

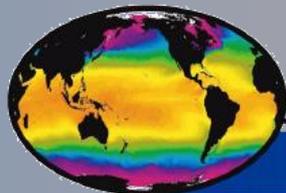
*To provide operational users and the science community  
with the SST measured by the satellite constellation*

**GHR SST:  
The Group for High Resolution Sea  
Surface Temperature**

*Anne O'Carroll*

*Chair, GHR SST Science Team*

*Co-Chair CEOS SST-VC*



**GHR SST**

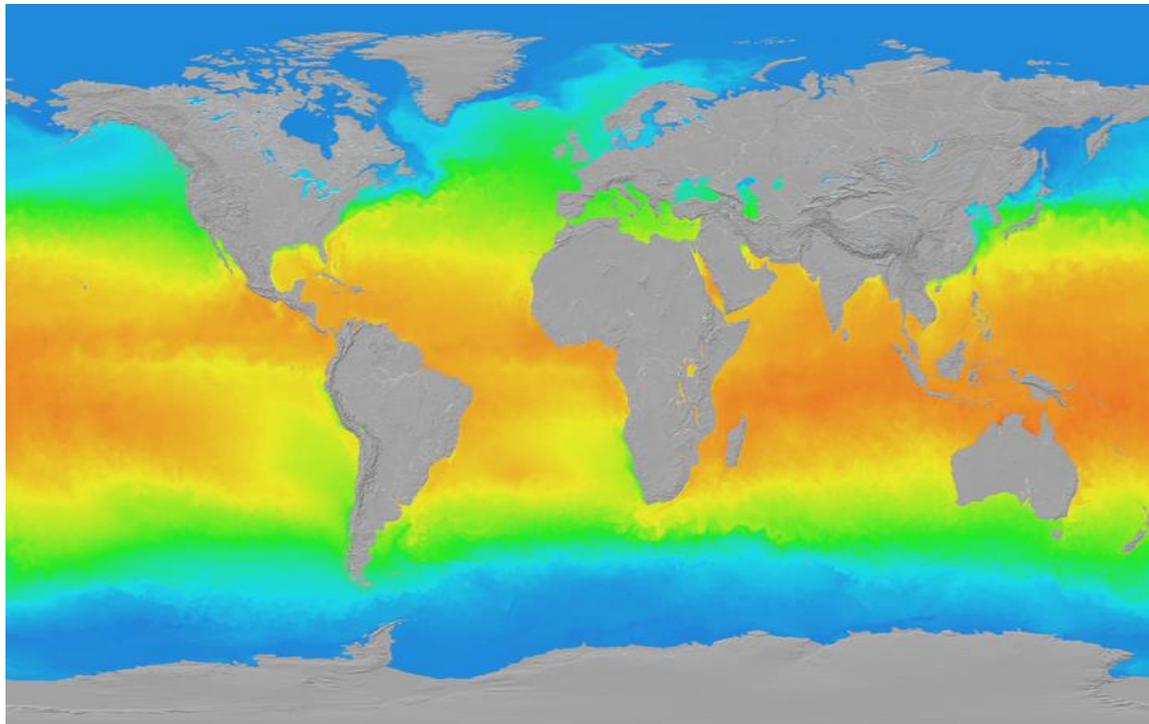
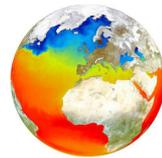
*Group for High Resolution  
Sea Surface Temperature*



Committee on Earth Observation Satellites  
Sea Surface Temperature Virtual Constellation

# **INTRODUCTION TO GHRSSST**

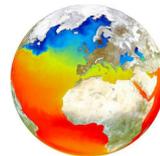
# GHRSSST Mission Statement



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

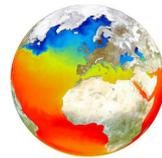
GHRSSST provides a framework for SST knowledge and data sharing, best practices for data processing, assessing uncertainties in the satellite SSTs, and a forum for scientific dialog including how best to provide SSTs for climate studies, bringing SST to the operational users and scientific researchers.

# What is GHRSSST?

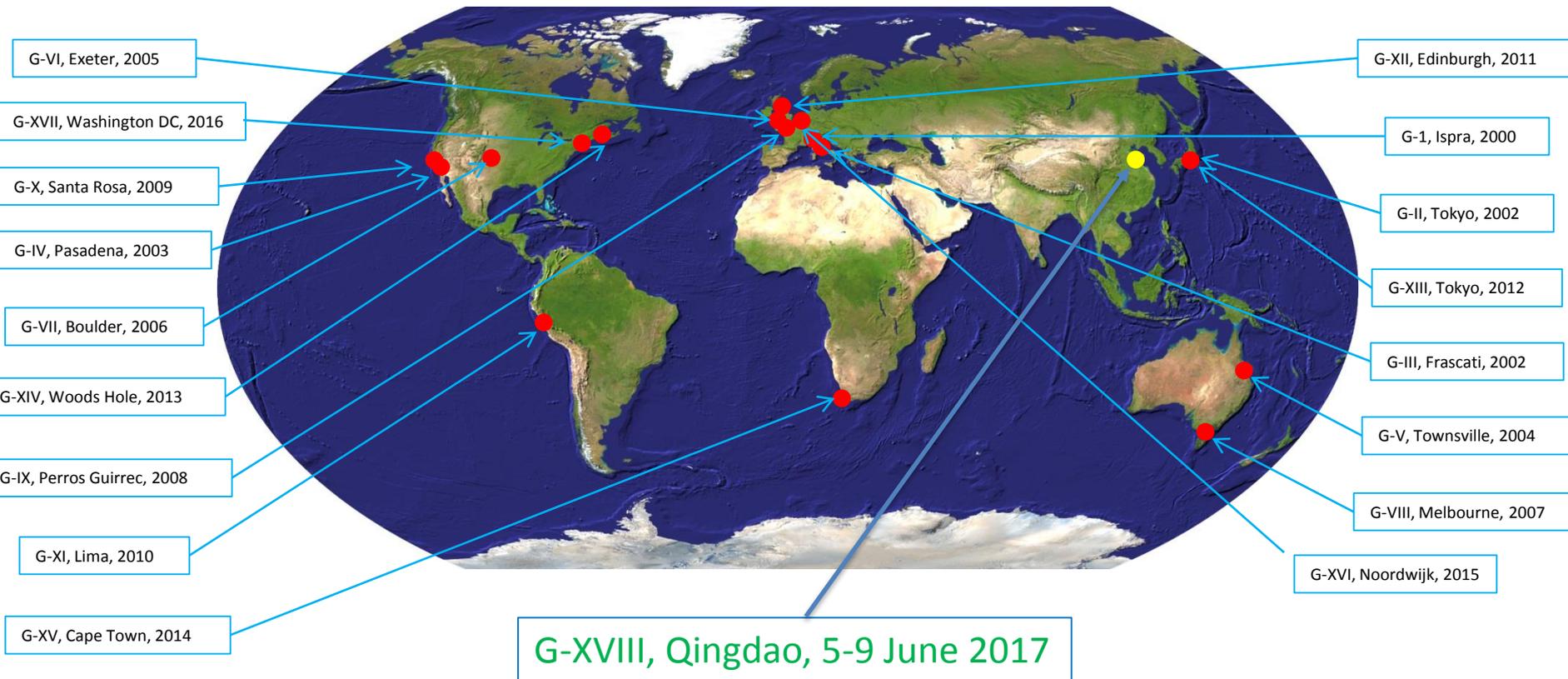
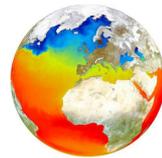


