The family of ERA5 datasets

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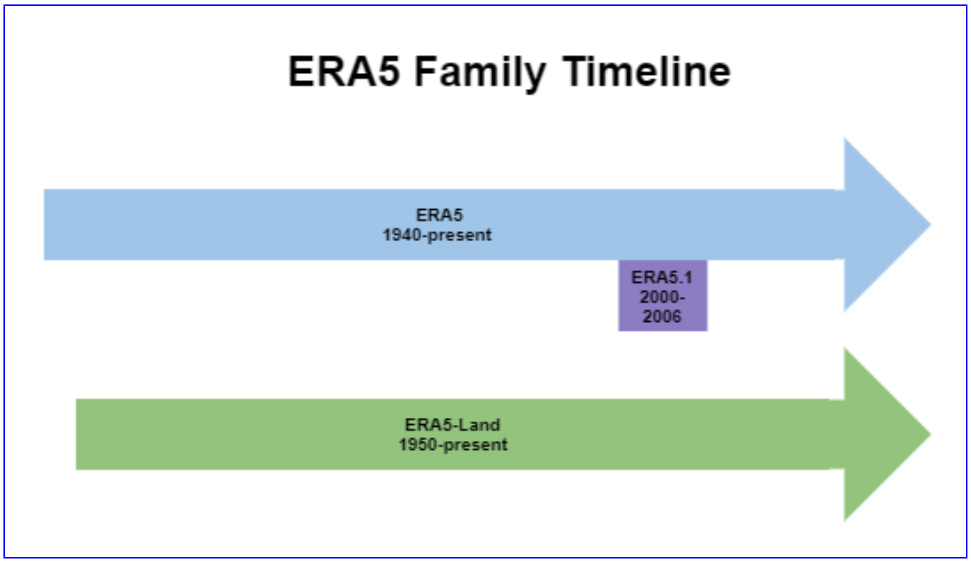

Currently, the family of ERA5 datasets is comprised of ERA5, ERA5.1 and ERA5-Land.

- **ERA5** is a comprehensive reanalysis, from 1940 to 5 days behind real time, which assimilates as many observations as possible in the upper air and near surface. The ERA5 atmospheric model is coupled with a land surface model and a wave model.
- **ERA5.1** is a re-run for ERA5, for the years 2000 to 2006 only, which was produced to improve upon the lower stratospheric cold bias evident in ERA5 during this period. Behaviour of ERA5 in most of the troposphere is similar to that in ERA5.1.
- **ERA5-Land** is a land surface dataset, from 1950 to 5 days behind real time, produced at higher resolution (9km) and forced by ERA5 atmospheric parameters with lapse rate correction, but with no additional data assimilation.

ERA5 back extension (preliminary version), from 1950 to 1978 was made available separately from ERA5. Reason for this is it appeared to suffer from tropical cyclones that are sometimes unrealistically intense. This has now been resolved for 1950 to 1978. Access to this preliminary product was discontinued on August 15, 2023.

Usually, access to the family of ERA5 datasets is through the C3S Climate Data Store (CDS). The complete datasets are held in ECMWF's tape archive, MARS, but a sub-set of the datasets (all of the dataset for ERA5-Land) have been interpolated to a regular latitude, longitude grid and put on the CDS disks. Data access from the CDS disks is faster than from MARS, so if possible it is better to retrieve the data from the CDS disks. Please see the Climate Data Store (CDS) documentation for further details.

ERA5

1. ERA5 data on CDS Disks - Fast access

The sub-set of data on the CDS disks comprises some single level parameters and pressure level parameters. The data are available hourly throughout the whole period. Monthly mean data are also available, in two forms: monthly means (of daily means) and monthly means for each hour of the day (synoptic monthly means). The CDS catalogue entries are:

- ERA5 hourly data on single levels from 1940 to present
- ERA5 monthly averaged data on single levels from 1940 to present
- ERA5 hourly data on pressure levels from 1940 to present
- ERA5 monthly averaged data on pressure levels from 1940 to present

2. ERA5 data on ECMWF MARS tapes - Slow access:

The complete ERA5 dataset, at full resolution on the native grid, is stored in MARS. ERA5 data that has not been made available on the CDS disks includes:

- ERA5 data on other level types i.e. model levels, potential temperature levels and one potential vorticity level, from 1940 to present (2 months in arrears). In addition, the last few months of data (up to 5 days in arrears) are kept online/cached and can be accessed much quicker than older data on tape.
- Any other ERA5 parameters not listed on the CDS Download forms (e.g. some forecast parameters and ocean wave spectra)
- ERA5.1 data for the years 2000 to 2006
- Further documentation on ERA5 data is available here.

ERA5-Land

For ERA5-Land, the data comprises some single level parameters.

- How to download ERA5-Land data residing on the CDS disks
- Download examples for ERA5-Land

The data are available hourly throughout the whole period. Monthly mean data are also available, in two forms: monthly means (of daily means) and monthly means for each hour of the day (synoptic monthly means). The CDS catalogue entries are:

- ERA5-Land hourly data from 1950 to present
- ERA5-Land monthly averaged data from 1950 to present

Further documentation on ERA5-Land data is available here.

Related articles

- ERA5-Land: data documentation
- ERA5: How to calculate wind speed and wind direction from u and v components of the wind?
- C3S User Support Journey
- Parameters valid at the specified time
- Convective and large-scale precipitation