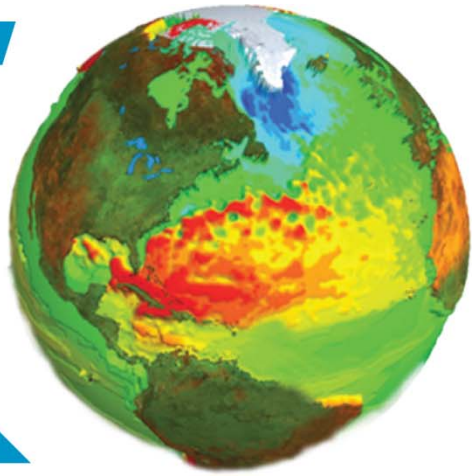
BRAT

BASIC RADAR ALTIMETRY TOOLBOX



Tools for all altimetry users

Basic Radar Altimetry Toolbox & Tutorial

- A Joint project between ESA and CNES,
  benefiting from years of Aviso and CLS's experience,
  and from Science & Technology scientific software development expertise

- Statements:
  - 17 years of altimetry and at least as many data formats as satellites,
  - A growing number of non-expert users of the data,
  - Scientists also need easy-to-use data products and tools!

- Version 1.0.0 released in April 2007
  Version 2.0.0 in April 2009

Basic Radar Altimetry Toolbox & Tutorial

- Basic Radar Altimetry Toolbox (BRAT)
  - Data reading, processing and visualisation
  - All altimetry data from official data centres since ERS-1 (1991)
- Radar Altimetry Tutorial (RAT)
  - A tutorial describing altimetry, for the users
  - technique, applications and missions
  - Products fact sheets and data use cases
- Available on the web (http://www.altimetry.info, http://earth.esa.int/brat/), or on DVD

Basic Radar Altimetry Toolbox software

- Windows & Linux
- Open source

Data read & processed:

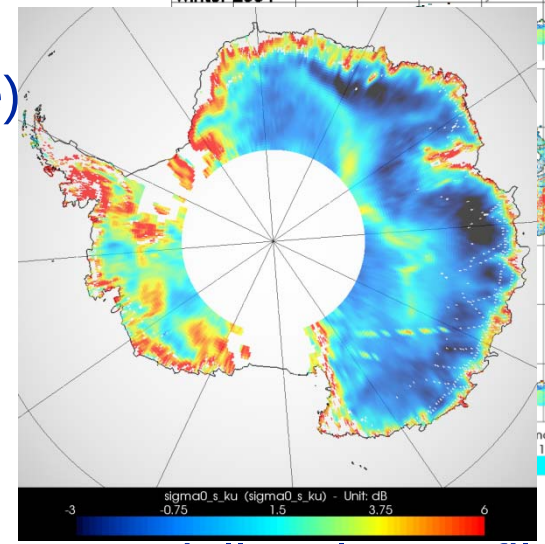
- From several satellites
  ERS-1 and 2, Topex/Poseidon, Geosat Follow-on, Jason-1, Envisat, Jason-2 and Cryosat.
- From several data centres
  Aviso, ESA, JPL/PoDaac, Noaa
- Of several processing levels
  from Sensor Geophysical Data Record to gridded merged data

- Present version: **v2.0.1** (released June 19, 2009)

Users'feedback about version 1

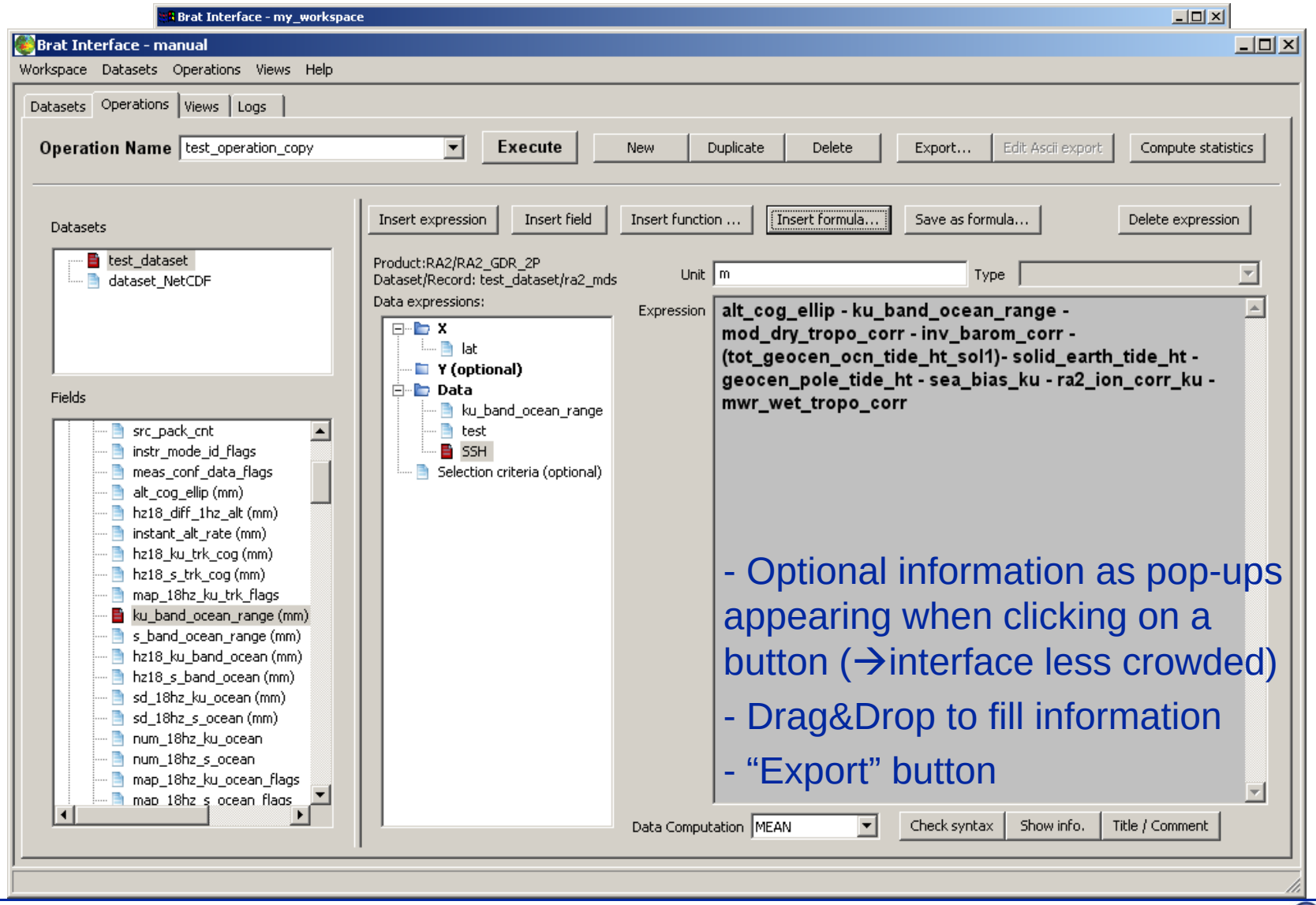
- Real interest:
  - 600 persons subscribed to download it between June 2007 and April 2009 ; plus DVD distribution at meetings, and two Esa's workshops)
  - (158 persons (85 new ones) between April 22 and June 18 (version 2))
- Request for altimetric waveform visualization capabilities
- Need for easier ascii data export (possible previously, but not within the GUI)
- Processing time sometimes a bit long
- Need of ergonomy improvement:
  - Very logical workflow once you get into it, but not self-explaining when you begin, and maybe a little tedious
  - Windows too crowded; users have problems knowing what and when filling some boxes or not, or even when they did it by mistake
- one of the problems is for people used to imagery data; however, altimetry is **not** imagery, but multi-parameter, along-track data…

