GLOBCURRENT
USER REQUIREMENTS DOCUMENT

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Revision change log

Issue	Date	Type	Change description
1.0	1 December 2013	Initial draft	Cover page only
2.0	6 March 2014	First version	Replacement of ESA URD
3.0	21 April 2014	RIDS revision	Additional URD elements
4.0	2 December 2014	Update	Post-UCM additions

Table of contents

Table of figures

Table of tables

1. Introduction

Thanks to satellite and *in situ* observations, combined with high resolution numerical ocean models, the last decade has witnessed the emergence of a global view of the ocean surface covered with mesoscale (~100 km) and sub-mesoscale (<~10 km) meandering currents and eddies. As spectacularly illustrated in Figure 1, we are now faced with the challenge of accurately quantifying the dynamics of these ubiquitous and newly resolvable features. This will require not only individual satellites with unprecedented temporal and spatial resolution. A more consistent and quantitative blending of familiar satellite capabilities is also required to improve our monitoring and anticipation of upper ocean dynamics at such scales.
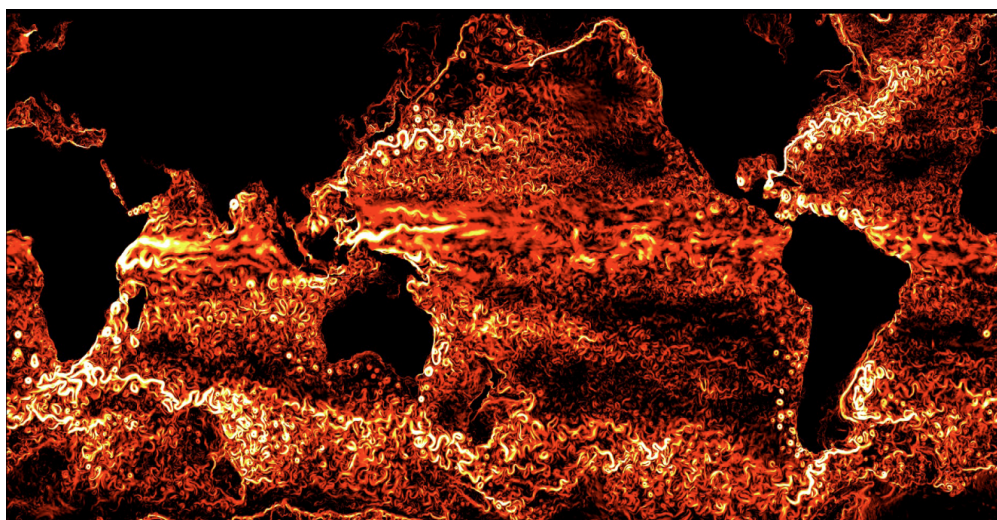
Figure 1: Map of global surface current features and eddies obtained from a high-resolution 1/10th-degree ocean model (courtesy R. Ferrari).

The GlobCurrent project aims to increase the use of satellite ocean surface current measurements in scientific, operational, and commercial applications. It is expected to be unique in more than a few aspects: it will re-map the world's ocean surface currents from a growing synergy of past and present observations and it will conduct a series of user-led case studies that resolve high spatial and temporal variability and the underlying processes that govern surface current dynamics.

By facilitating the uptake of ocean surface current observations within an established community, this project shall advance the retrieval of surface current information from a synergy of satellites, including those that will define the Sentinel era. In turn, this will promote greater understanding of a global ocean that is filled with meandering surface currents and eddies, whose impact we are now faced with the challenge of more accurately quantifying. 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.

1.1. Purpose and scope

The GlobCurrent project is blessed with a vibrant and engaged group of users, who began to identify their requirements well in advance of project kickoff in October 2013. Initial consultations with ESA resulted in a synthesis of requirements that was compiled in a separate User Requirements Document (URD) in early 2013. Thus, the present URD inherits this established group of users and an analysis of their requirements, which this GlobCurrent DUE project is designed to address. The evolution of this document captures new users, a solicitation of their requirements, and their responses. Based on the earlier ESA consultations, this document also summarizes the project's main points of contact, the derivation of a collective set of requirements, and the general requirements themselves. More detailed requirements, addressing mainly the implementation of a surface current analysis system, can be found in the project requirements baseline document (RB deliverable D-40).

1.2. Document structure

This document is organized into the following sections:

- Section 1 (this section) is an introduction with references
- Section 2 provides a document background and project overview
- Section 3 outlines user interactions via the project's main points of contact
- Section 4 describes how collective requirements are derived from user responses
- Section 5 provides a set of user requirements for the project
- Section 6 is a summary and conclusions
- The Annexes list all users and external partners and provide the forms used to solicit user requirements and the responses that have been received.

1.3. Applicable Documents

[AD-1] ESA Data User Element (DUE) GlobCurrent User Requirement Document (URD) EOP-SM/2451/CD-cd, Issue 1, Revision 3, 05/03/2013

[AD-2] Statement of Work for DUE GlobCurrent project (SoW), EOP-SM/2450, Issue 2, 26 March 2013

1.4. Reference documents

The following are the publications and web sites relevant to this document.

1.4.1. Publications

[RD-1] Larnicol, G., Guinehut, S., Rio, M.-H., Drevillon, M., Faugere, Y., and Nicolas, G. 2006, The global observed ocean products of the French Mercator project, in: Proceedings of the "15 years of progress in radar altimetry" ESA Symposium, ESA, Venice, 2006.

[RD-2] Bonjean F. and G.S.E. Lagerloef, 2002, Diagnostic Model and Analysis of the Surface Currents in the Tropical Pacific Ocean, *J. Phys. Ocean.*, 32, 2938-2954.

[RD-3] Madec G. 2008: "NEMO ocean engine". Note du Pole de modélisation, Institut Pierre-Simon Laplace (IPSL), France, No 27 ISSN No 1288-1619

1.4.2. Web sites

[WEB-1] GlobCurrent external web site   www.globcurrent.org
[WEB-2] GlobCurrent internal web site   globcurrent.nersc.no
[WEB-3] DUE web site   due.esrin.esa.int

1.5. Acronyms and abbreviations

AATSR	Advanced Along Track Scanning Radiometer (of ENVISAT)
ADB	Actions Data Base
AMSRE	Advanced Microwave Scanning Radiometer – E (of EoS Aqua)
AQUARIUS	Salinity mission (of NASA/CONAE)
ASAR	Advanced Synthetic Aperture Radar (of ENVISAT)
ASCAT	Advanced SCATterometer (of MetOp)
ATBD	Algorithm Theoretical Basis Document
AVHRR	Advanced Very High Resolution Radiometer
CDR	Critical Design Review
DIR	Directory (of project participants)
DMSP	Defense Meteorological Satellite Program (of the USA)
ENVISAT	Environnent Satellite (http://envisat.esa.int)
ESA	European Space Agency
EO	Earth Observation
EU	European Union
FR	Final Report
Hs	Significant Wave Height (also SWH)
ITT	Invitation To Tender
KO	Kick-Off
MR	Monthly Report
MTR	Mid-Term Review
NOP	Numerical Ocean Prediction
NWP	Numerical Weather Prediction
OSC	Ocean surface current
PAR	Preliminary analysis report
PM	Progress meeting
PMP	Project Management Plan
PMR	Passive Microwave Radiometry
RA-2	Radar Altimeter 2 (of ENVISAT)
RB	Reference Baseline
RD	Reference Document
SAR	Synthetic Aperture RADAR
SAR	Scientific Assessment Report (of *SOS*)
SAP	Scientific Analysis Plan
SIAR	Scientific and Impact Assessment Report
SMOS	Soil Moisture and Ocean Salinity (mission)
SOS	Surface Ocean Salinity and Synergy (project)
SoW	Statement of Work
SRR	System Requirements Review
SSH	Sea Surface Height
SSM/I	Special Sensor Microwave Imager (of DMSP)
SST	Sea Surface Temperature
SR	Scientific Roadmap
STSE	Support to Science Element
TBC	To Be Confirmed

TBD	To Be Determined
TDP	Technical Data Package
TDS	Test Data Set
TN	Technical Note (short report 10-50 pages)
TOA	Top of Atmosphere
TR	Technical Report (long report > 50 pages)
UCM	User Consultation Meeting
UM	User Manual
URD	User Requirements Document
URL	Universal Resource Locator
WP	Work Package

2. Background and vision

Satellite altimetry, arguably the most mature technique for mapping ocean currents, has permitted breakthroughs in our understanding the dynamics of large-scale (roughly >200km) oceanic circulation and an unequalled view of eddy kinetic energy on a global scale. Still, the conventional coarse ground track spacing of an individual altimeter is known to limit cross-track resolution to several hundred km. Similarly, multiple altimeters yield gridded maps of sea surface height (SSH) that is limited to a resolution of about 100 km and 10 days. This so-called "altimetry gap" has prompted attempts to combine the lower resolution altimeter data with sequences of medium and higher resolution satellite and in situ observations.

Direct and indirect estimates of ocean surface current and higher level derived quantities such as frontal boundaries can indeed be derived using a variety of satellite sensors, including altimetry (both conventional and SAR mode), gravimetry, SAR imaging and Doppler properties, scatterometry, optical (VIS and TIR) and passive microwaves. Sparse in-situ current measurements from drifting and moored buoys, coastal HF-radar installations, Argo floats, gliders and ship observations can also complement these satellite measurements. Each of these satellite and in-situ based measurement techniques has specific strengths and limitations (e.g., resolution, coverage, accuracy, depth integration, cloud dependence, empirical based retrieval methods, etc). By development and use of systematic data merging and sensor synergy combined with advanced processing tools and simulation models, the complementary strength of each sensing technique can be optimized. Deficiencies are thereby reduced and the final estimate of the OSC is more consistent, regular and reliable. In turn, the use and uptake of satellite based OSC derived products will grow.
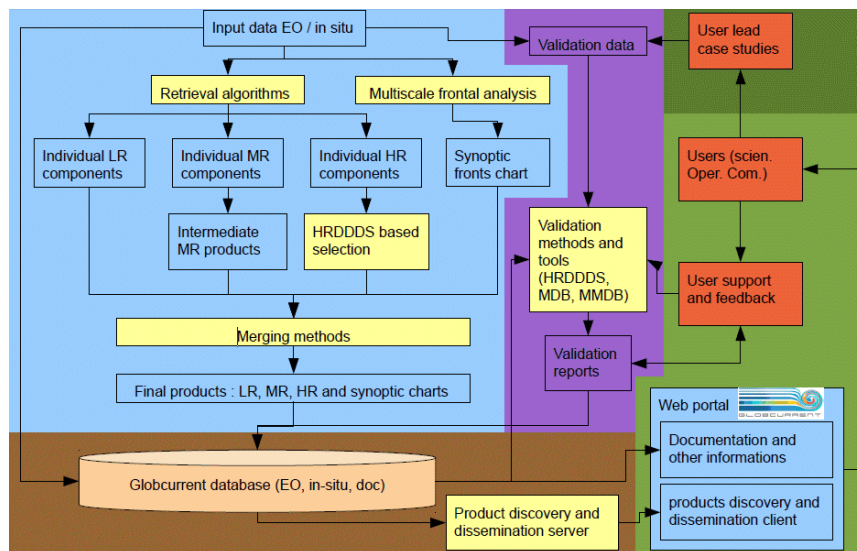
Figure 2: GlobCurrent architecture with flow of information through key subsystems (coloured backgrounds): processing algorithms and products (blue), validation (purple), user case studies (dark green), data management (brown), and communication and user interface (light green).

The GlobCurrent project is designed to re-map the world's ocean surface currents from a growing synergy of past and present observations and to conduct a series of user-led case studies that resolve high spatial and temporal variability and the underlying processes that

govern surface current dynamics. An overview of the project architecture is given in Fig. 2. This includes data ingestion, formatting, quality control, and processing to L2 and L4 products (blue), a data management system for all data within the project (i.e. the input EO and in situ data, products, validation reports, etc; brown), validation (purple) coupled to user-led case studies (dark green), and a data delivery and communication system interfaced to users (light green).

GlobCurrent aims to exploit the widest possible range of EO capabilities and to deliver at its conclusion a nowcasting system with a more firmly established user group and easy internet access. References for such an operational service are SURCOUF and OSCAR [RD-1, RD-2]. These processing systems provide near real time global ocean surface velocity fields based on satellite observations of sea surface height, wind, and temperature (OSCAR's regional focus is the tropical Pacific Ocean). Both systems are subject to extensive validation and error analysis, and are applicable to ocean, climate, and basic research challenges. The SURCOUF and OSCAR user base derives from complementary national monitoring (e.g., NOAA CoastWatch) and climate prediction programs, broad research initiatives, naval operational ocean analysis programs, and other civilian uses. Some of these users have also identified themselves within the GlobCurrent project.

The basis for ocean current analysis systems like SURCOUF and OSCAR is a linear combination of current components. Nevertheless, high resolution current analyses will require significant advances in processing tools and sensor synergy to allow the complementary strengths of ocean current sensors to be optimized. In the first year of the GlobCurrent project, global estimates of ocean surface current are provided at relatively large scales and low frequencies (e.g., those greater than about 20 days and 200 km), following in part the SURCOUF approach. Among these first GlobCurrent products to be produced are a global, three-hourly, two-level (0-m and 15-m) reanalysis for 2010-2012 that combines an estimate of the geostrophic and Ekman wind driven surface currents and provides users with estimates of data quality.

Subsequent GlobCurrent products target regional, high-resolution mesoscale current features and near real time services. Throughout the project, there is a distinction between separable current components distinguished in part by time and depth scales. The slowest components are considered to link interior and near-surface processes (and thus have a relatively large vertical scale, by analogy with foundation SST). Because some users will be looking toward assimilation, such a balanced and slow current may prove attractive for forecast initialization. Conventional altimetry, geoid models, passive microwave retrievals, and the notion of a current in geostrophic balance is the basis for such an analysis. Accommodation of high resolution (SAR) altimetry and consistency with patterns in infra-red and ocean colour imagery (particularly in coastal areas) may also be relevant.

One of the goals of this project is to resolve surface current variability on scales as small as one day and 25 km. Thus, subsequent GlobCurrent products increasingly focus on the fast current components that respond directly to a combination of wind, wave, and current forcing at the surface. Examples include the well known Ekman, Stokes drift, and wind drift components. Passive infrared and active microwave satellites are among the instruments that resolve these components.

Another objective of this project, as given by its users, is validation and estimation of data quality (e.g., errors and flags; Fig.2 purple), given observations that are independent of the analyses. Assessment of a GlobCurrent total surface current can be performed in part using assimilation systems (e.g., MyOcean) as a reference. However, because assimilation systems also depend on ocean models [RD-3] that have limited vertical resolution near the surface, they are not expected to be a reference for all the fast current variations that GlobCurrent aims to resolve. Global and regional observation-based and model-based surface currents are available at a spatial resolution of about 10 km, often as weekly analyses and daily forecasts. A complementary assessment of total current including fast variations is also possible using independent in situ observations (e.g., Argo and surface drifters), and high resolution remote sensing (e.g., satellite optical glitter and land-based high frequency radar). User led case studies (Fig.2, dark green) provide opportunities to pursue this objective at the GlobCurrent supersites (e.g., over the Orkney and Agulhas regions).

The last decade or two of EO has seen rapid growth in the measurement and interpretation of ocean surface current information. The arrival of the Sentinel era finds some techniques that are mature (e.g. altimetry, optical feature tracking), while new satellites (e.g. GOCE, Cryosat, SMOS) and techniques have emerged (e.g. SAR radial velocities, mean square slope from glitter patterns, improved geoid models) that promise additional capabilities to resolve ocean surface currents. This combination of established and newer techniques represents a rich infrastructure that can support a much greater provision of ocean services than it does now. Among numerous operational analyses and historical reanalyses of the ocean surface current (both global and local), GlobCurrent will seek to lead the exploitation of EO information.

The remainder of this URD draws from a consensus building exercise initiated by ESA following an international User Consultation Meeting that was held at IFREMER in Brest, France on 7-9 March, 2012. This ESA UCM brought together 133 users and experts in the field of EO (calibration, validation, data merging, algorithm development) and service delivery together to present their detailed product and service requirements, including user needs for better ocean currents, measurement of ocean currents from space and in situ, data blending and analysis techniques for ocean surface currents and data/systems analysis interspersed with presentations on data management and systems engineering. An ongoing analysis of the input from this user group yields the requirements that are listed in the next Section.

3. User participation

The participation of users prior to kickoff of the GlobCurrent project was essential for defining the project and will continue to be the basis of its success (even beyond a three-year timeframe). The early engagement of a representative group of users provided a framework that Champion Users clarify as the project evolves. Following DUE procedure, all users were required to a) provide a signed statement of detailed user requirements using the template provided in this document, and b) consider becoming a Champion user within the project by signing a Letter of Commitment (LOC) to: a) deliver requirements for ocean surface currents following the template provided below, and b) provide expert advice during the definition of the GlobCurrent project.

The approach taken to gather user requirements prior to GlobCurrent kickoff was based on:
- Direct consultation with the user community at the 2012 User Consultation Meeting,
- Requests to define user requirements using a specifically developed questionnaire,
- Follow up with specific users using email/telephone discussions,
- Collective analysis of user feedback and formal enumeration of requirements

Now that the project has kicked off, new users are also asked to formalize their relationship with the project and Champion Users are committed to:
- Demonstrate and evaluate GlobCurrent project outputs in areas of interest/applications and provide feedback at GlobCurrent User Consultation Meetings;
- Facilitate access to existing data (e.g., in-situ data) that may be useful for the project;
- Advise the GlobCurrent consortium in the consolidation of User Requirements during the initial project phase;
- As a user and potential beneficiary of the outcomes of the GlobCurrent project, 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).

Champion Users are key stakeholders that are fundamental to maintaining a good working relationship with the GlobCurrent User community throughout the project development lifecycle and as end users of the project outcomes. The project has a number of points of contact for new and existing user participation, which involves an open sharing of ocean surface current information and on interactions at various fora. An overview is given below and details are provided in the project Communication and Outreach Management Plan (D-90).

3.1. User consultation meetings

The UCM are an essential venue for promoting GlobCurrent and its products and for federating the international ocean surface current community. Meetings will consist of two-day gathering of the consortium partners, the user and science groups (GCSG, GCUG), and the champion, regular, and interested users. Three meetings are planned:

UCM	Date	Location

1 (T0+12)	12-13 Nov 2014	PML
2 (T0+24)	Oct 2015	Ifremer
3 (T0+34)	Oct 2016	TBD

For each meeting, attendance of about 30-60 participants is expected where the main achievements of the project are given by the consortium partners, presentations are given by the CGUG and by externals users, sessions are organised to collect new or refined requirements and recommendations that will be taken into account for the next step of the GlobCurrent project. Promotional brochures will be elaborated and distributed to each participant (4-8 pages). The main outcome of the meetings will include minutes of the meetings and an update of the URD (this document).

3.2. Newsletters

As a complement to the brochures that will be published and distributed during the UCM, one newsletter per year will be published that communicates the progress of the project. It will consist of 1-4 pages.

3.3. Globcurrent project web portals

The GlobCurrent website hosted at Ifremer [WEB-1] is where users may register to access data and receive updates on the news and events. A secondary website at NERSC [WEB-2] is available for internal use. The project aims to include other social media as it begins to generate data, updates, and questions.

3.4. External communication

The consortium partners will promote the GlobCurrent project and its results at international events throughout the lifetime of the project.

3.5. New users

New users who come forward or are identified by the consortium (or ESA) will be invited to fill the Annex I forms (based on what was requested of attendees of the original UCM in 2012). The arrival of newest users will be advertised both internally (via monthly reports) and possibly in a subsequent newsletter (describing the user and perhaps summarizing its special requirements). New requirements (i.e., outside the scope of those already addressed by the project) will be addressed by the consortium (and perhaps ESA) at the earliest opportunity in order to formulate an appropriate response.

4. User requirements analysis

The analysis of user responses is a challenging process that seeks both a collective and comprehensive assessment of real user needs. The following analysis is inherited from [AD-1] and is based on the individual user responses tabulated in Annex III. This analysis is then used to define the numbered requirements of the next section. A consensus for each requirement is sought and for instances where no consensus is evident, the analyst (ESA or the GlobCurrent consortium) has sought to define an inclusive collective requirement.

4.1. Application domains

Section 9.1 lists the individual user application domains. A top-level analysis shows that ocean and weather numerical forecasting services are the key user applications.
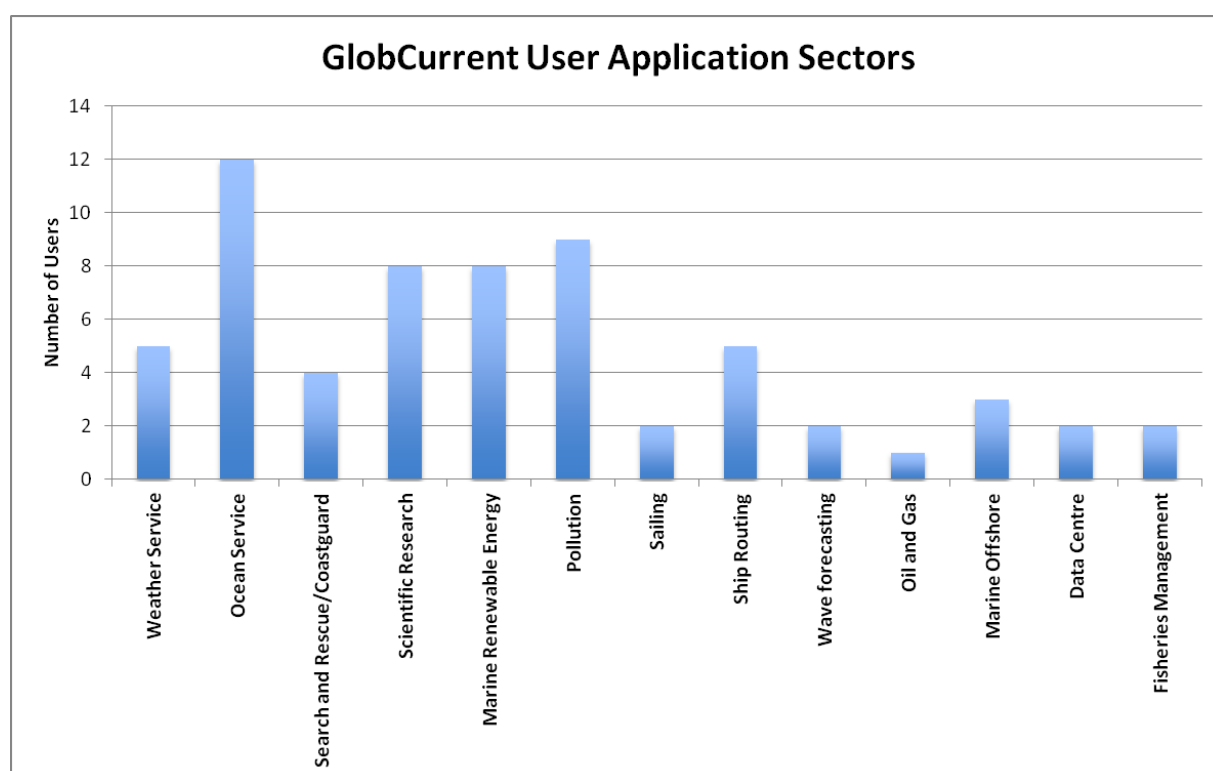
Figure 3: Number of champion and regular users per application sector.

4.2. Area of Interest

Section 9.3 presents the geographical areas of interest of most GlobCurrent users. The overwhelming requirement is for global coverage. However, many regional areas of interest are requested that have a wide global distribution.
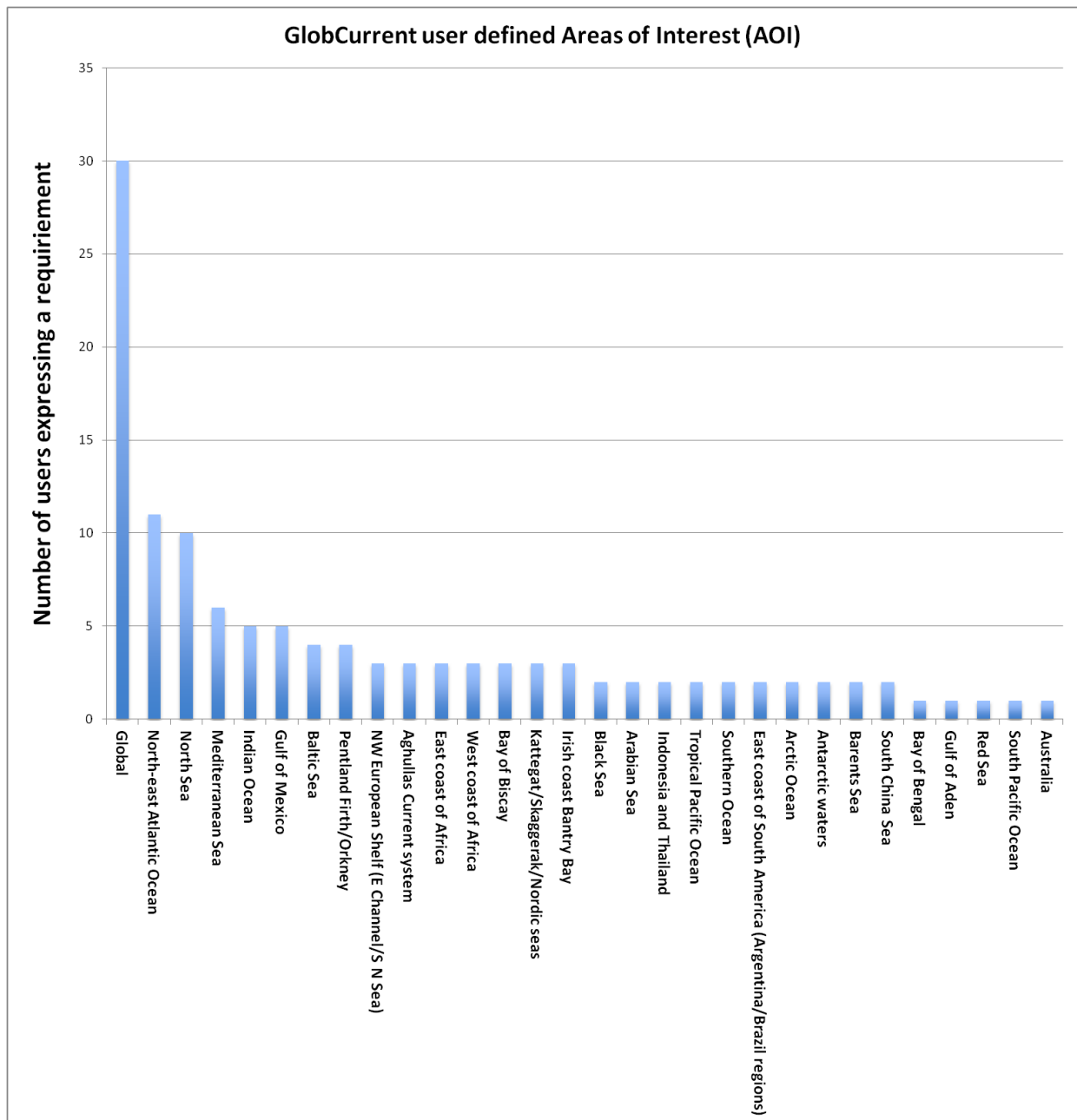
Figure 4: Areas of interest expressed by GlobCurrent users.

4.3. Driving requirements

Section 9.8 has been analysed to derive the driving user requirements for specific applications. The most common driving requirements are:

- **Accuracy of the product (implying uncertainty information)** is the clear driving requirement,
- **Timeliness of product** delivery is the second most common driver, and
- **NRT data access, format, coverage and resolution of products** are also driving requirements.

4.4. Product Requirements

Section 9.4, Section 9.6 and Section 9.7 have been used to data-mine GlobCurrent product requirements based on user inputs.

4.4.1. Nomenclature and symbology

Section 9.6 reports user requirements for ocean surface current nomenclature. Several users cite specific application-driven requirements (e.g. "my model assumes a 1m depth integrated current at the surface", "as relevant for shipping") that do not represent consensus needs and have not been considered further in the present analysis. Specific requirements may be taken up during the course of the project.

The most common response for nomenclature and symbology is for ocean surface currents to be expressed in the form of Total Current at a specified measurement depth (z) level (u_z, v_z) together with metadata to provide details on the current measurements. This approach is extended to include the time (t) and location (x,y) of the measurement leading to the consensus requirement:

Measurements of Total Current at a specified time (t), location (x,y) and measurement depth level (z) provided as vector components of the form (u[t,x,y,z], v[t,x,y,z]) where u is a vector component which is positive when directed eastward (negative westward) and v is a vector component which is positive when directed northward (negative southward).

4.4.2. Coverage

See Section 4.2. Users require local, regional and global products. The majority of users request global coverage products. Specific areas of interest are reported in Section 4.2.

4.4.3. Spatial resolution

Section 9.4 reveals a wide range of spatial resolution requirements for GlobCurrent products. The minimum requirement is for products of <<100m spatial resolution. The maximum requirement is for products of 1 degree resolution. Many users note that they want "the highest resolution possible".

The majority of users request higher resolution products closer the coast (1-2 km), 1-10 km for inland seas and 10-25 km spatial resolution for global products. Based on these data the target for GlobCurrent is **Global coverage 10-25 km and higher resolution where possible at regional and local scales**. Lower resolution products can be derived from higher resolution products if required.

It is noted that the spatial resolution is that defined by the data and/or the analysis technique and is distinct from the data product grid (which may be at a higher resolution than the effective resolution of the product it contains). Furthermore, the achievable spatial (and temporal) resolution is governed explicitly by the characteristics of the input data products - unless a model (stochastic or deterministic) is used to interpolate the data. Thus, the achievable resolution of GlobCurrent products may not be capable of satisfying all user requirements all of the time.

4.4.4. Temporal resolution/revisit

Section 9.4 has been analysed for GlobCurrent temporal resolution/revisit requirements. A range of user requirements is evident ranging from sub-hourly to monthly composite products.
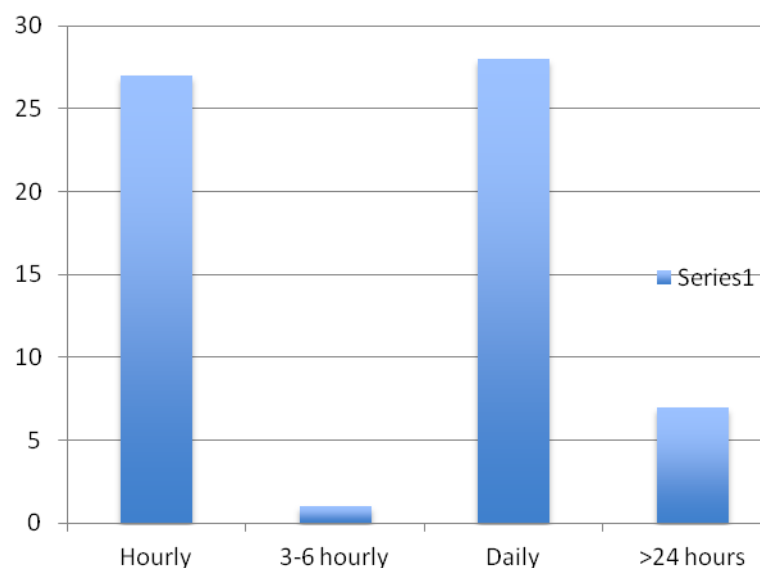
Figure 5: GlobCurrent temporal resolution requirements.

Based on user needs, GlobCurrent shall target an **hourly – daily product regime**. Hourly products are required in tidal areas if possible and daily products as a minimum requirement for all areas. Lower temporal resolution products can be derived from higher resolution products.

4.4.5. Format

Section 9.4 shows that the overwhelming requirement for **product format is NetCDF (CF-Compliant)**. In addition, many operational users request **GRIB2 format** products – particularly where email transmission is required as this data format compresses data

substantially. ASCII, webGIS and other GIS formats are also cited. Some users request ISO-19115-2 metadata compliance.

4.4.6. Flags and auxiliary data

Section 9.5 and 9.7 reveals that users require flags with all data products to aid their interpretation and application. Several users require information on the products used as input to any analysis within products. Flags to help monitor the performance of products are required. (The detailed definition of data flags and auxiliary data are part of the GlobCurrent project.)

4.4.7. Quality indicator and metrics

Section 9.7 reveals that many users require uncertainty estimates with data values within products. Quality indicators and metrics (particularly to help define accuracy) are required. (The detailed definition of quality indicators and metrics are part of the GlobCurrent project.)

4.4.8. Length of data record required

Section 9.5 reveals that a single year of data products is sufficient for demonstration purposes. A long-term archive of at least 10 years (preferably 20 years) is requested by users. Some users request a 20 year archive. GlobCurrent shall develop a 10 year archive of data products that may be extended according to user requirements.

4.4.9. Delivery timeliness

Section 9.5 shows that the majority of users require NRT data delivery of data products. The exact definition of NRT shall be clarified during the GlobCurrent project. As a starting point, NRT can be defined as "made available to users within TBC of the last available data set required to complete an operation" and will be different for L2 and L4 production.

4.4.10. Other product aspects

Section 9.7 shows that users require several specific product features including:

- L2 processed products with uncertainty estimates attached to each measurement,
- L3 products (collated) with uncertainty estimates attached to each grid cell ensemble,
- L4 analysis products with uncertainty estimates attached to each grid cell,
- Estimates of uncertainty together with correlation structures possibly expressed for vector components of the product ($u^{err}_{t,x,y,z}$ $v^{err}_{t,x,y,z}$),
- Complete CF-compliant metadata within each product,

- Details of the processing version used to create product linked to documentation,
- Separate estimates for tidal and Ekman velocities
- Access to underlying data used to create GlobCurrent products,
- Clear specification of underlying data used to create a grid point value, and
- High-quality geolocation of all data.

4.5. Service requirements

4.5.1. Documentation

Section 9.5 details documentation requests made by GlobCurrent users. These include:

- Product User Guide including a full description and example of product data formats and example computer read code for GlobCurrent products,
- Descriptions of all algorithms used in the generation of products (Algorithm Theoretical Baseline Documents – ATBD),
- Easy to use, but comprehensive, handbook of case-study examples of how to access and use GlobCurrent data sets, a full description of all QC and other flags with examples of their use,
- An extensive Technical Specification that explains how data were processed to GlobCurrent products,
- Product validation reports including an indication of product validity (i.e. quality of uncertainty/input data etc),
- Description of how uncertainty estimates were derived,
- Rapid access FAQ for GlobCurrent users, h) An address book of contacts that users may work with to resolve problems,
- Information on the NRT status and performance of the GlobCurrent system with an alert system if there are problems,
- Time series of GlobCurrent Metrics for the processing system, the delivery system(s) and product performance,
- Information on the actual resolution of the data products (as opposed to the simple grid resolution),
- Easy access (web-based) to all GlobCurrent documents.

4.5.2. Help and support

A project web site is required and dedicated point of contact for user help is required.

4.5.3. Feedback

Section 9.11 provides user requirements for feedback preferences. The main results are:

- Users prefer email as the main reporting medium both from and to the GlobCurrent project,
- Regular user workshops are requested,
- Regular information newsletters are requested,
- Facebook and other social media communication tools are requested,
- An RSS feed of useful up-to-date information is requested, and
- A Web Blog for users is requested.

