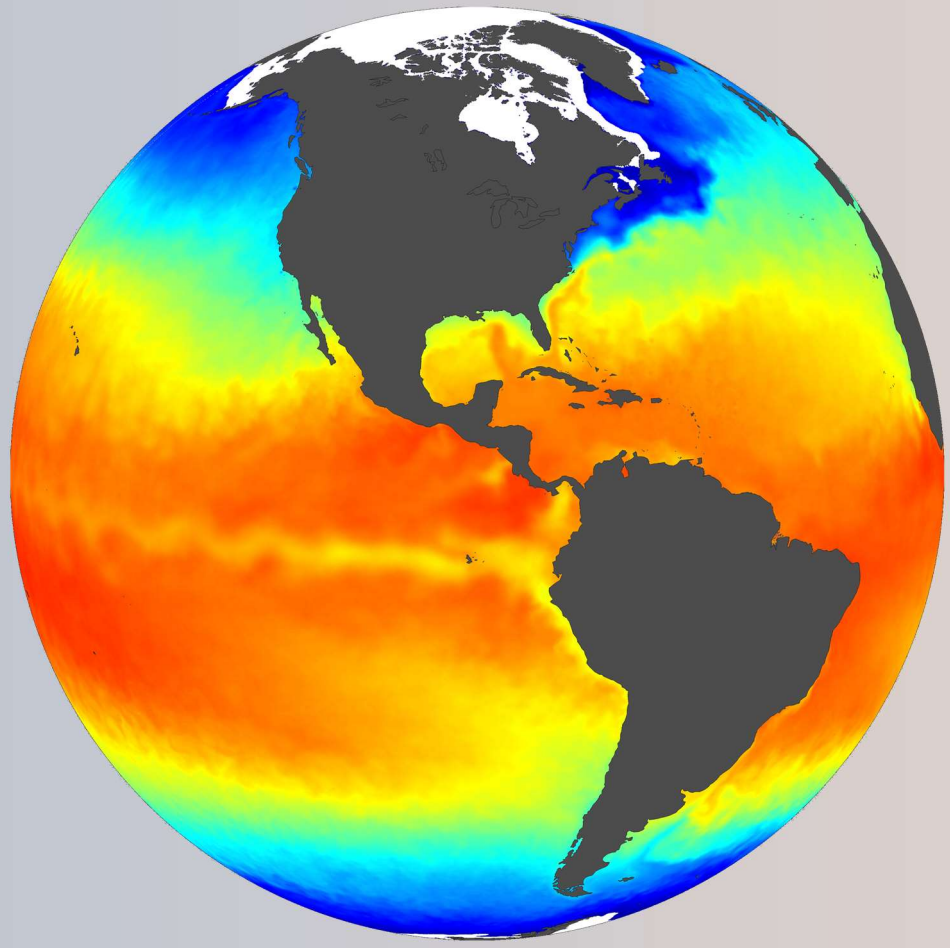


Group for High Resolution Sea Surface Temperature (GHRSST) Short Course on SST

Introduction

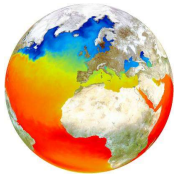
Chris Merchant, University of Reading
Peter Minnett, University of Miami
Gary Corlett, University of Leicester

To provide operational users and the science community with the SST measured by the satellite constellation

GHRSST
Group for High Resolution Sea Surface Temperature

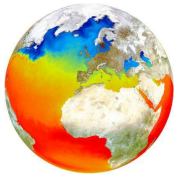
CEOS
Committee on Earth Observation Satellites
Sea Surface Temperature Virtual Constellation

Objectives



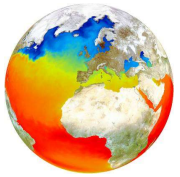
- To gain knowledge about GHRSST and what GHRSST provides
- To gain knowledge of IR radiative transfer, cloud masking and SST retrieval
- To apply the gained knowledge with real practical examples

Practical Examples



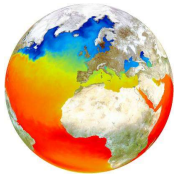
- The course will exploit practical examples of using SST data to understand scientific issues
- You will work together during and after the course on your assigned problem
- Ideally, the problems will come from your own research interests
- By the end of the course you should have sufficient knowledge to at least be able to write a short (1 page maximum) research plan on how you can best exploit GHRSST data in your research
- We would then encourage you to implement your research plan – taking time after the course as necessary – and to submit a short (4 page) report on what you found from your analysis.

