Package: readnoaa (via r-universe)

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Title Access 'NOAA' Climate and Weather Data

Version 0.1.2

Description Provides clean, tidy access to climate and weather data from the 'National Oceanic and Atmospheric Administration' ('NOAA') via the 'National Centers for Environmental Information' ('NCEI') Data Service API <https://www.ncei.noaa.gov/access/services/data/v1>. Covers daily weather observations, monthly and annual summaries, and 30-year climate normals from over 100,000 stations across 180 countries. No API key is required. Dedicated functions handle the most common datasets, while a generic fetcher provides access to all 'NCEI' datasets. Station discovery functions help users find stations by location or name. Data is downloaded on first use and cached locally for subsequent calls. This package is not endorsed or certified by 'NOAA'.

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BugReports https://github.com/charlescoverdale/readnoaa/issues

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Contents

`clear_cache` *Clear the readnoaa cache*

Description

Deletes all locally cached NOAA data files. The next call to any data function will re-download from the NCEI API.

Usage

```
clear_cache()
```

Value

Invisible `NULL`.

See Also

Other data access: `list_datasets()`, `list_datatypes()`, `noaa_get()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
clear_cache()
options(op)
```

list_datasets *List common NCEI datasets*

Description

Returns a curated table of the most commonly used NCEI datasets. No network call is made.

Usage

```
list_datasets()
```

Value

A data frame with columns:

dataset Character. Dataset identifier for use with `noaa_get()`.

description Character. Brief description.

frequency Character. Temporal resolution.

See Also

Other data access: `clear_cache()`, `list_datatypes()`, `noaa_get()`

Examples

```
list_datasets()
```

list_datatypes *List available data types for a dataset*

Description

Queries the NCEI API to discover what data types (variables) are available for a given dataset and station. This makes a short data request to identify available columns.

Usage

```
list_datatypes(dataset, station, cache = TRUE)
```

Arguments

`dataset`	Character. Dataset identifier (e.g. `"daily-summaries"`).
`station`	Character. A station ID to query.
`cache`	Logical. Use cached data if available (default `TRUE`).

Value

A character vector of available data type codes.

See Also

Other data access: `clear_cache()`, `list_datasets()`, `noaa_get()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
list_datatypes("daily-summaries", "USW00094728")
options(op)
```

`noaa_annual` *Annual weather summaries*

Description

Returns annual summary data from the NCEI Global Summary of the Year dataset.

Usage

```
noaa_annual(
  station,
  start_date,
  end_date,
  datatypes = NULL,
  units = "metric",
  include_flags = FALSE,
  include_location = FALSE,
  cache = TRUE
)
```

Arguments

`station`	Character. One or more station IDs.
`start_date`	Character. Start date in `"YYYY-MM-DD"` or `"YYYY-MM"` format.
`end_date`	Character. End date in the same format.
`datatypes`	Optional character vector of data type codes.
`units`	Character. `"metric"` (default) or `"standard"`.
`include_flags`	Logical. Include data quality flags from NCEI (default `FALSE`).
`include_location`	Logical. Include station latitude, longitude, and elevation columns (default `FALSE`).
`cache`	Logical. Use cached data if available (default `TRUE`).

Value

A data frame with columns including:

station Character. Station identifier.

date Date. First day of the year.

name Character. Station name.

... Numeric. Data columns vary by station and request.

See Also

Other weather data: `noaa_daily()`, `noaa_monthly()`, `noaa_normals()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
noaa_annual("USW00094728", "2020-01-01", "2024-01-01")
options(op)
```

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noaa_daily *Daily weather observations*

Description

Returns daily weather data from the NCEI Daily Summaries dataset (GHCN-Daily). Common data types include TMAX (maximum temperature), TMIN (minimum temperature), PRCP (precipitation), SNOW (snowfall), and SNWD (snow depth).

Usage

```
noaa_daily(
  station,
  start_date,
  end_date,
  datatypes = NULL,
  units = "metric",
  include_flags = FALSE,
  include_location = FALSE,
  cache = TRUE
)
```

Arguments

station	Character. One or more station IDs (e.g. "USW00094728" for Central Park, NYC).
start_date	Character. Start date in "YYYY-MM-DD" or "YYYY-MM" format.
end_date	Character. End date in the same format.
datatypes	Optional character vector of data type codes to retrieve (e.g. c("TMAX", "TMIN")). If NULL, all available types are returned.
units	Character. "metric" (default, Celsius/mm) or "standard" (Fahrenheit/inches).
include_flags	Logical. Include data quality flags from NCEI (default FALSE).
include_location	Logical. Include station latitude, longitude, and elevation columns (default FALSE).
cache	Logical. Use cached data if available (default TRUE).

Details

Requests spanning more than one year are automatically split into yearly chunks to avoid API timeouts.

Value

A data frame with columns including:

station Character. Station identifier.

date Date. Observation date.

name Character. Station name.

... Numeric. Data columns vary by station and request (e.g. tmax, tmin, prcp).

See Also

Other weather data: noaa_annual(), noaa_monthly(), noaa_normals()

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
# Daily temperatures for Central Park, NYC
noaa_daily("USW00094728", "2024-01-01", "2024-01-31",
           datatypes = c("TMAX", "TMIN"))
options(op)
```

noaa_get *Fetch any NCEI dataset*

Description

A generic fetcher for direct access to any NCEI dataset. Use `list_datasets()` to see common dataset identifiers.