4.5.4. Data access and delivery

Section 9.8 provides user requirements on data delivery. **The overwhelming request is for ftp data access. OpenDAP is then the second data access mechanism requested** followed by web (HTTP). Several users specifically request delivery of **GRIB2 files by email** (for operational purposes). Other mechanisms including LAS and WMS are also noted by some users.

4.5.5. Data visualisation

Section 9.8 shows that users will use GlobCurrent web tools to visualise data products. Several users do not require such services. The most appropriate tools will be determined by the GlobCurrent project.

4.5.6. Data discovery

Section 9.8 indicates that users prefer **a single point web-portal including a searchable catalogue working with product metadata** (e.g. Geoportal Server, CSW) to search for GlobCurrent data.

Several users requested simple data discovery based on ftp site directory/filenames or Google search engines. Some users have specific requirements (e.g. ADS Environmental Data Server used by the US Coast Guard or WMO Information System).

4.5.7. Validation data

Section 9.9 shows that many users have access to and can provide substantial validation data for the GlobCurrent project. Of particular interest is the use of coastal HF-RADAR systems, global shipping fleets (CMC, MAERSK), Oil and Gas Industry SIMORC data, ADCP installations and new-technology Glider/floats.

Regular **validation reports are requested** together with validation metrics (both for the products and the system) to assure users of the project robustness. Validation is a key

element of the GlobCurrent project system and shall be automated with performance metric reporting.

5. User requirements summary

A general summary of project requirements is given here based on the analysis of the previous section. As with the preceding analysis, this enumerated summary is also based on [AD-1], which in turn, provided a basis for the more specific requirements that were given by ESA in its project SoW [AD-2]. In turn, the SoW was the basis for the full set of technical requirements that now define the project's requirement baseline document (RB D-40). These three sets of requirements vary somewhat in scope and detail but are all broadly consistent. Requirements here were identified from one of the following (Source Trace column):

URD: analysis of the user data

REF: peer-reviewed paper

ESA: directly from ESA

Each requirement is also associated with one of the three years of the GlobCurrent project (Year column) and **applies to all subsequent years**.

5.1. Area of interest

At least 10 areas of interest will be employed by the end of the project for validation, testing of methods, and system development (starting with five areas in the first year). Also, regional current products will be issued in years two and three.

ID	Description	Source Trace	Year
GC-UR-010	GlobCurrent shall provide global coverage products. *Note: A limited number of regional products are foreseen to develop and test the GlobCurrent system prior to full implementation.*	URD	1
GC-UR-020	GlobCurrent shall provide a number of regional products for specific areas requested by Users.	URD	1

5.2. Product format

Convenient and popular data formats are employed to facilitate data distribution with an increasing variety of formats added in later years.

ID	Description	Source Trace	Year
GC-UR-030	GlobCurrent products shall all be formatted as NetCDF files.	URD	1
GC-UR-040	GlobCurrent shall provide data in GRIB-2 format. *Note: this requirement addresses the needs of operational/commercial systems requiring compressed NRT delivery of data to existing tools and systems*	URD	3
GC-UR-060	All GlobCurrent NetCDF products shall be fully self-describing and complaint with Climate Forecast (CF) metadata (see http://cf-pcmdi.llnl.gov). *Note: Sufficient metadata shall be provided to allow a reasonable number (TBC) of freely available netCDF readers to read and display the data with no additional tools.*	URD	1

5.3. Product content

These requirements relate to product spatial and temporal resolution, coverage, data record length, and delivery timeliness.

ID	Description	Source Trace	Year
GC-UR-050	GlobCurrent shall provide measurements of Total Current at a specified time (*t*), location (*x,y*) and measurement depth level (*z*) provided as vector components of the form (***u***[*t,x,y,z*], ***v***[*t,x,y,z*]) where ***u*** is a vector component which is positive when directed eastward (negative westward) and ***v*** is a vector component which is positive when directed northward (negative southward).	URD	1
GC-UR-070	GlobCurrent metadata shall be sufficiently detailed to implement end-to-end data management of all products and related parameters within the GlobCurrent project. *Note: the intention of this requirement is to ensure that metadata is able to properly capture such aspects as processing system identification, input data sets used within a file, contact points for data, licensing and version control etc.*	ESA	1
GC-UR-080	GlobCurrent shall provide Level-4 analysis (L4) products.	URD	1
GC-UR-090	GlobCurrent global coverage L4 products shall have a target spatial resolution of 25 km, or the highest available resolution possible. *Note: This requirement refers to the analysis resolution rather than the product grid resolution.*	URD	1
GC-UR-100	GlobCurrent regional coverage L4 products shall be produced at the highest spatial resolution possible. *Note: This requirement refers to the analysis resolution rather than the product grid resolution. Regional products are expected to have a higher spatial resolution than global coverage products.*	URD	2
GC-UR-130	GlobCurrent L4 products shall be produced once per day if feasible	URD	1
GC-UR-140	GlobCurrent L4 products shall be produced at sub-daily intervals where feasible.	URD	1
GC-UR-150	GlobCurrent L4 products shall be produced for a period of at least 10 years using archive data.	URD	3
GC-UR-160	GlobCurrent shall provide, in a common NetCDF CF-Compliant format, all L2 input data products used in the project	URD	1
GC-UR-170	All GlobCurrent L2 files shall provide L2 data using an identical native grid or swath provided by the data provider. *Note: The intent of this requirement is to preserve the data in their native form while reformatting to a common format data file.*	ESA	1
GC-UR-200	GlobCurrent shall provide as separate variables, significant	URD	1

ID	Description	Source Trace	Year
	components of the current field (i.e., tidal, Ekman…) when appropriate.		
GC-UR-210	All GlobCurrent products shall include precise geo-location information.	URD	1

5.4. Product quality and flags

The ESA URD analysis highlights a fundamental need for error estimates and flags, which are thus generated early in the project.

ID	Description	Source Trace	Year
GC-UR-110	All GlobCurrent products shall include ancillary data as dynamic flags to interpret the quality of OSC data. *Note: many users require uncertainty estimates attached to data values within products. Quality indicators and metrics (particularly to help define accuracy) are required to help users exploit uncertainty information.*	URD	1
GC-UR-120	GlobCurrent L4 products shall include uncertainty estimates for every grid-point in the data file.	URD	1
GC-UR-180	All GlobCurrent L2 files shall provide uncertainty estimates with each measurement.	URD	1
GC-UR-190	GlobCurrent L2 data files shall include dynamic flags to improve quality control of the data when used in higher-order analysis.	URD	1

5.5. Timelines

Only year 3 products will be issued in near real time.

ID	Description	Source Trace	Year
GC-UR-220	All GlobCurrent products shall be available in NRT. *Note: For this requirement NRT is defined as "made available to users within TBC of the last available data set required to complete an operation" and will be different for L2 and L4 production.*	URD	3

5.6. Delivery

Convenient and popular data distribution methods are employed with an increasing variety of methods added in later years.

ID	Description	Source Trace	Year
GC-UR-230	The primary mechanism for GlobCurrent product delivery to users shall be ftp/sftp.	URD	1
GC-UR-240	The secondary mechanism for GlobCurrent product delivery to users shall be OpenDAP.	URD	2
GC-UR-250	The tertiary mechanism for GlobCurrent product delivery to users shall be HTTP.	URD	1
GC-UR-260	GlobCurrent shall be able to deliver GRIB2 files by email to	URD / ESA	3

selected registered users.

5.7. Service

Initiation of most services begins early in the project to engage users. Optimization of most services and initiation of a few are (somewhat arbitrarily) held over to demonstrate an evolution in the project.

ID	Description	Source Trace	Year
GC-UR-270	GlobCurrent shall provide a single-point web portal to serve the needs of the user community.	URD	1
GC-UR-280	The GlobCurrent web portal shall provide a searchable catalogue of data products. Users may access data products from the catalogue.	URD	1
GC-UR-290	The GlobCurrent Portal shall provide visualisation tools for users to work with GlobCurrent products.	URD	1
GC-UR-300	The GlobCurrent Portal shall provide automated performance metrics for each product and service provided by the project on a daily basis. A time series of GlobCurrent Metrics for the processing system, the delivery system(s) and product performance shall be provided. *Note: the intention of this requirement is to provide users with an early warning of issues and problems and to help demonstrate the reliability of the system (as requested by many users).*	URD / ESA	1
GC-UR-310	Registered users of the GlobCurrent Service shall be informed immediately of problems and outages if they subscribe to this service element.	ESA	1
GC-UR-320	GlobCurrent shall inform registered users by email contact as the preferred form of feedback.	URD	1
GC-UR-330	In addition to email, all service information shall be published on the GlobCurrent web portal.	URD	1
GC-UR-340	GlobCurrent shall publish a newsletter every 3 months throughout the project lifecycle. The newsletter shall be available on the Web portal and delivered to all subscribed users.	URD	1
GC-UR-350	The GlobCurrent Web Portal shall include an interactive blog.	URD	1
GC-UR-360	GlobCurrent shall make full use of social networking tools (e.g. Twitter, Facebook etc) as part of its basic operational, outreach and communication service.	URD	1
GC-UR-370	GlobCurrent shall provide dedicated points of contact to assist users throughout the project.	URD	1
GC-UR-380	GlobCurrent shall arrange an annual workshop for users.	URD	1

5.8. Document

Metadata that are coded into the data files themselves will not be a formal definition of processing (particularly the creation of error estimates and flags). Most documents will be written in parallel with the development of the data themselves, starting early in the project.

ID	Description	Source	Year

		Trace	
GC-UR-390	All project documents shall be available to the GlobCurrent users via the GlobCurrent Web Portal.	ESA	1
GC-UR-400	A Product Handbook for each GlobCurrent Product shall be developed, maintained and published regularly. The PUG shall include a full description and example of product data formats, full description of all data fields and example computer read code for all GlobCurrent products and any other information required by users.	URD	1
GC-UR-410	Full, scientific and technical descriptions of all algorithms used in the generation of GlobCurrent products shall be published in a publicly available Algorithm Theoretical Baseline Document(s) (ATBD)	URD	1
GC-UR-420	An easy to use dossier of case-study examples of how to access and use each GlobCurrent data product and service shall be published.	URD	2
GC-UR-430	An extensive Technical Specification/Detailed Processing Model that explains how data were processed end-to-end for each GlobCurrent product shall be provided. *Note: the emphasis here is to provide users with a technical reference document that fully describes how GlobCurrent data products were generated.*	URD	1
GC-UR-450	An Uncertainty specification document describing in technical detail the derivation of uncertainties for each GlobCurrent Product shall be published on the GlobCurrent web portal.	URD	1
GC-UR-460	A Frequently Asked Questions (FAQ) for the GlobCurrent project shall be published and maintained on the GlobCurrent Web Portal	URD	1

5.9. Validation

All products will be validated.

ID	Description	Source Trace	Year
GC-UR-440	A validation report shall be published on the Web Portal and regularly (at least monthly) updated for each GlobCurrent product.	URD	1

5.10. Feedback

This activity facilitates improvements and external assessments of all products.

ID	Description	Source Trace	Year
GC-UR-470	The GlobCurrent Web Portal shall provide an open and easy way for users to provide feedback/updates and examples of their use of GlobCurrent Products.	ESA	1

5.11. Users

This activity is at the core of the project and thus is initiated early.

ID	Description	Source Trace	Year
CG-UR-480	GlobCurrent shall form and maintain a strong international collaborative ocean surface currents network (OSCN) including representatives from public, private and academic organizations. *Note: The OSCN will establish and manage relevant issues such as definitions, nomenclature, symbology, interoperability, formats, validation protocols etc.*	ESA	1

6. Summary

The present URD inherits an established group of users and an analysis of their requirements, and captures a growing group of new users, a solicitation of their requirements, and their responses. Following consultations prior to kickoff, this document also summarizes the project's main points of contact, the derivation of a collective set of requirements, and the general requirements themselves. More detailed requirements, addressing in part to the implementation of the project, can be found in the requirements baseline document (RB deliverable D-40).

The GlobCurrent project seeks to improve the retrieval of ocean surface current information from a synergy of satellites and facilitate the uptake of ocean surface current observations within an established community. This is expected to further our understanding of a global ocean that is filled with meandering surface currents and eddies, whose impact we are now faced with the challenge of more accurately quantifying.

7. ANNEX I – User requirements forms

7.1. Invitation letter

This user requirements and feedback questionnaire is designed to capture user needs for ocean surface current data products and demonstration activities that are being developed in the ongoing (2013-2016) GlobCurrent project. The GlobCurrent project is based on requirements derived from collective user needs and is summarized in an evolving User Requirements Document (URD; please see the GlobCurrent website at www.globcurrent.org to obtain documents and register to follow project news and events). User requirements from any user community may be provided as input to the GlobCurrent project.

Earth observation (EO) provides a unique and increasing capability to measure and monitor ocean surface currents at a variety of resolutions and time scales. While some mature techniques are already available to derive surface ocean currents (e.g. altimetry, optical feature tracking), new EO satellites (e.g. GOCE, Cryosat, SMOS) and new techniques are emerging (e.g. SAR radial velocities, mean square slope from glitter patterns, improved geoid models) promising additional capabilities to recover ocean surface currents from the Sentinel satellites.

The user community for ocean surface currents is large and includes:

- Shipping
- Offshore wind and wave energy
- MetOcean Services
- Oil and Gas Industries
- Numerical Weather Prediction and Numerical Ocean Prediction (NWP/NOP)
- GMES Marine Services
- Coastguard, Search and Rescue (GMDSS)
- Maritime Pollution services
- Ports and Harbours
- Hydrographic survey
- Aquaculture and fisheries
- Insurance Industry
- Offshore sailing (e.g. Amercias Cup, Volvo Ocean etc)
- Ice Services
- Local authorities
- Space Agencies
- Defense agencies
- Research community

Despite the clear user needs, many EO products are not optimized for users, are often provided as stand-alone products when synergies between complementary (both satellites and in-situ) products may be more appropriate, often do not include uncertainty estimates,

are provided in a variety of different formats and by different delivery mechanisms. These features all act as barriers to applications. Furthermore, emerging techniques (e.g. sun-glitter derived MSS and surface dynamics, SAR derived radial Doppler currents, multi-sensor merged products) require further R&D to provide reliable, validated ocean surface current products and application techniques.

The GlobCurrent project is promoting a wider development and application of ocean surface current measurements derived from EO. GlobCurrent is in the process of developing new products, performing R&D for better ocean current measurements from space, and demonstrating the use of new products based on the innovative use of EO satellite and in situ data. The project is linked to external user applications that are working together with the GlobCurrent project, minimizing duplication of existing activities. Successful elements of the project may be transferred to operations using existing programmatic opportunities at the end of the project. EO inputs include data from altimeters (e.g., ERS, ENVISAT, Jason, etc), gravity missions (e.g. GOCE), scatterometers (e.g., ASCAT), SAR (e.g. ERS, ENVISAT), optical measurements (ENVISAT MERIS, AATSR), and salinity (e.g., SMOS) and those from future instruments including the GMES Sentinels. Under various defined tasks, the scope of the project includes, for example:

- Integration, harmonisation and cataloguing of existing (satellite and in-situ) data streams,

- Preparations for the use of GMES Sentinels and other future EO data (e.g. GCOM-W),

- Development and testing of new retrieval techniques for ocean surface currents from EO data including the use of complementary EO data and in-situ data in synergy,

- Development of a web portal, a data archive, and software tools to assist the user community in the discovery and application of EO derived surface ocean current data,

- Processing and delivery of new types of products, based on research outcomes,

- Development of uncertainty estimates for EO ocean surface current estimates,

- Products and demonstration activities supporting data inter-comparisons and validation activities,

- Products and demonstration activities supporting the needs of surface drift applications, ocean modelling teams, data assimilation schemes, model validation, scientific research and commercial exploitation.

The GlobCurrent User Consultation Meeting (UCM), held at IFREMER, France 7-9th March 2012, brought together users of ocean current products and information, international specialists and experts in the field of EO (calibration, validation, data merging, algorithm development) and data delivery. This meeting explored R&D requirements for improved EO data products and demonstration activities in support of user needs for better ocean surface current products. Conclusions and stated requirements that emerged from this meeting were used to define the scope and develop initial guidelines for the project. Additional user inputs continue to be solicited, however, in part to develop further the user/producer base.

What you need to do to ensure GlobCurrent meets your needs

As a successful project, GlobCurrent needs to engage a representative group of users that requires EO-derived ocean surface current products. These so-called "Champion users" are actively involved in the GlobCurrent project, providing their user requirements and feedback to the project to ensure the best outcomes. The final outcomes of the project are intended to benefit the broad user community listed above.

In order to guarantee a good working relationship between the project and its user community, a formal relationship between the GlobCurrent project and its users is being developed. Following an approach laid out by earlier projects (see the ESA DUE project website for more information), we request the following:

- Provide a signed statement of your detailed user requirements using the questionnaire template provided in this document.

- If you wish to be a champion user within the project, please sign a letter of commitment to the project (appended below) enabling your organisation to participate as a Champion User within the project activities.

The GlobCurrent users advise on key aspects of the project development, including attending some of the project meetings if appropriate, and have the opportunity to evaluate the project outcomes at the mid-term and final project review.

If you would like to participate in the GlobCurrent project, this document provides a template for specifying your detailed user requirements and a template Champion User "letter of commitment" to the project. Please send your completed questionnaires (by email, if this is convenient) to participate@globcurrent.nersc.no or:

The GlobCurrent Project
Nansen Environmental and Remote Sensing Center
Thormøhlens gate 47
N-5006, Bergen, NORWAY
t: +47 55 20 58 00

User Requirements

The requirements you specify are meant to guide the GlobCurrent project work plan. The completeness of the information and the level of detail you provide will have a direct impact on our ability to define a project that successfully meets your needs. We ask you to complete all sections of this questionnaire as accurately and thoroughly as possible. If you have ideas for the GlobCurrent project, then please include them when you fill-in the questionnaire. Finally, it is of course very important that you help us to be aware of existing activities, so that the GlobCurrent Project can build synergy rather than needlessly duplicating what already exists.

A word on scope...

Please try to avoid specifying requirements that are out of scope. For example, the GlobCurrent project cannot:

- Build new satellite or in-situ infrastructure,

- Replace existing sources of data,

- Work on L0 → L1b product development activities,

- Duplicate existing services and activities.

Please tell us what you need in as much detail as you can. The more information we have to scope the GlobCurrent project, the better we can serve your needs.

Thank you for your inputs and support to the GlobCurrent project

Johnny A. ohannessen
Vice Director

Dr. Johnny A. Johannessen, NERSC

7.2. User requirements questionnaire

Please use as much space as you need.

Your Ocean Surface Current Applications
Please provide a contact that we can use to work with you.

Contact name	
Role	
Organisation	
Postal address	
Email	
Telephone	
Fax	
Type of organisation	*E.g. commercial, research, government agency, intergovernmental organisation, etc*

3.1 Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.

3.2 Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.

Your Ocean Surface Current Requirements

4.1 Area of Interest (please duplicate this section if more than one area is required):
*Please List the geographical areas, with coordinates, and time periods that you would like to work on together with GlobCurrent product/demonstration activities**.***

4.2 Product Requirements –what products do you need ?(please duplicate this section if more than one product is required):

4.2.1 Ocean Surface Current product: **coverage** (e.g., local, regional, global)

4.2.2 Ocean Surface Current product: **spatial resolution** (e.g., 25 km)

4.2.3 Ocean Surface Current product: **temporal resolution/revisit** (e.g., daily, 6 hourly, monthly…)

4.2.4 Ocean Surface Current product: **formats needed** (e.g. netCDF, GRIB2, BUFR, ECDIS…)

4.2.5 Ocean Surface Current product: **length of data record required** (e.g., near real time, 10 years…)

4.2.6 Ocean Surface Current product: **documentation** (what documents do you need?)

4.2.7 Ocean Surface Current product: **nomenclature** (How would you like to see GlobCurrent define surface ocean currents? Note: GlobCurrent proposes to use Total Current at a specified measurement depth level (u_z, v_z) together with metadata to provide details on the current measurements).

4.2.8 Ocean Surface Current product: **other** (any other aspect of the GlobCurrent products you need e.g. uncertainty estimates, flags, metadata…)

4.3 Activity Requirements (please duplicate this section if more than one demonstration activity is required):

4.3.1 Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview)

4.3.2 How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)

4.3.3 Why do you want products delivered in this way?

4.3.4 How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)

4.3.5 How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)

4.3.6 What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)

4.3.7 What metadata requirements do you have? (i.e. data product and data discovery metadata)

4.3.8 What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)

4.3.9 Any other aspect where GlobCurrent could assist you for this application?

4.4 Validation data

Please list any validation data and/or your interest in GlobCurrent validation activities that you could make available to validate GlobCurrent products.

4.5 Existing activities

4.5.1 Please list any existing activities that should be taken into account in defining the GlobCurrent project work plan.

4.5.2 How could GlobCurrent avoid duplication and achieve the best synergy with existing services/activities (note GlobCurrent will not duplicate existing activities and services)?

4.6 User Feedback

4.6.1 Please describe how you would prefer GlobCurrent to provide feedback on the project, its products, evolution and activities to you.

4.6.1 Please describe how you would prefer to provide your feedback to GlobCurrent.

4.7 Other information

Please describe any other requirements or aspects that you would like GlobCurrent to consider or you feel GlobCurrent must take into account.

Confirmation of User Requirements

I confirm that the above information defines my User Requirements for the *ESA GlobCurrent project*:

Signature:

Name:

Date:

7.3. User requirements letter of commitment

To take part in the *ESA GlobCurrent project* as a **Champion user** (you may also submit requirements as a "normal" user without a letter of commitment) we ask you to send us a letter of commitment by signing the 1-page document below:

From: <your name>

<your address>

To: The GlobCurrent Project
Nansen Environmental and Remote Sensing Center
Thormøhlens gate 47
N-5006, Bergen, NORWAY
t: +47 55 20 58 00
e: participate@globcurrent.nersc.no

Re. GlobCurrent Project: CHAMPION USER COMMITMENT LETTER

I confirm my agreement to collaborate with the GlobCurrent consortium as a *Champion User* during the ESA Data User Element GlobCurrent project, which will define, develop and demonstrate earth observation demonstration activities supporting the ocean surface current user community. I understand that the GlobCurrent project is funded by ESA under EOEP4 with the primary objective of fulfilling the user requirements of the ocean surface current EO data user community.

I agree to take the responsibility for:

- Delivering my requirements for ocean surface currents;

- Providing expert advice during the GlobCurrent project, such as on the consolidation of User Requirements during the initial project phase;

- Helping to demonstrate and evaluate GlobCurrent project outputs in my areas of interest/applications and provide feedback at the GlobCurrent User Consultation Meetings;

- Facilitating access to existing data (*e.g.*, *in-situ* data) that may be useful for the project;

I am aware that the project was kicked off on 8 October, 2013, will last for **three** years, and that the user community will have free access to the results of the project.

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 accept that this collaboration **does not imply any exchange of economic resources between the GlobCurrent project and my organization**.

I will respect the scheduling of delivery dates and will encourage and promote use of the project results;

Yours sincerely,

……………………………………		………………….
(signature)				(date)

……………………………………
(name)

8. ANNEX II – Group directories

Listed here are the project Demonstration and Scientific Committees that were formed at the beginning of the project. The GlobCurrent User Consultation Meeting that was held at Ifremer in Brest, France on 7-9 March, 2012 resulted in many of the established champion and regular users listed below. This is followed by a list of users who are interested in following the progress of GlobCurrent.

8.1. Demonstration committee

Areas of expertise

|	
Mathieu Rouault	Broad experience in ocean-atmosphere interaction, meteorology and climatology. Target advances in understanding how the ocean dynamics influence the climate of Southern Africa, atmospheric influences on oceans and ecosystems, satellite remote sensing, numerical model output and climate data. Also involved in development of a real time monitoring system around Africa.
Fabrice Hernandez	Lead validation and assessment activity in MyOcean2. Is proposed to be the led-user for the case study of the global GlobCurrent surface current project listed above.
Pierre-Marie Poulain	Expert on surface drifters and responsible for the Mediterranea Surface Drifter Database. Published an updated estimation of surface currents in the Mediterranen sea last year.
David Woolf	Heriot-Watt, where Dr. D. Woolf works, leads or is a partner in a number of modeling and in situ studies, including areas around Orkney Is as documented in the following publications (The dynamics of an energetic tidal channel, the Pentland Firth, Scotland Easton, M., Woolf, D. K. & Bowyer, P. 1-Oct-2012 In : Continental Shelf Research. 48, 1, p. 50-60, 11 p; Current patterns in the Inner Sound (Pentland Firth) from underway ADCP data Goddijn-Murphy, L., Woolf, D. K. & Easton, M. Jan-2013 In : Journal of Atmospheric and Oceanic Technology. 30, 1, p. 96-111, 16 p.)
Johannes Schulz Stellenfleth	The institute for Coastal Research at HZG , Hamburg, Germany has a long experience in the operation of coastal observational systems and numerical models. In the framework of COSYNA a unique observation systems was implemented for the German Bight. This system in particular includes three HF radar stations, which are ideally suited as a validation tool for *GlobCurrent* products.
Øyvind Sætra	Lead MyWave project. Expert on ocean surface waves and air-sea interaction including wave-surface current interaction and Stokes drift.
Gus Jeans	Experienced and involved in supply of reliable OSC data derivatives to support the full range of offshore industry applications. This includes long-term historic data to support engineering design and operability studies, with an increasing expectation for reliable forecasts to support current sensitive activities.
Gérald Bibot	Partner – Founder Great Circle sprl which is a company in Belgium that undertake and contribute to operational services using high resolution atmospheric models (WRF), ship routing and search and rescue.
Knut-Frode Dagestad	Experienced in electromagnetic propagation, remote sensing of the ocean, in particular wind and currents, by means of Synthetic Aperture Radar, real-time SAR processing and analysis, and Doppler signal processing, with a focus on surface wind retrieval.
Johnny A. Johannessen	Project manager responsible for product development, integration, and user involvements.

8.2. Scientific committee

Areas of expertise

Kathleen Dohan	Expert in turbulence and stratified flows, internal waves, mixed layer parameterization, wind-driven mixing. Has experience with both laboratory experiments and numerical simulations to study internal wave generation from a turbulent mixed region, interaction between turbulence and stratification, use of mooring data to quantify the dynamics of storm-driven upper ocean mixing during the fall deepening stage of the mixed layer evolution and its implications for mixed layer models. At ESR since December 2007 and now working on Ocean Surface Current Analyses-Real time (OSCAR) and sub-inertial wind-driven surface currents (Ocean Vector Wind).
Joseph Henry LaCasce	Leading expert on upper ocean dynamics. Proposed applying the SQG model to estimate near-surface velocities from SST in 2006. He studies oceanic dynamics and 2-D turbulence and is known for his work on Lagrangian dispersion in the ocean and atmosphere.
Ad Stoffelen	Expert on wind retrieval from satellites. Led the development of the CMOD empirical model to convert measured radar cross-section to near surface wind speed and direction. He is also highly experienced with NWP models and data assimilation of satellite winds.
Rick Lumpkin	His research focuses on upper ocean processes and ocean circulation. As scientific director of NOAA's Global Drifter Program (GDP) at AOML, he oversees a global array of ~1250 satellite-tracked drifting buoys measuring ocean temperatures and surface currents, and has used these data to write a number of peer-reviewed publications.
Øyvind Breivik	Experienced with coupled modelling of the air-sea interaction and the modulation by the sea state of energy and momentum fluxes from the atmosphere to the ocean mixed layer. Currently involved in the process of building a fully coupled model system where the atmospheric model (IFS) is communicating directly with the ocean model (NEMO) without an explicit coupler. The wave model (WAM) modulates the fluxes of momentum and energy from the atmosphere to the ocean.
Francisco J O Torres	Expert on SAR wave /wind field retrievals and validation. Involved in a new Mexican initiative to establish an observing system (in-situ, satellite, model based) for the Gulf of Mexico
Jordi-Isern Fonanet	His expertise is in SQG processing of SST and SSH data for upper ocean dynamics retrievals.
Gus Jeans	Experienced and involved in supply of reliable OSC data derivatives to support the full range of offshore industry applications. This includes long-term historic data to support engineering design and operability studies, with an increasing expectation for reliable forecasts to support current sensitive activities.
Bertrand Chapron	Project scientific coordinator
Johnny A. Johannessen	Project manager responsible for product development, integration, and user involvements.

8.3. Champion, regular, and interested users

The directory of GlobCurrent Users column indicates either that a full letter of commitment was returned, indicating a champion user (C), or that only the certified user requirements were returned, indicating a regular user (R). Otherwise, an expression of interest in following the progress of the project (I) has been received. These interested users are sent the user requirements forms (cf. Annex I) and invited to become champion or regular users. All users are included in the GlobCurrent email listserve (and receive UCM invitations and other updates).
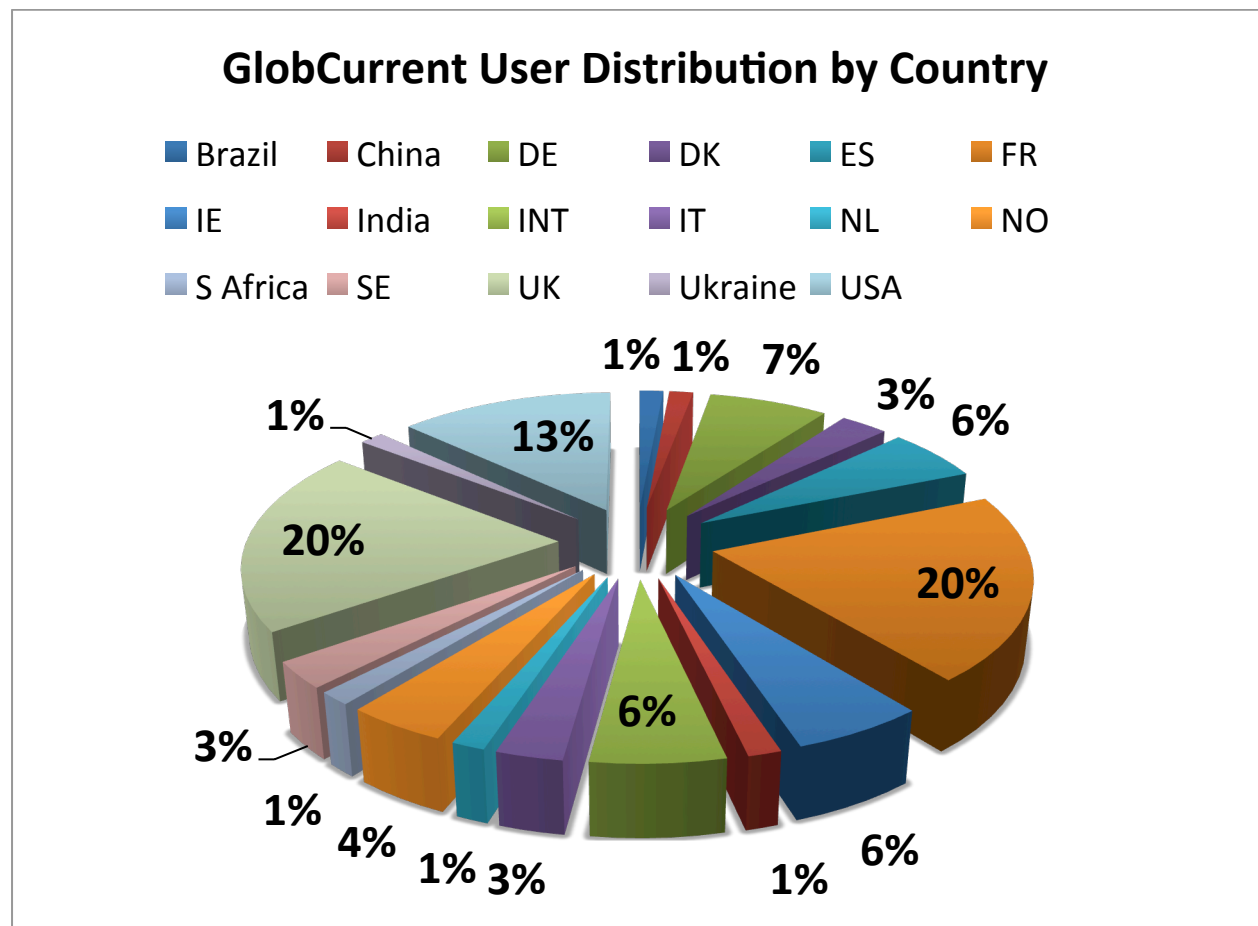
Figure 6: GlobCurrent user distribution by country.

