LOTUS Project 4th Review Meeting (Final Meeting)

4 February 2016

REA

Brussels

Welcome

Meeting Agenda

Agenda:

1. Introductory session (9:30-9:45):
2. Project overview (9:45-10:30)

   Coffee break (10:30-10:45)
3. Work packages – progress and status (10:45-15:00)

   Lunch break (12:30-13:30)

   Coffee break (15:00-15:15)
4. Impact of the project (15:15-16:00)
5. Project management session (16:00-16:15)
6. Closing session (16:15-16:30)

Preparing Land and Ocean Take Up from Sentinel-3

LOTUS

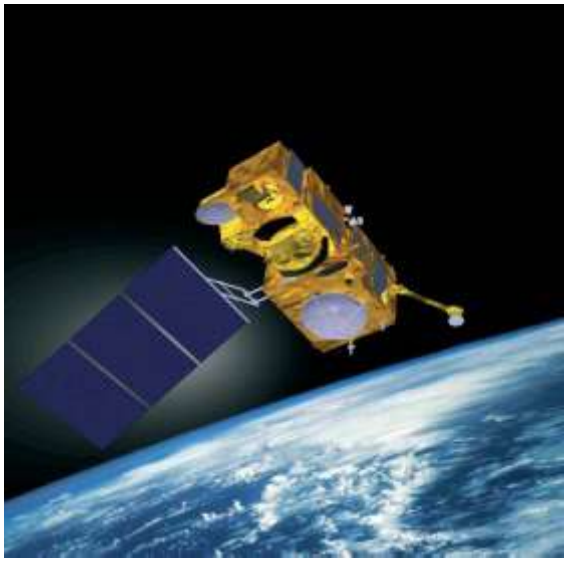
Project Overview

Per Knudsen

Coordinator

General Objectives

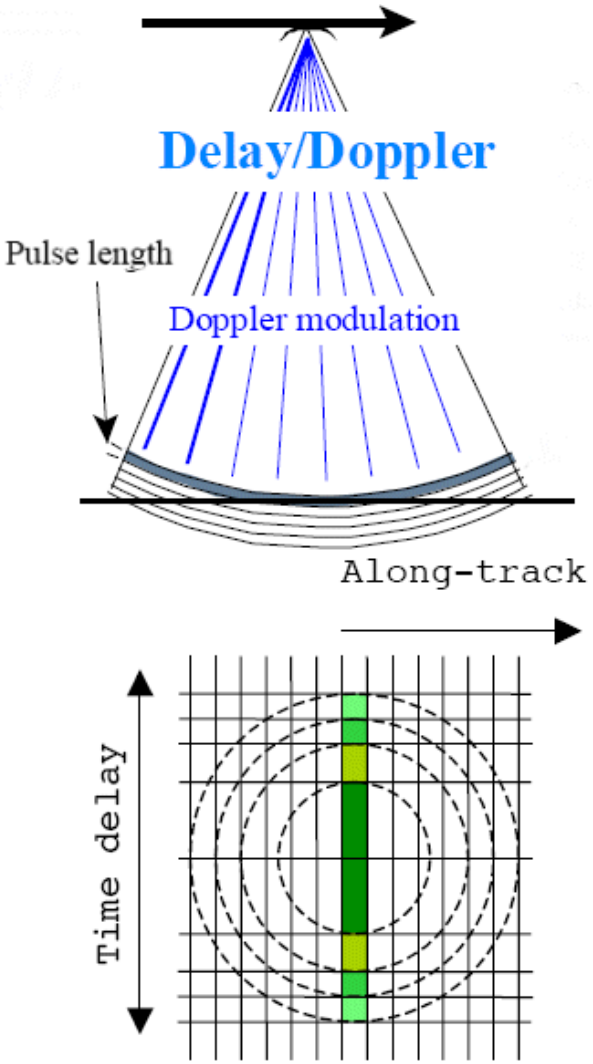
The objective of the LOTUS project was to support the development of Copernicus by **developing applications of Sentinel-3** to complete the space observation infrastructure that are designed **for land and ocean** monitoring for Copernicus.