Newest developments



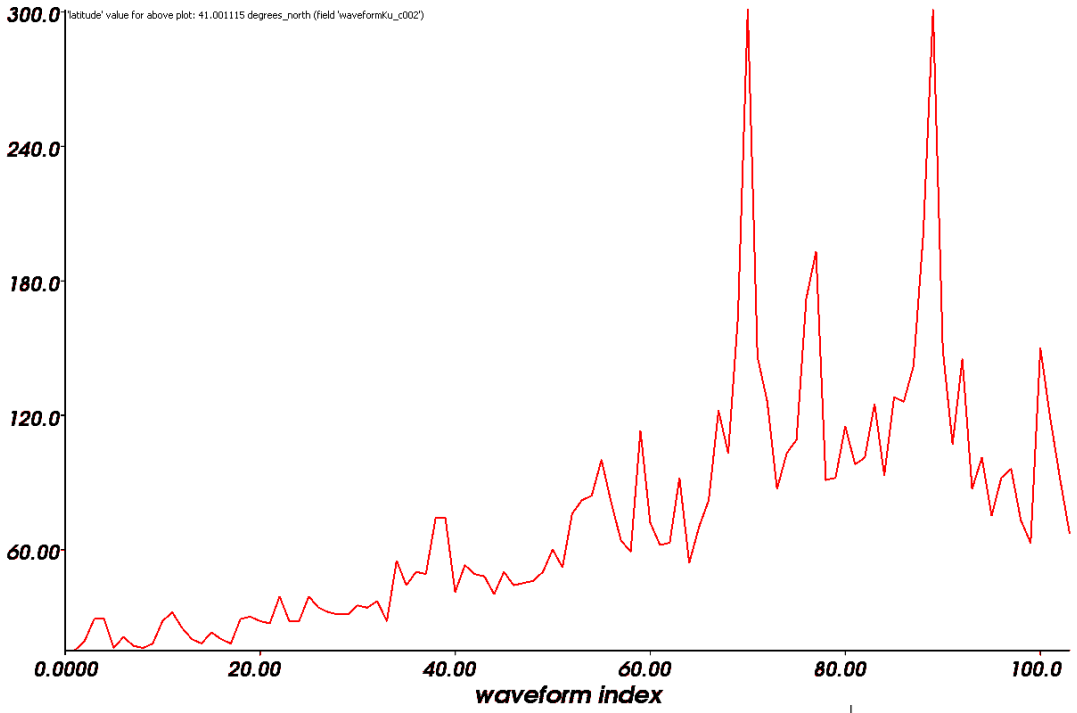
- Tutorial upgrades:
  - Four more Data use cases (Hydrology, Land, Ice and Sea ice)
  - Tutorial additional information
- Toolbox upgrades:
  - Ergonomic improvements
  - Brat Direct product interface
  - Mac OS X version
  - Data Pre-Selection: select only the potentially relevant files for faster processing
  - Waveform plots
  - Generic 3D plots (plot of any field wrt any two other fields)
  - Geo-localised output images (to be merged with e.g. MERIS maps)
  - River & Lake products

