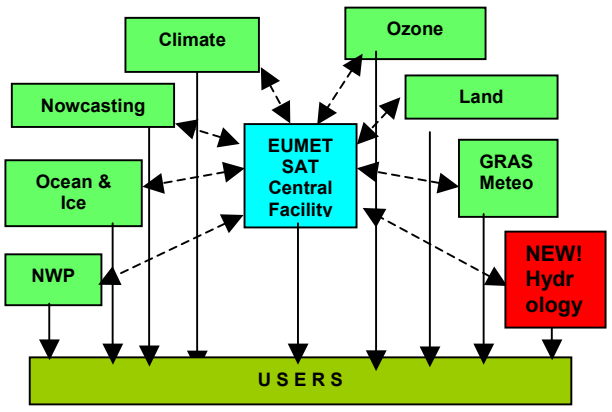
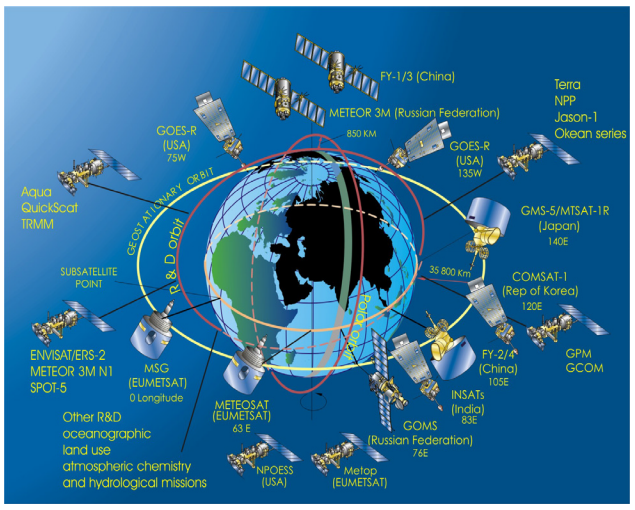
HYDROLOGY SATELLITE APPLICATION FACILITY (H-SAF)

HYDROLOGY SATELLITE APPLICATION FACILITY (H-SAF):
a distributed element
of the EUMETSAT Application Ground Segment
(by De Leonibus)

SAFs are initiatives which have been implemented at EUMETSAT to establish a common framework to deliver products, and services and to perform studies of satellite meteorological data.



Global Meteorological Satellite Network



The New H-SAF for Hydrology

In recent years, the interest of the hydrological community for using satellite data has rapidly increased because of improvements of satellite data quality and of performance of hydrological models including their capability to assimilate observational data.

H-SAF Background

Eumetsat started to study how to give operational support to the hydrological community. A consultation among EUMETSAT Member and Cooperating States showed that the best solution to achieve such a support was to establish a new SAF.

H-SAF Consortium

Italy (Aeronautica Militare - Ufficio Generale per la Meteorologia) has been selected to lead the HSAF Consortium of the following Eumetsat member and cooperating states

No.	Country	Main Unit in the Country	Role
01	Austria	Zentralanstalt für Meteorologie und Geodynamik	Leader for soil moisture
02	Belgium	Royal Meteorological Institute of Belgium	
03	ECMWF	N/A	Contributor for "core" soil moisture
04	Finland	Ilmatieteen Laitos	Leader for snow parameters
05	France	Météo-France	
06	Germany	Bundesanstalt für Gewässerkunde	
07	Hungary	Hungarian Meteorological Service	
08	Italy	Servizio Meteorologico dell'Aeronautica	Host + Leader for precipitation
09	Poland	Institute of Meteorology and Water Management	Leader for Hydrological validation
10	Romania	National Institute for Meteorology and Hydrology	
11	Slovakia	Slovakia Hydro-Meteorological Institute	
12	Turkey	Turkish State Meteorological Service	Contributor for "core" snow param.

