Package ‘scrubr’

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Description Clean biological occurrence records. Includes functionality for cleaning based on various aspects of spatial coordinates, unlikely values due to political ‘centroids’, coordinates based on where collections of specimens are held, and more.
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scrubr-package
coords

description

Description

scrubr - Clean biological occurrence data

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description

coords

Coordinate based cleaning

Usage

coord_incomplete(x, lat = NULL, lon = NULL, drop = TRUE)

coord_imprecise(x, which = "both", lat = NULL, lon = NULL, drop = TRUE)

coord_impossible(x, lat = NULL, lon = NULL, drop = TRUE)

coord_unlikely(x, lat = NULL, lon = NULL, drop = TRUE)

coord_within(
  x,
  field = NULL,
  country = NULL,
```r
lat = NULL,
lon = NULL,
drop = TRUE
)

coord_pol_centroids(x, lat = NULL, lon = NULL, drop = TRUE)

coord_uncertain(
  x,
  coorduncertaintyLimit = 30000,
  drop = TRUE,
  ignore.na = FALSE
)

Arguments

x (data.frame) A data.frame
lat, lon (character) Latitude and longitude column to use. See Details.
drop (logical) Drop bad data points or not. Either way, we parse out bad data points
  as an attribute you can access. Default: TRUE
which (character) one of "has_dec", "no_zeros", or "both" (default)
field (character) Name of field in input data.frame x with country names
country (character) A single country name
coorduncertaintyLimit (numeric) numeric threshold for the coordinateUncertaintyInMeters variable.
  Default: 30000
ignore.na (logical) To consider NA values as a bad point or not. Default: FALSE

Details

Explanation of the functions:

- coord_impossible - Impossible coordinates
- coord_incomplete - Incomplete coordinates
- coord_imprecise - Imprecise coordinates
- coord_pol_centroids - Points at political centroids
- coord_unlikely - Unlikely coordinates
- coord_within - Filter points within user input political boundaries
- coord_uncertain - Uncertain occurrences of measured through coordinateUncertaintyInMeters
  default limit= 30000

If either lat or lon (or both) given, we assign the given column name to be standardized names of
"latitude", and "longitude". If not given, we attempt to guess what the lat and lon column names
are and assign the same standardized names. Assigning the same standardized names makes down-
stream processing easier so that we’re dealing with consistent column names. On returning the data,
we return the original names.

For coord_within, we use countriesLow dataset from the rworldmap package to get country
borders.
Value

Returns a data.frame, with attributes

coord_pol_centroids

Right now, this function only deals with city centroids, using the maps::world.cities dataset of more than 40,000 cities. We’ll work on adding country centroids, and perhaps others (e.g., counties, states, provinces, parks, etc.).

Examples

```r
df <- sample_data_1

# Remove impossible coordinates
NROW(df)
df[1, "latitude"] <- 170
df <- dframe(df) %>% coord_impossible()
NROW(df)
attr(df, "coord_impossible")

# Remove incomplete cases
NROW(df)
df_inc <- dframe(df) %>% coord_incomplete()
NROW(df_inc)
attr(df_inc, "coord_incomplete")

# Remove imprecise cases
df <- sample_data_5
NROW(df)
## remove records that don't have decimals at all
df_imp <- dframe(df) %>% coord_imprecise(which = "has_dec")
NROW(df_imp)
attr(df_imp, "coord_imprecise")
## remove records that have all zeros
df_imp <- dframe(df) %>% coord_imprecise(which = "no_zeros")
NROW(df_imp)
attr(df_imp, "coord_imprecise")
## remove both records that don't have decimals at all and those that ## have all zeros
df_imp <- dframe(df) %>% coord_imprecise(which = "both")
NROW(df_imp)
attr(df_imp, "coord_imprecise")

# Remove unlikely points
NROW(df)
df_unlikely <- dframe(df) %>% coord_unlikely()
NROW(df_unlikely)
attr(df_unlikely, "coord_unlikely")

