

Package: tmap (via r-universe)

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Title Thematic Maps

Version 4.4-1.9000

Description Thematic maps are geographical maps in which spatial data distributions are visualized. This package offers a flexible, layer-based, and easy to use approach to create thematic maps, such as choropleths and bubble maps.

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URL <https://github.com/r-tmap/tmap>, <https://r-tmap.github.io/tmap/>

BugReports <https://github.com/r-tmap/tmap/issues>

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`tmap-package`*Thematic Map Visualization*

Description

Thematic maps are geographical maps in which spatial data distributions are visualized. This package offers a flexible, layer-based, and easy to use approach to create thematic maps, such as choropleths and bubble maps. It is based on the grammar of graphics, and resembles the syntax of `ggplot2`.

Author(s)

Martijn Tennekes <mtennekes@gmail.com>

References

Tennekes, M., 2018, tmap: Thematic Maps in R, Journal of Statistical Software, 84(6), 1-39, [doi:10.18637/jss.v084.i06](https://doi.org/10.18637/jss.v084.i06)

See Also

[Main documentation](#)

`.tmap_providers`*Get basemap tile providers*

Description

Get basemap tile providers and their credits (attribution text). `tmap_providers()` returns a list or vector of provider names or credits. `tmap_provider_credits()` returns the attribution text for a specific provider.

Usage

```
.tmap_providers
```

```
tmap_provider_credits(provider)
```

```
tmap_providers(mode, credits = FALSE, as.list = credits)
```

Arguments

<code>provider</code>	provider name
<code>mode</code>	mode. If not specified the current active mode is used.
<code>credits</code>	If TRUE the credit (attribution) text is returned. If FALSE (default) the provider name.
<code>as.list</code>	Should the output be returned as a list where names are provider names? By default TRUE when credits is also TRUE.

Details

`.tmap_providers` is an environment populated with all available provider names as named entries. Its primary purpose is to enable autocomplete in IDEs such as RStudio: typing `.tmap_providers$` in the console or a script triggers a dropdown list of all available providers, making it easy to discover and select provider names without consulting the documentation. It is not intended to be called as a function.

Value

`tmap_providers()` returns a list or vector (see `as.list`) of provider names or credits. `tmap_provider_credits()` returns the attribution text for the specified provider. `.tmap_providers` is an environment; see Details.

Examples

```
# List all providers for the current mode
tmap_providers()

# Use IDE autocomplete to discover providers interactively:
# type .tmap_providers$ in the RStudio console
```

land	<i>Spatial data of global land cover</i>
------	--

Description

Spatial data of global land cover, percent tree cover, and elevation of class `stars`. Two attributes in this object relates to global land cover. The `cover` layer classifies the status of land cover of the whole globe into 20 categories, while the `cover_cls` layer uses 8 simplified categories. Percent Tree Cover (trees) represents the density of trees on the ground, and the last attribute represents elevation.

Usage

```
land
```

Format

An object of class `stars` with 1080 rows and 540 columns.

Details

Important: publication of these maps is only allowed when cited to Tateishi et al. (2014), and when "Geospatial Information Authority of Japan, Chiba University and collaborating organizations." is shown.

References

Production of Global Land Cover Data - GLCNMO2008, Tateishi, R., Thanh Hoan, N., Kobayashi, T., Alsaadeh, B., Tana, G., Xuan Phong, D. (2014), Journal of Geography and Geology, 6 (3).

metro

Spatial data of metropolitan areas

Description

metro includes a population time series from 1950 to (forecasted) 2030. All metro areas with over 1 million inhabitants in 2010 are included.

Usage

metro

Format

An object of class sf (inherits from data.frame) with 436 rows and 13 columns.

Source

<https://population.un.org/wup/>

References

United Nations, Department of Economic and Social Affairs, Population Division (2014). World Urbanization Prospects: The 2014 Revision, CD-ROM Edition.

NLD_prov	<i>Spatial data of the Netherlands</i>
----------	--

Description

Datasets of the Netherlands for 2022 at three levels: NLD_prov (12) provinces, NLD_muni (345) municipalities and NLD_dist (3340) districts , all class [sf](#)

Usage

NLD_prov

NLD_muni

NLD_dist

Details

The data variables for NLD_muni and NLD_dist are identical:

Variable	Description
code	Code. Format is "GMaaaa" (municipality/' g emeente') and "WKaaaabb" (district/ w ijk). Here, "aaaa"
name	Name.
province	Province name.
area	Total area in km2. This area corresponds to the area of the polygons (including inland waters, exclud
urbanity	Level of urbanity. Five classes, determined by the number of addresses per km2 (break values are 25
population	The total population count at 2022-01-01.
pop_0_14	Percentage (rounded) of people between 0 and 15.
pop_15_24	Percentage (rounded) of people between 15 and 25.
pop_25_44	Percentage (rounded) of people between 25 and 45.
pop_45_64	Percentage (rounded) of people between 45 and 65.
pop_65plus	Percentage (rounded) of people of 65 and older.
dwelling_total	Number of dwellings.
dwelling_value	Average dwelling value (Dutch: WOZ-value).
dwelling_ownership	Percentage of dwellings owned by the residents.
employment_rate	Share of the employed population within the total population from 15 to 75 years old.
income_low	Percentage of individuals in private households belonging to the lowest 40% of personal income nati
income_high	Percentage of individuals in private households belonging to the highest 20% of personal income nat
edu_appl_sci	Percentage of people aged 15 to 75 with a university of applied sciences (Dutch: HBO) or university

See source for detailed information about the variables.

This dataset, created Noveber 2024, is an update from the datasets NLD_muni and NLD_prov used in tmap <= 3, which has been created around 2016. Note that the number of municipalities have been reduced (due to mergings). All old variables are included, except for variables related to ethnicity. Many new variable have been added, and moreover, district (Dutch: *wijk*) level data have added: NLD_dist.

The CRS (coordinate reference system) used is the Rijksdriekhoekstelsel New, EPSG 28992. Coordinates have been rounded to meters to reduce file size.

Source

<https://www.cbs.nl/nl-nl/maatwerk/2024/11/kerncijfers-wijken-en-buurt-en-2022>

References

Statistics Netherlands (2024), The Hague/Heerlen, Netherlands, <https://www.cbs.nl/>.

print.tmap	<i>Display thematic map</i>
------------	-----------------------------

Description

Display thematic map

Usage

```
## S3 method for class 'tmap'
print(
  x,
  return.asp = FALSE,
  show = TRUE,
  vp = NULL,
  knit = FALSE,
  options = NULL,
  in.shiny = FALSE,
  proxy = FALSE,
  ...
)

## S3 method for class 'tmap'
knit_print(x, ..., options = NULL)
```

Arguments

x	tmap object.
return.asp	should the aspect ratio be returned?
show	show the map
vp	viewport (for "plot" mode)
knit	A logical, should knit?
options	A vector of options
in.shiny	A logical, is the map drawn in shiny ?

proxy	A logical, if in.shiny, is <code>tmapProxy()</code> used?
...	passed on internally (for developers: in "view" mode, the proxy leaflet object is passed to <code>tmapLeafletInit</code>).

qtm

Quick thematic map plot

Description

Display a thematic map quickly. This function is a convenient wrapper of the main plotting method of stacking `tmap-elements`. Without arguments or with a search term, this functions draws an interactive map.

Usage

```
qtm(
  shp = NULL,
  fill = tmap::tm_const(),
  col = tmap::tm_const(),
  size = tmap::tm_const(),
  shape = tmap::tm_const(),
  lwd = tmap::tm_const(),
  lty = tmap::tm_const(),
  fill_alpha = tmap::tm_const(),
  col_alpha = tmap::tm_const(),
  text = tmap::tm_const(),
  text_col = tmap::tm_const(),
  text_size = tmap::tm_const(),
  by = NULL,
  scale = NULL,
  title = NULL,
  crs = NULL,
  bbox = NULL,
  basemaps = NA,
  overlays = NA,
  zindex = NA,
  group = NA,
  group.control = "check",
  style = NULL,
  format = NULL,
  ...
)
```

Arguments

shp	One of:
-----	---------

- shape object, which is an object from a class defined by the [sf](#) or [stars](#) package. Objects from the packages `sp` and `raster` are also supported, but discouraged.
- Not specified, i.e. `qtm()` is executed. In this case a plain interactive map is shown.
- An OpenStreetMap search string, e.g. `qtm("Amsterdam")`. In this case a plain interactive map is shown positioned according to the results of the search query (from OpenStreetMap nominatim)

`fill, col, size, shape, lwd, lty, fill_alpha, col_alpha`

Map variables.

`text, text_col, text_size`

Map variables.

`by` data variable name by which the data is split, or a vector of two variable names to split the data by two variables (where the first is used for the rows and the second for the columns). See also [tm_facets\(\)](#).

`scale` numeric value that serves as the global scale parameter. All font sizes, symbol sizes, border widths, and line widths are controlled by this value. The parameters `symbols.size`, `text.size`, and `lines.lwd` can be scaled separately with respectively `symbols.scale`, `text.scale`, and `lines.scale`. See also

`title` main title. For legend titles, use `X.legend`, where `X` is the layer name (see ...).

`crs` Either a [crs](#) object or a character value (PROJ.4 character string). By default, the projection is used that is defined in the shp object itself.

`bbox` bounding box. Argument passed on to [tm_shape\(\)](#)

`basemaps` name(s) of the provider or an URL of a tiled basemap. It is a shortcut to [tm_basemap\(\)](#). Set to NULL to disable basemaps. By default, it is set to the tmap option `basemaps`.

`overlays` name(s) of the provider or an URL of a tiled overlay map. It is a shortcut to [tm_tiles\(\)](#).

`zindex` Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.

`group` group

`group.control` group.control

`style` Layout options (see [tm_layout\(\)](#)) that define the style. See [tmap_style\(\)](#) for details.

`format` Deprecated, see [tm_format\(\)](#) for alternatives

... arguments associated with the map variables are passed on to the layer functions [tm_polygons\(\)](#), [tm_lines\(\)](#), [tm_symbols\(\)](#), and [tm_text\(\)](#). For instance, `fill.scale` is the scale specifications of the fill color of polygons (see [tm_polygons\(\)](#)).

Details

The first argument is a shape object (normally specified by [tm_shape\(\)](#)). The next arguments, from `fill` to `raster`, are the map variables from the main layers. The remaining arguments are related

to the map layout. Any argument from any main layer function, such as `tm_polygons()`, can be specified (see ...). It is also possible to stack `tmap-elements` on a `qtm` plot. See examples.

By default, a scale bar is shown. This option can be set with `tmap_options()` (argument `qtm.scalebar`). A minimap is shown by default when `qtm` is called without arguments or with a search term. This option can be set with `tmap_options()` (argument `qtm.minimap`).

zindex and pane names:

In view mode, each layer is rendered in a Leaflet pane named `"tmap{zindex}"` (e.g., `"tmap401"`, `"tmap402"`), with base tile layers placed in the standard `"tile"` pane.

Value

A `tmap-element`

References

Tennekes, M., 2018, `tmap`: Thematic Maps in R, Journal of Statistical Software, 84(6), 1-39, [doi:10.18637/jss.v084.i06](https://doi.org/10.18637/jss.v084.i06)

Examples

```
data(World, World_rivers, metro)

# just the map
qtm(World)

# choropleth
qtm(World, fill = "economy", style = "cobalt", crs = "+proj=eck4")

qtm(World, col = NULL) +
  qtm(metro, size = "pop2010",
    size.legend = tm_legend("Metropolitan Areas"))

# dot map
## Not run:
current.mode <- tmap_mode("view")
qtm(metro, bbox = "China")
tmap_mode(current.mode) # restore mode

## End(Not run)

## Not run:
# without arguments, a plain interactive map is shown (the mode is set to view)
qtm()

# search query for OpenStreetMap nominatim
qtm("Amsterdam")

## End(Not run)
```

Description

- `tmapOutput()` creates a UI element
- `renderTmap()` renders a tmap map
- `tmapProxy()` updates a tmap map in view mode

Adding layers is as usual via the map layer functions like `tm_polygons()`. Removing layers can be done, removing with `tm_remove_layer()`.

Usage

```
renderTmap(
  expr,
  env = parent.frame(),
  quoted = FALSE,
  execOnResize = TRUE,
  mode = NA
)
```

```
tmapOutput(outputId, width = "100%", height = 400, mode = NA)
```

```
tmapProxy(mapId, session = shiny::getDefaultReactiveDomain(), x, mode = NA)
```

```
tm_remove_layer(zindex)
```

```
renderTmapGS(x, ...)
```

```
tmapOutputGS(x, ...)
```

```
tmapProxyGS(x, ...)
```

Arguments

<code>expr</code>	A tmap object. A tmap object is created with <code>qtm()</code> or by stacking <code>tmap-elements</code> .
<code>env</code>	The environment in which to evaluate <code>expr</code>
<code>quoted</code>	Is <code>expr</code> a quoted expression (with <code>quote()</code>)? This is useful if you want to save an expression in a variable
<code>execOnResize</code>	If TRUE (default), when the plot is resized, the map is regenerated. When set to FALSE the map is rescaled: the aspect ratio is kept, but the layout will be less desirable.
<code>mode</code>	tmap mode, see <code>tmap_mode()</code> If not defined, the current mode is used
<code>outputId</code>	Output variable to read from

width, height	the width and height of the map
mapId	single-element character vector indicating the output ID of the map to modify (if invoked from a Shiny module, the namespace will be added automatically)
session	the Shiny session object to which the map belongs; usually the default value will suffice
x	the tmap object that specifies the added and removed layers.
zindex	The stacking number of the layer to be removed. It is recommended to specify the zindex for this layer when creating the map (inside renderTmap()).
...	passed on to the mode-specific methods

Details

Two features from tmap are not (yet) supported in Shiny: small multiples (facets) and colored backgrounds (argument `bg.color` of `tm_layout()`). Workarounds for small multiples: create multiple independent maps or specify `as.layers = TRUE` in `tm_facets()`.

See Also

[Shiny integration](#)

Examples

```
if (interactive() && require("shiny")) {

  data(World)
  world_vars <- setdiff(names(World), c("iso_a3", "name", "sovereign", "geometry"))

  current.mode <- tmap_mode("plot")

  shinyApp(
    ui = fluidPage(
      tmapOutput("map", height = "600px"),
      selectInput("var", "Variable", world_vars)
    ),
    server <- function(input, output, session) {
      output$map <- renderTmap({
        tm_shape(World) +
          tm_polygons(input$var, zindex = 401)
      })
    }
  )

  tmap_mode("view")

  shinyApp(
    ui = fluidPage(
      tmapOutput("map", height = "600px"),
      selectInput("var", "Variable", world_vars)
    ),
    server <- function(input, output, session) {
```

```

output$map <- renderTmap({
  tm_shape(World, id = "iso_a3") +
    tm_polygons(fill = world_vars[1], zindex = 401)
})
observe({
  var <- input$var
  tmapProxy("map", session, {
    tm_remove_layer(401) +
      tm_shape(World, id = "iso_a3") +
      tm_polygons(fill = var, zindex = 401)
  })
})
}, options = list(launch.browser=TRUE)
)

tmap_mode(current.mode)
}

```

theme_ps

ggplot2 theme for proportional symbols

Description

ggplot2 theme for proportional symbols. By default, this theme only shows the plotting area, so without titles, axes, and legend.

Usage

```

theme_ps(
  base_size = 12,
  base_family = "",
  plot.axes = FALSE,
  plot.legend = FALSE
)

```

Arguments

base_size	base size
base_family	base family
plot.axes	should the axes be shown?
plot.legend	should the legend(s) be shown?

tm_add_legend

*Map component: manual legend***Description**

Map component that adds a manual legend.

Usage

```
tm_add_legend(
  ...,
  labels = "",
  type = "symbols",
  title = "",
  orientation = NULL,
  position = NULL,
  group_id = NA_character_,
  group = NA,
  group.control = "check",
  z = NA_integer_
)
```

Arguments

...	map variables and arguments passed on to <code>tm_legend()</code> . By default, the argument type is set to "symbols", which means that the supported map variables are: "fill", "col", "shape", "size", "fill_alpha", "col_alpha", "lty", "lwd", "linejoin", and "lineend". The number of legend items will be equal to the maximum number of specific values (and specified labels.)
labels	labels by default "" (so omitted)
type	the layer type from which the map variables (see ...) are taken. Options: "symbols" (default), "lines", "polygons", and "text".
title	The title of the legend.
orientation	The orientation of the legend.
position	The position of the legend. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in <code>tm_components()</code> where its argument <code>id</code> should correspond to <code>group_id</code> .
group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)

group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
z	z index, e.g. the place of the component relative to the other componets

See Also

[Legends \(advanced\)](#), [Positioning of components](#)

Examples

```
## Not run:
tm_shape(NLD_muni) +
  tm_borders() +
  tm_basemap("OpenStreetMap") +
  tm_add_legend(labels = c("Motorway", "Primary road", "Secondary road", "Railway"),
    col = c("#E892A1", "#FCD6A4", "#F8FABF", "#707070"),
    lty = c("solid", "solid", "solid", "dotted"),
    lwd = 3,
    type = "lines",
    bg.color = "grey92",
    bg.alpha = 1)

## End(Not run)
```

tm_animate_fast	<i>Specify an animation</i>
-----------------	-----------------------------

Description

Specify an animation from a tmap plot. This is similar to creating facets with `tm_facets()`. The animation subsequently can be exported to a gif or video file (e.g. mp4) with `tmap_animation()`. If the tmap plot with `tm_animate()` is printed, the animation will be previewed. The default `tm_animate()` will show the individual frames slowly (frame per seconds (fps) set to 2) whereas `tm_animate_fast()` will show them like a movie (with a fps set to 24).

Usage

```
tm_animate_fast(
  frames = "VARS__",
  nframes = 60L,
  fps = 24L,
  play = c("loop", "pingpong", "once"),
  dpr = 2,
  ...
)
```

```
tm_animate(
  frames = "VARs__",
  nframes = 60L,
  fps = 2L,
  play = c("loop", "pingpong", "once"),
  dpr = 2,
  ...
)
```

Arguments

frames	group by variable used to create the animation frames. This is similar to the by argument of tm_facets_wrap() . Instead of showing facets next to each other, they are shown as animation frames. However, under the hood frames will be used to specify pages of tm_facets() . This makes it possible to create an animation of regular facets.
nframes	number of animation frames. So far, this only applied experimentally in transition map variables. See the extension package tmap.cartogram .
fps	frames per second. Default: 30 for tm_facets_animate and 2 for tm_facets_animate_slow .
play	how should the animation be played? One of "loop" (default), "pingpong", and "once", where "loop" means that the animation will loop indefinitely, "pingpong" means that it will play forward and then backward, and "once" means that it will play only once.
dpr	device pixel ratio. The ratio between the physical pixel density of a device and its logical pixel density.
...	passed on to tm_facets() . Note that for animated facets, by can be specified to create animated facet wraps, and rows and cols to create animated facet grids.

Note

In older versions (< 4.1) [tm_facets\(\)](#) with page specification was used to create animation frames and [tmap_animation\(\)](#) to create the animation itself using inputs like the frame rate specification. As of version 4.2, the whole animation, including frame rate, is specified in [tm_animate\(\)](#). The animation can still be saved via [tmap_animation\(\)](#).

See Also

[Animations](#), [tmap.cartogram](#)

Examples

```
if (interactive()) {
  tm_shape(NLD_prov) +
    tm_polygons("yellow") +
    tm_animate(frames = "name")

  tm_shape(metro) +
    tm_symbols(size = paste0("pop", seq(1950, 2030, by=10)),
              size.free = FALSE,
```

```

      size.legend = tm_legend("Population")) +
    tm_layout(panel.labels = seq(1970, 2030, by=10)) +
    tm_animate()
  }

```

tm_basemap

Map layer: basemap / overlay tiles

Description

Map layer that draws tiles from a tile server. `tm_basemap()` draws the tile layer as basemap, i.e. as bottom layer. In contrast, `tm_tiles()` draws the tile layer as overlay layer, where the stacking order corresponds with the order in which this layer is called, just like other map layers.

Usage

```

tm_basemap(
  server = NA,
  alpha = NULL,
  zoom = NULL,
  api = NULL,
  max.native.zoom = 17,
  sub = "abc",
  zindex = 0,
  group = NA,
  group.control = "radio"
)

```

```

tm_tiles(
  server = NA,
  alpha = NULL,
  zoom = NULL,
  max.native.zoom = 17,
  sub = "abc",
  zindex = NA,
  group = NA,
  group.control = "check"
)

```

Arguments

server	Name of the provider or an URL. Or a vector of multiple values. The list of available providers can be obtained with <code>providers</code> (tip: in RStudio, type <code>leaflet::providers\$</code> to see the options). See https://leaflet-extras.github.io/leaflet-providers/preview/ for a preview of those. When a URL is provided, it should be in template format, e.g. <code>"https://{s}.tile.openstreetmap.org/{z}/{x}/{y}.png"</code> . Use <code>NULL</code> in <code>tm_basemap()</code> to disable basemaps. It can be a named vector. In
--------	--

	that case these names will be used a group names, as alternative to the argument group.
alpha	Transparency level
zoom	Zoom level (only used in plot mode)
api	API key. Required for CartoDB basemaps (plot and view mode), Stadia/Thunderforest maps (plot mode), and Esri/MapTiler basemaps in "maplibre"/"mapbox" mode (alternatively set the env var ARCGIS_API_KEY / MAPTILER_API_KEY). See details
max.native.zoom	Maximum native zoom level (only used in view mode). The minimum and maximum zoom levels are determined in tm_view().
sub	subdomain of the tile server. Only used when server is a url template. The default is "abc" which works for most tile servers.
zindex	Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.
group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see group.control)
group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).

Details

API keys. CARTO, Stadia and Thunderforest require an API key for their maps. This can be set via the argument `api`, e.g. `tm_basemap("CartoDB.Positron", api = "YOUR_KEY")`. For Stadia and Thunderforest (plot mode only), the key can alternatively be stored in the environment variables "STADIA_MAPS" and "THUNDERFOREST_MAPS" with `Sys.setenv()`. Without a key, CARTO basemaps still work, but are shown with an "API KEY REQUIRED" watermark.

Advanced: for other, custom tile services that require an API key (i.e. not one of the providers above), server can instead be a URL template containing the placeholder "{apikey}", which is substituted with `api`, e.g. `tm_basemap("https://example.com/tiles/{z}/{x}/{y}.png?key={apikey}", api = "YOUR_KEY")`.

In view mode, each layer is rendered in a Leaflet pane named "tmap{zindex}" (e.g., "tmap401", "tmap402"), with base tile layers placed in the standard "tile" pane.

See Also

[Basemaps, Modes](#)

Examples

```
## Not run:
if (requireNamespace("maptiles")) {
  # view mode
  current_mode = tmap_mode("view")
  tm_basemap("Stadia.StamenWatercolor") +
```

```

tm_shape(World) +
tm_polygons(
  "HPI",
  fill.scale = tm_scale(values = "reds"),
  fill_alpha.scale = 0.5)

tm_shape(World, crs = "+proj=eqearth") +
tm_polygons(
  "HPI",
  fill.scale = tm_scale(values = "reds"),
  fill_alpha.scale = 0.5) +
tm_basemap(NULL)

# plot mode:
tmap_mode("plot")
tm_basemap() +
tm_shape(World) +
tm_polygons("HPI")

tm_basemap("OpenTopoMap") +
tm_shape(World) +
tm_polygons(fill = NA, col = "black")

tm_basemap("CartoDB.PositronNoLabels") +
tm_shape(NLD_prov, crs = 4236) +
tm_borders() +
tm_facets_wrap("name") +
tm_tiles("CartoDB.PositronOnlyLabels")

# restore mode
tmap_mode(current_mode)
}

## End(Not run)

```

tm_chart

Map component: scale charts

Description

Legend charts are small charts that are added to the map, usually in addition to legends.

Usage

```

tm_chart_histogram(
  breaks,
  plot.axis.x,
  plot.axis.y,
  extra.ggplot2,
  position,

```

```

    group_id,
    width,
    height,
    stack,
    z,
    ...
)

tm_chart_bar(
  plot.axis.x,
  plot.axis.y,
  extra.ggplot2,
  position,
  group_id,
  width,
  height,
  stack,
  z,
  ...
)

tm_chart_donut(position, group_id, width, height, stack, z, ...)

tm_chart_violin(position, group_id, width, height, stack, z, ...)

tm_chart_box(position, group_id, width, height, stack, z, ...)

tm_chart_none()

tm_chart_heatmap(position, group_id, width, height, stack, z, ...)

```

Arguments

breaks	The breaks of the bins (for histograms)
plot.axis.x, plot.axis.y	Should the x axis and y axis be plot?
extra.ggplot2	Extra ggplot2 code
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use <code>group_id</code> and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g.

	stacking, margins etc.) are determined in <code>tm_components()</code> where its argument <code>id</code> should correspond to <code>group_id</code> .
<code>width, height</code>	width and height of the component.
<code>stack</code>	stack with other map components, either "vertical" or "horizontal".
<code>z</code>	z index, e.g. the place of the component relative to the other componets
<code>...</code>	passed on to <code>tm_title()</code>

Details

Note that these charts are different from charts drawn inside the map. Those are called glyphs (to be implemented).

See Also

[Charts, Components, Positioning of components](#)

Examples

```
tm_shape(World) +
  tm_polygons("HPI",
    fill.scale = tm_scale_intervals(),
    fill.chart = tm_chart_histogram())
```

tm_check_fix	<i>Check and fix invalid geometries</i>
--------------	---

Description

Checks whether the geometries of the shapes specified via `tm_shape()` are valid. Invalid geometries can cause errors or maps with artifacts.

Usage

```
tm_check_fix()
```

Details

This tmap element checks the geometries with `sf::st_is_valid()` and, if needed, applies `sf::st_make_valid()`. If that is unsuccessful, it toggles the s2 backend of the `sf` package (on or off, depending on whether it was already enabled) and tries again. If the geometries are still invalid, the map is drawn with a warning and the invalid geometries are removed.

Value

A tmap element.

tm_circles*Map layer: geographic circles*

Description

Map layer that draws circles with geographically fixed radii — i.e. the radius is expressed in meters and the circles scale with zoom in interactive (view) mode. This is in contrast to [tm_bubbles\(\)](#), where the symbol size is a fixed number of screen pixels.

Usage

```
tm_circles(  
  size = tm_const(),  
  size.scale = tm_scale(),  
  size.legend = tm_legend(),  
  size.chart = tm_chart_none(),  
  size.free = NA,  
  fill = tm_const(),  
  fill.scale = tm_scale(),  
  fill.legend = tm_legend(),  
  fill.chart = tm_chart_none(),  
  fill.free = NA,  
  col = tm_const(),  
  col.scale = tm_scale(),  
  col.legend = tm_legend(),  
  col.chart = tm_chart_none(),  
  col.free = NA,  
  lwd = tm_const(),  
  lwd.scale = tm_scale(),  
  lwd.legend = tm_legend(),  
  lwd.chart = tm_chart_none(),  
  lwd.free = NA,  
  lty = tm_const(),  
  lty.scale = tm_scale(),  
  lty.legend = tm_legend(),  
  lty.chart = tm_chart_none(),  
  lty.free = NA,  
  fill_alpha = tm_const(),  
  fill_alpha.scale = tm_scale(),  
  fill_alpha.legend = tm_legend(),  
  fill_alpha.chart = tm_chart_none(),  
  fill_alpha.free = NA,  
  col_alpha = tm_const(),  
  col_alpha.scale = tm_scale(),  
  col_alpha.legend = tm_legend(),  
  col_alpha.chart = tm_chart_none(),  
  col_alpha.free = NA,  
)
```

```

plot.order = tm_plot_order("size"),
zindex = NA,
group = NA,
group.control = "check",
popup = tm_popup(),
popup.vars = NA,
popup.format = tm_label_format(),
hover = NA,
id = "",
blend = "over",
options = opt_tm_circles(),
...
)

opt_tm_circles(
  points_only = "ifany",
  point_per = "feature",
  on_surface = FALSE
)

```

Arguments

size, size.scale, size.legend, size.chart, size.free

Map variable that determines the size. See details. *Unit:* Meters. Accepts a plain numeric vector (values already in meters) or a units object from the **units** package (any linear unit, e.g. `units::as_units(50, "km")`), which is converted to meters automatically. *Unit:* Meters. Accepts a plain numeric vector (values already in meters) or a units object from the **units** package (any linear unit, e.g. `units::as_units(50, "km")`), which is converted to meters automatically.

fill, fill.scale, fill.legend, fill.chart, fill.free

Map variable that determines the fill color. See details. *Unit:* Color – a color name, hex string.

col, col.scale, col.legend, col.chart, col.free

Map variable that determines the color. See details. *Unit:* Color – a color name, hex string.

lwd, lwd.scale, lwd.legend, lwd.chart, lwd.free

Map variable that determines the line width. See details. *Unit:* Base R line-width units; 1 lwd is approx. 0.75 pt at 96 dpi.

lty, lty.scale, lty.legend, lty.chart, lty.free

Map variable that determines the line type. See details. *Unit:* Integer (1-6) or name: "solid", "dashed", "dotted", "dotdash", "longdash", "twodash".

fill_alpha, fill_alpha.scale, fill_alpha.legend, fill_alpha.chart,
fill_alpha.free

Map variable that determines the fill color transparency. See details. *Unit:* Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).

col_alpha, col_alpha.scale, col_alpha.legend, col_alpha.chart,
col_alpha.free

Map variable that determines the color transparency. See details. *Unit:* Proportion

	tion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
plot.order	Specification in which order the spatial features are drawn. See tm_plot_order() for details.
zindex	Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.
group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
popup	popup specification for "view" mode, the output of tm_popup() . It determines the data variables shown in the popup table, the popup title, and (in the future) the popup layout. This replaces the deprecated arguments <code>popup.vars</code> and <code>popup.format</code> .
popup.vars	(Deprecated.) Use popup with tm_popup() instead (via its <code>vars</code> argument). Names of data variables that are shown in the popups in "view" mode. Set <code>popup.vars</code> to TRUE to show all variables in the shape object. Set <code>popup.vars</code> to FALSE to disable popups. Set <code>popup.vars</code> to a character vector of variable names to show those variables in the popups. The default (NA) depends on whether visual variables (e.g. <code>fill</code>) are used. If so, only those are shown. If not, all variables in the shape object are shown.
popup.format	(Deprecated.) Use popup with tm_popup() instead (via its <code>format</code> argument). List of formatting options for the popup values. Output of tm_label_format() . Only applicable for numeric data variables. If one list of formatting options is provided, it is applied to all numeric variables of <code>popup.vars</code> . Also, a (named) list of lists can be provided. In that case, each list of formatting options is applied to the named variable.
hover	name of the data variable that specifies the hover labels (view mode only). Set to FALSE to disable hover labels. By default FALSE, unless <code>id</code> is specified. In that case, it is set to <code>id</code> ,
id	name of the data variable that specifies the indices of the spatial features. Only used for "view" mode.
blend	Compositing operator for layer blending. Default "over" applies no blending. See the "Layer blending" section for the supported values.
options	Options passed on to opt_tm_circles() .
...	To catch deprecated arguments from version < 4.0.
points_only	Should only point geometries of the shape object be plotted? Default "ifany" means TRUE whenever the geometry collection contains points.
point_per	How spatial points are generated for non-point geometries. One of "feature" (one point per feature, default), "segment" (one per sub-feature), or "largest" (only the largest sub-feature).
on_surface	For polygon inputs, should the centroid be guaranteed to lie on the surface? If TRUE (slower), centroids outside the polygon are replaced via sf::st_point_on_surface() .