Duration: 1 Jan 2013 – 31 Dec 2015

New instrumentation

- The SRAL instrument onboard Sentinel-3 is a new generation of radar altimeter featuring a SAR mode.
- The SAR capability is a new feature and no data products based on this SAR mode data are provided or used operationally.
- Therefore, new methodologies, data processing, and applications need to be developed to prepare the take-up of the Sentinel-3 data.



From: http://www.altimetry.info
(Credits R.K. Raney, Johns Hopkins University APL)

Objectives

Objective 1: Processing of SRAL SAR mode waveforms over ocean.

The objective of the LOTUS project was to:

- develop processing scheme for extracting **high-resolution sea surface heights, wave heights and wind speeds** from SAR mode data.

Objective 2: Processing of SRAL SAR mode waveforms over land.

The objective of the LOTUS project was to:

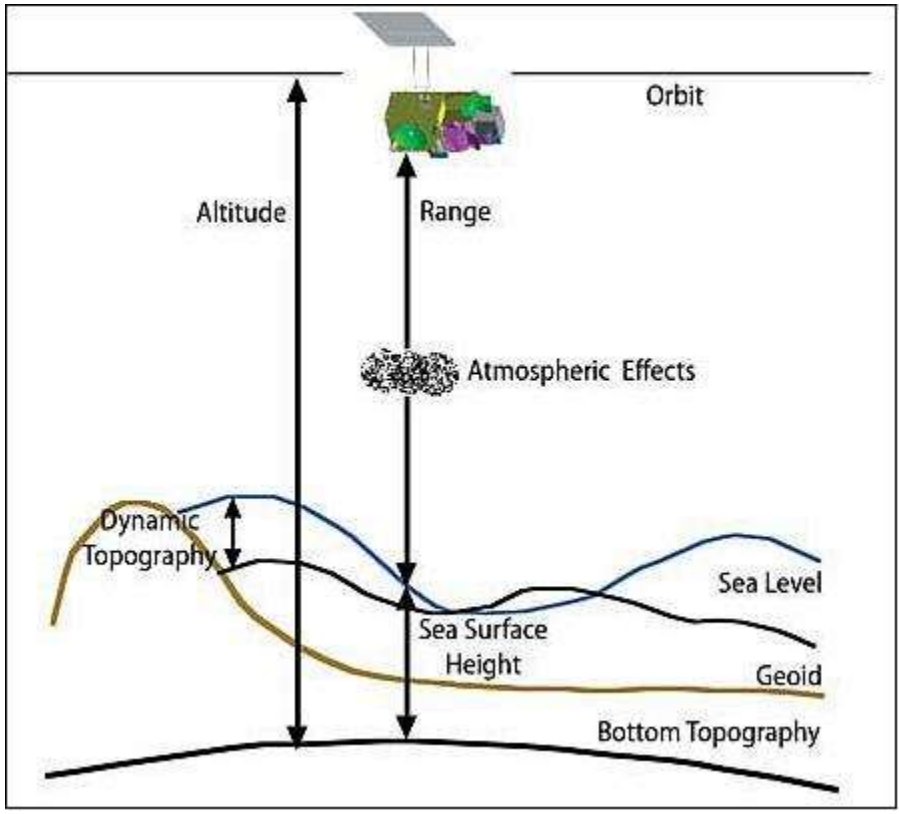
- develop processing scheme for extracting **high-resolution river and lake heights, soil moisture, and snow depths**.

Objectives

Objective 3: Definition of new data products and processing chains.

The objective was to design processing chains, simplified, easy-to-use or higher-level products. The processing chains were to be specified in close relationship with the relevant Copernicus services and downstream applications.

Several kinds of data products and processing chains were to be defined and designed, both new Level-2 data products and higher level data products, addressed to the different surface targets.



Objectives

Objective 4: Production of demo data and assessment.

