Logica

DUE GlobWave

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1st Annual User Assessment Report

GLOBWAVE

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Distribution

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Contents

1   EXECUTIVE SUMMARY

The highlight of Phase 1 of Project GlobWave has been the release of 25 years of satellite wave data (SAR and Altimetry) free of charge and in a common format and meta-data standard during April 2010. The content of this data is described in the Product User Guide, which has been released to users on the GlobWave Portal. We are also very proud to have delivered very strong Requirements Baseline and Technical Specification documents, which were constructed in close consultation with all the stakeholders within GlobWave.

We have faced delays in the project and we hope to formally close out Phase 1 in early September 2010. The remaining deliverables for Phase 1 are the satellite vs. *in situ* database, the Wave Data Quality Report, and the re-release of the delayed mode satellite data to include the error statistics. The delays we have faced have been due to a variety of reasons. We faced difficulties transcribing the *in situ* buoy data into the common format and also ensuring the necessary quality control, which is essential for wave data. The processing of such large quantities of satellite data while ensuring consistency and quality was also a challenge.

The Pilot Spatial Wave Forecast Verification Scheme has delivered two test reports to the UKMO and the feedback has been very positive. The production of operational reports has been delayed until early September 2010 when we expect the NRT data flow of GlobWave products to be operational. NOC have been working with other operational centres such as SHOM, ECMWF, NOAA, US Navy and Puertos del Estado, in order to send them tailored reports in due course based on their model forecasts.

A very successful UCM took place on the 29th and 30th April at Ifremer's premises near Brest, where over 50 people were in attendance. During the two days presentations were made by the Project Team and User Group members, who gave us valuable feedback on the project.

Other outreach activities have involved 2 newsletters, e-mail and telephone communications with users and presentations at 6 conferences. There is no doubt that the word has spread about GlobWave and the feedback we have had is overwhelmingly positive about what we are trying to achieve. We look forward to delivering the further planned products and services that will ensure maximum uptake of satellite wave data!

2   INTRODUCTION

This is the first Annual User Assessment Report, deliverable [D.27], which summarises Phase 1 of the GlobWave project. Further User Assessment Reports will be delivered at the end of Phases 2 and 3 of the project.

2.1   Purpose and Scope

The Annual User Assessment is a summary of all the services provided by GlobWave, including the including the data products, the Pilot Spatial WFVS and all functionality of the GlobWave portal. It also contains the recommendations of the Wave Community and Steering Team collected during the User Consultation Meeting.

All recommendations will be taken into account by the Logica Consortium in defining the work plan for the remainder of the project.

2.2   Document Structure

The document structure is as follows:

- Section 1 – Executive Summary.

- Section 2 – Introduction

- Section 3 – System Development Status and Product Summary

- Section 4 – Overview of UCM

- Section 5 – Feedback

- Section 6 – Steering Team Recommendations.

- ANNEX A – Feedback Repository

2.3   Definitions and Acronyms

A list of the definitions and acronyms used in this document is provided as follows:

Acronym	Description
ASAR	Advanced Synthetic Aperture Radar
ASCII	American Standard Code for Information Interchange
AVISO	Archiving, Validation and Interpretation of Satellite Oceanographic Data
CD	Compact Disc
CDIP	Coastal Data Information Program
CLS	Collecte Localisation Satellites
CNES	Centre National d'Etudes Spatiales

Acronym	Description
CSV	Comma Separated Value
DUE	Data User Element
DVD	Digital Versatile Disc
ECMWF	European Centre for Medium-Range Weather Forecasts
ENVISAT	ESA's Environmental Satellite
EO	Earth Observation
ERS	European Remote-Sensing Satellite
ESA	European Space Agency
ESRIN	ESA Space Research Institute
ESTEC	European Space Research and Technology Centre
GDR	Geophysical Data Record
GEOSAT	GEOdetic SATellite
GFO	GEOSAT Follow On
GHRSST	GODAE High Resolution Sea Surface Temperature
GODAE	Global Ocean Data Assimilation Experiment
GOES	Geostationary Operational Environment Satellites
HR-DDS	High Resolution Diagnostic Data Set
Hs	Significant Wave Height
I/O	Input/Output
JCOMM	Joint Technical Commission for Oceanography and Marine Meteorology
L2P	Level-2-Preprocessed
MATLAB	MATrix LABoratory
MDB	Match Up Database
MERSEA	Marine Environment and Security for the European Area
NASA	National Aeronautical Space Administration
NCOF	National Centre for Ocean Forecasting
NDBC	National Data Buoy Center
NERSC	Nansen Environmental and Remote Sensing Center
NetCDF	Network Common Data Form
NOAA	National Oceanic and Atmospheric Administration
NOCS	National Oceanography Centre Southampton
NODC	National Oceanographic Data Center
NRT	Near Real Time
PDF	Portable Document Format
PM	Progress Meeting
RADS	Radar Altimeter Database System

Acronym	Description
RB	Requirements Baseline
RMS	Root Mean Square
SAR	Synthetic Aperture Radar
SatOC	Satellite Oceanographic Consultants
SHOM	Service Hydrographique et Océanographique de la Marine
SQL	Structured Query Language
SSALTO	Segment Sol multi-missions d'ALTimetrie, d'orbitographie et de location précise
SST	Sea Surface Temperature
TBC	To Be Confirmed
THREDDS	THematic Real-time Environmental Distributed Data Services
UKMO	United Kingdom Meteorological Office
WAM	Wave Analysis Model
WFVS	Wave Forecast Verification Scheme

