

Figure S1. GNSS receivers (blue dots) and RAOB (Radiosonde OBservation) (red square) positions.

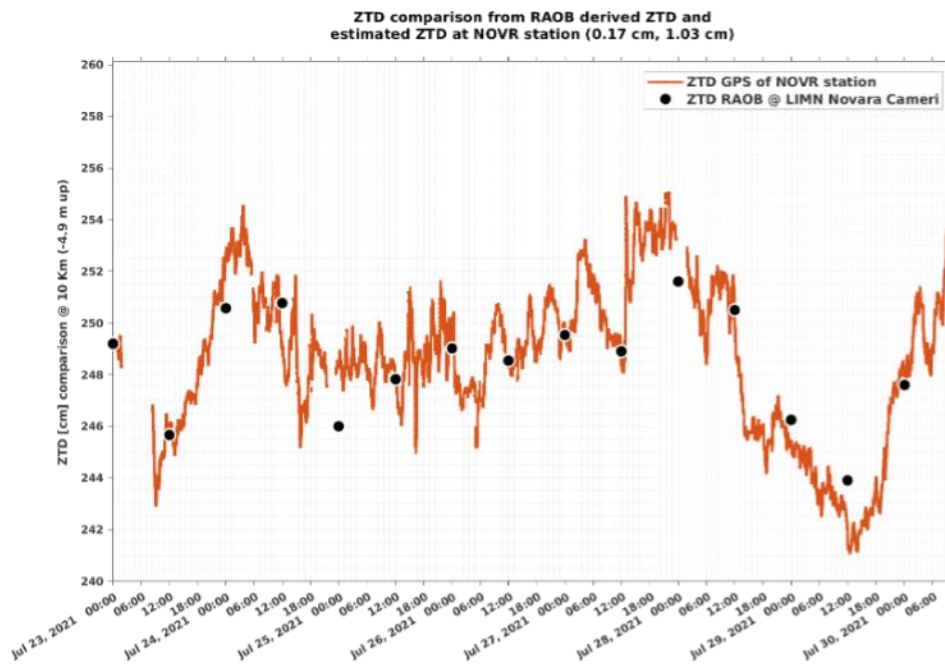


Figure S2. Comparison between the ZTD estimated from the station of NOVR by the NRT processing and ZTD derived by radiosondes observations at the close station of LIMN Novara Cameri, located at 10Km of distance.

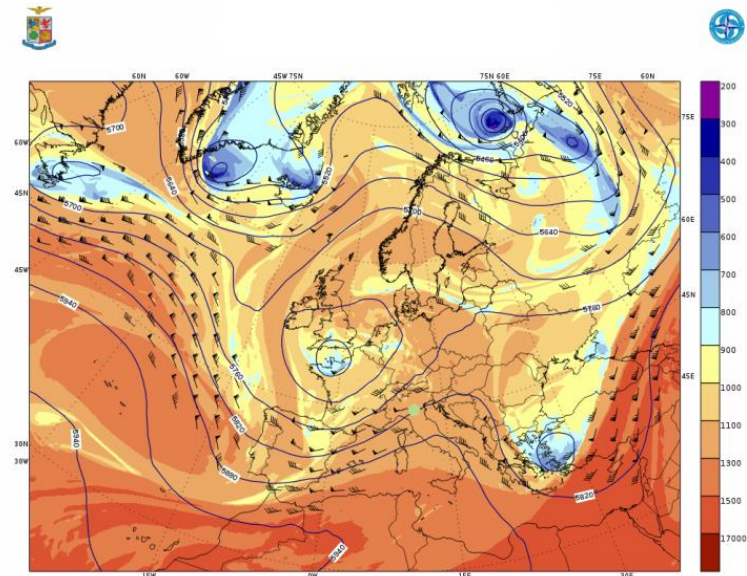


Figure S3. 25 July, 2021 at 00:00 UTC – ECMWF: dynamic tropopause, wind at 300 hPa and geopotential height at 500 hPa.

