In situ SST Quality Monitor (*i*Quam)

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

SST Quality Monitor (SQUAM)

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

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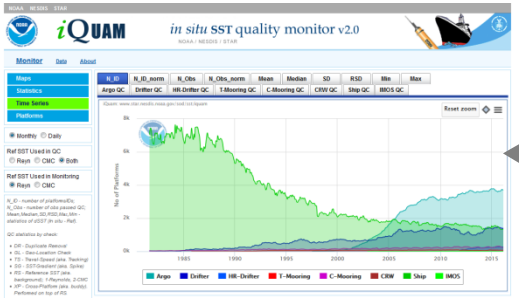
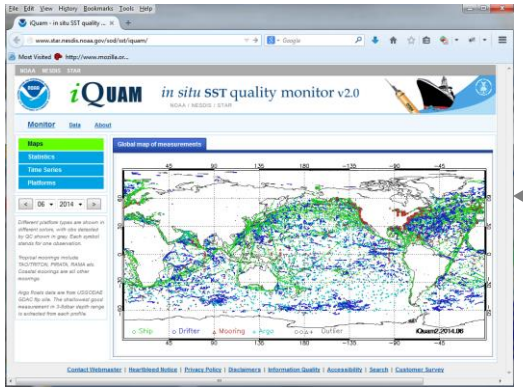
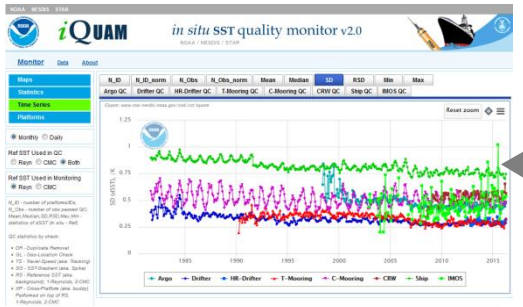
Thanks to NOAA and GHRSST Colleagues and Users

