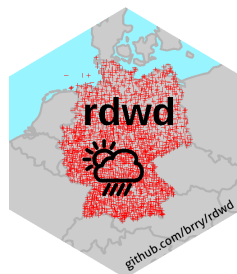


rdwd: interface to German Weather Service data



Berry Boessenkool, e-Rum Milano, June 2020

github.com/brry/rdwd
bookdown.org/brry/rdwd

`berry-b@gmx.de`

Presentation template generated with
`berryFunctions::createPres`



slides
[use freely, cite me](#)

The DWD has a ton of data freely available

The DWD has a ton of data freely available

but it's tedious to handle manually

The DWD has a ton of data freely available

but it's tedious to handle manually

- ▶ >300'000 datasets - too much for manual inspection

The DWD has a ton of data freely available

but it's tedious to handle manually

- ▶ >300'000 datasets - too much for manual inspection
- ▶ FTP server somewhat difficult to search

The DWD has a ton of data freely available

but it's tedious to handle manually

- ▶ >300'000 datasets - too much for manual inspection
- ▶ FTP server somewhat difficult to search
- ▶ various file formats (time series + gridded data)

The DWD has a ton of data freely available

but it's tedious to handle manually

- ▶ >300'000 datasets - too much for manual inspection
- ▶ FTP server somewhat difficult to search
- ▶ various file formats (time series + gridded data)

R saves the day

Main features of rdwd

Main features of rdwd

- ▶ find, select, download + read data from the German weather service DWD

Main features of rdwd

- ▶ find, select, download + read data from the German weather service DWD
- ▶ vectorized, progress bars, no re-downloads

Main features of rdwd

- ▶ find, select, download + read data from the German weather service DWD
- ▶ vectorized, progress bars, no re-downloads
- ▶ index of files + meta data

Main features of rdwd

- ▶ find, select, download + read data from the German weather service DWD
- ▶ vectorized, progress bars, no re-downloads
- ▶ index of files + meta data
- ▶ reads both data types:

Main features of rdwd

- ▶ find, select, download + read data from the German weather service DWD
- ▶ vectorized, progress bars, no re-downloads
- ▶ index of files + meta data
- ▶ reads both data types:
 - ▶ observational time series from 6k meteorological recording stations (2.5k active)

Main features of rdwd

- ▶ find, select, download + read data from the German weather service DWD
- ▶ vectorized, progress bars, no re-downloads
- ▶ index of files + meta data
- ▶ reads both data types:
 - ▶ observational time series from 6k meteorological recording stations (2.5k active)
-> rain, temperature, wind, sunshine, pressure, cloudiness, humidity, snow, ...

Main features of rdwd

- ▶ find, select, download + read data from the German weather service DWD
- ▶ vectorized, progress bars, no re-downloads
- ▶ index of files + meta data
- ▶ reads both data types:
 - ▶ observational time series from 6k meteorological recording stations (2.5k active)
-> rain, temperature, wind, sunshine, pressure, cloudiness, humidity, snow, ...
 - ▶ gridded raster data from radar + interpolation

Usage example for observational data - station selection

Usage example for observational data - station selection

interactive map of available stations



Usage example for observational data - data selection

Usage example for observational data - data selection

overview of available datasets

var= res=	1_minute	10_minutes	hourly	subdaily	daily	monthly	annual	multi_annual
	per	per	per	per	per	per	per	per
air_temperature		<<	<	<				
cloudiness			<	<				
cloud_type			<					
dew_point			<					
extreme_temperature		<<						
extreme_wind		<<						
kl					<	<	<	
moisture				<				

Usage example for observational data - code

Usage example for observational data - code

```
library("rdwd")  
link <- selectDWD("Potsdam", res="daily", var="kl", per="recent")
```

Usage example for observational data - code

```
library("rdwd")  
link <- selectDWD("Potsdam", res="daily", var="kl", per="recent")
```

```
link  
## ftp://opendata.dwd.de/climate_environment/CDC/observations_germany/  
## climate/daily/kl/recent/tageswerte_KL_03987_akt.zip
```

Usage example for observational data - code

```
library("rdwd")  
link <- selectDWD("Potsdam", res="daily", var="kl", per="recent")  
clim <- dataDWD(link, read=TRUE, varnames=TRUE)
```

```
link  
## ftp://opendata.dwd.de/climate_environment/CDC/observations_germany/  
## climate/daily/kl/recent/tageswerte_KL_03987_akt.zip
```