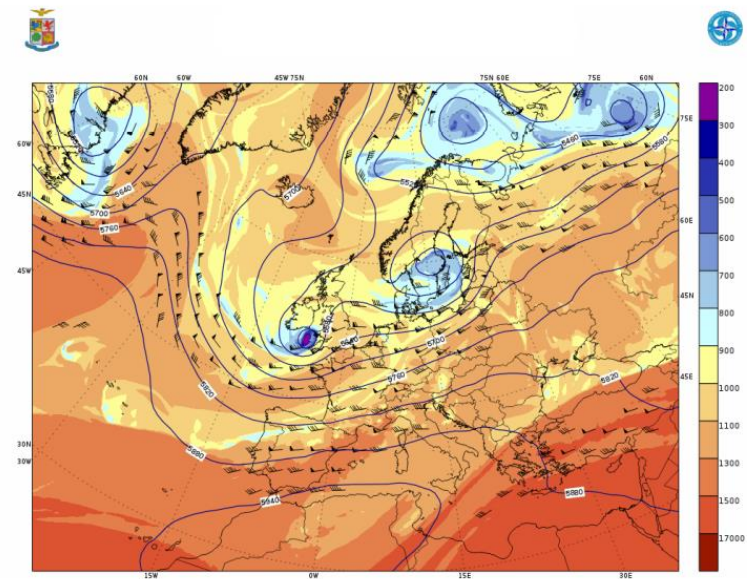


Figure S4. 30 July 2021 at 00:00 UTC - ECMWF: dynamic tropopause, wind at 300 hPa and geopotential height at 500 hPa.

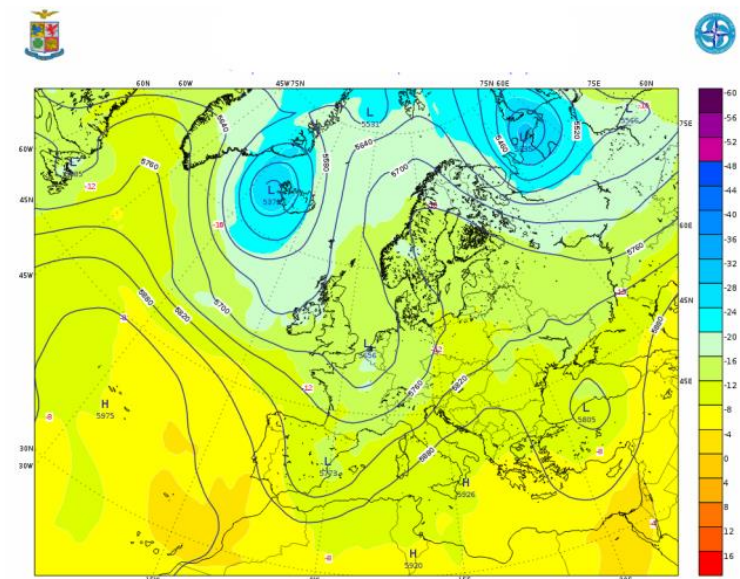


Figure S5. 26 July 2021 at 12:00 UTC - ECMWF: geopotential height and temperature at 500 hPa.

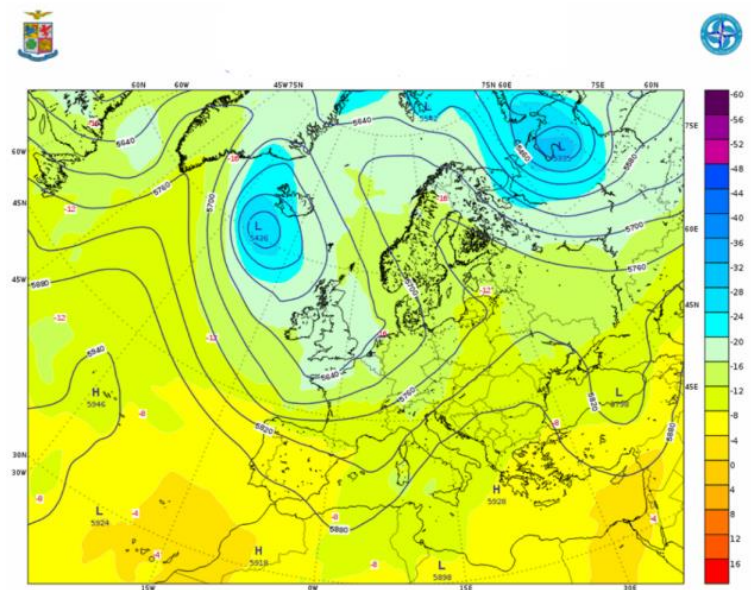


Figure S6. 27 July 2021 at 06:00 UTC - ECMWF: geopotential height and temperature at 500 hPa.

