The contribution of Medspiration towards new European operational SST analysis products

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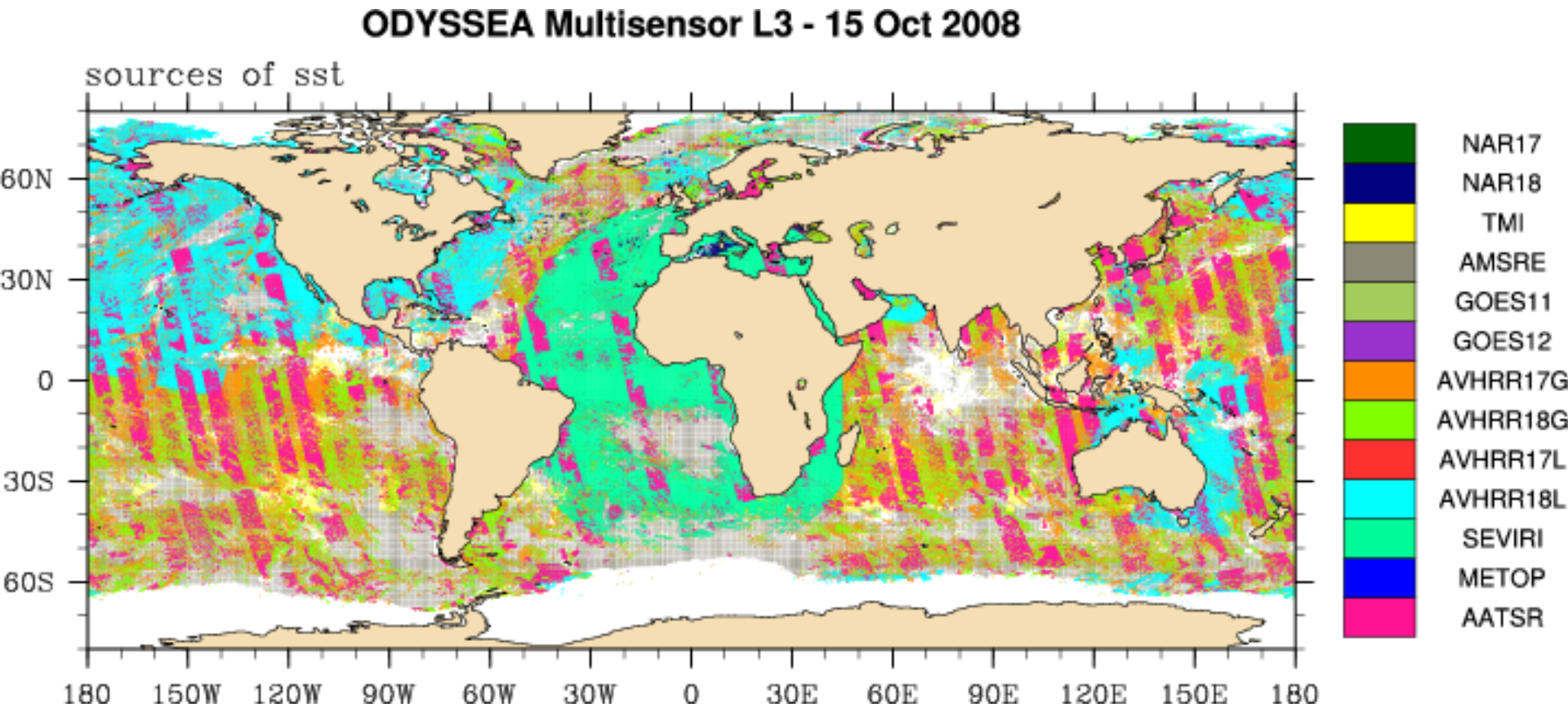
Summary

- 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 (GHRSST 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



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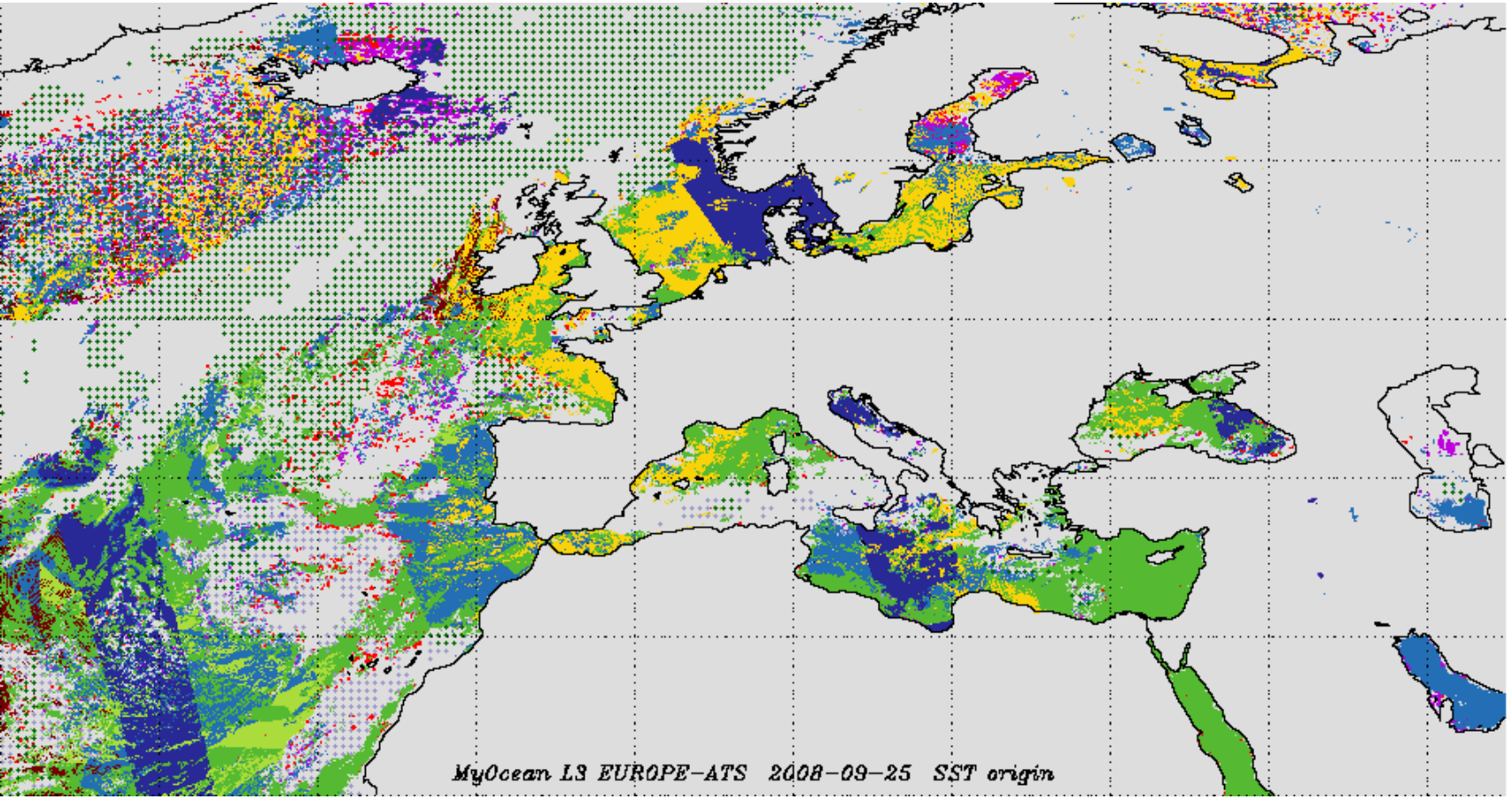
L2P SST sources used in M-F/CMS regional SST analysis (MERSEA/MyOcean)



