

# Package ‘maptiles’

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**Title** Download and Display Map Tiles

**Version** 0.8.0

**Description** To create maps from tiles, 'maptiles' downloads, composes and displays tiles from a large number of providers (e.g. 'OpenStreetMap', 'Stadia', 'Esri', 'CARTO', or 'Thunderforest').

**URL** <https://github.com/riatelab/maptiles/>

**BugReports** <https://github.com/riatelab/maptiles/issues/>

**License** GPL-3

**Depends** R (>= 3.5.0)

**Imports** sf (>= 0.9-5), curl, digest, graphics, grDevices, png, terra, tools, slippymath, utils

**Suggests** covr, tinytest

**Encoding** UTF-8

**RoxygenNote** 7.3.2

**NeedsCompilation** no

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**Repository** CRAN

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create_provider	<i>Create a new tile provider</i>
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### Description

Use this function to create new tiles provider.

### Usage

```
create_provider(name, url, sub = NA, citation)
```

### Arguments

name	name of the provider.
url	url of the provider. The url must contain {x}, {y} and {z} placeholders. It may also contain {s} for sub-domains or {apikey} for API keys (see Examples).
sub	sub-domains.
citation	attribution text of the provider.

### Value

a list is returned. This list can be used by [get\\_tiles](#).

### Examples

```
stadia_toner <- create_provider(
  name = "stadia_stamen_toner",
  url = "https://tiles.stadiamaps.com/tiles/stamen_toner/{z}/{x}/{y}.png?api_key={apikey}",
  citation = "© Stadia Maps © Stamen Design © OpenMapTiles © OpenStreetMap contributors"
)
opentopomap <- create_provider(
  name = "otm",
  url = "https://{s}.tile.opentopomap.org/{z}/{x}/{y}.png",
  sub = c("a", "b", "c"),
  citation = "map data: © OpenStreetMap contributors, SRTM | map style: © OpenTopoMap (CC-BY-SA)"
)
IGN <- create_provider(
  name = "orthophoto_IGN",
  url = paste0(
    "https://data.geopf.fr/wmts?",
    "request=GetTile",
    "&service=WMTS",
    "&version=1.0.0",
    "&style=normal",
    "&tilematrixset=PM_6_18",
    "&format=image/jpeg",
    "&layer=ORTHOIMAGERY.ORTHOPHOTOS.BDORTHO",
```

```
      "&tilematrix={z}",
      "&tilerow={y}",
      "&tilecol={x}"
    ),
    citation = "IGN, BD ORTHO®"
  )

# Find TileMatrixSet and Style values
layer <- "ORTHOIMAGERY.ORTHOPHOTOS.BDORTHO"
path <- "https://data.geopf.fr/wmts?"
param_info <- "service=wmts&request=GetCapabilities&version=1.0.0"
url <- paste0("WMTS:", path, param_info, ",layer=", layer)
## Not run:
tmp <- tempfile(fileext = ".xml")
sf::gdal_utils(
  util = "translate",
  source = url, destination = tmp,
  options = c("-of", "WMTS")
)
readLines(tmp)

## End(Not run)
```

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get\_credit

*Get basemap tiles attribution*

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## Description

Get the attribution of map tiles.

## Usage

```
get_credit(provider)
```

## Arguments

provider            provider name or provider object (as produced by [create\\_provider](#)).

## Examples

```
get_credit("OpenStreetMap")
```

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get_providers	<i>Providers</i>
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**Description**

List of builtin providers with their name, URL, subdomains and attribution text.

**Usage**

```
get_providers()
```

**Value**

A list of is returned.

**Examples**

```
get_providers()
```

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get_tiles	<i>Get basemap tiles from map servers</i>
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**Description**

Get map tiles based on a spatial object extent. Maps can be fetched from various map servers.

**Usage**

```
get_tiles(  
    x,  
    provider = "OpenStreetMap",  
    zoom,  
    crop = FALSE,  
    project = TRUE,  
    verbose = FALSE,  
    apikey,  
    cachedir,  
    forceDownload = FALSE  
)
```

**Arguments**

x	sf, sfc, bbox, SpatRaster, SpatVector or SpatExtent object. If x is a SpatExtent it must express coordinates in lon/lat WGS84 (epsg:4326).
provider	tile server to get the tiles from. It can be one of the builtin providers (see Details for the list) or a named list produced by <code>create_provider</code> (see Examples).
zoom	zoom level (see Details).
crop	TRUE if results should be cropped to the specified x extent, FALSE otherwise. If x is an sf object with one POINT, crop is set to FALSE.
project	if TRUE, the output is projected to the crs of x. If FALSE the output uses "EPSG:3857" (Web Mercator).
verbose	if TRUE, tiles filepaths, zoom level and attribution are displayed.
apikey	API key. Not needed for Thunderforest or Stadia servers if environment variables named "THUNDERFOREST_MAPS" or "STADIA_MAPS" are set.
cachedir	name of a folder used to cache tiles. If not set, tiles are cached in a <code>tempdir</code> folder.
forceDownload	if TRUE, existing cached tiles may be overwritten.