Details

Supported map variables: fill (fill color), col (border color), size (radius in meters), lwd (line width), lty (line type), fill_alpha (fill transparency), col_alpha (border transparency).

See Also

- [tm_bubbles\(\)](#) for screen-fixed proportional circles (pixel radius).
- [tm_symbols\(\)](#) for the general symbol layer with configurable shapes.
- [tm_scale_asis\(\)](#) to pass data values directly as metre radii.

Examples

```
## Three concentric layers of geographic circles at different administrative
## levels, each with a fixed radius that corresponds to a real-world distance.
## Because the radius is in meters the circles scale with zoom in view mode.
tm_shape(NLD_prov) +
  tm_circles(size = 5000, fill = "#0033ff", col = NULL) +
tm_shape(NLD_muni) +
  tm_circles(size = 2000, fill = "#99dd99", col = NULL) +
tm_shape(NLD_dist) +
  tm_circles(size = 1000, fill = "#ff8833", col = NULL)

## Use a units object – any linear unit is accepted and converted to meters
NLD_prov$one_mile <- units::as_units(1:12, "mi")
tm_shape(NLD_prov) +
  tm_circles(size = "one_mile", size.scale = tm_scale_asis())
```

tm_compass

Map component: compass

Description

Map component that adds a compass

Usage

```
tm_compass(
  north,
  type,
  text.size,
  size,
  show.labels,
  cardinal.directions,
  text.color,
  color.dark,
  color.light,
  lwd,
```

```

    position,
    group_id,
    bg,
    bg.color,
    bg.alpha,
    stack,
    just,
    frame,
    frame.color,
    frame.alpha,
    frame.lwd,
    frame.r,
    margins,
    z,
    ...
)

```

Arguments

north	north
type	compass type, one of: "arrow", "4star", "8star", "radar", "rose". The default is controlled by tm_layout() (which uses "arrow" for the default style)
text.size	Text size
size	size
show.labels	Show labels
cardinal.directions	cardinal.directions
text.color	Text color
color.dark	color.dark
color.light	color.light
lwd	lwd
position	The position specification of the component: an object created with tm_pos_in() or tm_pos_out() . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use group_id and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same group_id will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in tm_components() where its argument id should correspond to group_id.
bg	Show background?
bg.color	Background color

bg.alpha	Background transparency
stack	stack with other map components, either "vertical" or "horizontal".
just	just
frame	frame should a frame be drawn?
frame.color	frame color
frame.alpha	frame alpha transparency
frame.lwd	frame line width
frame.r	Radius of the rounded frame corners. 0 means no rounding.
margins	margins
z	z index, e.g. the place of the component relative to the other componets
...	to catch deprecated arguments (alpha)

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

tm_components

Group map components

Description

Control the grouping, position, and stacking of map components (legends, titles, scale bars, etc.).

Usage

```
tm_components(
  group_id = "",
  position,
  stack,
  frame_combine,
  equalize,
  resize_as_group,
  stack_margin,
  offset,
  frame,
  frame.color,
  frame.alpha,
  frame.lwd,
  frame.r,
  bg,
  bg.color,
  bg.alpha
)
```

Arguments

group_id	id of the component group. By default set to "", which will apply to all components. There are two other options. 1) To use the same (self-chosen) name that corresponds to the group_id argument of a component function, such as tm_legend() and tm_title() . 2) To specify one (or more) component function names, e.g. "tm_legend" or c("tm_scalebar", "tm_compass").
position	The position specification of the components in this group: an object created with tm_pos_in() or tm_pos_out() . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components .
stack	stacking "horizontal" or "vertical"
frame_combine	put frame around all components that are drawn on the same location. Whether a frame is drawn is still decided by the frame argument of the 'main' (first) component.
equalize	in case frame_combine is FALSE, should the separate frames be equalized, i.e. have the same width (when stacked vertically) or height (when stacked horizontally)?
resize_as_group	in case a component is rescaled because of the limited space, rescale the other components proportionally?
stack_margin	Margin between components. One or two values. If two values are provided, the first is the horizontal stacking margin and the second the vertical. The unit is text line heights.
offset	Offset margin between frame and the components block. One or two values. If two values are provided, the first is the horizontal offset and the second the vertical. The unit is text line heights.
frame	Should a frame be drawn? By default TRUE for legends, charts and insets, and FALSE otherwise.
frame.color	frame color
frame.alpha	frame alpha transparency
frame.lwd	frame line width
frame.r	Radius of the rounded frame corners. 0 means no rounding.
bg	Background color the components block. Is usually set in each component function, but if specified here, it will overwrite them.
bg.color	Background color the components block. Is usually set in each component function, but if specified here, it will overwrite them.
bg.alpha	Background alpha transparency of the components block. Is usually set in each component function, but if specified here, it will overwrite them.

Value

A [tmap-element](#)

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

tm_const	<i>Constant map variable value</i>
----------	------------------------------------

Description

Specify a constant value for a map variable (e.g. a fixed fill color or symbol size), bypassing data-driven scaling.

Usage

```
tm_const()
```

tm_credits	<i>Map component: credits</i>
------------	-------------------------------

Description

Map component that adds a text, typically used as credits. This function is the same as [tm_title\(\)](#) but with different default values.

Usage

```
tm_credits(  
  text,  
  size,  
  color,  
  padding,  
  fontface,  
  fontfamily,  
  alpha,  
  stack,  
  just,  
  frame,  
  frame.lwd,  
  frame.r,  
  bg,  
  bg.color,  
  bg.alpha,  
  position,  
  group_id,  
  width,  
  height,
```

```

    z,
    ...
)

```

Arguments

text	text
size	font size
color	font color
padding	padding
fontface	font face, bold, italic
fontfamily	font family
alpha	alpha transparency of the text
stack	stack with other map components, either "vertical" or "horizontal".
just	just
frame	frame should a frame be drawn?
frame.lwd	frame line width
frame.r	Radius of the rounded frame corners. 0 means no rounding.
bg	Show background?
bg.color	Background color
bg.alpha	Background transparency
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use <code>group_id</code> and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in tm_components() where its argument <code>id</code> should correspond to <code>group_id</code> .
width, height	width and height of the component.
z	z index, e.g. the place of the component relative to the other componets
...	to catch deprecated arguments

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

tm_crs	<i>Set the map projection (CRS)</i>
--------	-------------------------------------

Description

This function sets the map projection. It can also be set via `tm_shape()`, but `tm_crs` is generally recommended for most cases. It can also be determined automatically (see details); however, this is still work-in-progress.

Usage

```
tm_crs(crs = NA, property = NA, bbox = NULL, ...)
```

Arguments

crs	Map projection (CRS). Can be set to an <code>crs</code> object (see <code>sf::st_crs()</code>), a <code>proj4string</code> , an EPSG number, the value "auto" (automatic crs recommendation), or one the the following generic projections: <code>c("laea", "aeqd", "utm", "pconic", "eqdc", "stere")</code> . See details.
property	Which property should the projection have? One of: "global", "area" (equal-area), "distance" (equidistant), "shape" (conformal). Only applicable if <code>crs = "auto"</code> . See details.
bbox	bounding box. Three options: a <code>sf::st_bbox()</code> object, an Open Street Map query (passed on to <code>tmaptools::geocode_OSM()</code>), or "FULL", which means the whole earth , which means the whole earth (this also guarantees that transformations to another CRS keep the whole earth, unlike <code>sf::st_bbox()</code>).
...	passed on to <code>bb</code> (e.g. <code>ext</code> can be used to enlarge or shrink a bounding box)

Details

The map projection (`crs`) determines in which coordinate system the spatial object is processed and plotted. See vignette: **Map projections (CRS)**. The `crs` can be specified in two places: 1) `tm_shape()` and `tm_crs()`. In both cases, the map is plotted into the specified `crs`. The difference is that in the first option, the `crs` is also taken into account in spatial transformation functions, such as the calculation of centroids and cartograms. In the second option, the `crs` is only used in the plotting phase.

The automatic crs recommendation (which is still work-in-progress) is the following:

Property	Recommendation
global (for world maps)	A pseudocylindrical projection tmap option <code>crs_global</code> , by default "eqearth (Equal Earth)". See
area (equal area)	Lambert Azimuthal Equal Area (<code>laea</code>)
distance (equidistant)	Azimuthal Equidistant (<code>aeqd</code>)
shape (conformal)	Stereographic (<code>stere</code>)

For further info about the available "generic" projects see: for utm: <https://proj.org/en/9.4/operations/projections/utm.html> for laea: <https://proj.org/en/9.4/operations/projections/laea.html> for aeqd: <https://proj.org/en/9.4/operations/projections/aeqd.html> for pconic: <https://proj.org/en/9.4/operations/projections/pconic.html> for eqdc: <https://proj.org/en/9.4/operations/projections/eqdc.html>

Note

Plans are to migrate the functionality regarding generic crs and automatic crs recommendation to a separate package.

See Also

[Map projections \(CRS\)](#), [Choropleth \(Netherlands\)](#), [Choropleth \(World\)](#), [Terrain map](#)

Examples

```
SA = World[World$continent == "South America", ]

# latlon coordinates (WGS84)
tm_shape(SA) +
  tm_polygons() +
  tm_graticules() +
  tm_crs(4326)

tm_list = lapply(c("global", "area", "distance", "shape"), FUN = function(property) {
  tm_shape(SA) +
    tm_polygons() +
    tm_graticules() +
    tm_crs(property = property) +
    tm_title(property)
})

tmap_arrange(tm_list, nrow = 1)
```

tm_extra_inner_margin *Layout helpers: inner margins and legend placement*

Description

Layout helpers: inner margins and legend placement

Usage

```
tm_extra_inner_margin(left = 0, right = 0, top = 0, bottom = 0)

tm_place_legends_right(width = NA)

tm_place_legends_left(width = NA)
```

```
tm_place_legends_bottom(height = NA)

tm_place_legends_top(height = NA)

tm_place_legends_inside(pos.h = NULL, pos.v = NULL)
```

Arguments

left, right, top, bottom	
	extra margins
width	width
height	height
pos.h, pos.v	position (horizontal and vertical)

tm_facets

Specify facets

Description

- `tm_facets_wrap()` specify facets for one grouping variable (so one faceting dimension)
- `tm_facets_(hv)stack()` stacks the facets either horizontally or vertically (one grouping variable).
- `tm_facets_grid()` specify facets for two grouping variables in a grid of rows and columns.
- `tm_facets_pagewise()` same as `wrap`, but the facets are drawn on different plots (pages). Replaces the `along` argument from version 3.
- `tm_facets()` is the core function, but it is recommended to use the other functions.

Usage

```
tm_facets(
  by = NULL,
  rows = NULL,
  columns = NULL,
  pages = NULL,
  as.layers = FALSE,
  nrow = NA,
  ncol = NA,
  byrow = TRUE,
  orientation = NA,
  free.coords = NA,
  drop.units = TRUE,
  drop.empty.facets = TRUE,
  drop.NA.facets = FALSE,
  sync = TRUE,
```

```

    swipe = FALSE,
    na.text = NA,
    scale.factor = 2,
    type = NA,
    free.scales = NULL,
    ...
)

tm_facets_grid(rows = NULL, columns = NULL, pages = NULL, ...)

tm_facets_wrap(by = "VARS__", nrow = NA, ncol = NA, byrow = TRUE, ...)

tm_facets_pagewise(by = "VARS__", byrow = TRUE, ...)

tm_facets_stack(by = "VARS__", orientation = NA, ...)

tm_facets_hstack(by = "VARS__", ...)

tm_facets_vstack(by = "VARS__", ...)

tm_facets_flip(...)

```

Arguments

by	Group by variable (only for a facet wrap or facet stack)
rows	Variable that specifies the rows (only for a facet grid)
columns	Variable that specifies the columns (only for a facet grid)
pages	Variable that specifies the pages (only for a facet grid)
as.layers	show facets as layers?
nrow	Number of rows
ncol	Number of columns
byrow	Should facets be wrapped by row?
orientation	For facet stack: horizontal or vertical?
free.coords	Logical. If the by argument is specified, should each map has its own coordinate ranges? By default TRUE, unless facets are shown in as different layers (as.layers = TRUE)
drop.units	Logical. If the by argument is specified, should non-selected spatial units be dropped? If FALSE, they are plotted where mapped map variables are regarded as missing values. Not applicable for raster shapes. By default TRUE.
drop.empty.facets	Logical. If the by argument is specified, should empty facets be dropped? Empty facets occur when the by-variable contains unused levels. When TRUE and two by-variables are specified, empty rows and columns are dropped.
drop.NA.facets	Logical. If the by argument is specified, and all data values for specific facets are missing, should these facets be dropped? FALSE by default. In v3, it was called showNA.

sync	Logical. Should the navigation in view mode (zooming and panning) be synchronized? By default TRUE if the facets have the same bounding box. This is generally the case when rasters are plotted, or when <code>free.coords</code> is FALSE.
swipe	Logical. If TRUE, the two maps are overlaid with a draggable divider to reveal either map. Requires exactly two maps, and only works in the "mapbox" and "maplibre" modes provided by the tm.mapgl package. Default is FALSE.
na.text	Text used for facets of missing values. In v3, it was <code>textNA</code> .
scale.factor	Number that determines how the elements (e.g. font sizes, symbol sizes, line widths) of the small multiples are scaled in relation to the scaling factor of the shapes. The elements are scaled to the <code>scale.factor</code> th root of the scaling factor of the shapes. So, for <code>scale.factor = 1</code> , they are scaled proportional to the scaling of the shapes. Since elements, especially text, are often too small to read, a higher value is recommended. By default, <code>scale.factor = 2</code> .
type	"grid", "wrap" or "stack"
free.scales	deprecated. Please use the <code>.free</code> arguments in the layer functions, e.g. <code>fill.free</code> in <code>tm_polygons</code> .
...	passed on to <code>tm_facets()</code>

Note

In older versions (< 4.1) `tm_facets()` with page specification was used to create animations frames and `tmap_animation()` to create the animation itself using inputs like the frame rate specification. As of version 4.2, the whole animation, including frame rate, is specified in `tm_animate()`. The animation can still be saved via `tmap_animation()`.

See Also

[tm_animate\(\)](#)

[Facets, Animations, Gridmap](#)

Examples

```
## Not run:
tm_shape(NLD_dist) +
  tm_polygons("edu_appl_sci",
    fill.scale = tm_scale_intervals(values = "pu_gn", style = "kmeans", n = 7)) +
  tm_facets(by = "province") +
tm_shape(NLD_muni) +
  tm_borders(lwd = 3) +
  tm_facets(by = "province") +
tm_title("Population with a univeristy degree (incl appl. sciences), percentages")

tm_shape(World) +
  tm_polygons(c("gender", "press"),
    fill.scale = list(tm_scale_intervals(values = "bu_br_div", midpoint = 0.5),
      tm_scale_intervals(values = "pu_gn_div", midpoint = 50)),
    fill.legend = tm_legend("")) +
tm_layout(panel.labels = c("Gender Inequality Index (GII)", "World Press Freedom Index"))
```

```
## End(Not run)
```

tm_graticules	<i>Coordinate grid / graticule lines</i>
---------------	--

Description

Draws horizontal and vertical lines according to a coordinate reference system (CRS). `tm_grid()` uses the CRS of the (master) shape object, and `tm_graticules()` uses latitude and longitude coordinates (EPSG 4326). It creates a [tmap-element](#) that draws coordinate grid lines. It serves as a layer that can be drawn anywhere between other layers.

Usage

```
tm_graticules(
  x = NA,
  y = NA,
  n.x = NA,
  n.y = NA,
  crs = 4326,
  labels.format = list(suffix = intToUtf8(176)),
  labels.cardinal = TRUE,
  ...
)
```

```
tm_grid(
  x = NA,
  y = NA,
  n.x = NA,
  n.y = NA,
  crs = NA,
  col = NA,
  lwd = 1,
  alpha = NA,
  labels.show = TRUE,
  labels.pos = c("left", "bottom"),
  labels.size = 0.6,
  labels.col = NA,
  labels.rot = c(0, 0),
  labels.format = list(big.mark = ","),
  labels.cardinal = FALSE,
  labels.margin.x = 0,
  labels.margin.y = 0,
  labels.space.x = NA,
  labels.space.y = NA,
  labels.inside_frame = FALSE,
```

```

    ticks = labels.show & !labels.inside_frame,
    lines = TRUE,
    ndiscr = 100,
    zindex = NA,
    group = NA,
    group.control = "none",
    ...
)

```

Arguments

<code>x</code>	X coordinates for vertical grid lines. If NA, it is specified with a pretty scale and <code>n.x</code> .
<code>y</code>	Y coordinates for horizontal grid lines. If NA, it is specified with a pretty scale and <code>n.y</code> .
<code>n.x</code>	Preferred number of grid lines for the x axis. For the labels, a <code>pretty()</code> sequence is used, so the number of actual labels may be different than <code>n.x</code> .
<code>n.y</code>	Preferred number of grid lines for the y axis. For the labels, a <code>pretty()</code> sequence is used, so the number of actual labels may be different than <code>n.y</code> .
<code>crs</code>	Projection character. If specified, the grid lines are projected accordingly. Many world maps are projected, but still have latitude longitude (EPSG 4326) grid lines.
<code>labels.format</code>	List of formatting options for the grid labels. Parameters are: fun Function to specify the labels. It should take a numeric vector, and should return a character vector of the same size. By default it is not specified. If specified, the list items <code>scientific</code>, <code>format</code>, and <code>digits</code> (see below) are not used. scientific Should the labels be formatted scientifically? If so, square brackets are used, and the format of the numbers is "g". Otherwise, <code>format="f"</code>, and <code>text.separator</code>, <code>text.less.than</code>, and <code>text.or.more</code> are used. Also, the numbers are automatically rounded to millions or billions if applicable. format By default, "f", i.e. the standard notation <code>xxx.xxx</code>, is used. If <code>scientific=TRUE</code> then "g", which means that numbers are formatted scientifically, i.e. <code>n.dddE+nn</code> if needed to save space. digits Number of digits after the decimal point if <code>format="f"</code>, and the number of significant digits otherwise. ... Other arguments passed on to <code>formatC()</code>
<code>labels.cardinal</code>	Add the four cardinal directions (N, E, S, W) to the labels, instead of using negative coordinates for west and south (so it assumes that the coordinates are positive in the north-east direction).
...	Used to catch deprecated arguments from <code>tmap v3</code> .
<code>col</code>	Color of the grid lines.
<code>lwd</code>	Line width of the grid lines

<code>alpha</code>	Alpha transparency of the grid lines. Number between 0 and 1. By default, the alpha transparency of <code>col</code> is taken.
<code>labels.show</code>	Show tick labels. Either one value for both x and y axis, or a vector two: the first for x and latter for y.
<code>labels.pos</code>	position of the labels. Vector of two: the horizontal ("left" or "right") and the vertical ("top" or "bottom") position.
<code>labels.size</code>	Font size of the tick labels
<code>labels.col</code>	Font color of the tick labels
<code>labels.rot</code>	Rotation angles of the labels. Vector of two values: the first is the rotation angle (in degrees) of the tick labels on the x axis and the second is the rotation angle of the tick labels on the y axis. Only 0, 90, 180, and 270 are valid values.
<code>labels.margin.x</code>	Margin between tick labels of x axis and the frame. Note that when <code>labels.inside_frame = FALSE</code> and <code>ticks = TRUE</code> , the ticks will be adjusted accordingly.
<code>labels.margin.y</code>	Margin between tick labels of y axis and the frame. Note that when <code>labels.inside_frame = FALSE</code> and <code>ticks = TRUE</code> , the ticks will be adjusted accordingly.
<code>labels.space.x</code>	Space that is used for the labels and ticks for the x-axis when <code>labels.inside_frame = FALSE</code> . By default, it is determined automatically using the widths and heights of the tick labels. The unit of this parameter is text line height.
<code>labels.space.y</code>	Space that is used for the labels and ticks for the y-axis when <code>labels.inside_frame = FALSE</code> . By default, it is determined automatically using the widths and heights of the tick labels. The unit of this parameter is text line height.
<code>labels.inside_frame</code>	Show labels inside the frame? By default <code>FALSE</code> .
<code>ticks</code>	If <code>labels.inside_frame = FALSE</code> , should ticks can be drawn between the labels and the frame? Either one value for both x and y axis, or a vector two: the first for x and latter for y.
<code>lines</code>	If <code>labels.inside_frame = FALSE</code> , should grid lines can be drawn?
<code>ndiscr</code>	Number of points to discretize a parallel or meridian (only applicable for curved grid lines)
<code>zindex</code>	Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.
<code>group</code>	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
<code>group.control</code>	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).

Details

#' In view mode, each layer is rendered in a Leaflet pane named "tmap{zindex}" (e.g., "tmap401", "tmap402"), with base tile layers placed in the standard "tile" pane.

See Also

[Map projections \(CRS\)](#), [Choropleth \(Netherlands\)](#), [Choropleth \(World\)](#), [Terrain map](#)

Examples

```
## Not run:
current.mode <- tmap_mode("plot")

tm_shape(NLD_muni) +
  tm_polygons() +
  tm_grid()

tm_shape(NLD_muni) +
  tm_polygons() +
  tm_grid(crs = 4326)

tm_shape(NLD_muni) +
  tm_polygons() +
  tm_grid(crs = 3035, labels.inside.frame = TRUE)

tm_shape(World) +
  tm_polygons() +
  tm_facets(by = "continent") +
  tm_grid(labels.inside.frame = TRUE)

tm_shape(NLD_muni) +
  tm_polygons() +
  tm_graticules()

tm_shape(NLD_muni) +
  tm_polygons() +
  tm_graticules(labels.pos = c("right", "top"))

data(NLD_muni, World)

tmap_arrange(
  qtm(NLD_muni) + tm_grid(),
  qtm(NLD_muni) + tm_graticules()
)

qtm(World, shape.crs = "+proj=robin", style = "natural") +
  tm_graticules(ticks = FALSE) +
  tm_layout(frame=FALSE)

tmap_mode(current.mode)

## End(Not run)
```

`tm_group`*Layer group control*

Description

Controls the layer groups in interactive maps (view mode): the layer control box (radio buttons or check boxes) and at which zoom levels the layers are displayed at.

Usage

```
tm_group(name, control = NA, zoom_levels = NA)
```

Arguments

<code>name</code>	group name that corresponds with the group name specified in the layer functions (e.g. <code>tm_polygons()</code>)
<code>control</code>	The group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
<code>zoom_levels</code>	The zoom levels at which the group is displays at. When specified control will be set to "none".

See Also

[Layer groups \(view mode\)](#)

`tm_inset`*Map component: inset map*

Description

Map component that adds an inset object, e.g. a mini map

Usage

```
tm_inset(  
  x = NULL,  
  height,  
  width,  
  margins,  
  between_margin,  
  position,  
  group_id,  
  frame,
```

```

    frame.color,
    frame.alpha,
    frame.lwd,
    frame.r,
    bg,
    bg.color,
    bg.alpha,
    box_frame,
    box_frame.color,
    box_frame.alpha,
    box_frame.lwd,
    box_frame.lty,
    box_bg,
    box_bg.color,
    box_bg.alpha,
    main_frame,
    main_frame.r,
    main_frame.color,
    main_frame.alpha,
    main_frame.lwd,
    z
  )

```

Arguments

x	object to draw. Can be: bounding box, tmap object, ggplot2 object, grob object, image file name.
height	height of the component in number of text line heights.
width	width of the component in number of text line heights.
margins	margins
between_margin	Margin between
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use <code>group_id</code> and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in tm_components() where its argument <code>id</code> should correspond to <code>group_id</code> .
frame	frame should a frame be drawn?
frame.color	frame color
frame.alpha	frame alpha transparency

frame.lwd	frame line width
frame.r	Radius of the rounded frame corners. 0 means no rounding.
bg	Show background?
bg.color	Background color
bg.alpha	Background transparency
box_frame	Should a box frame be drawn in the main map that shows where the inset is? TRUE by default
box_frame.color, box_frame.alpha, box_frame.lwd, box_frame.lty	Properties of the box frame
box_bg	Should the frame box have a background? FALSE by default
box_bg.color, box_bg.alpha	Properties of the box background
main_frame	Should a frame be drawn around the inset map? Note that this is different from the general map component frame (the argument frame)
main_frame.r, main_frame.color, main_frame.alpha, main_frame.lwd	Properties of the main frame
z	z index, e.g. the place of the component relative to the other componets

See Also

[Inset maps, ggplot2 integration Components, Positioning of components, Grouping of components, Choropleth \(Netherlands\)](#)

Examples

```
## map
bb = tmaptools::bb(NLD_prov[NLD_prov$name == "Utrecht",], ext = 1.05)

bb_Randstad =
  sf::st_bbox(c(xmin = 120000, xmax = 150000, ymin = 460000, ymax = 500000), crs = 28992)

tm_shape(NLD_dist) +
  tm_polygons(
    fill = "dwelling_value",
    fill.scale = tm_scale_continuous_pseudo_log(values = "-cols4all.pu_gn_div"),
    col = NULL) +
  tm_shape(NLD_muni) +
  tm_borders(col = "black", lwd = 0.5) +
  tm_shape(NLD_prov) +
  tm_borders(col = "black", lwd = 1.5) +
  tm_inset(bb_Randstad, height = 12, width = 12, position = c("left", "top")) +
  tm_compass(position = c("left", "top"), )

## ggplot2
if (requireNamespace("ggplot2")) {
  library(ggplot2)
  p = ggplot(World, aes(x = gender, y = press, colour = continent)) +
    geom_point() +
```

```

theme_bw()

tm_shape(World) +
  tm_polygons(
    fill = "gender",
    fill.scale = tm_scale(values = "-cols4all.pu_gn_div")) +
    tm_inset(p, height = 15, width = 20, position = tm_pos_in("left", "bottom"))
}

```

tm_iso

Map layer: iso (contour)

Description

Map layer that draws iso (contour) lines. Stack of [tm_lines\(\)](#) and [tm_labels_highlighted\(\)](#).

Usage

```

tm_iso(
  col = tm_const(),
  text = tm_vars(x = 1),
  ...,
  options_lines = opt_tm_lines(),
  options_labels = opt_tm_labels()
)

```

Arguments

- | | |
|----------------|---|
| col | Map variable that determines the color. See details. <i>Unit:</i> Color – a color name, hex string. |
| text | Map variable that determines the text. See details. <i>Unit:</i> Character string. |
| ... | passed on to tm_lines() and tm_labels_highlighted() . For the text color and alpha transparency of the text labels, please use <code>text_col</code> and <code>text_alpha</code> instead of <code>col</code> and <code>col_alpha</code> . |
| options_lines | The options for tm_lines() |
| options_labels | The options for tm_labels_highlighted() |

tm_label_format	<i>Label formatting for scales</i>
-----------------	------------------------------------

Description

tmap function to specify labels used in the scale functions, e.g. via the argument `label.format` in `tm_scale_intervals()`.