Table 2-1: Acronyms

3 SYSTEM DEVELOPMENT STATUS AND PRODUCT SUMMARY

3.1 Requirements Baseline

The Requirements Baseline document was published to the Wave Community during April 2009. It provides a consolidated view of the requirements submitted to ESA by members of the "User Group", s set of wave domain experts gathered together by ESA at a an initial User Consultation Meeting in 2007. In formally defining the requirements Logica contacted all members of the "User Group" and conducted a series of telephone interviews where further requests were gathered. The result was a consistent and comprehensive Requirements Baseline document covering:

- Uniform Level-2-Preprocessed SAR and Altimetry Satellite Wave Products

- Satellite Wave Data Quality Reporting

- Pilot Spatial Wave Forecast Verification Scheme

- Satellite Wave Data Error Characterisation and Inter-comparison

- Content and Functionality of the GlobWave Web Portal

The document was reviewed internally within the Consortium and the content discussed via e-mail, teleconferences and bi-lateral discussion where appropriate. It has been accepted by ESA and the Steering Team.

As a result of continued consultation with users the Requirements Baseline document is updated when appropriate.

3.2 Technical Specification

The Technical Specification document was released to the User Community in August 2009. It contains the following:

- A system overview, including a high level architectural diagram

- Details of all GlobWave satellite products (including demonstration products), a description of the common format and associated product content, and sources of *in situ* and ancillary data.

- GlobWave services including data dissemination, the Diagnostic Data Set (DDS), Global Wave Statistics, Quality Reports, Product User Guide and Pilot Spatial Wave Forecast Verification Scheme.

- Details of the data processing methods required to enable delivery of the GlobWave services

- Details of processing infrastructure at both Ifremer (where the main GlobWave system will be hosted) and NOC (where the GlobWave DDS will be hosted).

The project team worked closely to ensure consistency of the definition and detail of the specification. As with the Requirements Baseline document the Technical Specification is updated when appropriate.

3.3   GlobWave Portal

The GlobWave portal is available on www.globwave.info. It contains basic information about the project, an area to access data products, access to 3rd party subsetting tools, a news area and a list of conferences and workshops (including those where GlobWave has been presented).

The GlobWave deliverables released to the User Community are made available on the portal. The portal is complete except for the introduction of the Community Exchange area and the online query service for satellite vs *in situ* buoy matchups. However, we continue to make modifications to the portal based on user feedback.

3.4   Data Collection and Processing

3.4.1   Satellite Data

The delayed mode GlobWave data was released to the User Community on 22nd April 2010. This data covers 25 years of Altimeter and SAR data from both ESA and non-ESA sources.

The delayed mode Altimeter data is available from the following satellites: ERS-1, ERS-2, Envisat, Topex/POSEIDON, Jason-1, Jason-2, US Navy GEOSAT and US Navy/NOAA GEOSAT Follow On. Delayed mode SAR data is available from Envisat. ERS-1 and ERS-2 SAR data will also be available in the future once the ESA Level 2 reprocessing is completed.

To access this data please see the GlobWave Satellite Data area of the portal for instructions. A Product User Guide is also available which outlines the GlobWave products and their content.

The data was released about 3 months later than originally planned. We found that the processing of such large quantities of satellite data was a real challenge and the extra time was needed to ensure consistency and quality.

3.4.2   In situ Data

While the project will strive to ingest more *in situ* data sources, a number of data sets will be used as a starting point based on the geographic location, size of network, and the provision of directional spectra and quality checked data.

During Phase 1 of the project the full archive of *in situ* data from the following data providers has been converted to the common format:

- National Oceanographic Data Centre (NODC) - US Buoy network in Atlantic and Pacific

- Hellenic Centre for Marine Research (HCMR) - Greek buoys in the Mediterranean

- UK Met Office - UK Met Office buoys around the British Isles

- Coastal Data Information Program (CDIP) - Mainly coastal buoys around North America and Pacific Islands

- Puertos del Estado - Spanish buoys in Atlantic and Mediterranean

The conversion of this data and the definition and implementation of the appropriate quality control processors, critical for wave data, was much more involved than originally thought and this had knock on effects in terms of the project schedule.

Data from the Marine Environment Data Services (MEDS) and Meteo-France is also planned to be made available during Phase 2 of GlobWave.

3.5 Error Characterisation and Intercomparison

3.5.1 Satellite vs *In situ*

The Altimeter vs *in situ* matchups for significant wave height are complete and the results are outlined in the first draft of the Wave Data Quality Report, currently being reviewed within the Consortium. The Altimeter matchups are based on all 5 buoy networks acquired within GlobWave so far (see section 3.4.2).

The SAR vs *in situ* matchups will be produced for significant wave height and the dominant wavelength and direction parameters. Only the NODC and CDIP buoy networks will be used since the other networks do not have the required directional spectra. This work is still ongoing and will be complete by mid August.

Once the full matchup analysis is complete for both the Altimeter and SAR then the derived error statistics for each parameter will be inserted into the satellite products. This will be complete by the end of August 2010.