8.4. Champion and regular users

ID	Acronym	Institute	Address	Country	Contact	Tel	User
1	UKMO	Met Office (Government Agency)	Ocean Forecasting Research and Development, Met Office, FitzRoy Road, Exeter EX1 3PB, UK	UK			C

ID	Acronym	Institute	Address	Country	Contact	Tel	User
2	DMI	Danish Meteorological Institute (Government Agency)	Polar Oceanography, Center for Ocean and Ice, Danish Meteorological Institute, Lyngbyvej 100 – 2100, Copenhagen Ø - Denmark	DK			C
3	NCEP	NOAA Environmental Modeling Center, NCEP/NWS (Government Agency)	NOAA Environmental Modeling Center, NCEP/NWS, 5830 University Research Court, College Park, MD 20740, USA	USA			C
4	ECMWF	European Centre for Medium Range Weather Forecasting (Inter-Government Agency)	ECMWF, Shinfield Park, Reading RG2 9AX, UK	INT			C
5	SMHI	Swedish Meteorological and Hydrological Institute (Government Agency)	SMHI, Folkborgsvägen 17, 601 76 Norrkoping, Sweden	SE			C
6	MF	Meteo France (Government Agency)	42 Av. G. Coriolis 31057 Toulouse Cedex, France	FR			C
7	KNMI	KNMI, Royal Netherlands Meteorological Institute (Government Agency)	KNMI, Postbus 201 de Bilt, 3730 AE the Netherlands	NL			C
8	IMRCC	Italian Coastguard (Government Agency)	Italian Coastguard Headquarters, 3 Dep. Operational Centre, IMRCC, Roma, Vialle del Arte 16, 00144, 9Roma, Italy	IT			C
9	USCG	U.S. Coast Guard Office of Search and Rescue (CG-5341) (Government Agency)	U.S. Coast Guard International Ice Patrol 1 Chelsea Street New London, CT 06320, USA	USA			R
10	AOML	NOAA Atlantic Oceanographic and Meteorological Laboratory	AOML, 4301 Rickenbacker Causeway, Miami, FL 33149, USA	USA			C

ID	Acronym	Institute	Address	Country	Contact	Tel	User
		(Government Agency)					C
11	NODC	NOAA National Oceanographic Data Center (Government Agency)	1315 East West Highway, Silver Spring MD 20910, USA	USA			C
12	INCOIS	Indian National Centre for Ocean Information Services (Government Agency)	Ministry of Earth Sciences, Govt. of India, "Ocean Valley", Pragathi Nagar (BO), Nizampet (SO), Hyderabad 500090, India	INDIA			C
13	BSH	Federal Maritime and Hydrographic Agency (BSH) (Government Agency)	BSH, Bernhard-Nocht-Strasse, 78, 20359, Hamburg, Germany	DE			R
14	EMSA	European Maritime Safety Agency (Inter-Government Agency)	EMSA, Cais do Sodré, 1249-206, Lisboa, Portugal	INT			R
15	IFREMER	French Research Institute for Exploration of the Sea (National Agency)	IFREMER, BP 70 , Plouzané, France	FR			C
16	JPL	NASA Jet Propulsion Laboratory (Space Agency)	MS 300-323, 4800 Oak Grove Drive, Pasadena, CA 91109, USA	USA			R
17	JCOMM	Joint Commission for Oceanography and Marine Meteorology (Inter-Government Agency)	JCOMM, Services and Forecasting Systems Program Area (SFSPA), Coordinator, 5830 University Research Court, College Park, MD 20740, USA	INT			R
18	OA	Oceananalysis Ltd.	43, Howbery Farm, Wallingford, OX10 8NR, UK	UK			C
19	MG	MeteoGroup	6 rue Porstrein, 29200 Brest France	FR			C
20	EN	Eur Nelias	11 rue du coteau du Frugy 29000 Quimper, France	FR			C
21	PFCAL	Pole Finistetre Course au Large	Port la Forêt 29940 LA FORET FOUESNANT, France	FR			C

ID	Acronym	Institute	Address	Country	Contact	Tel	User
22	ADRENA	ADRENA	183, Route de Clisson 44230 Saint Sebastien sur Loire France	FR			C
23	CMA	CMA Ships CMA-CGM Group	CMA-CGM Marseille Head Office 4, quai d'Arenc 13235 Marseille cedex 02 France	FR			R
24	CLS	Collecte Localisation Satellite	CLS, 8-10 Rue Hermes, Ramonville Saint Agne, 31520	FR			C
25	SO	SAT-OCEAN	53 Boulevard de la Reine, 78000, VERSAILLES, FRANCE	FR			C
26	MERC	MERCATOR Ocean	31520 Ramonville Saint Agne, France	FR			R
27	MSS (with outdated contacts)	Marine Science Scotland (updated contacts below)	PO Box 101 375 Victoria Road, Torry Aberdeen AB11 9DB Scotland UK	UK			R
28	BC	Brockmann Consult	GmbH, Max-Planck-Straße 2 21502 Geesthacht, Germany	DE			C
29	TOT	TOTAL SA	2, Place Jean Millier, La Defense 6, 92078 Paris La Defence, CEDEX, France	FR			C
30	NOV	NOVELTIS	153, rue du Lac, 31670 LABEGE, France	FR			R
31	EMEC	European Marine Energy Centre Ltd.	Old Academy, Stromness, Orkney, KW16 3AW, UK	UK			R
32	TCE	The Crown Estate	16 New Burlington Place, London, W1S 2HX, UK	UK			R
33	HRW	Hydraulics Research Wallingford	Howbery Park, Wallingford, Oxfordshire, OX10 8BA, United Kingdom	UK			C
34	SATOC	Satellite Oceanographic Consultants Ltd	SATOC, 49 Seal Road, Bramhall, Stockport, Cheshire	UK			C

ID	Acronym	Institute	Address	Country	Contact	Tel	User
			SK7 2JS, UK				C
35	UoN (an outdated acronym)	School of Geographical Sciences at U of Bristol University of Newcastle	School of Geographical Sciences at U of Bristol School of Civil Engineering and Geosciences Cassie Building Newcastle University Newcastle upon Tyne United Kingdom, NE1 7RU, UK	UK			C
36	CSIR	Council for Scientific and Industrial Research	15 Lower Hope Street, 7700 Rosebank, S Africa	SA			C
37	UoC	University of Cantabria	Environmental Hydraulics Institute, IH Cantabria, Univeristy of Cantabria, Parque Cientifico y Tecnologico di Cantabria, C/Isabel Torres 15, Santander, 39011, Spain	ES			C
38	PML	Plymouth Marine Laboratory	Prospect Place, Plymouth PL1 3DH, UK	UK			C
39	CNR (Pisa)	Consiglio Nazionale delle Ricerche	CNR, c/o Area della Ricerca CNR – via Moruzzi 1 – 56127 Pisa - italy	IT			C
40	ICIT	International Centre for Island Technology,	ICIT, The Old Academy, Back Road, Stromness, Orkney, KW16 3AW, UK	UK			C
41	PO	PROOCEANO	Av. Rio Branco, 311/1205 – CEP: 20040-009, Centro – Rio de Janeiro, RJ - Brazil	BRAZ			C
42	UHI	Environmental Research Institute, university of Highlands and Islands	CfEE, Ormlie Road, Thurso, Caithness, Scotland, KW14 7EE	UK			C
43	CEDRE	Centre of Documentation, Research and Experimentation on Accidental Water Pollution	715, rue Alain Colas - CS 41836 Brest Cedex 2 29218	FR			R
44	UoM	University of Miami	RSMAS, 4600	USA			R

ID	Acronym	Institute	Address	Country	Contact	Tel	User
			Rickenbacker Causeway, Miami FL 33149, USA				
45	CUT	Chalmers University of Technology	Department of Earth and Space Sciences, Hörsalsvägen 9, 4th floor, SE-412 96 Gothenburg, Sweden	SE			C
46	NERSC	Nansen Environmental and Remote Sensing Center	Thormøhlens gate 47 N-5006, Bergen NORWAY	NO			R
47	ERI	Earth and Space Research	2101 Fourth Ave, Suite 1310, Seattle, WA, USA 98121, USA	USA			C
48	LEGOS	CTOH/LEGOS	14 Av. E. Belin, 31400 Toulouse, France	FR			R
49	BMT	BMT ARGOSS	First Floor, 3700 Parkway, Solent Business Park, Whiteley, Fareham, Hampshire PO15 7AL, UK	UK			R
50	MEARSK	Maersk Maritime Technology, Hydrodynamics	Nicolai Eigtveds Gade 28, 1402 Copenhagen	DK			R
51	NIVA	Norsk Institutt for Vannforskning	NIVA, Gaustadalléen 21, NO-0349 OSLO	NO			R
52	PDE	Puertos del Estado	Jefe de Area de Media Fisico, Puertos del Estado, Avda del Partenon 10, 28042 Madrid	ES			C
53	DOMMRS	Daithi O'Murchu Marine Research Station	Gearhies Bantry Co. Cork, Ireland	IE			C
54	CLIVAR	Climate And Variability	International CLIVAR Project Office, National Oceanography Centre, Southampton Waterfront Campus, European Way Southampton, SO14 3ZH, UK	INT			R
55	RES	Renewable Energy Systems Limited (RES)	Faraday House, Station Road, Kings Langley WD4 8LH	UK			C

ID	Acronym	Institute	Address	Country	Contact	Tel	User
56	IRCG	Irish Coast Guard, MRCC Dublin – Operations Room	Department of Transport, Tourism & Sport, Leeson Lane, Dublin 2	IE			R
57	FSU	Center for Ocean-Atmospheric Prediction Studies (COAPS)	Florida State University Tallahassee, FL 32306-2840, USA	USA			C
58	CRMC	Coastal and Marine Research Centre	Naval Base, Haulbowline, Cobh, C. Cork, Ireland	IE			R
59	MHI-NASU	Marine Hydrophysical Institute National Academy of science of Ukraine (MHI NASU) / Marlin-Yug Ltd	2, Kapitanskaya Street, Sevastopol, 99011, Ukraine	UKR			R
60	HZG	Helmholtz-Zentrum Geesthacht	21502 Geesthacht, Germany	DE			R
61	UoK	Kiel University	Ludewig-Meyn-Str 14, 24118 Kiel, Germany	DE			R
62	MAIN	Mainstream Renewable Power Ltd.	Arena House, Sandyford, Dublin 18, Ireland	IE			C
63	NOC	National Oceanography Centre	Room 254/35 European Way, Southampton SO14 3ZH, United Kingdom	UK			R
64	FIO	First Institute of Oceanography	State Oceanic Administration, 266061, CHINA	CN			C
65	AZTI	AZTI-TECNALIA. Marine Research Unit, Dynamics and Operational Oceanography Area	Herrera Kaia, Portualdea zig E-20110 Pasaia, SPAIN	ES			C

Table 1: List of established champion and regular users.

8.5. Interested users

ID	Acronym	Institute	Address	Country	Contact	Tel	User
66	IC-US	Integral Consulting Inc	1205 West Bay Drive NW Olympia, WA 98502	USA			I
67	Met.no	Norwegian Meteorological Institute	Allégaten 70 5007 Bergen	NO			I
68	Qualitas	Qualitas Remos	Toronga, 31, bajo 28043 Madrid, Spain	ES			I
69	Helzel	Helzel Messtechnik GmbH	Carl-Benz-Str. 9 D-24568 Kaltenkirchen Germany	DE			I
70	CGMetoc	CG Metocean Consulting Limited	54 PULLMAN LANE, GODALMING, SURREY, GU7 1YB, UK (Sunbury-on-Thames)	UK			I
71	Shell	Shell U.K. Limited	1, Altens Farm Road, Aberdeen, AB12 3FY, UK	UK			I
72	RAN	Royal Australian Navy, Hydrography and METOC Branch, Maritime Military Geospatial Information and Services	Level 2, Building 89/90, Garden Island, POTTS POINT NSW 2011	AU			I
73	GREATC	Great Circle sprl	Place de la Gare 3 1330 Rixensart Belgique	BE			I
74	UNMSM	Universidad Nacional Mayor de San Marcos	Calle Germán Amézaga N° 375 - Edificio Jorge Basadre, Ciudad Universitaria, Lima 1	CL			I
75	PIXAL	Pixalytics Ltd	1 Davy Road, Plymouth Science Park, Derriford, Plymouth, Devon, PL6 8BX	UK			I
76	ESA	ESA ESRIN	Keplerlaan 1, Noordwijk, 2200AG	NL			I

Table 2: List of interested new users.

9. ANNEX III – Documented user requirements

The following sections present the replies given by champion and regular users to the GlobCurrent user requirements questionnaire. All information submitted is reproduced exactly (apart from obvious corrections and clarification) and collated to facilitate the analysis given in Section 4.

9.1. Main user application areas

ID	Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.
UKMO	• We develop and run the FOAM ocean forecasting system which we use to provide daily analyses and 7-day forecasts of ocean currents and tracers (including biogeochemical quantities) in various regimes. • In the deep ocean this includes the 1/4 degree global FOAM system as well as 3 regional FOAM systems at 1/12 degree resolution in the North Atlantic, Indian Ocean and Mediterranean Sea basins. • Additionally we run FOAM Shelf Seas systems too with a 7km Atlantic Margin Model (on the North-West European Shelf) and a 4km model in the Persian Gulf. • We also use the WaveWatch3 wave forecasting system to produce surface wave forecasts. These WW3 systems include a 35km global system twice daily, a 12km North Atlantic European system four times per day and a 18km model twice per day in the Persian Gulf. In the near future the WW3 models will be forced using FOAM surface currents.
DMI	• The Danish Meteorological Institute (DMI) is responsible for operational monitoring and forecasting of the ocean physical environment in Danish and Greenland Waters. In addition we provide a number of commercial services to off-shore operators such as the oil and gas industry operating in Greenland. • DMI operates and develops 3 ocean models. 1) A global climate model, the EC-earth setup 2) A regional model, the HBM model, covering the North Sea and the Baltic Sea, and finally 3) a deep ocean model coupled with a sea ice model, Hycom/CICE, covering the North Atlantic and the Arctic Ocean. Furthermore, our model groups are currently developing modules for ice berg drift and oil drift in sea ice conditions, for the Arctic setup. Both the HBM and the Hycom/CICE are applied operationally and forecasts are produced daily. • All models operate in partly sea ice infested areas, where in situ data for cal/val purposes are sparse or non-existing. This makes the GlobCurrent initiative extremely relevant for further development and validation of our models.
NCEP	• Development, enhancements, and maintenance of numerical prediction and analysis systems comprising NCEP operational production suite. • Operational oceanographic products (text warning bulletins, graphic analysis and forecast products). • Forecast support of government incident response and operations.
ECMWF	• In the near future, verification of ocean model, data assimilation and coupled forecasts • In the medium term, develop methods to assimilate ocean currents. • In the longer term, operational assimilation of ocean currents, possibly using coupled data assimilation. • Ocean reanalysis and coupled model evaluation.
SMHI	• SMHI provide NWP/NOP, GMES Marine Services, Ice Services, ship routing, maritime pollution, search and Rescue • Input for offshore wind and wave energy.
MF	• Global, Regional and Coastal ocean wave predictions
KNMI	• KNMI is involved in scatterometer wind processing. Wind scatterometry is an important source of information on the ocean surface winds, notably, since in most areas no in-situ measurements from buoys or ships exist. Scatterometer winds are used for nowcasting, for instance warnings for hurricane-force winds to shipping traffic, and are also assimilated into meteorological atmospheric models like that of ECMWF. • At this moment operational wind products are obtained from the Advanced Scatterometer (ASCAT) carried by Metop-A and MetOp-B, meteorological satellites operated by the European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT). The winds are produced in the EUMETSAT Ocean and Sea Ice Satellite Application Facility (OSI SAF) at KNMI. Metop-A was launched in 2006, Metop-B in 2012 and Metop-C will follow in 2017, thus aiming at least 15 years of operational scatterometer services. A second make of scatterometer currently in space is OSCAT on board the Indian Oceansat-2 satellite. A wind product derived from this instrument is now operational. In the future, wind products from the Chinese HY-2 and the Chinese- French CFOSAT can be expected. • Scatterometer winds measure the wind with respect to the moving water, while wind relative to the fixed Earth are assimilated into Numerical Weather Prediction (NWP) models. Ocean currents therefore cause a bias in scatterometer winds that needs to be corrected for, as data-assimilation techniques require unbiased data. Scatterometer winds are precise: the error in the wind components is only about 0.7 m/s as follows from simultaneous comparison with buoys. Scatterometer winds are also detailed: the operational ASCAT wind product on a 12.5 km grid has a spatial resolution of about 25 km as follows from spectral analysis. An ultra high resolution product on 6.25 km grid size that is currently under development is expected to have even better spatial resolution.
IMRCC	• Italian Coast Guard works in the framework of marine pollution prevention and response, using oil spill drifting models for pollution scenario, in case of emergency (e.g. Costa Concordia) and for risk assessment and risk management, other than CleanSeaNet web interface (maritime pollution prevention and response). • Moreover has ship reporting systems in which current data integration caul be very useful for S&R purposes.

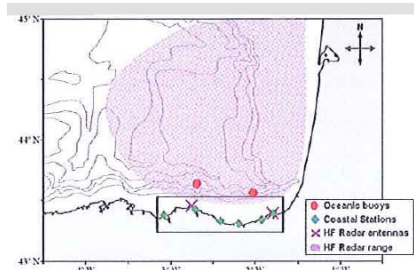| ID	Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.
USCG	• Maritime Search and Rescue. • The US Coast Guard Search and Rescue (SAR) program and its contractors provide new environmental products to the USCG SAR planning program (SAROPS) via the Environmental Data Server (EDS).
AOML	• Manage AOML's components of NOAA's Global Drifter Program, which maintains a global array of ~1250 satellite-tracked drifters to measure near-surface currents and provides a data management system for the scientific use of these data. • Create products derived from the drifter data, such as a global climatology of monthly near-surface currents.
NODC	• Provide on-line access to Ocean Surface Current data, if the data would be archived at the U.S. National Oceanographic Data Center. Note that NODC also archives and serves subsurface current data as well, but understands GlobCurrent is focused on the surface.
INCOIS	• As the nodal agency to provide operational oceanographic services in India, Indian National Centre for Ocean Information Services is actively involved in developing ocean prediction systems using numerical ocean models. • At present, we are providing ocean predictions based on the Regional Ocean Modelling System (ROMS), which is setup at a uniform horizontal resolution of 0.125 degree for the entire Indian Ocean domain. • Apart from many oceanographic parameters, one of the most important parameter we are providing to the user community is the surface current prediction. • We have a rich user base covering from Indian Navy to local fishermen and Maritime authorities to offshore energy sectors. • To cater the ever increasing needs of this user community, we are currently setting up a hierarchy of ocean models with data assimilation capabilities, which covers global oceans in a relatively coarser resolutions to the coastal waters around India in a very high horizontal resolution of approximately 1.5km.
BSH	• BSH is running a comprehensive operational model system for the North Sea and the Baltic Sea with focus on German territorial waters. • Main applications are sea level forecasting, storm surge warnings, sea ice information, oil spill simulations and support of search-and- rescue facilities.

EMSA	• EMSA provides a number of operational services to national administrations within the EU Member States. Services are provided from IMDatE and CleanSeaNet and support the operations of different maritime user communities, including:
	    o Search & Rescue
	    o Fisheries
	    o Safety – including vessel traffic monitoring
	    o Law enforcement
	    o Border Control
	    o Environmental
	• The Integrated Maritime Data Environment (IMDatE) is a modern technical framework developed by EMSA that supports the exchange of maritime data available from all the EMSA hosted applications as well as other user community specific data. IMDatE combines and processes (near) real-time operational data, also from EMSA's other maritime applications, to provide a single platform offering Maritime Situational Awareness tools with comprehensive and configurable services for users.
	• CleanSeaNet (CSN) is the European oil spill monitoring and vessel detection service and the Agency's backbone for EO satellite imagery. The service, based on the analysis of Synthetic Aperture Radar satellite data, provides aggregated products on possible oil spills, pollution alerts and related information to the operational maritime administrations within 30 min. after satellite acquisition to allow an effective use of the data for follow up activities.

IFREMER	• Use of ocean surface currents for numerical wave modelling (development of operational modelling system used later on by Meteo-France and NCEP or consulting companies)
JPL	• Diagnose variability of mixed-layer temperature and salinity. • Data assimilation.
JCOMM	• Development, enhancements, and maintenance of numerical prediction and analysis systems comprising operational production suite. • Operational oceanographic products (text warning bulletins, graphic analysis and forecast products). • Forecast support of incident response and operations.
OA	• For many years I have been routinely involved in supply of reliable OSC data derivatives to support the full range of offshore industry applications. This includes long term historic data to support engineering design and operability studies, with an increasing expectation for reliable forecasts to support current sensitive activities. • Key applications include offshore site characterisation, operability assessments and engineering design
MG	• **Marine forecasts** • **Route optimization** • **Metocean Studies**
EN	• Yacht Racing. I have been racing inshore and offshore since 1985. • I was navigator on Groupama 4 (winner) during the last Volvo Ocean Race.
PFCAL	• Training Centre and Training Course au Large (Labeled by the Pôle France FFV). For the reception, coaching and training of athletes (federal statute FFV) in this area and professional sailors. • For example some sailors Member Pole: Michel Desjoyeaux, Franck Cammas Roland Jourdain ... • Participants in the next Vendée Globe: Vincent Riou and Armel Le Cleac'h, Marc Guillemot, Jean Pierre Dick, Jérémie Beyou, Samantha Davies, Jean le Cam, Bernard Stamm, François Gabart.

ID	Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.
ADRENA	• We provide navigation, performance and routing software for offshore and inshore sailing boats. • We also develop routing application for commercial, ferries and fishing ship
CMA	• Ship Routing for an international fleet of 4000 ships in global waters. • We have to choose the best Route and Speed to save Fuel for all the rotations of our 420 containers ships on regular Lines. • The routes are from port to port, with scheduled time windows to respect to arrive just in time in terminals, on a weekly basis. So our needs are to receive the forecasting of Weather and Surface Current. • Drafts of vessels from 6m to 16 m
CLS	• We provide Current data and current analysis to customers around the world. This ranges from raw data file to high end product such as extreme events analysis
SO	• Between 2002 and 2008 I co-directed the OSCAR project (NOAA & NASA), which produced the first satellite-derived global and near real-time surface current dataset to be directly available online (http://www.oscar.noaa.gov) • Part of my R&D activities at SAT-OCEAN (http://www.sat-ocean.com) involves investigating and implementing methods to extract from satellite data relevant information to monitor surface ocean motion • I co-manage hindcast-based metocean study projects (including regional ocean current studies), and deliver historical study reports to customers from the sectors of Oil and Gas Industries and Offshore Current Energy. Note: O&G activities also include transport and towing around the world.
MERC	• Ocean (re)analysis and forecast service provider. • We assimilate available observations of the ocean (currently altimetry, SST products and in situ T/S profiles) in assimilative global and regional OGCM configurations to provide the services which consist of numerical product dissemination Doing so we produce and deliver numerical fields of 4D ocean variables (including currents) issued from the models
MSS	• Marine Scotland Science (MSS) is the Science Division of the Marine Scotland directorate of the Scottish Government (SG). • MSS provides scientific advice to the SG on all subjects relating to thee marine environment. • In particular, of relevance to GlobCurrent,. MSS carries out research in support of aquaculture, marine renewable energy, fisheries and other offshore activities, for the sustainable exploitation of the marine environment and the protection of marine ecosystems. • To that effect, detailed knowledge of the physical characteristics of the seas around Scotland and t the patterns and variability in water movements are at the basis of our research
BC	• Provision of marine downstream services in the marine sector. Our customers are mainly administrations responsible for marine monitoring and management, as well as research organisations and to (set) lesser extend other public and private organisations concerned with marine activities (e.g. offshore energy, emerging market). These organisations require the full set of oceanographic and meteorological information, including physical (such as currents and waves), biological (such as phytoplankton) and chemical (nutrients, heavy metals) data. Their needs range from low level (single point measurements of e.g. temperature, such as a from a buoy) to highly processed data (such as climatology of fronts). • Our application is to propose, develop and provide higher level products to our customers. For this we need good quality basic data (single measurement, satellite L1 data) as well as properly pre-processed data (numerical model output, Satellite L2 data and higher level data) as input.

TOT	• The Metocean Specialist role within Total with regards to GlobCurrent, is to:
	   o Assess the needs *of* projects for metocean data
	   o Provide metocean parameters *necessary* (0 design facilities and optimize marine *operations* using a
	   o database of previously acquired data (satellite observations, hindcast numerical model, in~situ survey ...).
	   o This database is maintained by the metocean department.
	   o Review and processing of obtained data using proven engineering methods to derive parameters 10 be
	   o considered : extreme values analysis, distributions, spectrum, current profile etc ...
	   o Define the metocean data necessary to prepare the design and construction of offshore and onshore Oil&Gas facilities.
	   o Define, prepare and organize in-situ metocean data acquisition surveys.

NOV	• At the present time, we are interested in currents maps for the following purposes:
	   o Calibration and validation of regional/coastal circulation models;
	   o Calibration/validation of global/regional/local sea state models (statistical models, like WAM, WW3, SWAN): improvement of sea state models by introducing the effect of current;
	   o Current products to make climatologies, and statistics: interannual/annual/seasonal variability, trends, extremes…
	• For these applications, we will be users of GlobCurrent products.

EMEC	• The European Marine Energy Centre (EMEC Ltd., www.emec.org.uk) is a not-for-profit private company that provides test facilities and services to developers of wave and tidal energy devices. • Our services to these developers include data collection at both our wave test site (by waverider buoys) and our tidal site (by ADCP deployment).

ID	Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.
TCE	• The Crown Estate is governed by an Act of Parliament. The property we manage is owned by the Crown, but is not the private property of HM the Queen. We work supportively with government; in Westminster, in Scotland, Wales, Northern Ireland and at a local level. Our property portfolio is diverse, covering urban areas, the countryside, around half of the foreshore and almost all of the seabed around the UK. • The Crown Estate lease seabed space for many sectors within UK waters. Relevant sectors to GlobCurrent include renewable energies (offshore wind, wave and tide), aquaculture, cables, pipelines and marine biomass. Access to high quality tidal current data is essential to support our planning and development activities within these sectors.
HRW	• Coastal flow modelling • Provision of Metocean conditions (operational and extremes)
SATOC	• SatOC is a consultancy that works with public sector and private sector partners to develop and evaluate oceanographic applications of satellite data.
UoN	• Determination of the ocean's time-mean and variable ocean circulation, including surface and deep geostrophic transports, and understanding the role these play in regulating Earth's climate, heat and freshwater fluxes, and coastal sea level.
CSIR	• I am physical oceanographer employed as a senior researcher at the CSIR and am interested in the physical oceanography of southern Africa. • My work involves research on the Agulhas Current's dynamics and variability as well as interactions between the Agulhas Current and the coastal and shelf regions. I also am interested in sea-state monitoring for improved marine safety.
UoC	• High-resolution operational oceanography systems (005) for coastal applications. • High-resolution oil spill forecasting systems. • Development of current hindcasts databases. • Hydrodynamic studies using numerical modeling. • Water quality studies using numerical modelling. • Oil-spill risk assessment. • Evaluation of ocean current energy (renewable energy). • Off-shore engineering.
PML	• FASTNEt (UK-NERC Fluxes Across Sloping Topography of the North East Atlantic): we are using thermal oceanic fronts and altimetry-based geostrophic currents to study the exchange processes at the NE Atlantic shelf-edge. Additional products on surface currents would be valuable to complement these other datasets, and would be used in comparison with drifters, gliders and moorings. More generally it would be an interesting research study to compare the locations of thermal/colour fronts with surface currents. • MEDINA (EC FP7 Marine Ecosystem Dynamics and Indicators for North Africa): we are developing EO and model-based ecological indicators to assist north African Mediterranean countries with environmental monitoring and assessment. Improved surface currents could be usefully compared with the outputs from a state of the art unstructured grid high-resolution coastal model, nested within a 1/10° ocean model. • NEODAAS (UK-NERC Earth Observation Data Acquisition and Analysis Service): we support the UK environmental research community, and we are sometimes asked for surface current data in addition to EO thermal/colour data, in particular for research cruise studies. This would be a useful and complementary product that we could extract and post-process for other scientists. • Harmful algal bloom (HAB) monitoring: we provide EO ocean colour-based products to assist with the early detection and management of HABs for various end users. On-going efforts to improve HAB forecasts would benefit from detailed surface currents.
CNR (Pisa)	• Application of remote sensing (radar altimetry, in particular) for studying coastal and marine environments (sea level variability, in particular). Development of satellite data retrieval algorithms and methods for data analysis and validation.
ICIT	• We conduct research relevant to the development of the marine renewable energy industry (both tidal and wave). Research includes studies to understand the resource (e.g. the strength of currents and their variability spatially and temporally) and the sensitivity of that resource to energy extraction and studies on potential environmental effects (e.g. the potential change in habitat by changing current flow).
PO	• Ocean Forecasting, • Oil spill fate prediction, • Vessel routing, • Search and rescue.
UHI	• We conduct research relevant to the development of the marine renewable energy industry (both tidal and wave). • Research includes studies to understand the resource (e.g. the strength of currents and their variability spatially and temporally) and the sensitivity of that resource to energy extraction and studies on potential environmental effects (e.g. the potential change in habitat by changing current flow). • Our current research includes the development of local and regional numerical models to study waves and tidal currents mainly in the Pentland Firth and Orkney Waters (PFOW), with a potential extension to a larger domain covering the Scottish Seas. • In conjunction with our modelling studies, we also undertake local in-situ surveys to characterise the wave and tidal currents in the Pentland Firth and beyond.

ID	Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.
CEDRE	• Cedre is a non-profit-making association created on 25 January 1979, as one of the measures taken in the aftermath of the Amoco Cadiz oil spill, to improve spill response preparedness and strengthen the national response organisation. • It is responsible, on a national level, for documentation, research and experimentation on pollutants, their effects and the response means and tools that can be used to combat them. • It is charged with providing advice and expertise to the authorities responsible for responding to accidental pollution. It is competent both for marine waters and inland surface waters. • Vincent Gouriou is engineer at the emergency response department, specialized in spill weathering and drift modelling, G.I.S and in incident management systems. He was involved in several multinational projects (including FP7 and Interreg projects). He participates in the emergency response duty.
UoM	• We do theoretical simulations of SAR and InSAR images of ocean features and develop algorithms for improved current retrievals from along-track InSAR data, e.g. by applying novel filters, improved corrections for wave motion contributions, techniques for separating contributions of water and land in images of narrow rivers (with water / land overlap due to SAR imaging artefacts). • We also develop new algorithms for higher-level data products, such as coastal bathymetry or information on oceanic internal waves. My group is not so much interested in an operational use of the data.
CUT	• Research in radar remote sensing with focus on retrieval of sea ice and ocean surface parameters. • Coordinating the projects "Measurement of sea surface currents with satellites to benefit Swedish GMES marine core services" and "Space borne radar measurements of sea ice parameters for climate models", both with funding from the Swedish National Space Board (SNSB) and in collaboration with the Swedish Meteorological and Hydrological Institute (SMHI). • Starting up the project "Future Sustainable Shipping in the Arctic – Assessment of environmental effects of oil spill supported by satellite remote sensing" where surface current will be an important input parameter.
NERSC	• We do ocean data assimilation, reanalysis and operational forecasting with the TOPAZ system. Examples of TOPAZ real-time applications are downscaling to coastal models, sea ice forecasting for maritime transport, iceberg trajectories, hindcasting for offshore oil and gas engineers (design criteria).
ERI	• Ocean Surface Current Analyses – Real-time (OSCAR) is an existing, but always evolving, global surface current product calculated from satellite-sensed fields using a simplified analytical model for mixed layer currents. It is produced at Earth and Space Research (ESR).
LEGOS	• The CTOH is a national French observation center who's objective is to help researchers to use altimetric measurements over the oceans and the hydrosphere. • In this context we also provide satellite surface currents (mean and time-variable surface geostrophic currents and Ekman surface currents) to researchers, from any part of the world, for very various oceanographic research applications. • http://ctoh.legos.obs-mip.fr/products/global-surface-currents • For now the Ekman current is computed using QuikScat wind stress and (coming soon online) ECMWF surface winds.
BMT	• We provide various metocean data packages including statistical analysis and detailed reports on specific regions to a range of clients including oil and gas, renewables, ports and harbours, shipping etc. • We use a range of data sources to provide metocean information.

MEARSK	• Primary application is Ship routing optimisation (have been doing this for a long time).
	• MAERSK have a ship reporting system where the fleet reports every 4 hours (speed, Met, position etc). These data are stored in a database in NRT and are used by the ship routing team to provide information on surface currents. The team use all this information to optimise the ship route. The system success depends on accuracy of the instruments on board the vessels (e.g. speed log) which are sometimes challenging.
	• GlobCurrent could help MAERSK in:
	   o Ship routing and optimisation using GlobCurrent satellite products
	   o QC of the MARESK ship routing database using GlobCurrent satellite data
	   o Validation of GlobCurrent products using MAERSK ship-routing data.

NIVA	• The Norwegian Institute for Water Research (NIVA) is a national research institute organised as a private foundation.
	• The institute is Norway's foremost professional competence centre for environmental and resource issues relating to the field of water.
	• NIVA carries out research and monitoring, as well as innovation and development work.
	• NIVA works both in fresh water and marine environments, often with a focus on coastal areas, with unique insights about the interaction between fresh water and marine influences.
	• Specific application relevant to GlobCurrent:
	   o Study coastal dynamics based associated with both freshwater discharge into coastal areas. The studies are based on both in situ measurements along ferry tracks (Ferry Box), Hydrography stations and numerical modeling
	   o Monitoring f or the aquaculture industry regarding physical stress (wind, current), HAB and virus spreading along the coast between aquaculture plants (input to models)
	   o Habitat modelling with GIS tools, where current is one of important parameters

PDE	• We are in charge of the IBI MFC system in the frame of MyOcean and GMES. • Therefore we provide ocean current forecast to society (via intermediate users).

ID	Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.
DOMMRS	• Through our project ASIMUTH we hope to use remote sensing amongst other data sources to predict Harmful Algal Blooms. • However, we are fish farmers primarily so are real end users of the products developed and do not understand the "ins and outs" of how this is achieved.
CLIVAR	• World Climate Research Programme (WCRP) project that addresses Climate Variability and Predictability, with a particular focus on the role of ocean-atmosphere interactions in climate. • CLIVAR's mission statement is: "To observe, simulate and predict changes in Earth's climate system, with a focus on ocean-atmosphere interactions, enabling better understanding of climate variability, predictability and change, to the benefit of society and the environment in which we live."

