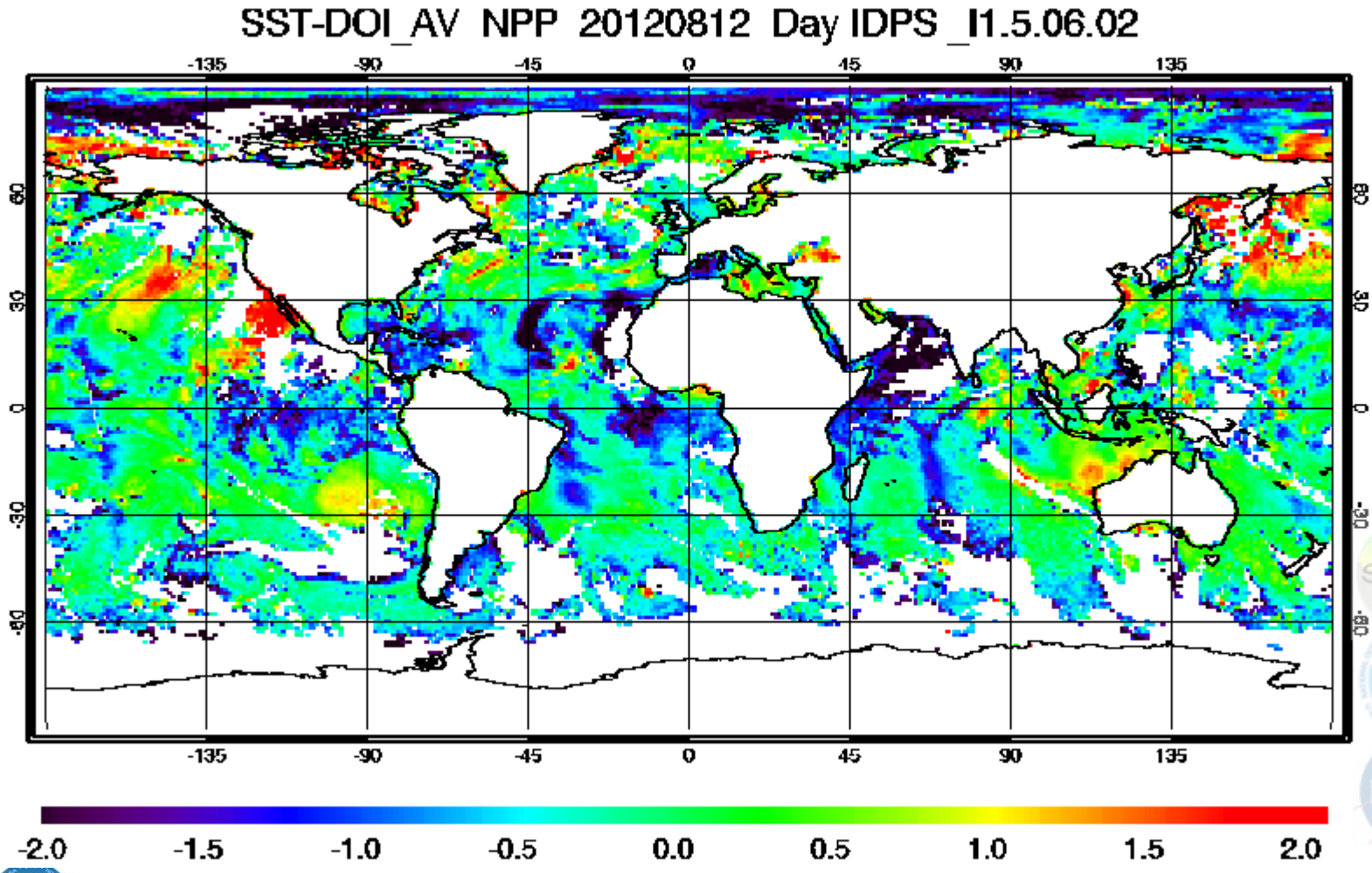

- *More Cloud leakages in IDPS than in ACSPO*
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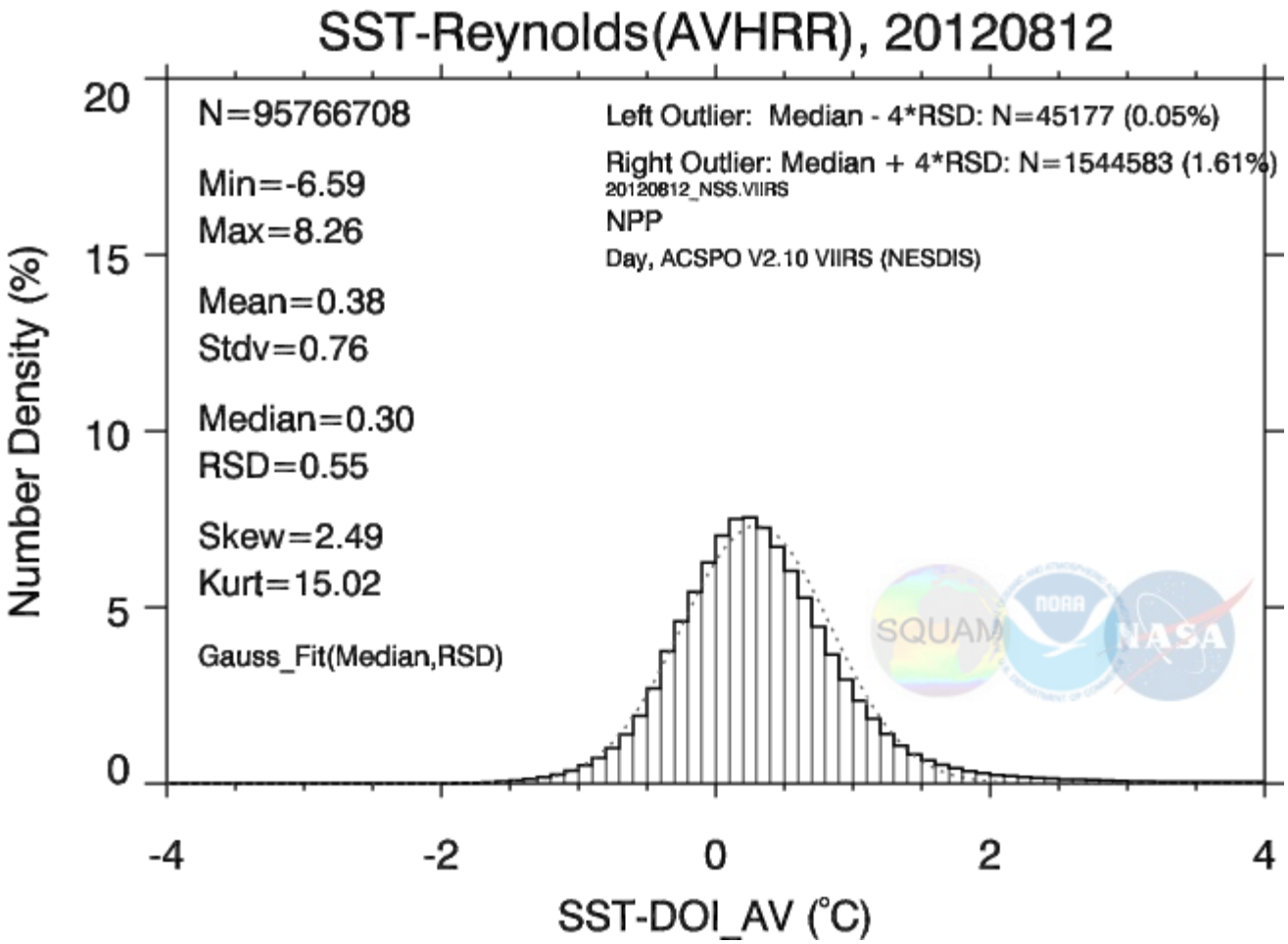
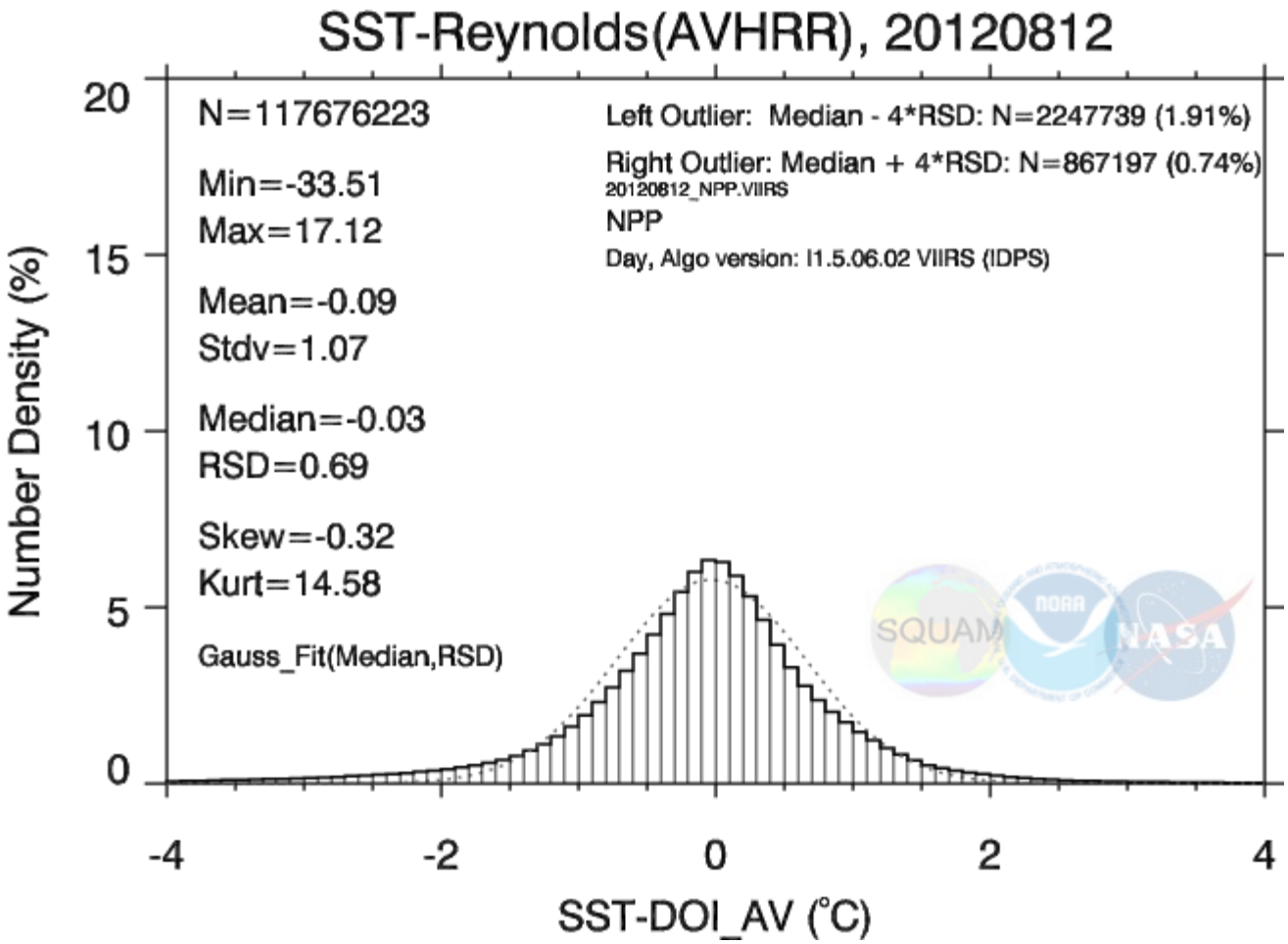


