Package 'tidyhydat'

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Title Extract and Tidy Canadian 'Hydrometric' Data

Version 1.0.0

Description Provides functions to access historical and real-time national 'hydrometric' data from Water Survey of Canada data sources and then applies tidy data principles.

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`allstations` *All Canadian stations*

Description

A shorthand to avoid having always call `hy_stations` or `realtime_stations`. Populated by both realtime and historical data from HYDAT.

Usage

```
allstations
```

Format

A tibble with 5 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **STATION_NAME**: Official name for station identification
- **PROV_TERR_STATE_LOC**: The province, territory or state in which the station is located
- **HYD_STATUS**: Current status of discharge or level monitoring in the hydrometric network
- **REAL_TIME**: Logical. Indicates if a station has the capacity to deliver data in real-time or near real-time
- **LATITUDE**: North-South Coordinates of the gauging station in decimal degrees
- **LONGITUDE**: East-West Coordinates of the gauging station in decimal degrees
- **station_tz**: Timezone of station calculated using the lutz package based on LAT/LONG of stations
- **standard_offset**: Offset from UTC of local standard time

Source

HYDAT, Meteorological Service of Canada datamart

`available_flows` *Get all available flow data (final + provisional)*

Description

Convenience function that combines final historical data (from HYDAT or web service) with provisional real-time data in a single call.

Usage

```
available_flows(
  station_number,
  start_date = NULL,
  end_date = Sys.Date(),
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`start_date`	Start date for data retrieval in YYYY-MM-DD format. Defaults to NULL (retrieves all available historical data).
`end_date`	End date for data retrieval in YYYY-MM-DD format. Defaults to current date (Sys.Date()).
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 6 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date. Formatted as a Date class.
- **Parameter**: Parameter being measured. Value is "Flow"
- **Value**: Discharge value. The units are m^3/s.
- **Symbol**: Measurement/river conditions
- **Approval**: Approval status: "final" (approved) or "provisional" (subject to revision)

Details

This function combines data from final and provisional data sources to provide a complete discharge record.

Data Sources and Priority:

Historical (Final) Data:

The function automatically determines the best source for historical data:

- `hydat_path` **provided** (path to database): Uses local HYDAT database at that path
- `hydat_path = FALSE`: Forces use of web service (useful when HYDAT unavailable)
- `hydat_path = NULL` (default): Uses HYDAT default location, automatically falls back to web service if HYDAT is unavailable

Real-time (Provisional) Data:

Provisional data is retrieved from ECCC's real-time web service using the `realtime_ws()` function. This data covers approximately the last 18 months and is updated regularly. Since real-time data is collected at sub-daily intervals, values are aggregated to daily means to match the daily format of HYDAT data. For non-aggregated real-time data, use `realtime_ws()` directly.

Data Approval Status:

The `Approval` column uses ECCC's terminology (see https://wateroffice.ec.gc.ca/contactus/faq_e.html):

- **"final"**: Historical data from HYDAT or web service that has been approved by ECCC.
- **"provisional"**: Real-time data from the web service representing the best available measurements, but subject to revision and not yet approved by ECCC.

Value

A tibble with class `available` combining final and provisional data with an additional `Approval` column indicating whether each record is "final" or "provisional". The object includes attributes for tracking data sources and query metadata.

See Also

Other available functions: `available_levels()`

Examples

```
## Not run:
## Basic usage - get all available data
flows <- available_flows("08MF005")

## Multiple stations
flows <- available_flows(c("08MF005", "08NM116"))

## Get only recent data (last 2 years)
recent_flows <- available_flows(
  "08MF005",
  start_date = Sys.Date() - lubridate::years(2),
  end_date = Sys.Date()
```

```
)

## Force use of web service (when HYDAT not available)
flows_ws <- available_flows("08MF005", hydat_path = FALSE)

## End(Not run)
```

`available_levels` *Get all available level data (final + provisional)*

Description

Convenience function that combines final historical data (from HYDAT or web service) with provisional real-time data in a single call.

Usage

```
available_levels(
  station_number,
  start_date = NULL,
  end_date = Sys.Date(),
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`start_date`	Start date for data retrieval in YYYY-MM-DD format. Defaults to NULL (retrieves all available historical data).
`end_date`	End date for data retrieval in YYYY-MM-DD format. Defaults to current date (Sys.Date()).
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 6 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date. Formatted as a Date class.
- **Parameter**: Parameter being measured. Value is "Level"
- **Value**: Level value. The units are metres.
- **Symbol**: Measurement/river conditions
- **Approval**: Approval status: "final" (approved) or "provisional" (subject to revision)

Details

This function combines data from final and provisional data sources to provide a complete water level record.

Data Sources and Priority:

Historical (Final) Data:

The function automatically determines the best source for historical data:

- `hydat_path` **provided** (path to database): Uses local HYDAT database at that path
- `hydat_path = FALSE`: Forces use of web service (useful when HYDAT unavailable)
- `hydat_path = NULL` (default): Uses HYDAT default location, automatically falls back to web service if HYDAT is unavailable

Real-time (Provisional) Data:

Provisional data is retrieved from ECCC's real-time web service using the `realtime_ws()` function. This data covers approximately the last 18 months and is updated regularly. Since real-time data is collected at sub-daily intervals, values are aggregated to daily means to match the daily format of HYDAT data. For non-aggregated real-time data, use `realtime_ws()` directly.

Data Approval Status:

The `Approval` column uses ECCC's terminology (see https://wateroffice.ec.gc.ca/contactus/faq_e.html):

- **"final"**: Historical data from HYDAT or web service that has been approved by ECCC.
- **"provisional"**: Real-time data from the web service representing the best available measurements, but subject to revision and not yet approved by ECCC.

Value

A tibble with class `available` combining final and provisional data with an additional `Approval` column indicating whether each record is "final" or "provisional". The object includes attributes for tracking data sources and query metadata.

