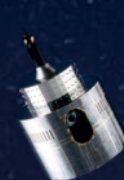


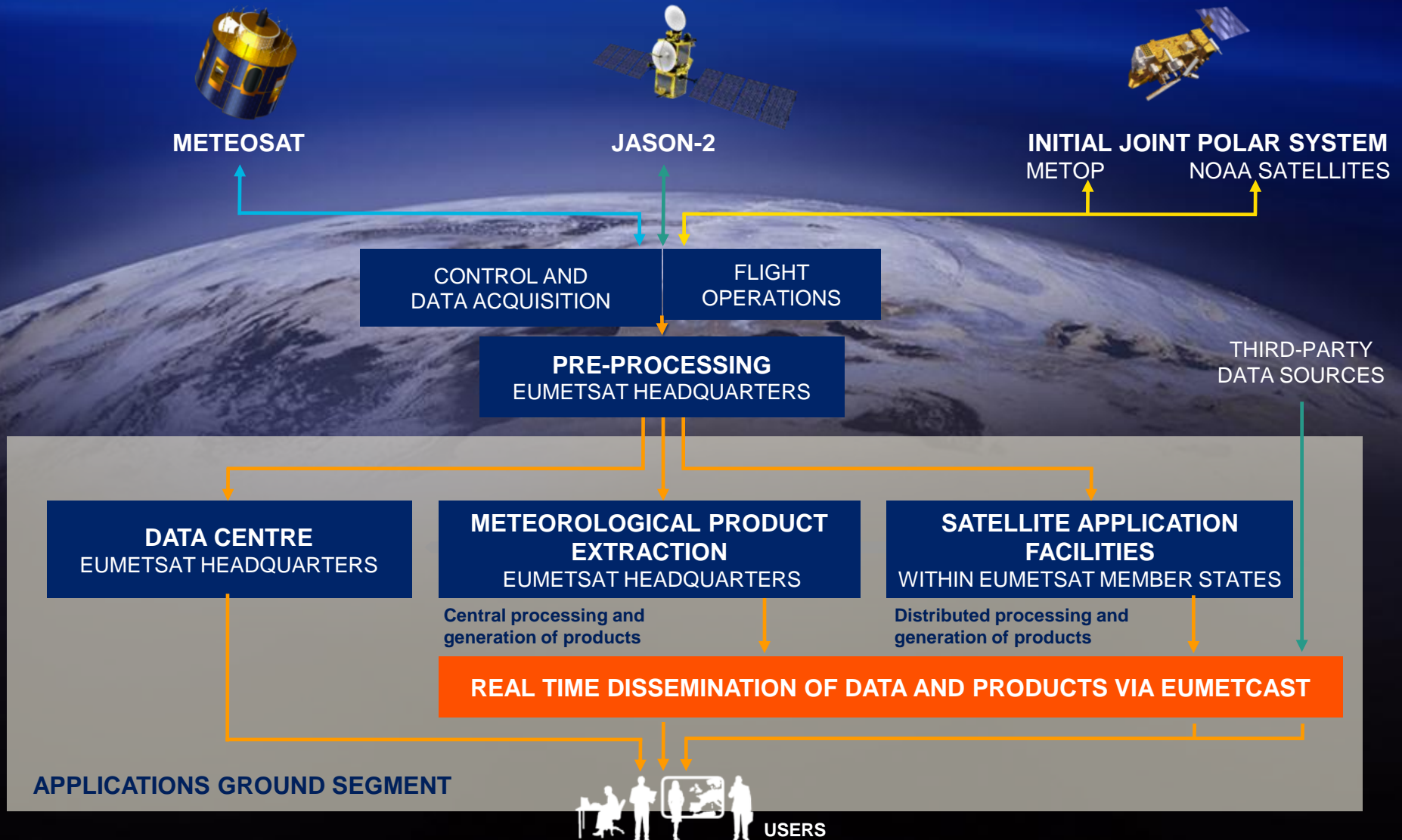
# EUMETSAT SAF NETWORK



**Vesa Nietosvaara, EUMETSAT  
Training Officer  
Lothar Schüller, EUMETSAT  
SAF Network Manager**



# EUMETSAT ground segment overview



# What is a SAF?



- SAF = **Satellite Application Facility**
- part of the EUMETSAT application ground segment
- complement production of standard meteorological products at EUMETSAT central facility
- providing products and services to users
- specialised on topics and themes
- located at Weather Services in EUMETSAT Member and Co-operating States
- developed and operated by consortium of partners

# Nature of SAF products

The goal of SAFs is to provide “operational” products.  
What do we mean with operational?