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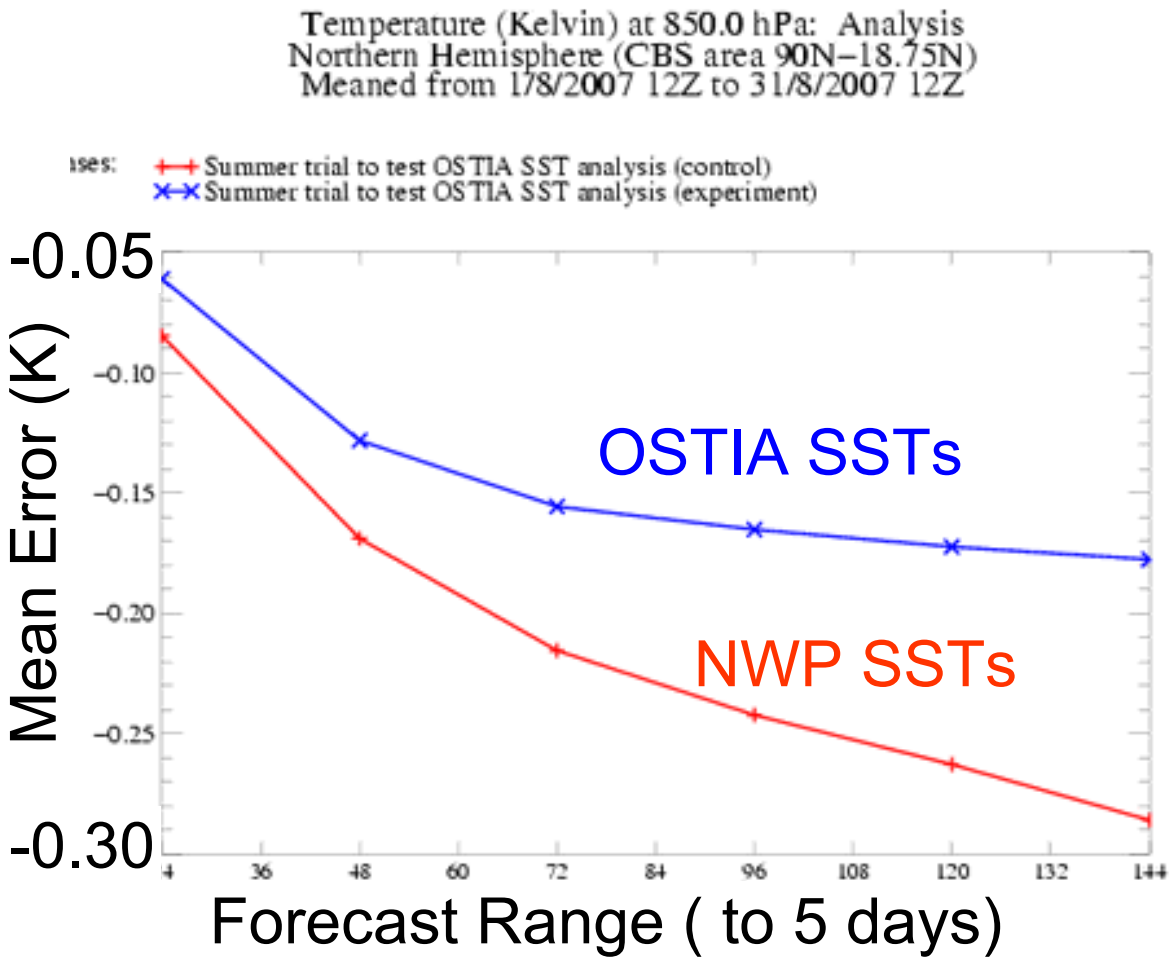
Impact of OSTIA on NWP at the Met Office

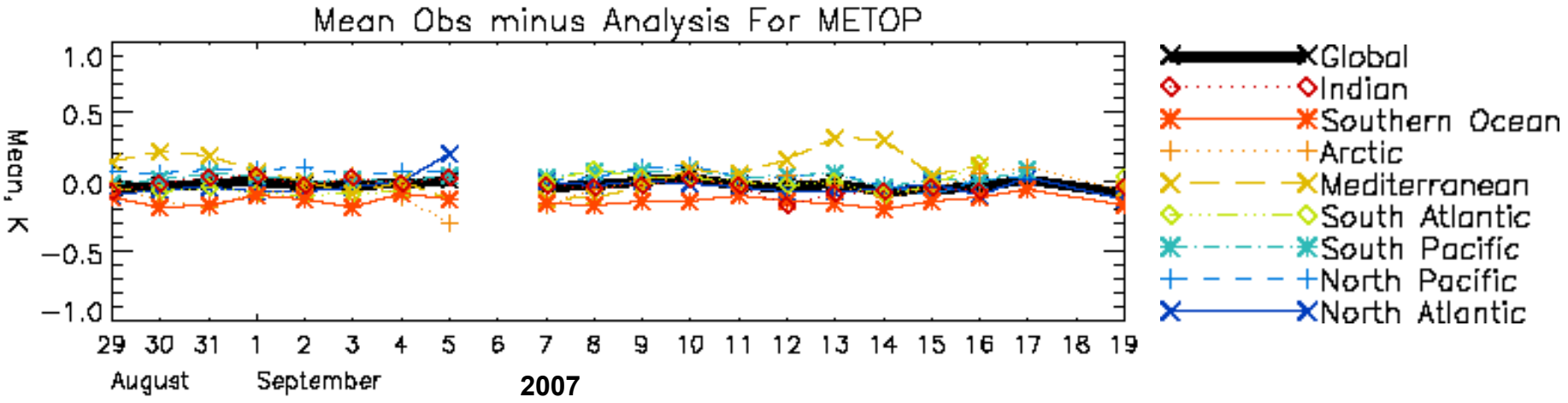


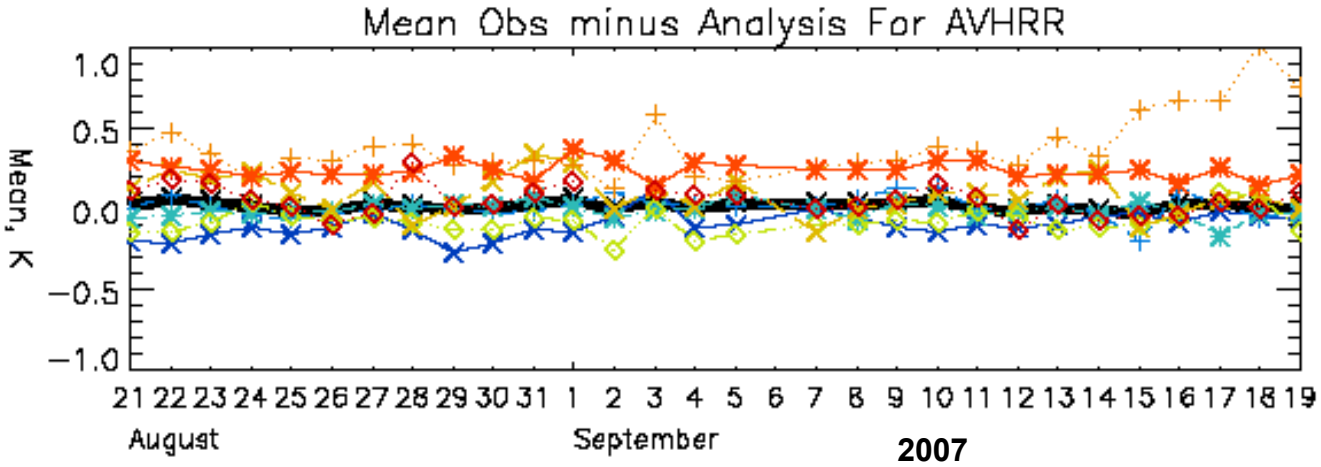
- OSTIA SSTs substantially reduced the negative bias seen with NWP SSTs at 850hPa.

