Package 'fred'

April 11, 2026

Title Access 'Federal Reserve Economic Data'

Version 0.2.0

Description Provides clean, tidy access to economic data from the 'Federal Reserve Economic Data' ('FRED') API <https://fred.stlouisfed.org/docs/api/fred/>. 'FRED' is maintained by the 'Federal Reserve Bank of St. Louis' and contains over 800,000 time series from 118 sources covering GDP, employment, inflation, interest rates, trade, and more. Dedicated functions fetch series observations, search for series, browse categories, releases, and tags, and retrieve series metadata. Multiple series can be fetched in a single call, in long or wide format. Server-side unit transformations (percent change, log, etc.) and frequency aggregation are supported, with readable transform aliases such as 'yoy_pct' and 'log_diff'. Real-time and vintage helpers (built on 'ALFRED') return a series as it appeared on a given date, the first-release version, every revision, or a panel of selected vintages. Data is cached locally for subsequent calls. This product uses the 'FRED' API but is not endorsed or certified by the 'Federal Reserve Bank of St. Louis'.

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Encoding UTF-8

Language en-US

URL https://github.com/charlescoverdale/fred

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

RoxygenNote 7.3.3

Depends R (>= 4.1.0)

Imports cli (>= 3.6.0), httr2 (>= 1.0.0), tools

Suggests testthat (>= 3.0.0), withr

Config/testthat/edition 3

NeedsCompilation no

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Repository CRAN

Date/Publication 2026-04-11 20:10:02 UTC

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`clear_cache` *Clear the fred cache*

Description

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

Usage

```
clear_cache()
```

Value

Invisible `NULL`.

See Also

Other configuration: `fred_cache_info()`, `fred_get_key()`, `fred_request()`, `fred_set_key()`

Examples

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

`fred_all_vintages` *Fetch every vintage of a series*

Description

Returns the full revision history: one row per (observation date, realtime range) combination. This is the FRED API's `output_type = 2` mode. The result can be reshaped into a vintage matrix or used to compute revision statistics.

Usage

```
fred_all_vintages(
  series_id,
  from = NULL,
  to = NULL,
  units = "lin",
  frequency = NULL,
  aggregation = "avg",
  cache = TRUE
)
```

Arguments

`series_id`	Character. One or more FRED series IDs.
`from`, `to`	Optional observation date range.
`units`	Character. Raw FRED units code. Default `"lin"`.
`frequency`, `aggregation`	Optional frequency aggregation arguments (see `fred_series()`).
`cache`	Logical. Cache results locally. Default `TRUE`.

Details

Be aware that some series have hundreds of thousands of vintage rows, so consider narrowing the date range with `from`/`to` for long-running indicators like GDP.

Value

A `fred_tbl` with columns `date`, `series_id`, `value`, `realtime_start`, `realtime_end`. The `realtime_start` and `realtime_end` columns identify the vintage window for each row.

See Also

Other vintages: fred_as_of(), fred_first_release(), fred_real_time_panel()

Examples

```
op <- options(fred.cache_dir = tempdir())
# All vintages of recent GDP releases
gdp_vint <- fred_all_vintages("GDP", from = "2020-01-01")
options(op)
```

---

fred_as_of *Fetch a series as it appeared on a given vintage date*

Description

Returns the values that were available in FRED on date, before any subsequent revisions. This is the standard real-time data access pattern: set realtime_start = realtime_end = date. Useful for backtesting forecasting models against the data that was actually available at the time, not the revised series we see today.

Usage

```
fred_as_of(
  series_id,
  date,
  from = NULL,
  to = NULL,
  units = "lin",
  frequency = NULL,
  aggregation = "avg",
  cache = TRUE
)
```

Arguments

series_id	Character. One or more FRED series IDs.
date	Character or Date. The vintage date ("YYYY-MM-DD").
from, to	Optional observation date range.
units	Character. Raw FRED units code. Default "lin".
frequency, aggregation	Optional frequency aggregation arguments (see fred_series()).
cache	Logical. Cache results locally. Default TRUE.

Details

Underneath, this calls the `series/observations` endpoint with the realtime parameters set. Results are cached separately from the default (latest-vintage) cache, so calling `fred_series("GDP")` and `fred_as_of("GDP", "2020-01-15")` keep distinct cache entries.

