Package 'StreamCatTools'

September 2, 2025

Type Package

Title StreamCat Tools

Version 0.6.0

Description Tools for using the 'StreamCat' and 'LakeCat' API and interacting with the 'StreamCat' and 'LakeCat' database. Convenience functions in the package wrap the API for 'StreamCat' on <https://api.epa.gov/StreamCat/streams/metrics>.

Depends R (>= 4.1.0)

Imports sf, nhdplusTools, jsonlite, httr2, curl (>= 6.0.0)

Suggests dplyr, ggplot2, mapview, testthat, knitr, rmarkdown, devtools, xml2, magrittr, readr, tidyr, stringr, purrr

Encoding UTF-8

URL https://usepa.github.io/StreamCatTools/, https://github.com/USEPA/StreamCatTools

BugReports https://github.com/USEPA/StreamCatTools/issues

VignetteBuilder knitr,rmarkdown

RoxygenNote 7.3.2

License CC0

NeedsCompilation no

Author Marc Weber [aut, cre], Ryan Hill [ctb], Travis Hudson [ctb], Allen Brookes [ctb], David Rebhuhn [ctb], Zachary Smith [ctb]

Maintainer Marc Weber <weber.marc@epa.gov>

Repository CRAN

Date/Publication 2025-09-02 20:40:02 UTC

Contents

`lc_fullname` *Lookup Full Metric Name*

Description

Function to retrieve a full metric name based on the short name using the LakeCat API.

Usage

```
lc_fullname(metric = NULL)
```

Arguments

`metric`	Short metric name Syntax: metric=value1 Values: metric

Value

A lookup of the full name for a given LakeCat metric

Author(s)

Marc Weber

Examples

```
fullname <- lc_fullname(metric='clay')
```

lc_get_comid *Get Lake COMIDs*

Description

Function to return NHDPlusV2 Waterbody COMIDS using either a dataframe with coordinates and a specified CRS or an sf object. The function generates a vector of NHDPlus Waterbody COMID values a user can then pass to lc_get_data function

Usage

```
lc_get_comid(
  dd = NULL,
  xcoord = NULL,
  ycoord = NULL,
  crsys = NULL,
  buffer = NULL
)
```

Arguments

dd	Name of data frame object. Can be a simple data frame with coordinate columns in a known CRS or an sf points data frame
xcoord	The x coordinate column if using a raw data frame
ycoord	The y coordinate column if using a raw data frame
crsys	The epsg code if using a raw data frame
buffer	The amount of buffer to use to extend search for a waterbody (simply passed to nhdplusTools::get_waterbodies)

Value

A new sf data frame with a populated 'COMID' column

Author(s)

Marc Weber

Examples

```
dd <- data.frame(x = c(-89.198,-114.125,-122.044),
y = c(45.502,47.877,43.730))

comids <- lc_get_comid(dd, xcoord='x',
                       ycoord='y', crsys=4269)

dd <- data.frame(x = c(-89.198,-114.125,-122.044),
```

```
y = c(45.502,47.877,43.730)) |>
   sf::st_as_sf(coords = c('x', 'y'), crs = 4326)

comids <- lc_get_comid(dd)
```

`lc_get_data` *Get LakeCat data*

Description

Function to return LakeCat metrics using the StreamCat API. The function allows a user to get specific metric data aggregated by area of interest, returned by comid(s), hydroregion(s), state(s), or county(ies).

Usage

```
lc_get_data(
  comid = NULL,
  metric = NULL,
  aoi = NULL,
  showAreaSqKm = NULL,
  showPctFull = NULL,
  state = NULL,
  county = NULL,
  region = NULL,
  conus = NULL,
  countOnly = NULL
)
```

Arguments

`comid`	Return metric information for specific COMIDs. Can be a comma-delimited list, a character vector, or any object that can be coerced to a comma-delimited list with `paste`. One of `comid`, `county`, `state`, or `region` is required unless `conus='true'`. Syntax: comid=<comid1>,<comid2>
`metric`	Name(s) of metrics to query. Must be character string with comma-delimited list of metrics. **Not** *case-sensitive*. Syntax: name=<name1>,<name2>
`aoi`	Specify the area of interest described by a metric. By default, all available areas of interest for a given metric are returned. *Case-sensitive*. Syntax: areaOfInterest=<value1>,<value2> Values: catchment|watershed|
`showAreaSqKm`	Return the area in square kilometers of a given area of interest. The default value is false. Values: true|false
`showPctFull`	Return the pctfull for each dataset. The default value is false. Values: true|false

`state` Return metric information for COMIDs within a specific state. Use a state's abbreviation to query for a given state. One of `comid`, `county`, `state`, or `region` is required unless `conus='true'`. If specified *and valid*, `comid` and `county` are ignored. *Case-sensitive*. Syntax: state=<state1>,<state2>