- GHRSSST, the Group for High Resolution Sea Surface Temperature grew out of a Pilot Project of the Global Ocean Data Assimilation Experiment (GODAE), 1997-2008.
- Composed of an international Science Team of researchers and operational practitioners.
- Coordinates research and operational developments in satellite-derived SST.
- Organized into Technical Advisory Groups and Task Teams focused on particular problems or activities.
- Data processing through Regional and Global Data Assembly Centers, combining satellite and NWP fields in common data formats for ease of access and analysis.
- Data are available in perpetuity at the GHRSSST Long Term Stewardship and Reanalysis Facility at the NOAA National Centers for Environmental Information (NCEI).

# Patrons and Sponsors

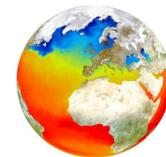


# International Science Team Meetings

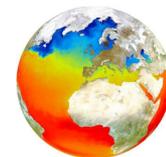


**Science Team Meetings are open to all**

# G-XVII: In Washington DC

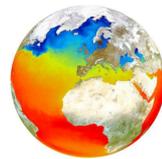


# Future meeting dates



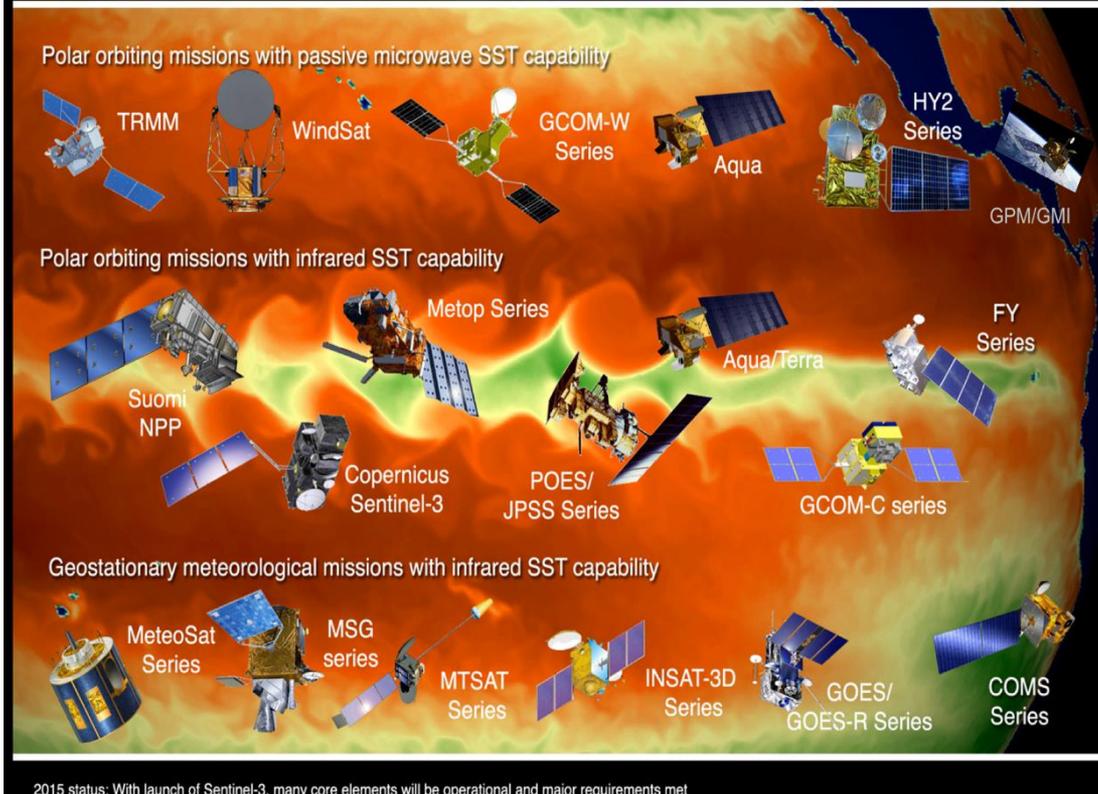
- G-XIX
  - EUMETSAT, Darmstadt, Germany, 4<sup>th</sup> – 8<sup>th</sup> June 2018
- G-XX
  - Location TBC, 3<sup>rd</sup> – 7<sup>th</sup> June 2019
  - Call for offers to host will open after G-XVIII