3.5.2 Satellite vs Satellite

All available crossovers of delayed model data between the Altimeter satellites will be made available in the Wave Data Quality Report. These crossover combinations are:

- ERS-1 vs. TOPEX/POSEIDON

- ERS-2 vs. TOPEX/POSEIDON

- ERS-2 vs. GFO

- ERS-2 vs. Jason-1

- ERS-2 vs. Jason-2

- Envisat vs. TOPEX/POSEIDON

- Envisat vs. GFO

- Envisat vs. Jason-1

- Envisat vs. Jason-2

- GFO vs. TOPEX/POSEIDON

A first draft of this report is being reviewed within the Consortium. It will be published to the Wave Community via the GlobWave Portal during September 2010.

At the end of each Phase of the project the new crossovers will be published in an Annual Quality Control Report.

3.6   Pilot Extension of the JCOMM Wave Forecast Verification Scheme

Requirements have been gathered from all members of the existing JCOMM Wave Forecast Verification scheme. In particular, NOC have been working very closely with the UKMO (who were identified by WTWS as the JCOMM contact) and SHOM/Ifremer. So far two test reports have so far been submitted to the UKMO and the feedback has been very positive. The feedback received will be incorporated into future reports.

The production of operational reports has been delayed until early September 2010, partly because the GlobWave NRT data is not operational but also to ensure reliability of the service in terms of consistent data flow from providers (ie monitoring of data collection) and providing meaningful comparisons between the models and data.

NOC have been working with other operational centres such as ECMWF, NOAA, US Navy and Puertos del Estado, in order to send them tailored reports in due course based on their model forecasts.

3.7   Communications, Outreach and GlobWave User Consultation Meetings

3.7.1   Conferences and Workshops

The GlobWave project has been presented by members of the Consortium at a variety of conferences and workshops. The table below provides a list of all posters, presentations and papers that have been presented to date.

Meeting	Dates	Venue	Type	Title
Waves in Shallow Water (WISE)	26-30 April, 2009	Enseneda, Mexico	Poster	GlobWave: A new generation of ocean wave products
OceanSAR	7-11 September	Herrsching, Germany	Oral	Project GlobWave
OceanObs	21-25 September, 2009	Venice, Italy	Poster + Paper	GlobWave: A new generation of satellite wave products

Meeting	Dates	Venue	Type	Title
SeaSAR	January, 2010	ESRIN, Italy	Oral	Project GlobWave
ESA Living Planet Symposium	28 June – 2 July 2010	Bergen, Norway	Oral	Project GlobWave
IGARSS	25 July – 30 July 2010	Honolulu, Hawaii	Oral	GlobWave and Applications of Global Satellite Wave Applications

3.7.2 Newsletters

Two GlobWave Newsletters have been issued – the first in September 2009 and the second in July 2010.

3.7.3 E-mails

Several e-mail communications have been sent to the Wave Community mailing list involving subjects such as the release of the data, requirements baseline document and project newsletters.

3.7.4 User Consultation Meeting

The User Consultation Meeting held during April 2010 is described in section 4.

4   OVERVIEW OF UCM

This section outlines what occurred at the first User Consultation Meeting which was held at Ifremer's premises in Brest, France. It contains the objectives and structure of the meeting as well as links to the final agenda and presentations given.

4.1   Objectives

There were two main objectives to the meeting which were to:

- Present the project to Wave Community. This involved explaining what data and services are already available and what we plan to do over the remainder of the project

- Obtain feedback from the Wave Community. This involved interacting with the users and ensuring that what we have done and plan to do aligns with their needs. Full details of the feedback is outlined in section 5.

4.2   UCM Structure

The UCM was split over two days, with each of the two days addressing the respective objectives outlined in the previous section. The following subsections explain the focus of each day and list the presentation given. We note that pdf's of all the presentations and the final agenda of the meeting are available [here](#).

4.2.1   Day 1 on 29/04/10

On the afternoon of the 29/04/10, six presentations were given by the Project Team which outlined what we have achieved so far and what we plan to do in the future. These presentations were as follows:

- Project GlobWave: Geoff Busswell, Logica

- GlobWave SAR Data Products and Error Characterisation Methodologies: Fabrice Collard, CLS

- GlobWave Altimeter Data Products and Error Characterisation Methodologies: Ellis Ash, SatOC

- HR-DDS & Pilot Spatial Wave Forecast Verification Scheme: Dave Poulter, NOC

- GlobWave Demonstration Products – Soprano and Fireworks: Fabrice Collard, CLS

- GlobWave Demonstration Products – HS-Tz Scatterplots: Ellis Ash, SatOC

- During the evening a GlobWave buffet and drinks session was held where users were able to network with each other and talk to members of the Project Team in more detail.

