

Package ‘arcgeocoder’

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Title Geocoding with the 'ArcGIS' REST API Service

Version 0.4.0

Description Lite interface for finding locations of addresses or businesses around the world using the 'ArcGIS' REST API service <<https://developers.arcgis.com/rest/geocode/api-reference/overview-world-geocoding-service.htm>>. Address text can be converted to location candidates and a location can be converted into an address. No API key required.

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URL <https://dieghernan.github.io/arcgeocoder/>,
<https://github.com/dieghernan/arcgeocoder>

BugReports <https://github.com/dieghernan/arcgeocoder/issues>

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arc_categories	<i>ArcGIS REST API category data base</i>
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Description

Database of available categories that can be used for filtering results provided by `arc_geo()`, `arc_geo_multi()` and `arc_geo_categories()` in `tibble` format.

Format

A `tibble` with 383 rows and fields:

- level_1** Top-level category
- level_2** Second-level category
- level_3** Child-level category

Details

See [ArcGIS REST Category filtering](#) for details and examples.

The geocoding service allows users to search for and geocode many types of addresses and places around the world. This simplifies the application building process, as developers don't need to know what types of places their users are searching for, because the service can decipher that. However, due to this flexibility, it is possible for ambiguous searches to match to many different places, and users may sometimes receive unexpected results. For example, a search for a city may match to a street name, or a search for an airport code may match to a country abbreviation.

For such cases, the service provides the ability to filter out unwanted geocode results with the `category` argument. The `category` argument limits the types of places for which the service searches, thus eliminating false positive matches and potentially speeding up the search process.

The results show a list of categories with three different hierarchy levels (level_1, level_2, level_3). If a level_1 category is requested (i.e. POI) the child categories may be included also in the results.

Note

Data extracted on **15 January 2026**.

Source

[ArcGIS REST Category filtering.](#)

See Also

[arc_geo_categories\(\)](#), [arc_geo\(\)](#), [arc_geo_multi\(\)](#)

Other datasets: [arc_spatial_references](#)

Examples

```
# Get all possible values
data("arc_categories")
arc_categories

# Using categories

sea_1 <- arc_geo("sea",
  custom_query = list(outFields = c("LongLabel", "Type")),
  limit = 2
)

dplyr::glimpse(sea_1)

# An airport, but if we use categories...

sea_2 <- arc_geo("sea",
  custom_query = list(outFields = c("LongLabel", "Type")),
  limit = 2, category = "Food"
)

dplyr::glimpse(sea_2)

# We can use a list of categories
sea_3 <- arc_geo("sea",
  custom_query = list(outFields = c("LongLabel", "Type")),
  sourcecountry = "UK", limit = 5,
  category = c("Amusement Park", "Aquarium")
)

dplyr::glimpse(sea_3)
```

Description

Geocodes addresses given as character values. This function returns the [tibble](#) object associated with the query.

This function uses the SingleLine approach detailed in the [ArcGIS REST docs](#). For multi-field queries (i.e. using specific address components), use [arc_geo_multi\(\)](#).

Usage

```
arc_geo(
  address,
  lat = "lat",
  long = "lon",
  limit = 1,
  full_results = FALSE,
  return_addresses = TRUE,
  verbose = FALSE,
  progressbar = TRUE,
  outsr = NULL,
  langcode = NULL,
  sourcecountry = NULL,
  category = NULL,
  custom_query = list()
)
```

Arguments

address	Single-line address text (e.g. "1600 Pennsylvania Ave NW, Washington") or a vector of addresses (c("Madrid", "Barcelona")).
lat	Latitude column name in the output data (default "lat").
long	Longitude column name in the output data (default "lon").
limit	Maximum number of results to return per input address. Each query has a hard API limit of 50 results.
full_results	Logical; if TRUE return all available API fields via outFields=*. Default is FALSE.
return_addresses	Logical; if TRUE keep input query in output.
verbose	Logical; if TRUE output process messages to console.
progressbar	Logical; if TRUE shows a progress bar for multiple points.
outsr	The spatial reference of the x, y coordinates returned by a geocode request. By default is NULL (i.e. the argument won't be used in the query). See Details and arc_spatial_references .

langcode	Sets the language in which reverse-geocoded addresses are returned.
sourcecountry	Country filter using ISO codes (e.g. "USA"). Multiple values can be specified (comma-separated).
category	Place or address type used as a filter. Multiple values are accepted (e.g. c("Cinema", "Museum")). See arc_categories .
custom_query	Additional API parameters as named list values.