# CEOS SST-VC

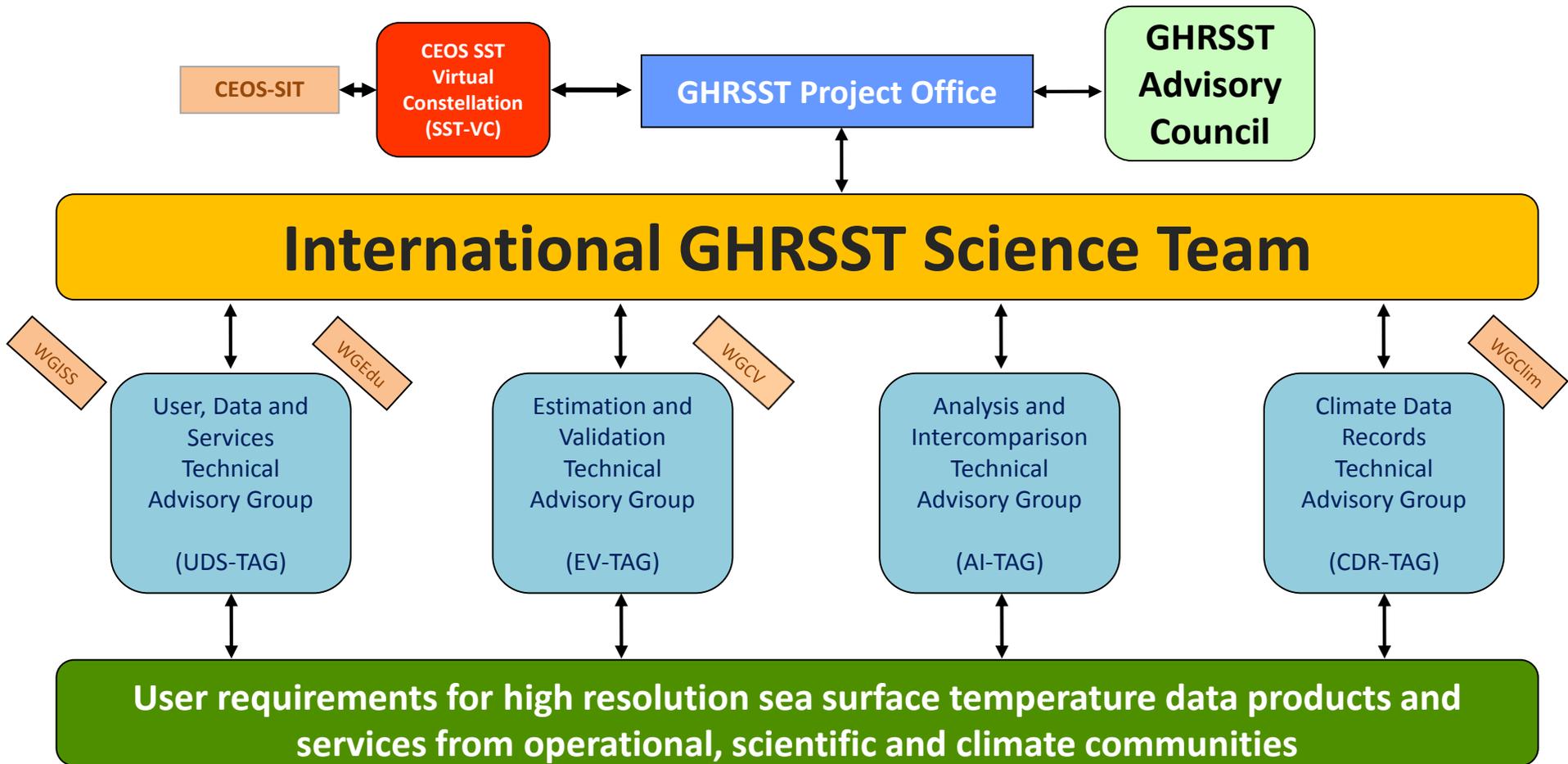
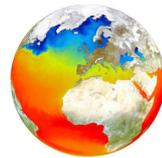


## CEOS Virtual Constellation for Sea Surface Temperature (SST-VC)

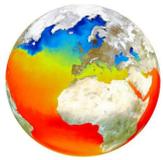
*Providing best quality SST data for wide application through international collaboration, scientific innovation, and rigor*



# GHRSSST CEOS SST-VC Interaction



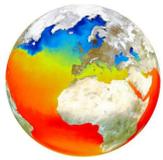
# GHRSSST Project Office



- GHRSSST Project Coordinator
  - Gary Corlett
  - University of Leicester, 40% FTE
- GHRSSST Project Administrator
  - Silvia Bragaglia-Pike
  - University of Reading, 50% FTE
- Currently funded by ESA
  - With contributions from NCEO, UoL and UoR



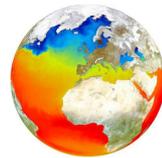
# Main activities



- Run Project Office
- Provide support to Science Team and ST Chair
- Organise ST meetings
- Capacity building
- Look after GHRSSST documents
- Maintain GHRSSST website
  - <http://www.ghrsst.org>



# GHRSSST Website



[HOME](#) | [QUICK START GUIDE](#) | [LATEST SST MAP](#) | [ABOUT GHRSSST](#) | [GHRSSST DATA & SERVICES](#) | [RESOURCES](#)

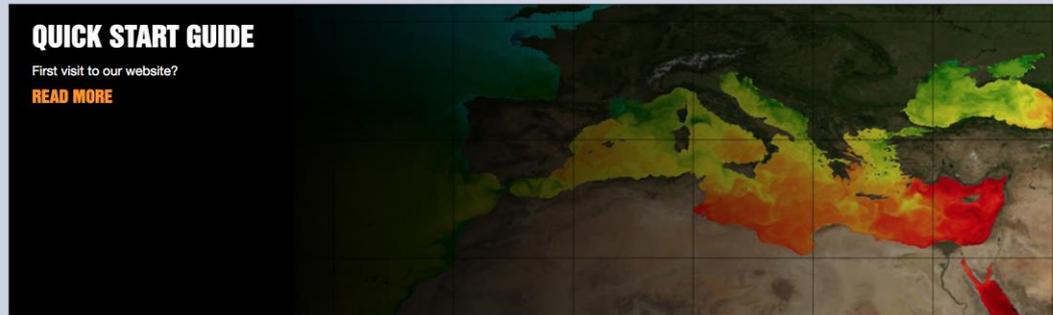
Latest:

[2nd GHRSSST Short Course on S](#)

## QUICK START GUIDE

First visit to our website?

