

# The contribution of Medspiration towards new European operational SST analysis products



# Summary

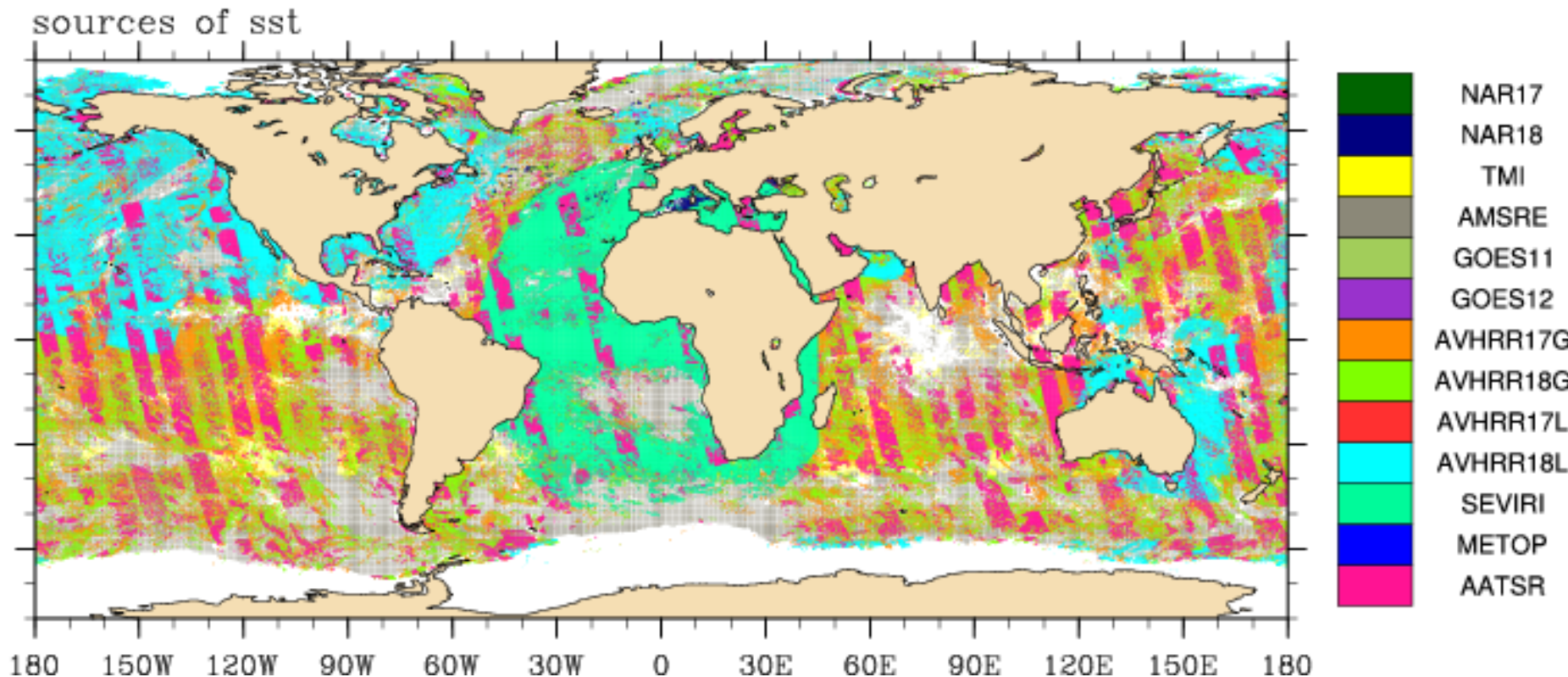
- The main contribution of Medspiration to the development of new operational SST analysis products is the NRT availability of and easy access to SST satellite products :
  - With a common content and format (GHRSSST L2P)
  - With a quality information and a quantitative error estimate associated to each SST value (SSES)

# Outline

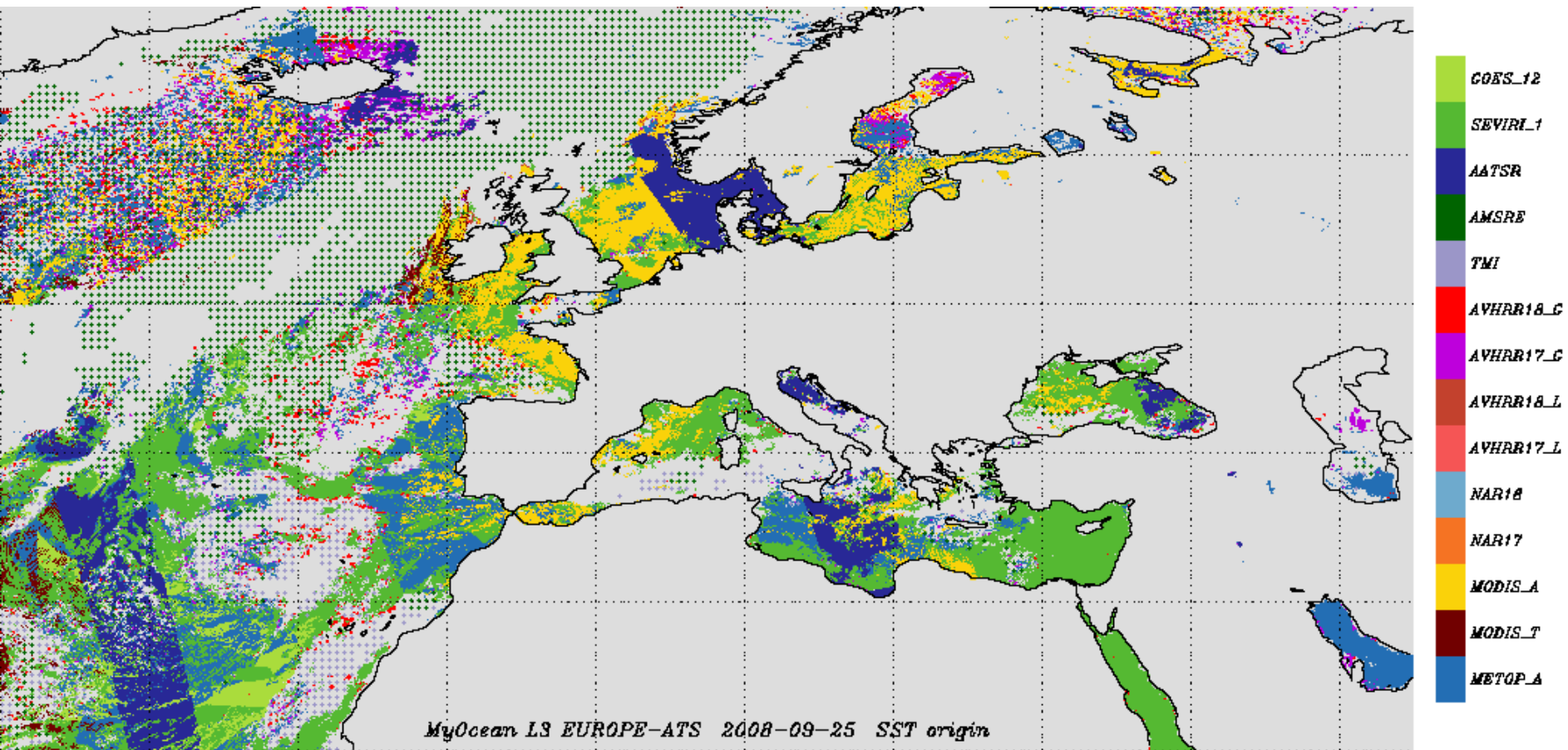
- Examples of Medspiration L2P products usage in new European SST analyses
- Characterisation and quantitative estimate of satellite (and in-situ) SST errors : SSES and beyond
  - Use of Match-up Data Base
  - Use of AATSR
- How to validate and QC SST analyses ?
- Outlook : need for improved SSES estimation and bias correction procedures

