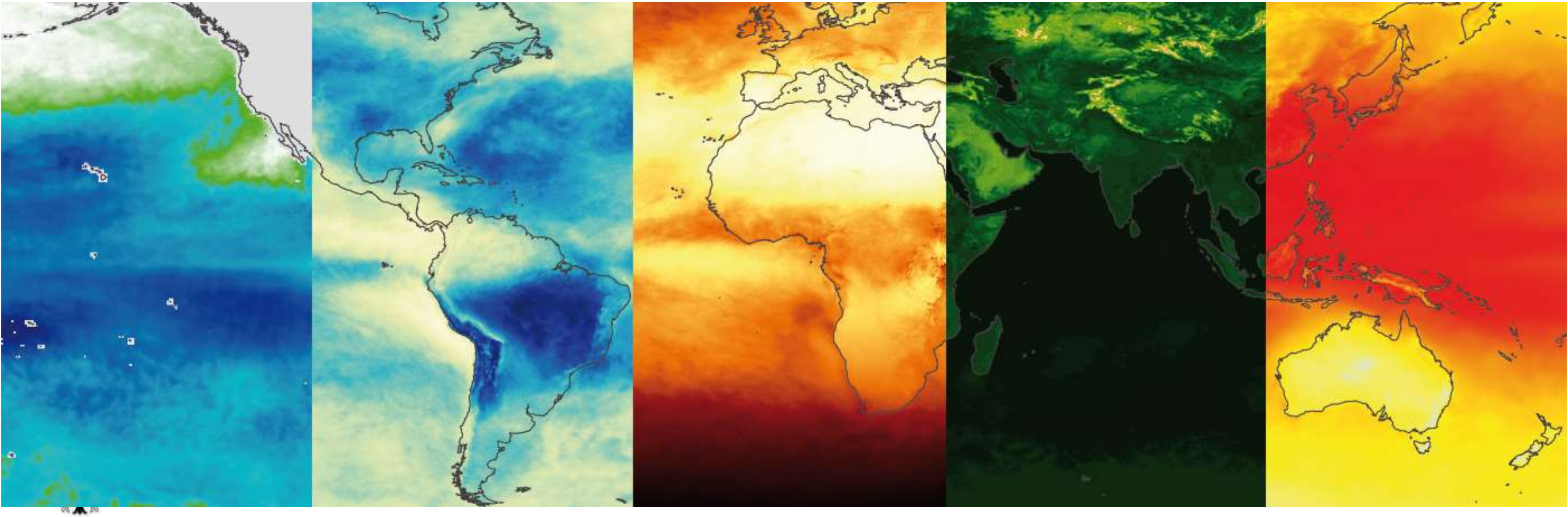
EUMETSAT CM SAF CLIMATE MONITORING

70 Jahre Deutscher Wetterdienst Wetter und Klima aus einer Hand DWD

Online Short Course: SARAH – A Climate Data Record on Surface Solar Radiation

14 June 2023



Data Access

➔ **Web User Interface (wui.cmsaf.eu)**

1. Register once
2. Search data
3. Change projection / spatial resolution / domain to reduce data size
4. Proceed to time range selection
5. Add to order cart
6. Login
7. Place an order
8. Wait for download email (“CM SAF product request has been finished”)

Data Access

Mi 12.04.2023 09:59

CMSAF Contact <Contact.Cmsaf@dwd.de>

CM SAF product request: ORD49252, ORD49253

An

Dear Steffen Kothe,

Thank you for your product order. The following information about
the requested product(s) is stored:

1 2004-01-01 2020-12-01 v004, CFC - Fractional cloud cover, SEVIRI on MSG, Monthly, Mean, METEOSAT full disk (includes Europe, Africa, Atlantic Ocean)
2 2021-01-01 2023-03-01 v004i1, CFC - Fractional cloud cover, SEVIRI on MSG, Monthly, Mean, METEOSAT full disk (includes Europe, Africa, Atlantic Ocean)

Total size of your order: 7.0 GB
(The total size above is based on the original products. Please be aware
that the final order size may differ from this value in case of selected order
post-processing, like format conversion or sub-domaining. It depends on the
selected sub-domain size and/or target horizontal resolution.
It's not possible to estimate the size of standing orders!)

