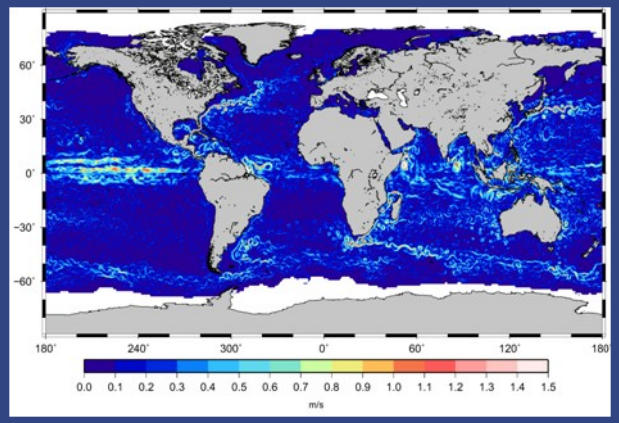
GlobCurrent aims to advance the quantitative estimation of ocean surface currents from satellite sensor synergy and to demonstrate the impact and advancements through user-led scientific, operational and commercial applications. This in turn, will highlight the advantages of satellite approaches and increase the uptake and exploitation of satellite ocean current measurements



Geostrophic currents

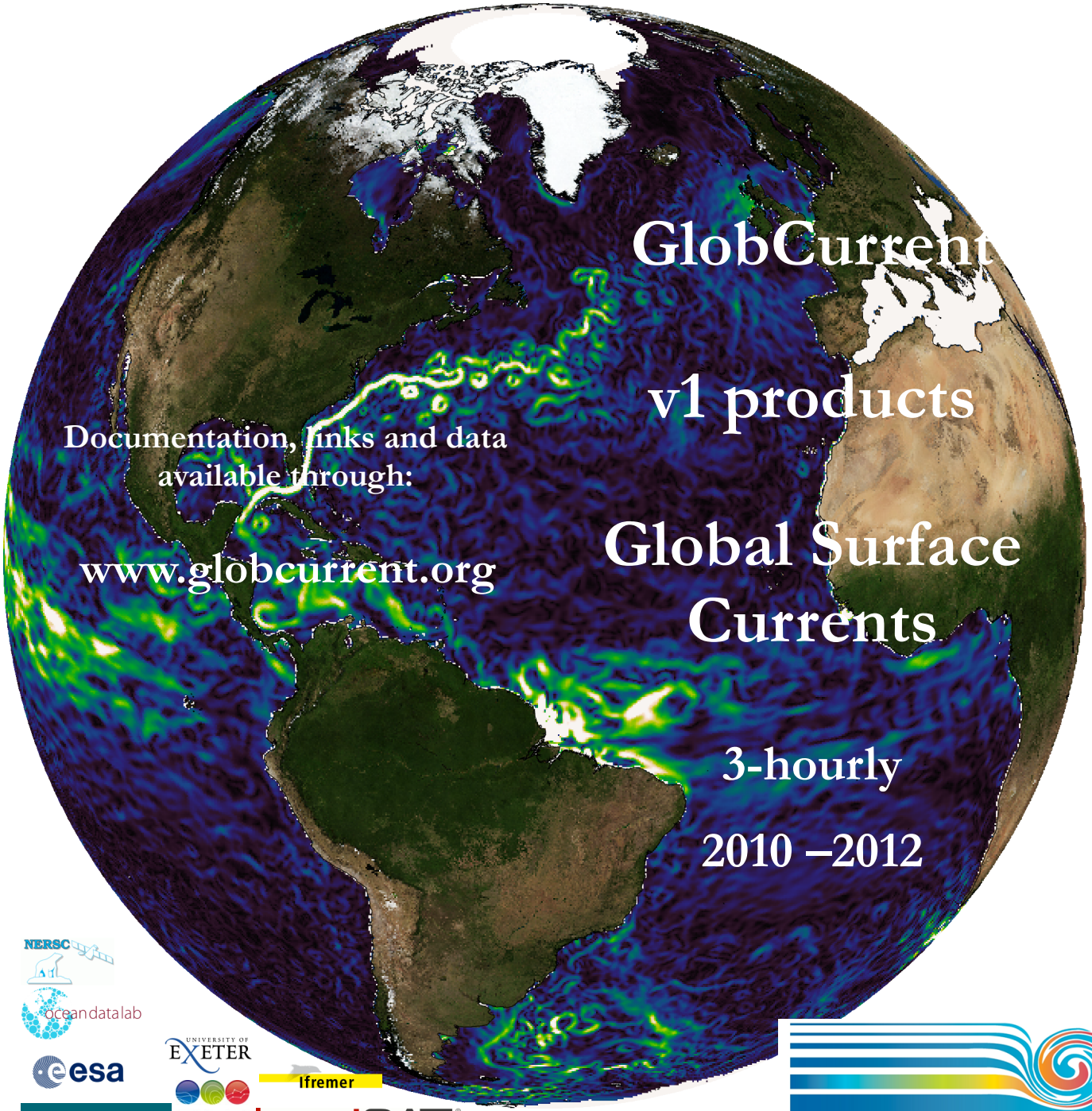
The GlobCurrent project is funded by the Data User Element, which is a programmatic element of the 4th period of the European Space Agency's Earth Observation Envelope Programme.

