Package ‘gwavr’

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Title Get Water Attributes Visually in R

Version 0.2.0

Description Provides methods to Get Water Attributes Visually in R (‘gwavr’). This allows the user to point and click on areas within the United States and get back hydrological data, e.g. flowlines, catchments, basin boundaries, comids, etc.

URL https://github.com/joshualerickson/gwavr/

BugReports https://github.com/joshualerickson/gwavr/issues/

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Encoding UTF-8

RoxygenNote 7.1.2

Imports dplyr, httr, jsonlite, leaflet, leaflet.extras, magrittr, miniUI, nhdplusTools, purrr, scales, sf, shiny, shinyWidgets, tidyr, units, utils, promises, elevatr, whitebox, terra

Suggests spelling, knitr, rmarkdown

Language en-US

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base_map

Description
A generic leaflet base map used in the shiny apps.

Usage
base_map()

Value
A leaflet map with provider layers: "Esri.WorldImagery", "CartoDB.Positron", "OpenStreetMap", "CartoDB.DarkMatter", "OpenTopoMap" "Hydrography"

basinMod

Description
Shiny Module Server for nhdplus

Usage
basinMod(input, output, session, values)

Arguments
input Shiny server function input
output Shiny server function output
session Shiny server function session
values A reactive Values list to pass

Value
server function for Shiny module
**basinModUI**  
*Shiny Module UI for basins*

**Description**
A shiny Module to.

**Usage**
```r
basinModUI(id, ...)
```

**Arguments**
- `id` character id for the the Shiny namespace
- `...` other arguments to `leafletOutput()`

**Value**
UI function for Shiny module

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**get_Basin**  
*Get Basin Boundary NLDI*

**Description**
This function uses the USGS water data API to link a point to a realized basin. This is not the same as delineating from the exact point, rather this API uses NLDI to find the closest basin downstream source point. There is a lot you can do with this API and I would recommend looking at nhdplusTools as that has a lot of functionality and better documentation.

**Usage**
```r
get_Basin(point)
```

**Arguments**
- `point` A sf point object.

**Value**
An sf object with added comid and basin.

**Note**
point needs geometry column.
get_basin_interactively

*Get Watershed Basin Interactively*

**Description**

This function allows the user delineate watershed basins interactively with a shiny app. It uses the elevatr package for DEM and whitebox package to delineate the watershed.

**Usage**

```r
get_basin_interactively(
  ns = "basin-ui",
  viewer = shiny::paneViewer(),
  title = "Delineate Basin",
  ...
)
```

**Arguments**

- `ns` string name for the Shiny namespace to use. The ns is unlikely to require a change.
- `viewer` function for the viewer. See Shiny `viewer`. NOTE: when using `browserViewer(browser = getOption("browser"))` to open the app in the default browser, the browser window will automatically close when closing the app (by pressing "done" or "cancel") in most browsers. Firefox is an exception. See Details for instructions on how to enable this behaviour in Firefox.
- `title` string to customize the title of the UI window. The default is "Delineate Basin".
- `...` other arguments to `leafletOutput()` in module.

**Value**

A list of sf objects that the user collected during shiny session.

**Examples**

```r
if(interactive()){
  nhdplus_data <- get_basin_interactively()
}
```
Description

This function allows the user to get NHDPlus realizations interactively with a shiny app.

Usage

get_nhdplus_interactively(
  ns = "hydro-ui",
  viewer = shiny::paneViewer(),
  title = "NHDPlus",
  ...
)

Arguments

ns  string name for the Shiny namespace to use. The ns is unlikely to require a change.
viewer  function for the viewer. See Shiny viewer. NOTE: when using browserViewer(browser = getOption("browser")) to open the app in the default browser, the browser window will automatically close when closing the app (by pressing "done" or "cancel") in most browsers. Firefox is an exception. See Details for instructions on how to enable this behaviour in Firefox.
title  string to customize the title of the UI window. The default is "NHDPlus".
...

other arguments to leafletOutput() in module.

Value

A list of sf objects that the user collected during shiny session.

Note

The picker list has seven options right now: NHDPlus Catchments, NHDPlus Flowlines, NHDPlus Waterbodies, NHDPlus Outlet, HUC 12, HUC 8, NWIS Site.

Examples

if(interactive()){
  nhdplus_data <- get_nhdplus_interactively()
}
get_NLDI  

*Get NLDI*

**Description**

This function grabs the upstream tributaries, upstream main stream and basin boundary using the NLDI API. It then combines the NLDI zonal stats to the basin boundary shape, i.e. 'TOT' is the 'total' basin zonal statistic.

**Usage**

```r
get_NLDI(point)
```

**Arguments**

- `point` A sf point.

**Value**

A list of UT, UM and basin boundary sf objects

---

get_NLDI_catchments  

*Get NLDI Catchments*

**Description**

This function grabs the 'local' zonal stats for 'all' subcatchments above a point or only for the 'local' catchment using the NLDI API. This is different than get_NLDI(), which grabs the entire basin above a point.

**Usage**

```r
get_NLDI_catchments(point, type = "local", method = "all")
```

**Arguments**

- `point` A sf point object.
- `type` A character 'local' or 'all'.
- `method` A character 'local' or 'all'.

**Value**

A list of sf objects: UT and catchments.

**Note**

This function can be expensive when using type = 'local' and method = 'all' depending on the size of the upstream area.
Description

This function uses the NLDI API to allow the user to visually select a location (point) to get numerous hydrologic realizations.

Usage

get_nldi_interactively()

Value

A list with sf objects.

Note

The picker list has three options right now: Total Basin, All Local Catchments and Only Local Catchment. Descriptions below:

• **Total Basin**: This will return the upstream tributaries (UT), upstream main (UM), basin boundary and site data above the user point.

• **All Local Catchments**: This will return the upstream tributaries (UT) and all the local NHD-PLUSV2 catchments above the user point. In addition, each catchment will contain the zonal stats associated with 'CAT' in NLDI.

• **Only Local Catchment**: This will only return the catchment at the point and tributary. In addition, it will also include the zonal stat for that catchment.

Examples

```r
if(interactive()){
  nldi_data <- get_nldi_interactively()
}
```
get_whitebox_basin    whitebox helpers

Description

whitebox helpers

Usage

get_whitebox_basin(
  sf_point,
  z,
  snap_dist,
  smoothing = TRUE,
  depressions = TRUE,
  ...
)

Arguments

  sf_point   a sf data.frame point(s)
  z          param for elevatr function get_elev_raster()
  snap_dist  distance to snap to stream (in meters)
  smoothing  logical
  depressions logical
  ...        arguments to pass to whitebox tools functions

Value

  a sf polygon

nhdplusMod    Shiny Module Server for nhdplus

Description

Shiny Module Server for nhdplus

Usage

nhdplusMod(input, output, session, values)
Arguments

input  Shiny server function input
output Shiny server function output
session Shiny server function session
values A reactive Values list to pass

Value

server function for Shiny module

---

**nhdplusModUI**  
*Shiny Module UI for nhdplus*

---

Description

A shiny Module to.

Usage

nhdplusModUI(id, ...)

Arguments

id  character id for the the Shiny namespace
... other arguments to leafletOutput()

Value

UI function for Shiny module

---

**nldi_basin_function**  
*Calling NLDI API*

---

Description

Calling NLDI API

Usage

nldi_basin_function(point)

Arguments

point  sf data.frame

Value

a sf data.frame with watershed basin
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