# L2P SST sources used in ODYSSEA

ODYSSEA Multisensor L3 - 15 Oct 2008

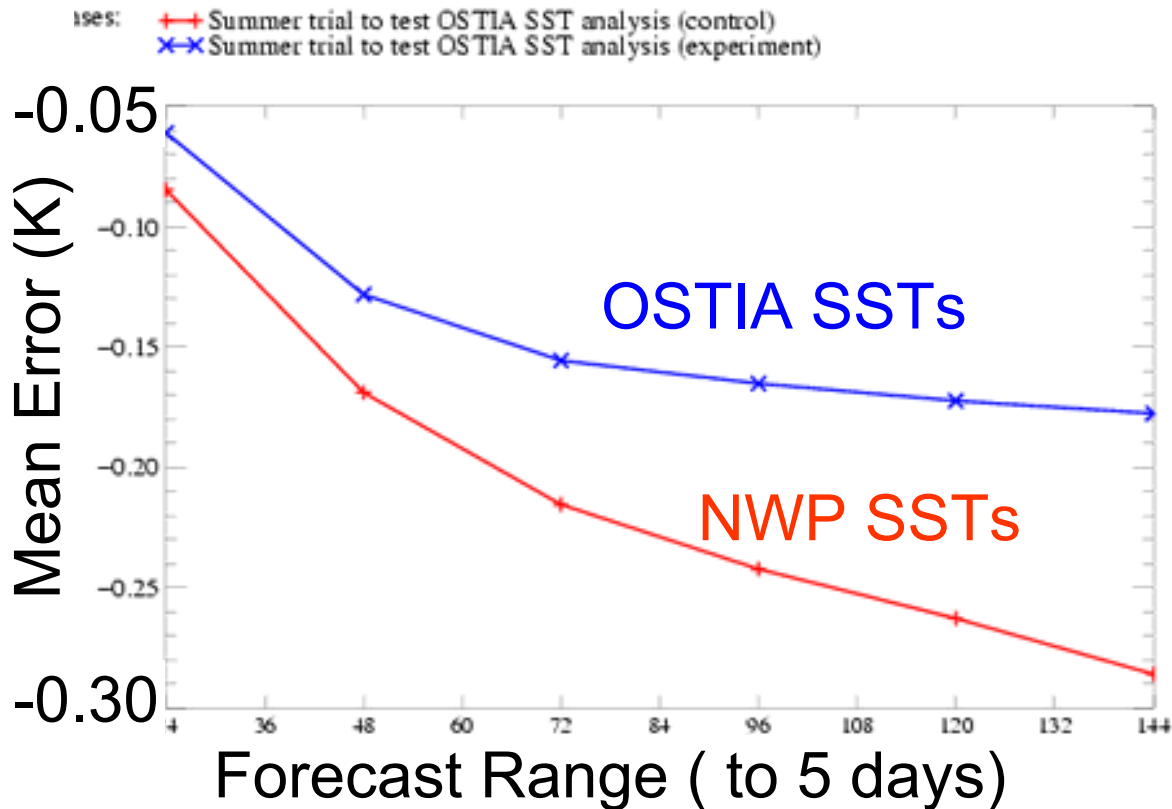


# L2P SST sources used in M-F/CMS regional SST analysis (MERSEA/MyOcean)



# Impact of OSTIA on NWP at the Met Office

Temperature (Kelvin) at 850.0 hPa: Analysis  
Northern Hemisphere (CBS area 90N–18.75N)  
Meaned from 1/8/2007 12Z to 31/8/2007 12Z



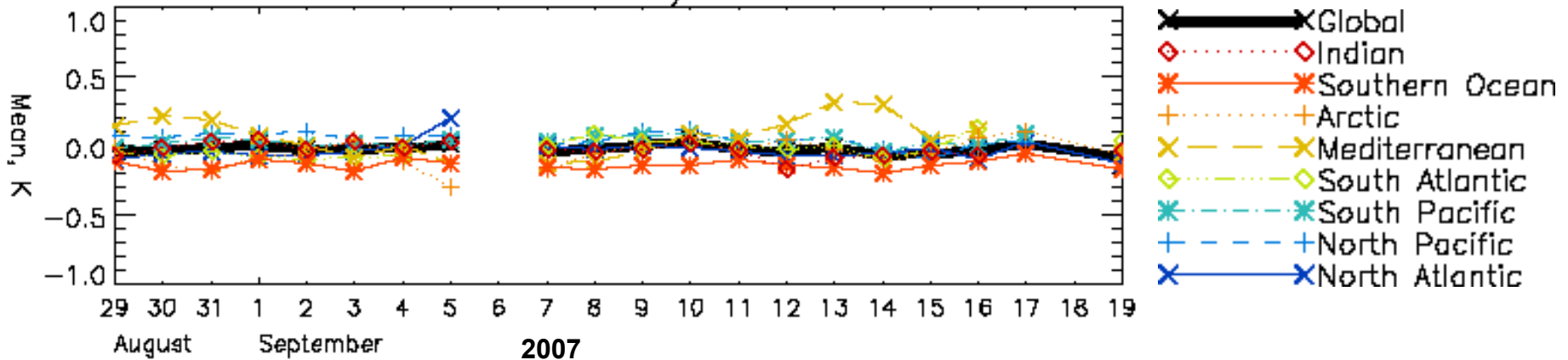
- OSTIA SSTs substantially reduced the negative bias seen with NWP SSTs at 850hPa.

(Courtesy John Stark, Met Office)

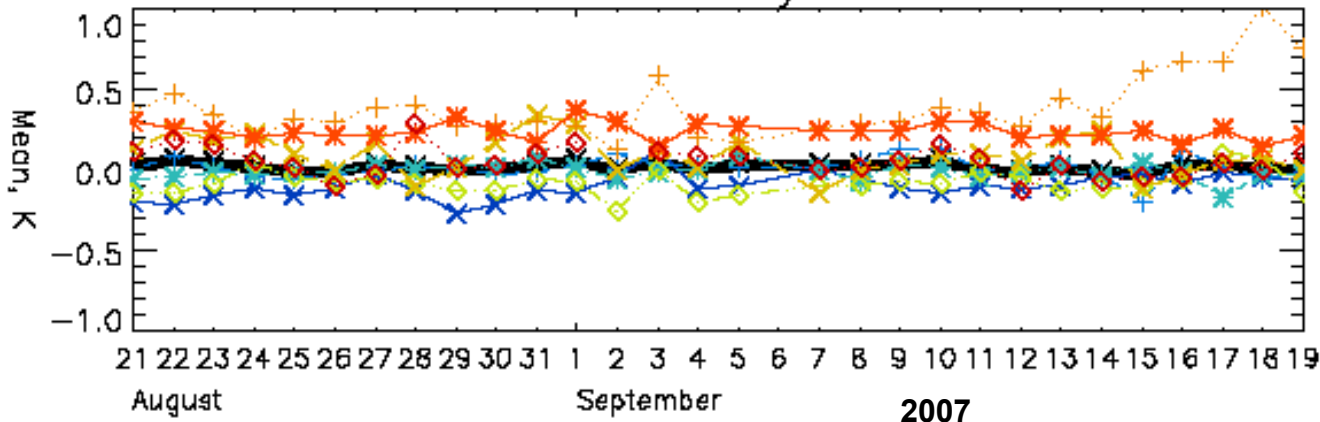
# Users now able to use new SST L2P products as soon as available (ex : OSI SAF METOP)