[READ MORE](#)



[LATEST SST MAP](#)

[QUICK START GUIDE](#)

[GROUP FOR HIGH RESOLUTION SEA SURFACE TEMPERATURE](#)

[GHRSSST XVIII – AGENDA & EXTENDED REGISTRATION DEADLINE](#)

[2ND GHRSSST SHORT COURSE ON SST](#)

## LATEST NEWS

[Satellite Validation International Workshop](#)

Added: 8 May 2017

[5th ESA Advanced Training on Ocean Remote Sensing and Synergy](#)

Added: 4 May 2017

## MEETINGS

[18th International GHRSSST Science Team Meeting \(GHRSSST XVIII\)](#)

Qingdao, China

5 - 9 June 2017

[17th International GHRSSST Science Team Meeting \(GHRSSST XVII\)](#)

## TWITTER

Want to learn about SST? Five days left to register for the GHRSSST course in Qingdao. <https://t.co/lmH5KVAhqj> <https://t.co/XNmqBDCgln>

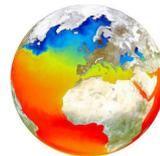
- 1 day ago



Only 3 days left to register for G-XVIII <https://t.co/rVGWVcq2BC> <https://t.co/WB7Sqao4K2>

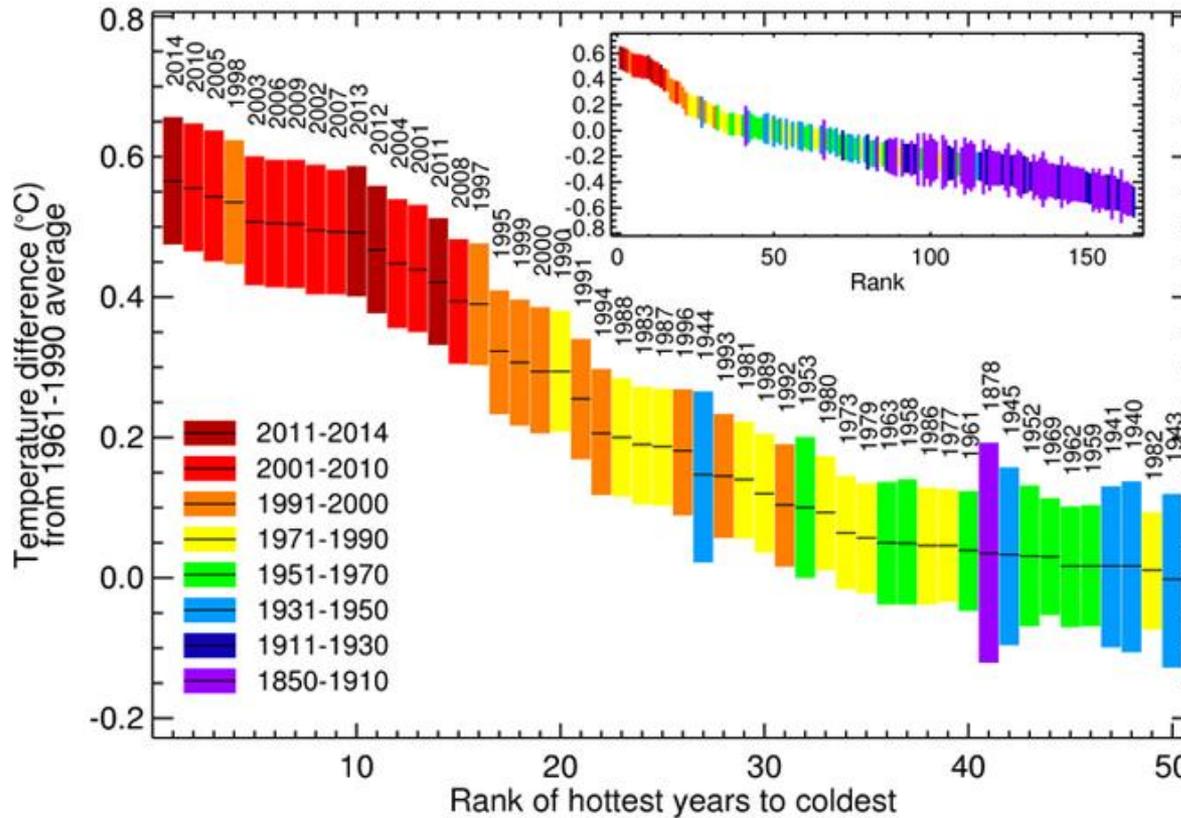
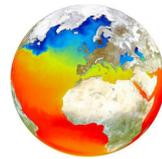
**SST**

# Why is SST important?



- SST influences atmospheric circulation
  - NWP boundary condition
- SST influences density and circulation of oceans
  - Operational oceanography
- SST changes can impact ocean biogeochemistry
  - Impact on fishing
- SST is an indicator of climate change
  - Improving seasonal prediction

