EUMETSAT SAF Activities

Christine Träger-Chatterjee

Lothar Schüller
Satellite Application Facilities

- EUMETSAT has a network of different Satellite Application Facilities (SAFs)
- SAFs are dedicated centres of excellence for processing satellite data
  - research, development and operational activities
  - each SAF focuses on specific user communities or application areas
- Each SAF is a consortium of entities from EUMETSAT member states
This presentation

• Overview on the SAF’s
• What are different SAF’s focusing on?
• Many products available
• Webpages: http://[XXX]-saf.eumetsat.int
• Helpdesk
Near real time data and data records

- Precipitation
- Soil Moisture
- Snow Cover
Precipitation

- Rainfall product (SSMI & SEVIRI)
- Instantaneous rain rates
- Accumulated rainfall
- Soon available for Africa
- Will replace MPI

http://h-saf.eumetsat.int
• New rainfall product obtained through the integration of:
  • soil moisture-derived rainfall, as natural precipitation measurement and
  • microwave precipitation estimates (direct observations).
• expected to provide accurate rainfall estimates over land
• daily temporal resolution
  • suitable for hydrological studies
• Goal: availability for next UFA

http://h-saf.eumetsat.int
Soil Moisture

http://h-saf.eumetsat.int
Drought 2017/2018 Western Cape, South Africa

Deviations of soil moisture from longterm average (2007-2016), observed from ASCAT onboard Metop

Mariette Vreugdenhil/TU Wien, EUMETSAT H SAF

http://h-saf.eumetsat.int
Software Packages to include satellite data in time critical applications (nowcasting, aviation, warning services).

New version expected in fall/winter 2018. Extended portfolio and further improvements:

• Convection Initiation
• Rapid Thunderstorm Development
• Probability of turbulences

http://nwc-saf.eumetsat.int
Nowcasting – Image Extrapolation

- Applicable to Geostationary satellite data (Meteosat)
- Extrapolation of satellite images (and product images) up to 1h based on SEVIRI high resolution wind vectors

Visualization of extrapolated cloud top temperature product using a false colour representation with the range -30°C to -40°C in yellow, -40°C to -50°C depicted in red, -50°C to -60°C in green. Superimposed are the isolines -30°C, -40°C, -50°C of the forecast image, showing how far the “yellow”, “red”, and “green” areas are expected to move in the next hour. The right panel shows the observed image of the forecast date for verification purposes.

Extrapolation using EXIM module part of the NWC SAF GEO software package Version 2016 applicable to geostationary satellite data. [http://nwc-saf.eumetsat.int](http://nwc-saf.eumetsat.int)
Near real-time data products and an offline archive including:

- Ozone
- Trace gases, such as NO2, SO2
- Absorbing aerosol index
- UV index
Carbon Monoxide (CO)

- Total column and vertical profiles
- Based on Metop / IASI
- Near Real Time production
- Global coverage

http://ac-saf.eumetsat.int
Wildfire Aerosol plumes

SO2 from IASI measurements [DU]

http://ac-saf.eumetsat.int
Near real time data and data records

- Winds over the sea surface
- Sea Ice extend, distribution, drift, temperature
- Sea surface temperature
Sea Surface Wind

Essential for forecast, especially for tropical storms forming over ocean.

Continuous extension of product portfolio to account for all scatterometer, also from other satellite data providers.
Near real time data and data records

• Surface radiation, including LST
• Vegetation
• Evapotranspiration
• Wild fire
Reference Evapotranspiration

- Evapotranspiration rate from a defined reference surface.
- Allows estimation of evaporative demand of the atmosphere independently of crop type, crop development or management practices.
- Can be combined with Actual Evapotranspiration to estimate drought conditions

http://lsa-saf.eumetsat.int
Vegetation Cover Uganda – Anomaly Study

2004 - 2008 Mean Fraction of Vegetation Cover over Uganda

Fraction of Vegetation Cover Anomaly for November 2017

Legend
- Feb_Mean
- 0
- 2500
- 5000
- 7500
- 1e+4

Simon Ageet, Uganda National Meteorological Authority

http://lsa-saf.eumetsat.int
Climate Monitoring

Climate Data Records and Operational Climate Monitoring Products on

- Radiation
- Clouds
- Atmospheric Moisture and Temperature Gradients
- SST & Wind over ice free oceans

→ Focus on creation of climate data records, data for climate applications

http://cm-saf.eumetsat.int
Solar Energy Potential Senegal

- Identify the best locations for solar energy power plants
- Decide, which kind of plants (PV or STP) will be most efficient

Global radiation at surface

SIS [W/m²], CM SAF SARAH-2 JJA mean 1983-2015

Direct normal radiation at surface

DNI [W/m²], CM SAF SARAH-2 JJA mean 1983-2015

Marianne Diop Khane, Steffen kothe

http://cm-saf.eumetsat.int
Climate Data Record Examples

Land Surface Temperature, Mean 1991 - 2016

Cloud Fractional Cover

http://cm-saf.eumetsat.int
• Each SAF has a helpdesk (contact via webpage)
• Do contact them in case of questions and/or feedback!
• Any kind of feedback is appreciated
  • positive experiences
  • questions
  • requirements / suggestions / whishes
  • ....