- Continuity of product provision
- Continuity of product improvements
- Continuous quality monitoring
- Committed user services
- Validation and review before official release/launch
- Complete Documentation of Products, Algorithms, Validation Results
- ...

# EUMETSAT SAF network across Europe



**H SAF**  
Support to Operational Hydrology and Water Management  
Led by Italian Meteorological Institute



**ROM SAF**  
Radio Occultation Meteorology  
Led by Danish Meteorological Institute



**O3M SAF**  
Ozone and Atmospheric Chemistry Monitoring  
Led by Finnish Meteorological Institute



**LSA SAF**  
Land Surface Analysis  
Led by Portuguese Meteorological Institute



**NWC SAF**  
Support to Nowcasting and Very Short  
Range Forecasting  
Led by Agencia Estatal de Meteorología,  
Spain



**OSI SAF**  
Ocean and Sea Ice  
Led by Météo France



**CM SAF**  
Climate Monitoring  
Led by Deutscher Wetterdienst, Germany



**NWP SAF**  
Numerical Weather Prediction  
Led by Met Office (UK)

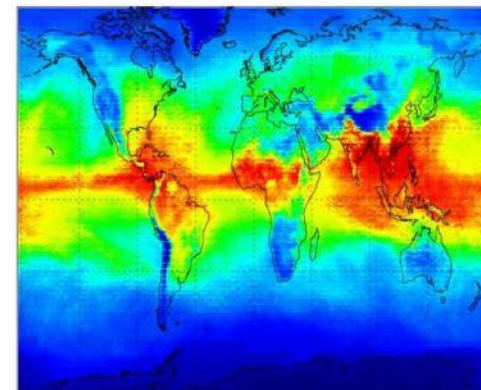
**EUMETSAT NETWORK  
OF SATELLITE  
APPLICATION  
FACILITIES**





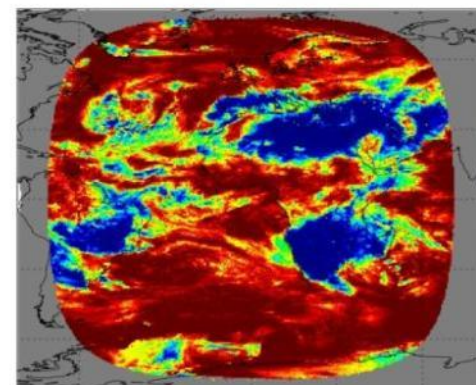
- SAF on Climate Monitoring
- generates and archives high-quality data-set for specific climate application areas
- Currently concentrates on:
  - cloud parameters
  - radiation budget parameters
  - atmospheric humidity
- Leading Entity is the German Weather Service DWD, Offenbach
- NOAA-AVHRR based data operationally produced since November 2004, MSG based data from October 2005, Metop data used since 2009.
- Climate Data Records (released in the last years):
  - HOAPS (precip, evap, hum., wind) from SSM/I (1987–2008)
  - FCDR SSM/I, Brightness-temperatures 1987-2008
  - NOAA-AVHRR based 20 years of homogeneous data record (clouds, surface radiation)
  - SEVIRI Cloud + radiation (2004-2012)
  - MVIRI/SEVIRI surface radiation (1982-2005(-2013))
  - GERB top of the atmosphere radiation (2004-2009)