The objective of the LOTUS project was to prepare prototype Sentinel-3 data sets to support the development of new value-adding applications for ocean and land services, respectively. Cryosat-2 SAR data and available Sentinel-3 data would be processed in specific targeted test areas to prepare prototype data sets of:

- Sea surface heights, wave heights and wind speeds,
- River and lake levels,
- Soil moisture, and
- Snow depths.

Subsequently, LOTUS assessed the prototype data.

Objectives

Objective 5: Applications of new data in value-adding ocean services.

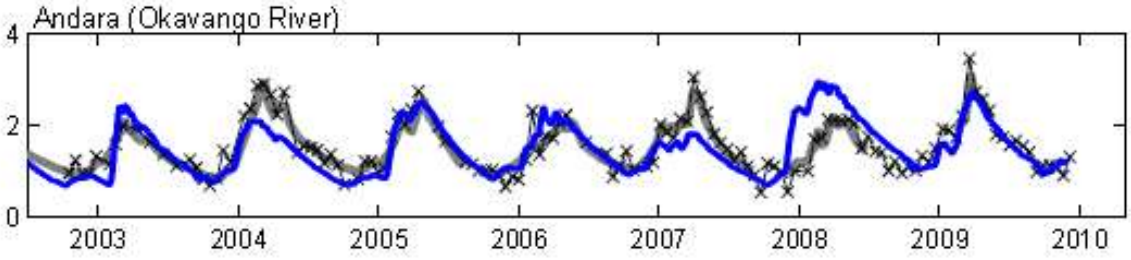
The objective of the LOTUS project was to develop new and improved coastal oceanographic services by utilizing the data features emerging with Sentinel-3. The services would primarily utilize the increased resolution of the SRAL SAR and place emphasis on value adding integration with complementary data such as ocean modelling, in-situ data and multiple sensors. The services are developed to have a global applicability.

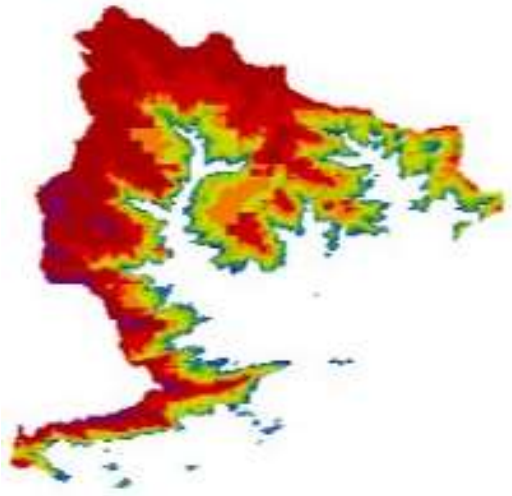
Objectives

Objective 6: Applications of new data in value-adding land services.

The objective of the LOTUS project was to develop new and improved land services by utilizing the data features emerging with Sentinel-3. The services would be developed to have a global applicability and would be demonstrated in selected case study regions and targeting the following applications:

- Monitoring of River and lake levels,
- Monitoring Soil moisture,
- Monitoring of Snow depth, and
- Contributions to climate monitoring.





Objectives

Objective 7: Dissemination and exploitation.

The LOTUS project would disseminate the results obtained in the project on the use of Sentinel-3 SRAL SAR mode data as well as derived new products for **Copernicus land and marine services**.

Effective dissemination actions are directed towards **European SMEs** to facilitate the exploitation of the new products in value adding applications for both ocean and land.

Furthermore, this project would disseminate the results to European services and projects contributing to the **climate and climate change monitoring** as well as to **Copernicus services for security and emergency management.**