Details

See the [ArcGIS REST docs](#) for more info and valid values.

Value

A [tibble](#) object with the results. See the details of the output in [ArcGIS REST API Service output](#).

outsr

The spatial reference can be specified as either a well-known ID (WKID). If not specified, the spatial reference of the output locations is the same as that of the service (WGS84, i.e. WKID = 4326).

See [arc_spatial_references](#) for values and examples.

References

[ArcGIS REST findAddressCandidates](#).

See Also

[tidygeocoder::geo\(\)](#)

Other functions for geocoding: [arc_geo_categories\(\)](#), [arc_geo_multi\(\)](#), [arc_reverse_geo\(\)](#)

Examples

```
arc_geo("Madrid, Spain")

library(dplyr)

# Several addresses with additional output fields
with_params <- arc_geo(c("Madrid", "Barcelona"),
  custom_query = list(outFields = c("LongLabel", "CntryName"))
)

with_params |>
  select(lat, lon, CntryName, LongLabel)

# With options: restrict search to USA
with_params_usa <- arc_geo(c("Madrid", "Barcelona"),
  sourcecountry = "USA",
  custom_query = list(outFields = c("LongLabel", "CntryName"))
)
```

```
with_params_usa |>
  select(lat, lon, CntryName, LongLabel)
```

arc_geo_categories *Geocode places on a given area by category*

Description

This function is useful for extracting places with a given category (or list of categories) near or within a given location or area. This is a wrapper of [arc_geo\(\)](#), but it is vectorized over category.

See [arc_categories](#) for a detailed explanation and available values.

Note: to obtain results, provide one of the following:

- A pair of coordinates (x, y arguments) used as a reference for geocoding.
- A viewbox (aka bounding box) via the `bbox` argument defining a desired extent for results.

It is possible to combine both approaches (i.e. providing $x, y, bbox$ values) to improve the geocoding process. See **Examples**.

Usage

```
arc_geo_categories(
  category,
  x = NULL,
  y = NULL,
  bbox = NULL,
  name = NULL,
  lat = "lat",
  long = "lon",
  limit = 1,
  full_results = FALSE,
  verbose = FALSE,
  custom_query = list(),
  ...
)
```

Arguments

<code>category</code>	A place or address type that can be used to filter results. Several values can be used as well as a vector (i.e. <code>c("Cinema", "Museum")</code>), performing one call for each value. See Details .
<code>x</code>	longitude values in numeric format. Must be in the range $[-180, 180]$.
<code>y</code>	latitude values in numeric format. Must be in the range $[-90, 90]$.

<code>bbox</code>	A numeric vector of latitude and longitude <code>c(minX, minY, maxX, maxY)</code> that restrict the search area. See Details .
<code>name</code>	Optionally, a string indicating the name or address of the desired results.
<code>lat</code>	Latitude column name in the output data (default "lat").
<code>long</code>	Longitude column name in the output data (default "lon").
<code>limit</code>	Maximum number of results per query. ArcGIS API limits a single request to 50 results.
<code>full_results</code>	Logical; if TRUE return all available API fields via <code>outFields=*</code> . Default is FALSE.
<code>verbose</code>	Logical; if TRUE output process messages to console.
<code>custom_query</code>	Additional API parameters as named list values.
<code>...</code>	Arguments passed on to <code>arc_geo</code>
	<code>sourcecountry</code> Country filter using ISO codes (e.g. "USA"). Multiple values can be specified (comma-separated).
	<code>outsr</code> The spatial reference of the x,y coordinates returned by a geocode request. By default is NULL (i.e. the argument won't be used in the query). See Details and <code>arc_spatial_references</code> .
	<code>langcode</code> Sets the language in which reverse-geocoded addresses are returned.

Details

Bounding boxes can be located using different online tools, as [Bounding Box Tool](#).

For a full list of valid categories see `arc_categories`. This function is vectorized over category, which means it performs one independent call to `arc_geo()` for each category value.

`arc_geo_categories()` also understands a single string of categories separated by commas ("Cinema,Museum"), that would be internally treated as `c("Cinema", "Museum")`.