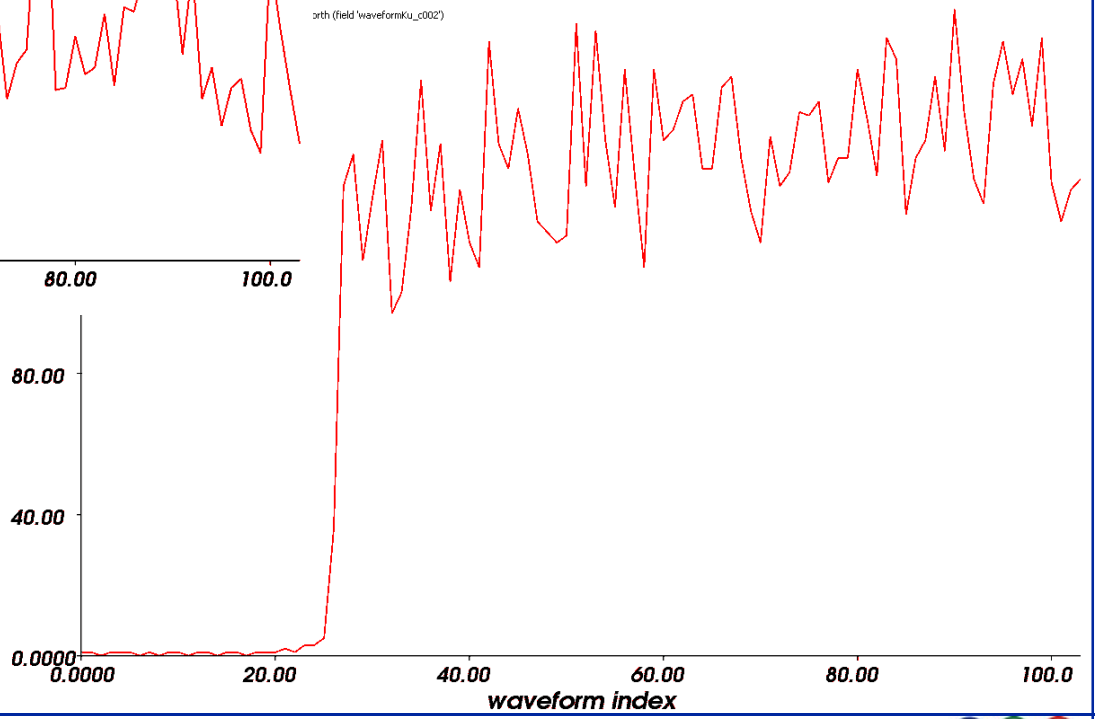
Ergonomy improvements



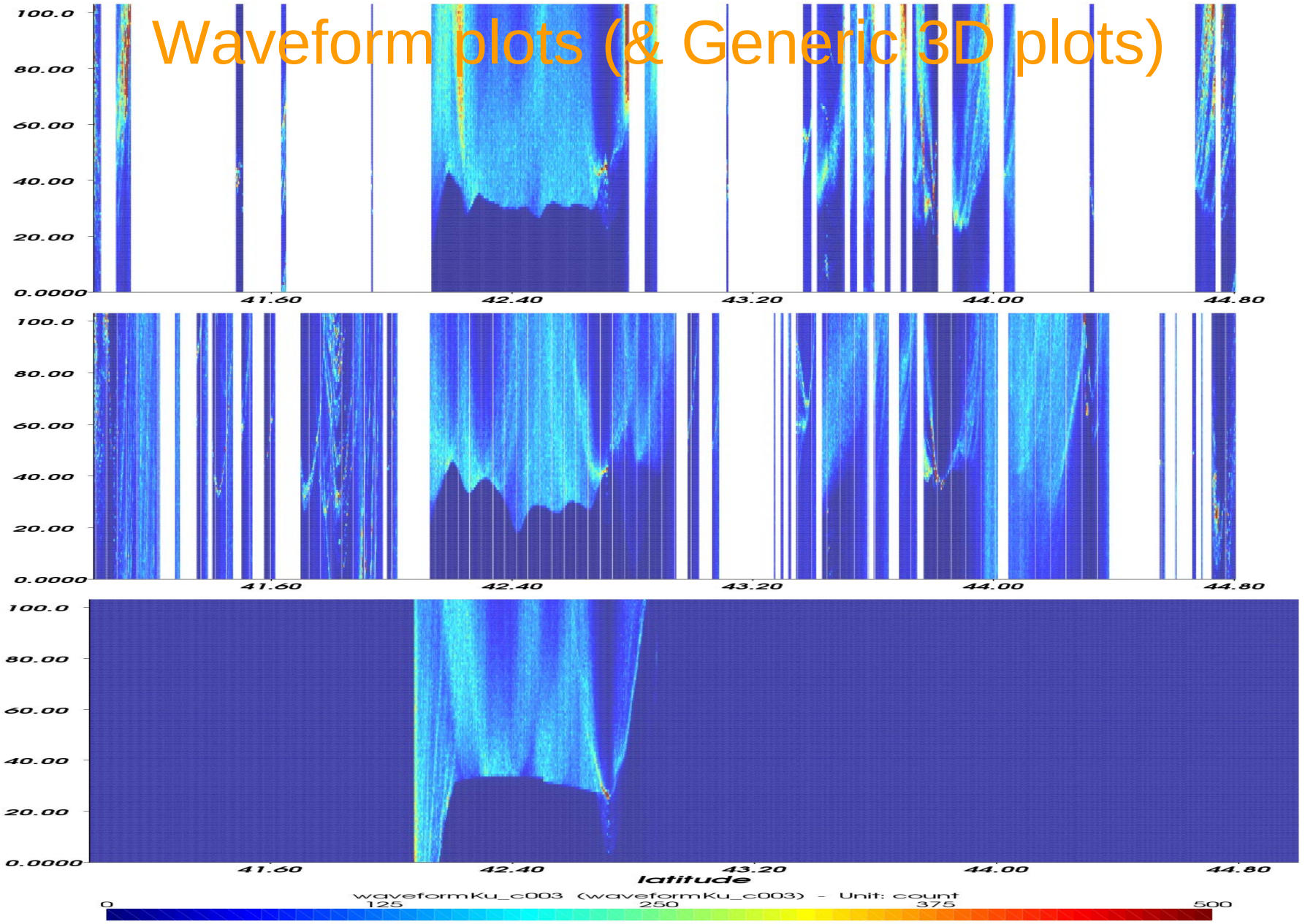
- Optional information as pop-ups appearing when clicking on a button (→interface less crowded)
- Drag&Drop to fill information
- “Export” button

