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ESA Sea Level CCI

D1.3 Data Access Requirements Document

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List of tables and figures

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Applicable documents

AD 1 Sea level CCI project Management Plan
CLS-DOS-NT-10-013

Reference documents

RD 1 ESA CCI EO Data requirements, P Regner, September 09
CLS-DOC

List of Contents

1. Introduction

This document identifies all the data that have been used by the partners to run the various algorithms as well as the data needed for the inter-comparison and selection. A distinction is made between the phase I (2010-2013) and phase II (2014-2016) of the Sea Level CCI project and the information related to phase I are appended at the end of this document. All the partners have contributed to this document.

The required data can be classified into several categories:

- The Instrumental characteristics
- The satellite data from L0 to L2 products. Concerning the satellite data, all the ESA (ERS-1/2, ENVISAT), CNES/EUMETSAT/NASA/NOAA (T/P, Jason-1/2) and US Navy (GFO) mission series will be optimally combined to produce the FCDR and ECV products. Figure 1 summarizes the different dataset and periods that will be used.
- The associated ancillary data
- The products needed for product inter-comparison and selection (in-situ, L3, L4, L5)

All these data are detailed in this document.

Note also that the reference document RD 1 also identifies the EO data required for the Sea level CCI project. They are all reported here, and more exhaustively specified, so this document becomes the applicable reference document.

2. Ordering strategy

Considering the required data to perform the activities of the Sea level CCI project, two categories of products are distinguished:

- data already owned by the partners of the Sea Level CCI consortium. For these data, no detailed information is provided as no ordering is necessary;
- data that are not owned by the partners of the Sea Level CCI consortium, for which detailed information is provided in this document.

Among the data to be ordered, two kinds of delivery are distinguished. We will need a one shot delivery on the overall period of availability. For data (satellite, ancillary …) that are operationally processed, we will need to set up a regular delivery mechanism in order to update the sea level CCI database.

3. Period of study

The reference period for the SLCCI will be 1991-07 to 2010-12 for phase I and the V1 associated products and up to 2015-12 for phase II of the project and the reprocessed V2 associated products. The following plot (Fig.1) shows the availability period for each satellite:

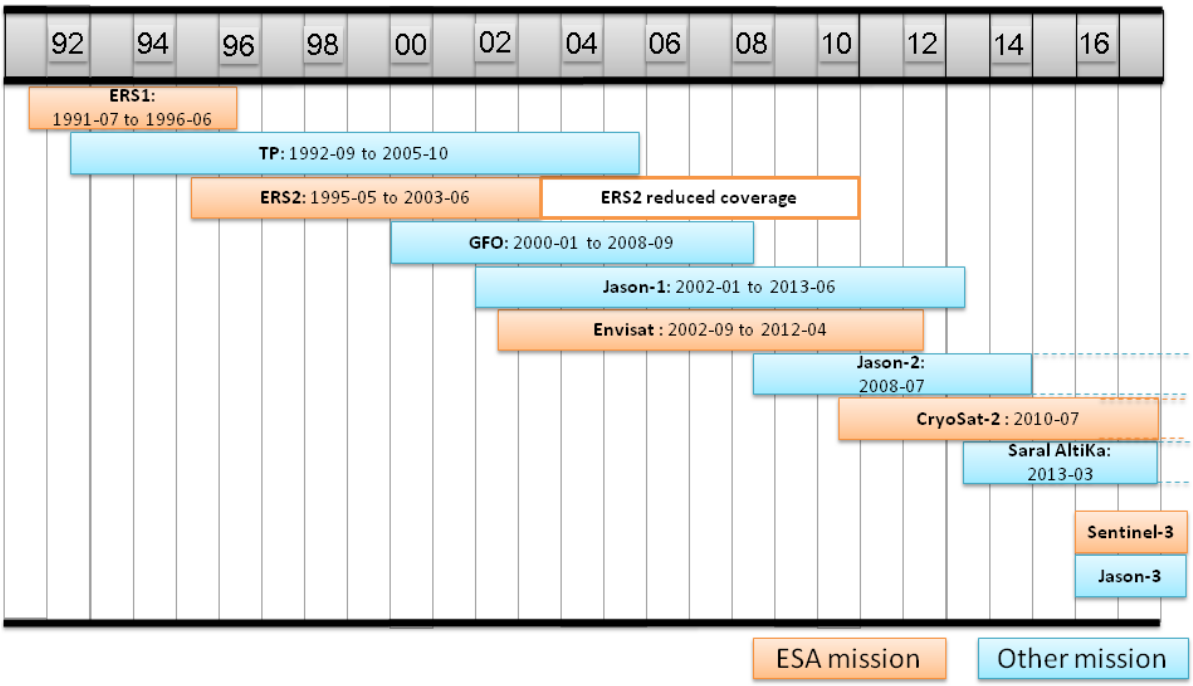

Figure 1: Required satellite data and corresponding time period for SL-CCI project

4. Phasing of the project with the reprocessing activities

4.1. SL-CCI phase I

The information related with Phase I of the project can be found in Appendix B -.