Value

A `tibble` object with the results. See the details of the output in [ArcGIS REST API Service output](#).

outsr

The spatial reference can be specified as either a well-known ID (WKID). If not specified, the spatial reference of the output locations is the same as that of the service (WGS84, i.e. WKID = 4326).

See `arc_spatial_references` for values and examples.

See Also

[ArcGIS REST Category filtering](#).

`arc_categories`

Other functions for geocoding: `arc_geo()`, `arc_geo_multi()`, `arc_reverse_geo()`

Examples

```

# Full workflow: Gas Stations near Carabanchel, Madrid

# Get Carabanchel
carab <- arc_geo("Carabanchel, Madrid, Spain")

# CRS
carab_crs <- unique(carab$latestWkid)

library(ggplot2)

base_map <- ggplot(carab) +
  geom_point(aes(lon, lat), size = 5, color = "red") +
  geom_rect(aes(xmin = xmin, xmax = xmax, ymin = ymin, ymax = ymax),
    fill = NA,
    color = "blue"
  ) +
  coord_sf(crs = carab_crs)

# Ex1: Search near Carabanchel (not restricted)
ex1 <- arc_geo_categories("Gas Station",
  # Location
  x = carab$lon, y = carab$lat,
  limit = 50, full_results = TRUE
)

# Reduce number of labels to most common ones
library(dplyr)

labs <- ex1 |>
  count(ShortLabel) |>
  slice_max(n = 7, order_by = n) |>
  pull(ShortLabel)

base_map +
  geom_point(data = ex1, aes(lon, lat, color = ShortLabel)) +
  scale_color_discrete(breaks = labs) +
  labs(
    title = "Example 1",
    subtitle = "Search near (points may be far away)"
  )

# Example 2: Include part of the name, different results
ex2 <- arc_geo_categories("Gas Station",
  # Name
  name = "Repsol",
  # Location
  x = carab$lon, y = carab$lat,
  limit = 50, full_results = TRUE
)

```

```
base_map +
  geom_point(data = ex2, aes(lon, lat, color = ShortLabel)) +
  labs(
    title = "Example 2",
    subtitle = "Search near with name"
  )

# Example 3: Near within a extent
ex3 <- arc_geo_categories("Gas Station",
  name = "Repsol",
  bbox = c(carab$xmin, carab$ymin, carab$xmax, carab$ymax),
  limit = 50, full_results = TRUE
)

base_map +
  geom_point(data = ex3, aes(lon, lat, color = ShortLabel)) +
  labs(
    title = "Example 3",
    subtitle = "Search near with name and bbox"
  )
```

arc_geo_multi

Geocoding using the ArcGIS REST API with multi-field query

Description

Geocodes addresses given specific address components. This function returns the [tibble](#) associated with the query.

For geocoding using a single text string use [arc_geo\(\)](#) function.

Usage

```
arc_geo_multi(
  address = NULL,
  address2 = NULL,
  address3 = NULL,
  neighborhood = NULL,
  city = NULL,
  subregion = NULL,
  region = NULL,
  postal = NULL,
  postalext = NULL,
  countrycode = NULL,
  lat = "lat",
  long = "lon",
  limit = 1,
```

```

full_results = FALSE,
return_addresses = TRUE,
verbose = FALSE,
progressbar = TRUE,
outsr = NULL,
langcode = NULL,
category = NULL,
custom_query = list()
)

```

Arguments

address, address2, address3, neighborhood, city, subregion
Address components. See **Details**.

region, postal, postalext, countrycode
Additional address components. See **Details**.

lat Latitude column name in the output data (default "lat").

long Longitude column name in the output data (default "lon").

limit Maximum number of results to return per input address. Each query has a hard API limit of 50 results.

full_results Logical; if TRUE return all available API fields via outFields=*. Default is FALSE.

return_addresses Logical; if TRUE keep input query in output.

verbose Logical; if TRUE output process messages to console.

progressbar Logical; if TRUE shows a progress bar for multiple points.

outsr The spatial reference of the x, y coordinates returned by a geocode request. By default is NULL (i.e. the argument won't be used in the query). See **Details** and [arc_spatial_references](#).

langcode Sets the language in which reverse-geocoded addresses are returned.

category Place or address type used as a filter. Multiple values are accepted (e.g. c("Cinema", "Museum")). See [arc_categories](#).

custom_query Additional API parameters as named list values.

Details

See the [ArcGIS REST docs](#) for more info and valid values.