4.2.2   Day 2 on 30/04/10

On the morning of the 30/04/10, five presentations were made by members of the User Group who gave us feedback on the project and outlined the challenges their organisation faces with wave data, and how GlobWave can help. These presentations were as follows:

- Use of GlobWave Services from a Research User Perspective: Nigel Tozer, HR Wallingford

- Use of GlobWave Services from a Research User Perspective: Sergei Badulin, P.P. Shirshov Institute of Oceanology

- Use of GlobWave Services from an Operational User Perspective: Jean-Michel Lefevre, Meteo-France

- Use of GlobWave Services from an Operational User Perspective: Francois Montagner, EUMETSAT

- Use of GlobWave Services from a Commercial User Perspective: Stephen Barstow, Fugro Oceanor

The presenters were chosen to reflect the different sectors of the wave community; namely operational, research and commercial. It is recognised that we need to reach out to users from all these areas if we are to make GlobWave a success and maximise the uptake of satellite wave data.

5   FEEDBACK

Feedback was obtained at the UCM in the following ways:

- User presentations on Friday 30th April. The presenters were sent a list of questions in advance to help guide their feedback

- Questions and Answers after each presentation

- All attendees were encouraged to write their thoughts on notepaper, which could be deposited in a box in the coffee area.

- Verbal discussions in the breaks and at the buffet dinner event.

- Recommendations from the GlobWave Steering Team

The raw feedback is recorded in Annex A, except for the Steering Team recommendations which are outlined in section 6. This information has been reviewed and grouped together into a number of areas, each represented by the subsections below.

5.1   Outreach

Feedback Refs	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
UP-SBN-2, SCM-1, SCM-9, SCM-14	Suggested to expand outreach to other communities e.g. coastal/climate/erosion.	User Presentation, Steering Team	AI	Andy Saulter to suggest a climate specialist for the User Group. Fabrice Ardhuin to suggest outreach opportunities for the coastal/erosion community. NOC to present at the Coastal Altimetry workshop in Porto. Also Logica to investigate a GlobWave presence at the AGU in San Francisco.
NP-1, NP-9, NP-12, NP-15	Users were very impressed by the UCM content and organisation. They enjoyed making new contacts and are looking forward to UCM-2	Notepaper	GP	Logica to build on the success of UCM-1 and ensure that UCM-2 is even better!
NP-18	User would like more talks from members of the wave community at future UCM's	Notepaper	AI	Logica to take this into account for UCM-2.
NP-19	Users are very pleased that the presentations will be made available on the website.	Notepaper	GP	Logica to ensure this is also done for UCM-2

Feedback Refs	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
NP-20	Users would like more travel funding for the UCM's	Notepaper	AI	Logica to review for UCM-2.
NP-21	Users are pleased that they are not overwhelmed by GlobWave e-mails	Notepaper	GP	None.
NP-21, SCM-16	Users liked the fact that the UCM was combined with another meeting.	Notepaper	GP	Logica to ensure that a similar approach is used for UCM-2.
NP-22	Some users said they did not have much idea what was happening in the project	Notepaper	AI	Logica to look at sending out a few more mails to the Wave Community, but taking care not to overwhelm them.
NP-22	Plenty of notice (~6 months) needs to be given for UCM-2	Notepaper	AI	Logica to ensure plenty of notice is given for UCM-2
SCM-1	Investigate putting an article in the EOS or EGU Newsletters	Steering Team	AI	Fabrice Ardhuin to investigate.
SCM-2, SCM-18	Investigate costs of ensuring that the GlobWave portal appears on more keyword searches e.g. Google,. Also look into a Wikipedia page.	Steering Team	AI	Logica to investigate.
SCM-3	Upload a 3 slide presentation to the portal for use by the wave community.	Steering Team	AI	Logica to upload slides
SCM-6	Check possibility of users uploading their own buoy data	Steering Team	AI	Logica to check with Ifremer
SCM-13	Include relevant portal and ftp stats in the monthly report to check user uptake.	Steering Team	AI	Logica to investigate.

5.2   Datasets and the Access Mechanism

Feedback Refs	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
UP-NT-2, NP-4, NP-7, NP-10	The datasets and access mechanism were thought to be described well by users. They found it very easy to access the data and	User Presentation	GP	None

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Feedback Refs	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
	really liked the fact that it was all in one place in a common format.			
VD-1, QA-EA-12, SCM-4	The ftp site should contain a merged product to contain all the data from the different satellites for that day.	Verbal Discussions, Questions & Answers	AI	Logica to discuss with Consortium
UP-NT-3	Users liked the NetCDF with CF conventions as the choice of format and meta-data standard respectively.	User Presentation	GP	None
UP-NT-4	Users would like more information on the tools required to read the data.	User Presentation	AI	Logica to add information to the portal.
UP-NT-5	Users were satisfied that the data contained what they expected.	User Presentation	GP	None
UP-FM-1, NP-17	Not clear to users what the estimated timeliness will be of the NRT products. Suggestion is to put real-time data in a fast access site.	User Presentation	AI	Logica to investigate.
UP-FM-2	Not clear to users that the ancillary values are not the ones used in the processing.	User Presentation	AI	Logica to ensure that this information is made clear in the product using the comment field in the NetCDF.
UP-FM-2	Not clear to users what effect using the ECMWF ancillary data has on the timeliness of NRT products	User Presentation	AI	Logica to make this clear in the User Guide.
UP-FM-3	Not clear to users what effect using the ice flags has on the timeliness of the NRT products.	User Presentation	AI	Logica to make this clear in the User Guide.
UP-JL-5, QA-FC-3, QA-EA-9	Users are not fully aware of the added value of GlobWave products over the L2 products.	Questions & Answers	AI	Logica to make this absolutely clear on the portal.
NP-5	Inexperienced users would like to have a system from where you can download data for specific space and time windows with knowledge of the data quality.	Notepaper	GP	This will be possible via the 3rd party tools advertised on the GlobWave portal. Logica to ensure that this information is clear on the portal.
NP-23	For some users the SAR	Notepaper	GP	None.