Waveform plots

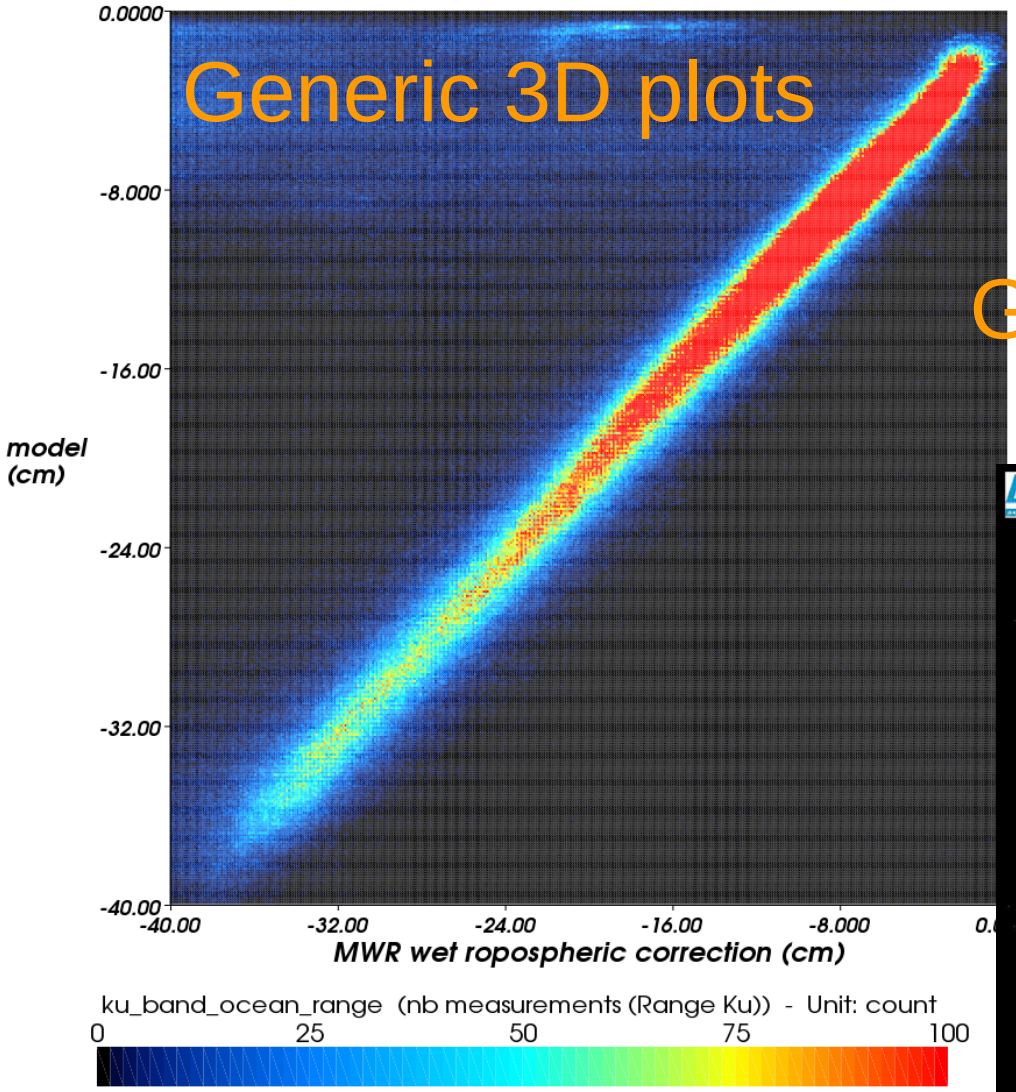




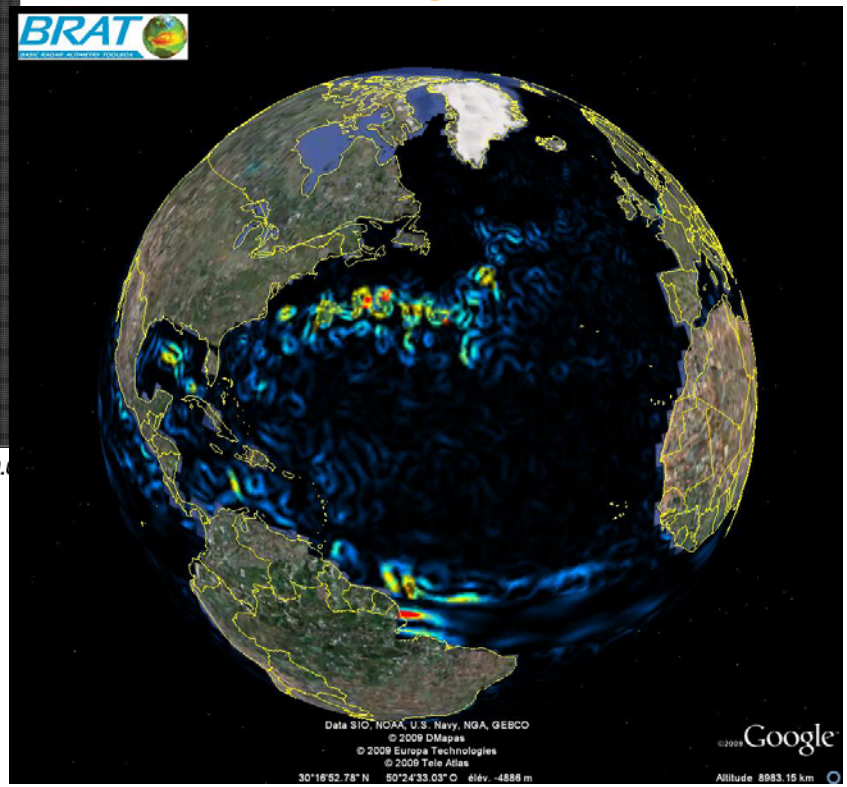
Waveform plots (& Generic 3D plots)



Generic 3D plots



GeoTiff & Google Earth output



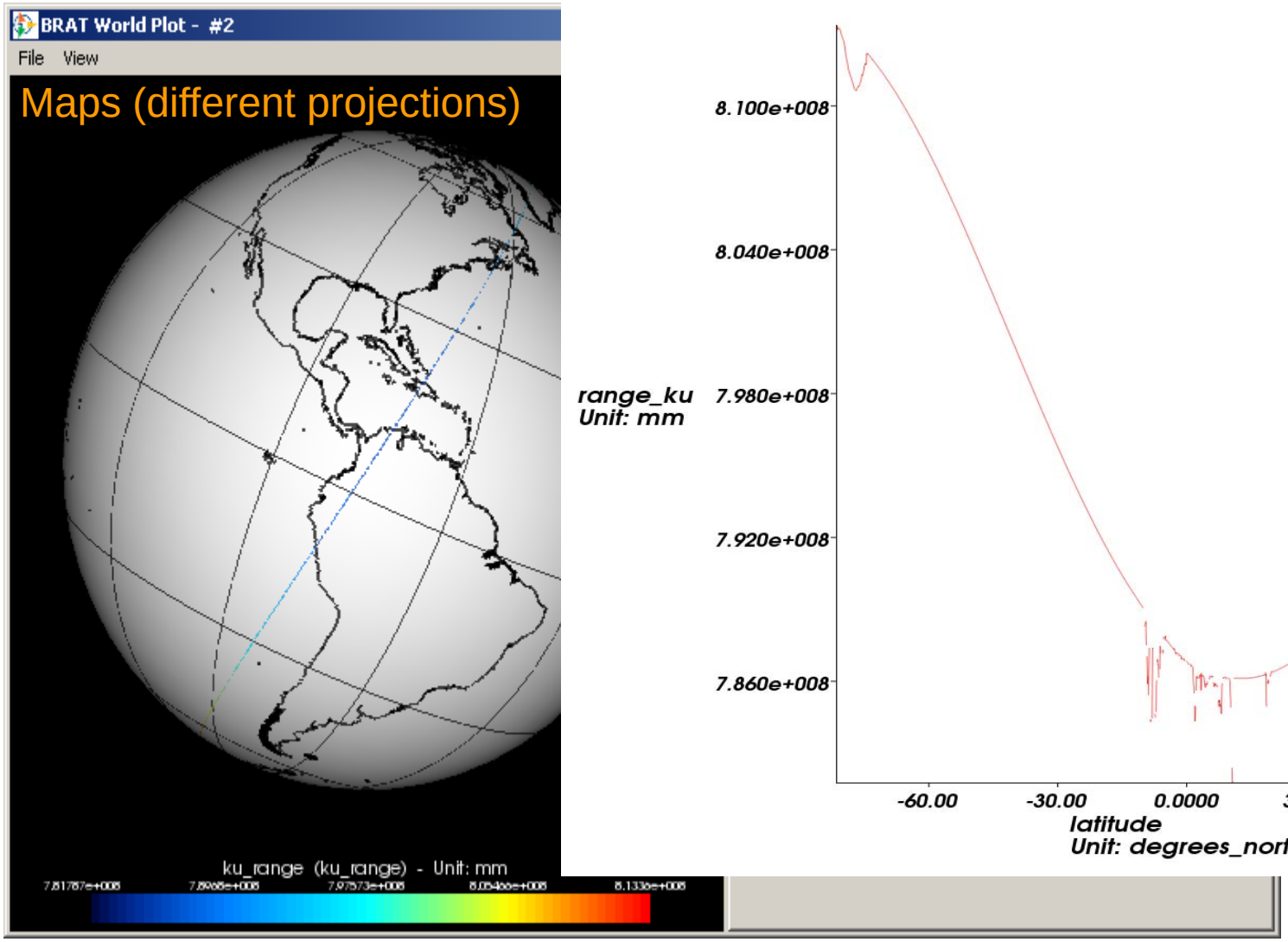
For more information

http://www.altimetry.info

(mirror on http://earth.esa.int/brat/)