See Also

Other available functions: `available_flows()`

Examples

```
## Not run:
## Basic usage - get all available data
levels <- available_levels("08MF005")

## Multiple stations
levels <- available_levels(c("08MF005", "08NM116"))

## Get only recent data (last 2 years)
recent_levels <- available_levels(
  "08MF005",
  start_date = Sys.Date() - lubridate::years(2),
  end_date = Sys.Date()
)

## Force use of web service (when HYDAT not available)
levels_ws <- available_levels("08MF005", hydat_path = FALSE)

## End(Not run)
```

`download_hydat` *Download and set the path to HYDAT*

Description

Download the HYDAT sqlite database. This database contains all the historical hydrometric data for Canada's integrated hydrometric network. The function will check for a existing sqlite file and won't download the file if the same version is already present.

Usage

```
download_hydat(dl_hydat_here = NULL, ask = TRUE)
```

Arguments

`dl_hydat_here`	Directory to the HYDAT database. The path is chosen by the `rappdirs` package and is OS specific and can be view by `hy_dir()`. This path is also supplied automatically to any function that uses the HYDAT database. A user specified path can be set though this is not the advised approach. It also downloads the database to a directory specified by `hy_dir()`.
`ask`	Whether to ask (as `TRUE`/`FALSE`) if HYDAT should be downloaded. If `FALSE` the keypress question is skipped.

Examples

```
## Not run:
download_hydat()

## End(Not run)
```

---

hy_agency_list *hy_agency_list function*

Description

AGENCY look-up Table

Usage

```
hy_agency_list(hydat_path = NULL)
```

Arguments

hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.

Value

A tibble of agencies

Source

HYDAT

See Also

Other HYDAT functions: hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_agency_list()

## End(Not run)
```

`hy_annual_instant_peaks` *Extract annual max/min instantaneous flows and water levels from HYDAT database*

Description

Provides wrapper to turn the ANNUAL_INSTANT_PEAKS table in HYDAT into a tidy data frame of instantaneous flows and water levels. `station_number` and `prov_terr_state_loc` can both be supplied.

Usage

```
hy_annual_instant_peaks(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_year = NULL,
  end_year = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.
`start_year`	First year of the returned record
`end_year`	Last year of the returned record

Value

A tibble of hy_annual_instant_peaks.

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
## Multiple stations province not specified
hy_annual_instant_peaks(station_number = c("08NM083", "08NE102"))

## Multiple province, station number not specified
hy_annual_instant_peaks(prov_terr_state_loc = c("AB", "YT"))

## End(Not run)
```

---

hy_annual_stats *Extract annual statistics information from the HYDAT database*

Description

Provides wrapper to turn the ANNUAL_STATISTICS table in HYDAT into a tidy data frame of annual statistics. Statistics provided include MEAN, MAX and MIN on an annual basis.

Usage

```
hy_annual_stats(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_year = "ALL",
  end_year = "ALL"
)
```

Arguments

station_number	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of prov_terr_state_loc is returned.
hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.

`prov_terr_state_loc`
: Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

`start_year`
: First year of the returned record

`end_year`
: Last year of the returned record

Format

A tibble with 8 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Parameter**: Parameter being measured. Only possible values are FLOW and LEVEL
- **Year**: Year of record.
- **Sum_stat**: Summary statistic being used.
- **Value**: Value of the measurement. If Parameter equals FLOW the units are m^3/s. If Parameter equals LEVEL the units are metres.
- **Date**: Observation date. Formatted as a Date class. MEAN is a annual summary and therefore has an NA value for Date.
- **Symbol**: Measurement/river conditions

Value

A tibble of hy_annual_stats.

Source

HYDAT

See Also

Other HYDAT functions: `hy_agency_list()`, `hy_annual_instant_peaks()`, `hy_daily()`, `hy_daily_flows()`, `hy_daily_levels()`, `hy_data_symbols`, `hy_data_types`, `hy_datum_list()`, `hy_monthly_flows()`, `hy_monthly_levels()`, `hy_reg_office_list()`, `hy_sed_daily_loads()`, `hy_sed_daily_suscon()`, `hy_sed_monthly_loads()`, `hy_sed_monthly_suscon()`, `hy_sed_samples()`, `hy_sed_samples_psd()`, `hy_stations()`, `hy_stn_data_coll()`, `hy_stn_data_range()`, `hy_stn_op_schedule()`, `hy_stn_regulation()`, `hy_version()`

Examples

```
## Not run:
## Multiple stations province not specified
hy_annual_stats(station_number = c("08NM083", "05AE027"))

## Multiple province, station number not specified
hy_annual_stats(prov_terr_state_loc = c("AB", "SK"))

## End(Not run)
```

hy_daily *Extract all daily water level and flow measurements*

Description

A thin wrapper around hy_daily_flows and 'hy_daily_levels" that returns a data frames that contains both parameters. All arguments are passed directly to these functions.

Usage

```
hy_daily(
  station_number = NULL,
  prov_terr_state_loc = NULL,
  hydat_path = NULL,
  ...
)
```

Arguments

station_number	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of prov_terr_state_loc is returned.
prov_terr_state_loc	Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.
hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
...	See hy_daily_flows() arguments

Format

A tibble with 5 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date. Formatted as a Date class.
- **Parameter**: Parameter being measured.
- **Value**: Discharge value. The units are m^3/s.
- **Symbol**: Measurement/river conditions

Value

A tibble of daily flows and levels

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_daily(station_number = c("02JE013", "08MF005"))

## End(Not run)
```

---

hy_daily_flows *Extract daily flows information from HYDAT database or web service*

Description

Provides wrapper to turn the DLY_FLOWS table in HYDAT (or historical web service) into a tidy data frame of daily flows. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large tibble for `hy_daily_flows`.

