A brief introduction to…

GHRSST Data Access and Visualisation

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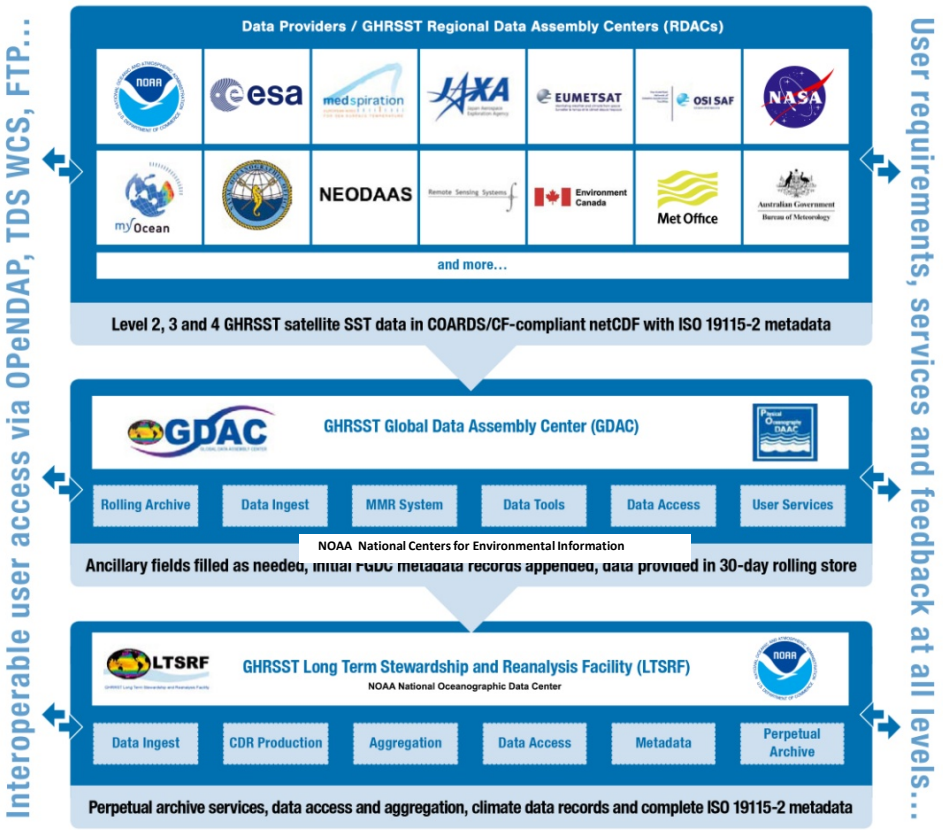
Regional/Global Task Sharing (R/GTS)



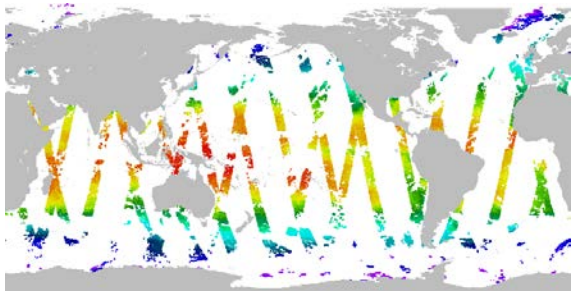
- GHRSST products genrrated by RDACs
  - Some RDACs are self-serve
- GHRSST offers to serve data on-behalf of RDACs
  - Optional step but recommended
  - Addtional metadata for discovery services required
- Real time
  - Global Data Assembly Centre (GDAC)
  - Primary system hosted by NASA JPL
    - See http://podaac.jpl.nasa.gov/
  - Secondary system hosted by Ifremer
    - See http://cersat.ifremer.fr/data/collections/ghrsst (requires simple registration)
    - Not all datasets are mirrored
- Delayed mode
  - Long-term Stewardship and Reanalysis Facility (LTSRF)
  - Hosted by NOAA NODC (now NCEI)
    - See http://data.nodc.noaa.gov/ghrsst/
- Data can be accessed using many methods
  - ftp, http, DAP, WMS, WCS, LAS, Geoportal, Granules, CWI
- Any issues
  - Please contact the GHRSST Project Office (gpc@ghrsst.org)