**Details**

Zoom levels are described in the OpenStreetMap wiki: [https://wiki.openstreetmap.org/wiki/Zoom\\_levels](https://wiki.openstreetmap.org/wiki/Zoom_levels).

Providers:

"OpenStreetMap", "OpenStreetMap.DE", "OpenStreetMap.France", "OpenStreetMap.HOT", "Open-TopoMap",  
 "Stadia.StamenToner", "Stadia.StamenTonerBackground", "Stadia.StamenTonerLines", "Stadia.StamenTonerLabels",  
 "Stadia.StamenTonerLite", "Stadia.StamenWatercolor", "Stadia.StamenTerrain", "Stadia.StamenTerrainBackground",  
 "Stadia.StamenTerrainLabels",  
 "Esri.WorldStreetMap", "Esri.WorldTopoMap", "Esri.WorldImagery", "Esri.WorldTerrain", "Esri.WorldShadedRelief",  
 "Esri.OceanBasemap", "Esri.NatGeoWorldMap", "Esri.WorldGrayCanvas",  
 "CartoDB.Positron", "CartoDB.PositronNoLabels", "CartoDB.PositronOnlyLabels", "CartoDB.DarkMatter",  
 "CartoDB.DarkMatterNoLabels", "CartoDB.DarkMatterOnlyLabels", "CartoDB.Voyager", "Car-  
 toDB.VoyagerNoLabels", "CartoDB.VoyagerOnlyLabels",  
 "Thunderforest.OpenCycleMap", "Thunderforest.Transport", "Thunderforest.TransportDark", "Thun-  
 derforest.SpinalMap", "Thunderforest.Landscape", "Thunderforest.Outdoors", "Thunderforest.Pioneer",  
 "Thunderforest.MobileAtlas", "Thunderforest.Neighbourhood"

**Value**

A SpatRaster is returned.

**Examples**

```
## Not run:
library(sf)
library(maptiles)
```

```
nc <- st_read(system.file("shape/nc.shp", package = "sf"), quiet = TRUE)
nc_osm <- get_tiles(nc, crop = TRUE, zoom = 6)
plot_tiles(nc_osm)

# Create a provider from a custom url
osm_tiles <- create_provider(
  name = "osm_tiles",
  url = "https://tile.openstreetmap.org/{z}/{x}/{y}.png",
  citation = "© OpenStreetMap contributors."
)
# Download tiles and compose raster (SpatRaster)
nc_osm2 <- get_tiles(
  x = nc, provider = osm_tiles, crop = FALSE,
  zoom = 6, project = FALSE, verbose = TRUE
)
# Plot the tiles
plot_tiles(nc_osm2)
# Add attribution
mtext(get_credit(osm_tiles), side = 1, line = -1)

## End(Not run)
```

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maptiles

*Download and Display Map Tiles*

---

## Description

To create maps from tiles, `maptiles` downloads, composes and displays tiles from a large number of providers (e.g. OpenStreetMap, Stamen, Esri, CARTO, or Thunderforest).

## Author(s)

**Maintainer:** `Timothée Giraud <timothee.giraud@cnrs.fr>` ([ORCID](#))

Other contributors:

- `Diego Hernangómez` ([ORCID](#)) [contributor]
- `Robert J. Hijmans` ([ORCID](#)) [contributor]
- `Hugh A. Graham` [contributor]

## See Also

Useful links:

- <https://github.com/riatelab/maptiles/>
- Report bugs at <https://github.com/riatelab/maptiles/issues/>

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plot\_tiles

*Plot map tiles*

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### Description

Plot map tiles.

### Usage

```
plot_tiles(x, adjust = FALSE, add = FALSE, ...)
```

### Arguments

x	a SpatRaster object.
adjust	if TRUE, plot the raster without zoom-in or zoom-out in the graphic device: add margins if the raster is smaller than the graphic device, zoom-in if the raster is larger than the graphic device. This feature does not work with an unprojected (lon/lat) raster.
add	whether to add the layer to an existing plot (TRUE) or not (FALSE).
...	balpha, smooth, or other arguments passed to be passed to <a href="#">plotRGB</a>

### Note

This function is a wrapper for [plotRGB](#) from the terra package.

### Examples

```
## Not run:
library(sf)
library(maptiles)
nc <- st_read(system.file("shape/nc.shp", package = "sf"), quiet = TRUE)
nc_osm <- get_tiles(nc, crop = TRUE)
plot_tiles(nc_osm)

## End(Not run)
```

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