- *Shape close to Gaussian*
- *Domain & Performance Stats close to expected*

DAY: IDPS L2 minus Reynolds L4
12 August 2012



- *IDPS sample +23% larger compared to ACSPO*
- *increased Min/Max, STDV/RSD & Larger fraction of outliers*

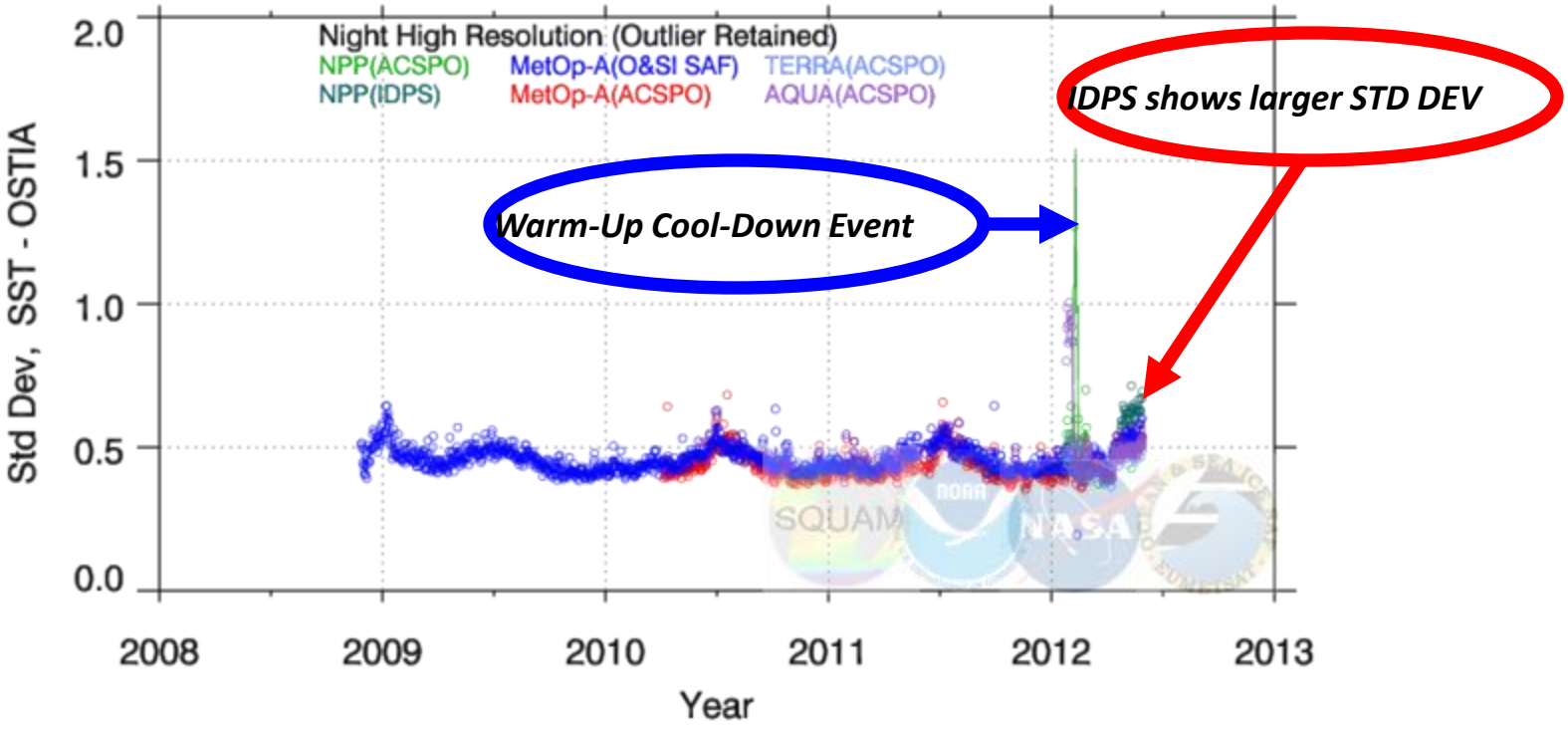
DAY 12 August 2012 – Summary

ΔT = "VIIRS minus Reynolds" SST (expected ~0)

	NOBS (%ACSPO)	Min/ Max	Mean/ STD	Med/ RSD	Skew/ Kurt
ACSPO	95.8M (100%)	-6.6/ +8.3	+0.38/0.76	+0.30/0.55	+2.5/ +15.0
IDPS	117.7M (123%)	-33.5/+17.1	-0.09/1.07	-0.03/0.69	-0.3/+14.6

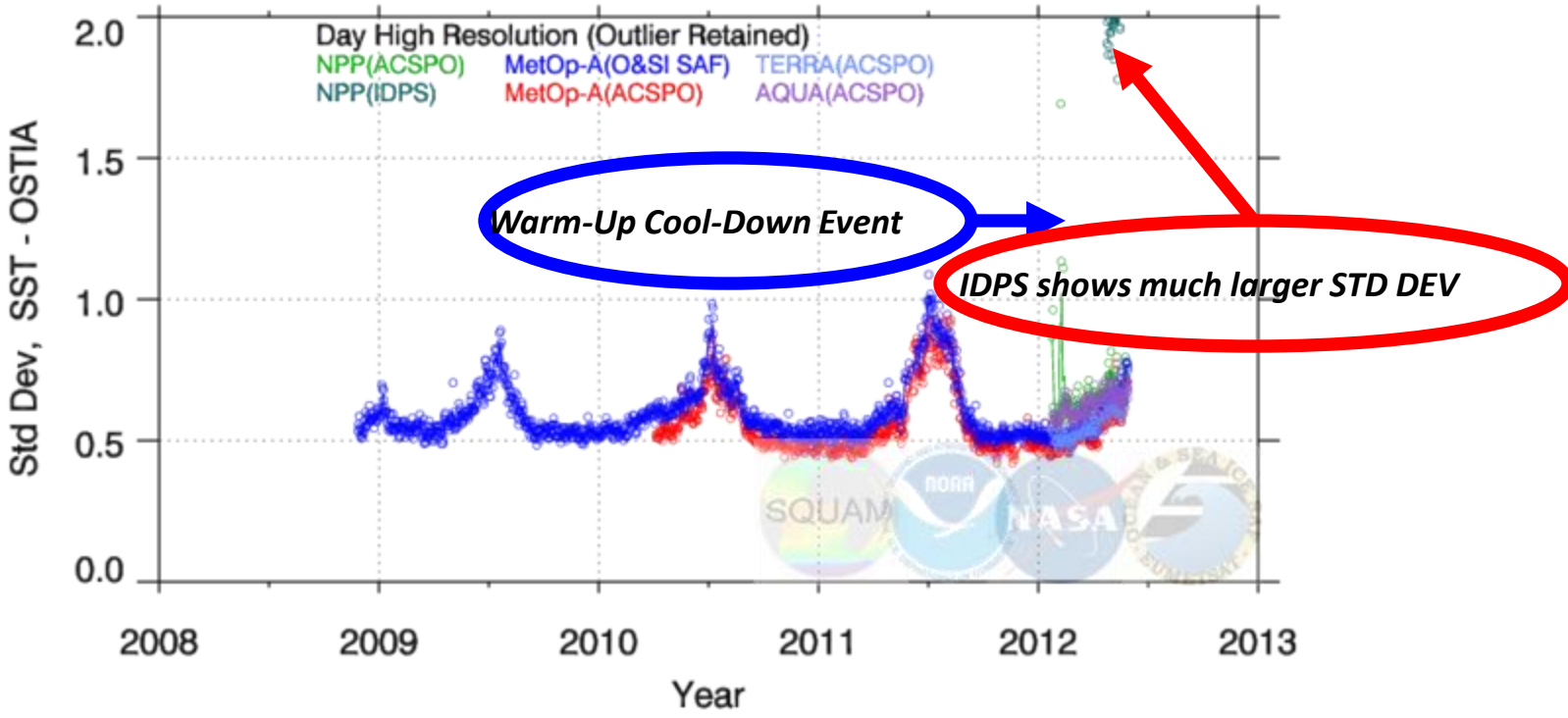
- *IDPS SST domain +23% larger & Stats degraded, compared to ACSPO*
- *Gap between Conventional and Robust stats wider in IDPS - More outliers*

