Applications of Satellite Climate Data Records in Numerical Modeling

Workshop Aims and Structure

Christine Träger-Chatterjee

Why are we here?

- Climate Monitoring Implementation Plan ➜ Member States request structured feedback from users
  - Who uses what?
  - Technical issues
  - Does EUMETSAT provide the right portfolio
  - What else?
- Workshops planned on regular basis

Objectives

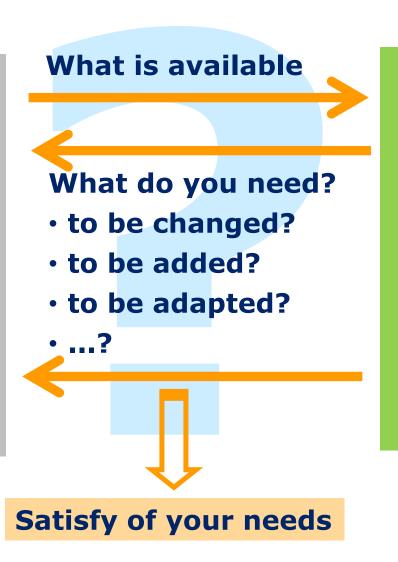- Establish feedback on and promote usage of EUMETSAT / CM SAF climate data in modelling applications

EUMETSAT

Why are we here?

Eumetsat

Data
- FCDR
- TCDR
- ....

Data Access
- Large data sets
- Filtering of data (hosted processing)
- ...

Users

What is available

What do you need?
- **to be changed?**
- **to be added?**
- **to be adapted?**
- **...?**

Modelling Applications

Requirements

Satisfy of your needs

EUMETSAT

Breakout Session with prior "Seeding Talks" on:

- Data assimilation and model initialization (using satellite data as 'input')
- Process-oriented model evaluation and improvement using satellite data
- Operational validation and model performance using satellite data

Working Group 1: Roger Saunders (Moderator); Viju John (Rapporteur)
Working Group 2: Johannes Quaas (Moderator); Jörg Trentmann (Rapporteur)

Workshop Outcome to be published in

- Peer reviewed journal
- Technical Report

EUMETSAT

What will happen?

Tuesday	
13:00 – 14:00	Registration and Lunch at ECMWF canteen
14:00 – 14:10	Welcome
14:10 – 14:30	Aims, content and structure of the Workshop
14:30 – 15:15	Applications of satellite climate data records in numerical modelling (R. Saunders)
15:15 – 16:00	EUMETSAT Climate Data Records (J. Schulz)
16:00 – 16:30	Coffee Break
16:30 – 17:15	CM SAF – Climate data records & Services (R. Hollmann)
17:15 – 17:45	Copernicus Climate Change Service (J.-N. Thépaut)
18:00	Icebreaker at ECMWF

EUMETSAT

What will happen?

Wednesday	Data assimilation and model initialisation
09:00 – 09:20	ECMWF Reanalysis (H. Hersbach)
09:20 – 09:40	JMA Reanalysis (S. Kobayashi)
09:40 – 10:00	Initialization of the ocean and sea ice in the GloSea5 Seasonal Forecast System (D. Peterson)
10:00 – 10:20	Initialization of the land surface component of ECMWF systems
10:20 – 10:45	Introduction into breakout #1
10:45 – 11:00	Coffee break
11:00 – 13:00	2 Breakout groups
13:00 – 14:00	Lunch

EUMETSAT

What will happen?

Wednesday	Process-oriented model evaluation and improvement using satellite data
14:00 – 14:20	Evaluation of cloud processes over West Africa in climate models (A. Fink)
14:20 – 14:40	Long-term evaluation of regional models (N. Van Lipzig)
14:40 – 15:00	Constraints on aerosol-cloud-climate forcing (J. Quaas)
15:00 – 15:15	Introduction into breakout #2
15:15 – 15:30	Coffee break
15:30 – 17:30	2 Breakout groups
19:30	Hosted Dinner, Cerise Restaurant in Reading

EUMETSAT

What will happen?

