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# The CM SAF R Tools

## - Q & A -

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### GENERAL QUESTIONS

#### WHAT ARE THE CM SAF R TOOLS?

The CM SAF R Tools are a set of three R-packages, which offer tools for working with CM SAF NetCDF climate data. There are the **cmsaf** R-package including the CM SAF R Toolbox, the **cmsafops** R-package including tools for the analysis of NetCDF climate data, and the **cmsafvis** R-package including visualization tools.

#### WHAT IS THE PURPOSE OF CM SAF R TOOLS?

The CM SAF R Tools offer an easy way to prepare, analyse and visualize CM SAF NetCDF formatted data.

#### WHICH TOOL SHOULD I USE?

The **cmsaf** R-package includes the **CM SAF R Toolbox** - the easiest way to work with CM SAF data. The CM SAF R Toolbox is an easy-to-use interface to the functionalities of the **cmsafops** and **ansafvis** R-packages, which requires no R or scripting experiences. Use the Toolbox if you are new with NetCDF climate data or just looking for the easy way.

The **cmsafops** R-package provides R-based operators for the analysis and manipulation of NetCDF formatted data. Use this package if you know R and if you are looking for more operator options.

The **cmsafvis** R-package provides R-based operators for analysis and visualization of CM SAF NetCDF formatted data. Some of the operators can be applied using a cronjob or a config files. Use this package if you know R and if you are looking for more operator options.

#### WHERE DO I GET THE CM SAF R TOOLS?

The CM SAF R-packages are available for free via CRAN (<https://CRAN.R-project.org/package=amsaf>). The easiest way to install all three packages is (a) via the R console by typing `install.packages("amsaf")` or (b) via RStudio (choose *Tools* → *Install packages* → *amsaf*). Installation of the **cmsaf** R-packages will automatically install **ansafops** and **ansafvis**, too.

#### WHAT'S NEW?

With the latest update (August 2020) we decided to split the **ansaf** R-package into three separate packages due to an increasing complexity and to allow more flexibility for users. Highlights of the update are:

- a new operator to analyse and visualize climate anomalies (`?ansafvis::monitor_climate`)
- new output formats for graphics (PNG, JPEG, PDF)
- options to download data in GeoTiff, KML or CSV format
- a quicklook operator to visualize CM SAF data using a config file

#### I'M USING THE TOOLBOX ALREADY. DO I NEED TO CHANGE ANYTHING?

No. The way to install and update the **cmsaf** R-package, which includes the CM SAF R Toolbox, hasn't changed. An update of the **cmsaf** R-package will result in the additional installation of the **cmsafops** and **ansafvis** R-packages.

#### WHERE DO I GET HELP?

If you need help or information you should first have a look at our website [https://www.cmsaf.eu/R\\_toolbox](https://www.cmsaf.eu/R_toolbox)  
If this does not help please contact our User Help Desk via [contact.amsaf@dwd.de](mailto:contact.amsaf@dwd.de)

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### **TROUBLESHOOTING & TIPPS**

#### **TCLTK ON MAC OS**

This is a Mac specific issue with the tcltk package. This package is used by a several other packages, thus it's anyway good to have it. There is a very good description on how to install it on MacOS [here](#).

This includes a description on how to install X11 or XQuartz, which will probably be needed, too. The tcltk package is only used for the file browsing at the very first start of the Toolbox. The user will be asked for a directory where the output will be written and for a resolution of the default grid (in case of interpolation). This is done only once. By this a folder named 'CMSAF-Toolbox' will be placed in the home directory, which includes two files (one including the output directory, the other including the grid definition).

#### **HIDDEN WINDOWS**

In some cases it might happen that file browsing dialogs open behind other windows or force the main Toolbox window to the background. Thus, it could be worth checking all open windows.

#### **COMBINE TAR-FILES**

Tar-files with the same 5-digits order number are handled as one file in the *Prepare* process. Just rename the tar-files including the data which should be combined (e.g., ORD12345\_1.tar, ORD12345\_2.tar, ORD12345\_3.tar). You can start the *Prepare* process as usual and choose one of the files (does not matter which one). The 'Time range selection' will show you the whole period and the final NetCDF file will include all selected time steps.

But, all data have to be on the exact same grid (same longitude and latitude) and overlapping time steps should be avoided.

#### **ANYTHING MISSING?**

This document will steadily be updated. If you are missing something, please let us know: [training.cmsaf@dwd.de](mailto:training.cmsaf@dwd.de)