NWC SAF sSHAI product Release Note:

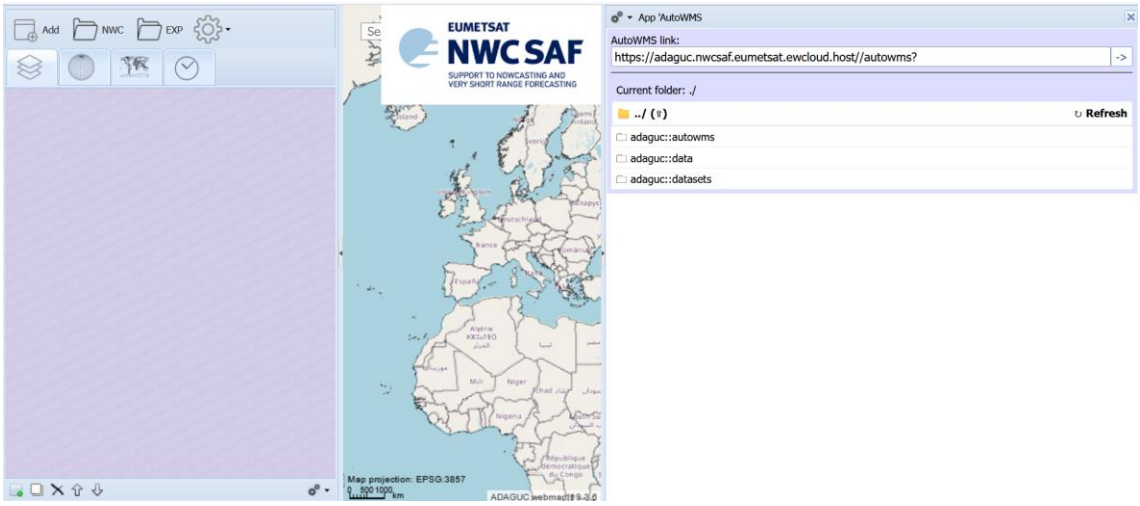
The sSHAI (sounder *Satellite Humidity And Instability)* product can be used in weather forecasting by retrieving the three-dimensional structure of atmospheric temperature and humidity from hyperspectral infrared sounders.

Until the new MTG-IRS is operational, as a starting point, the Infrared Atmospheric Sounding Interferometer (IASI) instrument on board polar orbiting satellite MetOp can provide a good approximation to the future MTG-IRS data. Therefore, IASI data is used in the new sSHAI prototype product as a proxy for MTG-IRS, to calculate satellite products such as retrieved atmospheric profiles of temperature and humidity and instability indices.

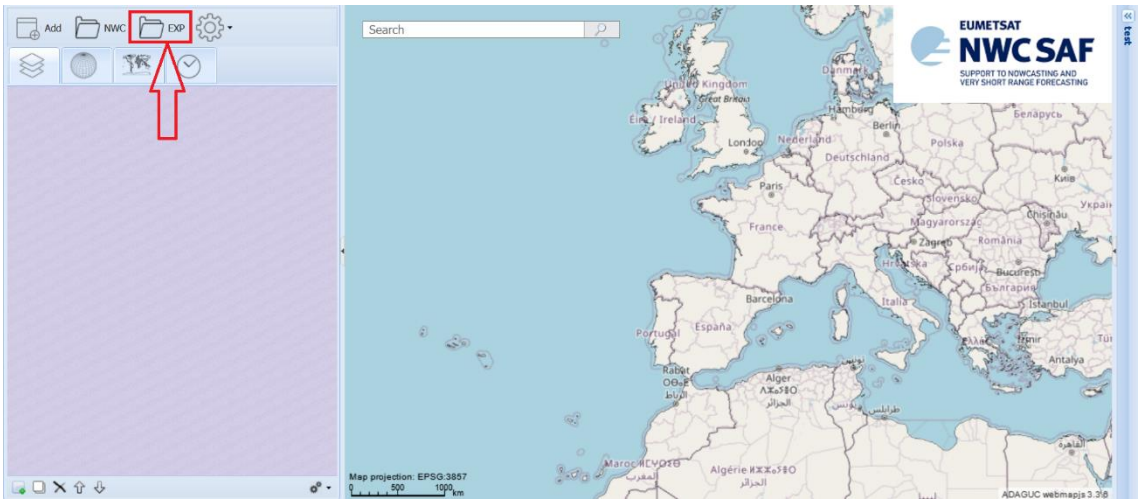
In order to obtain the best possible atmospheric profiles from the data provided by the future MTG-IRS (as starting point IASI-MetOp data as a proxy of MTG-IRS), an algorithm based on Machine Learning/Artificial Intelligence technique has been developed to characterise its capabilities in providing information on temperature, humidity profiles and atmospheric instability. The new NWC SAF sSHAI product prototype is able to retrieve accurate atmospheric temperature and humidity profiles under skies with cloud fraction up to 80% in a real-time operational mode. Providing accurate information on atmospheric instability and the state of the atmosphere, which can be very important for monitoring the possible occurrence of severe phenomena, such as severe convection.