Contributors



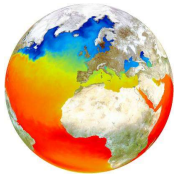
- Prof Chris Merchant
  - University of Reading, UK
- Prof Peter Minnett
  - University of Miami, USA
- Dr Gary Corlett
  - University of Leicester, UK
- Dr Mingqiang Fang
  - Ocean University of China, China

Day 1 - Schedule



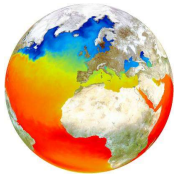
- Introductions (09:00)
  - Introduction to course and GHRSST
- Lecture 1 (09:30)
  - Basic Concepts
- Break for tea/coffee (10:30)
- Research topic assignments(11:00)

Day 1 – Schedule continued



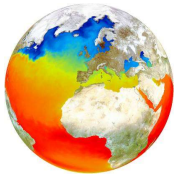
- Lecture 2(11:30)
  - Radiative Concepts
- Break for lunch (12:30)
- Practical 1 (13:30)
  - Introduction to access, download and analysis of GHRSST products
  - Introduction to **SNAP** http://step.esa.int/main/

Day 1 – Schedule continued



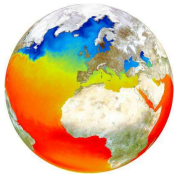
- Break for tea/coffee (15:30)
- Lecture 3 (16:00)
  - Sea Surface Temperature Retrieval
- Close day 1 (17:00)

Day 2 - Schedule



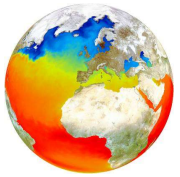
- Lecture 4 (09:30)
  - Cloud screening for SST
- Break for tea/coffee (10:30)
- Practical 2 (11:00)
  - Basic analysis of L1b imagery
  - Cloud masking; development of simple cloud mask
  - Carry out SST retrieval on L1b imagery
- Break for lunch (12:30)

Day 2 – Schedule continued



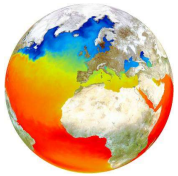
- Lecture 5 (13:30)
  - Measuring SST by microwave radiometers
- Practical 3 (14:30)
  - Extended analysis
    - Spatial averaging
    - SST gradients
    - Time series
- Break for tea/coffee (15:30)
- Practical 1 (16:00)
  - Research topics
- Close day 2 (17:00)

Day 3 - Schedule



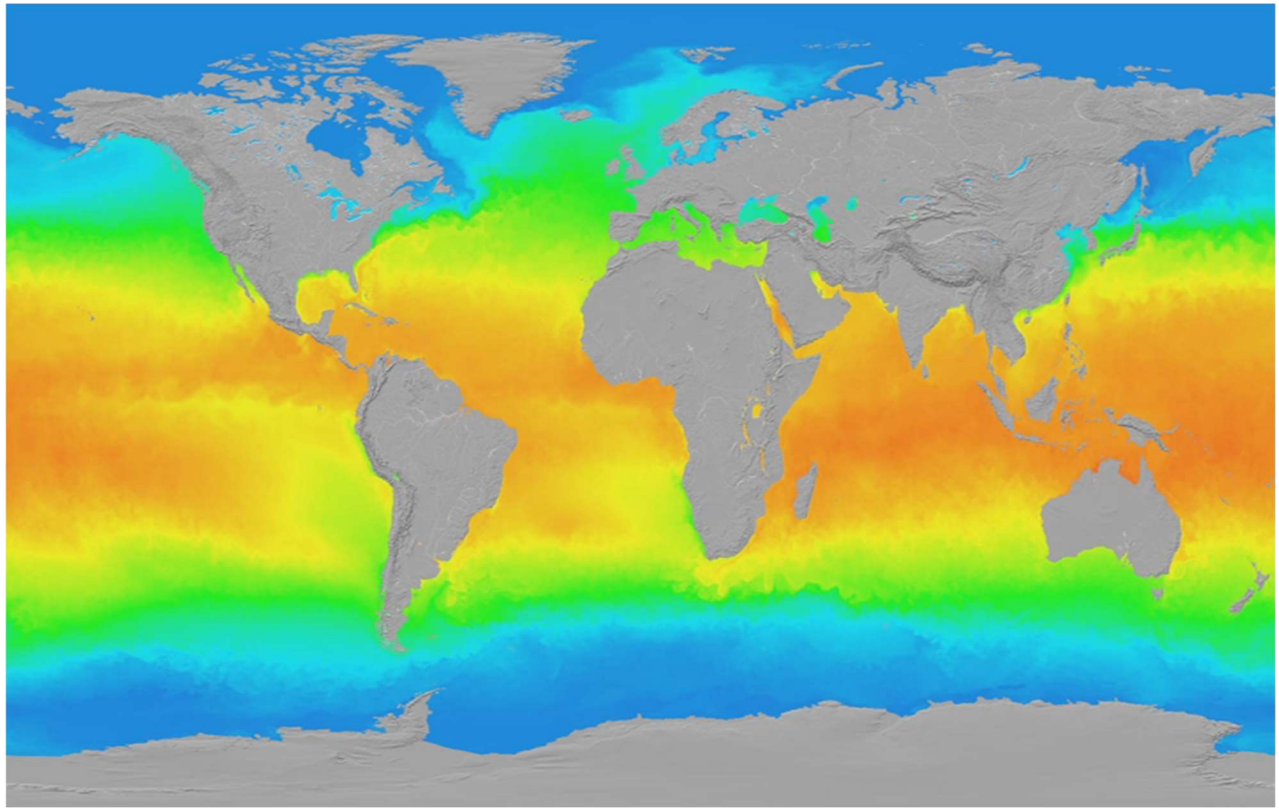
- Lecture 6 (09:30)
  - Uncertainties in SST
- Break for tea/coffee (10:30)
- Practical 5 (11:00)
  - Research topics
- Break for lunch (12:30)

