5th Atmospheric Limb Conference/Workshop

ESA Climate Change Initiative (CCI)

New ESA Programme with the aim to contribute to worldwide efforts to generate Essential Climate Variables (ECVs)

C. Zehner

Helsinki, 19/11/2009

GEOSS

Global Earth Obse
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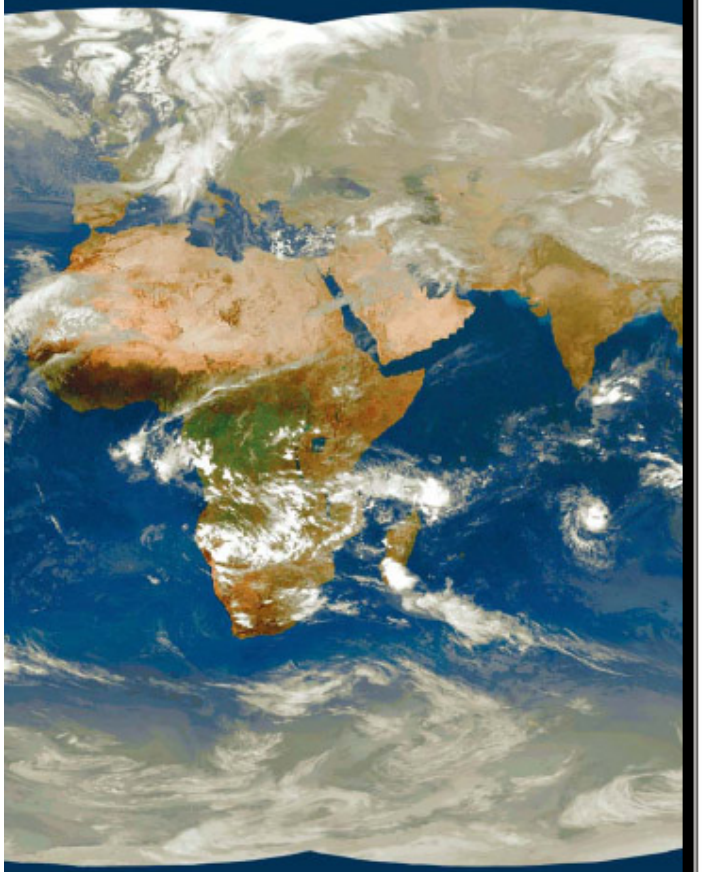
GEOSS



10-Year Implementation Plan Refere

Group on Earth Observation

THE CEOS IMPLEMENTATION PLAN FOR SPACE-BASED OBSERVATIONS FOR GEOSS

Version 0.1.10
7th May 2007

CEOS
Committee on Earth Observation Satellites

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GCOS

esa

Global Climate Observing System (GCOS) Report

SYSTEMATIC OBSERVATION REQUIREMENTS FOR SATELLITE-BASED PRODUCTS FOR CLIMATE

Supplemental details to the satellite-based component of the "Implementation Plan for the Global Observing System for Climate in Support of the UNFCCC"