NIGHT STD DEV wrt. OSTIA L4



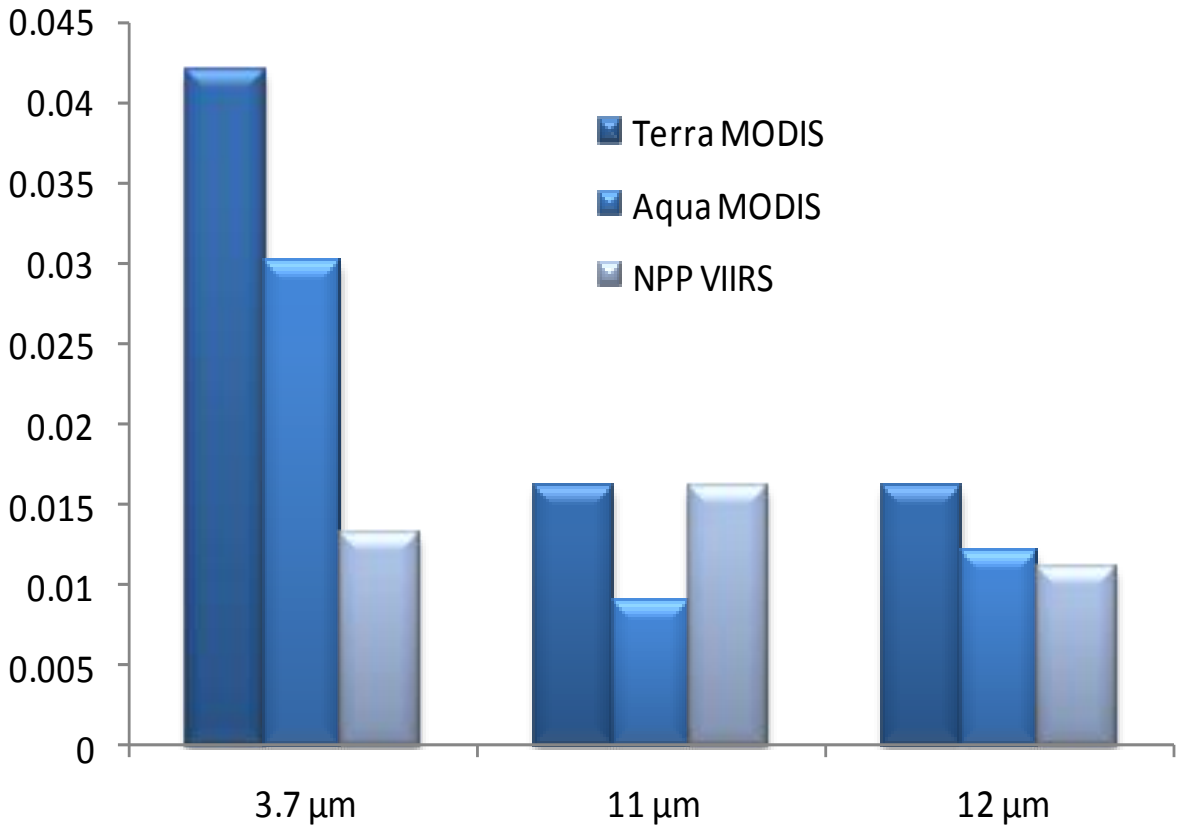
- *AVHRR & MODIS SSTs are consistent*
- *ACSPO VIIRS is consistent with MODIS & AVHRR*
- *IDPS VIIRS EDR shows larger STD DEV*

DAY STD DEV wrt. OSTIA L4



- *AVHRR & MODIS SSTs are consistent*
- *ACSPO VIIRS is consistent with MODIS & AVHRR*
- *IDPS VIIRS EDR shows much larger STD DEV*

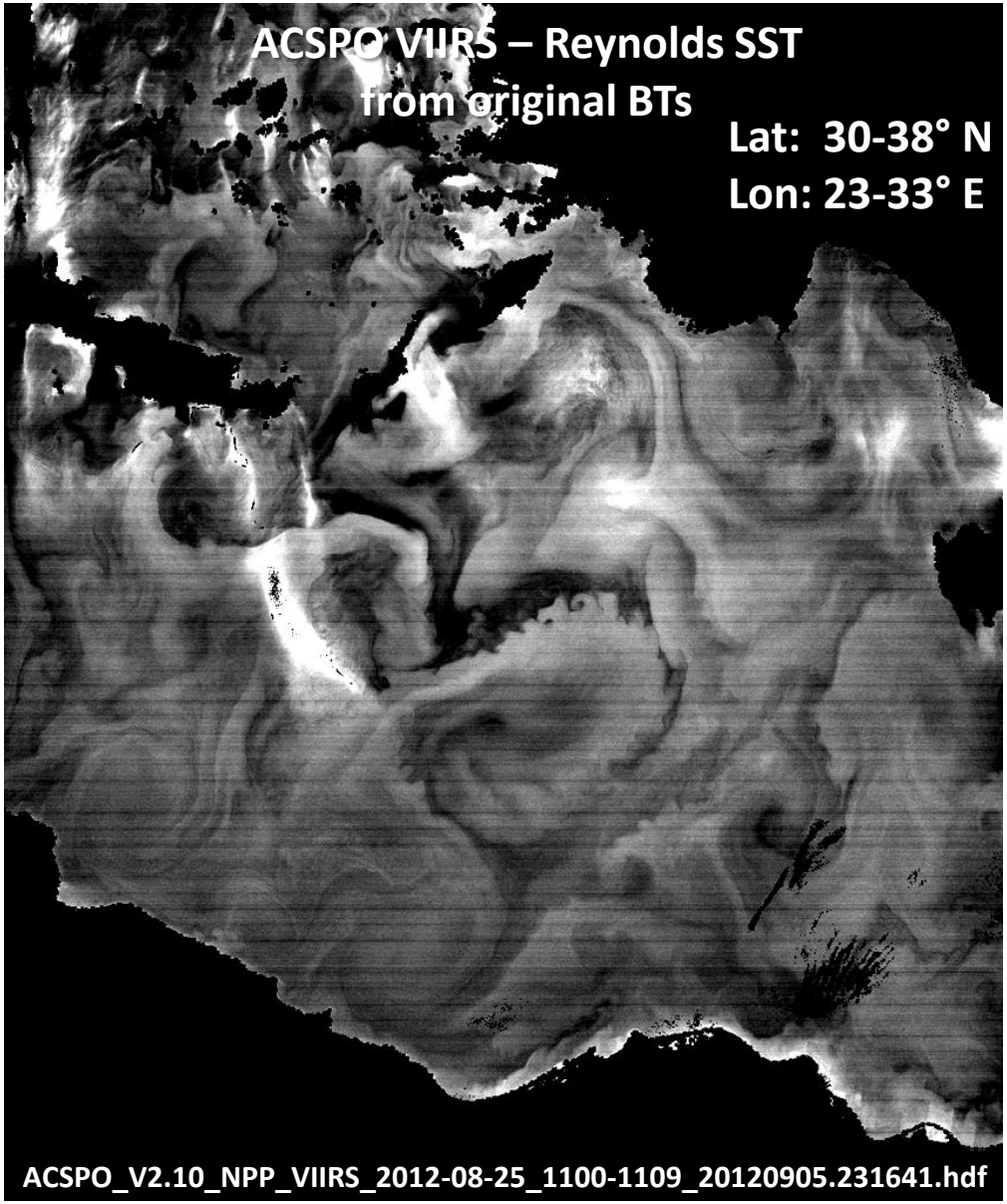
Striping in SST Bands M12, M15, M16: VIIRS vs. MODIS



