EUMETSAT

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METIS – Clouds

INTRODUCTION

METIS (Monitoring and Evaluation of Thematic Information from Space) is a web application tool (develop by EUMETSAT) that aims to routinely monitor stability, quality and performance of the EUMETSAT operational products, on a global and regional focus.

METIS-Clouds is specifically dedicated to the analysis of clouds and cloud related products, derived from geostationary instruments (MSG/SEVIRI and MTG/FCI), as well as instruments on polar-orbiting platforms (EPS/AVHRR, EPS-SG/METimage and EPS-SG/3MI). Amongst all available products, here we focus on products that are most required by users. These include: the cloud mask (CLM), the Cloud Top Properties (CTP), the Optimal Cloud Analysis (OCA) the Total Precipitable Water (TPW), and the Outgoing Longwave Radiation (OLR).
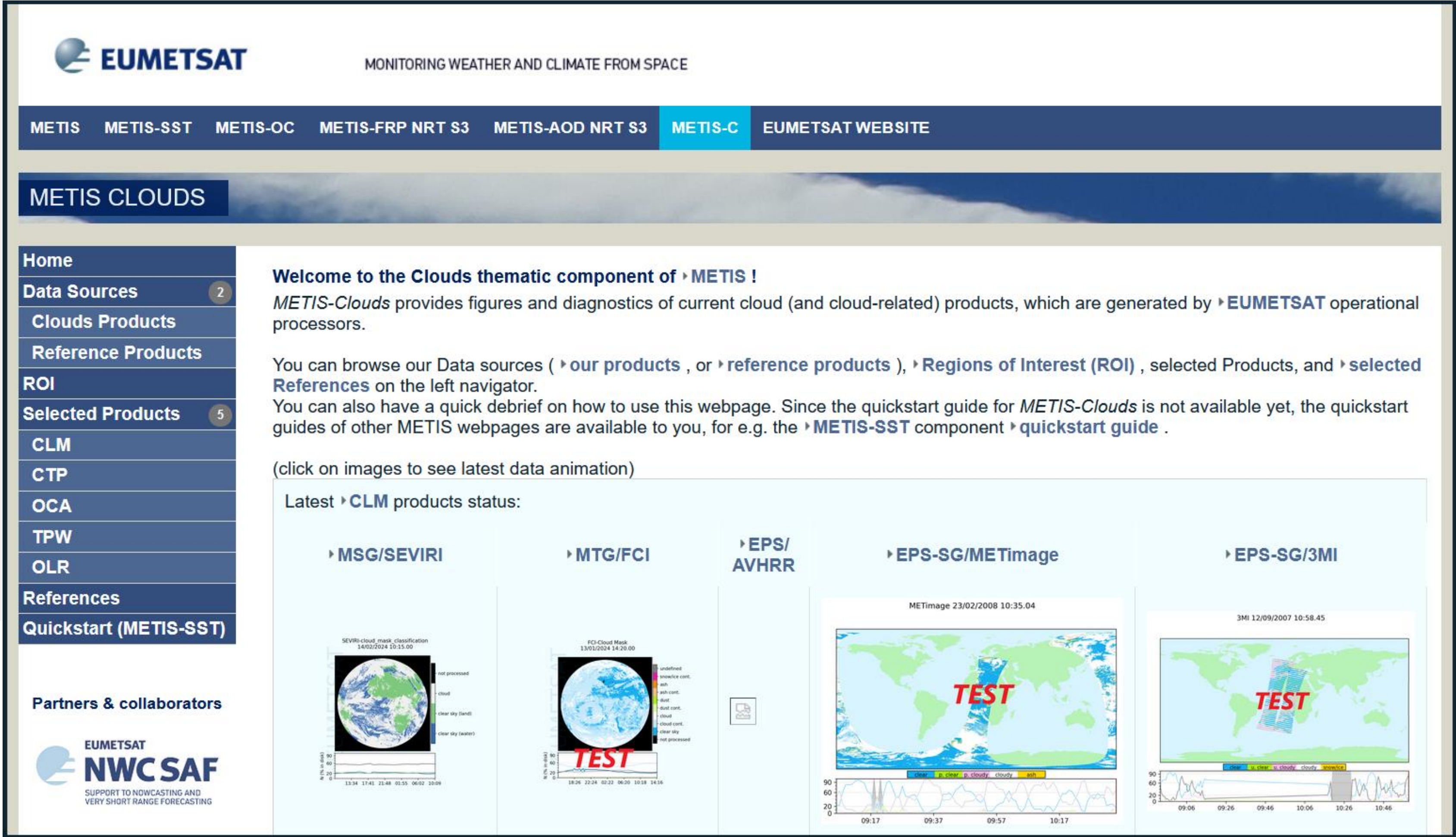
HOME