OSI SAF METOP L2Ps available on a test basis since July 2007

Mean Obs minus Analysis For METOP



Mean Obs minus Analysis For AVHRR

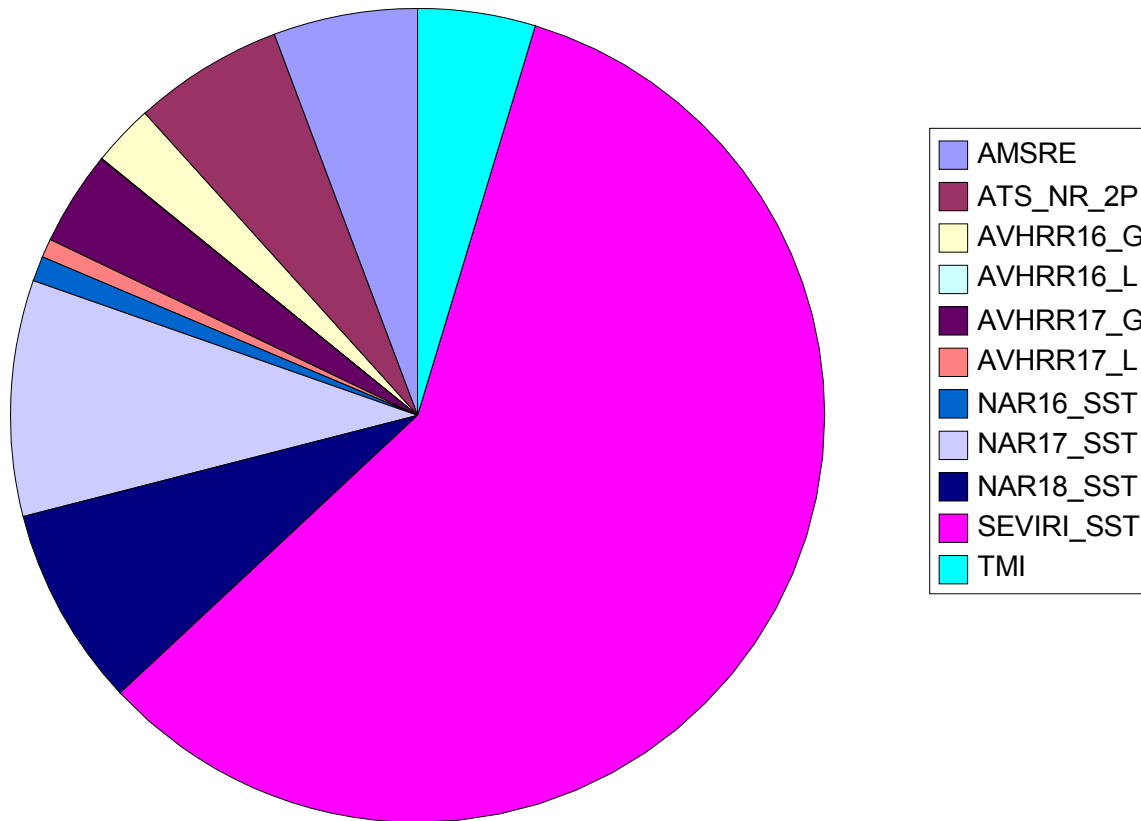


(Courtesy John Stark, Met Office)

OSI SAF METOP L2Ps assimilated operationally in OSTIA since April 2008

# Medspiration Match-up Data base

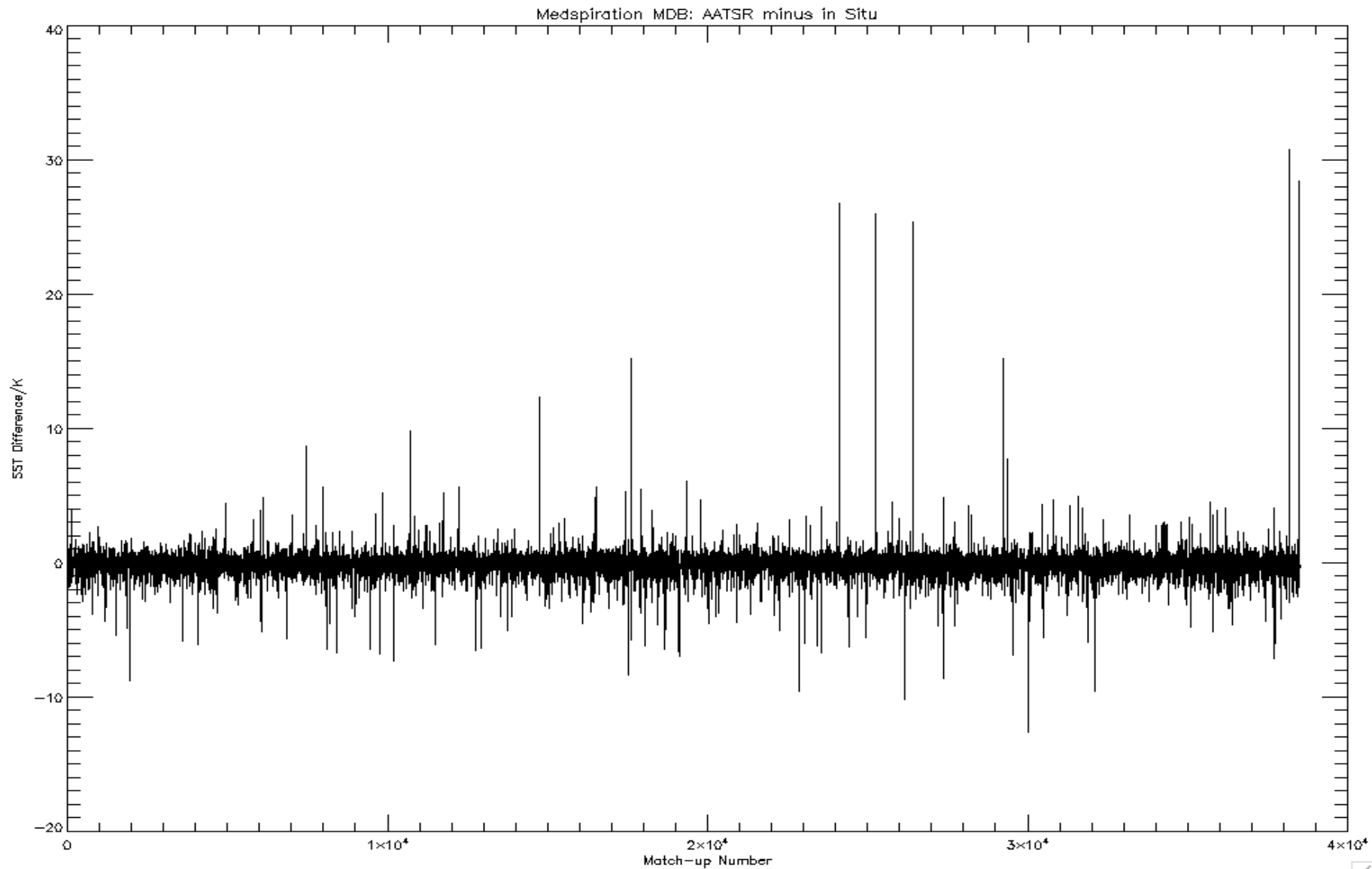
## Sampling of MDB



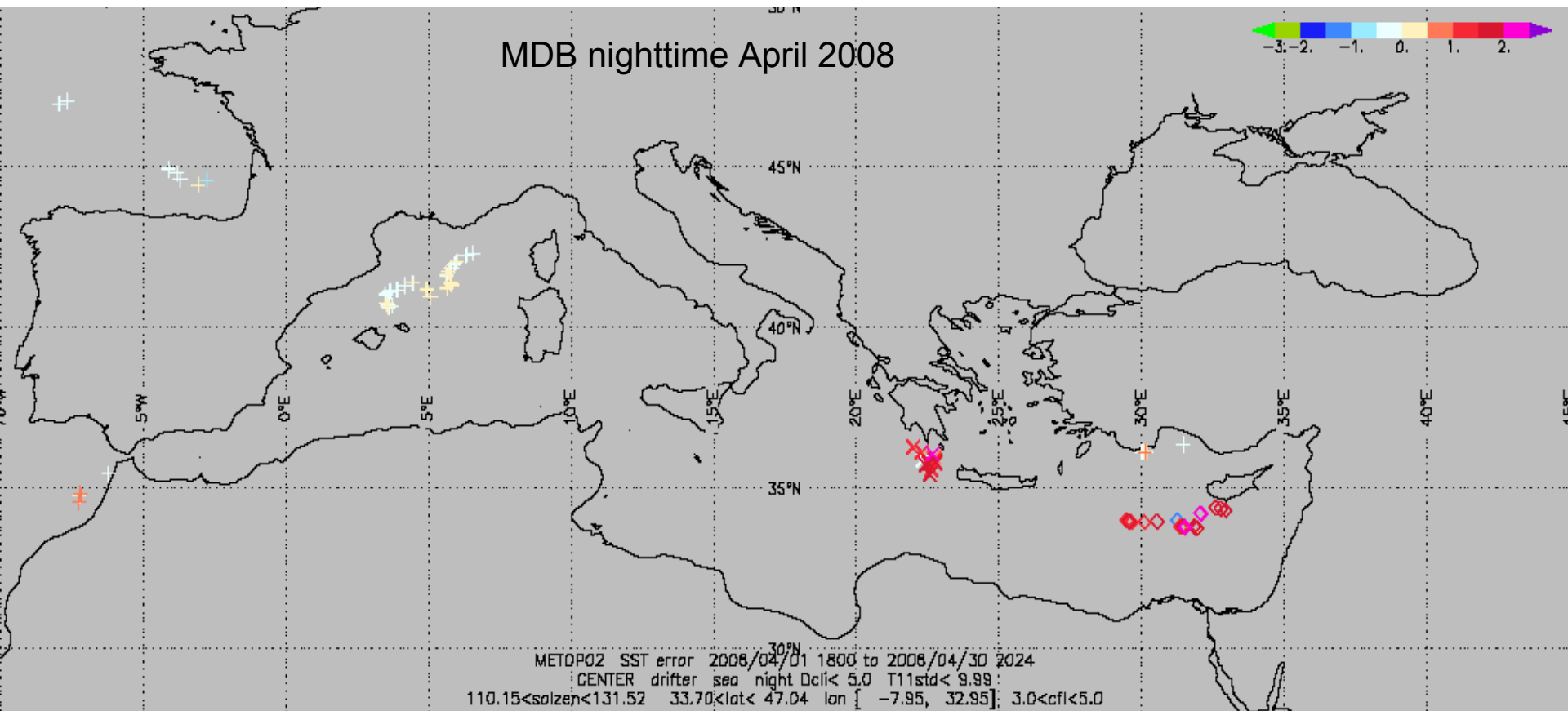
About  
4.800.000  
match-ups  
(98% drifters,  
2% profilers)