RES	• RES Offshore focuses on the development of marine renewable project, primarily offshore wind. It is involved in the development of over 5 Offshore Wind farm and Wave and Tidal projects. Current data are used:
	   ○ For design (e.g. of foundations)
	   ○ For the planning of construction and installation of all component (turbines, substations, cables)
	   ○ For the planning of operations and maintenance (access at port, access at site)
	   ○ For resource assessment in the case of tidal energy

IRCG	• The Irish Coast Guard (IRCG) has responsibility for the marine emergency management in Ireland's Exclusive Economic Zone (EEZ) and inland waterways. It is responsible for response to, and coordination of, maritime accidents which require Search & Rescue and Counter Pollution & Salvage operations. It also has responsibility for vessel traffic monitoring.
	• SAR (search and rescue)
	   ○ Drift pattern - PIW (person in water) & other objects; liferaft, punt, container, fishing boat, ship etc
	   ○ Water temperatures – PIW survivability.
	• Pollution and salvage
	   ○ Drift pattern - Oil or chemicals in the water, derelict vessel
	   ○ Water temperatures – affects the viscosity/ dispersal of oils and chemical

FSU	• Provide surface vector winds, • Use currents to adjust satellite winds to match in situ winds, • Use currents for oil spill and seep transport, use currents for studying ocean processes, currently with stronger interest in the Gulf of Mexico, Gulf Stream, and Nordic Seas
CRMC	• One of the projects in which our centre is involved relates to marine litter. • It I would be interesting to have surface current data to look at the general movements of marine litter. • Additionally surface current data would be useful to assist in understanding the movement of jellyfish (e.g. Portuguese man off war) and the movement of marine predators (e .g. turtles, sharks). • We have tagged such animals so relating their movements to ocean physical and biological characteristics would be useful
MHI-NASU	• Marine Hydrophysical institute National Academy of science of Ukraine develops and evaluates in-situ different kinds of surface drifters, including SVP and SVP-B standard and mini types. The experimental buoys are manufactured by scientific venture Marlin-Yug Ltd, which has full cycle to produce and test buoys before deployments. The goal of our investigation is the updating of current measuring capabilities of buoys to get perfect data of long duration under any weather conditions, as well as development of new measuring capabilities without essential increasing of a buoy's cost. • Our proposal to take part in the project could be under the following item "Product and demonstration activities supporting data inter-comparisons and validation activities" listed among the different items in the scope of the project. We see that our participation in the project could be in general as the partner, not as a user. We took and take part in different the Data Buoy Co-operation Panel (DBCP) pilot projects to develop and evaluate different areas of activity connected with study of new satellite telemetry Iridium and Argos-3; long-living air pressure measurement under any weather conditions, temperature profiling within active layer in tropical and polar regions, parachute drifters, etc. • The results of our investigations, which are reflected in the reports of annual DBCP Workshops allows to suggest reliable drifters with high spatial-temporal resolution to monitor the subsurface currents. Use of these buoys makes it possible to create inter-comparison nets of drifters to monitor the currents under wide range of variability from mesoscale to inter-year. Further text created under "User Requirements Template", has more details about our suggestion.
HZG	• We are developing assimilation and forecast systems for the North Sea/Baltic Sea area (in particular German Bight). • We are running HF radar systems as part of the COSYNA system in the German Bight to measure surface currents.
UoK	• My group develops approaches to monitor coastal areas, especially shallow waters. • One major issue is the water column correction to derive types of bottom substrate (sediment, rock, vegetation types) in shallow waters. To do this, we derive water quality parameters (yellow substances, chlorophyll, DOM) and calculate bathymetry. A second issue is the atmospheric correction over shallow water areas to enable water column correction. • For the future I plan to couple remote sensing data with submerged vegetation growth models.
MAIN	• Mainstream Renewable Power is a private enterprise engaged in the Development, Construction and Operation of large-scale Offshore Wind Farms in the North Sea
NOC	• The development and analysis of datasets of parameters important for air-sea interaction

ID	Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.
FIO	• To monitor the dynamic processes in the coastal sea and its adjacent area. • To predict the ocean environment and the diffusion or drifting of pollution such as oil spill, red tide and sea ice. • To serve the fishery and transport industry. • To study ocean circulation.
AZTI	• AZTI Is a private non-far-profit research organization. AZTI belongs to the research corporation called TECNALIA that has become the fifth EU private research organization In size. Its main objective is the social development and the Increase of the competitiveness in Its working areas by means of the research and technological innovation. Since 1981 the activities of AZTI have been focused to solve the problems of its clients (public administrations, Harbour Authorities, fisheries and maritime stakeholders, offshore Industry, etc) with an innovative and equilibrated model between the generation and caption of technologies and Its diffusion and transfer. Specialized scientific knowledge, innovation and continuous technological development have been key tools to give response to the requirements for Integrated coastal and ocean resources management and to support decision making linked to the marine environment. The Marine Research Division and, especially, the Marine Dynamics and Operational Oceanography (DMOO) group have a long experience In oceanographic studies related to the Bay of Biscay (BoB). During the last 5 years this group has been involved in several regional, national and European projects about ocean-meteorological networks, operational oceanography, marine energy, environmental impacts, fisheries management and aquaculture. In the framework of physical and operational oceanography, an observational and modelling network in the SE BoB has been extensively developed during the last years. This network consists of: (i) A Near Real Time (NRT) Observatory (Figure 1), made up of: • Six coastal stations (water depths <30 m) that provide, since 2004, 10-mlnute data of temperature, currents, tides and waves at six strategic points of the Basque coast. • Two buoys located over the slope in front of San Sebastian (Donostia Buoy) and Cape Matxitxako (Matxitxako Buoy), over 550 and 450 m isobaths, respectively, which provide, since 2007, hourly data of meteorological and oceanographic variables (air temperature, air pressure, wind intensity and direction, solar and net radiation, waves -directional sensor, sea surface temperature and sea surface currents) at the sea surface. In addition to the surface sensors, a downward looking ADCP measures currents, within 8 m vertical bins, at the upper 200 m of the water column, whilst a chain of CTs provide temperature and conductivity data at 10, 20, 30, 50,75,100 and 200 m. • A HF Radar array with two stations located at the Spanish coast providing hourly surface current fields. This system Is working operationally since January 2009. HF radar-derived surface hourly currents are collected by means of a CODAR Seasonde system. The antennae (emitting at 40 kHz broadband and 4.5 MHz frequency) cover a 150 km range with 5 km radial and 5 deg angular resolutions. **Figure 1. Distribution and spatial coverage of the operational observing system (hourly data from oceanic buoys, coastal stations and HF radar)** In addition to the NRT systematic observations, it is worth noting the availability of a large data set of historical data from oceanographic campaigns performed by the Marine Research Unit of AZTITECNALIA. During the last decades, plankton (eggs, larvae, chi-a) and also juvenile populations of some key pelagic species in the BoB have been monitored. For the last 10 years, CTDs, and ADCPs data of the upper 100 m depth, have been yearly collected: N40 days In March·May during BIOMAN and TRIENAL campaigns and N40 days in September-October during JUVENA campaign. CTD data are also available from other punctual surveys, covering the SE corner of the BoB (ECOANCHOA, IMPRESS, SAVOR projects).

ID	*Please provide a short summary of your applications (what do you do?) that are relevant to GlobCurrent.*
AZTI	 **Figure 2: Example of CTD stations during JUVENA surveys In 2011.** (ii) An ocean modelling nested system covering regional, sub-regional (~2 km) and coastal scales <500 m. Hindcast and prediction are performed using mainly ROMS model (Shchepetkin and McWIlliams, Ocean model., 2005) for regional and subregional configurations and MOHID (Coelho et al., 2001, Jour.Mar.Sys., 2001), TRIMODENA (Gonzalez et aI., 2001) and SELFE (Zhang and Baptista, Ocean Model., 2008) models for local applications. WAM (Wave prediction Model) model Is also used for wave prediction within the southeastern Bay of Biscay. **Figure 3. Simulated surface salinity with ROMS model sub-regional operational configuration for the SE BoB, on January 2013** The development of this observational and modelling network in the SE BoB has allowed the group to significantly progress in the fields of: a) Operational Oceanography applications: • Ocean currents and wave predictions from the hydrodynamic and wave models are used to produce: 96-hour forecast of currents, temperature, salinity and waves for several users, wave energy resource estimations, river plumes evolution, maritime rescue, oil spill dispersion, yellow fish evolution in summer, waste waters discharges evolution, eggs and larvae dispersion ... • Operational use of HF radar data to monitor OSC and Lagrangian transport. Main lines: Lagrangian diagnostics and tools and application of short term prediction algorithms from HF radar data (based on OMA, EOFs). • A centralised online THREDDS data catalogue is being implemented to manage and distribute all the data and products generated in the group. Big efforts are being Invested to adopt standards for file formats and metadata. • New end·user oriented Web Services are being developed using open·source libraries and applications (Openlayers, geoext, jquery, etc) to provide online data portals that meet specific user objectives (i.e oil spill simulations, jellyfish monitoring, forecast of harbour navigation conditions, forecast of waves for surfing spots, data publication, etc). b) Physical processes studies: • Along·slope and open ocean circulation, meso-scale variability in the BoB. • Shelf and coastal circulation, HF processes, river plume dynamics c) Biological oceanography: • The main focus of this activity is: to study the Influence of environmental conditions (physical, chemical, and biological) on ecosystem components and processes. d) Climate change (CC): • The main focuses of this activity in AZTI are: monitoring of the CC ocean indicators in the SE BoB, prediction of future evolution of such indicators, and analysis of the impacts of the CC In the Basque Coast.

9.2. Specific User Needs

ID	*Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.*
UKMO	• Primarily we would like ocean current measurements against which to validate the ocean currents from the FOAM system. • Additionally, if a sufficiently high quality product were available, we would like to investigate the possibility of assimilating these current measurements. • The most significant benefit that the GlobCurrent project could provide would be to increase the accuracy of surface current predictions (and hence our wave forecast predictions too).
DMI	• In general we lack all levels of surface current observations at very high latitudes, i.e. observations of surface current at all temporal and spatial resolutions. A major issue for tuning our large-scale models is to get the general ocean circulation in place and unbiased. Therefore, the most urgent needs are temporally aggregated general circulation data at high latitudes, with special focus on ice-infested areas, like the Arctic Ocean. • Monthly or seasonal net Arctic Ocean circulation will be extremely valuable for tuning our HYCOM/CICE setup, where we have problems preserving sea ice thickness and concentration. Erroneous general surface circulation may be party responsible for this. Such information will also be essential for our efforts in development of iceberg and oil drift models. • Surface current observations on climate scale will have a great impact on the further development and validation of our EC-Earth setup, where net annual current maps would be ideal. • Also surface current observations at lower latitudes will be generally beneficial for our future development of our ocean models. • Remote Sensing methods like those shown by Kimura and Wakatsuchi (2000) and further developed and applied by DMI (2009) seem to be a feasible means to generate large scale temporally averaged surface current information for sea ice infested areas. • In addition, the increased frequency and accuracy of visible and infrared satellite data (AVHRR (NOAA & MetOp), VIIRS and MODIS) should allow monitoring of small-scale ocean current information using ice as a tracer. Under relatively calm ocean conditions (which often prevails in Summer) ice moves with the ocean surface currents, and with medium resolution visible images, such small scale motion can be monitored, preferably in a systematic way, to provide information about the semi-permanent eddies that prevails in many ocean areas around Greenland, in particular along the east coast. Knowing the location and size of these features is crucial in order to produce accurate forecasts of iceberg drift. • DMI, 2009. The influence of wind on sea ice motion in the Baffin Bay. Thesis L.L. Christoffersen, University of Copenhagen and Danish Meteorological Institute. • Kimura, N. and M. Wakatsuchi, 2000. Relationship between sea-ice motion and geostrophic wind in the Northern Hemisphere. Geophysical Research Letters, 27, no. 22, pp. 3735-3738.
NCEP	• Ocean currents is one of the most widely used fields in our forecast products in both coastal (e.g. for US Coastal Guard incident response) and global (e.g. Gulfstream North Wall location for shipping) scales. • Having reliable ocean currents analysis and forecast will allow us to significantly improving wind wave predictions through wave-current interaction.
ECMWF	• Ocean currents are relevant for wave forecasts. • Ocean currents are also important for validation of ocean reanalysis and initial conditions, and ocean model development. • If the ocean currents could be properly assimilated in the ocean model, its information could be used in the NWP coupled forecasts of weather, waves and ocean. • Ocean reanalysis and coupled model evaluation
SMHI	• Verification of model results and assimilation of data into models. Direct use in daily production for ship routing, ice services and warning services
MF	• High quality surface currents to validate predicted currents provided by ocean models.
KNMI	• For successful bias correction of scatterometer near real-time wind processing, predictions of ocean surface currents are needed on a grid of 12.5 km (comparable in size to that of the ECMWF model) with a forecast interval of 1 hour up to 24 hours and a precision of 0.1 m/s. Taking into account required accuracy and spatial resolution, for reprocessing, it would probably be sufficient to have 3-hourly analysis fields of ocean surface currents, since 10-km scale currents are generally not expected to change much (0.1 m/s) over 3 hours. While this goal may be hard to achieve, a threshold requirement would be 0.3 m/s accuracy currents on a 50- km spatial scale. • Once accurate currents are available, the comparison of buoy and ECMWF winds with scatterometer data would improve. This would be beneficial for scatterometer data assimilation, or, more generally, for providing appropriate guidance to use scatterometer winds, be it in a relative reference frame, as of today, or an absolute reference frame, as used by buoys and NWP models today.
IMRCC	• Italian Coast Guard would like to use GolbCurrent to validate forecast current in oil spill drifting models. • Moreover it could be useful to integrate current data in our ship reporting systems for S&R purposes other than in CleanSeaNet web interface (maritime pollution prevention and response)

ID	Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.
USCG	• Search And Rescue missions require surface current (top 1- meter) fields now casted and forecasted a minimum of 24 hours. While longer forecasts are generally better, we don't plan further ahead than 24 hours, the extra forecasted fields provide 'cover' when the source goes down, and we rely on the forecasted fields until the source is recovered. If you are providing data vs. models, then we prefer that your data be assimilated into a model or models to fill in the nowcasted fields and produce the forecasted fields. • The last step and often most difficult or overlooked step is getting the products truly into operational decision makers hands or more accurately the computers and their decision making software the necessary environmental data and products. This is what we have been doing operationally since Feb 2007 with the EDS and SAROPS. All sources of potential new surface currents is of direct interest to the SAR mission in that the drift trajectories of SAR objects require accurate and timely now and forecasted surface current fields. The single major issue facing SAR controllers using global or regional surface current products is the lack of real-time assessments of the quality of the products. Therefore, my number one priority would be the 'Development of uncertainty estimates for EO ocean surface current estimates'. • The challenge back to ESA GlobCurrent is to provide the accuracy of the currents that are being delivered to the user. If you provide measurements or estimates of accuracy or uncertainty either globally, by region, by season, or on grid cell by grid cell then the SAROPS tool can directly use those values. SAROPS uses a random flight model (variance and half life estimate are required). If your data is not or cannot be assimilated into models, then your data should be used to estimate the accuracy of the surface currents generated by models. And this may require first establishing the accuracy of the ESA data.
AOML	• The GlobCurrent project could provide independent estimates of near-surface currents that could be used for quality control of the drifter data, for increased understanding of how the drifters move in high wind/wave states, and perhaps for synthesis with the drifter observations for higher-resolution products than permissible from the drifter data alone.
NODC	• To preserve and serve the data to a wide variety of users, beyond the original intent of the data collectors.
INCOIS	• From the GlobCurrent project of ESA, we are looking forward for a reliable estimates of ocean surface current at a sufficiently high spatial resolution, which can be used for the validation of the our predictions on surface currents. In addition, if these estimates are provided on an operational basis, we can make use of it for very short-term applications.
BSH	• First aim would be the support of ocean model development by model validation based on GlobCurrent data. • Further steps could be the assimilation of GlobCurrent data into the model system and direct use of the data in drift modelling. • The potential benefit is in improvements in the model system and all applications supported by the system, especially drift forecast for oil spill combating and search-and-rescue.
EMSA	• High resolution near-real-time current data to be visualised on the web graphical user interface and integrated/combined with other sources of data such as vessel traffic, nautical information, oil spill detection, etc. to improve the end-users/operators knowledge in terms of maritime situational awareness. • High resolution near-real-time current data to be fed in a number of automated maritime tools, which in combination with other sources of data such as vessel traffic, nautical information, oil spill detection, etc., can generate user-specific post-processed products such as alerts, etc. This includes the use of high resolution near-real-time current data for input into hindcast and forecast models for example for search and rescue operations, iceberg drifts, as well as oil spill trajectory.
IFREMER	• Ocean surface currents with enough spatial resolution to resolve all the strong horizontal shears that are responsible for the modification of the surface wave field.
JPL	• Monthly maps of surface current vector on a grid better than 1x1 degree.
JCOMM	• Ocean currents is one of the most widely used fields in forecast products in both coastal and open ocean forecasting services. • Having reliable ocean currents analysis and forecast will allow to significantly improving wind wave predictions through wave-current interaction.
OA	• Requirements share those of the wider metocean community, i.e. cost effective reliable long term sources of OSC data that can be demonstrated to be fit for purpose. • Many offshore operations and structures require detailed reliable OSC information and this is often lacking, especially in the early stages of a project before in-situ data are available. Key benefits could include more efficient access to high quality ocean surface current data and improved clarity on data reliability and suitability for a range of applications. • We are in an exciting time when the availably and reliability of OSC data are both improving rapidly. However this comes with the challenge of educating potential users about the limitations of readily available data sources and their suitability for the intended purpose. GlobCurrent could play a key role in further improving the availability and reliability of data, whilst ensuring limitations are clearly understood.

ID	Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.

MG	• **MeteoGroup would be highly interested in:**
	  o **altimetry derived current (archived and NRT)**
	  o **sar derived current (archived and NRT)**
	  o **in situ data (archived and NRT)**
	  o **validation & quality information for each source**
	• **The benefit of Globcurrent would be first to gather all these products/data into one portal.**
	• **For the SAR derived current, the challenge would be to provide an easy tool to make requests (depending on the location of interest and time range, like Soprano) not only in interactive mode but also in command line. The big interest would be to extract all the requested files at once through a script and not manually one by one (as it is now in Soprano).**

EN	• We use a software who takes into account in the routing process the speed current and direction. • During the last Volvo Ocean Race I used Volvo GRIB Aviso files available on the entire route. GlobCurrent could help.

PFCAL	• Figures of the value of different ocean currents (especially the surface current) to:
	  o Improve our knowledge and that of our competitors.
	  o Use these data as part of a strategic study of a given area.
	  o Improve the performance of our competitors in terms of race strategy (routing, observation ...).

ADRENA	• We need current data available in a GRIB file format on a worldwide coverage with validity information.

CMA	• We need to improve our ship routing performance.
	• The main need in terms of surface currents is to be able to receive permanently:
	  o **Gridded values maps of forecasted surface currents**
	  o **Scheduling: current forecast until one month (this is the Pacific crossing duration in super slow steaming at that time), in order to use some Global route optimization softwares**
	  o **Speed accuracy: about 0,1 kt**
	  o **Direction accuracy: about 10 °**
	  o **Surface currents including Tidal currents**
	  o **Time validity: One hour**
	  o **Confidence level: bad/ medium/high in order to assess our risk**
	  o **Surface currents from 5 to 15m deep (usual drafts of container ships)**
	• The potential of saving can be assessed to be between 5 to 20 M USD/year.
	• The Fuel Budget of the company is around 4 Billion USD/year

CLS	• For most of our services we need high quality observations to validate our models over the whole globe.

SO	• We need a global and ongoing surface current database based on satellite and in-situ measurements. Potential benefits are
	  o better and more complete monitoring of surface current speed and direction anywhere in the world ocean,
	  o the improvement of our OGCM-based hindcast products through calibration/validation and possibly assimilation of surface current data

MERC	• We expect the GlobCurrent project to design and develop advanced methods for global ocean currents, bring innovation, develop demonstration products, so that that we could at least compare these products to our model products, and if we demonstrate a potential benefit, to ultimately adopt these methods for our operational chains and/or assimilate these new products. • Eventually the GlobCurrent project can deliver new processing methods and/or new products; we may use the methods to improve our production chains; we may use the products to improve our own products through assimilation and/or to improve our quality assessment through comparison.
MSS	• Real time, historic and climatic (average) flow fields data in Scottish waters in general, and in specific areas of importance to specific sectors/interests, such as areas where human activities are more likely to impact on the marine environment and vice versa
BC	• Not specified
TOT	• Not specified
NOV	• Not specified
EMEC	• A finer description and understanding of tidal stream characteristics at our test site.
TCE	• Tidal current data is an important input to our spatial planning. Our tidal energy sector requires high quality information to identify and utilise areas of good tidal resource to develop clean renewable energy. • For other sectors we actively use tidal resource data to plan opportunities and constraints. • Most sectors seek to avoid areas of higher tidal currents however some developments e.g. aquaculture and marine biomass, rely on certain tidal conditions to supply nutrients or recycle waste. • Better tidal data will help us support the UK marine sectors by informing decisions on which activities to lease where.
HRW	• Additional data to validate global/regional model data and to provide an estimate of the uncertainty. • We are looking for data with high spatial resolution (track data) and logn time series (>10 years).

ID	Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.
SATOC	• We tend to work as a "value adder" with ad-hoc clients from industry – so our needs would reflect those of relevant parts of the commercial sector (Shipping lines –especially the slow moving, heavy or unusual load sector, exploration and survey, oil and gas sector – especially deep water operations involving floating production facilities, cable laying, etc). • Therefore we would like to see the development of reliable, consistent, global products which would benefit real time decision making, route planning and operational planning. • Anticipated benefits would include improved efficiency (in terms of fuel use), better planning (e.g. to meet pre-planned arrival times) and avoidance of delay. • We have experience of working with clients in these areas and believe we have a good understanding of their requirements.
UoN	• I, and others in the research community, require an easily accessible database of ocean surface current data, with as complete as possible spatial and temporal coverage, and spanning the widest possible range of spatial scales. • The main benefit would be the elimination of the effort required to understand and synthesise data from a disparate range of sources, an effort that is duplicated many times over by individual researchers worldwide. • The elevation of this burden would bring considerable benefits and efficiency savings to the research community, enabling more research effort to be spent doing fundamental, societally important science.

CSIR	• From the GlobCurrent project I would hope to gain access to new and inovative ocean current products such as ocean current information derived from SARs, improved altimetry products or ocean currents derived from optical images.
	 • I have a need for higher resolution products (1 to 10km) and ocean current information in the coastal and shelf region. Access to data assimilation ocean current products for near real time monitoring would also be very valuable.
	 • Better resolving the meso and submesoscale processes in the southern African region would provide the following benefits:
	     o Improved monitoring of fishery
	     o Improved ecosystem preservation
	     o Improved sea safety for ships or offshore activities
	     o Better understanding of the potential effect of climate change on our marine environments.

UoC	• It would be very valuable to have ocean surface currents to:
	     o Calibrate/validate results from numerical models.
	     o To assimilate t hem into the operational oceanography systems

PML	• None specified
CNR (Pisa)	• GlobCurrent project should provide a unique access to all relevant ocean currents products derived from in situ, satellite and model reanalysis in open ocean and coastal ocean. • It is also important that documentation and case-studies of applications are provided to the users. Benefits for scientists and stakeholders include the improved ocean currents statistics and climatologies in the area of interests. • Ocean current data sets could be also used in the area of ocean forecasting domain.
ICIT	• Primarily "Pentland Firth and Orkney Waters" 58 30' N to 59 30'N, 2 to 4 30'W. • Time unlimited (research and industrial activity is ongoing and will be for the foreseeable future).
PO	• None specified
UHI	• We have limited data on currents in areas of interest (primarily sites of exceptional currents, such as Pentland Firth and Orkney Waters (PFOW), see http://www.thecrownestate.co.uk/media/71431/pentland_firth_how_the_projects_could_be_built.pdf). • We'd be particularly interested in swath views that can describe the spatial variability in currents. In order to better understand the complexity of the hydrodynamics in the PFOW area and to provide a good validation to hydrodynamic models, we would need comprehensive data at a fine resolution (better than 100 metre) and with a good spatial coverage.
CEDRE	• Oil spill modelling: need for currents forecast / observation as input data, in order to run model software (OILMAP and CHEMMAP: oil spill and chemical spill modelling software - transport and weathering). • Crisis communication tools: need for temperature, currents forecast / observation in order to display synthetic geographic information on a WEBGIS server.
UoM	• We are interested in all kinds of along-track InSAR products for a variety of applications, and we can provide simulated products for an evaluation of the suitability of future data products for such applications.
CUT	• We need information about sea surface currents in Arctic and Antarctic waters. The sea surface current is a major driving force for sea ice drift and for spreading of oil spill and other types of pollution, and is therefore important as input in several of our research projects. • We expect that GlobCurrent will give us a possibility to evaluate surface current information/ products that potentially could increase the coverage and improve the accuracy and usefulness of the output from our projects. • We also want to make sure that the development in GlobCurrent takes into account needs and requirements specific for Arctic and Antarctic waters.
NERSC	• a global MDT that handles consistently the transition to ice-covered areas for assimilation of altimeter data, this should improve the large-scale circulation in TOPAZ. • Surface current velocities derived from SAR for model tuning and assimilation
ERI	• ESR wishes to work together with the GlobCurrent project in a collaborative fashion. • There is much room for advancement in global surface currents.

ID	Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.
LEGOS	• As a national observation center we try to impact as many people as possible. For this reason we mainly focus on global products. • Concerning the GlobCurrent project, we could help share our experience on global surface current production and distribution, to elaborate products and to identify some researchers needs. • It is also important for us to be aware of new available standards and products for the benefit of the users and for us to avoid redundant work. • Finally, a project such as GlobCurrent could take advantage of a large community representation and its privileged position in ESA to obtain and distribute quickly new data relevant for surface currents (eg, satellite data but also collect of measurements made onboard commercial ships, …).
BMT	• We would like a long-term database of metocean data, particularly relating to currents, that has sufficient global and temporal coverage and is as accurate as possible in order to confidently provide good information to our clients.
MEARSK	• The most important need is for forecast product – we have an analysis from the ship database. • We need to have Forecast out to as long as possible – ocean passages of 3-7 weeks – we need to have this lead time as we need to optimise form Day 1. Just in time strategy to get the most up to date data. • Spatial resolution requirements – 10km is very fine but would be good. Normally use 1 deg boxes so analyses are useful at 10km • Frequency: Every 24 hours OK • Format: netCDF • Tools: No tools to read data: windows based readers – most would read data themselves. Most intereset to use data for evaluation of data from the vessel • Validation would be very interesting -> could be useful for ESA and MAERSK. • Have in mind a System that can evaluate a waypoint from a vessel and mark this as a QC tool. All about optimising the route of ships across the entire voyage. • Historical data: could be useful 1-5 years data? • Documentation: EN simple with examples of how to use data • Need for error estimates: bias and SD • Data delivery: email/web depends on the volume of data sets. We have some data via special email. • Current nomenclature: (deg, strength), want surface 15m depth? • Training course? Don't need this – depends on how things develop though if we start to use GlobCurrent data we might need data • Feedback from ESA: use email. • Feedback to ESA: could be developed: email preferred • Could help to provide feedback – provide a way to provide data from ships to validate the GlobCurrent data sets
NIVA	• Our specific needs are current data delivered on a regular bas is with sufficient quality. • The data will be used both directly and indirectly as input to numerical models and in combination also with in situ observations.
PDE	• We need a near real time reliable estimation of currents (mainly surface) for model validation/assimilation.
DOMMRS	• Harmful algal blooms are known to periodically produce toxicity in shellfish and to kill farmed fish throughout Europe. The Atlantic coast of Europe is often affected by such blooms causing devastation to aquaculture Industries due to closures of farms and large-scale fish kills. • The management of shellfish toxicity is well developed along the Atlantic margin in response to EU Directives, and the caged fish culture has also developed protocols to react to harmful blooms. Identification of the origins of HAB events are essential to policy makers and industry since the only mitigation action possible lies in their prediction as these are naturally occurring. Having the ability to forecast when such events might occur to give advanced warning of the impending problem to the aquaculture industry could be a very valuable tool. • Farmers will be able to use these forecasts to plan harvesting operations or to alter husbandry practices (aeration) at finfish sites temporarily while a harmful algal bloom passes through a particular area.
CLIVAR	• Ocean current vectors on a fine spatial and temporal grid, as fine as can be realistically supported by the data. So, I would like u(x,y,t) and v(x,y,t) at say 0.25-degreex0.25-degree spacing, every 6 hours. • I would like the data in a netcdf file that contains the velocity vector data u and v, on a latitude, longitude, time grid. I would also like good documentation about how the fields are calculated. • Validation of ocean models, understand the dynamics of the Ocean, ocean advisory services • We need not only surface currents, but also currents of the upper ocean, to study nonlinear behaviour of ENSO, for example, mean zonal advection, nonlinear dynamical heating of the ENSO and rge , to understand the mechanism. • Such an effort would be welcome if it accounted for the upper ocean dynamics and ice in a way that was an improvement over what we can do now. Perhaps they could be convinced to emphasize better results in both polar regions, motivated by the Arctic changes.
RES	• GlobCurrent would provide data that can be used: • At the early stages of a project, to gauge whether a location is going to be challenging in terms of design and construction. • Later on in the development of the project to verify the Metocean conditions provided by external consultants. It will increase the accuracy of the data used in design and planning and therefore will allow us to design projects that are more cost-efficient.

ID	Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.

IRCG	- Drift Analysis Simulations
	   o Drift caused by tidal currents;
	   o Drift caused by the Leeway effect of the wind over the object exposed surface;
	   o Drift caused by sea currents;
	   o Drift caused by local wind currents (currents that result from the interaction of the wind and the surface of the water);
	   o Drift caused by river currents and other local coastal phenomena;
	   o Significant wave height;
	   o Significant wake peak direction;
	   o Significant wave peak period;
	   o Sea wave peak period;
	   o Swell significant wave height;
	   o Swell wave peak period.
	   o Sea temperature
	- Improved computer modelling input information on;
	   o Near costal current data information
	   o Bays and inlet current data information
	   o Underwater current data – body recovery
	   o Water salinity data - affects the buoyancy of an object
	   o Water temperatures at different depths - chemical/oil dispersal
	
	- Current software programs/sources of information (Mostly derived from the UK Hydrographic office)
	   o SARMAP / OILMAP/ CHEMMAP
	   o IRCG Environmental Decision Support Tool (with current data hyperlink)
	   o NOWCASTING
	   o Sailing Directions
	   o Tidal stream atlas/ Easy Tide
	   o Nautical charts
	   o Met Eireann / Met Office
	   o Local knowledge etc
	
	- Where improvement can be made:
	   o Near costal current data information
	   o Bays and inlet current data information
	   o Underwater current data – body recovery
	   o Water salinity data - affects the buoyancy of an object
	   o Water temperatures at different depths - chemical/oil dispersal

FSU	- We would prefer fine temporal and spatial resolution currents. - The needs depend on our application. Rough estimates are 25km and 3 hourly
CRMC	- Not specified
MHI-NASU	- The goal of our scientific, experimental and manufacturing activity is the development, producing and evaluation in-situ of different drifting buoys for study of near-surface atmosphere and active layer of ocean. Increasing of data quality and spatio-temporal resolution, when study of surface currents, is one of important area of our activity. - We would like to suggest three areas of our possible participation in the GlobCurrent project. They are: operational, scientific and experimental. More about is below. - Operational participation means that we can suggest our last developments to build drifter networks with high spatio-temporal resolution for calibration and validation of satellite product. The benefit of this proposal is that all the advantages of last prototypes of the SVP (SVP-B) drifters, equipped with Iridium or Argos telemetry; Real Time Clocks and GPS receivers can be used for objective expertise of new satellite methods for study of currents. - Scientific participation means that we would like to evaluate the method, we suggest, for estimating of the surface waves period and amplitude by means of standard drifters without increasing of their cost and use of additional sensors. - Experimental participation means that MHI NASU could assist with deployment of project's drifters in the Black Sea, which is known with active dynamics of upper layer, and this area could be used as experimental polygon to monitor currents with high spatio-temporal resolution. The data about current's parameters can get in the MHI the preliminary analysis and processing to be used for estimation of satellite results.
HZG	- For us a comparison of the HF radar data with GlobCurrent data could be of interest to develop strategies for the evolution of the German Bight monitoring system in the future. - We have very strong spatial dynamics of the currents in our area, .i.e for most applications we need 2D current vectors (range component alone not very interesting). - Also we need current measurements very close to the coast. The area is very shallow with complicated bathymetry, i.e., deriving currents indirectly from pressure gradients obtained with altimeter will not be sufficient. - Altimeter observations very close to the coast can still be interesting for us though.

ID	Please describe your specific needs (what do you want?) from the GlobCurrent project and describe the potential benefits that the project may provide.
UoK	• For current research I would require water parameters (as mentioned above) at spatial resolutions higher than 100m. • For future research I would also require water surface temperature, salinity, maybe coastal currents and wave heights. The spatial resolution required should also be higher than 100m.
MAIN	• Mainstream is leading a collaborative network which aims to create an Integrated Sea Information System, ISIS. It is important to ensure ISIS is aligned with the work of Globcurrent.
NOC	• High-quality, high-resolution estimates of surface currents would help us to reconcile differences between in situ-based and satellite-based wind speed estimates.
FIO	• Ocean current data in the coastal area with high spatial resolution and accuracy.

AZTI	• One of the missions of AZTI's Marine Research Division is to provide information and advisory services to its regional clients and partners (public managers, private companies, sea related associations, and broad public. In this sense, many projects of the last yea rs are focused In providing user-end products and services based on scientific knowledge and findings. These projects cover a large scope of fields including, coastal pressures and Impact analysis, risk prevention and assessment, coastal spatial planning, operational information for forecast & monitoring applied to beach pollution risk, jellyfish and garbage landings, civil protection, aquaculture, navigation etc.
	
	• Within the main work lines that are already suggested for the upcoming DUE GLOBCURRENT ESA Tender, our main interests and contributions are centred in the following topics:
	   o Broaden the use of OSC satellite products for operational applications and science, through exploitation of the synergy between in-situ and space observations. We will benefit from OSC with larger coverage than those derived from HF radars and moorings and from 3D current products. This will permit us a better understanding of the processes/circulation patterns observed at local scales and model local configurations.
	   o -Integrate Globcurrent products In operational oceanography systems, in order to provide operational data In larger areas than that covered by in-situ observatories (buoys, HF radars, coastal stations ...). The main benefits will be to increase coverage, minimize data gaps and Increase the accuracy and robustness of observations and forecasts.
	   o Validation of Globcurrent products through Intercomparlson with available historical and NRT Insitu observations.
	   o Progress on ocean modelling, by the use of Globcurrent prod cuts for validation, data assimilation and high resolution open boundary conditions for coastal grids.
	   o Calibration for the BoB area, of the new techniques for deriving OSC from EO, developed in the framework of Globcurrent.
	• Among the UIM-AZTI's work lines that could be beneficiated from the OSCs derived from Globcurrent, we Identify the followings:
	   o Applications oriented to several users In the fields of maritime rescue, oil spill and floating debris dispersion, yellow fish evolution In summer, waste waters discharges evolution, eggs and larvae dispersion ...
	   o Offshore Energy: Wave energy resource estimations, impact evaluation/monitoring of offshore Installations
	   o Offshore aquaculture: offshore circulation must be taken into account for looking for best emplacements.
	   o Scientific research on mesoscale and submesoscale processes and in interactions between physical and biological processes.
	   o Ecosystems: environmental conditions affecting the distribution of species and habitats. Habitat conservation/loss. Conditions for Invasive, endangered, endemic species. Impact of climate change on physical processes affecting the life cycle of different biological resources, etc.

