



Deliverable D-22

Monthly Progress Report

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AMENDMENT HISTORY

Version	Date	Change Description	Author
1.0	09/01/12	Report December 2011 to ESA	Yvonne Gusdal

DISTRIBUTION

Name	Role	Company
Craig Donlon	Scientific Officer	ESA

EXECUTIVE SUMMARY

During December:

- Updated the STARS webpage with contacts, task-diagram for STARS and a historical polar Low case happening October 31, 2001.
- For the STARS data set we have worked with re-gridding of NWP data (HIRLAM), SLA from Envisat and GFO and AMSRE-REMSS-L2P.
- The bottom topography for the model (ROMS) has been prepared
- Have contacted the Norwegian Space Centre for funding support during the workshop.
- A registration form for the workshop is now available on the webpage.

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INTRODUCTION

Purpose and Scope

This is the Progress Report for the STARS project and forms deliverable D-22 of the project documents. The purpose of the report is to provide a monthly update of the project activities and progress over each elapsed reporting period and a project plan of the activities for the following month.

This STARS progress report covers the elapsed period from 1 to 31 December 2012. The plan summarises task of STARS Phase II (described in the Project Management Plan (D-21)), management activities, status of deliverables, milestones and travel, risk analysis, problem areas and activities to be performed in the coming months.

The next progress report is planned for 5. February 2012.

Document Structure

The information within this document is structured as follows:

- Section 1: This introduction
- Section 2: Provides an overview of the project
- Section 3: Progress, problems and forthcoming activities for all major work packages
- Section 4: A summary of the management activities addressing contractual and financial aspects, status of deliverables, milestones and travel expenditure, actions and risks

Referenced Documents

ID	Title	Reference	Version	Date
SOW	Sea Surface Temperature and Altimeter Synergy	EOP-SM/1900/CD-cd	1.0 Rev 2	23/02/2009
D-21	STARS Project Management Plan Phase II		2.2	
D-1	STARS web portal			
D-23	STARS Action Database			
D-2	STARS Literature review		1.0	14/04/2009
D-3	STARS Scientific analysis Plan		6	
D-4	STARS-DAT v10			

PROJECT OVERVIEW

The main objective of the STARS project is to investigate possible ocean surface warming by strong winds from polar lows using an extensive satellite data set. In the STARS project a data set will be built and used to investigate each polar low event over a ten year period.

In the original plan for phase II of STARS, a coupled atmosphere-ocean model will be designed. The purpose of the coupled system is to simulate polar low events and to investigate how the ocean and atmosphere interacts. However, due to an installation of a new super computer facility in Norway in 2011, it is considerable uncertain that the required resources are available to the STARS project in 2011/2012. The shift in computer infrastructure also ties up expert resources on the proposed atmosphere model. It will therefore be difficult to allocate the expert competence assumed available in the proposed implementation plan. The original plan for phase II of STARS is therefore altered to not implement and use the coupled STARS-MODEL.

In the second phase, we will conduct an ocean hindcast simulation with a resolution of ~800 m. The objective is to investigate with observations and numerical modelling the adjustment processes that lead to ocean re-stratification after PL events. A process that influence the net heat loss to the atmosphere.

The oceanic response to hurricanes has long been recognised (Price, 1983; Sanford et al., 1987; Brink, 1989). Strong turbulent mixing entrainment of cold waters from deep layers leads to a cooling of the sea-surface. This rapid surface cooling reduces the surface fluxes and inhibits further hurricane intensification. When hurricanes moves over deep cores of warm waters, such as the Loop Current in the Gulf of Mexico, or warm core rings this surface cooling is strongly reduced. The warm water will then act to insulate the entrainment of cold waters form even deeper layers (Hong et al., 2000; Shay et al., 2000). In such cases, strong hurricane intensification has been observed. In 2005, Katrina intensified into a category 5 hurricane as it entered the warm Gulf of Mexico (Kafatos et al., 2006).

