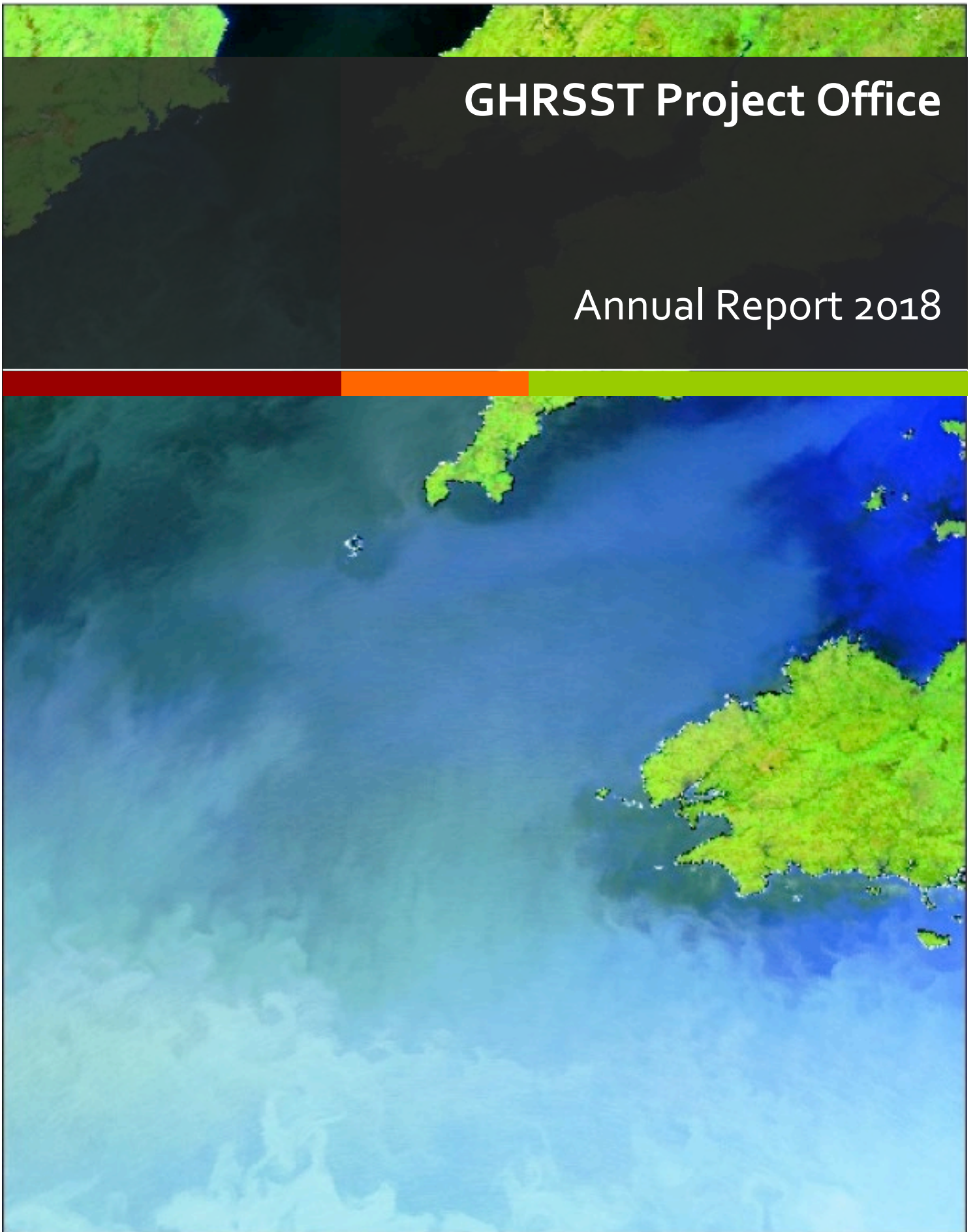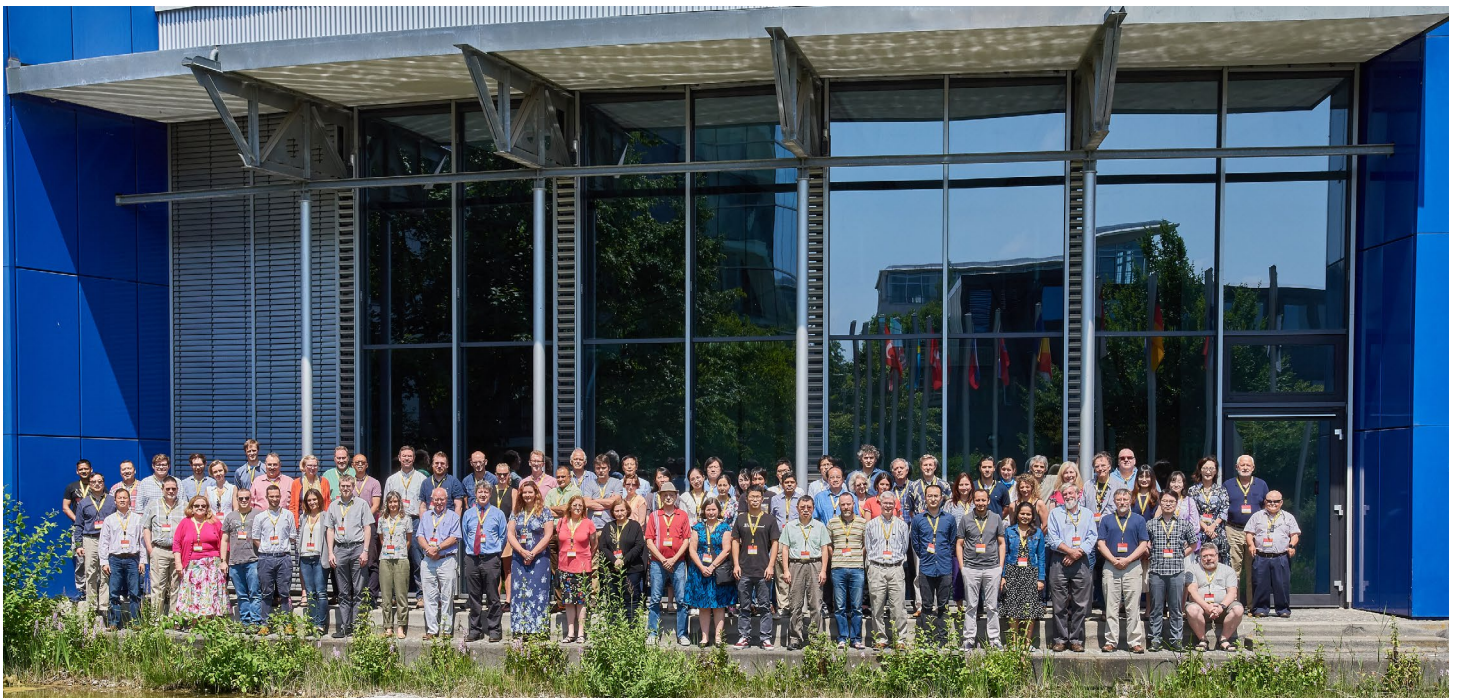# GHRSST Project Office

