

# GHRSSST

*Group for High Resolution  
Sea Surface Temperature*

## GHRSSST Report to JCOMM SOT

Gary Corlett

*on behalf of*

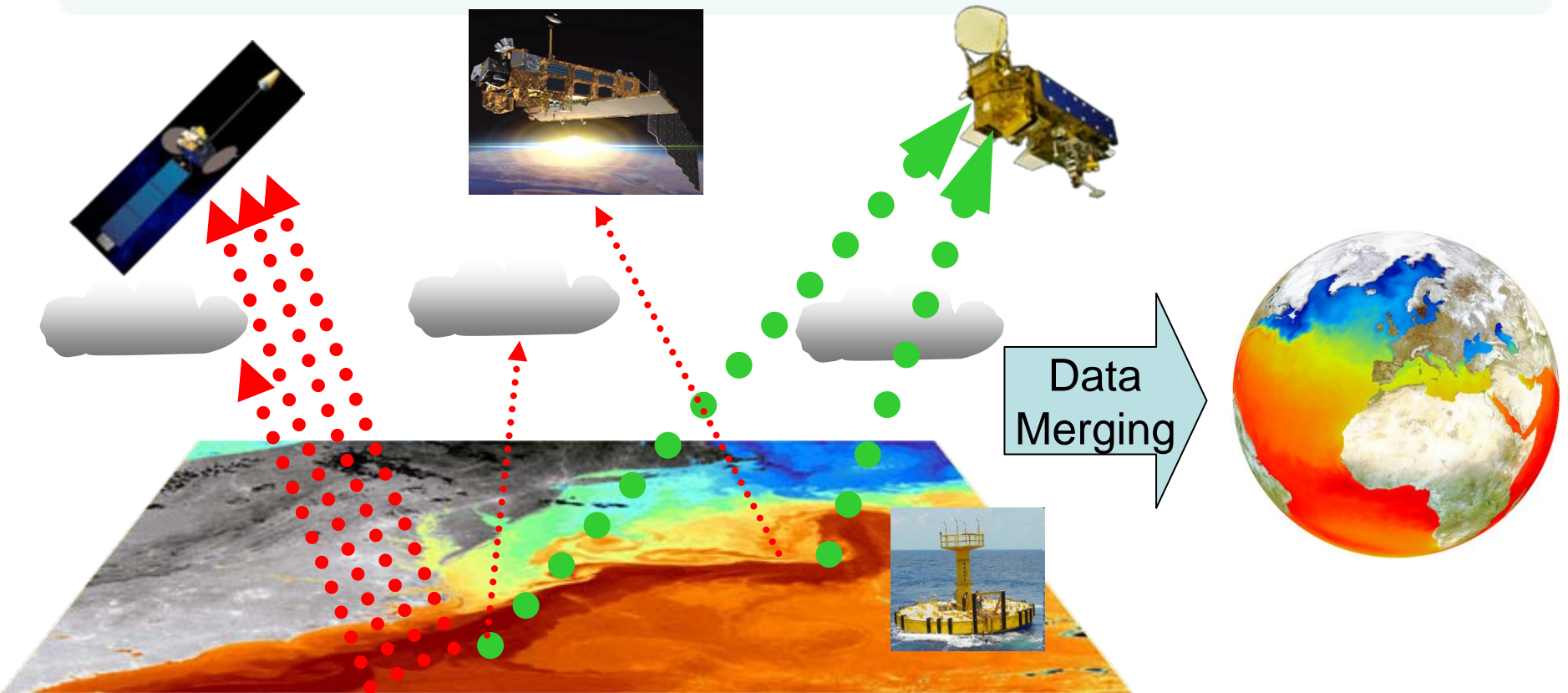
The International GHRSSST Science-Team

Presented at the 5<sup>th</sup> JCOMM SOT Meeting, Geneva, Switzerland,  
18<sup>th</sup> May 2009