4.2. SL-CCI phase II

The technical developments performed within WP2000 have started on February 2014 and have ended on summer 2015. These new algorithms will be evaluated and the best one will be selected at the end of 2015 for the production of the reprocessed V2.0 sea level ECV products planned in 2016. Thus, the input data have to be available at the beginning of 2014.

The following plot (Fig. 2) shows the phasing of the altimetry activity against the other altimetry projects and in particular with the reprocessing activities considering SL_cci phase II. These reprocessing projects are independent of the SL_cci project. The phasing of the activities thus depends on the schedule of these external projects:

- ERS1/2 REAPER project, available 2014-2015.
- ENVISAT reprocessed data, available in 2016 but the schedule is not detailed yet.
- CryoSat 2 reprocessed ocean products generated by ESA in 2015-2016.
- GDR Saral/AltiKa reprocessing, not available before 2016 (schedule not detailed yet).
- GDR-E Jason-1 CNES reprocessing, expected by the end of 2015.

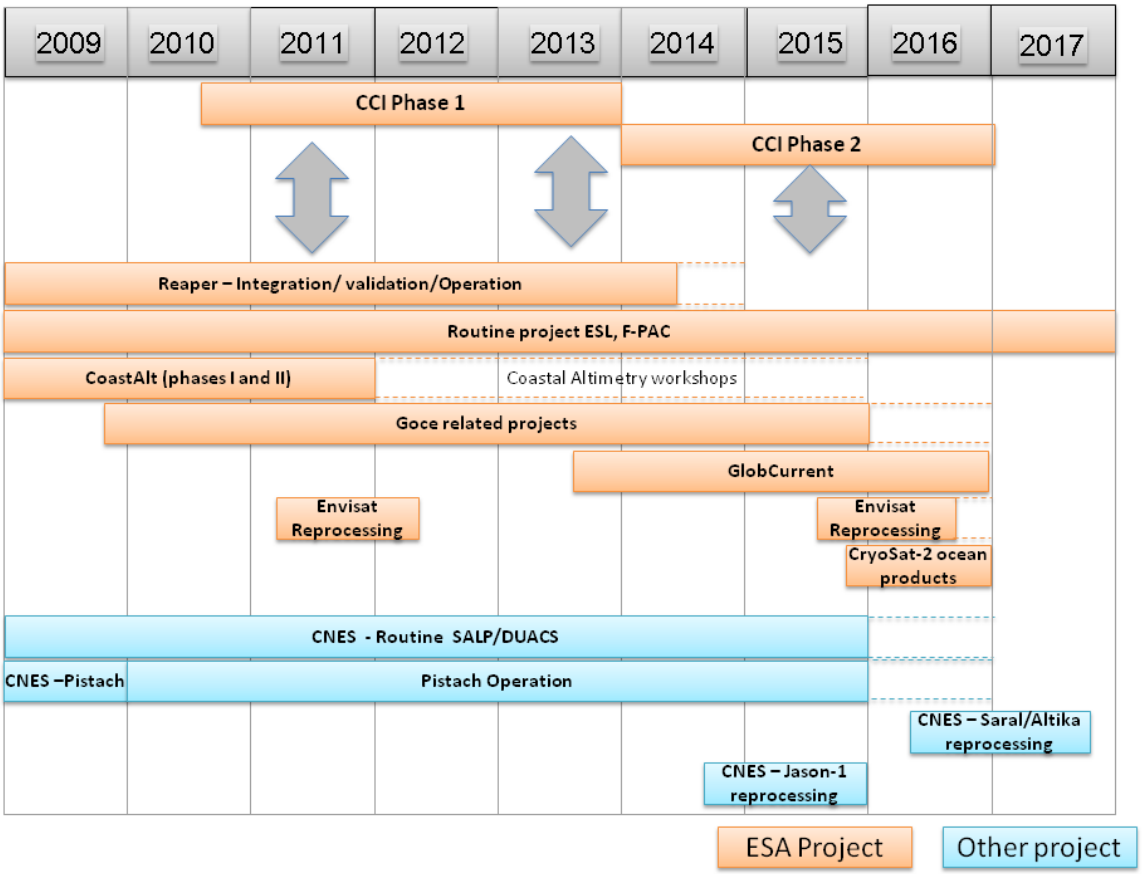

Figure 2: Phasing of the SL-CCI phase II with other projects

5. List of data required

5.1. SL-CCI phase I

The information related with Phase I of the project can be found in Appendix C -.

5.2. SL-CCI phase II

The following tables describe the data required to perform the algorithm development and the inter-comparison and selection task within SL-CCI phase II.

Table 1 lists the data that are already available at partner premises.