Value

A [tibble](#) object with the results. See the details of the output in [ArcGIS REST API Service output](#).

The resulting output will include also the input arguments (columns with prefix q_) for better tracking the results.

Address components

This function allows performing structured queries by different components of an address. At least one field should be different than NA or NULL.

A vector of values can be provided for each argument for multiple geocoding. When using vectors on different arguments, their lengths should be the same.

The following list provides a brief description of each argument:

- **address**: A string that represents the first line of a street address. In most cases it will be the **street name and house number** input, but it can also be used to input building name or place-name.
- **address2**: A string that represents the second line of a street address. This can include **street name/house number, building name, place-name, or sub unit**.
- **address3**: A string that represents the third line of a street address. This can include **street name/house number, building name, place-name, or sub unit**.
- **neighborhood**: The smallest administrative division associated with an address, typically, a **neighborhood** or a section of a larger populated place.
- **city**: The next largest administrative division associated with an address, typically, a **city or municipality**.
- **subregion**: The next largest administrative division associated with an address. Depending on the country, a sub region can represent a **county, state, or province**.
- **region**: The largest administrative division associated with an address, typically, a **state or province**.
- **postal**: The **standard postal code** for an address, typically, a three- to six-digit alphanumeric code.
- **postalext**: A **postal code extension**, such as the United States Postal Service ZIP+4 code.
- **countrycode**: A value representing the **country**. Providing this value **increases geocoding speed**. Acceptable values include the full country name in English or the official language of the country, the two-character country code, or the three-character country code.

outsr

The spatial reference can be specified as either a well-known ID (WKID). If not specified, the spatial reference of the output locations is the same as that of the service (WGS84, i.e. WKID = 4326).

See [arc_spatial_references](#) for values and examples.

References

[ArcGIS REST findAddressCandidates](#)

See Also

[tidygeocoder::geo\(\)](#)

Other functions for geocoding: [arc_geo\(\)](#), [arc_geo_categories\(\)](#), [arc_reverse_geo\(\)](#)

Examples

```
simple <- arc_geo_multi(  
  address = "Plaza Mayor", limit = 10,  
  custom_query = list(outFields = c("LongLabel", "CntryName", "Region"))  
)  
  
library(dplyr)  
  
simple |>  
  select(lat, lon, CntryName, Region, LongLabel) |>  
  slice_head(n = 10)  
  
# Restrict search to Spain  
simple2 <- arc_geo_multi(  
  address = "Plaza Mayor", countrycode = "ESP",  
  limit = 10,  
  custom_query = list(outFields = c("LongLabel", "CntryName", "Region"))  
)  
  
simple2 |>  
  select(lat, lon, CntryName, Region, LongLabel) |>  
  slice_head(n = 10)  
  
# Restrict to a region  
simple3 <- arc_geo_multi(  
  address = "Plaza Mayor", region = "Segovia",  
  countrycode = "ESP",  
  limit = 10,  
  custom_query = list(outFields = c("LongLabel", "CntryName", "Region"))  
)  
  
simple3 |>  
  select(lat, lon, CntryName, Region, LongLabel) |>  
  slice_head(n = 10)
```

arc_reverse_geo

Reverse Geocoding using the ArcGIS REST API

Description

Generates an address from a latitude and longitude. Latitudes must be in the range $[-90, 90]$ and longitudes in the range $[-180, 180]$. This function returns the [tibble](#) associated with the query.

Usage

```
arc_reverse_geo(  
  lat = 40.4168, lon = -3.7038, region = "Segovia",  
  countrycode = "ESP", limit = 10,  
  custom_query = list(outFields = c("LongLabel", "CntryName", "Region"))  
)
```

```

x,
y,
address = "address",
full_results = FALSE,
return_coords = TRUE,
verbose = FALSE,
progressbar = TRUE,
outsr = NULL,
langcode = NULL,
featuretypes = NULL,
locationtype = NULL,
custom_query = list()
)