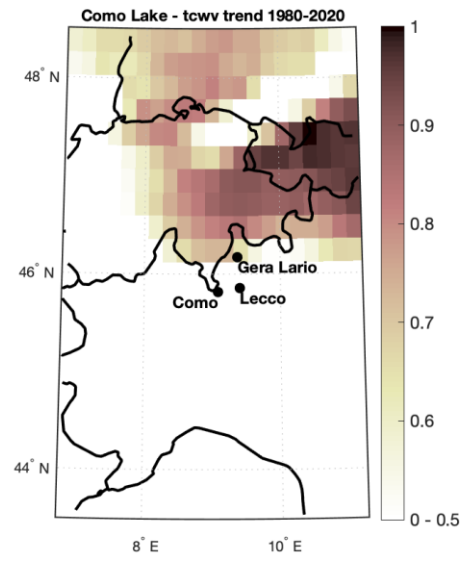


Figure S7. Total Column Water Vapour trend referred to the period 1980-2020 by ERA5 data.

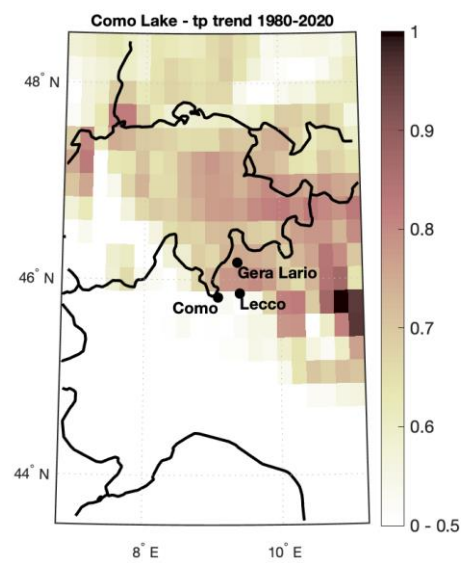


Figure S8. Total Precipitation trend referred to the period 1980-2020 by ERA5 data.

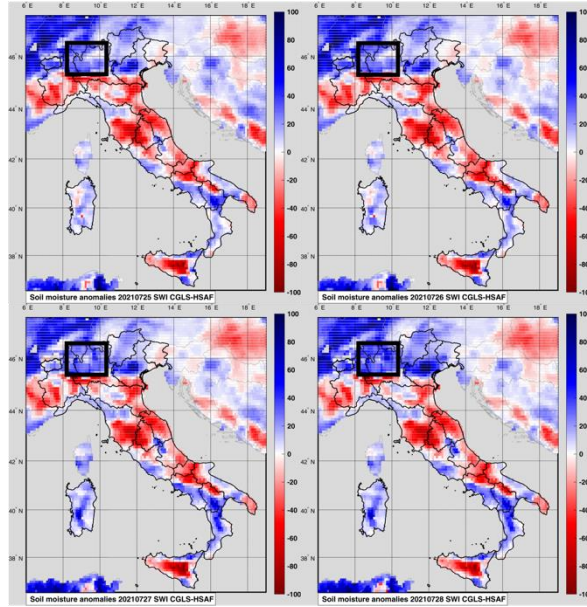


Figure S9. Soil moisture anomaly map (ASCAT Soil Water Index from Copernicus and EUMETSAT), period July 25th, 2021 - July 28th, 2021.