Usage

```
tm_label_format(
  fun,
  scientific,
  format,
  digits,
  interval.disjoint,
  big.num.abbr,
  prefix,
  suffix,
  text.separator,
  text.less.than,
  text.less.than_as.prefix,
  text.or.more,
  text.or.more_as.prefix,
  text.align,
  text.to.columns,
  html.escape,
  ...
)
```

Arguments

<code>fun</code>	Function to specify the labels. It should take a numeric vector, and should return a character vector of the same size. By default it is not specified. If specified, the list items <code>scientific</code> , <code>format</code> , and <code>digits</code> (see below) are not used.
<code>scientific</code>	Should the labels be formatted scientifically? If so, square brackets are used, and the format of the numbers is "g". Otherwise, <code>format="f"</code> , and <code>text.separator</code> , <code>text.less.than</code> , and <code>text.or.more</code> are used. Also, the numbers are automatically rounded to millions or billions if applicable. By default, FALSE
<code>format</code>	By default, "f", i.e. the standard notation <code>xxx.xxx</code> , is used. If <code>scientific = TRUE</code> then "g", which means that numbers are formatted scientifically, i.e. <code>n.dddE+nn</code> if needed to save space.
<code>digits</code>	Number of digits after the decimal point if <code>format="f"</code> , and the number of significant digits otherwise. By default NA, meaning as many as needed to have distinct numbers

<code>interval.disjoint</code>	In case of intervals (see <code>tm_scale_intervals()</code>), should the intervals appear disjoint, e.g. 0 to 999, 1000 – 1999, 2000 – 2999 (TRUE, default), or not: 0 – 1000, 1000 – 2000, 2000– 3000.
<code>big.num.abbr</code>	Vector that defines whether and which abbreviations are used for large numbers. It is a named numeric vector, where the name indicated the abbreviation, and the number the magnitude (in terms on numbers of zero). Numbers are only abbreviation when they are large enough. Set it to NA to disable abbreviations. The default is <code>c("mln" = 6, "bln" = 9)</code> . For layers where style is set to <code>log10</code> or <code>log10_pretty</code> , the default is NA.
<code>prefix</code>	Prefix of each number
<code>suffix</code>	Suffix of each number
<code>text.separator</code>	Character string to use to separate numbers in an interval legend (default: "to").
<code>text.less.than</code>	Character value(s) to use for 'less than'. Default "Less than". When a character vector of length 2 is specified, one for each word, these words are aligned when <code>text.to.columns = TRUE</code>
<code>text.less.than_as.prefix</code>	Should <code>text.less.than</code> be used as prefix?
<code>text.or.more</code>	Character value(s) to use to 'or more'. Default is "or more". When a character vector of length 2 is specified, one for each word, these words are aligned when <code>text.to.columns = TRUE</code>
<code>text.or.more_as.prefix</code>	Should <code>text.or.more</code> be used as prefix?
<code>text.align</code>	Not implemented in v4 (yet). Value that determines how the numbers are aligned, "left", "center" or "right". By default "left".
<code>text.to.columns</code>	Not implemented in v4 (yet). Logical that determines whether the text is aligned to three columns (from, text.separator, to). By default FALSE.
<code>html.escape</code>	Logical that determins whther HTML code is escaped in the popups in view mode. By default TRUE. If set to FALSE HTML code can be added, e.g. to added white space via <code>&nbsp;</code> ;
<code>...</code>	arguments passed on to <code>formatC</code>

Value

list with formatting options

See Also

[Legends \(advanced\)](#), [Positioning of components](#)

tm_legend

*Map component: scale legend***Description**

Legend specification

Usage

```
tm_legend(  
  title,  
  show,  
  orientation,  
  reverse,  
  na.show,  
  position,  
  group_id,  
  width,  
  height,  
  z,  
  title.color,  
  title.size,  
  title.fontface,  
  title.fontfamily,  
  title.alpha,  
  title.padding,  
  title.align,  
  text.color,  
  text.size,  
  text.fontface,  
  text.fontfamily,  
  text.alpha,  
  format,  
  frame,  
  frame.color,  
  frame.alpha,  
  frame.lwd,  
  frame.r,  
  bg,  
  bg.color,  
  bg.alpha,  
  absolute_fontsize,  
  item.height,  
  item.width,  
  item.space,  
  item.na.height,  
  item.na.width,
```

```

    item.na.space,
    item.shape,
    ticks,
    ticks.disable.na,
    ticks.col,
    ticks.lwd,
    margins,
    item_text.margin,
    ...
)

tm_legend_hide()

tm_legend_combine(variable)

tm_legend_bivariate(
  xlab,
  ylab,
  xlab.color,
  xlab.size,
  xlab.rot,
  xlab.fontface,
  xlab.fontfamily,
  xlab.alpha,
  xlab.padding,
  xlab.align,
  ylab.color,
  ylab.size,
  ylab.rot,
  ylab.fontface,
  ylab.fontfamily,
  ylab.alpha,
  ylab.padding,
  ylab.align,
  ...
)

```

Arguments

title	Legend title
show	Show legend?
orientation	Orientation of the legend: "portrait" or "landscape"
reverse	Should the legend items be reversed?
na.show	Show NA values in legend?
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case,

	meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use group_id and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same group_id will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in tm_components() where its argument id should correspond to group_id.
width	Width of the legend. Units are 'text line heights'. In case a negative number is specified, the units are (approximate) pixels. The relation between these two is configured via the option absolute_fontsize.
height	Height of the legend. Units are 'text line heights'. In case a negative number is specified, the units are (approximate) pixels. The relation between these two is configured via the option absolute_fontsize.
z	z index, e.g. the place of the component relative to the other componets
title.color	The color of the title of the legend.
title.size	The size of the title of the legend.
title.fontface	The font face of the title of the legend. See <code>graphics::par</code> , option 'font'.
title.fontfamily	The font family of the title of the legend. See <code>graphics::par</code> , option 'family'.
title.alpha	The alpha transparency of the title of the legend.
title.padding	The padding of the title of the legend. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
title.align	The align of the title of the legend.
text.color	The color of the text of the legend.
text.size	The size of the text of the legend.
text.fontface	The font face of the text of the legend. See <code>graphics::par</code> , option 'font'.
text.fontfamily	The font family of the text of the legend. See <code>graphics::par</code> , option 'family'.
text.alpha	The alpha transparency of the text of the legend.
format	Not used anymore: use the format argument of the <code>tm_scale_*</code> () functions instead.
frame	frame should a frame be drawn?
frame.color	frame color
frame.alpha	frame alpha transparency
frame.lwd	frame line width
frame.r	Radius of the rounded frame corners. 0 means no rounding.
bg	Show background?
bg.color	The color of the bg of the legend.

bg.alpha	The alpha transparency of the bg of the legend.
absolute_fontsize	The absolute fontsize of the legend. So far, only used to calculate legend dimensions
item.height	The height of the item of the legend.
item.width	The width of the item of the legend.
item.space	The space of the item of the legend. In terms of number of text line heights.
item.na.height	The height of the na item of the legend.
item.na.width	The width of the na item of the legend.
item.na.space	The space of the na item of the legend. In terms of number of text line heights.
item.shape	The shape of the item of the legend.
ticks	List of vectors of size 2 that determines a tick mark line (for portrait legends). The values are the y-values of begin and endpoint of a tick mark. For a solid line, only one vector is required, for dashed lines one for each dash. See vignette: tmap vs ggplot2 .
ticks.disable.na	Remove ticks for NA values
ticks.col	The color of the ticks of the legend.
ticks.lwd	The line width of the ticks of the legend. See <code>graphics::par</code> , option 'lwd'.
margins	The margins of the legend. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
item_text.margin	The margin of the space between item and text of the legend.
...	visual values, e.g. col, fill, lwd, can be specified. If so, they overrule the default visual values, which are determined by the drawn map objects (e.g. polygons)
variable	visual (or transformation) variable to combine the legend with: e.g. "fill" or "size"
xlab	label for the x dimension (rows)
ylab	label for the y dimension (columns)
xlab.color	The color of the xlab of the legend.
xlab.size	The size of the xlab of the legend.
xlab.rot	The rot of the xlab of the legend.
xlab.fontface	The font face of the xlab of the legend. See <code>graphics::par</code> , option 'font'.
xlab.fontfamily	The font family of the xlab of the legend. See <code>graphics::par</code> , option 'family'.
xlab.alpha	The alpha transparency of the xlab of the legend.
xlab.padding	The padding of the xlab of the legend. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
xlab.align	The align of the xlab of the legend.

ylab.color	The color of the ylab of the legend.
ylab.size	The size of the ylab of the legend.
ylab.rot	The rot of the ylab of the legend.
ylab.fontface	The font face of the ylab of the legend. See <code>graphics::par</code> , option 'font'.
ylab.fontfamily	The font family of the ylab of the legend. See <code>graphics::par</code> , option 'family'.
ylab.alpha	The alpha transparency of the ylab of the legend.
ylab.padding	The padding of the ylab of the legend. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
ylab.align	The align of the ylab of the legend.

Value

A `tm_legend` component

See Also

[Legends \(advanced\)](#), [Positioning of components](#), [Bivariate choropleth Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

Examples

```
# Example using different settings from tm_legend()

tm_shape(World) +
  tm_polygons(
    fill = "HPI",
    fill.legend = tm_legend(
      title = "Home Price Index",
      title.color = "orange",
      bg.color = "purple",
      show = TRUE
    ),
    id = "name",
    # Format the labels using dollar sign
    fill.scale = tm_scale_intervals(
      label.format = function(x) format(x, big.mark = " "),
    )
  )
```

tm_lines

Map layer: lines

Description

Map layer that draws lines. Supported map variables are: `col` (the color), `lwd` (line width), `lty` (line type), and `col_alpha` (color alpha transparency).

Usage

```

tm_lines(
  col = tm_const(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  lwd = tm_const(),
  lwd.scale = tm_scale(),
  lwd.legend = tm_legend(),
  lwd.chart = tm_chart_none(),
  lwd.free = NA,
  lty = tm_const(),
  lty.scale = tm_scale(),
  lty.legend = tm_legend(),
  lty.chart = tm_chart_none(),
  lty.free = NA,
  col_alpha = tm_const(),
  col_alpha.scale = tm_scale(),
  col_alpha.legend = tm_legend(),
  col_alpha.chart = tm_chart_none(),
  col_alpha.free = NA,
  linejoin = "round",
  lineend = "round",
  plot.order = tm_plot_order("lwd", reverse = TRUE, na.order = "bottom"),
  zindex = NA,
  group = NA,
  group.control = "check",
  popup = tm_popup(),
  popup.vars = NA,
  popup.format = tm_label_format(),
  hover = NA,
  id = "",
  blend = "over",
  options = opt_tm_lines(),
  ...
)

opt_tm_lines(lines.only = "ifany", hitbox = "auto")

```

Arguments

col, col.scale, col.legend, col.chart, col.free
 Map variable that determines the color. See details. *Unit:* Color – a color name, hex string.

lwd, lwd.scale, lwd.legend, lwd.chart, lwd.free
 Map variable that determines the line width. See details. *Unit:* Base R line-width units; 1 lwd is approx. 0.75 pt at 96 dpi.

lty, lty.scale, lty.legend, lty.chart, lty.free	Map variable that determines the line type. See details. <i>Unit</i> : Integer (1-6) or name: "solid", "dashed", "dotted", "dotdash", "longdash", "twodash".
col_alpha, col_alpha.scale, col_alpha.legend, col_alpha.chart, col_alpha.free	Map variable that determines the color transparency. See details. <i>Unit</i> : Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
linejoin, lineend	line join and line end. See gpar() for details.
plot.order	Specification in which order the spatial features are drawn. See tm_plot_order() for details.
zindex	Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.
group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
popup	popup specification for "view" mode, the output of tm_popup() . It determines the data variables shown in the popup table, the popup title, and (in the future) the popup layout. This replaces the deprecated arguments <code>popup.vars</code> and <code>popup.format</code> .
popup.vars	(Deprecated.) Use popup with tm_popup() instead (via its <code>vars</code> argument). Names of data variables that are shown in the popups in "view" mode. Set <code>popup.vars</code> to TRUE to show all variables in the shape object. Set <code>popup.vars</code> to FALSE to disable popups. Set <code>popup.vars</code> to a character vector of variable names to show those variables in the popups. The default (NA) depends on whether visual variables (e.g. <code>fill</code>) are used. If so, only those are shown. If not, all variables in the shape object are shown.
popup.format	(Deprecated.) Use popup with tm_popup() instead (via its <code>format</code> argument). List of formatting options for the popup values. Output of tm_label_format() . Only applicable for numeric data variables. If one list of formatting options is provided, it is applied to all numeric variables of <code>popup.vars</code> . Also, a (named) list of lists can be provided. In that case, each list of formatting options is applied to the named variable.
hover	name of the data variable that specifies the hover labels (view mode only). Set to FALSE to disable hover labels. By default FALSE, unless <code>id</code> is specified. In that case, it is set to <code>id</code> ,
id	name of the data variable that specifies the indices of the spatial features. Only used for "view" mode.
blend	Compositing operator for layer blending. Default "over" applies no blending. See the "Layer blending" section for the supported values.
options	options passed on to the corresponding <code>opt_<layer_function></code> function
...	to catch deprecated arguments from version < 4.0

lines.only	should only line geometries of the shape object (defined in <code>tm_shape()</code>) be plotted, or also other geometry types (like polygons)? By default "ifany", which means TRUE in case a geometry collection is specified.
hitbox	Controls whether an invisible interaction layer with a larger clickable area ("<code>hitbox</code>") is added on top of the lines. This can improve click and popup behavior for thin or densely packed lines by increasing the effective mouse interaction width. Possible values: "none" No additional hitbox layer is added. Lines are clickable only at their visible width. "plusX" Adds X pixels to the visible line width to compute the interaction width: <code>line_width + X</code>. For example, "plus8" widens the clickable area by 4 pixels on each side. "pmaxX" Ensures a minimum interaction width of X pixels: <code>pmax(line_width, X)</code>. For example, "pmax8" guarantees at least 8 pixels. Useful for very thin lines. "auto" "pmax8" if and only if interactive features are enabled (popup or hover), lines are thin (median line width < 4), and there are fewer than 10000 features. Otherwise "none". plus and pmax can be combined, e.g. "plus4pmax8" means <code>pmax(line_width + 4, 8)</code>. Adding a hitbox improves usability for thin lines but may reduce performance for very large datasets, as an additional invisible layer is rendered.

Details

The map variable arguments (e.g. `col`) can be specified with a data variable name (e.g., a spatial vector attribute or a raster layer of the object specified in `tm_shape()`), with a visual value (for `col`, a color is expected), or with a geometry-derived variable (see below). See vignette: [Map variables](#).

Multiple values can be specified: in that case facets are created. These facets can be combined with other faceting data variables, specified with `tm_facets()`. See vignette: [Facets](#).

- The `*.scale` arguments determine the used scale to map the data values to map variable values. These can be specified with one of the available `tm_scale_*`() functions. The default is specified by the tmap option (`tm_options()`) `scales.var`. See 'rvignette: [Scales](#)
- The `*.legend` arguments determine the used legend, specified with `tm_legend()`. The default legend and its settings are determined by the tmap options (`tm_options()`) `legend.`. See 'rvignette: [Legends](#)
- The `*.chart` arguments specify additional charts, specified with `tm_chart_`, e.g. `tm_chart_histogram()`. See 'rvignette: [Charts](#)
- The `*.free` arguments determine whether scales are applied freely across facets, or shared. A logical value is required. They can also be specified with a vector of three logical values; these determine whether scales are applied freely per facet dimension. This is only useful when facets are applied (see `tm_facets()`). There are maximally three facet dimensions: rows, columns, and pages. This only applies for a facet grid (`tm_facets_grid()`). For instance, `col.free = c(TRUE, FALSE, FALSE)` means that for the map variable `col`, each

row of facets will have its own scale, and therefore its own legend. For facet wraps and stacks (`tm_facets_wrap()` and `tm_facets_stack()`) there is only one facet dimension, so the `*`.free argument requires only one logical value.

Currently, three geometry-derived variables are implemented:

- "AREA" (polygons only), which uses the feature area;
- "LENGTH" (lines only), which uses the feature length; and
- "MAP_COLORS", which assigns values so that adjacent features receive different values, making it particularly suitable for coloring neighbouring polygons.

Note that geometry-derived variables do not generate a legend automatically. If a legend is required, compute the corresponding variable explicitly, for example with `sf::st_area()`, `sf::st_length()`, or `tmaptools::map_coloring()`, and use the resulting values instead.

Map variable units:

Every map variable maps data values to a specific output unit. Knowing the unit matters when supplying constant values via `tm_const()`, or output ranges via `values.range / values.scale` in the scale functions.

Variable	Output unit	Notes
fill, col, bgcol	color	name, hex, or palette string
fill_alpha, col_alpha, bgcol_alpha	proportion 0-1	0 = transparent, 1 = opaque
size (symbols, bubbles, squares, dots)	typographic lines	1 line approx. 1/6 inch; scaled by <code>values.scale</code>
size (circles)	meters	plain numeric or a <code>units</code> object
size (text, labels)	multiplier	1 = 12 pt (plot) / 12 px (view)
lwd	lwd	base R units; 1 lwd approx. 0.75 pt at 96 dpi
lty	–	integer 1-6 or name ("solid", "dashed", ...)
shape	–	integer pch 1-25 or single character
angle	degrees	0-360, clockwise from north
fontface	–	"plain", "bold", "italic", "bold.italic"

Symbol size (size in `tm_symbols`, `tm_bubbles`, `tm_squares`, `tm_dots`):

"Lines" is a typographic unit: one line is approximately 1/6 inch (the default base line-height in R graphics). The global multiplier `tmap_options(values.scale = list(size.bubbles = 1.5))` scales all symbol sizes without changing the data mapping.

Circle size (size in `tm_circles`):

The value is a geographic radius in meters. A plain numeric vector is interpreted as meters; a `units` object (from the **units** package) is automatically converted, so `units::as_units(1, "mi")` gives a 1-mile radius. Because the radius is geographic, circles scale with zoom in interactive (view) mode – unlike bubble symbols which keep a fixed screen size.

Text size (size in `tm_text`, `tm_labels`):

The value is a multiplier of the base font size. `size = 1` renders at 12 pt in plot mode (R's default `par("ps")`) and at 12 px in view mode (`gp$cex * 12 px`, see `tmapLeafletDataPlot.tm_data_text`); the two modes are consistent by design.

Layer blending (blend):

Blend modes control how a layer’s pixels are combined with the pixels beneath it. For each pixel, let S be the source (top layer) RGB value and D be the destination (bottom layer) RGB value, both normalised to $[0, 1]$.

blend	Formula	Use case
"over"	$S \cdot \alpha + D \cdot (1 - \alpha)$	Standard alpha compositing (default)
"multiply"	$S \times D$	Hillshading over color raster; both layers darken each other
"screen"	$1 - (1 - S)(1 - D)$	Inverse of multiply; brightens
"overlay"	multiply if $D < 0.5$, screen if $D \geq 0.5$	Boosts contrast; preserves midtones
"darken"	$\min(S, D)$	Keeps the darker of the two layers per channel
"lighten"	$\max(S, D)$	Keeps the lighter of the two layers per channel

Requires R >= 4.2 and a compatible graphics device (e.g. `png(type = "cairo")`, `svg()`). In view mode, blending is applied via CSS `mix-blend-mode`. See `grid::groupGrob()` for the full list of supported operators.

zindex and pane names:

In view mode, each layer is rendered in a Leaflet pane named `"tmap{zindex}"` (e.g., `"tmap401"`, `"tmap402"`), with base tile layers placed in the standard `"tile"` pane.

See Also

[Map variables](#), [Scales](#), [Legends](#), [Facets](#), [Units](#), [Layer blending](#), [Terrain map](#)

Examples

```
tm_shape(World_rivers) +
  tm_lines(lwd = "strokewd",
    lwd.scale = tm_scale_asis(values.scale = 0.2, value.neutral = 2),
    col = "scalerank",
    col.scale = tm_scale_categorical(values = "seaborn.dark"))

tm_shape(World) +
  tm_lines(col = "continent",
    col.scale = tm_scale_categorical(values = "seaborn.dark"),
    lty = "continent",
    lwd = 1.5,
    lty.legend = tm_legend_combine("col"))
```

tm_logo	Map component: logo
---------	---------------------

Description

Map component that adds a logo.

Usage

```
tm_logo(
  file,
  height,
  margins,
  between_margin,
  stack,
  position,
  group_id,
  frame,
  frame.color,
  frame.alpha,
  frame.lwd,
  frame.r,
  z
)
```

Arguments

file	either a filename or url of a png image. If multiple files/urls are provided with a character vector, the logos are placed near each other. To specify logos for small multiples use a list of character values/vectors. In order to stack logos vertically, multiple <code>tm_logo</code> elements can be stacked.
height	height of the logo in number of text line heights. The width is scaled based the height and the aspect ratio of the logo. If multiple logos are specified by a vector or list, the heights can be specified accordingly.
margins	margins
between_margin	Margin between
stack	stack with other map components, either "vertical" or "horizontal".
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use <code>group_id</code> and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in tm_components() where its argument <code>id</code> should correspond to <code>group_id</code> .
frame	frame should a frame be drawn?
frame.color	frame color
frame.alpha	frame alpha transparency
frame.lwd	frame line width

frame.r Radius of the rounded frame corners. 0 means no rounding.
 z z index, e.g. the place of the component relative to the other componets

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

Examples

```
data(World)

tm_shape(World) +
  tm_polygons("HPI", fill.scale = tm_scale_intervals(values = "brewer.rd_yl_gn")) +
  tm_logo(c("https://www.r-project.org/logo/Rlogo.png",
            system.file("help", "figures", "logo.png", package = "tmap"))) +
  tm_logo("https://happyplanetindex.org/wp-content/themes/hpi/public/images/hpi-logo.svg",
          height=5, position = c("left", "center"))
```

tm_minimap	<i>Map component: minimap</i>
------------	-------------------------------

Description

Map component that adds a [minimap](#) in view mode.

Usage

```
tm_minimap(
  server,
  toggle,
  height,
  width,
  margins,
  between_margin,
  position,
  group_id,
  frame,
  frame.color,
  frame.alpha,
  frame.lwd,
  frame.r,
  bg,
  bg.color,
  bg.alpha,
  z,
  ...
)
```

Arguments

server	name of the provider or an URL (see tm_tiles()). By default, it shows the same map as the basemap, and moreover, it will automatically change when the user switches basemaps. Note the latter does not happen when server is specified.
toggle	should the minimap have a button to minimise it? By default TRUE.
width, height	width and height of the component.
margins	margins
between_margin	Margin between
position	The position specification of the component: an object created with tm_pos_in() or tm_pos_out() . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use group_id and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same group_id will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in tm_components() where its argument id should correspond to group_id.
frame	frame should a frame be drawn?
frame.color	frame color
frame.alpha	frame alpha transparency
frame.lwd	frame line width
frame.r	Radius of the rounded frame corners. 0 means no rounding.
bg	Show background?
bg.color	Background color
bg.alpha	Background transparency
z	z index, e.g. the place of the component relative to the other componets
...	Arguments passed on to leaflet::addMiniMap
map	a map widget object
collapsedWidth	The width of the toggle marker and the minimap when collapsed, in pixels. Defaults to 19.
collapsedHeight	The height of the toggle marker and the minimap when collapsed, in pixels. Defaults to 19.
zoomLevelOffset	The offset applied to the zoom in the minimap compared to the zoom of the main map. Can be positive or negative, defaults to -5.
zoomLevelFixed	Overrides the offset to apply a fixed zoom level to the minimap regardless of the main map zoom. Set it to any valid zoom level, if unset zoomLevelOffset is used instead.

centerFixed Applies a fixed position to the minimap regardless of the main map's view / position. Prevents panning the minimap, but does allow zooming (both in the minimap and the main map). If the minimap is zoomed, it will always zoom around the centerFixed point. You can pass in a LatLng-equivalent object. Defaults to false.

zoomAnimation Sets whether the minimap should have an animated zoom. (Will cause it to lag a bit after the movement of the main map.) Defaults to false.

toggleDisplay Sets whether the minimap should have a button to minimize it. Defaults to false.

autoToggleDisplay Sets whether the minimap should hide automatically, if the parent map bounds does not fit within the minimap bounds. Especially useful when 'zoomLevelFixed' is set.

minimized Sets whether the minimap should start in a minimized position.

aimingRectOptions Sets the style of the aiming rectangle by passing in a Path.Options (<https://web.archive.org/web/20220702182250/https://leafletjs.com/reference-1.3.4.html#path-options>) object. (Clickable will always be overridden and set to false.)

shadowRectOptions Sets the style of the aiming shadow rectangle by passing in a Path.Options (<https://web.archive.org/web/20220702182250/https://leafletjs.com/reference-1.3.4.html#path-option>) object. (Clickable will always be overridden and set to false.)

strings Overrides the default strings allowing for translation.

tiles URL for tiles or one of the pre-defined providers.

mapOptions Sets Leaflet options for the MiniMap map. It does not override the MiniMap default map options but extends them.

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#) .doc_see_also_insets()

tm_mouse_coordinates *Map component: mouse coordinates*

Description

Map component that adds mouse coordinates

Usage

```
tm_mouse_coordinates(stack, position, group_id, z)
```

Arguments

stack	stack with other map components, either "vertical" or "horizontal".
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use <code>group_id</code> and specify component in <code>tm_components()</code> .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in <code>tm_components()</code> where its argument <code>id</code> should correspond to <code>group_id</code> .
z	z index, e.g. the place of the component relative to the other components

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

tm_options	<i>Per-map tmap options</i>
------------	-----------------------------

Description

Set tmap options for a single map. Unlike `tmap_options()`, which sets options globally, `tm_options()` applies only to the map it is added to. `tm_layout()` is identical but exposes only the layout-related options.

Usage

```
tm_options(
  crs,
  facet.max,
  facet.levels.max,
  free.scales,
  raster.max_cells,
  raster.warp,
  show.messages,
  show.warnings,
  output.format,
  output.size,
  output.dpi,
  animation.dpi,
  value.const,
  value.na,
```

```
value.null,  
value.blank,  
values.var,  
values.range,  
value.neutral,  
values.scale,  
scales.var,  
scale.misc.args,  
continuous.nclass_per_legend_break,  
continuous.nclasses,  
label.format,  
label.na,  
scale,  
asp,  
bg,  
bg.color,  
outer.bg,  
outer.bg.color,  
frame,  
frame.color,  
frame.alpha,  
frame.lwd,  
frame.r,  
frame.double_line,  
outer.margins,  
inner.margins,  
inner.margins.extra,  
meta.margins,  
meta.auto_margins,  
between_margin,  
panel.margin,  
xlab.show,  
xlab.text,  
xlab.size,  
xlab.color,  
xlab.rotation,  
xlab.space,  
xlab.fontface,  
xlab.fontfamily,  
xlab.alpha,  
xlab.side,  
ylab.show,  
ylab.text,  
ylab.size,  
ylab.color,  
ylab.rotation,  
ylab.space,  
ylab.fontface,
```

```
ylab.fontfamily,  
ylab.alpha,  
ylab.side,  
panel.type,  
panel.wrap.pos,  
panel.xtab.pos,  
unit,  
color.sepia_intensity,  
color.saturation,  
color_vision_deficiency_sim,  
text.fontface,  
text.fontfamily,  
r,  
component.position,  
component.offset,  
component.stack_margin,  
component.autoscale,  
component.resize_as_group,  
component.frame_combine,  
component.stack,  
legend.stack,  
chart.stack,  
component.equalize,  
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component.frame.alpha,  
component.frame.lwd,  
component.frame.r,  
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component.bg.alpha,  
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legend.width,  
legend.height,  
legend.reverse,  
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legend.title.fontface,  
legend.title.fontfamily,  
legend.title.alpha,  
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legend.xlab.fontfamily,
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legend.xlab.alpha,  
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legend.ylab.fontface,  
legend.ylab.fontfamily,  
legend.ylab.alpha,  
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legend.text.size,  
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legend.frame.r,  
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legend.settings.landscape,  
add_legend.position,  
chart.show,  
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chart.plot.axis.y,  
chart.position,  
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chart.reverse,  
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chart.xlab.alpha,  
chart.ylab.color,  
chart.ylab.size,  
chart.ylab.fontface,  
chart.ylab.fontfamily,  
chart.ylab.alpha,
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chart.text.color,  
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chart.text.fontface,  
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chart.frame.alpha,  
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credits.fontface,  
credits.fontfamily,  
credits.alpha,  
credits.padding,  
credits.position,  
credits.width,  
credits.height,  
compass.north,  
compass.type,  
compass.text.size,  
compass.size,  
compass.show.labels,  
compass.cardinal.directions,  
compass.text.color,  
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compass.color.light,  
compass.lwd,  
compass.margins,  
compass.position,
```

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inset.position,  
logo.height,  
logo.margins,  
logo.between_margin,  
logo.position,  
inset_map.height,  
inset_map.width,  
inset_map.margins,  
inset_map.between_margin,  
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inset.width,  
inset.margins,  
inset.between_margin,  
inset.frame,  
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inset.bg.alpha,  
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scalebar.text.fontface,  
scalebar.text.fontfamily,  
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scalebar.color.light,  
scalebar.lwd,  
scalebar.size,  
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grid.show,  
grid.labels.pos,  
grid.x,  
grid.y,  
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grid.col,  
grid.lwd,  
grid.alpha,  
grid.labels.show,  
grid.labels.size,
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grid.labels.col,  
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grid.labels.format,  
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grid.labels.space.y,  
grid.labels.inside_frame,  
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grid.ndiscr,  
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minimap.toggle,  
minimap.position,  
panel.show,  
panel.labels,  
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panel.label.color,  
panel.label.fontface,  
panel.label.fontfamily,  
panel.label.alpha,  
panel.label.bg,  
panel.label.bg.color,  
panel.label.bg.alpha,  
panel.label.frame,  
panel.label.frame.color,  
panel.label.frame.alpha,  
panel.label.frame.lwd,  
panel.label.frame.r,  
panel.label.height,  
panel.label.rot,  
qtm.scalebar,  
qtm.minimap,  
qtm.mouse_coordinates,  
earth_boundary,  
earth_boundary.color,  
earth_boundary.lwd,  
earth_datum,  
space,  
space.color,  
space_overlay,  
check_and_fix,  
basemap.show,  
basemap.server,
```