To test the new “pre-operational” NWC SAF sSHAI product, just go to the following link: https://adaguc.nwcsaf.eumetsat.ewcloud.host/

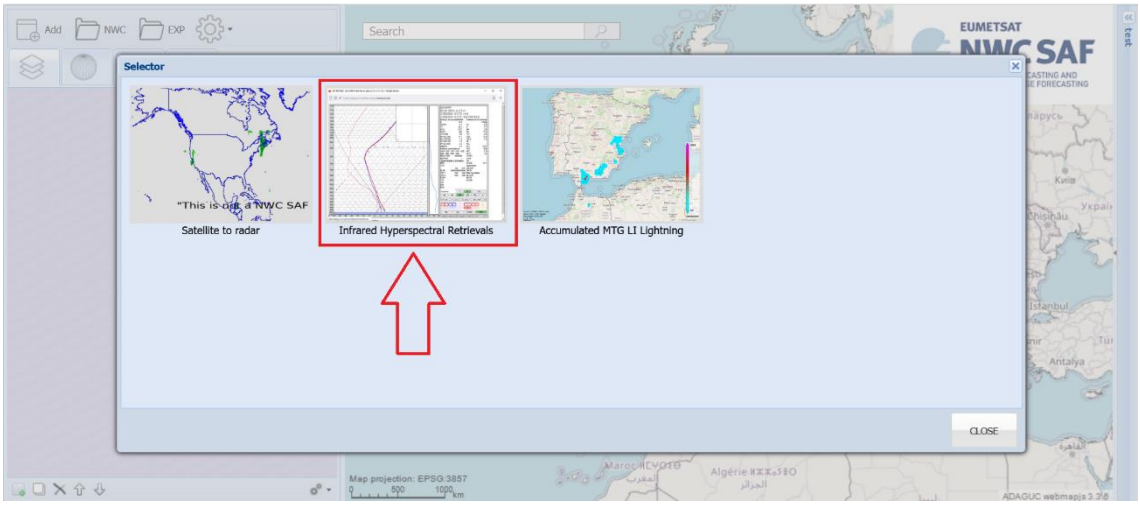
You will access the following website:



In the menu on the left click on the EXP folder:



A new menu will open, select the product it says: “Infrared Hyperspectral Retrievals”:

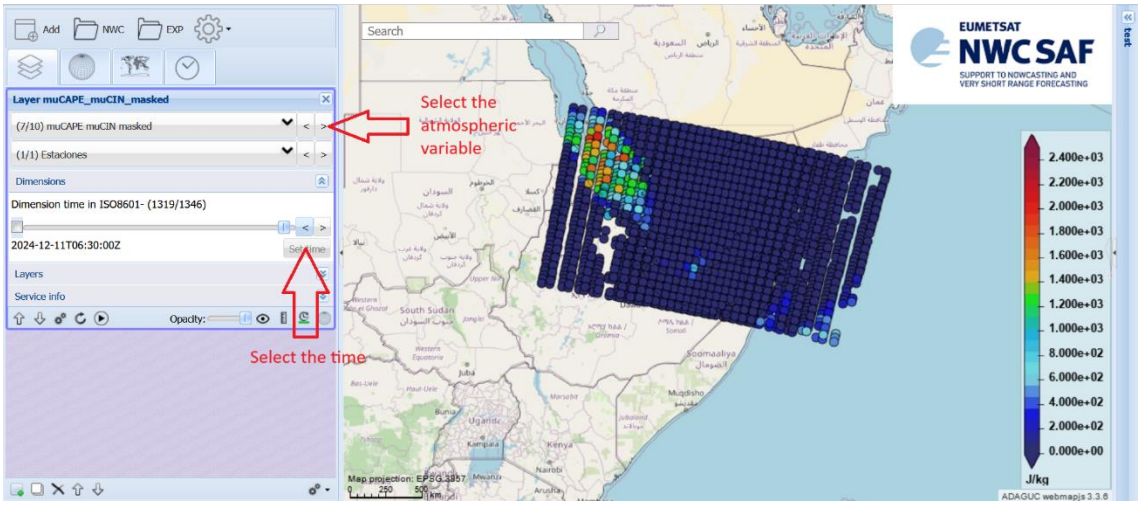


A new menu will open with three options.