Functionalities

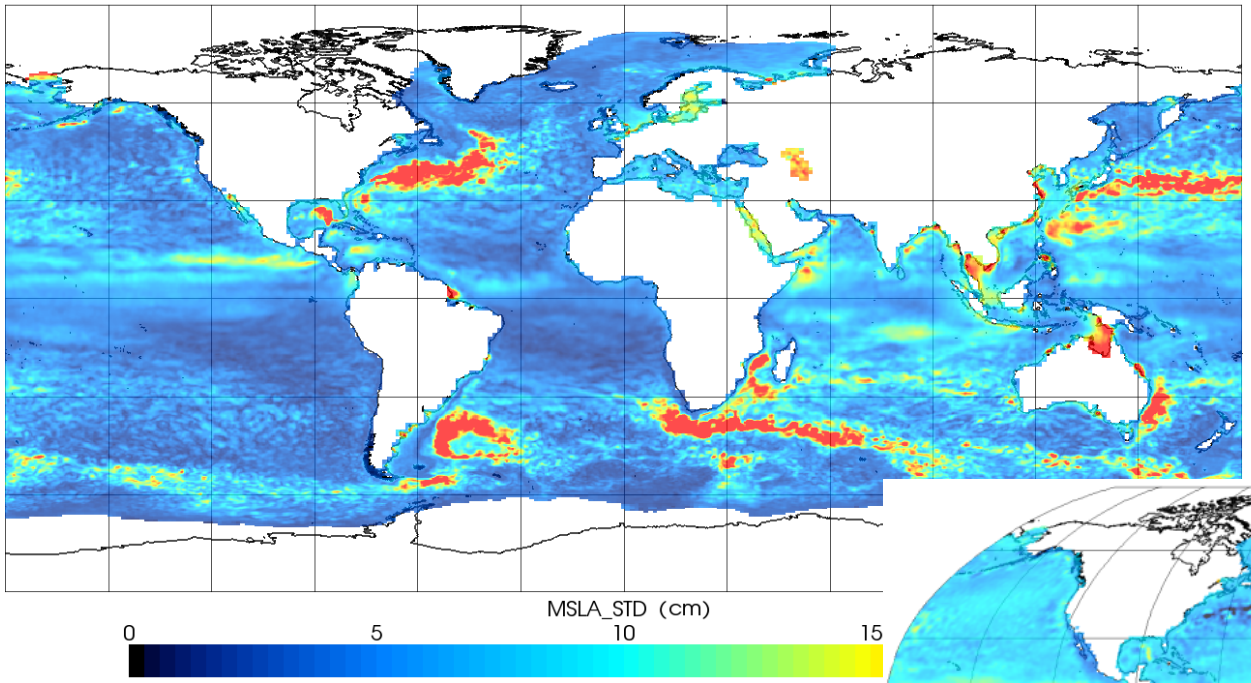
Data quick-look & visualisation



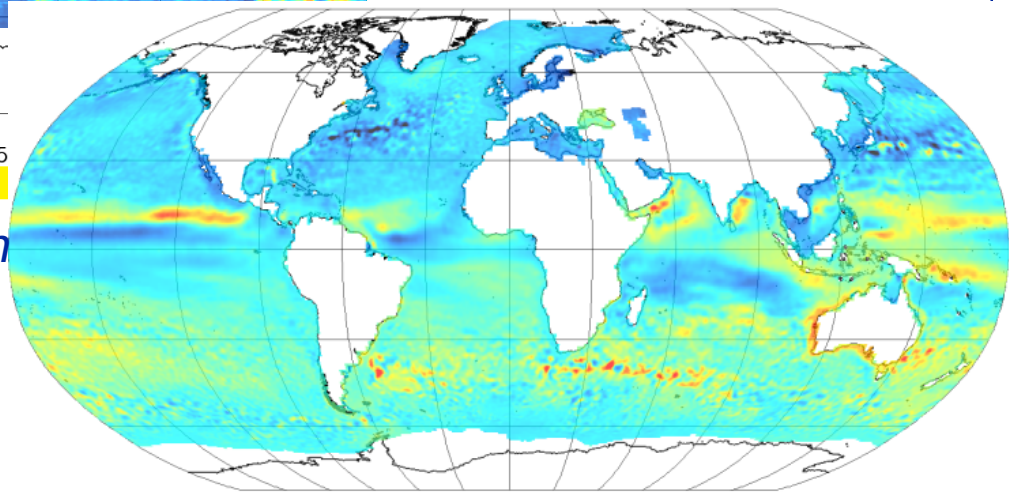
Curves

Statistics

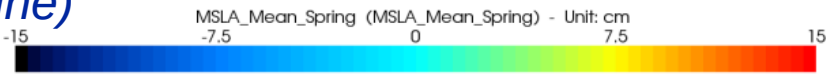
+ *Minimum,*
Maximum



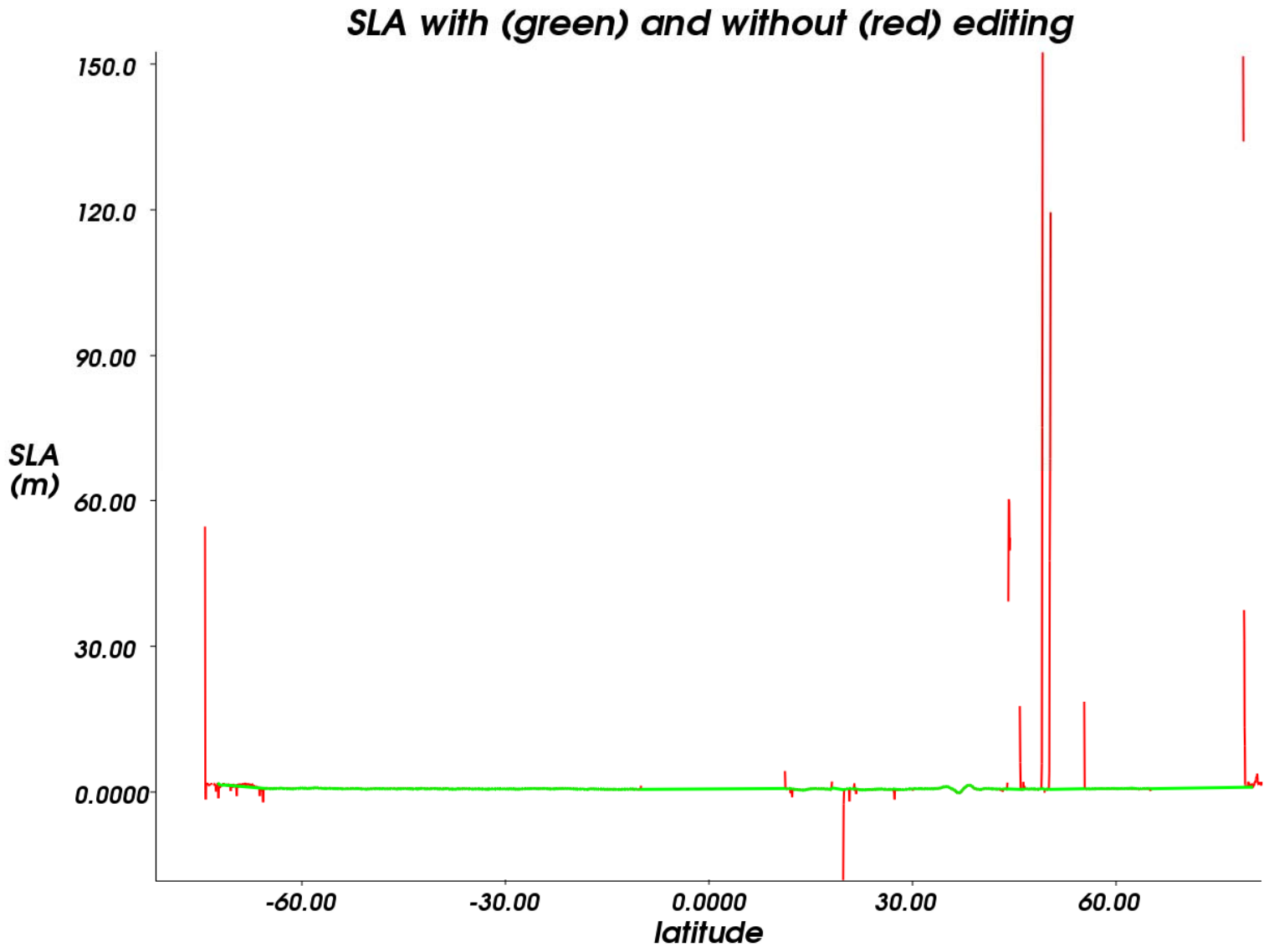
Sea Level Anomalies Standard deviation



Mean of Sea Level Anomalies over the Springs 1993-2006 (April-May-June)



