# Package 'hydrodownloadR'

May 8, 2026

**Title** Hydrologic Station Catalogs and Time Series from Public APIs

**Version** 0.1.3

**Description** Provides a unified, extensible interface to discover hydrologic stations and download daily time series (e.g., water discharge, water level, water temperature, and several other water quality parameter) from national and regional public APIs. Includes a provider registry, S3 generics 'stations' and 'timeseries', licensing metadata, date-range and 'complete history' modes, rate limiting and retries, optional authentication via environment variables, tidy outputs, UTF-8 to ASCII transliteration, and WGS84 coordinates. Designed for reproducible workflows and straightforward addition of new providers.

Background and use cases are described in Farber et al. (2025) <doi:10.5194/essd-17-4613-2025> and Farber et al. (2023) <doi:10.57757/IUGG23-2838>.

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**URL** https://bafg-bund.github.io/hydrodownloadR/, https://github.com/bafg-bund/hydrodownloadR

**BugReports** https://github.com/bafg-bund/hydrodownloadR/issues

**Depends** R (>= 4.1.0)

**Imports** cli, dataRetrieval, DBI, dplyr, httr, httr2, jsonlite, lubridate, pdftools, progress, rappdirs, ratelimitr, rlang, RSQLite, sf, magrittr, tibble, cellranger, stringi, stringr

**Suggests** odbc, purrr, readr, readxl, rvest, tidyr, tidyselect, xml2, cachem, curl, memoise, testthat (>= 3.0.0), writexl

**Config/testthat/edition** 3

**Encoding** UTF-8

**Language** en-US

**LazyData** true

**LazyDataCompression** xz

**RoxygenNote** 7.3.1

**NeedsCompilation** no

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**Repository** CRAN

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`fi_syke_runoff_meta` *SYKE runoff station metadata (area & altitude)*

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## Description

Catchment area and altitude for Finnish SYKE runoff stations. Area may be `NA` for a few stations; altitude may still be present. Used to compute discharge from runoff time series: `discharge_m3s = (value_lps_per_km2 * area_km2) / 1000`.

## Usage

```
data(fi_syke_runoff_meta)
```

## Format

A tibble with:

**place_id** Character. SYKE Paikka_Id.

**area** Numeric (km^2). May be NA.

**altitude** Numeric (m). May be NA.

## Source

Finnish Environment Institute (SYKE).

## fr_hubeau_meta *FR_HUBEAU precomputed station metadata*

### Description

Preloaded metadata for Hub'Eau stations, built offline from the Hub'Eau referentials plus scraped site/station fiches (area, site altitude, gauge-zero altitude, vertical datum at site). Used to speed up `stations()` for the FR_HUBEAU provider.

### Format

A data frame/tibble with columns:

**code_site** Character. Hub'Eau site code.

**station_id** Character. Hub'Eau station code.

**area** Numeric ($km^2$). Catchment area from site fiche; may be `NA`.

**altitude_api** Numeric (m). API referential altitude (hydrometry in mm to m; temperature in m).

**altitude_site** Numeric (m). Site altitude parsed from the site fiche; may be `NA`.

**altitude_station** Numeric (m). "Cote du zero d'echelle" from station fiche; may be `NA`.

**vertical_datum_site** Character. Site-level vertical datum label; may be `NA`.

**retrieved_at** POSIXct (UTC). Timestamp when the row was scraped.

### Details

Built by `data-raw/fr_hubeau_meta_build.R`. The file `data/fr_hubeau_meta.rda` is shipped with the package and may be refreshed out-of-band. A build-date string is also stored in the object attribute `metadata_date`.

### Source

Hub'Eau APIs and https://www.hydro.eaufrance.fr/ site/station fiches.

## hydro_service *Create a hydro service object*

### Description

Create a hydro service object

### Usage

```
hydro_service(provider_id, ...)
```

### Arguments

| | |
|---|---|
| provider_id | ID as listed by hydro_services() |
| ... | Reserved for future use. |

### Value

An object of class "hydro_service" (a list) containing the provider configuration used by stations() and timeseries() (e.g. provider_id, provider_name, country, base_url, and other adapter-specific settings).