TPW (average, 06 2005) /  $\text{kg m}^{-2}$



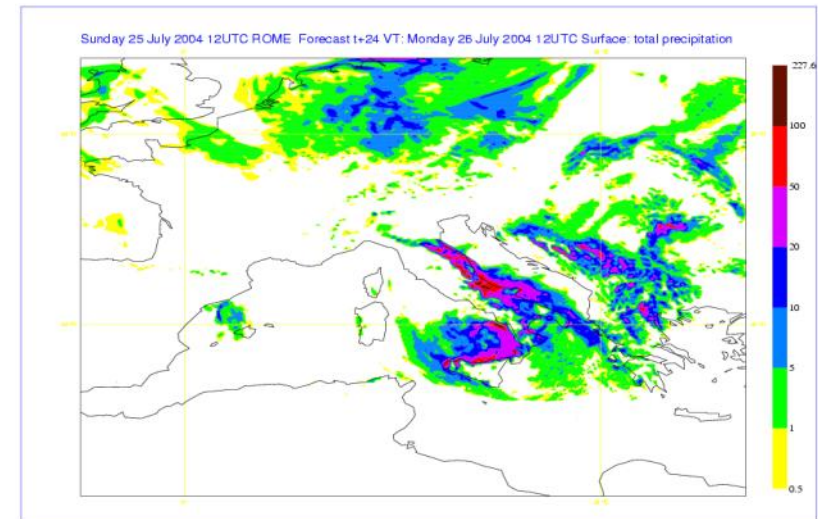
Total precipitable water

cloud fraction / %



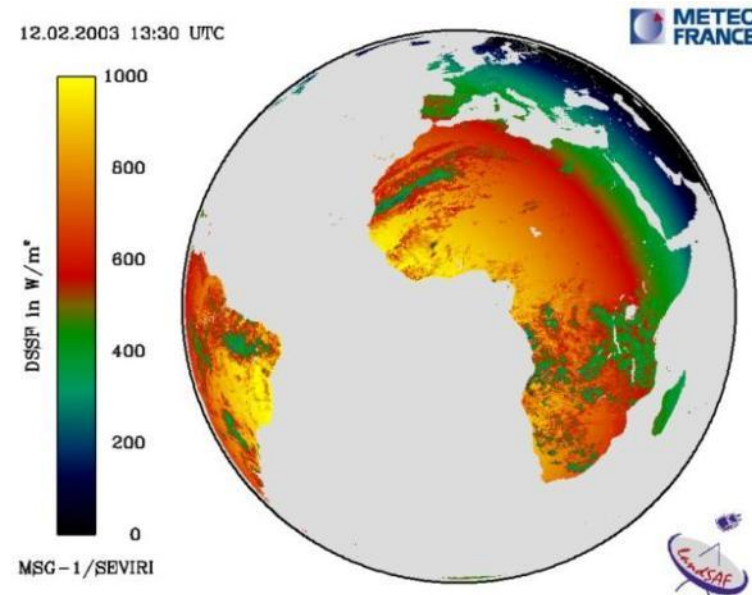


- SAF on Support to Operational Hydrology and Water Management
- Leading Entity: Italian Meteorological Service (USAM)
- SAF products focuses on
  - ▶ precipitation
  - ▶ soil moisture
  - ▶ snow parameters
  - ▶ utilisation of these parameters in hydrological models and NWP