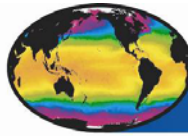
<http://www.ghrsst-pp.org>

# GHRSSST builds on EO complementarities



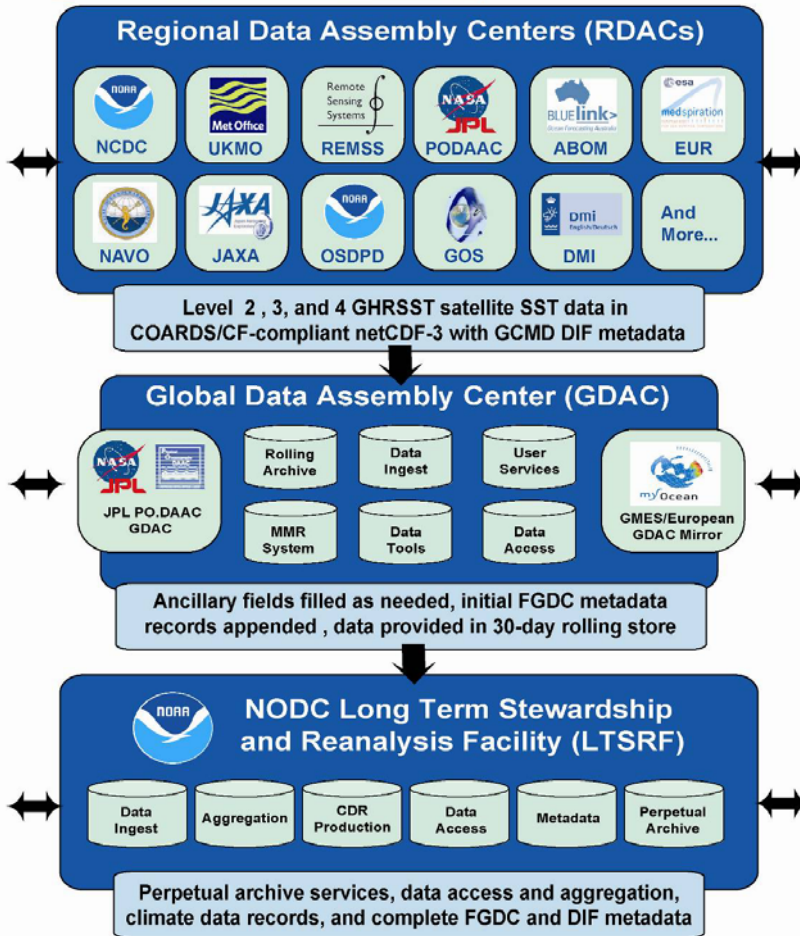
- Polar Orbiting infrared has *high accuracy & spatial resolution*
- Geostationary infrared has *high temporal resolution*
- Microwave Polar orbiting has *all-weather capability*
- In situ data provide *the reference in all weather conditions*

# GHRSSST R/GTS framework

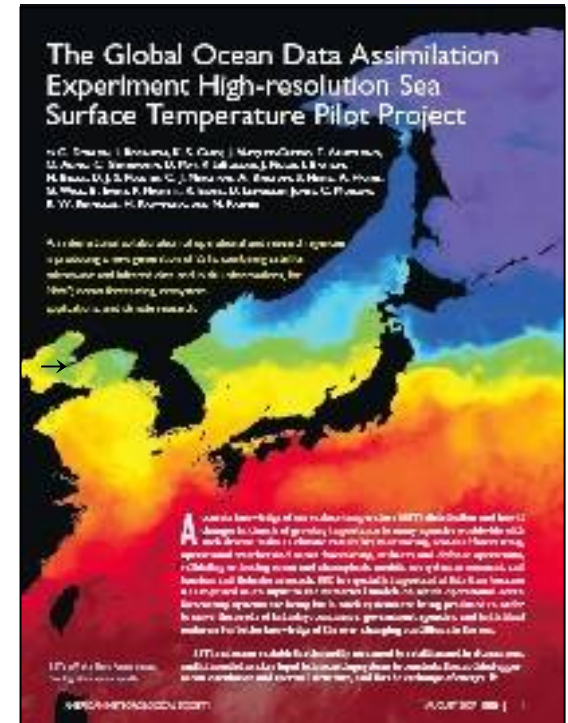


**GHRSSST-PP** Regional/Global Task Sharing Framework  
 GODAE High Resolution Sea Surface Temperature Pilot Project

Interoperable User Access via OPeNDAP, TDS, WCS, FTP...