(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





(Courtesy John Stark, Met Office)

OSI SAF METOP L2Ps assimilated operationally in OSTIA since April 2008

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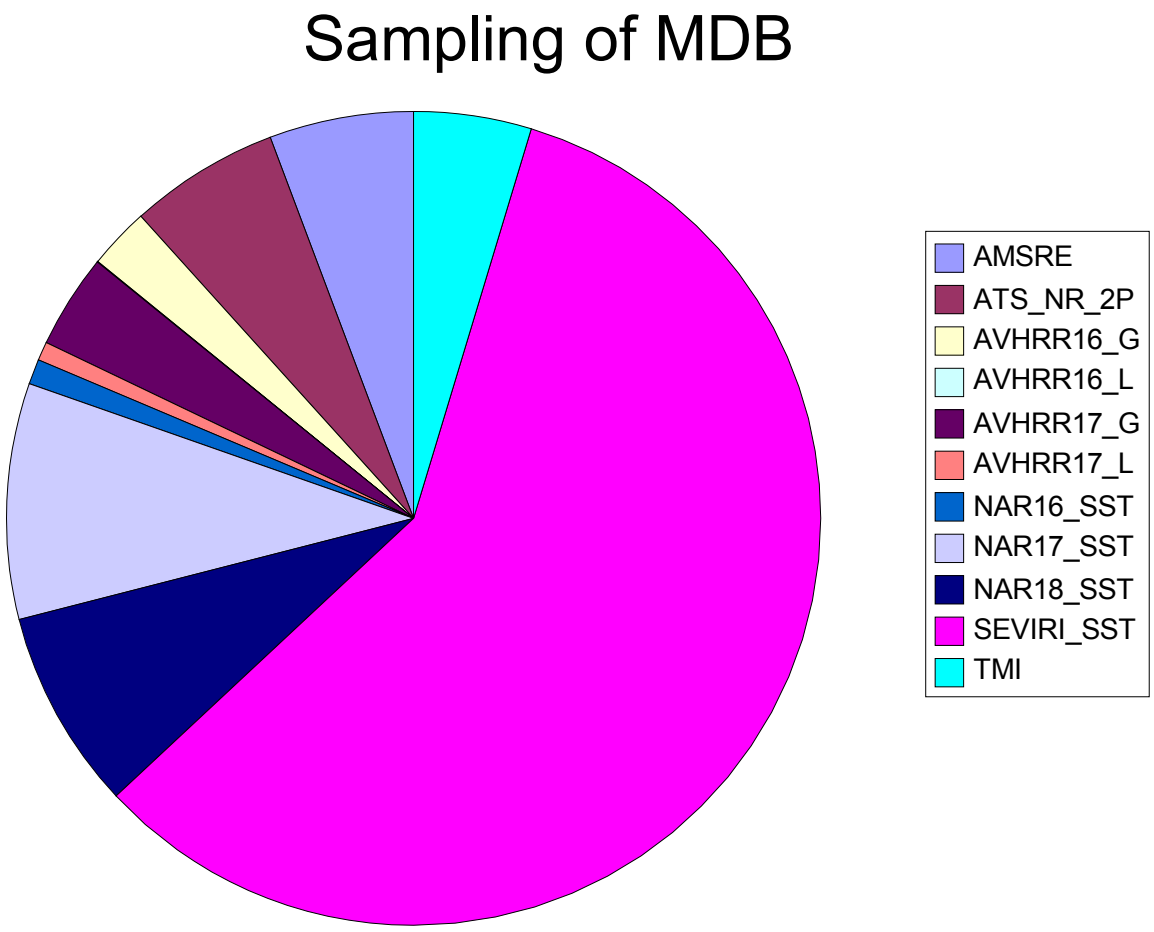
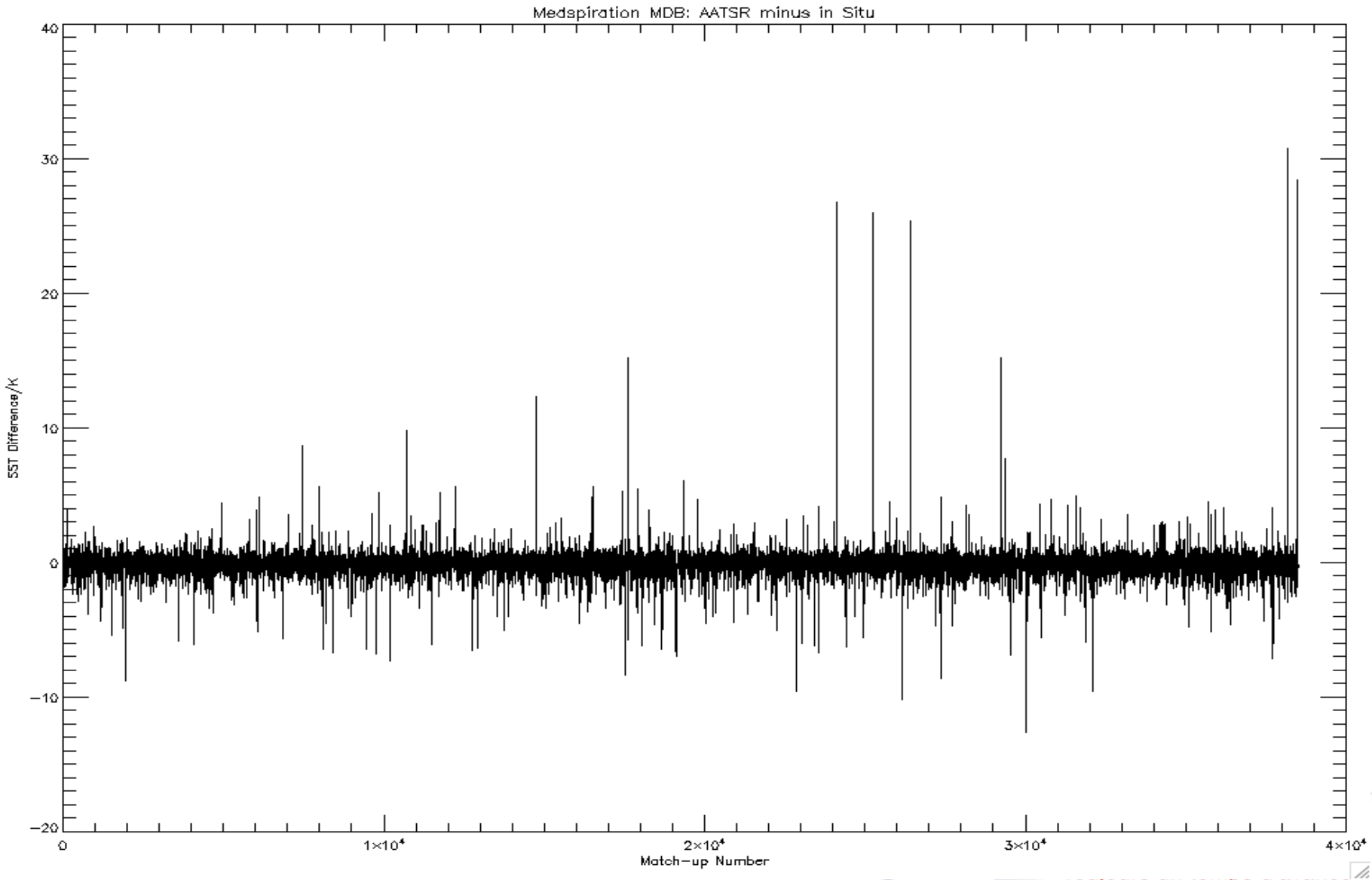
Medspiration Match-up Data base