```

    basemap.alpha,
    basemap.zoom,
    tiles.show,
    tiles.server,
    tiles.alpha,
    tiles.zoom,
    attr.color,
    crs_extra,
    crs_global,
    crs_basemap,
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    main.title = NULL,
    main.title.size = NULL,
    main.title.color = NULL,
    main.title.fontface = NULL,
    main.title.fontfamily = NULL,
    main.title.position = NULL,
    fontface = NULL,
    fontfamily = NULL,
    style,
    ...
)

```

Arguments

<code>crs</code>	Map crs (see tm_shape()). NA means the crs is specified in tm_shape() . The crs that is used by the transformation functions is defined in tm_shape() .
<code>facet.max</code>	Maximum number of facets in a static plot (rows x columns); animation frames are not counted.
<code>facet_levels.max</code>	Maximum number of facet levels processed across all faceting dimensions, animation frames included (rows x columns x frames). Default 1e5.
<code>free.scales</code>	For backward compatibility: if this value is set, it will be used to impute the free arguments in the layer functions
<code>raster.max_cells</code>	Maximum number of raster grid cells. Can be mode specific <code>c(plot = 3000, view = 1000, 1000)</code> (the last value is the fall back default)
<code>raster.warp</code>	Should rasters be warped or transformed in case a different projection (crs) is used? Warping creates a new regular raster in the target crs, whereas transforming creates a (usually non-regular) raster in the target crs. The former is lossy, but much faster and is therefore the default. When a different projection (crs) is used, a (usually) regular raster will be
<code>show.messages</code>	Show messages?
<code>show.warnings</code>	Show warnings?
<code>output.format</code>	Output format
<code>output.size</code>	Output size

output.dpi	Output dpi
animation.dpi	Output dpi for animations
value.const	Default visual value constants e.g. the default fill color for <code>tm_shape(World) + tm_polygons()</code> . A list is required with per map variable a value.
value.na	Default visual values that are used to visualize NA data values. A list is required with per map variable a value.
value.null	Default visual values that are used to visualize null (out-of-scope) data values. A list is required with per map variable a value.
value.blank	Default visual values that correspond to blank. For color these are "#00000000" meaning transparent. A list is required with per map variable a value.
values.var	Default values when a data variable is mapped to a map variable, e.g. a color palette. A list is required with per map variable a value.
values.range	Default range for values. See <code>values.range</code> of <code>tm_scale_categorical()</code> . A list is required with per map variable a value.
value.neutral	Default values for when a data variable is mapped to a map variable, e.g. a color palette. A list is required with per map variable a value.
values.scale	Default scales (as in object sizes) for values. See <code>values.range</code> of <code>tm_scale_categorical()</code> . A list is required with per map variable a value.
scales.var	Default scale functions per map variable and type of data variable. A list is required with per map variable per data type.
scale.misc.args	Default values of scale function-specific arguments. A list is required with per scale function and optional per map variable.
continuous.nclass_per_legend_break	The number of continuous legend breaks within one 'unit' (label). The default value is 50.
continuous.nclasses	the number of classes of a continuous scale. Should be odd. The default value is 101.
label.format	Format for the labels. These are the default values for <code>tm_label_format()</code>
label.na	Default label for missing values.
scale	Overall scale of the map
asp	Aspect ratio of each map. When <code>asp</code> is set to NA (default) the aspect ratio will be adjusted to the used shapes. When set to 0 the aspect ratio is adjusted to the size of the device divided by the number of columns and rows.
bg	Draw map background?
bg.color	Background color of the map.
outer.bg	Draw map background (outside the frame)?
outer.bg.color	Background color of map outside the frame.
frame	Draw map frame?
frame.color	The color of the frame.
frame.alpha	The alpha transparency of the frame.

<code>frame.lwd</code>	The line width of the frame. See <code>graphics::par</code> , option 'lwd'.
<code>frame.r</code>	The <i>r</i> (radius) of the frame.
<code>frame.double_line</code>	The double line of the frame. TRUE or FALSE.
<code>outer.margins</code>	The margins of the outer space (outside the frame). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inner.margins</code>	The margins of the inner space (inside the frame). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inner.margins.extra</code>	The extra arguments of the margins of the inner space (inside the frame). A list of arguments.
<code>meta.margins</code>	The margins of the 'meta' space (reserved for outside map components). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>meta.auto_margins</code>	The <code>auto_margins</code> of the 'meta' space (reserved for outside map components).
<code>between_margin</code>	Margin between the map.
<code>panel.margin</code>	The margin of the panel.
<code>xlab.show</code>	The visibility of the xlab. TRUE or FALSE.
<code>xlab.text</code>	The text of the xlab.
<code>xlab.size</code>	The size of the xlab.
<code>xlab.color</code>	The color of the xlab.
<code>xlab.rotation</code>	The rotation of the xlab.
<code>xlab.space</code>	The space of the xlab. In terms of number of text line heights.
<code>xlab.fontface</code>	The font face of the xlab. See <code>graphics::par</code> , option 'font'.
<code>xlab.fontfamily</code>	The font family of the xlab. See <code>graphics::par</code> , option 'family'.
<code>xlab.alpha</code>	The alpha transparency of the xlab.
<code>xlab.side</code>	The side of the xlab.
<code>ylab.show</code>	The visibility of the ylab. TRUE or FALSE.
<code>ylab.text</code>	The text of the ylab.
<code>ylab.size</code>	The size of the ylab.
<code>ylab.color</code>	The color of the ylab.
<code>ylab.rotation</code>	The rotation of the ylab.
<code>ylab.space</code>	The space of the ylab. In terms of number of text line heights.
<code>ylab.fontface</code>	The font face of the ylab. See <code>graphics::par</code> , option 'font'.
<code>ylab.fontfamily</code>	The font family of the ylab. See <code>graphics::par</code> , option 'family'.

<code>ylab.alpha</code>	The alpha transparency of the ylab.
<code>ylab.side</code>	The side of the ylab.
<code>panel.type</code>	The type of the panel.
<code>panel.wrap.pos</code>	The panel positions for wrapped facets created with <code>tm_facets_grid()</code> . One of "left", "right", "top" (default) or "bottom".
<code>panel.xtab.pos</code>	The panel positions for grid facets created with <code>tm_facets_grid()</code> . Vector of two, where the first determines the locations of row panels ("left" or "right") and the second the location of column panels ("top" or "bottom").
<code>unit</code>	Unit of the coordinate
<code>color.sepia_intensity</code>	The sepia_intensity of the color.
<code>color.saturation</code>	The saturation of the color.
<code>color_vision_deficiency_sim</code>	Color vision deficiency simulation. Either "protan", "deutan", or "tritan".
<code>text.fontface</code>	The font face of the text. See <code>graphics::par</code> , option 'font'.
<code>text.fontfamily</code>	The font family of the text. See <code>graphics::par</code> , option 'family'.
<code>r</code>	The r (radius) (overall).
<code>component.position</code>	The position of the component. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>component.offset</code>	The offset of the component.
<code>component.stack_margin</code>	The stack_margin of the component.
<code>component.autoscale</code>	The autoscale of the component.
<code>component.resize_as_group</code>	The resize_as_group of the component.
<code>component.frame_combine</code>	The frame_combine of the component.
<code>component.stack</code>	The stack of the component.
<code>legend.stack</code>	The stack of the legend.
<code>chart.stack</code>	The stack of the chart.
<code>component.equalize</code>	The equalize of the component.
<code>component.frame</code>	The frame of the component.
<code>component.frame.color</code>	The color of the frame of the component.

`component.frame.alpha`
The alpha transparency of the frame of the component.

`component.frame.lwd`
The line width of the frame of the component. See `graphics::par`, option `'lwd'`.

`component.frame.r`
The `r` (radius) of the frame of the component.

`component.bg`
The `bg` of the component.

`component.bg.color`
The color of the `bg` of the component.

`component.bg.alpha`
The alpha transparency of the `bg` of the component.

`legend.show`
The visibility of the legend. TRUE or FALSE.

`legend.orientation`
The orientation of the legend.

`legend.position`
The position of the legend. A `tm_pos` object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See `tm_pos` for details

`legend.width`
The width of the legend.

`legend.height`
The height of the legend.

`legend.reverse`
The reverse of the legend.

`legend.na.show`
The visibility of the `na` of the legend. TRUE or FALSE.

`legend.title.color`
The color of the title of the legend.

`legend.title.size`
The size of the title of the legend.

`legend.title.fontface`
The font face of the title of the legend. See `graphics::par`, option `'font'`.

`legend.title.fontfamily`
The font family of the title of the legend. See `graphics::par`, option `'family'`.

`legend.title.alpha`
The alpha transparency of the title of the legend.

`legend.xlab.color`
The color of the `xlab` of the legend.

`legend.xlab.size`
The size of the `xlab` of the legend.

`legend.xlab.rot`
The `rot` of the `xlab` of the legend.

`legend.xlab.fontface`
The font face of the `xlab` of the legend. See `graphics::par`, option `'font'`.

`legend.xlab.fontfamily`
The font family of the `xlab` of the legend. See `graphics::par`, option `'family'`.

legend.xlab.alpha	The alpha transparency of the xlab of the legend.
legend.ylab.color	The color of the ylab of the legend.
legend.ylab.size	The size of the ylab of the legend.
legend.ylab.rot	The rot of the ylab of the legend.
legend.ylab.fontface	The font face of the ylab of the legend. See <code>graphics::par</code> , option 'font'.
legend.ylab.fontfamily	The font family of the ylab of the legend. See <code>graphics::par</code> , option 'family'.
legend.ylab.alpha	The alpha transparency of the ylab of the legend.
legend.text.color	The color of the text of the legend.
legend.text.size	The size of the text of the legend.
legend.text.fontface	The font face of the text of the legend. See <code>graphics::par</code> , option 'font'.
legend.text.fontfamily	The font family of the text of the legend. See <code>graphics::par</code> , option 'family'.
legend.text.alpha	The alpha transparency of the text of the legend.
legend.frame	The frame of the legend.
legend.frame.color	The color of the frame of the legend.
legend.frame.alpha	The alpha transparency of the frame of the legend.
legend.frame.lwd	The line width of the frame of the legend. See <code>graphics::par</code> , option 'lwd'.
legend.frame.r	The r (radius) of the frame of the legend.
legend.bg	The bg of the legend.
legend.bg.color	The color of the bg of the legend.
legend.bg.alpha	The alpha transparency of the bg of the legend.
legend.only	Should only legends be printed (so without map)?
legend.absolute_fontsize	The absolute fontsize of the legend. So far, only used to calculate legend dimensions
legend.settings.portrait	The portrait of the settings of the legend.

<code>legend.settings.landscape</code>	The landscape of the settings of the legend.
<code>add_legend.position</code>	The position of the <code>add_legend</code> . A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>chart.show</code>	The visibility of the chart. TRUE or FALSE.
<code>chart.plot.axis.x</code>	The x of the axis of the plot of the chart.
<code>chart.plot.axis.y</code>	The y of the axis of the plot of the chart.
<code>chart.position</code>	The position of the chart. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>chart.width</code>	The width of the chart.
<code>chart.height</code>	The height of the chart.
<code>chart.reverse</code>	The reverse of the chart.
<code>chart.na.show</code>	The visibility of the na of the chart. TRUE or FALSE.
<code>chart.title.color</code>	The color of the title of the chart.
<code>chart.title.size</code>	The size of the title of the chart.
<code>chart.title.fontface</code>	The font face of the title of the chart. See <code>graphics::par</code> , option 'font'.
<code>chart.title.fontfamily</code>	The font family of the title of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.title.alpha</code>	The alpha transparency of the title of the chart.
<code>chart.xlab.color</code>	The color of the xlab of the chart.
<code>chart.xlab.size</code>	The size of the xlab of the chart.
<code>chart.xlab.fontface</code>	The font face of the xlab of the chart. See <code>graphics::par</code> , option 'font'.
<code>chart.xlab.fontfamily</code>	The font family of the xlab of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.xlab.alpha</code>	The alpha transparency of the xlab of the chart.
<code>chart.ylab.color</code>	The color of the ylab of the chart.
<code>chart.ylab.size</code>	The size of the ylab of the chart.
<code>chart.ylab.fontface</code>	The font face of the ylab of the chart. See <code>graphics::par</code> , option 'font'.

<code>chart.ylab.fontfamily</code>	The font family of the ylab of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.ylab.alpha</code>	The alpha transparency of the ylab of the chart.
<code>chart.text.color</code>	The color of the text of the chart.
<code>chart.text.size</code>	The size of the text of the chart.
<code>chart.text.fontface</code>	The font face of the text of the chart. See <code>graphics::par</code> , option 'font'.
<code>chart.text.fontfamily</code>	The font family of the text of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.text.alpha</code>	The alpha transparency of the text of the chart.
<code>chart.frame</code>	The frame of the chart.
<code>chart.frame.color</code>	The color of the frame of the chart.
<code>chart.frame.alpha</code>	The alpha transparency of the frame of the chart.
<code>chart.frame.lwd</code>	The line width of the frame of the chart. See <code>graphics::par</code> , option 'lwd'.
<code>chart.frame.r</code>	The r (radius) of the frame of the chart.
<code>chart.bg</code>	The bg of the chart.
<code>chart.bg.color</code>	The color of the bg of the chart.
<code>chart.bg.alpha</code>	The alpha transparency of the bg of the chart.
<code>chart.object.color</code>	The color of the object of the chart.
<code>title.size</code>	The size of the title.
<code>title.color</code>	The color of the title.
<code>title.fontface</code>	The font face of the title. See <code>graphics::par</code> , option 'font'.
<code>title.fontfamily</code>	The font family of the title. See <code>graphics::par</code> , option 'family'.
<code>title.alpha</code>	The alpha transparency of the title.
<code>title.padding</code>	The padding of the title. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>title.frame</code>	The frame of the title.
<code>title.frame.color</code>	The color of the frame of the title.
<code>title.frame.alpha</code>	The alpha transparency of the frame of the title.
<code>title.frame.lwd</code>	The line width of the frame of the title. See <code>graphics::par</code> , option 'lwd'.
<code>title.frame.r</code>	The r (radius) of the frame of the title.

<code>title.position</code>	The position of the title. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>title.width</code>	The width of the title.
<code>credits.size</code>	The size of the credits.
<code>credits.color</code>	The color of the credits.
<code>credits.fontface</code>	The font face of the credits. See <code>graphics::par</code> , option 'font'.
<code>credits.fontfamily</code>	The font family of the credits. See <code>graphics::par</code> , option 'family'.
<code>credits.alpha</code>	The alpha transparency of the credits.
<code>credits.padding</code>	The padding of the credits. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>credits.position</code>	The position of the credits. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>credits.width</code>	The width of the credits.
<code>credits.height</code>	The height of the credits.
<code>compass.north</code>	The north of the compass.
<code>compass.type</code>	The type of the compass.
<code>compass.text.size</code>	The size of the text of the compass.
<code>compass.size</code>	The size of the compass.
<code>compass.show.labels</code>	The labels of the show of the compass.
<code>compass.cardinal.directions</code>	The directions of the cardinal of the compass.
<code>compass.text.color</code>	The color of the text of the compass.
<code>compass.color.dark</code>	The dark of the color of the compass.
<code>compass.color.light</code>	The light of the color of the compass.
<code>compass.lwd</code>	The line width of the compass. See <code>graphics::par</code> , option 'lwd'.
<code>compass.margins</code>	The margins of the compass. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>compass.position</code>	The position of the compass. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details

<code>inset.position</code>	The position of the inset. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>logo.height</code>	The height of the logo.
<code>logo.margins</code>	The margins of the logo. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>logo.between_margin</code>	The <code>between_margin</code> of the logo.
<code>logo.position</code>	The position of the logo. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>inset_map.height</code>	The height of the <code>inset_map</code> .
<code>inset_map.width</code>	The width of the <code>inset_map</code> .
<code>inset_map.margins</code>	The margins of the <code>inset_map</code> . A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inset_map.between_margin</code>	The <code>between_margin</code> of the <code>inset_map</code> .
<code>inset_map.position</code>	The position of the <code>inset_map</code> . A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>inset_map.frame</code>	The frame of the <code>inset_map</code> .
<code>inset.height</code>	The height of the inset.
<code>inset.width</code>	The width of the inset.
<code>inset.margins</code>	The margins of the inset. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inset.between_margin</code>	The <code>between_margin</code> of the inset.
<code>inset.frame</code>	The frame of the inset.
<code>inset.bg</code>	The bg of the inset.
<code>inset.bg.color</code>	The color of the bg of the inset.
<code>inset.bg.alpha</code>	The alpha transparency of the bg of the inset.
<code>inset_grob.height</code>	The height of the <code>inset_grob</code> .
<code>inset_grob.width</code>	The width of the <code>inset_grob</code> .
<code>inset_gg.height</code>	The height of the <code>inset_gg</code> .
<code>inset_gg.width</code>	The width of the <code>inset_gg</code> .

`scalebar.breaks`
 See `tm_scalebar()`
`scalebar.width` See `tm_scalebar()`
`scalebar.allow_clipping`
 See `tm_scalebar()`
`scalebar.text.size`
 The size of the text of the scalebar.
`scalebar.text.color`
 The color of the text of the scalebar.
`scalebar.text.fontface`
 The font face of the text of the scalebar. See `graphics::par`, option 'font'.
`scalebar.text.fontfamily`
 The font family of the text of the scalebar. See `graphics::par`, option 'family'.
`scalebar.color.dark`
 The dark of the color of the scalebar.
`scalebar.color.light`
 The light of the color of the scalebar.
`scalebar.lwd` The line width of the scalebar. See `graphics::par`, option 'lwd'.
`scalebar.size` The size of the scalebar.
`scalebar.margins`
 The margins of the scalebar. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
`scalebar.position`
 The position of the scalebar. A `tm_pos` object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See `tm_pos` for details
`grid.show` The visibility of the grid. TRUE or FALSE.
`grid.labels.pos`
 The pos of the labels of the grid.
`grid.x` The x of the grid.
`grid.y` The y of the grid.
`grid.n.x` The x of the n of the grid.
`grid.n.y` The y of the n of the grid.
`grid.crs` The coordinate reference system (CRS) of the grid.
`grid.col` The color of the grid.
`grid.lwd` The line width of the grid. See `graphics::par`, option 'lwd'.
`grid.alpha` The alpha transparency of the grid.
`grid.labels.show`
 The visibility of the labels of the grid. TRUE or FALSE.
`grid.labels.size`
 The size of the labels of the grid.
`grid.labels.col`
 The color of the labels of the grid.

<code>grid.labels.fontface</code>	The font face of the labels of the grid. See <code>graphics::par</code> , option 'font'.
<code>grid.labels.fontfamily</code>	The font family of the labels of the grid. See <code>graphics::par</code> , option 'family'.
<code>grid.labels.rot</code>	The rot of the labels of the grid.
<code>grid.labels.format</code>	The format of the labels of the grid.
<code>grid.labels.cardinal</code>	The cardinal of the labels of the grid.
<code>grid.labels.margin.x</code>	The x of the margin of the labels of the grid.
<code>grid.labels.margin.y</code>	The y of the margin of the labels of the grid.
<code>grid.labels.space.x</code>	The x of the space of the labels of the grid.
<code>grid.labels.space.y</code>	The y of the space of the labels of the grid.
<code>grid.labels.inside_frame</code>	The <code>inside_frame</code> of the labels of the grid.
<code>grid.ticks</code>	The ticks of the grid.
<code>grid.lines</code>	The lines of the grid.
<code>grid.ndiscr</code>	The <code>ndiscr</code> of the grid.
<code>mouse_coordinates.position</code>	The position of the <code>mouse_coordinates</code> . A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>minimap.server</code>	The server of the minimap.
<code>minimap.toggle</code>	The toggle of the minimap.
<code>minimap.position</code>	The position of the minimap. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>panel.show</code>	The visibility of the panel. TRUE or FALSE.
<code>panel.labels</code>	The labels of the panel.
<code>panel.label.size</code>	The size of the label of the panel.
<code>panel.label.color</code>	The color of the label of the panel.
<code>panel.label.fontface</code>	The font face of the label of the panel. See <code>graphics::par</code> , option 'font'.
<code>panel.label.fontfamily</code>	The font family of the label of the panel. See <code>graphics::par</code> , option 'family'.

<code>panel.label.alpha</code>	The alpha transparency of the label of the panel.
<code>panel.label.bg</code>	The bg of the label of the panel.
<code>panel.label.bg.color</code>	The color of the bg of the label of the panel.
<code>panel.label.bg.alpha</code>	The alpha transparency of the bg of the label of the panel.
<code>panel.label.frame</code>	The frame of the label of the panel.
<code>panel.label.frame.color</code>	The color of the frame of the label of the panel.
<code>panel.label.frame.alpha</code>	The alpha transparency of the frame of the label of the panel.
<code>panel.label.frame.lwd</code>	The line width of the frame of the label of the panel. See <code>graphics::par</code> , option 'lwd'.
<code>panel.label.frame.r</code>	The r (radius) of the frame of the label of the panel.
<code>panel.label.height</code>	The height of the label of the panel.
<code>panel.label.rot</code>	Rotation angles of the panel labels. Vector of four values that determine the panel label rotation when they are placed left, top, right, and bottom. The default angles are 90, 0, 270 and 0 respectively. Note that the second value is the most common, since labels are by default shown on top (see <code>panel.wrap.pos</code>). In cross-table facets created with <code>tm_facets_grid()</code> , the first two values are used by default (see <code>panel.xtab.pos</code>).
<code>qtm.scalebar</code>	The scalebar of the qtm.
<code>qtm.minimap</code>	The minimap of the qtm.
<code>qtm.mouse_coordinates</code>	The mouse_coordinates of the qtm.
<code>earth_boundary</code>	The earth boundary
<code>earth_boundary.color</code>	The color of the earth_boundary.
<code>earth_boundary.lwd</code>	The line width of the earth_boundary. See <code>graphics::par</code> , option 'lwd'.
<code>earth_datum</code>	Earth datum
<code>space</code>	Should the space be drawn? Only applicable is earth_boundary is enabled.
<code>space.color</code>	The color of the space.
<code>space_overlay</code>	Should the space be drawn as overlay (to make sure spatial features or rasters do not exceed the earth boundary), or as background? By default TRUE when a raster is warped.
<code>check_and_fix</code>	Should attempt to fix an invalid shapefile

basemap.show	The visibility of the basemap. TRUE or FALSE.
basemap.server	The server of the basemap.
basemap.alpha	The alpha transparency of the basemap.
basemap.zoom	The zoom of the basemap.
tiles.show	The visibility of the tiles. TRUE or FALSE.
tiles.server	The server of the tiles.
tiles.alpha	The alpha transparency of the tiles.
tiles.zoom	The zoom of the tiles.
attr.color	The color of the attr.
crs_extra	Only used internally (work in progress)
crs_global	The used crs for world maps
crs_basemap	The crs_basemap (overall).
title	deprecated See tm_title()
main.title	deprecated See tm_title()
main.title.size, main.title.color, main.title.fontface, main.title.fontfamily, main.title.position	deprecated. Use the title. options instead.
fontface, fontfamily	renamed to text.fontface and text.fontfamily
style	style see tm_style()
...	List of tmap options to be set, or option names (characters) to be returned (see details)

See Also

[Layout](#), [Margins and aspect ratio](#), [Options and styles](#), [Choropleth \(World\)](#), [Terrain map](#)

tm_plot

Plot mode options

Description

Plot mode options. This option is specific to the plot mode.

Usage

```
tm_plot(use_gradient, limit_latitude_3857)
```

Arguments

`use_gradient` Use gradient fill using [linearGradient\(\)](#)

`limit_latitude_3857` Vector of two limit latitude values for maps printed in Web Mercator projection (EPSG 3857). If `c(-90, 90)` the poles will be inflated too much. The Web Mercator is defines as `c(-85.06, 85.06)`, but the default setting in tmap is `c(-84, 84)`.

See Also

[Modes](#)

tm_plot_order	<i>Determine plotting order of features</i>
---------------	---

Description

Determine plotting order of features.

Usage

```
tm_plot_order(
  aes,
  reverse = TRUE,
  na.order = c("mix", "bottom", "top"),
  null.order = c("bottom", "mix", "top"),
  null.below.na = TRUE
)
```

Arguments

<code>aes</code>	Map variable for which the values determine the plotting order. Example: bubble map where the "size" map variable is used. A data variable (say population) is mapped via a continuous scale (tm_scale_continuous()) to bubble sizes. The bubbles are plotted in order of size. How is determined by the other arguments. Use "DATA" to keep the same order as in the data. Another special value are "AREA" and "LENGTH" which are preserved for polygons and lines respectively: rather than a data variable the polygon area / line lengths determines the plotting order.
<code>reverse</code>	Logical that determines whether the visual values are plotted in reversed order. The visual values (specified with tmap option "values.var") are by default reversed, so plotted starting from the last value. In the bubble map example, this means that large bubbles are plotted first, hence at the bottom.
<code>na.order</code>	Where should features be plotted that have an NA value for (at least) one other map variable? In the (order) "mix", at the "bottom", or on "top"? In the bubble map example: if fill color is missing for some bubble, where should those bubbles be plotted?

null.order Where should non-selected (aka null) features be plotted?
 null.below.na Should null features be plotted below NA features?

tm_polygons	<i>Map layer: polygons</i>
-------------	----------------------------

Description

Map layer that draws polygons. Supported map variables are: fill (the fill color), col (the border color), lwd (line width), lty (line type), fill_alpha (fill color alpha transparency) and col_alpha (border color alpha transparency).

Usage

```
tm_polygons(
  fill = tm_const(),
  fill.scale = tm_scale(),
  fill.legend = tm_legend(),
  fill.chart = tm_chart_none(),
  fill.free = NA,
  col = tm_const(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  lwd = tm_const(),
  lwd.scale = tm_scale(),
  lwd.legend = tm_legend(),
  lwd.chart = tm_chart_none(),
  lwd.free = NA,
  lty = tm_const(),
  lty.scale = tm_scale(),
  lty.legend = tm_legend(),
  lty.chart = tm_chart_none(),
  lty.free = NA,
  fill_alpha = tm_const(),
  fill_alpha.scale = tm_scale(),
  fill_alpha.legend = tm_legend(),
  fill_alpha.chart = tm_chart_none(),
  fill_alpha.free = NA,
  col_alpha = tm_const(),
  col_alpha.scale = tm_scale(),
  col_alpha.legend = tm_legend(),
  col_alpha.chart = tm_chart_none(),
  col_alpha.free = NA,
  linejoin = "round",
  lineend = "round",
```

```

plot.order = tm_plot_order("lwd", reverse = TRUE, na.order = "bottom"),
zindex = NA,
group = NA,
group.control = "check",
popup = tm_popup(),
popup.vars = NA,
popup.format = tm_label_format(),
hover = NA,
id = "",
blend = "over",
options = opt_tm_polygons(),
...
)

tm_fill(...)

tm_borders(col = tm_const(), ...)

opt_tm_polygons(polygons.only = "ifany")

```

Arguments

fill, fill.scale, fill.legend, fill.chart, fill.free
 Map variable that determines the fill color. See details. *Unit:* Color – a color name, hex string.

col, col.scale, col.legend, col.chart, col.free
 Map variable that determines the color. See details. *Unit:* Color – a color name, hex string.

lwd, lwd.scale, lwd.legend, lwd.chart, lwd.free
 Map variable that determines the line width. See details. *Unit:* Base R line-width units; 1 lwd is approx. 0.75 pt at 96 dpi.

lty, lty.scale, lty.legend, lty.chart, lty.free
 Map variable that determines the line type. See details. *Unit:* Integer (1-6) or name: "solid", "dashed", "dotted", "dotdash", "longdash", "twodash".

fill_alpha, fill_alpha.scale, fill_alpha.chart, fill_alpha.legend, fill_alpha.free
 Map variable that determines the fill color transparency. See details. *Unit:* Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).

col_alpha, col_alpha.scale, col_alpha.legend, col_alpha.chart, col_alpha.free
 Map variable that determines the color transparency. See details. *Unit:* Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).

linejoin, lineend
 Line join and line end. See [gpar\(\)](#) for details.

plot.order
 Specification in which order the spatial features are drawn. See [tm_plot_order\(\)](#) for details.

zindex
 Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.

group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
popup	popup specification for "view" mode, the output of <code>tm_popup()</code> . It determines the data variables shown in the popup table, the popup title, and (in the future) the popup layout. This replaces the deprecated arguments <code>popup.vars</code> and <code>popup.format</code> .
popup.vars	(Deprecated.) Use popup with <code>tm_popup()</code> instead (via its <code>vars</code> argument). Names of data variables that are shown in the popups in "view" mode. Set <code>popup.vars</code> to TRUE to show all variables in the shape object. Set <code>popup.vars</code> to FALSE to disable popups. Set <code>popup.vars</code> to a character vector of variable names to show those variables in the popups. The default (NA) depends on whether visual variables (e.g. <code>fill</code>) are used. If so, only those are shown. If not, all variables in the shape object are shown.
popup.format	(Deprecated.) Use popup with <code>tm_popup()</code> instead (via its <code>format</code> argument). List of formatting options for the popup values. Output of <code>tm_label_format()</code> . Only applicable for numeric data variables. If one list of formatting options is provided, it is applied to all numeric variables of <code>popup.vars</code> . Also, a (named) list of lists can be provided. In that case, each list of formatting options is applied to the named variable.
hover	name of the data variable that specifies the hover labels (view mode only). Set to FALSE to disable hover labels. By default FALSE, unless <code>id</code> is specified. In that case, it is set to <code>id</code> ,
id	name of the data variable that specifies the indices of the spatial features. Only used for "view" mode.
blend	Compositing operator for layer blending. Default "over" applies no blending. See the "Layer blending" section for the supported values.
options	options passed on to the corresponding <code>opt_<layer_function></code> function
...	to catch deprecated arguments from version < 4.0
polygons.only	should only polygon geometries of the shape object (defined in <code>tm_shape()</code>) be plotted? By default "ifany", which means TRUE in case a geometry collection is specified.

Details

The map variable arguments (e.g. `col`) can be specified with a data variable name (e.g., a spatial vector attribute or a raster layer of the object specified in `tm_shape()`), with a visual value (for `col`, a color is expected), or with a geometry-derived variable (see below). See vignette: [Map variables](#).

Multiple values can be specified: in that case facets are created. These facets can be combined with other faceting data variables, specified with `tm_facets()`. See vignette: [Facets](#).

- The `*.scale` arguments determine the used scale to map the data values to map variable values. These can be specified with one of the available `tm_scale_*` functions. The default is specified by the tmap option (`tm_options()`) `scales.var`. See 'vignette: [Scales](#)

- The `*.legend` arguments determine the used legend, specified with `tm_legend()`. The default legend and its settings are determined by the tmap options (`tm_options()`) `legend`. See ‘rvignette: [Legends](#)
- The `*.chart` arguments specify additional charts, specified with `tm_chart_`, e.g. `tm_chart_histogram()`. See ‘rvignette: [Charts](#)
- The `*.free` arguments determine whether scales are applied freely across facets, or shared. A logical value is required. They can also be specified with a vector of three logical values; these determine whether scales are applied freely per facet dimension. This is only useful when facets are applied (see `tm_facets()`). There are maximally three facet dimensions: rows, columns, and pages. This only applies for a facet grid (`tm_facets_grid()`). For instance, `col.free = c(TRUE, FALSE, FALSE)` means that for the map variable `col`, each row of facets will have its own scale, and therefore its own legend. For facet wraps and stacks (`tm_facets_wrap()` and `tm_facets_stack()`) there is only one facet dimension, so the `*.free` argument requires only one logical value.

Currently, three geometry-derived variables are implemented:

- "AREA" (polygons only), which uses the feature area;
- "LENGTH" (lines only), which uses the feature length; and
- "MAP_COLORS", which assigns values so that adjacent features receive different values, making it particularly suitable for coloring neighbouring polygons.

Note that geometry-derived variables do not generate a legend automatically. If a legend is required, compute the corresponding variable explicitly, for example with `sf::st_area()`, `sf::st_length()`, or `tmaptools::map_coloring()`, and use the resulting values instead.

Map variable units:

Every map variable maps data values to a specific output unit. Knowing the unit matters when supplying constant values via `tm_const()`, or output ranges via `values.range / values.scale` in the scale functions.

Variable	Output unit	Notes
<code>fill</code> , <code>col</code> , <code>bgcol</code>	color	name, hex, or palette string
<code>fill_alpha</code> , <code>col_alpha</code> , <code>bgcol_alpha</code>	proportion 0-1	0 = transparent, 1 = opaque
<code>size</code> (symbols, bubbles, squares, dots)	typographic lines	1 line approx. 1/6 inch; scaled by <code>values.scale</code>
<code>size</code> (circles)	meters	plain numeric or a units object
<code>size</code> (text, labels)	multiplier	1 = 12 pt (plot) / 12 px (view)
<code>lwd</code>	<code>lwd</code>	base R units; 1 <code>lwd</code> approx. 0.75 pt at 96 dpi
<code>lty</code>	–	integer 1-6 or name ("solid", "dashed", ...)
<code>shape</code>	–	integer pch 1-25 or single character
<code>angle</code>	degrees	0-360, clockwise from north
<code>fontface</code>	–	"plain", "bold", "italic", "bold.italic"

Symbol size (size in `tm_symbols`, `tm_bubbles`, `tm_squares`, `tm_dots`):

"Lines" is a typographic unit: one line is approximately 1/6 inch (the default base line-height in R graphics). The global multiplier `tmap_options(values.scale = list(size.bubbles = 1.5))` scales all symbol sizes without changing the data mapping.

Circle size (size in tm_circles):

The value is a geographic radius in meters. A plain numeric vector is interpreted as meters; a units object (from the **units** package) is automatically converted, so `units::as_units(1, "mi")` gives a 1-mile radius. Because the radius is geographic, circles scale with zoom in interactive (view) mode – unlike bubble symbols which keep a fixed screen size.

Text size (size in tm_text, tm_labels):

The value is a multiplier of the base font size. `size = 1` renders at 12 pt in plot mode (R's default `par("ps")`) and at 12 px in view mode (`gp$cex * 12 px`, see `tmapLeafletDataPlot.tm_data_text`); the two modes are consistent by design.

Layer blending (blend):

Blend modes control how a layer's pixels are combined with the pixels beneath it. For each pixel, let S be the source (top layer) RGB value and D be the destination (bottom layer) RGB value, both normalised to $[0, 1]$.

blend	Formula	Use case
"over"	$S \cdot \alpha + D \cdot (1 - \alpha)$	Standard alpha compositing (default)
"multiply"	$S \times D$	Hillshading over color raster; both layers darken each other
"screen"	$1 - (1 - S)(1 - D)$	Inverse of multiply; brightens
"overlay"	multiply if $D < 0.5$, screen if $D \geq 0.5$	Boosts contrast; preserves midtones
"darken"	$\min(S, D)$	Keeps the darker of the two layers per channel
"lighten"	$\max(S, D)$	Keeps the lighter of the two layers per channel

Requires R ≥ 4.2 and a compatible graphics device (e.g. `png(type = "cairo")`, `svg()`). In view mode, blending is applied via CSS `mix-blend-mode`. See `grid::groupGrob()` for the full list of supported operators.

zindex and pane names:

In view mode, each layer is rendered in a Leaflet pane named `"tmap{zindex}"` (e.g., `"tmap401"`, `"tmap402"`), with base tile layers placed in the standard `"tile"` pane.

See Also

[Map variables](#), [Scales](#), [Legends](#), [Facets](#), [Units](#), [Layer blending](#), [Choropleth \(World\)](#), [Choropleth \(Netherlands\)](#), [Bivariate choropleth](#), [Gridmap](#)

Examples