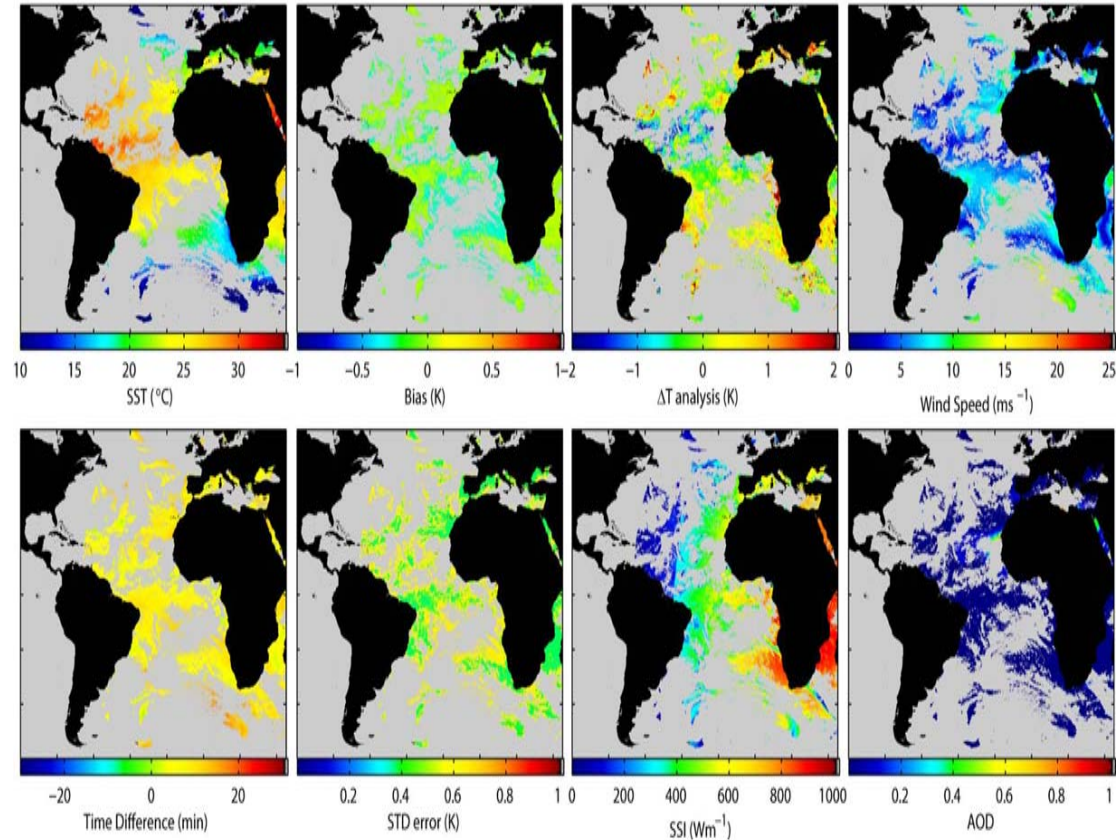
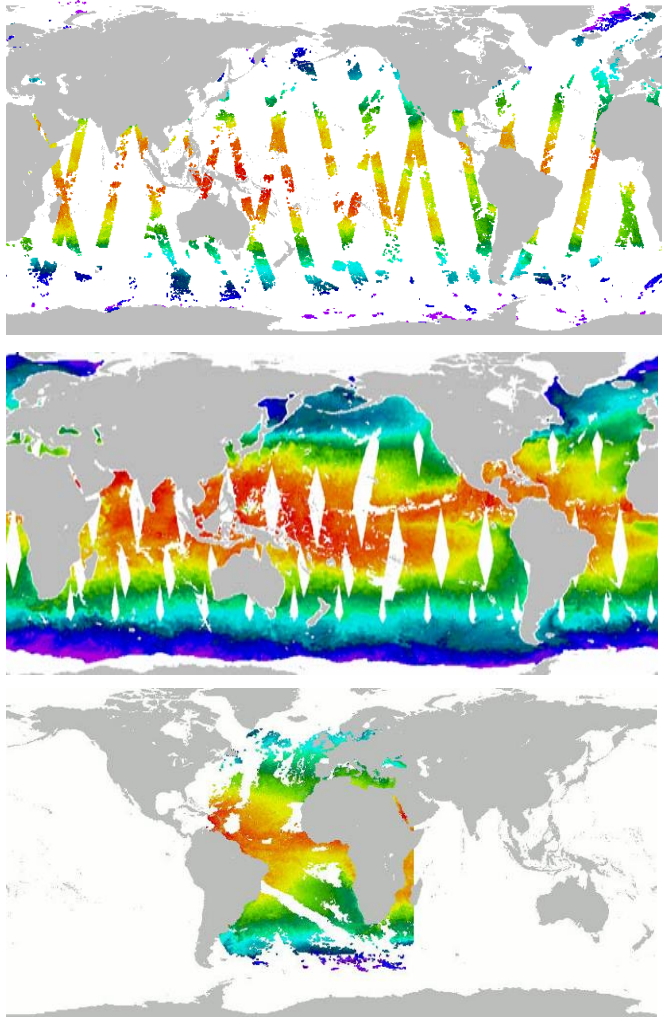
User Requirements, Services, and Feedback at all Levels...