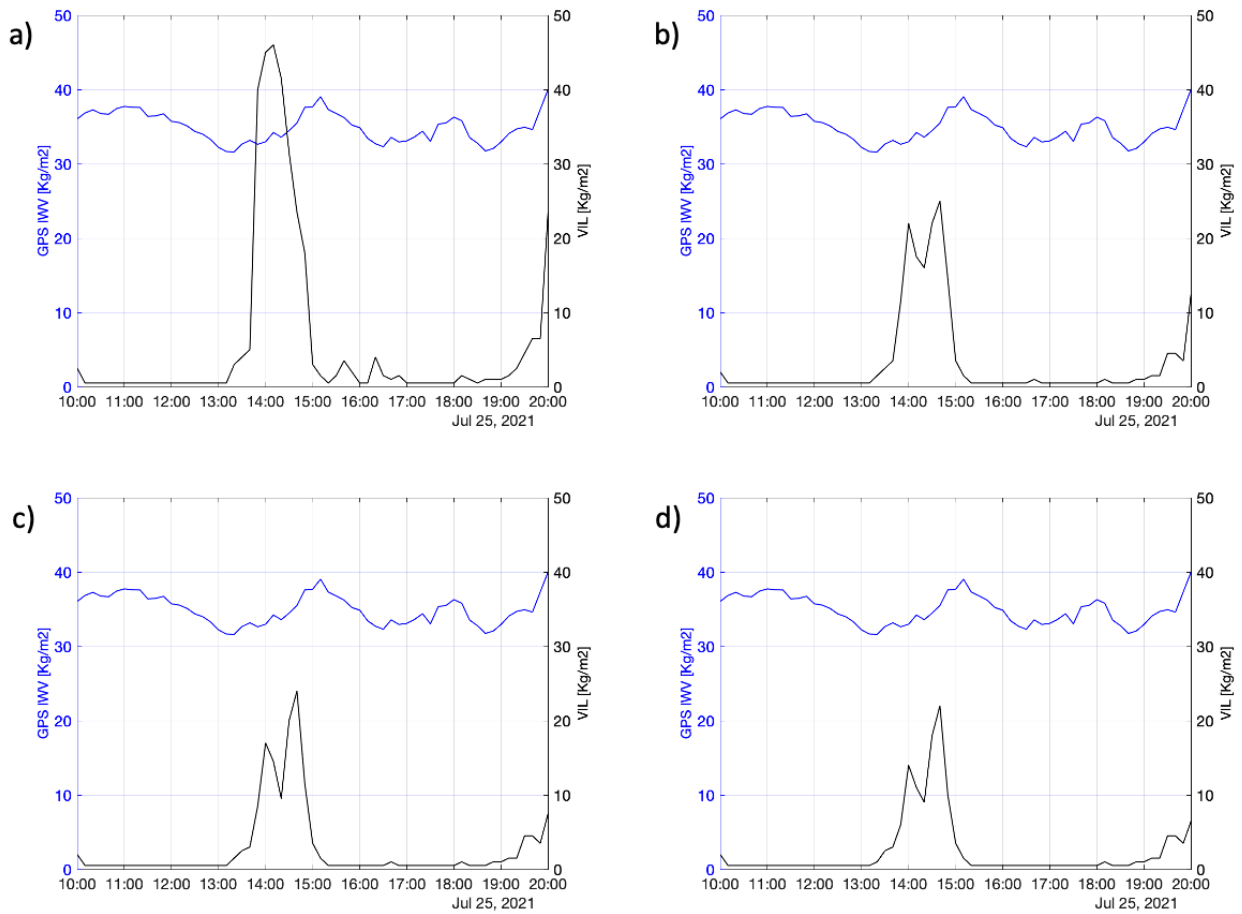


Figure S10. The panels (a) 7x7 pixel, b) 15x15 pixel, c) 17x17 pixel and d) 19x19 pixel) represent the VIL parameter (black line), obtained by calculating the median over a gradually increasing area of interest (from a radius of about 10 km to a radius of almost 30 km), compared to the IWV (blue line) obtained from GPS observations.