Usage

```
hy_daily_flows(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL,
  symbol_output = "code"
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.

hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
prov_terr_state_loc	Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.
start_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
end_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
symbol_output	Set whether the raw code, or the english or the french translations are outputted. Default value is code.

Format

A tibble with 5 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date. Formatted as a Date class.
- **Parameter**: Parameter being measured. Only possible value is Flow
- **Value**: Discharge value. The units are m^3/s.
- **Symbol**: Measurement/river conditions

Details

The hydat_path argument controls the data source:

- **NULL** (default): Uses local HYDAT database (default location)
- **FALSE**: Forces use of historical web service (requires start_date and end_date)
- **Path string**: Uses HYDAT database at the specified path

Value

A tibble of daily flows

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
# download_hydat()
hy_daily_flows(
  station_number = c("08MF005"),
  start_date = "1996-01-01", end_date = "2000-01-01"
)

hy_daily_flows(prov_terr_state_loc = "PE")

## End(Not run)
```

`hy_daily_levels` *Extract daily levels information from HYDAT database or web service*

Description

Provides wrapper to turn the DLY_LEVELS table in HYDAT (or historical web service) into a tidy data frame. The primary value returned by this function is water level. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_daily_levels`.

Usage

```
hy_daily_levels(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL,
  symbol_output = "code"
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

start_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
end_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
symbol_output	Set whether the raw code, or the english or the french translations are outputted. Default value is code.

Format

A tibble with 5 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date. Formatted as a Date class.
- **Parameter**: Parameter being measured. Only possible value is Level
- **Value**: Level value. The units are metres.
- **Symbol**: Measurement/river conditions

Details

The hydat_path argument controls the data source:

- **NULL** (default): Uses local HYDAT database (default location)
- **FALSE**: Forces use of historical web service (requires start_date and end_date)
- **Path string**: Uses HYDAT database at the specified path

Value

A tibble of daily levels

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_daily_levels(
  station_number = c("02JE013", "08MF005"),
  start_date = "1996-01-01", end_date = "2000-01-01"
)

hy_daily_levels(prov_terr_state_loc = "PE")

## End(Not run)
```

`hy_data_symbols` *DATA SYMBOLS look-up table*

Description

A look table for data symbols

Usage

```
hy_data_symbols
```

Format

A tibble with 5 rows and 3 variables:

- **SYMBOL_ID**: Symbol code
- **SYMBOL_EN**: Description of Symbol (English)
- **SYMBOL_FR**: Description of Symbol (French)

Source

HYDAT

See Also

Other HYDAT functions: `hy_agency_list()`, `hy_annual_instant_peaks()`, `hy_annual_stats()`, `hy_daily()`, `hy_daily_flows()`, `hy_daily_levels()`, `hy_data_types`, `hy_datum_list()`, `hy_monthly_flows()`, `hy_monthly_levels()`, `hy_reg_office_list()`, `hy_sed_daily_loads()`, `hy_sed_daily_suscon()`, `hy_sed_monthly_loads()`, `hy_sed_monthly_suscon()`, `hy_sed_samples()`, `hy_sed_samples_psd()`, `hy_stations()`, `hy_stn_data_coll()`, `hy_stn_data_range()`, `hy_stn_op_schedule()`, `hy_stn_regulation()`, `hy_version()`

hy_data_types *DATA TYPES look-up table*

Description

A look table for data types

Usage

```
hy_data_types
```

Format

A tibble with 5 rows and 3 variables:

- **DATA_TYPE**: Data type code
- **DATA_TYPE_EN**: Descriptive data type (English)
- **DATA_TYPE_FR**: Descriptive data type (French)

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

hy_datum_list *Extract datum list from HYDAT database*

Description

DATUM look-up Table

Usage

```
hy_datum_list(hydat_path = NULL)
```

Arguments

hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.

Value

A tibble of DATUMS

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_datum_list()

## End(Not run)
```

---

hy_dir *Output OS-independent path to the HYDAT sqlite database*

Description

Provides the download location for download_hydat in an OS independent manner.

Usage

```
hy_dir(...)
```

Arguments

...	arguments potentially passed to rappdirs::user_data_dir

Examples

```
## Not run:
hy_dir()

## End(Not run)
```

`hy_monthly_flows` *Extract monthly flows information from the HYDAT database*

Description

Tidy data of monthly flows information from the monthly_flows HYDAT table. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_monthly_flows`.

Usage

```
hy_monthly_flows(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.
`start_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
`end_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

Format

A tibble with 8 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Year**: Year of record.
- **Month**: Numeric month value
- **Full_Month**: Logical value is there is full record from Month
- **No_days**: Number of days in that month
- **Sum_stat**: Summary statistic being used.
- **Value**: Value of the measurement in m^3/s.
- **Date_occurred**: Observation date. Formatted as a Date class. MEAN is a annual summary and therefore has an NA value for Date.

Value

A tibble of monthly flows.

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_monthly_flows(
  station_number = c("02JE013", "08MF005"),
  start_date = "1996-01-01", end_date = "2000-01-01"
)

hy_monthly_flows(prov_terr_state_loc = "PE")

## End(Not run)
```

`hy_monthly_levels` *Extract monthly levels information from the HYDAT database*

Description

Tidy data of monthly river or lake levels information from the DLY_LEVELS HYDAT table. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_monthly_levels`.

Usage

```
hy_monthly_levels(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.
`start_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
`end_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

Format

A tibble with 8 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Year**: Year of record.
- **Month**: Numeric month value
- **Full_month**: Logical value is there is full record from Month
- **No_days**: Number of days in that month

- **Sum_stat**: Summary statistic being used.
- **Value**: Value of the measurement in metres.
- **Date_occurred**: Observation date. Formatted as a Date class. MEAN is a annual summary and therefore has an NA value for Date.

Value

A tibble of monthly levels.