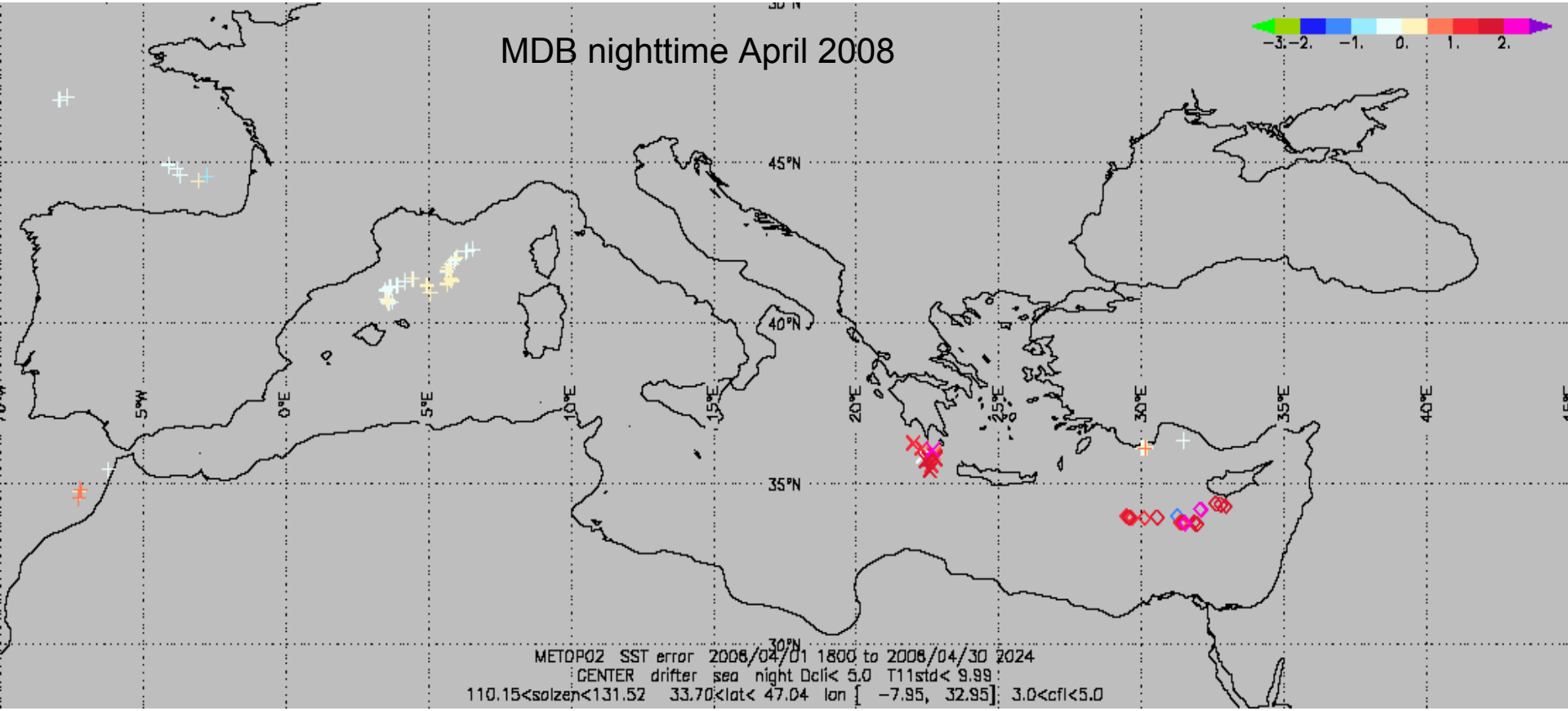
About 4.800.000 match-ups (98% drifters, 2% profilers)

(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

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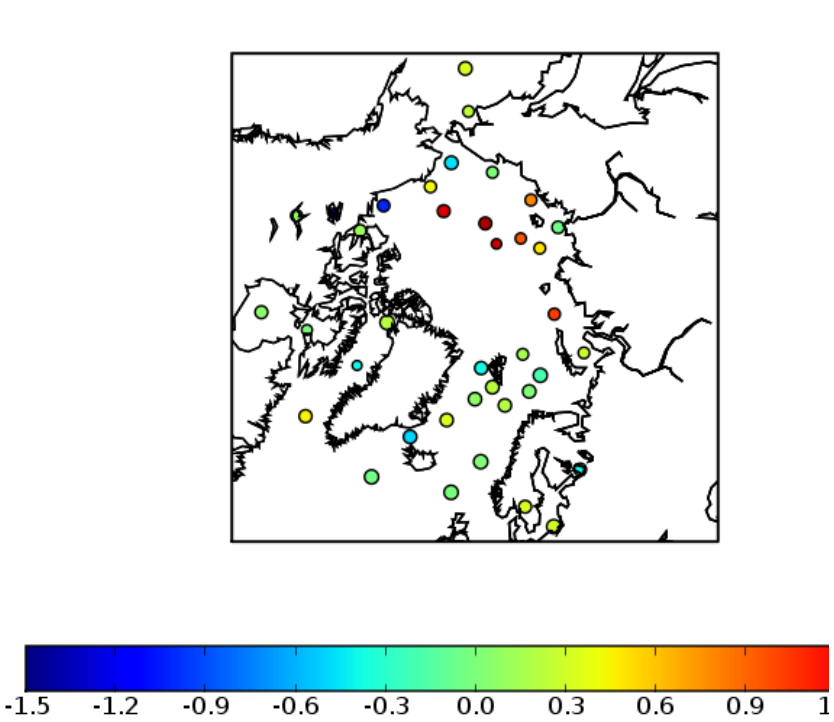
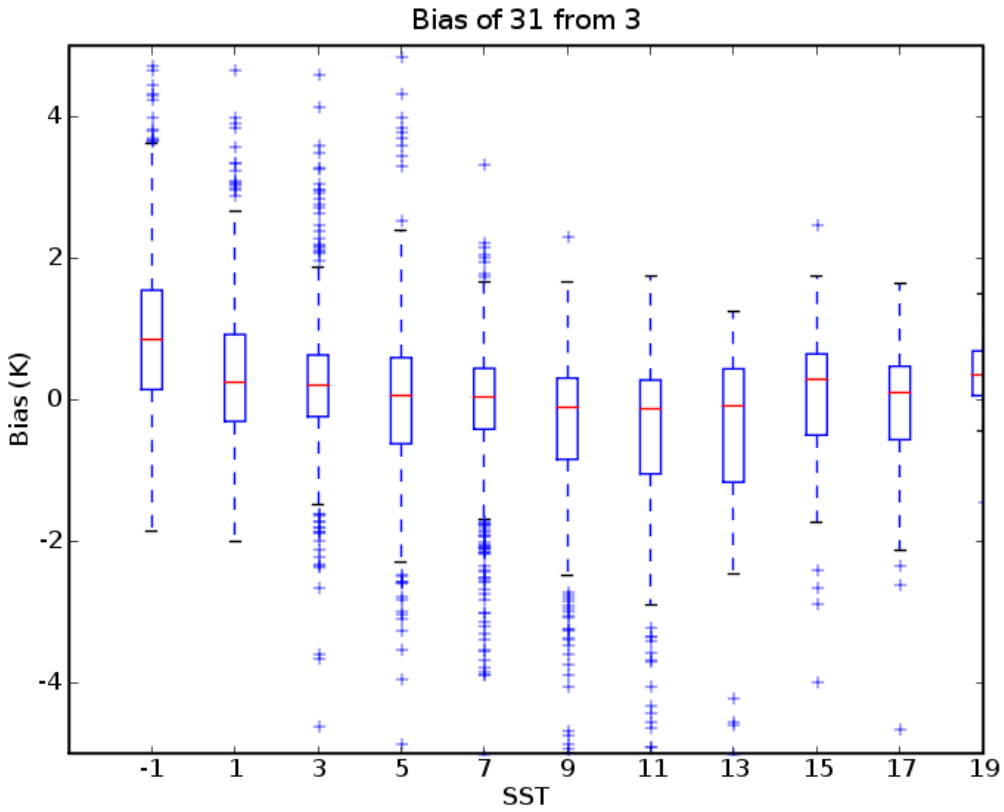
Validation using a reference satellite sensor ?