Annual Report 2018

GHRSST

To provide operational users and the science community with accurate SST's derived from the satellite constellation

The Group for High Resolution Sea Surface Temperature (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 is:

- Composed of a Science Team of researchers and operational practitioners.

- Coordinates research and operational developments in satellite-derived SST.

- The science team of the CEOS Virtual Constellation for SST

- Organised into Technical Advisory Groups and Task Teams focused on particular problems or activities

GHRSST services offer:

- Data processing through Regional and Global Data Assembly Centers, combining satellite and NWP fields in common data formats for ease of access and analysis.

- A variety of tailored methods for downloading and access full products or subsets.

- Online visualisation of data quality through diagnostic comparisons

International collaboration

GHRSST comprises researchers and operational practitioners of SST from a number of worldwide institutes and agencies. These bodies are represented by the set of logos shown below. Participation in GHRSST is always increasing as new groups join the project.

CEOS SST Virtual Constellation

A key development in recent years is the formation of the CEOS SST Virtual Constellation (SST-VC). The CEOS Virtual Constellations coordinate space-based, ground-based, and/or data delivery systems to meet a common set of requirements within a specific domain. They leverage inter-Agency collaboration and partnerships to address observational gaps, sustain the routine collection of critical observations, and minimize duplication/overlaps, while maintaining the independence of individual CEOS Agency contributions. GHRSST acts as the science team for the CEOS SST-VC

GHRSST Project Office

The GHRSST Project Office (GPO) provides the secretariat for the GHRSST Project. The GPO is funded by the European Union as part of the Copernicus Programme. The office is comprised of the GHRSST Project Coordinator (GPC), Gary Corlett from the University of Leicester, and the GHRSST Project Administrator (GPA), Silvia Bragaglia-Pike from the University of Reading. Contact details are provided later on page 7.