(courtesy Jean-  
Francois Piollé,  
IFREMER)

# QC of In Situ Data (1)



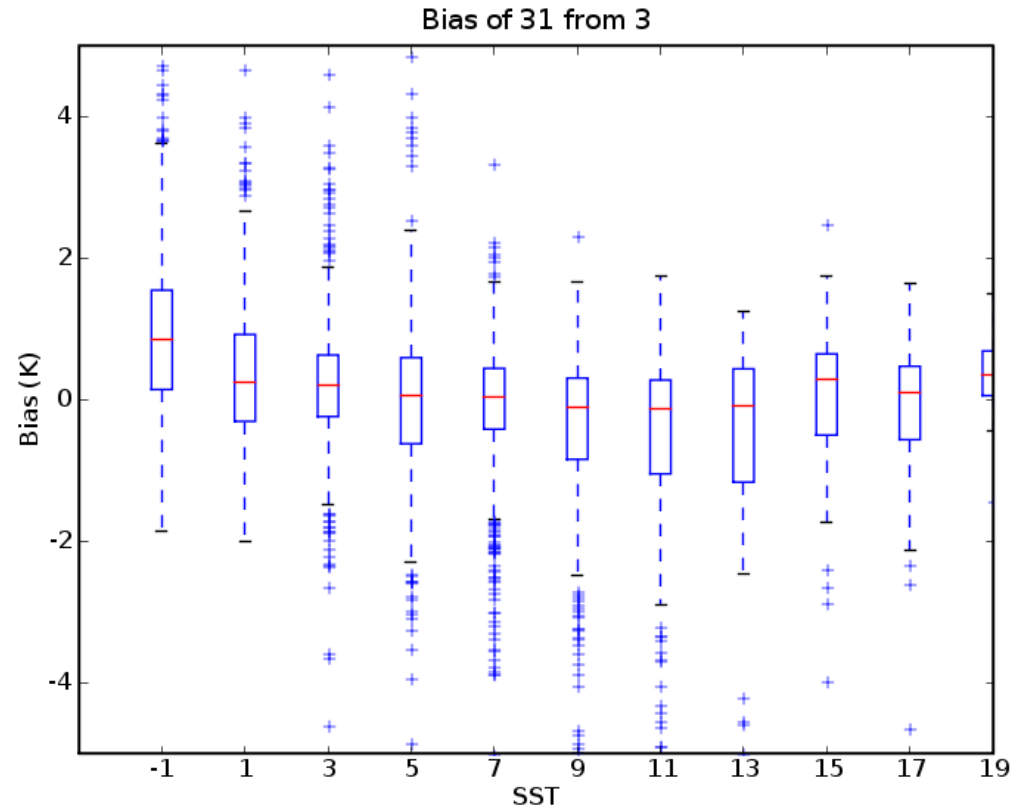
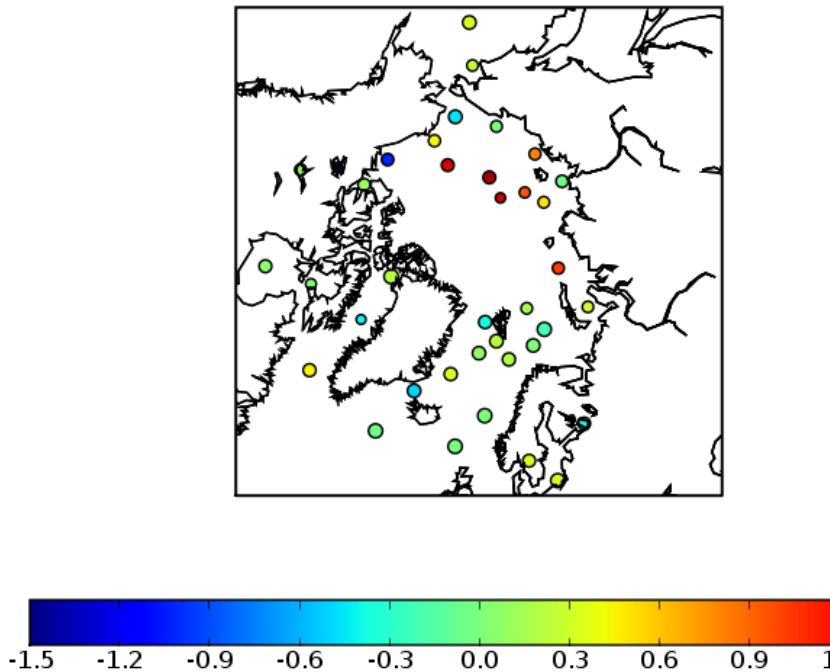
## QC of In Situ Data (2)



- The quality of in-situ measurements is essential

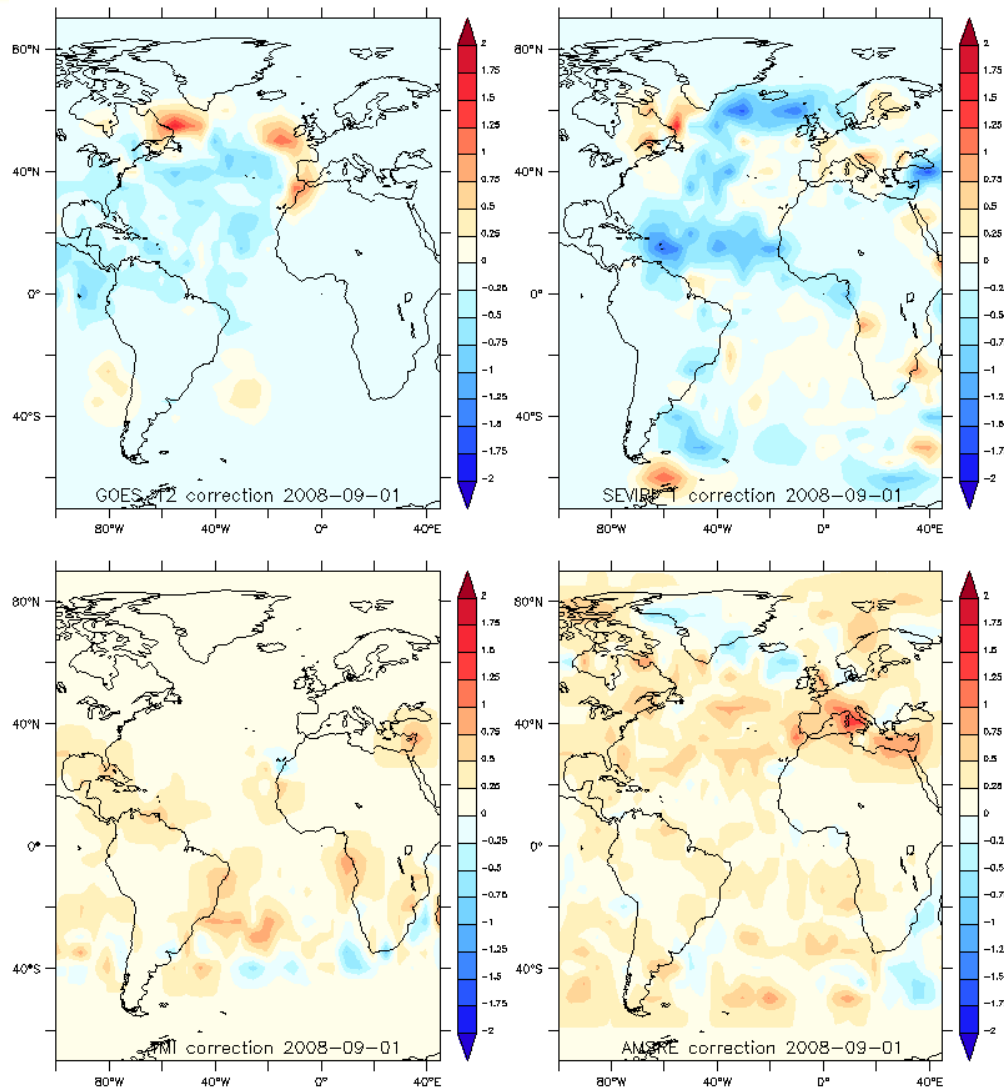
# Validation using a reference satellite sensor ?

