



MONARCH-A

Collaborative Project

D5.1.4 Report on service level agreement with GMES core services and ESA CCI

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Project Coordinator: Johnny A. Johannessen	Due month 6 Delivered month 12
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Table of content

- 1. Introduction**
- 2. Status**
- 3. Conclusion**

1. Introduction

Under the management task (WP 5) in MONARCH-A it is planned to establish and maintain contact with the GMES core services and the relevant ESA CCI projects. This is handled in Task 5.4 with the specific objectives to establish service level agreements with MyOcean and G-2 in which the user requirements from the MONARCH-A projects are mapped on to the service specification and product catalogues provided in these GMES core services. In addition implementation of special agreements are foreseen between MONARCH-A and other relevant the projects such as those under ESA CCI.

Table 1 lists the MONARCH-A ECVs that will be explored in MONARCH-A. The ECVs are listed according to observation type, complementing data sources, and derived information products obtained from re-analyses and synthesis using a state-of-the-art land carbon flux model, coupled ocean-ice models and coupled atmosphere–ice-ocean-land climate model.

ECV	Data sources			Derived information product
	Satellite	In-situ	Complement	
Vegetation cover	Optical, active microwaves	Limited and spotty	GLOBCOVER, G-2, GLC-2000, MODIS products including VCF	Fraction of Plant Functional Type per model grid-cell
Fire	Optical and infrared	Limited and spotty	MODIS Collection 5, GBA-2000, GLOBCARBON, MODIS FRP, SEVIRI FRP	Burnt area and carbon emissions
River discharges	Radar altimeters	Flow gauges - Global Runoff Data Centre		Contribution to freshwater runoff
Snow cover	Passive and active microwaves	Spotty station observations of snow cover and depth	G-2 GLOBECOVER	Contribution to freshwater runoff, Impact on albedo,
Permafrost	Passive and active microwaves	Rare and spotty	G-2 GLOBECOVER	Permafrost maps
Ice sheets and glaciers	Passive and active microwaves, GRACE	Selected repeat ground profiling	Database of aircraft altimeter observations along selected profiles	,Mass balance change; Contribution to sea level and freshwater runoff
Sea level	Altimetry,	Tide gauges, hydrography, GNSS	MYOCEAN, GLOSS, PSMSL, SALTO/DUACS NISE data base	High latitude and Arctic Ocean regional sea level variations
Current	Altimetry for geostrophic current,	Very limited north of 65 degrees N	MYOCEAN drifters, moorings	Heat and volume transports
Ocean color	Imaging spectrometers	Limited data on marine biology primary production; nearly no data on export production; selected data on water column biogeochemistry (carbon, alkalinity,	MYOCEAN GLOBCOLOR, CZCS, SeaWiFS, MODIS, MERIS	Primary production of POC (particulate organic carbon) and possibly PIOC (particulate inorganic carbon) and its influence on CO2 fluxes

ECV	Data sources			Derived information product
	Satellite	In-situ	Complement	
		nutrients, oxygen) exist		
Sea ice drift	Passive and active microwaves	Ice buoys	MYOCEAN GLOBEICE	Transport across straits. Contribution to freshwater
Surface wind speeds and direction	Passive microwaves, scatterometer	Ice buoys, coastal stations	CERSAT ECMWF NCEP	Wind climatology, storm tracks, surface stress, curl
Partial pressure CO₂ ocean	Not possible direct, wind speed from satellites used	Very limited data, from research vessel and VOS	SOCAT (surface ocean), CARINA (3D), CARBOOCEAN EPOCA	Air-sea CO ₂ fluxes, acidification
Partial pressure CO₂ atmosphere	Aeroplane and possibly satellite measurements	Flask measurements and continuous measurements	NOAA, SIO, CSIRO, GOSAT (2009)	CO ₂ and its impact on radiation
Sea ice extent, concentration,	Passive and active microwaves,		MYOCEAN OSI-SAF CM-SAF GLOBICE	Regional high latitude sea ice climatology, impact on albedo
Sea ice thickness	Radar and laser altimetry	Spotty station observations	MYOCEAN	
Sea surface temperature	Passive microwaves, IR,	XBT lines, VOS	MYOCEAN GHRSST, OSI-SAF, CM-SAF	High latitude and Arctic SST fields in consistence with sea ice extent and heat fluxes

Table 1: Essential Climate Variables, their observation type, specific data source and derived products. The ECVs in the yellow rows will be formed by synthesizing available datasets and casting them into forms suitable for exploitation by models. The ECVs in the brown rows will be pulled from existing archives, but not refined.

2. Status

The original goal was to have the service level agreement completed and documented no later than six months (e.g. September 2010) after kick-off of the MONARCH-A project. This has been delayed for the following reasons:

- the reanalyses and reprocessing of the relevant fields from MyOcean and G2 are expected to emerge during 2nd quarter 2011.
- the relevant ESA CCI projects did experience late starts and data and information products are not yet available.

Regarding **MyOcean** the data of particular interests include:

- sea level,
- ocean currents,
- ocean colour,
- sea ice drift,
- sea ice concentration

The reanalyses and reprocessing of these fields are currently being executed from

- (i) the Arctic Modelling and Forecasting Center (MFC);
- (ii) the sea level TAC;
- (iii) the ocean colour TAC;
- (iv) the Sea Ice and Wind Thematic Assembly Center (TAC);

- (v) the in-situ TAC; and
- (vi) the Global (MFC) (with focus on high latitude and Arctic).

These fields are expected to be presented at the 2nd Annual Meeting in Rome on 28-29 April 2011. The agreement to use these data for the MONARCH-A study project will be addressed at this meeting. No difficulties are expected regarding this agreement. (Note that NERSC is leading the Arctic MFC and is a member of the sea ice TAC). It can also be mentioned that the satellite based sea ice extent and concentration data from passive microwaves from 1978 to present is available for the project via the <http://www.arctic-roos.org> operated at NERSC. Moreover sea ice drift from 2002/2003 is also available at NERSC.

In the same time period we will also get in contact with **G-2** for eventual arrangement of similar agreement.

The **ESA CCI** study projects of relevance for MONARCH-A include the following quantities:

- fire,
- sea level,
- ocean colour,
- snow cover,
- ice sheets and
- sea ice.

Whereas the first 5 projects started in August 2010, the sea ice will not kick-off until late spring 2011. Currently these projects are focusing on collecting user requirements, and refining and testing retrieval algorithms and processing tools. The full productions of the corresponding fields listed above are therefore not yet started.

3. Conclusion

There is a delay in the establishment of service level agreements for getting access to relevant data for the MONARCH-A project (see Table 1). However, it is emphasized that this delay has no consequences and impact for the progress of MONARCH-A as no relevant data is yet available from the GMES core services and ESA CCIs. Progress in this task will be reported in SESAM.