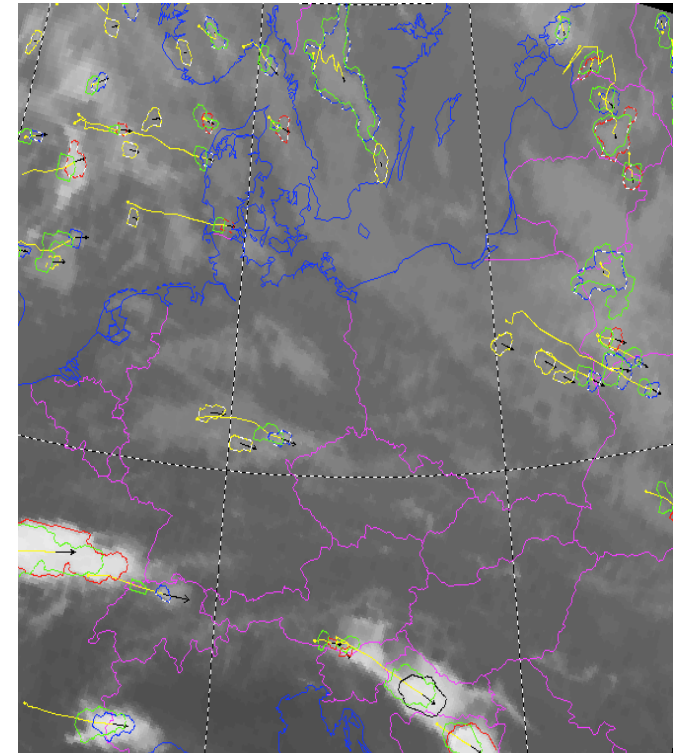
- SAF on Land Surface Analysis (LSA SAF)
- established to increase the benefit from MSG and EPS data related to land, land-atmosphere interaction and biospheric applications
- Generates operationally data services related to Surface Radiation, Vegetation and wild fire
- Leading entity is the Portuguese Sea and Atmosphere Institute, IPMA, Lisbon







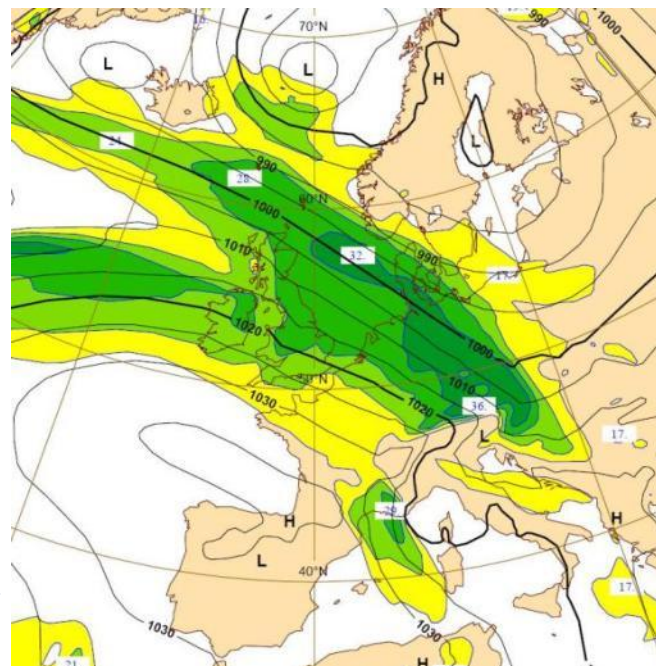
- “Support to Nowcasting and Very Short Range Forecasting” (NWC SAF)
- established to utilise the new data from:
  - Geostationary satellites (Meteosat and others) and
  - the polar platforms (Metop, NOAA, Soumi NPP) for enhancing Nowcasting
- Development of Software packages for the operational extraction of products relevant to Nowcasting and for local installation
- Leading Entity is the Spanish Meteorological Agency AEMET in Madrid
- Regular updated software packages since October 2004



Rapidly developing Thunderstorm Product



- SAF on Numerical Weather Prediction (NWP SAF)
- aims at increasing the benefits to Met.-Services from Numerical Weather Prediction (NWP)
- develops advanced techniques for the effective use of satellite data
- development and maintenance of RTTOV radiative transfer model, ATOVS and AVHRR Pre-processing Package (AAPP)
- Leading Entity is the UK MetOffice, Exeter