Ex: OSI-SAF METOP against AATSR using HR-DDS



(Courtesy S. Eastwood, Met.no and D. Poulter, NOCS)

# Inter-sensor bias correction using AATSR



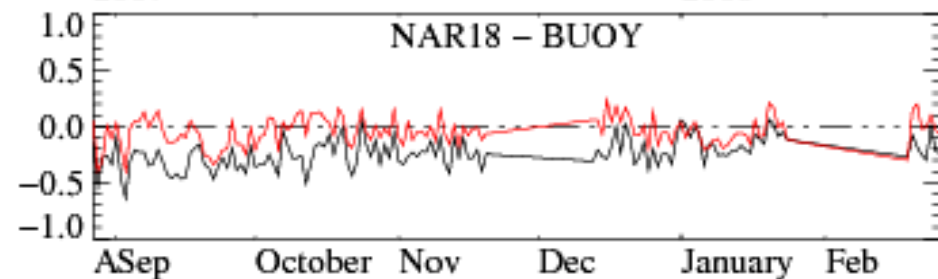
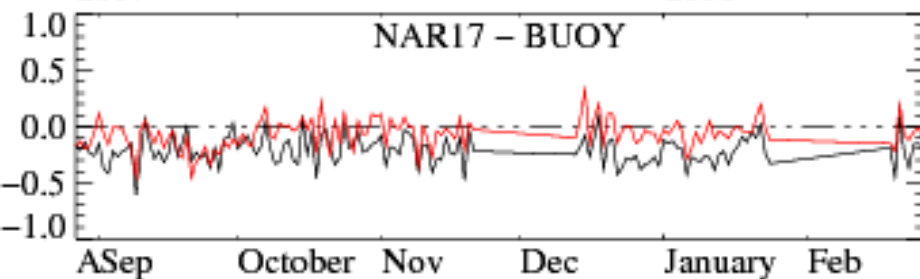
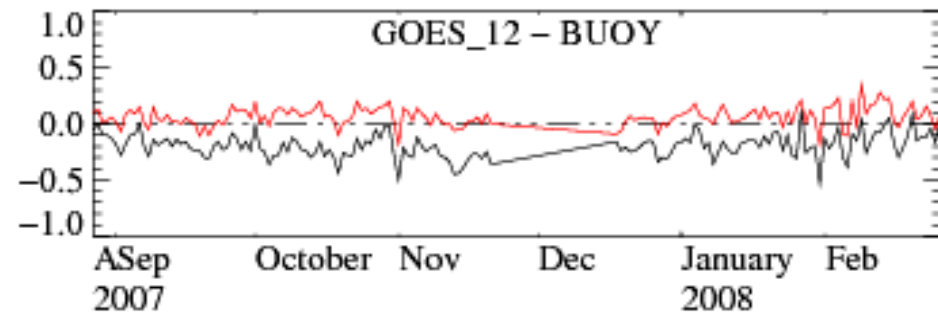
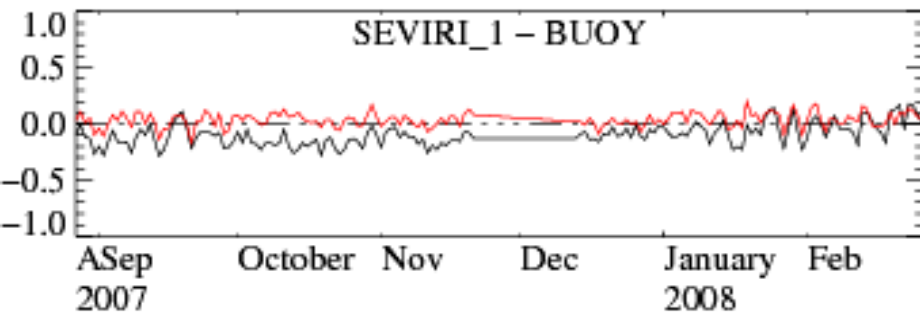
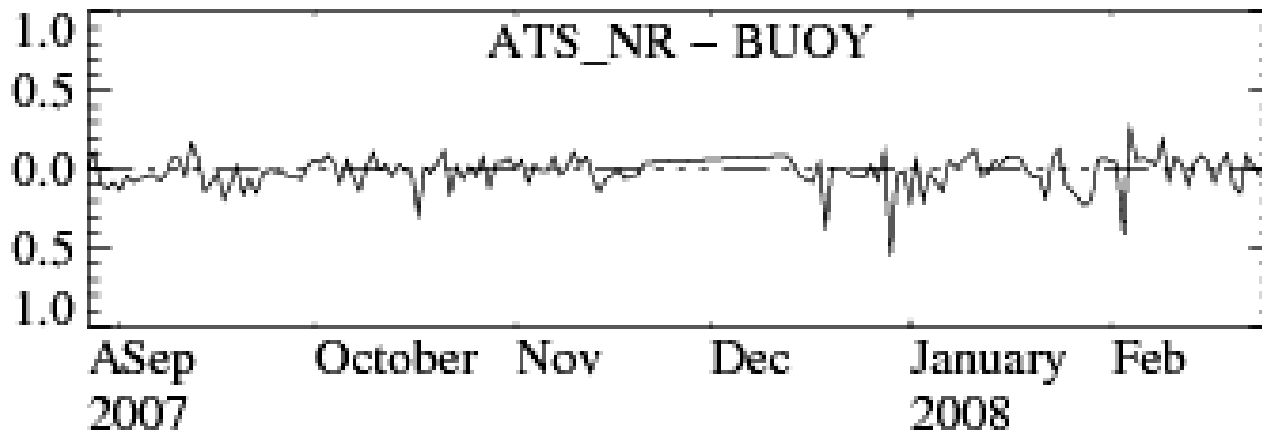
19 November 2008