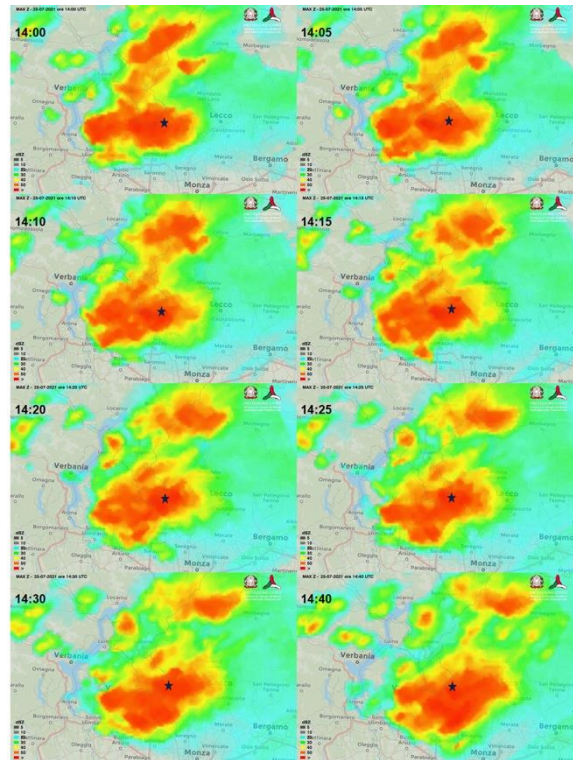


Figure S11. Time sequence of maximum vertical reflectivity (dB) as observed by the national radar network between 14:00 and 14:40 UTC of the 25th July 2021.

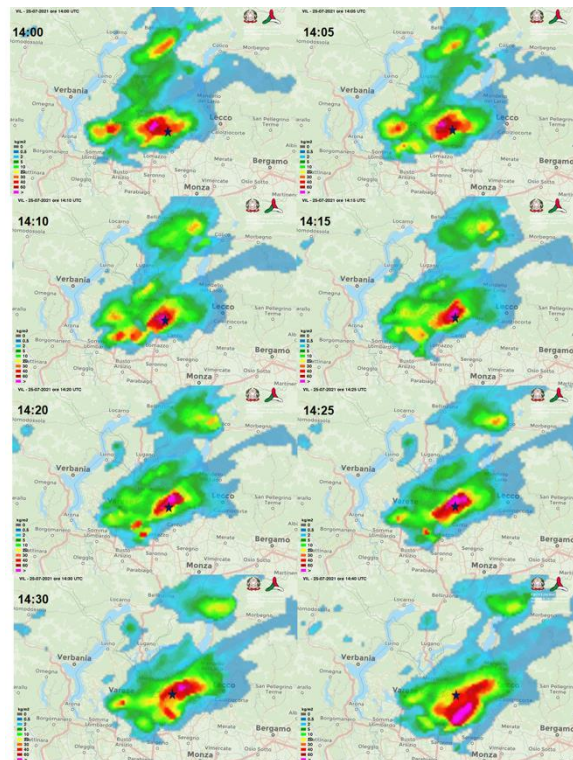


Figure S12. As in Fig. \ref{fig:VMI} but regarding the Vertical Integrated Liquid content (kg m^{-2}).

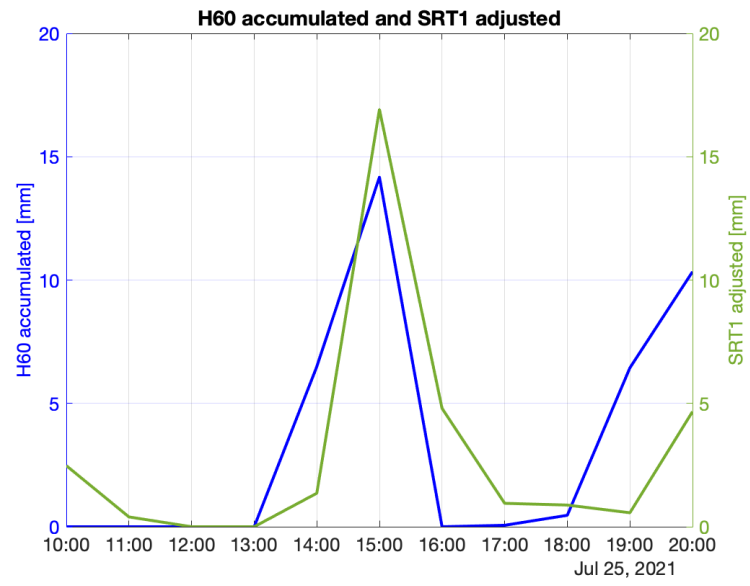


Figure S13. Comparison between H60 accumulated and SRT1 adjusted.