```
# load Africa country data
data(World)
Africa = World[World$continent == "Africa", ]
Africa_border = sf::st_make_valid(sf::st_union(sf::st_buffer(Africa, 0.001))) # slow and ugly

# without specifications
tm_shape(Africa_border) + tm_polygons()
tm_shape(Africa_border) + tm_fill()
tm_shape(Africa_border) + tm_borders()
```

```

# specification with map variable values
tm_shape(Africa) +
  tm_polygons(fill = "limegreen", col = "purple", lwd = 2, lty = "solid", col_alpha = 0.3) +
  tm_text("name", options = opt_tm_text(remove_overlap = TRUE)) +
tm_shape(Africa_border) +
  tm_borders("darkred", lwd = 3)

# specification with a data variable
tm_shape(Africa) +
  tm_polygons(fill = "income_grp", fill.scale = tm_scale_categorical(values = "-tol.muted"))

# continuous color scale with landscape legend
tm_shape(Africa) +
  tm_polygons(fill = "inequality",
    fill.scale = tm_scale_continuous(values = "-scico.roma"),
    fill.legend = tm_legend(
      title = "", orientation = "landscape",
      position = tm_pos_out("center", "bottom"), frame = FALSE
    )) +
tm_shape(Africa_border) +
  tm_borders(lwd = 2) +
tm_title("Inequality index", position = tm_pos_in("right", "TOP"), frame = FALSE) +
tm_layout(frame = FALSE)

# bivariate scale
tm_shape(World) +
  tm_polygons(tm_vars(c("inequality", "well_being"), multivariate = TRUE))

```

tm_popup

Popup specification for interactive maps

Description

tm_popup() specifies the popups that are shown in interactive ("view") mode when a feature is clicked. It is passed to the popup argument of the layer functions ([tm_polygons\(\)](#), [tm_symbols\(\)](#), [tm_lines\(\)](#), etc.). It replaces the (now deprecated) layer arguments popup.vars and popup.format.

Usage

```

tm_popup(
  vars = NA,
  title = NA,
  format = tm_label_format(),
  width = "auto",
  max.height = "25em",
  title.align = "left",
  title.color = NULL,
  label.align = "left",

```

```

    label.color = "#888888",
    value.align = "right",
    value.color = NULL,
    css = NULL
)

```

Arguments

<code>vars</code>	Names of the data variables that are shown in the popup table. A (possibly named) character vector; when named, the names are used as labels in the popup table. Besides a character vector, the following special values are supported (identical to the former <code>popup.vars</code> argument): TRUE show all variables of the shape object; FALSE disable popups; NA (default) automatic: if map variables (e.g. <code>fill</code>) are used, only those are shown, otherwise all variables of the shape object are shown.
<code>title</code>	Name of the data variable used as the popup title (the bold header shown above the popup table). This overrules the layer argument <code>id</code>, analogous to how <code>hover</code> overrules <code>id</code> for hover labels. The default (NA) means that the popup title is derived from <code>id</code> (the former, and still default, behavior). A length-one character vector is expected; a named value is allowed and reserved for future use.
<code>format</code>	A list of formatting options for the popup values, the output of <code>tm_label_format()</code>. Only applicable to numeric data variables. If one list of formatting options is provided, it is applied to all numeric variables of <code>vars</code>. A (named) list of lists can also be provided; in that case, each list of formatting options is applied to the named variable.
<code>width</code>	Width of the popup content (view mode). A bare number is interpreted as pixels (e.g. 300 means "300px"); a character string is used as-is, so any CSS length is accepted ("300px", "20em", "50%"). The default "auto" lets the popup size to its content.
<code>max.height</code>	Maximum height of the popup table before it becomes vertically scrollable (view mode). A bare number is interpreted as em (e.g. 5 means "5em", roughly "show 5 lines"); a character string is used as-is. Default "25em". Use <code>max.height = "none"</code> (or NA/Inf) to remove the cap, so the popup grows to fit its content and never scrolls.
<code>title.align</code> , <code>label.align</code> , <code>value.align</code>	Horizontal alignment of the popup title (bold header), the variable-name (label) column, and the value column respectively. Each one of "left", "center", or "right". Defaults: title "left", label "left", value "right".
<code>title.color</code> , <code>label.color</code> , <code>value.color</code>	Text color of the popup title, the label column, and the value column respectively. NULL (the default for title and value) inherits the browser/popup default; <code>label.color</code> defaults to "#888888" (grey).
<code>css</code>	Optional free-form CSS, injected verbatim as a <code><style></code> block in each popup, for full restyling beyond the arguments above. Target the semantic classes <code>.tmap-popup</code> (container), <code>.tmap-popup-table</code>, <code>.tmap-popup-title</code>, <code>.tmap-popup-label</code>,

and `.tmap-popup-value`. To size the popup box itself, target the backend's own popup element (`.leaflet-popup-content` in view mode, `.maplibregl-popup-content` in maplibre mode). Default NULL.

Value

A `tm_popup` object.

See Also

[tm_polygons\(\)](#), [tm_symbols\(\)](#), [tm_lines\(\)](#)

<code>tm_pos</code>	<i>Set the position of map components</i>
---------------------	---

Description

Set the position of map components, such as legends, title, compass, scale bar, etc. `tm_pos()` is the function to position these components: `tm_pos_out()` places the components outside the map area, `tm_pos_in()` inside the map area, and `tm_pos_on_top()` on top of the map. Each position argument of a map layer or component should be specified with one of these functions. The functions `tm_pos_auto_out()` and `tm_pos_auto_in()` are used to set the components automatically, and should be used via [tmap_options\(\)](#). See Details how the positioning works.

Usage

```
tm_pos(cell.h, cell.v, pos.h, pos.v, align.h, align.v, just.h, just.v)
```

```
tm_pos_in(pos.h, pos.v, align.h, align.v, just.h, just.v)
```

```
tm_pos_out(cell.h, cell.v, pos.h, pos.v, align.h, align.v, just.h, just.v)
```

```
tm_pos_on_top(pos.h, pos.v, align.h, align.v, just.h, just.v)
```

```
tm_pos_auto_out(cell.h, cell.v, pos.h, pos.v, align.h, align.v, just.h, just.v)
```

```
tm_pos_auto_in(align.h, align.v, just.h, just.v)
```

Arguments

`cell.h`, `cell.v` The plotting area is overlaid with a 3x3 grid, of which the middle grid cell is the map area. Components can be drawn into any cell. `cell.h` specifies the horizontal position (column) and can take values "left", "center", and "right". `cell.v` specifies the vertical position (row) and can take values "top", "center", and "bottom". See details for a graphical explanation.

- `pos.h, pos.v` The position of the component within the cell. The main options for `pos.h` are "left", "center", and "right". For `pos.v` these are "top", "center", and "bottom". These options can also be provided in upper case; in that case there is no offset (see the `tmap` option `component.offset`). Also numbers between 0 and 1 can be provided, which determine the position of the component inside the cell (with (0,0) being left bottom). The arguments `just.h` and `just.v` determine the justification point.
- `align.h, align.v` The alignment of the component in case multiple components are stacked. When they are stacked horizontally, `align.v` determines how components that are smaller in height than the available height (determined by the `outer.margins` if specified and otherwise by the highest component) are justified: "top", "center", or "bottom". Similarly, `align.h` determines how components are justified horizontally when they are stacked vertically: "left", "center", or "right".
- `just.h, just.v` The justification of the components. Only used in case `pos.h` and `pos.v` are numbers.

Details

`tm_pos_in()` sets the position of the component(s) inside the maps area, which is equivalent to the center-center cell (in case there are facets, these are all drawn in this center-center cell).

`tm_pos_out()` sets the position of the component(s) outside the map.

`tm_pos_on_top()` is the same as `tm_pos_out`, but with the cell set to the center cell. It may be therefore seem similar to `tm_pos_in()`, but with an essential difference: `tm_pos_in()` takes the map frame into account whereas `tm_pos_on_top()` does not. # The amount of space that the top and bottom rows, and left and right columns occupy is determined by the `tm_layout()` arguments `meta.margins` and `meta.auto_margins`. The former sets the relative space of the bottom, left, top, and right side. In case these are set to NA, the space is set automatically based on 1) the maximum relative space specified by `meta.auto_margins` and 2) the presence and size of components in each cell. For instance, if there is one landscape oriented legend in the center-bottom cell, then the relative space of the bottom row is set to the height of that legend (given that it is smaller than the corresponding value of `meta.auto_margins`), while the other four sides are set to 0.

`tm_pos_auto_out()` is more complex: the `cell.h` and `cell.v` arguments should be set to one of the four corners. It does not mean that the components are drawn in a corner. The corner represents the sides of the map that the components are drawn. By default, legends are drawn either at the bottom or on the right-side of the map by default (see `tmap_options("legend.position")`). Only when there are row- and column-wise legends and a general legend (using `tm_facets_grid()`), the general legend is drawn in the corner, but in practice this case will be rare.

The arguments `pos.h` and `pos.v` determine where the components are drawn within the cell. Again, with "left", "center", and "right" for `pos.h` and "top", "center", and "bottom" for `pos.v`. The values can also be specified in upper-case, which influences the offset with the cell borders, which is determined by `tmap` option `component.offset`. By default, there is a small offset when components are drawn inside and no offset when they are drawn outside or with upper-case.

`tm_pos_auto_in()` automatically determines `pos.h` and `pos.v` given the available space inside the map. This is similar to the default positioning in `tmap3`.

In case multiple components are drawn in the same cell and the same position inside that cell, they are stacked (determined which the stack argument in the legend or component function). The `align.h` and `align.v` arguments determine how these components will be justified with each other.

Note that legends and components may be different for a facet row or column. This is the case when `tm_facets_grid()` or `tm_facets_stack()` are applied and when scales are set to free (with the `.free` argument of the map layer functions). In case legends or components are drawn row- or column wise, and the position of the legends (or components) is right next to the maps, these legends (or components) will be aligned with the maps.

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

tm_raster

Map layer: raster

Description

Map layer that draws rasters. Supported map variable is: `col` (the color).

Usage

```
tm_raster(
  col = tm_vars(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  col_alpha = tm_const(),
  col_alpha.scale = tm_scale(),
  col_alpha.legend = tm_legend(),
  col_alpha.chart = tm_chart_none(),
  col_alpha.free = NA,
  zindex = NA,
  group = NA,
  group.control = "check",
  blend = "over",
  options = opt_tm_raster(),
  ...
)

opt_tm_raster(interpolate = FALSE)
```

Arguments

<code>col</code> , <code>col.scale</code> , <code>col.legend</code> , <code>col.chart</code> , <code>col.free</code>	Map variable that determines the color. See details. <i>Unit</i> : Color – a color name, hex string.
<code>col_alpha</code> , <code>col_alpha.scale</code> , <code>col_alpha.legend</code> , <code>col_alpha.chart</code> , <code>col_alpha.free</code>	Map variable that determines the color transparency. See details. <i>Unit</i> : Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
<code>zindex</code>	Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.
<code>group</code>	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
<code>group.control</code>	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
<code>blend</code>	Compositing operator for layer blending. Default "over" applies no blending. See the "Layer blending" section for the supported values.
<code>options</code>	options passed on to the corresponding <code>opt_<layer_function></code> function
<code>...</code>	to catch deprecated arguments from version < 4.0
<code>interpolate</code>	Should the raster image be interpolated? Currently only applicable in view mode (passed on to grid)

Details

The map variable arguments (e.g. `col`) can be specified with a data variable name (e.g., a spatial vector attribute or a raster layer of the object specified in [tm_shape\(\)](#)), with a visual value (for `col`, a color is expected), or with a geometry-derived variable (see below). See vignette: [Map variables](#).

Multiple values can be specified: in that case facets are created. These facets can be combined with other faceting data variables, specified with [tm_facets\(\)](#). See vignette: [Facets](#).

- The `*.scale` arguments determine the used scale to map the data values to map variable values. These can be specified with one of the available `tm_scale_*`() functions. The default is specified by the tmap option ([tm_options\(\)](#)) `scales.var`. See 'rvignette: [Scales](#)
- The `*.legend` arguments determine the used legend, specified with [tm_legend\(\)](#). The default legend and its settings are determined by the tmap options ([tm_options\(\)](#)) `legend.`. See 'rvignette: [Legends](#)
- The `*.chart` arguments specify additional charts, specified with `tm_chart_`, e.g. [tm_chart_histogram\(\)](#). See 'rvignette: [Charts](#)
- The `*.free` arguments determine whether scales are applied freely across facets, or shared. A logical value is required. They can also be specified with a vector of three logical values; these determine whether scales are applied freely per facet dimension. This is only useful when facets are applied (see [tm_facets\(\)](#)). There are maximally three facet dimensions: rows, columns, and pages. This only applies for a facet grid ([tm_facets_grid\(\)](#)). For instance, `col.free = c(TRUE, FALSE, FALSE)` means that for the map variable `col`, each

row of facets will have its own scale, and therefore its own legend. For facet wraps and stacks (`tm_facets_wrap()` and `tm_facets_stack()`) there is only one facet dimension, so the `*`.free argument requires only one logical value.

Currently, three geometry-derived variables are implemented:

- "AREA" (polygons only), which uses the feature area;
- "LENGTH" (lines only), which uses the feature length; and
- "MAP_COLORS", which assigns values so that adjacent features receive different values, making it particularly suitable for coloring neighbouring polygons.

Note that geometry-derived variables do not generate a legend automatically. If a legend is required, compute the corresponding variable explicitly, for example with `sf::st_area()`, `sf::st_length()`, or `tmtools::map_coloring()`, and use the resulting values instead.

Map variable units:

Every map variable maps data values to a specific output unit. Knowing the unit matters when supplying constant values via `tm_const()`, or output ranges via `values.range / values.scale` in the scale functions.

Variable	Output unit	Notes
fill, col, bgcol	color	name, hex, or palette string
fill_alpha, col_alpha, bgcol_alpha	proportion 0-1	0 = transparent, 1 = opaque
size (symbols, bubbles, squares, dots)	typographic lines	1 line approx. 1/6 inch; scaled by <code>values.scale</code>
size (circles)	meters	plain numeric or a <code>units</code> object
size (text, labels)	multiplier	1 = 12 pt (plot) / 12 px (view)
lwd	lwd	base R units; 1 lwd approx. 0.75 pt at 96 dpi
lty	–	integer 1-6 or name ("solid", "dashed", ...)
shape	–	integer pch 1-25 or single character
angle	degrees	0-360, clockwise from north
fontface	–	"plain", "bold", "italic", "bold.italic"

Symbol size (size in `tm_symbols`, `tm_bubbles`, `tm_squares`, `tm_dots`):

"Lines" is a typographic unit: one line is approximately 1/6 inch (the default base line-height in R graphics). The global multiplier `tmap_options(values.scale = list(size.bubbles = 1.5))` scales all symbol sizes without changing the data mapping.

Circle size (size in `tm_circles`):

The value is a geographic radius in meters. A plain numeric vector is interpreted as meters; a `units` object (from the **units** package) is automatically converted, so `units::as_units(1, "mi")` gives a 1-mile radius. Because the radius is geographic, circles scale with zoom in interactive (view) mode – unlike bubble symbols which keep a fixed screen size.

Text size (size in `tm_text`, `tm_labels`):

The value is a multiplier of the base font size. `size = 1` renders at 12 pt in plot mode (R's default `par("ps")`) and at 12 px in view mode (`gp$cex * 12 px`, see `tmapLeafletDataPlot.tm_data_text`); the two modes are consistent by design.

Layer blending (blend):

Blend modes control how a layer’s pixels are combined with the pixels beneath it. For each pixel, let S be the source (top layer) RGB value and D be the destination (bottom layer) RGB value, both normalised to $[0, 1]$.

blend	Formula	Use case
"over"	$S \cdot \alpha + D \cdot (1 - \alpha)$	Standard alpha compositing (default)
"multiply"	$S \times D$	Hillshading over color raster; both layers darken each other
"screen"	$1 - (1 - S)(1 - D)$	Inverse of multiply; brightens
"overlay"	multiply if $D < 0.5$, screen if $D \geq 0.5$	Boosts contrast; preserves midtones
"darken"	$\min(S, D)$	Keeps the darker of the two layers per channel
"lighten"	$\max(S, D)$	Keeps the lighter of the two layers per channel

Requires R >= 4.2 and a compatible graphics device (e.g. `png(type = "cairo")`, `svg()`). In view mode, blending is applied via CSS `mix-blend-mode`. See `grid::groupGrob()` for the full list of supported operators.

zindex and pane names:

In view mode, each layer is rendered in a Leaflet pane named `"tmap{zindex}"` (e.g., `"tmap401"`, `"tmap402"`), with base tile layers placed in the standard `"tile"` pane.

Examples

```
## Not run:
# load land data
data(land, World)

tm_shape(land) +
  tm_raster("cover")

tm_shape(land) +
  tm_raster("elevation", col.scale = tm_scale_continuous(values = terrain.colors(9))) +
  tm_shape(World) +
  tm_borders()

## End(Not run)
```

tm_rgb	Map layer: RGB images
--------	-----------------------

Description

Map layer that displays an RGB image. The used (multivariate) map variable is `col`, which should be specified with 3 or 4 variables for `tm_rgb()` and `tm_rgba()` respectively. The first three correspond to the red, green, and blue channels. The optional fourth is the alpha transparency channel.

Usage

```
tm_rgb(
  col = tm_vars(n = 3, multivariate = TRUE),
  col.scale = tm_scale_rgb(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  col_alpha = tm_const(),
  col_alpha.scale = tm_scale(),
  col_alpha.legend = tm_legend(),
  col_alpha.chart = tm_chart_none(),
  col_alpha.free = NA,
  blend = "over",
  options = opt_tm_rgb(),
  ...
)

tm_rgba(
  col = tm_vars(n = 4, multivariate = TRUE),
  col.scale = tm_scale_rgba(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  blend = "over",
  options = opt_tm_rgb()
)

opt_tm_rgb(interpolate = FALSE, saturation = 1)
```

Arguments

col, col.scale, col.legend, col.chart, col.free	Map variable that determines the color. col is a multivariate variable, with 3 (tm_rgb) or 4 (tm_rgba) numeric data variables. These can be specified via tm_vars() with multivariate = TRUE
col_alpha, col_alpha.scale, col_alpha.legend, col_alpha.chart, col_alpha.free	Map variable that determines the color transparency. See details. <i>Unit</i> : Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
blend	Compositing operator for layer blending. Default "over" applies no blending. See the "Layer blending" section of tm_polygons() for supported values.
options	options passed on to the corresponding opt_<layer_function> function
...	to catch deprecated arguments from version < 4.0
interpolate	Should the raster image be interpolated? Currently only applicable in view mode (passed on to grid)
saturation	The saturation of the rgb.

Examples

```

## Not run:
require(stars)
file = system.file("tif/L7_ETMs.tif", package = "stars")

L7 = stars::read_stars(file)

tm_shape(L7) +
  tm_rgb()

# the previous example was a shortcut of this call
tm_shape(L7) +
  tm_rgb(col = tm_vars("band", dimvalues = 1:3, multivariate = TRUE))

# alternative format: using a stars dimension instead of attributes
L7_alt = split(L7, "band")
tm_shape(L7_alt) +
  tm_rgb()

# with attribute names
tm_shape(L7_alt) +
  tm_rgb(col = tm_vars(c("X1", "X2", "X3"), multivariate = TRUE))

# with attribute indices
tm_shape(L7_alt) +
  tm_rgb(col = tm_vars(1:3, multivariate = TRUE))

if (requireNamespace("terra")) {
  L7_terra = terra::rast(file)

  tm_shape(L7_terra) +
    tm_rgb()

  # with layer names
  tm_shape(L7_terra) +
    tm_rgb(tm_vars(names(L7_terra)[1:3], multivariate = TRUE))

  # with layer indices
  tm_shape(L7_terra) +
    tm_rgb(col = tm_vars(1:3, multivariate = TRUE))
}

## End(Not run)

```

Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in `tm_polygons()`). The function `tm_scale()` is a scale that is set automatically given by the data type (factor, numeric, and integer) and the map variable. The tmap option `scales.var` contains information which scale is applied when.

Usage

```
tm_scale(...)
```

Arguments

... arguments passed on to the applied scale function `tm_scale_*`()

See Also

Scales, Map variables, Multivariate map variables `tm_scale_asis()`, `tm_scale_ordinal()`, `tm_scale_categorical()`, `tm_scale_intervals()`, `tm_scale_discrete()`, `tm_scale_continuous()`, `tm_scale_rank()`, `tm_scale_continuous_log()`, `tm_scale_continuous_log2()`, `tm_scale_continuous_log10()`, `tm_scale_continuous_log1p()`, `tm_scale_continuous_sqrt()`, `tm_scale_continuous_pseudo_log()`, `tm_scale_rgb()`, `tm_scale_bivariate()`

tm_scale_asis	<i>Scales: as is</i>
---------------	----------------------

Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in `tm_polygons()`). The function `tm_scale_asis()` is used to take data values as they are and use them as such for the map variable.

Usage

```
tm_scale_asis(values.scale = NA, value.neutral = NA, value.na = NA, ...)
```

Arguments

- values.scale (generic scale argument) Scaling of the values. Only useful for size-related map variables, such as size of `tm_symbols()` and lwd of `tm_lines()`.
- value.neutral (generic scale argument) Value that can be considered neutral. This is used for legends of other map variables of the same map layer. E.g. when both `fill` and `size` are used for `tm_symbols()` (using filled circles), the size legend items are filled with the `value.neutral` color from the `fill.scale` scale, and fill legend items are bubbles of size `value.neutral` from the `size.scale` scale.

value.na (generic scale argument) Value used for missing values. See tmap option "value.na" for defaults per map variable.

... Arguments caught (and not used) from the automatic function [tm_scale\(\)](#)

See Also

[Scales](#), [Map variables](#), [Multivariate map variables](#) [tm_scale\(\)](#)

tm_scale_bivariate	<i>Scales: bivariate scale</i>
--------------------	--------------------------------

Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in [tm_polygons\(\)](#)). The function `tm_scale_bivariate()` is used for bivariate scales.

Usage

```
tm_scale_bivariate(
  scale1 = tm_scale(),
  scale2 = tm_scale(),
  values = NA,
  values.repeat = FALSE,
  values.range = NA,
  values.scale = 1,
  value.na = NA,
  value.null = NA,
  value.neutral = NA,
  labels = NULL,
  label.na = NA,
  label.null = NA
)
```

Arguments

scale1, scale2 two `tm_scale` objects. Currently, all `tm_scale_*`() functions are supported except `tm_scale_continuous()`.

values (generic scale argument) The visual values. For colors (e.g. `fill` or `col` for `tm_polygons()`) this is a palette name from the `cols4all` package (see [cols4all::c4a\(\)](#)) or vector of colors, for size (e.g. `size` for `tm_symbols()`) these are a set of sizes (if two values are specified they are interpreted as a range), for symbol shapes (e.g. `shape` for [tm_symbols\(\)](#)) these are a set of symbols, etc. The tmap option `values.var` contains the default values per map variable and in some cases also per data type.

values.repeat (generic scale argument) Should the values be repeated in case there are more categories?

values.range	(generic scale argument) Range of the values. Vector of two numbers (both between 0 and 1) where the first determines the minimum and the second the maximum. Full range, which means that all values are used, is encoded as <code>c(0, 1)</code> . For instance, when a grey scale is used for color (from black to white), <code>c(0, 1)</code> means that all colors are used, <code>0.25, 0.75</code> means that only colors from dark grey to light grey are used (more precisely "grey25" to "grey75"), and <code>0, 0.5</code> means that only colors are used from black to middle grey ("grey50"). When only one number is specified, this is interpreted as the second number (where the first is set to 0). Default values can be set via the <code>tmap</code> option <code>values.range</code> .
values.scale	(generic scale argument) Scaling of the values. Only useful for size-related map variables, such as size of <code>tm_symbols()</code> and lwd of <code>tm_lines()</code> .
value.na	(generic scale argument) Value used for missing values. See <code>tmap</code> option "value.na" for defaults per map variable.
value.null	(generic scale argument) Value used for NULL values. See <code>tmap</code> option "value.null" for defaults per map variable. Null data values occur when out-of-scope features are shown (e.g. for a map of Europe showing a data variable per country, the null values are applied to countries outside Europe).
value.neutral	(generic scale argument) Value that can be considered neutral. This is used for legends of other map variables of the same map layer. E.g. when both <code>fill</code> and <code>size</code> are used for <code>tm_symbols()</code> (using filled circles), the size legend items are filled with the <code>value.neutral</code> color from the <code>fill.scale</code> scale, and fill legend items are bubbles of size <code>value.neutral</code> from the <code>size.scale</code> scale.
labels	(generic scale argument) Labels
label.na	(generic scale argument) Label for missing values
label.null	(generic scale argument) Label for null (out-of-scope) values

See Also

[Scales](#), [Map variables](#), [Multivariate map variables](#) [Legends](#), [Legends \(advanced\)](#), [Components](#), [Positioning of components](#), [Bivariate choropleth](#) `tm_scale()`

tm_scale_continuous	<i>Scales: continuous scale</i>
---------------------	---------------------------------

Description

Scales in `tmap` are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in `tm_polygons()`). The function `tm_scale_continuous()` is used for continuous data. The functions `tm_scale_continuous_<x>()` use transformation functions `x`.

Usage

```

tm_scale_continuous(
  n = NULL,
  limits = NULL,
  outliers.trunc = NULL,
  ticks = NULL,
  trans = NULL,
  midpoint = NULL,
  values = NA,
  values.repeat = FALSE,
  values.range = NA,
  values.scale = NA,
  value.na = NA,
  value.null = NA,
  value.neutral = NA,
  labels = NULL,
  label.na = NA,
  label.null = NA,
  label.format = tm_label_format(),
  trans.args = list()
)

tm_scale_continuous_log(..., base = exp(1))

tm_scale_continuous_log2(...)

tm_scale_continuous_log10(...)

tm_scale_continuous_log1p(...)

tm_scale_continuous_sqrt(...)

tm_scale_continuous_pseudo_log(..., base = exp(1), sigma = 1)

```

Arguments

<code>n</code>	Preferred number of tick labels. Only used if <code>ticks</code> is not specified
<code>limits</code>	Limits of the data values that are mapped to the continuous scale. When <code>NA</code> , the range of data values is taken. When only one value is provided, the range of data values with this provided value is taken. The default depends on the map variable: it is 0 for all map variables other than color when <code>tm_scale_continuous</code> is used. For the transformation scale functions, it is <code>NA</code> .
<code>outliers.trunc</code>	Should outliers be truncated? An outlier is a data value that is below or above the respectively lower and upper limit. A logical vector of two values is expected. The first and second value determines whether values lower than the lower limit respectively higher than the upper limit are truncated to the lower respectively upper limit. If <code>FALSE</code> (default), they are considered as missing values.

ticks	Tick values. If not specified, it is determined automatically with <code>n</code>
trans	Transformation function. One of "identity" (default), "log", and "log1p". Note: the base of the log scale is irrelevant, since the log transformed values are normalized before mapping to visual values.
midpoint	The data value that is interpreted as the midpoint. By default it is set to 0 if negative and positive values are present. Useful when values are diverging colors. In that case, the two sides of the color palette are assigned to negative respectively positive values. If all values are positive or all values are negative, then the midpoint is set to NA, which means that the value that corresponds to the middle color class (see <code>style</code>) is mapped to the middle color. If it is specified for sequential color palettes (e.g. "Blues"), then this color palette will be treated as a diverging color palette.
values	(generic scale argument) The visual values. For colors (e.g. <code>fill</code> or <code>col</code> for <code>tm_polygons()</code>) this is a palette name from the <code>cols4all</code> package (see <code>cols4all::c4a()</code>) or vector of colors, for size (e.g. <code>size</code> for <code>tm_symbols()</code>) these are a set of sizes (if two values are specified they are interpreted as a range), for symbol shapes (e.g. <code>shape</code> for <code>tm_symbols()</code>) these are a set of symbols, etc. The <code>tmap</code> option <code>values.var</code> contains the default values per map variable and in some cases also per data type.
values.repeat	(generic scale argument) Should the values be repeated in case there are more categories?
values.range	(generic scale argument) Range of the values, especially useful for color palettes. Vector of two numbers (both between 0 and 1) where the first determines the minimum and the second the maximum. Full range, which means that all values are used, is encoded as <code>c(0, 1)</code> . For instance, when a gray scale is used for color (from black to white), <code>c(0, 1)</code> means that all colors are used, <code>0.25, 0.75</code> means that only colors from dark gray to light gray are used (more precisely "grey25" to "grey75"), and <code>0, 0.5</code> means that only colors are used from black to middle gray ("grey50"). When only one number is specified, this is interpreted as the second number (where the first is set to 0). Default values can be set via the <code>tmap</code> option <code>values.range</code> .
values.scale	(generic scale argument) Scaling of the values. Only useful for size-related map variables, such as <code>size</code> of <code>tm_symbols()</code> and <code>lwd</code> of <code>tm_lines()</code> .
value.na	(generic scale argument) Value used for missing values. See <code>tmap</code> option "value.na" for defaults per map variable.
value.null	(generic scale argument) Value used for NULL values. See <code>tmap</code> option "value.null" for defaults per map variable. Null data values occur when out-of-scope features are shown (e.g. for a map of Europe showing a data variable per country, the null values are applied to countries outside Europe).
value.neutral	(generic scale argument) Value that can be considered neutral. This is used for legends of other map variables of the same map layer. E.g. when both <code>fill</code> and <code>size</code> are used for <code>tm_symbols()</code> (using filled circles), the size legend items are filled with the <code>value.neutral</code> color from the <code>fill.scale</code> scale, and fill legend items are bubbles of size <code>value.neutral</code> from the <code>size.scale</code> scale.
labels	(generic scale argument) Labels

label.na	(generic scale argument) Label for missing values
label.null	(generic scale argument) Label for null (out-of-scope) values
label.format	(generic scale argument) Label formatting. Output of tm_label_format()
trans.args	list of additional argument for the transformation (generic transformation arguments)
...	passed on to tm_scale_continuous()
base	base of logarithm
sigma	Scaling factor for the linear part of pseudo-log transformation.

See Also

[Scales](#), [Map variables](#), [Multivariate map variables](#) [tm_scale\(\)](#)

Examples