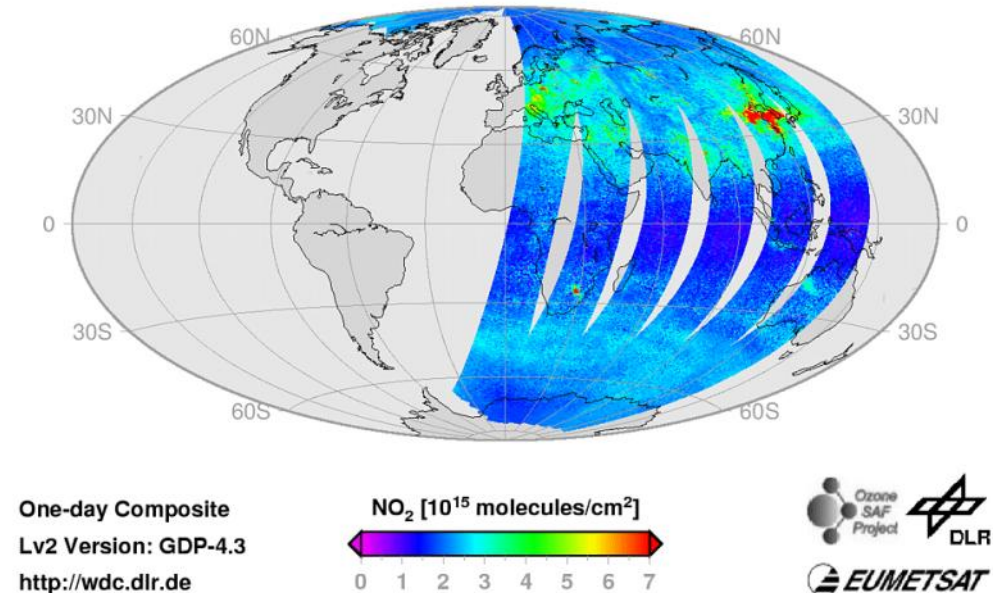




- SAF on Ozone and Atmospheric Chemistry Monitoring (O3M SAF)
- developed for the processing of data on ozone, other trace gases, aerosols and ultraviolet radiation
- Emphasis on the Global Ozone Monitoring Experiment (GOME-2) and IASI on EPS (Metop)
- Leading Entity is the Finnish Meteorological Institute FMI, Helsinki
- First release of products in Summer 2007

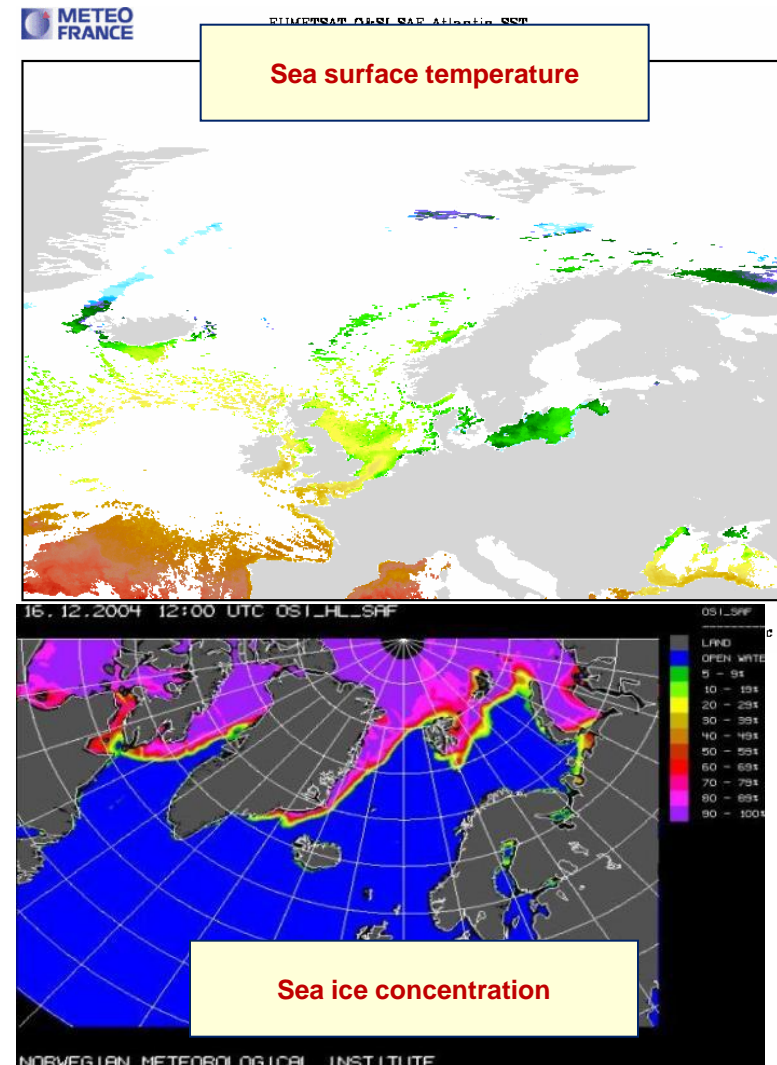
GOME-2 / MetOp  
NO<sub>2</sub> Vertical Column Density