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_monthly_levels(
  station_number = c("02JE013", "08MF005"),
  start_date = "1996-01-01", end_date = "2000-01-01"
)

hy_monthly_levels(prov_terr_state_loc = "PE")

## End(Not run)
```

---

hy_plot *This function is deprecated in favour of generic plot methods*

Description

This is an easy way to visualize a single station using base R graphics. More complicated plotting needs should consider using ggplot2. Inputting more 5 stations will result in very busy plots and longer load time. Legend position will sometimes overlap plotted points.

Usage

```
hy_plot(
  station_number = NULL,
  Parameter = c("Flow", "Level", "Suscon", "Load")
)
```

Arguments

station_number	A (or several) seven digit Water Survey of Canada station number.
Parameter	Parameter of interest. Either "Flow" or "Level".

---

hy_reg_office_list *Extract regional office list from HYDAT database*

Description

OFFICE look-up Table

Usage

```
hy_reg_office_list(hydat_path = NULL)
```

Arguments

hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.

Value

A tibble of offices

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_reg_office_list()

## End(Not run)
```

hy_remote — *Get the version date of HYDAT that is current on the ECCC website*

Description

Retrieve the date of the HYDAT version available for download.

Usage

```
hy_remote()
```

hy_sed_daily_loads — *Extract daily sediment load information from the HYDAT database*

Description

Provides wrapper to turn the SED_DLY_LOADS table in HYDAT into a tidy data frame of daily sediment load information. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_sed_daily_loads`.

Usage

```
hy_sed_daily_loads(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.
`start_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
`end_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

Format

A tibble with 4 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date. Formatted as a Date class.
- **Parameter**: Parameter being measured. Only possible value is Load
- **Value**: Discharge value. The units are tonnes.

Value

A tibble of daily suspended sediment loads

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_sed_daily_loads(prov_terr_state_loc = "PE")

## End(Not run)
```

---

hy_sed_daily_suscon *Extract daily suspended sediment concentration information from the HYDAT database*

Description

Provides wrapper to turn the SED_DLY_SUSCON table in HYDAT into a tidy data frame of daily suspended sediment concentration information. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_sed_daily_suscon`.

Usage

```
hy_sed_daily_suscon(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL,
  symbol_output = "code"
)
```

Arguments

station_number	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of prov_terr_state_loc is returned.
hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
prov_terr_state_loc	Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.
start_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
end_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
symbol_output	Set whether the raw code, or the english or the french translations are outputted. Default value is code.

Format

A tibble with 5 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date. Formatted as a Date class.
- **Parameter**: Parameter being measured. Only possible value is Suscon
- **Value**: Discharge value. The units are mg/l.
- **Symbol**: Measurement/river conditions

Value

A tibble of daily suspended sediment concentration

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_sed_daily_suscon(station_number = "01CE003")

## End(Not run)
```

---

hy_sed_monthly_loads *Extract monthly flows information from the HYDAT database*

Description

Tidy data of monthly loads information from the SED_DLY_LOADS HYDAT table. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_sed_monthly_loads`.

Usage

```
hy_sed_monthly_loads(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

start_date — Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

end_date — Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

Format

A tibble with 8 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Year**: Year of record.
- **Month**: Numeric month value
- **Full_Month**: Logical value is there is full record from Month
- **No_days**: Number of days in that month
- **Sum_stat**: Summary statistic being used.
- **Value**: Value of the measurement in tonnes.
- **Date_occurred**: Observation date. Formatted as a Date class. MEAN is a annual summary and therefore has an NA value for Date.

Value

A tibble of monthly sediment loads.

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_sed_monthly_loads(station_number = "01CE003")

## End(Not run)
```

hy_sed_monthly_suscon *Extract monthly flows information from the HYDAT database*

Description

Tidy data of monthly suspended sediment concentration information from the SED_DLY_SUSCON HYDAT table. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_sed_monthly_suscon`.

Usage

```
hy_sed_monthly_suscon(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.
`start_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
`end_date`	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

Format

A tibble with 8 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Year**: Year of record.
- **Month**: Numeric month value
- **Full_Month**: Logical value is there is full record from Month
- **No_days**: Number of days in that month

- **Sum_stat**: Summary statistic being used.
- **Value**: Value of the measurement in mg/l.
- **Date_occurred**: Observation date. Formatted as a Date class. MEAN is a annual summary and therefore has an NA value for Date.

Value

A tibble of monthly suspended sediment concentrations.

Source

HYDAT

See Also

Other HYDAT functions: `hy_agency_list()`, `hy_annual_instant_peaks()`, `hy_annual_stats()`, `hy_daily()`, `hy_daily_flows()`, `hy_daily_levels()`, `hy_data_symbols`, `hy_data_types`, `hy_datum_list()`, `hy_monthly_flows()`, `hy_monthly_levels()`, `hy_reg_office_list()`, `hy_sed_daily_loads()`, `hy_sed_daily_suscon()`, `hy_sed_monthly_loads()`, `hy_sed_samples()`, `hy_sed_samples_psd()`, `hy_stations()`, `hy_stn_data_coll()`, `hy_stn_data_range()`, `hy_stn_op_schedule()`, `hy_stn_regulation()`, `hy_version()`

Examples

```
## Not run:
hy_sed_monthly_suscon(station_number = "08MF005")

## End(Not run)
```

---

hy_sed_samples *Extract instantaneous sediment sample information from the HYDAT database*

Description

Provides wrapper to turn the hy_sed_samples table in HYDAT into a tidy data frame of instantaneous sediment sample information. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. That is a large vector for `hy_sed_samples`.