`county` Return metric information for COMIDs within a specific county. Users must use the FIPS code, not county name, as a way to disambiguate counties. One of `comid`, `county`, `state`, or `region` is required unless `conus='true'`. If specified *and valid*, `comid` is ignored. Syntax: county=<county1>,<county1>

`region` Return metric information for COMIDs within a specified hydroregion. Hydroregions are specified using full name i.e. `'Region01'`, `'Region03N'`, `'Region10L'` One of `comid`, `county`, `state`, or `region` is required unless `conus='true'`. If specified *and valid*, `comid`, `county`, and `state` are ignored. *Case-sensitive*. Syntax: region=<regionid1>,<regionid2>

`conus` Return all COMIDs in the conterminous United States. Character string (**Not** *case-sensitive*) or logical. The default value is false. If true, `comid`, `county`, `state`, and `region` are ignored. Values: truelfalse

`countOnly` Return a CSV containing only the row count (ROWCOUNT) and the column count (COLUMNCOUNT) that the server expects to return in a request. The default value is false. Values: truelfalse

Value

A tibble of desired StreamCat metrics. If data are missing for all rows of a given metric, then the column for that metric will not exist. If data are missing for only some rows, then they will be specified with NA.

Author(s)

Marc Weber

Examples

```
df <- lc_get_data(comid='23794487', aoi='cat', metric='fert')

df <- lc_get_data(metric='pcturbmd2006', aoi='ws',
comid='24083377')

df <- lc_get_data(metric='pctgrs2006', aoi='ws', region='Region01')

df <- lc_get_data(metric='pctwdwet2006', aoi='ws', county='41003')

df <- lc_get_data(metric='pcturbmd2006', aoi='ws',
comid='24083377', showAreaSqKm=FALSE, showPctFull=TRUE)

df <- lc_get_data(metric='pcturbmd2006,damdens',
aoi='cat,ws', comid='23783629,23794487,23812618')

df <- lc_get_data(metric='pcturbmd2006,damdens',
aoi='cat,ws', comid=c('23783629','23794487','23812618'))
```

```
df <- lc_get_data(metric='pcturbmd2006,damdens',
aoi='cat,ws', comid='23783629,23794487,23812618',
countOnly=TRUE)
```

`lc_get_params` *Get LakeCat Parameters*

Description

Function to return available LakeCat parameters using the StreamCat API.

Usage

```
lc_get_params(param = NULL)
```

Arguments

`param`	List of available parameters in the API for the following options: name, areaofInterest, region, state, county. State and county return a data frame that includes FIPS codes, names and state abbreviations Syntax: param=<value1>,<value2> Values: namelarea

Value

A list of all the current LakeCat values for a given parameter

Author(s)

Marc Weber

Examples

```
params <- lc_get_params(param='variable_info')
params <- lc_get_params(param='metric_names')
params <- lc_get_params(param='areaOfInterest')
params <- lc_get_params(param='state')
params <- lc_get_params(param='county')
```

`lc_nlcd` *Get NLCD Data*

Description

Function to specifically retrieve all NLCD metrics for a given year using the StreamCat API.

Usage

```
lc_nlcd(
  year = "2019",
  aoi = NULL,
  comid = NULL,
  showAreaSqKm = NULL,
  showPctFull = NULL,
  countOnly = NULL
)
```

Arguments

`year`	Years(s) of NLCD metrics to query. Only valid NLCD years are accepted (i.e. 2001, 2004, 2006, 2008, 2011, 2013, 2016, 2019) Syntax: year=<year1>,<year2>
`aoi`	Specify the area of interest described by a metric. By default, all available areas of interest for a given metric are returned. Syntax: areaOfInterest=<value1>,<value2> Values: catchment|watershed|riparian_catchment|riparian_watershed|other
`comid`	Return metric information for specific COMIDs Syntax: comid=<comid1>,<comid2>
`showAreaSqKm`	Return the area in square kilometers of a given area of interest. The default value is false. Values: true|false
`showPctFull`	Return the pctfull for each dataset. The default value is false. Values: true|false
`countOnly`	Return a CSV containing only the row count (ROWCOUNT) and the column count (COLUMNCOUNT) that the server expects to return in a request. The default value is false. Values: true|false

Value

A tibble of desired StreamCat metrics

Author(s)

Marc Weber

Examples

```
df <- lc_nlcd(comid='23783629', year='2019', aoi='ws')

df <- lc_nlcd(year='2016', aoi='cat',
comid='23783629,23794487,23812618', showAreaSqKm=FALSE, showPctFull=TRUE)

df <- lc_nlcd(year='2016', aoi='cat',
comid='23783629,23794487,23812618', countOnly=TRUE)

df <- lc_nlcd(year='2016, 2019', aoi='cat,ws',
comid='23783629,23794487,23812618')
```

`sc_fullname` *Lookup Full Metric Name*

Description

Function to retrieve a full metric name based on the short name using the StreamCat API.

