The NWC SAF in the era of the new EUMETSAT Satellites MTG and EPS SG

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FUTURE FOCUS — Weather and climate data like never before

EUMETSAT NWC SAF — SUPPORT TO NOWCASTING AND VERY SHORT RANGE FORECASTING

AEMET · METEO FRANCE · ZAMG · METEO ROMANIA · SMHI

Introduction and current status

The objective of the NWC SAF is to develop, maintain and distribute software packages that allow the generation of satellite derived products with a direct application in Nowcasting like Clouds, Precipitation, Convection and Stability Products, High Resolution Winds, detection of meteorological features and Imagery Extrapolation.
Current software packages:

NWC SAF GEO v2021

- Supports geostationary satellites: all MSG satellites, GOES-13/17 and Himawari-8/9
- Reduced latency for MSG & Himawari with "early execution" mechanism in some cases
- CRRPh and EXIM products upgraded to operational status
- Use of GOES/ABI channels and GLM data as preparation for MTG
- Several improvements in some products

CRRPh 28 April 2022 12:00 UTC
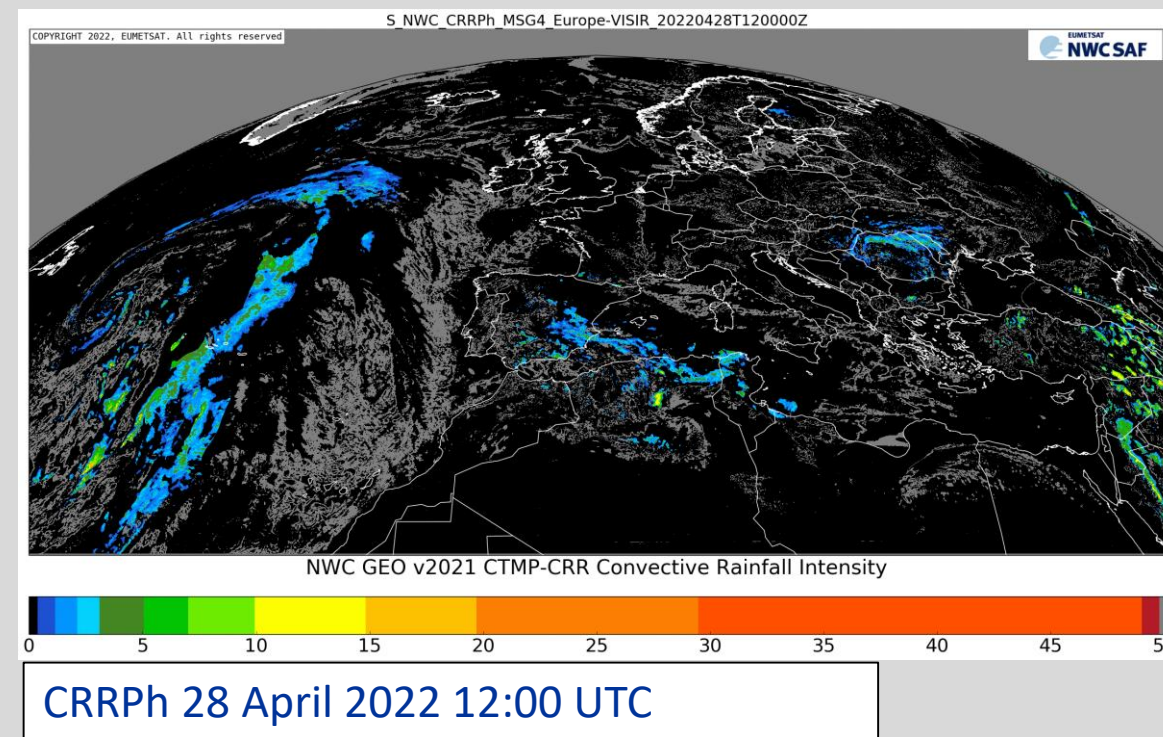
NWC SAF PPS v2021