Products available	Period	Data volume
ERS-1 OPR Phase C OPR V6 Phase E OPR V3 Phase F OPR V3 Phase G OPR V6	07-1991 / 06-1996	75 Go
ERS-2 OPR V6	05-1995 / 06-2003	120 Go
Envisat GDR 2.1 MWR data 2.2b	09-2002 / 04-2012	160 Go
T/P MGDR	09-1992 / 10-2005	195 Go
Jason-1 GDR-E (expected in December 2014)	01-2002 / 06-2013	165 Go
Jason-2 GDR-D	07-2008 onwards	>=90 Go
GFO GDR NOAA	01-2000 / 09-2008	120 Go
Tide gauges time series	1991 onwards	40 Go
Argo data	2004 onwards	50 Go
Multi-mission Sea level from the DUACS/SLTAC system	1993 onwards	30 Go
GRACE GFZ coefficients	2002-2013	100 MB
GRACE GFZ R5a coeff. (GSM, GAC, GAD), from GFZ/GRGS. Option TUD WP1100.	2002-2014	
Steric sea level: gridded Temperature and	1993-2014	

salinity, from Ishii. Option TUD WP1100		
Land hydrology WaterGAP2 from GFZ. Total water storage. Option TUD WP1100.	2002-2014	
Evaporation 1-deg monthly, OAFLUX, from WHOI. Option TUD WP1100.	1993-2014	
GPCP precipitation, 2.5 deg monthly mean, from NOAA. Option TUD WP1100	1993-2014	
River runoff time series from WaterGAP2. Option TUD WP1100 (collaboration with GFZ)	2002-2015	
GPS raw data at TG German Bight. GNSS from BfG. Option TUD WP1200. TUDa access agreement with local organizations	2008-2015	
In-situ gauge data, wave height, wind time series from BfG, BSH. Option TUD WP1200. TUDa access agreement with local organizations	2008-2015	
Ellipsoid height at TG in Med from AVISO, SONEL. Option TUD WP1200	2008-2015	
ERA Interim model meteo fields. Mean Sea level pressure and 10m winds from ECMWF. Option TUD WP1200	2008-2015	
BSHcmod Operational model: sea level 0.25h, 0.08x0.05deg from BSH. Option TUD WP1200. TUDa access agreement with BSH and DWD	2008-2015	
LSM model wave, LSM, 3h, 0.17x0.10deg from BSH/DWD. Option TUD WP1200. TUDa access agreement with BSH and DWD	2008-2015	
COSMO-EU wind: COSMO-EU, 1h, 0.08x0.05deg from BSH/DWD. Option TUD WP1200. TUDa access agreement with BSH and DWD	2008-2015	
ATNE-WW3 wave: ATNE-WW3, 3h, 0.17x0.25deg from IFREMER. Option TUD WP1200.	2008-2015	
ECMWF wind: ECMWF forecast, 3h, 16km no	2008-2015	

grid from ECMWF. Option TUD WP1200. Access via agreement with DWD/ECMWF.		

Table 1: List of data already available at partners premises

The following tables list the data that will be used for phase II.

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110/ CLS	Envisat reprocessing	L2	EN	ESA	whole mission		FTP	
WP2110 / CLS	New ocean tide correction (FES 2012/2014)	L2	EN		whole mission		FTP	
WP2110 / CLS	New atmospheric correction	L2	EN		whole mission		FTP	
WP2130 / isardSAT	Envisat reprocessing	L2	EN	ESA	whole mission		FTP	
WP2310 / UPorto	Global GPD correction possibly improved over the selected regions	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the various TBs and associated flags.	EN	SL-CCI data base	whole mission		FTP	
WP2410 / UPorto	Global GPD wet troposphere correction	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the various TBs and	EN	SL-CCI data base	whole mission		FTP	

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
		associated flags.						

Table 2: List of data to be ordered for Envisat

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110/ CLS	ERS-1 ERS-2 Reaper reprocessing	L2	E1 E2	ESA	whole missions		FTP	Required for Sept. 2014
WP2110 / CLS	New ocean tide correction (FES 2012/2014)	L2	E1 E2		whole missions		FTP	
WP2110 / CLS	New atmospheric correction	L2	E1 E2		whole missions		FTP	
WP2310 / UPorto	Global GPD correction possibly improved over the selected regions	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the various TBs and associated flags.	E1 E2	SL-CCI data base	whole missions		FTP	
WP2410 / UPorto	Global GPD wet troposphere correction	Along-track altimeter files	E1 E2	SL-CCI data base	whole missions		FTP	

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
		containing pass, time, location and all relevant MWR parameters, including the various TBs and associated flags.						