Day 3 – Schedule continued



- Lecture 7 (13:30)
  - Processing Concetps
- Practical 6 (14:30)
  - Research topics
- Break for tea/coffee (15:30)
- Closing session (16:00)
  - Student presentations
- Close of course (17:00)

GHRSST Mission Statement

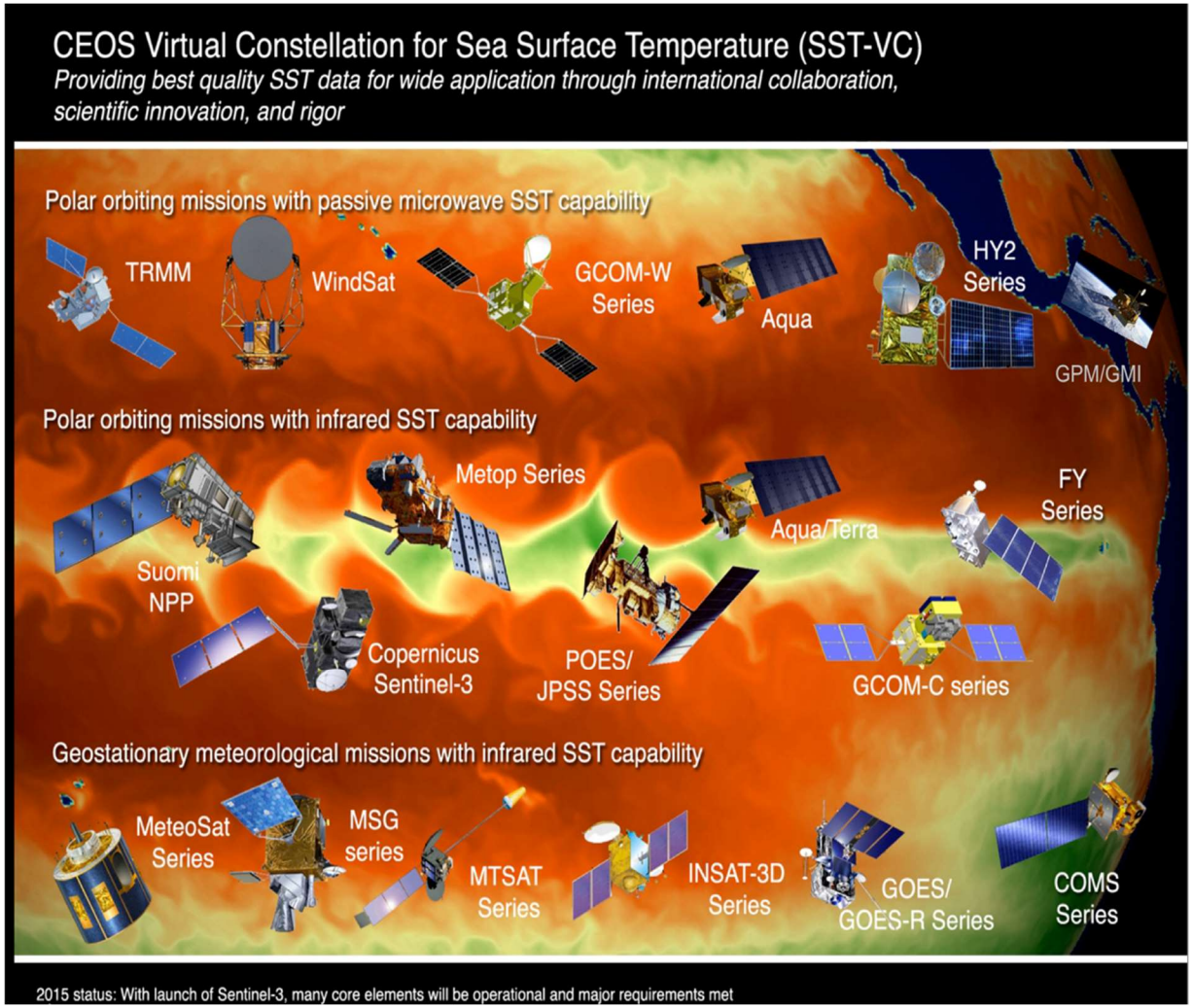


GHRSST mission: To provide operational users and the science community with the SST measured by the satellite constellation

GHRSST provides a framework for SST knowledge and data sharing, best practices for data processing, assessing uncertainties in the satellite SSTs, and a forum for scientific dialog including how best to provide SSTs for climate studies, bringing SST to the operational users and scientific researchers.