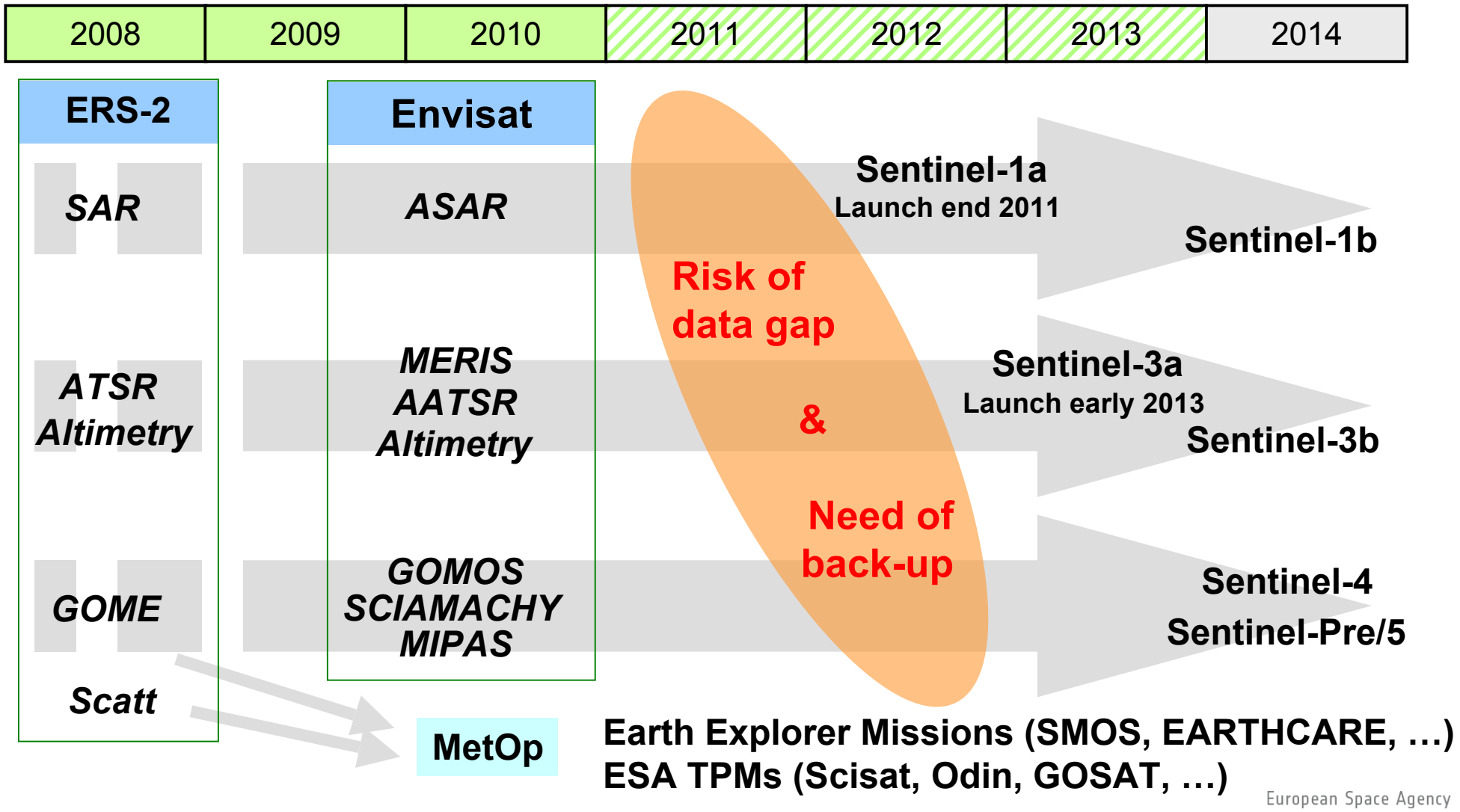
September 2006

GCOS – 107

(WMO/TD No. 1338)

Space Agencies agreed to take actions on 26 ECVs

ENVISAT Lifetime and Operations Extension



Based on existing missions ESA could contribute to 18 ECVs

CCI Objectives

To realize the full potential of the long-term global Earth Observation archives that ESA together with its Member states have established over the last thirty years, as a significant and timely contribution to the ECV databases required by United Nations Framework Convention on Climate Change (UNFCCC).

- Implement all steps necessary for the systematic generation and regular updating of the relevant ECVs,
- A coherent and continuous suite of actions fully coordinated with on-going international efforts in the climate change community (eg. WCRP, IGBP, SCOPE, etc)
- Ensure full capital is derived from on-going & planned ESA missions for climate purposes
- Duration 6 years (2009 – 2015): Budget 75 Meuro
- Initial Focus on 11 ECVs

11 selected ECVs

Sea-level
Sea Surface Temperature
Sea Ice
Ocean Colour
Land Cover
Fire Disturbance
Glaciers and Ice Caps
Cloud Properties
Aerosol Properties
Ozone
Greenhouse Gases (CO_2, CH_4)

ECV Feedback Loops

Long Term Archiving Programmes
Multi-mission infrastructure

INPUT FROM

Re-processing ex archive (e.g. calibration)

"Gather"

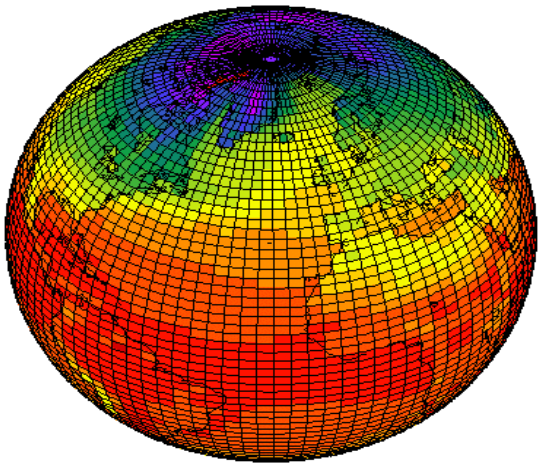
ECV generation (e.g. validation & bias)

"Deliver"

ECV assimilation & assessment

"Exploit"

FEEDBACK LOOP:
6 year programme for 2 phases



OUTPUT TO

International Climate Programmes
EC & MS R&D Programmes
IPCC Process, UNFCCC

Education & Awareness

"Show"

International Coordination

- UNFCCC which coordinates the interests and decisions of its Parties on Climate Policy,
- GCOS which represents the scientific and technical requirements of the Global Climate Observing System on behalf of UNFCCC,
- CEOS which serves as a focal point for Earth Observation related activities of Space Agencies,
- Individual Partner Space Agencies with whom ESA cooperates bilaterally,
- International Climate Research Programmes, which represent the collective interests and priorities of the worldwide climate research,
- EC and National Research Programmes which establish research priorities and provide resources for climate research community within Europe.

Programme: First Phase

- First Phase has a duration of 3 years: Definition, Algorithm Development, Protoyping Phase – 25 MEuro

- All ESA Programmes are implemented via contracts with industry and research organizations in ESA states

- Contracts are awarded via open competitive tender – CCI ITT to has been isssued, deadline end of Jan. 2010, 11 contracts on ECVs to start early 2010 and 1 additional contract interacting with Key Climate Modelling Groups

What has do be done in Phase 1:

Task 1: Scientific Requirements Analysis and Detailed Specifications

The objective is using the GCOS documentation to identify in detail the technical requirements and specifications for the relevant ECV data product and the interface to the Earth system science and climate modelling community that ultimately will exploit such products.

Task 2: Algorithm Development, Validation and Inter-comparison

The objective of this task is to develop, test and validate the necessary algorithms to generate the high quality (multi-sensor) FCDRs and the derived ECV data products required by the end-users and matching the GCOS performance requirements (L1, L2 and data merging algorithms including detailed error characterisation). Parallel Algorithms development is encouraged.

Task 3: System Prototyping and FCDR and ECV Production

Given development of the algorithm(s) in task 2 this task will comprise the development of the software prototype and production of the necessary ECV products for Task 4.

Task 4: Final Product Validation and User Assessment

Characterisation and comprehensive validation of the ECV products with scientific rigour is a fundamental issue and a very considerable task necessary to provide the high quality long term ECV products as requested by the end users and GCOS.

Task 5: System Specification for Phase 2

Task 6: Management