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





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

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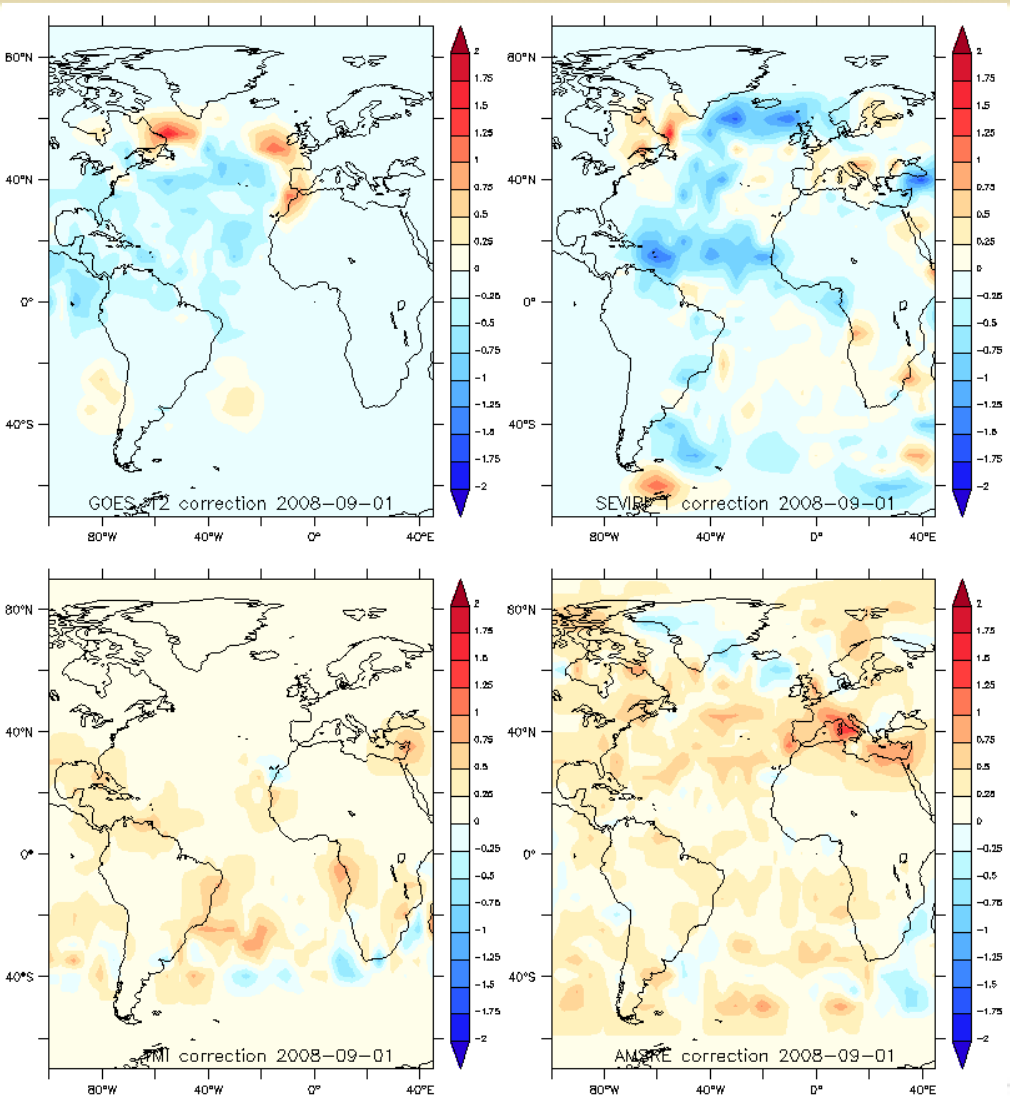
Inter-sensor bias correction using AATSR



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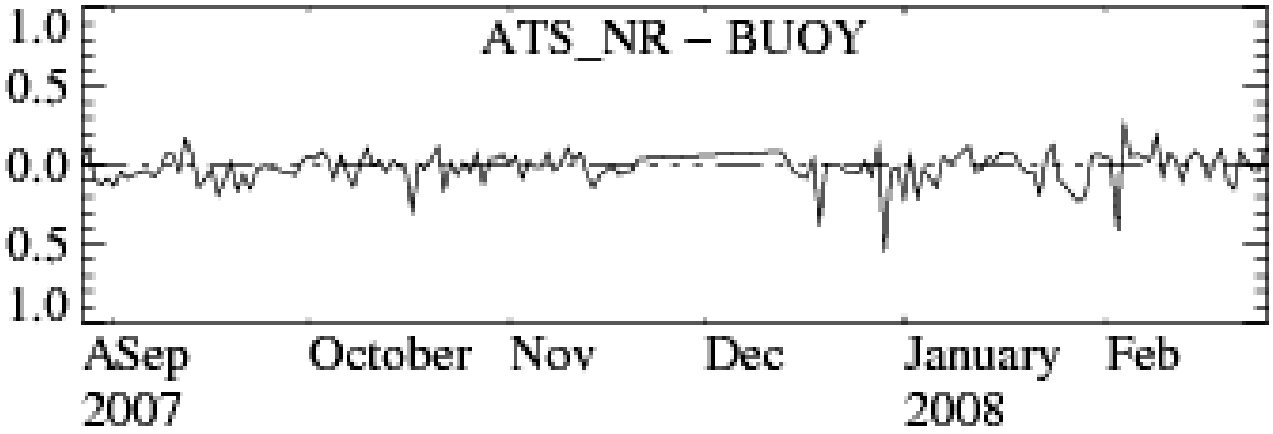
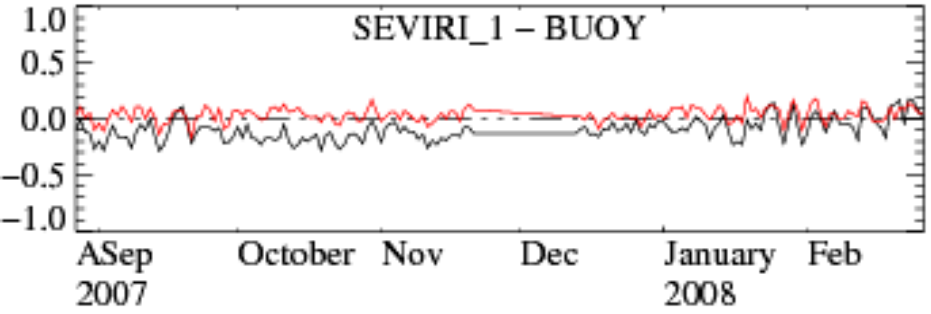
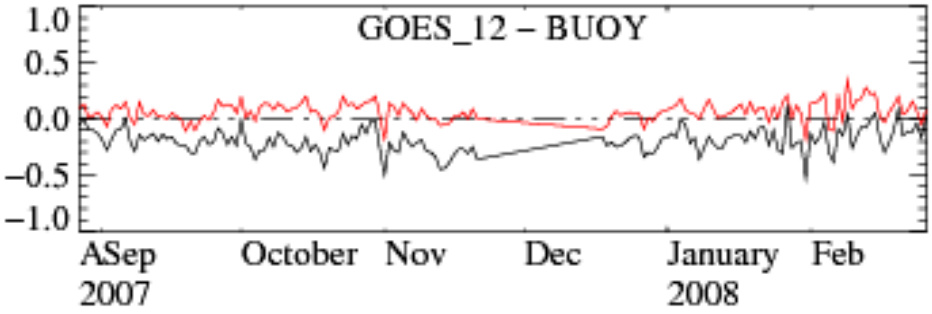
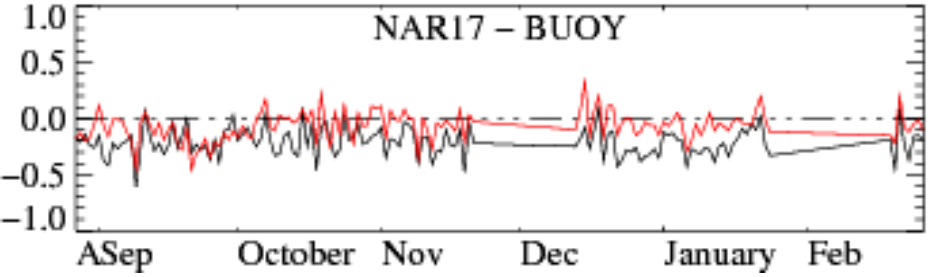
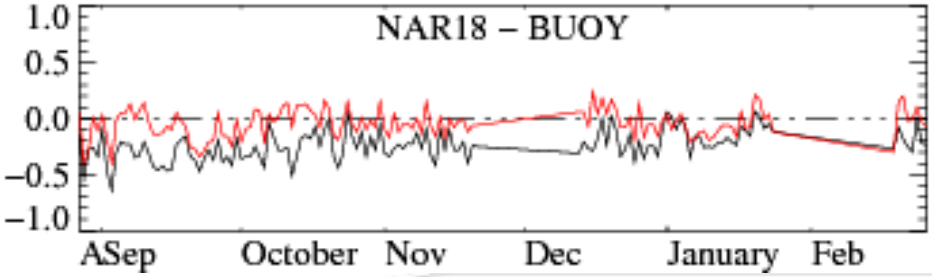
Validation of AATSR-based bias correction : better agreement with buoy measurements