Satellite SSTs – *i*Quam – Match-ups – Monitoring in SQUAM





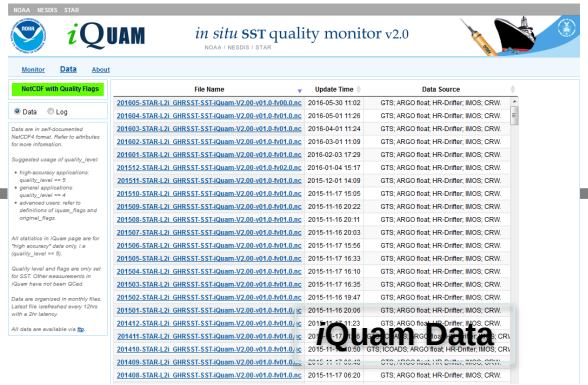


Monitoring in iQuam

NOAA L2

NOAA L3

NOAA L4



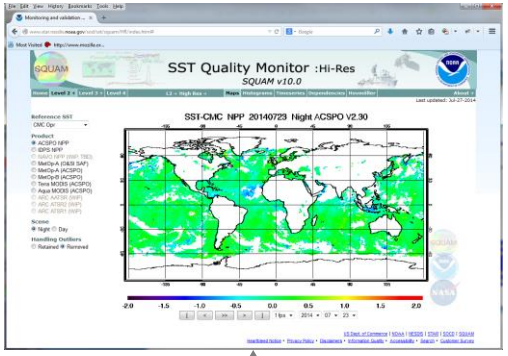
iQuam Data

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

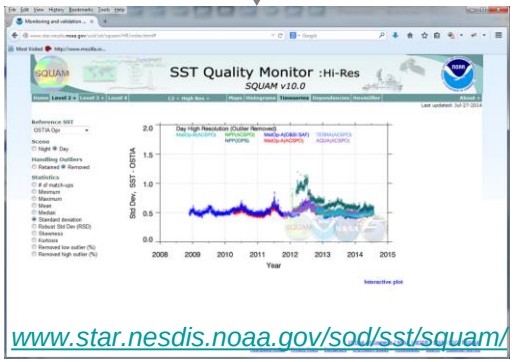
GHRSST L2

GHRSST L3

GHRSST L4



Satellite-*i*Quam-L4 Match-Ups



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

Monitoring in SQUAM

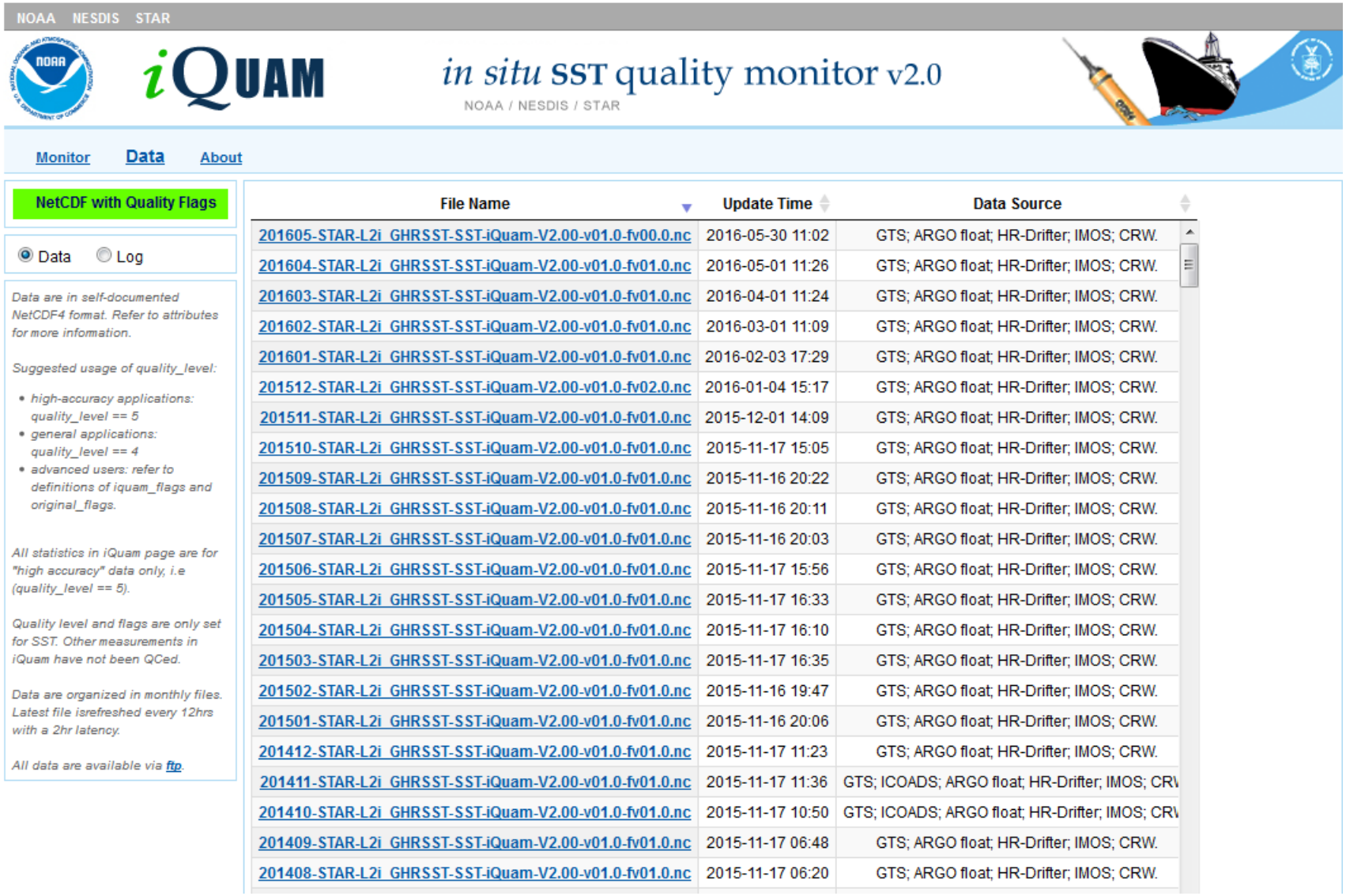
Major Functionalities of *i*Quam

- ***Collect in situ data (1981-pr)*** from multiple sources
- ***Perform uniform and accurate QC***
- ***Monitor online*** statistical summaries of *in situ* minus reference L4 SST
  - by platform type (drifters, ships, tropical/coastal moorings, ARGO floats, etc)
  - by individual platforms/IDs
- ***Serve QC'ed data (updated twice daily) to users***
  - NOAA JPSS, GOES-R, Himawari, AVHRR SQUAM (US)
  - JPL MUR (US) – M. Chin
  - U. Miami MODIS, VIIRS (US) – K. Kilpatrick, L. Williams
  - Felyx (France/UK) – J.-F. Piolle
  - CMS (France) – A. Marsouin
  - JAXA (Japan) – Y. Kurihara, M. Kachi