Ocean surface currents result from both local and remote factors, e.g. sea level slope, winds, ocean stratification, surface as well as internal waves, tides, different mixing processes, etc., part of which are turbulent.

These processes lead to a variety of structures, both at the surface and at depth, with different penetration, periodicity and duration. Better estimates of the surface currents are essential to an understanding of the ocean, including its biogeochemical aspects.

How to get involved ?

New products are posted regularly at **www.globcurrent.org**.
twitter: **@globcurrent** email: **participate@globcurrent.nersc.no**



GlobCurrent

v1 products

Global Surface Currents

3-hourly

2010 –2012

Documentation, links and data available through:

www.globcurrent.org

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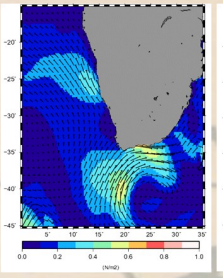
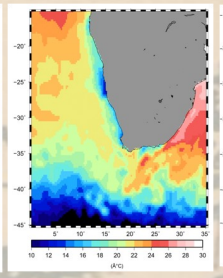
The Benguela Upwelling System

February, 11th 2012

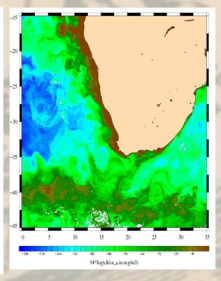
Very often wind is blowing northward along the West African coast, resulting in the upwelling of the underlying colder, nutrient rich waters as shown in both surface temperature and chlorophyll maps. The GlobCurrent combined Geostrophic + Ekman surface currents show the phenomena (while Ekman or Geostrophic currents alone miss part of it).



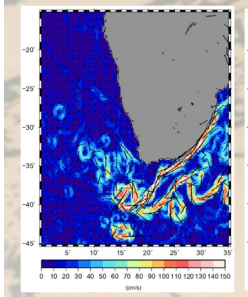
Wind field



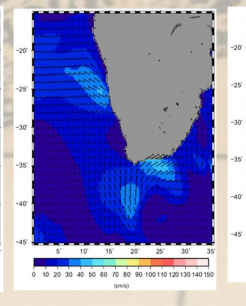
Sea Surface Temperature



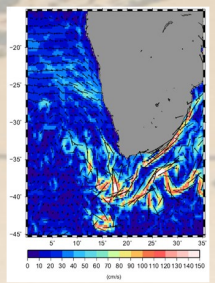
Chlorophyll-a concentration



Geostrophic currents



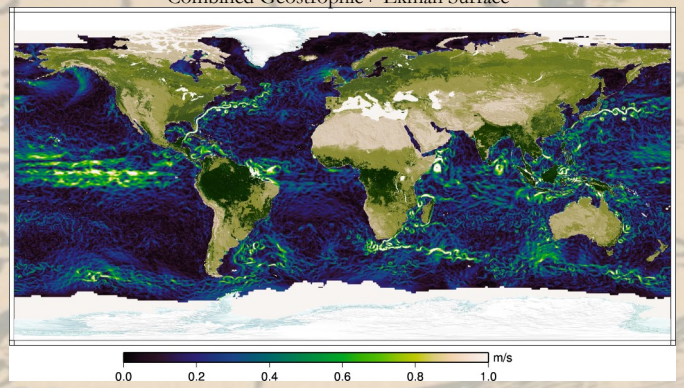
Surface Ekman currents



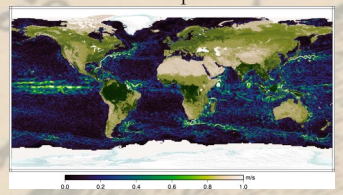
Combined Geostrophic + Ekman surface currents