H-SAF Objectives

HSAF has

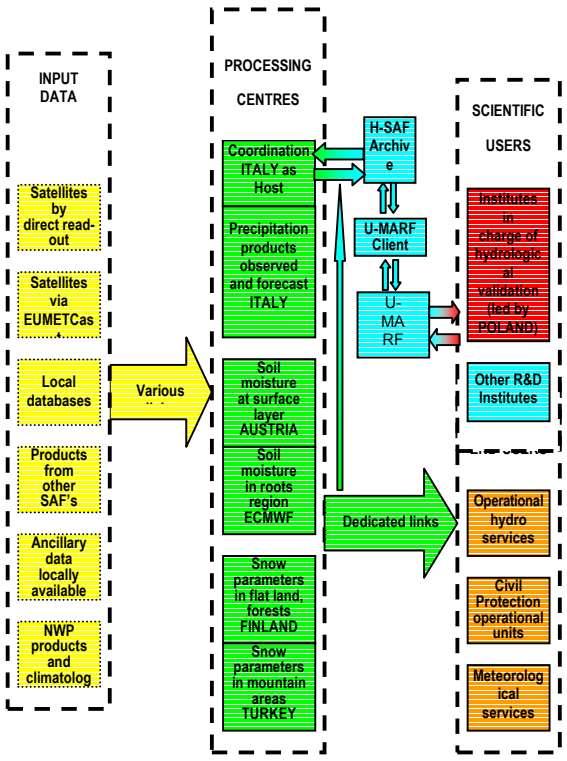
to provide new satellite-derived products:

- **precipitation** (liquid, solid, rate, cumulate)
- **soil moisture** (at surface, in the roots region)
- **snow parameters (cover, melting conditions, water equivalent**);

to perform independent validation of the usefulness of the new products for hydrological applications.**H-SAF**

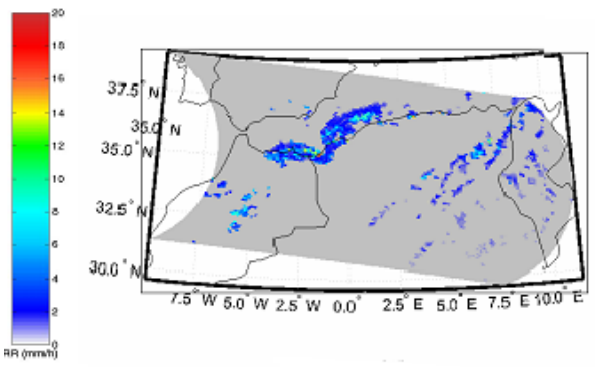
System Architecture

HSAF system architecture takes advantage of input data form both Polar orbiting and geostationary satellites



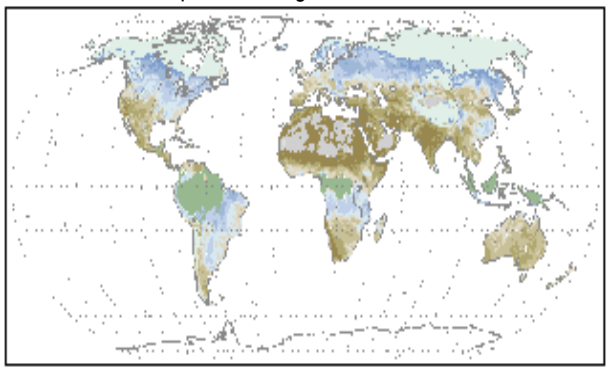
H-SAF Precipitation Products

Italy with other countries will produce, in real time, precipitation observation maps over Europe with a resolution of 10km and best accuracy of 10%. The rain rate directly retrieved from Polar orbiting satellite data will be combined with the Geostationary satellite Data (Meteosat Second Generation). Below an example of rain rate retrieval from polar orbiting satellite.