  - Ocean University (China) – L. Guan
  - CMA (China) – S. Wang
  - SOA (China) – Q. Tu
  - NOAA geo-polar blended team (US) – P. Koner, J. Mittaz, A. Harris, E. Maturi
  - NOAA NCEI (K. Saha)
  - EUMETSAT (Germany) – P. Dash, A. O'Carroll

*i*Quam2 (2015) additions to *i*Quam1 (2009)

- **Extended *i*Quam period to 1981 (*i*Quam1: 1991) using ICOADS data**
- **Improved QC**
  - Added 2nd reference SST – CMC (*i*Quam1 only used Reynolds SST)
  - Added CMS black list, and individual QFs from data producers
  - Added "performance history" check (iQuam version of CMS/UKMO "black lists
- **Added 4 new *in situ* data types (in addition to the 4 available in *i*Quam1: ships, drifters, tropical moorings, and coastal moorings)**
  - ARGO Floats (in 2 modes: NRT and post-processing)
  - High-Resolution GHRSST Drifters
  - IMOS Ships (ABoM/Helen Beggs)
  - Coral Reef Watch buoys
- **Improved Web interface**
  - Added daily statistics (to available monthly)
  - Enhanced web graphics (interactive display; print/save capability)
  - Redesigned and optimized the code
- **Changed output format to NetCDF4 "GDS2i"**