The aim of the GHRSST Project Office is to:

- Coordinate, at the international level, the Group for High Resolution Sea Surface Temperature and its scientific teams to foster effective scientific and operational progress in the subject area of sea surface temperature.

The Objectives of the project office are:

- Together with the GHRSST Science Team Chairperson, coordinate, enable and facilitate, on behalf of the GHRSST Science Team, the open exchange of relevant satellite and in situ data streams for use within GHRSST.

- Provide direct logistical co-ordination and technical support to the, GHRSST Advisory Council.

- Together with the GHRSST Science Team Chairperson, provide direct logistical co-ordination and technical support to coordinate, enable and facilitate the GHRSST Science Team and all subsidiary TAG and WG and the GHRSST Advisory Council.

- Manage GHRSST activities in cooperation with international, national and regional institutions, committees, and offices as well as related global programs.

- Ensure good information flow among GHRSST participants and work effectively with the GHRSST Science Team Chair.

- Act as an interface to, and integrate the GHRSST with, other global systems and projects as appropriate.

- Manage GHRSST documentation.

- Promote the activities of GHRSST on the International stage.

In support of these objectives, the GHRSST Project Office will:

- Maintain the GHRSST website (http://www.ghrsst.org)

- Maintain the GHRSST Twitter feed

- Maintain the primary GHRSST documentation, comprising:

  o GHRSST Strategy and Implementation Plan (GDIP)

  o User Requirements Document (URD)

  o GHRSST Data Specification (GDS)

  o Climate Data Assessment Framework (CDAF)

  o Validation Protocol Document (VPD)

- Organise the annual Science Team meeting

- Provide secretarial support to the GHRSST Science Team Chair and the GHRSST Science Team

- Provide an interface to the CEOS SST-VC

- Publish GHRSST newsletters

- Maintain the GHRSST brochure

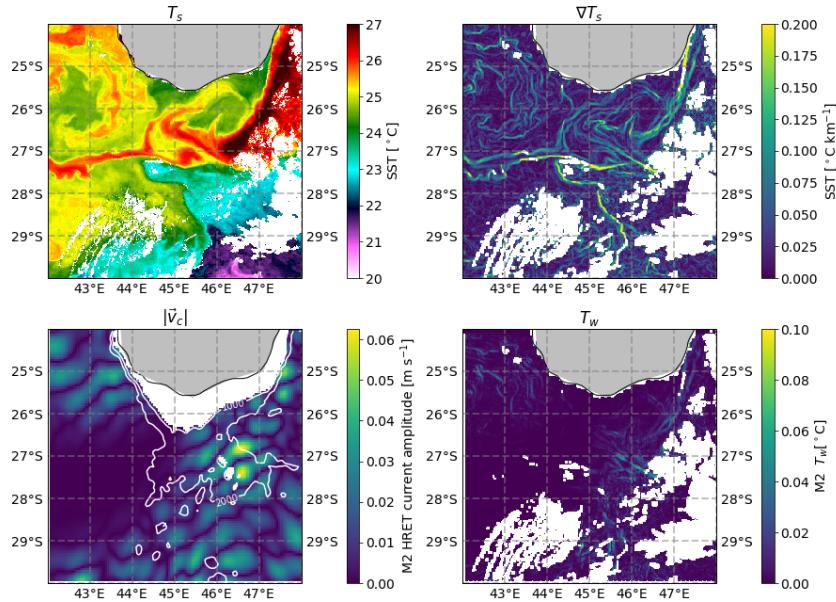- Promote GHRSST at international conferences and meetings.