The main navigation menu, placed horizontally in the website's header allows the user to easily navigate through METIS and all its components.

Under the *METIS-Clouds* component, the left side menu lists all sub-sections METIS-Clouds has to offer. This Includes Data Sources, the definition of the Regions of Interest (ROI), a subsection for each selected product, references, and the link to a quick guide document (in PDF format).

HOME (cont.)

The central part of the *Home* page (left figure) briefly explains how to navigate through the webpage. This is followed by some figures that show the current status of each the product, from each instrument. Further, by clicking on the images a zoomed in animation of the selected product for the last 24h will be shown.

Data Sources

• **Clouds Products** (*www.eumetsat.int*)

In this subsection you will find a list of the current cloud and cloud-related products details that EUMETSAT has to offer. Here we provide amongst other details, a small description of each product, links to direct data access, and links to the respective product manuals.

• **Reference Products**

The reference products subsection shares information regarding the datasets used to validate the EUMETSAT Cloud products. The validation results are also part of METIS-Clouds (see below).

ROI

The regions of interest (ROI) subsection details the locations of the *in-situ* measurements (ground-based stations, radiosondes, GPS, amongst others) used for validating EUMETSAT Cloud products. Weblinks to the providers of these data are also given.

Selected Products

• **CLM**

Under this tab you will find the validation and monitoring results of the CLM products. For FCI, these results are produced by a dedicated EUMETSAT Cal/Val infrastructure named FCI-STAR. Given a periodicity of your choice (daily, weekly or monthly), you can look at the FCI/CLM Cloud fraction or at several comparison indices, for *e.g.* the cloud matrix (confusion matrix) *shown on the left*; the probability of cloud detection; the precision for cloudy pixels (*shown on the right*); the F1-score for cloudy pixels; with respect to the reference products (SEVIRI or NWCSAF cloud masks).