Data



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201602-STAR-L2i_GHRSST-SST-iQuam-V2.00-v01.0-fv01.0.nc	2016-03-01 11:09	GTS; ARGO float; HR-Drifter; IMOS; CRW.
201601-STAR-L2i_GHRSST-SST-iQuam-V2.00-v01.0-fv01.0.nc	2016-02-03 17:29	GTS; ARGO float; HR-Drifter; IMOS; CRW.
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201510-STAR-L2i_GHRSST-SST-iQuam-V2.00-v01.0-fv01.0.nc	2015-11-17 15:05	GTS; ARGO float; HR-Drifter; IMOS; CRW.
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201507-STAR-L2i_GHRSST-SST-iQuam-V2.00-v01.0-fv01.0.nc	2015-11-16 20:03	GTS; ARGO float; HR-Drifter; IMOS; CRW.
201506-STAR-L2i_GHRSST-SST-iQuam-V2.00-v01.0-fv01.0.nc	2015-11-17 15:56	GTS; ARGO float; HR-Drifter; IMOS; CRW.
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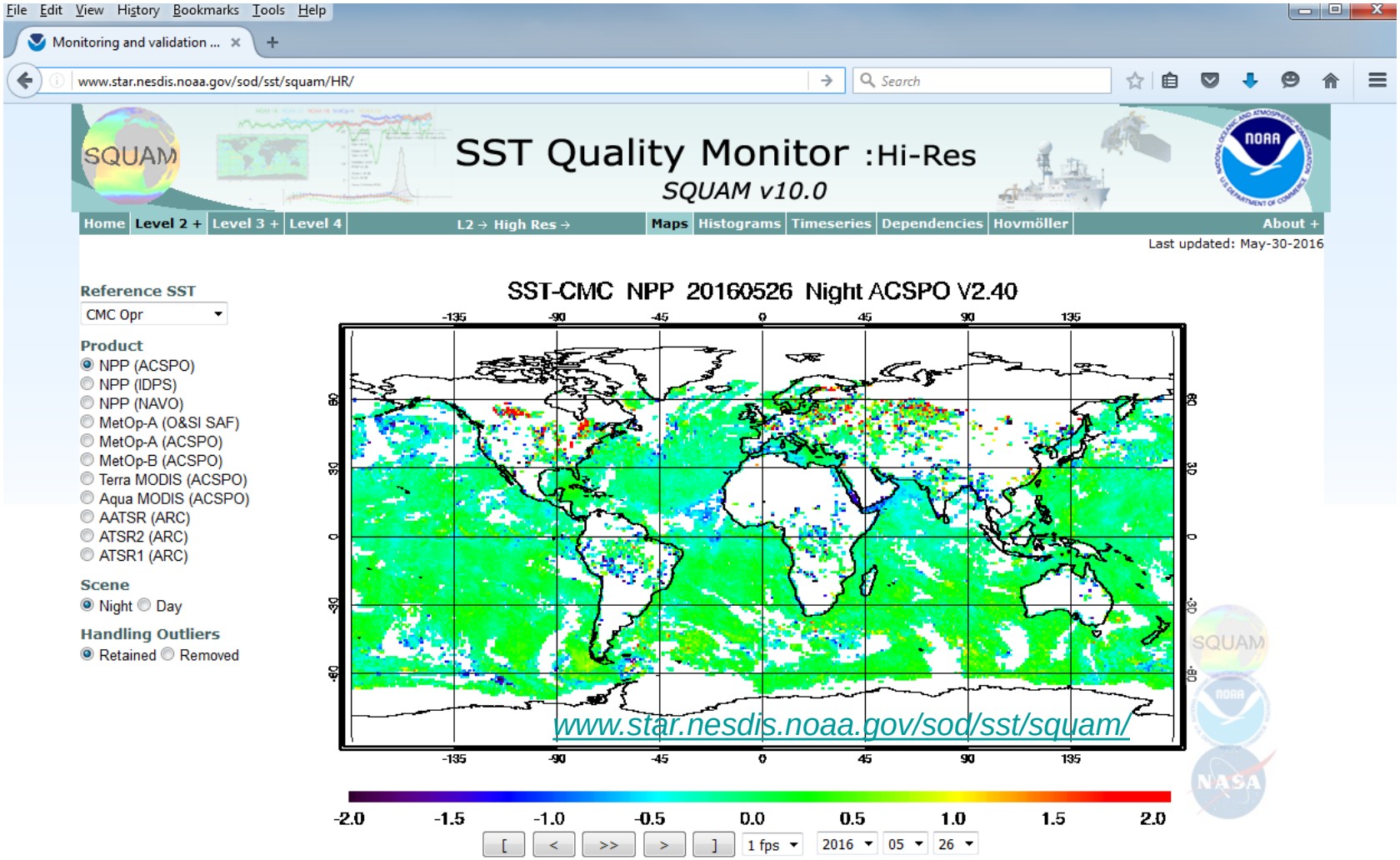
Ongoing *i*Quam2 work

- **Completing transition to *i*Quam2 (current default: *i*Quam1)**
  - Will send a 2-4 week warning via GHRSST
- **We recommend switching to *i*Quam2 NetCDFs data feed, soonest**
  - ***i*Quam1 hdf data continue being produced but are not supported any longer**
  - **No fixes will be possible in case the *i*Quam1 processing fails – use at your own risk!**
  - *i*Quam2: More *in situ* data (e.g., ARGO floats), longer record (1981-pr), better QC
  - Data (structure, location) have been finalized and won't change
- **Have a question? Check online FAQs**
  - If still have questions – let us know, we will help
- **Working to document *i*Quam2 in peer-reviewed paper**
- **Let us know what we can improve?**
- **Tell us if you use *i*Quam data (to be informed about patches etc)**

SQUAM



Dash, et al: The SST Quality Monitor (SQUAM), JTECH, 2010.