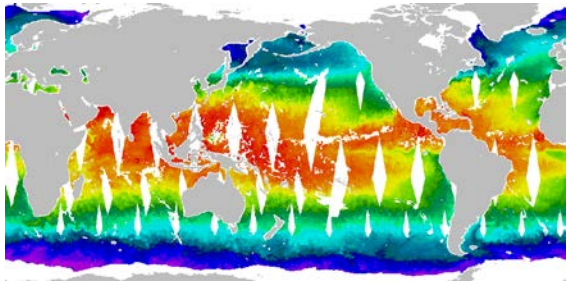
GDS2.0

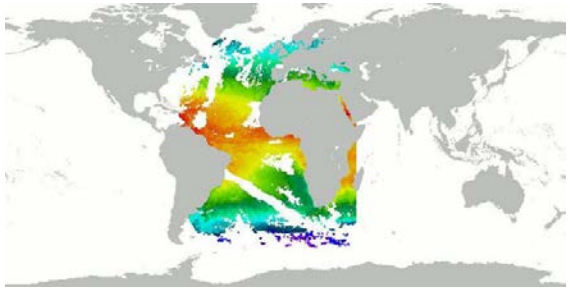
- GHRSST Data Processing Specification (GDS) 2.0
- All data files are in NetCDF file format
- All data files contain COARDS/CF compliant file level metadata
- All data files have a corresponding DIF metadata record, and once in the LTSRF, FGDC metadata as well

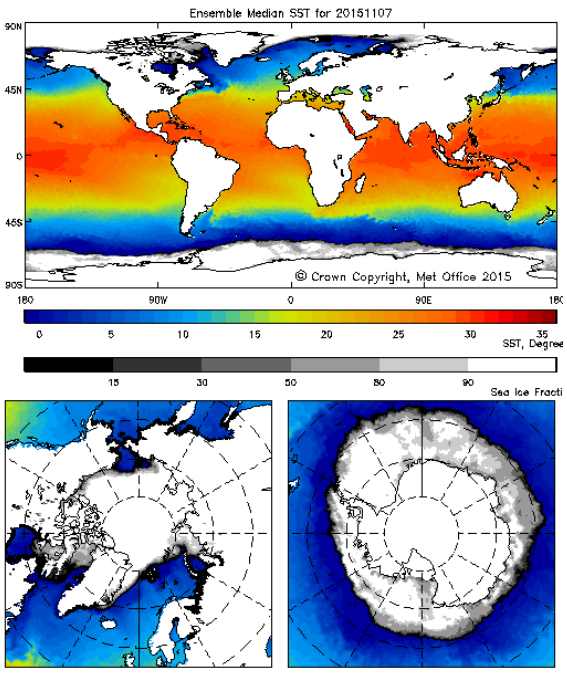
- All data are free and openly available to everyone
- Some RDACs require simple registration

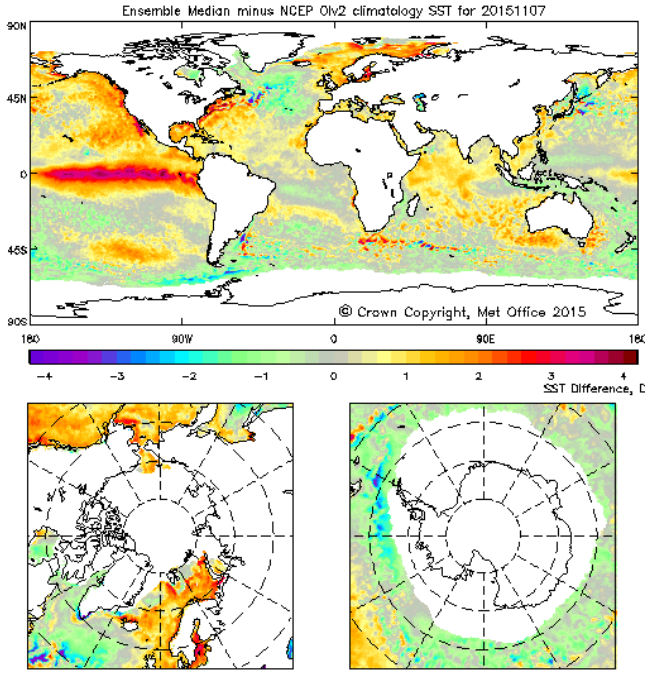
Example L2P and L4 data











RDACs

- Regional Data Assembly Centres
- **GHRSST Data Producers**
  - Provide L2P, L3 or L4 data
- Self serve or pass to GDACs
  - If self-serve then metadata should at least be passed to GDAC/LTSRF

GDACs and LTSRF

- Global Data Assembly Centres
- **GHRSST Data Distributors**
  - Mainly real-time (up to 30 days)

- Long-term Stewardship and Reanalysis Facility
- **GHRSST Data Archive**
  - And much, much more…

