

Package ‘tidyhydat’

May 1, 2018

Title Extract and Tidy Canadian 'Hydrometric' Data

Version 0.3.4

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

License Apache License (== 2.0) | file LICENSE

URL <https://github.com/ropensci/tidyhydat>

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

Depends R (>= 3.2.0)

Imports cli (>= 1.0.0), crayon (>= 1.3.4), DBI (>= 0.7), dbplyr (>= 1.1.0), dplyr (>= 0.7.4), httr (>= 1.3.1), lubridate (>= 1.6.0), rappdirs (>= 0.3.1), readr (>= 1.1.1), rlang (>= 0.1.2), RSQLite (>= 2.0), tidyr (>= 0.7.1)

Suggests ggplot2, knitr, rmarkdown, testthat, covr

VignetteBuilder knitr

Encoding UTF-8

LazyData true

RoxygenNote 6.0.1

NeedsCompilation no

Author Sam Albers [aut, cre] (<<https://orcid.org/0000-0002-9270-7884>>),
David Hutchinson [ctb],
Dewey Dunnington [ctb],
Province of British Columbia [cph],
Luke Winslow [rev] (Reviewed for rOpenSci),
Laura DeCicco [rev] (Reviewed for rOpenSci)

Maintainer Sam Albers <sam.albers@gov.bc.ca>

Repository CRAN

Date/Publication 2018-05-01 21:41:41 UTC

R topics documented:

allstations	3
download_hydat	3
hy_agency_list	4
hy_annual_instant_peaks	5
hy_annual_stats	6
hy_daily	8
hy_daily_flows	9
hy_daily_levels	10
hy_data_symbols	12
hy_data_types	13
hy_datum_list	13
hy_dir	14
hy_monthly_flows	15
hy_monthly_levels	16
hy_plot	18
hy_reg_office_list	18
hy_sed_daily_loads	19
hy_sed_daily_suscon	21
hy_sed_monthly_loads	22
hy_sed_monthly_suscon	24
hy_sed_samples	25
hy_sed_samples_psd	27
hy_set_default_db	28
hy_src	29
hy_stations	30
hy_stn_data_coll	32
hy_stn_data_range	33
hy_stn_datum_conv	34
hy_stn_datum_unrelated	35
hy_stn_op_schedule	36
hy_stn_regulation	38
hy_stn_remarks	39
hy_test_db	40
hy_version	41
realtime_daily_mean	42
realtime_dd	42
realtime_plot	43
realtime_stations	44
search_stn_name	45

allstations	<i>All Canadian stations</i>
-------------	------------------------------

Description

A shorthand to avoid having always call `hy_stations` or `realtime_stations`. Only up to date as of 2017-10-26. 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

Source

HYDAT, Meteorological Service of Canada datamart

download_hydat	<i>Download and set the path to HYDAT</i>
----------------	---

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)
```

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.

Examples

```
## Not run:
download_hydat()

## End(Not run)
```

hy_agency_list	<i>hy_agency_list function</i>
----------------	--------------------------------

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_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_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 = "ALL", end_year = "ALL")
```

Arguments

<code>station_number</code>	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of <code>prov_terr_state_loc</code> is returned.
<code>hydat_path</code>	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.
<code>prov_terr_state_loc</code>	Province, state or territory. If this argument is omitted, the value of <code>station_number</code> is returned. See <code>unique(allstations\$prov_terr_state_loc)</code>
<code>start_year</code>	First year of the returned record
<code>end_year</code>	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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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	<i>Extract annual statistics information from the HYDAT database</i>
-----------------	--

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 <code>unique(allstations\$prov_terr_state_loc)</code>
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 m³/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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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	<i>Extract all daily water level and flow measurements</i>
----------	--