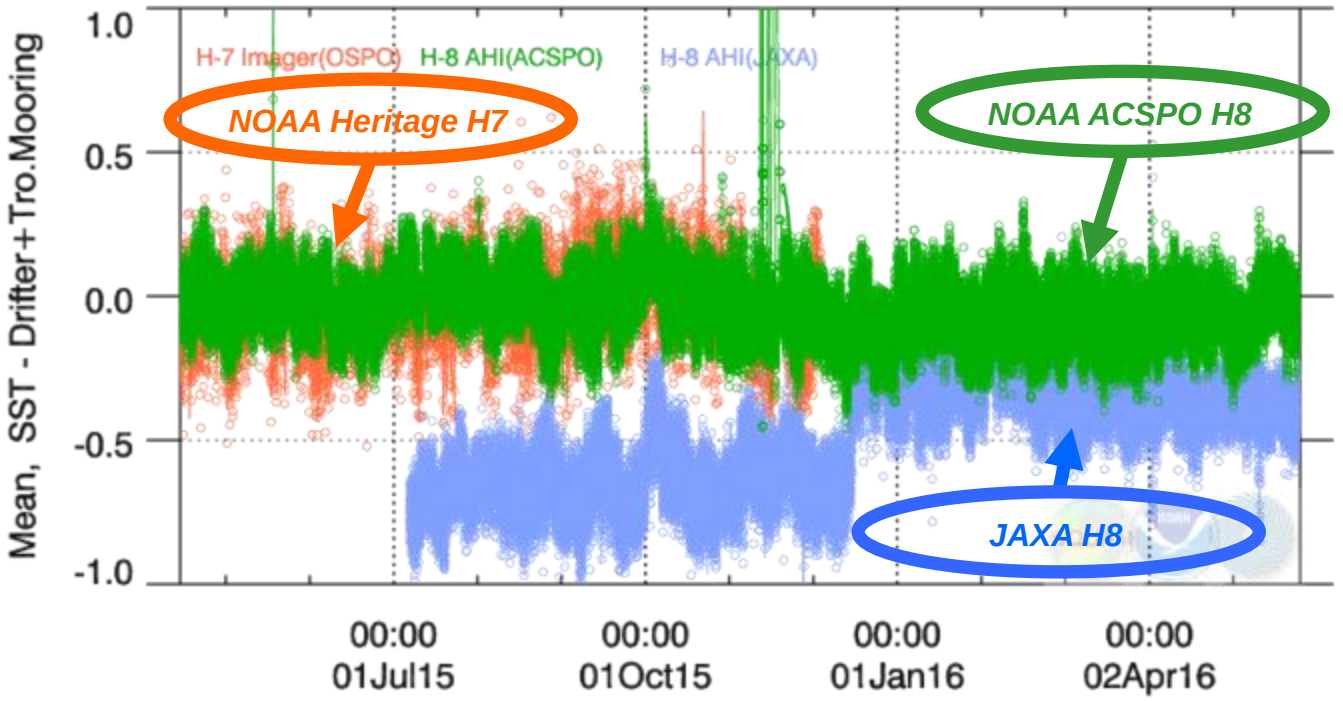
Major SQUAM Additions Since G16

- **Himawari SST**
  - ACSPO H8 SST (14 Apr 2015 – on)
  - NOAA heritage H7 (MTSAT2) SST (14 Apr 2015 - 4 Dec 2015)
  - JAXA H8 SST (7 Jul 2015 – on)

- **AVHRR Reprocessing**
  - ACSPO GAC RAN1 (2002 – 2015)
  - PFV5.2 (1981 – 2012)
  - AVHRR CCI (1991 – 2010)

Mean Bias wrt. iQuam2 (Drifters + Tropical Moorings)