- Supports Metop & NOAA (AVHRR) SNPP & JPSS (VIIRS) EOS (MODIS) FY-3D (MERSI-2) Sentinel-3 (SLSTR demonstrational status)
- New High Resolution Winds product, with demonstrational status
- Improvements in Cloud products
- Technical/engineering changes to be prepared for EPS SG
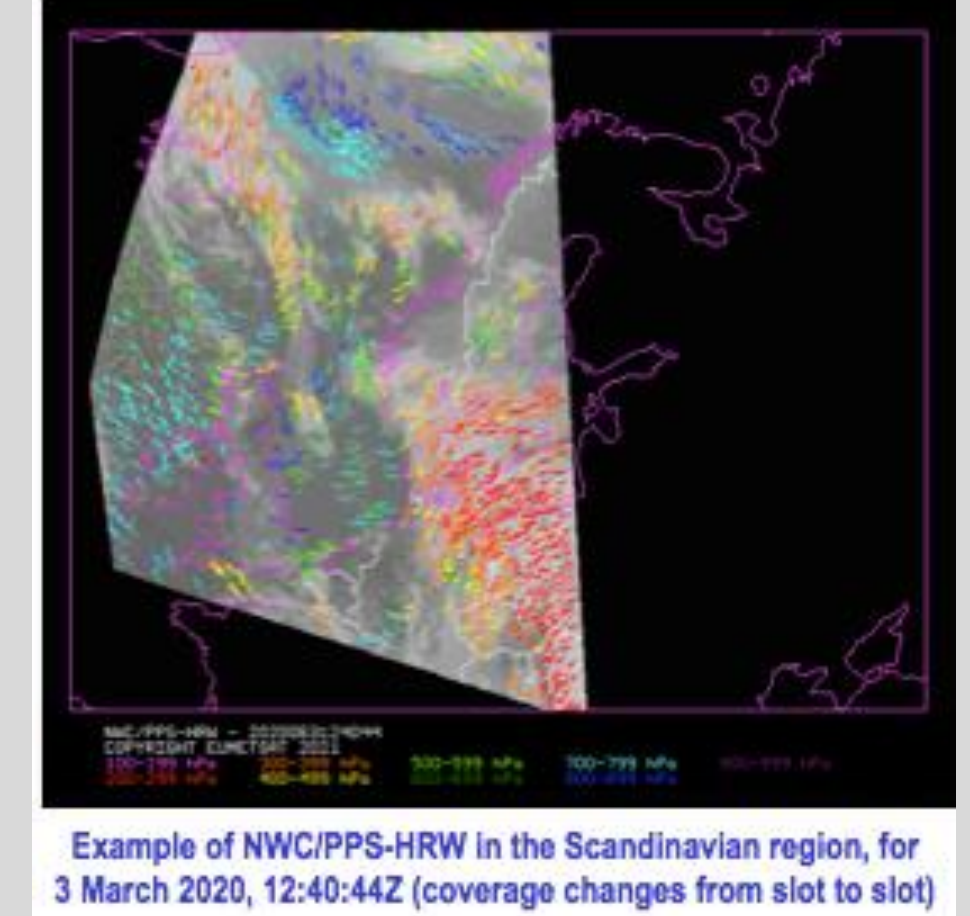
Example of NWC/PPS-HRW in the Scandinavian region, for 3 March 2020, 12:40:44Z (coverage changes from slot to slot)

MTG-I day-1 software version

- Available from the first day that MTG-I is operational
- Ensures continuation of current services for MSG
- Benefit from the higher spatial and temporal resolution of MTG-I/FCI
- Use of some of the new channels thanks to the experience gained with GOES/ABI
- Use of MTG-I/LI data as input for the RDT-CW product
- Updated NetCDF format to be 100% compliant with CF convention, for an easier processing by other tools
- New product ASII-ICE for high-altitude ice crystals detection and Icing potential based on supercooled water droplet detection, as demonstrational product
- Expected to be released end 2023/beginning 2024

EPS SG A day-1 software version

- Available from the first day that EPS SG A is operational
- Ensures continuation of current services for Metop
- Expected to be released mid 2025

Products from MTG-I/LI sensor

LiStack
- Accumulation of EUMETSAT L2 LI gridded products in the user´s defined time period and region (with option of parallax correction).
- To monitor the lightning activity.
- Released around end 2024 in a dedicated release.