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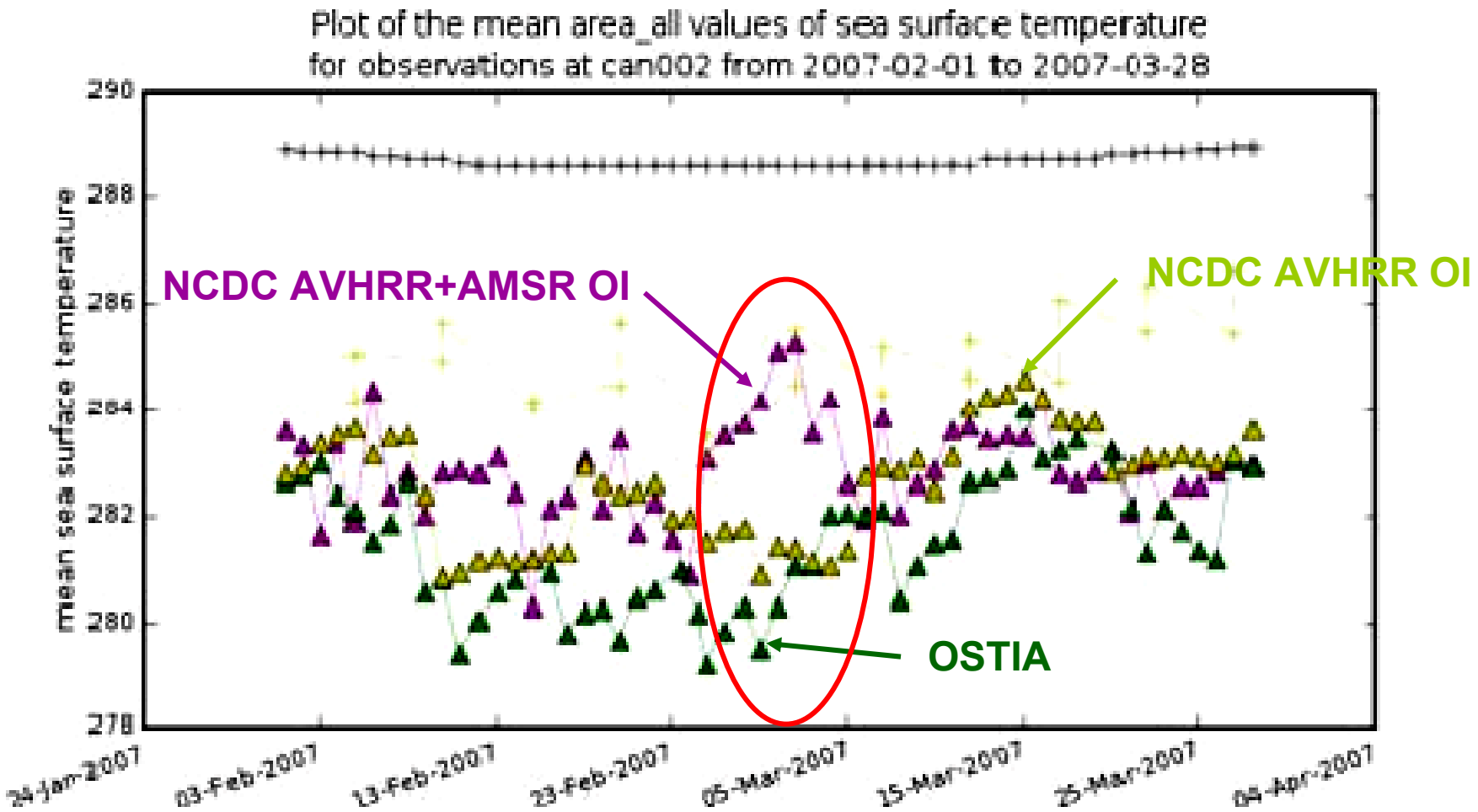
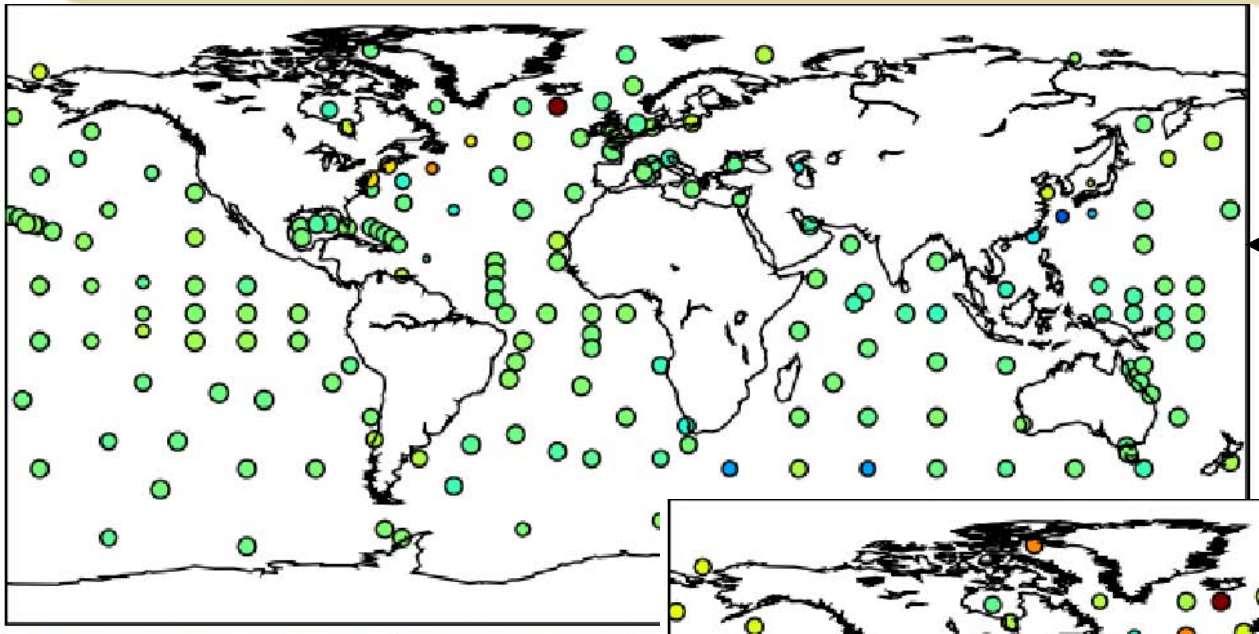
Use of HR-DDS to validate SST analyses (1)