Usage

```
noaa_get(
  dataset,
  station = NULL,
  start_date = NULL,
  end_date = NULL,
  datatypes = NULL,
  bbox = NULL,
  units = "metric",
  include_flags = FALSE,
  include_location = FALSE,
  cache = TRUE
)
```

Arguments

`dataset`	Character. The dataset identifier (e.g. `"daily-summaries"`, `"global-summary-of-the-month"`).
`station`	Optional character vector of station IDs.
`start_date`	Optional start date in `"YYYY-MM-DD"` or `"YYYY-MM"` format.
`end_date`	Optional end date in the same format.
`datatypes`	Optional character vector of data type codes.
`bbox`	Optional numeric vector of length 4 defining a bounding box: `c(south_lat, west_lon, north_lat, east_lon)`.
`units`	Character. `"metric"` (default) or `"standard"`.
`include_flags`	Logical. Include data quality flags from NCEI (default `FALSE`).
`include_location`	Logical. Include station latitude, longitude, and elevation columns (default `FALSE`).
`cache`	Logical. Use cached data if available (default `TRUE`).

Value

A data frame. Columns vary by dataset.

See Also

Other data access: `clear_cache()`, `list_datasets()`, `list_datatypes()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
# Fetch daily data using the generic function
noaa_get("daily-summaries", station = "USW00094728",
         start_date = "2024-01-01", end_date = "2024-01-31")
options(op)
```

`noaa_monthly` *Monthly weather summaries*

Description

Returns monthly summary data from the NCEI Global Summary of the Month dataset.

Usage

```
noaa_monthly(
  station,
  start_date,
  end_date,
  datatypes = NULL,
  units = "metric",
  include_flags = FALSE,
  include_location = FALSE,
  cache = TRUE
)
```

Arguments

`station`	Character. One or more station IDs.
`start_date`	Character. Start date in `"YYYY-MM-DD"` or `"YYYY-MM"` format.
`end_date`	Character. End date in the same format.
`datatypes`	Optional character vector of data type codes.
`units`	Character. `"metric"` (default) or `"standard"`.
`include_flags`	Logical. Include data quality flags from NCEI (default `FALSE`).
`include_location`	Logical. Include station latitude, longitude, and elevation columns (default `FALSE`).
`cache`	Logical. Use cached data if available (default `TRUE`).

Value

A data frame with columns including:

station Character. Station identifier.

date Date. First day of the month.

name Character. Station name.

... Numeric. Data columns vary by station and request.

See Also

Other weather data: `noaa_annual()`, `noaa_daily()`, `noaa_normals()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
noaa_monthly("USW00094728", "2024-01", "2024-12")
options(op)
```

`noaa_nearby` *Find stations near a location*

Description

Searches for weather stations within a given radius of a point, sorted by distance. Uses the GHCN-Daily station inventory.

Usage

```
noaa_nearby(lat, lon, radius_km = 50, limit = 25L)
```

Arguments

`lat`	Numeric. Latitude of the target location.
`lon`	Numeric. Longitude of the target location.
`radius_km`	Numeric. Search radius in kilometres (default 50).
`limit`	Integer. Maximum number of results (default 25).

Value

A data frame with the same columns as `noaa_stations()` plus:

distance_km Numeric. Distance from the target point in kilometres.

See Also

Other station discovery: `noaa_stations()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
# Stations within 25 km of central London
noaa_nearby(51.5, -0.1, radius_km = 25)
options(op)
```

`noaa_normals` *Climate normals (1991-2020)*

Description

Returns 30-year climate normals from the NCEI Normals dataset. Normals represent the average climate conditions over the 1991-2020 period.

Usage

```
noaa_normals(
  station,
  period = "monthly",
  datatypes = NULL,
  include_flags = FALSE,
  include_location = FALSE,
  cache = TRUE
)
```

Arguments

`station`	Character. One or more station IDs.
`period`	Character. One of `"monthly"`, `"daily"`, or `"annual"`.
`datatypes`	Optional character vector of data type codes.
`include_flags`	Logical. Include data quality flags from NCEI (default `FALSE`).
`include_location`	Logical. Include station latitude, longitude, and elevation columns (default `FALSE`).
`cache`	Logical. Use cached data if available (default `TRUE`).

Value

A data frame. Columns vary by period but typically include station, date or month, and normal values for temperature, precipitation, and other variables.

See Also

Other weather data: `noaa_annual()`, `noaa_daily()`, `noaa_monthly()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
noaa_normals("USW00094728", "monthly")
options(op)
```

`noaa_stations` *Search for weather stations*

Description

Searches the GHCN-Daily station inventory by bounding box or text query. The station list (~120,000 stations worldwide) is downloaded once and cached locally.

Usage

```
noaa_stations(bbox = NULL, text = NULL, limit = 25L, cache = TRUE)
```

Arguments

`bbox`	Optional numeric vector of length 4 defining a bounding box: `c(south_lat, west_lon, north_lat, east_lon)`.
`text`	Optional character string to search station names (case-insensitive).
`limit`	Integer. Maximum number of results (default 25).
`cache`	Logical. Use cached station list if available (default `TRUE`).

Value

A data frame with columns:

station Character. Station identifier.

name Character. Station name.

latitude Numeric. Latitude in decimal degrees.

longitude Numeric. Longitude in decimal degrees.

elevation Numeric. Elevation in metres.

See Also

Other station discovery: `noaa_nearby()`

Examples

```
op <- options(readnoaa.cache_dir = tempdir())
# Search for stations in London area
noaa_stations(bbox = c(51.3, -0.5, 51.7, 0.3))

# Search by name
noaa_stations(text = "Heathrow")
options(op)
```

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