LiJump
- Lightning jump detection (Image like product).
- Released at a later stage around 2026.

Simulated MTG LI L2 AFA accumulated product B. Viticchie, EUMETSAT
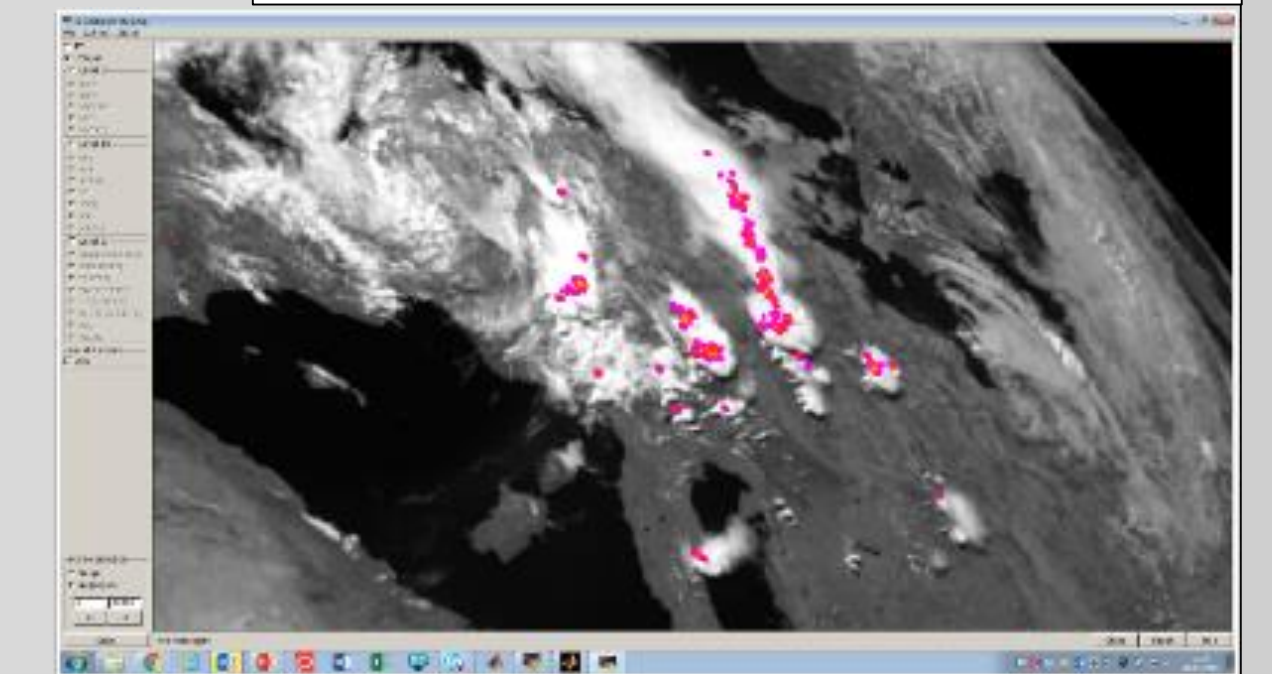
Products from MTG-I/LI sensor will be used as input of RDT-CW to add new convection features or to replace existing ones.

NEW GEO-S software package

New products from MTG-S/IRS instrument
First infrared hyperspectral sounder in a geostationary satellite for Europe

qIRS: Tool to manage MTG-S/IRS data: calculates radiances/BTs for channels & combinations with physical meaning

sSHAI: Atmospheric vertical profiles retrievals (T,q,ozone) and derived stability indices. Integration of ground based measurements to the profile retrievals will be explored.

