



# **ESA DUE GlobCurrent User Consultation Meeting**

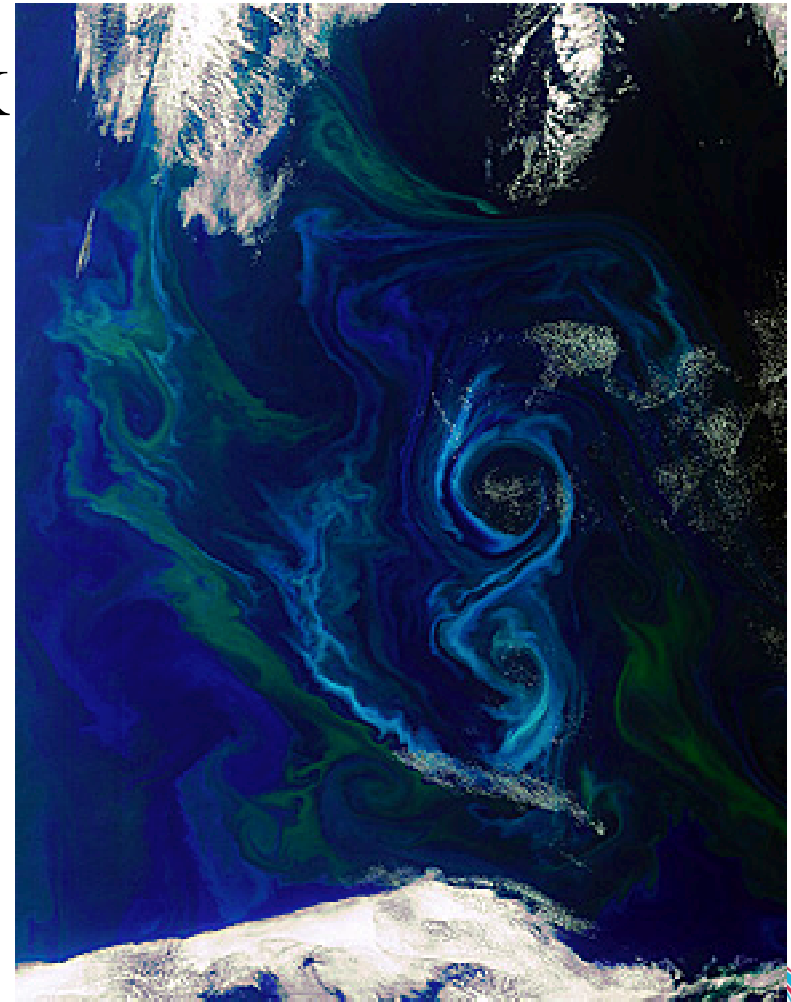
***IFREMER, Brest France  
7-9<sup>th</sup> March 2012***

***Craig Donlon and Olivier Arino  
European Space Agency***



# Outline

- Requirements Feedback
  - General Scope
  - Specific requirements
  - Product Specification
  - Potential Methods
  - Specific tools
  - Data
  - R&D Activities
- Next Steps



2 December 2011 MERIS bloom S Atlantic

# ESA Globcurrent



## Project

- A new ESA Data User Element project from 2013



- €1.5 Million earmarked for a 2 year project

### Aim:

- Develop and demonstrate R&D activities for *EO derived* ocean surface currents...
- over a 2 year period...
- based on the innovative use of satellite and in situ data...

linked to external user applications that





70% Earth's surface covered by water

The final frontier...

*"If I were to choose a single phrase to characterize the first century of modern oceanography, it would be a century of under-sampling."*

*Walter Munk, Woods Hole Oceanographic Institute, 2000*

**CONFIRMED**  
**But...**

# General Scope (1/2)

- Focus on providing the best *EO derived measurements* to users (no constraint) in a consistent manner
- Documentation is required tuned to user needs
- All activities shall be open and freely available (data, tools, access, documentation...): maximise uptake, promote creativity and user feedback
- User applications shall be considered at all project phases
- User involvement is mandatory (the project shall foster an international user/producer network)
- User community development is mandatory
- Duplication of existing capability is forbidden <> complementarity is expected
- Focus on R&D Activities to deliver the best data sets for user applications