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

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



Bias OSTIA – AATSR

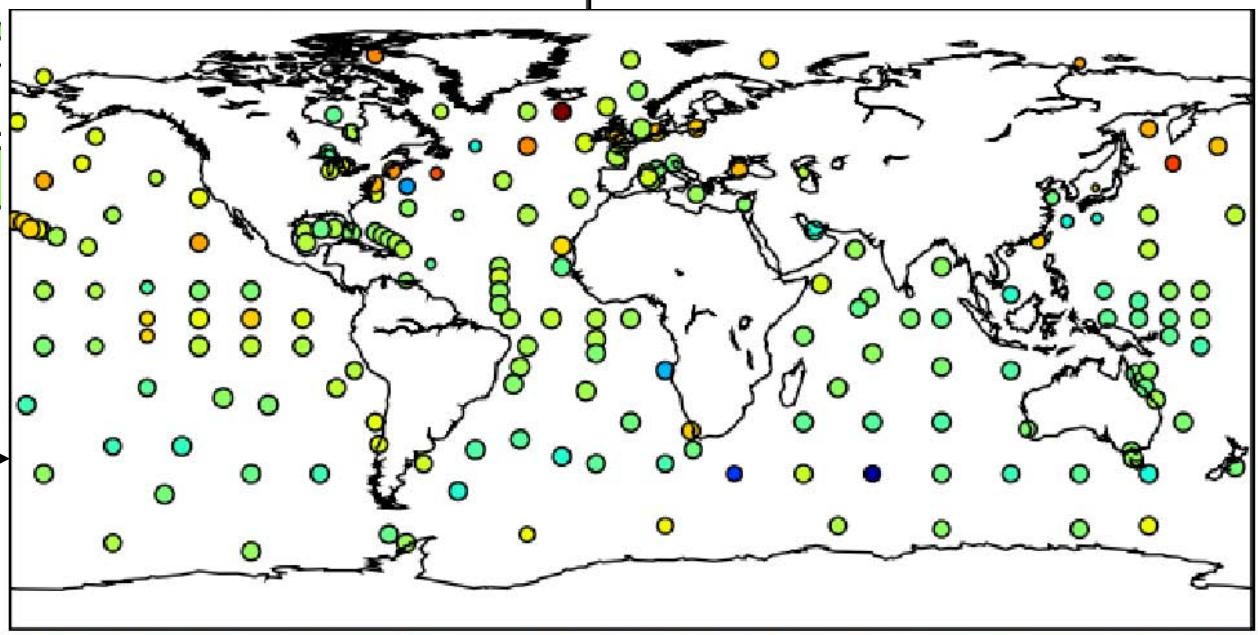
Night only

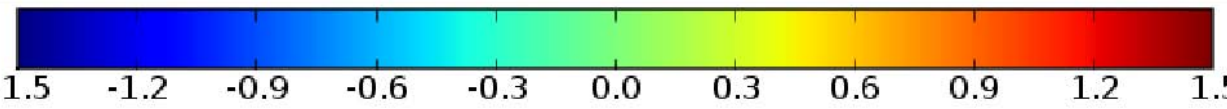
(global mean 0.00 K)

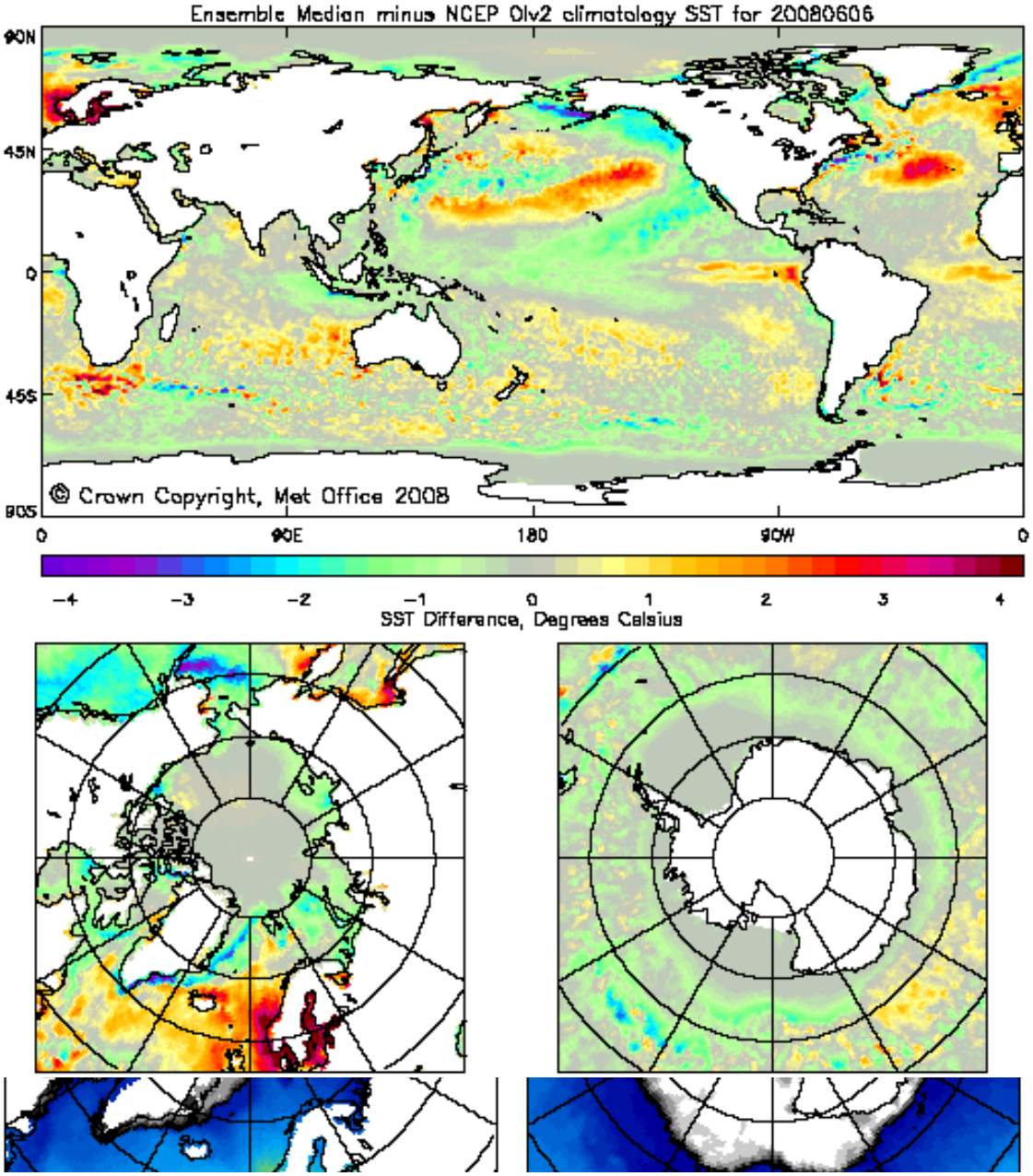
Bias NCDC AVHRR OI – AATSR

Night only

(global mean 0.15 K)