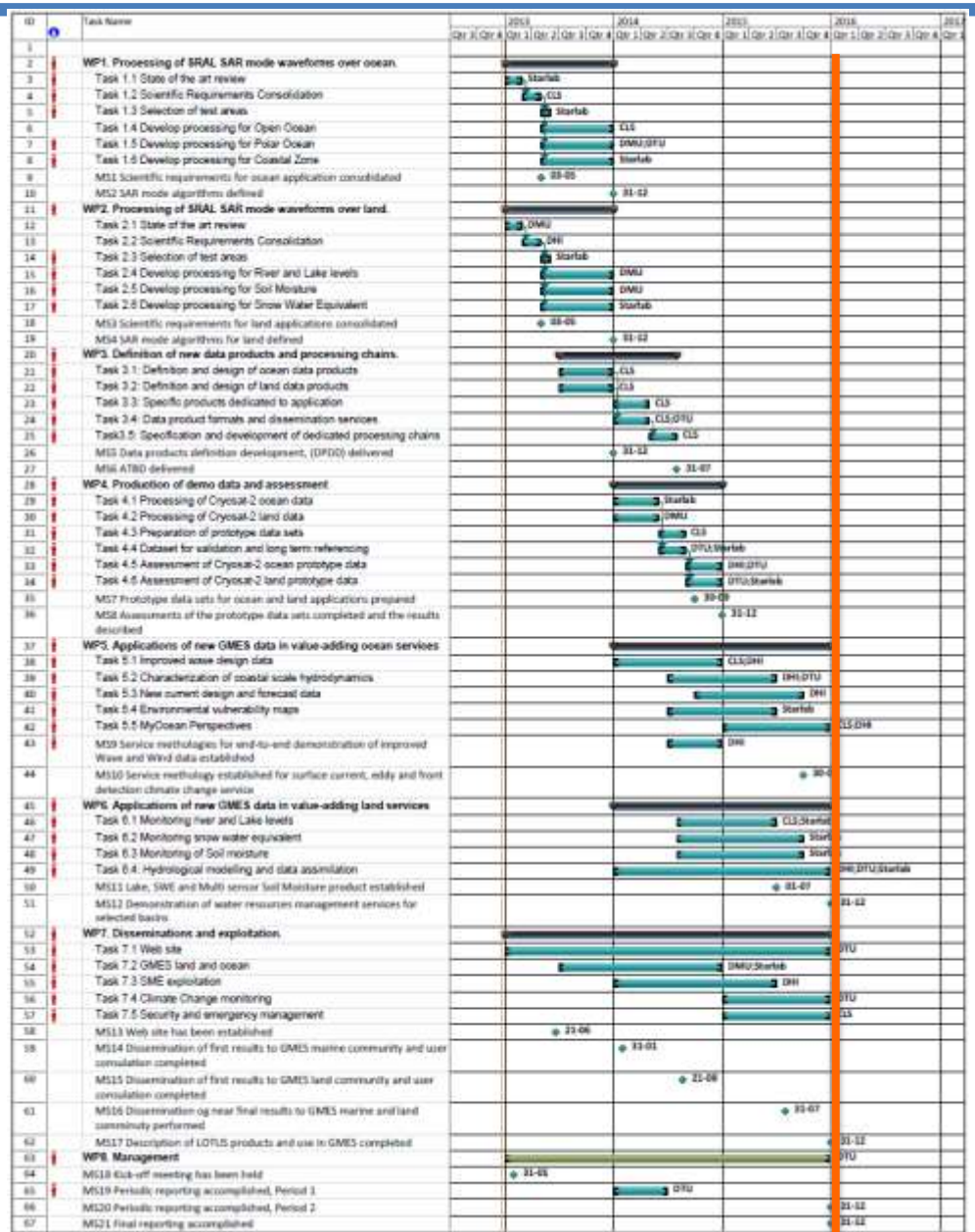
Partners

No.	Name	Short name	Country	Entry month	Exit month
1	DANMARKS TEKNISKE UNIVERSITET	DTU	Denmark	1	36
2	STARLAB BARCELONA SL	Starlab	Spain	1	36
4	COLLECTE LOCALISATION SATELLITES SA	CLS	France	1	36
5	DHI	DHI	Denmark	1	36
6	UNIVERSITY OF NEWCASTLE	UNEW	UK	7	36