Donlon et al, 2007



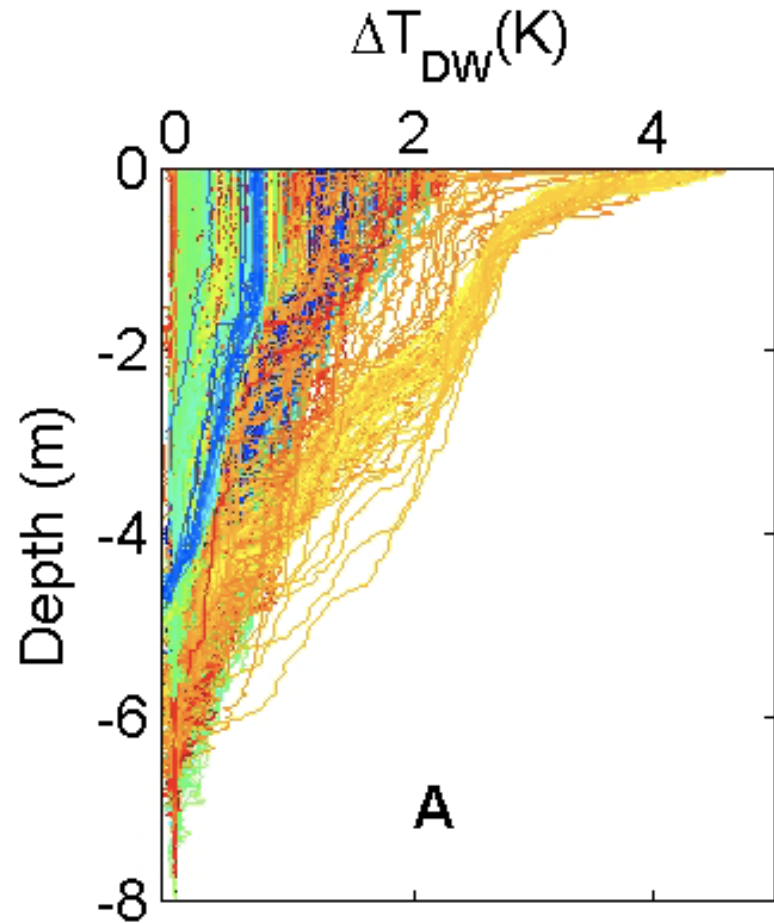
# L2P: common format with uncertainty



Ancillary information in L2P products: dynamic flags

# Assessing uncertainties in satellite SSTs

- In an ideal case, the derivation of satellite SST uncertainties would require:
  - A complete traceable characterisation to agreed national standards of the satellite instrument and SST retrieval algorithm
  - A suite of global traceable reference data points that preserve the nature of the satellite SST.
- In addition, if the sensor is part of a series, there should be a sufficient overlap period between successive sensors