Highlights 2018

INTER-CALIBRATION OF HY-1B/COCTS THERMAL INFRARED CHANNELS WITH METOP-A/IASI
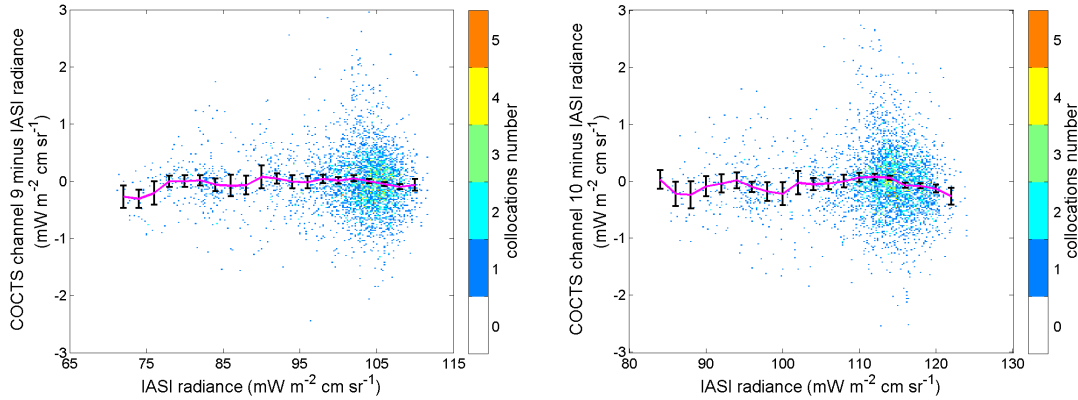
The variation of COCTS channel 9 and channel 10 minus IASI radiance against IASI radiance after correction

EXPLORING INTERNAL WAVE SIGNATURE ON REMOTE SENSING INFRARED SST OBSERVATIONS

(Top left) SST captured by METOP-A on the 5 June 2014. (Top right) Sobel gradient of SST. (Bottom left) M2 baroclinic High Resolution Empirical Tide (HRET) amplitude current for areas with a bathymetry deeper than 1000m. White contour lines correspond to the bathymetry. (Bottom right) Estimation of the amplitude of M2 Internal Wave (IW) signature on SST

GHRSST data provision

GHRSST pioneered a Regional/Global Task sharing Framework (R/GTS), shown schematically below, which acquired existing SST data products and enhanced them by adding additional information and a common format so that they could be combined to produce the new generation of products using a strategy that was scientifically sound and technically feasible.

The project focused on the exploitation of unique contributions made by each satellite sensor type and institutional partner. Success was achieved not just by solving scientific, operational and technical problems, but also by co-operation at an international level to agree on data product definitions and standards acceptable to users, producers and data managers. GHRSST established international consensus definitions for SST that are now part of the network Common Data Form (NetCDF) Climate Forecast (CF) convention. It conducts detailed research on the impact and mitigation of diurnal SST variability in SST measurements and analyses, developed satellite pixel and grid-point time varying uncertainty estimates, coordinated international data management systems, established procedures and protocols, tested and implemented archives to manage the extensive GHRSST data sets (currently ~25Gb per day), provided near real-time data access portals and user services and

implemented near real-time quality control monitoring services. The GHRSST has been extremely successful in revolutionizing the way satellite SST data sets are developed, shared and applied in modern oceanography, meteorology and climate centres.

Today the GHRSST is a truly international project with over $30+ Million US invested across all of the project activities. It orchestrates a wide variety of GHRSST data streams input and output data that must be shared, indexed, processed, quality controlled, analysed and documented within an international framework called the Regional/Global Task Sharing (R/GTS) framework. Large volumes of data and data services must be harnessed together to deliver the new generation of global coverage high resolution SST data sets that meet the GHRSST User Requirements.