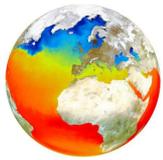
# Global mean temperature increase



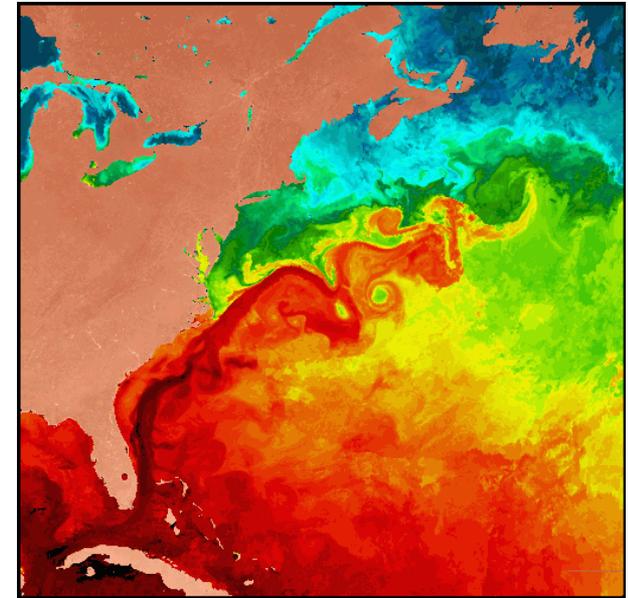
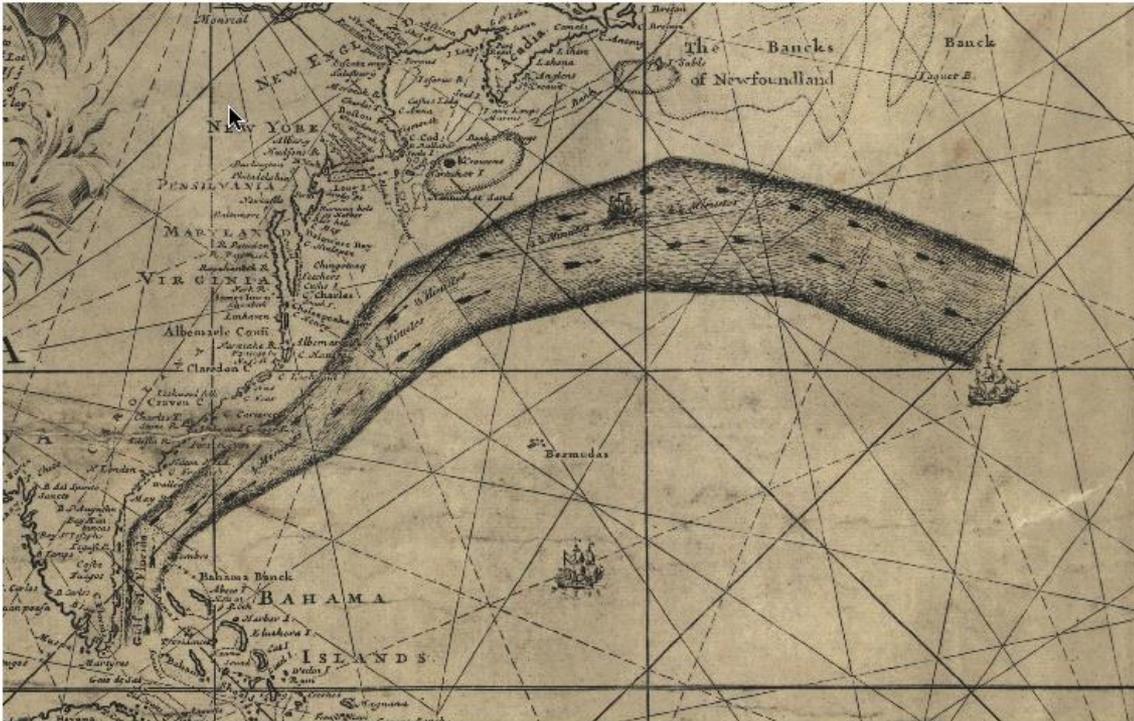
Produced by the Met Office. © Crown copyright 2014



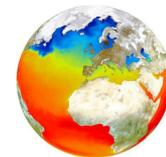
# Early SST measurements



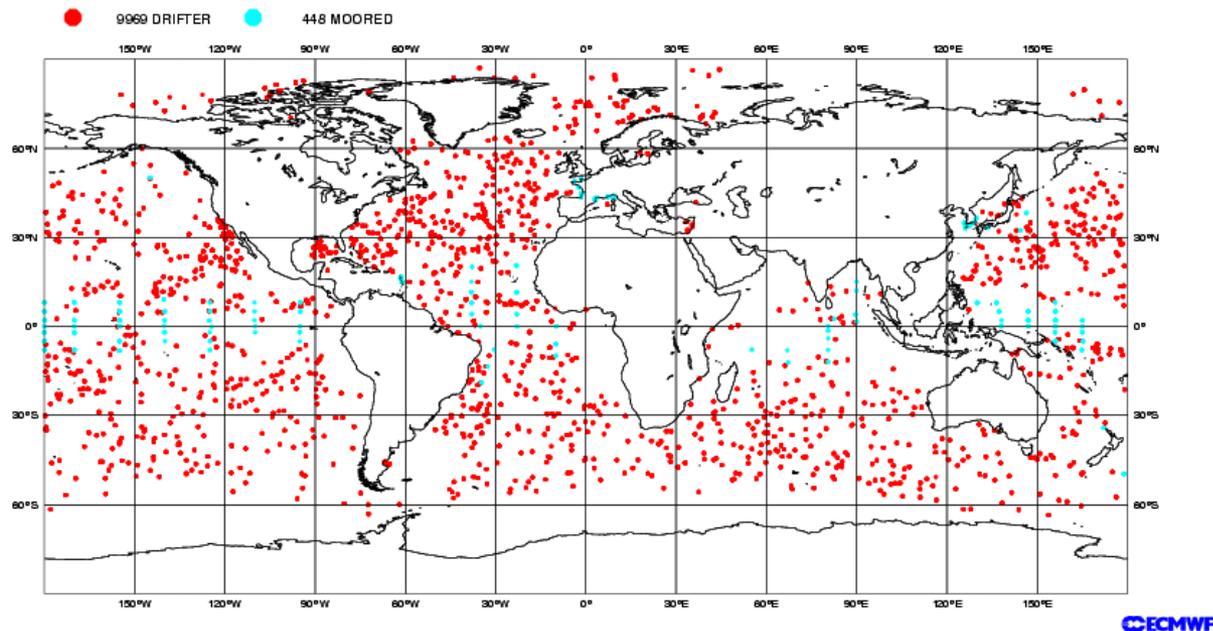
- Benjamin Franklin and Timothy Folger - chart of North Atlantic Currents – 1770s