- Both have many ways to access GHRSST data
  - ftp, http, DAP, WMS, WCS, LAS, Geoportal, Granules, CWI

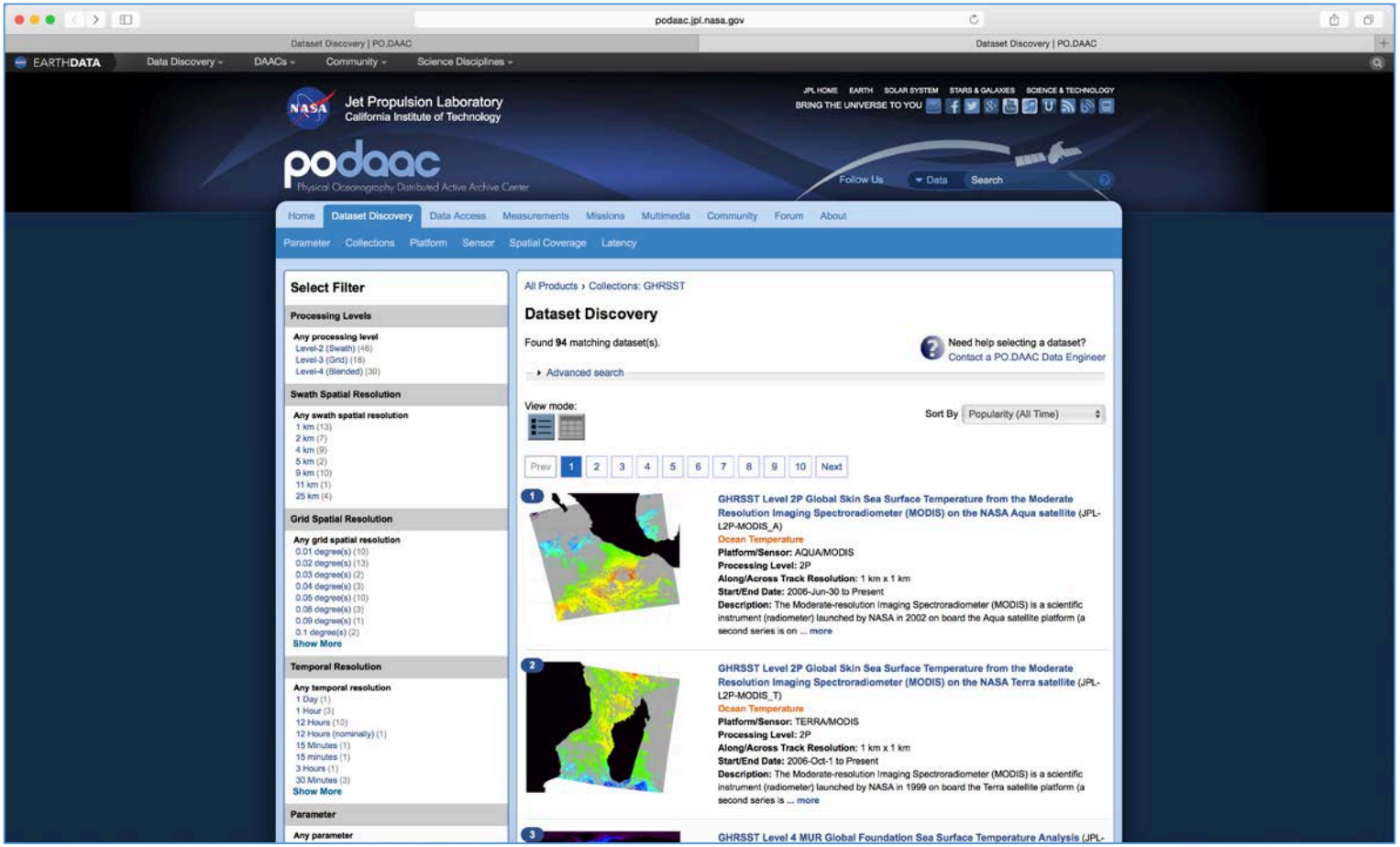
LTSRF Progression

	2007	2008	2009	2010	2011	2012	2013	2014	2015*
Products		22	26	27	40	59	60	62	77
Accessions		39,048	49,957	59,982	67,906	92,282	105,046	112,182	123,325
Files		679,000	993,580	1,352,901	1,662,004	2,459,724	3,290,806	3,971,657	4,894,891
Volumes (TB)		13	20	28	34	57	69	81	92
Services	ftp http	ftp http	ftp http DAP	ftp http DAP WMS WCS	ftp http DAP WMS WCS LAS	ftp http DAP WMS WCS LAS Geoportal	ftp http DAP WMS WCS LAS Geoportal Granules CWIC	ftp http DAP WMS WCS LAS Geoportal Granules CWIC	ftp http DAP WMS WCS LAS Geoportal Granules CWIC

