

Package: fmi2 (via r-universe)

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Title Finnish Meteorological Institute open data API R client

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Description R client for the Finnish Meteorological Institute (FMI) open data API. This package supersedes the obsolete fmi package. Client can be used to fetch geospatial over FMI's WFS <<https://en.ilmatieteenlaitos.fi/open-data-manual-accessing-data>> and converted into geospatial objects in R.

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URL <https://ropengov.github.io/fmi2/>, <https://github.com/rOpenGov/fmi2>

BugReports <https://github.com/rOpenGov/fmi2/issues>

Depends R (>= 3.3)

Imports checkmate (>= 1.9.4), dplyr (>= 0.7.6), glue (>= 1.3.1), httpcache (>= 1.1.0), httr (>= 1.4.1), lubridate (>= 1.7.4), magrittr (>= 1.5), methods, purrr (>= 0.3.2), rlang (>= 0.1.2), rvest (>= 0.3.2), sf (>= 0.6.3), tibble (>= 1.4.2), xml2 (>= 1.2.0)

Suggests covr (>= 3.1.0), DT (>= 0.8), ggplot2 (>= 3.2.1), httptest (>= 3.2.2), knitr (>= 1.20), leaflet (>= 2.0.2), prettydoc (>= 0.3.0), rmarkdown (>= 1.10), roxygen2 (>= 6.1.1), skimr (>= 1.0.7), testthat (>= 2.0.0), tidyr (>= 0.8.3)

VignetteBuilder knitr

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X-schema.org-isPartOf <http://ropengov.org/>

X-schema.org-keywords ropengov

Collate 'fmi2-global.R' 'aaa.R' 'describe_variables.R' 'fmi_api.R'
 'fmi_stations.R' 'list_parameters.R' 'list_queries.R'
 'obs_weather_daily.R' 'obs_weather_hourly.R' 'to_sf.R'
 'utils-pipe.R' 'valid_fmisisd.R'

Config/pak/sysreqs libgdal-dev gdal-bin libgeos-dev libicu-dev
 libxml2-dev libssl-dev libproj-dev libsqlite3-dev
 libudunits2-dev

Repository <https://ropengov.r-universe.dev>

RemoteUrl <https://github.com/rOpenGov/fmi2>

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describe_variables *Describe FMI Variables*

Description

Describe FMI observation variable(s).

Usage

```
describe_variables(x)
```

Arguments

x character vector of observation variables to be described.

Details

FMI provides a machine-readable (XML) description of different observation variables. Use this function to see the specifications of a given variable.

Value

tibble containing the following columns:

variable Observation variable name

label Variable (parameter) label used by the FMI

base_phenomenon Base phenomenon that the variable is characterising

unit Variabel unit

stat_function Statistical function used the derive the variable value

agg_period Aggregation time period

Author(s)

Joona Lehtomäki joona.lehtomaki@iki.fi

Examples

```
## Not run:
desc <- describe_variables(c("TG_PT12H_min", "rrday"))

## End(Not run)
```

fmi_api

FMI API

Description

Requests to FMI API.

Usage

```
fmi_api(request, storedquery_id = NULL, ...)
```

Arguments

request character request type of either DescribeStoredQueries or getFeature.

storedquery_id character id of the stored query id. If request is getFeature, then storedquery_id must be provided and otherwise it's ignored.

... stored query specific parameters. NOTE: it's up to the high-level functions to check the validity of the parameters.

Details

Make a request to the FMI API. The base url is opendata.fmi.fi/wfs?service=WFS&version=2.0.0 to which other components defined by the arguments are appended.

This is a low-level function intended to be used by other higher level functions in the package.

Note that GET requests are used using `httplib` meaning that requests are cached. If you want clear cache, use `httplib::clearCache()`. To turn the cache off completely, use `httplib::cacheOff()`

Value

fmi_api (S3) object with the following attributes:

content XML payload.

path path provided to get the response.

response the original response object.

Author(s)

Joona Lehtomäki joona.lehtomaki@iki.fi

Examples

```
# List stored queries
fmi_api(request = "DescribeStoredQueries")
```

fmi_stations

Get a table of active FMI observation stations.

Description

Data is retrieved using a FMI API stored query.

Usage

```
fmi_stations()
```

Value

a tibble of active observation stations

Author(s)

Joona Lehtomäki <joona.lehtomaki@gmail.com>

See Also

<https://en.ilmatieteenlaitos.fi/observation-stations>

list_parameters	<i>List and describe all valid parameters for a given stored query.</i>
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Description

For valid stored query IDs, see [list_queries](#).

Usage

```
list_parameters(query_id)
```

Arguments

query_id character string query ID.

Value

a tibble describing the valid parameters.

Author(s)

Joona Lehtomäki joona.lehtomaki@iki.fi

See Also

[list_queries](#).

