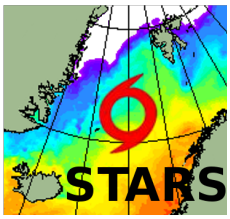

Deliverable D-22

Monthly Progress Report

Customer	:	ESA
Author	:	Met.no
STARS Contract number	:	22644/09/NL/CT
Document Reference	:	STARS_D22_October
Version	:	1.0
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Category	:	A

Prepared by (met.no)	:	Yvonne Gusdal	
Accepted by (ESA)	:	Technical Officer	no

AMENDMENT HISTORY

Version	Date	Change Description	Author
1.0	14/11/12	Report October 2012 to ESA	Yvonne Gusdal

DISTRIBUTION

Name	Role	Company
Craig Donlon	Scientific Officer	ESA

EXECUTIVE SUMMARY

For October:

- Have expanded the existing software package for STARS to produce netCDF files of Hs from GlobWave and wind from Quickscat in the same grid, projection and convention as the current outputs. The new version of STARS-DAT for the years 2002-2011 are now completed. However, the dataset is 1.9Tb and we have to apply for more external disk space before publishing on ftp. This may be a problem in the future when we want to expand the dataset.

- The ocean response to two PLs (March 2008 and March 2010) have been examined in more detail from the high-resolution model runs in Task 9.

Contents

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 October 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 5th of December 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 could 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:

- Have hired David Poulter for a little period to work on expanding the existing met.no software package for **STARS.**
- Have registered two invoices on ESA-P for the Final Payment of the project.

Plans for Comming Reporting Period:

- Due to the large size of the STARS dataset of 1.9Tb, we will apply for more external disk space.

Task 7: Maintain and improve STARS web portal

Results of Reporting Period

- Non Activities reported

Plans for Comming Reporting Period

- Will update the webpage with news about STARS-DAT when it is available on ftp.

Task 8: Extend STARS-DAT data set

Results of Reporting Period:

- With help from David, we have developed software to produce netCDF files of calibrated significant wave height (Hs) from the GlobWave project archives in the same grid, projection and convention as the current outputs. A software is also developed to produce netCDF files of wind from Quickscat. The STARS-DAT for the years 2002-2011 are now completed.
- Have gone through preliminary Task 8 report on SAR and scatterometer in polar low situations and identified items where more description and discussions are needed, as well as figures needed to give a more complete picture.

Plans for Comming Reporting Period

- In task 8.1 on extending STARS-DAT:

- Will start to merge all the python codes to ONE proper version which will incorporate the old L2P code, the QuickScat and the GlobWave L2P. This will be 100% documented and tested.

- The new nersion of STARS-DAT is now completed and documented in the User Manual. However, the archive has a size of 1.9 Tb and we have to apply for more storage of external disk before we can make it available on the ftp. The size of the data set may be a problem if we want to extend it further!

- Work on Finalising the Task 8 report on ASAR and ASCAT winds in PL situations

Task 9: Impact assessment of Polar Lows

Results of Reporting Period

- In task 9 on Ocean adjustment:

  - The ocean response to two PLs (March 2008 and March 2010) have been examined in more detail from the high-resolution model runs. The turbulent mixing in the model during the forcing stage is confined to the top 50-100m. The upper water column is weakly unstable with respect to temperature during winter, and the turbulent mixing thereby reduces SSTs by ~0.2C. The direct advective response involves near-inertial waves that decay with depth. Typically the response is dominated by the barotropic and the first baroclinic mode and lasts for 2-5 days. No clear sign of enhanced mixed layer baroclinic instability has been found.

Plans for Comming Reporting Period

- In task 9 on Ocean adjustment:
  - Summarize findings and write a final report.

Task 10: Polar Low Scientific Community Development

Results of Reporting Period

- Non Activities reported

Plans for Comming Reporting Period

- Non Activities reported

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
PTM2	03/02/12	Progress team meeting 2 - PLI
PTM3	16/02/12	Progress team meeting 3 – SAR + ASCAT

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-7	Review the potential for RFI contamination of AMSRE data in Thorpex event	ØS		Close action (will not be done)	15/11-12
MTR-9	CD to organize an ESA web story on Polar Lows with STARS team in preparation for 2011/2012 PL season	CD		Close action (will not be done)	15/11-12
MTR-13	Update phase-II plan to include steering of PL by mesoscale ocean structure	ØS		Close action (will not be done)	15/11-12
Progress meeting					

ESA (PM)					
PM-2	Include information/pictures of the first forecasted polar low this season on the web page	GN		Ongoing	
Progress meeting Tromsø (PM8)					
PM8-7	Check AMSRE TCWV fields from RSS to be included in STARS-DAT	SE	No more resources available	closed	15/11-12
PM8-18	Can we find out how many people have accessed the STARS-DAT?	SE		closed	15/11-12
PM8-19	Need to have a discussion within STARS to actually provide PL track data in the right way for further use. Currently hourly interpolated ASCII file of time and positions. Aim to put a short publication/note.	All		closed	15/11-12
PM8-22	ØS and team - to contact university professors and ensure that students are aware that STARS-DAT can be used for a project. And figure out what period of the data set should be given to the users!!	ØS			
PM8-28	Remember to mention in the finale report the use of EOLI software if we are missing anything, or positive feedbacks	BF	December		

Status of Deliverables

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

Doc Ref	Doc Title	Delivery Date	Status
P2D-1	STARS-web	01/10/11	Accepted
P2D-4	STARS-DAT-UM-v3	01/10/12	Not accepted
P2D-5	REP-4	08/10/12	Not accepted

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	Tromsø	Progress meeting	Completed
PM	01/10/12	Met.no	Progress meeting	Not Completed
FM	05/12/12	ESA	Final Meeting	Not Completed

Status of Travel Expenditure

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