Table 3: List of data to be ordered for ERS1/2

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110 / CLS	Jason-1 GDR-E reprocessing	L2	J1	CNES	whole mission		FTP	
WP2110 / CLS	New ocean tide correction (FES 2012/2014)	L2	J1 J2		whole missions		FTP	
WP2110 / CLS	New atmospheric correction	L2	J1 J2		whole missions		FTP	
WP2120 / GFZ	New orbit solution	Orbit data	J1 J2	IDS, ILRS, IGN, GFZ	J1: 12/2001 - 07/2013, J2: 06/2008 - 12/2014	J1: 25 G, J2: 10 G	FTP	Data already available to GFZ: - Satellite macro- and attitude models; - Optical properties of the surfaces; - Satellite orbit maneuver instants, accelerations and mass;

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Deliver y	Comment
								- South Atlantic Anomaly model for JASON-1; - SLR and DORIS data; - Earth orientation parameters; Data to be obtained: - ITRF2013 realization (expected from IGN in October-December 2014), - a new Earth time-variable gravity field model (expected from GFZ/GRGS in Autumn 2014), - new other improved background models for precise orbit determination (to be implemented in the GFZ EPOS-OC software in Summer 2014)
WP2310 / UPorto	Global GPD correction possibly improved over the selected regions	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the various TBs and associated flags.	J1 J2	SL-CCI data base	whole missions up to end of 2014.		FTP	
WP2410 / UPorto	Global GPD wet troposphere correction	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the	J1 J2	SL-CCI data base	whole missions up to end of 2014.		FTP	

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
		various TBs and associated flags.						

Table 4: List of data to be ordered for Jason1/2

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110 / CLS	Correction of TOPEX anomalies	L2	TP		whole mission		FTP	
WP2110 / CLS	New ocean tide correction (FES 2012/2014)	L2	TP		whole mission		FTP	
WP2110 / CLS	New atmospheric correction	L2	TP		whole mission		FTP	
WP2120 / GFZ	New orbit solution	Orbit data	TP	IDS, ILRS, IGN, GFZ	01/1993 – 10/2005	TP: 30 Gb	FTP	Data already available to GFZ: - Satellite macro- and attitude models; - Optical properties of the surfaces; - Satellite orbit maneuver instants, accelerations and mass; - SLR and DORIS data; - Earth orientation parameters; Data to be obtained: - ITRF2013 realization (expected from IGN in October-December 2014), - a new Earth time-variable gravity field model (expected from GFZ/GRGS in Autumn 2014), - new other improved background models for precise orbit determination (to be implemented in the GFZ EPOS-OC software in Summer 2014)
WP2310 / UPorto	Global GPD correction possibly improved over the selected regions	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the	TP	SL-CCI data base	whole mission		FTP	

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
		various TBs and associated flags.						
WP2310 / UPorto	Global GPD wet troposphere correction	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the various TBs and associated flags.	TP	SL-CCI data base	whole mission		FTP	

Table 5: List of data to be ordered for TOPEX/Poseidon

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110 / CLS	New ocean tide correction (FES 2012/2014)	L2	GFO		whole mission		FTP	
WP2110 / CLS	New atmospheric correction	L2	GFO		whole mission		FTP	

Table 6: List of data to be ordered for GFO

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110 / CLS	Reprocessed GDR	L2	Saral/AltiKa	CNES	whole mission		FTP	
WP2110 / CLS	New ocean tide correction (FES 2012/2014)	L2	Saral/AltiKa		whole mission		FTP	
WP2110 / CLS	New atmospheric correction	L2	Saral/AltiKa		whole mission		FTP	
WP2310 / UPorto	Global GPD correction possibly improved over the selected regions	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the various TBs	Saral/AltiKa	SL-CCI data base	whole mission up to end of 2014.		FTP	

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
		and associated flags..						
WP2410 / UPorto	Global GPD wet troposphere correction	Along-track altimeter files containing pass, time, location and all relevant MWR parameters, including the various TBs and associated flags.	Saral/AltiKa	SL-CCI data base	whole mission up to end of 2014.		FTP	

Table 7: List of data to be ordered for Saral/AltiKa

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110 / CLS	New CryoSat-2 ocean products	L2	CS2	CNES	Whole mission		FTP	Only 1 year of ESA GOP product is available (the full reprocessing is planned in 2016) and L2P (validated sea level products over the ocean) do not exist. Thus, CryoSat altimetry database derived from CNES CPP products will be used for the SL_cci v2.0.
WP2110 / CLS	New ocean tide correction (FES 2012/2014)	L2	CS2		whole mission		FTP	
WP2110 /	New atmospheric correction	L2	CS2		whole mission		FTP	

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
CLS								
WP2310 / UPorto	Global GPD correction possibly improved over the selected regions	Along-track altimeter files containing all relevant parameters: pass, time, location and model WTC	CS2	SL-CCI data base	whole mission up to end of 2014.		FTP	
WP2410 / UPorto	Global GPD correction possibly improved over the selected regions	Along-track altimeter files containing all relevant parameters: pass, time, location and model WTC	CS2	SL-CCI data base	whole mission up to end of 2014.		FTP	