- The first one is the product without forecast. The sSHAI product only uses the IASI data to make the retrievals of the atmospheric variables.
- The second product uses the IASI data and also the ECMWF global Numerical Weather Prediction (NWP) forecasts as input to calculate the atmospheric retrievals.
- And finally you also have the possibility to visualise the atmospheric variables from just the ECMWF forecasts, which are co-located over the same IASI Field of Views (FOVs)

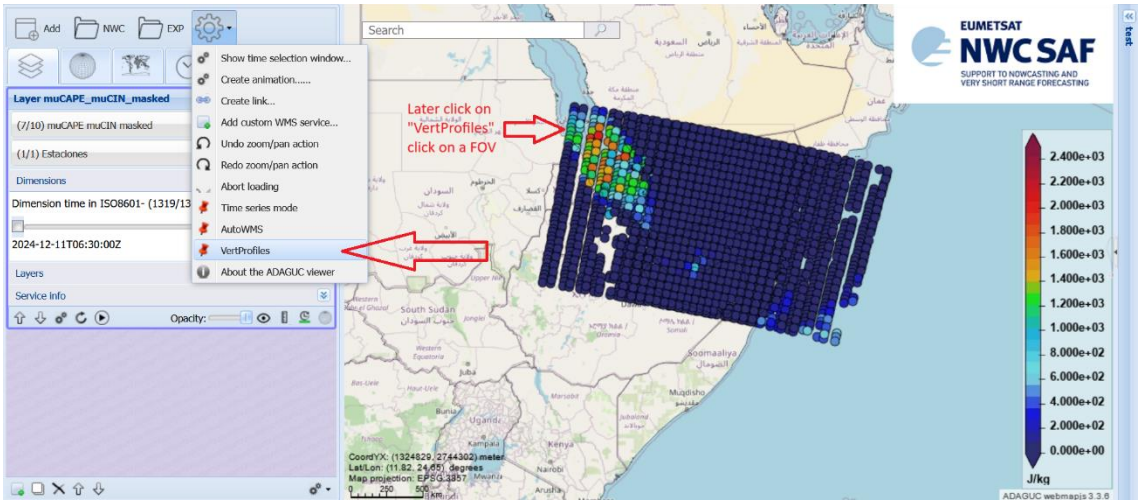
In this way, you can easily compare the new sSHAI product with the ECMWF forecast and monitor more effectively the state of the atmosphere

Once you have selected the product you want to display, the following screen will appear: (remember that you can load one, two or all three at the same time)

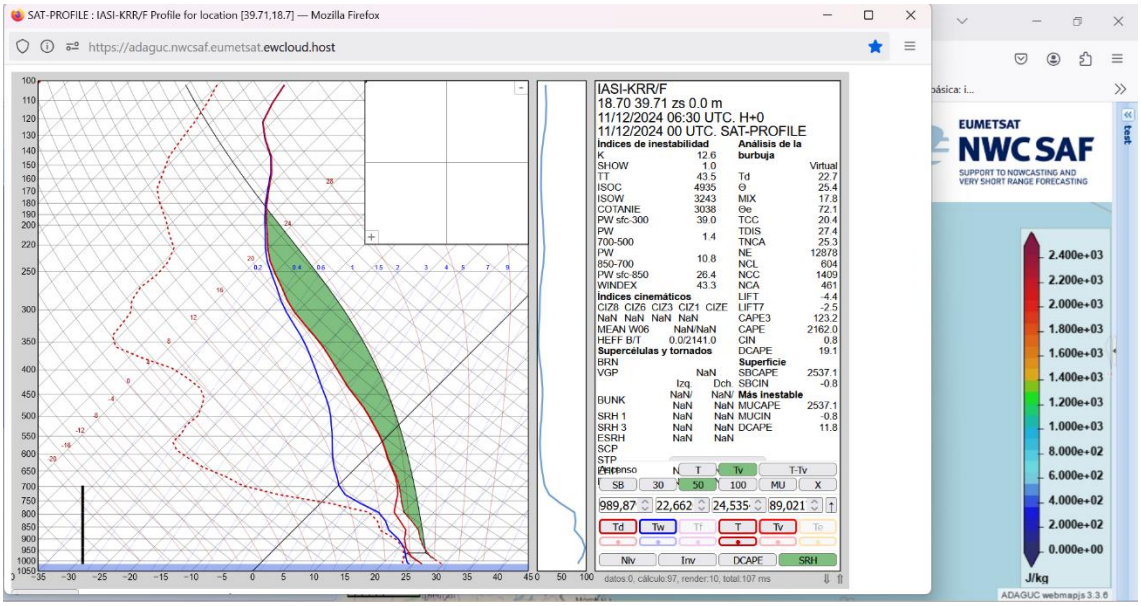


You can choose to display 10 different atmospheric variables (muCAPE, muCIN, muCAPE masked for FOVS where muCIN is higher than 300 J/kg (in this case muCAPE=0), level of free convection, lifting convection level, air temperature, dew point temperature, surface temperature and humidity variables,...).

In addition, the atmospheric vertical profiles for each IASI FOV from the sSHAI product can be displayed:



After click on “VertProfiles” you need click on a FOV, and a new window will open (please make sure that your browser allows pop-up windows):



The atmospheric profile from the FOV that you selected is shown!

We hope that this tool will be very useful for you! If you have any questions about the new sSHAI product, please contact the NWC SAF team. It will be our pleasure to guide you through this new NWC SAF product!