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, quiet = TRUE,
         hydat_path = NULL, ...)
```

Arguments

<code>station_number</code>	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of <code>prov_terr_state_loc</code> is returned.
<code>prov_terr_state_loc</code>	Province, state or territory. If this argument is omitted, the value of <code>station_number</code> is returned. See <code>unique(allstations\$prov_terr_state_loc)</code>
<code>quiet</code>	Generate output of parameters successfully queried? Defaults to <code>TRUE</code> . The output can be overly verbose when querying multiple stations but is useful when only querying a few stations.
<code>hydat_path</code>	The path to the <code>hydat</code> database or <code>NULL</code> to use the default location used by download_hydat . It is also possible to pass in an existing <code>src_sqlite</code> such that the database only needs to be opened once per user-level call.
<code>...</code>	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_psd](#), [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_daily(station_number = c("02JE013", "08MF005"))

## End(Not run)
```

hy_daily_flows	<i>Extract daily flows information from the HYDAT database</i>
----------------	--

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 = "ALL", end_date = "ALL",
  symbol_output = "code")
```

Arguments

<code>station_number</code>	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of <code>prov_terr_state_loc</code> is returned.
<code>hydat_path</code>	The path to the hydat database or <code>NULL</code> 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.
<code>prov_terr_state_loc</code>	Province, state or territory. If this argument is omitted, the value of <code>station_number</code> is returned. See <code>unique(allstations\$prov_terr_state_loc)</code>
<code>start_date</code>	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
<code>end_date</code>	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
<code>symbol_output</code>	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 m³/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_levels](#), [hy_daily](#), [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_sed_samples](#), [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("02JE013", "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 = "ALL", end_date = "ALL",
  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)`

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_flows](#), [hy_daily](#), [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_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_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	<i>DATA SYMBOLS look-up table</i>
-----------------	-----------------------------------

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [hy_stations](#), [hy_stn_data_coll](#), [hy_stn_data_range](#), [hy_stn_op_schedule](#), [hy_stn_regulation](#), [hy_version](#)

hy_data_types	<i>DATA TYPES look-up table</i>
---------------	---------------------------------

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [hy_sed_samples](#), [hy_stations](#), [hy_stn_data_coll](#), [hy_stn_data_range](#), [hy_stn_op_schedule](#), [hy_stn_regulation](#), [hy_version](#)

hy_datum_list	<i>Extract datum list from HYDAT database</i>
---------------	---

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_datum_list()  
  
## End(Not run)
```

hy_dir

Wrapped on rappdirs::user_data_dir("tidyhydat")

Description

A function to avoid having to always type `rappdirs::user_data_dir("tidyhydat")`

Usage

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

Arguments

... arguments potentially passed to `rappdirs::user_data_dir`

Examples

```
## Not run:  
hy_dir()  
  
## End(Not run)
```

hy_monthly_flows	<i>Extract monthly flows information from the HYDAT database</i>
------------------	--

Description

Tidy data of monthly flows information from the DLY_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 = "ALL", end_date = "ALL")
```

Arguments

<code>station_number</code>	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of <code>prov_terr_state_loc</code> is returned.
<code>hydat_path</code>	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 <code>src_sqlite</code> such that the database only needs to be opened once per user-level call.
<code>prov_terr_state_loc</code>	Province, state or territory. If this argument is omitted, the value of <code>station_number</code> is returned. See <code>unique(allstations\$prov_terr_state_loc)</code>
<code>start_date</code>	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
<code>end_date</code>	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 m³/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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_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	<i>Extract monthly levels information from the HYDAT database</i>
-------------------	---

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 = "ALL", end_date = "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)
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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_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	<i>Convenience function to plot realtime data</i>
---------	---

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 than 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".

Value

A plot of recent realtime values

Examples

```
## Not run:  
## One station  
hy_plot("08MF005")  
  
## Multiple stations  
hy_plot(c("07EC002", "01AD003"))  
  
## End(Not run)
```

hy_reg_office_list	<i>Extract regional office list from HYDAT database</i>
--------------------	---

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_reg_office_list()  
  
## End(Not run)
```

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 = "ALL", end_date = "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 <code>unique(allstations\$prov_terr_state_loc)</code>
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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_daily_loads(prov_terr_state_loc = "PE")

## End(Not run)
```

hy_sed_daily_suscon	<i>Extract daily suspended sediment concentration information from the HYDAT database</i>
---------------------	---

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 = "ALL", end_date = "ALL",
  symbol_output = "code")
```