Mar 26, 2009



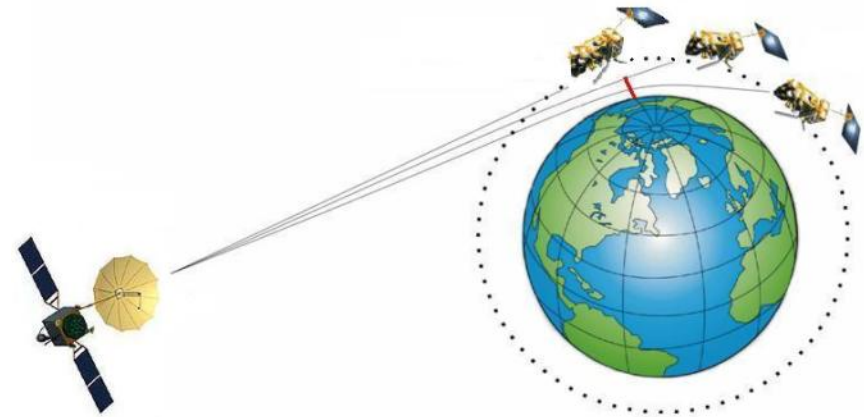


- Ocean and Sea Ice (OSI) SAF routinely produces and disseminates products characterising the ocean surface:
  - Sea Surface Temperature and the energy fluxes
  - Information on the sea ice characteristics (extend, concentration, ...)
  - Wind speed from Scatterometry
- Leading Entity is Météo-France in Lannion
- OSI SAF distributes near real-time products based on NOAA, MSG, Metop, DMSP and GOES data





- SAF on Radio Occultation Meteorology
- GRAS: Global Positioning System (GPS) Receiver for Atmospheric Sounding flown on EPS/Metop satellites
- near real-time and offline:
  - ▶ sounding data (temperature, pressure, humidity)
  - ▶ corresponding validation products, and
  - ▶ assimilation software
- The Leading Entity is the Danish Meteorological Institute DMI, Copenhagen
- Software packages released since 2007, first NRT product dissemination in October 2008





# Network function of the NWC SAF



Support to Operational Hydrology and Water Management  
Led by Italian Meteorological Institute



Radio Occultation Meteorology  
Led by Danish Meteorological Institute



Ozone and Atmospheric Chemistry Monitoring  
Led by Finnish Meteorological Institute



Land Surface Analysis  
Led by Portuguese Meteorological Institute



Support to Nowcasting and Very Short  
Range Forecasting  
Led by Agencia Estatal de Meteorología,  
Spain