Usage

```
hy_sed_samples(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL
)
```

Arguments

station_number	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of prov_terr_state_loc is returned.
hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
prov_terr_state_loc	Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.
start_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
end_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

Format

A tibble with 19 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **SED_DATA_TYPE**: Contains the type of sampling method used in collecting sediment for a station
- **Date**: Contains the time to the nearest minute of when the sample was taken
- **SAMPLE_REMARK_CODE**: Descriptive Sediment Sample Remark in English
- **TIME_SYMBOL**: An "E" symbol means the time is an estimate only
- **FLOW**: Contains the instantaneous discharge in cubic metres per second at the time the sample was taken
- **SYMBOL_EN**: Indicates a condition where the daily mean has a larger than expected error
- **SAMPLER_TYPE**: Contains the type of measurement device used to take the sample
- **SAMPLING_VERTICAL_LOCATION**: The location on the cross-section of the river at which the single sediment samples are collected. If one of the standard locations is not used the distance in meters will be shown
- **SAMPLING_VERTICAL_EN**: Indicates sample location relative to the regular measurement cross-section or the regular sampling site
- **TEMPERATURE**: Contains the instantaneous water temperature in Celsius at the time the sample was taken
- **CONCENTRATION_EN**: Contains the instantaneous concentration sampled in milligrams per litre
- **SV_DEPTH2**: Depth 2 for split vertical depth integrating (m)

Value

A tibble of instantaneous sediment samples data

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_sed_samples(station_number = "01CA004")

## End(Not run)
```

---

hy_sed_samples_psd *Extract instantaneous sediment sample particle size distribution information from the HYDAT database*

Description

Provides wrapper to turn the hy_sed_samples_psd table in HYDAT into a tidy data frame of instantaneous sediment sample particle size distribution. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations()` table are returned. That is a large vector for `hy_sed_samples_psd`.

Usage

```
hy_sed_samples_psd(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL,
  start_date = NULL,
  end_date = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.

hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
prov_terr_state_loc	Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.
start_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
end_date	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.

Format

A tibble with 5 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **SED_DATA_TYPE**: Contains the type of sampling method used in collecting sediment for a station
- **Date**: Contains the time to the nearest minute of when the sample was taken
- **PARTICLE_SIZE**: Particle size (mm)
- **PERCENT**: Contains the percentage values for indicated particle sizes for samples collected

Value

A tibble of sediment sample particle size data

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_sed_samples_psd(station_number = "01CA004")

## End(Not run)
```

hy_set_default_db *Set the default database path*

Description

For many reasons, it may be convenient to set the default database location to somewhere other than the global default. Users may wish to use a previously downloaded version of the database for reproducibility purposes, store hydat somewhere other than hy_dir().

Usage

```
hy_set_default_db(hydat_path = NULL)
```

Arguments

hydat_path	The path to the a HYDAT sqlite3 database file (e.g., hy_test_db)

Value

returns the previous value of hy_default_db.

Examples

```
## Not run:
# set default to the test database
hy_set_default_db(hy_test_db())

# get the default value
hy_default_db()

# set back to the default db location
hy_set_default_db(NULL)

## End(Not run)
```

hy_src *Open a connection to the HYDAT database*

Description

This function gives low-level access to the underlying HYDAT database used by other functions. Many of these tables are too large to load into memory, so it is best to use dplyr to `dplyr::filter()` them before using `dplyr::collect()` to read them into memory.

Usage

```
hy_src(hydat_path = NULL)

hy_src_disconnect(src)
```

Arguments

hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
src	A as returned by hy_src().

Value

A SQLite DBIConnection

See Also

download_hydat()

Examples

```
## Not run:
library(dplyr)

# src is a src_sqlite
src <- hy_src(hydat_path = hy_test_db())
src_tbls(src)

# to get a table, use dplyr::tbl()
tbl(src, "STATIONS")

# one you're sure the results are what you want
# get a data.frame using collect()
tbl(src, "STATIONS") |>
  filter(PROV_TERR_STATE_LOC == "BC") |>
  collect()

# close the connection to the database
hy_src_disconnect(src)

## End(Not run)
```

hy_stations *Extract station information from the HYDAT database*

Description

Provides wrapper to turn the hy_stations table in HYDAT into a tidy data frame of station information. `station_number` and `prov_terr_state_loc` can both be supplied. If both are omitted all values from the `hy_stations` table are returned. This is the entry point for most analyses is tidyhydat as establish the stations for consideration is likely the first step in many instances.

Usage

```
hy_stations(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 15 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **STATION_NAME**: Official name for station identification
- **PROV_TERR_STATE_LOC**: The province, territory or state in which the station is located
- **REGIONAL_OFFICE_ID**: The identifier of the regional office responsible for the station. Links to hy_reg_office_list
- **HYD_STATUS**: Current status of discharge or level monitoring in the hydrometric network
- **SED_STATUS**: Current status of sediment monitoring in the hydrometric network
- **LATITUDE**: North-South Coordinates of the gauging station in decimal degrees
- **LONGITUDE**: East-West Coordinates of the gauging station in decimal degrees
- **DRAINAGE_AREA_GROSS**: The total surface area that drains to the gauge site (km^2)

- **DRAINAGE_AREA_EFFECT**: The portion of the drainage basin that contributes runoff to the gauge site, calculated by subtracting any noncontributing portion from the gross drainage area (km^2)
- **RHBN**: Logical. Reference Hydrometric Basin Network station. The Reference Hydrometric Basin Network (RHBN) is a sub-set of the national network that has been identified for use in the detection, monitoring, and assessment of climate change.
- **REAL_TIME**: Logical. Indicates if a station has the capacity to deliver data in real-time or near real-time
- **CONTRIBUTOR_ID**: Unique ID of an agency that contributes data to the HYDAT database. The agency is non-WSC and non WSC funded
- **OPERATOR_ID**: Unique ID of an agency that operates a hydrometric station
- **DATUM_ID**: Unique ID for a datum

Value

A tibble of stations and associated metadata

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
## Multiple stations province not specified
hy_stations(station_number = c("08NM083", "08NE102"))