Gentemann et al, 2009

# Reference sources

## Comparison of various reference sources to AATSR

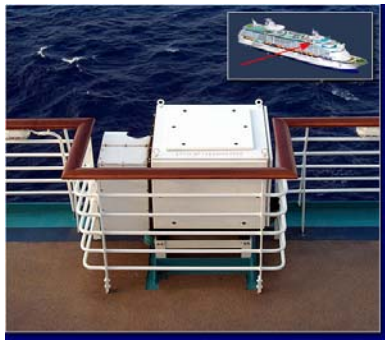
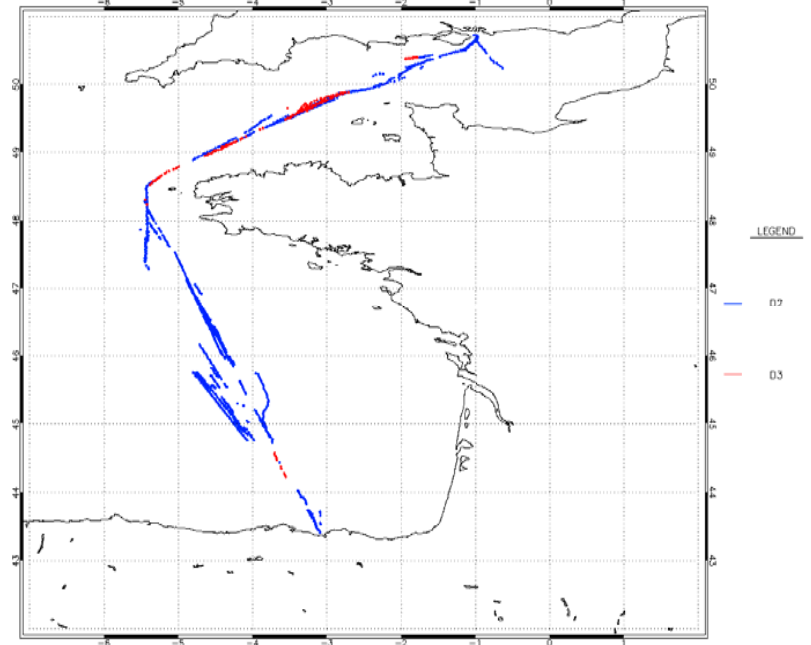
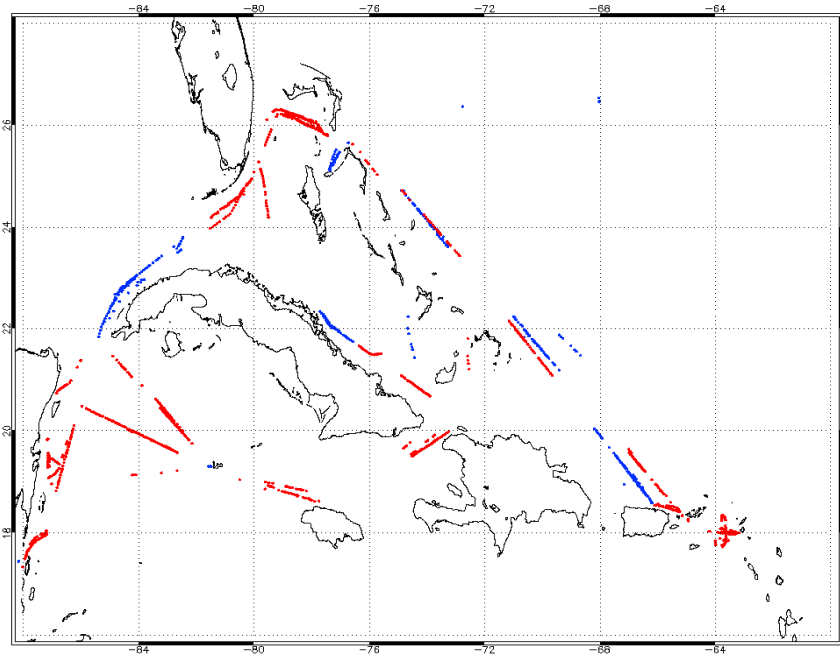
Reference Source	Daytime		Nighttime	
	Number of match-ups	Standard deviation (K)	Number of match-ups	Standard deviation (K)
Drifting buoys <sup>a</sup>	8301	0.33	10682	0.32
Moored buoys <sup>ab</sup>	884	0.56	1115	0.41
TAO/TRITON/PIRATA <sub>a</sub>	235	0.31	443	0.27
Ships <sup>a</sup>	3367	1.16	3720	1.11
Radiometers <sup>c</sup>	392	0.34	688	0.24

<sup>a</sup> Ground-based observations provided by the Met Office from the ICOADS database (Worley et al., 2005)

<sup>b</sup> Not including the TAO/TRITON/PIRATA arrays

<sup>c</sup> Average of comparisons to the M-AERI (Minnett et al., 2002) and ISAR (Donlon et al., 2008) radiometers

# Radiometer Validation





# CEOS IR radiometer intercomparison

- Third in a series of inter-comparisons establish degree of equivalence (biases) between participant's
  - Reference black bodies
  - IR radiometers under lab conditions
  - IR radiometers as used viewing Ocean (SST)
- Ensure robust traceability to SI (via NIST and NPL)
- Establish protocols based on QA4EO to facilitate future comparisons and strategy for maintenance of long-term traceability
- Pre-cursor for Land Surface Temperature community

## Two parts:

Laboratory (NPL) 21-22 April 2009

Laboratory and ocean viewing (Miami) 11-15 May 2009

(Core funding from ESA & NASA; participants self-funded)



Further details of the QA4EO framework and its associated key guidelines can be found at: <http://calvalportal.ceos.org/CalValPortal/showQA4EO.do?section=qa4eoIntro>.