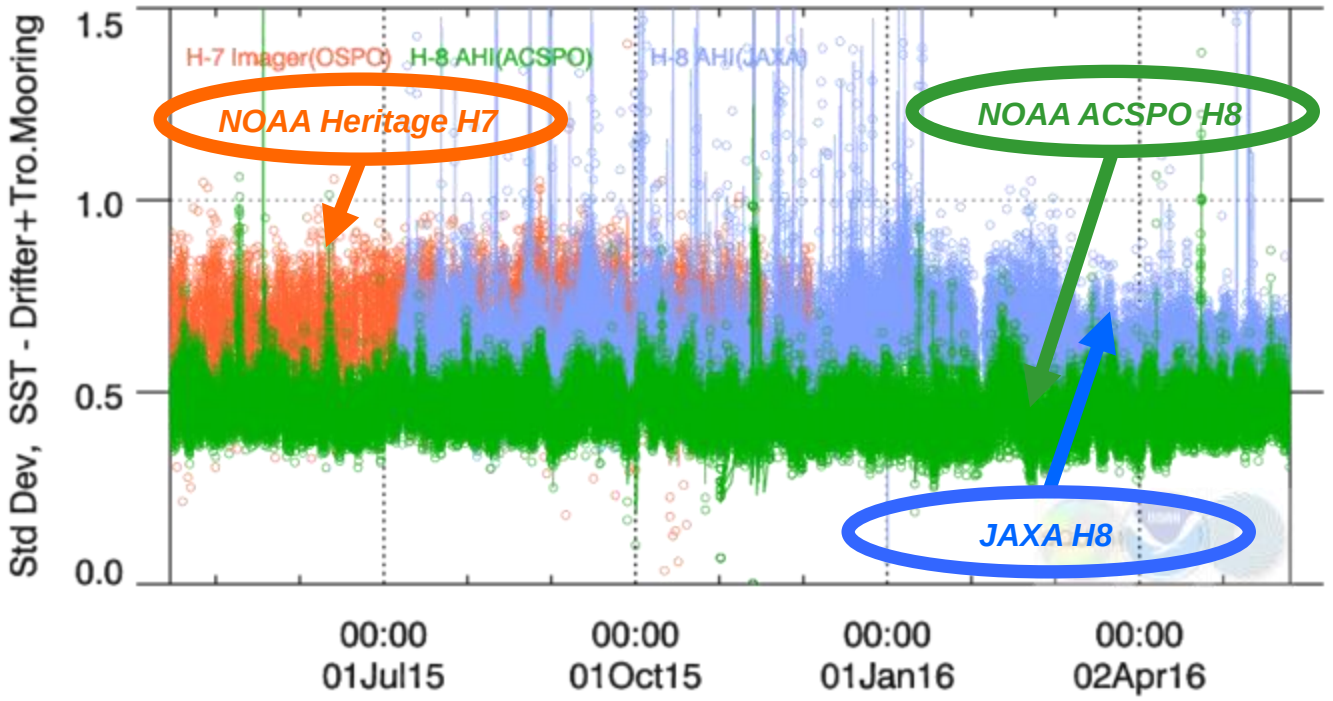
www.star.nesdis.noaa.gov/sod/sst/squam/GEO/



- NOAA heritage H7 SST used before Dec'2015, ACSPO H8 SST after Dec'2015
- JAXA skin SST (expected ~-0.17K) produced since Jul'2015
- The JAXA processing apparently has changed in Dec 2015

Std. Dev. wrt. iQuam2 (Drifters + Tropical Moorings)

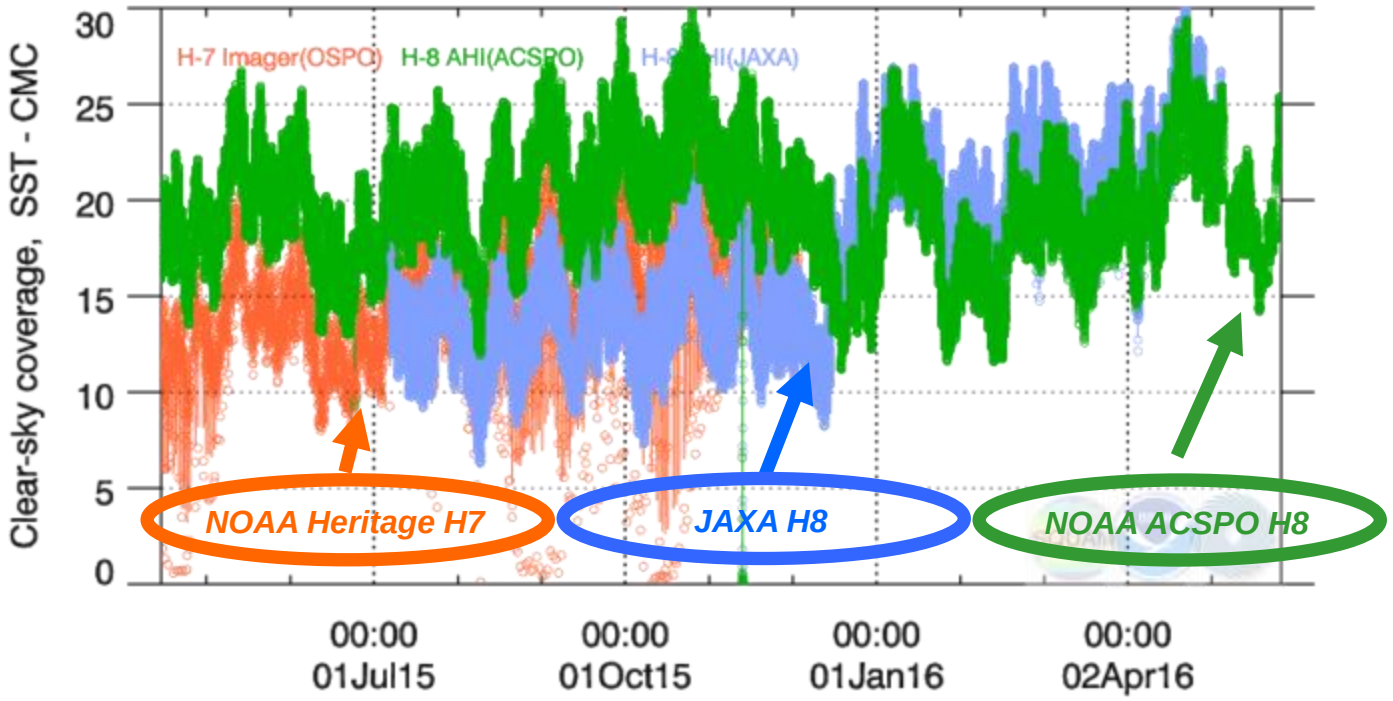
www.star.nesdis.noaa.gov/sod/sst/squam/GEO/



