Dataset for validation and long term referencing

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Ocean: Coastal	1.0	29/05/2015	Final version	Patrick Dich Grode
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Dataset for validation and long term referencing

1 Data description

This document describes reference and validation datasets for the various sub themes including both multi-mission altimetry data and in situ data. The individual reference datasets are described below for each sub theme.

2 Land - River and lakes

This section describes reference and validation data sets for inland water. The table below gives an overview of the different datasets for each test area. The individual data set contains a header except Envisat and Saral/Altika data, which is described below.

Table 1 - River and lakes - Reference datasets

Test Area	Data name	Data type	Data description	Datum	Reference
Denmark	REF_1_LAN_DK	Satellite altimetry	Envisat GDR, 18Hz	WGS 84	ESA
	REF_2_LAN_DK	Satellite altimetry	Altika SGDR, 40Hz	Topex/Poseidon	AVISO
	REF_3_LAN_DK	Airborne laser data	Average lake levels for selected Danish lakes	DVR 90	http://gst.dk/
	REF_4_LAN_DK	Lake gauges	Daily time series for 2013 for Arresø and Furresø	Unknown local reference	Naturstyrelsen
Brahmaputra	REF_1_LAN_BRAHM	Satellite altimetry	Envisat GDR, 18 Hz	WGS 84	ESA
Amazon	REF_1_LAN_AM	Satellite altimetry	Altika SGDR, 40Hz	Topex/Poseidon	AVISO
Thailand	REF_1_LAN_THAI	Satellite altimetry	Envisat GDR, 18 Hz	WGS 84	ESA

	REF_2_LAN_THAI	Satellite altimetry	Altika SGDR, 40Hz	Topex/Poseidon	AVISO
	REF_3_LAN_THAI	River gauges	Daily time series	MSL	Hydro and Argo Informatics Institute, Thailand
Lake Vänern, Sweden	REF_1_LAN_VS	Lake gauge	Daily time series	RH 00	Swedish Meteorological and Hydrological Institute
Lake Okeechobee, FL, US	REF_3_LAN_OFU	Lake gauge	Daily time series	NGVD 1929	http://waterdata.usgs.gov/nwis
Brhamaputra	RLH	Satellite altimetry	ESA River&Lake product (.rlh)	Relative differences	N/A
Brahmaputra	River Mask	LANDSAT	Raster dataset	WGS84	N/A
Brahmaputra	SRTM	SRTM	Raster dataset	WGS84	N/A
Brahmaputra	In Situ	River gauges	Daily time series	None	N/A

2.1 Description of Envisat data

Table 2 - River and lakes - Reference datasets - Envisat data

Column name	Column description
Orbit No	N/A
Latitude	N/A
Longitude	N/A
Time	Seconds since January 1 2000
H_Ice1	Surface elevation in m relative to WGS 84 based on the Ice1 retracker
H_Ice2	Surface elevation in m relative to WGS 84 based on the Ice2 retracker

2.2 Description of Altika data

Table 3 - River and lakes - Reference datasets - AltiKa data

Column name	Column Description
Cycle No	N/A
Orbit No	N/A
Year	N/A
Month	N/A
Day	N/A
DecYear	Decimal years
Latitude	N/A
Longitude	N/A

H_Ice1	Surface elevation in m relative to Topex/Poseidon based on the Ice1 retracker
H_Ice2	Surface elevation in m relative to Topex/Poseidon based on the Ice2 retracker

3 Land - Soil moisture

This section contains soil moisture datasets used as reference to be compared with soil moisture estimation from altimetry (CryoSat-2). Those soil moisture estimates derived from Jason2 data over the three CSME validation deserts. As for the Cryosat2 CSME products, these estimates are track-based, with one averaged value for each pass. Jason2 has a 10-day repeat orbit. This has allowed one product to be delivered over the Simpson desert (the only long track crossing the desert). Over the Kalahari and Tenere deserts, two products are delivered, from two repeat passes over each desert. These have been selected to cross the deserts at widely separated locations, to permit the spatial differences in soil moisture variation to be examined, and thus allow a better comparison with the dense spatial sampling of the Cryosat2 estimates.

