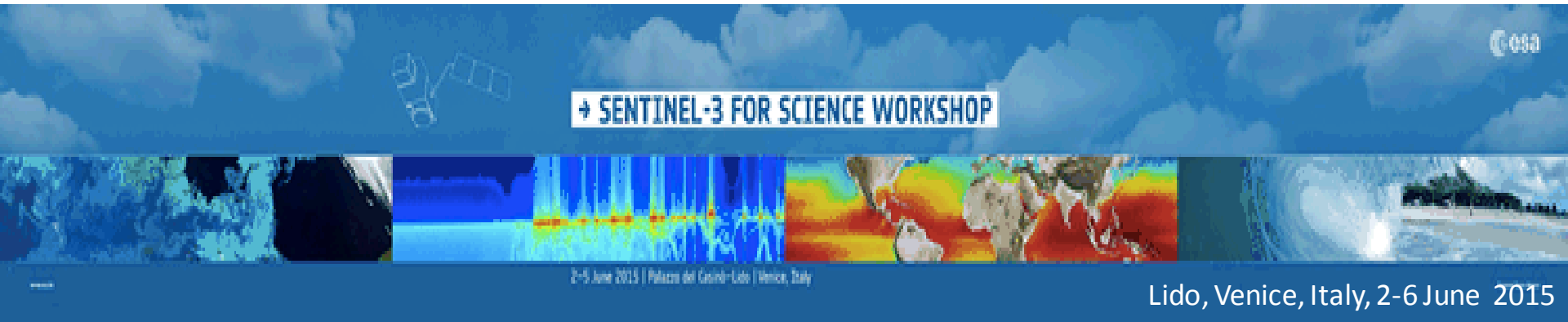
GlobCurrent: Sentinel-3 Synergy in Action

An ESA funded project under DUE up to December 2016

www.globcurrent.org



Lido, Venice, Italy, 2-6 June 2015

The Team

Nansen Center	J.A. Johannessen, R. Danielson, A. Korosov, R. Raj, M. Hansen
Ifremer	B. Chapron, J.-F. Piollé, J. Tournadre
PML	G. Quartly, F. Nencioli, M. Warren
CLS	M.-H. Rio, G. Larnicol, S. Labroue
isardSAT UK	M. Roca, R. Escola
ODL	F. Collard
Univ. of Exeter	J. Shutler

GlobCurrent Overall Objective

Advance the quantitative estimation of ocean surface currents from satellite sensor synergy.

Demonstrate impact in user led scientific, operational and commercial applications.

Improve and strengthen the uptake of satellite measurements.

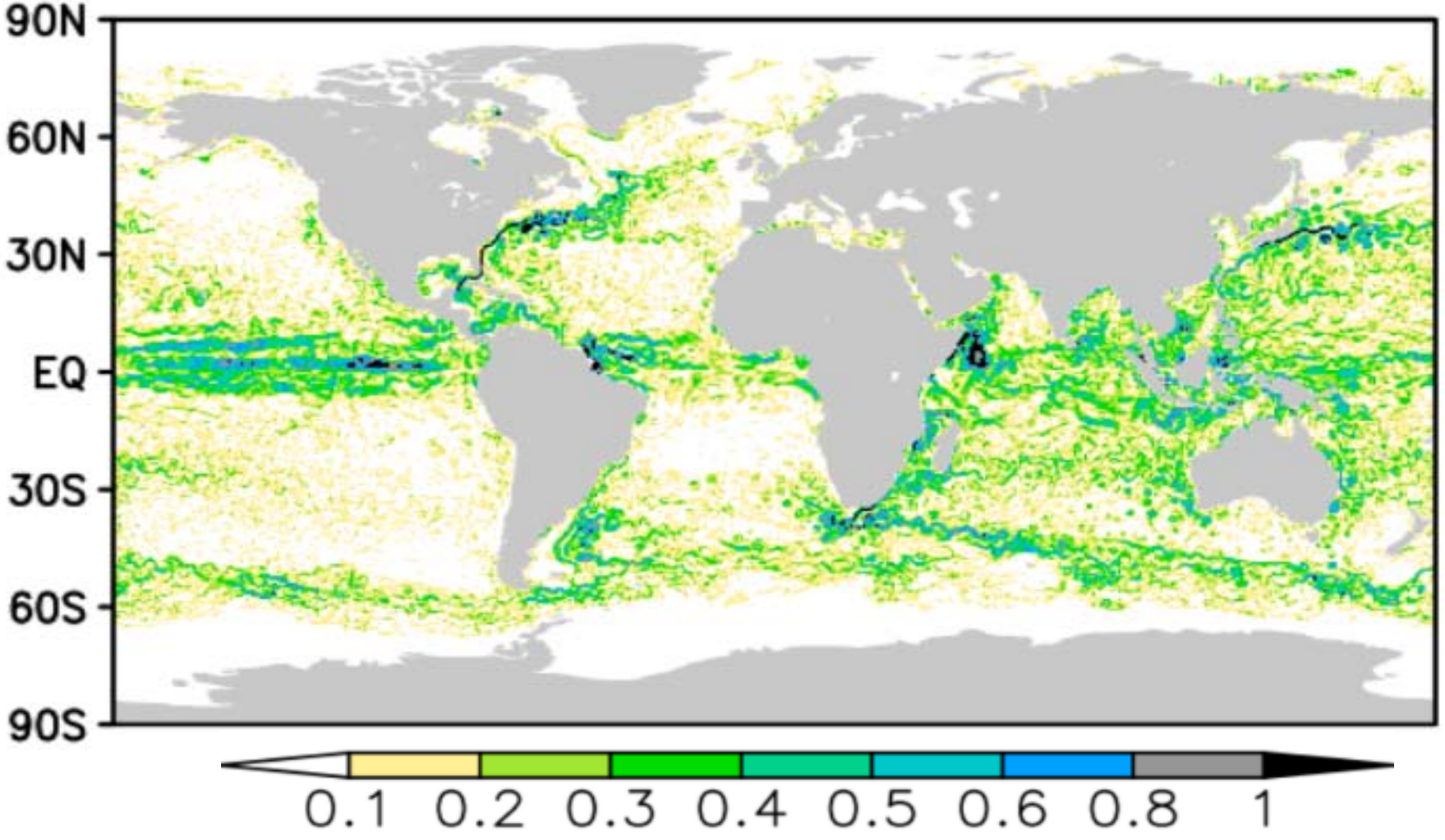
GlobCurrent Product (download from www.globcurrent.org)

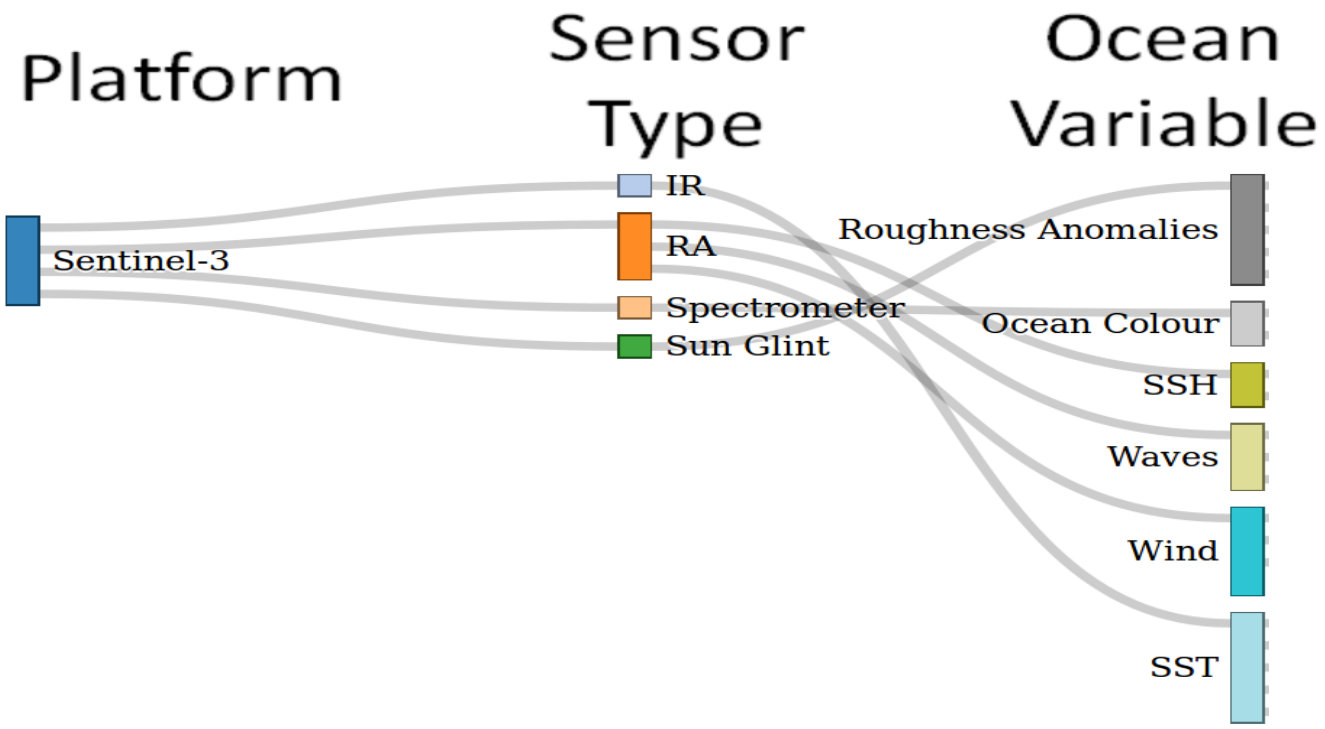
Global data interpolated to a 10 km grid at 3 hour intervals covering 3-years from 2010 to 2012 include:

- Surface geostrophic current (Alt, GOCE, GRACE)
- Surface and 15 m Ekman current (Scatterometer, Argo, surface drifters)
- Stokes drift (Wave model)

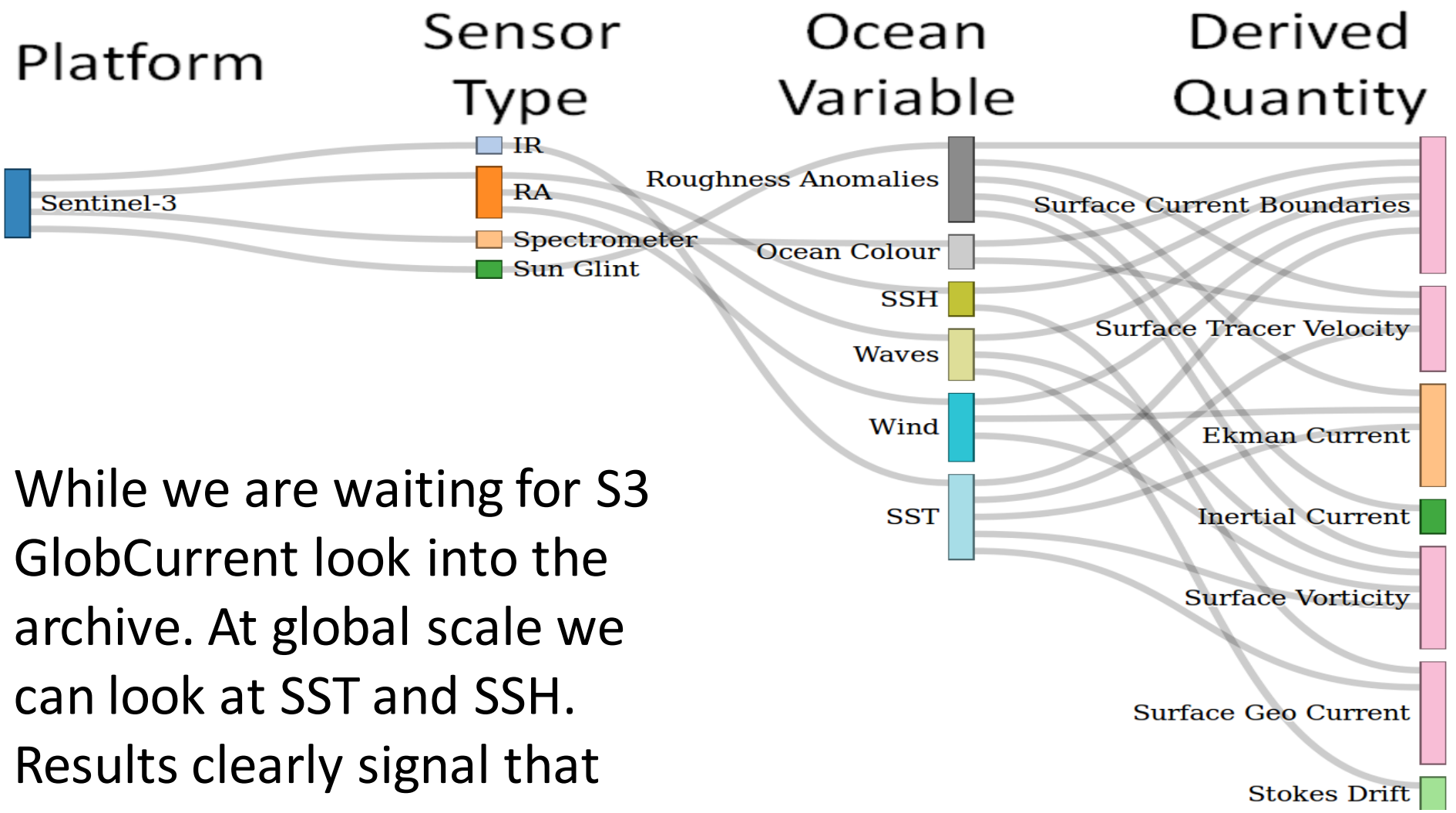
GLOBCURRENT

Global Surface Geostrophic Current Product



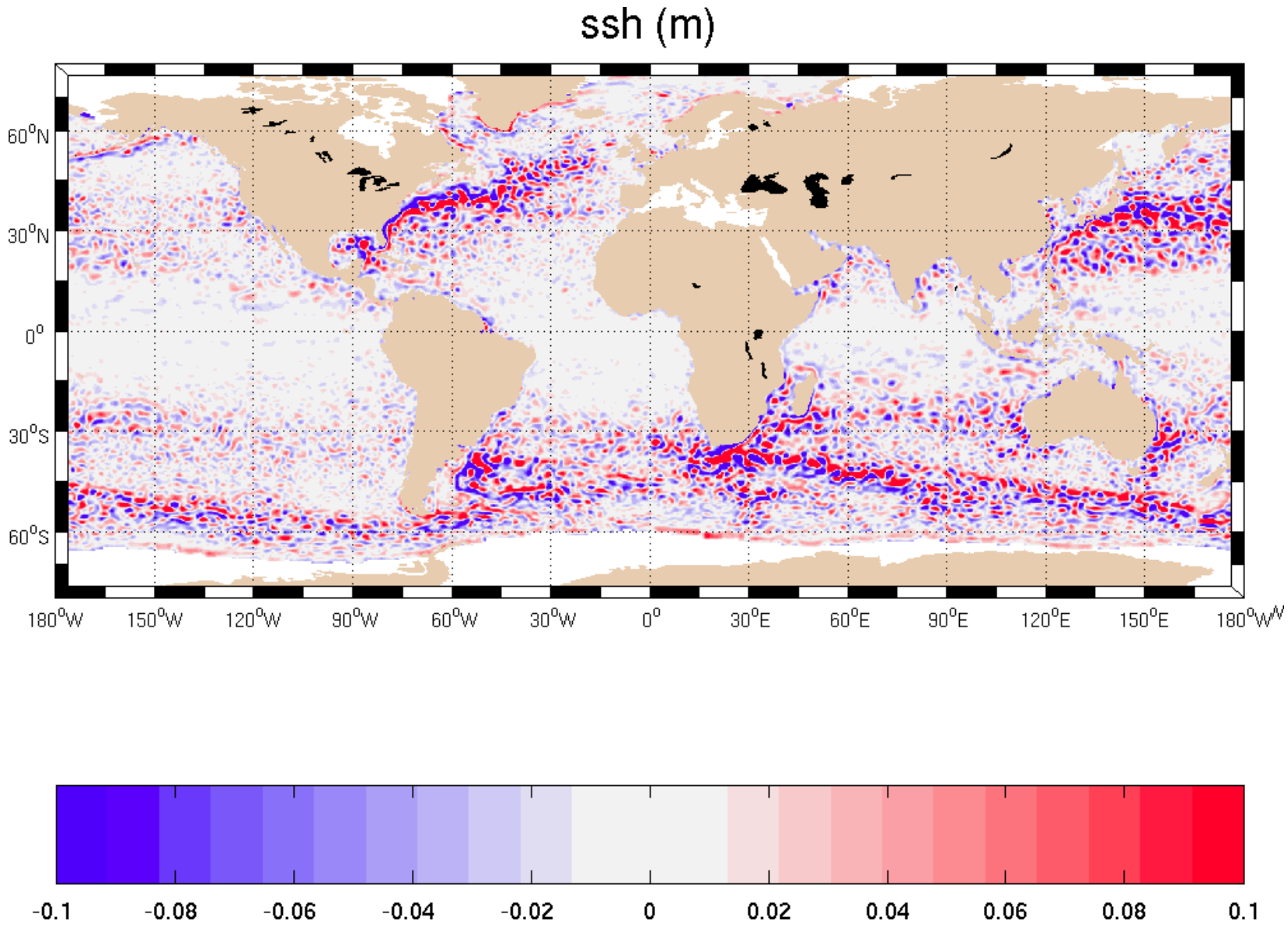


GLOBCURRENT



While we are waiting for S3 GlobCurrent look into the archive. At global scale we can look at SST and SSH. Results clearly signal that Our Expectation is HIGH.