Value

A `fred_tbl` with columns `date`, `series_id`, `value`, `realtime_start`, `realtime_end`.

See Also

Other vintages: `fred_all_vintages()`, `fred_first_release()`, `fred_real_time_panel()`

Examples

```
op <- options(fred.cache_dir = tempdir())
# GDP as it looked on 1 March 2020
gdp_2020 <- fred_as_of("GDP", "2020-03-01")
options(op)
```

`fred_cache_info` *Inspect the local fred cache*

Description

Returns information about the local cache: where it lives, how many files it contains, and how much disk space they take. Useful when debugging stale results or deciding whether to call `clear_cache()`.

Usage

```
fred_cache_info()
```

Value

A list with elements `dir`, `n_files`, `size_bytes`, `size_human`, and `files` (a data frame with `name`, `size_bytes`, and `modified` columns). Returns the same shape with zero counts if the cache directory does not yet exist.

See Also

Other configuration: `clear_cache()`, `fred_get_key()`, `fred_request()`, `fred_set_key()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_cache_info()
options(op)
```

fred_category *Get a FRED category*

Description

Returns information about a single category. The FRED category tree starts at category 0 (the root) and branches into 8 top-level categories: Money, Banking & Finance; Population, Employment & Labor Markets; National Accounts; Production & Business Activity; Prices; International Data; U.S. Regional Data; and Academic Data.

Usage

```
fred_category(category_id = 0L)
```

Arguments

category_id	Integer. The category ID. Default 0 (root).

Value

A data frame with category metadata.

See Also

Other categories: fred_category_children(), fred_category_series()

Examples

```
op <- options(fred.cache_dir = tempdir())
# Root category
fred_category()

# National Accounts (category 32992)
fred_category(32992)
options(op)
```

fred_category_children *List child categories*

Description

Returns the child categories for a given parent category.

Usage

```
fred_category_children(category_id = 0L)
```

Arguments

category_id	Integer. The parent category ID. Default 0 (root).

Value

A data frame of child categories.

See Also

Other categories: fred_category(), fred_category_series()

Examples

```
op <- options(fred.cache_dir = tempdir())
# Top-level categories
fred_category_children()
options(op)
```

---

fred_category_series *List series in a category*

Description

Returns all series belonging to a given category. Automatically paginates through all results.

Usage

```
fred_category_series(category_id, limit = 1000L)
```

Arguments

category_id	Integer. The category ID.
limit	Integer. Maximum number of results to return. Default 1000.

Value

A data frame of series metadata.

See Also

Other categories: fred_category(), fred_category_children()

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_category_series(32992)
options(op)
```

`fred_first_release` *Fetch the first-release ("real-time") version of a series*

Description

Returns only the value that was published when each observation first appeared in FRED, with no subsequent revisions. Internally this fetches the full revision history and keeps the earliest `realtime_start` row for each observation date. Useful when you want a clean comparison between what policymakers saw at the time versus what the data look like after revisions.

Usage

```
fred_first_release(
  series_id,
  from = NULL,
  to = NULL,
  units = "lin",
  frequency = NULL,
  aggregation = "avg",
  cache = TRUE
)
```

Arguments

`series_id`	Character. One or more FRED series IDs.
`from, to`	Optional observation date range.
`units`	Character. Raw FRED units code. Default `"lin"`.
`frequency, aggregation`	Optional frequency aggregation arguments (see `fred_series()`).
`cache`	Logical. Cache results locally. Default `TRUE`.

Value

A `fred_tbl` with columns `date`, `series_id`, `value`, `realtime_start`, `realtime_end`.

See Also

Other vintages: `fred_all_vintages()`, `fred_as_of()`, `fred_real_time_panel()`

Examples

```
op <- options(fred.cache_dir = tempdir())
# Initial-release GDP, never revised
gdp_first <- fred_first_release("GDP", from = "2018-01-01")
options(op)
```

`fred_get_key` *Get the current FRED API key*

Description

Returns the API key set via `fred_set_key()` or the `FRED_API_KEY` environment variable. Raises an error if no key is found.

Usage

```
fred_get_key()
```

Value

Character. The API key.