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## hydro_services *List available providers*

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### Description

List available providers

### Usage

```
hydro_services()
```

### Value

A tibble with columns: provider_id, provider_name, country, base_url, license, license_link, access_class, reuse_class, is_open_data

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## jp_mlit_meta *Japan MLIT stations metadata snapshot*

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### Description

A tibble used by the JP MLIT adapter to speed up station discovery.

### Usage

```
data(jp_mlit_meta)
```

## Format

A tibble/data.frame with one row per station and typical columns:

**station_id** MLIT station identifier (character)

**station_name** Station name (character)

**river** River name, if available (character)

**lat** Latitude in WGS84 (double)

**lon** Longitude in WGS84 (double)

**area_km2** Drainage area in km^2, if available (double)

**altitude_m** Altitude in meters, if available (double)

**country** ISO country code (character)

**provider_id** Adapter provider id, e.g. `"JP_MLIT"` (character)

**provider_name** Provider name (character)

## Source

MLIT; see package README for licensing.

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# `list_countries` *List available countries*

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## Description

List available countries

## Usage

```
list_countries()
```

## Value

A character vector of country codes (e.g. ISO 3166-1 alpha-2) for which at least one provider is available.

## stations *List stations for a provider*

### Description

List stations for a provider

### Usage

```
stations(x, ...)
```

### Arguments

| | |
|---|---|
| x | A hydro_service object created by hydro_service(). |
| ... | Passed to provider-specific methods. |

### Value

A tibble with station metadata.

### Examples

```
# Offline: enumerate providers (no network)
s <- hydro_services()
head(names(s))


# Online (opt-in): fetch stations
x <- hydro_service("SE_SMHI")
st <- stations(x)
head(st)
```

## stations.hydro_service_BR_ANA *ANA stations (Brazil) - cache-first with optional update from inventory*

### Description

Loads the cached ANA station catalogue (if present) or rebuilds it from a locally downloaded SNIRH inventory (InventarioDD_MM_YYYY.zip / .mdb) when update = TRUE.

### Usage

```
## S3 method for class 'hydro_service_BR_ANA'
stations(x, ...)
```

### Arguments

| | |
|---|---|
| x | A hydro_service created with hydro_service("BR_ANA"). |
| ... | Named arguments:<br>• zip_or_mdb: path to InventarioDD_MM_YYYY.zip or .mdb<br>• dest_dir: unzip destination (default: "data-raw/BR_ANA")<br>• cache_dir: cache dir for RDS (default: user cache)<br>• update: TRUE to rebuild from provided inventory |

### Value

A tibble with ANA station metadata.

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## timeseries *Retrieve time series for a provider*

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### Description

Retrieve time series for a provider

### Usage

```
timeseries(
  x,
  parameter,
  stations = NULL,
  start_date = NULL,
  end_date = NULL,
  mode = c("range", "complete"),
  ...
)
```

### Arguments

| | |
|---|---|
| x | A hydro_service object created by hydro_service(). |
| parameter | One of "water_discharge","water_level","water_temperature","water_velocity". |
| stations | Optional character vector of station IDs. |
| start_date, end_date | YYYY-MM-DD strings for mode = "range". |
| mode | Either "range" or "complete" (1900-01-01 to today). |
| ... | Passed to provider-specific methods. |

### Value

A tibble with columns: country, provider_id, provider_name, station_id, parameter, timestamp, value, unit, quality_code, source_url.

## Examples

```
# Offline: construct a service object (no network)
x <- hydro_service("SE_SMHI")


# Online (opt-in): one station for a short range
st <- head(stations(x)$station_id, 1)
ts <- timeseries(x, parameter = "water_discharge",
                 stations = st,
                 start_date = "2020-01-01", end_date = "2020-01-10")
head(ts)
```

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`timeseries_parameters` *List supported parameters/units for a provider*

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## Description

List supported parameters/units for a provider

## Usage

```
timeseries_parameters(x, ...)
```

## Arguments

| | |
|---|---|
| `x` | A `hydro_service` object. |
| `...` | Reserved for future use. |

## Value

A tibble with columns: parameter, code, unit.

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