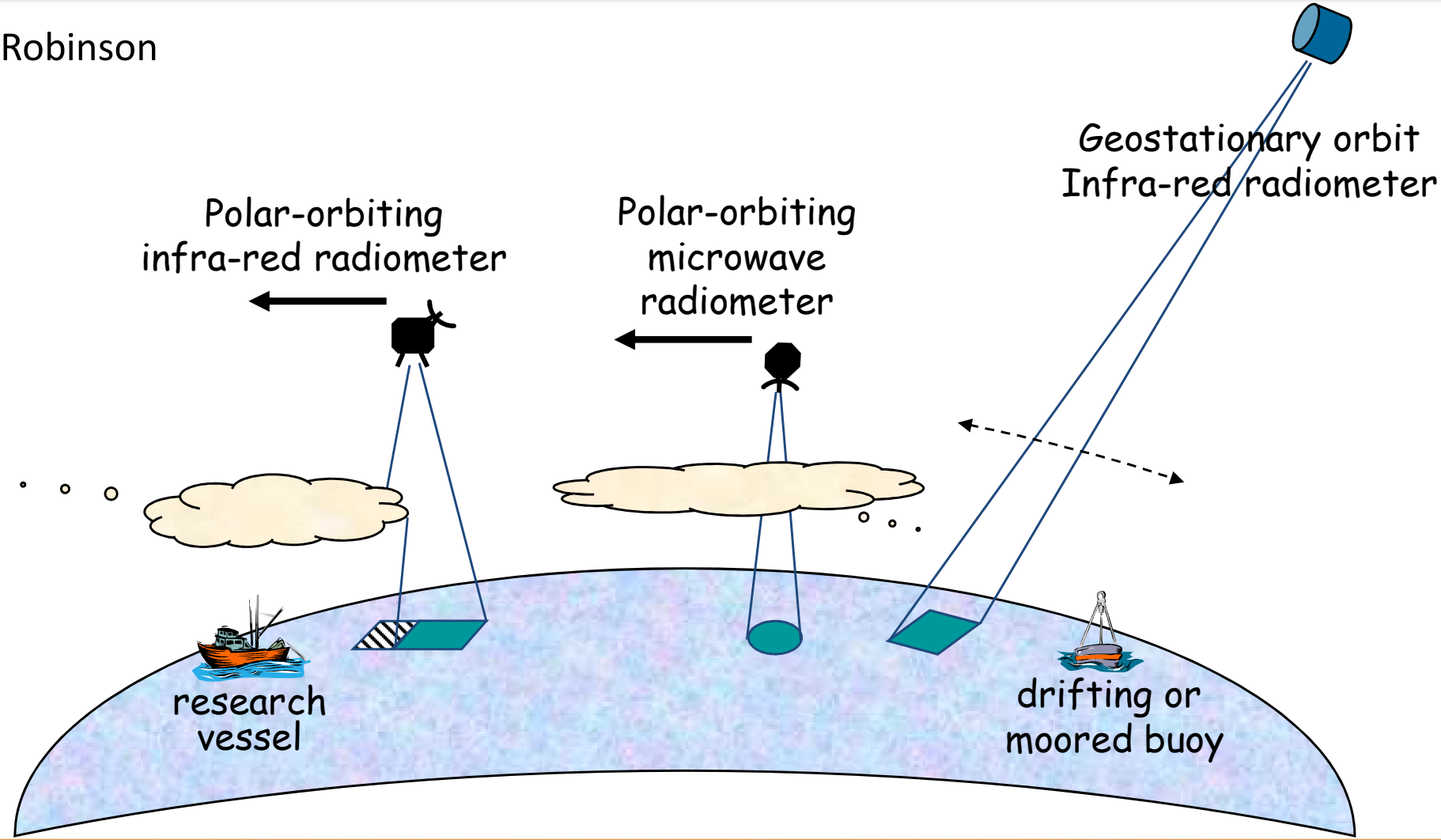
GHRSST Website

CEOS SST-VC


CEOS Virtual Constellation for Sea Surface Temperature (SST-VC)
Providing best quality SST data for wide application through international collaboration, scientific innovation, and rigor
Polar orbiting missions with passive microwave SST capability
TRMM
WindSat
GCOM-W Series
Aqua
HY2 Series
GPM/GMI
Polar orbiting missions with infrared SST capability
Metop Series
Aqua/Terra
FY Series
Suomi NPP
Copernicus Sentinel-3