# GHRSSST use of SOT Data

- The limited use of ship measurements by GHRSSST is mainly due to a combination of their:
  - Non-uniform global data coverage, and
  - Relatively high uncertainty, in the case of non-radiometric measurements.
- The GHRSSST project would like to establish closer links to the Ship Observations Team (SOT) to address both these issues, as improved coverage and uncertainties of SST data from ships would benefit a number of areas within GHRSSST, not least in:
  - Satellite SST validation
  - Reanalysis
  - Diurnal warming studies

# SOT use of GHRSSST Data

- Several users now using satellite data to QC ship observations

- Hadley Centre

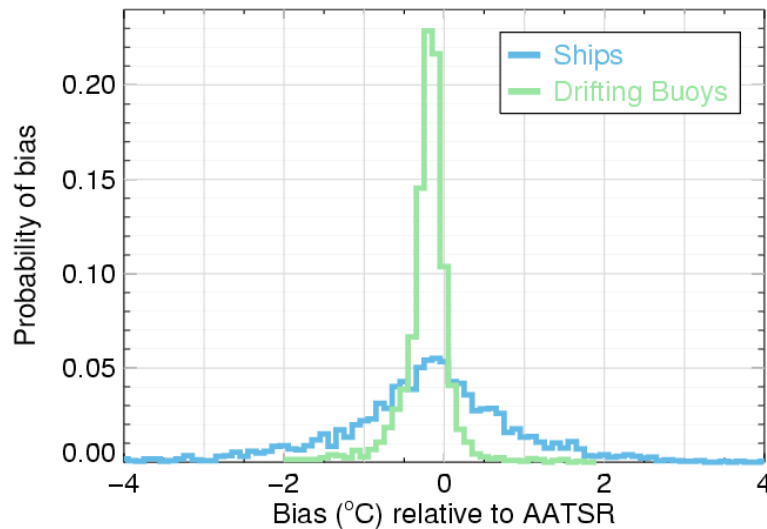


Image courtesy of John Kennedy

- Bureau of Meterology

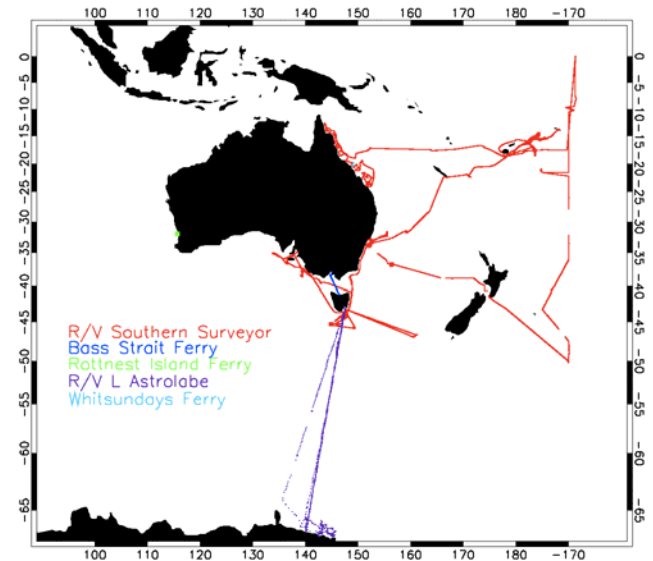


Image courtesy of Helen Beggs

# Recommendations

- To maximise the impact and benefit of existing and future SST measurements from ships, GHRSSST recommends that the SOT considers:
  - Adding the provision of radiometric skin SST data to its portfolio of measurements.
  - Using GHRSSST data to characterise the uncertainties of non-radiometric SST measurements from existing ship data.
  - Establishing a working group to collaborate with GHRSSST to better define requirements for measurements of SST from ships.