Example SST and SSH gradients DISPLAY CURRENT FRONTS (global scale)

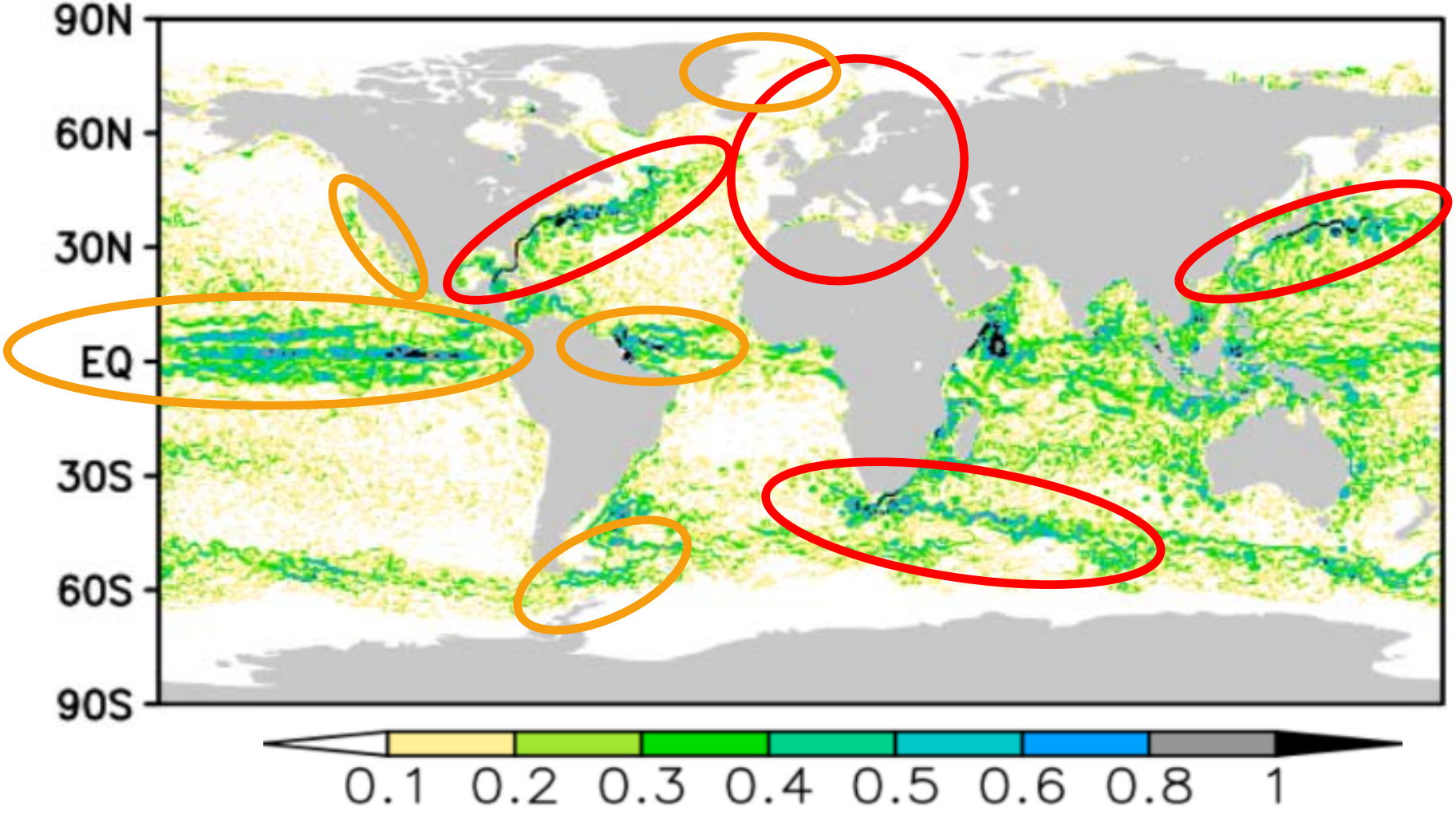


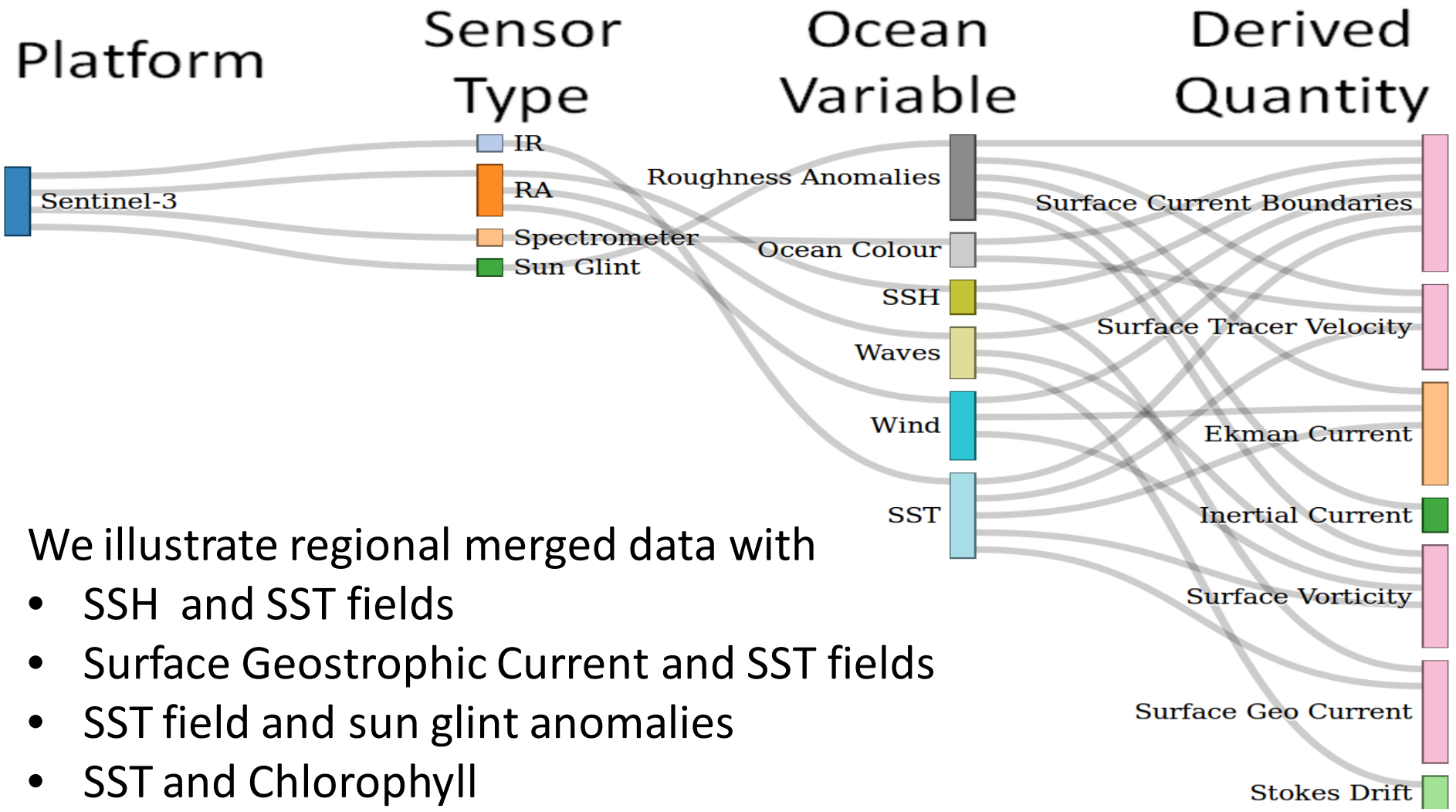
GlobCurrent Product (at www.globcurrent.org)

The global product will soon be blended with higher resolution regional data including

- Sea surface frontal features and their motion (SST, OC, ALT, SAR)
- Range Doppler velocities (SAR)
- Sun glint
- Other higher level (2-4) products