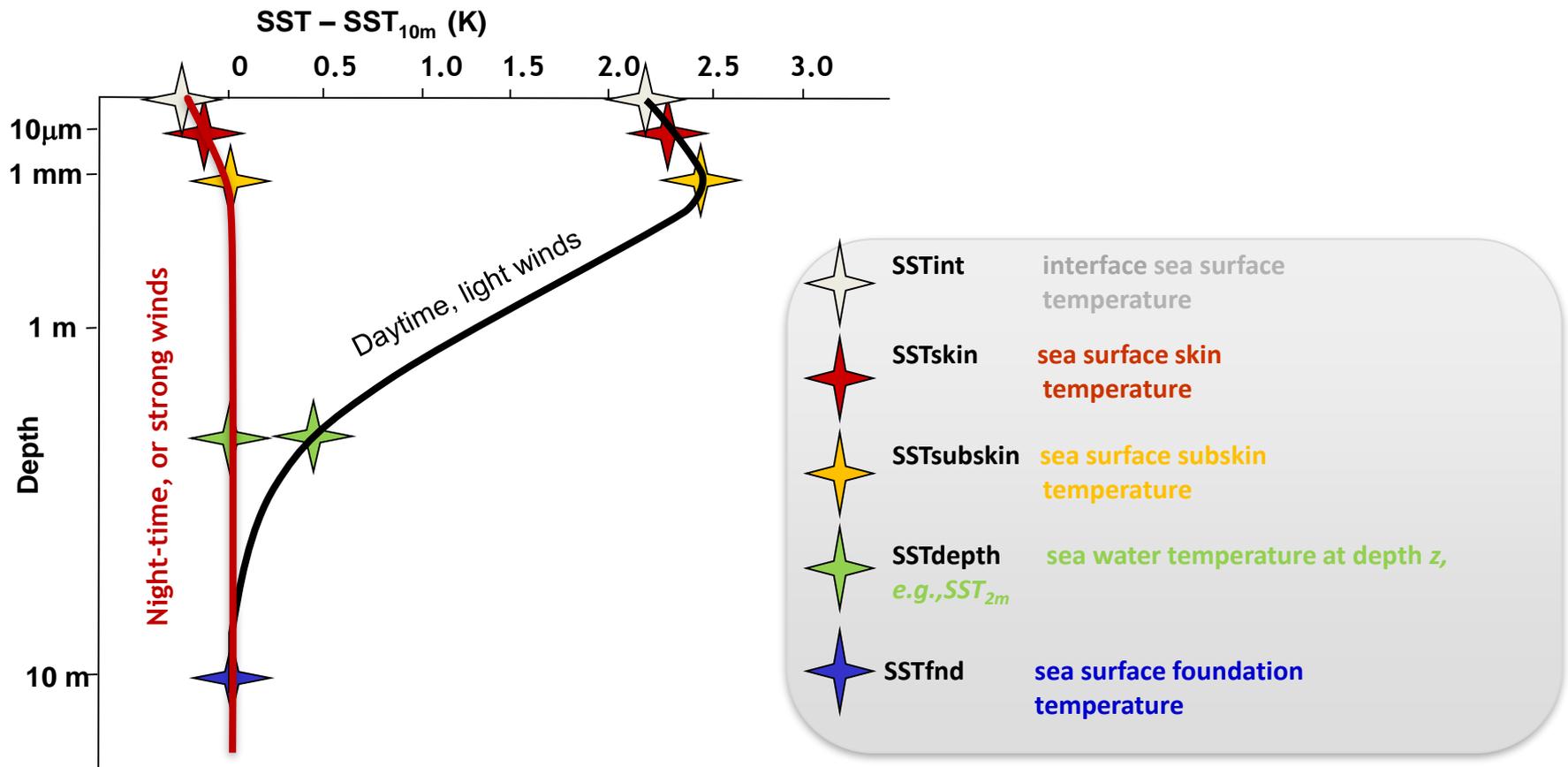
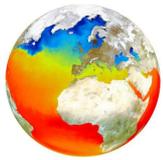
# Modern in situ: buoys