Table 8: List of data to be ordered for CryoSat-2

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2110 / CLS	ERA Interim model Meteo fields	Aux files	-	ECMWF				Atmospheric fields requested: • Model Levels: o Specific humidity 3D (q3d - code 133) o Temperature 3D (t3d - code 130) o Logarithm of surface pressure (code 152) • Surface: o 2m temperature (t2m - code 167) o 2m dewpoint (td2m - code 168) o Mean Sea Level Pressure code 151 o 10m winds (U/V comp.) codes 165 and 166 • The data requested are analysed files (4 times/day: 00h, 06h, 12h, 18h) on N128 reduced gaussian grids (0.7 ° resolution) and all hybrid model levels for the 3D fields.
WP24/ CLS	ERA-Clim new ECMWF reanalysis Meteo fields	Aux files	-	ECMWF				Atmospheric fields requested: • Model Levels: o Specific humidity 3D (q3d - code 133) o Temperature 3D (t3d - code 130) o Logarithm of surface pressure (code 152) • Surface: o 2m temperature (t2m - code 167) o 2m dewpoint (td2m - code 168) o Mean Sea Level Pressure code 151 o 10m winds (U/V comp.) codes 165 and 166 The data requested are analysed files (4 times/day: 00h, 06h, 12h, 18h) on N128 reduced gaussian grids (0.7 ° resolution) and all hybrid model levels for the 3D fields.
WP2110 / CLS	New MSS	Aux file	-	CNES/CLS				
WP2420 / CLS	Impact of new reanalysis on DAC and WTC	Japanese JRA-55 atmospheric reanalysis		Japanese Meteorological Institute	1992-2014			

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP 2310, WP 2410 UPorto	Global GPD wet tropospheric correction	GNSS data; Water vapor products from scanning imaging radiometers; data from ECMWF operational and most recent reanalysis models	N/A	IGS, EPN, SuomiNet; ECMWF; various data centers	1992-2014		FTP	UPorto has direct access to these datasets

Table 9: List of ancillary files to be ordered (common for all altimeter missions)

6. Summary

This document and in particular section 5.1 and 5.2 provide the list of necessary data to run the algorithms and to perform the inter-comparison and selection task within SL-CCI phase I and phase II of the project. It includes satellite data from 9 altimeter missions (ERS-1, ERS-2, Envisat, Jason-1, Jason-2, T/P, GFO, CryoSat-2 and AltiKa) as well as ancillary and in-situ data.

Appendix A - **List of acronyms**

CLS	Collecte Localisation Satellite
CNES	Centre National d'Etudes Spatiales
COSMO-EU	COSMO Europa
CPP	Cryosat Processing Prototype
DAC	Dynamical Atmospherical Correction
DORIS	Doppler Orbitography and Radiopositioning Integrated by Satellite
DTU	Denmark Technical University
DUACS	Data Unification and Altimeter Combination System
DWD	Deutscher WetterDienst
ECMWF	European Centre for Medium-range Weather Forecasts
EN	EnviSat
ERA	ECMWF ReAnalysis
ESA	European Space Agency
FES	Finite Element Solution
GCOS	Global Climate Observing System
GDR	Geophysical Data Record
GFO	GeoSat-Follow-On
GFZ	Deutsche GeoForschungsZentrum
GIA	Glacial Isostatic Adjustment
GMSL	Global Mean Sea Level
GMWS	Global Mean Wind Speed
GNSS	Global Navigation Satellite System
GOT	Goddard Ocean Tide
GPD	GNSS-derived Path Delay
GPS	Global Positionning System
GRACE	Gravity Recovery and Climate Experiment
GRGS	Groupe de Recherche en Géodésie Spatiale
GSFC	Goddard Space Flight Center
IFREMER	Institut Français de Recherche pour l'Exploitation de la Mer
IGN	Institut National de l'Information Géographique et Forestière
ITRF	International Terrestrial Reference Frame
J1	Jason-1
J2	Jason-2
JMR	Jason-1 Microwave Radiometer
JRA	Japanese Re-Analysis
LSR	Least Square Regression

MGDR	Merged Geophysical Data Record
MSL	Mean Sea Level
MSS	Mean Sea Surface
MWR	Micro-Wave radiometer
NOAA	National Oceanographic and Atmospheric Administration
OSTST	Ocean Surface Topography Science Team
POD	Precise Orbit Determination
RBU	Relative Bias Uncertainty
RMSL	Regional Mean Sea Level
SALP	Satellite Altimetry Localisation Précise (CNES project)
SLA	Sea level Anomalies
SLCCI	Sea Level - Climate Change Initiative
SLR	Satellite Laser Ranging
SONEL	Système d'Observation du Niveau des Eaux Littorales
SSB	Sea State Bias
STD09	Standard-09
SWH	Significant Wave Height
T/P	TOPEX/Poséidon
TG	Tidal Gauge
TMR	Topex Radiowave Radiometer
WTC	Wet Tropospheric Correction
WW3	WaveWatch III

Appendix B - **Phasing of the project with reprocessing activities (Phase I)**

WP2000 will start on 15/10/2010 and will end 15/01/2012. The deadline for the generation of the Round Robin Data package is October 15th 2011. This means that input data have to be available around mid 2010 at the latest.