```
tm_shape(World) +
  tm_polygons(
    fill = "HPI",
    fill.scale = tm_scale_continuous(values = "scico.roma", midpoint = 30))

tm_shape(metro) +
  tm_bubbles(
    size = "pop1950",
    size.scale = tm_scale_continuous(
      values.scale = 1),
    size.legend = tm_legend("Population in 1950", frame = FALSE))

tm_shape(metro) +
  tm_bubbles(
    size = "pop1950",
    size.scale = tm_scale_continuous(
      values.scale = 2,
      limits = c(0, 12e6),
      ticks = c(1e5, 3e5, 8e5, 4e6, 1e7),
      labels = c("0 - 200,000", "200,000 - 500,000", "500,000 - 1,000,000",
        "1,000,000 - 10,000,000", "10,000,000 or more"),
      outliers.trunc = c(TRUE, TRUE)),
    size.legend = tm_legend("Population in 1950", frame = FALSE))
# Note that for this type of legend, we recommend tm_scale_intervals()
```

tm_scale_discrete	<i>Scales: discrete scale</i>
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Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in [tm_polygons\(\)](#)). The function [tm_scale_discrete\(\)](#) is used for discrete numerical data, such as integers.

Usage

```
tm_scale_discrete(
  ticks = NA,
  midpoint = NULL,
  values = NA,
  values.repeat = FALSE,
  values.range = NA,
  values.scale = NA,
  value.na = NA,
  value.null = NA,
  value.neutral = NA,
  labels = NULL,
  label.na = NA,
  label.null = NA,
  label.format = list()
)
```

Arguments

ticks	Discrete values. If not specified, it is determined automatically: unique values are put on a discrete scale.
midpoint	The data value that is interpreted as the midpoint. By default it is set to 0 if negative and positive values are present. Useful when values are diverging colors. In that case, the two sides of the color palette are assigned to negative respectively positive values. If all values are positive or all values are negative, then the midpoint is set to NA, which means that the value that corresponds to the middle color class (see <code>style</code>) is mapped to the middle color. If it is specified for sequential color palettes (e.g. "Blues"), then this color palette will be treated as a diverging color palette.
values	(generic scale argument) The visual values. For colors (e.g. <code>fill</code> or <code>col</code> for <code>tm_polygons()</code>) this is a palette name from the <code>cols4all</code> package (see <code>cols4all::c4a()</code>) or vector of colors, for size (e.g. <code>size</code> for <code>tm_symbols()</code>) these are a set of sizes (if two values are specified they are interpreted as a range), for symbol shapes (e.g. <code>shape</code> for <code>tm_symbols()</code>) these are a set of symbols, etc. The <code>tmap</code> option <code>values.var</code> contains the default values per map variable and in some cases also per data type.
values.repeat	(generic scale argument) Should the values be repeated in case there are more categories?
values.range	(generic scale argument) Range of the values. Vector of two numbers (both between 0 and 1) where the first determines the minimum and the second the maximum. Full range, which means that all values are used, is encoded as <code>c(0, 1)</code> . For instance, when a gray scale is used for color (from black to white), <code>c(0, 1)</code> means that all colors are used, <code>0.25, 0.75</code> means that only colors from dark gray to light gray are used (more precisely "grey25" to "grey75"), and <code>0, 0.5</code> means that only colors are used from black to middle grey ("grey50"). When only one number is specified, this is interpreted as the second number (where the first is set to 0). Default values can be set via the <code>tmap</code> option <code>values.range</code> .

values.scale	(generic scale argument) Scaling of the values. Only useful for size-related map variables, such as size of <code>tm_symbols()</code> and lwd of <code>tm_lines()</code> .
value.na	(generic scale argument) Value used for missing values. See tmap option "value.na" for defaults per map variable.
value.null	(generic scale argument) Value used for NULL values. See tmap option "value.null" for defaults per map variable. Null data values occur when out-of-scope features are shown (e.g. for a map of Europe showing a data variable per country, the null values are applied to countries outside Europe).
value.neutral	(generic scale argument) Value that can be considered neutral. This is used for legends of other map variables of the same map layer. E.g. when both fill and size are used for <code>tm_symbols()</code> (using filled circles), the size legend items are filled with the value.neutral color from the fill.scale scale, and fill legend items are bubbles of size value.neutral from the size.scale scale.
labels	(generic scale argument) Labels
label.na	(generic scale argument) Label for missing values
label.null	(generic scale argument) Label for null (out-of-scope) values
label.format	(generic scale argument) Label formatting. Output of <code>tm_label_format()</code>

See Also

Scales, Map variables, Multivariate map variables `tm_scale()`

tm_scale_intervals	<i>Scales: interval scale</i>
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Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in `tm_polygons()`). The function `tm_scale_intervals()` is used for numerical data.

Usage

```
tm_scale_intervals(
  n = 5,
  style = ifelse(is.null(breaks), "pretty", "fixed"),
  style.args = list(),
  breaks = NULL,
  interval.closure = "left",
  label.style = "discrete",
  label.select = TRUE,
  midpoint = NULL,
  as.count = FALSE,
  values = NA,
  values.repeat = FALSE,
```

```

values.range = NA,
values.scale = NA,
value.na = NA,
value.null = NA,
value.neutral = NA,
labels = NULL,
label.na = NA,
label.null = NA,
label.format = tm_label_format()
)

```

Arguments

n	Number of intervals. For some styles (see argument style below) it is the preferred number rather than the exact number.
style	Method to create intervals. Options are "cat", "fixed", "sd", "equal", "pretty", "quantile", "kmeans", "hclust", "bclust", "fisher", "jenks", "dpih", "headtails", and "log10_pretty". See the details in classInt::classIntervals() (extra arguments can be passed on via style.args).
style.args	List of extra arguments passed on to classInt::classIntervals() .
breaks	Interval breaks (only used and required when style = "fixed")
interval.closure	value that determines whether where the intervals are closed: "left" or "right". If as.count = TRUE, interval.closure is always set to "left".
label.style	Either "discrete" or "continuous". If discrete (default) intervals will be labeled. If continuous, the legend will be similar to a continuous scale legend (but with discrete colors), where the breaks are labeled.
label.select	Which labels are shown? A logical vector is expected, which is repeated along the number of labels. By default TRUE, which means all.
midpoint	The data value that is interpreted as the midpoint. By default it is set to 0 if negative and positive values are present. Useful when values are diverging colors. In that case, the two sides of the color palette are assigned to negative respectively positive values. If all values are positive or all values are negative, then the midpoint is set to NA, which means that the value that corresponds to the middle color class (see style) is mapped to the middle color. If it is specified for sequential color palettes (e.g. "Blues"), then this color palette will be treated as a diverging color palette.
as.count	Should the data variable be processed as a count variable? For instance, if style = "pretty", n = 2, and the value range of the variable is 0 to 10, then the column classes for as.count = TRUE are 0; 1 to 5; 6 to 10 (note that 0 is regarded as an own category) whereas for as.count = FALSE they are 0 to 5; 5 to 10. Only applicable if style is "pretty", "fixed", or "log10_pretty". By default FALSE.
values	(generic scale argument) The visual values. For colors (e.g. fill or col for tm_polygons()) this is a palette name from the cols4all package (see cols4all::c4a()) or vector of colors, for size (e.g. size for tm_symbols()) these are a set of sizes

	(if two values are specified they are interpreted as a range), for symbol shapes (e.g. shape for <code>tm_symbols()</code>) these are a set of symbols, etc. The <code>tmap</code> option <code>values.var</code> contains the default values per map variable and in some cases also per data type.
<code>values.repeat</code>	(generic scale argument) Should the values be repeated in case there are more categories?
<code>values.range</code>	(generic scale argument) Range of the values. Vector of two numbers (both between 0 and 1) where the first determines the minimum and the second the maximum. Full range, which means that all values are used, is encoded as <code>c(0, 1)</code> . For instance, when a gray scale is used for color (from black to white), <code>c(0, 1)</code> means that all colors are used, <code>0.25, 0.75</code> means that only colors from dark gray to light gray are used (more precisely "gray25" to "gray75"), and <code>0, 0.5</code> means that only colors are used from black to middle grey ("grey50"). When only one number is specified, this is interpreted as the second number (where the first is set to 0). Default values can be set via the <code>tmap</code> option <code>values.range</code> .
<code>values.scale</code>	(generic scale argument) Scaling of the values. Only useful for size-related map variables, such as size of <code>tm_symbols()</code> and lwd of <code>tm_lines()</code> .
<code>value.na</code>	(generic scale argument) Value used for missing values. See <code>tmap</code> option "value.na" for defaults per map variable.
<code>value.null</code>	(generic scale argument) Value used for NULL values. See <code>tmap</code> option "value.null" for defaults per map variable. Null data values occur when out-of-scope features are shown (e.g. for a map of Europe showing a data variable per country, the null values are applied to countries outside Europe).
<code>value.neutral</code>	(generic scale argument) Value that can be considered neutral. This is used for legends of other map variables of the same map layer. E.g. when both <code>fill</code> and <code>size</code> are used for <code>tm_symbols()</code> (using filled circles), the size legend items are filled with the <code>value.neutral</code> color from the <code>fill.scale</code> scale, and fill legend items are bubbles of size <code>value.neutral</code> from the <code>size.scale</code> scale.
<code>labels</code>	(generic scale argument) Labels
<code>label.na</code>	(generic scale argument) Label for missing values
<code>label.null</code>	(generic scale argument) Label for null (out-of-scope) values
<code>label.format</code>	(generic scale argument) Label formatting. Output of <code>tm_label_format()</code>

See Also

Scales, Map variables, Multivariate map variables `tm_scale()`

Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in `tm_polygons()`). The functions `tm_scale_categorical()` and `tm_scale_ordinal()` are used for categorical data. The only difference between these functions is that the former assumes un-ordered categories whereas the latter assumes ordered categories. For colors (the map variable `fill` or `col`), different default color palettes are used (see the tmap option `values.var`).

Usage

```
tm_scale_ordinal(  
  n.max = 30,  
  values = NA,  
  values.repeat = FALSE,  
  values.range = 1,  
  values.scale = NA,  
  value.na = NA,  
  value.null = NA,  
  value.neutral = NA,  
  levels = NULL,  
  levels.drop = FALSE,  
  labels = NULL,  
  label.na = NA,  
  label.null = NA,  
  label.format = list()  
)  
  
tm_scale_categorical(  
  n.max = 30,  
  values = NA,  
  values.repeat = TRUE,  
  values.range = NA,  
  values.scale = NA,  
  value.na = NA,  
  value.null = NA,  
  value.neutral = NA,  
  levels = NULL,  
  levels.drop = FALSE,  
  labels = NULL,  
  label.na = NA,  
  label.null = NA,  
  label.format = list()  
)
```

Arguments

<code>n.max</code>	Maximum number of categories (factor levels). In case there are more, they are grouped into <code>n.max</code> groups.
--------------------	--

values	(generic scale argument) The visual values. For colors (e.g. fill or col for <code>tm_polygons()</code>) this is a palette name from the <code>cols4all</code> package (see <code>cols4all::c4a()</code>) or vector of colors, for size (e.g. size for <code>tm_symbols()</code>) these are a set of sizes (if two values are specified they are interpreted as a range), for symbol shapes (e.g. shape for <code>tm_symbols()</code>) these are a set of symbols, etc. The <code>tmap</code> option <code>values.var</code> contains the default values per map variable and in some cases also per data type.
values.repeat	(generic scale argument) Should the values be repeated in case there are more categories?
values.range	(generic scale argument) Range of the values. Vector of two numbers (both between 0 and 1) where the first determines the minimum and the second the maximum. Full range, which means that all values are used, is encoded as <code>c(0, 1)</code> . For instance, when a gray scale is used for color (from black to white), <code>c(0, 1)</code> means that all colors are used, <code>0.25, 0.75</code> means that only colors from dark gray to light gray are used (more precisely "grey25" to "grey75"), and <code>0, 0.5</code> means that only colors are used from black to middle gray ("gray50"). When only one number is specified, this is interpreted as the second number (where the first is set to 0). Default values can be set via the <code>tmap</code> option <code>values.range</code> .
values.scale	(generic scale argument) Scaling of the values. Only useful for size-related map variables, such as size of <code>tm_symbols()</code> and lwd of <code>tm_lines()</code> .
value.na	(generic scale argument) Value used for missing values. See <code>tmap</code> option "value.na" for defaults per map variable.
value.null	(generic scale argument) Value used for NULL values. See <code>tmap</code> option "value.null" for defaults per map variable. Null data values occur when out-of-scope features are shown (e.g. for a map of Europe showing a data variable per country, the null values are applied to countries outside Europe).
value.neutral	(generic scale argument) Value that can be considered neutral. This is used for legends of other map variables of the same map layer. E.g. when both fill and size are used for <code>tm_symbols()</code> (using filled circles), the size legend items are filled with the <code>value.neutral</code> color from the <code>fill.scale</code> scale, and fill legend items are bubbles of size <code>value.neutral</code> from the <code>size.scale</code> scale.
levels	Levels to show. Other values are treated as missing.
levels.drop	Should unused levels be dropped (and therefore are not assigned to a visual value and shown in the legend)?
labels	(generic scale argument) Labels
label.na	(generic scale argument) Label for missing values
label.null	(generic scale argument) Label for null (out-of-scope) values
label.format	(generic scale argument) Label formatting. Output of <code>tm_label_format()</code>

See Also

Scales, Map variables, Multivariate map variables `tm_scale()`

tm_scale_rank	<i>Scales: rank scale</i>
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Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in `tm_polygons()`). The function `tm_scale_rank()` is used to rank numeric data.

Usage

```
tm_scale_rank(
  n = NULL,
  ticks = NULL,
  values = NA,
  values.repeat = FALSE,
  values.range = NA,
  values.scale = NA,
  value.na = NA,
  value.null = NA,
  value.neutral = NA,
  labels = NULL,
  label.na = NA,
  label.null = NA,
  label.format = tm_label_format(),
  unit = "rank"
)
```

Arguments

<code>n</code>	Preferred number of tick labels. Only used if <code>ticks</code> is not specified
<code>ticks</code>	Tick values. If not specified, it is determined automatically with <code>n</code>
<code>values</code>	(generic scale argument) The visual values. For colors (e.g. <code>fill</code> or <code>col</code> for <code>tm_polygons()</code>) this is a palette name from the <code>cols4all</code> package (see <code>cols4all::c4a()</code>) or vector of colors, for size (e.g. <code>size</code> for <code>tm_symbols()</code>) these are a set of sizes (if two values are specified they are interpreted as a range), for symbol shapes (e.g. <code>shape</code> for <code>tm_symbols()</code>) these are a set of symbols, etc. The tmap option <code>values.var</code> contains the default values per map variable and in some cases also per data type.
<code>values.repeat</code>	(generic scale argument) Should the values be repeated in case there are more categories?
<code>values.range</code>	(generic scale argument) Range of the values, especially useful for color palettes. Vector of two numbers (both between 0 and 1) where the first determines the minimum and the second the maximum. Full range, which means that all values are used, is encoded as <code>c(0, 1)</code> . For instance, when a gray scale is used for color (from black to white), <code>c(0, 1)</code> means that all colors are used, <code>0.25, 0.75</code> means

that only colors from dark gray to light gray are used (more precisely "grey25" to "grey75"), and 0, 0.5 means that only colors are used from black to middle gray ("grey50"). When only one number is specified, this is interpreted as the second number (where the first is set to 0). Default values can be set via the tmap option `values.range`.

<code>values.scale</code>	(generic scale argument) Scaling of the values. Only useful for size-related map variables, such as size of <code>tm_symbols()</code> and lwd of <code>tm_lines()</code> .
<code>value.na</code>	(generic scale argument) Value used for missing values. See tmap option "value.na" for defaults per map variable.
<code>value.null</code>	(generic scale argument) Value used for NULL values. See tmap option "value.null" for defaults per map variable. Null data values occur when out-of-scope features are shown (e.g. for a map of Europe showing a data variable per country, the null values are applied to countries outside Europe).
<code>value.neutral</code>	(generic scale argument) Value that can be considered neutral. This is used for legends of other map variables of the same map layer. E.g. when both fill and size are used for <code>tm_symbols()</code> (using filled circles), the size legend items are filled with the <code>value.neutral</code> color from the <code>fill.scale</code> scale, and fill legend items are bubbles of size <code>value.neutral</code> from the <code>size.scale</code> scale.
<code>labels</code>	(generic scale argument) Labels
<code>label.na</code>	(generic scale argument) Label for missing values
<code>label.null</code>	(generic scale argument) Label for null (out-of-scope) values
<code>label.format</code>	(generic scale argument) Label formatting. Output of <code>tm_label_format()</code>
<code>unit</code>	The unit name of the values. By default "rank".

See Also

[Scales](#), [Map variables](#), [Multivariate map variables](#) `tm_scale()`

<code>tm_scale_rgb</code>	<i>Scales: RGB</i>
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Description

Scales in tmap are configured by the family of functions with prefix `tm_scale`. Such function should be used for the input of the `.scale` arguments in the layer functions (e.g. `fill.scale` in `tm_polygons()`). The function `tm_scale_rgb()` is used to transform r, g, b band variables to colors. This function is adopted from (and works similar as) `stars::st_rgb()`

Usage

```
tm_scale_rgb(
  value.na = NA,
  stretch = FALSE,
  probs = c(0, 1),
```

```
    max_color_value = 255L
  )

  tm_scale_rgba(
    value.na = NA,
    stretch = FALSE,
    probs = c(0, 1),
    max_color_value = 255
  )
```

Arguments

value.na	value for missing values
stretch	should each (r, g, b) band be stretched? Possible values: "percent" (same as TRUE), "histogram", FALSE. In the first case, the values are stretched to probs[1]...probs[2]. In the second case, a histogram equalization is performed
probs	probability (quantile) values when stretch = "percent"
max_color_value	maximum value

See Also

[Scales](#), [Map variables](#), [Multivariate map variables](#) `tm_scale()` `stars::st_rgb()`

Examples

```
## Not run:
require(stars)
file = system.file("tif/L7_ETMs.tif", package = "stars")

L7 = stars::read_stars(file)

tm_shape(L7) +
  tm_rgb(col.scale = tm_scale_rgb(probs = c(0, .99), stretch = TRUE))

tm_shape(L7) +
  tm_rgb(col.scale = tm_scale_rgb(stretch = "histogram"))

## End(Not run)
```

tm_scalebar	<i>Map component: scale bar</i>
-------------	---------------------------------

Description

Map component that adds a scale bar.

Usage

```
tm_scalebar(
  breaks,
  width,
  allow_clipping,
  text.size,
  text.color,
  color.dark,
  color.light,
  lwd,
  position,
  group_id,
  bg,
  bg.color,
  bg.alpha,
  size = "deprecated",
  stack,
  frame,
  frame.color,
  frame.alpha,
  frame.lwd,
  frame.r,
  margins,
  z
)
```

Arguments

breaks	Scale bar break positions. E.g. <code>c(0, 10, 50)</code> places breaks at 0, 10, and 50 units. The unit is controlled by the <code>unit</code> argument from <code>tm_shape()</code> . When NULL (default), break positions are chosen automatically.
width	Width of the scale bar, in number of text line heights (roughly equivalent to character widths). When breaks are specified, width is only useful for fine-tuning, e.g. to prevent label clipping or reduce excess whitespace.
allow_clipping	Should clipping of the last label be allowed? If TRUE (default), the last break label including its unit suffix is printed even when it extends beyond the frame. If FALSE, that label is suppressed and the unit suffix is appended to the second-to-last label instead.
text.size	text size
text.color	text.color
color.dark	color.dark
color.light	color.light
lwd	linewidth
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case,

meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: [Positioning of components](#). In case multiple components should be combined (stacked), use `group_id` and specify component in `tm_components()`.

<code>group_id</code>	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in <code>tm_components()</code> where its argument <code>id</code> should correspond to <code>group_id</code> .
<code>bg</code>	Show background?
<code>bg.color</code>	Background color
<code>bg.alpha</code>	Background transparency
<code>size</code>	Deprecated (use <code>text.size</code> instead)
<code>stack</code>	stack with other map components, either "vertical" or "horizontal".
<code>frame</code>	frame should a frame be drawn?
<code>frame.color</code>	frame color
<code>frame.alpha</code>	frame alpha transparency
<code>frame.lwd</code>	frame line width
<code>frame.r</code>	Radius of the rounded frame corners. 0 means no rounding.
<code>margins</code>	margins
<code>z</code>	z index, e.g. the place of the component relative to the other componets

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

<code>tm_seq</code>	<i>Specify a numeric sequence</i>
---------------------	-----------------------------------

Description

Specify a numeric sequence, for numeric scales like `tm_scale_continuous()`. This function is needed when there is a non-linear relationship between the numeric data values and the map variables. E.g. to make relationship with the area of bubbles linear, the square root of input variables should be used to calculate the radius of the bubbles.

Usage

```
tm_seq(
  from = 0,
  to = 1,
  power = c("lin", "sqrt", "sqrt_perceptual", "quadratic")
)
```

Arguments

from, to	The numeric range, default 0 and 1 respectively
power	The power component, a number or one of "lin", "sqrt", "sqrt_perceptual", "quadratic", which correspond to 1, 0.5, 0.5716, 2 respectively. See details.

Details

The perceived area of larger symbols is often underestimated. Flannery (1971) experimentally derived a method to compensate this for symbols. This compensation is obtained by using the power exponent of 0.5716 instead of 0.5, or by setting power to "sqrt_perceptual"

tm_sf	<i>Map layer: simple features</i>
-------	-----------------------------------

Description

Map layer that draws simple features as they are. Supported map variables are: fill (the fill color), col (the border color), size the point size, shape the symbol shape, lwd (line width), lty (line type), fill_alpha (fill color alpha transparency) and col_alpha (border color alpha transparency).

Usage

```
tm_sf(
  fill = tm_const(),
  fill.scale = tm_scale(),
  fill.legend = tm_legend(),
  fill.free = NA,
  col = tm_const(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.free = NA,
  size = tm_const(),
  size.scale = tm_scale(),
  size.legend = tm_legend(),
  size.free = NA,
  shape = tm_const(),
  shape.scale = tm_scale(),
  shape.legend = tm_legend(),
  shape.free = NA,
  lwd = tm_const(),
  lwd.scale = tm_scale(),
  lwd.legend = tm_legend(),
  lwd.free = NA,
  lty = tm_const(),
  lty.scale = tm_scale(),
  lty.legend = tm_legend(),
```

```

lty.free = NA,
fill_alpha = tm_const(),
fill_alpha.scale = tm_scale(),
fill_alpha.legend = tm_legend(),
fill_alpha.free = NA,
col_alpha = tm_const(),
col_alpha.scale = tm_scale(),
col_alpha.legend = tm_legend(),
col_alpha.free = NA,
linejoin = "round",
lineend = "round",
plot.order.list = list(polygons = tm_plot_order("AREA"), lines =
  tm_plot_order("LENGTH"), points = tm_plot_order("size")),
options = opt_tm_sf(),
zindex = NA,
group = NA,
group.control = "check",
blend = "over",
...
)

opt_tm_sf(
  polygons.only = "yes",
  lines.only = "yes",
  points_only = "yes",
  point_per = "feature",
  points.icon.scale = 3,
  points.just = NA,
  points.grob.dim = c(width = 48, height = 48, render.width = 256, render.height = 256)
)

```

Arguments

fill, fill.scale, fill.legend, fill.free
 Map variable that determines the fill color. See details. *Unit:* Color – a color name, hex string.

col, col.scale, col.legend, col.free
 Map variable that determines the color. See details. *Unit:* Color – a color name, hex string.

size, size.scale, size.legend, size.free
 Map variable that determines the size. See details. *Unit:* Typographic lines ("lines"); 1 line is approx. 1/6 inch. Controlled by `values.scale` and `tmap_options(values.scale = ...)`.

shape, shape.scale, shape.legend, shape.free
 Map variable that determines the shape. See details. *Unit:* Integer pch code (1-25) used as a plotting symbol. See example of `tm_symbols()`

lwd, lwd.scale, lwd.legend, lwd.free
 Map variable that determines the line width. See details. *Unit:* Base R line-

	width units; 1 lwd is approx. 0.75 pt at 96 dpi.
lty, lty.scale, lty.legend, lty.free	Map variable that determines the line type. See details. <i>Unit:</i> Integer (1-6) or name: "solid", "dashed", "dotted", "dotdash", "longdash", "twodash".
fill_alpha, fill_alpha.scale, fill_alpha.legend, fill_alpha.free	Map variable that determines the fill color transparency. See details. <i>Unit:</i> Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
col_alpha, col_alpha.scale, col_alpha.legend, col_alpha.free	Map variable that determines the color transparency. See details. <i>Unit:</i> Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
linejoin, lineend	line join and line end. See gpar() for details.
plot.order.list	Specification in which order the spatial features are drawn. This consists of a list of three elementary geometry types: for polygons, lines and, points. For each of these types, which are drawn in that order, a tm_plot_order() is required.
options	options passed on to the corresponding <code>opt_<layer_function></code> function
zindex	Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.
group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
blend	Compositing operator for layer blending, applied to each sublayer (polygons, lines, points). Default "over" applies no blending. See the "Layer blending" section of tm_polygons() for supported values.
...	passed on to tm_polygons() , tm_lines() , and tm_dots()
polygons.only	should only polygon geometries of the shape object (defined in tm_shape()) be plotted? By default "ifany", which means TRUE in case a geometry collection is specified.
lines.only	should only line geometries of the shape object (defined in tm_shape()) be plotted, or also other geometry types (like polygons)? By default "ifany", which means TRUE in case a geometry collection is specified.
points_only	should only point geometries of the shape object (defined in tm_shape()) be plotted? By default "ifany", which means TRUE in case a geometry collection is specified.
point_per	specification of how spatial points are mapped when the geometry is a multi line or a multi polygon. One of "feature", "segment" or "largest". The first generates a spatial point for every feature, the second for every segment (i.e. subfeature), the third only for the largest segment (subfeature). Note that the last two options can be significant slower.

<code>points.icon.scale</code>	scaling number that determines how large the icons (or grobs) are in plot mode in comparison to proportional symbols (such as bubbles). For view mode, use the argument <code>grob.dim</code>
<code>points.just</code>	justification of the points relative to the point coordinates. Either one of the following values: "left", "right", "center", "bottom", and "top", or a vector of two values where first value specifies horizontal and the second value vertical justification. Besides the mentioned values, also numeric values between 0 and 1 can be used. 0 means left justification for the first value and bottom justification for the second value. Note that in view mode, only one value is used.
<code>points.grob.dim</code>	vector of four values that determine how grob objects (see details) are shown in view mode. The first and second value are the width and height of the displayed icon. The third and fourth value are the width and height of the rendered png image that is used for the icon. Generally, the third and fourth value should be large enough to render a ggplot2 graphic successfully. Only needed for the view mode.

Details

The map variable arguments (e.g. `col`) can be specified with a data variable name (e.g., a spatial vector attribute or a raster layer of the object specified in `tm_shape()`), with a visual value (for `col`, a color is expected), or with a geometry-derived variable (see below). See vignette: [Map variables](#).

Multiple values can be specified: in that case facets are created. These facets can be combined with other faceting data variables, specified with `tm_facets()`. See vignette: [Facets](#).

- The `*.scale` arguments determine the used scale to map the data values to map variable values. These can be specified with one of the available `tm_scale_*`() functions. The default is specified by the tmap option (`tm_options()`) `scales.var`. See 'rvignette: [Scales](#)
- The `*.legend` arguments determine the used legend, specified with `tm_legend()`. The default legend and its settings are determined by the tmap options (`tm_options()`) `legend.`. See 'rvignette: [Legends](#)
- The `*.chart` arguments specify additional charts, specified with `tm_chart_`, e.g. `tm_chart_histogram()`. See 'rvignette: [Charts](#)
- The `*.free` arguments determine whether scales are applied freely across facets, or shared. A logical value is required. They can also be specified with a vector of three logical values; these determine whether scales are applied freely per facet dimension. This is only useful when facets are applied (see `tm_facets()`). There are maximally three facet dimensions: rows, columns, and pages. This only applies for a facet grid (`tm_facets_grid()`). For instance, `col.free = c(TRUE, FALSE, FALSE)` means that for the map variable `col`, each row of facets will have its own scale, and therefore its own legend. For facet wraps and stacks (`tm_facets_wrap()` and `tm_facets_stack()`) there is only one facet dimension, so the `*.free` argument requires only one logical value.

Currently, three geometry-derived variables are implemented:

- "AREA" (polygons only), which uses the feature area;
- "LENGTH" (lines only), which uses the feature length; and

- "MAP_COLORS", which assigns values so that adjacent features receive different values, making it particularly suitable for coloring neighbouring polygons.

Note that geometry-derived variables do not generate a legend automatically. If a legend is required, compute the corresponding variable explicitly, for example with `sf::st_area()`, `sf::st_length()`, or `tmtools::map_coloring()`, and use the resulting values instead.

Map variable units:

Every map variable maps data values to a specific output unit. Knowing the unit matters when supplying constant values via `tm_const()`, or output ranges via `values.range / values.scale` in the scale functions.

Variable	Output unit	Notes
<code>fill</code> , <code>col</code> , <code>bgcol</code>	color	name, hex, or palette string
<code>fill_alpha</code> , <code>col_alpha</code> , <code>bgcol_alpha</code>	proportion 0-1	0 = transparent, 1 = opaque
<code>size</code> (symbols, bubbles, squares, dots)	typographic lines	1 line approx. 1/6 inch; scaled by <code>values.scale</code>
<code>size</code> (circles)	meters	plain numeric or a <code>units</code> object
<code>size</code> (text, labels)	multiplier	1 = 12 pt (plot) / 12 px (view)
<code>lwd</code>	<code>lwd</code>	base R units; 1 <code>lwd</code> approx. 0.75 pt at 96 dpi
<code>lty</code>	–	integer 1-6 or name ("solid", "dashed", ...)
<code>shape</code>	–	integer pch 1-25 or single character
<code>angle</code>	degrees	0-360, clockwise from north
<code>fontface</code>	–	"plain", "bold", "italic", "bold.italic"

Symbol size (size in `tm_symbols`, `tm_bubbles`, `tm_squares`, `tm_dots`):

"Lines" is a typographic unit: one line is approximately 1/6 inch (the default base line-height in R graphics). The global multiplier `tmap_options(values.scale = list(size.bubbles = 1.5))` scales all symbol sizes without changing the data mapping.

Circle size (size in `tm_circles`):

The value is a geographic radius in meters. A plain numeric vector is interpreted as meters; a `units` object (from the **units** package) is automatically converted, so `units::as_units(1, "mi")` gives a 1-mile radius. Because the radius is geographic, circles scale with zoom in interactive (view) mode – unlike bubble symbols which keep a fixed screen size.

Text size (size in `tm_text`, `tm_labels`):

The value is a multiplier of the base font size. `size = 1` renders at 12 pt in plot mode (R's default `par("ps")`) and at 12 px in view mode (`gp$cex * 12 px`, see `tmapLeafletDataPlot.tm_data_text`); the two modes are consistent by design.

Layer blending (blend):

Blend modes control how a layer's pixels are combined with the pixels beneath it. For each pixel, let S be the source (top layer) RGB value and D be the destination (bottom layer) RGB value, both normalised to $[0, 1]$.

blend	Formula	Use case
"over"	$S \cdot \alpha + D \cdot (1 - \alpha)$	Standard alpha compositing (default)
"multiply"	$S \times D$	Hillshading over color raster; both layers darken each other
"screen"	$1 - (1 - S)(1 - D)$	Inverse of multiply; brightens

"overlay"	multiply if $D < 0.5$, screen if $D \geq 0.5$	Boosts contrast; preserves midtones
"darken"	$\min(S, D)$	Keeps the darker of the two layers per channel
"lighten"	$\max(S, D)$	Keeps the lighter of the two layers per channel

Requires R $\geq$ 4.2 and a compatible graphics device (e.g. `png(type = "cairo")`, `svg()`). In view mode, blending is applied via CSS `mix-blend-mode`. See `grid::groupGrob()` for the full list of supported operators.

zindex and pane names:

In view mode, each layer is rendered in a Leaflet pane named `"tmap{zindex}"` (e.g., `"tmap401"`, `"tmap402"`), with base tile layers placed in the standard `"tile"` pane.

Examples