Thursday	Operational validation and model performance using satellite data
09:00 – 09:20	Status and plans for obs4MIPs (D. Waliser)
09:20 – 09:40	Evaluation of decadal variability (R. Allen)
09:40 – 10:00	Operational validation of IFS forecasts (T. Haiden)
10:00 – 10:20	On the representation of Arctic sea ice in global climate models (T. Koenigk)
10:20 – 10:45	Introduction into breakout #3
10:45 – 11:00	Coffee break
11:00 - 13:00	2 Breakout groups
13:00 – 14:00	Lunch
14:00 – 15:15	Reports on the 3 breakouts and discussion
15:15 – 15:30	Wrap up and closure

EUMETSAT

Go to ‚View' menu and click on ‚Slide Master' to update this footer. Include DM reference, version number and date

EUMETSAT

General questions

- Can the community use NetCDF4 formatted data having CF compliant metadata or are specific formats to be provided and if yes which ones?

- What metadata is generally required with each data record or are basic sets as defined for obs4MIPS sufficient?

- How do you decide which data record to use? (The discussion may also cover how international activities such as obs4Mips handle this)

EUMETSAT

Data assimilation for reanalyses

- Which EUMETSAT data records do you use already?

- Which FCDR and TCDRs have the highest priority, e.g., for atmospheric, ocean, land, cryosphere, coupled models?

- What are the specific roles of FCDRs and TCDRs for the assimilation into such models?

- Do the necessary observation operators exist for FCDR and TCDRs?

- Is it possible to present the needed accuracy as a quantitative requirement and how accurate need the data to be?

- What representation of uncertainty is needed (including pixel level vs. global number, data set ensemble, etc.)?

- How is this uncertainty information used in the models?

- How important is consistency between different TCDRs?

- How important is the temporal stability of the data records?

- Which differences between global and regional models concerning the needs exist?

- What is needed in terms of data recovery for old instruments and long term data preservation for existing FCDR/TCDRs.?

- How does the picture change in the mid-term future (5-10 years)?

Model initialisation

- What role can satellite data play for the initialisation of decadal prediction models and what kind of products are needed?

- Which different needs for regional and global models do we know?

- What is needed in the future to support this application?

General questions

- Can the community use NetCDF4 formatted data having CF compliant metadata or are specific formats to be provided and if yes which ones?

- What metadata is generally required with each data record or are basic sets as defined for obs4MIPS sufficient?

- How do you decide which data record to use? (The discussion may also cover how international activities such as obs4Mips handle this)

     EUMETSAT

- Which processes are evaluated with satellite data?

- How is this evaluation done, e.g. comparison of specific situation vs. usage of data to improve parameterisations?

- What is the role of satellite simulators to facilitate comparisons of models to satellite products?

- Which geophysical parameters have currently and in the future highest priority?

- How accurate need those data to be in relation to the process?

- What representation of uncertainty is needed?

- How do you currently treat uncertainty information?

- Is temporal and spatial coverage and sampling (grid spacings) of current and future planned instruments/products adequate or what needs to be improved?

- How important is temporal stability, e.g. for oceanic processes?

EUMETSAT

General questions

- Can the community use NetCDF4 formatted data having CF compliant metadata or are specific formats to be provided and if yes which ones?

- What metadata is generally required with each data record or are basic sets as defined for obs4MIPS sufficient?

- How do you decide which data record to use? (The discussion may also cover how international activities such as obs4Mips handle this)

EUMETSAT

- What is the role of satellite simulators to facilitate comparisons of models to satellite products?

- Will there be an increasing role of comparisons at Level1 (FCDR)?

- What representation of uncertainty is needed for model performance monitoring and what is missing today?

- How do you currently treat uncertainty information?

- How accurate need those data to be?

- How important is temporal stability for the monitoring and how to estimate it for TCDRs?

- How important is closeness to the measurement and independence of the model, e.g., for the operational forecast that assimilates many observations from satellites?

- Which datasets should be submitted to Obs4MIPS?

EUMETSAT