Standard deviation of stripe noise in Terra/Aqua MODIS and VIIRS Brightness Temperatures

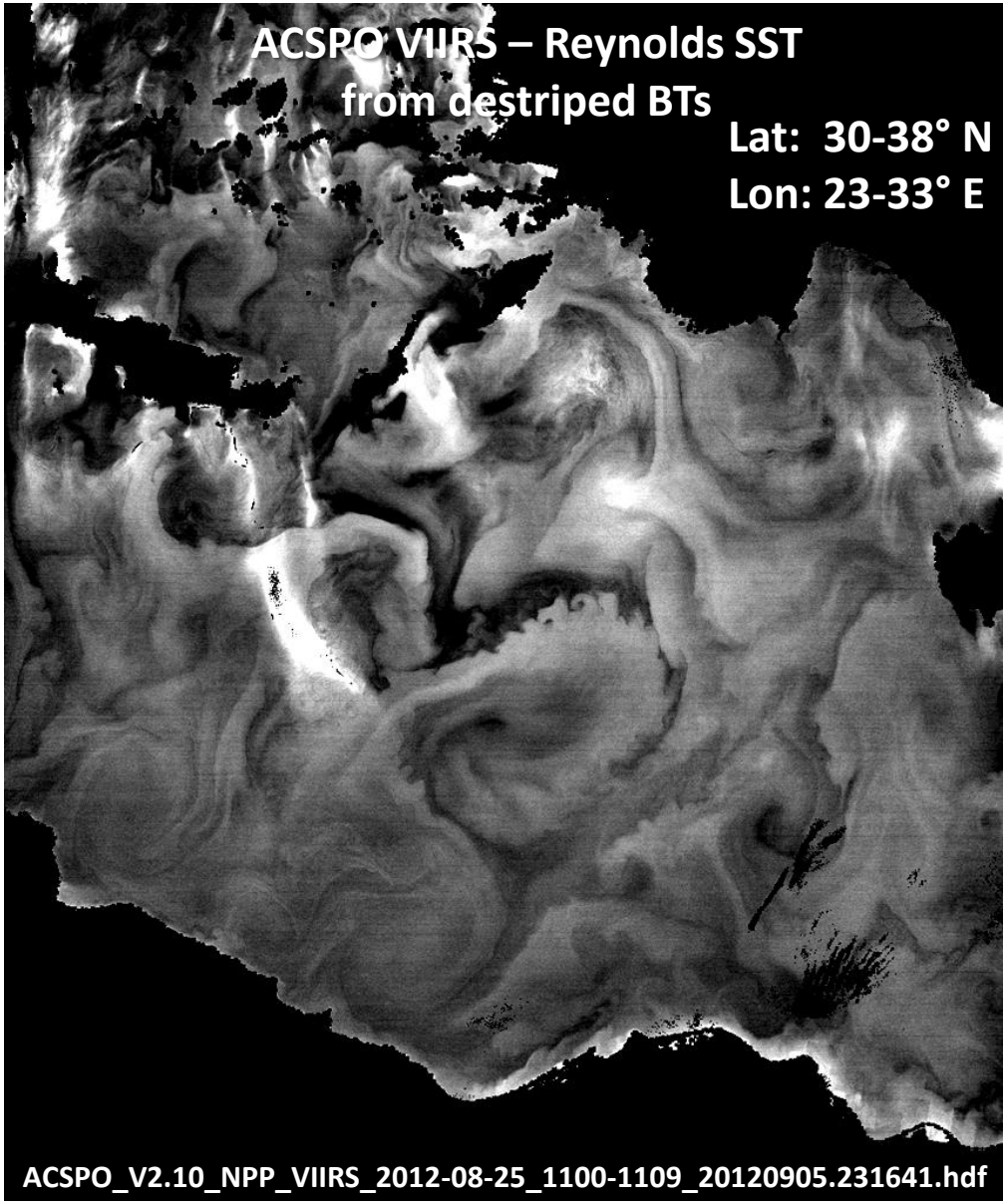
Stripe noise in VIIRS SST bands is weaker than, or comparable to MODIS

Example of Daytime Imagery: Greece/Turkey, 25 August 2012



NESDIS Advanced Clear-Sky Processor for Oceans (ACSPO) SST Product: Note striping in the imagery

Example of Daytime Imagery: Greece/Turkey, 25 August 2012

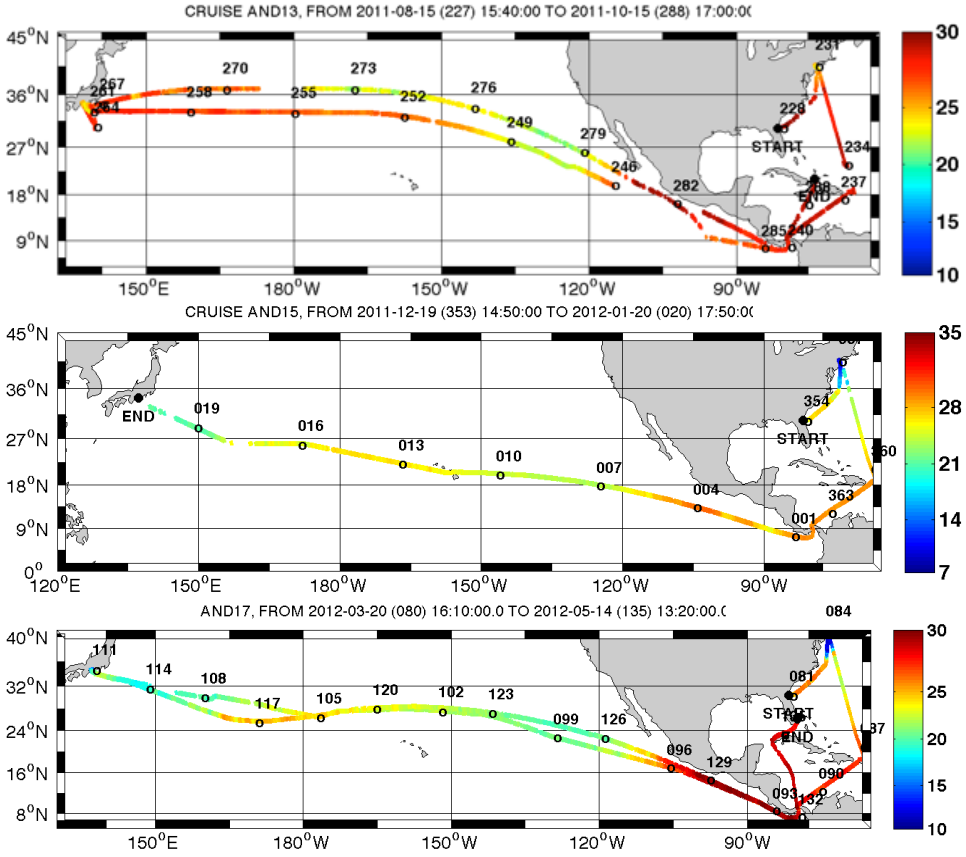


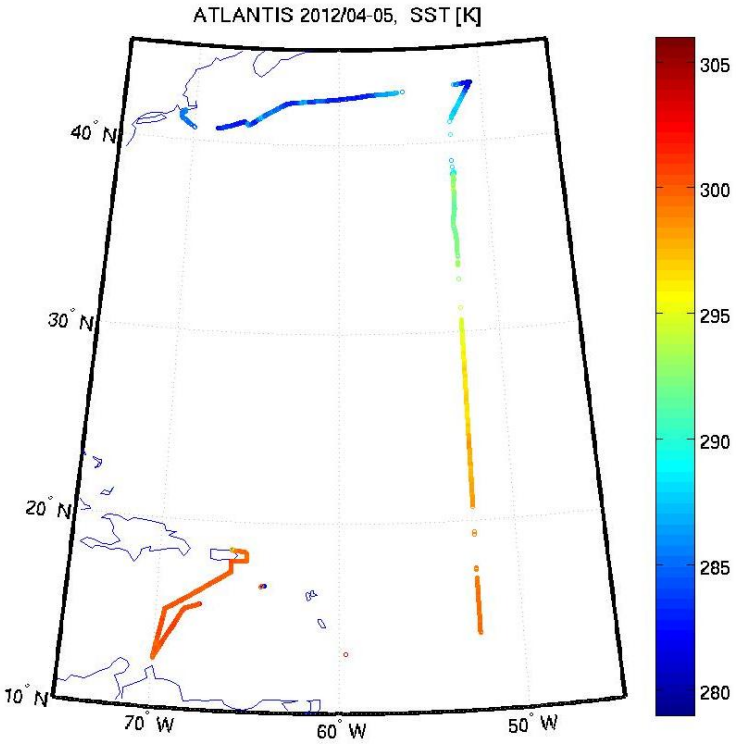
Destriped VIIRS Brightness Temperatures used as input to ACSPO)

U. Miami: ISAR and M-AERI deployments

Minnett

Examples of skin SST measured by ISARs on the M/V *Andromeda Leader.* The instruments operate continuously, reporting via Iridium. A round trip takes about two months. These data and are included in VIIRS SST matchup data bases.