Examples

```
## Not run:  
list_parameters("fmi::observations::weather::daily::timevaluepair")  
  
## End(Not run)
```

list_queries	<i>List stored queries available over the FMI API.</i>
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Description

Stored queries are identifiers for data sets. The current version on the Open Data WFS service of the Finnish Meteorological Institute uses the stored queries extensively to enable users to select the features, areas and times they require as easily as possible. See [the Open data WFS Service](#) for more detailed information about the available stored queries and their request parameters.

Usage

```
list_queries(all = FALSE)
```

Arguments

all logical should all stored queries available through the API be listed(default: FALSE)?

Value

tibble containing the following columns:

query_id ID of the storied query.

query_desc Description of the storied query.

no_parameters Number of parameters.

function_name Name of the function in fmi2 if wrapped, NA otherwise.

Author(s)

Joona Lehtomäki joona.lehtomaki@iki.fi

See Also

<https://en.ilmatieteenlaitos.fi/open-data-manual-fmi-wfs-services>

Examples

```
## Not run:  
# List the stored queries that have been wrapped (i.e. are accessible) by  
# the fmi2 package  
list_queries()  
# List all stored queries available through the API  
list_queries(all = TRUE)  
  
## End(Not run)
```

obs_weather_daily *Weather observations*

Description

Daily weather observations from weather stations.

Usage

```
obs_weather_daily(starttime, endtime, fmid = NULL, place = NULL)
```

Arguments

starttime	character or Date start of the time interval in ISO-format. character will be coerced into a Date object.
endtime	character or Date end of the time interval in ISO-format. character will be coerced into a Date object. data.
fmid	numeric FMI observation station identifier (see fmi_stations).
place	character location name for which to provide data.

Details

Default set contains daily precipitation rate, mean temperature, snow depth, and minimum and maximum temperature. By default, the data is returned from last 744 hours. At least one location parameter (geoid/place/fmid/wmo/bbox) has to be given.

The FMI WFS stored query used by this function is `fmi::observations::weather::daily::simple`. For more informations, see the [FMI documentation page](#).

Value

sf object in a long (melted) form. Observation variables names are given in variable column. Following variables are returned:

rrday Precipitation amount
snow Snow depth
tday Average air temperature
tmin Minimum air temperature
tmax Maximum air temperature
TG_PT12H_min Ground minimum temperature

Note

For a complete description of the accepted arguments, see `list_parameters("fmi::observations::weather::daily::s`

See Also

<https://en.ilmatieteenlaitos.fi/open-data-manual-fmi-wfs-services>,
[list_parameters](#)

obs_weather_hourly *Hourly weather observations from weather stations.*

Description

Default set contains hourly air temperature average, maximum and minimum, air relative humidity average, wind speed average, minimum (10 minute average) and maximum (10 minute average), wind direction average, wind gust speed maximum (3 second average), rain accumulated, rain intensity maximum, air pressure average and the most significant weather code. By default, the data is returned from last 24 hours. At least one location parameter (geoid/place/fmisid/wmo/bbox) has to be given.

Usage

```
obs_weather_hourly(starttime, endtime, fmisid = NULL)
```

Arguments

starttime	character begin of the time interval in ISO-format.
endtime	character end of time interval in ISO-format. data.
fmisid	numeric FMI observation station identifier (see fmi_stations).

Details

The FMI WFS stored query used by this function is `fmi::observations::weather::hourly::simple`. For more informations, see [the FMI documentation page](#).

Value

sf object in a long (melted) form. Observation variables names are given in variable column. Following variables are returned:

rrday Precipitation amount
snow Snow depth
tday Average air temperature
tmin Minimum air temperature
tmax Maximum air temperature
TG_PT12H_min Ground minimum temperature

Note

For a complete description of the accepted arguments, see `list_parameters("fmi::observations::weather::hourly::simple")`.

See Also

<https://en.ilmatieteenlaitos.fi/open-data-manual-fmi-wfs-services>,
[list_parameters](#)

`to_sf`*Transform a fmi_api object into a sf object.*

Description

FMI API response object's XML (GML) content is temporarily written on disk and then immediately read back in into a sf object.

Usage

```
to_sf(api_obj)
```

Arguments

```
api_obj      fmi api object
```

Value

sf object

Note

For internal use, not exported.

Author(s)

Joona Lehtomäki joona.lehtomaki@iki.fi

See Also

[fmi_api](#)

Examples

```
## Not run:
response <- fmi_api(request = "getFeature",
  storedquery_id = "fmi::observations::weather::daily::timevaluepair",
  starttime = "2019-01-01", endtime = "2019-01-04",
  fmsid = 100946)
sf_obj <- to_sf(response)

## End(Not run)
```

`valid_fmisis`*Check if a provided ID number is a valid FMI SID.*

Description

fmisis is a ID numbering system used by the FMI.

Usage

```
valid_fmisis(fmisis)
```

Arguments

fmisis numeric or character ID number.

Value

logical

Author(s)

Joona Lehtomaki <joona.lehtomaki@gmail.com>

See Also

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