Some considerations in selecting a GHRSST product…

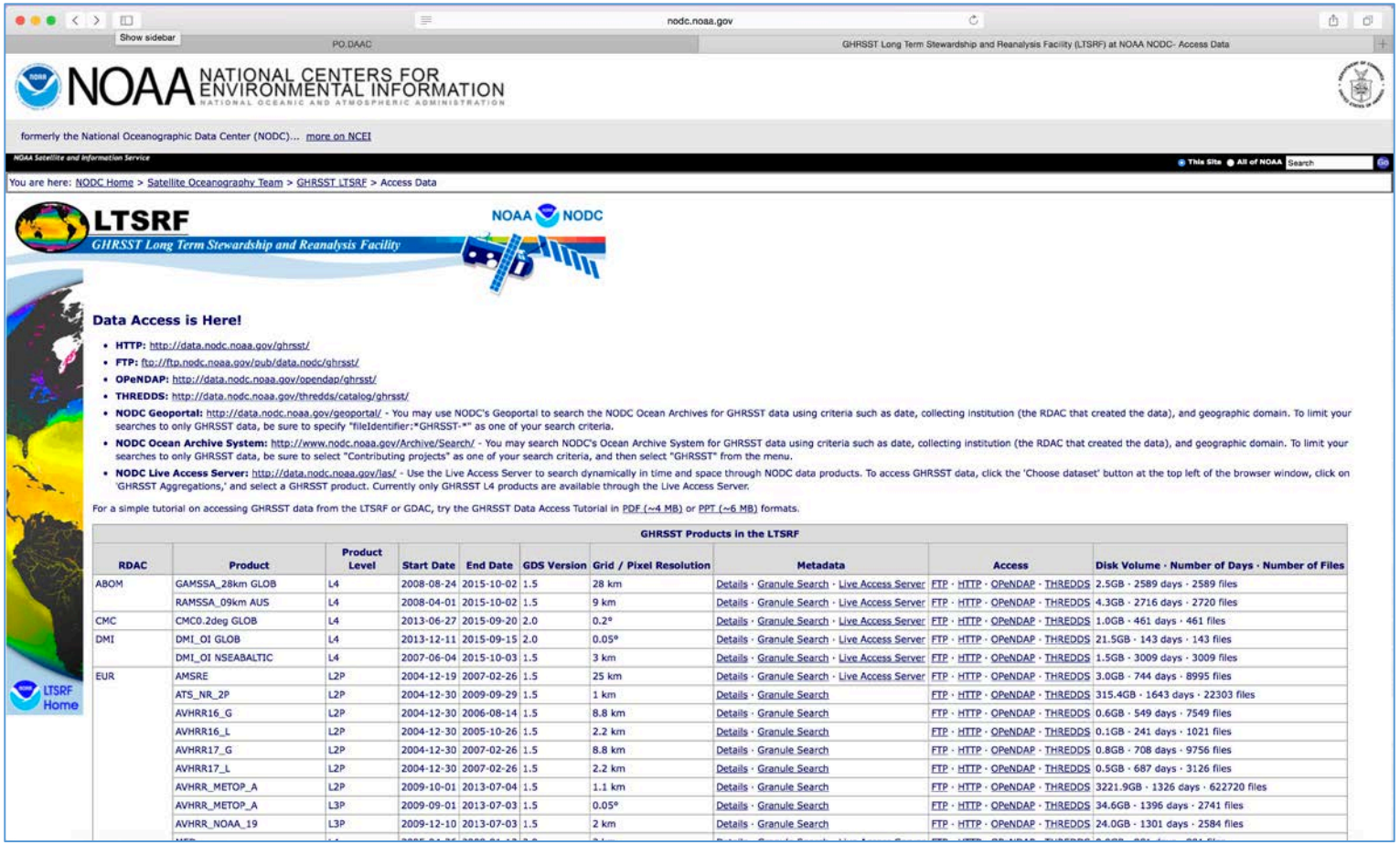
- Spatially complete?
  - Analysis or native swath data
- Duration?
  - Time series or single image
- Spatial resolution?
  - High-resolution near coast or basin scale
- Level of uncertainty?
  - Best quality only
- Depth?
  - Skin or other defined depth
- Synergy?
  - Co-located with other data
- Availability?
  - Timeliness
- Volume?
  - Local or remote processing