Medspiration UCM-6



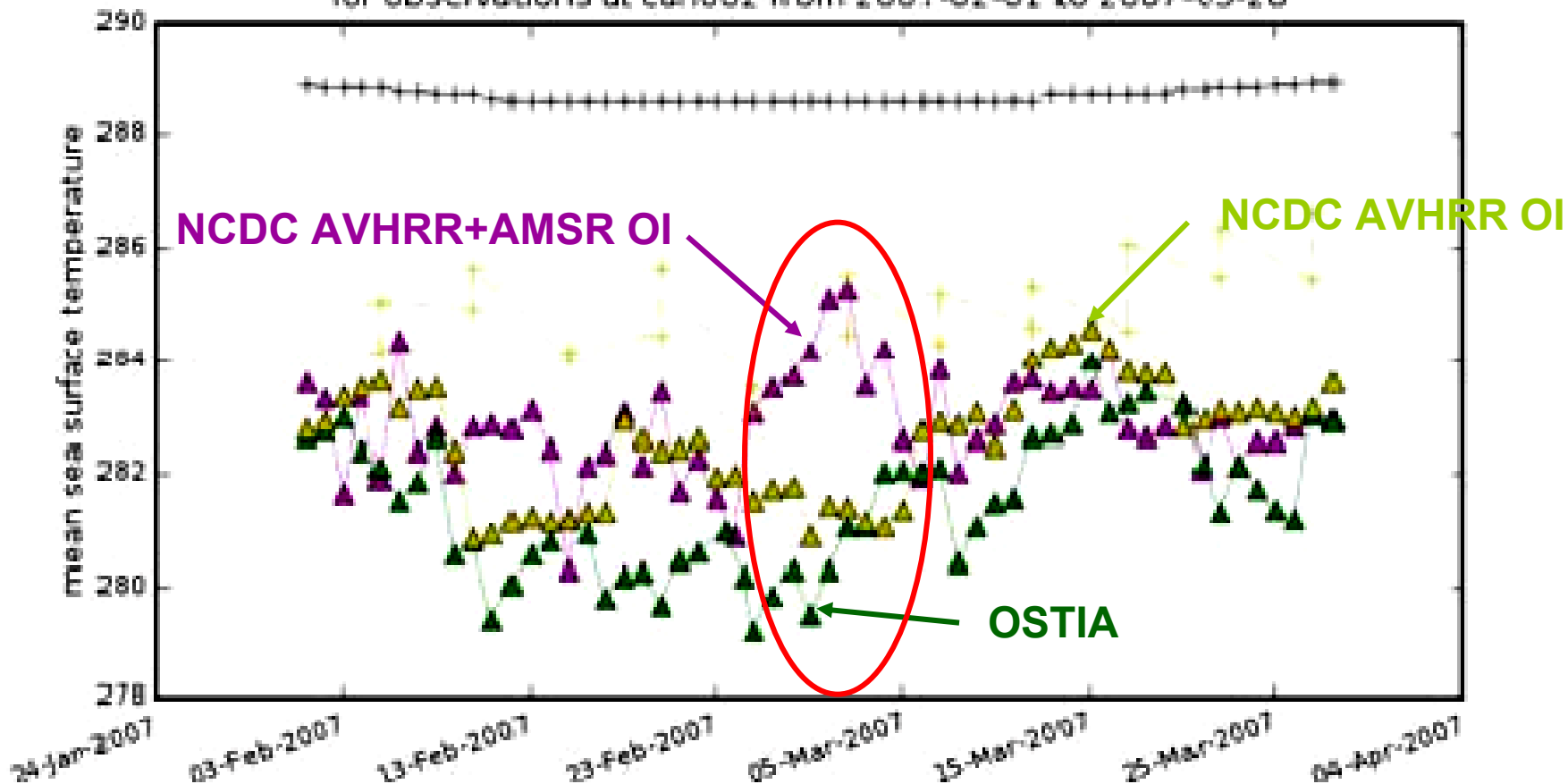
**METEO FRANCE**  
Toujours un temps d'avance

# Validation of AATSR-based bias correction : better agreement with buoy measurements



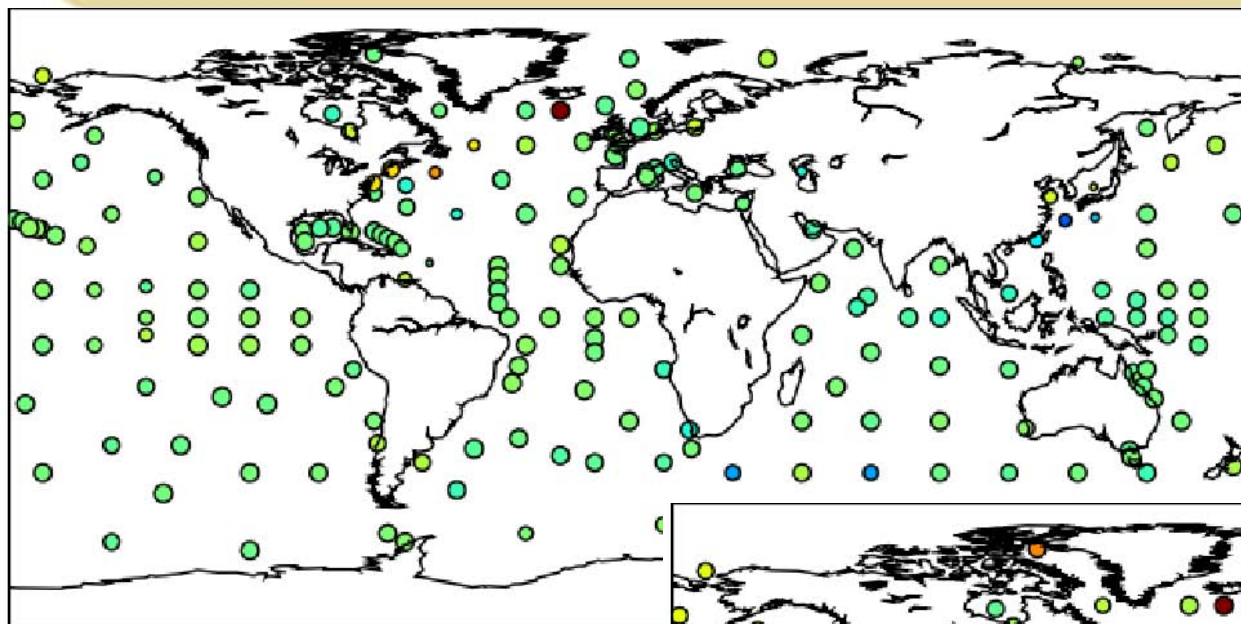
# Use of HR-DDS to validate SST analyses (1)

Plot of the mean area\_all values of sea surface temperature for observations at can002 from 2007-02-01 to 2007-03-28



Report MERSEA-WP02-USOU-STR-002-1A, D. Poulter & I. Robinson

# Use of HR-DDS to validate SST analyses (2)



**Bias OSTIA – AATSR**

**Night only**

**(global mean 0.00 K)**

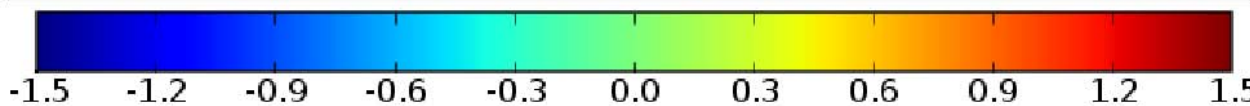
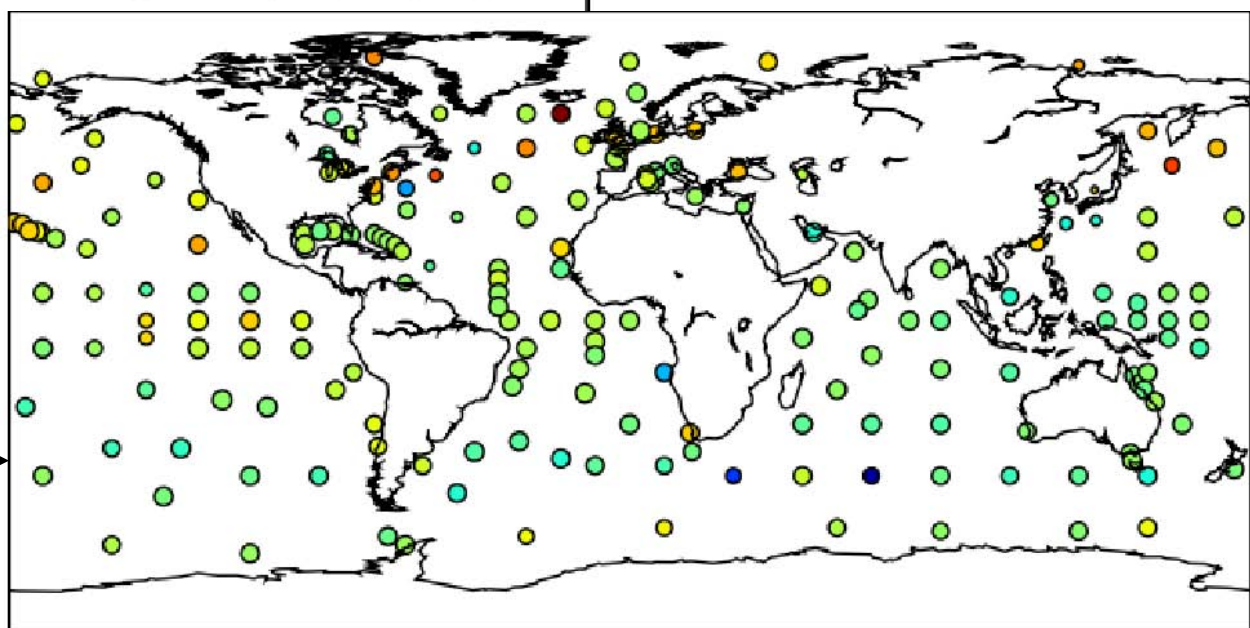