Data editing

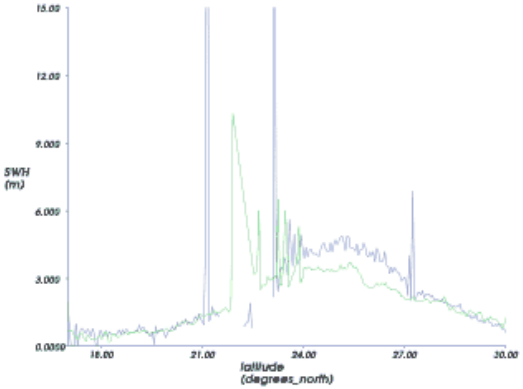


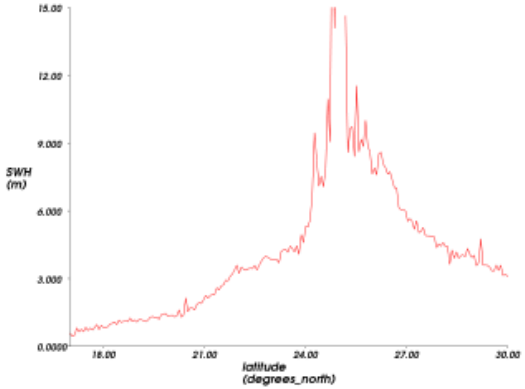
examples

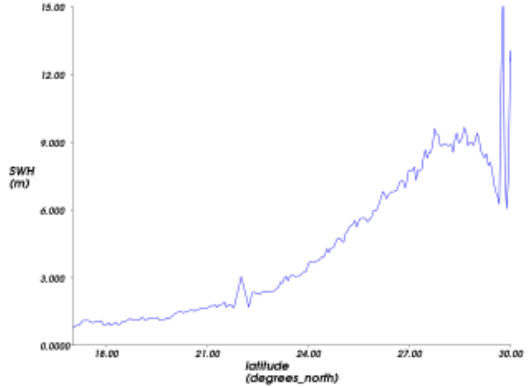
Hurricane Katrina

Jason-1 & T/P | Envisat | GFO

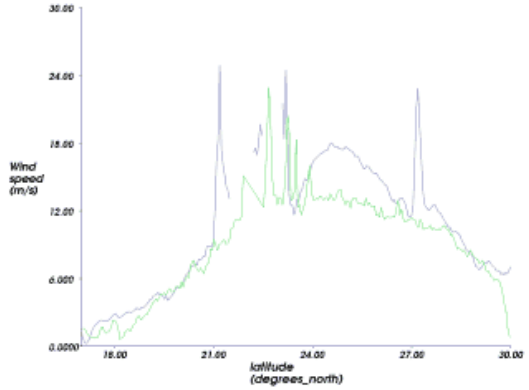
SWH

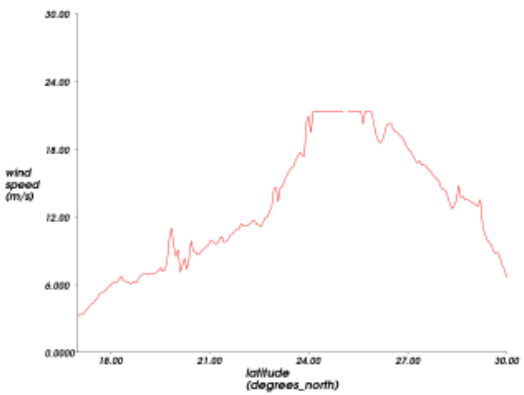


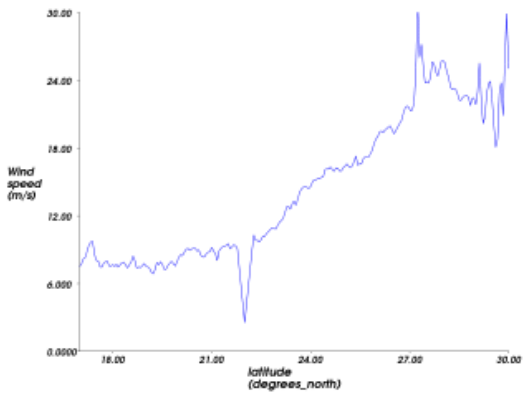


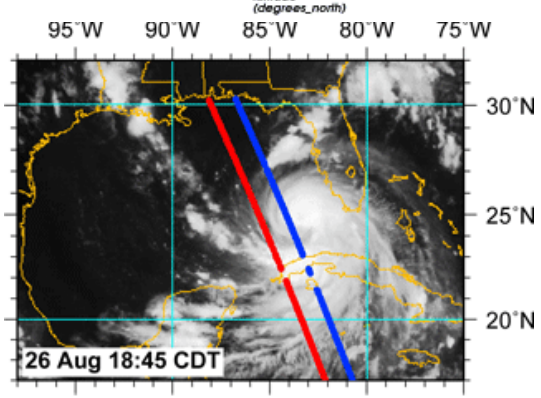