Feedback Refs	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
	data is the only source of spectra in their regions of interest e.g. South Pacific			

5.3   Portal

Feedback Ref	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
QA-EA-6, NP-3, VD-2	Users would like to be able to browse the data using a link from the portal.	Questions & Answers, Notepaper, Verbal Discussions	AI	Logica to investigate.
UP-NT-1	Background to satellite data, devices, methods, inaccuracies not available yet. Would like this ASAP.	User Presentation	AI	Logica to ensure provision of this information in the Wave Data Quality Report and User Handbook
UP-NT-8	The portal looks good and info is clear and well laid out.	User Presentation	GP	Continue to that portal looks good as this is the first point of entry for many users to GlobWave.
UP-NT-9, NP-2	The following things could be added to the portal: a high level tutorial on the datasets and information on timescales.	User Presentation	AI	Logica to add info regarding timescales and investigate the possibility of a tutorial.
UP-NT-10	It was not clear that there will be training courses for inexperienced users of satellite wave data.	User Presentation	AI	Logica to add this info.
UP-NT-11	It was not clear on the portal how to get support.	User Presentation	AI	Logica to add this info.
UP-NT-12	It was not clear whether in situ data is made available or whether just an inventory will be provided	User Presentation	AI	Logica to add this info.
UP-SBN-3	The community exchange area will be useful and should be made available	User Presentation	AI	Logica to ensure this is added.
SCM-12	Include a feedback button on the portal	Steering Team	AI	Logica to include this.

5.4 Handbook, Matchups and Error Characterisation

Feedback Ref	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
UP-JL-1	Users were pleased that GlobWave will provide inter-calibrated NRT data and bias corrections (tables, etc.) and the ability to monitor the NRT data as a function of time.	User Presentation	GP	Logica to ensure that this information is provided as planned.
UP-JL-2	In addition to co-located data users also want maps of wave trains and statistics of crossing swells.	User Presentation	AI	Logica to investigate.
SCM-5	Ensure that the differences between NRT and calibration corrections are clear	Steering Team	AI	Logica to check with SaOC
SCM-19	Produce a technical note on partitioning algorithms	Steering Team	AI	Logica to check with Fabrice Collard and Bertrand Chapron
SCM-11	Include in handbook the differences in Altimeter resolution and parameter accuracy. The limitations of measuring extreme waves should also be mentioned.	Steering Team	AI	SatOC to include this in the handbook.

5.5 HR-DDS and PS-WFVS

Feedback Ref	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
UP-JL-3	Users would like maps of mean and std analysis increments so it is easy to see where satellite data is most useful.	User Presentation	AI	Logica to investigate.
UP-JL-4	Users would like GlobWave to define and share common data sets so that the impact of data assimilation can be analysed.	User Presentation	AI	Logica to investigate.
QA-DP-1	Users would like model data to be publically available?	Questions & Answers	AI	SHOM data is already available. Logica to work with providers to make as much available as

Feedback Ref	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
				possible.
QA-DP-2	Users really want the interactive service to configure their GPPS-WFVS reports.	Questions & Answers	GP	Logica to ensure that this gets delivered on time as this is clearly a priority.
NP-13	Wave modellers would like a co-location tool to extract satellite data and compare to models in a space and time window of interest.	Notepaper	AI	This sounds like what the HR-DDS will do using a web interface, but Logica will investigate further.
NP-14	GlobWave can be a great place for comparing models from different centres.	Notepaper	GP	None.
NP-23, NP-24	Users are very interested to hear that validation of model forecasts is possible via GlobWave	Notepaper	GP	None.

5.6 Demonstration Products

Feedback Ref	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
UP-NT-6	Information on demo products could be clearer on the portal and in the User Guide	User Presentation	AI	Logica to investigate how to make this information clearer
UP-NT-7	The concept of the demo products is very good. It provides an easy way to access the data.	User Presentation	GP	Logica to ensure we push to exploit the demo products concept
UP-NT-7, NP-6, SCM-7	Coastal products need to be provided to maximise user uptake via GlobWave.	User Presentation	AI	Logica to investigate possibility of making available COASTALT and PISTACH products in GlobWave format.
UP-FM-5	A suggested demo products is to use: maps of modelled wave height contours from an operational model with altimeter tracks overlaid	User Presentation	AI	Logica to investigate.
UP-FM-5	A suggested demo product is to extract the actual SWH and collocated wave heights together in a plot,.	User Presentation	AI	Logica to investigate.
UP-SBN-1	A suggested demo product is for GlobWave	User Presentation	AI	Logica to investigate.

