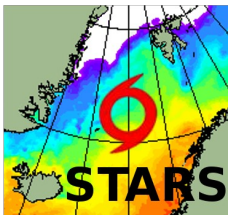

Deliverable D-22

Monthly Progress Report

Customer	:	ESA
Author	:	Met.no
STARS Contract number	:	22644/09/NL/CT
Document Reference	:	STARS_D22_October_09
Version	:	1.1
Date of Issue	:	03. October 2009
Category	:	A

Prepared by (met.no)	:	Øyvind Saetra STARS Project Manager	
Accepted by (ESA)	:	Technical Officer	no

AMENDMENT HISTORY

Version	Date	Change Description	Author
1.0	03/10/2009	Report Oct. 2009 to ESA	Øyvind Saetra

DISTRIBUTION

Name	Role	Company
Craig Donlon	Scientific Officer	ESA

EXECUTIVE SUMMARY

This is the project summary covering the progress in October 2009. During this work on Task 2, the literature review, has started. The Stars web page are gradually updated with a historical summary of polar low research, which is a result of the activity in Task 2. The web page is also continually updated with relevant information about the project.

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 is the first STARS progress report and covers the elapsed period from 1 October to 31 October 2009. The plan summarises the nine tasks 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 1 December 2009.

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			
D-1	STARS web portal		1.0	29/09/2009
D-23	STARS Action Database			03/09/2009

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 first phase of the project, the STARS data set will be built and used to investigate each polar low event over a five year period and use the satellite data to detect any possible ocean atmosphere interaction incidents. I addition, 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.

In the second phase, the coupled model system will be implemented and used for polar low simulations. A verification study of the coupled system behaviour will then be carried out. Basically, the scientific investigation will consist of two categories of simulations. First, short term forecasts will be conducted over selected polar low events to investigate the impact on the atmospheric circulation, such as the polar low intensity. The second part consists of long term ocean circulation simulations to investigate the longer term ocean response to polar low events.

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?
- Can the forecasting of polar lows be improved by introducing coupled atmosphere ocean models?
- Does the strong turbulent mixing induced by polar lows have an anomalously strong impact on the cooling of the North Atlantic Current?

PROGRESS ON MAJOR TASKS

Task 1: Management

Results of Reporting Period

Deliverable D-1, the STARS web page version 1.0 has been established.

Plans for Comming Reporting Period

The content of the STARS web page will be updated to the detailed specified in the project management plan. A hostorical review of polar low research is currently under writing.

Task 2: Preliminary Analysis

Results of Reporting Period

The task started 15 October and polar low literature is now being examined.A summary of the findings will be added to the STARS web page.

Plans for Comming Reporting Period

The preliminary analysis will scontinue by gather literature concerning polar lows. We will start by establishing the history of polar low research. The firs ever large scale project on polar low research was led by met.no (then DNMI) in the early 1980's. All reports from this project is archavied at the met.no liberary. The earliest references recorded by Rasmussen and Turner (2004) is to a book by the Norwegian meteorologist Danevig i 1954. We use this oportunity to dig into the met.no liberary to see if we can find more information on the earliest scientific considerations of polar low.

We will then start to describe the state of the art of pola low forecasting, in particular we will refer to the IPY-THORPEX campaign where an international team of forecasters and scientists were gathered at Andøya in Northen Norway for a period of three weeks aiming at taking observations from polar lows. One of the main obstacles experienced during this period was to correctly forecasting polar lows before filing in flight plans. Description will relate mostly to the use of model prognoses and and IR satellite images.

MANAGEMENT

Invoices

Milestone	Schedule date	Payment	Invoice to ESA	Payment Revieved
ADVANCE PAYMENT: upon signature of the Contract by both Parties	September 2009	24.000	yes	no
PROGRESS PAYMENT: Upon successful completion of phase 1 and acceptance of all related deliverables by the Agency	December 2010	96.000	no	no
ADVANCE PAYMENT: Upon written authorization to proceed with phase 2	January 2011	16.000	no	no
PROGRESS PAYMENT: Upon the acceptance by the agency of **D-12 NS-MODEL-SAD** **D-13 NS-MODEL-OM** **D-14 TEST DATA SET**	October 2011	20.000	no	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 deloverables	May 2011	144.000	no	no
Totals		300.000	no	no

Action Database

Action Ref	Action	Actionee	Actioner	Target Date	Status	Date Closed
	Invoice ESA	ØS				03.10.09
	Make web page visible to technical officers	SE				03.10.09

Status of Deliverables

The following contractual deliverables have been submitted to ESA during September 2009.

Doc Ref	Doc Title	Delivery Date	Status
STARS D-1	STARS Web page	15/09/2009	Approval

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
KO	03/09/2009	Met.no	Kick-off meeting	Completed

Status of Travel Expenditure

There have been no travel activities during this reporting phase.

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