List of workpackages

WP	WP title	Type	Lead	PM	Start	End
WP1	Processing of SRAL SAR mode waveforms over ocean.	RTD	STARLAB	37.00	1	12
WP2	Processing of SRAL SAR mode waveforms over land	RTD	UNEW	30.00	1	12
WP3	Definition of new data products and processing chains	RTD	CLS	40.75	7	18
WP4	Production of demo data and assessment	DEM	DTU	39.75	13	24
WP5	Applications of new GMES data in value-adding ocean services	RTD	DHI	28.00	13	36
WP6	Applications of new GMES data in value-adding land services	RTD	STARLAB	32.50	13	36
WP7	Dissemination and exploitation	OTHER	DTU	28.75	1	36
WP8	Management	MGT	DTU	5.00	1	36

Work plan – Gantt diagram



ID	Task Name
1	
2	**WP1. Processing of SRAL SAR mode waveforms over ocean.**
3	Task 1.1 State of the art review
4	Task 1.2 Scientific Requirements Consolidation
5	Task 1.3 Selection of test areas
6	Task 1.4 Develop processing for Open Ocean
7	Task 1.5 Develop processing for Polar Ocean
8	Task 1.6 Develop processing for Coastal Zone
9	MS1 Scientific requirements for ocean application consolidated
10	MS2 SAR mode algorithms defined
11	**WP2. Processing of SRAL SAR mode waveforms over land.**
12	Task 2.1 State of the art review
13	Task 2.2 Scientific Requirements Consolidation
14	Task 2.3 Selection of test areas
15	Task 2.4 Develop processing for River and Lake levels
16	Task 2.5 Develop processing for Soil Moisture
17	Task 2.6 Develop processing for Snow Water Equivalent
18	MS3 Scientific requirements for land applications consolidated
19	MS4 SAR mode algorithms for land defined
20	**WP3. Definition of new data products and processing chains.**
21	Task 3.1: Definition and design of ocean data products
22	Task 3.2: Definition and design of land data products
23	Task 3.3: Specific products dedicated to application
24	Task 3.4: Data product formats and dissemination services
25	Task3.5: Specification and development of dedicated processing chains
26	MS5 Data products definition development, (DPDD) delivered
27	MS6 ATBD delivered
28	**WP4. Production of demo data and assessment**
29	Task 4.1 Processing of Cryosat-2 ocean data
30	Task 4.2 Processing of Cryosat-2 land data
31	Task 4.3 Preparation of prototype data sets
32	Task 4.4 Dataset for validation and long term referencing
33	Task 4.5 Assessment of Cryosat-2 ocean prototype data
34	Task 4.6 Assessment of Cryosat-2 land prototype data
35	MS7 Prototype data sets for ocean and land applications prepared
36	MS8 Assessments of the prototype data sets completed and the results described
37	**WP5. Applications of new GMES data in value-adding ocean services**
38	Task 5.1 Improved wave design data
39	Task 5.2 Characterization of coastal scale hydrodynamics
40	Task 5.3 New current design and forecast data
41	Task 5.4 Environmental vulnerability maps
42	Task 5.5 MyOcean Perspectives
43	MS9 Service methologies for end-to-end demonstration of improved Wave and Wind data established
44	MS10 Service methology established for surface current, eddy and front detection climate change service
45	**WP6. Applications of new GMES data in value-adding land services**
46	Task 6.1 Monitoring river and Lake levels
47	Task 6.2 Monitoring snow water equivalent
48	Task 6.3 Monitoring of Soil moisture
49	Task 6.4: Hydrological modelling and data assimilation
50	MS11 Lake, SWE and Multi sensor Soil Moisture product established
51	MS12 Demonstration of water resources management services for selected basins
52	**WP7. Dissemination and exploitation.**
53	Task 7.1 Web site
54	Task 7.2 GMES land and ocean
55	Task 7.3 SME exploitation
56	Task 7.4 Climate Change monitoring
57	Task 7.5 Security and emergency management
58	MS13 Web site has been established
59	MS14 Dissemination of first results to GMES marine community and user consulation completed
60	MS15 Dissemination of first results to GMES land community and user consulation completed
61	MS16 Dissemination og near final results to GMES marine and land comminuty performed
62	MS17 Description of LOTUS products and use in GMES completed
63	**WP8. Management**
64	MS18 Kick-off meeting has been held
65	MS19 Periodic reporting accomplished, Period 1
66	MS20 Periodic reporting accomplished, Period 2
67	MS21 Final reporting accomplished