```
data(World)

World$geometry[World$continent == "Africa"] <-
  sf::st_centroid(World$geometry[World$continent == "Africa"])
World$geometry[World$continent == "South America"] <-
  sf::st_cast(World$geometry[World$continent == "South America"],
    "MULTILINESTRING", group_or_split = FALSE)

tm_shape(World, crs = "+proj=robin") +
  tm_sf()
```

tm_shape	<i>Shape (spatial object) specification</i>
----------	---

Description

Specify a shape, which is a spatial object from one of these spatial object class packages: [sf](#), [stars](#), or [terra](#).

Usage

```
tm_shape(
  shp = NULL,
  bbox = NULL,
  crs = NULL,
  is.main = NA,
  layer = NULL,
  name = NULL,
  unit = NULL,
  filter = NULL,
  ...
)
```

Arguments

shp	Spatial data object. Typically an object from sf , terra , or stars . Additional spatial data types can be supported via extension packages, such as tmap.networks and tmap.sources (experimental). These may include, for example, remote or streaming data sources.
bbox	Bounding box of the map. Only used when shp is the main shape (see <code>is.main</code>). Three options are supported: • a <code>sf::st_bbox()</code> object, • a character string specifying a location, passed to <code>tmaptools::geocode_OSM()</code>, • "FULL", which represents the whole earth. This option ensures that reprojection retains the full global extent, unlike a regular bounding box.
crs	Map projection (CRS). Can be set to an crs object (see <code>sf::st_crs()</code>), a proj4string, an EPSG number, the value "auto" (automatic crs recommendation), or one the the following generic projections: <code>c("laea", "aeqd", "utm", "pconic", "eqdc", "stere")</code> . See details.
is.main	Is shp the main shape, which determines the crs and bounding box of the map? By default, TRUE if it is the first <code>tm_shape</code> call
layer	Name of the layer to use. This is primarily relevant for multi-layer or remote data sources (e.g. PMTiles or vector tiles), where multiple layers may be available.
name	of the spatial object
unit	Unit of distance measurement, used by <code>tm_scalebar()</code> . Either a specific unit string such as "km", "m", "mi", "yd", "ft", or "in" (see <code>units::valid_udunits()</code> for all options), or one of two automatic options: "metric" (default) selects the most readable unit from km, m, and mm; "imperial" selects from mi, yd, ft, and in. In both cases the unit is chosen as the largest one for which the map width expressed in that unit is at least 10.
filter	Optional filter expression used to subset features. The exact syntax depends on the data source. For in-memory objects (e.g. sf), this is typically evaluated in R, whereas for remote sources it may be translated to a query and executed on the server side.
...	passed on to <code>bb</code> (e.g. <code>ext</code> can be used to enlarge or shrink a bounding box)

Details

The map projection (`crs`) determines in which coordinate system the spatial object is processed and plotted. See vignette: **Map projections (CRS)**. The `crs` can be specified in two places: 1) `tm_shape()` and `tm_crs()`. In both cases, the map is plotted into the specified `crs`. The difference is that in the first option, the `crs` is also taken into account in spatial transformation functions, such as the calculation of centroids and cartograms. In the second option, the `crs` is only used in the plotting phase.

The automatic crs recommendation (which is still work-in-progress) is the following:

Property**Recommendation**

global (for world maps) A pseudocylindrical projection `tmap` option `crs_global`, by default "eqearth (Equal Earth). See

area (equal area)	Lambert Azimuthal Equal Area (laea)
distance (equidistant)	Azimuthal Equidistant (aeqd)
shape (conformal)	Stereographic (stere)

For further info about the available "generic" projects see: for utm: <https://proj.org/en/9.4/operations/projections/utm.html> for laea: <https://proj.org/en/9.4/operations/projections/laea.html> for aeqd: <https://proj.org/en/9.4/operations/projections/aeqd.html> for pconic: <https://proj.org/en/9.4/operations/projections/pconic.html> for eqdc: <https://proj.org/en/9.4/operations/projections/eqdc.html>

Note

as of tmap 4.0, simplify has been removed. Please use `tmaptools::simplify_shape()` instead

See Also

[Map projections \(CRS\)](#), [Choropleth \(Netherlands\)](#), [Choropleth \(World\)](#), [Terrain map](#)

Examples

```
tm_shape(World, crs = "auto") +
  tm_polygons()

tm_shape(World, crs = 3035, bb = "Europe") +
  tm_polygons()

tm_shape(World, crs = "+proj=robin", filter = World$continent=="Africa") +
  tm_polygons()
```

tm_style

Per-map layout options

Description

Specify the layout of the maps. `tm_layout()` is identical as `tm_options()` but only contain the tmap options that are directly related to the layout. `tm_style()` sets the style for the map. A style is a specified set of options (that can be changed afterwards with `tm_layout()`). These functions are used within a plot call (stacked with the + operator). Their counterparts `tmap_options()` and `tmap_style()` can be used to set the (layout) options globally.

Usage

```
tm_style(style, ...)

tm_layout(
  scale,
  asp,
```

```
legend.only,  
bg,  
bg.color,  
outer.bg,  
outer.bg.color,  
frame,  
frame.color,  
frame.alpha,  
frame.lwd,  
frame.r,  
frame.double_line,  
outer.margins,  
inner.margins,  
inner.margins.extra,  
meta.margins,  
meta.auto_margins,  
between_margin,  
text.fontfamily,  
text.fontface,  
r,  
attr.color,  
panel.margin,  
panel.type,  
panel.wrap.pos,  
panel.xtab.pos,  
color.sepia_intensity,  
color.saturation,  
color_vision_deficiency_sim,  
panel.show,  
panel.labels,  
panel.label.size,  
panel.label.color,  
panel.label.fontface,  
panel.label.fontfamily,  
panel.label.alpha,  
panel.label.bg,  
panel.label.bg.color,  
panel.label.bg.alpha,  
panel.label.frame,  
panel.label.frame.color,  
panel.label.frame.alpha,  
panel.label.frame.lwd,  
panel.label.frame.r,  
panel.label.height,  
panel.label.rot,  
earth_boundary,  
earth_boundary.color,  
earth_boundary.lwd,
```

```

    earth_datum,
    space,
    space.color,
    ...
)

```

Arguments

<code>style</code>	name of the style
<code>...</code>	List of tmap options to be set, or option names (characters) to be returned (see details)
<code>scale</code>	Overall scale of the map
<code>asp</code>	Aspect ratio of each map. When <code>asp</code> is set to NA (default) the aspect ratio will be adjusted to the used shapes. When set to 0 the aspect ratio is adjusted to the size of the device divided by the number of columns and rows.
<code>legend.only</code>	Should only legends be printed (so without map)?
<code>bg</code>	Draw map background?
<code>bg.color</code>	Background color of the map.
<code>outer.bg</code>	Draw map background (outside the frame)?
<code>outer.bg.color</code>	Background color of map outside the frame.
<code>frame</code>	Draw map frame?
<code>frame.color</code>	The color of the frame.
<code>frame.alpha</code>	The alpha transparency of the frame.
<code>frame.lwd</code>	The line width of the frame. See <code>graphics::par</code> , option 'lwd'.
<code>frame.r</code>	The r (radius) of the frame.
<code>frame.double_line</code>	The double line of the frame. TRUE or FALSE.
<code>outer.margins</code>	The margins of the outer space (outside the frame). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inner.margins</code>	The margins of the inner space (inside the frame). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inner.margins.extra</code>	The extra arguments of the margins of the inner space (inside the frame). A list of arguments.
<code>meta.margins</code>	The margins of the 'meta' space (reserved for outside map components). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>meta.auto_margins</code>	The auto_margins of the 'meta' space (reserved for outside map components).
<code>between_margin</code>	Margin between the map.

<code>text.fontfamily</code>	The font family of the text. See <code>graphics::par</code> , option 'family'.
<code>text.fontface</code>	The font face of the text. See <code>graphics::par</code> , option 'font'.
<code>r</code>	The r (radius) (overall).
<code>attr.color</code>	The color of the attr.
<code>panel.margin</code>	The margin of the panel.
<code>panel.type</code>	The type of the panel.
<code>panel.wrap.pos</code>	The panel positions for wrapped facets created with <code>tm_facets_grid()</code> . One of "left", "right", "top" (default) or "bottom".
<code>panel.xtab.pos</code>	The panel positions for grid facets created with <code>tm_facets_grid()</code> . Vector of two, where the first determines the locations of row panels ("left" or "right") and the second the location of column panels ("top" or "bottom").
<code>color.sepia_intensity</code>	The sepia_intensity of the color.
<code>color.saturation</code>	The saturation of the color.
<code>color_vision_deficiency_sim</code>	Color vision deficiency simulation. Either "protan", "deutan", or "tritan".
<code>panel.show</code>	The visibility of the panel. TRUE or FALSE.
<code>panel.labels</code>	The labels of the panel.
<code>panel.label.size</code>	The size of the label of the panel.
<code>panel.label.color</code>	The color of the label of the panel.
<code>panel.label.fontface</code>	The font face of the label of the panel. See <code>graphics::par</code> , option 'font'.
<code>panel.label.fontfamily</code>	The font family of the label of the panel. See <code>graphics::par</code> , option 'family'.
<code>panel.label.alpha</code>	The alpha transparency of the label of the panel.
<code>panel.label.bg</code>	The bg of the label of the panel.
<code>panel.label.bg.color</code>	The color of the bg of the label of the panel.
<code>panel.label.bg.alpha</code>	The alpha transparency of the bg of the label of the panel.
<code>panel.label.frame</code>	The frame of the label of the panel.
<code>panel.label.frame.color</code>	The color of the frame of the label of the panel.
<code>panel.label.frame.alpha</code>	The alpha transparency of the frame of the label of the panel.
<code>panel.label.frame.lwd</code>	The line width of the frame of the label of the panel. See <code>graphics::par</code> , option 'lwd'.

<code>panel.label.frame.r</code>	The <i>r</i> (radius) of the frame of the label of the panel.
<code>panel.label.height</code>	The height of the label of the panel.
<code>panel.label.rot</code>	Rotation angles of the panel labels. Vector of four values that determine the panel label rotation when they are placed left, top, right, and bottom. The default angles are 90, 0, 270 and 0 respectively. Note that the second value is the most common, since labels are by default shown on top (see <code>panel.wrap.pos</code>). In cross-table facets created with <code>tm_facets_grid()</code> , the first two values are used by default (see <code>panel.xtab.pos</code>).
<code>earth_boundary</code>	The earth boundary
<code>earth_boundary.color</code>	The color of the earth_boundary.
<code>earth_boundary.lwd</code>	The line width of the earth_boundary. See <code>graphics::par</code> , option 'lwd'.
<code>earth_datum</code>	Earth datum
<code>space</code>	Should the space be drawn? Only applicable is earth_boundary is enabled.
<code>space.color</code>	The color of the space.

Details

When `tm_style()` is called, all layout options are reset according to that style. To override specific layout options for a chosen style, call `tm_layout()` *after* `tm_style()`.

Note

In earlier versions of tmap, the "natural" style enabled the earth boundary automatically. This is no longer the case, because it did not work well for many projections. The earth boundary can still be enabled explicitly via the `earth_boundary` argument of `tm_layout()` (see the example above).

See Also

[Layout](#), [Margins and aspect ratio](#), [Options and styles](#), [Choropleth \(World\)](#), [Terrain map](#)

Examples

```
tm_shape(World) +
  tm_polygons() +
  tm_layout(
    bg.color = "steelblue",
    outer.bg.color = "gold",
    frame.lwd = 3,
    inner.margins = 0)

tm_shape(World) +
  tm_polygons(fill = "HPI") +
  tm_style("classic")
```

```
tm_shape(World) +  
  tm_polygons(fill = "HPI") +  
  tm_style("cobalt")
```

tm_symbols

Map layer: symbols

Description

Map layer that draws symbols. Supported map variables are: `fill` (the fill color), `col` (the border color), `size` the symbol size, `shape` the symbol shape, `lwd` (line width), `lty` (line type), `fill_alpha` (fill color alpha transparency) and `col_alpha` (border color alpha transparency).

Usage

```
tm_symbols(  
  size = tm_const(),  
  size.scale = tm_scale(),  
  size.legend = tm_legend(),  
  size.chart = tm_chart_none(),  
  size.free = NA,  
  fill = tm_const(),  
  fill.scale = tm_scale(),  
  fill.legend = tm_legend(),  
  fill.chart = tm_chart_none(),  
  fill.free = NA,  
  col = tm_const(),  
  col.scale = tm_scale(),  
  col.legend = tm_legend(),  
  col.chart = tm_chart_none(),  
  col.free = NA,  
  shape = tm_const(),  
  shape.scale = tm_scale(),  
  shape.legend = tm_legend(),  
  shape.chart = tm_chart_none(),  
  shape.free = NA,  
  lwd = tm_const(),  
  lwd.scale = tm_scale(),  
  lwd.legend = tm_legend(),  
  lwd.chart = tm_chart_none(),  
  lwd.free = NA,  
  lty = tm_const(),  
  lty.scale = tm_scale(),  
  lty.legend = tm_legend(),  
  lty.chart = tm_chart_none(),  
  lty.free = NA,
```

```

    fill_alpha = tm_const(),
    fill_alpha.scale = tm_scale(),
    fill_alpha.legend = tm_legend(),
    fill_alpha.chart = tm_chart_none(),
    fill_alpha.free = NA,
    col_alpha = tm_const(),
    col_alpha.scale = tm_scale(),
    col_alpha.legend = tm_legend(),
    col_alpha.chart = tm_chart_none(),
    col_alpha.free = NA,
    plot.order = tm_plot_order("size"),
    zindex = NA,
    group = NA,
    group.control = "check",
    popup = tm_popup(),
    popup.vars = NA,
    popup.format = tm_label_format(),
    hover = NA,
    id = "",
    blend = "over",
    options = opt_tm_symbols(),
    ...
)

```

```

tm_dots(
  fill = tm_const(),
  fill.scale = tm_scale(),
  fill.legend = tm_legend(),
  fill.free = NA,
  size = tm_const(),
  size.scale = tm_scale(),
  size.legend = tm_legend(),
  size.free = NA,
  lwd = tm_const(),
  lwd.scale = tm_scale(),
  lwd.legend = tm_legend(),
  lwd.free = NA,
  lty = tm_const(),
  lty.scale = tm_scale(),
  lty.legend = tm_legend(),
  lty.free = NA,
  fill_alpha = tm_const(),
  fill_alpha.scale = tm_scale(),
  fill_alpha.legend = tm_legend(),
  fill_alpha.free = NA,
  plot.order = tm_plot_order("DATA"),
  zindex = NA,
  group = NA,

```

```
    group.control = "check",
    options = opt_tm_dots(),
    ...
)

tm_bubbles(
  size = tm_const(),
  size.scale = tm_scale(),
  size.legend = tm_legend(),
  size.free = NA,
  fill = tm_const(),
  fill.scale = tm_scale(),
  fill.legend = tm_legend(),
  fill.free = NA,
  col = tm_const(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.free = NA,
  lwd = tm_const(),
  lwd.scale = tm_scale(),
  lwd.legend = tm_legend(),
  lwd.free = NA,
  lty = tm_const(),
  lty.scale = tm_scale(),
  lty.legend = tm_legend(),
  lty.free = NA,
  fill_alpha = tm_const(),
  fill_alpha.scale = tm_scale(),
  fill_alpha.legend = tm_legend(),
  fill_alpha.free = NA,
  col_alpha = tm_const(),
  col_alpha.scale = tm_scale(),
  col_alpha.legend = tm_legend(),
  col_alpha.free = NA,
  plot.order = tm_plot_order("size"),
  zindex = NA,
  group = NA,
  group.control = "check",
  options = opt_tm_bubbles(),
  ...
)

tm_squares(
  size = tm_const(),
  size.scale = tm_scale(),
  size.legend = tm_legend(),
  size.free = NA,
  fill = tm_const(),
```

```

    fill.scale = tm_scale(),
    fill.legend = tm_legend(),
    fill.free = NA,
    col = tm_const(),
    col.scale = tm_scale(),
    col.legend = tm_legend(),
    col.free = NA,
    lwd = tm_const(),
    lwd.scale = tm_scale(),
    lwd.legend = tm_legend(),
    lwd.free = NA,
    lty = tm_const(),
    lty.scale = tm_scale(),
    lty.legend = tm_legend(),
    lty.free = NA,
    fill_alpha = tm_const(),
    fill_alpha.scale = tm_scale(),
    fill_alpha.legend = tm_legend(),
    fill_alpha.free = NA,
    col_alpha = tm_const(),
    col_alpha.scale = tm_scale(),
    col_alpha.legend = tm_legend(),
    col_alpha.free = NA,
    plot.order = tm_plot_order("size"),
    zindex = NA,
    group = NA,
    group.control = "check",
    options = opt_tm_squares(),
    ...
)

tm_markers(
  text = tm_const(),
  text.scale = tm_scale(),
  text.legend = tm_legend(),
  text.chart = tm_chart_none(),
  text.free = NA,
  size = tm_const(),
  size.scale = tm_scale(),
  size.legend = tm_legend(),
  size.chart = tm_chart_none(),
  size.free = NA,
  col = tm_const(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  col_alpha = tm_const(),

```

```

    col_alpha.scale = tm_scale(),
    col_alpha.legend = tm_legend(),
    col_alpha.chart = tm_chart_none(),
    col_alpha.free = NA,
    fontface = tm_const(),
    fontface.scale = tm_scale(),
    fontface.legend = tm_legend(),
    fontface.chart = tm_chart_none(),
    fontface.free = NA,
    fontfamily = "",
    bgcol = tm_const(),
    bgcol.scale = tm_scale(),
    bgcol.legend = tm_legend(),
    bgcol.chart = tm_chart_none(),
    bgcol.free = NA,
    bgcol_alpha = tm_const(),
    bgcol_alpha.scale = tm_scale(),
    bgcol_alpha.legend = tm_legend(),
    bgcol_alpha.chart = tm_chart_none(),
    bgcol_alpha.free = NA,
    xmod = 0,
    xmod.scale = tm_scale(),
    xmod.legend = tm_legend_hide(),
    xmod.chart = tm_chart_none(),
    xmod.free = NA,
    ymod = 0,
    ymod.scale = tm_scale(),
    ymod.legend = tm_legend_hide(),
    ymod.chart = tm_chart_none(),
    ymod.free = NA,
    angle = 0,
    angle.scale = tm_scale(),
    angle.legend = tm_legend_hide(),
    angle.chart = tm_chart_none(),
    angle.free = NA,
    plot.order = tm_plot_order("AREA", reverse = FALSE, na.order = "bottom"),
    zindex = NA,
    group = NA,
    group.control = "check",
    options = opt_tm_markers(),
    ...
)

opt_tm_markers(
  markers_on_top_of_text = FALSE,
  points_only = "ifany",
  point_per = "feature",
  on_surface = FALSE,

```

```

    shadow = FALSE,
    shadow.offset.x = 0.1,
    shadow.offset.y = 0.1,
    just = "center",
    along_lines = TRUE,
    bg.padding = 0.4,
    clustering = TRUE,
    point.label = TRUE,
    point.label.gap = 0.4,
    point.label.method = "SANN",
    remove_overlap = FALSE,
    dots.just = NA,
    dots.icon.scale = 3,
    dots.grob.dim = c(width = 48, height = 48, render.width = 256, render.height = 256)
  )

  opt_tm_symbols(
    points_only = "ifany",
    point_per = "feature",
    on_surface = FALSE,
    clustering = FALSE,
    icon.scale = 3,
    just = NA,
    hitbox = "auto",
    grob.dim = c(width = 48, height = 48, render.width = 256, render.height = 256)
  )

  opt_tm_dots(
    points_only = "ifany",
    point_per = "feature",
    on_surface = FALSE,
    clustering = FALSE,
    icon.scale = 3,
    just = NA,
    hitbox = "auto",
    grob.dim = c(width = 48, height = 48, render.width = 256, render.height = 256)
  )

  opt_tm_bubbles(
    points_only = "ifany",
    point_per = "feature",
    on_surface = FALSE,
    clustering = FALSE,
    icon.scale = 3,
    just = NA,
    hitbox = "auto",
    grob.dim = c(width = 48, height = 48, render.width = 256, render.height = 256)
  )

```

```

opt_tm_squares(
  points_only = "ifany",
  point_per = "feature",
  on_surface = FALSE,
  clustering = FALSE,
  icon.scale = 3,
  just = NA,
  hitbox = "auto",
  grob.dim = c(width = 48, height = 48, render.width = 256, render.height = 256)
)

```

Arguments

`size`, `size.scale`, `size.legend`, `size.chart`, `size.free`
 Map variable that determines the size. See details. *Unit*: Typographic lines ("lines"); 1 line is approx. 1/6 inch. Controlled by `values.scale` and `tmap_options(values.scale = ...)`.

`fill`, `fill.scale`, `fill.legend`, `fill.chart`, `fill.free`
 Map variable that determines the fill color. See details. *Unit*: Color – a color name, hex string.

`col`, `col.scale`, `col.legend`, `col.chart`, `col.free`
 Map variable that determines the color. See details. *Unit*: Color – a color name, hex string.

`shape`, `shape.scale`, `shape.legend`, `shape.chart`, `shape.free`
 Map variable that determines the shape. See details. *Unit*: Integer pch code (1-25) used as a plotting symbol. See example of `tm_symbols()`

`lwd`, `lwd.scale`, `lwd.legend`, `lwd.chart`, `lwd.free`
 Map variable that determines the line width. See details. *Unit*: Base R line-width units; 1 lwd is approx. 0.75 pt at 96 dpi.

`lty`, `lty.scale`, `lty.legend`, `lty.chart`, `lty.free`
 Map variable that determines the line type. See details. *Unit*: Integer (1-6) or name: "solid", "dashed", "dotted", "dotdash", "longdash", "twodash".

`fill_alpha`, `fill_alpha.scale`, `fill_alpha.legend`, `fill_alpha.chart`, `fill_alpha.free`
 Map variable that determines the fill color transparency. See details. *Unit*: Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque). the fill color alpha transparency See details.

`col_alpha`, `col_alpha.scale`, `col_alpha.legend`, `col_alpha.chart`, `col_alpha.free`
 Map variable that determines the color transparency. See details. *Unit*: Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).

`plot.order`
 Specification in which order the spatial features are drawn. See `tm_plot_order()` for details.

`zindex`
 Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.

group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
popup	popup specification for "view" mode, the output of <code>tm_popup()</code> . It determines the data variables shown in the popup table, the popup title, and (in the future) the popup layout. This replaces the deprecated arguments <code>popup.vars</code> and <code>popup.format</code> .
popup.vars	(Deprecated.) Use popup with <code>tm_popup()</code> instead (via its <code>vars</code> argument). Names of data variables that are shown in the popups in "view" mode. Set <code>popup.vars</code> to TRUE to show all variables in the shape object. Set <code>popup.vars</code> to FALSE to disable popups. Set <code>popup.vars</code> to a character vector of variable names to show those variables in the popups. The default (NA) depends on whether visual variables (e.g. fill) are used. If so, only those are shown. If not, all variables in the shape object are shown.
popup.format	(Deprecated.) Use popup with <code>tm_popup()</code> instead (via its <code>format</code> argument). List of formatting options for the popup values. Output of <code>tm_label_format()</code> . Only applicable for numeric data variables. If one list of formatting options is provided, it is applied to all numeric variables of <code>popup.vars</code> . Also, a (named) list of lists can be provided. In that case, each list of formatting options is applied to the named variable.
hover	name of the data variable that specifies the hover labels (view mode only). Set to FALSE to disable hover labels. By default FALSE, unless <code>id</code> is specified. In that case, it is set to <code>id</code> ,
id	name of the data variable that specifies the indices of the spatial features. Only used for "view" mode.
blend	Compositing operator for layer blending. Default "over" applies no blending. See the "Layer blending" section for the supported values.
options	options passed on to the corresponding <code>opt_<layer_function></code> function
...	to catch deprecated arguments from version < 4.0
text, text.scale, text.legend, text.chart, text.free	Map variable that determines the text. See details. <i>Unit</i> : Character string.
fontface, fontface.scale, fontface.legend, fontface.chart, fontface.free	Map variable that determines the font face. See details. <i>Unit</i> : "plain", "bold", "italic", or "bold.italic".
fontfamily	The font family. See <code>gpar()</code> for details.
bgcol, bgcol.scale, bgcol.legend, bgcol.chart, bgcol.free	Map variable that determines the background color. See Details. <i>Unit</i> : Color – a color name, hex string.
bgcol_alpha, bgcol_alpha.scale, bgcol_alpha.legend, bgcol_alpha.chart, bgcol_alpha.free	Map variable that determines the background color transparency. See Details. <i>Unit</i> : Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).

xmod, xmod.scale, xmod.legend, xmod.chart, xmod.free	Transformation variable that determines the x offset. See details. <i>Unit:</i> Line heights, relative to the label anchor. Positive = right.
ymod, ymod.scale, ymod.legend, ymod.chart, ymod.free	Transformation variable that determines the y offset. See details. <i>Unit:</i> Line heights, relative to the label anchor. Positive = up. the text. See details.
angle, angle.scale, angle.legend, angle.chart, angle.free	Rotation angle <i>Unit:</i> Degrees, clockwise from north (0-360).
markers_on_top_of_text	should markers be plot on top of the text (by default FALSE)
points_only	should only point geometries of the shape object (defined in tm_shape()) be plotted? By default "ifany", which means TRUE in case a geometry collection is specified.
point_per	specification of how spatial points are mapped when the geometry is a multi line or a multi polygon. One of "feature", "segment" or "largest". The first generates a spatial point for every feature, the second for every segment (i.e. subfeature), the third only for the largest segment (subfeature). Note that the last two options can be significant slower.
on_surface	In case of polygons, centroids are computed. Should the points be on the surface? If TRUE, which is slower than the default FALSE, centroids outside the surface are replaced with points computed with sf::st_point_on_surface() .
shadow	Shadow behind the text. Logical.
shadow.offset.x, shadow.offset.y	Shadow offset in line heights
just	justification of the text relative to the point coordinates. Either one of the following values: "left", "right", "center", "bottom", and "top", or a vector of two values where first value specifies horizontal and the second value vertical justification. Besides the mentioned values, also numeric values between 0 and 1 can be used. 0 means left justification for the first value and bottom justification for the second value. Note that in view mode, only one value is used.
along_lines	logical that determines whether labels are rotated along the spatial lines. Only applicable if a spatial lines shape is used.
bg.padding	The padding of the background in terms of line heights.
clustering	in interactive modes (e.g. "view" mode), should clustering be applied at lower zoom levels? Either FALSE (default), TRUE, or a mode specific specification, e.g. for "view" mode markerClusterOptions .
point.label	logical that determines whether the labels are placed automatically. By default FALSE for tm_text, and TRUE for tm_labels if the number of labels is less than 500 (otherwise it will be too slow).
point.label.gap	numeric that determines the gap between the point and label
point.label.method	the optimization method, either "SANN" for simulated annealing (the default) or "GA" for a genetic algorithm.

<code>remove_overlap</code>	logical that determines whether the overlapping labels are removed
<code>dots.just</code>	justification of the text relative to the point coordinates. Either one of the following values: "left", "right", "center", "bottom", and "top", or a vector of two values where first value specifies horizontal and the second value vertical justification. Besides the mentioned values, also numeric values between 0 and 1 can be used. 0 means left justification for the first value and bottom justification for the second value. Note that in view mode, only one value is used.
<code>dots.icon.scale</code>	scaling number that determines how large the icons (or grobs) are in plot mode in comparison to proportional symbols (such as bubbles). In view mode, the size is determined by the icon specification (see tmap_icons) or, if grobs are specified by <code>grob.width</code> and <code>grob.height</code>
<code>dots.grob.dim</code>	vector of four values that determine how grob objects (see details) are shown in view mode. The first and second value are the width and height of the displayed icon. The third and fourth value are the width and height of the rendered png image that is used for the icon. Generally, the third and fourth value should be large enough to render a ggplot2 graphic successfully. Only needed for the view mode.
<code>icon.scale</code>	scaling number that determines how large the icons (or grobs) are in plot mode in comparison to proportional symbols (such as bubbles). For view mode, use the argument <code>grob.dim</code>
<code>hitbox</code>	Controls whether an invisible interaction layer with a larger clickable area ("<code>hitbox</code>") is added on top of the symbols. This can improve click and popup behavior for small or densely packed symbols by enlarging the effective mouse interaction area. Possible values: "none" No additional hitbox layer is added. Symbols are clickable only at their visible size. <code>\item{"plusX"}{Adds <code>\code{X}</code> pixels to the visible symbol diameter to compute the interaction size. For example, <code>\code{"plus8"}</code> widens the clickable area by 4 pixels around each symbol edge.}</code> <code>\item{"pmaxX"}{Ensures a minimum interaction diameter of <code>\code{X}</code> pixels: <code>\code{pmax(symbol_diameter, X)}</code>. Useful only for very small symbols, as it adds no margin to symbols already larger than <code>\code{X}</code>.}</code> <code>\item{"auto"}{\code{"pmax12"} if and only if interactive features are enabled (popup or hover), symbols are small (median visible diameter < 12px), and there are fewer than 10000 features. Otherwise <code>\code{"none"}</code>.}</code> plus and pmax can be combined, e.g. "plus4pmax8". The hitbox is not applied when clustering is enabled.
<code>grob.dim</code>	vector of four values that determine how grob objects (see details) are shown in view mode. The first and second value are the width and height of the displayed icon. The third and fourth value are the width and height of the rendered png image that is used for the icon. Generally, the third and fourth value should be large enough to render a ggplot2 graphic successfully. Only needed for the view mode.

Details

A symbol shape specification is one of the following three options.

1. A numeric value that specifies the plotting character of the symbol. See parameter `pch` of [points](#) and the last example to create a plot with all options. Note that this is not supported for the "view" mode.
2. A [grob](#) object, which can be a `ggplot2` plot object created with [ggplotGrob](#). To specify multiple shapes, a list of grob objects is required. Tip: for proportional symbols, such as donuts or pies, see the extension package vignette: [tmap.glyphs](#).
3. An icon specification, which can be created with [tmap_icons\(\)](#).

To specify multiple shapes (needed for the `shapes` argument), a vector or list of these shape specification is required. The shape specification options can also be mixed. For the `shapes` argument, it is possible to use a named vector or list, where the names correspond to the value of the variable specified by the `shape` argument. For small multiples, a list of these shape specification(s) should be provided.

See Also

[Map variables](#), [Scales](#), [Legends](#), [Facets](#), [Units](#), [Layer blending](#), [Bubble map](#), [Terrain map](#)

Examples