Feedback Ref	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
	to provide a basic climatology info. Advanced climatology studies from different organisations could be made available as separate demonstration products.			
UP-SBW-1	Suggested to put a presentation about what Fugro Oceanor do as a demo product. A particularly good thing to include would be Fugro's wave energy maps.	User Presentation	AI	Logica to investigate.
QA-EA-13	Users would like the Hs:Tz demo product can buoy-satellite plot to be put on the portal.	Questions & Answers	AI	Logica to investigate.
QA-EA-14	Users would like the equations for the Hs:Tz demo product to be put on the portal	Questions & Answers	AI	This information is currently in the User Guide. Logica to ensure that it is clear on the portal that further details can be found in the User Guide.
SCM-8	Investigate Storm Track demo product	Steering Team	AI	Logica to check with Bertrand Chapron
SCM-10	Investigate possibility of the WMO using the fireworks product	Steering Team	AI	Logica to check with Craig Donlon

5.7   Miscellaneous

Feedback Ref	Brief Description	Feedback Mechanism	Good Point (GP) or Area for Improvement (AI)	Next Action
UP-FM-6, NP-11, SCM-15 SCM-17	Gerneral concern about the long term future of the service. Once decided this should clearly be communicated to users. For example operational users will need a commitment on the sustainability of the GlobWave service.	User Presentation, Notepaper	AI	This is noted. Logica, ESA and the Steering Team will continue to work on ensuring the future of GlobWave. Logica will keep in contact with EUMETSAT as they are a key client for the NRT data.
NP-8, NP-16	Users really want this service and do not want it delivered late.	Notepaper	AI	.Logica to ensure that the products and services are delivered as quickly as possible.

6 STEERING TEAM RECOMMENDATIONS

After the UCM a meeting of the Steering Team, Logica and ESA took place on the afternoon of Friday 30th April, 2010. The following recommendations were made as a result of this meeting:

Feedback Ref	Brief Description	Next Action
SCM-1	Investigate possibility of putting an article in the EOS or EGU Newsletters, as well as looking at outreach opportunities to other communities e.g. coastal, erosion	.Fabrice Ardhuin to investigate.
SCM-2	Investigate costs of ensuring that the GlobWave portal appears on more keyword searches e.g. Google.	Logica to investigate.
SCM-3	Upload a 3 slide presentation to the portal for use by the wave community.	Logica to upload relevant slides.
SCM-4	Produce a blended GlobWave product	Logica to investigate
SCM-5	Check the differences between NRT and calibration corrections	Logica to investigate
SCM-6	Check possibility of users uploading their own buoy data	Logica to investigate
SCM-7	Investigate possibility of coastal Altimetry demo products	The COASTALT and PISTACH products are what people need. Logica to investigate if this is feasible.
SCM-8	Investigate Storm Track demo product	Logica to check with Bertrand Chapron.
SCM-9	Submit abstract for coastal Altimetry conference	NOC to present at this conference in Porto
SCM-10	Investigate possibility of the WMO using the fireworks product	Logica to check with Craig Donlon
SCM-11	Include in handbook the differences in Altimeter resolution and parameter accuracy. The limitations of measuring extreme waves should also be mentioned.	SatOC to include in the Handbook
SCM-12	Include a feedback button on the portal	Logica to include this
SCM-13	Include relevant portal and ftp stats in the monthly report to check user uptake.	Ifremer to provide relevant statistics
SCM-14	Have a GlobWave presence at the AGU in San Francisco	Logica to investigate
SCM-15	Follow up with EUMETSAT about them using GlobWave data	Logica to check with Francois Montagner of EUMETSAT
SCM-16	Check possibility of having UCM-2 with the Oceanology conference in 2011	This is only held every two years. Logica to investigate other UCM possibilities.
SCM-17	Investigate sustainability options for GlobWave	Logica and ESA to investigate.
SCM-18	Investigate having a Wikipedia page	Logica to investigate
SCM-19	Produce a technical note on partitioning algorithms	Logica to check with Fabrice Collard and Bertrand Chapron

ANNEX A   FEEDBACK REPOSITORY

A.1   User Presentations

Feedback Reference	Presenter	Description	Good Point (GP) or Area for Improvement (AI)
UP-NT-1	Nigel Tozar, HR Wallingford	Background to satellite data, devices, methods, inaccuracies not available yet. Would like this ASAP.	AI
UP-NT-2	Nigel Tozar, HR Wallingford	The datasets and access mechanism were described well. It was very easy to access the data.	GP
UP-NT-3	Nigel Tozar	The format and meta-data standard (NetCDF with CF conventions) is fine.	GP
UP-NT-4	Nigel Tozar, HR Wallingford	More information would be useful on the tools required to read the data.	AI
UP-NT-5	Nigel Tozar, HR Wallingford	The data seemed to contain what I expected, although I did not have time to analyse fully.	GP
UP-NT-6	Nigel Tozar, HR Wallingford	Information on demo products could be clearer on the portal and in the User Guide	AI
UP-NT-7	Nigel Tozar, HR Wallingford	The concept of the demo products is very good. It provides an easy way to access the data.	GP
UP-NT-8	Nigel Tozar, HR Wallingford	The portal looks good and info is clear and well laid out.	GP
UP-NT-9	Nigel Tozar, HR Wallingford	The following things could be added to the portal: a high level tutorial on the datasets and information on timescales.	AI
UP-NT-10	Nigel Tozar, HR Wallingford	Will there be training courses? It was not clear to me.	AI
UP-NT-11	Nigel Tozar, HR Wallingford	How will I get support? It was not clear to me.	AI
UP-NT-12	Nigel Tozar, HR Wallingford	In situ data – will this be hosted or an inventory? It was not clear to me	AI
UP-NT-13	Nigel Tozar, HR Wallingford	Coastal products need to be provided to maximise user uptake via GlobWave.	AI
UP-FM-1	Francois Montagner, EUMETSAT	It is not mentioned what the estimated timeliness will be for the NRT products	AI
UP-FM-2	Francois Montagner, EUMETSAT	It should be made clear in the product (e.g. in the comment field of the NetCDF) that the ancillary values are not the ones used in the processing	AI
UP-FM-3	Francois Montagner, EUMETSAT	The ancillary fields are based on ECMWF analysis and not forecast fields. It should be made clear what effect this has on the timeliness as ECWMF only runs twice a day.	AI
UP-FM-4	Francois Montagner,	For the OSI SAF ice flag, do these updates happen often enough for them to be useful	AI