Details of your order:

==========

Order identification: ORD49252
from: Wed Apr 12 07:59:23 UTC 2023

Position: 1
Product type: CFC-Product
Area: METEOSAT full disk (includes Europe, Africa, Atlantic Ocean)
Temporal resolution: Monthly
Statistics: Mean

Data Access

Mi 12.04.2023 10:52

CMSAF Contact <Contact.Cmsaf@dwd.de>

CM SAF product request has been finished: ORD49253

An

Dear Steffen Kothe,

The extraction of your ordered CM SAF product (CFC, SEVIRI on MSG, Monthly, Mean, Version 004, Latitude-longitude grid (0.05x0.05 degree), METEOSAT full disk (includes Europe, Africa, Atlantic Ocean), NetCDF4:LatLon,-11.0,44.0,5.0,34.0,0.05,0.05, 2021-01-01 - 2023-03-01) from our archive has been finished successfully.

Your order has a total size of 9.9 MB (10332160 Byte) and contains 27 individual data files.

The order data files are available on our data server for the next 14 days.

You can get access to the data server via https:
host: cmsaf.dwd.de
Username: routcm
Password: 4gVdHUdpq8UhHclJIP
Directory: data/ORD49253
link: https://cmsaf.dwd.de/data/ORD49253/
wget: wget -r -np -nH --cut-dirs=1 --reject="index.html" --user=routcm --password=4gVdHUdpq8UhHclJIP https://cmsaf.dwd.de/data/ORD49253/

or via sftp:
host: cmsaf.dwd.de
Username: routcm
Password: 4gVdHUdpq8UhHclJIP
Port: 2424
Directory: data/ORD49253
login: sftp -P 2424 routcm@cmsaf.dwd.de:data/ORD49253/

The individual product data files are stored in a single tar-file on our data server:

Filename: ORD49253.tar
Filesize: 9.9 MB (10332160 Byte)

Data Access

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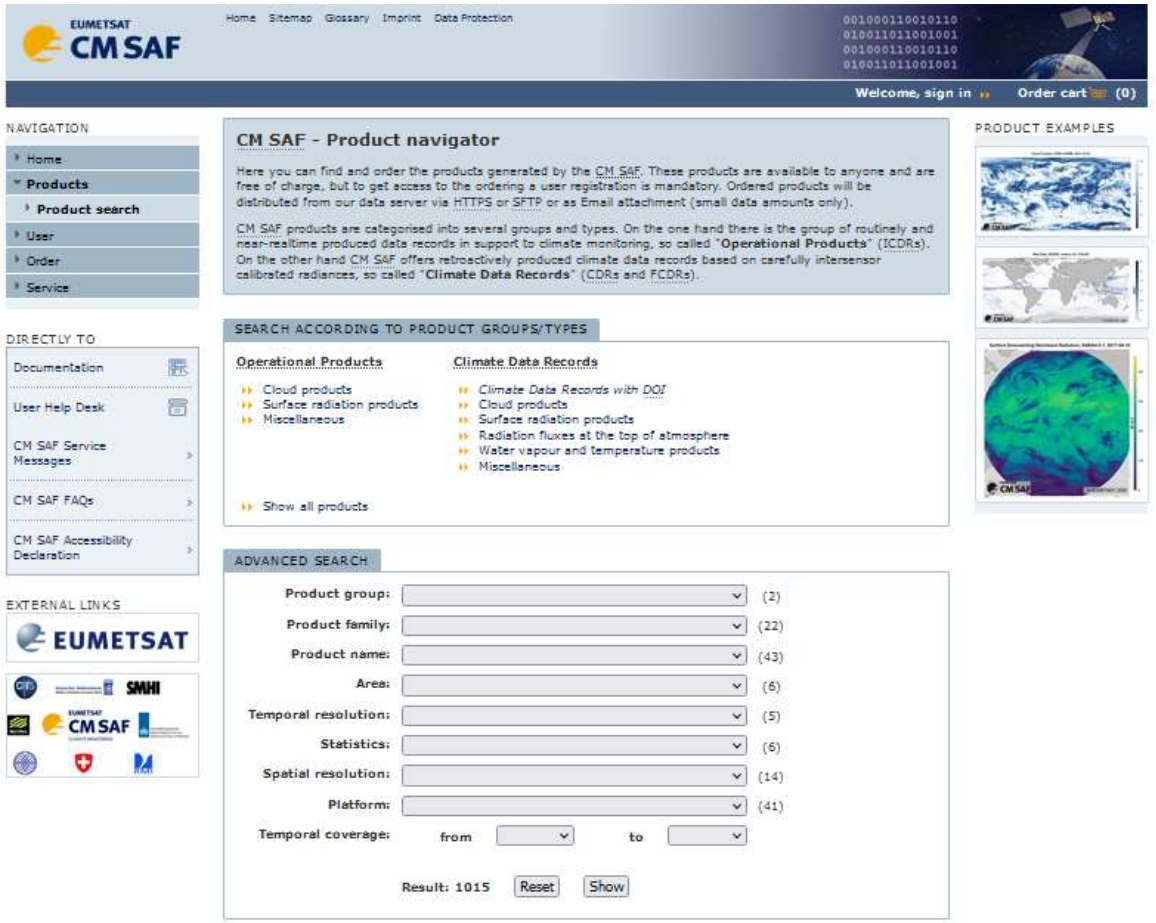
Data Access