The following plot (Fig. 3) shows the phasing of the altimetry activity against the other altimetry projects and in particular with the reprocessing activities considering the phase I of the SL-CCI.

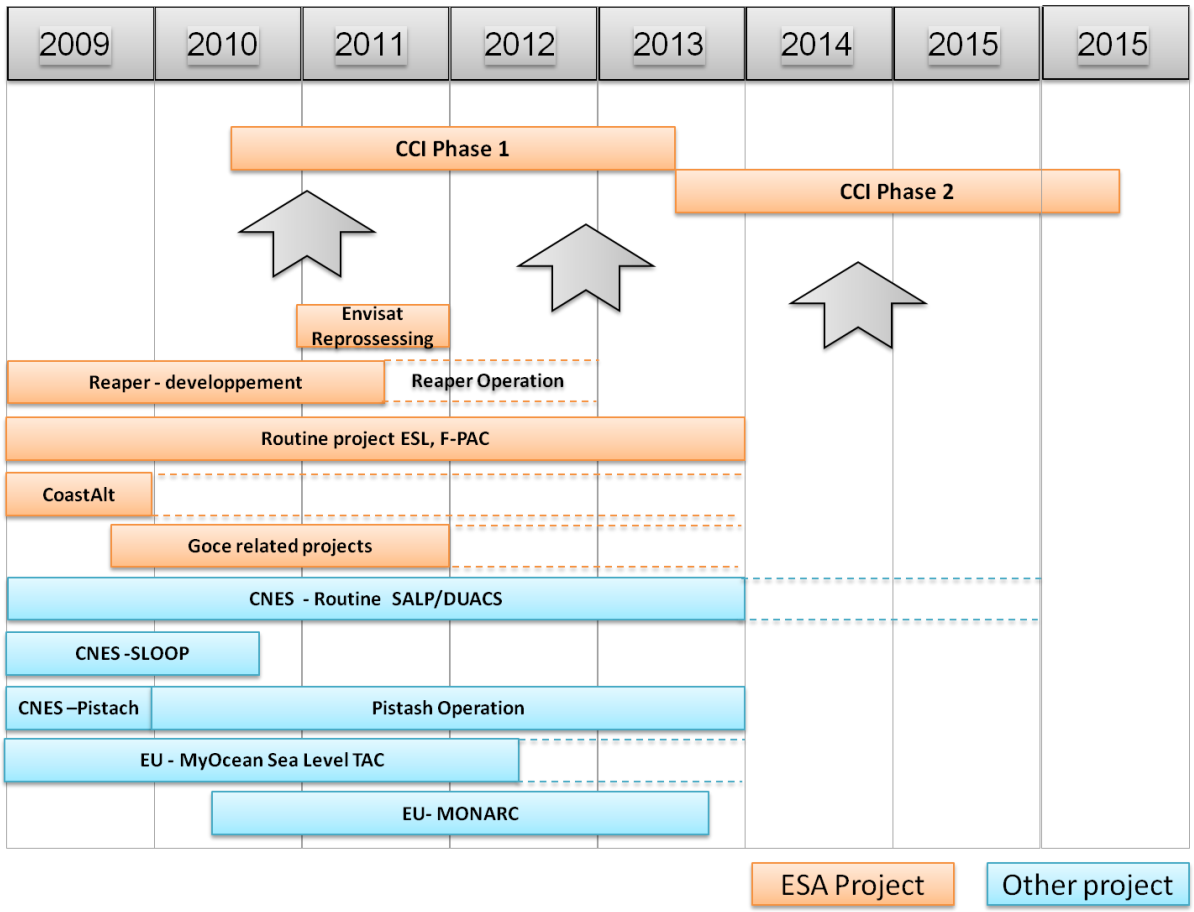

Figure 3: Phasing of the SL-CCI Phase I with other projects

Two projects are of major importance for the CCI project, the Envisat reprocessing, and the Reaper ERS1/2 reprocessing project. Unfortunately, these two projects are not well phased with WP2000:

- Envisat reprocessing activities are expected to start in January 2011 and are likely to last 1 year. Half of the mission should be available by mid 2011 in reprocessed version. Moreover 1 year of reprocessed data will be rapidly available by early 2011 allowing the Envisat ESL project to compute a SSB table compatible with the reprocessed data.
- The start of the operational phase of the Reaper ERS1/2 reprocessing project is not known today but no activity is foreseen before mid 2011. Consequently the Level-2 data, outputs of this reprocessing project, will thus not be available in time for the CCI project. However, the use of the auxiliary files associated will be interesting. The following Reaper auxiliary files are of interest:
    - Reaper ERS1/2 ionosphere correction based on NIC09

- Reaper ERS1/2 Orbit solution: availability end 2010
- Reaper ECMWF ERA INTERIM meteo files 1st quarter 2011

Appendix C - **List of data required (Phase I)**

The following tables describe the data required to perform the algorithm development and the inter-comparison and selection task within SL-CCI phase I.

Table 10 lists the data that are already available at partner premises.