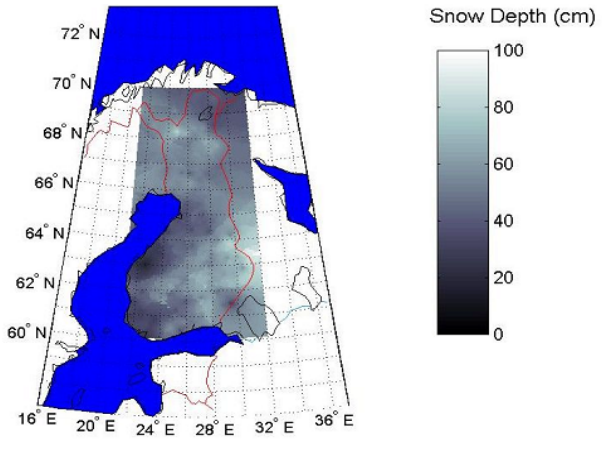
H-SAF Soil Moisture Products

Austria with other countries and ECMWF will produce soil moisture maps over Europe every 36 hours with a resolution of about 25km. The product will be generated directly from polar orbiting satellite radar data and via numerical assimilation. Below an example of monthly mean soil moisture from polar orbiting satellite data.



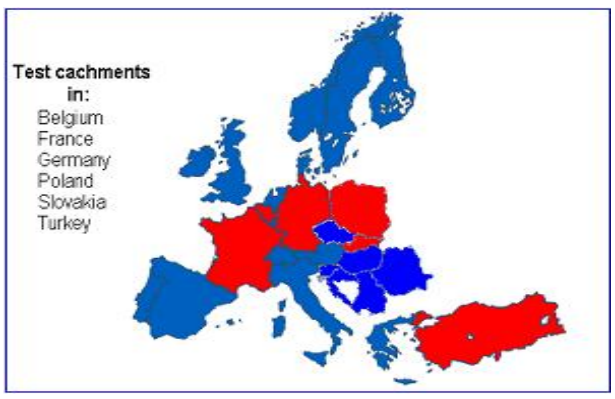
H-SAF Snow Products

Finland with other Countries will produce snow maps over Europe with a resolution of 2 – 10 km, giving information on snow coverage, depth, status and water equivalent content. Below an example of snow depth retrieval form polar orbiting satellite data merged with in situ observations.



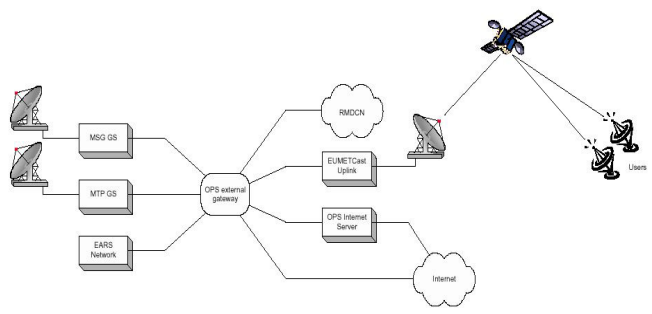
H-SAF Validation Studies

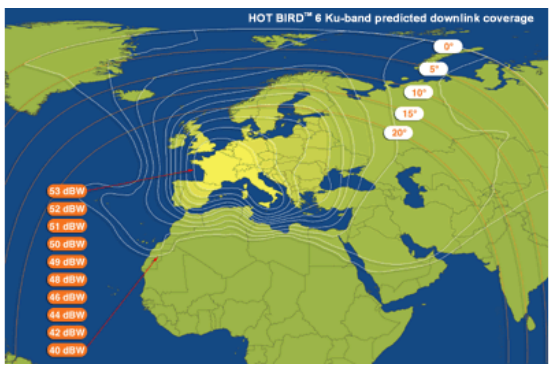
Countries responsible for impact studies and validation will test the HSAF products versus Hydrological models over specific basins as in the map below.



H-SAF Product Distribution Scheme

HSAF products will be disseminated world wide in pictorial and numerical format via Eumetcast (Eumetsat satellite broadcast service) and via international meteorological networks as standard World Weather Organisation messages.
Domestic dissemination will be responsibility of participating Countries.





Eumetcast dissemination scheme (above) and its coverage area (below)

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