Usage

```
sc_fullname(metric = NULL)
```

Arguments

`metric`	Short metric name Syntax: metric=value1 Values: metric

Value

A lookup of the full name for a given StreamCat metric

Author(s)

Marc Weber

Examples

```
fullname <- sc_fullname(metric='clay')
```

sc_get_comid *Get COMIDs*

Description

Function to return NHDPlusV2 COMIDS using either a dataframe with coordinates and a specified CRS or an sf object. The function generates a vector of COMID values a user can then pass to sc_get_data function

Usage

```
sc_get_comid(dd = NULL, xcoord = NULL, ycoord = NULL, crsys = NULL)
```

Arguments

dd	Name of data frame object. Can be a simple data frame with coordinate columns in a known CRS or an sf points data frame
xcoord	The x coordinate column if using a raw data frame
ycoord	The y coordinate column if using a raw data frame
crsys	The epsg code if using a raw data frame

Value

A new sf data frame with a populated 'COMID' column

Author(s)

Marc Weber

Examples

```
dd <- data.frame(x = c(-122.649,-100.348,-75.186,-106.675),
y = c(45.085, 35.405,42.403,38.721))

comids <- sc_get_comid(dd, xcoord='x',
                       ycoord='y', crsys=4269)

dd <- sf::read_sf(system.file("shape/nc.shp", package="sf"))
comids <- sc_get_comid(dd)

comids <- sc_get_comid(dd, xcoord='x',
ycoord='y', crsys=4269)

dd <- sf::read_sf(system.file("shape/nc.shp", package="sf"))
comids <- sc_get_comid(dd)
```

`sc_get_data` *Get StreamCat data*

Description

Function to return StreamCat catchment and watershed metrics using the StreamCat API. The function allows a user to get specific metric data aggregated by area of interest, returned by comid(s), hydroregion(s), state(s), or county(ies).

Usage

```
sc_get_data(
  comid = NULL,
  metric = NULL,
  aoi = NULL,
  showAreaSqKm = NULL,
  showPctFull = NULL,
  state = NULL,
  county = NULL,
  region = NULL,
  conus = NULL,
  countOnly = NULL
)
```

Arguments

`comid`	Return metric information for specific COMIDs. Can be a comma-delimited list, a character vector, or any object that can be coerced to a comma-delimited list with `paste`. One of `comid`, `county`, `state`, or `region` is required unless `conus='true'`. Syntax: comid=<comid1>,<comid2>
`metric`	Name(s) of metrics to query. Must be character string with comma-delimited list of metrics, or, if `metric='all'` then all metrics will be queried. **Not** *case-sensitive*. Syntax: name=<name1>,<name2>
`aoi`	Name(s) of areas of interest to query. If a metric does not have data for a given AOI, no data is returned for that AOI. Certain metrics that have no AOI specified for StreamCat need the AOI to be specified as `'other'`. These metrics include: BankfullDepth, BankfullWidth, ThalwagDepth (sic), CHEM_V2_1, CONN, HABT, HYD, ICI, IWI, TEMP, WettedWidth, prg_bmmi, and all the mast, msst, mwst metrics. *Case-sensitive*. Syntax: areaOfInterest=<value1>,<value2> Values: cat|ws|catrp100|wsrp100|other
`showAreaSqKm`	Return the area in square kilometers of a given area of interest. The default value is false. Values: true|false
`showPctFull`	Return the pctfull for each dataset. The default value is false. Values: true|false
`state`	Return metric information for COMIDs within a specific state. Use a state's abbreviation to query for a given state. One of `comid`, `county`, `state`, or `region`

is required unless `conus='true'`. If specified *and valid*, `comid` and `county` are ignored. *Case-sensitive*. Syntax: state=<state1>,<state2>

`county` Return metric information for COMIDs within a specific county. Users must use the FIPS code, not county name, as a way to disambiguate counties. One of `comid`, `county`, `state`, or `region` is required unless `conus='true'`. If specified *and valid*, `comid` is ignored. Syntax: county=<county1>,<county1>

`region` Return metric information for COMIDs within a specified hydroregion. Hydroregions are specified using full name i.e. `'Region01'`, `'Region03N'`, `'Region10L'` One of `comid`, `county`, `state`, or `region` is required unless `conus='true'`. If specified *and valid*, `comid`, `county`, and `state` are ignored. *Case-sensitive*. Syntax: region=<regionid1>,<regionid2>

`conus` Return all COMIDs in the conterminous United States. Character string (**Not** *case-sensitive*) or logical. The default value is false. If true, `comid`, `county`, `state`, and `region` are ignored. Values: truelfalse

`countOnly` Return a CSV containing only the row count (ROWCOUNT) and the column count (COLUMNCOUNT) that the server expects to return in a request. The default value is false. Values: truelfalse

Value

A data frame of StreamCat metrics. If data are missing for all rows of a given metric, then the column for that metric will not exist. If data are missing for only some rows, then they will be specified with NA.