Products available
ERS-1 OPR Phase C OPR V6 Phase E OPR V3 Phase F OPR V3 Phase G OPR V6
ERS2 OPR V6
Envisat GDR 1
T/P MGDR
Jason-1 GDR-C
Jason-2 GDR-C
GFO GDR NOAA
Tide gauges time series
Argo data
Multi-mission Sea level from the DUACS/SLTAC system
Envisat Level 0 product 2002-07/2009
NCEP meteo fields
Envisat SSB table (Tran 2011)

Table 10: List of data already available at partner premises

The following tables list the data that will have to be ordered.

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP21/ IsardSAT	Envisat On-board (House Keeping) USO temperatures	Instrumental information	EN	ESA	EN: 09/2002-12/2010	30G (10M/day)	ftp	On-board USO temperatures (H0066 for USO TEMP A, and H1066 for USO TEMP B)
WP21/ IsardSAT	Envisat and ERS 1-2 satellite unavailability's (switch's on/off)	Instrumental information	E1 E2 EN	ESA	E1: 07/1991-06/1996 E2: 05/1995-06/2003 EN: 09/2002-12/2010	-	ftp	-
WP21/ IsardSAT	Envisat Level 0 product	Level0	EN	ESA via FPAC/CNES	07/2009-01/2010	200G (1G/d).	USB disc	A routine delivery to be open for current data
WP21/ IsardSAT	Envisat Level 1 product used for routine processing	Level 1	EN	ESA via FPAC/CNES	09/2002-12/2010	3.5T (1G/d).	USB disc	A routine delivery to be open for current data
WP21/ IsardSAT	Envisat Auxiliary files used for the reprocessing	Aux files	EN	ESA via FPAC/CNES	EN: 09/2002-12/2010	100M	ftp	IF filter, Configuration files, Characterisation files: • All RA2_CHD used for reprocessing • All RA2_CON_AUX used for reprocessing • All RA2_IFF_AUX used for reprocessing
WP2/ GFZ	Data for orbit computation of Envisat	Orbit data	EN	ESA	EN: 09/2002-12/2010	~10G ~20G (~5M/day)	FTP	contact person: Michiel Otten Detail of data: *- Macro models (for verification);* *- actual (measured) attitude models (for verification), in particular in quaternion form, if exist* *(c.f. examples for Jason-1/2 at ftp://ftp.ids-doris.org/pub/ids/ancillary/quaternions/jason1_2_quaternion_solar_panel.pdf* *ftp://cddis.gsfc.nasa.gov/pub/doris/ancillary/quaternions/ja1/).*

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2/ GFZ	Data for orbit computation of Envisat	Orbit data	EN	CNES	EN: 09/2002-12/2010	~15G		Contact person: Nicolas Picot Details on data: *- Optical properties of the surfaces* *- Satellite orbit manoeuvre instants, accelerations and mass* *- Daily initial state vectors (cartesian coordinates and velocities)* *- MOG2D and GOT4.7 ocean tide models for inclusion into Altimeter Database and Processing System (ADS).*
WP27/ FCUP	Envisat Level 2 informations	L2	EN	ESA	EN: 09/2002-12/2010	520 G (185M/d)	ftp	The needed fields are: • Time • Latitude • Longitude • Dry tropospheric correction from ECMWF • Wet tropospheric correction from the microwave radiometer (MWR) • Wet tropospheric correction from ECMWF • Altimeter land/ocean flag • Radiometer land/ocean flag • GDR:MWR Quality Interpolation Flag (only for Envisat)

Table 11: List of data to be ordered for Envisat

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP21/ IsardSAT	ERS-1 ERS-2 Reaper instrument corrections	Aux files	E1 E2	ESA	E1: 07/1991-06/1996 E2: 05/1995-06/2003	-	-	
WP2/ GFZ	Data for orbit computation of ERS-1/2 mission	Orbit data	E1 E2	ESA	E1: 07/1991-06/1996 E2: 05/1995-06/2003	~10G ~20G (~5M/day)	FTP	contact person: Michiel Otten Detail of data: *- Macro models(for verification);* *- actual (measured) attitude models for (for verification), in particular in quaternion form, if exist* *(c.f. examples for Jason-1/2 at ftp://ftp.ids-doris.org/pub/ids/ancillary/quaternions/jason1_2_quaternion_solar_panel.pdf* *ftp://cddis.gsfc.nasa.gov/pub/doris/ancillary/quaternions/ja1/).* *Note that ERS-1/2 attitude is modeled in REAPER project as nominal. Use of actual (measured) attitude could improve orbit quality.*
WP22/ CLS	Reaper orbit solutions	Aux files	E1 E2	ESA/Reaper project	E1: 07/1991-06/1996 E2: 05/1995-12/2010	500M	ftp	Orbit solution in sp1 format The 4 Reaper solutions and the result of the selection will be delivered by the end of March. These orbits will be available to the scientific community, and thus no problem is foreseen for an evaluation in the SLCCI. To be checked (Action Pierre)
WP23/ CLS	L1.5 MBT ERS1 and ERS2 2 (Brightness temperature products)	L1	E1 E2	ESA via F-PAF/IFREMER	E1: 07/1991-06/1996 E2: 05/1995-06/2003	250G (50M/day)	FTP	Fields requested • TB 23.8 GHz at 1 Hz on all surfaces • TB 36.5GHz at 1 Hz on all surfaces