Arguments

<code>station_number</code>	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of <code>prov_terr_state_loc</code> is returned.
<code>hydat_path</code>	The path to the hydat database or <code>NULL</code> to use the default location used by download_hydat . It is also possible to pass in an existing <code>src_sqlite</code> such that the database only needs to be opened once per user-level call.
<code>prov_terr_state_loc</code>	Province, state or territory. If this argument is omitted, the value of <code>station_number</code> is returned. See <code>unique(allstations\$prov_terr_state_loc)</code>
<code>start_date</code>	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
<code>end_date</code>	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
<code>symbol_output</code>	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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_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 = "ALL", end_date = "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)`

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_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 = "ALL", end_date = "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)`

`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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_psd](#), [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_monthly_suscon(station_number = "08MF005")

## End(Not run)
```

hy_sed_samples	<i>Extract instantaneous sediment sample information from the HYDAT database</i>
----------------	--

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 = "ALL", end_date = "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)`

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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	<i>Extract instantaneous sediment sample particle size distribution information from the HYDAT database</i>
--------------------	---

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 = "ALL", end_date = "ALL")
```

Arguments

<code>station_number</code>	A seven digit Water Survey of Canada station number. If this argument is omitted, the value of <code>prov_terr_state_loc</code> is returned.
<code>hydat_path</code>	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.
<code>prov_terr_state_loc</code>	Province, state or territory. If this argument is omitted, the value of <code>station_number</code> is returned. See <code>unique(allstations\$prov_terr_state_loc)</code>
<code>start_date</code>	Leave blank if all dates are required. Date format needs to be in YYYY-MM-DD. Date is inclusive.
<code>end_date</code>	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_EN 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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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	<i>Set the default database path</i>
-------------------	--------------------------------------

Description

For testing purposes, it may be convenient to set the default database location to somewhere other than the global default. Additionally, users may wish to use a previously downloaded version of the database for reproducibility purposes.

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 [filter](#) them before using [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 [src_sqlite](#) as returned by `hy_src()`.

Value

A dplyr [src_sqlite](#)

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)`

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 (km²)

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 (km²)

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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	<i>Extract station data collection from HYDAT database</i>
------------------	--

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)`

Format

A tibble with 6 variables:

STATION_NUMBER Unique 7 digit Water Survey of Canada station number

DATA_TYPE_EN The type of data

YEAR_FROM First year of use

YEAR_TO Last year of use

MEASUREMENT_CODE_EN Either 1) the sampling method used in the collection of sediment data or 2) the type of the gauge used in the collection of the hydrometric data

OPERATION_CODE_EN 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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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)
```

<code>hy_stn_data_range</code>	<i>Extract station data range from HYDAT database</i>
--------------------------------	---

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)`

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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	<i>Extract station datum conversions from HYDAT database</i>
-------------------	--

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)`

Format

A tibble with 4 variables:

- STATION_NUMBER** Unique 7 digit Water Survey of Canada station number
- DATUM_EN_FROM** Identifying a datum from which water level is being converted
- DATUM_EN_TO** Identifying a datum to which water level is being converted
- CONVERSION_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)`

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)`

Format

A tibble with 6 variables:

STATION_NUMBER Unique 7 digit Water Survey of Canada station number

DATA_TYPE_EN 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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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)`

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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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	<i>Extract station remarks from HYDAT database</i>
----------------	--

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)`

Format

A tibble with 4 variables:

STATION_NUMBER Unique 7 digit Water Survey of Canada station number

REMARK_TYPE_EN Type of Remark

YEAR Year of the remark

REMARK_EN 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_flows](#), [hy_daily_levels](#), [hy_daily](#), [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_sed_samples](#), [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)
```

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	Water Survey of Canada station number. If this argument is omitted from the function call, the value of prov_terr_state_loc is returned.
prov_terr_state_loc	Province, state or territory. If this argument is omitted from the function call, the value of station_number is returned.

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 as 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 m³/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

Value

A tibble of water flow and level values.