Feedback Reference	Presenter	Description	Good Point (GP) or Area for Improvement (AI)
	EUMETSAT	for the NRT products (e.g. for marine forecasting)	
UP-FM-5	Francois Montagner, EUMETSAT	Some suggested additional demo products are: 1) Maps of modelled wave height contours from an operational model with altimeter tracks overlaid within a space and time region of interest. The actual times of the altimeter observations should be annotated along the track. 2) Possibility of further extracting the actual SWH and collocated wave heights together in a plot, with the x axis showing the observation time.	AI
UP-FM-6	Francois Montagner, EUMETSAT	If we are to use GlobWave we will need some commitment eventually on the long term continuity of the service. Perhaps future of GlobWave is within the Sentinel 3 ground segment which EUMETSAT is running.?	AI
UP-JL-1	Jean-Michel Lefevre, Meteo-France	We need Inter-calibrated NRT data and bias corrections (tables, etc.). We also need to be able to monitor the NRT data as a function of time.. GlobWave should be able to provide all this which is great.	GP
UP-JL-2	Jean-Michel Lefevre, Meteo-France	Need for collocated data but also maps of wave trains, statistics of crossing swells, etc.	AI
UP-JL-3	Jean-Michel Lefevre, Meteo-France	Need for maps of mean and std analysis increments (so we see areas where model FG are corrected and so where data are useful)	AI
UP-JL-4	Jean-Michel Lefevre, Meteo-France	Define and share common data sets to evaluate the impact of assimilation of remote sensed data in wave models.	AI
UP-JL-5	Jean-Michel Lefevre, Meteo-France	Need to make users more aware what is in the added value over the Level 2 products.	AI
UP-SBN-1	Sergei Badulin, SIO	Suggested that GlobWave could provide basic climatology information. Institutes like SIO should be doing advanced climatology studies for less experienced users. Advanced climatology studies from different organisations could be made available as demonstration products.	AI
UP-SBN-2	Sergei Badulin, SIO	Suggested to add a climate specialist to the User Group. Andy Saulter said he would suggest someone.	AI
UP-SBN-3	Sergei Badulin, SIO	The community exchange area will be useful and should be made available	AI
UP-SBW-1	Stephen Barstow, Fugro Oceanor	Suggested to put a presentation about what Fugro Oceanor do as a demo product. A particularly good thing to include would be Fugro's wave energy maps.	AI

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A.2 Questions & Answers

Feedback Reference	Presenter	Question	Answer	Question (Q), Good Point (GP) or Area for Improvement (AI)
QA-GB-1	Geoff Busswell	How do you plan for GlobWave to continue? It is not clear at present what will happen at the end of the 3 years.	Currently this has not been decided. At present we are focussing on making GlobWave a success. This will make it much easier to attract funding in the long term	Q
QA-GB-2	Geoff Busswell	Are people/organisations involved in the project on the portal?	Yes, the Consortium and User Group organisations are on the portal. The plan is to extend the User Group as the project evolves.	Q
QA-FC-1	Fabrice Collard	Is it worth doing comparisons with spectral moments instead?	Richer information is available from analysing the full wave spectrum than if you estimate the moments.	Q
QA-FC-2	Fabrice Collard	Are outcomes sensitive to parameter choices you make?	For the spread this is indeed the case.	Q
QA-FC-3	Fabrice Collard	Is the GlobWave SAR data different to the ESA Level 2 data?	Yes it is. GlobWave provides the information in a common format and also adds in much ancillary information. Also, the processing to the GlobWave format is very fast so NRT is possible.	Q
QA-FC-4	Fabrice Collard	Do the GlobWave SAR products contain partitions and direction information?	Yes, they contain both.	Q
QA-FC-5	Fabrice Collard	With the matchups, what happens if there is more than 1 buoy within the time window?	We only keep the closest buoy	Q
QA-EA-6	Ellis Ash	Can users browse the archive from the GlobWave portal? This would be a nice feature	Currently users can browse the ftp site using the standard methods e.g. web browser, command line, etc. We agree it would be nice to	AI