See Also

Other configuration: `clear_cache()`, `fred_cache_info()`, `fred_request()`, `fred_set_key()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_get_key()
options(op)
```

`fred_info` *Get metadata for a FRED series*

Description

Returns descriptive information about a series, including its title, units, frequency, seasonal adjustment, and notes.

Usage

```
fred_info(series_id)
```

Arguments

series_id	Character. A single FRED series ID.

Value

A data frame with one row containing series metadata.

See Also

Other series: fred_search(), fred_series(), fred_updates(), fred_vintages()

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_info("GDP")
options(op)
```

---

fred_real_time_panel *Fetch a real-time panel of a series across selected vintages*

Description

Returns the values that were available on each of a chosen set of vintage dates. This is the FRED API's vintage_dates parameter: instead of asking for every revision (potentially huge), you ask for only the snapshots you care about, e.g. quarterly vintages aligned to GDP release dates.

Usage

```
fred_real_time_panel(
  series_id,
  vintages,
  from = NULL,
  to = NULL,
  units = "lin",
  frequency = NULL,
  aggregation = "avg",
  cache = TRUE
)
```

Arguments

series_id	Character. One or more FRED series IDs.
vintages	Character or Date vector. Vintage dates to fetch.
from, to	Optional observation date range.
units	Character. Raw FRED units code. Default "lin".
frequency, aggregation	Optional frequency aggregation arguments (see fred_series()).
cache	Logical. Cache results locally. Default TRUE.

Value

A `fred_tbl` with columns `date`, `series_id`, `value`, `realtime_start`, `realtime_end`.

See Also

Other vintages: `fred_all_vintages()`, `fred_as_of()`, `fred_first_release()`

Examples

```
op <- options(fred.cache_dir = tempdir())
# GDP as published at three quarterly snapshots
gdp_panel <- fred_real_time_panel(
  "GDP",
  vintages = c("2023-04-30", "2023-07-31", "2023-10-31")
)
options(op)
```

---

fred_related_tags *Find tags related to a given tag*

Description

Returns tags that are frequently used together with the specified tag.

Usage

```
fred_related_tags(tag_names)
```

Arguments

`tag_names`	Character. One or more tag names, separated by semicolons (e.g. `"gdp"`, `"usa;quarterly"`).

Value

A data frame of related tags.

See Also

Other tags: `fred_tags()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_related_tags("gdp")
options(op)
```

fred_releases *List all FRED releases*

Description

Returns all data releases available on FRED. A release is a collection of related series published together (e.g. "Employment Situation", "GDP").

Usage

```
fred_releases()
```

Value

A data frame of releases with columns including `id`, `name`, `press_release`, and `link`.

See Also

Other releases: `fred_release_dates()`, `fred_release_series()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_releases()
options(op)
```

fred_release_dates *Get release dates*

Description

Returns the dates on which data for a release were published. Useful for understanding the data calendar and when revisions occurred.

Usage

```
fred_release_dates(release_id)
```

Arguments

`release_id`	Integer. The release ID.

Value

A data frame with columns `release_id` and `date`.

See Also

Other releases: fred_release_series(), fred_releases()

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_release_dates(53)
options(op)
```

---

fred_release_series *List series in a release*

Description

Returns all series belonging to a given release.

Usage

```
fred_release_series(release_id)
```

Arguments

release_id	Integer. The release ID.

Value

A data frame of series metadata.

See Also

Other releases: fred_release_dates(), fred_releases()

Examples

```
op <- options(fred.cache_dir = tempdir())
# GDP release
fred_release_series(53)
options(op)
```

fred_request *Make a raw request to the FRED API*

Description

Low-level function that sends a request to any FRED API endpoint and returns the parsed JSON as a list. Most users should use the higher-level functions such as `fred_series()` or `fred_search()`.

Usage

```
fred_request(endpoint, ...)
```

Arguments

`endpoint`	Character. The API endpoint path (e.g. `"series/observations"`).
`...`	Named parameters passed as query string arguments to the API.

Value

A list parsed from the JSON response.

See Also

Other configuration: `clear_cache()`, `fred_cache_info()`, `fred_get_key()`, `fred_set_key()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_request("series", series_id = "GDP")
options(op)
```

fred_search *Search for FRED series*

Description

Searches the FRED database by keywords or series ID substring. Returns matching series with their metadata, ordered by relevance.