**Bias NCDC AVHRR OI – AATSR**

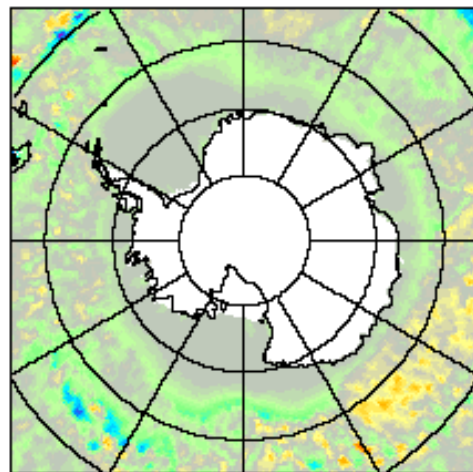
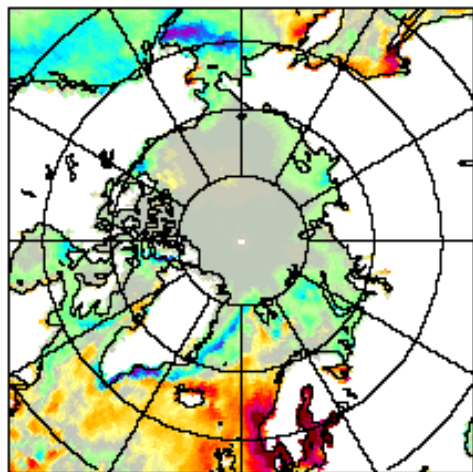
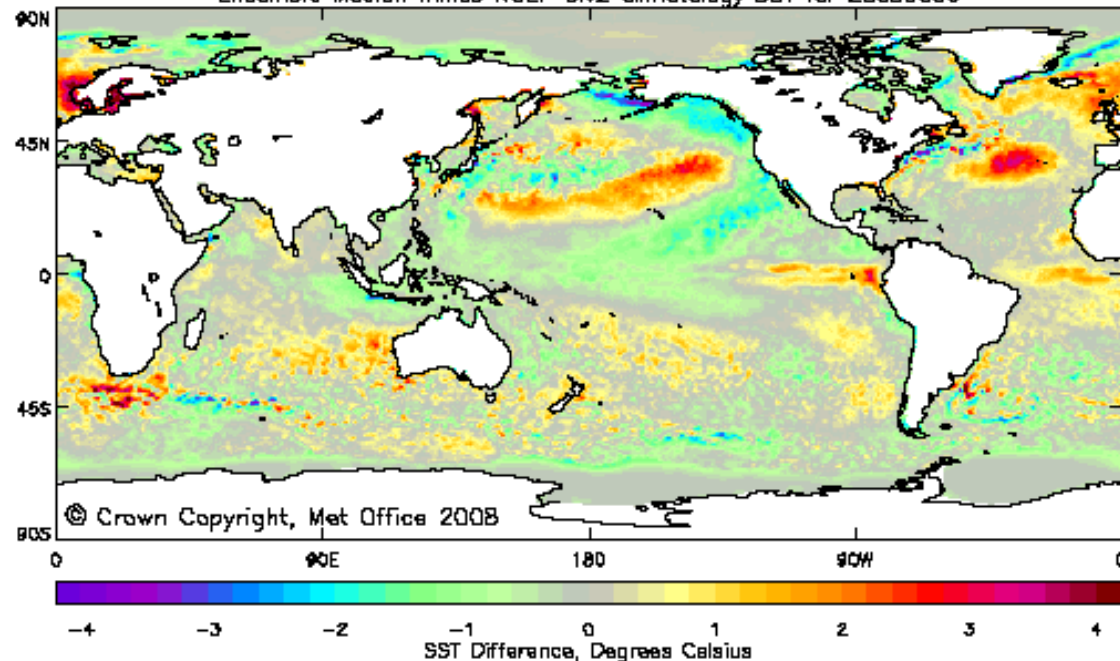
**Night only**

**(global mean 0.15 K)**

19 November 2008



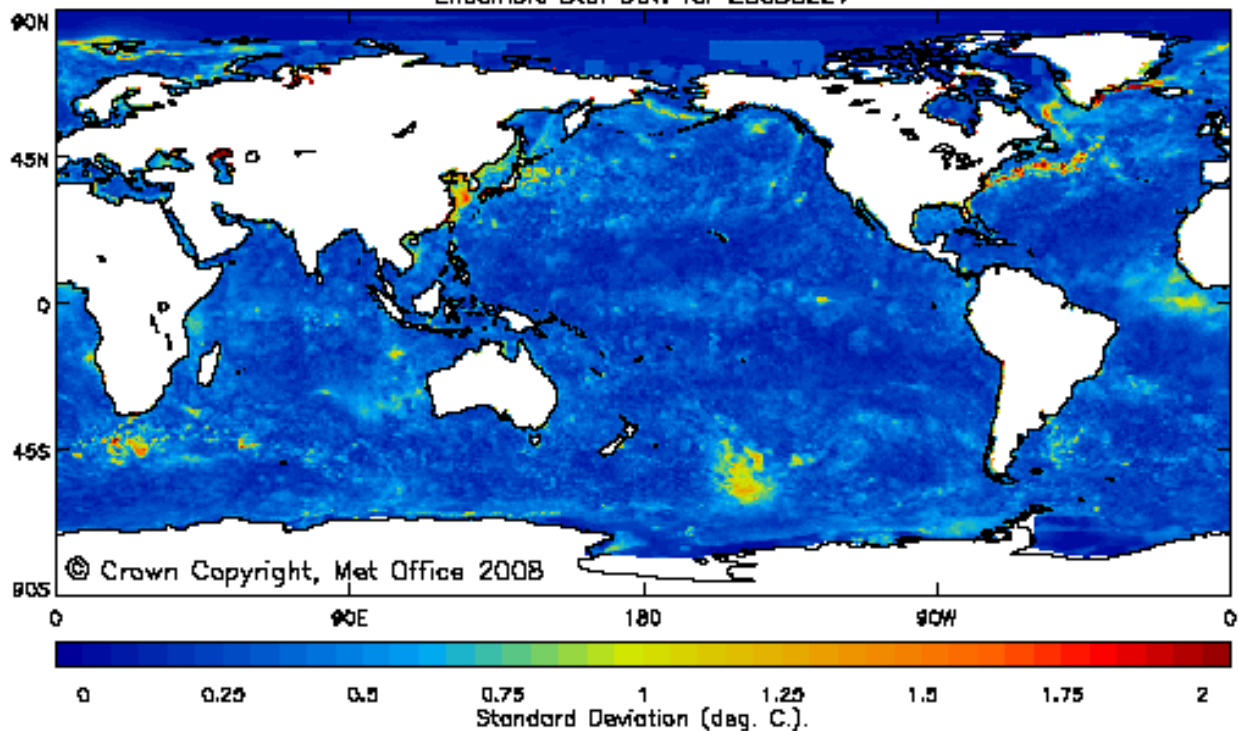
Ensemble Median minus NCEP Olv2 climatology SST for 20080606



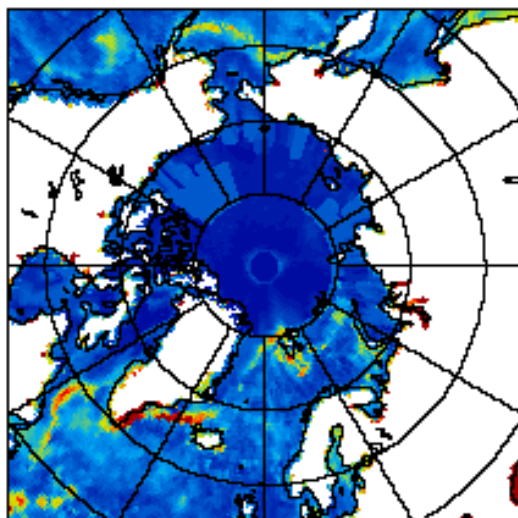
## GHRSSST-PP Multi-Product Median Ensemble Computed using:

Met Office [OSTIA SST](#)  
NCEP [RTG SST HR SST](#)  
NAVOCEANO [NAVO K10 SST](#) JMA [MGDSST SST analysis](#)  
RSS [RSS MW Fusion SST analysis](#)  
RSS [RSS MW+IR Fusion SST](#) [FNMOC GHRSSST-PP SST](#)  
MERSEA [ODYSSEA SST](#)  
[Canadian Met. Centre](#) (CMC)  
[NOAA AVHRR OI](#) (Reynolds).