• **CTP***

Under this tab you will find monitoring and validation plots of Cloud Top Properties products, which for FCI includes Cloud Top Temperature and Hight (CTTH) parameters.
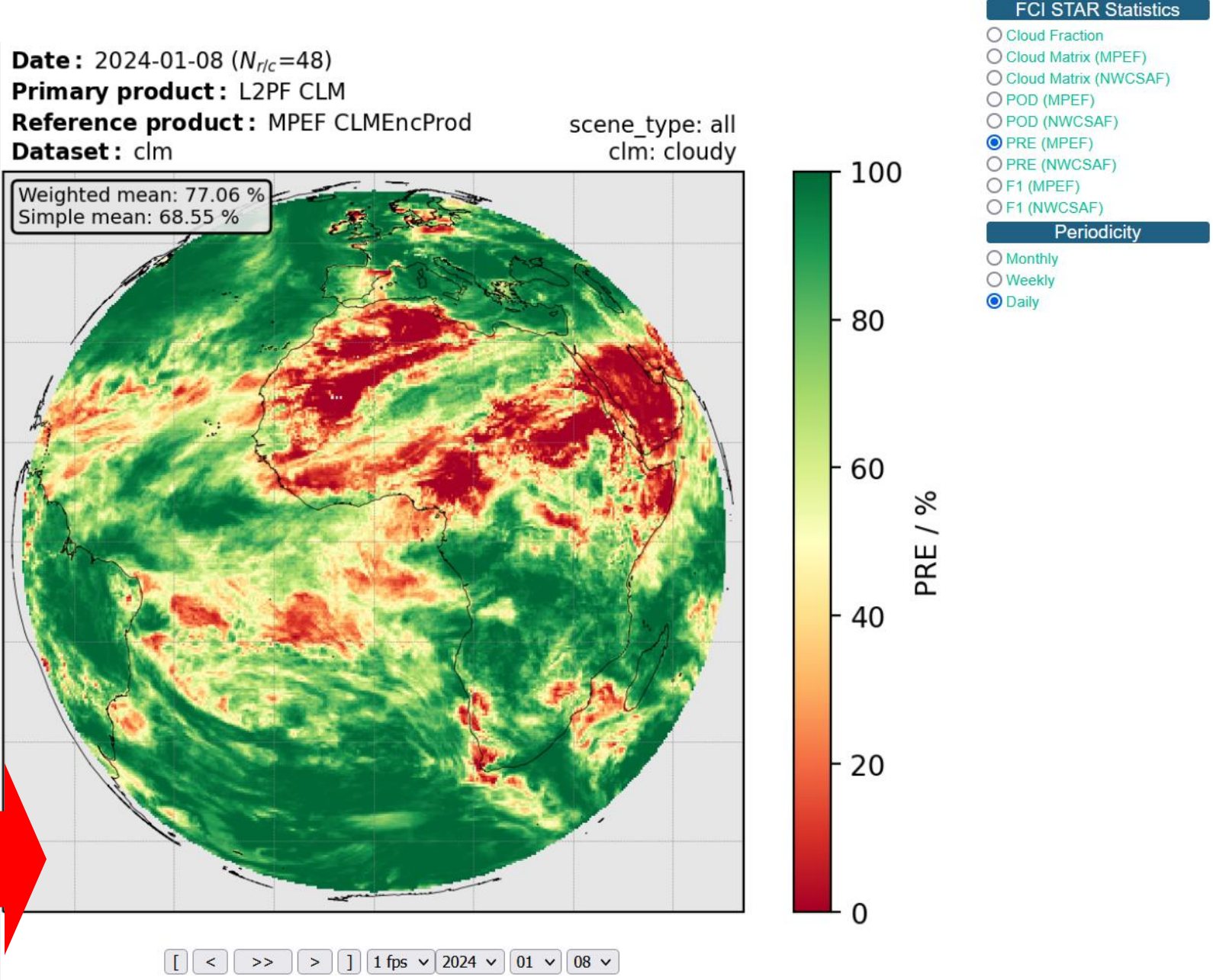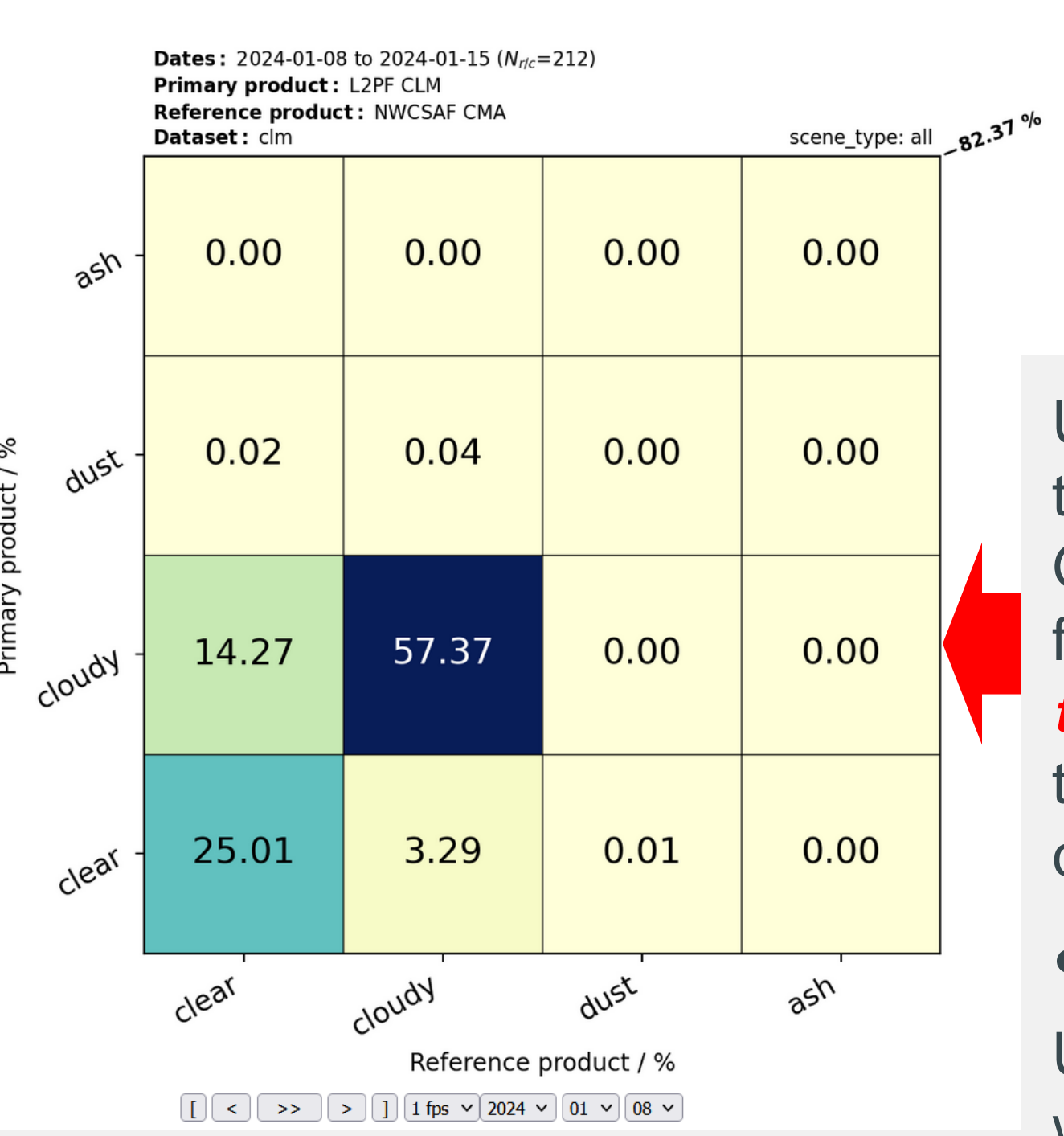
• **OCA**

