

# Package: geoarea (via r-universe)

September 7, 2024

**Title** Fast, Dependency-Free Geodesic Area Calculations

**Version** 0.0.1.007

**Description** Dependency-free, ultra fast calculation of geodesic areas, using the the reference nanometre-accuracy libraries of Karney (2013) <[doi:10.1007/s00190-012-0578-z](https://doi.org/10.1007/s00190-012-0578-z)>, as used by the 'sf' package. The main function accepts a single input of two columns containing the longitude and latitude coordinates, assumed to be a polygon and represented in WSG84 projection, and returns the area in square metres, and perimeter in metres.

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**URL** <https://github.com/hypertidy/geoarea>

**BugReports** <https://github.com/hypertidy/geoarea/issues>

**Suggests** bench, geosphere, rmarkdown, sf, testthat

**Encoding** UTF-8

**LazyData** true

**NeedsCompilation** yes

**RoxygenNote** 7.2.1

**Config/testthat/edition** 3

**Config/testthat/parallel** true

**Repository** <https://hypertidy.r-universe.dev>

**RemoteUrl** <https://github.com/hypertidy/geoarea>

**RemoteRef** HEAD

**RemoteSha** 45b2efe11ecf198b283f39c9c906ed4eddfb1837

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### Description

Calculation is based on the "geographiclib" code of Charles Karney <doi:10.1007/s00190-012-0578-z>, available at <https://github.com/geographiclib/geographiclib-c>. These calculations are available in many other libraries and R packages, and are notably included in the 'PROJ' library, and used by many packages which depend on that library, including **sf**. The **geosphere** package also includes the C++ version of this code, but depends on the obsolete **sp** package.

### Usage

```
geoarea(x, spherical = FALSE)
```

### Arguments

x	Rectangular object (matrix, data.frame, <b>tibble</b> , whatever) containing longitude and latitude coordinates of a polygon.
spherical	If 'TRUE', calculate approximate area presuming spherical geometry, using method of Bevis and Cambareri (1987) <doi:10.1007/BF00897843>.

### Details

In contrast to all other implementations, this function performs no pre-processing or input checking whatsoever, and simply aims to provide the fastest way to calculate areas of polygons expressed in longitudes and latitudes.

### Value

A vector of two numbers quantifying the area and perimeter of the polygon 'x'. The 'cheap = TRUE' method does not calculate perimeters, and returns 'NA' for the second value.

### Examples

```
# Perimeter of Antarctica as documented in original 'geographiclib' code
lats <- c (-72.9, -71.9, -74.9, -74.3, -77.5, -77.4, -71.7, -65.9, -65.7,
          -66.6, -66.9, -69.8, -70.0, -71.0, -77.3, -77.9, -74.7)
lons <- c (-74, -102, -102, -131, -163, 163, 172, 140, 113, 88, 59, 25, -4,
          -14, -33, -46, -61)
xy <- cbind (lons, lats)
geoarea (xy)
```

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