GlobCurrent v1 products

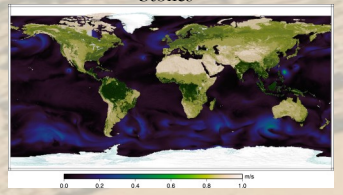
Combined Geostrophic+ Ekman Surface



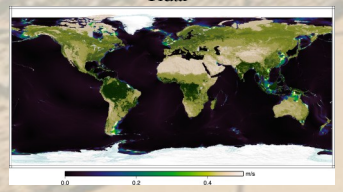
Geostrophic



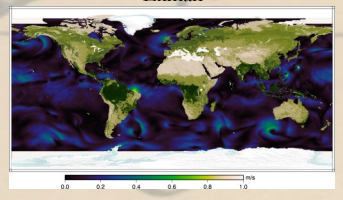
Stokes



Tidal



Ekman



In its first version, the GlobCurrent system provides 2010 to 2012 1/10°, global, 3-hourly NetCDF files of geostrophic currents, surface and 15-m Ekman currents, tidal currents, Stokes currents, as well as a combination of Geostrophic plus Ekman currents at the surface and 15-m depth.The GlobCurrent v1 products are available for everybody to use and exploit.

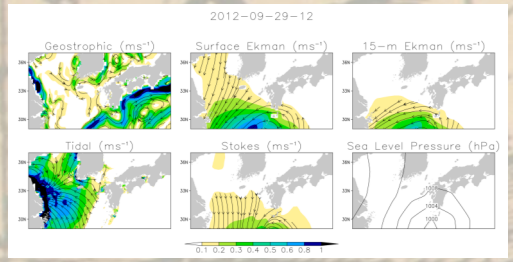
References

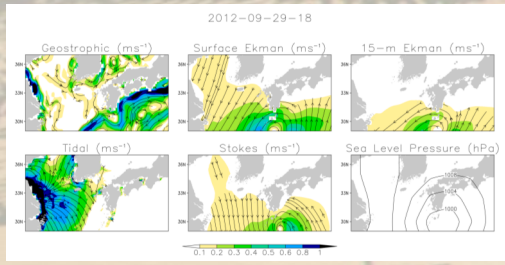
Geostrophy and Ekman: Rio, M-H. et al., 2014. Beyond GOCE for the ocean circulation estimate: Synergetic use of altimetry, gravimetry and in-situ data provides new insight into geostrophic and Ekman currents.

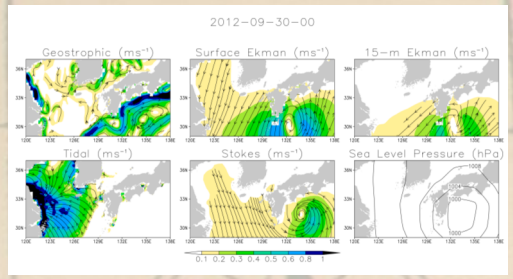
Stokes:Rascle, N. and F. Ardhuin (2013), A global wave parameter database for geophysical applications. Part 2: model validation with improved source parameterization. Ocean Modelling 70 (2013) 174-188

Tides: Stammer, D., et al. (2014), Accuracy assessment of global barotropic ocean tide models, Rev. Geophys., 52, 243-282, doi:10.1002/2014RG000450

Arrival of supertyphoon Jelewat along the Japanese coast







The tidal component reveals 12-hourly ebb and flood cycles that are clearly visible in the relatively shallow depths of the Yellow and East China Seas and through the Tsushima Strait between Korea and Japan.

The Stokes current component is closely linked to wave generation associated with the arrival of Supertyphoon Jelewat, which caused considerable damage along the coast of Japan. Peak currents of about 1m/s may underestimate this component, given that the waves breaking was likely significant, although the location of the peak current to the east of the cyclone center was likely accurate, given that the wave in that region experienced a longer effective fetch owing to their travel in the same direction as Jelewat itself.