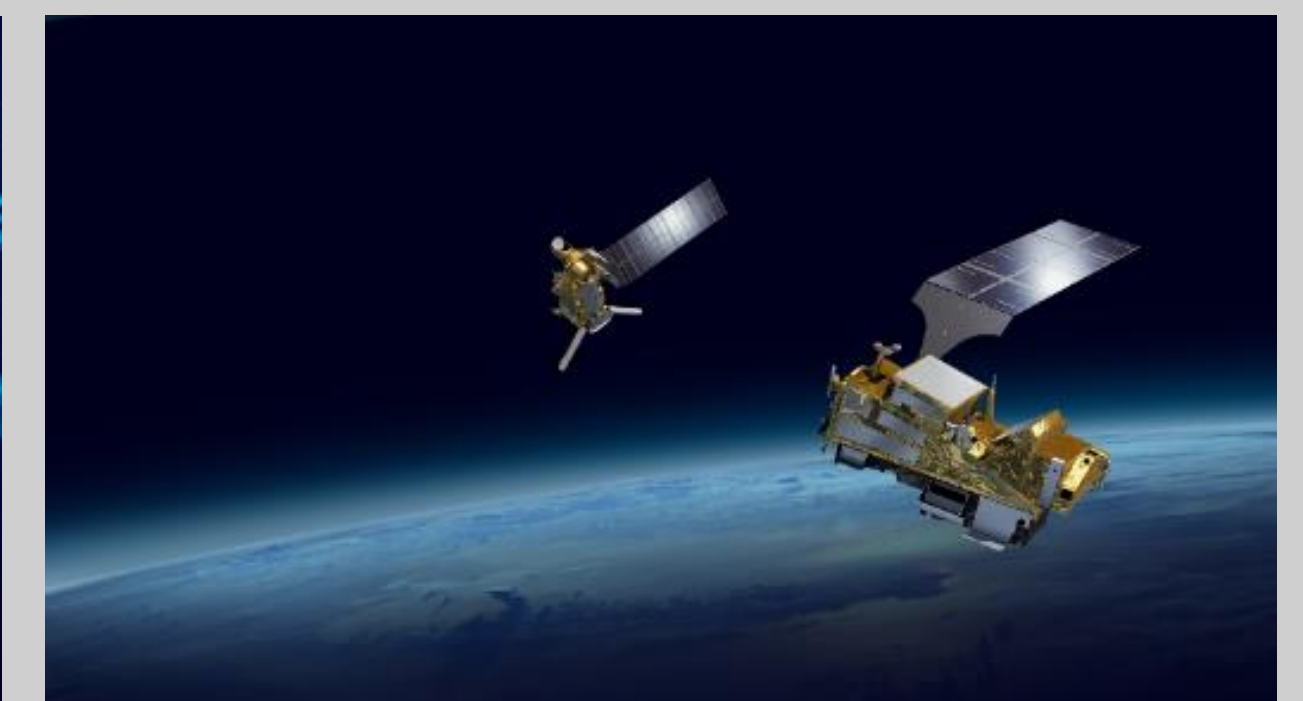**sSHAI_ES**: Stability indices derived from EUMETSAT Secretariat L2 vertical profiles.

We aim to integrate GEO-I and GEO-S software packages for synergies of FCI,LI,IRS instruments
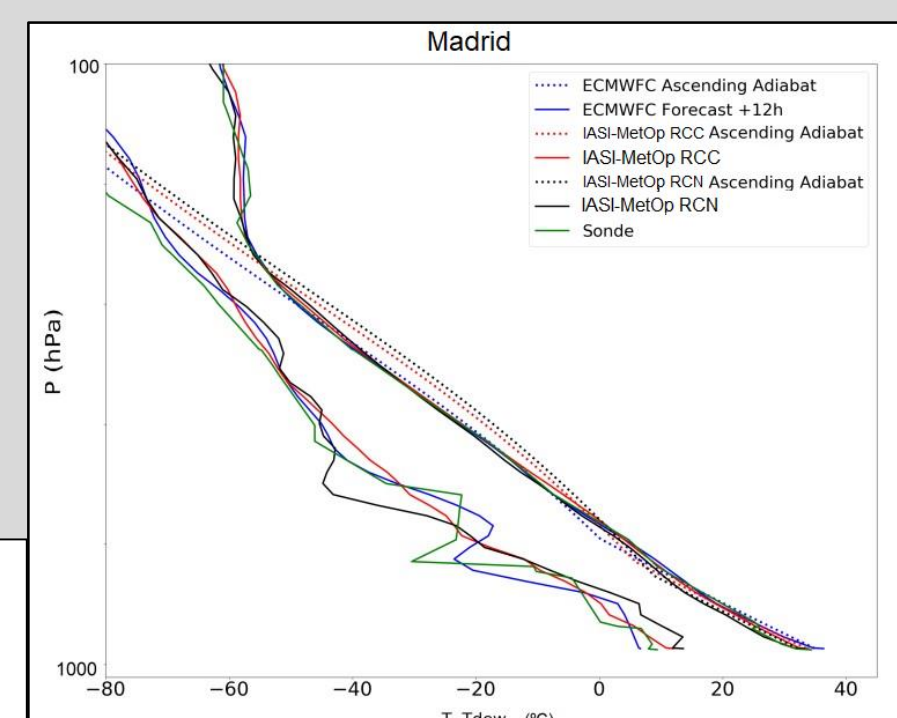
15 June 2015 12:00 UTC, Madrid
Comparison of prototype retrievals with ECMWF forecast and radiosonde