Issues

From RV1 (+9):

- State-of-the-art studies too comprehensive – involved R&D.
- Soil moisture and snow depth applications less mature – detached from original plan

From RV2 (+18):

- Re-organisation/-establishment of key personnel and key expertise caused some delays in WP1 and WP2, respectively, which, in turn, caused delays in WP3 and WP4,
- The project appears to be 4-6 months delayed.
- Activities of WP5 and WP6 have been initiated as planned using preliminary data sets.

Results at RP1 (+18):

- Actual, total costs 34% below budget.

Issues

From RV3 (+27):

- Development of processing and demo data completed,
- Issues with six WP3 and WP4 deliverables,
- Activities of WP5 and WP6 (applications) are ongoing,
- WP7 on exploitation and dissemination are stating up,
- The project appears to be a few months delayed.

Status at RV4

Review of RV3 action item

- ✓ Partners to complete D3.2, D3.3, D4.1, D4.2, D4.3, D4.4, D4.5 ASAP
- ✓ DHI to complete the D5.1 within a few weeks
- ✓ DTU should compile a list of publications and presentations with results relevant to the LOTUS project (included in Final report)
- ✓ DTU must draft a draft exploitation plan (included in Final report)
- ✓ DTU to check up on payments
- ✓ DTU to check up on procedures for accounting w.r.t. the final meeting and reporting/auditing

Results

During the projects lifetime the partners followed the objectives of the project and produced a lot of nice results:

- 38 out of 39 deliverables completed
- 19 out of 21 milestones achieved

  (only RV4 minutes + RP2 report + Final report missing)
- A series of Sentinel-3 prototype data sets
- A series of validation data sets
- 5 publications with peer-review
- 47 presentations at scientific conferences (14 orals)

- Many more presentations and publications (EGU/Living Planes).
- Much impact to be encountered once Sentinel-3 is launched

- End of part 1.

Work Package Overviews

By the WP leaders

WP 7

Dissemination and exploitation

Participant number [10]	Participant short name [11]	Person-months per participant
1	DTU	8.00
2	Starlab	6.75
4	CLS	4.00
5	DHI	7.00
6	UNEW	3.00
	Total	28.75

Objectives

This workpackage will disseminate the results obtained in the LOTUS project on the use of Sentinel-3 SRAL SAR mode data as well as derived new products for Copernicus land and marine services. This includes the setting-up a web site for visualization and dissemination of project data and results.

Effective dissemination actions are directed towards European SMEs to facilitate the exploitation of the new products in value adding applications for both ocean and land.

Furthermore, this workpackage will disseminate the results of the LOTUS project to European services and projects contributing to the Climate and Climate Change monitoring.

Finally, this workpackage will disseminate the results of the LOTUS project to Copernicus services for security and emergency management.

Tasks

Task 7.1 Project Web Site (DTU)

The public website has been established for disseminating the results and products of the projects.

The web pages contain description of the general purpose and aims of the project; news and events; description of main technical aspects; partners; sponsoring, Copernicus context, press materials.

All public deliverables are made available on the public web.

Demonstration data and validation report based on D3.1 and D 3.2 as well as guides on “how to” use new data and products are made available.

The website will be updated according to the final report and maintained after the project end.

Task 7.2 GMES land and ocean (Starlab and UNEW)

Presentation by Camille.

Task 7.3 SME exploitation (DHI)

Presentation by Henrik.