9.3. User area of interest (AOI)

ID	Please List the geographical areas, with coordinates, and time periods that you would like to work on together with GlobCurrent product/demonstration activities.
UKMO	• Global ocean in near-real-time (although for reanalyses runs periods from 2007 onwards would be useful) • Areas of particular interest are the North-West European Shelf (UK Waters), the Northeast Indian Ocean & Arabian Seas/Gulfs, the North Atlantic, the West African coast • The eastern Tropical Atlantic, Gulf of Guinea & West African Coasts for 2008-2010
DMI	• Area of interest is mainly sea ice infested areas, i.e. approximately +50N.
NCEP	• Global coverage
ECMWF	• Global coverage

ID	Please List the geographical areas, with coordinates, and time periods that you would like to work on together with GlobCurrent product/demonstration activities.
SMHI	• Mainly the Baltic sea area including the Kattegatt and Skagerrak is important (N53 39' E009 23' to N66 02' E030 29'). • Secondarily the North sea area (N48 27' W004 09' to N0 44' E009 23').
MF	• Global and regional oceans (all areas)
KNMI	• Global coverage would be optimal, but smaller areas useful. • For demonstration activities, a period (typically a few months) in the past could be selected. In a routine NRT application, current knowledge is needed several hours ahead.
IMRCC	• Mediterranean sea and Black Sea (Atlantic Ocean up to Canarian Islands)
USCG	• The US Coast Guard has global, regional, and local interests and therefore will work with ESA in any region that ESA is interested. All Coast Guards or maritime responding agencies have their own regional and local interests. The world's oceans are divided by international agreements into areas of responsibility, and therefore all waters are ultimate of interest. • The time period for SAR includes present forward 24-72 hours with emphasis on getting the nowcast accurate and the shorter term forecasts (=< 24hrs). The EDS archives the nowcasted fields, so that we can cover the trajectories of the incident before the Coast Guard received notification of an incident.
AOML	• Global domain, time periods from hourly (drifter data are collected at approximately hourly intervals) to interannual.
NODC	• Global ocean areas
INCOIS	• Arabian Sea (5-28N, 40-78E) • Bay of Bengal (5-24N,78-100E) • Equatorial Indian Ocean (5S-5N, 40-100E) • We are looking forward for the surface current estimates for the period 2002-till date
BSH	• Geographical area 1: North Sea, Longitude: S"W-12"E; Latitude: 47"N-62"N • Geographical area 2: Baltic Sea, Longitude: 9"E-31"E; Latitude: S3"N-66"N
EMSA	• Global • Mediterranean Sea • North Sea • Baltic Sea • North-East Atlantic • Black Sea • Arctic (Barents) Sea • Gulf of Aden • Indian Ocean (up to 70°W) • Eastern Atlantic (down to the Equator) • Red Sea
IFREMER	• Global scale 2008 to 2010 (good for validation with buoy / satellite data) • Northwest European Shelf (especially English Channel + southern North Sea) • Indonesia + Thailand (large error in today's wave model) • Tropical pacific + Southern Ocean • Agulhas current system • A daily global 1/10° degree would be a good start + information on high frequency variability (e.g. tidal constituents of the 10 most energetic tidal components + near-inertial oscillations …) • For the coastal areas (Northwest European Shelf, Indonesia + Thailand) , the resolution requirements are certainly finer but difficult to determine in general. For example we are now getting good results in the English Channel with modeled currents at a resolution of ~ 1km and a time resolution of 1 hour (mostly tidal currents, so that tidal harmonics can be enough).
JPL	• Global (regional will be useful too).
JCOMM	• Global
OA	• Global
MG	• **Global for the last 20 years to N.R.T.**
EN	• Project 2013/2014: the routing for the record attempt around the world alone. So the area will be North and South Atlantic Ocean, South Indian Ocean, South Pacific Ocean The record is 54 days.
PFCAL	• All areas crossed by sailing races at different scales (Atlantic, Mediterranean, Indian, Pacific ...)
ADRENA	• Our applications could be used for different type of boat or ship. So if for commercial ship commercial line area is required, for sailing boat worldwide coverage is required.
CMA	• From 60° South to 80 ° North • At any time in the world. • One month of forecast in advance.
CLS	• Global, gridded
SO	• Our areas of interest are potentially all areas of the global ocean including the marginal seas, and most often near-shore areas above shelf and shelf break.
MERC	• Global ocean

ID	Please List the geographical areas, with coordinates, and time periods that you would like to work on together with GlobCurrent product/demonstration activities.
MSS	• We are interested in data over any area of Scottish waters, although in particular the main inflows into the northern North Sea (F air Isle Inflow and East Shetland Atlantic Inflow), the Scottish west coast and thee Pentland Firth are of particular interest. • As stated before, we are interested in any past and current data, including average/composite data, which could complement other observational and modelling data sources.
BC	• North Sea: 48°00'N, 5°00'W / 63°00'N, 13°00'E • Baltic Sea: 65°54'28.05"N , 9°46'40.59"E / 53°36'11.86"N , 30°40'41.66"E • North-East Atlantic (includes areas 1 and 2, but here lower spatial resolution would be ok); 77°32'22.78"N , 32°57'1.08"W / 36°32'17.98"N , 44°27'36.68"E
TOT	• Total's interests are global. The main areas of interest are: • Africa (Gulf of Guinea In particular, South Africa, East AfriC<l) • South East Asia (Indonesia, Brunei, Malaysia) • Australia • South America (Argentina, Brazil) • Gulf of Mexico • Due to the use of metocean data for both estimation of design criteria and operations purposes, historical data and real-time data are required. The longer the time periods available are the better.
NOV	• North East Atlantic Lon [-20°E,+15°E], Lat[20°N, 70°N] • Mediterranean Lon [-10°E,+37°E], Lat[30°N, 46°N] • Gulf of Mexico Lon [-98°E,-79 °E], Lat[18°N, 31°N] • Agulhas Current Lon [+15°E,+40°E], Lat[-45°N, -30°N]
EMEC	• Outer Box Corners: [58.5°N, 04.5°W 59.6°N,04.5°W 59.6°N, 01.5°W 58.5°N, 01.5°W] • Inner Box Corners: [59.333°N, 03.0833°W 59.0833°N, 02.5°W 58.9167°N, 02.75°W 59.1666°N, 03.1666°W]
TCE	• We are a longstanding organisation so have no time constraints however we will be actively looking at how best to facilitate tidal energy opportunities in UK waters over the next few years. • We are interested in all areas of UK waters.
HRW	• East coast of Africa, East coast of South America, Arctic.
SATOC	• For the entries below I've used the requirements for coastal and offshore operations as collated and reported in the Innovative Radar Altimeter Study project (2004) managed by ALCATEL. • For these applications Global coverage would be important. Time periods for demonstration activities would depend on the coincidence of relevant activities of potential end-users. • Required resolution (in time and space) depends on the location of the activity, with a higher resolution in time and space needed closer to the coast
UoN	• Global/North Atlantic; From 1993 onwards.
CSIR	• Southern African region from 15 East to 50 east and from 10 South to 50 South • time-period for working together with GlobCurrent activities: 2013 - 2016
UoC	• During the cal/val period we would like to work in t he Gulf of Biscay area, due to our in-situ data availability over the area. • Nevertheless, our interest is used the GlobCurrent products all over the world
PML	• NE Atlantic - UK waters: 47 to 63°N, -18 to 13°E. • Mediterranean Sea: 30 to 46.5°N, -7 to 47°E.
CNR (Pisa)	• Coastal ocean, especially Mediterranean Sea, Indonesia, Gulf of Mexico
ICIT	• Primarily "Pentland Firth and Orkney Waters". 58 30' N to 59 30'N, 2 to 4 30'W. • Time unlimited (research and industrial activity is ongoing and will be for the foreseeable future).
PO	• Our main interest is the South Atlantic Ocean (10° N – 60° S; 80° W – 20° E) with more detailed features in the Brazilian Ocean Basin (3° N – 33° S; 70° W - 25° W).
UHI	• We are primarily interested in "Scottish Seas" (10°W to 0°W, 54°N to 62°N) which includes the PFOW area and covers a larger domain, for instance to integrate over long fetch distances and includes other potential marine energy sites of interest. • There is no specific limitation on time periods. The research and industrial activity on renewable energy is on-going and will continue for a foreseeable future. In addition long time periods can be used to evaluate the impact of climate change on the marine energy resources, and the long-term impact of human activity on the environment.
CEDRE	• Location: It depends of the incident location …. • First priority: French area • Second priority: world cover • Time periods: 3 days forecast, time step : 6 hours
UoM	• All areas around the world where high-resolution current field measurements can be of interest: Coastal areas, rivers, ocean areas with internal waves, eddies, etc.

ID	Please List the geographical areas, with coordinates, and time periods that you would like to work on together with GlobCurrent product/demonstration activities.

CUT	• Area 1: Arctic waters (north of 70°N)
	    o Of specific interest are the Fram Strait and the Greenland, Barents and Kara Seas (30°W to 100°E and 70°N to 85°N). All years and seasons are of interest. The areas where it is possible to observe surface currents will decrease during periods with compact ice cover.
	• Area 2: Antarctic waters (south of 60°S)
	    o Of specific interest is the Amundsen Sea (90°W to 130°W and 60°S to 78°S). All years and seasons are of interest. The areas where it is possible to observe surface currents will decrease during periods with compact ice cover.

NERSC	• Primarily in the Arctic.
	• But we are also interested in data elsewhere:
	    o the North Sea,
	    o South Africa,
	    o Indian Ocean,
	    o South China Sea,
	    o Gulf of Mexico,
	    o West Africa.

ERI	• We are interested in advancements in resolvable time and space scales as well as coastal coverage. • Keeping each other involved with any new gridded products, (or gridding methods), new satellite data availability/improvements, advancements in coastal altimetry, pilot projects in specific regions, etc, would be very desirable. • We're also potentially interested in working together on creating blended in situ and remotely sensed data products.
LEGOS	• As a distribution center we focus on global products.
BMT	• Global coverage for as many years as possible
MEARSK	• Global
NIVA	• Norwegian water, 2°E to 3 2°E and 57°N to 72°N • Skagerrak and Kattegat, 2°E to 14°E and d 54°N to 60°N • Barents Sea, 00°E to 30°E and 70°N to 79°N • The areas are also the same as the coverage e (latitude) of the Norwegian Ferrybox network.
PDE	• We need a near real time reliable estimation of currents (mainly surface) for model validation/assimilation.
DOMMRS	• Bantry Bay - fish farm site GPS - N 51 38 849 W 09 36 068
CLIVAR	• Global, the longest time temporal coverage possible. • And the finest spatial grid possible. If you need smaller regions in order to produce fine resolution data, then I would choose: Indian Ocean (20E-160E; 90S-30N)

RES	• For offshore wind, the current regions of interest are:
	    o The Greater Wash in the United Kingdom
	    o The Irish Sea
	    o Northern Ireland
	    o The Bay of saint-Brieuc
	• For marine renewables, the regions of interest are:
	    o The Pentland Firth
	    o The Mull of Kintyre
	    o Northern Ireland
	• However, it is anticipated that in the next years, the European North-West shelf in general will be of interest, as well as the East coast of the USA. In term of time periods, long time-series are of more interest to us than near-real time.

IRCG	• All coastal waters of Ireland including harbours, bays and inlets, with 24/7 data
FSU	• Gulf of Mexico • Gulf Stream (from the Yucatan Straight up the US East Coast) • Nordic Seas • Global for work on understanding differences between satellite and in situ winds
CRMC	• Regional -Bay of Biscay region 20005 to now • 0° to 15°W; 40° to 52° N
MHI-NASU	• Our suggestion covers any areas on the Ocean, because our drifters can provide high spatio-temporal resolution, when measurements of currents under any weather conditions and during any seasons.
HZG	• North Sea, Baltic Sea, German Bight
UoK	• Currently my areas of interest are Helgoland as example for marine applications and the freshwater lakes in Southern Germany.
MAIN	• North Sea, Irish Sea, Atlantic waters of Europe.
NOC	• Global, all periods
FIO	• Geographical area: 99-130E,0-41N in the last 5 years and in the future.

ID	Please List the geographical areas, with coordinates, and time periods that you would like to work on together with GlobCurrent product/demonstration activities.
AZTI	• Regional scale: BoB. Coords: l° W 11°W, 31°N 48°N • Subserglonal scale: SE BoB. Coords: 43.1°N . 44.12°N, 1.2°W·3.2°W • Local scales: Coastal areas and marine areas over the shelf <200m) • For CC research, and research In mesoscale, sub-mesoscale processes the longest series available and Ideally > 20 years. • For the SE BoB, the period 2007·today will be especially Interesting to work on merging the available In·situ (slope buoys since 2007, HF radar since 2009) and satellite OSCs for validation, operational applications and scientific research.

9.4. Ocean surface current product requirements

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
UKMO	Global coastal models	2 km	0.5 hr	NetCDF	NRT
UKMO	Global (but anything is useful) deep ocean models	<25 km	1-3 hr	NetCDF	NRT
DMI	Regional coverage – Arctic Ocean	50-10 km	Monthly, Seasonal and Annual	NetCDF	+10 yr
DMI	Regional – Local, Greenland waters	1-5 km	1-24 hr	NetCDF	NRT
NCEP	Global	25 km	24 hr	BUFR, netCDF, GRIB2 (in the order of importance).	NRT
NCEP	Regional (regions of responsibility along US coasts)	10 km	1 hr	BUFR, netCDF, GRIB2 (in the order of importance).	NRT
ECMWF	Global Waves	<25 km	6-24 hr. Good quality delayed monthly products can also be useful for verification	netCDF or GRIB2 or BUFR	NRT Record as long as possible. Minimum 1 year.
ECMWF	Global Model evaluation	25 km	6h, daily and monthly	NetCDF, CF Compliant	+10 years. The longer the better. Updates as close as possible to real time.
SMHI	Local and Regional	2 km	1 hr	NetCDF GRIB2	NRT
MF	Local	1 km	N/S	GRIB2	Not specified
MF	Regional	5 km	N/S	GRIB2	Not specified
MF	Global	25 km	N/S	GRIB2	Not specified
KNMI	Global	25 km	For NRT processing: a forecast interval of 1 hour up to 24 hours. For reprocessing, it would be sufficient to have hourly analysis fields of ocean surface currents.	GRIB2	Near real time. For demonstration activities, a period (typically a few months) in the past could be selected.

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
IMRCC	Mediterranean sea and Black Sea (Atlantic Ocean up to Canarian Islands)	1 – 7 km	Daily	netCDF, ECDIS, XML, KML, SHP	NRT
USCG	Global, regional, and local,	The smaller the coverage the finer the resolution is required	Temporal resolution of the surface currents product required by SAR trajectories is of the order one hour. Models runs are typically once per day.	netCDF, GRIB1 or GRIB2, The Environmental Data Server is very powerful and can handle a variety of format and methods for accessing the data in its native format. The EDS manages heterogeneous data and provides harmonization and data access services. The EDS can manage disparate data formats, but integration is nearly seamless when the data is available from providers in NetCDF (CF Compliant) format. Data available via DAP/TDS is also compliant with EDS.	Two files is best; an 0-24 hour hourly nowcast/analysis field; and a >24 hour forecasted fields. The nowcasted fields are archived each cycle, and the forecasted fields are overwritten by the latest forecasted fields.
AOML	Global	½ degree or higher is desirable (resolve jets and western boundary currents)	increasing value with higher temporal resolution: hourly is optimal.	NetCDF	NRT not needed; delayed mode of up to a year acceptable. Data record length: depends on application. A study of near-inertial amplitudes would require a few years, while a climate study of Interannual variations requires a decade or more.
NODC	Global	No preference, but as fine as possible.	No preference, but as frequently as possible.	NetCDF and ASCII formats. NODC now prefers netCDF-4 conforming to ACDD and CF conventions. See http://www.nodc.noaa.gov/data/formats/netcdf/ for details on our preferred format.	Both near real-time, and > 10 years in length for climate related applications.
INCOIS	Arabian Sea (5-28N, 40-78E) Bay of Bengal (5-24N,78-100E) Equatorial Indian Ocean (5S-5N, 40-100E)	at least 25km	6 hourly	netCDF/GRIB2	10 years and NRT
BSH	Regional: North Sea and Baltic Sea	<5km, optimal would be 1 km	<daily, optimal would be hourly	netCDF	2008-today and NRT

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
EMSA	Global Mediterranean Sea North Sea Baltic Sea North-East Atlantic Black Sea Arctic (Barents) Sea Gulf of Aden Indian Ocean (up to 70°W) Eastern Atlantic (down to the Equator) Red Sea	Highest spatial resolution, ideally 1km	6 hourly.	WMS for raster layers, WFS and WCS for vector and NetCDF	NRT Historical data availability up to T0-12 months
IFREMER	global	1/10° degree would be a good start + information on high frequency variability (e.g. tidal constituents of the 10 most energetic tidal components + near-inertial oscillations …)	daily	Not specified	For demonstration purposes a well processed 1 year would be enough (in particular for tides).
IFREMER	For the coastal areas (Northwest European Shelf, Indonesia + Thailand)	~ 1km (mostly tidal currents, so that tidal harmonics can be enough).	1km	Not specified	For demonstration purposes a well processed 1 year would be enough (in particular for tides).
JPL	Global,	No coarser than 1 degree.	Monthly will fit most [purpose. But in regions where sub-monthly variability contribute to the variability of mixed-layer temperature and salinity (e.g., the tropical Indian Ocean with strong bi-weekly variability, tropical Pacific Ocean where tropical instability waves have periods of 17-33 days), daily to two-day average would be needed.	netCDF	The longest period possible. The longer the time series, the more science one can do.
JCOMM	Global	25 km	Daily	BUFR, netCDF, GRIB2 (in the order of importance).	NRT
JCOMM	Regional	10 km	Daily	BUFR, netCDF, GRIB2 (in the order of importance).	NRT
OA	Global	As high as possible	As frequent as possible	Is MATLAB binary an option? If not netCDF or other widely accepted standard	10 years or longer for hindcast, near real time to support forecasts

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
MG	Global	**Highest as possible, ideally 25km offshore, 1km near shore.**	**6 hourly (3 hourly if possible), or along track products**	NetCDF or GRIB2	**Near Real time and the last 10/20 years**
EN	**Local and regional**	**25 km**	hourly for racing Daily for statistic studies	**GRIB 1**	Near real time for racing 10 years for statistic studies on the route.
PFCAL	Local, Regional and Global	The higher the resolution is fine strategic analysis is more accurate in the short term. A higher resolution allows us to work in the medium or long term.	The higher the resolution is fine strategic analysis is more accurate in the short term. A higher resolution allows us to work in the medium or long term.	Especially GRIB files compressed (. Grb.bz2) operable on our routing software. Card also observing and forecasting.	Near real-time forecasting. The archives are also useful preparation period.
ADRENA	Global	10 km	Daily	GRIB	Near real time and historical data available in the same condition is important
CMA	Global	10 Nm out of strong current or variable areas 1 Nm when time variable current or strong spatial discrepancies (in straits, near capes: Gibraltar, Aguhlas current, Kuroshio current, Guyana current, Gulf Stream, etc …)	Minimum is 6 hrs, better is 1 hour (because of the need to use tidal currents when transiting in straits)	GriB and ECDIS	NRT, 1 year
CLS	Global	1/12° degree. It is important for us that the currents from observations include a significant part of the mesoscale.	Daily	NetCDF	10 years and NRT
SO	Global coverage including the near-shore	The smallest possible resolution (sometimes we produce hindcast datasets at 1/64th degree = 1.5km resolution)	The smallest possible resolution (daily down to 1 or 3 hours)	Preferably NetCDF or Grib2, but we adapt to any format.	At least 10 years, and near real time
MERC	The need is global. However, even local products in open oceans (including shelf areas) if global coverage cannot be achieved will be looked at.	All products could be used (even low resolution). Our target is eddy resolving resolution at the global scale but we are also interested in sub meso-scale resolutions locally (namely in the North eastern Atlantic and the occidental med sea).	For non tidal currents daily should be sufficient, if tidal currents are included, 6-hourly (or better) is preferable	NetCDF, using CF convention	We will need NRT products to be used in our real-time service, and reprocessed data to run reanalysis. The longer the period, the better. We currently run 20-years reanalysis (the modern altimetric era). To evaluate the products, we will need at least one year of products (better if we have several years). For R/T delivery, if the products age is greater than 1 week (WRT real time), this will be very difficult to use them.

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
MSS	Local over specific are as of interest such as those listed above and regional over the extent of Scottish waters and surrounding sea areas	As fine as feasible, given that it is al ways possible to re-grid any data to a coarser resolution if required.	As fine resolution as feasible. Historic data and composite/climatic datasets are also useful.	This is not critical since we should be able to convert between formats. netCDF is fine.	As stated above, any dataset would be useful, from near real time to historic data.
BC	Local	4km or better	daily	netCDF	a) Near real time b) 10 years time series (or longer) Both is equally important, for two different services: NRT services and statistical products where we evaluate long term time series (e.g. for fronts)
BC	Regional	25km or better	daily	netCDF	a) Near real time b) 10 years time series (or longer) Both is equally important, for two different services: NRT services and statistical products where we evaluate long term time series (e.g. for fronts)
TOT	The coverage must be global as Total's interests are widespread	The higher the spatial resolution is the better, particularly In nearshore/coastal areas	In-situ measurements are generally recorded with a order of magnitude of minutes. Considering that it is better to have the highest resolution as possible. If 6-hourly or lower resolutions are available it would better suit our needs.	netCDF or ASCII formats	Due to the diversity of our operations, we use both near real-time and historical data
NOV	Global	Our expectations are variable according to the technology and instruments behind the products, and the applications. Current products with spatial resolution better than 1 deg are interesting. Global: 1deg and better	The most demanding applications (Global, regional) would necessitate updates every 6 hrs (ideally).	netCDF.	Long data records : 10 years, or more. Global & Regional : NRT for metocean applications
NOV	Regional	Regional: 1/8degand better	The most demanding applications (Global, regional) would necessitate updates every 6 hrs (ideally).	netCDF.	long data records : 10 years, or more. Global & Regional : NRT for metocean applications
EMEC	Local	0.5 – 5 km	Highest possible	netCDF	10 years + NRT
TCE	UK-wide for general sector-wide planning decisions, site specific for detailed site leasing decisions	Better than 1.8km for UK-wide decisions (we already have a 1.8km dataset that most of our needs), <100m resolution for detailed site decisions	Weekly for all sectors except tidal energy, which ideally requires 15min data	Formats that can be imported into common GIS software e.g. ESRI	1year +

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
HRW	We would need global coverage. We often work in regions of the World where no other data than global models are available, because they have generated little interest so far. Local/Regional coverage is likely to be provided in regions of large interest, where other data are available (including in-situ), and satellite data would be less valuable.	We would want to keep the highest resolution as possible, i.e. finer than 5km (1km?), rather than a gridded product.	We would want to keep the finest time step possible. Each track provides a snapshot of a given region of interest, and the revisit time would be the finest time step that can be obtained. If we are provided with track data, we will be able to carry out more advanced analysis at a regional level than with gridded products.	NetCDF would be the preferred format for us; however most of our clients (and other smaller consultancies) would deal with text files only. The NetCDF files should not be zipped as it only leads to a marginal gain in storage (NetCDF is already binary) and massively slows down the process of scanning the data.	As long as possible. Our interest would be mostly in long-term hindcast, although we also set-up forecast system for which we need near real-time data.
SATOC	Global – coastal and open ocean	Order 10km, less close to the coast	Hourly products would be needed for coastal areas (which indicates a need to assimilate satellite data into models to meet operational need). In the open ocean a daily product would be sufficient.	End users indicated they would want single products which combined all sources of information (i.e. not separate feeds of model predictions, in situ data and satellite data) and fed into the navigation system. This might argue a requirement for data assembly centres	Near real time for operational decision making support. We didn't record any requirement for climatologies
UoN	Global	As high as possible at least 50 km	Monthly	NetCDF	From 1993 onwards 20 years
CSIR	Regional coverage	1 to 10km within 100km from coast\n\n10km to 25km in deeper regions	6 hourly within 100km for the coast and for high resolution products\n\nDaily in deeper regions	NetCDF	Both near real time and longer time-series if possible (10years of more)
UoC	We consider that it would be necessary to have three products (local, regional and global). Based on three different spatial resolutions, as we understand the difficulty of having a global high' resolution product.	we are ideally interested in a spatial resolution of 1 km and 5 km for high resolution studies (local and regional), and 25 km for global coverage.	We consider that an hourly temporal resolution would be ideal, at least for the coastal areas.	An standard netCDF format would be the most adequate	Depending on the project (and application), we usually work with near real time and historical data (necessary for our operational oceanography system) so, we would like to have near real time products as well as the possible longest time series.

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
PML	Regional.	As high as possible. 1km for comparison with EO data would be ideal, and provide useful information near to the coast. Otherwise 4km or 9km.	Daily, 8-day, monthly.	netCDF	Near-real time, and 5-10 years archive
CNR (Pisa)	Coastal Zone and Regional	5-10 km	Hourly for operational applications. Daily to monthly for retrospective analysis	NetCDF, Google KML	Many years in order to have robust statistics
ICIT	Local (PFOW) primarily but up to global for "prospecting" of potential tidal energy sites worldwide	~25-20 metres preferred, 100mteres is adequate and anything better than 1km would have some utility	As often as possible. Since currents are primarily tidal, prevention of tidal aliasing (as per altimetry missions) is essential	All data available in consistent netCDF format please.	Preferably a long record. Some applications might require a near real time product but a properly checked and validated record in a reasonable delivery time (preferably less than one month) will be most useful.
PO	Regional and local	Eddy resolving (~10km)	At least 12h	NetCDF	Near real time and historic data of at least 2 years
UHI	Local (PFOW) primarily but up to global for "prospecting" of potential tidal energy sites worldwide	A fine resolution (20 to 25 m) would be ideal for characterising the small scale turbulence in the complex area of the POFW, but any resolution lower than 1 km can be adequate.	To prevent tidal aliasing (as per altimetry missions), it is desirable to have a short temporal resolution, e.g. with a time interval no longer than 1 hour if possible.	All data available in consistent netCDF format please.	The length of data record depends on the data applications. Long records would be preferable and made available in archives. Some applications might require a near real time product but a properly checked and validated record in a reasonable delivery time (preferably less than one month) will be most useful.
CEDRE	It depends of the incident … local, regional, global	100 meters (near the shoreline) to 10 km	6 hourly	NetCDF The same format as PREVIMER (IFREMER)	NRT (and 3 days forecast)
UoM	Typically local.	Full-resolution SAR product (not interested in higher-level products, not interested in altimeter data).	We will take what is available.	Not interested in getting surface current product.	Most applications do not require near real time. Long time series can be good for applications such as bathymetry monitoring, river runoff monitoring.
CUT	Local coverage for field campaigns, validation efforts and product development	0.05-0.1 km	One snap shot close in time for specific events or best available temporal resolution for a few days.	NetCDF should be ok.	Archived data for a few days usually enough
CUT	Regional coverage for ice drift and oil spill information	1-5 km	Daily as a minimum	NetCDF should be ok.	Multi-year data records during development phase, near real time for future semi operational service
NERSC	MDT: Global	25 km would be good for a start.	Static	NetCDF	N/A
NERSC	surface currents from SAR: Global	Surface current from SAR: 4 km.	by daily scenes	NetCDF	Surface current from SAR: at least 1 year

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
ERI	Global.	Presently OSCAR is at 1/3 degree. This could be enhanced both from using swath data and from combining in situ with remote.	OSCAR is pseudo-daily, but output on 5-day timebase. Improved daily currents would be an advancement.	We work in netCDF so far.	We're at 20 years, but are interested in enhanced products during time periods of maximized satellite coverage.
LEGOS	Global coverage.	As small as possible spatial resolution for global product. We are producing today 1/3 or ¼ degrees global product (ie, 25 to 36km), so the future GlobCurrent product should be of finer resolution (5-10 km?).	As fast as possible global product (daily, 12h, 6h).	NetCDF with standard [CF] conventions.	At least the altimetric period (20 years).
BMT	Regional	Finer than that on a regional scale (possibly 1/36th degree)	Hourly	NetCDF, grib2, matlab	10 years+ and near real time
BMT	Global	Finer than 1/12 degree if possible on a regional scale	Hourly	netCDF, grib2, matlab	10 years+ and near real time
MEARSK	Global	Better than 1 x 1 deg lat/lon	Daily	Please provide readers for Windows	5 years
NIVA	Local	1 km or better for the area "Skagerrak and Kattegat" and thee near coastal areas of Norway	Daily or every hour if possible. Temporal resolution in between (for example 6 hourly) is not needed.	netCDF	5 years
NIVA	Regional	4 km or better for the area Norwegian water and Barents Sea	Daily or every hour if possible. Temporal resolution in between (for example 6 hourly) is not needed.	netCDF	5 years
PDE	Regional and local	Highest resolution possible	Hourly	We fon;t mind – we can read anything	NRT
DOMMRS	Local	1km or less	Daily but more often (6 hourly during a bloom)	Not specified	NRT
CLIVAR	Global	No coarser than 1 degree latitude x longitude	Monthly will fit most purpose.	NetCDF	The longest period possible. The longer the time series, the more science one can do.
CLIVAR	Regional will be useful too	0.25-degree would be nice. Even finer for regional areas if possible.	But in regions where sub-monthly variability contribute to the variability of mixed-layer temperature and salinity (e.g., the tropical Indian Ocean with strong bi-weekly variability, tropical Pacific Ocean where tropical instability waves have periods of 17-33 days), daily to two-day average would be needed.	NetCDF	The longest period possible. The longer the time series, the more science one can do.
RES	Local to regional	As accurate as possible (~10 to 100m)	~ hourly	NetCDF or text files	A least 10 years

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
IRCG	All coastal waters of Ireland including harbours, bays and inlets, to EEZ – lesser data required with 24/7 data	Highest resolution available	Real time	ECDIS/ENC, CMAP, SARMAP/ CHEMMAP/ OILMAP	Real time with archiving of 2-5yrs
FSU	Regional and global	25 km or finer	3 hourly would be preferred, but can work with daily	netCDF	At least 1999 through 2009 for scatterometer work (more recent is also highly desirable). 2010 would be good for our regional study in the Gulf of Mexico
CRMC	Regional (Bay of Biscay)	0.25 degrees	Daily to 10-day composites	NetCDF but also products for easy visualization (e.g. jpg) also ability to animate a time-series of current data	NRT
MHI-NASU	Global and (or) local (Black Sea)	Highest available	Not specified	Not specified	Not specified
HZG	Regional, local	Better than 10 km	The core problem in our area is the tides. To resolve the tides we basically need at least 4 observation per day. However there are a couple of things one can do with single snapshot measurements available now and then.	We are using netCDF	One year is OK to start with
UoK	Local, regional	Higher than 100 m	Monthly or bimonthly	HDF would be preferred	For modelling approaches as long periods as possible
MAIN	Regional, North Sea, Irish Sea, Atlantic waters of Europe.	1 km	Daily	NetCDF	near real time and historical trends back 10 years
NOC	Global	Compatible with satellite wind measurements typically 25-50 km	Compatible with satellite-based wind speed measurements, probably around 6-hourly (SSM/I would require better than 6-hourly)	NetCDF	Multi-decadal, up to present, no requirement for speedy delivery (weeks to months of delay are OK).
FIO	Regional area in the Chinese Sea	Better than 25km	At least daily	NetCDF	Near real time, more than 5 years
AZTI	Regional scale: BoB. Coords: l° W 11°W, 31°N 48°N	< 5-10 km to solve for mesoscale	6 hourly to daily	NetCDF CF-Compliant	For climate change research, and research In mesoscale, submesoscale processes the longest serle available, ideally> 20 years.
AZTI	Subserglonal scale: SE BoB. Coords: 43.1°N . 44.12°N, 1.2°W·3.2°W	< 5-10 km to solve for mesoscale	6 hourly to daily	NetCDF CF-Compliant	For historical SE BoB, the period 2007·today will be especially Interesting to work on merging

ID	Coverage	Spatial resolution	Temporal Resolution /revisit	Format	Length of Record/NRT
AZTI	Local scales: Coastal areas and marine areas over the shelf <200m	< 5-10 km to solve for mesoscale	6 hourly to daily	NetCDF CF-Compliant	the available in·situ (slope buoys since 2007, HF radar since 2009) and satellite OSCs for validation, operational applications and scientific research. Near real time data to integrate OSC satellite derived measurements In 00 systems to provide operational data on ocean currents in larger areas than that covered by In·sltu observatories.

9.5. Documentation requirements

ID	Ocean Surface Current product: documentation (what documents do you need?)
UKMO	• Details of how the currents are derived and the QC process used
DMI	• A Product User Manual (PUM)
NCEP	• We need description of the algorithm used to derive surface currents from the measurements, quality control procedures if any, averaging techniques if used, biases. • Detailed description of the data formats and delivery procedures is important.

ECMWF	• Waves:
	   o Production algorithms.
	   o How the data is gathered and combined.
	   o Error characteristics in values, positions and time.
	• Coupled Model:
	   o Input observations and Methods for estimation.
	   o A quantitate idea of accuracy
	• Qualitative description of strengths and weakness (e.g, how good are at the equator, at high latitudes…)
	• How do they compare with other observational products (OSCAR currents, others)

SMHI	• Format documentation
MF	• Not specified
KNMI	• User manual describing the data format, quality flagging where appropriate, statement on data quality and precision.
IMRCC	• Manuals for users
USCG	• The preference is that all NetCDF files have standard metadata in the global attributes. • Documentation related to the grid definition (horizontal and vertical), coordinate system, date time specification, forcing conditions used, and technical points of contact are required.
AOML	• Explanation of how the product was derived; error bars accompanying the velocities are essential.
NODC	• Data user manual and techniques used to derive ocean surface current product, plus ISO-19115-2 metadata.
INCOIS	• Documentation should include a brief description of the methodology adopted for estimating the surface currents, error estimates, details of data such as (format, resolution etc) and if possible sample fortran code to retrieve the data, details on how to access the data etc.
BSH	• Documentation of data accuracy, errors, limitations, applied corrections, time and space averaging
EMSA	• Interface Control Document • Service Level Agreement (including availability, performance, etc.) • Products specification (including processing methodologies, calibration, validation, reliability, etc.)
IFREMER	• Not specified
JPL	• Description of how the product is generated. • What observations go into the analysis that generates the product. • What effective temporal and spatial resolutions the product has (not the gridded temporal and spatial resolutions).
JCOMM	• We need description of the algorithm used to derive surface currents from the measurements, quality control procedures if any, averaging techniques if used, biases. • Detailed description of the data formats and delivery procedures is important.

ID	Ocean Surface Current product: documentation (what documents do you need?)
OA	• Clear documentation on data reliability and applicability • Publications detailing verification against in-situ data
MG	• **Documents about format, quality and validation.** • **Validation & comparison of EO currents against in situ and model data.** • **Validity range of the measurements depending on the sensors and the method to derive the current (sar, atlimetry…)** • **Spatial and temporal acquisition procedure of the sar derived current. Why only Europe and 2 super sites? ...**
EN	• Not specified
PFCAL	• Data records and forecasting, analysis documents and general statistical studies.
ADRENA	• Not specified
CMA	• Statistics variability, • confidence level in forecasting quality • explanation of the main environmental settings that influences the values and forecasting of each REGIONAL/LOCAL currents)
CLS	• Validation reports
SO	• Standard user guide
MERC	• Users guide and quality docs (scientific quality of the products).
MSS	• Any documentation necessary to interpret the data, or references to the sources of such information.
BC	• A product user guide, which explains precisely the products (what parameters, what units, …), summarizes briefly how these parameters have been derived (in-depth info on algorithms can be found in other docs), expresses clearly the scope (where/under which conditions valid / not valid) and recommends tools for working with the products. It shall provide in an annex a detailed format specification so that I can implement my own readers if I am not happy with the tools recommended. • ATBDs on the algorithms • Validation Report • Technical Specification (processing chain description) and IODD (sate data used, auxiliary data, output data). IODD shall not only contain structure and format, but also scientific relevance, e.g. if certain look-up tables, neural nets or whatever are used: how are they generated (what is the science/algorithm behind; ref. to ATBD is applicable). Needs to be traceable from product. • Use case example (how shall I work with the products, demonstrated at "real live" applications)
TOT	• We always require a QC of the data recorded with metadata as well as operation reports including any issue which might have occurred during recording.
NOV	• Product description/user manual. • Report on product precision/accuracy. • Report with illustration of case studies.
EMEC	• Description of measurement method. • Description of time synchronization.
TCE	• Full ISO 19115 metadata
HRW	• Example python script of how to download to data (these could be generated automatically by filling an online form, in a similar way as what is done in the MyOcean project). • Report describing the derivation of the current values and calculation of the error bar
SATOC	• Web based, searchable product handbook
UoN	• Sufficient to understand how the product was created, its likely quality and its limitations.
CSIR	• I would like to see both PDF and web pages documentations containing a brief description of the data such as record length, coverage, temporal and spatial resolution etc. • I would also like the documentation to contain information or reference to the methods used for the derivation of the product. A description of the flags and quality control process would be useful as well.
UoC	• We think that it would be of great importance to have a clear and thorough ATBD, describing the algorithms and products.
PML	• User guide • Algorithm description.
CNR (Pisa)	• Handbook and case-studies of applications
ICIT	• General description of the data product (coverage, timing, resolution, accuracy) • Explanation of any issues, flagging etc. • An error budget • FAQs and address book for general contacts, expert advice and troubleshooting
PO	• A paper describing the methodology of results should be enough.
UHI	• The preferable options for surface ocean currents would be: • North and south components of current. • Formal definition of effective measurement depth

ID	Ocean Surface Current product: documentation (what documents do you need?)
CEDRE	• Not specified
UoM	• Not interested in getting surface current product.
CUT	• As detailed as possible. As a minimum, info about input data, processing and output format
NERSC	• Product description including sources of data, quality estimates
ERI	• Online documentation is sufficient.