POES/ JPSS Series
GCOM-C series
Geostationary meteorological missions with infrared SST capability
MeteoSat Series
MSG series
MTSAT Series
INSAT-3D Series
GOES/ GOES-R Series
COMS Series
2015 status: With launch of Sentinel-3, many core elements will be operational and major requirements met

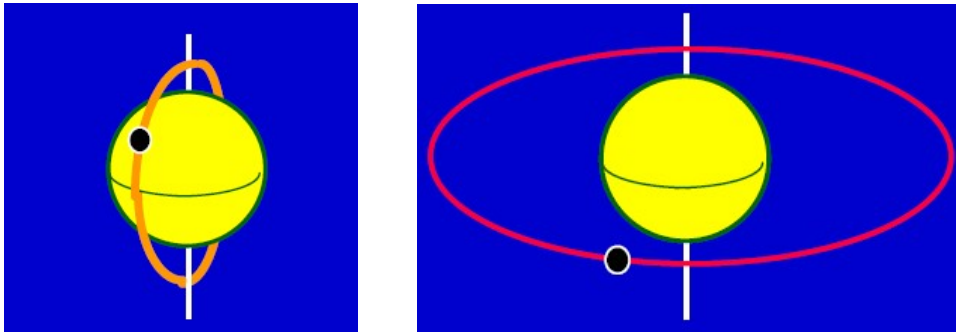
Platforms for measuring SST

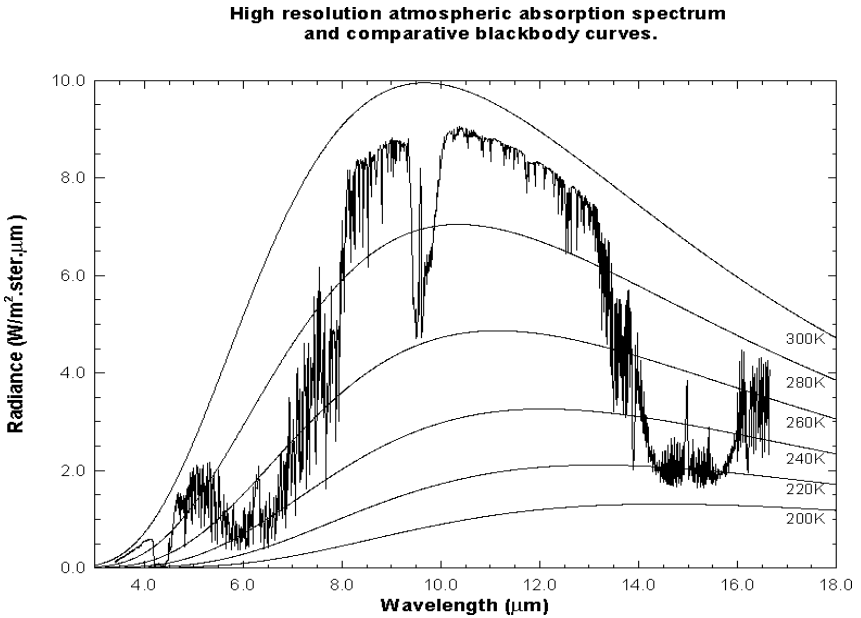
Ian Robinson



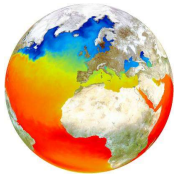
How do we measure SST from Space?