Overview of GHRSST Regional/Global Tasking Sharing (R/GTS) framework for data production and distribution
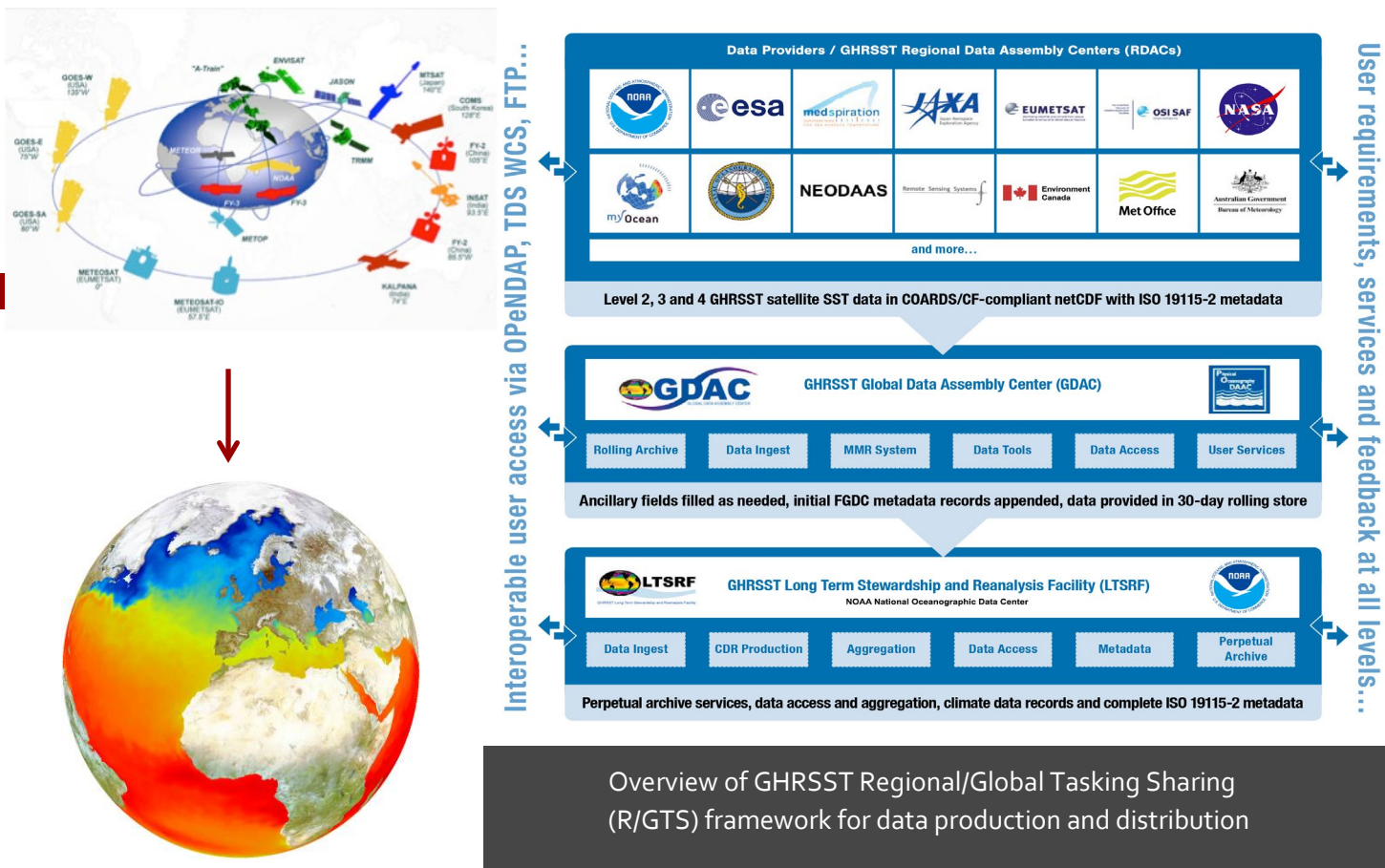
Contact details for the GHRSST Project Office and the major GHRSST components and services are given below.

GHRSST Project Office

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GDAC

You can download real-time data from the respective data producers (RDACs), or as collected by the GHRSST Global Data Archiving Centre (GDAC), which is provided and hosted by NASA at their Physical Oceanography Distributed Active Archive Center (PO.DACC). For further details of the GDAC and instructions on how to download data please go to the GDAC website at http://podaac.jpl.nasa.gov/.


LTSRF

Historical SST products (older than 30 days) are available from the GHRSST Long-Term Stewardship and Reanalysis Facility, which is provided and hosted by NOAA at the National Oceanographic Data Centre (NODC). For further details of the LTSRF and instructions on how to download data please go to the LTSRF website at http://data.nodc.noaa.gov/ghrsst/.

Felyx

The aim of the Felyx project is to provide an open-source, flexible and reusable software system that can be used to research and monitor the quality and performance of Earth observation (EO) data streams. Felyx is being developed by IFREMER, PML and Pelamis and funded by the European Space Agency. For further details please see http://hrdds.ifremer.fr.
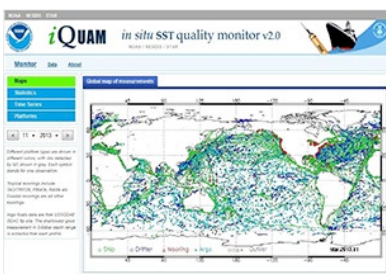
iQUAM and SQUAM

The in situ data quality monitor, iQUAM, and SST summary quality monitor, SQUAM, systems are provided and hosted by NOAA. For further details please see http://www.star.nesdis.noaa.gov/sod/sst/iquam/ and http://www.star.nesdis.noaa.gov/sod/sst/squam/, respecitively.

GHRSST Project Office

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The GHRSST Project Office is funded by the European Union