- SD for ACSPO H8 SST tends to be on a lower envelope of the 3 products
- SD for JAXA SST is typically between ACSPO H8 and NOAA heritage H7
- After Dec 2015, SD and outliers in JAXA SST have reduced

% Fraction of clear-sky ocean pixels with valid SST

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



- ACSPO H8 SST tends to be on an upper envelope of clear-sky SST domain
- H7 SST domain was smaller and less stable
- JAXA H8 SST domain increased in Dec'2015, now comparable with ACSPO

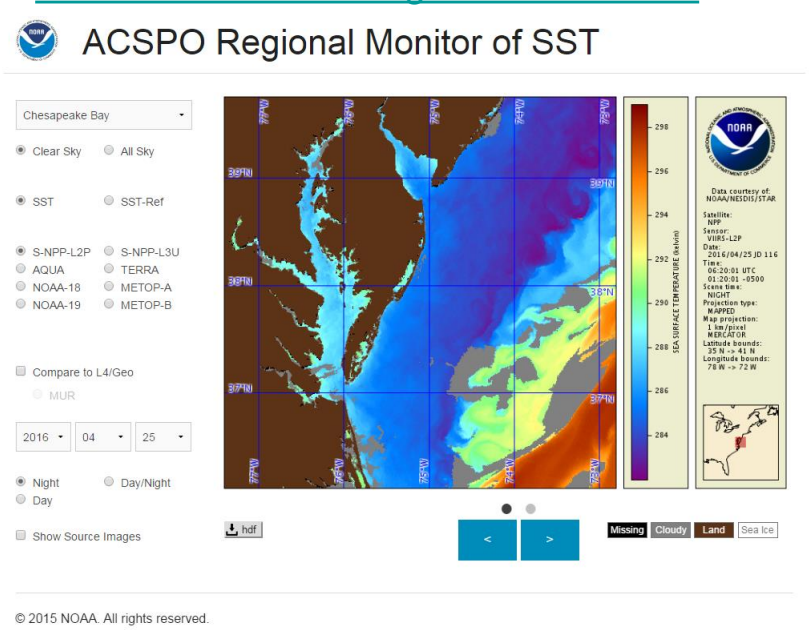
Ongoing SQUAM Work

- **Reorganizing SQUAM (underway)**
  - Regroup products, link geo, etc
  - Exclude products with no interest/feedback (from data producers / users)
  - Intuitive interface, complete functionality, fast response, dynamic graphics
  - We will try to contribute to CDR assessment
- **Tell us what we can do better**

More SST Monitoring Resources at G-XVI

- ✓ Feng Xu – Error Characterization in *i*Quam SSTs using triple-collocations with satellite data – Poster #52
- ✓ Yanni Ding – ACSPO Regional Monitor for SST (ARMS) – Poster #8
- ✓ Kai He – Sensor Stability for SST (3S) – Poster #14

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



www.star.nesdis.noaa.gov/sod/sst/3s/

Thank You!