Skin SSTs measured by an M-AERI, funded by NASA, along the track of the R/V *Atlantis*, in April and May, 2012. These data are included in VIIRS SST matchup data bases.

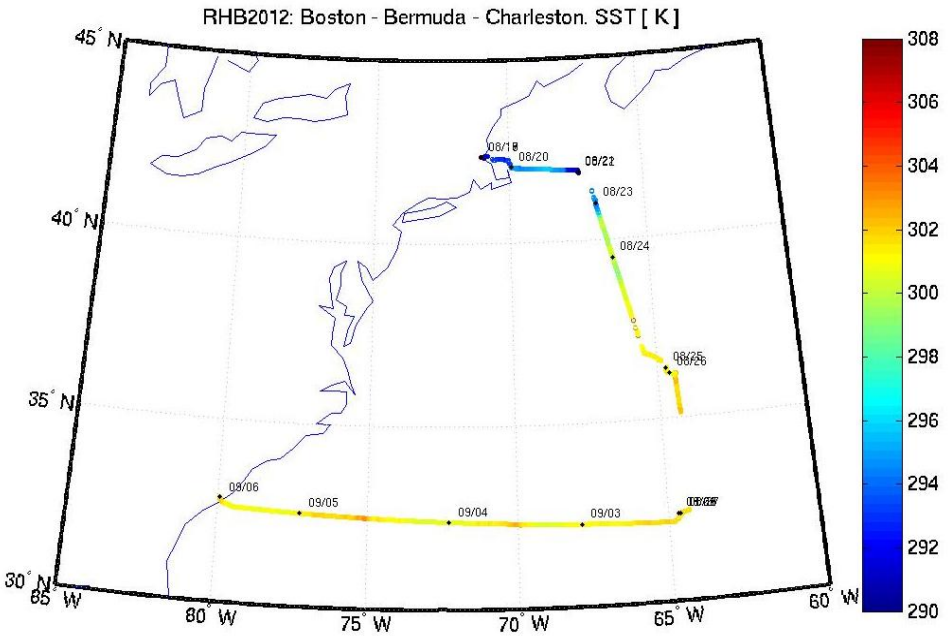
The ISARs were developed with funding from NASA through the National Oceanographic Partnership Program (NOPP)

U. Miami: M-AERI Mk 2 Deployment

Minnett

M-AERI Mk2 on the O2 deck of the NOAA Ship *Ronald H Brown*. The fore-optics (scan mirror and calibration blackbodies) are protected by the smaller box on the front side of the main enclosure which contains the interferometer, aft-optics, Stirling-cycle cooler, electronics and computer. The lower enclosure contains an air-conditioning unit to extract heat from the main enclosure. The small plate on the railing supports a rain sensor. To the left is part of a microwave radiometer used to measure the atmospheric water vapor column.

The M-AERI Mk2 was developed with funding from NASA



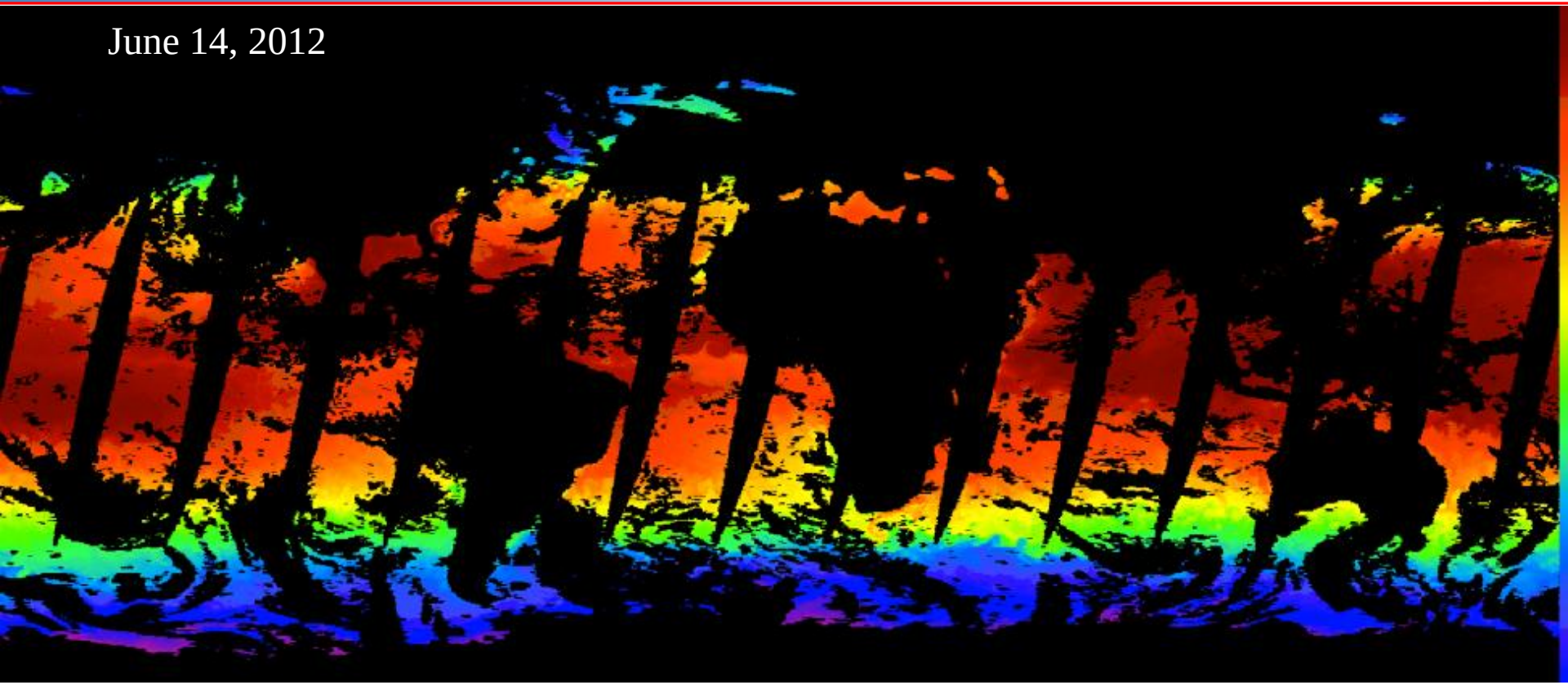
Skin SSTs measured by a M-AERI Mk2 along the track of the NOAA Ship *Ronald H Brown*, August 19 – September 6, 2012. Main cruise, Bermuda to Barbados via PNE moorings off W. Africa was cancelled, and rescheduling is under discussion.

These are preliminary data and after quality assurance will be included in VIIRS SST matchup data bases.