# Remove points not within correct political borders
```
if (requireNamespace("rgbif", quietly = TRUE)) {
  library("rgbif")
  wkt <- 'POLYGON((30.1 10.1,40 40,20 40,10 20,30.1 10.1))'
  res <- rgbif::occ_data(geometry = wkt, limit=300)$data
} else {
  res <- sample_data_4
}

## By specific country name
NROW(res)
df_within <- dframe(res) %>% coord_within(country = "Israel")
NROW(df_within)
attr(df_within, "coord_within")

## By a field in your data - makes sure your points occur in one
## of those countries
NROW(res)
df_within <- dframe(res) %>% coord_within(field = "country")
NROW(df_within)
head(df_within)
attr(df_within, "coord_within")

## Remove those very near political centroids
## not ready yet
# NROW(df)
# df_polcent <- dframe(df) %>% coord_pol_centroids()
# NROW(df_polcent)
# attr(df_polcent, "coord_polcent")

## lat/long column names can vary
df <- sample_data_1
head(df)
names(df)[2:3] <- c('mylon', 'mylat')
head(df)
df[1, "mylat"] <- 170
df <- sample_data_6

# Remove uncertain occurrences
NROW(df)
df1 <- df %>% coord_uncertain()
NROW(df1)
attr(df, "coord_uncertain")

NROW(df)
df2 <- df %>% coord_uncertain(coorduncertaintyLimit = 20000)
NROW(df2)

NROW(df)
df3 <- df %>% coord_uncertain(coorduncertaintyLimit = 20000, ignore.na=TRUE)
NROW(df3)
Date based cleaning

Usage

date_standardize(x, format = "%Y-%m-%d", date_column = "date", ...)
date_missing(x, date_column = "date", drop = TRUE, ...)
date_create(x, ...)
date_create_(x, ..., .dots, format = "%Y-%m-%d", date_column = "date")

Arguments

x (data.frame) A data.frame
format (character) Date format. See \texttt{as.Date()}
date_column (character) Name of the date column
... Comma separated list of unquoted variable names
drop (logical) Drop bad data points or not. Either way, we parse out bade data points as an attribute you can access. Default: \texttt{TRUE}
.dots Used to work around non-standard evaluation

Details

- \texttt{date_standardize} - Converts dates to a specific format
- \texttt{date_missing} - Drops records that do not have dates, either via being NA or being a zero length character string
- \texttt{date_create} - Create a date field from

Value

Returns a data.frame, with attributes

Examples

\begin{verbatim}
  df <- sample_data_1
  # Standardize dates
  dframe(df) %>% date_standardize()
  dframe(df) %>% date_standardize("%Y/%m/%d")
  dframe(df) %>% date_standardize("%d%b%Y")
  dframe(df) %>% date_standardize("%Y")
\end{verbatim}
# drop records without dates
NROW(df)
NROW(dframe(df) %>% date_missing())

# Create date field from other fields
def <- sample_data_2
## NSE
dframe(df) %>% date_create(year, month, day)
## SE
date_create_(dframe(df), "year", "month", "day")

dedup

## Deduplicate records

### Description
Deduplicate records

### Usage
```r
dedup(x, how = "one", tolerance = 0.9)
```

### Arguments
- **x** (data.frame) A data.frame, tibble, or data.table
- **how** (character) How to deal with duplicates. The default of "one" keeps one record of each group of duplicates, and drops the others, putting them into the `dups` attribute. "all" drops all duplicates, in case e.g., you don’t want to deal with any records that are duplicated, as e.g., it may be hard to tell which one to remove.
- **tolerance** (numeric) Score (0 to 1) at which to determine a match. You’ll want to inspect outputs closely to tweak this value based on your data, as results can vary.

### Value
Returns a data.frame, optionally with attributes

### Examples
```r
df <- sample_data_1
smalldf <- df[1:20, ]
smalldf <- rbind(smalldf, smalldf[10,])
smalldf[21, "key"] <- 1088954555
NROW(smalldf)
dp <- dframe(smalldf) %>% dedup()
NROW(dp)
attr(dp, "dups")
```
# Another example - more than one set of duplicates
df <- sample_data_1
twodups <- df[1:10,]
twodups <- rbind(twodups, twodups[c(9, 10),])
rownames(twodups) <- NULL
NROW(twodups)
dp <- dframe(twodups) %>% dedup()
NROW(dp)
attr(dp, "dups")

---

dframe  Compact data.frame

**Description**
Compact data.frame

**Usage**
dframe(x)

**Arguments**

x  Input data.frame

**Examples**
dframe(sample_data_1)
dframe(mtcars)
dframe(iris)

---

eco_region  Filter points within ecoregions

**Description**
Filter points within ecoregions

**Usage**
eco_region(x, dataset = "meow", region, lat = NULL, lon = NULL, drop = TRUE)
regions_meow()
regions_fao()
Arguments

- **x** (data.frame) A data.frame
- **dataset** (character) the dataset to use. one of: "meow" (Marine Ecoregions of the World), "fao"(). See Details.
- **region** (character) the region name. has the form a:b where a is a variable name (column in the sf object) and b is the value you want to filter to within that variable. See Details.
- **lat, lon** (character) name of the latitude and longitude column to use
- **drop** (logical) Drop bad data points or not. Either way, we parse out bad data points as an attribute you can access. Default: TRUE #param ignore.na (logical) To consider NA values as a bad point or not. Default: FALSE

Details

see scrubr_cache for managing the cache of data

Value

Returns a data.frame, with attributes

dataset options

- Marine Ecoregions of the World (meow):
  - data from: https://opendata.arcgis.com/datasets/ed2be4cf8b7a451f84fd093c2e7660e3_0.geojson
- Food and Agriculture Organization (fao):

region options

- within meow:
  - ECOREGION: many options, see regions_meow()
  - ECO_CODE: many options, see regions_meow()
  - and you can use others as well; run regions_meow() to get the data used within eco_region() and see what variables/columns can be used
- within fao:
  - OCEAN: Atlantic, Pacific, Indian, Arctic
  - SUBOCEAN: 1 through 11 (inclusive)
  - F_AREA (fishing area): 18, 21, 27, 31, 34, 37, 41, 47, 48, 51, 57, 58, 61, 67, 71, 77, 81, 87, 88
  - and you can use others as well; run regions_fao() to get the data used within eco_region() and see what variables/columns can be used
## Not run:
if (requireNamespace("mapview") && requireNamespace("sf")) {
  # Marine Ecoregions of the World
  wkt <- 'POLYGON((-119.8 12.2, -105.1 11.5, -106.1 21.6, -119.8 20.9, -119.8 12.2))'
  res <- rgbif::occ_data(geom = wkt, limit=300)$data
  res2 <- sf::st_as_sf(res, coords = c("decimalLongitude", "decimalLatitude"))
  mapview::mapview(res2)
  tmp <- eco_region(dframe(res), dataset = "meow",
                    region = "ECOREGION:Mexican Tropical Pacific")
  tmp2 <- sf::st_as_sf(tmp, coords = c("decimalLongitude", "decimalLatitude"))
  mapview::mapview(tmp2)
  
  # FAO
  wkt <- 'POLYGON((72.2 38.5, -173.6 38.5, -173.6 -41.5, 72.2 -41.5, 72.2 38.5))'
  manta_ray <- rgbif::name_backbone("Mobula alfredi")$usageKey
  res <- rgbif::occ_data(manta_ray, geom = wkt, limit=300, hasCoordinate = TRUE)
  dat <- sf::st_as_sf(res$data, coords = c("decimalLongitude", "decimalLatitude"))
  dat <- sf::st_set_crs(dat, 4326)
  mapview::mapview(dat)
  tmp <- eco_region(dframe(res$data), dataset = "fao", region = "OCEAN:Indian")
  tmp <- tmp[!is.na(tmp$decimalLongitude), ]
  tmp2 <- sf::st_as_sf(tmp, coords = c("decimalLongitude", "decimalLatitude"))
  tmp2 <- sf::st_set_crs(tmp2, 4326)
  mapview::mapview(tmp2)
}
## End(Not run)

---

**fix_names**  
Change taxonomic names to be the same for each taxon

### Description
That is, this function attempts to take all the names that are synonyms, for whatever reason (e.g., some names have authorities on them), and collapses them to the same string - making data easier to deal with for making maps, etc. OR - you can think of this as a tool for

### Usage
```r
fix_names(x, how = "shortest", replace = NULL)
```

### Arguments
- `x`: (data.frame) A data.frame. the target taxonomic name column should be 'name'
- `how`: One of a few different methods:
  - shortest - Takes the shortest name string that is likely to be the prettiest to display name, and replaces all names with that one, better for maps, etc.
supplied - If this method, supply a vector of names to replace the names with.

replace

A data.frame of names to replace names in the occurrence data.frames with. Only used if how="supplied". The data.frame should have two columns: the first is the names to match in the input x data.frame, and the second column is the name to replace with. The column names don’t matter.

Value

a data.frame

Examples