Candidate Regional Data Merging Sites - SUPERSITES

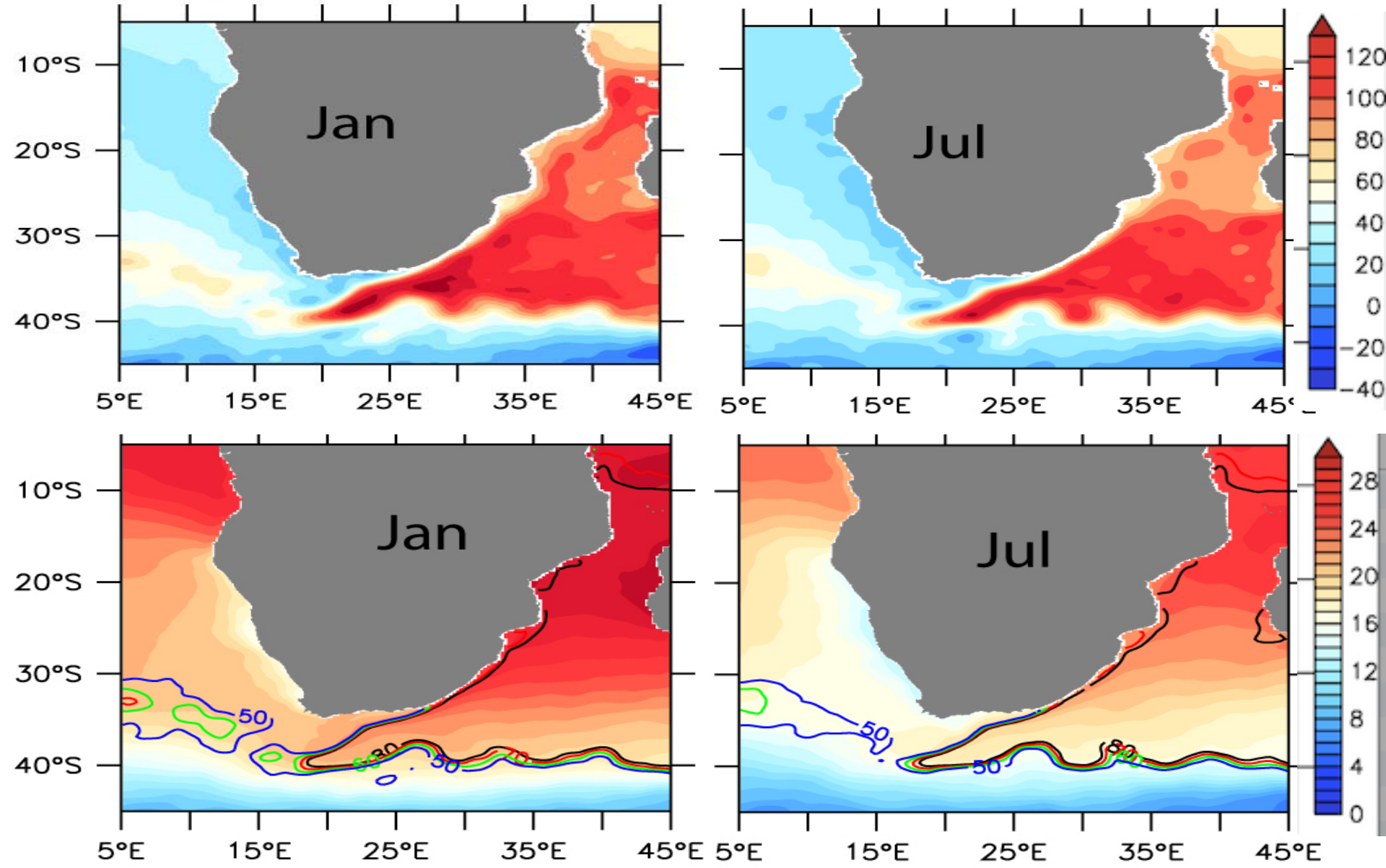


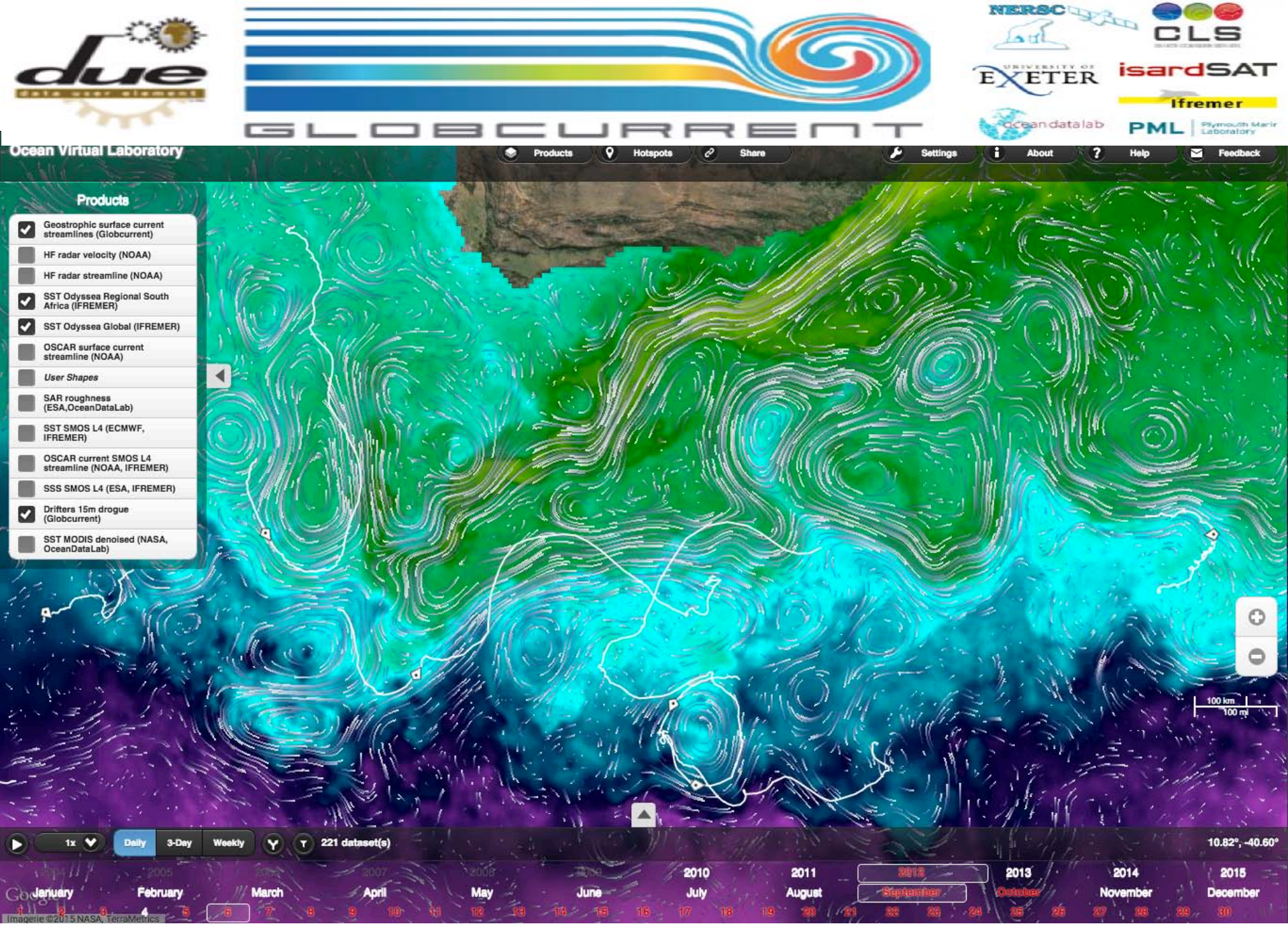


We illustrate regional merged data with

- SSH and SST fields
- Surface Geostrophic Current and SST fields
- SST field and sun glint anomalies
- SST and Chlorophyll
- Lagrangian forward/backward advection from combined SST and altimetry

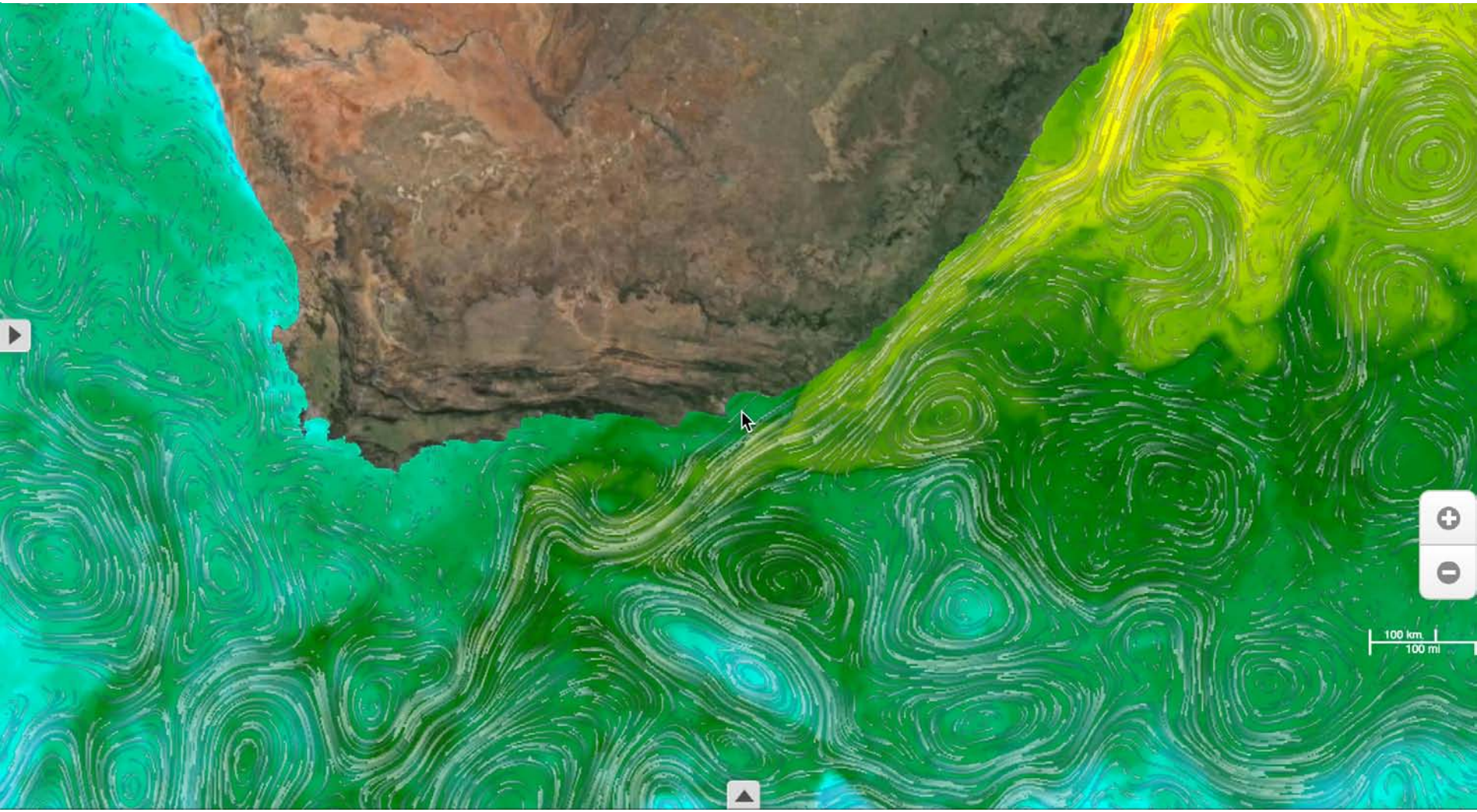
CLIMATOLOGY OF SSH AND SST (regional scale, 1993-2012)



