

Last modified on Oct 11, 2024 13:19

Table of Contents

- [Summary](#)
- [Observation quality control](#)
- [Successful rerun](#)
- [Related articles](#)

Summary

Quality control by the ECMWF Reanalysis team flagged an issue with snow data for an area in the Alps from July 2024 that was not consistent with the weather pattern for the region. Subsequent investigation revealed the cause of the problem, enabling the Reanalysis team to correct the data before the final ERA5 release was made available.

As a result, for the months **July, August, September and October 2024, the final ERA5 product is (and will be) different from ERA5T** (the preliminary version of ERA5 made available about 5 days after real time). The differences are mostly limited to the Alps and mainly to surface parameters (in particular snow depth and 2m temperature and 2m dewpoint temperature). However, all the resulting reanalysis fields do differ slightly over the whole globe but these differences should be within their range of uncertainty (which is estimated by the ensemble spread and which can be large for some parameters). On the Climate Data Store (CDS), the initial (ERA5T) fields have been/will be overwritten, i.e., for these months, access to the original CDS ERA5T product will not be possible after it has been overwritten.

Observation quality control

In July 2024, a problem with snow cover was spotted in the Alps, and snow depth is shown in Figure 1. This affected surface air temperature, which can be clearly seen as negative anomalies (blue regions) when compared to July averages for 1991-2020 (Figure 2). As this pattern was not supported by information on weather in the region, the ECMWF Reanalysis team launched an investigation. This revealed that the cause was an issue with the quality control, plus the usage of some snow depth observations that were not representative for the ERA5 model resolution in question.

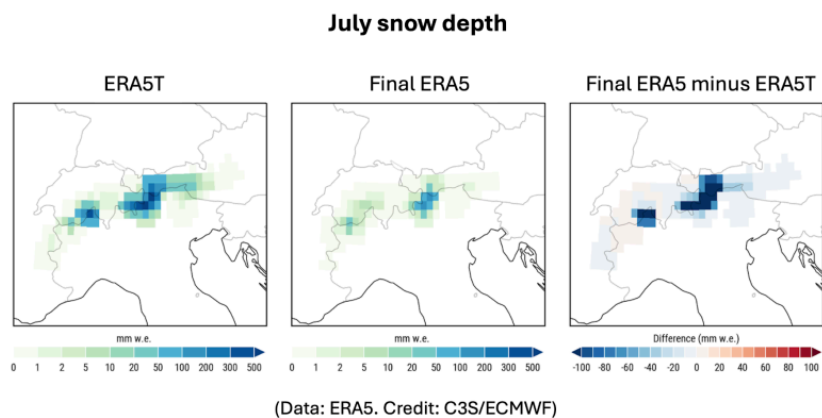
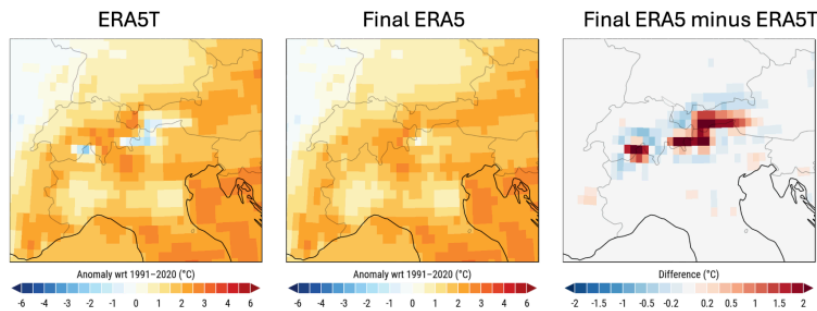


Figure 1: Monthly averaged snow depth (in mm water equivalent) for July 2024 over the Alps from ERA5T (left), the final corrected ERA5 product (middle), and their difference (right). Data source: ERA5. Credit: Copernicus Climate Change Service/ECMWF.

July surface air temperature anomalies



(Data: ERA5. Credit: C3S/ECMWF)

Figure 2: Monthly averaged surface air temperature anomalies (in °C) for July 2024 over the Alps from ERA5T (left), the final corrected ERA5 product (middle), and their difference (right). The anomalies are relative to the 1991–2020 average. Data source: ERA5. Credit: Copernicus Climate Change Service/ECMWF.

Successful rerun

As a result of the investigation, the issue in the quality control system was handled and the non-representative snow observations were removed from the system. Luckily, the ERA5 product could be rerun from July 2024 onwards, so for the final ERA5 product the issue was resolved.

The main difference between ERA5T and the final ERA5 product from July to October 2024 is in this region where the snow was corrected (Figure 1). Alongside a significant reduction in snow, the corrected ERA5 product also has warmer surface temperatures and changes in other variables associated with the reduction in snow. Due to the nature of how the model processes observations, there are small differences across many fields seen throughout the globe.