The ocean surface warming reported by Saetra et al. (2008) has only been observed by microwave satellite data. During cold air outbreaks the ubiquitous cumulus convection prevents the sea-surface to be observed by infrared sensors (IR) such as AATSR, AVHRR and MODIS. However, verification of such ocean response to polar lows is urgent. Here, we propose to use altimeter combined with SST products from both microwave and infrared sensors to investigate possible surface warming in connection with polar lows. As the altimeter measures the surface anomaly (SLA) this can be related to the ocean heat content.

The main scientific questions to be addressed are:

- Can satellite IR observations in combination with altimeter be used to detect possible sea-surface warming caused by strong winds under polar low events?
- Can we identify a Polar Low Indicator based on satellite data that could be a useful tool for polar low forecasting?

- What are the dominant time and space scale of the ocean advection processes that govern the adjustments after PL event ?

In the second phase of STARS, an International Workshop on Polar Lows will be arranged in Oslo in 2012. The workshop aims at bringing together scientists and weather forecasters to present the results of the recent activity on polar low research, to share new knowledge and to encourage discussions on improved forecasting and understanding of polar lows

PROGRESS ON MAJOR TASKS PHASE II

Task 1: Management (Ongoing through the whole project)

Results of Reporting Period:

Plans for Comming Reporting Period:

Task 7: Maintain and improve STARS web portal

Results of Reporting Period

- Included a historical/educational polar Low case to the stars web-site, about the Torsvaag event happening October 31 2001
- Included STARS task-diagram and contacts to the web-site

Plans for Comming Reporting Period

- Include the following on the webpage: wiki blog, PL forecasting, news, images of PL, Information and pictures of the first polar low this season (One case on the 27th. of November 2011)
- Further entries of historical/educational cases to the stars web-site

Task 8: Extend STARS-DAT data set

Results of Reporting Period:

- In task 8.1 on extend STARS-DAT:
 - Regridded SLA from Envisat and GFO and AMSRE-REMSS-L2P, for the extended period.
 - Wind was not included in the NWP data of STARS-DAT version 2.1. Have included wind in the re-gridded NWP data (HIRLAM)
- In task 8.2 on including SAR in STARS-DAT:
 - Non Activities

Plans for Comming Reporting Period

- In task 8.1 on extending STARS-DAT:

- Convert STARS-DAT v2.1 to NetCDF4 format
- Make STARS-DAT v2.1 available for users at STARS web portal
- Download Altimeter data of Wave Height (Hs) from the met.no archive
- In task 8.2 on including SAR in STARS-DAT:
 - Order SAR scenes for PL cases. Writing of scripts to run wind speed calculation from ASAR image for each storm case.
- In task 8.2 on including scatterometer products
 - Start ingestion of coastal scatterometer product, Start design of analysis software for information content assessment, Go through Polar Low inventory to identify landfall events for closer examination.

Task 9: Impact assessment of Polar Lows

Results of Reporting Period

- In task 9 on Ocean adjustment:
 - Bottom topography matrix for the model was prepared. It was generated from ETOPO1 (one arc minute) data, projected onto a polarstereographic grid centered on 60N. Some editing of the land mask and smoothing has been performed (needed to reduce pressure gradient errors associated with the terrain-following vertical coordinate system of ROMS).
- In task 9 on implement the Polar Low Indicator (PLI) for operational use at met.no:
 - One case recorded, this was a complex case with unusually poor model performance. A case report is so far only distributed internally within the staff at the met.no forecasting division i Tromsø.

Plans for Comming Reporting Period

- In task 9 on Ocean adjustment:
 - Continue early tests of wavelet-based variance analysis.
 - Continue setting up the model (atmospheric forcing and lateral boundary conditions).
- In task 9 on implement the Polar Low Indicator (PLI) for operational use at met.no:
 - Further entries of historical/educational cases to the stars web-site

Task 10: Polar Low Scientific Community Development

Results of Reporting Period

- Contacted the Norwegian Space Centre for funding support covering lunch for the participants.
- Registration form is now available on the the web page for the workshop

Plans for Comming Reporting Period

- On request, follow with more information on the workshop arrangement. Set up a general structure of the agenda for the workshop, i.e. decide the number of oral presentation, the length of the presentations, the start end end time workshop etc.