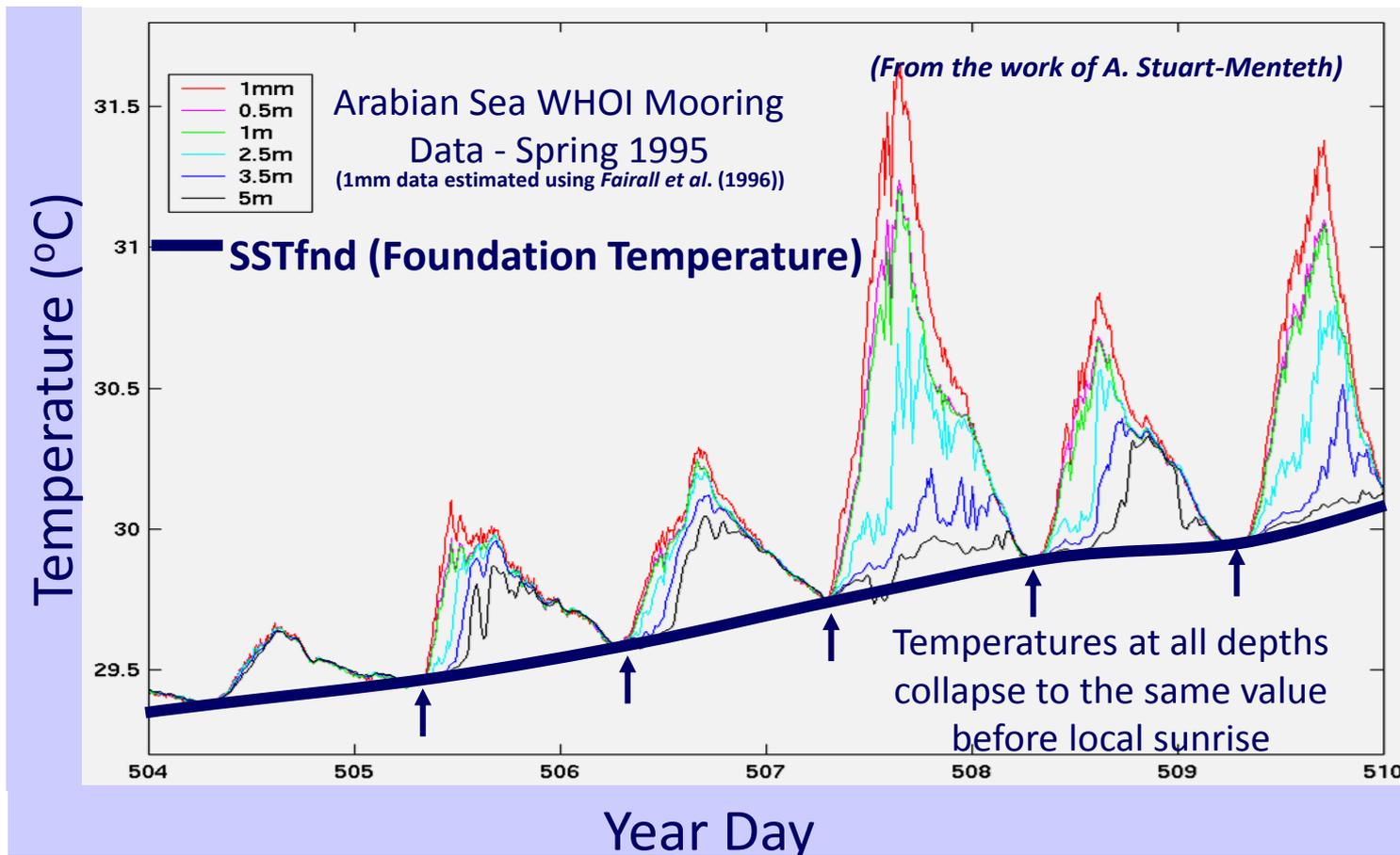
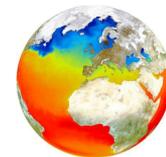
ECMWF Data Coverage (All obs DA) - BUOY  
11/SEP/2010; 12 UTC  
Total number of obs = 10417



# What is SST?

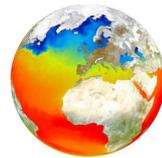


# Diurnal variability



# MEETING USER NEEDS

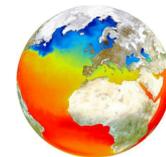
# GHRSSST is driven by user requirements



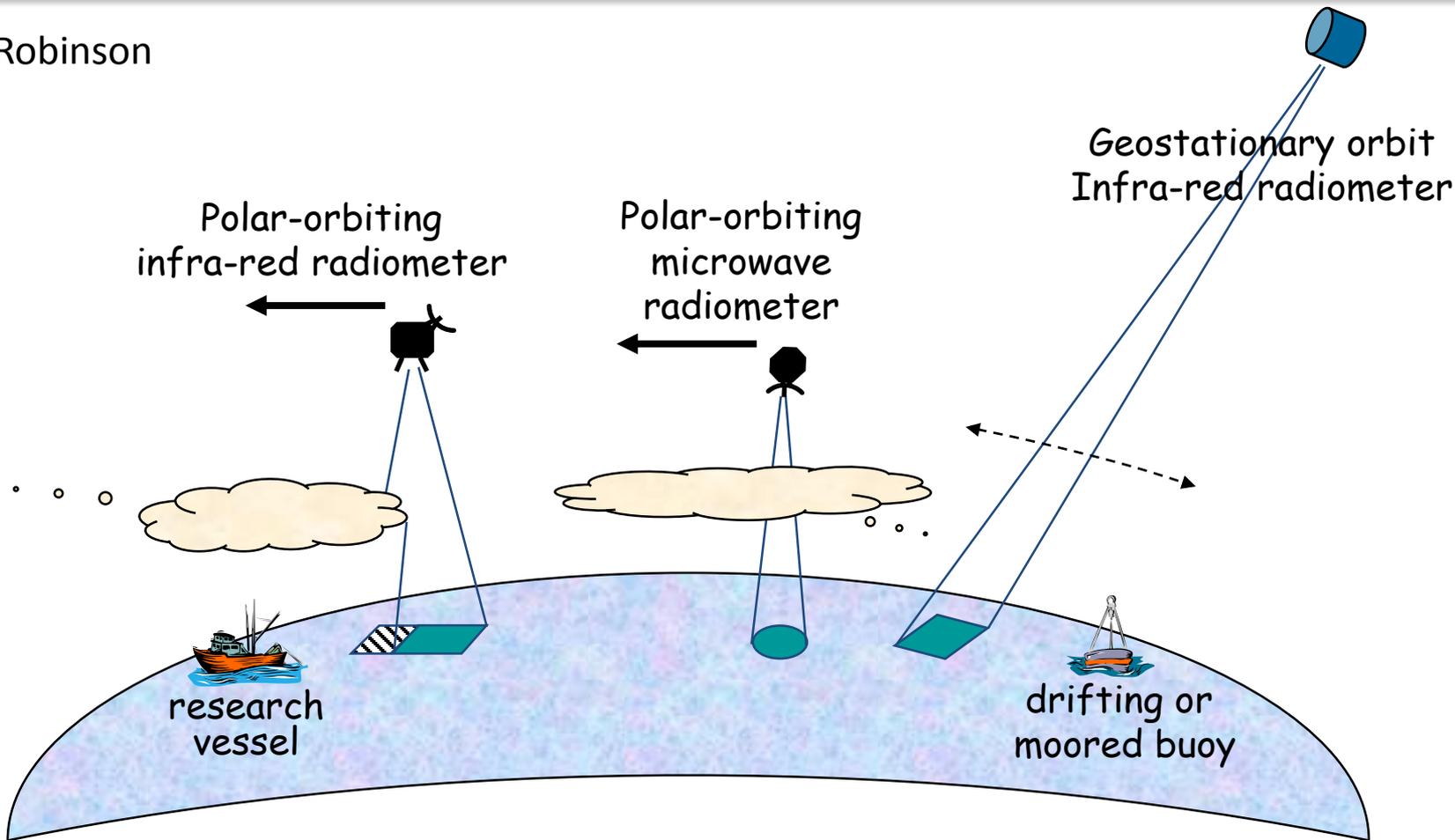
- GHRSSST sources users requirements from many communities, including, for example:
  - The WMO Rolling Requirements Review
  - GODAE Ocean View and JCOMM ETOOFS
  - GCOS
  - OOPC
  - Internal GHRSSST Science Team members
- GHRSSST then synthesises these requirements into a common set of:
  - Measurement requirements for both space based and surface based instrumentation
    - Includes a gap analyses and list of priorities
  - Scientific and technical challenges for ongoing R&D elements
    - Drives the program of the working groups and technical advisory groups