U. Miami: VIIRS SST (night-time 3-band)

Evans

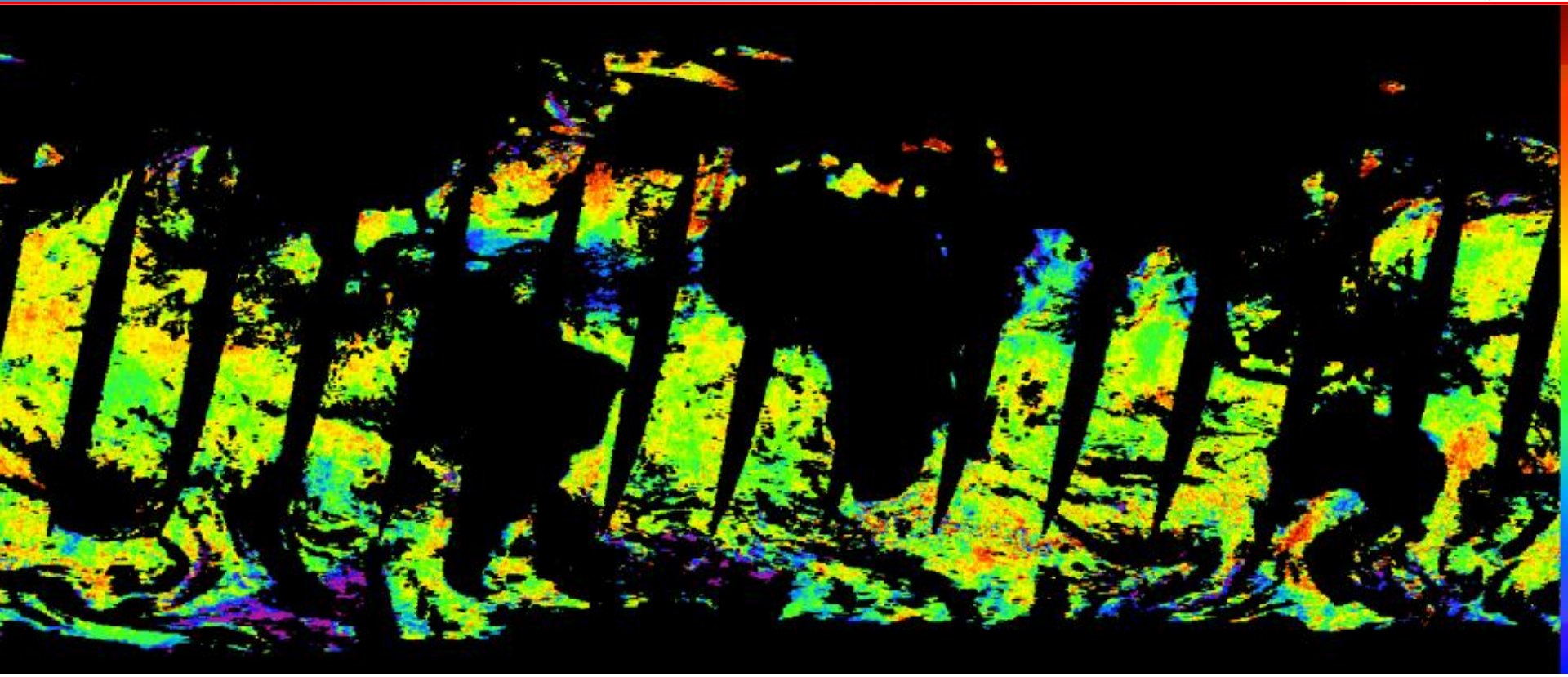
June 14, 2012

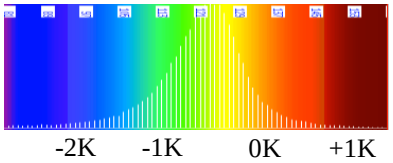


VIIRS SSTs derived using the SST Team atmospheric correction algorithm with monthly, latitudinally dependent coefficients derived using temperatures from quality-controlled drifting buoys, including those from *i*Quam

U. Miami: SST Differences: VIIRS (3band night) – WindSat

Evans





Differences VIIRS infrared and WindSat microwave SSTs. Over much of the ocean the differences are small and uniform. Large negative differences (purple colors) in the Southern Ocean are likely due to cloud contamination in the VIIRS SSTs. The negative differences in the Atlantic (blue) are where we expect to see the effects of Saharan dust aerosols. Standard Deviation for SST derived from monthly coefficients, full IR mission are order 0.3K. The color scale is given at left.

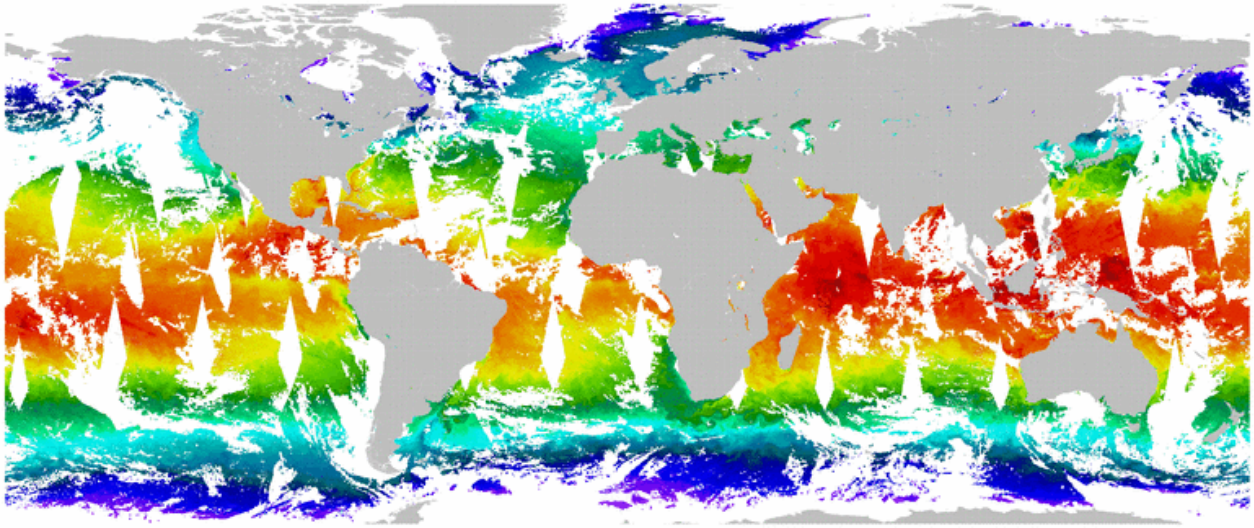
FY-12 Accomplishments: NAVO

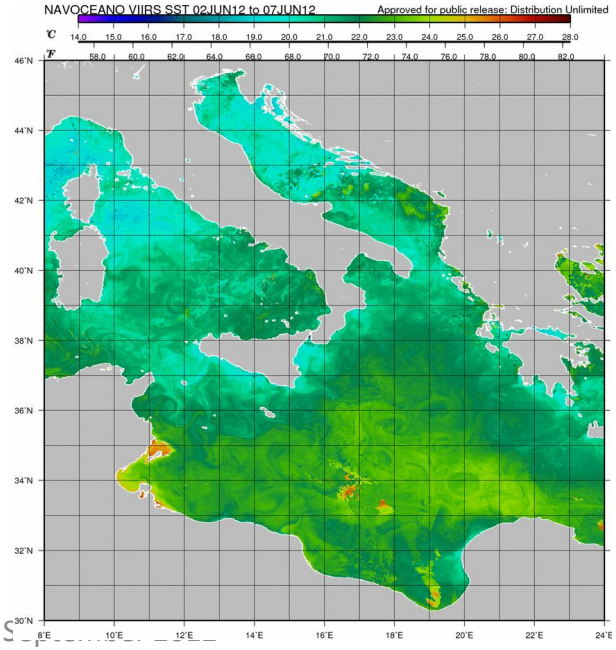
- Generating global VIIRS SSTs in real-time
  - Began with GRAVITE data, then switched to feed from AFWA IDP
  - Utilizing Quality Flag parameters to identify data not to be used
  - Generating 30 day accuracy statistics relative to in situ data every week
  - Began deriving VIIRS SST for full swath data.

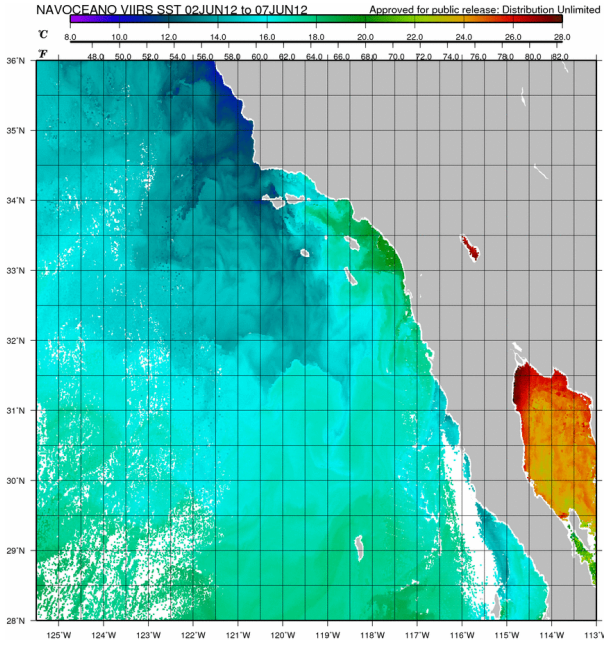
- Examined NLSST equations and dependency on temperature unit term
  - Demonstrated NLSST accuracy improves when adding an offset to the temperature field
  - Implemented expanded NLSST equation into NAVO VIIRS SST processing

- Compared Cloud Mask Intermediary Product with NAVOCEANO Cloud Mask
  - Now generating 100 night and 100 day most cloud free granules each day for comparison
  - CM IP Clear category found to be restrictive