GDAC Access



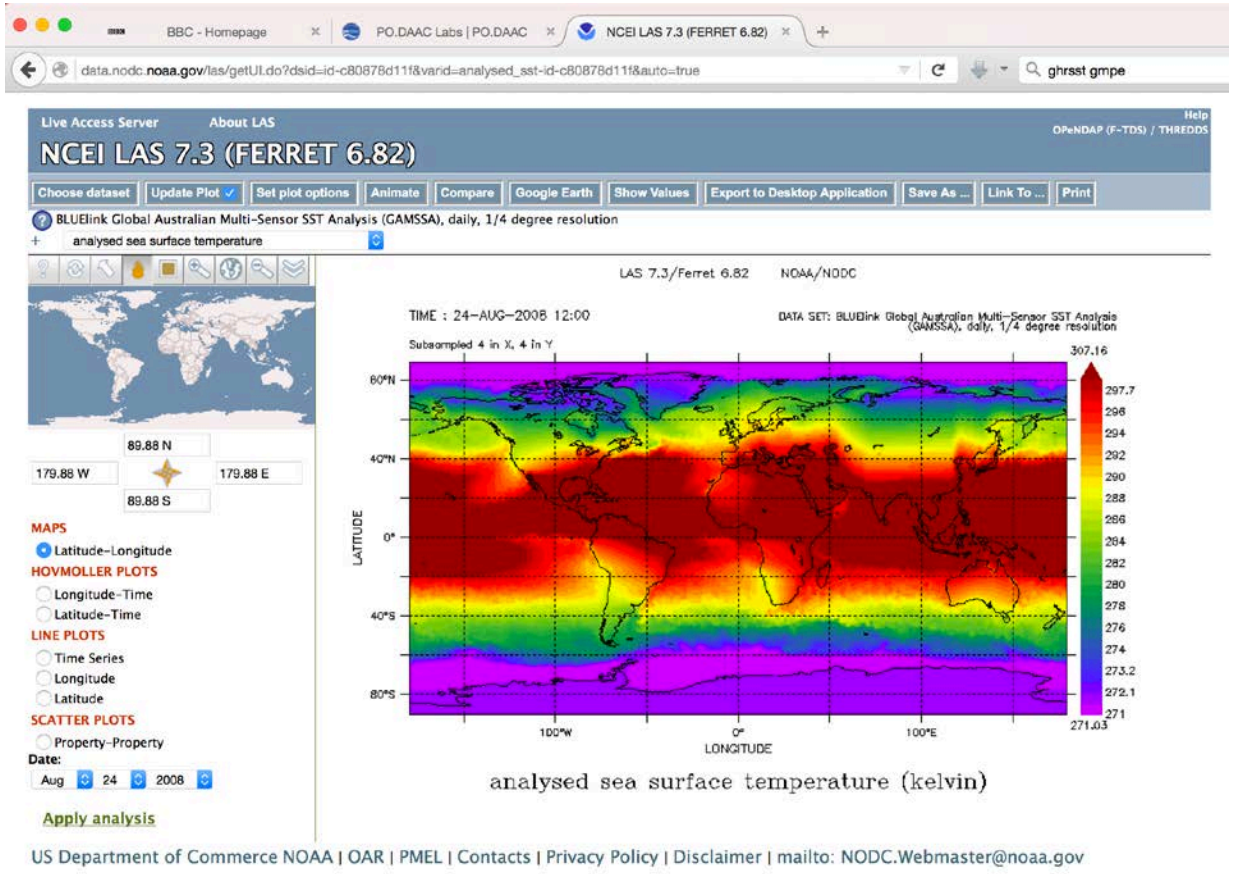
http://podaac.jpl.nasa.gov/

LTSRF Access



http://www.nodc.noaa.gov/sog/ghrsst/accessdata.html

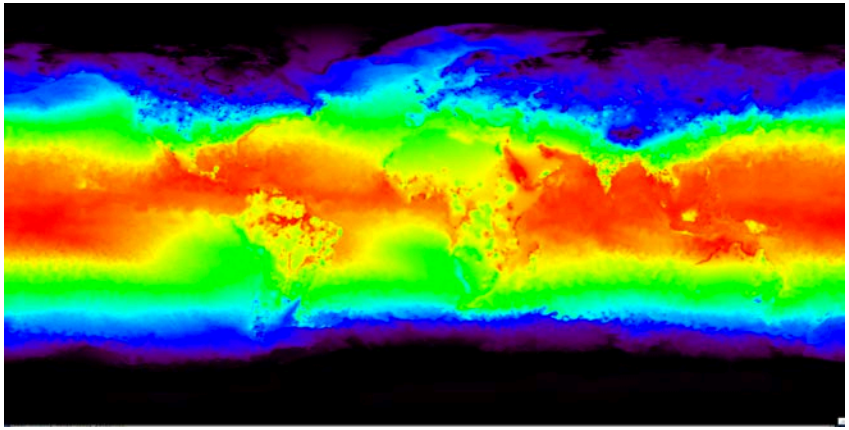
Live Access Server



OPeNDAP

- Easy access to GDS2.0 format through OPeNDAP
  - Internally compressed NetCDF 4.0 format
- Can use IDL, MATLAB, etc., for direct acccess

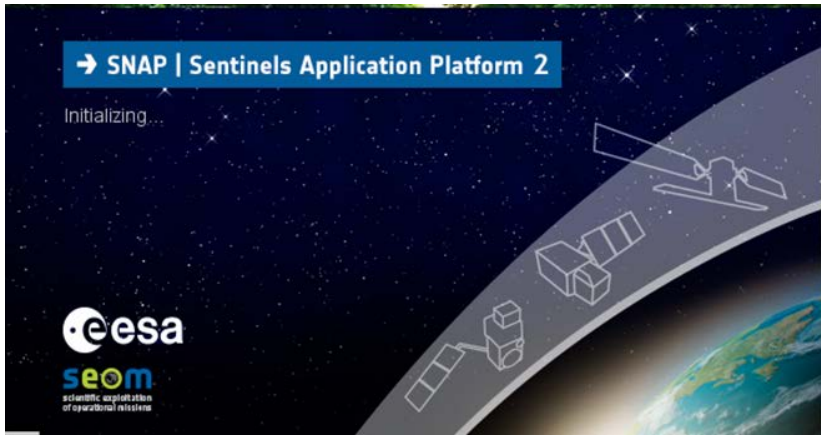
```
url = 'http://podaac-opendap.jpl.nasa.gov/opendap/allData/ghrsst/data/GDS2/L4/GLOB/CMC/CMC0.2deg/v2/' $
    + '2015/' $
    + '311/' $
    + '20151107120000-CMC-L4_GHRSST-SSTfnd-CMC0.2deg-GLOB-v02.0-fv02.0.nc'

file_id = NCDF_OPEN(url, /nowrite)
NCDF_VARGET, file_id, 'analysed_sst', sst
NCDF_CLOSE, file_id
DEVICE, decomposed=0
LOADCT, 39, /silent
TV, BYTSCL(sst)
```