Ocean and Sea Ice  
Led by Météo France



Climate Monitoring  
Led by Deutscher Wetterdienst, Germany

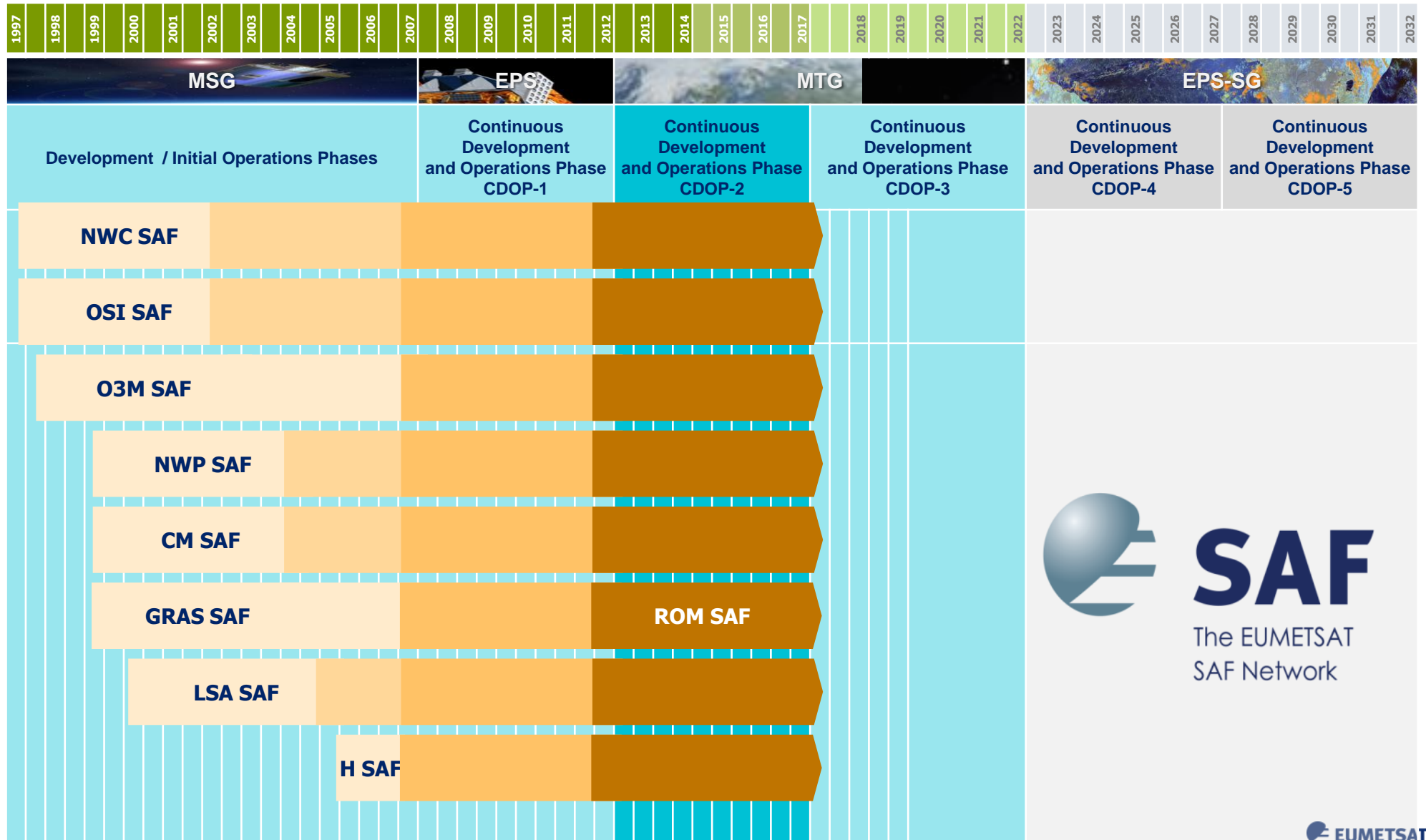


Numerical Weather Prediction  
Led by Met Office (UK)