## Multiple province, station number not specified
hy_stations(prov_terr_state_loc = c("AB", "YT"))

## End(Not run)
```

`hy_stn_data_coll` *Extract station data collection from HYDAT database*

Description

hy_stn_data_coll look-up Table

Usage

```
hy_stn_data_coll(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 6 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **DATA_TYPE**: The type of data
- **Year_from**: First year of use
- **Year_to**: Last year of use
- **MEASUREMENT**: The sampling method used in the collection of sediment data or the type of the gauge used in the collection of the hydrometric data
- **OPERATION**: The schedule of station operation for the collection of sediment or hydrometric data

Value

A tibble of hy_stn_data_coll

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_stn_data_coll(station_number = c("02JE013", "08MF005"))

## End(Not run)
```

---

hy_stn_data_range *Extract station data range from HYDAT database*

Description

hy_stn_data_range look-up Table

Usage

```
hy_stn_data_range(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

station_number	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of prov_terr_state_loc is returned.
hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
prov_terr_state_loc	Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.

Format

A tibble with 6 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **DATA_TYPE**: Code for the type of data
- **SED_DATA_TYPE**: Code for the type of instantaneous sediment data
- **Year_from**: First year of use
- **Year_to**: Last year of use
- **RECORD_LENGTH**: Number of years of data available in the HYDAT database

Value

A tibble of hy_stn_data_range

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_op_schedule(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_stn_data_range(station_number = c("02JE013", "08MF005"))

## End(Not run)
```

---

hy_stn_datum_conv *Extract station datum conversions from HYDAT database*

Description

hy_stn_datum_conv look-up Table

Usage

```
hy_stn_datum_conv(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

station_number	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of prov_terr_state_loc is returned.
hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.
prov_terr_state_loc	Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.

Format

A tibble with 4 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **DATUM_FROM**: Identifying a datum from which water level is being converted
- **DATUM_TO**: Identifying a datum to which water level is being converted
- **CONVERSTION_FACTOR**: The conversion factor applied to water levels referred to one datum to obtain water levels referred to another datum

Value

A tibble of hy_stn_datum_conv

Examples

```
## Not run:
hy_stn_datum_conv(station_number = c("02JE013", "08MF005"))

## End(Not run)
```

`hy_stn_datum_unrelated` *Extract station datum unrelated from HYDAT database*

Description

hy_stn_datum_unrelated look-up Table

Usage

```
hy_stn_datum_unrelated(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 4 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **DATUM_ID**: Unique code identifying a datum
- **Year_from**: First year of use
- **Year_to**: Last year of use

Value

A tibble of hy_stn_datum_unrelated

Examples

```
## Not run:
hy_stn_datum_unrelated()

## End(Not run)
```

`hy_stn_op_schedule` *Extract station operation schedule from HYDAT database*

Description

hy_stn_op_schedule look-up Table

Usage

```
hy_stn_op_schedule(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 6 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **DATA_TYPE**: The type of data
- **Year**: Year of operation schedule
- **Month_from**: First month of use
- **Month_to**: Last month of use

Value

A tibble of hy_stn_op_schedule

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_regulation(), hy_version()

Examples

```
## Not run:
hy_stn_op_schedule(station_number = c("02JE013"))

## End(Not run)
```

---

hy_stn_regulation *Extract station regulation from the HYDAT database*

Description

Provides wrapper to turn the hy_stn_regulation table in HYDAT into a tidy data frame of station regulation. station_number and prov_terr_state_loc can both be supplied. If both are omitted all values from the hy_stations table are returned.

Usage

```
hy_stn_regulation(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

station_number	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of prov_terr_state_loc is returned.

hydat_path The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.

prov_terr_state_loc
Province, state or territory. If this argument is omitted, the value of station_number is returned. See unique(allstations$prov_terr_state_loc). Will also accept CA to return only Canadian stations.

Format

A tibble with 4 variables:

STATION_NUMBER Unique 7 digit Water Survey of Canada station number

Year_from First year of use

Year_to Last year of use

REGULATED logical

Value

A tibble of stations, years of regulation and the regulation status

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_version()

Examples

```
## Not run:
## Multiple stations province not specified
hy_stn_regulation(station_number = c("08NM083", "08NE102"))

## Multiple province, station number not specified
hy_stn_regulation(prov_terr_state_loc = c("AB", "YT"))

## End(Not run)
```

`hy_stn_remarks` *Extract station remarks from HYDAT database*

Description

hy_stn_remarks look-up Table

Usage

```
hy_stn_remarks(
  station_number = NULL,
  hydat_path = NULL,
  prov_terr_state_loc = NULL
)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 4 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **REMARK_TYPE**: Type of Remark
- **Year**: Year of the remark
- **REMARK**: Remark

Value

A tibble of hy_stn_remarks

Examples

```
## Not run:
hy_stn_remarks(station_number = c("02JE013", "08MF005"))

## End(Not run)
```

hy_test_db *Get the location of the HYDAT database*

Description

The full HYDAT database needs to be downloaded from download_hydat, but for testing purposes, a small test database is included in this package. Use `hydat_path = hy_test_db()` in hy_* functions to explicitly use the test database; use `hydat_path = hy_downloaded_db()` to explicitly use the full, most recent downloaded database (this is also the path returned by `hy_default_db()`).

Usage

```
hy_test_db()

hy_downloaded_db()

hy_default_db()
```

Value

The file location of a HYDAT database.

See Also

hy_src, hy_set_default_db.

Examples

```
## Not run:
hy_test_db()
hy_downloaded_db()
hy_default_db()

## End(Not run)
```

hy_version *Extract version number from HYDAT database*

Description

A function to get version number of hydat

Usage

```
hy_version(hydat_path = NULL)
```

Arguments

hydat_path	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from hy_src() such that the database only needs to be opened once per user-level call.