- We need two things:
  - A high-performance radiometer in Space
  - An effective Atmospheric Correction



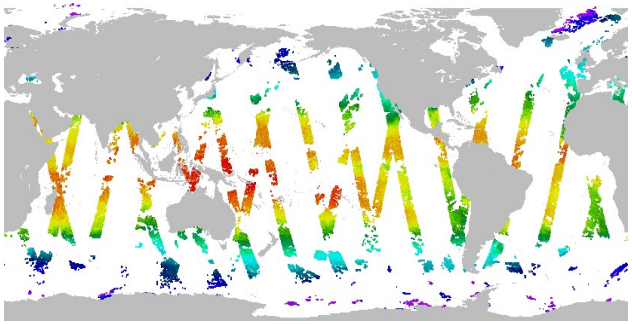


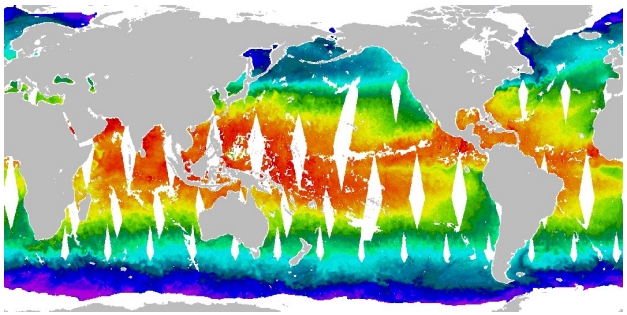
Data Processing Levels

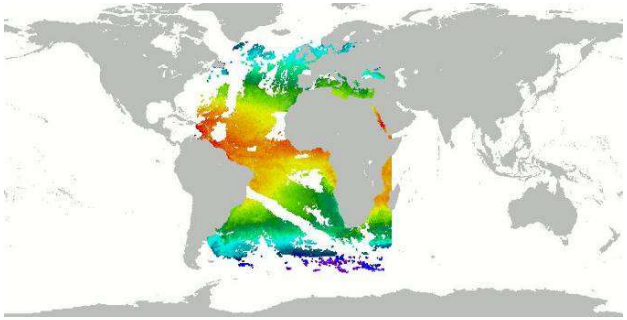


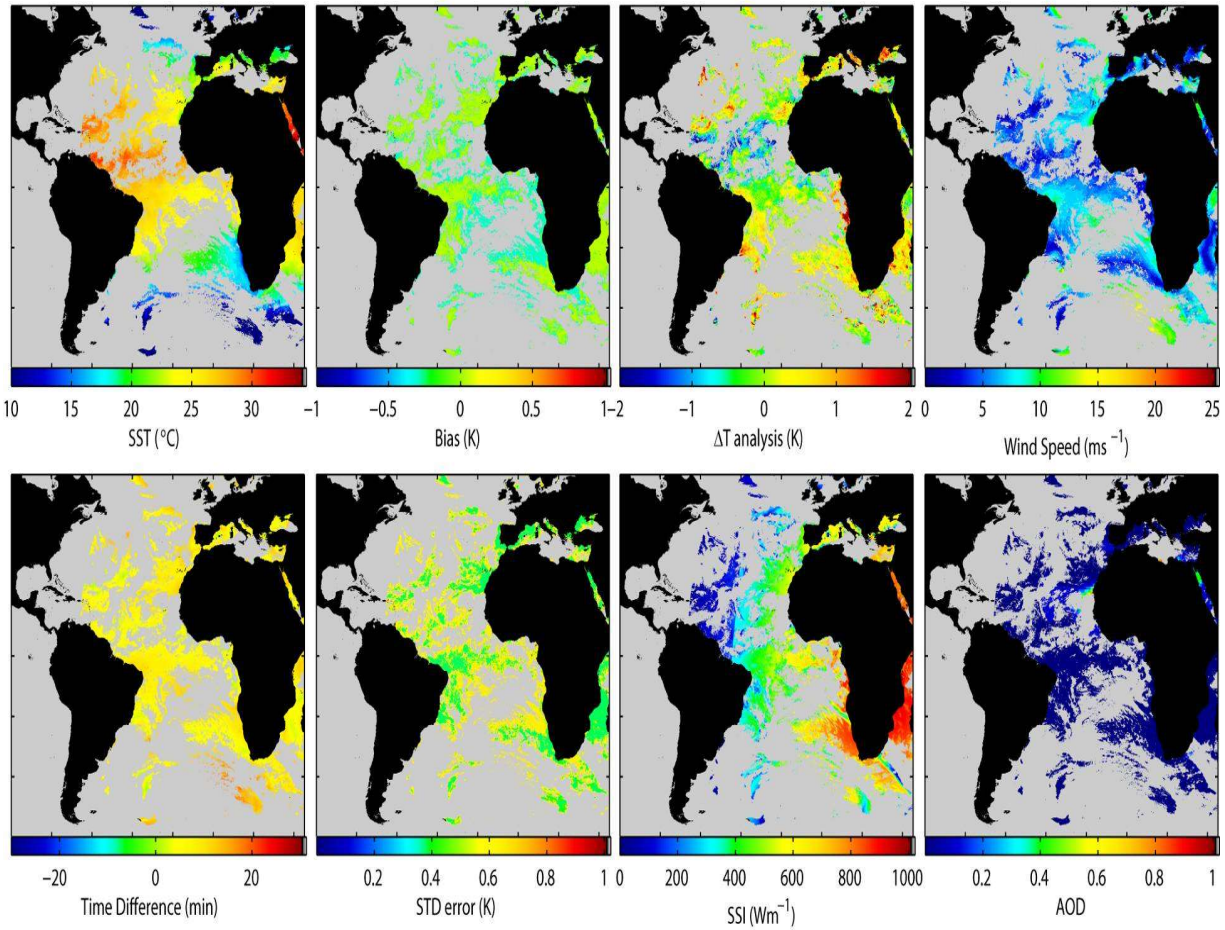
Data Level	Description
Level 0	Reconstructed, unprocessed instrument and payload data at full resolution.
Level 1B	Level 0 data that have been processed to geolocated radiances
Level 2P	Derived SST at the same resolution and location as Level 1B source data.
Level 3	Variables mapped on uniform space-time grid scales, with some degree of spatial averaging (L3U and L3S) and temporal averaging (L3C).
Level 4	Output from analyses of lower-level data (e.g., variables derived from multiple measurements).