- Geostationary Nowcasting Cloud Products
- EARS cloud products transmission

# 35 years of SAF Development and Operations

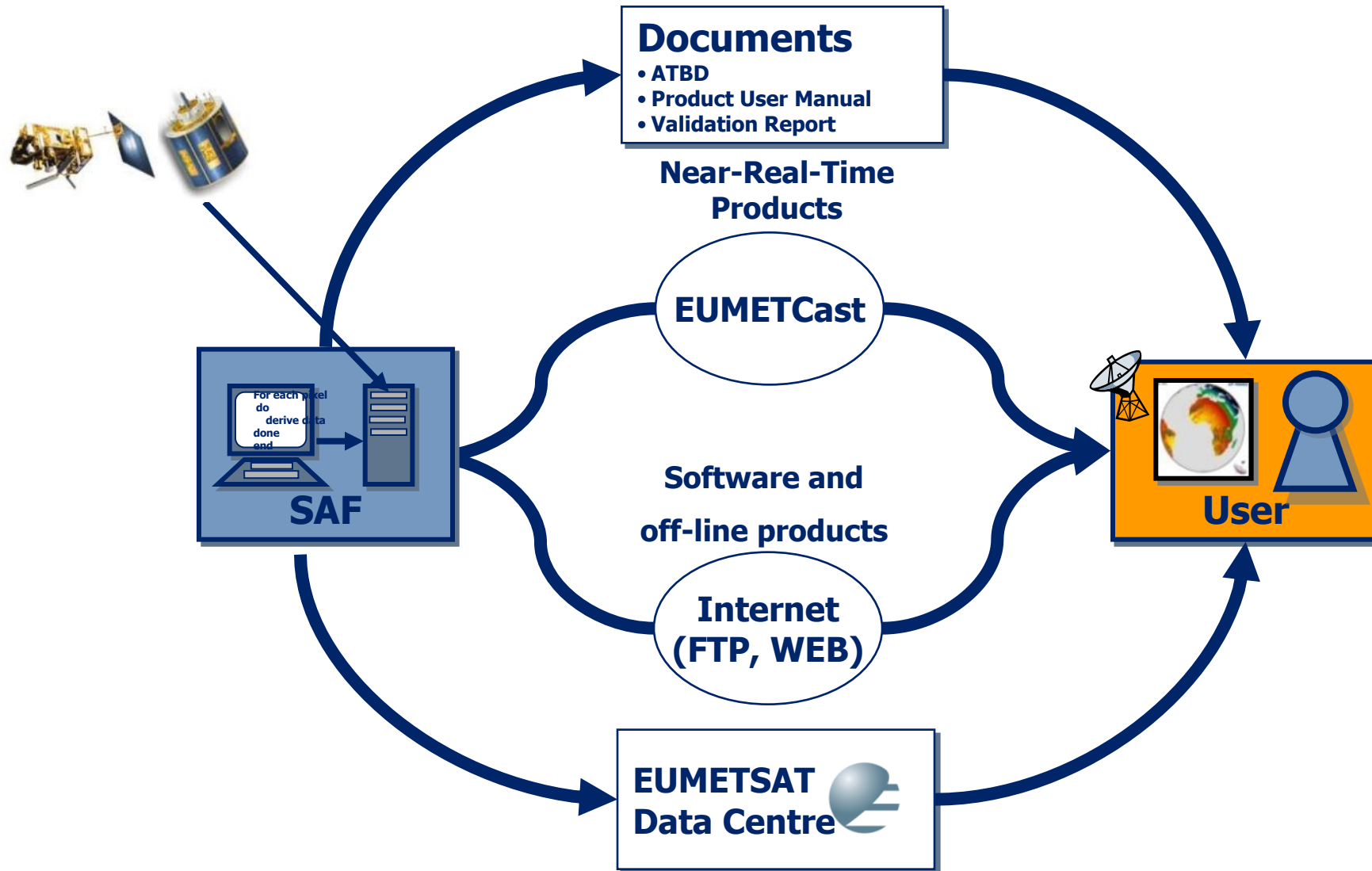


# Synergy: Research to Operations

- SAFs embedded programmatically in the EUMETSAT mandatory programmes, currently secured until 2022 (2032).
- The purpose and commitment of SAFs is to:
  - deliver **operational** products / software addressing requirements of the EUMETSAT member states
  - develop new products / software implementing **mature** retrievals validated by (internal or **external**) Research (transition from Research to Operations)
- Next SAF development and operations phase (CDOP-3 for 2017-2022): proposals expected end of 2015.

# Interaction with Users:

## Services provided to users



# Interaction with Users: Feedback provided to SAFs