FY-12 Accomplishments: NAVO







SST from NPP/VIIRS

NLSST Daytime Algorithm Form

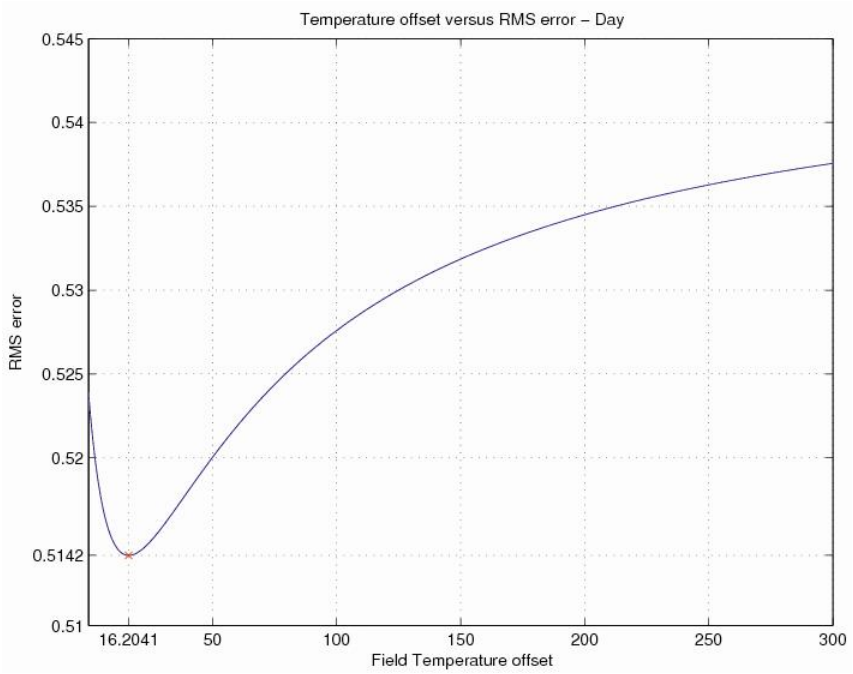
$\Delta T = T_{11} - T_{12}$

T_s^0 = First Guess Temperature Field in Degrees Celsius

S_θ = Secant of satellite zenith angle minus 1

$$SST = a_0 + a_1 * T_{11} + a_2 * T_s^0 * \Delta T + a_3 * S_\theta * \Delta T$$

Offsetting T_s^0 by x, i.e. , Replacing T_s^0 by $T_s^0 + x$ generates different accuracy results.



- The plot shows that the NLSST equation is more accurate with T_s^0 in Celsius ($T_s^0 + 0^o$) than with T_s^0 in Kelvin ($T_s^0 + 273.15^o$)

- The optimal offset to T_s^0 is 16.2^o and provides the most accurate NLSST results.

NPP VIIRS SST

	Count	RMSE	Bias
NAVO Daytime Clear	17875	0.50	0.08
EDR Daytime Clear	5650	0.50	-0.14
NAVO Nighttime Clear	16414	0.41	0.03
EDR Nighttime Clear	6173	0.39	-0.17

Buoy SST matchup statistics on Sep 17, 2012
(30 days of matches within 4 hr & 25 km)

NPP VIIRS SST

Comparison of NAVO Cloud Mask to Cloud Mask Intermediary Product (CM IP)

(Accuracy of EDR when the two cloud masks are either clear or cloud)

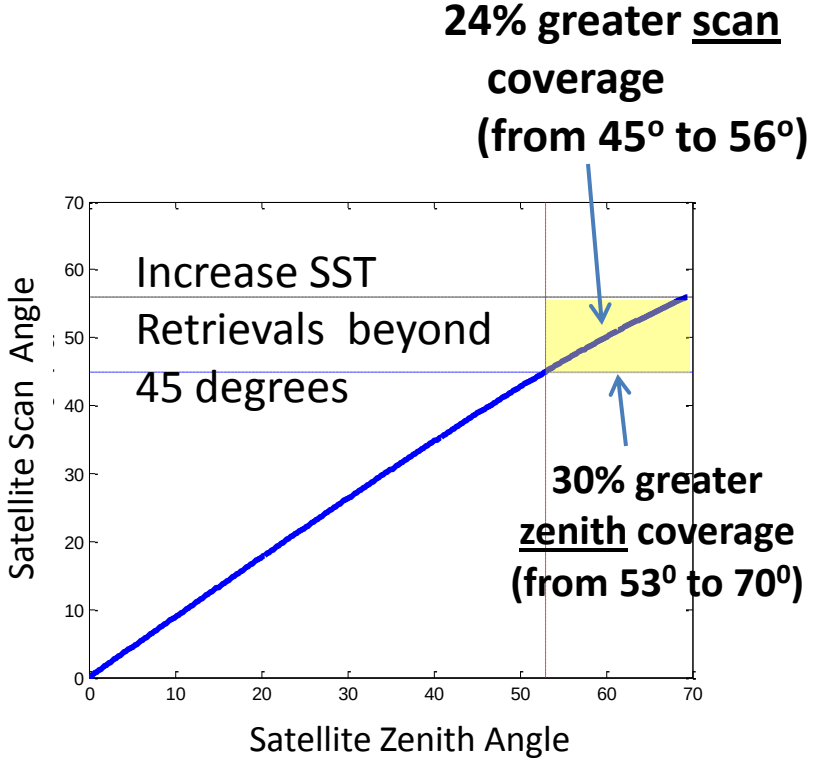
	Count	RMSE	Bias
NAVO Clear & CM IP Clear	8026	0.43	0.16
NAVO Cloud & CM IP Clear	14265	0.74	-0.22
NAVO Clear & CM IP Cloud	2754	0.66	0.08

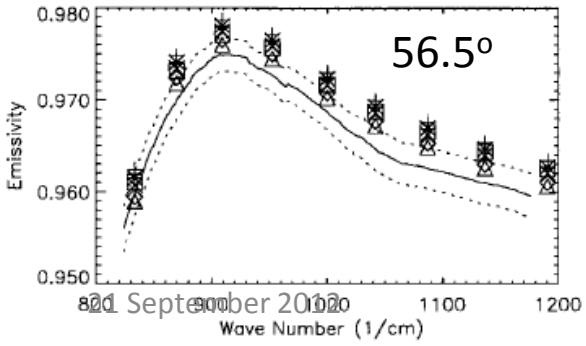
Buoy SST matchup statistics on Sep 17, 2012
(30 days of matches within 4 hr & 25 km)

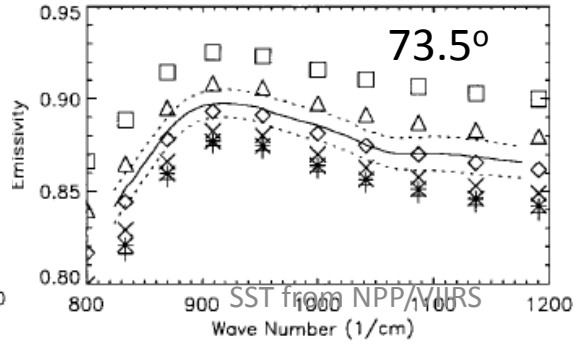
FY-12 Accomplishments – NRL/USM

McBride/ Arnone

- Established capability to ingest NAVO VIIRS and buoy matchup data file and to apply their NLSST daytime/nighttime algorithms. NRL and NAVO are now on “same page”.
- Increase SST VIIRS Retrievals at larger angles
  - . Identified physics-based tasking necessary to address **zenith angles > 53 degrees**.
- Began numerical analysis of importance of spectral emissivity at 11 and 12 microns at large zenith angles.
- Began assessment of **wind speed effects** at very large zenith angles on ocean







Wind Speeds:

0 (+), 1 (∗), 2 (×), 4 (◇), 8 (△), and 16 (□) m/s.

FY-12 Accomplishments: DRs

DR number	Short Description
4696	Fast-track SST EDR Tables
4727	Update FT VIIRS SST regression coefficients table
4748	Algorithm needs to check cloud mask quality
4789	Remove/replace bulk SST data
4790	SST QFs code reorganization
4807	Change forms of SST equations
4844	SZA exclusion and SZA degradation flags affected by setting of cloudy/clear flags
4845	OAD for SST does not agree with code in PCR31250
4846	CDFCB vol IV part 3 SZA quality flag definition

Scientific Advances - 1

- Monitoring VIIRS Radiances in MICROS – feedback to SDR
  - VIIRS PRT coefficients updates on 7 March increased BTs by +0.14K, brought closer in AVHRR family
  - WUCD event in Feb 2012 – large anomalies in BTs, identified the need to debugging SDR code
  - VIIRS Radiances stable, accurate, consistent with AVHRR - VIIRS is a good sensor for SST
  - Surprising finding - MODIS out-of-family behavior (due to a bug in CRTM v2.0 coefficients; should be fixed in newly released CRTM v2.1)

- Monitoring IDPS & ACSPO SSTs in SQUAM – feedback to VCM
  - Routine match ups with *iQuam* SST generated (tried to use NGAS ASFs, but ancillary flow unstable on GADA, first-guess SST often missing)
  - IDPS SST out of (AVHRR-MODIS-VIIRS community SSTs) family
  - SST suboptimal due to VCM performance, and outdated SST algorithms - EDR redesign is needed to fix (new algorithms)

Scientific Advances - 2

- Striping analyses performed – feedback to SDR
  - VIIRS performance comparable to MODIS

- JPSS presentations at national / international meetings
  - NASA SST Science Team Meeting (Coconut Grove, USA, November 2011)
  - AGU (San Francisco, USA, Dec 2011)
  - GODAE Ocean-View Coastal Oceans & Shelf Seas Task Team Workshop (Miami, USA, Jan 2012)
  - AMS (New Orleans, USA, Jan 2012)
  - International Space Science Institute Study Group on Climate Data Records of Satellite-derived SST (Bern, Switzerland, Mar 2012)
  - SPIE (Baltimore, USA, Apr 2012)
  - NPP Science Team Meeting (Greenbelt, USA, May 2012)
  - Group for High-Resolution SST Annual Meeting (Tokyo, Japan, Jun 2012)
  - IGARSS (Munich, Germany, Jul 2012)
  - Int'l Radiation Symposium (Berlin, Germany, Aug 2012)
  - SPIE (San Diego, USA, Aug 2012)
  - EUMETSAT (Sopot, Poland, Sep 2012)
  - GSICS Users Conference (Sopot, Poland, Sep 2012)
  - SPIE (Kyoto, Japan, Oct 2012)