Usage

```
fred_search(
  query,
  type = "full_text",
  limit = 100L,
  order_by = "search_rank",
  filter_variable = NULL,
  filter_value = NULL,
  tag_names = NULL
)
```

Arguments

query	Character. Search terms (e.g. "GDP", "unemployment rate").
type	Character. Either "full_text" (default) for keyword search or "series_id" for series ID substring matching (supports * wildcards).
limit	Integer. Maximum number of results to return. Default 100, maximum 1000.
order_by	Character. How to order results. One of "search_rank" (default), "series_id", "title", "units", "frequency", "seasonal_adjustment", "last_updated", "popularity", "group_popularity".
filter_variable	Character. Optional variable to filter by. One of "frequency", "units", or "seasonal_adjustment".
filter_value	Character. The value to filter on (e.g. "Monthly", "Quarterly"). Required if filter_variable is specified.
tag_names	Character. Optional comma-separated tag names to filter results (e.g. "gdp", "usa;quarterly").

Value

A data frame of matching series with columns including id, title, frequency, units, seasonal_adjustment, last_updated, popularity, and notes.

See Also

Other series: fred_info(), fred_series(), fred_updates(), fred_vintages()

Examples

```
op <- options(fred.cache_dir = tempdir())
# Keyword search
fred_search("unemployment rate")

# Filter to monthly series only
fred_search("consumer price index", filter_variable = "frequency",
            filter_value = "Monthly")

# Search by series ID pattern
```

```
fred_search("GDP*", type = "series_id")
options(op)
```

`fred_series` *Fetch observations for one or more FRED series*

Description

The main function in the package. Downloads time series observations from FRED and returns a tidy data frame. Multiple series can be fetched in a single call, in either long or wide format.

Usage

```
fred_series(
  series_id,
  from = NULL,
  to = NULL,
  units = "lin",
  transform = NULL,
  frequency = NULL,
  aggregation = "avg",
  format = c("long", "wide"),
  cache = TRUE
)
```

Arguments

`series_id`	Character. One or more FRED series IDs (e.g. `"GDP"`, `c("GDP", "UNRATE", "CPIAUCSL")`).
`from`	Optional start date. Character (`"YYYY-MM-DD"`) or Date.
`to`	Optional end date. Character (`"YYYY-MM-DD"`) or Date.
`units`	Character. Raw FRED units code. Default `"lin"` (levels). Mutually exclusive with `transform`.
`transform`	Character. Readable transformation name. See Details.
`frequency`	Character. Frequency aggregation. One of `"d"` (daily), `"w"` (weekly), `"bw"` (biweekly), `"m"` (monthly), `"q"` (quarterly), `"sa"` (semiannual), `"a"` (annual), or `NULL` (native frequency, the default).
`aggregation`	Character. Aggregation method when `frequency` is specified. One of `"avg"` (default), `"sum"`, or `"eop"` (end of period).
`format`	Character. `"long"` (default) returns one row per `(series_id, date)`. `"wide"` returns one row per date with one column per series.
`cache`	Logical. If `TRUE` (the default), results are cached locally and returned from the cache on subsequent calls. Set to `FALSE` to force a fresh download from the API.

Details

FRED supports server-side unit transformations via the `units` argument. This avoids the need to compute growth rates or log transforms locally. For readability you can pass `transform` instead of `units`:

- `"level"`, `"raw"` -levels (the default)
- `"diff"`, `"change"` -change from previous period
- `"yoy_diff"` -change from one year ago
- `"qoq_pct"`, `"mom_pct"`, `"pop_pct"` -percent change from previous period
- `"yoy_pct"` -percent change from one year ago
- `"annualised"`, `"qoq_annualised"` -compounded annual rate of change
- `"log"` -natural log
- `"log_diff"` -continuously compounded rate of change
- `"log_diff_annualised"` -continuously compounded annual rate

Raw FRED `units` codes (`"lin"`, `"chg"`, `"ch1"`, `"pch"`, `"pc1"`, `"pca"`, `"cch"`, `"cca"`, `"log"`) are also accepted.