L2P: Common format with uncertainties



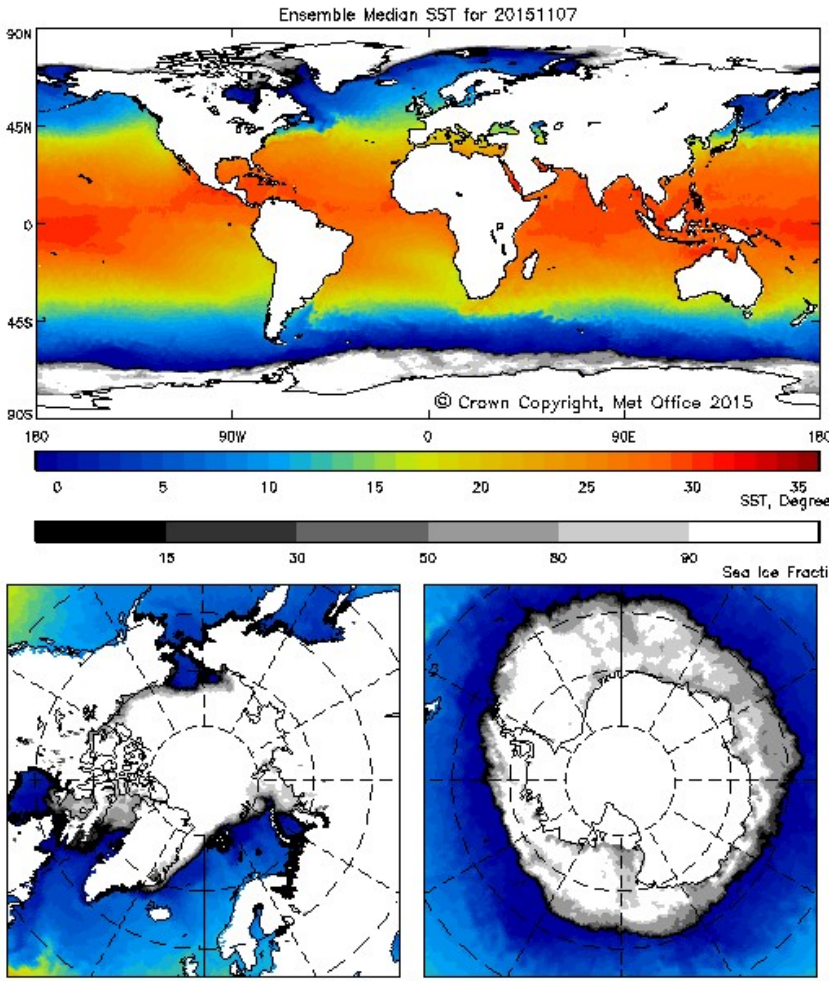


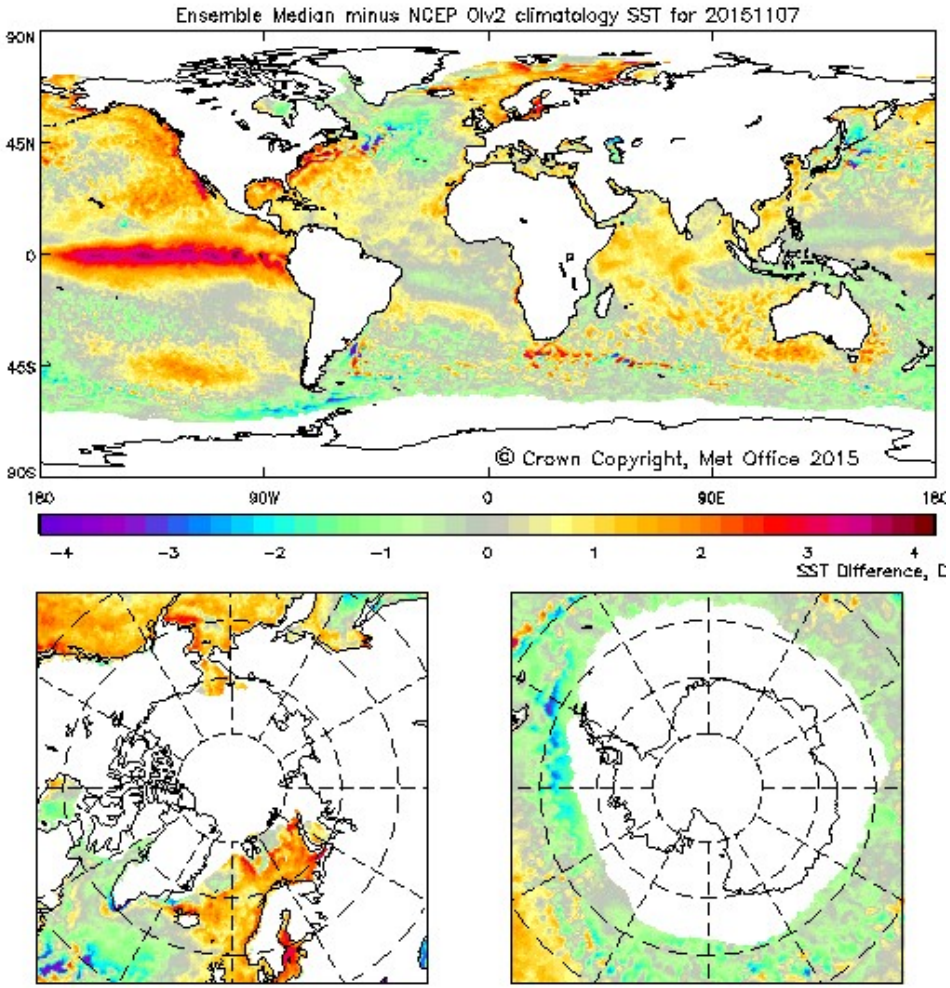




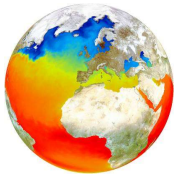
Ancillary information in L2P products: dynamic flags

Example L4 data





GDAC and LTSRF



- Global Data Assembly Centre (GDAC)
- **GHRSST Data Distributors**
  - Mainly real-time (up to 30 days)
- http://ghrsst.jpl.nasa.gov

- Long-term Stewardship and Reanalysis Facility (LTSRF)
- **GHRSST Data Archive**
  - And much, much more…
- http://www.nodc.noaa.gov/sog/ghrsst/