```

Arguments

x	longitude values in numeric format. Must be in the range $[-180, 180]$.
y	latitude values in numeric format. Must be in the range $[-90, 90]$.
address	Output address column name (default "address").
full_results	Logical; if TRUE return all available API fields. FALSE (default) returns latitude, longitude and address only.
return_coords	Logical; if TRUE return input coordinates with results.
verbose	Logical; if TRUE output process messages to console.
progressbar	Logical; if TRUE shows a progress bar for multiple points.
outsr	The spatial reference of the x, y coordinates returned by a geocode request. By default is NULL (i.e. the argument won't be used in the query). See Details and arc_spatial_references .
langcode	Sets the language in which reverse-geocoded addresses are returned.
featuretypes	This argument limits the possible match types returned. By default is NULL (i.e. the argument won't be used in the query). See Details .
locationtype	Specifies whether the output geometry of featuretypes = "PointAddress" or featuretypes = "Subaddress" matches should be the rooftop point or street entrance location. Valid values are NULL (i.e. not using the argument in the query), rooftop and street.
custom_query	API-specific arguments to be used, passed as a named list.

Details

See the [ArcGIS REST docs](#) for more info and valid values.

Value

A [tibble](#) with the corresponding results. The x, y values returned by the API are named lon, lat. Note that these coordinates correspond to the geocoded feature, and may be different from the x, y values provided as inputs.

See the details of the output in [ArcGIS REST API Service output](#).

outsr

The spatial reference can be specified as either a well-known ID (WKID). If not specified, the spatial reference of the output locations is the same as that of the service (WGS84, i.e. WKID = 4326).

See [arc_spatial_references](#) for values and examples.

featuretypes

See `vignette("featuretypes", package = "arcgeocoder")` for a detailed explanation of this argument.

This argument may be used for filtering the type of feature to be returned when geocoding. Possible values are:

- "StreetInt"
- "DistanceMarker"
- "StreetAddress"
- "StreetName"
- "POI"
- "Subaddress"
- "PointAddress"
- "Postal"
- "Locality"

It is also possible to use several values as a vector (`featuretypes = c("PointAddress", "StreetAddress")`).

References

[ArcGIS REST reverseGeocode](#).

See Also

[tidygeocoder::reverse_geo\(\)](#)

Other functions for geocoding: [arc_geo\(\)](#), [arc_geo_categories\(\)](#), [arc_geo_multi\(\)](#)

Examples

```
arc_reverse_geo(x = -73.98586, y = 40.75728)

# Several coordinates
arc_reverse_geo(x = c(-73.98586, -3.188375), y = c(40.75728, 55.95335))

# With options: using some additional arguments
sev <- arc_reverse_geo(
  x = c(-73.98586, -3.188375),
  y = c(40.75728, 55.95335),
  # Restrict to these features
```

```

featuretypes = "POI,StreetInt",
# Result on this WKID
outsr = 102100,
verbose = TRUE, full_results = TRUE
)

dplyr::glimpse(sev)

```

arc_spatial_references

ESRI (ArcGIS) Spatial Reference data base

Description

Database of available spatial references (CRS) in [tibble](#) format.

Format

A [tibble](#) with 9,608 rows and fields:

projtype Projection type ("ProjectedCoordinateSystems", "GeographicCoordinateSystems", "VerticalCoordinateSystems")

wkid Well-Known ID

latestWkid Most recent wkid, in case that wkid is deprecated

authority wkid authority (Esri or EPSG)

deprecated Logical indicating if wkid is deprecated

description Human-readable description of the wkid

areaname Use area of the wkid

wkt Representation of wkid in Well-Known Text (WKT). Useful when working with [sf](#) or [terra](#)

Details

This data base is useful when using the `outsr` argument of the functions.

Some projections ids have changed over time, for example Web Mercator is `wkid = 102100` is deprecated and currently is `wkid = 3857`. However, both values would work, and they would return similar results.

Note

Data extracted on **15 January 2026**.

Source

[ESRI Projection Engine factory](#)

See Also[sf::st_crs\(\)](#)Other datasets: [arc_categories](#)**Examples**

```
# Get all possible values
data("arc_spatial_references")
arc_spatial_references

# Request with deprecated Web Mercator
library(dplyr)
wkid <- arc_spatial_references |>
  filter(latestWkid == 3857 & deprecated == TRUE) |>
  slice(1)

glimpse(wkid)

add <- arc_geo("London, United Kingdom", outsr = wkid$wkid)

# Note values lat, lon and wkid. latestWkid give the current valid wkid
add |>
  select(lat, lon, wkid, latestWkid) |>
  glimpse()

# See with sf

try(sf::st_crs(wkid$wkid))

# But
try(sf::st_crs(wkid$latestWkid))

# or
try(sf::st_crs(wkid$wkt))
```

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