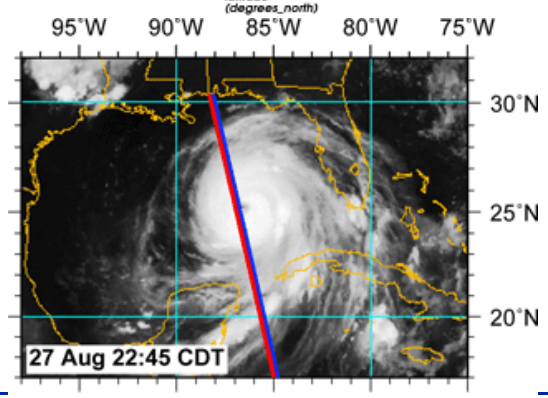
Wind

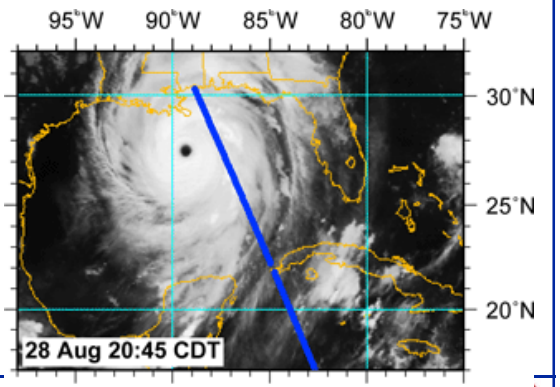






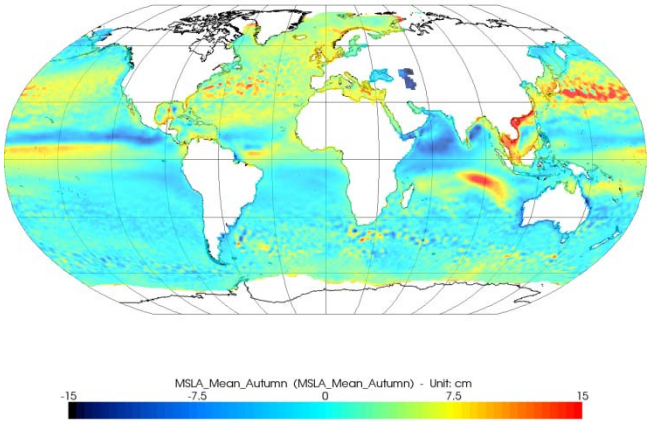




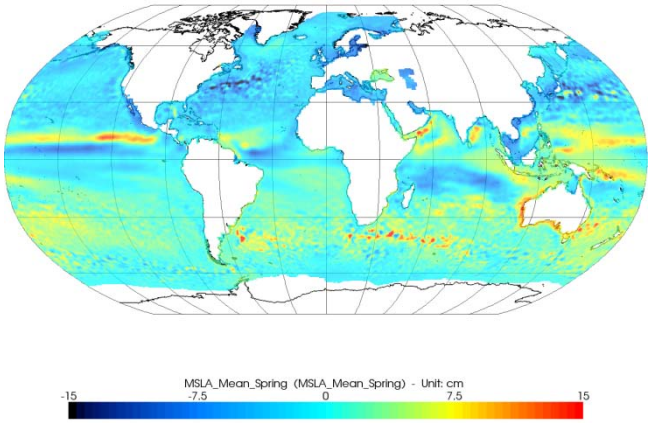


Sea level anomaly seasonal variations

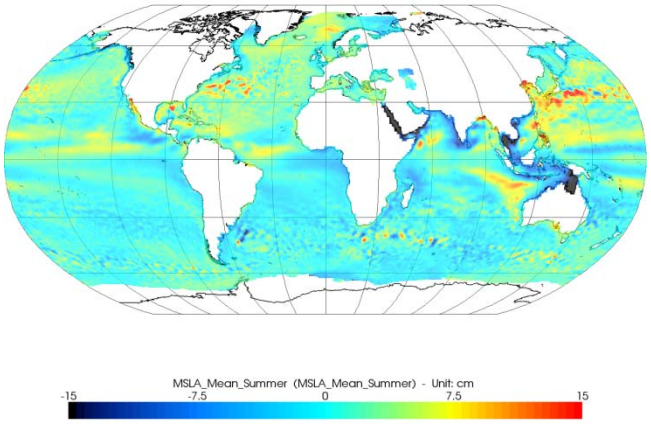
Autumn



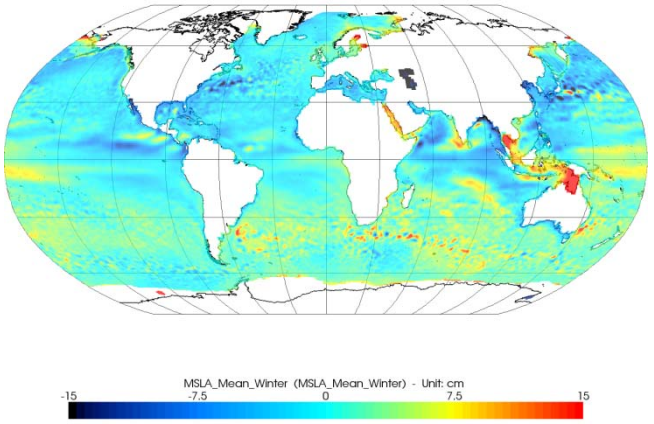
Spring



Summer

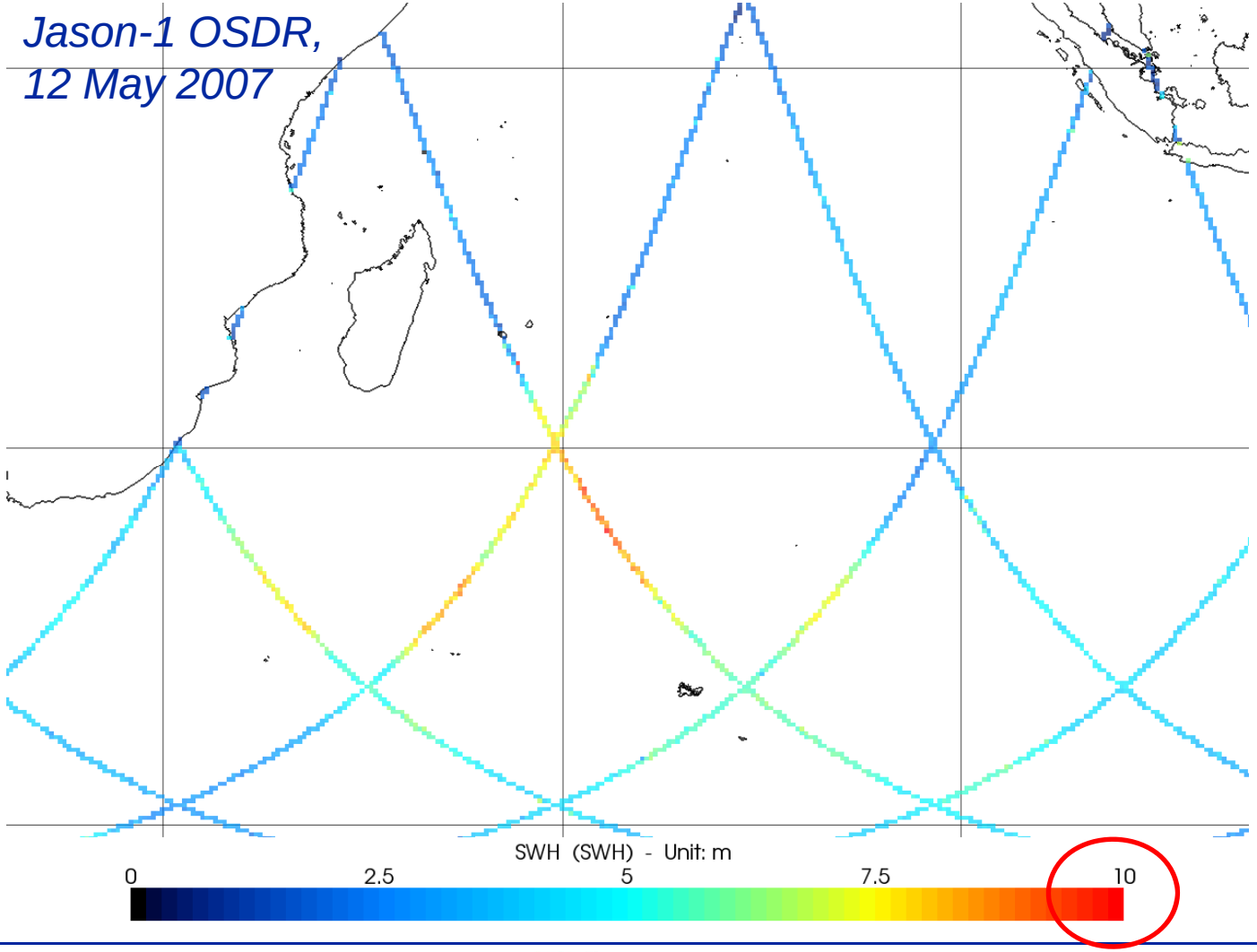


Winter