Value

version number and release date

Source

HYDAT

See Also

Other HYDAT functions: hy_agency_list(), hy_annual_instant_peaks(), hy_annual_stats(), hy_daily(), hy_daily_flows(), hy_daily_levels(), hy_data_symbols, hy_data_types, hy_datum_list(), hy_monthly_flows(), hy_monthly_levels(), hy_reg_office_list(), hy_sed_daily_loads(), hy_sed_daily_suscon(), hy_sed_monthly_loads(), hy_sed_monthly_suscon(), hy_sed_samples(), hy_sed_samples_psd(), hy_stations(), hy_stn_data_coll(), hy_stn_data_range(), hy_stn_op_schedule(), hy_stn_regulation()

Examples

```
## Not run:
hy_version()

## End(Not run)
```

---

param_id *Parameter ID*

Description

A tibble of parameter id codes and their corresponding explanation/description specific to the ECCC webservice

Usage

```
param_id
```

Format

A tibble with 8 rows and 7 variables:

- **Parameter**: Numeric parameter code
- **Code**: Letter parameter code
- **Name_En**: Code name in English
- **Name_En**: Code name in French
- **Unit**: Parameter units

---

plot *Plot available data (final + provisional)*

Description

This method plots combined final and provisional data, visually distinguishing between validated (final) and provisional records.

This method plots either daily time series data from HYDAT or realtime data from the datamart. These plots are intended to be convenient and quick methods to visualize hydrometric data.

Usage

```
## S3 method for class 'available'
plot(x = NULL, ...)

## S3 method for class 'hy'
plot(x = NULL, ...)

## S3 method for class 'realtime'
plot(x = NULL, Parameter = c("Flow", "Level"), ...)
```

Arguments

x	Object created by either a hy_daily_* or realtime_dd data retrieval function
...	passed to plot()
Parameter	Parameter of interest. Either "Flow" or "Level". Defaults to "Flow".

Methods (by class)

- plot(realtime): plot.realtime

Examples

```
## Not run:
# One station
flows <- available_flows("08MF005")
plot(flows)

## End(Not run)

## Not run:
# One station
fraser <- hy_daily_flows("08MF005")
plot(fraser)

## End(Not run)

## Not run:
# One station
fraser_realtime <- realtime_dd("08MF005")
plot(fraser_realtime)

## End(Not run)
```

`pull_station_number` *Convenience function to pull station number from tidyhydat functions*

Description

This function mimics `dplyr::pull` to avoid having to always type dplyr::pull(STATION_NUMBER). Instead we can now take advantage of autocomplete. This can be used with `realtime_` and `hy_` functions.

Usage

```
pull_station_number(.data)
```

Arguments

`.data`	A table of data

Value

A vector of station_numbers

Examples

```
## Not run:

hy_stations(prov_terr_state_loc = "PE") |>
  pull_station_number() |>
  hy_annual_instant_peaks()

## End(Not run)
```

`realtime_add_local_datetime` *Add local datetime column to realtime tibble*

Description

Adds `local_datetime` and `tz_used` columns based on either the most common timezone in the original data or a user supplied timezone. This function is meant to used in a pipe with the `realtime_dd()` function.

Usage

```
realtime_add_local_datetime(.data, set_tz = NULL)
```

Arguments

`.data`	Tibble created by `realtime_dd`
`set_tz`	A timezone string in the format of `OlsonNames()`

Details

`Date` from `realtime_dd` is supplied in UTC which is the easiest format to work with across timezones. This function does not change `Date` from UTC. Rather `station_tz` specifies the local timezone name and is useful in instances where `realtime_add_local_datetime` adjusts local_datetime to a common timezone that is not the `station_tz`. This function is most useful when all stations exist within the same timezone.

Examples

```
## Not run:

realtime_dd(c("08MF005", "02LA004")) |>
  realtime_add_local_datetime()

## End(Not run)
```

realtime_daily_mean *Calculate daily means from higher resolution realtime data*

Description

This function is meant to be used within a pipe as a means of easily moving from higher resolution data to daily means.

Usage

```
realtime_daily_mean(.data, na.rm = FALSE)
```

Arguments

.data	A data argument that is designed to take only the output of realtime_dd
na.rm	a logical value indicating whether NA values should be stripped before the computation proceeds.

Examples

```
## Not run:
realtime_dd("08MF005") |> realtime_daily_mean()

## End(Not run)
```

realtime_dd *Download a tibble of realtime river data from the last 30 days from the Meteorological Service of Canada datamart*

Description

Download realtime river data from the last 30 days from the Meteorological Service of Canada (MSC) datamart. The function will prioritize downloading data collected at the highest resolution. In instances where data is not available at high (hourly or higher) resolution daily averages are used. Currently, if a station does not exist or is not found, no data is returned.

Usage

```
realtime_dd(station_number = NULL, prov_terr_state_loc = NULL)
```

Arguments

`station_number`	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of `prov_terr_state_loc` is returned.
`prov_terr_state_loc`	Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 8 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **PROV_TERR_STATE_LOC**: The province, territory or state in which the station is located
- **Date**: Observation date and time for last thirty days. Formatted as a POSIXct class in UTC for consistency.
- **Parameter**: Parameter being measured. Only possible values are Flow and Level
- **Value**: Value of the measurement. If Parameter equals Flow the units are m^3/s. If Parameter equals Level the units are metres.
- **Grade**: reserved for future use
- **Symbol**: reserved for future use
- **Code**: quality assurance/quality control flag for the discharge
- **station_tz**: Station timezone based on tidyhydat::allstations$station_tz

Value

A tibble of water flow and level values. The date and time of the query (in UTC) is also stored as an attribute.