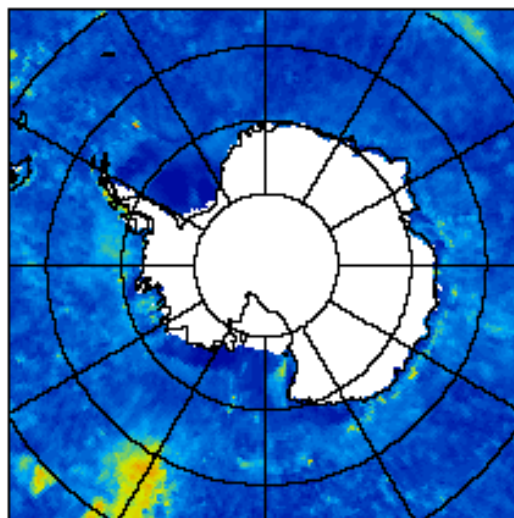
(Courtesy John Stark, Met Office)



Anomalies for each INPUT analysis with reference to the GMPE ensemble median for 5<sup>th</sup> March 2008



19 November 2008

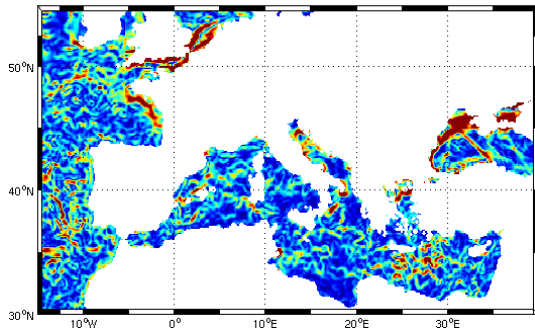


Medspiration UCM-6

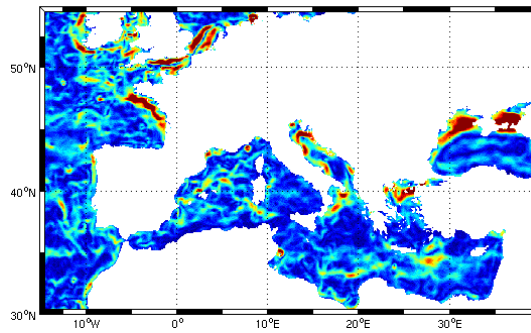
7-Day animation of Ensemble Standard Deviation

(Courtesy John Stark, Met office)

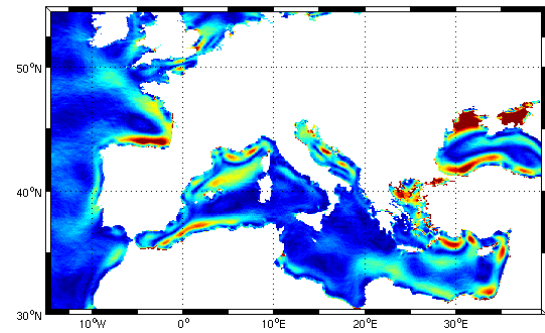
ODYSSEA L4



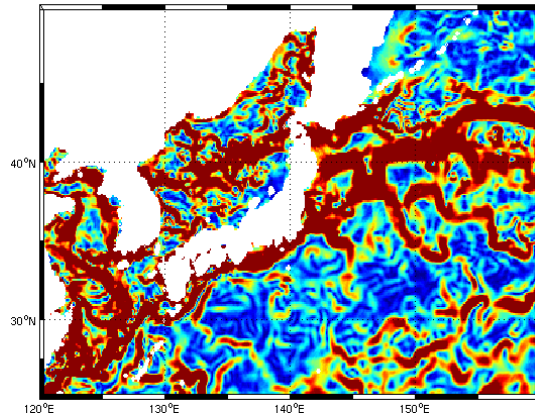
OSTIA L4



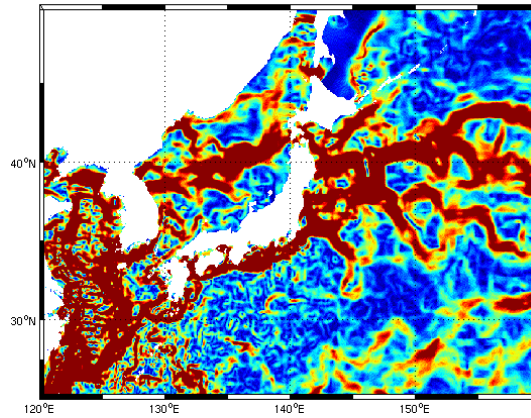
RTG-HR L4



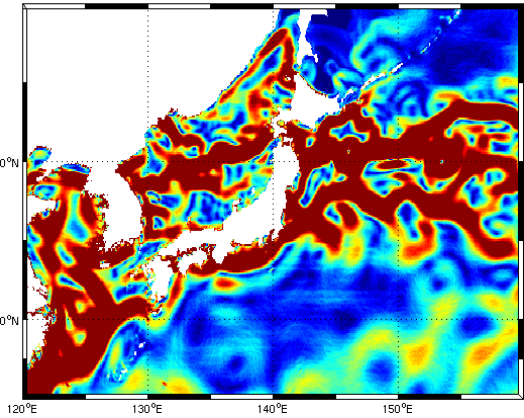
ODYSSEA L4



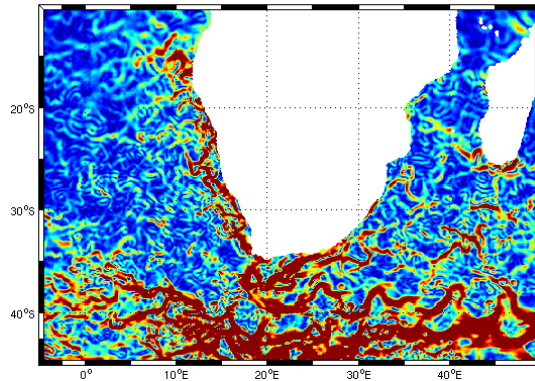
OSTIA L4



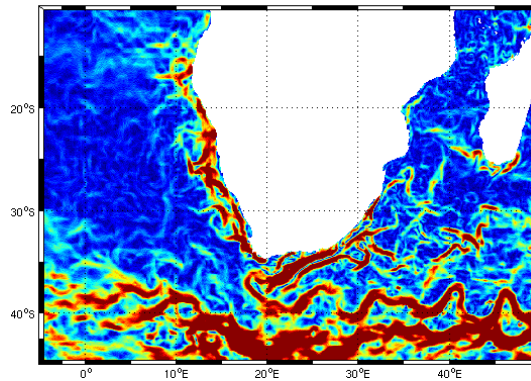
RTG-HR L4



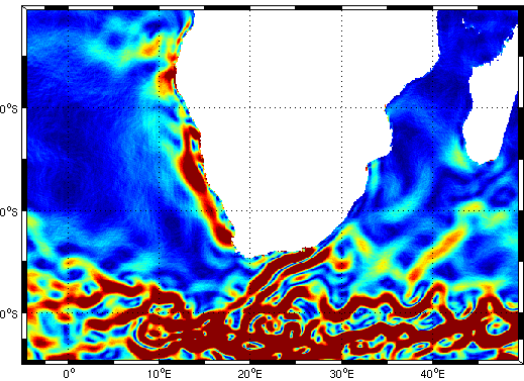
ODYSSEA L4



OSTIA L4



RTG-HR L4



0

0.01

0.02

[http://www.mersea.eu.org/Satellite/sst\\_validation\\_on\\_l4\\_glob\\_oi.html](http://www.mersea.eu.org/Satellite/sst_validation_on_l4_glob_oi.html)

# Outlook

- SSES estimation :
  - Current estimation procedures : lack of homogeneity among L2P producers, lack of horizontal consistency for most L2P products (discontinuities)
  - The use of in-situ measurements only can be a limitative factor at regional scale
  - A better physical understanding of error sources is needed (⇒ **InterSST project**)
- Bias correction :
  - The current bias correction schemes are not successful in all cases (in particular at high latitudes and/or at very high resolution), and are very sensitive to any problem in AATSR products quality and availability
  - A better physical understanding of inter-sensor biases is needed (⇒ **InterSST project**)