LEGOS	• Detailed presentation:
	  o of the algorithms and methods used to produce the data
	  o of the input data and if possible
	  o of the validation procedure or other quality assessments.

BMT	• Technical background and accuracy details
MEARSK	• Sufficient to use data
NIVA	• A general description of measurement methods is needed. If the data is gridded the positions of the original data is needed.
PDE	• Estimation of accmacy (uncertainty estimates), • Description on how to access, • Method of computation and • Monthly validation with moorings and HF radars to check properly functioning,
DOMMRS	• We would like a simple alert, speed of alert is more important than what it looks like
CLIVAR	• Description of how the product is generated. What observations go into the analysis that generates the product. What effective temporal and spatial resolutions the product has (not the gridded temporal and spatial resolutions).
RES	• Information about the reliability and accuracy of the data set, and about independence of the data set in relation to other publicly available (e.g. buoy data) • Information about the spatial and temporal scale of the processes that are thought to be captured/missed
IRCG	• Not Specified
FSU	• Averaging assumptions: resolution rather than grid spacing • Documentation format • Metadata on content of the files
CRMC	• Product descriptions
MHI-NASU	• Not specified
HZG	• The main thing is validation
UoK	• Data user handbook, references how products are calculated
MAIN	• Not specified
NOC	• Not specified
FIO	• User handbook, • validation report, • product handbook and • how to obtain the GlobCurrent data
AZTI	• Nature of the measurements, accuracy, calibration, validation and results from the quality control If any. • Ideally, the data should be presented in self·descrlbed formats as Netcdf including all the relevant information, such as quality flags, details on units, standard names for variables, processing details, data producers Information, data policy, etc.

9.6. Ocean current nomenclature requirements

ID	Ocean Surface Current product: nomenclature (How would you like to see GlobCurrent define surface ocean currents? Note: GlobCurrent proposes to use Total Current at a specified measurement depth level (u_z, v_z) together with metadata to provide details on the current measurements).
UKMO	Total currents would be fine (although the various components may also be useful, geostrophic, tidal, Ekman etc.)
DMI	(u_z, v_z) at z=0 Alternatively, center and size of eddy features.
NCEP	We support the idea of Total Current with metadata.
ECMWF	(u_z, v_z) with depth, lat, lon. Naming convention not so important
SMHI	u and v components at a specified depth (u_z, v_z) with metadata of details on the current measurements
MF	Not specified

ID	Ocean Surface Current product: nomenclature (How would you like to see GlobCurrent define surface ocean currents? Note: GlobCurrent proposes to use Total Current at a specified measurement depth level (u_z, v_z) together with metadata to provide details on the current measurements).
KNMI	We are only interested in the total current at surface level.
IMRCC	A simple approach (u_z, v_z)
USCG	The Coast Guard's trajectory models assume that the surface currents are the top 1.0 meters (i.e., 0.0 cm to 100.0cm depth integrated). The closer the models come to this standard the better. U and V components of the surface currents co-located at given lat/longs.
AOML	For the purposes of combining these data with surface drifter data, the two most important depths are 15m (center depth of the drogue) and the upper ~10 cm of the water column (undrogued drifter).
NODC	Not specified
INCOIS	uz for the zonal current component and vz for the meridional current component.
BSH	East-west (u) and north-south (v) component of current, u{t,x,y,z}, v(t,x,y,z} at specific depth intervals, e.g. surface, averaged 0-5m depth, ...
EMSA	Nomenclature: surface current (for the top level 1m-50cm?) Units: ms-1 and knots EMSA is interested in having current data at different levels within the water column.
IFREMER	Although "total current" (i.e. Lagrangian mean along the sea surface) is what we need for waves in the short term (longer term we may worry about depth dependence), in practice it is probably better to separate tides (including the phase-locked internal tides) from the rest.
JPL	Total current (u,v) at a fixed depth is fine (e.g., 5 m or 25 m).
JCOMM	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
OA	Not specified
MG	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
EN	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
PFCAL	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
ADRENA	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
CMA	Just one value for average current between 5 to 15 m deep
CLS	Not specified
SO	Consider existing standards (e.g. Climate and Forecasting CF)
MERC	No requirements since the products are defined without ambiguity. Proposed approach (Total Current at a specified measurement depth level (u_z, v_z) together with metadata) looks correct
MSS	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
BC	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
TOT	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
NOV	Total Current at a specified measurement depth level (uz, vz)
EMEC	No preference
TCE	Not specified
HRW	The nomenclature should reflect what is given. For example, if satellites are best at providing currents at the very surface only (i.e. z = 0), we would rather obtain that value, with information about what it actually represents, rather than a value that has been corrected to represent the currents at e.g. 5m depth. However, it would be good if a recommended correction is provided in the metadata (where/when possible).
SATOC	10m surface average, or as relevant for shipping.
UoN	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
CSIR	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
UoC	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
PML	No opinion.
CNR (Pisa)	Total current sounds ok, but it is important that for any product is specified what is measured (real current, geostrophic component, anomaly over a period, etc.)
ICIT	North and East components of current. Formal definition of effective measurement depth
PO	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
UHI	The preferable options for surface ocean currents would be: • North and south components of current. • Formal definition of effective measurement depth

ID	Ocean Surface Current product: nomenclature (How would you like to see GlobCurrent define surface ocean currents? Note: GlobCurrent proposes to use Total Current at a specified measurement depth level (u_z, v_z) together with metadata to provide details on the current measurements).
CEDRE	Although "total current" (i.e. Lagrangian mean along the sea surface) is what we need for waves in the short term (longer term we may worry about depth dependence), in practice it is probably better to separate tides (including the phase-locked internal tides) from the rest.
UoM	This looks like a good idea. For along-track InSAR based current fields, I would include raw Doppler velocities and corrected Doppler velocities (= currents) to enable users to develop their own correction techniques.
CUT	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
NERSC	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
ERI	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
LEGOS	Following CF-convention and usage convention in altimetry (see Jason GDR for instance).
BMT	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
MEARSK	Want clear definitions but interested in top 15 m of the ocean (deg, strength)
NIVA	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
PDE	Not specified
DOMMRS	Simple enough for fish farmers to understand
CLIVAR	Total current (u,v) at a fixed depth is fine (e.g., 5 m or 25 m).
RES	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
IRCG	Not Specified
FSU	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
CRMC	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
MHI-NASU	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
HZG	It is important that the current product can be related to classical in situ observations, in particular ADCP.
UoK	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
MAIN	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
NOC	If period averages are provided, need all of uz, vz and current speed to account for unsteadiness
FIO	Total Current at a specified measurement depth level (u_z, v_z) together with metadata
AZTI	Standards defined In CF metadata conventions.

9.7. Other ocean surface current product requirements

ID	Ocean Surface Current product: other (any other aspect of the GlobCurrent products you need e.g. uncertainty estimates, flags, metadata…)
UKMO	• Estimates of uncertainty are important (essential for assimilation). • Also it would be useful to retain bad/QC'd currents too.
DMI	• Uncertainty Estimates
NCEP	• Uncertainty estimates and quality control flags.
ECMWF	• Error characteristics in values, positions and time (it is essential to be able to eliminate data that are not reliable and/or representative).
SMHI	• Uncertainty estimates and flags when used for data assimilation
MF	• Not specified
KNMI	• Uncertainty estimates and flags are necessary, including a monitoring flag for NRT use.
IMRCC	• Uncertainty estimates, flags, metadata
USCG	• Provide the accuracy of the currents that are being delivered to the user. Measurements with estimates of accuracy or uncertainty either globally, by region, by season, or on grid cell by grid cell. • SAROPS is capable of receiving and handling uncertainty estimates along with the U and V components of the surface currents. • Standard deviation (U' and V') of the surface currents • Tau (half-life decay of the U' and V') for random flight calculations of uncertainty in the U and V components of the surface currents.
AOML	• Uncertainty estimates and quality flags are essential.

ID	Ocean Surface Current product: other (any other aspect of the GlobCurrent products you need e.g. uncertainty estimates, flags, metadata…)
NODC	• It would be good to have L2 and un-collated L3 data to be available, both for use in their own right and also as supporting datasets for higher level L3 super-collated and L4 products. • Well-defined uncertainties, quality flags and metadata are all highly desirable. • Also, synthesized products (L3 super-collated and L4) using as many sources of info as possible would be good.
INCOIS	• Not specified
BSH	• Uncertainty estimates
EMSA	• Full metadata products, errors (u^{err}_z, v^{err}_z), uncertainty estimates, and quality flags.
IFREMER	• Not specified
JPL	• Uncertainty estimate is very important, especially uncertainty as a function of space (uncertainty as a function of time would be very helpful as well).
JCOMM	• Uncertainty estimates and quality control flags.
OA	•
MG	• Uncertainty estimates and quality control flags.
EN	• Not specified
PFCAL	• Uncertainty estimates
ADRENA	• Not specified
CMA	• Uncertainty estimates
CLS	• Errors bar and flags would be very useful
SO	• Uncertainty estimates. • For each separated type of components at their own optimum resolution, metadata includes the main geophysical information about the components (spatiotemporal coverage and resolution, source, sensor)
MERC	• To properly assimilate observational products we need to characterize the error covariance matrix, including the observational errors variance, the representativeness error variance, and the error covariances (extra diagonal terms if any • We will need also quality flags and advises on how to use these flags.
MSS	• Any available uncertainty estimates, metadata, quality flags, etc. would be useful.

BC	• Meta data:
	  o algorithm version (traceable to the ATBD)
	  o processor version (traceable to TS)
	  o auxiliary data version, traceable to the IODD
	  o processing date
	  o input data used
	  o … all other commonly used stuff
	• Uncertainties: Yes, if possible. Preferably the uncertainty should be linked to a comparison with in-situ measurements, and not only the methodological error (quality of fit)
	• Ideally the quality information would be separated into accuracy and precision
	• Flags of any information that is generated during processing (exceptions, out-of-bounds of LUTs, special decision steps) and that helps understanding the product should be included in the product
	• Flags describing the environmental condition (too high / low wind speed, …)
	• Processor software
	• The processing software should be made available with source code to users. The software can be used by user to modify processing parameters to tailor the processing to his specific needs or region. Additional (optional) output can be switched on. Code can be modified to try out own processing steps.
	• This software should be made available under the BEAM/NEST/Leoworks development platform (BEAM API). The BEAM API will be able to work with C and Python early next year, offering the chance to integrate processor in Java, C, C++, Python.

TOT	• Data QC including flags is a requirement within Total.

NOV	• Precision and accuracy.
	• Include in the product auxiliary data to compute other type of currents from the Total Current:
	  o Ocean tide current,
	  o Eckman velocity.

EMEC	• Uncertainty Estimates Geo-referencing and coverage data Pixel resolution
TCE	• Not specified
HRW	• Uncertainties (i.e. an error bar) • Quality flag (the levels given in GlobWave, i.e. good/suspect/bad should be sufficient). • Ancillary data were not found to be useful to us, so the service should allow the user not to download them if not needed (the UCM showed that some users wanted access to these data – the choice could be given by the user via the OpenDAP interface).
SATOC	• Quality flags, error estimates,

ID	Ocean Surface Current product: other (any other aspect of the GlobCurrent products you need e.g. uncertainty estimates, flags, metadata…)
UoN	• Uncertainty estimates would be a valuable additional data product, essential for some applications such as data assimilation.
CSIR	• Clear information on the flags. • uncertainty estimates • Access to the data from which the ocean current product is originally derived (eg., Doppler centroid anomaly and wind product used for SARs, MDT for absolute geostrophic currents...)
UoC	• We consider that uncertainty estimates, quality flags and metadata are of great importance.
PML	• Uncertainty may be helpful. • Flags to indicate which source modality was available for each pixel.
CNR (Pisa)	• Users have to access all relevant information about the product including data sources. • Uncertainty is a strong requirement for applications
ICIT	• Not specified
PO	• A matrix containing the indexes of data reliability would be great.
UHI	• Uncertainty Estimates • Flags (e.g. rain) • Metadata
CEDRE	• Uncertainty estimates
UoM	• We mainly need well-documented raw interferograms if they are available form SAR interferometer missions.
CUT	• Regional coverage: Accurate and detailed geographical info for whole product if in-house geocoding is required. Uncertainty estimates and flags for bad data or data with low reliability wanted • Local coverage: Accurate and detailed geographical info for whole product if in-house geocoding is required. Uncertainty estimates and flags for bad data or data with low reliability wanted
NERSC	• Uncertainty estimates should be provided for each pixel.
ERI	• Uncertainty estimates/Quality information would be much better practice than what is in place for most remotely sensed products, and is where the community agrees we need to progress.

LEGOS	• Following CF-convention and usage convention in altimetry (see Jason GDR for instance).
	    o Reference to the production chain within the metadata.
	    o Attributes like: units, scale_factor, _FillValue, ...
	• Uncertainty estimates would be a great improvement if reliable.

BMT	• List of variables that may not be fully resolved in the product e.g. riverine input *etc*
MEARSK	• We need uncertainty estimates
NIVA	• Uncertainty estimates are appreciated
PDE	• Estimation of accuracy (uncertainty estimates), Description on how to access, method of computation and monthly validation with moorings and HF radars to check properly functioning,
DOMMRS	• Only applicable to intermediate users (service suppliers) not end users like fish farmers.
CLIVAR	• Uncertainty estimate is very important, especially uncertainty as a function of space (uncertainty as a function of time would be very helpful as well).
RES	• Estimated accuracy of the data, quality flag, and other metadata as specified in NetCDF convention CF 1.4.
IRCG	• Not specified
FSU	• Uncertainty estimates would be useful, but are not needed yet. In the absence of uncertainty estimates, quality assessment flags on a grid-cell be grid-cell basis would be needed. Standard metadata are essential.
CRMC	• Uncertainty estimates are important in order to understand how reliable the data may be.
MHI-NASU	• Not specified
HZG	• Validation report
UoK	• Uncertainty, data flags would be very useful, accuracy assessment as well
MAIN	• Not specified
NOC	• Need estimates of uncertainty (and its correlation structure), appropriate exclusion flags, all relevant metadata.
FIO	• Not specified
AZTI	• Uncertainty estimates, flags form the quality control, accuracy of the measured variable and full metadata fields.

9.8. Application specific requirements

9.8.1. UKMO

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We would like ocean current measurements against which to validate the ocean currents from the FOAM system. If a sufficiently high quality product were available then we would like to assimilate these current measurements into the system to increase the accuracy of surface current predictions (and hence our wave forecast predictions too).
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	FTP (or GTS)
Why do you want products delivered in this way?	For ease of download in near-real-time
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	I'm not sure that visualisation would be needed but perhaps a WMS could be useful.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	We'd be happy with ftp/web listings
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Not sure
What metadata requirements do you have? (i.e. data product and data discovery metadata)	QC information, error estimates
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness then accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.2. DMI

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Arctic Ocean: We would like to use the GlobCurrent data to validate our own current estimates. (CAL/VAL) Greenland: We would like to use the GlobCurrent data to validate our current models and eventually to assimilate in to the models if feasible.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	ftp
Why do you want products delivered in this way?	Easy automation
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Not required
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Email when available on ftp site We will discover on the ftp site when data are available, or you could use ftp push to our site.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	A Contact point
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Data product metadata
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Arctic: product accuracy Greenland: Accuracy and timeliness
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.3. NCEP

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Primary uses will be: 1. To assimilate data in preparing initializations and hindcasts. 2. To help in evaluating forecast performance

Activity Requirements	Response
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	The best way would be to send the data through WMO GTS. Ftp and Opendap will also be useful.
Why do you want products delivered in this way?	Using GTS will make it straightforward to use in real-time applications. We can also pull data through FTP in special cases. Opendap will me convenient for research and development.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web-based visualization is preferable.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Proper metadata ingestion in GTS/WIS will make discovery straightforward (for example use of WMO headers).
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Having contact person who can provide timely user support, especially at the beginning, is very useful. Having prompt information about any changes in the product contents and availability is essential for operational implementations. On line tools are very useful too.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	It would be best to follow WMO outlined standards for metadata information.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timely and stable real-time delivery is important for forecast applications.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.4. ECMWF

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Ocean currents are important for validation of ocean reanalysis, numerical experiments with coupled models for the generation of ocean initial conditions, and for ocean model and data assimilation development. If the ocean currents could be properly assimilated in the ocean model, its information could be used in the NWP coupled forecasts of weather, waves and ocean. The methodology to assimilate correctly ocean currents needs to be developed. It will be possible to use the current variational data assimilation method NEMOVAR, but work will be needed. In the future, they could also be used in coupled reanalysis of the earth-system.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web, ftp, Opendap
Why do you want products delivered in this way?	Ftp may be the most efficient for ECMWF. It will allow automatic acquisition. It also allows automatic transfer of large chunks of data. web and Opendap allows easy exploration of contents and visualization.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web-based visualization
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Single web access point (via Google)
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools (easy tutorials to help the collocation process between our model data, either in grib or netCDF, and the GlobCurrent data). A technical help desk is always a must.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	CF Compliant
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness and accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Ocean currents are relevant for wave forecasts. They are also relevant for estimating the fluxes of momentum and turbulent kinetic energy at the air-sea interface, which will affect the forecasts of atmosphere, waves and ocean variables at a range of time scales: medium range monthly and seasonal forecasts.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web, ftp, Opendap

Why do you want products delivered in this way?	Ftp may be the most efficient for ECMWF. It will allow automatic acquisition. It also allows automatic transfer of large chunks of data.
	web and Opendap allows easy exploration of contents and visualization.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web-based visualization
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	As easily as possible.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools (easy tutorials to help the collocation process between our model data, either in grib or netcdf, and the GlobCurrent data). A technical help desk is always a must.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness and accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.5. SMHI

Not provided

9.8.6. MF

Not provided

9.8.7. KNMI

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We would like to asses the impact of GlobCurrent data on the comparison of scatterometer winds to moored buoys and ECMWF NWP data.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap) Why do you want products delivered in this way?	FTP is preferred We use FTP for all our operational data flows.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	We visualise the products ourselves.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not specified
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	A contact point is necessary to discuss scientific matters concerning the quality and usage of the products.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	For NRT processing, timeliness is necessary. Impact of GlobCurrent accuracy on scatterometer winds is to be investigated.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.8. IMRCC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Italian Coast Guard would like to use GlobCurrent to validate forecast current in oil spill drifting models. Moreover it could be useful to integrate current data in our ship reporting systems for S&R purposes other than in CleanSeaNet web interface (maritime pollution prevention and response)
How would you like products to be delivered for this	Both web and ftp

Activity Requirements	Response
activity? (e.g., web, ftp, Opendap) *Why do you want products delivered in this way?*	Via web in order to be used in our peripheral offices (through a link on our intranet). Via ftp to automatically download data in our tools and systems.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web, tablets and smartphone, data multiplatform compatible (aliOS, like windows Linux and MacOs)
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not specified
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools, contact point, workshop
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness, accuracy, formats
Any other aspect where GlobCurrent could assist you for this application?	Data in geographical coordinates WGS84. Products should not be no bigger than 100 MB

9.8.9. USCG

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Search and Rescue operations Integration of Globcurrent data into the EDS for evaluation with search & rescue activities. The EDS also supports oil spill modelling so this integration activity could also support oil spill trajectory modelling analysis.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	To the ASA Environmental Data Server (ASA-EDS) NetCDF (FTP), or DAP
Why do you want products delivered in this way?	The ASA server links to the SAROPS tool used by USCG. Simplest level of integration
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	No visualization requirement. EDS provides visualization
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Via the ASA-EDS and/or Via a Catalog Service
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Technical support questions on data forma
What metadata requirements do you have? (i.e. data product and data discovery metadata)	ISO Compliant metadata
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Data via ASA-EDS and uncertainty. Timeliness, (work up to 24 hours ahead in a nowcast mode) Development of uncertainty estimates for EO ocean surface current estimates.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.10. AOML

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Comparison with drifter velocities, to examine the behaviour of drogued and undrogued drifters in high wind/wave states.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	ftp
Why do you want products delivered in this way?	Optimal, since acquisition of updates is easily implemented.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Tables
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	A web portal describing the data and metadata, and pointing to the relevant ftp sites.

Activity Requirements	Response
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	The metadata should clearly state the depth level and quality of each observation, if depth level is not uniform.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy and formats.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.11. NODC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	NODC has one on-going, and two potential projects that would be interesting to coordinate with GlobCurrent one. The existing project is our Global Ocean Currents activity, in which we are converting historical currents holdings into standardized netCDF files. One possible projects this new fiscal year is to automate the archive of the US national HF Radar network, and there is a possibility of NODC working to maintain the OSCAR system.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	HTTP, FTP, OPENDAP/Hyrax, and Unidata THREDDS Data Server.
Why do you want products delivered in this way?	Because they support easy access, on demand sub-setting and visualization, and because our users demand it!
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web interfaces like Live Access Server and services like WCS and WMS.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Via human web interfaces like the Geoportal Server and via web services like CSW.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools and contact point
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Data Discovery by time and position, platform, statistics about the data, information about processing and lineage (provenance), algorithms used, platform characteristics – in summary, as complete as possible ISO 19115-2 data.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Improving accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.12. INCOIS

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Our primary objective is to validate the surface current simulations and predictions based on the numerical ocean models. At present, the validations are done only at selected locations where surface current observations are available form the platforms such as moored buoys.

However, before attempting to do this we need to validate the GlobCurrent using in situ observations available at our region. This may be done using the data from moored buoys, drifters, and HF radars. |
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	We like to get the data through ftp, dedicated web-interface (something similar to live access server)
Why do you want products delivered in this way?	This is a convenient way as we can automate the process of accessing the data.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web interfaces.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	We like to have dedicated web-interface (something similar to live access server) through which we can navigate and select the data of our interest. It would be great if this can be documented in the technical document provided along with the data.

Activity Requirements	Response
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	A workshop on the usage of the data is highly appreciated. However, a contact point would be good.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Metadata may include the details of spatial and temporal resolution, length of the data, variable names with long-names, version of the data.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	The most important aspect of the GlobCurrent improving accuracy.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.13. BSH

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	1) We would like to use the data in model validation and calibration first, i.e. statistical comparison of observed and modelled data. 2) Based on the results the next step could be data-assimilation of the n+ t data into the model
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	That depends on the product: 1) ftp if product is already tailored for us (exact region, levels, etc. that suit our needs) 2) Opendap if we have to do data extraction, e.g. from global data set, ourselves
Why do you want products delivered in this way?	1) most robust for operational purpose 2) most convenient when data need to be extracted
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web interfaces.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web portal
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools for data visualization
What metadata requirements do you have? (i.e. data product and data discovery metadata)	None if data are provided in netCDF-format
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	1) Accuracy, formats for "historic data" 2) timeliness, accuracy, error estimates for n-r-t data
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.14. EMSA

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Test campaigns in a number of selected areas for Search & Rescue operations and oil spill trajectory /propagation. Tentative areas could include areas of high vessel traffic such as: Channel, Adriatic Sea, Gibraltar, and North Sea.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Both via Web Services (including CSW, WMS, WFS, WCS, WPS), and FTP.
Why do you want products delivered in this way?	EMSA's services are developed and implemented on standardised and interoperable web service interfaces.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Raster layer will be visualised through the EMSA web interfaces.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Via standard web service calls including: Catalogue CSW "GetRecords"; WMS INSPIRE "GetCapabilities" and "GetMap", etc.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point for interface and integration activities. User training on data content and specification.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Metadata following the CSW EO profile standards and existing netCDF convention.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness Availability Performance

| | Medium to long term sustainability |
| Any other aspect where GlobCurrent could assist you for this application? | Not specified |

9.8.15. IFREMER

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Validate GlobCurrent product currents by comparing the results of numerical wave models against satellite and buoy data.
How would you like products to be delivered for this activity? (e.g., web, ftp, OpenDAP)	Ftp is easy. Having both ftp and OpenDAP would be great.
Why do you want products delivered in this way?	Ftp is easy, but for very big datasets OpenDAP certainly helps.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Don't know.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Simple NetCDF files and contact point to discuss the data quality if needed.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Hard to tell before hand.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy and easy access. There are already quite a few surface currents floating around (OSCAR …,tidal currents from OSU, RTOFS from NOAA/NCEP …) and none has all geophysical processes included, and many are rather hard to use.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.16. JPL

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Use surface current and sea surface temperature and salinity to study the role of horizontal advection on these variabilities. Assimilate the surface current product into GCMs at the correct depth level.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	LAS, ftp
Why do you want products delivered in this way?	Convenience (I am used to these methods)
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web (e.g., LAS).
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web (e.g., by Google search of "surface current")
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools and contact point.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Specification of unit, grid, depth, time.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy and uncertainty estimate.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.17. JCOMM

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	To assimilate data in preparing initializations and hindcasts. To help in evaluating forecast performance

Activity Requirements	Response
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	The best way would be to send the data through WMO GTS. Ftp and Opendap will also be useful.
Why do you want products delivered in this way?	Using GTS will make it straightforward to use in real-time applications. We can also pull data through FTP in special cases. Opendap will me convenient for research and development.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web-based visualization is preferable.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Proper metadata ingestion in GTS/WIS will make discovery straightforward (for example use of WMO headers).
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Having contact person who can provide timely user support, especially at the beginning, is very useful. Having prompt information about any changes in the product contents and availability is essential for operational implementations. On line tools are very useful too.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	It would be best to follow WMO outlined standards for metadata information.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timely and stable real-time delivery is important for forecast applications.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.18. OA

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Acquisition of long term current data time series or surface maps for a region
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	No bespoke requirements
Why do you want products delivered in this way?	Not specified
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	I would probably use MATLAB
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Global GIS front end and/or spatial temporal query tools
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools, contact point, workshop all would be useful
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Reliability and Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.19. MG

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	**Marine forecasts** **Route optimization** **Metocean Studies** **For these 3 activities requirements are the same.**
How would you like products to be delivered for this	ftp

Activity Requirements	Response
activity? (e.g., web, ftp, Opendap) Why do you want products delivered in this way?	**To easily download a large amount of data.**
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	**Availabilities map for the SA product.** **No visualisation needed for the product itself (data), ftp is fine.**
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	**Catalogue describing available data/products and time range.**
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	**Catalogue describing available data/products and time range.**
What metadata requirements do you have? (i.e. data product and data discovery metadata)	**Quality flag**
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	**Spatial and temporal selection of the sar derived current files.**
	"For the sar derived current, the challenge would be to provide an easy tool to make requests (depending on the location of interest and time range, like Soprano) not only in interactive mode but also in command line. The big interest would be to extract all the requested files at once through a script and not manually one by one (as it is now in Soprano). "
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.20. MG

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	For near real time I want to be able to download daily a GRIB file for a variable area (according to the movement of the vessel). A small software like Ugrib http://www.grib.us/ or Viewfax http://siriuscyber.net/wxfax/ looks to be a good way to make this kind off selection. For statistic studies I want to be able to download from a ftp, opendap or order a CD data for a whole ocean area.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap) Why do you want products delivered in this way?	Not specified Not specified
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Not specified
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not specified
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On line tools
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.21. PFCAL

Activity Requirements	Response

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Educational activity for training and a need accurate information and real data exploitable for strategic studies (routing, moving ocean).
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Email and ftp
Why do you want products delivered in this way?	Efficient and easy
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Grib files and maps
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Query via mail or web
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Command Interface such as Ugrib, Navimail. Or reference data from these suppliers among others.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	The real-time data but also the forecast.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.22. ADRENA

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We provide navigation, performance and routing software for offshore and inshore sailing boats. We also develop routing application for commercial, ferries and fishing ship
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	FTP, WEB, E-MAIL request
Why do you want products delivered in this way?	Automatic download and e-mail request for non-permanent internet connection
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Tablet and PC compliant But an independent specific interface to download the GRIB is necessary
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Selection could be integrate in our system and we send only the request (area, time, resolution)
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point, technical support and accurate update information
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	1 accuracy 2 format 3 low prices
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.23. CMA

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Integration of the forecasted values in route optimization software to calculate the best route and speed from one departure port to one arrival port.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web, or any other format easily readable.
Why do you want products delivered in this way?	Most of our routing operators have built some Fleet Management Tracking System on websites according to our specifications. These systems are external owned system, and we cannot easily include some other commercial and strategic data.

Activity Requirements	Response
	We would like to use some weather and current data to be able to display these data and to optimize ourself the routes and speed of our vessels on our software internal Fleet System.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Select a geographical area on a world map, then the time window and if necessary other settings (resolution, data volume to be transferred, etc …)
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	First workshops to request and update needed improvements when first trials
	Then Contact point and on line tools when operational data system
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	To focus on currents knowledge needs of referenced ports:
	- Local currents: from the entrance channel to the wharf
	- Assessment of more accurate tide water depths
	o Container vessels are often economically pushed to entered ports with no under keel margin and large uncertainties in order to bring more cargo: less than 20 cm on a 300 m length with all bending and share forces aspect; squat effect with the vessel speed…
	The monsoon often creates some currents which change the sea bed (ground sand banks) and so the water depth …

9.8.24. CLS

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Daily maps of surface currents at 1/12°, visible via a web interface and downloadable for further processing.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web interface and web client to download netCDF data file
Why do you want products delivered in this way?	For quick visualization and further processing
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web interface is the most useful way to visualise the data.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Via a well documented web interface
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point, technical support and accurate update information
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Metadata identical to MyOcean
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy and operationality.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.25. SO

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	For evaluation/demonstration, a historical study (at least 3-year long) over one or several areas to be later specified using the new surface current dataset, also including a comparison study with an OGCM-based hindcast dataset.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Ftp or Opendap
Why do you want products delivered in this way?	Downloading tasks can easily be automated
How would you like products to be visualised for this	No visualization necessary at this stage

Activity Requirements	Response
activity? (e.g., web, tables, phone interfaces)	
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web, interface similar to MyOcean for example
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Data product metadata
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.26. MERC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We will first use the products to compare with our model current. If the model/data discrepancies correspond to innovations that could be inserted through data assimilation, and that we prove that there is a potential benefit doing so, we will develop the technology to be able to assimilate these products, we will test it, and if the impact is positive at the end, we will look after the operational implementation of it. We could also envisage, if useful, to merge our model current with the GlobCurrent products using simpler methods (compared to full data assimilation) in order to provide numerical fields of better quality for the surface currents
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Any kind of modern (internet-based) dissemination is OK for us. If we implement real-time access to the products, we will need sustained robust services which are delivering the products.
Why do you want products delivered in this way?	We are used to get data from various sources, and we have the capacity to implement things
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	If numerical products are delivered in NetCDF CF, any good software will enable to visualize them. If in addition, the products can be viewed directly on the server using a web interface, this is a plus.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not clear
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Since the first expectation is scientific added value, the standard way of disseminating research outcomes is ok. At least a contact person is needed. This person should be able to redirect to product experts if needed. Having workshops organized is something which can be very useful. There is no operational production immediately foreseen, so there are no requirements on our side to set up a costly interface, and to develop costly toolboxes.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	To properly assimilate observational products we need to characterize the error covariance matrix, including the observational errors variance, the representativeness error variance, and the error covariances (extra diagonal terms if any We will need also quality flags and advises on how to use these flags.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	The most important aspect is scientific data quality (accuracy of products). If, at the end, we implement R/T access to the product, availability and timeliness requirements will have to be taken into account, but this will come later. E.G. a brilliant scientific solution without possible real-time feasibility must be flagged as such: not to say it's not useful, but to clarify that operational production is not foreseen.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.27. MSS

Activity Requirements	Response
Please describe the Activity that you would like to use to	We have commissioned a hydrodynamic model for Scottish shelf waters so

Activity Requirements	Response
work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	any data available for model validation would be very useful. We have specific high resolution for this model for area as of the Scottish west coast, Shetland and Pentland Firth/Orkney Waters. We are also involved in a pilot study to test the usefulness of High Frequency Radar for the measurement off surface currents in the Fair Isle Channel, and additional surface currents information to complement this and other measurements that will be put in place during the pilot period (moored current meters and drifters, most likely) would also bee very useful.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap) Why do you want products delivered in this way?	Any method that works. No preference
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	No Preference
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	No preference
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools, contact point, workshop
What metadata requirements do you have? (i.e. data product and data discovery metadata)	We have a metadata catalogue and it would be useful if any metadata characteristics were compatible with those. The details would have to be worked out with our Data Manager.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy is the most important aspect, followed by a good spatial and temporal coverage.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.28. BC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We are currently producing statistical products on oceanic fronts for the North Sea (extending a bit off the continental shelf), and we are analysing (together with our customer, BSH) this dataset w.r.t. to correlation with wind pattern, all this part of an investigation of the impact of climate change on water ways. We would like to extend this activity and include ocean currents. We would further like to extend it geographically (see areas listed in the beginning). Our portfolio of marine services includes currently biological parameters and temperature, based on ocean colour and SST sensors. We are in the process of extending this and to offer a full suite of marine products (physical and biological). We do this by linking with ocean modelling groups. In this context we would like to extend our contribution (from the satellite side) by GlobCurrent products. We need to investigate further with our modelling partners how we would include this in the overall portfolio.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	a) FTP b) OpenDAP c) WMS or WFS (both not high priority) d) also web processing service (WPS) would be an idea, to process the products on demand when we need them. Not so sure, though.
Why do you want products delivered in this way?	We will mainly establish a computer to computer interface to systematically acquire the products we are interested. OpenDAP today looks a very useful and practical way of doing this (a bit more smart than ftp).
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	We would like to work with these product interactively using BEAM, and programmatically using the BEAM API and specifically the GPF framework of BEAM.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	I can find easily the ftp or OpenDAP address, I register and establish my machine-machine link.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	A workshop is definitively a good idea to introduce the products. This could be accompanied by a hands on training where the products are interactively explored using application case studies.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	As above

Activity Requirements	Response
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	a) Quality of products (in comparison with currents from measurements and models) b) Reliability of service. If we include the products in our statistics service, we need to get the announced time series at a certain point in time. If it comes to an NRT service, the products should appear on the server as specified (whatever the specification is), and this service should be stable (specification should not change often) and long term ensured.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.29. TOT

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	NRT: Access to real-time current speed and direction in any pan of the world Historical: Access to historical current speed and direction in any part of the world
How would you like products to be delivered for this activity? (e.g., web, ftp, OpenDAP)	A dedicated website would be better or access to a dedicated part of the GlobCurrent website only available to Total?
Why do you want products delivered in this way?	Total's policies sometimes forbid access to some ftp sites
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Tables, images, access to the time series (if any)
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not specified
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools and contact point are best.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Time-series, tables, images, and detailed summary of time period, location, instruments, etc.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.30. NOV

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We consider that the list of activities listed in the present document at the top of p-4 reflects well what has been recommended at the UCM of March 2012. In particular, we find particularly important the following activities: • Development of uncertainty estimates for EO ocean surface current estimates, • Products and demonstration activities supporting data inter-comparisons and validation activities, • Development of a web portal, a data archive, or software tools to assist the user community in the discovery and application of EO derived surface ocean current data, They are very important in order to stimulate the interest of users for the Globcurrent products, and encourage them to use the products.
How would you like products to be delivered for this activity? (e.g., web, ftp, OpenDAP)	Web, with webGIS interface for data exploration + simple ftp access.
Why do you want products delivered in this way?	WebGIS: for data exploration and selection, quick visualisation, to look at a particular event… ftp: for downloading of long time series, for scientific and operational use.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web interface (webGIS), phone/tablet interface (not limited to a particular smartphone/tablet trademark)
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web portal.