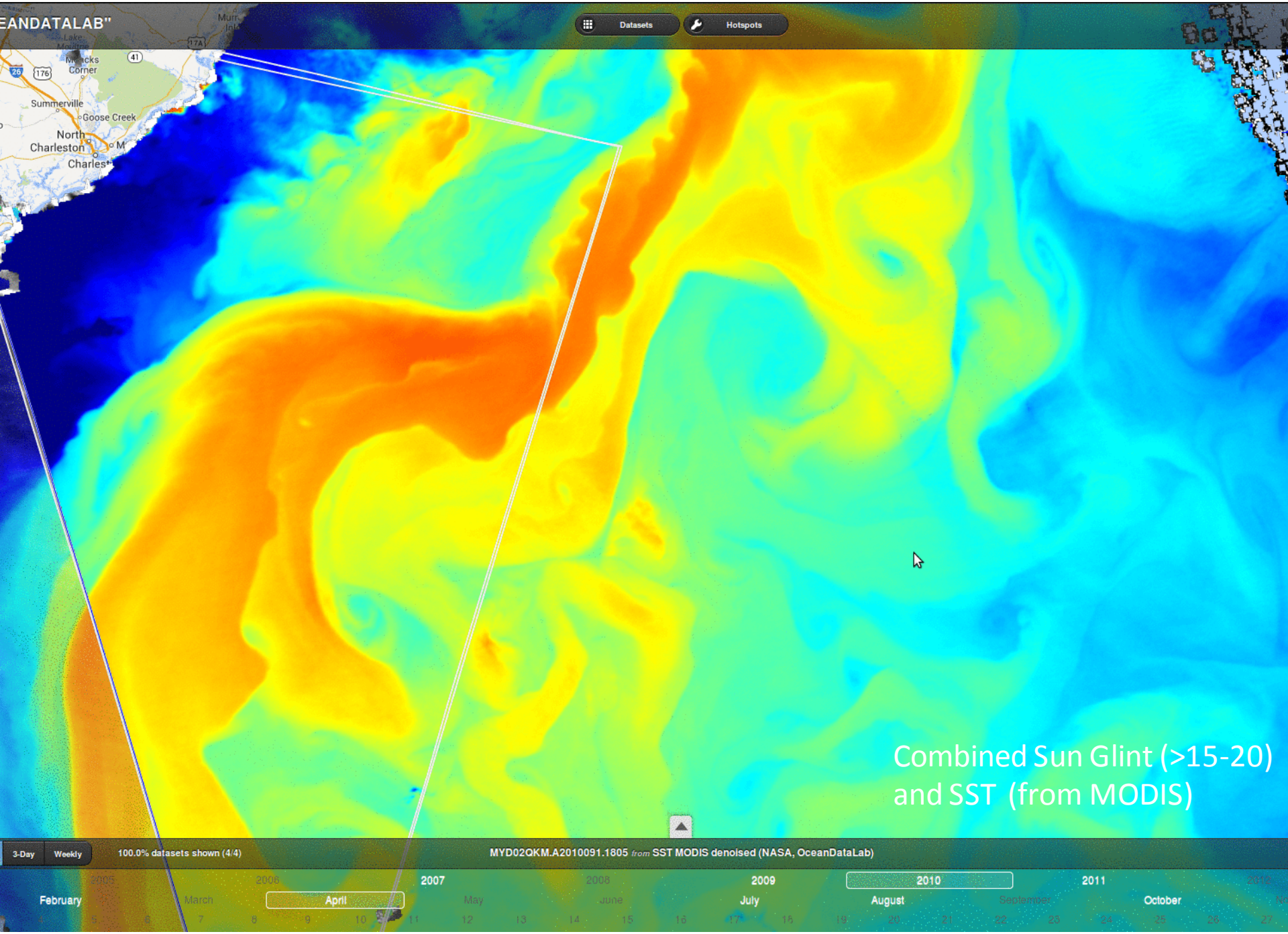


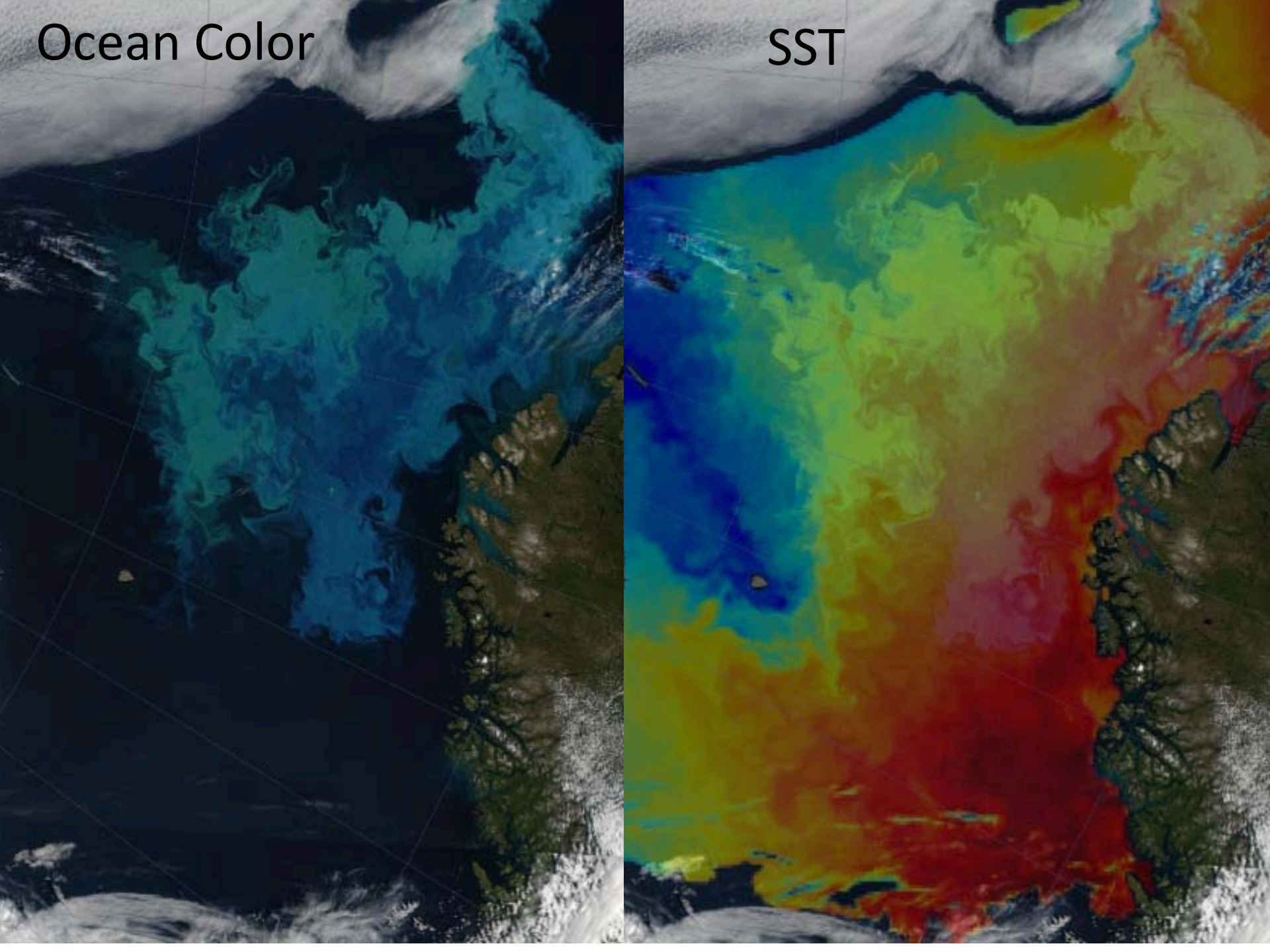
SNAPSHOT 6 SEPTEMBER 2012

Lido, Venice, Italy, 2-6 June 2015

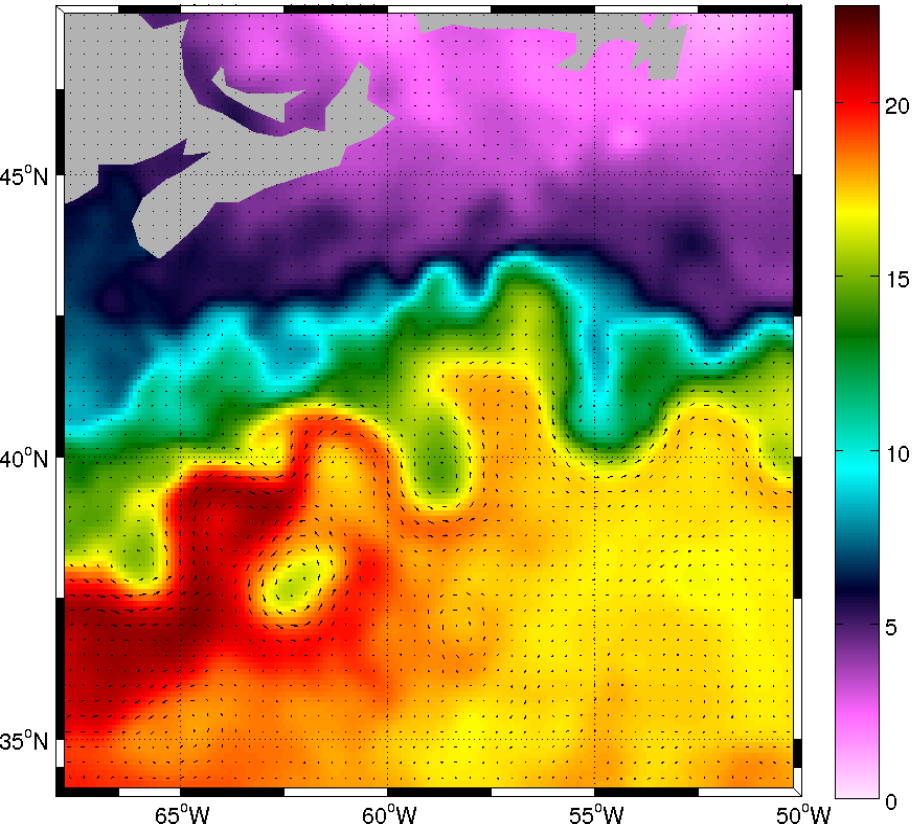


Lido, Venice, Italy, 2-6 June 2015

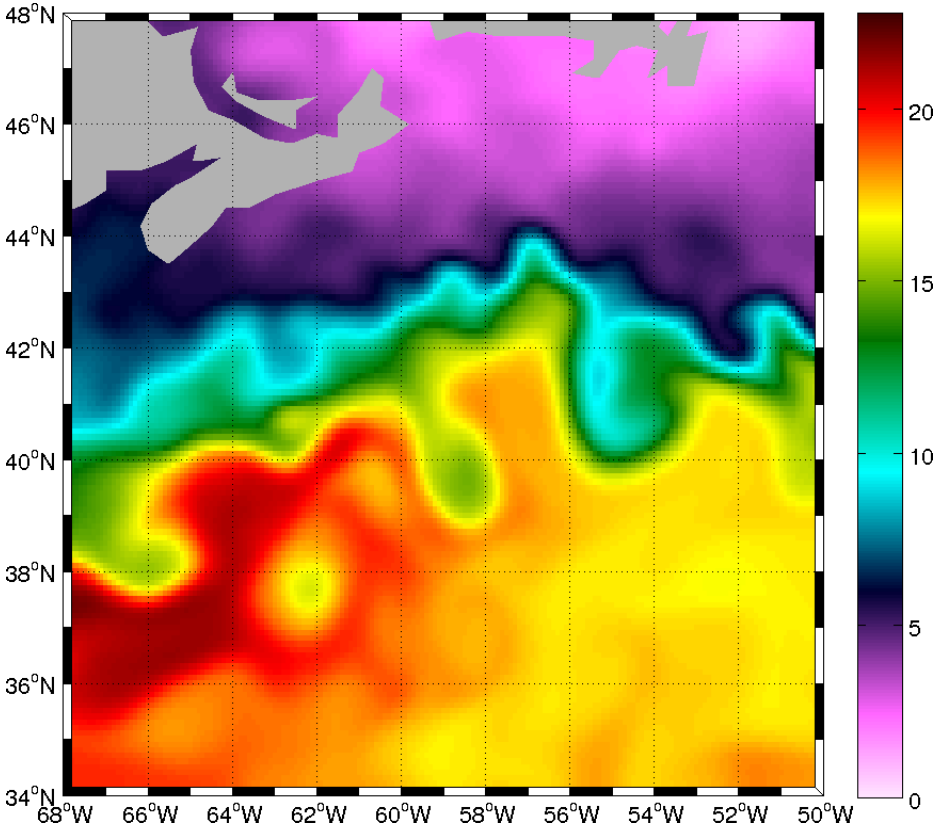

EANDATALAB"
Datasets
Hotspots
Summerville
Goose Creek
North Charleston
Combined Sun Glint (>15-20) and SST (from MODIS)
3-Day
Weekly
100.0% datasets shown (4/4)