Issues, Challenges, Setbacks - 1

- Analysis suggest the need for SST EDR redesign
  - Withdraw Bulk SST layer, write 0.17K delta to attribute
  - Reuse bulk SST layer to report first guess SST
  - Redefine Nighttime and Daytime SST algorithms
  - Reorganize SST QF code (More Readable/Maintainable)
  - Write out to SST EDR the VCM QF

- Submitted a DR; Working with NJO Program Office and Program Scientist to implement

Issues, Challenges, Setbacks - 2

- Daytime VCM performance for SST
  - suboptimal, improved some after 8 Aug 2012 but remains unacceptable for SST
  - +22% more retrievals compared with ACSPO, significantly degraded SST statistics
- Nighttime VCM performance for SST
  - Recent performance: +23% more retrievals compared with ACSPO, degraded SST statistics (mostly, due to large outliers)
- Current suboptimal SST equations also contribute to cold biases at swath edges – need SST redesign
- Cancellation of NOAA Ship *Ronald H Brown* in Sep-Oct 2012 has negative impact on skin SST validation activity

Changes in Strategy (due to funding constraints)

- Postpone automation of SST algorithm calibration (recalculation of regression SST coefficients)
- Postpone iQuam upgrades (add ARGO floats, aggregate w/OSI SAF black list, upgrade to IDL8, etc)
- Postpone ACSPO upgrades (improvements to cloud mask, exploring physical SST retrievals, adding and exploring optional SST bands M13, M14)
- Reduce number of validation cruises
- Reduce rate of progress due to restrictions in personnel support
- Postpone investigation into wind effects at zenith angles > 65°

FY-13 Schedule and Milestones – STAR/1

- Continue meeting program responsibilities
  - Support reporting, scheduling, meetings
  - Declare SST EDR Beta – October 2012
  - Declare SST EDR Provisional – July 2013

- Redesign SST EDR – 2013 (date TBD)
  - Report skin SST, write 0.17K delta to global attribute to calculate bulk
  - Reformulate SST algorithms/regression equations
  - Write out VCM QF to SST EDR
  - Reorganize SST QF code for readability/maintainability

- MICROS: Monitor VIIRS Radiances in SST bands – feedback to SDR
  - Continue monitoring M12, M15, M16 in MICROS - ongoing
  - Add optional SST bands M13 (4.05 µm), M14 (8.55 µm), and MODIS bands 22, 23, 29 to ACSPO output – March 2012
  - Add monitoring of optional SST bands in MICROS – October 2013
  - Work w/SDR towards reconciliation of AVHRR, MODIS, VIIRS radiances

FY-13 Schedule and Milestones – STAR/2

- SQUAM: Continue monitoring IDPS and ACSPO SSTs (VIIRS, AVHRR, MODIS)
  - Resolve anomalies
  - Work towards consistency with heritage AVHRR/MODIS products
  - Explore longer (monthly) aggregation intervals in SQUAM (currently, daily)

- *In situ* Quality Monitor (*iQuam*) upgrades
  - Establish version control – February 2013
  - Add ARGO floats – July 2013
  - Consolidate with OSI SAF buoy black list – September 2013
  - Upgrade iQuam codes to IDL8; Explore alternatives to flash player – Dec 2013

- Destriping analyses
  - Explore setting up near-real time "DEMO" destriping processing of SDRs at STAR
  - Generate destriped SST out of destriped radiances
  - Identify performance metrics, demonstrate improvements

- Publications/Presentations on VIIRS SST
  - Support scientific and programmatic meetings
  - Document in peer-reviewed publications

FY-13 Schedule and Milestones – U. Miami

Minnett/ Evans

- Continue validation cruises, including long-duration deployment on commercial vessels (ISARS on *Andromeda Leader* and *Horizon Spirit*; M-AERIs on RCCL cruise ships)
- Continue compilation of VIIRS SST Match-Up Data Bases
- Derive uncertainty characteristics of VIIRS SSTs
- Investigate alternative formulations of atmospheric correction algorithms
- Investigate alternative cloud identification schemes

FY-13 Schedule and Milestones – NAVO

- Integrate improvements into operational NPP VIIRS Seatemp and evaluate accuracy results.
- Compare NPP VIIRS SST EDR accuracy statistics to Seatemp VIIRS SST.
- Evaluate VIIRS Cloud Mask IP and Seatemp cloud detection methods and modify procedures where necessary. Participate in VCM telcons.
- Attend and participate in JPSS Customer Forums, VOAT and VIIRS ocean cal/val meetings.

FY-13 Schedule and Milestones – NRL/USM

McBride/ Arnone

- Investigate and evaluate emissivity corrections to SST beyond 53 degrees based upon zenith angle, wavelength, wind speed and/or sea state.
- Investigate and evaluate improved water vapor corrections due to path length increase as scan angle increases.
- Investigate the impact of sources of error due to buoy measurements at different depths.
- Evaluate resulting improvements to IDPS SST algorithms.
- Attend and participate in JPSS Customer Forums, VOAT and VIIRS ocean cal/val meetings.

Path Forward (FY-13 thru FY-17)

(assume "FYxx" runs from April 1, 20xx to March 31, 20xx+1)

	Suomi NPP	JPSS J1
FY13	Beta / Provisional SST EDR Redesign, ATBD Update iQuam Upgrade (ARGO, OSI SAF black list) NRT Destriping system set up	
FY14	Val 1 / Val 2; Destriping system documented Optional SST bands evaluated in MICROS Peer-Reviewed Report	Update online monitoring systems MICROS/SQUAM to allow displaying J1 data
FY15	Val 3; Destriping system implemented SST Alg. Update – Optional bands explored ATBD Update, Peer-Reviewed Report	Add J1 proxy data stream in MICROS/SQUAM LTM
FY16	LTM in MICROS/SQUAM/iQuam continues SST Alg. Update – Aerosol Corrected SST ATBD Update, Peer-Reviewed Report	J1 launch; work with SDR Team Radiance consistency with S-NPP, AVHRRs, MODISs explored
FY17	LTM in MICROS/SQUAM/iQuam continues Improved bulk SST algorithms explored Skin SST validated against ship radiometers	Beta/Provisional SST Consistency with S-NPP, AVHRRs, and MODISs explored

Summary: 1/3
International JPSS SST Team

- International JPSS SST Team comprises all major global processing IR SST data centers: 3 in the US (NESDIS, NAVO, Miami) & 1 in France (O&SI SAF)

- All Team members are capable of Acquiring/Processing global VIIRS, MODISs, AVHRRs radiance and SST data

- World best expertise in SST
  - Retrievals from Polar (AVHRR, MODIS, VIIRS) and Geo (GOES, MSG
  - Cal/Val against bulk & skin *in situ* SSTs

- Near-real time web-based monitoring and Cal/Val
  - SST radiances (MICROS) – feedback to SDR
  - Satellite SST (SQUAM) – feedback to VCM
  - In situ SSTs (*i*Quam) – Qced input to SST Cal/Val

Summary: 2/3
FY12 Accomplishments

- Near real time online LTM of global clear-sky ocean radiances and SSTs fully established in MICROS and SQUAM, from day-1 of opening cryoradiator doors. LTM of in situ SST for the use in Cal/Val sustained in iQuam

- Worked closely with SDR Team to evaluate VIIRS sensor for SST. SST Team consensus is that the sensor is accurate and stable, and well suited for SST

- 3 NGAS Cal/Val ASF evaluated (match-up, Cal, Val) and found unstable in G-ADA, with ancillary data often missing. Fully established STAR tools based on heritage codes and tools, and run them on global data in NRT

- Analyzes of SST EDR suggests need for VCM improvements
  - Daytime – significant leakages
  - Nighttime – measurable fraction of large outliers

- The need to SST EDR redesign identified
  - Withdraw Bulk SST layer, write 0.17K delta to attribute
  - Reuse bulk SST layer to report first guess SST
  - Redefine Nighttime and Daytime SST algorithms
  - Reorganize SST QF code (More Readable/Maintainable)
  - Write out to SST EDR the VCM QF

Summary: 3/3
Need help from PO and VCM Team

- SST Team is interested in combining the Beta and Provisional processes together, in the interest of time. However, redesign must be completed before SST EDR is declared Provisional

- SST EDR redesign needed before declaring provisional
  - Withdraw Bulk SST layer, write 0.17K delta to attribute
  - Reuse bulk SST layer to report first guess SST
  - Redefine Nighttime and Daytime SST algorithms
  - Reorganize SST QF code (More Readable/Maintainable)
  - Write out to SST EDR the VCM QF

- Improve VCM performance for SST
  - Daytime VCM has large room for improvement
  - Nighttime VCM works better, but still outperformed by ACSPO