Activity Requirements	Response
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Tools to read the data: e.g. matlab routines, BEAM module,… Case studies showing how the products can be used (e.g. choice of radar data processing when several processing are available, choice/impact of corrections (e.g. tide model), impact of post-processing (e.g. spatial filtering).
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Ordinary metadata information (version and name of processing software, start date, end date…)
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	1/ Information on the products 2/ Error bars, precision/accuracy 3/ Case studies showing how to use/customize the GlobCurrent products for the user's purposes 4/ Easiness of use: web platform to explore, select, access to the products.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.31. EMEC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Spatial mapping of surface current
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web
Why do you want products delivered in this way?	Convenience
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Tables
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web catalogue
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point
What metadata requirements do you have? (i.e. data product and data discovery metadata)	None specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness Accurate geo-location
Any other aspect where GlobCurrent could assist you for this application?	None specified

9.8.32. TCE

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Not specified
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	ftp
Why do you want products delivered in this way?	Ease of access
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	GIS applications
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web-portal
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Online tools and contact point
What metadata requirements do you have? (i.e. data product and data discovery metadata)	ISO 19115 metadata
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.33. HRW

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We would not use GlobCurrent data on their own, so any application of the data would start with a comparison against other available data (ocean circulation model, in-situ data). For example, plotting selected along-track current data against the equivalent model track (e.g. model interpolated at track time and location) would be a very valuable tool. (It's the sort of comparison we have carried out w3ith GlobWave track data).
How would you like products to be delivered for this activity? (e.g., web, ftp, OpenDAP)	OpenDAP accessible via both automatic python scripts and web interface. An ftp site on its own would not allow us to sample data per location, unless the folder structure was per tile rather than per time period (which is unlikely to be suitable for users interested in global simulations for example).
Why do you want products delivered in this way?	Access should be both easy (i.e. not require any training or development) and flexible (i.e. allow easy automated access)
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web. We would probably have our own tools for data visualisation, as they are very closely linked to the tools we use for data analysis.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	The best would be to have a GIS interface in which we draw/load a polygon representing the region of interest. However, giving a bounding box such as is done in the MyOcean project works fine and is a cheaper option. As a first pass, a list of metadata could be extracted to allow the request to be refined before the data are downloaded (particularly if the data extraction process is slow).
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	The best support activities are exchanges rather than one-way communication. Workshops are useful because we can explain how we do things, and get feedbacks from specialist users. A user forum, with frequent contributions from the support team, would also be welcome.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Each track data should be provided with: the satellite and instruments that were used, and the process that was applied to obtain the data, as well as information about which depths levels the given current is representative of.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	The service should be reliable and maintained on the long-term. Users are unlikely to invest time (and money) in learning how to use the service if it is then provided via a completely different platform, or frequently unavailable.
Any other aspect where GlobCurrent could assist you for this application?	Provision of comparison plots and statistics.

9.8.34. SATOC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We would like to work with marine operators to test and evaluate products. The answers to the questions below would depend on the end-users that we could engage, and to what extent a tailored product would be required to meet their needs. We anticipate it may be necessary to add a layer of processing to the GlobCurrent output so it can be merged with the normal transmission of navigation/metocean information to the ship.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Ftp
Why do you want products delivered in this way?	Ease of access to basic products
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Visualisation is usually tailored to requirements, but quick look graphical products would be useful
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	FTP site
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Handbook and contact point
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	To be determined, but timeliness and continuity together with accuracy for purpose are probably the key aspects
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.35. UoN

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Usually oceanographers determine geostrophic ocean currents by differentiation of an estimate of the ocean's mean dynamic topography (MDT). It is however possible to reverse the process and determine the MDT from the geostrophic ocean currents. Potentially therefore the GlobCurrent products could be used to develop a high resolution MDT which could be used to better constrain operational ocean models. In collaboration with the UK Met Office I would like to investigate this possibility as part of an existing independent project that will run until September 2015.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap) *Why do you want products delivered in this way?*	ftp

I find this format most convenient for downloading data. |
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	N/A
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	website information portal
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	A specific point of contact would be helpful.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Data types and quality; uncertainty estimates
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy; uncertainty information
Any other aspect where GlobCurrent could assist you for this application?	None specified

9.8.36. CSIR

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Data validation / comparisons exercise with in-situ observations or other satellite remote sensing observations.

Regional process studies and comparisons with ocean circulation models

Near-real time marine monitoring activities. |
| *How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)* *Why do you want products delivered in this way?* | FTP and OpenDAP.

To allow easy download of large chunks of data within personal scripts
To be able to extract small regions. |
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Through a web page
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact points, bibliography.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	None specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.37. UoC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview –	During the cal/val phase, we would like to be involved in the validation of the outputs of our operational oceanography system at the Cantabrian

Activity Requirements	Response
we will use this information to consider developing a dedicated module to address your needs)	coast (Gulf of Biscay, Spain). However, after this period, we would like to work at a global scale.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	We are familiarized with all these transfer protocols.
Why do you want products delivered in this way?	We are familiarized with all these transfer protocols.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	We think that the most widely distribution media may be the web, mostly considering that most of the people using such data will be researchers, managers, technicians ...
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	The data should be visible and easily accessible; otherwise the number of users would not be high.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	We think that on-line tools and workshops, as well as contact points, would be very helpful.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	The product should contain metadata clearly indicating the coordinates, the units of the variables, the processing information, etc.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	We consider that the accuracy and spatial resolution of the products are the most relevant aspects, as well as the data formats, that should be clearly specified.
Any other aspect where GlobCurrent could assist you for this application?	None specified

9.8.38. PML

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	For UK FASTNEt project, additional products on surface currents would be valuable to complement other EO datasets, and would be used in comparison with drifters, gliders and moorings
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	FTP or wget
Why do you want products delivered in this way?	Scriptable
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Ftp
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact e-mail, on-line documents.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	netCDF
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness, resolution.
Any other aspect where GlobCurrent could assist you for this application?	None specified

9.8.39. CNR (Pisa)

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Maps of currents, time series of currents, examples of how currents are exploited to solve problems
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web site and Google Earth
Why do you want products delivered in this way?	Easy to use for applications
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Google Earth
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Google
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Online tools (e.g. Matlab code to read and process data), webinars explaining products and applications, workshops to show demos.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	All ancillary information about sensor, processing and auxiliary data sets

Activity Requirements	Response
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	None

9.8.40. ICIT

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Demonstration data sets for Pentland Firth and Orkney Waters to be planned to coincide with in situ measurements, shore-based radar measurements and numerical modelling. The area is notable for exceptionally high currents (up to ~ 7m/s in at least one case, generally exceeding 2 m/s at the several sites of immediate interest). These currents are also highly turbulent with eddies, meanders, boils and maelstroms at scales from 1km to a few metres.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	No preference as long as it works.
Why do you want products delivered in this way?	N/A
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Some examples on web. Might look at YouTube or phone apps as a marketing tool.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	A friendly web-based search tool
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	All sorts of support are helpful. Reliable contact points are essential.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Fairly simple. Ability to find data by location and/or time. Immediate discovery of any pertinent issues (flags) immediately attached to the data.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	A reliable and helpful Ground Segment
Any other aspect where GlobCurrent could assist you for this application?	Contacts between the user community and earth observation specialists (a multi-disciplinary GlobCurrent community)

9.8.41. PO

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Oil spill fate prediction, vessel routing, search and rescue.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Opendap
Why do you want products delivered in this way?	Opendap allows the extraction of subdomains in space and time and can be accessed automatically via scripts in matla, python, etc
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Mostly web.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Opendap and a gui web page that you can do q simple query.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	A description of each variable should be fine.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	For us, accuracy, resolution and reliability on the operational aspects.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.42. UHI

Activity Requirements	Response

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Demonstration data sets for Pentland Firth and Orkney Waters to be planned to coincide with in situ measurements, shore-based radar measurements and numerical modelling. The area is notable for exceptionally high currents (up to ~ 7 m/s in at least one case, generally exceeding 2 m/s at the several sites of immediate interest). These currents are also highly turbulent with eddies, meanders, boils and maelstroms at scales from 1 km to a few metres.

Use of wave data in Scottish Seas for calibration and validation of mathematical models, and studies on wave-current interaction. |
| *How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)*
Why do you want products delivered in this way? | No specific preference.

N/A |
| *How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)* | Some examples on web. Might look at YouTube or phone apps as a marketing tool.

Products to be visualised through a web application, and possibly given as tables that can be used with specific data visualisation software such as Matlab. |
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	A friendly web-based search tool
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	A comprehensive on-line documentation with search facilities for FAQs. Reliable contact points are essential.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Fairly simple. Ability to find data by location and/or time. Immediate discovery of any pertinent issues (flags) immediately attached to the data.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	A reliable and helpful Ground Segment
Any other aspect where GlobCurrent could assist you for this application?	Contacts between the user community and earth observation specialists (a multi-disciplinary GlobCurrent community)

9.8.43. CEDRE

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Model: We would like to run our model software with currents from GlobCurrent. We need for 3 days forecast.

Web Visualisation: We would like to visualize currents data on our WEBGIS |
| *How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)* | Model: Opendap.

Web: WMS or WFS services (Web Map Service or Web Map Features) |
| *Why do you want products delivered in this way?* | Model: CHEMMAP and OILMAP can connect to opendap server and download specific data (selected area and time).

Web: In order to simplify the integration in our GIS server. Automatically updated. |
| *How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)* | Model: web

Web: Web GIS |
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web GIS
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Usual specification
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Formats compatible with CHEMMAP and OILMAP
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.44. UoM

Activity Requirements	Response

Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Current measurements in rivers, coastal bathymetry retrieval / monitoring, oceanic internal wave studies.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	FTP.
Why do you want products delivered in this way?	It seems to be the most straightforward method.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	A quicklook SAR image and a low-resolution Doppler map should be sufficient.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	There should be an online data ordering system and catalog like it has been done for other SARs.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Tools for reading the data can be nice if the file format is complicated.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not sure
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	High spatial resolution, good spatial coverage, good accuracy of current products.
Any other aspect where GlobCurrent could assist you for this application?	Nothing I see at this time

9.8.45. CUT

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Validation and other activities (as discussed previously) for Arctic and Antarctic regions
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Ftp as long as the data volume is reasonable.
Why do you want products delivered in this way?	Simple, possible to automate and has worked well for satellite data.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Quick looks on webpage could be one option.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web based tool which show metadata and geographical and temporal coverage useful for browsing. Ftp archive good for automated downloading.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Web based tool for data browsing (see question 4.3.5) Webpage with data manual, news and status updates, FAQ, contact info etc. Workshop for exchange of information and results.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	As detailed as possible. As a minimum, info about input data, including geographical and temporal coverage, processing and output format.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	The most important aspect is issues that might reduce the accuracy or availability for Arctic and Antarctic waters.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.46. NERSC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	1- Removal of seasonal sampling biases for computing the MDT close to the sea ice edge. 2- Assimilation of Doppler SAR surface currents.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	FTP. (or OpeNDAP)
Why do you want products delivered in this way?	Simplicity.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	A web-map viewing service would be great.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Use the names as used in the scientific community (MDT, SLA, SAR scenes …)

Activity Requirements	Response
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Workshop Presentations.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Error estimates
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Scientific validity.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.47. ERI

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	One possible activity could be a surface current forecast system: a few days ahead for most regions, a couple of weeks in equatorial regions. (just a suggestion!)
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web plots may be sufficient.
Why do you want products delivered in this way?	For quick viewing in times of crisis (e.g. hurricanes).
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Images, like Google earth.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web page.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Not specified
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Not specified
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.48. LEGOS

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Data dissemination, Lagrangian statistics.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	ftp
Why do you want products delivered in this way?	This protocol is easily scriptable.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	We use our own visualization tools. However free, multi-platform and simple software are always useful for the community.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web and (light) mailing (on subscription) for the important events (eg, new data type availability).
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	A help desk would be useful.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Data reliability.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.49. BMT

Activity Requirements	Response
Please describe the Activity that you would like to use to	Ocean current hindcast and forecast (up to 5 days) modelling

Activity Requirements	Response
work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	ftp
Why do you want products delivered in this way?	Easy to use and fast
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web pages or tables, and interface to extract only relevant date e.g. by location or time period would be beneficial
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Internet based with an interface
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line examples and a support forum
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Data product and data discovery metadata
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.50. MAERSK

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	GlobCurrent could help MAERSK in: 1. Ship routing and optimisation using GlobCurrent satellite products 2. QC of the MARESK ship routing database using GlobCurrent satellite data 3. Validation of GlobCurrent products using MAERSK ship-routing data. Most interest to use data for evaluation of data from the vessel for route management
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Email/web depends on the volume of data sets. We have some data via special email.
Why do you want products delivered in this way?	We work this way
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Not specified
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not specified
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Not specified
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Not specified
Any other aspect where GlobCurrent could assist you for this application?	Need for error estimates: bias and SD

9.8.51. NIVA

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	NIVA projects that could benefit from GlobCurrent data: • Ocean Acidification (pH, ppCO2) in the important Barents Sea (transect Tromsø-Svalbard) where we would like to have background information about water movement in the surface (about 4 m depth) will help to analyse the variation in the data. • Modelling of water discharge (nutrients s, carbon) into the coastal areas and transport along the coast. • Modelling of spreading of diseases (virus, particles) a long the coast.
How would you like products to be delivered for this	ftp is best for making the download automatic, but web or Opendap will also

Activity Requirements	Response
activity? (e.g., web, ftp, Opendap)	work
Why do you want products delivered in this way?	Easy to use
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	We usually do our own visualization
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Be informed by newsletters.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Email support
What metadata requirements do you have? (i.e. data product and data discovery metadata)	All metadata is appreciated
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy is the far most important aspect
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.52. PDE

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Validation/assimilation into model. Eventually oil spill tracking
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	I can read all of them, I want a good product... I can read all the mentioned systems
Why do you want products delivered in this way?	Not specified
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not specified
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Good documentation, users forum, contact point, mailing list for communicate news and problems.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	All what I need to use the data (units, location, t ime resolution, accuracy if possible)
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.53. DOMMRS

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	**(2012)** Through our project ASIMUTH we hope to use remote sensing amongst other data sources to predict Harmful Algal Blooms. However, we are fish farmers primarily so are real end users of the products developed and do not understand the "ins and outs" of how this is achieved. **(2014)** Near Real Time data and Lower resolution (40-100km) 1) Forecasting the movement of harmful algal blooms - how quickly will an identified bloom hit a shellfish production area and whats the water exchange rate (how long will the bloom hang around). Depending on the type of HAB there may be impacts on finfish aquaculture also. Higher resolution data needed the closer the bloom gets to the bay 2) Forecasting the movement of pathogens which mainly affect finfish - (particularly temperature related) If a warm front is detected - how long until it hits the bay/area concerned and how long before it's likely to disperse. GlobCurrent data may prove useful here in areas more prone to clouds i.e.IRELAND! which may hamper the ability to use ocean colour data in producing such forecasts.

	Long-term (decadal) and more recent (previous months) datasets
	High resolution (<5km)
	3) Different species have different needs for flow regimes e.g. bivalves need a certain amount of flow (bringing phytoplankton) and finish require particular water regimes. Therefore to identify new sites, farmers need to know the water exchange rate - tidal and total current.
	Mesoscale resolution (5-40km)
	4) Identifying where shellfish larvae (such as mussels) go and where the seed will settle
	Lower resolution (40-100km)
	5) Create a climatology on the direction and movement of prominent water currents for establishing new farms - identify no go areas due to potential for structural damage to cages, anchors, lines etc.
	If you aim for the actual fish-farmers to be your final end user - in general they won't care about the methods you use to give them the data - they will just ask for your percentage accuracy ~80% is acceptable.
	- they would like apps for forecasting and EASY TO USE (minimum jargon) desktop web service for the more longterm datasets.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Simple
Why do you want products delivered in this way?	Not specified
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Phone interfaces then web. Perhaps: • An on-line mapping tool so that farmers can zoom in to their area • An ability to query data by parameter and time period as defined by the farmer
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Not specified
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools
What metadata requirements do you have? (i.e. data product and data discovery metadata)	N/A for fish farmers
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Firstly, timeliness then accuracy (we do understand that it may not always be right)
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.54. CLIVAR

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Use surface current and sea surface temperature and salinity to study the role of horizontal advection on these variability's. Assimilate the surface current product into GCMs at the correct depth level. I am studying the circulation in the southeast Indian Ocean and in the Antarctic Circumpolar Current. I have shipboard and profiling float measurements of velocity through the water column. These data provide a snapshot of the current at certain points. I need a surface current field to show how my points of data fit into the spatial field at the surface, and how the velocity field is changing in time before and after my observations.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	LAS, ftp, OpenDAP
Why do you want products delivered in this way?	Convenience - used to these methods
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web (e.g., LAS).
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web (e.g., by Google search of "surface current")
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools and contact point.

Activity Requirements	Response
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Specification of unit, grid, depth, time.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy and uncertainty estimate.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.55. RES

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We would use GlobCurrent data to validate the Metocean data provided by third-party consultants. The specific project & location on which this activity will be done depends on when the data become available.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Opendap server + an online web form that allows to launch an opendap request without coding.
Why do you want products delivered in this way?	This would be efficient, and would not require additional training.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web based climate tables & roses as a specific location
	Spatial map of e.g. average current across region of interest
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	By specifying a bounding box, either with coordinates or via a GIS interface
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	• Web-based Frequently Asked Questions page • Online user forum • Demonstration products • User workshops
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Information about data coverage within the bounding box before data download
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy and resolution of the data
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.56. IRCG

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Information feed for SARMAPPING, Pollution & IMP (Integrated Maritime Picture)
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web
Why do you want products delivered in this way?	Live information needed
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Feed
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Contact point/email
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Not specified
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	24/7 information – as accurate as possible
Any other aspect where GlobCurrent could assist you for this application?	Not Specified

9.8.57. FSU

Activity Requirements	Response

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Transport in the Nordic Seas, Oil slick transport
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	FTP or Opendap are preference
Why do you want products delivered in this way?	Ease of access.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Any clearly defined file & directory structure should work provide good naming convention and appropriate documentation.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web and search of directories
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	We find on-line visualization very useful. A point of contact is extremely valuable. Occasional workshops would help, but are less important to us than the other to support activities.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Compliancy with current guidelines should meet our needs, provided that averaging and resolution (not grid spacing) information is available either in the metadata or in documentation. Explanation of QA flags is essential.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Fine temporal resolution

9.8.58. CRMC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	I would download a series of jpeg for a particular time period (e.g. every 10 days I would download a composite figure for mean current strength/direction for a period off 3 months). Then I would join these jpegs together in GIS to create an animation to visualise the surface currents for that area and see how it could drive the accumulation of marine litter in particular areas/hotspots. It would be nice if the associated data for each jpeg could also be extracted easily for analysis.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web
Why do you want products delivered in this way?	Easier for a non IT technical person to access
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web visualisations, but with ability to extract underlying data
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Via an easy to use web application
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	On-line tools. The system needs to be fairly self explanatory in order to ensure wide usage.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Discovery metadata level (the more the merrier)
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy, or at least a documented level of accuracy.
Any other aspect where GlobCurrent could assist you for this application?	Not Specified

9.8.59. MHI

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	**Product Requirements referring to our suggestion** **Coverage:** Global and (or) local (Black Sea) **Spatial resolution,** This item relates to capability of GPS receiver to produce locations with minimum spatial uncertainty. In other words, the location should be determined with error as small as possible. Second thing here is that GPS should produce locations with necessary

repetition period independently of weather conditions, when buoy could have long duration been submerged. Evaluation in 2008-2012 of the last prototypes of SVP (SVP-B) drifters shown that GPS locations of a buoy's position has the accuracy of 50 m. Continuity of GPS locations is 86% under very rough weather conditions of South Ocean and close to 97% as a whole, while drifter keeps its drogue attached.

Temporal resolution.

This item relates to capability of satellite telemetry to deliver locations and samples to a user without loss in data independently of weather conditions, when because of submergence a buoy loses contacts with satellites. Evaluation in 2008-2012 of the last prototypes of SVP (SVP-B) drifters shown that continuity of data delivered via Iridium to a user, is 99% under any weather conditions. This result shows that for last prototype of drifters the capability of Iridium telemetry is slightly higher in contrast with capability of GPS to get locations. In other words, Iridium telemetry can transfer data under such weather condition, when GPS receiver cannot produce locations. But nevertheless, the tandem Iridium – GPS allows reaching for SVP (SVP-B) drifters high spatial-temporal resolution to study variability of surface currents since mesoscale. Current repetition period is one hour, but Iridium allows increasing of temporal resolution, when 30-min or 15-min period is used.

Timeliness of data and locations.

This item means that delay between sample (location) and delivery to a user has to be as small as possible. May be for the GlobCurrent project this requirement is not important, but for operational marine meteorology it is vitally necessary. Evaluation in 2008-2012 of the last prototypes of Iridium SVP (SVP-B) drifters shown that delay between sample (location) and time to be delivered to a user is 10 minutes maximum. Mean delay is on 3-4 minutes.

Synchronization of samples and locations in global drifter network.

This item means that all the drifters have to produce samples and locations simultaneously and connected with round hours.

Last prototypes of drifters have the inserted RTC (Real Time Clock) with GPS synchronization. This feature allows producing of samples and locations simultaneously, having GPS time accuracy to be connected with round hours. Main here is that there is not necessity now to approximate the data of tracks to be connected on the same temporal scale.

Air pressure measurements.

Last prototypes of buoys produce reliable air pressure data under any weather conditions. First of all this feature is important for marine meteorology. But we guess this capability could be useful for GlobCurrent project, e.g. to determine the input of barogradient component on the current field.

Duration of the drogue to be attached.

Some efforts were carried out to keep the Holey-Sock attached as long as possible. This study could be important for GlobCurrent project because the buoy with drogue is real tracker for study of near-surface currents. The experimental buoys updated under this issue are now in operation and we monitor them to see how all work.

Lifetime of drifters.

Evaluation in 2008-2012 of the last prototypes of SVP (SVP-B) drifters shown that drifters with hourly samples and locations can have more of 3 years lifetime under rough weather conditions. Duration of drogue e to be attached was on the level of 300-500 days

Kinds of activity, we would like to use to work with GlobCurrent.
1. Development and manufacturing of drifters with technical parameters to be in compliance with the GlobCurrent needs.
2. Shipment of drifters in any points of the Earth to build the drifter

	networks with inter-comparison goals.
	3. Comparison of current's parameters, taken by drifters, with same data from remote sensing. Carrying out of comparative analysis of data from drifters and satellite product.
	4. Comparison of wave's parameters, estimated by experimental buoys with corresponding data from Meteo-France wave model.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	To delivery data from drifters to MHI (Marlin-Yug) the Argos web could be prefect for Argos equipped buoys and e-mails for Iridium equipped buoys. Satellite product could be delivered via ftp or web.
Why do you want products delivered in this way?	Use of Argos web and e-mails for Iridium are main methods now, we use in our practice. There is full set of software to process data received with this way.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	The data after processing can be visualized with any way under request of the project manager.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	To discover GlobCurrent data any variants are possible: web portal or ftp site.
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Assistance to provide Meteo-France wave model data could be useful for our activity.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	We will supple the project with the metadata about drifters in the format, used by DBCP and NOAA to build and support database on global drifter network. The format of metadata is provided in the Template
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	The most important aspects of this application for GlobCurrent are listed in the first part of the table.
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.60. HGZ

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Studies to assess potential inclusion of data in an assimilation/validation system for the North Sea/Baltic Sea / German Bight. Comparison with existing sensors (ADCP, HF radar)
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	ftp, opendap
Why do you want products delivered in this way?	Easy access with existing analysis software
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	gif files with current vector maps are sufficient for starters
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web tool and simple naming conventions for files
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Online search tool would be nice
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Accurate geocoding, information on spatial and temporal averaging procedures applied.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy, high spatial and adequate temporal resolution, 2D information, clear connection with other current observations (e.g. what is the thickness of the surface layer that is sensed by the instrument)
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.61. UoK

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	My group develops approaches to monitor coastal areas, especially shallow waters. One major issue is the water column correction to derive types of bottom substrate (sediment, rock, vegetation types) in shallow waters. To do this, we derive water quality parameters (yellow substances, chlorophyll, DOM) and calculate bathymetry. A second issue is the atmospheric correction over shallow water areas to enable water column correction.
	For the future I plan to couple remote sensing data with submerged

Activity Requirements	Response
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	vegetation growth models.
	web, ftp, Opendap
Why do you want products delivered in this way?	Fast delivery, easy access
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web portal
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Data product metadata
What metadata requirements do you have? (i.e. data product and data discovery metadata)	On-line tools, workshops would be useful to discuss research activities
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy, easy to use, formats as well
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.62. MAIN

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	We want to optimise the locations of Offshore Wind Farms, taking into account Current characteristics.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web
Why do you want products delivered in this way?	Integrates into ISIS
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Web
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Workshop initially to define protocols and standards to be delivered via web.
What metadata requirements do you have? (i.e. data product and data discovery metadata)	MEDIN approach
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Align all commercial stakeholders to an agreed standard

9.8.63. NOC

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Use with air-sea interaction datasets
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	Web or ftp would be fine.
Why do you want products delivered in this way?	Want access to data.
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Not sure.
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	Via a webpage
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Documentation, FAQs and contact details
What metadata requirements do you have? (i.e. data product and data discovery metadata)	All information related to uncertainty of product
What is the most important aspect of this application for	Accuracy and long time period

Activity Requirements	Response
GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.8.64. FIO

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Data in the coastal area and ocean environment will be used in studies of the movement of sea-water and its relation to the global change.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	ftp
Why do you want products delivered in this way?	Easy to get
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Web
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	By website
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Workshop
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Data product metadata
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Accuracy
Any other aspect where GlobCurrent could assist you for this application?	Global data of ocean current extremely useful for scientific study and applications.

9.8.65. AZTI

Activity Requirements	Response
Please describe the Activity that you would like to use to work with GlobCurrent? (general 2-3 sentence overview – we will use this information to consider developing a dedicated module to address your needs)	Provide NRT OSC and lagrangian transport using a lagrangian web based utility for the BoB and specially the SE Bay. The application fields are Regional and local Sea Monitoring and Forecasting Center, GMES Intermediate user services, Offshore wind and wave energy, Maritime pollution, Aquaculture and fisheries, and Research activities on the mesoscale processes and ocean-atmosphere Interactions In BoB.
How would you like products to be delivered for this activity? (e.g., web, ftp, Opendap)	THREDDS (OPENDAP, WMS, NCSS, HTIP) + FTP.
Why do you want products delivered in this way?	The web services cited above optimize the access to data produced by third parties. We do not need to store flies In our computers (OPENDAP/WMS) to use those data. We can remotely access to subsetted datasets (ncss) If needed we can download files (HTIP & FTP)
How would you like products to be visualised for this activity? (e.g., web, tables, phone interfaces)	Mainly through user interactive Web Portals and/or Services allowing different type of visuallsatlons (Tables, maps, graphs)
How would you like to discover GlobCurrent data for this activity? (i.e. how do I find the data?)	THREDDS/Geonetwork Catalog or something like LAS Server or DAPPER
What help and support activities do you need? (e.g., on-line tools, contact point, workshop?)	Not specified
What metadata requirements do you have? (i.e. data product and data discovery metadata)	Metadata compliant with standards (CF and ISO). CSW Service would be welcome to connect with CSW browsing applications.
What is the most important aspect of this application for GlobCurrent to work on? (e.g. timeliness, accuracy, formats etc.)	Timeliness, accuracy, formats
Any other aspect where GlobCurrent could assist you for this application?	Not specified

9.9. Validation data

ID	Please list any validation data and/or your interest in GlobCurrent validation activities that you could make available to validate GlobCurrent products.
UKMO	We can provide FOAM model fields (velocities, surface height etc.) for validation/inter-comparison purposes
DMI	DMI NWP/NOP Model data
NCEP	Real-time global 3D ocean numerical 6-day forecasts. Real-time coastal ocean forecasts for selected regions along US coast.
ECMWF	Surface current data from a model are already used in the operational limited area model. Extension to the global model configurations is being studied. However, there are still questions on the actual quality of those ocean surface current fields. If instead of model data, we were to use surface current fields reconstructed from GlobCurrent data, then the quality of GlobCurrent data could be assessed by its impact on wave hind-casts.
SMHI	Not specified
MF	Not specified
KNMI	Within the EUMETSAT OSI SAF and NWP SAF, we developed standard and routine procedures for moored buoy and ECMWF model wind comparisons, such as triple collocation. These techniques would demonstrate a successful representation of the scatterometer winds in an absolute reference frame.
IMRCC	Drifters data
USCG	The US Coast Guard deploys CODE/Davis style surface drifters in response to SAR cases. These data are made available in real-time.
AOML	Not specified
NODC	In-situ measurements from extensive NODC holdings including US coastal HF RADAR network data.
INCOIS	Due to restrictions from the Indian Navy on sharing the data, we may not be able to provide observed data in the Indian EEZ to any foreign collaborators. However, we can provide the validation reports based these data sets on a standardized format.
BSH	ADCP data from BSH Marnet (http://www. bsh.de/ de/Meeresdaten/ Beobachtungen/MARNETMessnetz/MARNET.jsp)
EMSA	Not specified
IFREMER	HF radar data off the French West coast (e.g. Ardhuin et al. JPO 2009) and wave model output and validation once driven by the GlobCurrent fields.
JPL	Not specified
JCOMM	Real-time global 3D ocean numerical 6-day forecasts. Real-time coastal ocean forecasts.
OA	Client data subject to client approval
MG	Not specified
EN	**On board we record data log (time, position, boat speed, and heading, course on the ground and speed on the ground). I think it could be a good to share the logs.**
PFCAL	It's hard to say, but indirectly, with the agreement of our sailors, we could recover the data collected by their central navigation during races. Subject to acceptance and reliability.
ADRENA	None specified
CMA	Data from 400+ ships operating globally. Providing: 5 days Forecasted surface current amplitude and course compared to actual measure on board (in Aguhlas current area for instance). Same for 1 day Tidal forecasted current (in Gibraltar Strait for instance)
CLS	ADCP and drifting buoy data
SO	We do not have validation data that we can share
MERC	Model products. Our models simulate ocean currents that could be used by GlobCurrent as validation data. We are ready to consider any request from GlobCurrent WRT our products
MSS	Historic current meter data and other hydrographic data (T, S,, chlorophyll, drifter tracks)). Similar datasets could be collected in t he future to complement any future GlobCurrent product.
BC	Unfortunately we do not have own validation data. We can link with our customer(s), mainly BSH, but probably they submitted a questionnaire themselves and offered their data.

ID	Please list any validation data and/or your interest in GlobCurrent validation activities that you could make available to validate GlobCurrent products.
TOT	Total is part of the $IMORC service originally partly funded by the European Commission and partly funded by BP, Shell and Total. All partners' measured metocean metadata are available for information. If specific datasets are considered of use, GlobCurrent can apply and ask for access to the measurements themselves. The data owner will decide on whether to provide full access and the conditions of their use. Total is ready to provide the data for validation purposes within this specific GlobCurrent project activities for the next two years. Please see http://www.simorc.org
NOV	NOVELTIS is interested in contributing to validation activities: 1/ selection of corrections according to the zone (e.g. tide correction) 2/ Selection of in situ data for validation 3/ Application of an evaluation protocol for comparing Globcurent products with in situ current measurements data (moorings, ship transects).
EMEC	ADCP measurements X-band radar measurements
TCE	Potentially we have modelled tidal data for parts of UK waters and ADCP observation from our tidal leases. Release of this data would require further discussion with our tenants.
HRW	We would provide validation plots and statistics such as produced when comparing different data sources for consultancy projects.
SATOC	None specified
UoN	To some extent this will depend on what data is used in the GlobCurrent products. However, I have experience in developing heuristic estimates of current errors and I would interested in applying these methods to the GlobCurrent current products and using them to validate any GlobCurrent uncertainty products.
CSIR	I would be interested in validation activities and might gain access to locally available current meter and ADCP data.
UoC	We have access to current measurements from two buoys located along the Cantabrian coast (operating since 2009).
PML	Drifters, gliders, moorings.
CNR (Pisa)	Comparison of satellite-derived currents with in situ measurements and model reanalysis in selected areas of investigation
ICIT	We and our collaborators are actively involved in measurement and modelling of currents and other environmental variables, mainly in the Pentland Firth and Orkney Waters area. We would be pleased to supply historical data and delighted to help construct a specific validation activity.
PO	We work a lot with surface drifters and most of those data are available for non-commercial use.
UHI	We and our collaborators are actively involved in measurement and modelling of currents and other environmental variables, mainly in the Pentland Firth and Orkney Waters area. We would be pleased to supply historical data and delighted to help construct a specific validation activity.
CEDRE	Oil spill drift / buoys drift.
UoM	We could probably provide HF radar and /or nautical radar data for some test areas and put buoys into the water.
CUT	It would be important with validation data from Arctic and Antarctic waters. Currently we do not have access to such data.
NERSC	Note the IMR has a new buoy replacing Station M
ERI	OSCAR is routinely validated against the global drifting buoy array, as well as with the TAO/Triton, Pirata, and Indian mooring arrays. OSCAR can be seen as a reference for any future products (I envision a 2-way comparison). Any alternate validation/calibration methods will be welcome – especially for a coastal and high latitude emphasis.
LEGOS	We presently use ship-born ADCP data, moored current meter records, and 2D surface tracer data to validate our CTOH satellite surface current products– this could also be used to validate future GlobCurrent products.
BMT	Comparisons with measured data
MEARSK	MAERSK have a ship reporting system where the fleet reports every 4 hours (speed, Met, position etc). These data are stored in a database in NRT and are used by the ship routing team to provide information on surface currents. Access will need to be discussed.
NIVA	NIVA has a network off Ferrybox systems and if these data can be of any use (e.g. salinity, , temperature) we are happy to provide such data. NIVA h as provided such data to ENVISAT MERIS, AATSR and SMOS.
PDE	We have a network of buoy with current meters. Also some HF radars. All the info at www.puertos.es.
DOMMRS	Not specified
CLIVAR	Not specified
RES	We do not own most of the data we have access to, therefore we would not be able to make them available to the project. However, we will be able to carry out our own comparison and to give feedbacks on our use of the data.