No flags applied

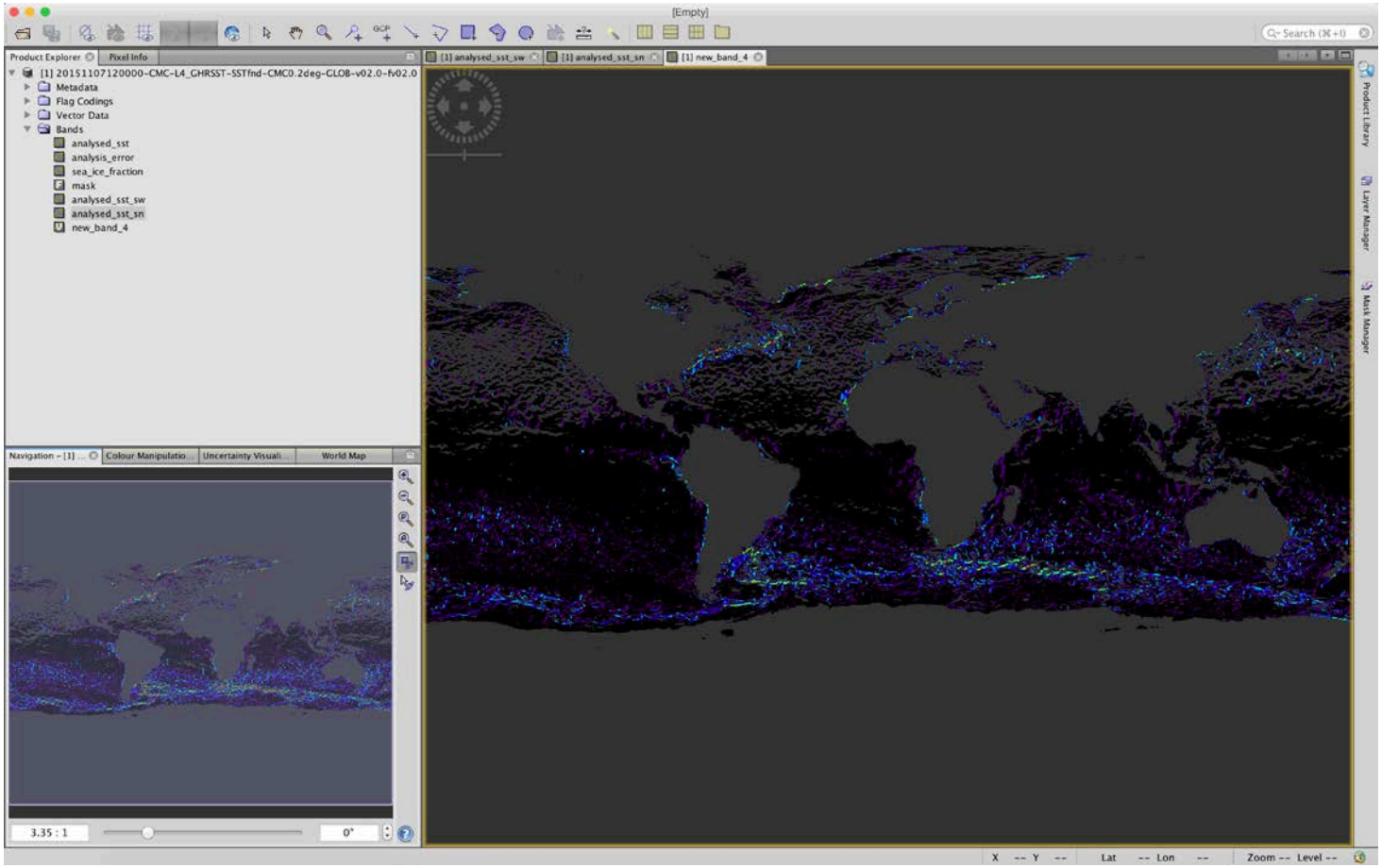
SNAP – Sentinel Application Platform

http://step.esa.int/main/download/

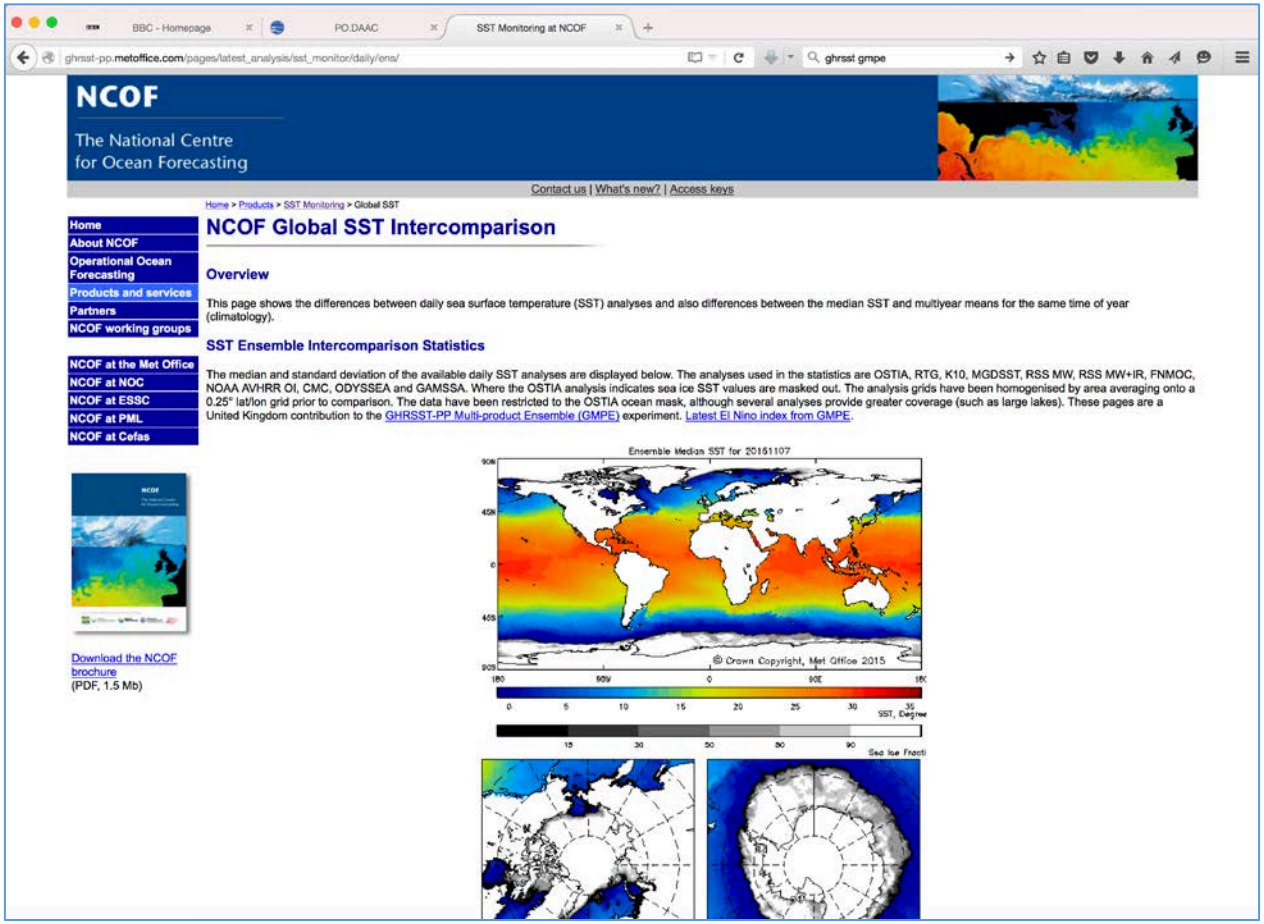


- SNAP is an open source toolbox for visualisation, analysis and processing of the Sentinels 1, 2 and 3 EO data. All supports many third-party missions and generic formats (e.g. NetCDF).

Example: SST gradients



GMPE

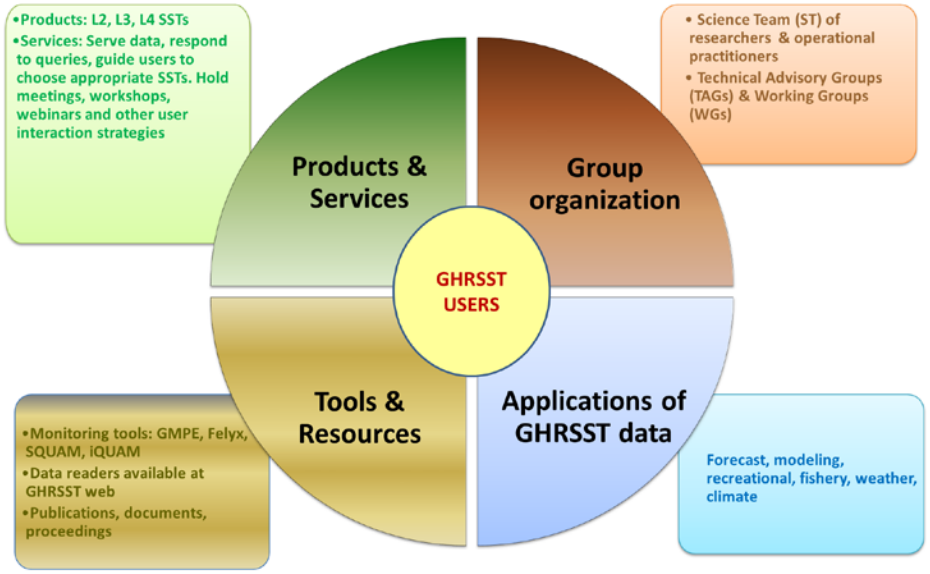


http://ghrsst-pp.metoffice.com/pages/latest_analysis/sst_monitor/daily/ens/

Finding the SST you need

Interested in GHRSST data:

- Real-time data (collection - GHRSST): http://podaac.jpl.nasa.gov
- Long-term data: http://www.nodc.noaa.gov/SatelliteData/ghrsst/
- Which data to use? Please check "Quick Start" : www.ghrsst.org/quick-start
- Tools/resources/codes: https://www.ghrsst.org/products-and-services/tools/



Interested in GHRSST activities:

- Visit the GHRSST website at https://www.ghrsst.org
- For your interest in a particular technical advisory group (TAG) or working group (WG), please check the description for that working group

Other products/tools

- Globcurrent (ocean currents)
  - http://www.globcurrent.org/
- OceanDataLab (online visualisation)
  - http://www.oceandatalab.com/syntool-web/
- NANSAT (Python toolbox
  - https://github.com/nansencenter/nansat
- NAIAD (visualisation and extraction
  - http://naiad.ifremer.fr
- Nephelae (data mining and processing)
  - http://cersat.ifremer.fr/oceanography-from-space/our-domains-of-research/mass-data-processing-and-mining

Uncertainty of measurement

- SST is 300 K
  - SST error is +0.5 K
  - SST uncertainty is 0.5 K