Feedback Reference	Presenter	Question	Answer	Question (Q), Good Point (GP) or Area for Improvement (AI)
			have a link from the portal which requires a username and password	
QA-EA-7	Ellis Ash	How easy is it to search for data in a particular location?		Q
QA-EA-8	Ellis Ash	Will presentations be available on the GlobWave portal?	Yes	Q
QA-EA-9	Ellis Ash	How is this different to what Ifremer are doing? Are you re-inventing the wheel?	The products that Ifremer provide are not available in a common format and meta-data standard with uniform quality flags. Also, the error characterisation work in the GlobWave products are based on the uniform quality flag definition.	Q
QA-EA-10	Ellis Ash	Is wind speed included?	Yes, it is but it is not calibrated at present	Q
QA-EA-11	Ellis Ash	Will the changes to calibration be documented?	Yes, the full error characterisation analysis will be made available in the Wave Data Quality Report	Q
QA-EA-12	Ellis Ash	Products should be merged as many people don't case which satellite the data comes from	Yes, this would indeed be a nice feature and we will look into this.	AI
QA-EA-13	Ellis Ash	What about SWH above 15m? How can we validate data here?	A good question and the audience was challenged to come up with suggestions. It was agreed that only models can really help here and we have to understand if the models can make good predictions for	AI

Feedback Reference	Presenter	Question	Answer	Question (Q), Good Point (GP) or Area for Improvement (AI)
			these types of extreme waves.	
QA-EA-14	Ellis Ash	For the HS:Tz demo product can we put the buoy-satellite plot you showed on the slide on the portal?	Yes, no problem	AI
QA-EA-15	Ellis Ash	For the Hs:Tz demo product the equations you showed were very useful. Can these go on the portal.	Yes, no problem	AI
QA-DP-1	Dave Poulter	Will model data be made publically available?	SHOM data will be (and in fact already is). We will work to try and make as much model available as possible.	AI
QA-DP-2	Dave Poulter	When will the interactive PS-WFVS be available via the website?	This will be available at the end of Phase 2	Q
QA-DP-3	Dave Poulter	Who are you getting data from?	Currently data is being received from the UKMO, SHOM and ECMWF. However, we would like to work with and receive daya from as many participants of the existing WFVS as possible so please contact us if you would like us to ingest your data.	Q

A.3 Notepaper

Feedback Reference	Description	Good Point (GP) or Area for Improvement (AI)
NP-1	Coordinated effort is quite impressive	GP
NP-2	Not clear who the intended audience was. For the end user at this point the interest is what is available, in what format and how to access. A tutorial would have been useful.	AI
NP-3	Add link to ftp site – as long as clear you need userid and password.	AI

Feedback Reference	Description	Good Point (GP) or Area for Improvement (AI)
NP-4	Satellite data in one place with common format is great.	GP
NP-5	An inexperienced user would like to have a system from which you can download data for specific space and time windows with knowledge of the data quality.	AI
NP-6	Coastal satellite data should be made available.	AI
NP-7	Nice prospect for availability of altimeter and SAR data under one umbrella	GP
NP-8	Don't delay	AI
NP-9	Very useful workshop as it was extremely informative on the Altimeter/SAR data.. I look forward to further discussions and meetings.	GP
NP-10	Very good approach. It will certainly help exploiting satellite data.	GP
NP-11	Would be good to understand how things will work in the future (>2012)	AI
NP-12	The UCM was a good networking opportunity for future involvement and collaborations.	GP
NP-13	For wave modellers the 3 main uses of satellite data would be: calibration of hindcast, validation of hindcast and forecast, data assimilation. For the purposes it would be useful to have a tool that, given a regular grid, a time period (YYYYMMDDHH1- YYYYMMDDHH2) and a time step, all the satellite data from the database were extracted and associated to a grid point and a time. Format should contain (Grid point (x,y), time (YYYYMMDDHH, satellite values (Hs, wave dir, Tp, Tm, Vv, wind). If for a certain point and date there is more than 1 sat value all could be presented. I think that a collocation tool like this would make the difference.	AI
NP-14	GlobWave can be a great place for comparing models from difference centres.	GP
NP-15	The UCM was very well organised	GP
NP-16	GlobWave needs to deliver faster	AI
NP-17	Operational centres require fast-delivery (near) real time data. Scattering the data at different sites may help reduce the net-jam at one site. Will GlobWave consider putting real-time data in fast-access sites.	AI
NP-18	More talks from different participants of GlobWave	AI
NP-19	Great that presentations will be available on the website.	GP
NP-20	Travel funding for young (and not-young) colleagues would be a good thing).	AI
NP-21	Not overwhelmed by e-mails. Combining with a science meeting is good.	GP
NP-22	Don't have much idea what is happening in the project. Need to give plenty of notice (~ 6 months).	AI
NP-23	So far I've not been using satellite data. It will help me to verify my numerical models (altimeter) and also to study the spatial distribution of errors for data assimilation systems. I will also be looking at the SAR spectra as it is the only source of observed spectra in my area of interest	GP

Feedback Reference	Description	Good Point (GP) or Area for Improvement (AI)
	(South Pacific).	
NP-24	The validation of models through this system sounds interesting.	GP

A.4   Verbal Discussions

Feedback Reference	Description	Good Point (GP) or Area for Improvement (AI)
VD-1	The ftp site should contain a merged product to contain all the data from the different satellites for that day. This is because many users do not care which satellite the data comes from.	AI
VD-2	It should be possible to browse the archive of data directly from the portal. It is recognised that the user will need to be prompted for a username and password.	AI

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