MYD02QKM.A2010091.1805 from SST MODIS denoised (NASA, OceanDataLab)
2005
2006
2007
2008
2009
2010
2011
February
March
April
May
June
July
August
September
October


Ocean Color
SST

Forward Lagrangian Advection from 02/05 to 06/05 2010

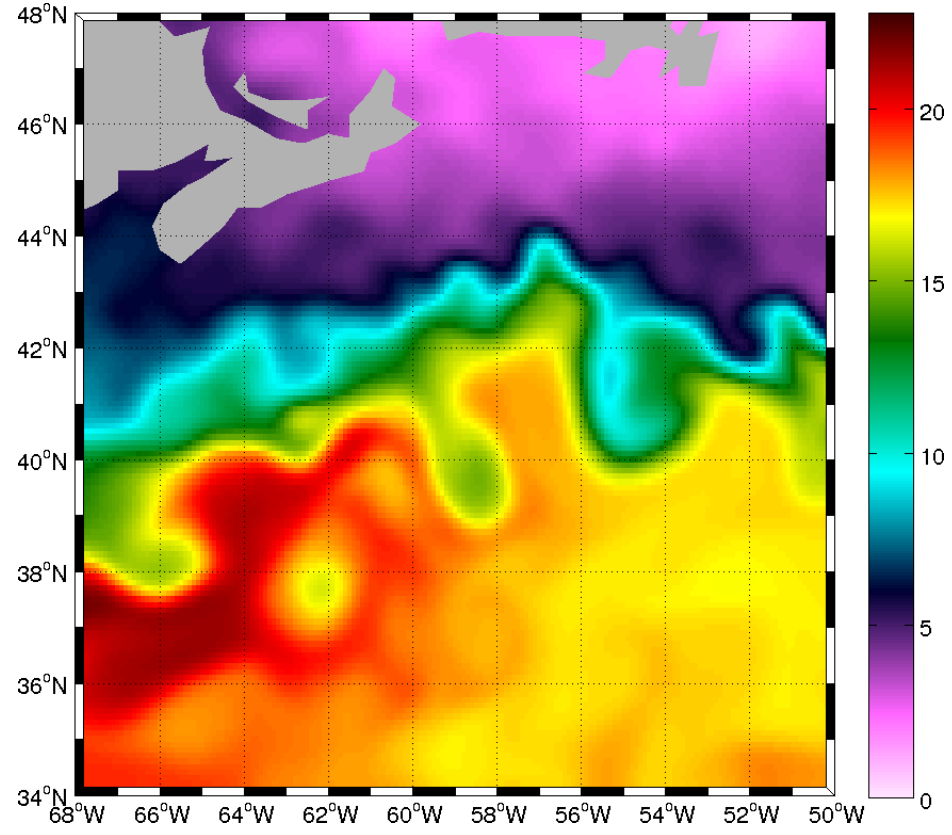


SST and AVISO Current Vectors at 25 km resolution (02/05/2010)

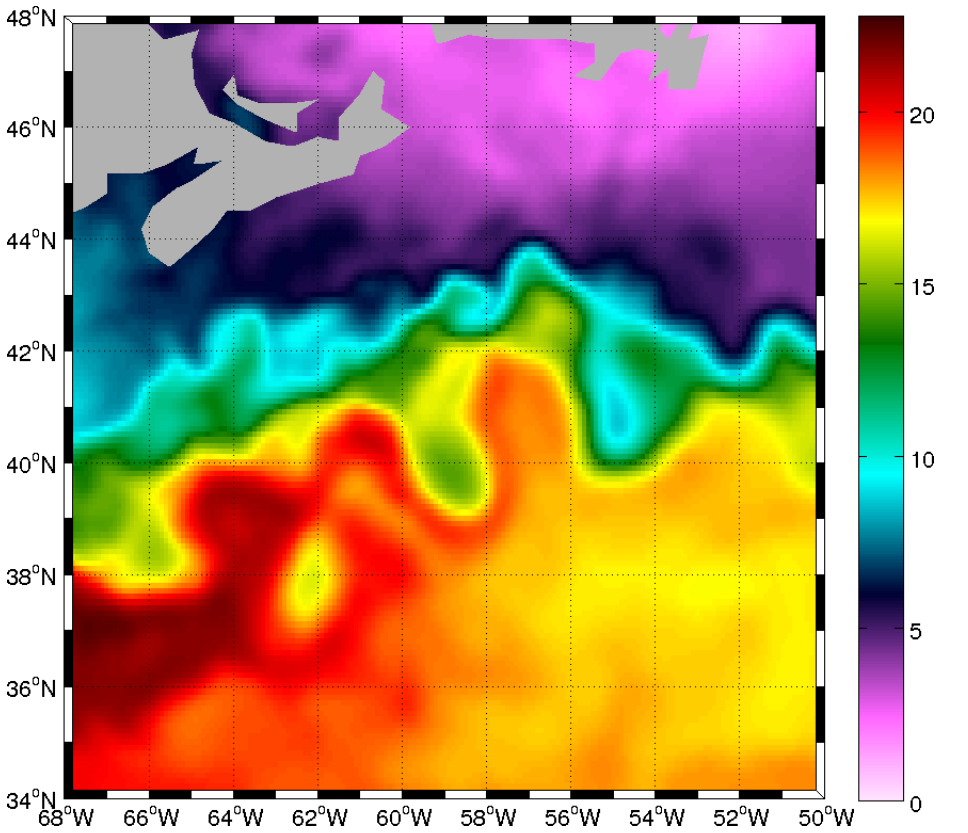


06/05/2010 - « smoothed » advected SST (4 days)