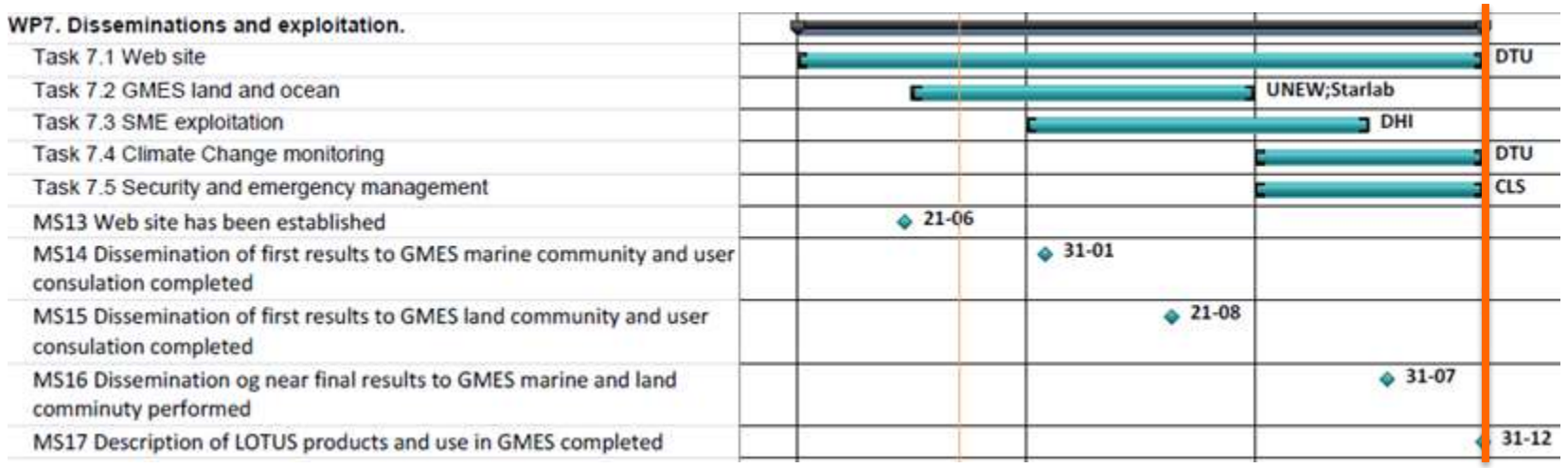
Task 7.4 Climate Change monitoring (DTU)

Presentation by Karina.

Task 7.5 Security and emergency management (CLS)

Presentation by Thomas.

Work plan



	Milestone number [59]	Milestone name	Lead benefi-ciary number	Delivery date from Annex I [60]	Comments
V	MS13	Web site has been established	1	6	Website is public
V	MS14	Dissemination of first results to GMES marine community and user consultation completed	2	13	Report submitted
V	MS15	Dissemination of first results to GMES land community and user consultation completed	5	20	Report submitted
V	MS16	Dissemination of near final results to GMES marine and land community performed	1	31	Report submitted
V	MS17	Description of LOTUS products and use in GMES completed	4	36	Report submitted

Deliverables

	Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
V	D7.1	Report describing web site	1	2.00	R	PU	6
V	D7.2	Report describing Sentinel-3 SRAL SAR mode data and new products for GMES land and marine services	2	7.75	R	PU	24
V	D7.3	New LOTUS products and their potential use in value adding applications described in report	5	7.00	R	PU	30
V	D7.4	Report describing the results to European services and projects contributing to Climate monitoring	1	6.00	R	PU	36
V	D7.5	LOTUS results to GMES services for security and emergency management described in report	4	6.00	R	PU	36
			Total	28.75			

WP 8

Management

Participant number [10]	Participant short name [11]	Person-months per participant
1	DTU	5.00
	Total	5.00

Objectives

The goal of this WP is to implement appropriate management and organizational activities to monitor the short and long term development and deployment of LOTUS. It includes:

- Day to day management of the project
- Chairing the steering committee and the advisory board consisting of one representative per partner and/or the

WP leaders and external experts respectively:

- maintain efficient management procedures to meet milestones and reporting/deliverables deadlines,
- follow Grant Agreement contracts and payment procedures and rules in consistence and cooperation with the project officers.