The individual data set contains a header, which is described below.

Table 4 - Soil moisture - Reference datasets

Test Area	Data name	Data type	Data description
Kalahari desert	CRYSM_J2_Kalahari_Product1	Satellite altimetry	Jason2 LRM
	CRYSM_J2_Kalahari_Product2	Satellite altimetry	Jason2 LRM
Simpson desert	CRYSM_J2_Simpson_Product1	Satellite altimetry	Jason2 LRM
Tenere desert	CRYSM_J2_Tenere_Product1	Satellite altimetry	Jason2 LRM
	CRYSM_J2_Tenere_Product2	Satellite altimetry	Jason2 LRM

4 Land - Snow depth

As the snow depth estimation process stayed at research level as agreed with the European Commission, not any snow depth datasets have been produced, and thus not any reference datasets was used to validate the datasets.

5 Ocean - Open ocean

This section details the reference datasets used to evaluate and validate the open ocean datasets.

Table 5 - Open ocean - Reference datasets

Test Area	Data name	Data type	Data description	Datum	Reference

Ekofisk (North Sea)	Ekofisk_Observations_2012-05-01_-_2014-05-01.xlsx	In-situ	Anemometer	Wind speed	Norwegian Meteorological institute (eklima): http://sharki.oslo.dnmi.no/portal/page?_pageid=73,39035,73_39049&_dad=portal&_schema=PORTAL
Ekofisk (North Sea)	Ekofisk_Observations_2012-05-01_-_2014-05-01.xlsx	In-situ	Wave rider	Significant wave height	Norwegian Meteorological institute (eklima): http://sharki.oslo.dnmi.no/portal/page?_pageid=73,39035,73_39049&_dad=portal&_schema=PORTAL
North East Atlantic	DHI_Jason-2	Altimeter	Jason-2	Wind speed & Significant wave height	DHI_Jason-2 (NASA)
North East Atlantic	DHI_CFSR	Model	The Climate Forecast System Reanalysis (CFSR)	Wind speed	DHI_CFSR (NOAA)
North East Atlantic	DHI_M21SW	Model	Mike by DHI Spectral wave model	Significant wave height	DHI_M21SW (NE Atlantic)

6 Ocean - Coastal area

This section details the reference datasets used to evaluate and validate the Coastal areas datasets.

Table 6 - Coastal area - Reference datasets

Test Area	Data name	Data type	Data description	Datum	Reference
Huibergat (Dutch coast)	potwind_285_2011.dat	In-situ	Anemometer	Wind speed	Royal Netherlands Meteorological Institute. http://www.knmi.nl/samenw/hydra
Schiermonnikoog (Dutch coast)	id22-SCHIERMNOND-201205010000-201405012359.txt	In-situ	Directional wave rider	Significant wave height	Rijkswaterstaat: http://live.waterbase.nl/waterbase_wns.cfm?taal=en
North East	DHI_Jason-2	Altimete	Jason-2	Wind speed &	DHI_Jason-2 (NASA)

Atlantic		r		Significant wave height	
North East Atlantic	DHI_CFSR	Model	The Climate Forecast System Reanalysis (CFSR)	Wind speed	DHI_CFSR (NOAA)
North East Atlantic	DHI_M21SW	Model	Mike by DHI Spectral wave model	Significant wave height	DHI_M21SW (NE Atlantic)

7 Ocean - Polar ocean

This section details the reference datasets used to evaluate and validate the Coastal areas datasets.

Table 7 - Polar ocean - Reference datasets

Test Area	Data name	Data type	Data description	Datum	Reference
Svalbard	Ny Aalesund	Tide gauge	1993 - 2013	Monthly sea surface height	Psmsl.org
Svalbard	AltiKa	Altimeter	2013-onvards 78-82N, 0-14E	SSH, windspeed and significant waveheight	RADS Rads.tudelft/nl/experts /manual.pdf
Svalbard	Envisat	Altimeter	2002-2011 78-82N, 0-14E	SSH, windspeed and significant waveheight	RADS Rads.tudelft/nl/experts /manual.pdf