See Also

Other realtime functions: `realtime_stations()`, `realtime_ws()`

Examples

```
## Not run:
## Download from multiple provinces
realtime_dd(station_number = c("01CD005", "08MF005"))

## To download all stations in Prince Edward Island:
pei <- realtime_dd(prov_terr_state_loc = "PE")

## Access the time of query
attributes(pei)$query_time

## End(Not run)
```

realtime_plot *Convenience function to plot realtime data*

Description

This is an easy way to visualize a single station using base R graphics. More complicated plotting needs should consider using ggplot2. Inputting more 5 stations will result in very busy plots and longer load time. Legend position will sometimes overlap plotted points.

Usage

```
realtime_plot(station_number = NULL, Parameter = c("Flow", "Level"))
```

Arguments

station_number	A seven digit Water Survey of Canada station number. Can only be one value.
Parameter	Parameter of interest. Either "Flow" or "Level". Defaults to "Flow".

Value

A plot of recent realtime values

Examples

```
## Not run:
## One station
realtime_plot("08MF005")

## Multiple stations
realtime_plot(c("07EC002", "01AD003"))

## End(Not run)
```

realtime_stations *Download a tibble of active realtime stations*

Description

An up to date dataframe of all stations in the Realtime Water Survey of Canada hydrometric network operated by Environment and Climate Change Canada

Usage

```
realtime_stations(prov_terr_state_loc = NULL)
```

Arguments

prov_terr_state_loc
: Province, state or territory. If this argument is omitted, the value of `station_number` is returned. See `unique(allstations$prov_terr_state_loc)`. Will also accept `CA` to return only Canadian stations.

Format

A tibble with 6 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **STATION_NAME**: Official name for station identification
- **LATITUDE**: North-South Coordinates of the gauging station in decimal degrees
- **LONGITUDE**: East-West Coordinates of the gauging station in decimal degrees
- **PROV_TERR_STATE_LOC**: The province, territory or state in which the station is located
- **TIMEZONE**: Timezone of the station

See Also

Other realtime functions: `realtime_dd()`, `realtime_ws()`

Examples

```
## Not run:
## Available inputs for prov_terr_state_loc argument:
unique(realtime_stations()$prov_terr_state_loc)

realtime_stations(prov_terr_state_loc = "BC")
realtime_stations(prov_terr_state_loc = c("QC", "PE"))

## End(Not run)
```

---

realtime_ws *Download realtime data from the ECCC web service*

Description

Function to actually retrieve data from ECCC web service. The maximum number of days that can be queried depends on other parameters being requested. If one station is requested, 18 months of data can be requested. If you continually receiving errors when invoking this function, reduce the number of observations (via station_number, parameters or dates) being requested.

Usage

```
realtime_ws(
  station_number,
  parameters = NULL,
  start_date = Sys.Date() - lubridate::days(30),
  end_date = Sys.Date()
)
```

Arguments

station_number	Water Survey of Canada station number.
parameters	parameter ID. Can take multiple entries. Parameter is a numeric code. See param_id for some options though undocumented parameters may be implemented. Defaults to Water level provisional, Secondary water level, Tertiary water level, Discharge Provisional, Discharge, sensor, Water temperature, Secondary water temperature, Accumulated precipitation
start_date	Accepts either YYYY-MM-DD or YYYY-MM-DD HH:MM:SS. If only 'start date" is supplied (i.e. YYYY-MM-DD) values are returned from the start of that day. Defaults to 30 days before current date. Time is supplied in UTC.
end_date	Accepts either YYYY-MM-DD or YYYY-MM-DD HH:MM:SS. If only 'end_date" is supplied (i.e. YYYY-MM-DD) values are returned from the end of that day. Defaults to current date. Time is supplied in UTC.

Format

A tibble with 6 variables:

- **STATION_NUMBER**: Unique 7 digit Water Survey of Canada station number
- **Date**: Observation date and time. Formatted as a POSIXct class as UTC for consistency.
- **Name_En**: Code name in English
- **Value**: Value of the measurement.
- **Unit**: Value units
- **Grade**: future use
- **Symbol**: future use
- **Approval**: future use
- **Parameter**: Numeric parameter code
- **Code**: Letter parameter code

See Also

Other realtime functions: realtime_dd(), realtime_stations()

Examples

```
## Not run:

ws_08 <- realtime_ws(
  station_number = c("08NL071", "08NM174"),
  parameters = c(47, 5)
)

fivedays <- realtime_ws(
  station_number = c("08NL071", "08NM174"),
  parameters = c(47, 5),
  end_date = Sys.Date(), # today
  start_date = Sys.Date() - lubridate::days(5) # five days ago
)

## End(Not run)
```

`search_stn_name` *A search function for hydrometric station name or number*

Description

Use this search function when you only know the partial station name or want to search.

Usage

```
search_stn_name(search_term, hydat_path = NULL)

search_stn_number(search_term, hydat_path = NULL)
```

Arguments

`search_term`	Only accepts one word.
`hydat_path`	The path to the hydat database or NULL to use the default location used by download_hydat. It is also possible to pass in an existing database connection from `hy_src()` such that the database only needs to be opened once per user-level call.

Value

A tibble of stations that match the `search_term`

Examples

```
## Not run:
search_stn_name("Cowichan")

search_stn_number("08HF")
```

```
## End(Not run)
```

`summary.available` *Summarize available data by station*

Description

Returns a tibble with date ranges and record counts for each station, broken down by approval status (final vs provisional).

Usage

```
## S3 method for class 'available'
summary(object, ...)
```

Arguments

`object`	Object created by `available_flows()` or `available_levels()`
`...`	ignored

Value

A tibble with columns:

- STATION_NUMBER
- final_start, final_end - date range for validated data
- provisional_start, provisional_end - date range for provisional data
- final_n, provisional_n - record counts

Examples

```
## Not run:
flows <- available_flows(c("08MF005", "08MF010"))
summary(flows)

## End(Not run)
```

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