```r
## Not run:
df <- sample_data_7

# method: shortest
fix_names(df, how="shortest")$name

# method: supplied
(replace_df <- data.frame(
  one = unique(df$name),
  two = c("P. contorta", "P.c. var. contorta",
            "P.c. subsp bolanderi", "P.c. var. murrayana"),
  stringsAsFactors = FALSE))
fix_names(df, how="supplied", replace = replace_df)$name

## End(Not run)
```

---

**Description**

- sample_data_1
- sample_data_2
- sample_data_3
- sample_data_4
- sample_data_6
**Taxonomy based cleaning**

**Usage**

```r
tax_no_epithet(x, name = NULL, drop = TRUE)
```

**Arguments**

- `x` (data.frame) A data.frame
- `name` (character) Taxonomic name field Optional. See Details.
- `drop` (logical) Drop bad data points or not. Either way, we parse out bade data points as an attribute you can access. Default: TRUE

**Value**

Returns a data.frame, with attributes

**Examples**

```r
if (requireNamespace("rgbif", quietly = TRUE)) {
  library("rgbif")
  res <- rgbif::occ_data(limit = 200)$data
} else {
  res <- sample_data_3
}

# Remove records where names don't have genus + epithet
# so removes those with only genus and those with no name (NA or NULL)
NROW(res)
df <- dframe(res) %>% tax_no_epithet(name = "name")
NROW(df)
attr(df, "name_var")
attr(df, "tax_no_epithet")
```
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