Usage example for observational data - code

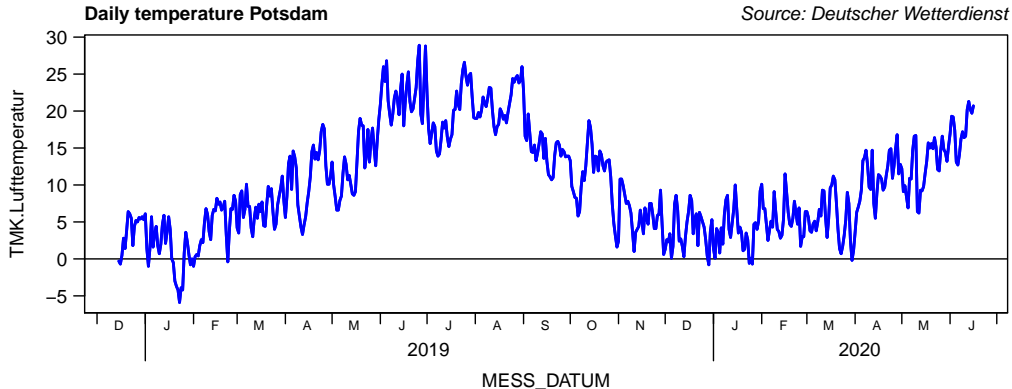
```
library("rdwd")  
link <- selectDWD("Potsdam", res="daily", var="kl", per="recent")  
clim <- dataDWD(link, read=TRUE, varnames=TRUE)
```

```
link  
## ftp://opendata.dwd.de/climate_environment/CDC/observations_germany/  
## climate/daily/kl/recent/tageswerte_KL_03987_akt.zip
```

```
colnames(clim)  
##   [1] "STATIONS_ID"          "MESS_DATUM"          "QN_3"  
##   [4] "FX.Windspitze"        "FM.Windgeschwindigkeit" "QN_4"  
##   [7] "RSK.Niederschlagshoehe" "RSKF.Niederschlagsform" "SDK.Sonnenscheindauer"  
##  [10] "SHK_TAG.Schneehoehe"  "NM.Bedeckungsgrad"   "VPM.Dampfdruck"  
##  [13] "PM.Luftdruck"         "TMK.Lufttemperatur"   "UPM.Relative_Feuchte"  
##  [16] "TXK.Lufttemperatur_Max" "TNK.Lufttemperatur_Min" "TGK.Lufttemperatur_5cm"  
##  [19] "eor"
```


Usage example for observational data - further processing

```
plot(clim[,c(2,14)], type="l", xaxt="n", las=1, col="blue", lwd=2)  
berryFunctions::monthAxis() ; abline(h=0)
```



Usage example for gridded data

Usage example for gridded data

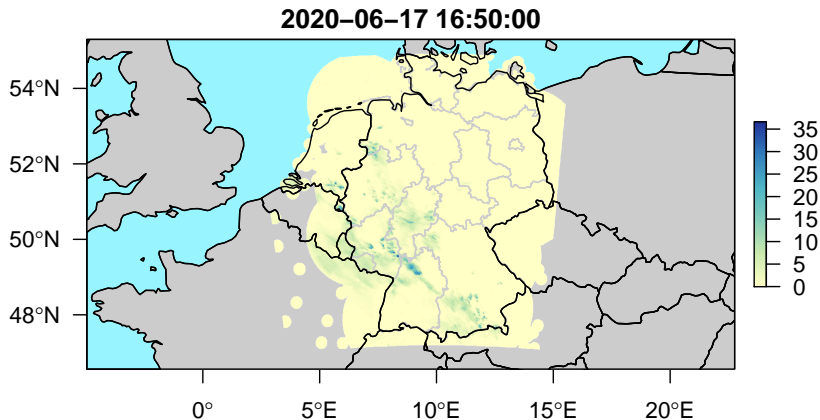
```
links <- indexFTP("hourly/radolan/recent/bin", base=gridbase, overwrite=TRUE)
```

Usage example for gridded data

```
links <- indexFTP("hourly/radolan/recent/bin", base=gridbase, overwrite=TRUE)
rad <- dataDWD(links[4047], base=gridbase, joinbf=TRUE, read=TRUE)
```

Usage example for gridded data

```
links <- indexFTP("hourly/radolan/recent/bin", base=gridbase, overwrite=TRUE)
rad <- dataDWD(links[4047], base=gridbase, joinbf=TRUE, read=TRUE)
plotRadar(rad$dat, main=rad$meta$date, mar=c(2.5, 3.5, 1.5, 5))
```

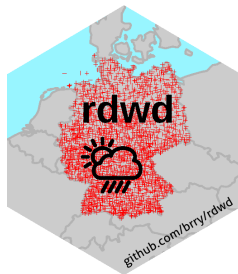


select, download + read data

time series from meteorological stations

raster data from radar + interpolation

bookdown.org/brry/rdwd



```
link <- selectDWD("Potsdam", res="daily", var="kl", per="recent")
clim <- dataDWD(link, varnames=TRUE)

links <- indexFTP("hourly/radolan/recent/bin", base=gridbase)
rad <- dataDWD(links[4047], base=gridbase, joinbf=TRUE)
plotRadar(rad$dat, main=rad$meta$date)
```