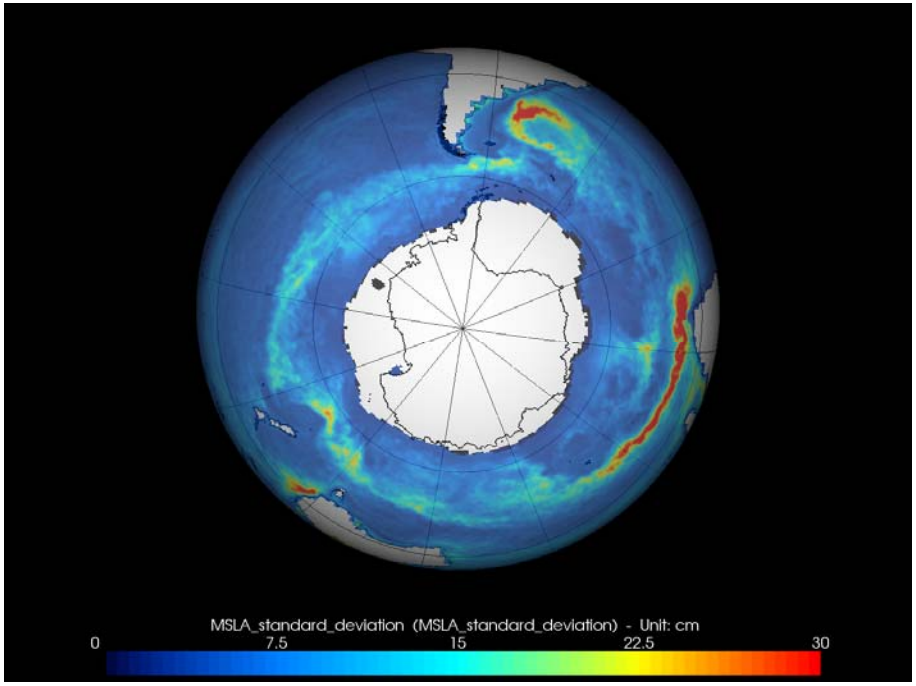


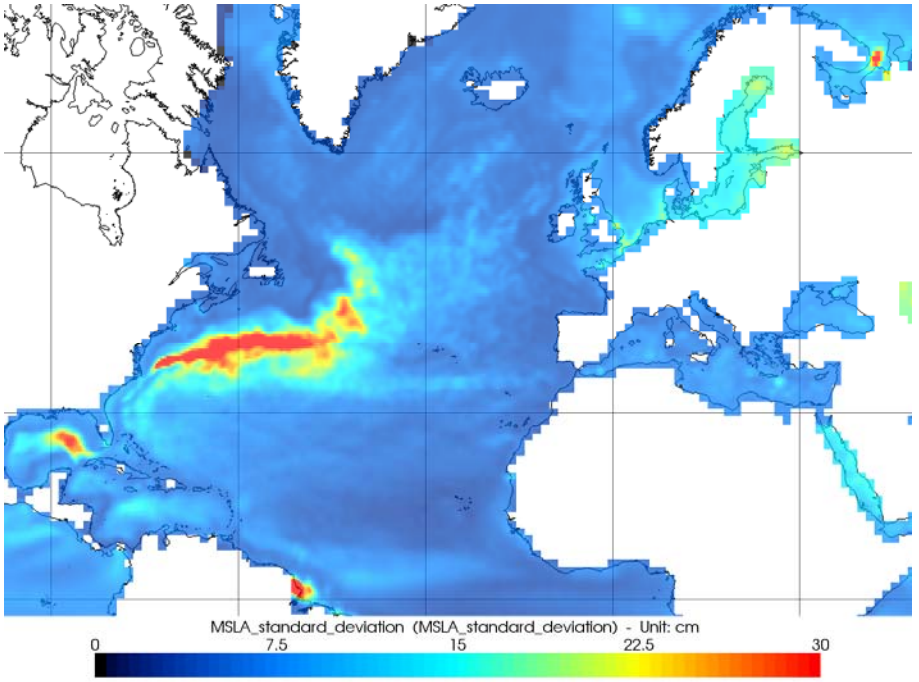
Southern swell, May 2007

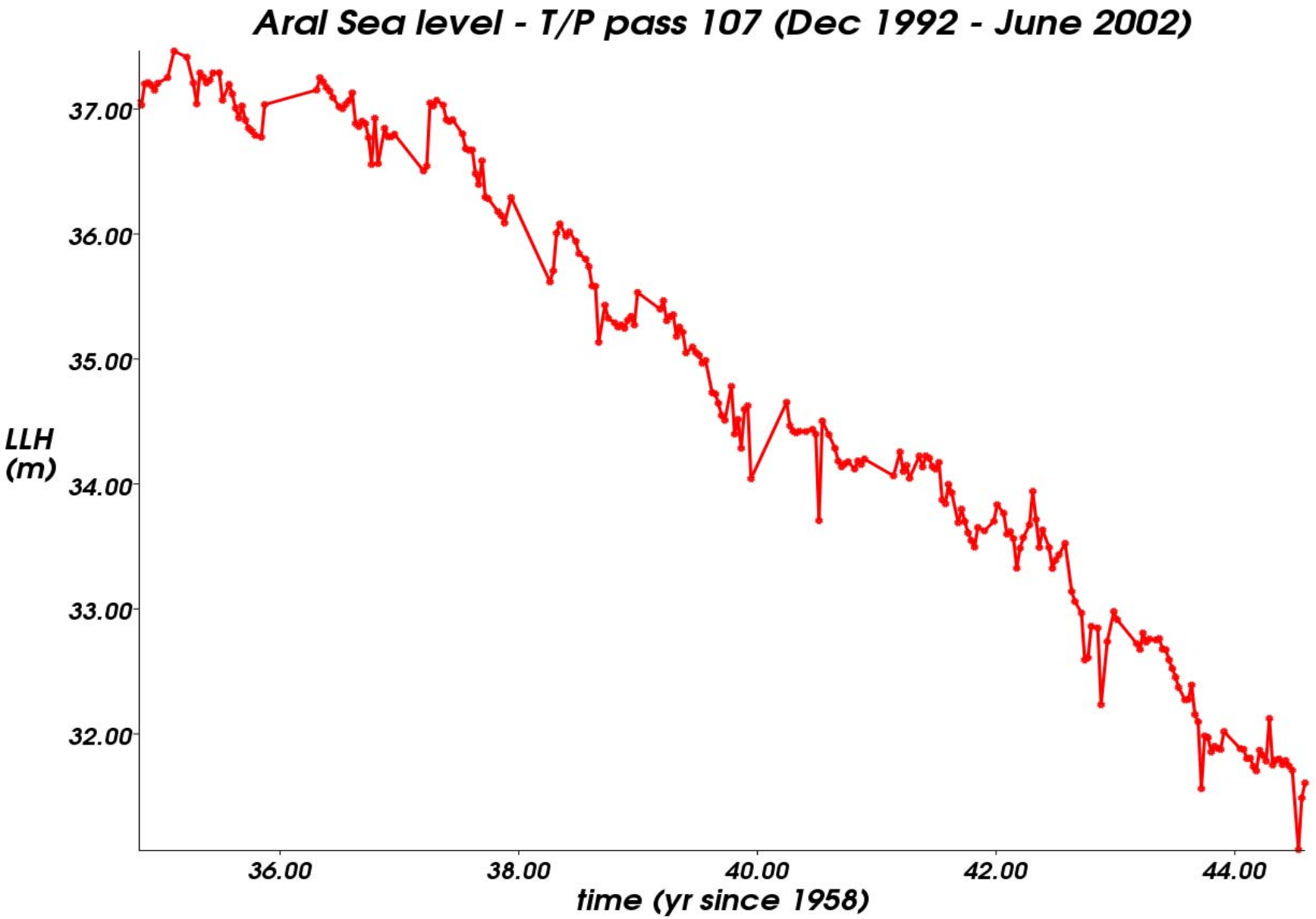
Jason-1 OSDR,
12 May 2007



Ocean variability
(SLA standard deviation over 15 years)






Aral Sea level - T/P pass 107 (Dec 1992 - June 2002)
37.00
36.00
35.00
34.00
33.00
32.00
LLH (m)
36.00
38.00
40.00
42.00
44.00
time (yr since 1958)