Progress team meetings

Name	Date	Purpose
PTM1	05/07/11	Progress team meeting 1 - SAR
IKO	21/09/11	Internal Kick-off meeting for STARS phase II

MANAGEMENT

Invoices

Milestone	Schedule date			
		Payment	Invoice to ESA	Payment Received
ADVANCE PAYMENT: upon signature of the Contract by both Parties	September 2009	24.000	yes	yes
PROGRESS PAYMENT: Upon successful completion of phase 1 and acceptance of all related deliverables by the Agency	June 2011	96.000	yes	yes
ADVANCE PAYMENT: Upon written authorization to proceed with phase 2	June 2011	16.000	yes	yes
PROGRESS PAYMENT: Upon the acceptance by the agency of P2D-1 STARS-web P2D-2 STARS-DAT-V3 P2D-3 STARS-DAT-DB-V3 P2D-4 STARS-DAT-UM-V3 P2D-5 REP-4	March 2012	20.000	yes	no
FINAL SETTLEMENT: Upon satisfactory completion of all obligations, including the ones relating to Appendix 5 on statement of inventions and inventory, and acceptance by ESA of all deliverables	11/01/12	144.000	yes	no
Totals		300.000		

Action Database

Action Ref	Action	Actioner	Target Date	Status	Date Closed
Mid Term Review MTR-5	Investigate the inclusion of animation of AVHRR images as part of STARS-DAT – update Phase II plan to include this task	SE			
MTR-7	Review the potential for RFI contamination of AMSRE data in Thorpex event	ØS			
MTR-9	CD to organize an ESA web story on Polar Lows	CD			

	with STARS team in preparation for 2011/2012 PL season				
MTR-13	Update phase-II plan to include steering of PL by mesoscale ocean structure	SE/ØS			
MTR-18	Discuss with KNMI access and use of OceanSat-II data for STARS-DAT.	SE			
MTR-19	Include an assessment of SOPRANO data sets for use in STARS project and plan to use in STARS-DAT if appropriate	SE			
Progress team meeting 1 PTM1-2	Send the extended polar low list to BF when ready	YG		closed	
Internal Kick-off IKO-5	The SAR winds should be ready 1.January 2012	JR	1.Jan	Ongoing	
Progress meeting ESA (PM)					
PM-1	Arrange meeting in Tromsø	YG	ASAP	Ongoing	
PM-2	Include information/pictures of the first forecasted polar low this season on the web page	GN/YG			
PM-3	Download Altimeter Hs from EOLI	YG		Ongoing	
PM-4	Workshop: Include information about Accommodation	ØS			
PM-5	Workshop: page for registration (if met.no has a system for this??)	ØS/YG		closed	
PM-6	Workshop: Make a more detailed agenda	ØS			

Status of Deliverables

The following contractual deliverables of Phase II have been submitted to ESA during June 2011.

Doc Ref	Doc Title	Delivery Date	Status

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Each document will be submitted to ESA for approval. Upon confirmation from ESA that the deliverables are satisfactory, the status shall be updated to accepted.

Status of Milestones

Milestone meetings are planned at vital points throughout the project lifetime. The status of these meetings to date is as follows.

Name	Date	Venue	Purpose	Status
MTR Phase I	07/06/11	ESA	Mid Term Review	Completed
KO Phase II	07/06/11	ESA	Kick-off meeting Phase II	Completed
PM	23/11/11	Met.no	Progress meeting	Completed
PM	22/03/12	Svalbard	Progress meeting	Not Completed
PM	01/10/12	Met.no	Progress meeting	Not Completed
FM	05/12/12	ESA	Final Meeting	Not Completed

Status of Travel Expenditure

Non Travel Expenditure in July

Risk Analysis

The table below shows the most probable risks and issues identified to date.

ID	Type	Risk title and Description	Probability	Impact	Duration	Mitigation Strategy