ID	Please list any validation data and/or your interest in GlobCurrent validation activities that you could make available to validate GlobCurrent products.
IRCG	IRCG have a close working relationship with Met Eireann and CMRC Cork, could be work group partners
FSU	1) Consistency with differences between scatterometer and in situ winds 2) Consistency with oil drift motion
CRMC	We have tracks from turtles and sharks. These are not exactly validation data, but it would be interesting to see how the current fields relate to these recorded movements
MHI-NASU	Our suggestion includes the following items to be used as validation data: • Parameter of a buoy's track via hourly GPS locations. If it needs we can do necessary processing to determine the velocity and direction of a current on basis of hourly locations. • If shorter repetition period for GPS locations is used, e.g. 30-min or 15-min, these data can be processed also under the Globcurrent goals. • We have the tool to interpolate data from GPS receiver. It might be similar of the CLS Argos tool, but uses another mathematics. Our tool could be used to keep continuity of hourly GPS locations if holes in data take place because of bad weather conditions. • If SVP-B type of drifters is used for validation, the air pressure data can be supplied to increase quality of the GlobCurrent product. The importance of this parameter is that it cannot be currently monitored with remote sensing methods. • In spite of the experimental entity of wave parameters, which could be estimated by means of experimental drifters, these data could be used for validation of scatterometer satellites.
HZG	• Not specified
UoK	• Water quality parameters of field campaigns
MAIN	• Not specified
NOC	• No current data available. • Improvement in agreement between in situ and satellite wind speeds/stress would provide indirect validation.
FIO	• Current Data of Buoys, HF radar in the Chinese Sea
AZTI	• We dispose of a large data set of historical and NRT data that we think will be very useful for the validation/checking of OSC satellite measurements (L3 and L4 products) in a regular/systematic basis and establishment of automatic Quality Control Methodologies. To look for and take advantage of the synergies between in-situ data, namely HF radar, and satellite OSC is one of the main activities we would specially Interested in, within the framework of Globcurrent.

9.10. Existing activities relevant to GlobCurrent

ID	Please list any existing activities that should be taken into account in defining the GlobCurrent project work plan.	How could GlobCurrent avoid duplication and achieve the best synergy with existing services/activities (note GlobCurrent will not duplicate existing activities and services)?
UKMO	UKMO has expertise in: NWP, NOP, Ice Services, Ship routing, maritime pollution services, SAR, Offshore wind and wave renewables, verification of ocean model, data assimilation and coupled forecasts, develop methods to assimilate ocean currents, operational assimilation of ocean currents, possibly using coupled data assimilation	Not Specified.
DMI	We are continuously developing our model systems, and lack validation data in the Arctic. We are continuously developing our model systems in Greenland regions (Local), including iceberg drift and oil spill drift models.	GlobCurrent products will be unique as an observation dataset.
NCEP	The most critical aspect of operational use of any data stream is its robust real-time or near real-time delivery.	Accurate real-time global coverage of oceans would best compliment other existing global ocean surface products (SST, SSH and SSS).

ID	Please list any existing activities that should be taken into account in defining the GlobCurrent project work plan.	How could GlobCurrent avoid duplication and achieve the best synergy with existing services/activities (note GlobCurrent will not duplicate existing activities and services)?
ECMWF	Possible application of GlobCurrent products • Comparison with ocean reanalysis: • Daily data: bias and RMS fit to data (first guess and analysis) • Daily data; assessment and characterization of tropical instability waves, MJO • Monthly data; temporal correlation of ocean reanalysis • Assessment of coupled models. • Definition of indices for Gulf Stream displacement and interannual variability. Seasonal prediction of Gulf Stream position and impact on atmosphere	Knowing that we currently use surface current data from the TOPAZ system and from MERCATOR, it would be good to have both institutes involved in GlobCurrent.
SMHI	None specified.	Not specified
MF	None specified.	Not specified
KNMI	Standard and routine procedures for moored buoy and ECMWF model wind comparisons as employed by EUMETSAT OSI SAF and NWP SAF and developed within the International Ocean Vector Winds Science Team (IOVWST).	Collaborate with the EUMETSAT SAFs and provide the required current fields for cal/val.
IMRCC	None specified.	Not specified
USCG	The EDS developed by Applied Science Associates (ASA) continues to add surface current products for USCG and other agencies. Much of the data cyber - infrastructure already available via the EDS	Coordinate closely with ASA on cyber – infrastructure standard and issues.
AOML	Surface drifter observations and the OSCAR model should not be replicated, as these are existing activities. Efforts to synthesize various measurement techniques will be highly valuable for GlobCurrent to provide.	Maintain liasons with PIs of existing activities (e.g., myself for the GDP, Kathleen Dohan for OSCAR).
NODC	Global Ocean Currents in-situ data project at NODC, as well as the US IOOS coordinated efforts involving the US HF-radar network.	Routine coordination with NODC since we are engaged in various surface current activities, including the US network of HF-radar.
INCOIS	None specified.	Not specified
BSH	MyOcean-2	Participation in MyOcean meetings. Contact to work packages (TACs) dealing with satellite and in-situ data
EMSA	EMSA, as ESA (see work conducted within HMA), is involved in interoperability and standardization work which needs to be taken into consideration in the definition of the interfaces and data/metadata specification.	Avoid duplication with MyOcean (if any).
IFREMER	There is some networking of HF radar operators about the use of frequencies, that networking can be leveraged to contact these people and get their data if they are not already channeled through GOOS.	Not specified
JPL	Not specified	Not specified
JCOMM	The most critical aspect of operational use of any data stream is its robust real-time or near real-time delivery.	Accurate real-time global coverage of oceans would best compliment other existing global ocean surface products (SST, SSH and SSS).
OA	The widespread use of the freely available HYCOM consortium products must be taken into account and potential advantages of GlobCurrent explored.	Not specified
MG	Not specified	Not specified
EN	Not specified	Not specified
PFCAL	Not specified	Not specified
ADRENA	Record around the world Commercial ship routing application	Not specified
CMA	To have a common approach for other similar **weather data Program** if any ? (waves, wind, swell, pressure, temperature, etc …)	Not specified

ID	Please list any existing activities that should be taken into account in defining the GlobCurrent project work plan.	How could GlobCurrent avoid duplication and achieve the best synergy with existing services/activities (note GlobCurrent will not duplicate existing activities and services)?
CLS	Many and MyOcean	Not specified
SO	OSCAR http://www.oscar.noaa.gov	GlobCurrent could develop a global product (heterogeneous, with regional focuses wherever possible) that utilizes as many types of measurements as possible (going beyond the 3 sensor-type approach of OSCAR), providing either total velocity (including tidal motion), or each component depending on request.
MERC	MyOcean and GMES Marine, GODAE OceanView.	The discussions with MyOcean should be engaged since the beginning. The goal would be that the GlobCurrent numerical products are disseminated through the GMES Marine portal, which is currently implemented through the MyOcean 2 project. This would avoid duplicating effort on the service side, and enable devoting complementary efforts on the innovative production side, and also on the user's uptake and support.
MSS	Development of a hydrodynamic model of Scottish shelf waters. Specific modelling activities in the west coast, Pentland Firth/Orkney Waters, Shetland, Firth off Forth/Tay. Potential HF Radar pilot in Fair Isle Channel.	None of the uses described above would be duplicated by GlobCurrent – they would complement each other.
BC	German national KLIWAS Project, subprojects on fronts.	Not specified
TOT	Not specified	Not specified
NOV	1/ We develop Global and Regional tide models (E.g. The COMAPI atlases (North-East Atlantic, and Mediterranean Sea, or FES2012) by assimilating altimetric and tide gauges data in an hydrodynamical model. FES2012 will contain the tide currents. It would be possible to recomputed COMAPI with the tide currents. 2/ We can work directly with the Finite Elements unstructured grid of the models to get the best usage of its intrinsic resolution (instead of using the tidal atlas distributed on a regular grid). 3/ We have a protocol to compare/evaluate tides models from different origins, and select the best one for a particular zone (variance reduction on altimetry and TG time series, comparison of individual harmonic constants with TG or altimetry-derived harmonic constants.)	GlobCurrent should not propose existing products like the DUACS one (global, or regional altimetric currents from altimetry), but should develop NEW products from specific processing with separate instruments (e.g. L3 current maps from altimeter constellation only (coastal altimetry), SAR only, optical sensors only, coastal radar only)… and from the synergy between these sensors.
EMEC	The European Marine Energy Centre (EMEC Ltd.,www.emec.org.uk) is a not-for-profit private company that provides test facilities and services to developers of wave and tidal energy devices. Our services to these developers include data coaction at both our wave test site (by waverider buoys) and our tidal site (by ADCP deployment). We also have a hard-wired ADCP at this site, from which data for comparison may be available (on discussion). The essential interface with the GlobCurrent project pla would be a common driver to gain increasing know ledge an understanding of the surface currents, especially at the tid site.	By ensuring close liaison with the relevant parties
TCE	Not specified	Not specified
HRW	Global circulation models: MyOcean , HYCOM In-situ measurements OSCAR/SURCOUF	I don't think there are any risk of duplications when considering model and in-situ data. GlobCurrent should aim to provide high resolution data sets, giving the total currents rather than the geostrophic and Ekman components only.
SATOC	SOS report "Ocean Currents from Space" 2002: http://www.satoc.eu/projects/reports/docs/OC_WP4_v2.pdf	Check for commercial services and be careful to avoid overlap.

ID	Please list any existing activities that should be taken into account in defining the GlobCurrent project work plan.	How could GlobCurrent avoid duplication and achieve the best synergy with existing services/activities (note GlobCurrent will not duplicate existing activities and services)?
UoN	None specified	None specified
CSIR	• Research on Agulhas Current variability • Research on impact of Agulhas Current on the coastal and shelf regions • Comparisons of altimetry and in-situ observations.	• By organising a workshop gathering users and groups that have been attributed funding through the GlobCurrent project. • By informing all users who have filled this form of the activities conducted by each group • By facilitating meetings between contractors in the GlobCurrent projects and users.
UoC	Some examples could be: • MyOcean project (http://www.myocean.eu.org/) • GlobColour project. • PO.DAAC archive.	Within the PO.Daac archive there is a list of variables that are measured. It is a very complete archive, therefore it could be a good start about what has been done and hasn't.
PML	Data for next FASTNEt cruise in June/July 2013 would be nice but probably impractical. FASTNEt drifters and gliders are operating from now until Oct. 2014.	Communicating a clear list of other surface current products available online.
CNR (Pisa)	OSCAR (http://www.oscar.noaa.gov/); SEOS (http://www.seos-project.eu/modules/oceancurrents/oceancurrents-c00-p01.html);	GlobCurrent should act as portal to all similar services
ICIT	Measurement of currents by fixed and boat mounted ADCP data in the PFOW region (e.g. http://dx.doi.org/10.1175/JTECH-D-11-00223.1) Modelling of dynamics and currents in the PFOW region (e.g. http://dx.doi.org/10.1016/j.csr.2012.08.009 ; Terawatt project http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/J010170/1) Measurement of currents by X-band radar at EMEC tidal site (in PFOW) http://noc.ac.uk/project/flowbec Testing of tidal devices at EMEC tidal site http://www.emec.org.uk/facilities/tidal-test-site/ Commercial development of wave and tidal sites in PFOW region http://www.thecrownestate.co.uk/energy/wave-and-tidal/	Duplication is not a real risk. Maximizing synergy with both other measurement strategies/techniques and with modelling needs to be explored in a planned experiment.
PO	Not specified	Not specified

ID	Please list any existing activities that should be taken into account in defining the GlobCurrent project work plan.	How could GlobCurrent avoid duplication and achieve the best synergy with existing services/activities (note GlobCurrent will not duplicate existing activities and services)?
UHI	**Activities by the Environmental Research Institute, Thurso** • Measurement of currents by fixed and boat mounted ADCP data in the PFOW region (e.g., http://dx.doi.org/10.1175/JTECH-D-11-00223.1) • Modelling of dynamics and currents in the PFOW region (e.g., http://dx.doi.org/10.1016/j.csr.2012.08.009 ; • Two directional wave buoys, three tidal gauges and a weather station in the PFOW region. • Collaboration with MeyGen Ltd tidal stream project in PFOW region (http://www.meygen.com/) **Activities by others** • Measurement of currents by X-band radar at EMEC tidal site (in PFOW) http://noc.ac.uk/project/flowbec • Testing of tidal devices at EMEC tidal site http://www.emec.org.uk/facilities/tidal-test-site/ • Other commercial development of wave and tidal sites in PFOW region http://www.thecrownestate.co.uk/energy-infrastructure/wave-and-tidal/	Duplication is not a real risk. Maximizing synergy with both other measurement strategies/techniques and with modelling needs to be explored in a planned experiment.
CEDRE	Oil spill drift forecast	Not specified
UoM	Not specified	Not applicable (probably more relevant to altimetry than to along-track InSAR).
CUT	We have an on-going project "Measurement of sea surface currents with satellites to benefit Swedish GMES marine core services", but I don't see that this should affect the work plan for GlobCurrent.	Our project is limited to Swedish waters and the focus is on evaluation of two existing methods, maximum cross correlation for AVHRR data and along track interferometry for TanDEM-X data. This project will end in November 2013, which I assume is before GlobCurrent will go into its active phase. The risk for duplication is therefore minimal.
NERSC	No conflicting projects	Nothing specified
ERI	OSCAR	no need to reproduce OSCAR currents - Let's keep working together.
LEGOS	Our service : http://ctoh.legos.obs-mip.fr And of course AVISO DUACS geostrophic current products, MyOcean surface currents and OSCAR surface currents.	GlobCurrent should be aware of all existing activities and services related to surface currents distribution and interact with these services before proposing new products. The products must be totally free of access and clearly documented to track all the data production procedures (input data origin and applied methodology).
BMT	Not specified	Not specified
MEARSK	Not specified	Not specified
NIVA	The above mentioned Ferrybox data if applicable. If GlobCurrent provides surface currents on a regional scale with sufficient spatial resolution so the data can be gridded, this product will be unique. I think that in a few limited areas along thee Norwegian coast land based HF radar measurements provide surface currents on an experimental basis.	Not specified
PDE	HF radars and buoys with current meters. Circulation forecast al basin scale and at High resolution (including the interior of harbours).	Via coordination and collaboration, including data interchange. This questionnaire is a good starting point.
DOMMRS	Not specified	Work with other existing FP7 projects in the same subject area.
CLIVAR	Not specified	Not specified

ID	Please list any existing activities that should be taken into account in defining the GlobCurrent project work plan.	How could GlobCurrent avoid duplication and achieve the best synergy with existing services/activities (note GlobCurrent will not duplicate existing activities and services)?
RES	The PREVIMER project around the French coast HYCOM model data provided by the US Naval Research Laboratory Data provided by the MyOcean project	The GlobCurrent project should deliver a data set that is independent from other model data, to allow the users to carry out independent validation.
IRCG	Not Specified	Discuss current service providers and results
FSU	Inter-comparison of wind forcing used by GlobCurrent with research quality ocean surface wind products. However, the focus should be on the type of winds that are most important for forcing ocean currents. Comparison to OSCAR currents.	Products finer resolution in time currents. Ideally 3 hourly or better, but even daily would be a substantial improvement.
CRMC	Not Specified	Not Specified
MHI-NASU	Results of our participation in the DBCP Argos-3 Pilot Project. In spite of the fact that our Argos-3 experimental drifters, deployed in the Tasman Sea, have demonstrated good results and longest duration to be in operation, one-satellite Argos-3 constellation did not show visible advantages in contrast with Argos-2 and Iridium telemetry especially. Results of our participation in the DBCP Iridium Pilot Project. The Iridium SVP-B/RTC/GPS drifters have demonstrated perfect results in operation under any weather conditions. This prototype of drifters can be recommended for GlobCurrent as a perfect tool for validation goals. Decision of the problem to get reliable air pressure samples under any weather conditions for longer of 3 years. This feature could be useful for GlobCurrent. WMO-IOC Data Buoy Cooperation Panel, DBCP Technical Document No. 45: ftp://ftp.wmo.int/Documents/PublicWeb/amp/mmop/documents/dbcp/Dbcp45-Workshop-2012/presentations/DBCP-28-Wrk-11-Motyzev-Effectiveness-Article.pdf Practical interest for the GlobCurrent could be the results of use in the Black Sea of Iridium drifters with 30-min repetition period for GPS locations. If due to some reasons the GlobCurrent would prefer to use Argos-2 drifters the good enough results could be also reached.	We guess that to avoid duplications, our drifters could be deployed to carry out the particularized experiments with validation goals in different areas of the Ocean, including the Black Sea.
HZG	COSYNA observing system in the German Bight	Not specified
UoK	Not specified	If data are distributed web-based, users might be informed about existing products (via web-links to existing data bases)
MAIN	Align with ISIS (http://www.isispilot.com)	Form strong collaborative network representing public, private and academic organisations
NOC	Not specified	Not specified
FIO	Not specified	Not specified
AZTI	See Previous introduction sections	See Previous introduction sections

9.11. User feedback preferences

ID	Please describe how you would prefer GlobCurrent to provide feedback on the project, its products, evolution and activities to you	Please describe how you would prefer to provide your feedback to GlobCurrent.

ID	Please describe how you would prefer GlobCurrent to provide feedback on the project, its products, evolution and activities to you	Please describe how you would prefer to provide your feedback to GlobCurrent.
UKMO	None Specified	None Specified
DMI	Email and via a website	Email
NCEP	Web-based and/or e-mail correspondence on timely updates and news. Monthly/quarterly reports on all related activities. Annual scientific meetings.	E-mail for daily/weekly communications on data related issues. Annual meetings for impact of GlobCurrent products.
ECMWF	Being a recipient of specific newsletters and part of an email list to be used when significant news will be posted on the web portal. Telephone contact	To be invited to submit news items for the newsletters and the web portal. No formal reporting.
SMHI	A website with the latest project news and links to more in depth information	User form at the website
MF	None Specified	None Specified
KNMI	Email correspondence is fine, but it would be better when the product development is listed on a web site. Service messages and a service desk should exist for any NRT service. Product should have listed strengths and weaknesses and one could indicate how these weaknesses would/could be tackled and with what priority.	Analysis document/presentation.
IMRCC	via e-mail	Through dedicated web application or e-mail.
USCG	Email and phone conference calls.	Email and phone conference calls.
AOML	Feedback should be provided on the web portal. Product-specific feedback should be added to the relevant pages for those projects as it becomes available.	E-mail, and perhaps a workshop if extensive interaction is warranted.
NODC	An RSS feed we could subscribe to would nice. A Facebook page about the project would be interesting. We could all then post updates to it.	Facebook also usual email would work well.
INCOIS	We can preferably provide the feedback in the form of a detailed validation report.	A user workshop towards the end of the project will also be highly useful.
BSH	GlobCurrent should provide documents on products, product quality, evaluation and planned activities. Access to the internal project web pages or wiki would be nice, also the possibility to participate in GlobCurrent project meetings.	Due to operational obligations and strong involvement in other projects, the feedback to GlobCurrent will be limited. Feedback could be a short report on the use of GlobCurrent products by BSH including results of our validation activities.
EMSA	None Specified	None Specified
IFREMER	email	email
JPL	Not specified	Not specified
JCOMM	Web-based and/or e-mail correspondence on timely updates and news. Monthly/quarterly reports on all related activities. Annual scientific meetings.	E-mail for daily/weekly communications on data related issues. Annual meetings for impact of GlobCurrent products.
OA		
MG	Email &website	**Forms and user meeting**
EN	Email	Email
PFCAL	No special request if it is documents in French, if possible.	email
ADRENA	Not specified	Not specified
CMA	A website to inform about the latest improvements and products which are available, with indication of some deadlines	To write my requirements on an E-mail address to this website
CLS	e-mail updates and seminars	e-mail questionnaire
SO	Email, meeting depending on location	Email, meeting depending on location

ID	Please describe how you would prefer GlobCurrent to provide feedback on the project, its products, evolution and activities to you	Please describe how you would prefer to provide your feedback to GlobCurrent.
MERC	A newsletter disseminated through email and accessible on the web, could give information about the development of the project. A web-site should be setup and should be updated to reflect the actual progress of the project. Workshop should be organized (annual + final) to inform the community about the advances, problems encountered, and so on.	Communications in conferences and workshops
MSS	By email preferably but we are quite flexible.	By email or online questionnaire.
BC	Yearly workshops are best. A Website that is updated regularly should complement this (e.g. reporting on project progress and results, e.g. from validation activities)	Discussions during WS Working with test data in phases of the project, when not everything is already set in stone.
TOT	Provision of a progress report every 3 or 6 months would be good. Maybe a meeting every 6 months or once a year to present the progress made as well	E-mails contact with the project team could help too. If there are enough participants, maybe a forum on a dedicated website?
NOV	Web portal, downloadable reports.	By direct involvement in the project.
EMEC	By regular email update	Electronically, either as input to website, or by email.
TCE	Emails and electronic information	Not specified
HRW	Emails are the most likely to be read, if they are not too frequent. There could be two types of newsletters, one for 'necessary' information sent via email (e.g. changes to service delivery), and the other available online (e.g. describing data uses).	User meetings are a good way of providing feedbacks because they are interactive, although are associated to travel cost and take up at least a couple of days. There could be made less frequent, but complemented by teleconferences between the GlobCurrent project leader and users (i.e. one telecon per company/research group). Teleconferences would allow the consortium to engage with and support more users, even those that cannot afford to go to the user meetings (e.g. small consultancies).
SATOC	Email newsletter	Email
UoN	Email alerts; web site with RSS feed.	Email, and web surveys.
CSIR	Through a monthly newsletter sent by email Through a yearly report of activities and milestones	Via email. Possibly through user feedback forms sent at regular interval throughout the year (once or twice a year).
UoC	Based on past experiences, the best way to provide feedback would be using both by sending informative emails about the status of the projects or related news, as well as via its own web page, within a "News" board. Another aspect that would be of interest would be to have specific sessions in "theme-related" workshops.	Same as to left column
PML	Newsletter.	E-mail issues, questionnaire.
CNR (Pisa)	Mailing list or blog	Mailing list or through blog
ICIT	Private e-mail Web summary and web blog. Workshop of user community	Private e-mail Web summary and web blog. Workshop of user community
PO	Electronic forms via Webpage.	Electronic forms via Webpage.
UHI	Private e-mail Web summary and web blog. Workshop of user community	Private e-mail Web summary and web blog. Workshop of user community
CEDRE	By email	By email
UoM	Organize user workshops.	Organize user workshops
CUT	Web based tool for data browsing Webpage with data manual, news and status updates, FAQ, contact info etc. Workshop for exchange of information and results.	Questionnaire with a few open questions.
NERSC	Not specified	A questionnaire.

ID	Please describe how you would prefer GlobCurrent to provide feedback on the project, its products, evolution and activities to you	Please describe how you would prefer to provide your feedback to GlobCurrent.
ERI	Active collaboration: emails, conference calls, etc.	Active collaboration: emails, conference calls, etc.
LEGOS	Web and, for important news, mailing list (with self un/subscription).	Mail
BMT	Email a newsletter	Questionnaire via email
MEARSK	Use email	Could be developed: email preferred
NIVA	An interactive web page with "news" and a possibility to post comments from registered users.	Not specified
PDE	Glob Current to understand what I do and react (e.g. by mail) when something of interest related to my work occur.	Contact paint and mail.
DOMMRS	Webpage	Interview
CLIVAR	Not specified	Not specified
RES	Web based news (included selected items from the users forum) that would be emailed on a regular basis with a frequency defined by the user.	Presentation at user workshops. It would be good for users to have the opportunity to comment on the demonstration products during these workshops.
IRCG	Email/short questionnaire	Email/short questionnaire
FSU	On line reports and emails, followed by a user working group meeting.	Written report and speaking directly to an expert on product. This expert could be the same contact that users interact with.
CRMC	Via an on-line dedicated web-site. Occasional targeted E-mail shots	Telephone contact after testing on-line developed tools
MHI-NASU	Provided via web portal is acceptable for us	Any method to provide the feedback from our side are acceptable for us.
HZG	Documents, website with illustrative case studies and workshops	Presentations at workshops
UoK	Workshops, questionnaire	Workshop
MAIN	Via web and workshop	Via web and workshop
NOC	Via email or website	Via email or website
FIO	By submitting the relative reports or papers	By Email or the workshop
AZTI	WEB/ WIKI, organization of workshops, training courses and seminaries	WIKI, Document web platform (e.g. NUXEO)

9.12. Other information relevant to GlobCurrent

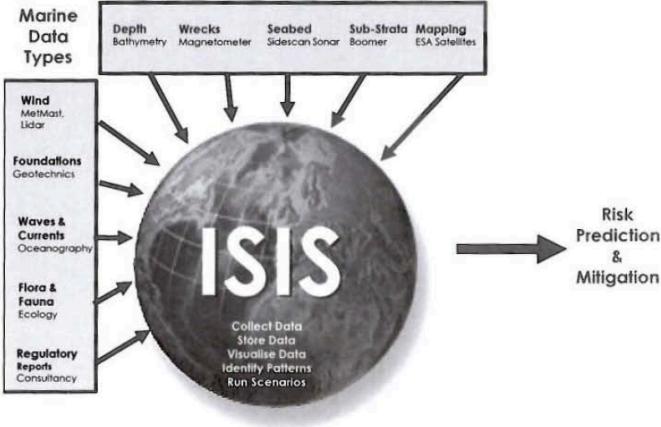| ID	Please describe any other requirements or aspects that you would like GlobCurrent to consider or you feel GlobCurrent must take into account.
UKMO	None specified
DMI	None specified
NCEP	None specified
ECMWF	Please do not award the management of the project to an institution that has no real interest in the science that will be developed in the project.
SMHI	None specified
MF	None specified
KNMI	None specified
IMRCC	None specified
USCG	If your data is not or cannot be assimilated into models, then your data should be used to estimate the accuracy of the surface currents generated by models. This may require first establishing the accuracy of the ESA data. Ultimately, end users are going to get numerical model products and not data sources, so making those data sources available for assimilation into numerical models is the best pathway for operational end users, such as SAR controllers.
AOML	None specified
NODC	None specified

INCOIS	None specified
BSH	None specified
EMSA	None specified
IFREMER	None specified
JPL	None specified
JCOMM	None specified
OA	None specified
MG	None specified
EN	None specified
PFCAL	We have no technical advice. At our level, we are more users of finished products and not research. As mentioned above reliable data is an important point for us.
ADRENA	None specified
CMA	When first data are available, please may you plan a similar seminar like Brest with operational users for some improvements requirements: it would be perfect!
CLS	None specified
SO	Many of the sectors listed (user community including SAT-OCEAN customers) have their activities close to the coasts. It is a challenge but also a requirement to extend the global surface current product as much as possible toward the coastline. In particular, one objective of the GlobCurrent project should concern tides: since in many coastal regions tidal motion is dominant or non-negligible, accurate tidal currents (or components) must be estimated (if time resolution is to be a fraction of a day).
MERC	GlobCurrent should explicitly take into account existing initiatives (including MyOcean, GODAE OceanView) in order to avoid duplication of efforts, and in order to concentrate the resources on what is really needed.
MSS	As mentioned above, any data that would complement our modelling project and/or thee HF Radar pilot initiative would be very welcome.
BC	Not specified
TOT	Not specified
NOV	NOVELTIS is partner of the FP7 'Citclops' project started October 2012: 'Citizens' Observatory for Coast and Ocean Optical Monitoring' . Citclops will develop a platform permitting giving access to information from various origins: 'crowdsourced' information, e.g. pictures of the ocean colour taken by ordinary citizens with smartphone (and a specific processing); environmental information in the coastal zone, like meteorological parameters, sea level, currents,…; satellite data like ocean colour products... The planning of the two projects should allow Citclops to benefit from GlobCurrent products. Hence, GlobCurrent should take into account the possibility for information platforms like Citclops to connect to its database (FYI, the Citclops brochure and web site are in preparation: they should be released in December 2012).
EMEC	Not specified
TCE	None specified
HRW	To be successful, the GlobCurrent project should be user focussed, and not over-estimate the users' capabilities for innovation. Research users have been able to use data from the previous DUE initiatives; however these new data sets are also useful to the industry. The current state of the economy means that many companies are struggling to invest in innovation, so the project has to make it easy for them to use the data. This may also imply taking a more active approach when marketing GlobCurrent data – for example, it may be needed to contact potential users rather than to wait for them to contact us. Presenting the product and its application at conferences that are industry focussed is also important.
SATOC	When developing products be clear on how they relate to the real world, e.g. how a surface current value on 25km grid relates to actual current profile over top 10m and spatial variability over 25km length scale.
UoN	None specified
CSIR	None specified
UoC	We believe that good documentation about the project and products is key for its success.
PML	None specified
CNR (Pisa)	None Specified
ICIT	None Specified
PO	None specified
UHI	The imperative for the development of a sustainable marine renewable energy industry of receiving good and timely data.
CEDRE	Not specified
UoM	Not specified
CUT	Not specified

NERSC	Not specified
ERI	Not specified
LEGOS	We would like to follow the development of the GlobCurrent project but we do not have the means to contribute three man-months of efforts for this project. We could provide some data comparisons or participate in data dissemination but it is important for us to not have any data distribution constraints (unlimited non commercial usage).
BMT	Not specified
MEARSK	Could help to provide feedback – provide a way to provide data from ships to validate the GlobCurrent data sets
NIVA	Not specified
PDE	Not specified
DOMMRS	Not specified
CLIVAR	It will be useful if the horizontal salt and heat transport available for the selected regions (ex. Major boundary currents regions)
RES	Not specified
IRCG	Not specified
FSU	The currents from storms are an important consideration, and require fine temporal resolution winds.
CRMC	Not specified
MHI-NASU	Not specified
HZG	Not specified
UoK	Not specified

	A compelling need exists for an Integrated Sea Information System (ISIS) to accelerate the € 6.4 trillion offshore wind energy industry in European seas.

In 2011, Mainstream Renewable Power formed the ISIS collaborative network with 22 organisations from six EU member states. The ISIS collaborative network is a partnership between academia, public authorities and commercial enterprises.

The primary focus of the network is to accelerate the EU's marine policy through innovation and resource optimisation in information and communications technology (ICT). This network has created a clear ISIS vision of faster, better, simpler, cheaper risk management built on a collaborative technology platform.

As a collaborative technology platform, ISIS aims to;
- Bring together industry leaders and global organisations to collaborate openly for the benefit of Europe's offshore wind and marine industries;
- Aggregate multiple discrete data sources to deliver an innovative data brokerage that facilitates multiple initiatives between academia, public authorities and commercial enterprises, raising the quality of data initiatives and driving standardisation;
- Provide visualisation via leading edge technological platform s, including big data, cloud computing and software gaming technology, built with open standards. ISIS converts data into wisdom;
- Allow strategic risk analysis and mitigation resulting in informed decision-making by pooling the collaborative research capabilities of academia, public authorities and commercial enterprises;
- lead to higher success and reduced risk thereby lowering the cost of developing, building and operating offshore wind and marine industries.

The need for ISIS by 2014 is no coincidence. Europe's offshore wind and marine industries are expanding rapidly and need reliable high resolution dataset s. Europe's seas represent a vast natural resource with 5 million people directly employed across 22 of the 27 EU member states. Effective data management practices are an imperative for academia, public authorities and commercial enterprises working with marine data.

There are 3 drivers to establish the ISIS collaborative network;
1. Driver I: EU Renewable Energy Target 20:20:20. There is an overarching target to reduce green house gas emissions to 20% below 1990 levels and derive 20% of the EU's final energy consumption from renewable energy sources, both by 2020. Building offshore wind farms is a major component of this target. By 2050, 50 % of Europe's energy will need to come from wind, an incremental investment of € 6.4 trillion.
2. Driver 2: EU Directives impact on the marine industry. There are four EU directives which have particular impact and relevance to marine-based commercial enterprises; the Marine Strategy Framework Directive, the INSPIRE Directive, the Birds and Habitat Directives and the Data Collection Framework for Fisheries.
3. Driver 3: European Marine Data Management Infrastructure, EMODNET, is in place. Europe's marine observation and data management infrastructure is built and operated by EU government agencies and research institutes working together. The 1515 collaborative network will develop as a marine data user and data supplier, while other European marine data infrastructure plans are executed.

ISIS aims to support Europe's organisations in reaching high levels of maturity in marine data management in collaboration with existing EU data management strategies. In 2007, the EU began developing an integrated marine policy to maximise the sustainable use of the sea, while enabling growth of the marine economy and coastal regions.

The Marine Directive poses new challenges including the need for additional data monitoring where creative solutions must be found. A strong collaboration between academia, public authorities and commercial enterprises will provide extra monitoring sites and data streams, stimulate innovation and drive the Blue Economy. ISIS will adhere to open standards and build upon existing EU data management programmes such as ICES, GMES, INSPIRE, EMODNET, SeaDataNet, MyOcean, and WISE-MARINE.

Marine Knowledge 2020 recognises the importance of shared marine knowledge and identifies 3 phases of data processing: the Collection of Data, the Assembly of Data and the Application of Data. The focus of the ISIS collaborative network is on the assembly of existing datasets combined with additional data collection thereby testing and strengthening the EMODNET infrastructure.

ISIS is using the Capability Maturity Framework approach developed by the Innovation Value Institute. This framework demonstrates how the data management practices of different organisations can be classified according to 5 different maturity levels, ranging from "level 1 Initial" to "level 5 Optimising". The ISIS programme will define a set of innovative projects which adopt existing standards, make use of existing technology and create new technology, and it will also deliver software products and create reports about data availability, resolution and quality that can be fed back to academia, public authorities and commercial enterprises.

The programme has a commercial focus and aims to create a risk surface to identify and solve practical problems. It will create user-friendly solutions to predict and mitigate marine risk. There are 5 layers to the ISIS programme; instrumentation, communications, database, visualisation and risk scenarios. ISIS will deliver a set of projects that incorporate advanced high performance computing, advanced visualisation technology from the software gaming sector, a data historian Infrastructure and encrypted fault-tolerant wireless communications. The ISIS Programme is focused on using data rather than reporting data. |

The label **MAIN** appears in the left column of the table.

MAIN

Since 2011 the ISIS collaborative network has identified 3 Use Cases;

1. ISIS Use Case 1: Coordination of marine measurements to reduce data collection costs. ISIS will reduce data measurement costs and allow cross-correlation of data to provide a resource map covering locations throughout Europe's seas.
2. ISIS Use Case 2: Meteorological buoy data synchronisation to build better models. Governments of all North Sea states have had a large number of buoys employed for decades. 151S will improve the synchronisation of data between sites and countries allowing for greater confidence In measured values. Furthermore, additional meteorological buoys installed by offshore wind developers could fit into such a 'met buoy grid' to fill in the gaps, helping to validate sea-state models.
3. ISIS Use Case 3: Overlaying of existing and future marine Infrastructures to identify risks sooner. ISIS will create a new, integrated presentation of existing infrastructure maps and functions. Visualisation of what is there, and what may be there, is a crucial tool for sustainable commercial use of European seas.

ISIS accelerates the Blue Economy. With an openly available integrated sea information system, a knowledge base can be built, commercial enterprises can make better decisions, and sustainability can be achieved sooner. Developing and building wind farms and marine industries would happen faster. Such a system would also help answer questions on long-term sea-life habitat formation and help to improve health & safety in marine industries. ISIS acts as a decision support tool and needs to be more than 3D in structure; the model needs to be n-dimensional. ISIS delivers analytical and predictive software tools to

identify and mitigate risk as welt as accelerating the pace of sustainable development by removing uncertainty, delays and errors.

ISIS is complementary to existing EU data collection strategies and seeks to leverage EU initiatives already underway. To create ISIS, new EU policies, new EU regulations, new technology standards, greater cooperation and innovative ICT are needed. ISIS will not succeed in the absence of EU support. Targeted EU innovation funding will ensure ISIS is developed in the timeframe required by stakeholders. The timely publishing of EU regulations on marine data management will ensure ISIS is developed In a cost-effective manner. The pace of achieving benefits from the ISIS Programme is highly dependent on EU innovation funding and the creation of EU regulations. |
NOC	Not specified
FIO	Not specified
AZTI	Not specified