

## QUICK START

- Install R (Version  $\geq 3.5$ )  
<https://cran.r-project.org>
- Install R-Studio  
(recommended, not mandatory)  
<https://www.rstudio.com/download>
- Install the cmsaf R-package using  
the following command in RStudio  
`install.packages("cmsaf")`
- Run the Toolbox using the following  
commands in RStudio  
`library(cmsaf)`  
`run_toolbox()`
- Have fun

### User Help Desk

In case that a question or problem can not be solved by help of the README or the cmsaf R-package manual contact the CM SAF User Help Desk ([contact.cmsaf@dwd.de](mailto:contact.cmsaf@dwd.de)).

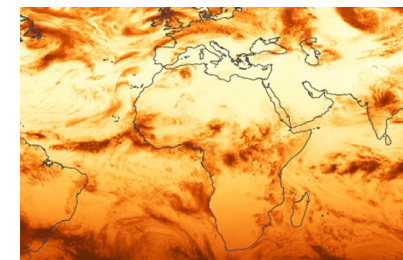


The Satellite Application Facility  
on Climate Monitoring

[www.cmsaf.eu](http://www.cmsaf.eu)  
[contact.cmsaf@dwd.de](mailto:contact.cmsaf@dwd.de)



## The CM SAF R TOOLBOX



R-based tools for an easy  
usage of CM SAF NetCDF data

[www.cmsaf.eu/tools](http://www.cmsaf.eu/tools)



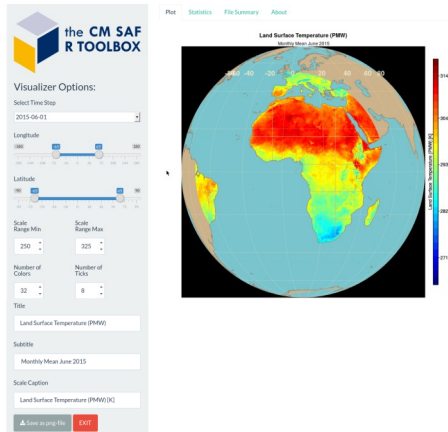
CM SAF data records can be ordered free of charge by [wui.cmsaf.eu](http://wui.cmsaf.eu). The data are provided via https or sftp as tarball.

Use the **Prepare** step to:

- Extract
- Unzip
- Select time range
- Select region
- Merge

### CM SAF R TOOLBOX scripts

The usage of the CM SAF R TOOLBOX requires no R or scripting experience. After starting the Toolbox the user is guided through all options.



The **Analyse** step provides an easy-to-use interface to the diversity of operators of the cmsaf R-package.

### cmsaf R-package

The cmsaf R-package is a collection of functions for basic analysis and manipulation of CM SAF NetCDF data. It contains more than 60 operators, such as:

- dayrange – diurnal range
- fldmean – mean of a 2d field
- mon.anomaly – monthly anomalies
- monmean – monthly means
- monsum – monthly sums
- ncinfo – content of a NetCDF file
- remapbil – bilinear interpolation
- seas.anomaly – seasonal anomalies
- seasmean – seasonal means
- sellonlatbox – select a region
- selpoint – extract a point or time series
- timmean – temporal mean
- trend – linear trend
- wfldmean – weighted 2d field mean
- year.anomaly – annual anomalies
- yearmean – annual means
- yearsum – annual sums
- ymonmean – long-term monthly means

The **Visualize** option provides a powerful tool for the visualization of CM SAF data. It can be used to display 2d maps, 1d line plots or statistical figures. The tool offers several options for customization.