# General Scope (2/2)

- Specify depth of current measurement (propose  $(u_z, v_z)$  where  $z$  defines the depth of current) nomenclature → free of interpretation)
- Make full use of all available EO data (ESA 3<sup>rd</sup> Party Missions)
- Coverage: global and regional areas of significant interest (User driven, e.g., West Africa Oil and Gas, Agulhas, European shelf seas, Polar regions ...)
- Coverage: currents close to the coast are missing
- Resolution: <10 km (Sub-Mesoscale sampling is needed at high resolution)
- Quality control is essential
- Delivery of data: timeliness (15 min → 24 hrs)
- Uncertainty estimates for each measurement is essential
- Consistency of delivery and products
- Validated currents are essential (Confidence)



# Specific Requirements (1/2 TBC)

- Specify depth of current measurement (propose  $(u_z, v_z$  where  $z$  defines the depth of current) nomenclature → free of interpretation)
- Full application of Cryosat (open ocean and particularly in the the coastal zone) → preparation for S3
- Use GOCE geoid and improve where possible
- Time series > 5 years (10 years +)
- Large river outflows (Gironde, Elbe, Congo...)
- Want wind/waves/currents at the same time



# Specific Requirements (2/2 TBC)

- outreach and communication and support to users essential.
- Validation procedures and methods
- Need a pure observational database of current ( $u_z, v_z$ ) that we can use as a reference
- Use HF RADAR for validation
- Consider time<>space scales of user applications in product specs.
- Impacts/application of waves (current<>wave, vorticity)





# Product Specification (TBC)

- Direction: 10deg, 25km, 1day
- Direction in EEZ: 10 km 10 deg, 1 hr
- Speed: 25km, 0.1m/s, 1 day
- Speed in EEZ, 10 km 0.1m/s 1 hr
- Shall include uncertainty
- QC with flags (do not delete data)
- Format: netCDF, WMO BUFR and GRIB2
- Low level (swath) product
- A high-resolution atlas of ocean surface currents
- Want Climatologies/statistics of long time scales to look at mean structures
- Want access to lower level corrections on data



# Potential Methods

- MCC tuned to specific data and regimes
- MSS from optical glitter
- eSQG
- SAR Doppler
- Lapyunov vectors
- Synergy between different complementary data sets
- L4 merging
- ...

# Specific Tools

- Database of best EO ocean surface current measurements on Z-levels
- QC and Validation tools
- Uncertainty estimation tools
- Graphical outputs as the dissemination method/presentation
- Delivery: ftp, OpenDAP (must be easy to access and manipulate for specific regions)
  - Standard formats that can be mailed to ships
- Innovative L3 + L4 merging tools preserving data integrity
- webGIS data presentation server



# R&D Activities

- Test, verify and select best methods and algorithms
- Implement uncertainty for all measurements
- Validation methods to ensure user confidence
- GOCE + other data to give high-res Geoid
- Coastal altimetry (CryoSat → S3 SRAL preparation)
- SAR Doppler (ASAR → S1 preparation)
- Use of SEVIRI (get to the 1 hourly) in synergy
- Optical Glitter
- Blending (SST, Alt, Glitter, SAR...)
- Currents in ice infested water
- Wave Current interactions



# Data

- SAR data
- Scatterometry
- Coastal altimetry (20Hz + waveforms required)
- TIR (Geo and Leo) → Bt and SST
- Visible (including glitter)
- Altimetry
- Coastal HF RADAR
- In situ (ADCP, Current meter, SVDP...)



# Exploitation



- Validation of NOP outputs – could be embargoed
- Many user applications of database of  $[u_z, v_z]$
- Many, many users – we need to connect and demonstrate

# Next Steps

- Discussion in the next session to consolidate and refine the scope of GlobCurrent
- **The challenge is to focus and feedback to ESA**
- User Consultation feedback
- Create your User Requirements Document (URD) – a key input to the DUE Process



# Outputs: User Commitments





**ESA GlobCurrent User Consultation Meeting**  
 IFREMER, Brest, France, 7-9 March 2012  
 Lucien Laubier Conference Room

**User Requirements  
 User Inputs**

(Version 1.2)  
 Released 5<sup>th</sup> March 2012

ESA GlobCurrent User Consultation Meeting – User Feedback and Requirements Page 1 of 9



*Please use as much space as you need.*

#### 4 Your Contact details

*Please provide a contact that we can use to work with you.*

Contact name	
Role	
Organisation	
Postal address	
Email	
Telephone	
Fax	
Type of organisation	<i>(e.g. commercial, research, government agency, intergovernmental organisation, etc.)</i>

#### 5 Your Ocean Surface Current Applications

3.1 Please provide a short summary of your applications that are relevant to **GlobCurrent**.

3.2 Please describe the specific use of a **GlobCurrent** service and describe the potential benefits that the service may provide.


