Package 'tidyhydat'

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Title Extract and Tidy Canadian 'Hydrometric' Data

Version 0.7.0

Description Provides functions to access historical and real-time national 'hydrometric' data from Water Survey of Canada data sources (<https://dd.weather.gc.ca/hydrometric/csv/> and <https://collaboration.cmc.ec.gc.ca/cmc/hydrometrics/www/>) and then applies tidy data principles.

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URL https://docs.ropensci.org/tidyhydat/, https://github.com/ropensci/tidyhydat/

BugReports https://github.com/ropensci/tidyhydat/issues/

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Contents

`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

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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 the HYDAT database*

Description

Provides wrapper to turn the DLY_FLOWS table in HYDAT 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 src_sqlite 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

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 the HYDAT database*

Description

Provides wrapper to turn the DLY_LEVELS table in HYDAT into a tidy data frame. The primary value returned by this function is discharge. `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 src_sqlite 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

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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 src_sqlite 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 historical and realtime data*

Description

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 '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
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() - 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 a 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() - 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 src_sqlite 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)
```

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