- **Web User Interface**
  - Easy selection and online ordering
  - Possibility of regular data delivery
  - Postprocessing
    - Spatial, temporal selection
  - Data format (NetCDF)
  - Download via https
  - All data free of charge
- **User Help Desk**



https://wui.cmsaf.eu

What is the CM SAF R Toolbox?

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R-based
cmsafops – Analysis
cmsafvis – Visualzation
cmsaf – GUI & Preparation

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What is the CM SAF R Toolbox?

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cmsafops – Analysis
cmsafvis – Visualzation
cmsaf – GUI & Preparation

GUI or Command Line
Apply via graphical user interface or directly via command line

Prepare
Ready-to-use NetCDF files

Analyze
Data analysis and manipulation

Visualize
Data visualization and info

Freely available
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Tasks

1. Plot the long-term monthly mean of SARAH SIS for June for: a) Europe, b) a country of your choice.
2. Plot a time series of monthly mean SIS for Offenbach [lon 8.75 , lat 50.1] or a location of your choice.
3. Plot a map of the monthly anomaly of SARAH SDU for May 2023.

Download link for prepared data:

https://public.cmsaf.dwd.de/data/stkothe/SARAH_SC/

Please share your results with us:

https://padlet.com/CMSAF/the-cm-saf-padlet-azeujpu4vc9cbfcy

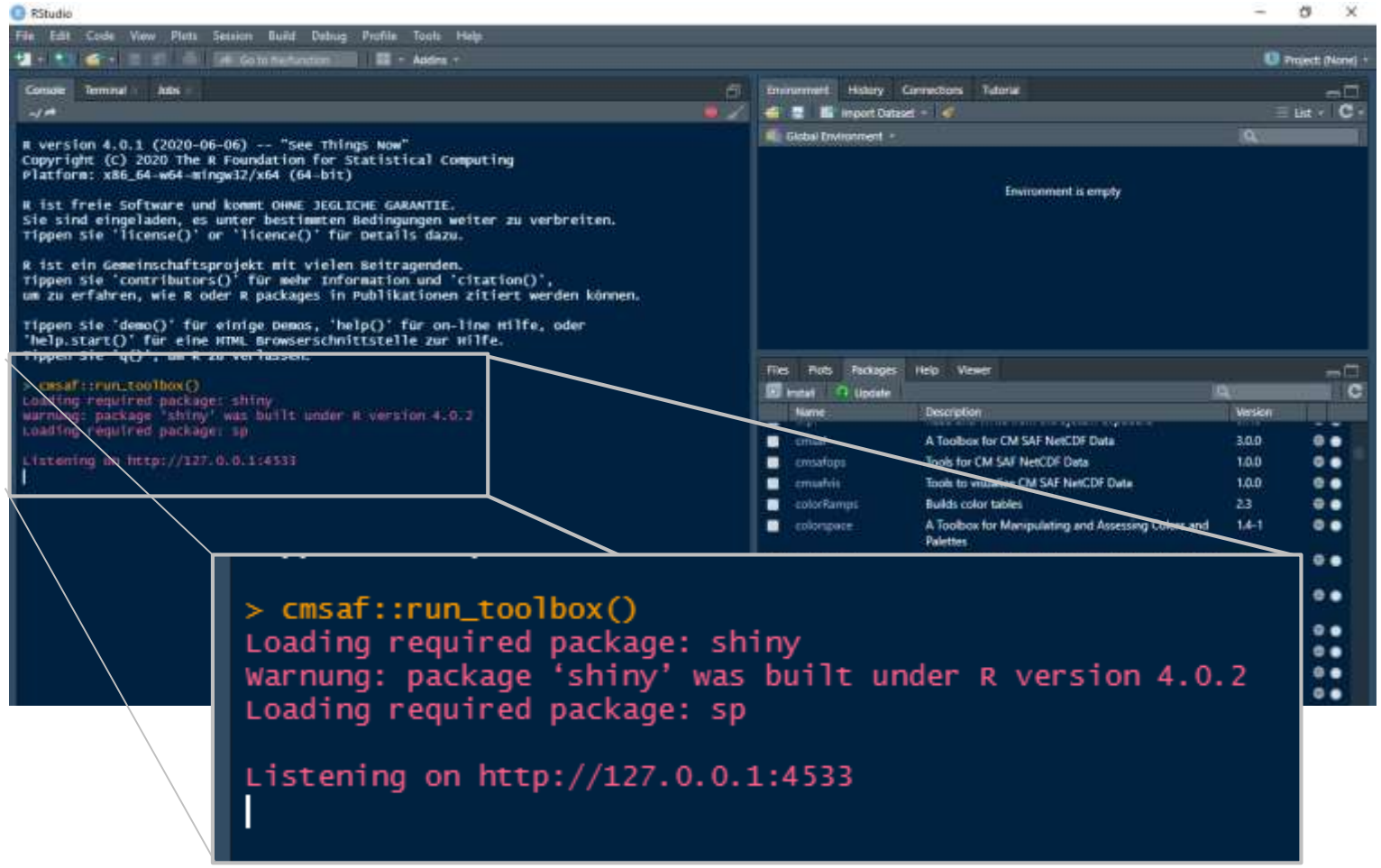
Installation

1. Install R
   - https://cran.r-project.org
2. Install Rstudio
   - https://www.rstudio.com/download
3. Run RStudio and install cmsaf R-package
   - install.packages('cmsaf')

Start the Toolbox

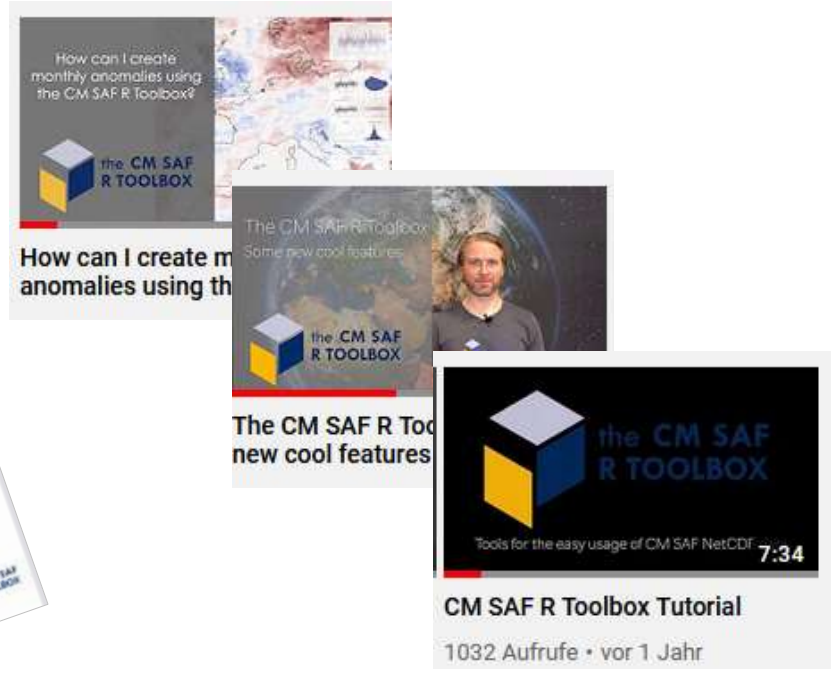
- Start Rstudio and type:

➔ `cmsaf::run_toolbox()`



Support

- If you need help using the Toolbox have a look at our manuals, Youtube videos, the Toolbox paper, Q&A document, Cheat Sheets, flyer, etc.
  - www.cmsaf.eu/R_toolbox
  - contact.cmsaf@dwd.de



Support – Tutorials

➔ Status report and trend analysis with corresponding tutorial

➔ www.cmsaf.eu/R_toolbox

Internship August 2021

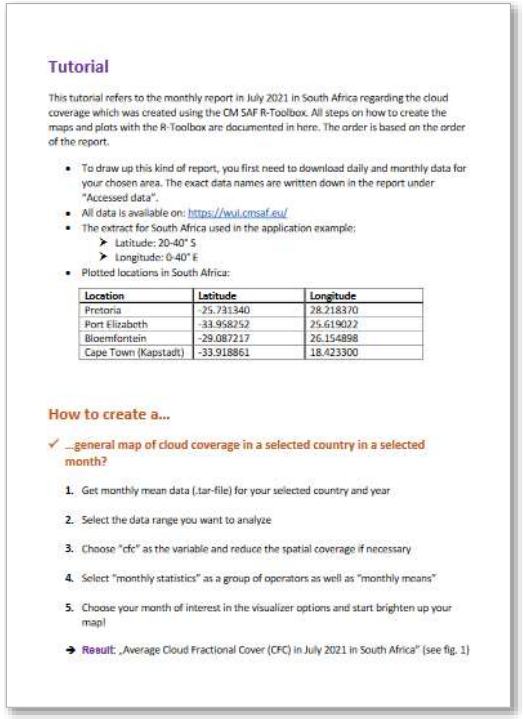
Mini-Project

CLOUD COVERAGE IN SOUTH AFRICA

Monthly report July 2021

Author: Janine Besch

15. AUGUST 2021



Tutorial

This tutorial refers to the monthly report in July 2021 in South Africa regarding the cloud coverage which was created using the CM SAF R-Toolbox. All steps on how to create the maps and plots with the R-Toolbox are documented in here. The order is based on the order of the report.

- To draw up this kind of report, you first need to download daily and monthly data for your chosen area. The exact data names are written down in the report under "Accessed data".
- All data is available on: https://wui.cmsaf.eu/
- The extract for South Africa used in the application example:
  - Latitude: 20-40° S
  - Longitude: 0-40° E
- Plotted locations in South Africa:

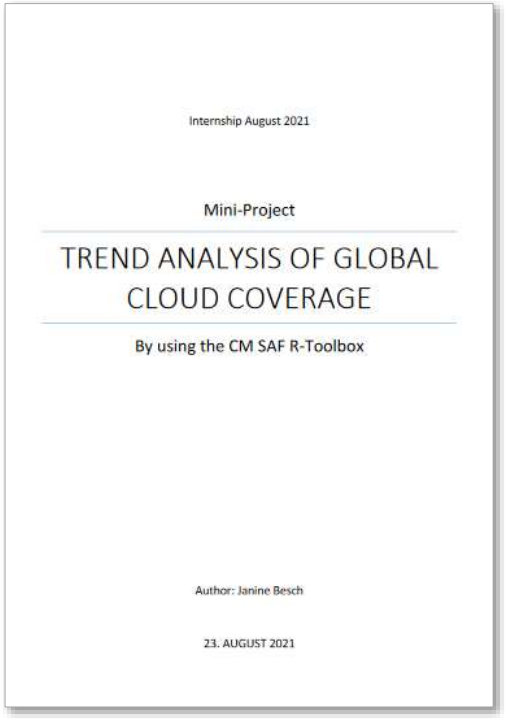
Location	Latitude	Longitude
Pretoria	-25.731340	28.218370
Port Elizabeth	-33.958252	25.619022
Bloemfontein	-29.087217	26.154898
Cape Town (Kapstadt)	-33.918861	18.423300

How to create a...

✓ ...general map of cloud coverage in a selected country in a selected month?

1. Get monthly mean data (.tar-file) for your selected country and year
2. Select the data range you want to analyze
3. Choose "cfc" as the variable and reduce the spatial coverage if necessary
4. Select "monthly statistics" as a group of operators as well as "monthly means"
5. Choose your month of interest in the visualizer options and start brighten up your map!

➔ **Result:** „Average Cloud Fractional Cover (CFC) in July 2021 in South Africa" (see fig. 1)



Internship August 2021

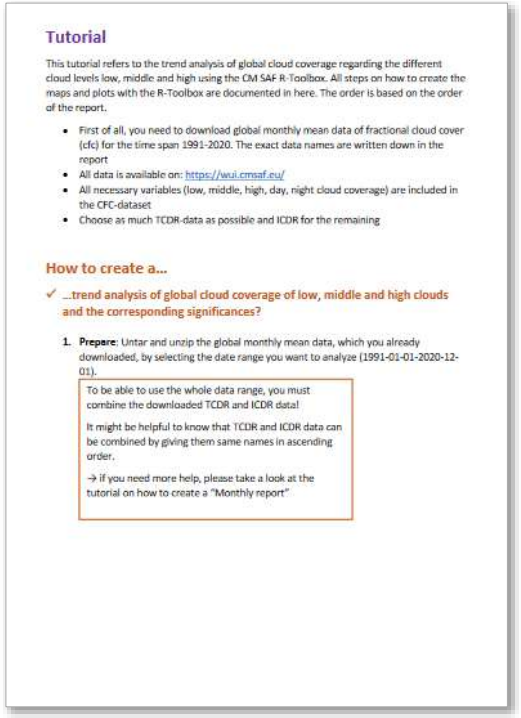
Mini-Project

TREND ANALYSIS OF GLOBAL CLOUD COVERAGE

By using the CM SAF R-Toolbox

Author: Janine Besch

23. AUGUST 2021



Tutorial

This tutorial refers to the trend analysis of global cloud coverage regarding the different cloud levels low, middle and high using the CM SAF R-Toolbox. All steps on how to create the maps and plots with the R-Toolbox are documented in here. The order is based on the order of the report.

- First of all, you need to download global monthly mean data of fractional cloud cover (cfc) for the time span 1991-2020. The exact data names are written down in the report
- All data is available on: https://wui.cmsaf.eu/
- All necessary variables (low, middle, high, day, night cloud coverage) are included in the CFC-dataset
- Choose as much TCDR-data as possible and ICDR for the remaining

How to create a...

✓ ...trend analysis of global cloud coverage of low, middle and high clouds and the corresponding significances?

1. **Prepare**: Untar and unzip the global monthly mean data, which you already downloaded, by selecting the date range you want to analyze (1991-01-01-2020-12-01).

To be able to use the whole data range, you must combine the downloaded TCDR and ICDR data!

It might be helpful to know that TCDR and ICDR data can be combined by giving them same names in ascending order.

→ If you need more help, please take a look at the tutorial on how to create a "Monthly report"

Share your Results

https://padlet.com/CMSAF/the-cm-saf-padlet-azeujpu4vc9cbfcy