MTG-I and MTG-S Satellites, EUMETSAT

EPS-SG A and EPS SG B Satellites, EUMETSAT

New PPS-MW software package

Processing of new products from microwave sensors
EPS-SG B/MWI and ICI, EPS-SG A/MWS (and possible ESA/AWS satellite):
- **Ice Water Path (IWP from ICI)**
- **Liquid Water Path (LWP from MWI)**
- **Precipitation Rate (PR and PR_Regional**, for Nordic regional nowcasting)

The globally applicable MW precipitation algorithms are developed by HSAF and will be implemented in the NWC/PPS-MW software

Workshops planned during CDOP 4

An online short Workshop is planned after each software release that implies a new EUMETSAT satellite, and/or a new sensor

Estimated Date	Name	Contents	Lecturers	Comments
After release of MTG-I day-1 (Q1 2024)	Workshop on GEO-I MTG-I day-1	Training focused on MTG: * Enhanced capabilities and main differences respect to MSG + Collection of users' feedback	AEMET team with collaboration of NWC SAF GEO partners	**Online** Organised by AEMET/ cooperation with EUMeTrain
After release of GEO-I LI (Q3 2024)	Workshop on MTG-LI products	Training focused on presenting the first NWC SAF MTG-LI specific products and related technical aspects	NMA and AEMET Team	**Online** Co-organised by NMA and AEMET/ cooperation with EUMeTrain
Q1 2025	NWC SAF Users' Workshop	* Applicability and usefulness of the NWC SAF (GEO-I, GEO-S, PPS and PPS-MW) products. * User Requirements collection for CDOP-5 next phase	NWC SAF partners NWC SAF users Other experts	**Face-to-face** Organised by AEMET
After release of EPS-SG A day-1 (Q3 2025)	Workshop on PPS EPS-SG day-1	Training focused on technical and science issues of the first software version for EPS-SG A	SMHI team	**Online** Organised by SMHI/ cooperation with EUMeTrain
After release of GEO-S (Q4 2025)	Workshop on GEO-S NGS1	Training on NWC SAF products from MTG-S/IRS	AEMET team	**Online** Organised by AEMET/ cooperation with EUMeTrain
After release of PPS-MW1 (Q1 2027)	Workshop on PPS-MW	Focused on technical aspects and products of first release of PPS-MW	SMHI team	**Online** Organised by SMHI/ cooperation with EUMeTrain

Other activities:

- The team will continue to improve the products in MTG day-1 and EPS SG A day-1 packages during CDOP 4, to be distributed in the following releases
- The team will continue to provide support to the users and to participate in outreach activities to promote the NWC SAF products and to collect user requirements
- The team is collaborating with EUMETSAT to install the NWC SAF GEO software and provide the output products in the EUMETSAT Cloud infrastructure, with the objective to contribute to set a common platform to develop nowcasting tools for the community
- Related to machine learning techniques:
  - The team will explore to extend the use of machine learning techniques within the NWC SAF software packages
  - The team will continue to collaborate IARAI (Institute of Advance Research in Artificial Intelligence, https://www.iarai.ac.at/) to set AI competitions in the meteorological satellite field

Information, documentation, license and software: **nwc-saf.eumetsat.int**