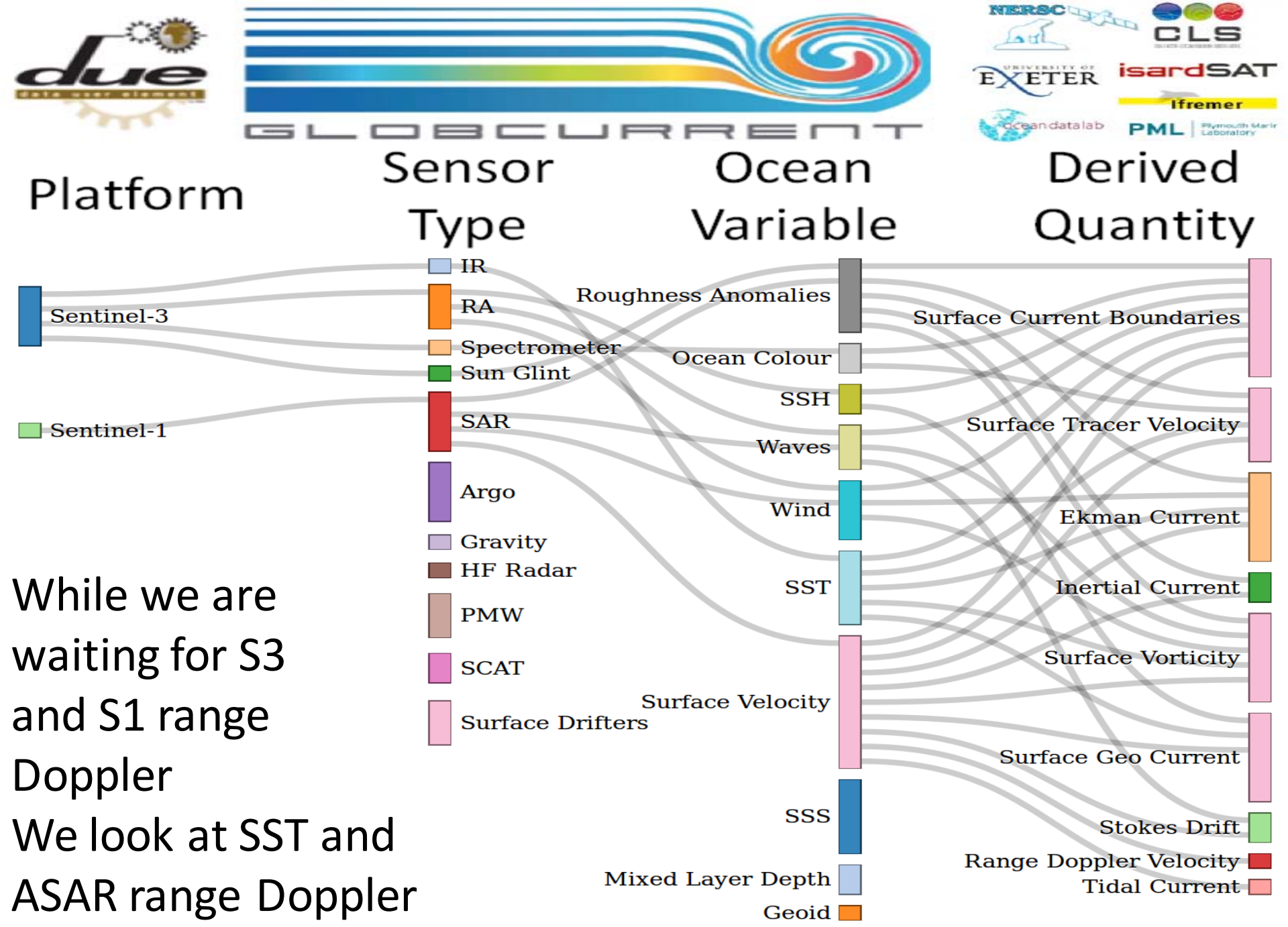
Forward Lagrangian Advection from 02/05 to 06/05 2010



06/05/2010 - « smoothed » advected SST (4 days)