See Also

Other realtime functions: [realtime_stations](#)

Examples

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

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

## 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/Territory or Location. See examples for list of available options.
`realtime_stations()` for all 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](#)

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)
```

search_stn_name	<i>A search function for hydrometric station name or number</i>
-----------------	---

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)
```

Index

*Topic **datasets**

- allstations, 3
 - hy_data_symbols, 12
 - hy_data_types, 13
- allstations, 3
- collect, 29
- download_hydat, 3, 4–6, 8, 9, 11, 13, 15, 16, 19–22, 24, 25, 27, 29, 30, 32, 33, 35–41, 45
- filter, 29
- hy_agency_list, 4, 6, 7, 9–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_annual_instant_peaks, 4, 5, 7, 9–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_annual_stats, 4, 6, 6, 9–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_daily, 4, 6, 7, 8, 10–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_daily_flows, 4, 6–9, 9, 11–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_daily_levels, 4, 6, 7, 9, 10, 10, 12–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_data_symbols, 4, 6, 7, 9–11, 12, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_data_types, 4, 6, 7, 9–12, 13, 14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_datum_list, 4, 6, 7, 9–13, 13, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_default_db, 28
- hy_default_db (hy_test_db), 40
- hy_dir, 14
- hy_downloaded_db (hy_test_db), 40
- hy_monthly_flows, 4, 6, 7, 9–14, 15, 17, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_monthly_levels, 4, 6, 7, 9–14, 16, 16, 19, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_plot, 18
- hy_reg_office_list, 4, 6, 7, 9–14, 16, 17, 18, 20, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_sed_daily_loads, 4, 6, 7, 9–14, 16, 17, 19, 19, 22, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_sed_daily_suscon, 4, 6, 7, 9–14, 16, 17, 19, 20, 21, 23, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_sed_monthly_loads, 4, 6, 7, 9–14, 16, 17, 19, 20, 22, 22, 25, 26, 28, 31, 33, 34, 37, 39, 41
- hy_sed_monthly_suscon, 4, 6, 7, 9–14, 16, 17, 19, 20, 22, 23, 24, 26, 28, 31, 33, 34, 37, 39, 41
- hy_sed_samples, 4, 6, 7, 9–14, 16, 17, 19, 20, 22, 23, 25, 25, 28, 31, 33, 34, 37, 39, 41
- hy_sed_samples_psd, 4, 6, 7, 9–14, 16, 17, 19, 20, 22, 23, 25, 26, 27, 31, 33, 34, 37, 39, 41
- hy_set_default_db, 28, 40
- hy_src, 29, 40
- hy_src_disconnect (hy_src), 29
- hy_stations, 4, 6, 7, 9–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 30, 33, 34, 37, 39, 41
- hy_stn_data_coll, 4, 6, 7, 9–14, 16, 17, 19, 20, 22, 23, 25, 26, 28, 31, 32, 34, 37,

39, 41
hy_stn_data_range, 4, 6, 7, 9–14, 16, 17, 19,
20, 22, 23, 25, 26, 28, 31, 33, 33, 37,
39, 41
hy_stn_datum_conv, 34
hy_stn_datum_unrelated, 35
hy_stn_op_schedule, 4, 6, 7, 9–14, 16, 17,
19, 20, 22, 23, 25, 26, 28, 31, 33, 34,
36, 39, 41
hy_stn_regulation, 4, 6, 7, 9–14, 16, 17, 19,
20, 22, 23, 25, 26, 28, 31, 33, 34, 37,
38, 41
hy_stn_remarks, 39
hy_test_db, 28, 40
hy_version, 4, 6, 7, 9–14, 16, 17, 19, 20, 22,
23, 25, 26, 28, 31, 33, 34, 37, 39, 41

realtime_daily_mean, 42
realtime_dd, 42, 45
realtime_plot, 43
realtime_stations, 43, 44

search_stn_name, 45
search_stn_number (search_stn_name), 45
src_sqlite, 4–6, 8, 9, 11, 13, 15, 16, 19–22,
24, 25, 27, 29, 30, 32, 33, 35–39, 41,
45