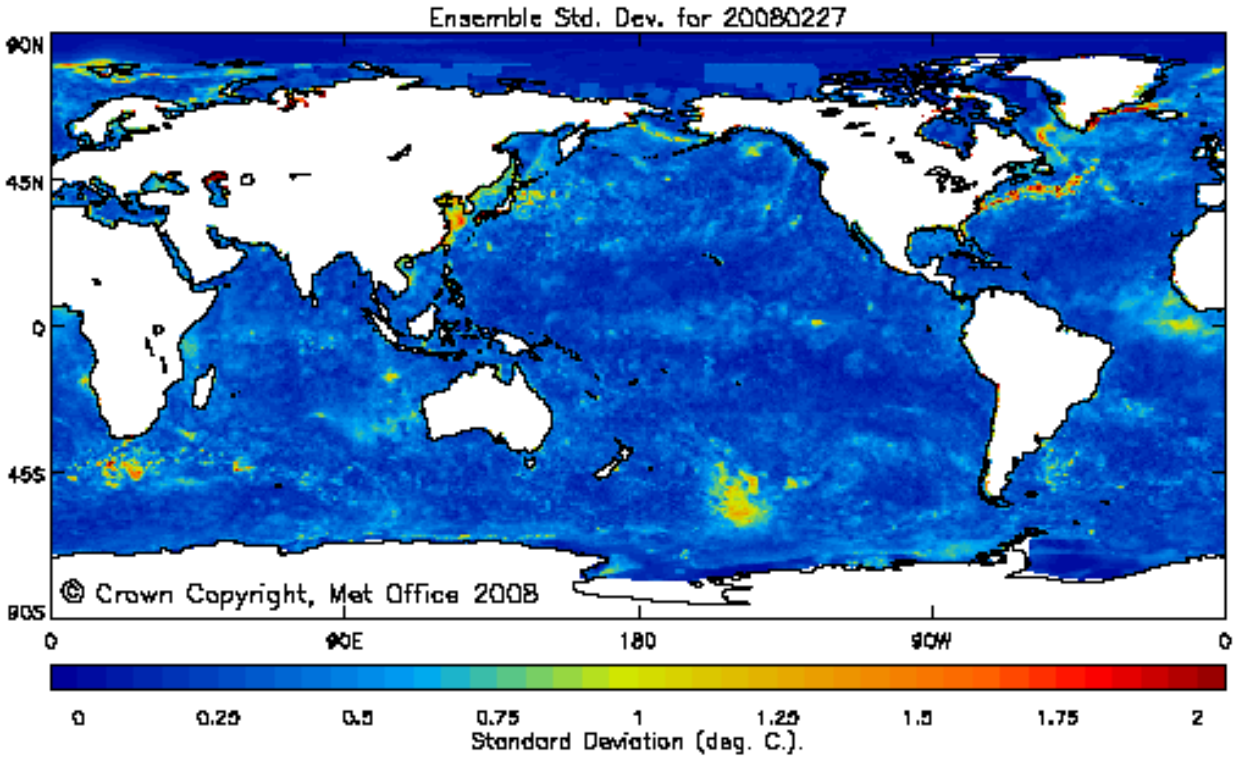
GHRSST-PP Multi-Product Median Ensemble

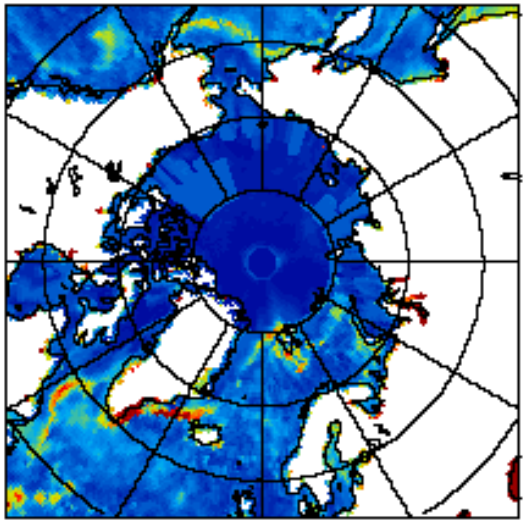
Computed using:

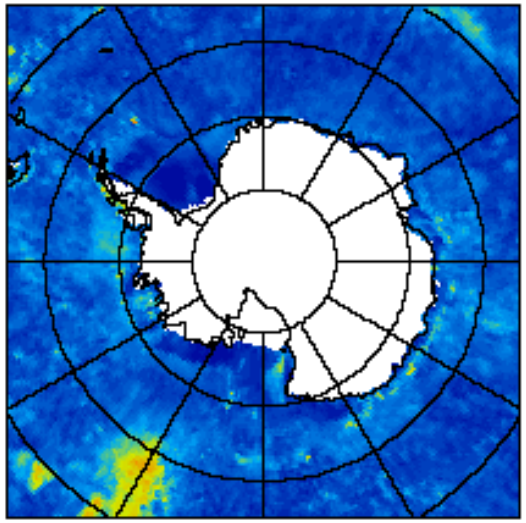
Met Office OSTIA SST
NCEP RTG_SST_HR SST
NAVOCEANO NAVO K10 SST JMA MGDSST SST analysis
RSS RSS MW Fusion SST analysis
RSS RSS MW+IR Fusion SST FNMOC GHRSST-PP SST
MERSEA ODYSSEA SST
***Canadian Met. Centre* (CMC)**
***NOAA AVHRR OI* (Reynolds).**

(Courtesy John Stark, Met Office)

http://ghrsst-pp.metoffice.com/pages/latest_analysis/sst_monitor/daily/ens/index.html



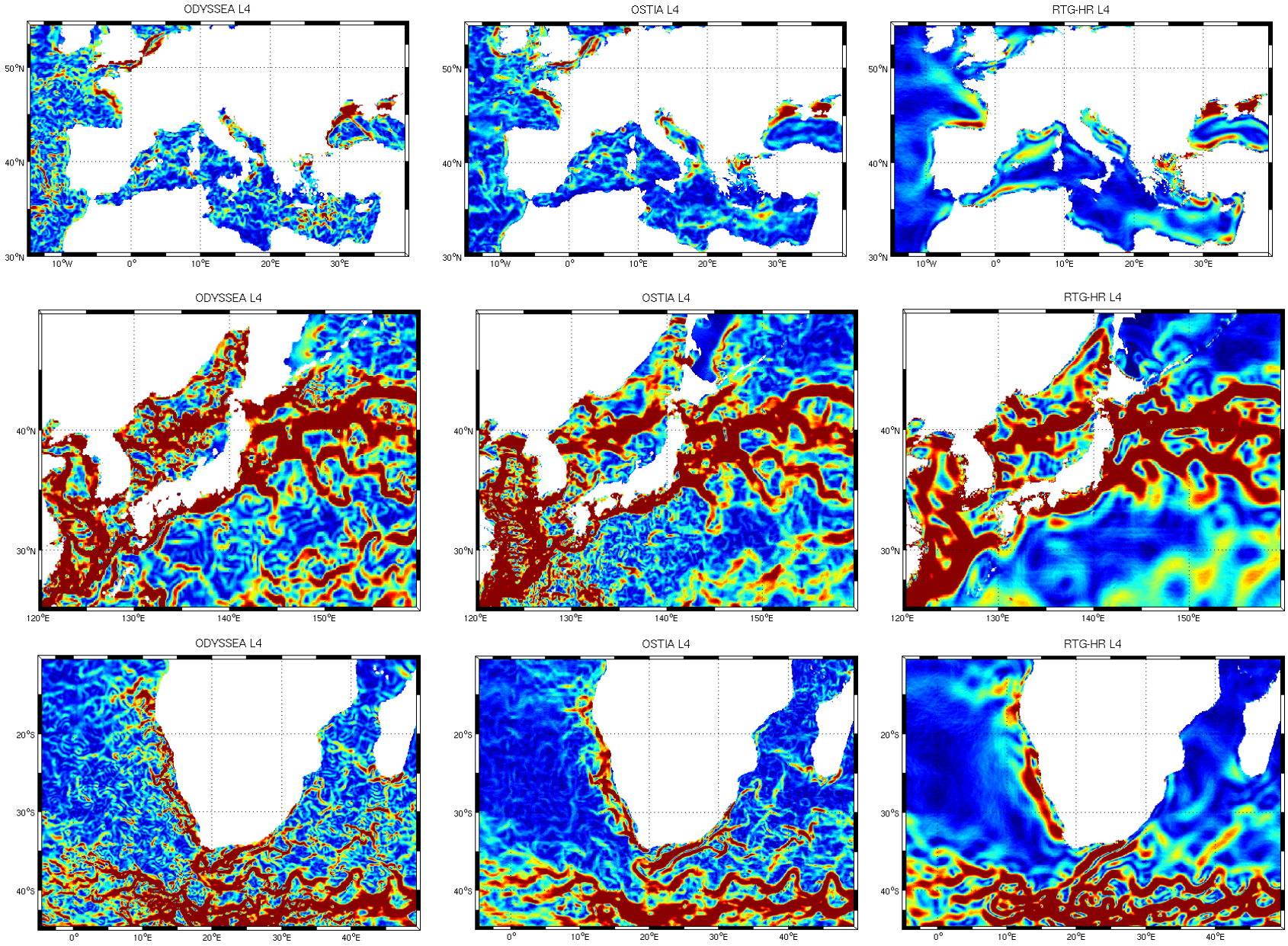




Anomalies for each INPUT analysis with reference to the GMPE ensemble median for 5th March 2008

7-Day animation of Ensemble Standard Deviation

(Courtesy John Stark, Met office)



http://www.mersea.eu.org/Satellite/sst_validation_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 ($\Rightarrow$ **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 ($\Rightarrow$ **InterSST project**)