Author(s)

Marc Weber

Examples

```
df <- sc_get_data(comid='179', aoi='cat', metric='fert')

df <- sc_get_data(metric='pctgrs2006', aoi='ws', region='Region01')

df <- sc_get_data(metric='pctwdwet2006', aoi='ws', county='41003')

df <- sc_get_data(metric='pcturbmd2006', aoi='wsrp100',
comid='1337420')

df <- sc_get_data(metric='pcturbmd2006,damdens',
aoi='cat,ws', comid='179,1337,1337420')

df <- sc_get_data(metric='pcturbmd2006,damdens',
aoi='cat,ws', comid='179,1337,1337420',
showAreaSqKm='true', showPctFull='true')

df <- sc_get_data(metric='pcturbmd2006,damdens',
aoi='cat,ws', comid='179,1337,1337420', countOnly='true')

df <- sc_get_data(metric='thalwagdepth', comid='179,1337,1337420', aoi='other')
```

```
df <- sc_get_data(metric='thalwagdepth', comid=c('179','1337','1337420'), aoi='other')

df <- sc_get_data(comid='179', aoi='ws', metric='all')
```

---

sc_get_params *Get StreamCat Parameters*

Description

Function to return available StreamCat parameters using the StreamCat API.

Usage

```
sc_get_params(param = NULL)
```

Arguments

param	List of available parameters in the API for the following options: name, areaofInterest, region, state, county. State and county return a data frame that includes FIPS codes, names and state abbreviations Syntax: param=<value1>,<value2> Values: name|area

Value

A list of all the current StreamCat values for a given parameter

Author(s)

Marc Weber

Examples

```
params <- sc_get_params(param='variable_info')
params <- sc_get_params(param='metric_names')
params <- sc_get_params(param='areaOfInterest')
params <- sc_get_params(param='state')
params <- sc_get_params(param='county')
```

sc_nlcd *Get NLCD Data*

Description

Function to retrieve all NLCD metrics for a given year using the StreamCat API.

Usage

```
sc_nlcd(
  year = "2019",
  comid = NULL,
  aoi = NULL,
  showAreaSqKm = NULL,
  showPctFull = NULL,
  state = NULL,
  county = NULL,
  region = NULL,
  conus = NULL,
  countOnly = NULL
)
```

Arguments

year	Years(s) of NLCD metrics to query. Only valid NLCD years are accepted (i.e. 2001, 2004, 2006, 2008, 2011, 2013, 2016, 2019) Syntax: year=<year1>,<year2>
comid	Return metric information for specific COMIDs Syntax: comid=<comid1>,<comid2>
aoi	Specify the area of interest described by a metric. By default, all available areas of interest for a given metric are returned. Syntax: areaOfInterest=<value1>,<value2> Values: catchment|watershed|riparian_catchment|riparian_watershed|other
showAreaSqKm	Return the area in square kilometers of a given area of interest. The default value is false. Values: true|false
showPctFull	Return the pctfull for each dataset. The default value is false. Values: true|false
state	Return metric information for COMIDs within a specific state. Use a state's abbreviation to query for a given state. Syntax: state=<state1>,<state2>
county	Return metric information for COMIDs within a specific county. Users must use the FIPS code, not county name, as a way to disambiguate counties. Syntax: county=<county1>,<county1>
region	Return metric information for COMIDs within a specified hydroregion. Syntax: region=<regionid1>,<regionid2>
conus	Return all COMIDs in the conterminous United States. The default value is false. Values: true|false
countOnly	Return a CSV containing only the row count (ROWCOUNT) and the column count (COLUMNCOUNT) that the server expects to return in a request. The default value is false. Values: true|false

Value

A tibble of desired StreamCat metrics

Author(s)

Marc Weber

Examples

```
df <- sc_nlcd(year='2001', aoi='cat',comid='179,1337,1337420')

df <- sc_nlcd(year='2001', aoi='ws', region='Region01')

df <- sc_nlcd(year='2001', aoi='ws', region='Region01',
countOnly=TRUE)

df <- sc_nlcd(year='2001', aoi='ws', region='Region01',
showAreaSqKm=FALSE, showPctFull=TRUE)

df <- sc_nlcd(year='2001, 2006', aoi='cat,ws',
comid='179,1337,1337420')
```

Index