Under this tab you will find the results of cloud parameters contained in the OCA products. This validation is done by comparison against *in situ* data from ACTRIS[1] ground stations. The example (*on the right*) shows a cross section of the cloud classification by the lidar/radar measurement co-located with the OCA SEVIRI product. Cloud top and base height and cloud phase are compared.
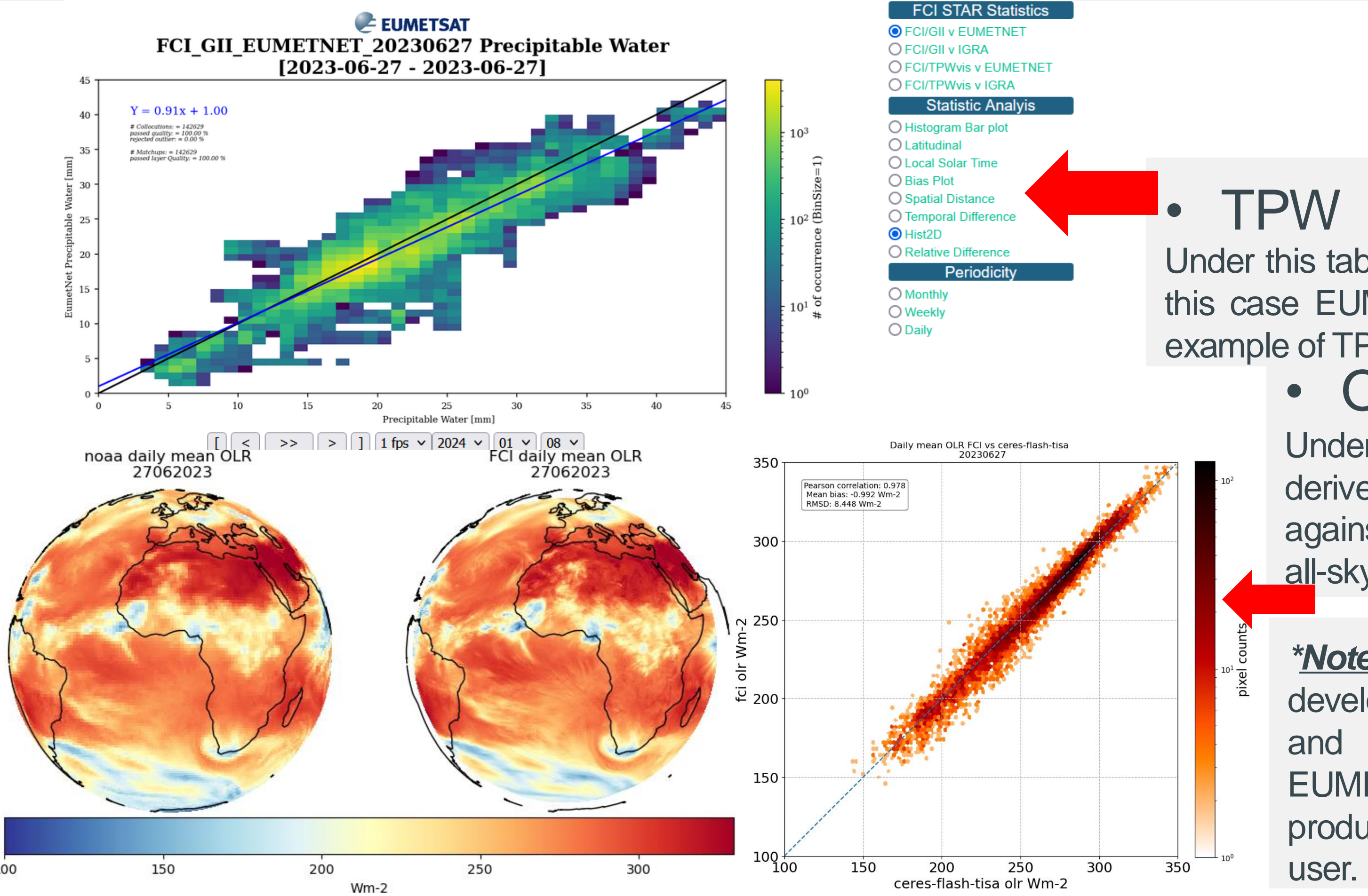
• **TPW**

Under this tab you will find monitoring and validation plots of TPW retrieved from our space-born imagers. In this case EUMETNET [2] GPS data and IGRA [3] radiosound data are used as reference. *On the left* an example of TPW from FCI/GII product against TPW from EUMETNET data is shown.

• **OLR**

Under this tab you will find a comparison between the FCI/OLR product and equivalent products derived from other satellites. The example provided here show comparison of daily-mean OLR against the OLR observed by CERES[4] (*left scatter plot*) and against the OLR estimated from daily all-sky radiance from HIRS [5] (*left maps*).

***Note** - this website is in current development. We aim to have validation and monitoring reports/graphics on all EUMETSAT Cloud (and cloud related) products available and desseminated to the user.

References – 1 column

[1] https://cloudnet.fmi.fi/
[2] www.eumetnet.eu
[3] https://www.ncei.noaa.gov/products/weather-balloon/integrated-global-radiosonde-archive
[4] https://ceres.larc.nasa.gov/data/#fast-longwave-and-shortwave-flux-flashflux
[5] https://www.ncei.noaa.gov/products/climate-data-records/outgoing-longwave-radiation-daily