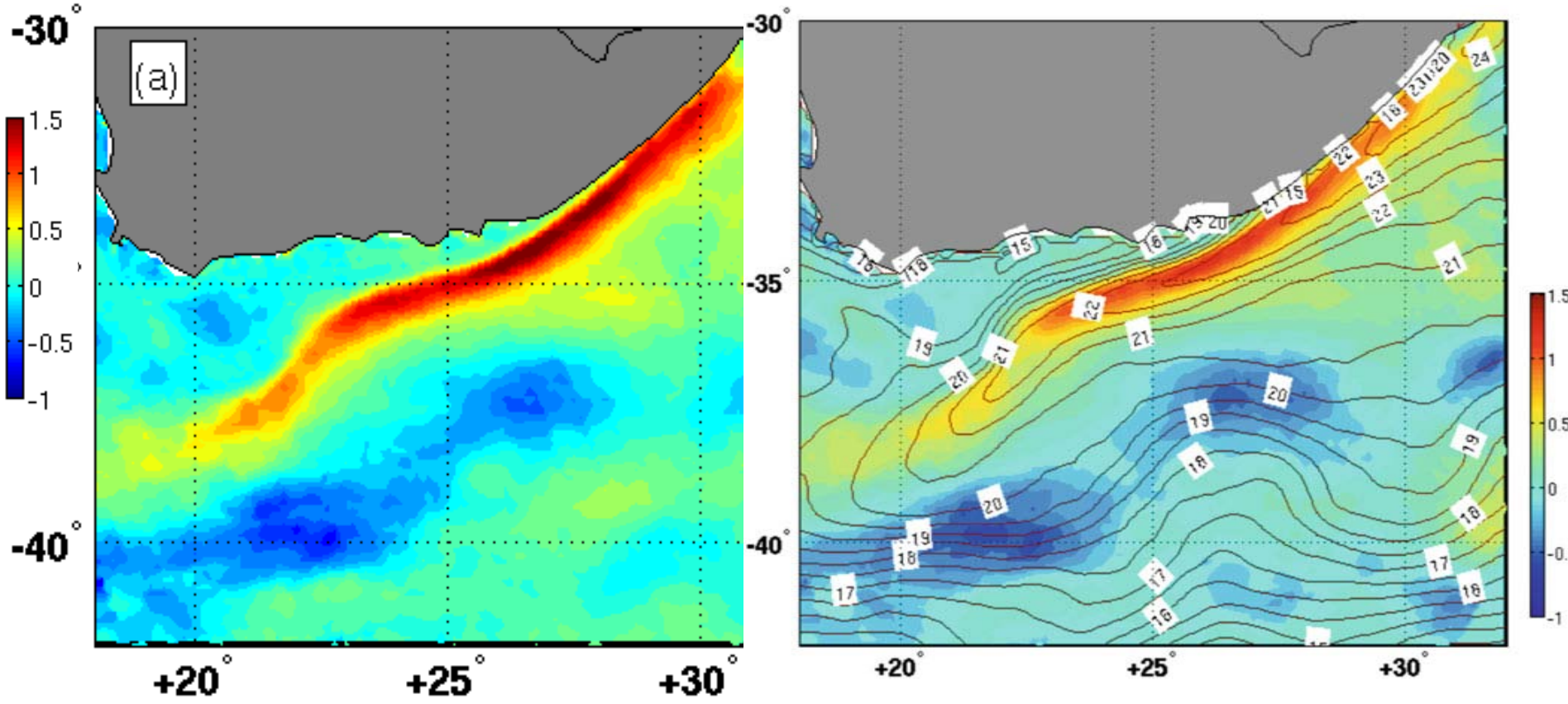


06/05/2010 – Observed SST



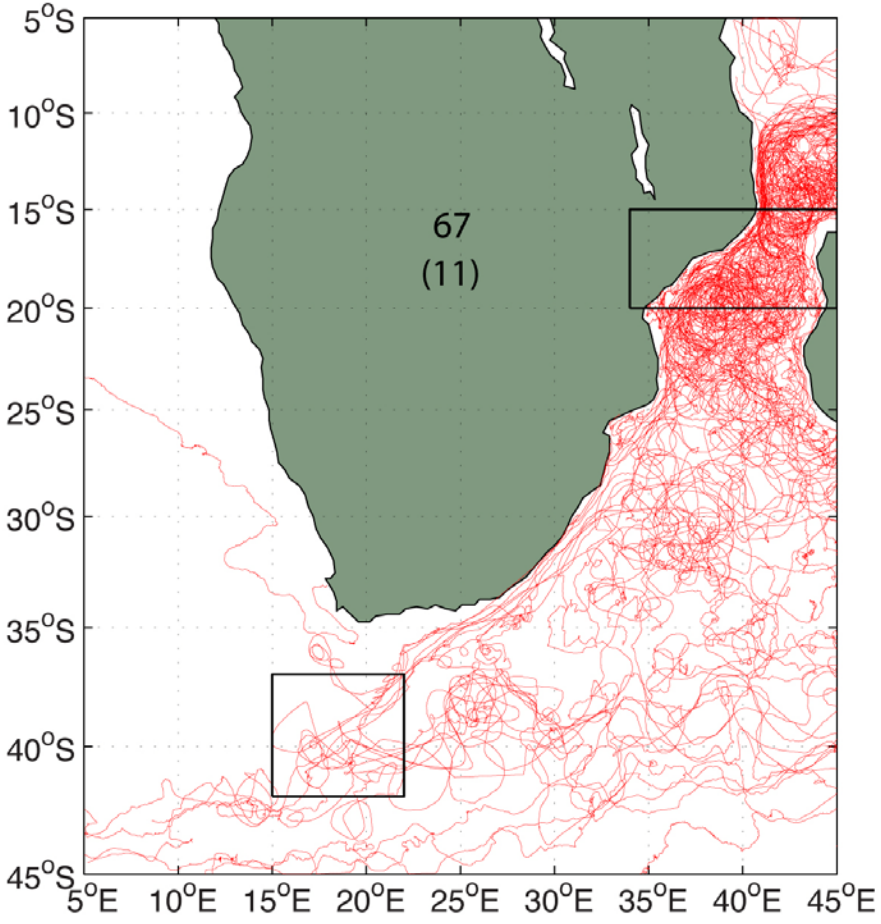
While we are waiting for S3 and S1 range Doppler
We look at SST and ASAR range Doppler

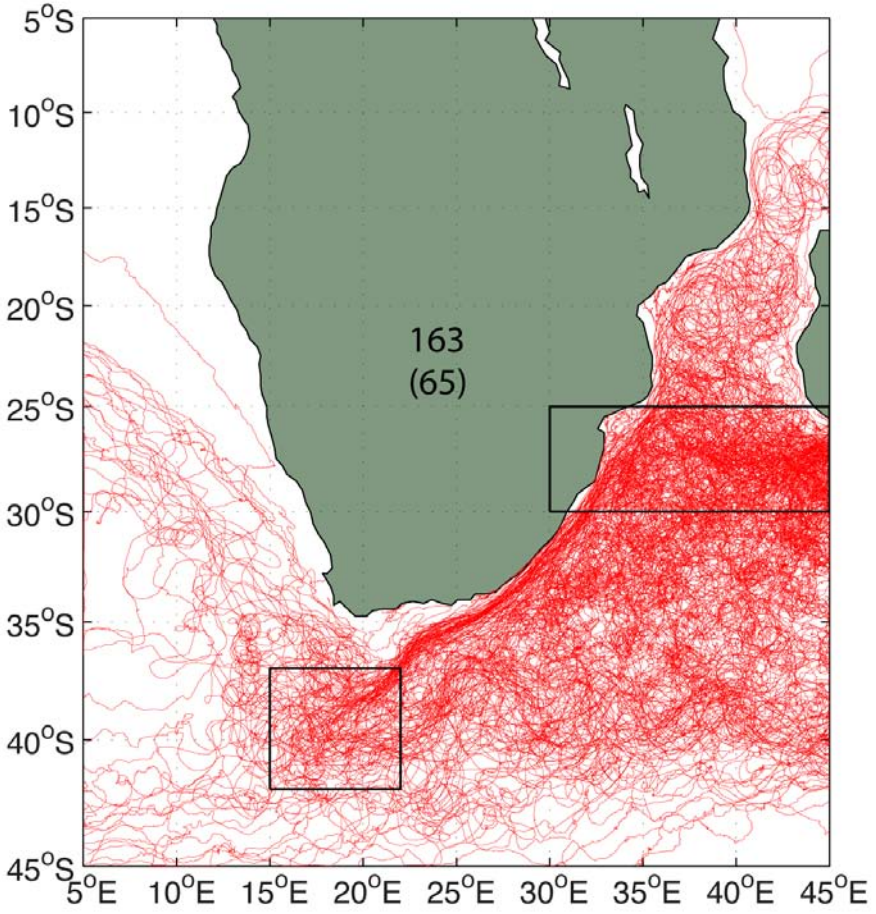
Mean Range Doppler velocity and SST for 2007-20012



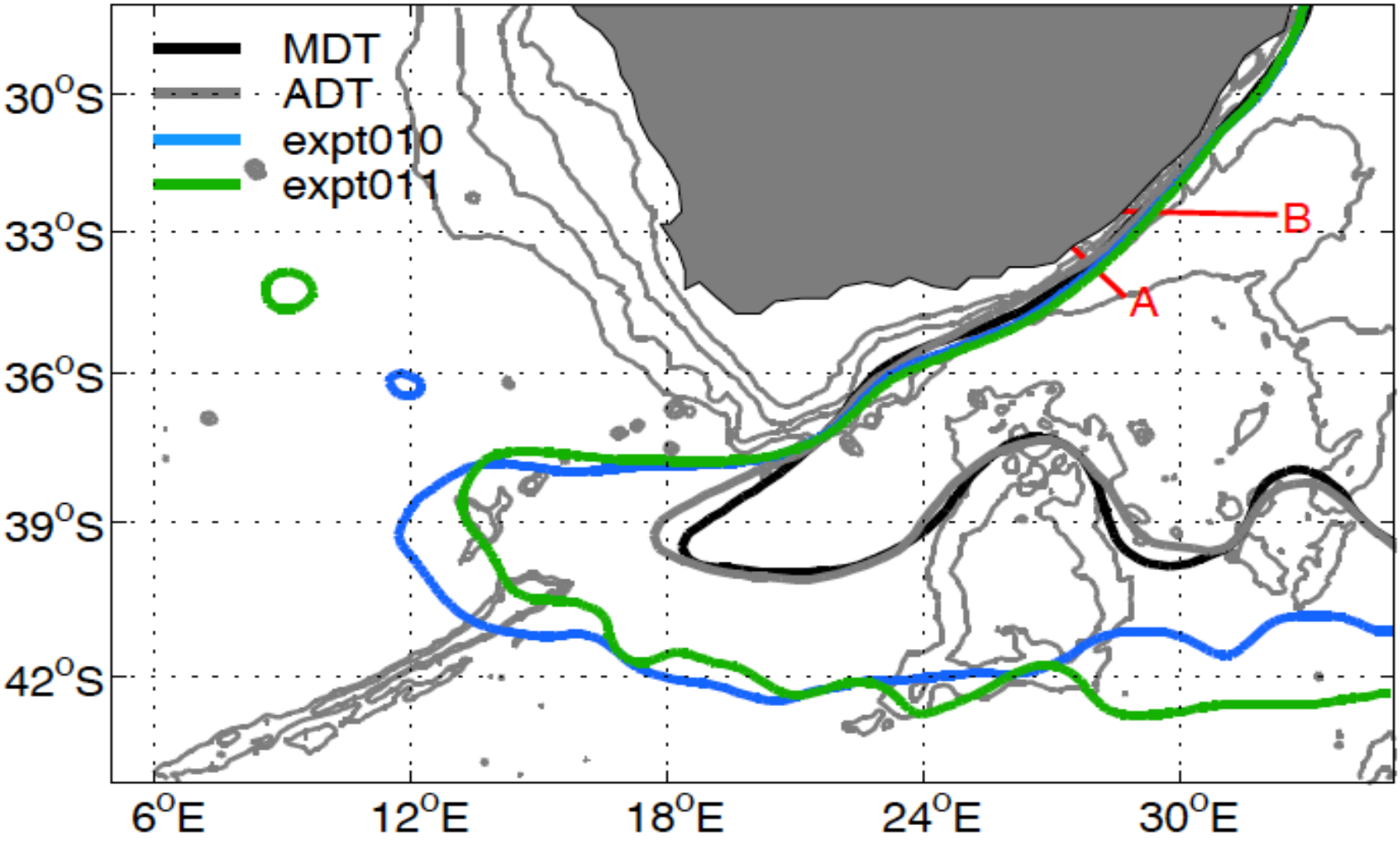
Johannessen et al., 2014

Validation: Surface drifter velocity 1992-2014





Validation: Frontal locations observed & modelled



Summary

Satellite based global data product

- Surface geostrophic current
- Surface and 15 m Ekman current
- Stokes drift

collocated to a 10 km grid at a 3 hour temporal resolution
can now be downloaded from www.globcurrent.org/products-data.

Towards the end of the year the global data base will be extended to cover 2002-2015

It will importantly soon be combined with high resolution data from the new Sentinel-3 (SST, RA, OC) and Sentinel-1 (range Doppler) missions

Outlook

- A new framework for satellite sensor synergy is now emerging that can advance studies of the upper ocean (~ 100 m) dynamics

- The goal is to ensure simple and easy access and use of the framework

- A User Consultation Meeting will take place at IFREMER, Brest 4-6 November following an ESA science conference on future current mission the same place from 2-3 November.