EUMETSAT Climate Related Activities Update

Jörg Schulz
Vapour Trails From Meteorite Shower over Russia

Meteosat-9 SEVIRI HRV image taken at 03:15 UTC, 15 February 2013.
EUMETSAT Climate Monitoring Implementation Plan

- EUMETSAT updated its Climate Monitoring Implementation Plan that contains:
  - The EUMETSAT Data Set Generation Plan with all records to be produced by the Central Facility and all SAFs until 2017;
  - The plan covers in particular needs for NWP model-based reanalysis;
  - It supports generation of data records contributing to 18 GCOS ECVs (10 Atm., 2 Ocean., 5 Terres.);
  - The CF has the main responsibility to create FCDRs for all EUM instruments;
- The Implementation Plan has been endorsed by the EUMETSAT Council in November 2012.
Current EUMETSAT Satellites

METOP A and B
(LOW-EARTH, SUN – SYNCHRONOUS ORBIT)
EUMETSAT POLAR SYSTEM/INITIAL JOINT POLAR SYSTEM

JASON-2
(LOW-EARTH, 63° INCL. NON SYNCHRONOUS ORBIT)
OCEAN SURFACE TOPOGRAPHY MISSION

METEOSAT 8-9-10 (2nd GENERATION)
(GEOSTATIONARY ORBIT)
TWO-SATELLITE SYSTEM:
- METEOSAT-10: FULL DISK IMAGERY MISSION AT 0° (15 MN)
- METEOSAT-8: RAPID SCAN SERVICE OVER EUROPE AT 9.5°E (5 MN)
- METEOSAT-9: TAKES OVER RAPID SCAN SERVICE OVER EUROPE IN APRIL 2013

METEOSAT – 7 (1st GENERATION)
(GEOSTATIONARY ORBIT)
INDIAN OCEAN DATA COVERAGE MISSION AT 57°5 E
For band 2 at water vapor absorption region, CrIS and IASI are consistent to each other and the difference is close to a zero line. CrIS and IASI are nearly benchmark quality measurements and are critical for vicarious calibration of other infrared sounder and imager measurements.
METEOSAT-7 MVIRI vs. IASI Metop-A

IR window

IR WV
Example: Antarctica 4 April 2008, 07:58 UTC

Data processing for Metop-A AVHRR (1 March 2007 – 31 Dec 2012) is finished, validation activities are ongoing, submission to ECMWF is under preparation. Full AVHRR record (back to 1979) is planned for ERA CLIM 2 and will also be part of a new SCOPE-CM project on AMVs if selected.
Climate Change Monitoring: Arctic Sea Ice

Arctic Sea Ice Extent

Graph was plotted 11/12/12 08:10 UTC
Source: EUMETSAT OSI SAF (http://osisaf.met.no)

OSI SAF
Ocean and Sea Ice

Mean broadband surface albedo derived from Meteosat observations for the August-October (ASO) period for year 1984 (left) and 2003 (right). Unprocessed data are shown in white to the exception of oceans which are shown in light blue. Products available from www.eumetsat.int.
Comparison of FLUXNET ground truth data ("Tower") against surface albedo products from GlobAlbedo, MODIS ("MCD43C3"), MISR, MSA on MVIRI_5 (IODC) and MVIRI_7 (0DEG) for one site in Germany (DE_HAI, IGBP: deciduous broadleaf forest) and one site in Hungary (HU_BUG, IGBP: cropland).
From observations to information

New opportunities in climate modelling using long-term satellite observations

Example Sahel drought: how does the land surface affect droughts?

Courtesy of Alexander Loew, MPI-M, Hamburg, Germany
Assimilation of EUMETSAT albedo observations in ECHAM

... results in more realistic precipitation variability

Courtesy of Alexander Loew, MPI-M, Hamburg, Germany

Hagemann & Loew, 2012, JAMES
EU FP7 Project: CORE-CLIMAX
COordinating Earth observation data validation for RE-analysis for CLIMAte ServiceS
Coordinator: Professor Bob Su, z.su@utwente.nl,
ITC, University of Twente, The Netherlands
Coordination with GMES ongoing activities to support the formulation of the GMES Climate Service;

Major Objectives:
- Analyse the European capability to generate ECV CDRs;
- Develop a structured process for generating ECV CDRs – Best regards book on CDR generation;
- Develop a validation process for ECV CDRs – establishes a protocol for validation and develops validation concepts for some ECVs;
- Develop a feedback mechanism from NWP-based reanalysis – Establishes protocol for feedback from reanalysis to CDR provider and generates a CDR quality assessment procedure in reanalysis environment;
- Develop a process for comparison of different NWP-based reanalysis - Establishes a protocol for comparison.
WP 2 Partners, Tasks and Activities

• Partners: EUMETSAT*, ITC, ECMWF, DWD, VITO, FMI, MTF
• Task 2.1 Analysis of ECV capability and prioritisation for GMES climate services;
• Task 2.2 Preparation of a white book for structured process to derive ECV data records.
• Major activities:
  • Work out a ECV CDR description and agree with community;
  • Make use of the Maturity Matrix approach also adapting and extending it coordinating with all groups working on it;
  • Perform a ECV CDR assessment workshop for records produced by European institutions in January 2014 at EUMETSAT;
  • Compile a report and extendable data base for EC.