Tasks

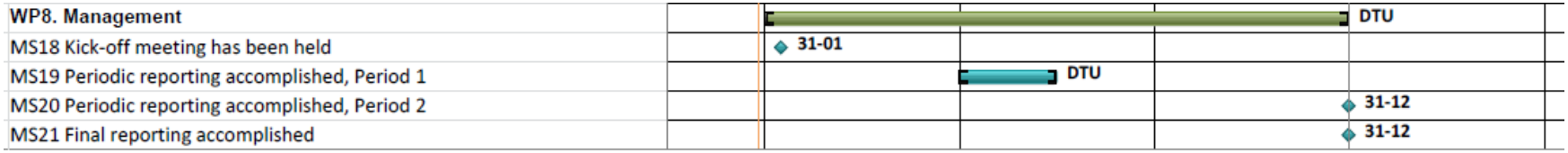
The management will be performed on a day-to-day basis and through regular meetings of the steering group via phone conferences and face-to-face meetings (~every 9 months) to address issues of relevance to the LOTUS progress.

This includes:

Task 8.1 Implement a management that maintain and capitalize on the work plan and budget in close collaboration with the partners and the project steering committee.

Task 8.2 Monitor and control the scheduling for deliverables, project meetings presentations, milestones etc.

Work plan



	Milestone number [59]	Milestone name	Lead benefi-ciary number	Delivery date from Annex I [60]	Comments
✓	MS18	Kick-off meeting has been held	1	1	
✓	MS19	Periodic reporting accomplished, Period 1	1	18	Report submitted
✓	MS20	Periodic reporting accomplished, Period 2	1	36	Report submitted
✓	MS21	Final reporting accomplished	1	36	Report submitted

Deliverables

	Delive-rable Number [61]	Deliverable Title	Lead benefi-ciary number	Estimated indicative person-months	Nature [62]	Dissemi-nation level [63]	Delivery date [64]
✓	D8.1	Project Management Plan	1	1.00	R	PU	4
✓	D8.2	Minutes of Kick-off meeting	1	0.20	R	PU	1
✓	D8.3	Minutes of project RV1	1	0.20	R	PU	10
✓	D8.4	Minutes of project RV2	1	0.20	R	PU	19
✓	D8.5	Minutes of project RV3	1	0.20	R	PU	28
	D8.6	Minutes of project RV4	1	0.20	R	PU	36
			Total	2.00			

Steering Committee

The Steering Committee (SC) of the consortium includes the coordinator and one representative from each partner. The SC will have meetings jointly with the progress meetings and, if needed, to make decision regarding scientific-technical planning and work implementation including eventually necessitating amendment of the GA with the approval of the REA , etc. The SC will make decision regarding involvement of users, IPR issues, and publication of results, as well as other dissemination activities.

Advisory board

To ensure that the developments in the LOTUS project progress consistently with the developments of the Sentinel-3 mission including data processing and data flows, an advisory board is established.

In September 2013 the Advisory Board is:

- Hans Bonekamp (EUMETSAT)
- Johnny Johannessen (MyOcean),
- Paul Bates (Uni. Bristol) and
- Giovanni Cecconi (Thetis)

In addition, Jerome Benveniste (ESA) will attend as an observer.

Representative for Copernicus Land service were contacted to obtain EEA views. (Hans Dufourmont (EEA))

Impact

- The LOTUS project will establish a basis for the development of innovative new Copernicus products or applications based on operational space data availability from European Sentinel-3 satellites.
- LOTUS will utilise the new capabilities of the Sentinel-3 SRAL instruments and develop new products with increased resolution for both marine and land Copernicus services.
- To integrate the new products into existing operational capabilities the LOTUS project will collaborate with the MyOcean Sea-level TAC.
- Subsequently, the Sea-level TAC may provide Sentinel-3 SRAL data products for other Copernicus services as well, e.g. Geoland-2, SAFER, and G-MOSAIC.
- In addition, the LOTUS project will develop new and improved coastal oceanographic services and land services.
- A majority of the work carried out in the LOTUS project will be carried out by innovative companies.
- Finally, the LOTUS project will disseminate the results to European services and projects contributing to the Climate and Climate Change monitoring as well as to Copernicus services for security and emergency management


SENTINEL 3


lotus