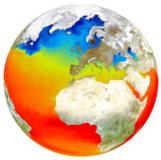
# Platforms for measuring SST



Ian Robinson



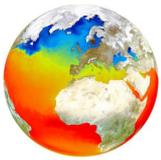
# Status – LEO IR



- Currently have several sensors in operation
  - Including AVHRR, MODIS, VIIRS
  - Recent launch of SLSTR provides dual-view capability
  - Products available in GHRSSST L2P format from many agencies
- Status
  - Satisfactory
- Activities on-going
  - JPSS VIIRS follow-on
  - EPS-SG METimage



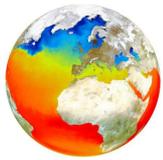
# Status – LEO PMW



- AMSR2 main workhorse
  - Products available in GHRSSST L2P format from JAXA and RSS
- Status
  - Sub-critical – need redundant capability for global data
- Activities on-going
  - Working to bring CMA and NSOAS into GHRSSST
  - Report to CEOS
    - Joining up with P-VC (precipitation) on common interest
  - Report to CGMS



# Status – GEO IR

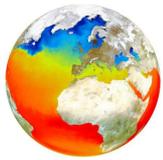


- Geostationary constellation well supported
  - GOES, GOES-R, MSG, Himawari-8, Himawari-9
  - METEOSAT-8 now over Indian Ocean
    - SST status TBC
  - Data available in L2P from many agencies
- Status
  - Satisfactory (TBC)
- Activities on-going
  - Continued discussions with ISRO
  - Interaction with CMA, ROSHYDROMET and KMA



# **CAPACITY BUILDING**

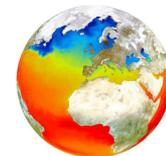
# GHRSSST and Capacity Building



- Information for users
- Growing the constellation
- Education and training



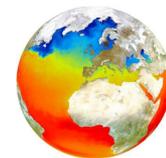
# Information for users



- Website
  - Currently being refreshed
- Glossy brochure
- GHRST monographs (initiating)
- Expanding to social media
- Ocean sciences booth



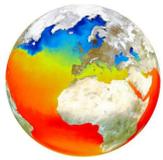
# Education and training



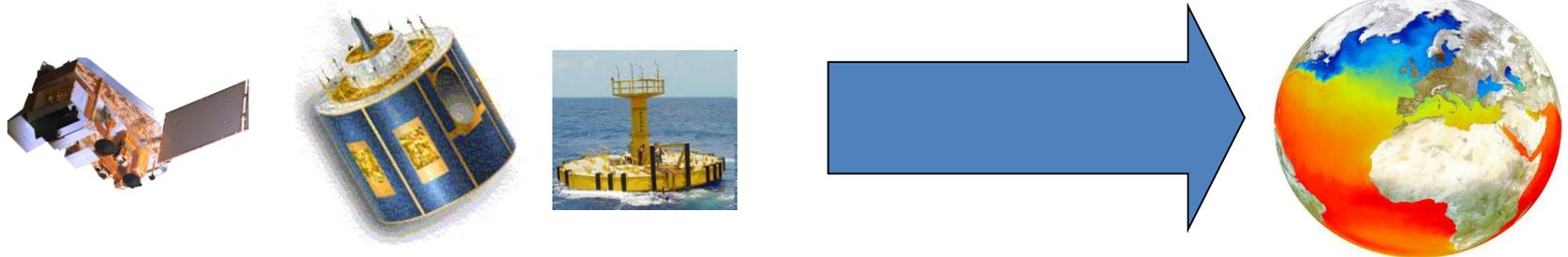
- First GHRSSST “short course on SST” given to MSc students from University of Cape Town in June 2014
- Intensive 2-day course
  - Practical based
  - Plus lectures
  - Plus presentations from students
- Heritage from ESA and EUMETSAT Ocean Training Courses
- Heritage from academics on GHRSSST Science Team
- 2<sup>nd</sup> Course held last week at OUC
  - Expanded to 3-days



# Summary



- GHRSSST mission: To provide satellite-derived global SSTs with good estimates of uncertainty to operational users and the science community



- GHRSSST is a Science Team of operational practitioners and researchers
- The provision of SST data through GHRSSST has grown to a mature sustainable essential service
- GHRSSST provides a wide range of user driven SST-related products and services
- The SST constellation is not optimal and always changing
- GHRSSST is an example of international cooperation that does work