Value

A `fred_tbl` (a `data.frame` subclass that prints with a one-line provenance header). In long format, columns are `date`, `series_id`, `value`. In wide format, columns are `date` plus one numeric column per series.

See Also

Other series: `fred_info()`, `fred_search()`, `fred_updates()`, `fred_vintages()`

Examples

```
op <- options(fred.cache_dir = tempdir())
# Single series
gdp <- fred_series("GDP")

# Multiple series, long format
macro <- fred_series(c("GDP", "UNRATE", "CPIAUCSL"))

# Multiple series, wide format
macro_w <- fred_series(c("GDP", "UNRATE"), format = "wide")

# Readable transformation: year-on-year percent change
gdp_growth <- fred_series("GDP", transform = "yoy_pct")

# Aggregate daily to monthly
rates <- fred_series("DGS10", frequency = "m")
options(op)
```

fred_set_key *Set the FRED API key*

Description

Sets the API key used to authenticate requests to the FRED API. The key persists for the current R session. Alternatively, set the FRED_API_KEY environment variable in your .Renviron file.

Usage

```
fred_set_key(key)
```

Arguments

key	Character. A 32-character FRED API key.

Details

Register for a free API key at https://fredaccount.stlouisfed.org/apikeys.

Value

Invisible NULL.

See Also

Other configuration: clear_cache(), fred_cache_info(), fred_get_key(), fred_request()

Examples

```
## Not run:
fred_set_key("your_api_key_here")

## End(Not run)
```

fred_sources *List all FRED data sources*

Description

Returns all data sources that contribute series to FRED. Sources include the Bureau of Labor Statistics, Bureau of Economic Analysis, Federal Reserve Board, U.S. Census Bureau, and over 100 others.

Usage

```
fred_sources()
```

Value

A data frame of sources with columns including `id`, `name`, and `link`.

See Also

Other sources: `fred_source_releases()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_sources()
options(op)
```

---

fred_source_releases *List releases from a source*

Description

Returns all releases published by a given data source.

Usage

```
fred_source_releases(source_id)
```

Arguments

`source_id`	Integer. The source ID.

Value

A data frame of releases.

See Also

Other sources: `fred_sources()`

Examples

```
op <- options(fred.cache_dir = tempdir())
# Bureau of Labor Statistics
fred_source_releases(22)
options(op)
```

fred_tags *List or search FRED tags*

Description

Returns FRED tags, optionally filtered by a search query. Tags are keywords used to categorise series (e.g. "gdp", "monthly", "usa", "seasonally adjusted").

Usage

```
fred_tags(query = NULL, limit = 1000L)
```

Arguments

query	Character. Optional search string to filter tags.
limit	Integer. Maximum number of results. Default 1000.

Value

A data frame of tags with columns including name, group_id, notes, popularity, and series_count.

See Also

Other tags: fred_related_tags()

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_tags()
fred_tags("inflation")
options(op)
```

fred_updates *List recently updated FRED series*

Description

Returns series that have been recently updated or revised.

Usage

```
fred_updates(limit = 100L)
```

Arguments

limit	Integer. Maximum number of results. Default 100, maximum 100.

Value

A data frame of recently updated series.

See Also

Other series: `fred_info()`, `fred_search()`, `fred_series()`, `fred_vintages()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_updates()
options(op)
```

`fred_vintages` *Get vintage dates for a FRED series*

Description

Returns the dates on which data for a series were revised. This is useful for real-time analysis and understanding data revisions.

Usage

```
fred_vintages(series_id)
```

Arguments

`series_id`	Character. A single FRED series ID.

Value

A data frame with columns `series_id` and `vintage_date`.

See Also

Other series: `fred_info()`, `fred_search()`, `fred_series()`, `fred_updates()`

Examples

```
op <- options(fred.cache_dir = tempdir())
fred_vintages("GDP")
options(op)
```

`print.fred_tbl` *Print method for fred_tbl*

Description

Adds a one-line provenance header above the data frame body. The header summarises the query: number of series, observation count, transformation in effect, and any vintage information.

Usage

```
## S3 method for class 'fred_tbl'
print(x, ...)
```

Arguments

`x`	A `fred_tbl`.
`...`	Passed to the underlying `print.data.frame` method.

Value

`x`, invisibly.

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