Table 12: List of data to be ordered for ERS1/2

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2/ GFZ	Data for orbit computation of J1/2	Orbit data	J1 J2	CNES	J1: 01/2002-12/2010 J2: 07/2008-12/2010	~15G ~5G		Contact person: Nicolas Picot Details on data: *Macro and attitude models;* *- Optical properties of the surfaces* *- Satellite orbit manoeuvre instants, accelerations and mass* *- South Atlantic Anomaly model for JASON-1;* *- DORIS data ;* *- Daily initial state vectors (cartesian coordinates and velocities)* *- attitude model in quaternion form* *- GPS data (GPS data for only 2002-2003 for JASON-1 are available at ftp://cddis.gsfc.nasa.gov/gps/data/satellite/jason/; hopefully, could be provided by CNES for the whole missions);* *- MOG2D and GOT4.7 ocean tide models for inclusion into Altimeter Database and Processing System (ADS).*

Table 13: List of data to be ordered for Jason1/2

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2/ GFZ	Data for orbit computation of T/P	Orbit data	T/P	NASA /CNES	T/P: 09/1992-10/2005	~25G		Contact person: Nicolas Picot Details on data: *Macro and attitude models;* *- Coordinates of satellite laser ranging (SLR) retroreflector array, DORIS,* *GPS and radar altimeter instruments in the spacecraft body fixed system;* *- SLR retroreflector corrections;* *- GPS data.*

Table 14: List of data to be ordered for Topex-Poseidon

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP2/ GFZ	Data for orbit computation of GFO	Orbit data	GFO	NOAA	GFO: 01/2000-09/2008	~15G		Franck Lemoine and/or J Lillibridge to be contacted

Table 15: List of data to be ordered for GFO

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Delivery	Comment
WP24/ CLS	Reaper Meteo fields based on ERA Interim	Aux files	-	ESA/Reaper	01/07/1991-31/12/2009	700G (100M/day)	ftp	Fields requested: • Wet troposphere correction • Dry troposphere correction • Invert Barometer P Femenias gives an agreement to use the Reaper Meteo fields in the SLCCI. They should be available within 1st quarter 2011.

WP24/ CLS	ERA INTERIM model Meteo fields	Aux files	-	ECMWF	01/01/2010-31/12/2010	32G (100M/day)	FTP	Atmospheric ields requested:
								• Model Levels:
								  ○ Specific humidity 3D (q3d - code 133)
								  ○ Temperature 3D (t3d - code 130)
								  ○ Logarithm of surface pressure (code 152)
								• Surface:
								  ○ 2m temperature (t2m - code 167)
								  ○ 2m dewpoint (td2m - code 168)
								  ○ Mean Sea Level Pressure code 151
								  ○ 10m winds (U/V comp.) codes 165 and 166
								The data requested are analysed files (4 times/day: 00h, 06h, 12h, 18h) on N128 reduced gaussian grids (0.7 ° resolution) and all hybrid model levels for the 3D fields.
								A routine delivery to be open for current data
								Note that 01/07/1991-31/12/2009 was delivered as part as the Reaper project.
								The SeaLevel-cci team will not make the received ecmwf data set publicly available. If ECMWF data is made available to others, it will only be the ecmwf data interpolated to the satellite footprints. The interpolation will be done by CLS only.

WP24/ CLS	ERA INTERIM additional fields	Aux files	-	ECMWF	01/07/1991-31/12/2010	36G (5M/day)	FTP	Atmospheric surface fields requested: • Sea surface temperature (grib code 34)

Needed by	Product and version	Data type	Sat	Source	Period needed	Data volume	Deliver y	Comment
								• Sea-ice cover (grib code 31) • wind stress for u and v (grib code 180+181) The data requested are analysed files (4 times/day: 00h, 06h, 12h, 18h) on N128 reduced gaussian grids (0.7 ° resolution) <u>Wave fields requested</u> • Mean wave direction (grib code 230) • Mean wave period (grib code 232) • Significant wave height (grib code 229) • Significant height of total swell (grib code 237) • Significant height of wind wave (grib code 234) The data requested are analysed files (4 times/day: 00h, 06h, 12h, 18h) on N128 reduced gaussian grids (0.7 ° resolution) A routine delivery to be open for current data. The SeaLevel-cci team will not make the received ecmwf data set publicly available. If ECMWF data is made available to others, it will only be the ecmwf data interpolated to the satellite footprints. The interpolation will be done by CLS only.

Table 16: List of ancillary files to be ordered (common for all altimeter mission