3.3 Please provide details of any existing activities which do, or could even partly, satisfy your requirements. What more is needed?

#### 6 Your Ocean Surface Current Requirements

4.1 Area of Interest (please duplicate this section if more than one area is required):  
 List the geographical areas, with coordinates, and time periods over which a product/service is required.

4.2 Product Requirements (please duplicate this section if more than one product is required):  
 Ocean Surface Current product: coverage (e.g., local, regional, global)  
 Ocean Surface Current product: spatial resolution (e.g., 25 km)  
 Ocean Surface Current product: temporal resolution (e.g., daily, 6 hourly, monthly...)  
 Ocean Surface Current product: formats needed (e.g. netCDF, ECCIS...)  
 Ocean Surface Current product: length of data record required (e.g., near real time, 10 years...)  
 Ocean Surface Current product: documentation (what documents do you need?)  
 Ocean Surface Current product: other (any other aspect of the **GlobCurrent** products you need e.g. uncertainty estimates, flags, metadata...)

4.3 Service Requirements (please duplicate this section if more than one service is required):  
 Ocean Surface Current service: product delivery (e.g., web, ftp, **OpenDAP**)  
 Ocean Surface Current service: visualisation (e.g., web, tablet, phone interface)  
 Ocean Surface Current service: data discovery (i.e. how do I find the data?)  
 Ocean Surface Current service: help and support requirements  
 Ocean Surface Current service: **metadata**  
 Ocean Surface Current service: other (any other aspect of the **GlobCurrent** service you need)



#### 8 Letter of Commitment

To take part in the **ESA GlobCurrent** project as a Champion user we ask you to send us a letter of commitment following the template below:

From: <your name>  
 <your address>

To: Dr. Olivier Arino  
 Data User Element Programme Manager  
 ESA/ESRIN  
 Via Galileo Galilei  
 Casella Postale 64  
 00044 Frascati (Roma)  
 Italy  
 Tel: +39 06 941801  
 Fax: +39 06 94180280

**Re. ESA GlobCurrent Project: CHAMPION USER COMMITMENT LETTER**

I send you this commitment letter to indicate my agreement to collaborate with ESA as a champion user in the Data User Element GlobCurrent project, which will define, develop and demonstrate an earth observation service supporting the ocean surface current user community. I understand that the GlobCurrent project will be a project funded by ESA with the primary objective of fulfilling the user requirements of the ocean surface current user community.

I agree to take the responsibility for:

(During the preparation of the project):

- Delivering a User Requirements Document following the template provided by ESA;
- Providing expert advice in the definition of the project activities

(During the project lifetime)

- Facilitating access to existing data (e.g., in-situ data) that may be useful for the project;
- Advising the contractor in the consolidation of the User Requirements during the initial phase of the project;
- Performing an evaluation of the project outcomes at the mid-term and final reviews;

As a user and potential beneficiary of the outcomes of the GlobCurrent project, I agree to contribute **three man-months** of effort to the project (or an equivalent in-kind contribution, such as providing access to existing data or services on which the project can build – to be specified in an annex to this letter).

I am aware that the project is scheduled to start in mid 2010, will last for **three years**, and that ESA will provide me and the user community with free access to the results of the project.

I accept that this collaboration does not imply any exchange of economic resources between ESA and my organization. I equally accept to collaborate during the project with the consortium that ESA selects following evaluation of the proposals received in answer to the open and competitive GlobCurrent project invitation to Tender (ITT), and that I will withdraw from my role as a GlobCurrent project champion user if I am involved in the successful bid.

I will respect the scheduling of delivery dates, to be agreed during the kick-off of the project;

I will encourage and promote use of the project results;

Yours sincerely,

.....  
 (signature) (date)  
 .....  
 (name)



# GlobCurrent ITT Process Logistics

- March 2012: UCM
- July 2012: Return of User Requirements
- Sept 2012: Consolidated Public URD
- Early 2013: Issue of Invitation To Tender (ITT)
- 1<sup>st</sup> qtr 2013: Selection of one winning bid
- Spring 2013: Project Kick Off (2 year project)





- What does your user application want?
  - Products, data delivery, timeliness, tools, documentation, access, product uncertainties?
- What can be done?
  - Develop/Implement/Transfer R&D activities/products to consolidated, systematic, robust demonstration activities with user engagement



We are here to listen to your  
needs...





*Thank you - any questions?*

**For more information**

**<http://www.esa.int>**

**Contact: [craig.donlon@esa.int](mailto:craig.donlon@esa.int)**