```
#####
## plot symbol shapes
#####

# create grid of 25 points in the Atlantic
atlantic_grid = cbind(expand.grid(x = -51:-47, y = 20:24), id = seq_len(25))
x = sf::st_as_sf(atlantic_grid, coords = c("x", "y"), crs = 4326)

tm_shape(x, bbox = tmaptools::bb(x, ext = 1.2)) +
  tm_symbols(shape = "id",
    size = 2,
    lwd = 2,
    fill = "orange",
    col = "black",
    shape.scale = tm_scale_asis()) +
  tm_text("id", ymod = -2)
```

tm_text

Map layer: text

Description

Map layer that draws symbols Supported map variables are: `text` (the text itself) `col` (color), `size` (font size), and `fontface` (font face).

Usage

```
tm_text(  
  text = tm_const(),  
  text.scale = tm_scale(),  
  text.legend = tm_legend(),  
  text.chart = tm_chart_none(),  
  text.free = NA,  
  size = tm_const(),  
  size.scale = tm_scale(),  
  size.legend = tm_legend(),  
  size.chart = tm_chart_none(),  
  size.free = NA,  
  col = tm_const(),  
  col.scale = tm_scale(),  
  col.legend = tm_legend(),  
  col.chart = tm_chart_none(),  
  col.free = NA,  
  col_alpha = tm_const(),  
  col_alpha.scale = tm_scale(),  
  col_alpha.legend = tm_legend(),  
  col_alpha.chart = tm_chart_none(),  
  col_alpha.free = NA,  
  fontface = tm_const(),  
  fontface.scale = tm_scale(),  
  fontface.legend = tm_legend(),  
  fontface.chart = tm_chart_none(),  
  fontface.free = NA,  
  fontfamily = NA,  
  bgcol = tm_const(),  
  bgcol.scale = tm_scale(),  
  bgcol.legend = tm_legend(),  
  bgcol.chart = tm_chart_none(),  
  bgcol.free = NA,  
  bgcol_alpha = tm_const(),  
  bgcol_alpha.scale = tm_scale(),  
  bgcol_alpha.legend = tm_legend(),  
  bgcol_alpha.chart = tm_chart_none(),  
  bgcol_alpha.free = NA,  
  xmod = 0,  
  xmod.scale = tm_scale(),  
  xmod.legend = tm_legend_hide(),  
  xmod.chart = tm_chart_none(),  
  xmod.free = NA,  
  ymod = 0,  
  ymod.scale = tm_scale(),  
  ymod.legend = tm_legend_hide(),  
  ymod.chart = tm_chart_none(),  
  ymod.free = NA,
```

```

    angle = 0,
    angle.scale = tm_scale(),
    angle.legend = tm_legend_hide(),
    angle.chart = tm_chart_none(),
    angle.free = NA,
    plot.order = tm_plot_order("size", reverse = FALSE),
    zindex = NA,
    group = NA,
    group.control = "check",
    blend = "over",
    options = opt_tm_text(),
    ...
)

```

```

tm_labels(
  text = tm_const(),
  text.scale = tm_scale(),
  text.legend = tm_legend(),
  text.chart = tm_chart_none(),
  text.free = NA,
  size = tm_const(),
  size.scale = tm_scale(),
  size.legend = tm_legend(),
  size.chart = tm_chart_none(),
  size.free = NA,
  col = tm_const(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  col_alpha = tm_const(),
  col_alpha.scale = tm_scale(),
  col_alpha.legend = tm_legend(),
  col_alpha.chart = tm_chart_none(),
  col_alpha.free = NA,
  fontface = tm_const(),
  fontface.scale = tm_scale(),
  fontface.legend = tm_legend(),
  fontface.chart = tm_chart_none(),
  fontface.free = NA,
  fontfamily = "",
  bgcol = tm_const(),
  bgcol.scale = tm_scale(),
  bgcol.legend = tm_legend(),
  bgcol.chart = tm_chart_none(),
  bgcol.free = NA,
  bgcol_alpha = tm_const(),
  bgcol_alpha.scale = tm_scale(),

```

```

bgcol_alpha.legend = tm_legend(),
bgcol_alpha.chart = tm_chart_none(),
bgcol_alpha.free = NA,
xmod = 0,
xmod.scale = tm_scale(),
xmod.legend = tm_legend_hide(),
xmod.chart = tm_chart_none(),
xmod.free = NA,
ymod = 0,
ymod.scale = tm_scale(),
ymod.legend = tm_legend_hide(),
ymod.chart = tm_chart_none(),
ymod.free = NA,
angle = 0,
angle.scale = tm_scale(),
angle.legend = tm_legend_hide(),
angle.chart = tm_chart_none(),
angle.free = NA,
plot.order = tm_plot_order("AREA", reverse = FALSE, na.order = "bottom"),
zindex = NA,
group = NA,
group.control = "check",
options = opt_tm_labels(),
...
)

tm_labels_highlighted(
  text = tm_const(),
  text.scale = tm_scale(),
  text.legend = tm_legend(),
  text.chart = tm_chart_none(),
  text.free = NA,
  size = tm_const(),
  size.scale = tm_scale(),
  size.legend = tm_legend(),
  size.chart = tm_chart_none(),
  size.free = NA,
  col = tm_const(),
  col.scale = tm_scale(),
  col.legend = tm_legend(),
  col.chart = tm_chart_none(),
  col.free = NA,
  col_alpha = tm_const(),
  col_alpha.scale = tm_scale(),
  col_alpha.legend = tm_legend(),
  col_alpha.chart = tm_chart_none(),
  col_alpha.free = NA,
  fontface = tm_const(),

```

```

    fontface.scale = tm_scale(),
    fontface.legend = tm_legend(),
    fontface.chart = tm_chart_none(),
    fontface.free = NA,
    fontfamily = "",
    bgcol = tm_const(),
    bgcol.scale = tm_scale(),
    bgcol.legend = tm_legend(),
    bgcol.chart = tm_chart_none(),
    bgcol.free = NA,
    bgcol_alpha = tm_const(),
    bgcol_alpha.scale = tm_scale(),
    bgcol_alpha.legend = tm_legend(),
    bgcol_alpha.chart = tm_chart_none(),
    bgcol_alpha.free = NA,
    xmod = 0,
    xmod.scale = tm_scale(),
    xmod.legend = tm_legend_hide(),
    xmod.chart = tm_chart_none(),
    xmod.free = NA,
    ymod = 0,
    ymod.scale = tm_scale(),
    ymod.legend = tm_legend_hide(),
    ymod.chart = tm_chart_none(),
    ymod.free = NA,
    angle = 0,
    angle.scale = tm_scale(),
    angle.legend = tm_legend_hide(),
    angle.chart = tm_chart_none(),
    angle.free = NA,
    plot.order = tm_plot_order("AREA", reverse = FALSE, na.order = "bottom"),
    zindex = NA,
    group = NA,
    group.control = "check",
    options = opt_tm_labels(),
    ...
)

opt_tm_text(
  points_only = "ifany",
  point_per = "feature",
  on_surface = FALSE,
  shadow = FALSE,
  shadow.col = NA,
  shadow.offset.x = 0.05,
  shadow.offset.y = 0.05,
  halo = FALSE,
  halo.col = NA,

```

```

    halo.width = 0.05,
    halo.blur = 0,
    halo.alpha = 0.8,
    just = "center",
    along_lines = FALSE,
    bg.padding = 0.4,
    bg.border = FALSE,
    bg.border.col = "black",
    bg.border.lwd = 1,
    clustering = FALSE,
    point.label = FALSE,
    point.label.gap = 0,
    point.label.method = "SANN",
    remove_overlap = FALSE
  )

  opt_tm_labels(
    points_only = "ifany",
    point_per = "feature",
    on_surface = FALSE,
    shadow = FALSE,
    shadow.col = NA,
    shadow.offset.x = 0.05,
    shadow.offset.y = 0.05,
    halo = FALSE,
    halo.col = NA,
    halo.width = 0.05,
    halo.blur = 0,
    halo.alpha = 0.8,
    just = "center",
    along_lines = TRUE,
    bg.padding = 0.4,
    bg.border = FALSE,
    bg.border.col = "black",
    bg.border.lwd = 1,
    clustering = FALSE,
    point.label = NA,
    point.label.gap = 0.4,
    point.label.method = "SANN",
    remove_overlap = FALSE
  )

```

Arguments

text, text.scale, text.legend, text.chart, text.free

Map variable that determines the text. See details. *Unit:* Character string.

size, size.scale, size.legend, size.chart, size.free

Map variable that determines the size. See details. *Unit:* Multiplier of the base font size. size = 1 renders at the default font size, which is 12 pt in plot mode

	(par("ps")) and 12 px in view mode (consistent by design). size = 1.5 renders at 18 pt / px, etc.
col, col.scale, col.legend, col.chart, col.free	Map variable that determines the color. See details. <i>Unit:</i> Color – a color name, hex string.
col_alpha, col_alpha.scale, col_alpha.legend, col_alpha.chart, col_alpha.free	Map variable that determines the color transparency. See details. <i>Unit:</i> Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
fontface, fontface.scale, fontface.legend, fontface.chart, fontface.free	Map variable that determines the font face. See details. <i>Unit:</i> "plain", "bold", "italic", or "bold.italic".
fontfamily	The font family. See gpar() for details.
bgcol, bgcol.scale, bgcol.legend, bgcol.chart, bgcol.free	Map variable that determines the background color. See Details. <i>Unit:</i> Color – a color name, hex string.
bgcol_alpha, bgcol_alpha.scale, bgcol_alpha.legend, bgcol_alpha.chart, bgcol_alpha.free	Map variable that determines the background color transparency. See Details. <i>Unit:</i> Proportion – numeric 0-1 (0 = fully transparent, 1 = fully opaque).
xmod, xmod.scale, xmod.legend, xmod.chart, xmod.free	Transformation variable that determines the x offset. See details. <i>Unit:</i> Line heights, relative to the label anchor. Positive = right.
ymod, ymod.scale, ymod.legend, ymod.chart, ymod.free	Transformation variable that determines the y offset. See details. <i>Unit:</i> Line heights, relative to the label anchor. Positive = up. the text. See details.
angle, angle.scale, angle.legend, angle.chart, angle.free	Rotation angle <i>Unit:</i> Degrees, clockwise from north (0-360).
plot.order	Specification in which order the spatial features are drawn. See tm_plot_order() for details.
zindex	Controls the stacking order of map layers. Should be set to a value above 400. By default, layers are stacked in call order, starting at 401. See details.
group	Name of the group to which this layer belongs. This is only relevant in view mode, where layer groups can be switched (see <code>group.control</code>)
group.control	In view mode, the group control determines how layer groups can be switched on and off. Options: "radio" for radio buttons (meaning only one group can be shown), "check" for check boxes (so multiple groups can be shown), and "none" for no control (the group cannot be (de)selected).
blend	Compositing operator for layer blending. Default "over" applies no blending. See the "Layer blending" section for the supported values.
options	options passed on to the corresponding <code>opt_<layer_function></code> function
...	to catch deprecated arguments from version < 4.0

points_only	should only point geometries of the shape object (defined in <code>tm_shape()</code>) be plotted? By default "ifany", which means TRUE in case a geometry collection is specified.
point_per	specification of how spatial points are mapped when the geometry is a multi line or a multi polygon. One of "feature", "segment" or "largest". The first generates a spatial point for every feature, the second for every segment (i.e. subfeature), the third only for the largest segment (subfeature). Note that the last two options can be significant slower.
on_surface	In case of polygons, centroids are computed. Should the points be on the surface? If TRUE, which is slower than the default FALSE, centroids outside the surface are replaced with points computed with <code>sf::st_point_on_surface()</code> .
shadow	Shadow behind the text. Logical.
shadow.col	Color of the shadow.
shadow.offset.x, shadow.offset.y	Shadow offset in line heights
halo	Halo behind the text. In plot mode, it is just an outline, in view mode also a subtle glow.
halo.col	Color of the halo.
halo.width	Width (thickness) of the halo outline. In line heights
halo.blur	Blur radius of the halo glow (view mode only). In line heights. Should be sufficiently larger than halo.width in order to see the effect.
halo.alpha	Alpha transparency of the halo
just	justification of the text relative to the point coordinates. Either one of the following values: "left", "right", "center", "bottom", and "top", or a vector of two values where first value specifies horizontal and the second value vertical justification. Besides the mentioned values, also numeric values between 0 and 1 can be used. 0 means left justification for the first value and bottom justification for the second value. Note that in view mode, only one value is used.
along_lines	logical that determines whether labels are rotated along the spatial lines. Only applicable if a spatial lines shape is used.
bg.padding	The padding of the background in terms of line heights.
bg.border	Should the background have borders?
bg.border.col	Color of the borders
bg.border.lwd	Line width of the borders
clustering	in interactive modes (e.g. "view" mode), should clustering be applied at lower zoom levels? Either FALSE (default), TRUE, or a mode specific specification, e.g. for "view" mode <code>markerClusterOptions</code> .
point.label	logical that determines whether the labels are placed automatically. By default FALSE for <code>tm_text</code> , and TRUE for <code>tm_labels</code> if the number of labels is less than 500 (otherwise it will be too slow).
point.label.gap	numeric that determines the gap between the point and label

point.label.method
 the optimization method, either "SANN" for simulated annealing (the default) or "GA" for a genetic algorithm.

remove_overlap logical that determines whether the overlapping labels are removed

Details

The map variable arguments (e.g. col) can be specified with a data variable name (e.g., a spatial vector attribute or a raster layer of the object specified in `tm_shape()`), with a visual value (for col, a color is expected), or with a geometry-derived variable (see below). See vignette: [Map variables](#).

Multiple values can be specified: in that case facets are created. These facets can be combined with other faceting data variables, specified with `tm_facets()`. See vignette: [Facets](#).

- The `*.scale` arguments determine the used scale to map the data values to map variable values. These can be specified with one of the available `tm_scale_*`() functions. The default is specified by the `tmap` option (`tm_options()`) `scales.var`. See ‘rvignette: [Scales](#)
- The `*.legend` arguments determine the used legend, specified with `tm_legend()`. The default legend and its settings are determined by the `tmap` options (`tm_options()`) `legend.`. See ‘rvignette: [Legends](#)
- The `*.chart` arguments specify additional charts, specified with `tm_chart_`, e.g. `tm_chart_histogram()`. See ‘rvignette: [Charts](#)
- The `*.free` arguments determine whether scales are applied freely across facets, or shared. A logical value is required. They can also be specified with a vector of three logical values; these determine whether scales are applied freely per facet dimension. This is only useful when facets are applied (see `tm_facets()`). There are maximally three facet dimensions: rows, columns, and pages. This only applies for a facet grid (`tm_facets_grid()`). For instance, `col.free = c(TRUE, FALSE, FALSE)` means that for the map variable col, each row of facets will have its own scale, and therefore its own legend. For facet wraps and stacks (`tm_facets_wrap()` and `tm_facets_stack()`) there is only one facet dimension, so the `*.free` argument requires only one logical value.

Currently, three geometry-derived variables are implemented:

- "AREA" (polygons only), which uses the feature area;
- "LENGTH" (lines only), which uses the feature length; and
- "MAP_COLORS", which assigns values so that adjacent features receive different values, making it particularly suitable for coloring neighbouring polygons.

Note that geometry-derived variables do not generate a legend automatically. If a legend is required, compute the corresponding variable explicitly, for example with `sf::st_area()`, `sf::st_length()`, or `tmtools::map_coloring()`, and use the resulting values instead.

Map variable units:

Every map variable maps data values to a specific output unit. Knowing the unit matters when supplying constant values via `tm_const()`, or output ranges via `values.range / values.scale` in the scale functions.

Variable	Output unit	Notes
----------	-------------	-------

fill, col, bgcol	color	name, hex, or palette string
fill_alpha, col_alpha, bgcol_alpha	proportion 0-1	0 = transparent, 1 = opaque
size (symbols, bubbles, squares, dots)	typographic lines	1 line approx. 1/6 inch; scaled by values.scale
size (circles)	meters	plain numeric or a units object
size (text, labels)	multiplier	1 = 12 pt (plot) / 12 px (view)
lwd	lwd	base R units; 1 lwd approx. 0.75 pt at 96 dpi
lty	–	integer 1-6 or name ("solid", "dashed", ...)
shape	–	integer pch 1-25 or single character
angle	degrees	0-360, clockwise from north
fontface	–	"plain", "bold", "italic", "bold.italic"

Symbol size (size in tm_symbols, tm_bubbles, tm_squares, tm_dots):

"Lines" is a typographic unit: one line is approximately 1/6 inch (the default base line-height in R graphics). The global multiplier `tmap_options(values.scale = list(size.bubbles = 1.5))` scales all symbol sizes without changing the data mapping.

Circle size (size in tm_circles):

The value is a geographic radius in meters. A plain numeric vector is interpreted as meters; a units object (from the **units** package) is automatically converted, so `units::as_units(1, "mi")` gives a 1-mile radius. Because the radius is geographic, circles scale with zoom in interactive (view) mode – unlike bubble symbols which keep a fixed screen size.

Text size (size in tm_text, tm_labels):

The value is a multiplier of the base font size. `size = 1` renders at 12 pt in plot mode (R's default `par("ps")`) and at 12 px in view mode (`gp$cex * 12 px`, see `tmapLeafletDataPlot.tm_data_text`); the two modes are consistent by design.

Layer blending (blend):

Blend modes control how a layer's pixels are combined with the pixels beneath it. For each pixel, let S be the source (top layer) RGB value and D be the destination (bottom layer) RGB value, both normalised to $[0, 1]$.

blend	Formula	Use case
"over"	$S \cdot \alpha + D \cdot (1 - \alpha)$	Standard alpha compositing (default)
"multiply"	$S \times D$	Hillshading over color raster; both layers darken each other
"screen"	$1 - (1 - S)(1 - D)$	Inverse of multiply; brightens
"overlay"	multiply if $D < 0.5$, screen if $D \geq 0.5$	Boosts contrast; preserves midtones
"darken"	$\min(S, D)$	Keeps the darker of the two layers per channel
"lighten"	$\max(S, D)$	Keeps the lighter of the two layers per channel

Requires R ≥ 4.2 and a compatible graphics device (e.g. `png(type = "cairo")`, `svg()`). In view mode, blending is applied via CSS `mix-blend-mode`. See `grid::groupGrob()` for the full list of supported operators.

zindex and pane names:

In view mode, each layer is rendered in a Leaflet pane named `"tmap{zindex}"` (e.g., `"tmap401"`, `"tmap402"`), with base tile layers placed in the standard `"tile"` pane.

See Also

[Map variables, Scales, Legends, Facets, Units, Layer blending](#)

[Map variables, Scales, Legends, Facets, Units, Layer blending, Topographic map \(Africa\), Terrain map](#)

Examples

```
tm_shape(World, bbox = World) +
  tm_text("name", size="pop_est", col="continent",
    col.scale = tm_scale_categorical(values = "seaborn.dark"),
    col.legend = tm_legend_hide(),
    size.scale = tm_scale_continuous(values.scale = 4),
    size.legend = tm_legend_hide())

metro$upside_down = ifelse(sf::st_coordinates(metro)[,2] < 0, 180, 0)
tm_shape(metro) +
  tm_text(text = "name", size = "pop2020",
    angle = "upside_down", size.legend = tm_legend_hide(),
    col = "upside_down",
    col.scale = tm_scale_categorical(values = c("#9900BB", "#228822")),
    col.legend = tm_legend_hide()) +
  tm_title_out("Which Hemisphere?", position = tm_pos_out("center", "top", pos.v = "bottom"))
```

tm_title	<i>Map component: title</i>
----------	-----------------------------

Description

Map component that adds a title

Usage

```
tm_title(
  text,
  size,
  color,
  padding,
  fontface,
  fontfamily,
  alpha,
  stack,
  just,
  frame,
  frame.color,
  frame.alpha,
  frame.lwd,
  frame.r,
```

```

    bg,
    bg.color,
    bg.alpha,
    position,
    group_id,
    width,
    height,
    z
)

tm_title_in(text, ..., position = tm_pos_in("left", "top"))

tm_title_out(text, ..., position = tm_pos_out("center", "top"))

```

Arguments

text	text
size	font size
color	font color
padding	padding
fontface	font face, bold, italic
fontfamily	font family
alpha	alpha transparency of the text
stack	stack with other map components, either "vertical" or "horizontal".
just	just
frame	frame should a frame be drawn?
frame.color	frame color
frame.alpha	frame alpha transparency
frame.lwd	frame line width
frame.r	Radius of the rounded frame corners. 0 means no rounding.
bg	Show background?
bg.color	Background color
bg.alpha	Background transparency
position	The position specification of the component: an object created with <code>tm_pos_in()</code> or <code>tm_pos_out()</code> . Or, as a shortcut, a vector of two values, specifying the x and y coordinates. The first is "left", "center" or "right" (or upper case, meaning tighter to the map frame), the second "top", "center" or "bottom". Numeric values are also supported, where 0, 0 means left bottom and 1, 1 right top. See also vignette: Positioning of components . In case multiple components should be combined (stacked), use <code>group_id</code> and specify component in tm_components() .
group_id	Component group id name. All components (e.g. legends, titles, etc) with the same <code>group_id</code> will be grouped. The specifications of how they are placed (e.g. stacking, margins etc.) are determined in tm_components() where its argument <code>id</code> should correspond to <code>group_id</code> .

width, height	width and height of the component.
z	z index, e.g. the place of the component relative to the other componets
...	passed on to <code>tm_title()</code>

See Also

[Components](#), [Positioning of components](#), [Grouping of components](#), [Choropleth \(Netherlands\)](#)

tm_vars	<i>Specify variables</i>
---------	--------------------------

Description

tmmap function to specify all variables in the shape object

Usage

```
tm_vars(
  x = NA,
  dimvalues = NULL,
  n = NA,
  multivariate = FALSE,
  animate = FALSE
)
```

Arguments

x	variable names, variable indices, or a dimension name
dimvalues	dimension values
n	if specified the first n variables are taken (or the first n dimension values)
multivariate	in case multiple variables are specified, should they serve as facets (FALSE) or as a multivariate map variable?
animate	should the variable(s) be animated? (experimental)

See Also

[Scales](#), [Map variables](#), [Multivariate map variables](#)

tm_view

*View mode options***Description**

View mode options. These options are specific to the view mode.

Usage

```
tm_view(
  use_browser,
  use_WebGL,
  control.position,
  control.bases,
  control.overlays,
  control.collapse,
  set_bounds,
  set_view,
  set_zoom_limits,
  use_circle_markers,
  leaflet.options,
  ...
)
```

Arguments

<code>use_browser</code>	If TRUE it opens an external browser, and FALSE (default) it opens the internal IDEs (e.g. RStudio) browser.
<code>use_WebGL</code>	use webGL for points, lines, and polygons. For large spatial objects, this is much faster than the standard leaflet layer functions. However, it can not always be used for two reasons. First, the number of map variables are limited; only fill, size, and color (for lines) are supported. Second, projected CRS's are not supported. Furthermore, it has the drawback that polygon borders are not as sharp. By default only TRUE for large spatial objects (1000 or more features) when the mentioned criteria are met. By default TRUE if no other map variables are used.
<code>control.position</code>	The position of the control. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>control.bases</code>	base layers
<code>control.overlays</code>	overlay layers
<code>control.collapse</code>	Should the box be collapsed or expanded?

set_bounds	logical that determines whether maximum bounds are set, or a bounding box. Not applicable in plot mode. In view mode, this is passed on to setMaxBounds()
set_view	numeric vector that determines the view. Either a vector of three: lng, lat, and zoom, or a single value: zoom. See setView() . Only applicable if bbox is not specified
set_zoom_limits	numeric vector of two that set the minimum and maximum zoom levels (see tileOptions()).
use_circle_markers	If TRUE (default) circle shaped symbols (e.g. <code>tm_dots()</code> and <code>tm_symbols()</code>) will be rendered as addCircleMarkers() instead of addMarkers() . The former is faster, the latter can support any symbol since it is based on icons
leaflet.options	options passed on to leafletOptions()
...	to catch deprecated arguments

See Also

[Modes Layer groups \(view mode\)](#)

tm_xlab	<i>Map component: axis labels</i>
---------	-----------------------------------

Description

The x and y labels for maps

Usage

```
tm_xlab(text, size, color, rotation, space, fontface, fontfamily, alpha, side)
```

```
tm_ylab(text, size, color, rotation, space, fontface, fontfamily, alpha, side)
```

Arguments

text	text of the title
size	font size of the title
color	color
rotation	rotation in degrees
space	space between label and map in number of line heights
fontface	font face
fontfamily	font family
alpha	alpha transparency of the text
side	side: "top" or "bottom" for tm_xlab and "left" or "right" for tm_ylab

tmap-element	<i>Stacking of tmap elements</i>
--------------	----------------------------------

Description

The plus operator allows you to stack tmap elements (functions with a prefix `tm_`)

Usage

```
## S3 method for class 'tmap'
e1 + e2
```

Arguments

e1	first tmap element
e2	second tmap element

tmap_animation	<i>Save tmap animation to file</i>
----------------	------------------------------------

Description

Create a gif animation or video from an animated tmap plot. First use `tm_animate()` or `tm_animate_fast()` to animate the plot, and then apply `tmap_animation()` to save it as a gif or video file (e.g. mp4).

Usage

```
tmap_animation(
  tm,
  filename = NULL,
  width = NA,
  height = NA,
  dpi = NA,
  outer.margins = NA,
  asp = NULL,
  scale = NA,
  ...
)
```

Arguments

<code>tm</code>	tmap or a list of tmap objects. If <code>tm</code> is a tmap object, animation frames should be created using either <code>tm_animate()</code> or <code>tm_animate_fast()</code> .
<code>filename</code>	filename. If omitted (default), the animation will be shown in the viewer or browser. If specified, it should be a gif file or a video file (i.e. mp4). The package <code>gifski</code> is required to create a gif animation. The package <code>av</code> (which uses the FFmpeg library) is required for video formats. The mp4 format is recommended but many other video formats are supported, such as wmv, avi, and mkv.
<code>width, height</code>	Dimensions of the animation file (in pixels). Required when <code>tm</code> is a list, and recommended to specify in advance when <code>tm</code> is a tmap object. If not specified in the latter case, it will be determined by the aspect ratio of the map.
<code>dpi</code>	dots per inch. By default 100, but this can be set with the option <code>animation.dpi</code> in <code>tmap_options()</code> .
<code>outer.margins</code>	(passed on to <code>tmap_save()</code>) overrides the <code>outer.margins</code> argument of <code>tm_layout()</code> (unless set to NA)
<code>asp</code>	(passed on to <code>tmap_save()</code>) if specified, it overrides the <code>asp</code> argument of <code>tm_layout()</code> . Tip: set to 0 if map frame should be placed on the edges of the image.
<code>scale</code>	(passed on to <code>tmap_save()</code>) overrides the <code>scale</code> argument of <code>tm_layout()</code> (unless set to NA)
<code>...</code>	arguments passed on to <code>av::av_encode_video()</code>

Note

Not only tmap plots are supported, but any series of R plots.

Examples

```
if (interactive()) {
  m1 <- tm_shape(NLD_prov) +
    tm_polygons("yellow") +
    tm_animate(frames = "name")

  tmap_animation(m1, filename = "countries.gif")

  m2 <- tm_shape(metro) +
    tm_symbols(size = paste0("pop", seq(1950, 2030, by=10)),
              size.free = FALSE,
              size.legend = tm_legend("Population")) +
    tm_layout(panel.labels = seq(1970, 2030, by=10)) +
    tm_animate()

  tmap_animation(m2, filename = "cities.gif")
}
```

tmap_arrange

*Arrange small multiples in grid layout***Description**

Arrange small multiples in a grid layout. Normally, small multiples are created by specifying multiple variables for one map variable or by specifying the `by` argument (see `tm_facets()`). This function can be used to arrange custom small multiples in a grid layout.

Usage

```
tmap_arrange(
  ...,
  ncol = NA,
  nrow = NA,
  widths = NA,
  heights = NA,
  sync = FALSE,
  asp = 0,
  outer.margins = 0.02,
  height = NULL
)

## S3 method for class 'tmap_arrange'
knit_print(x, ..., options = NULL)

## S3 method for class 'tmap_arrange'
print(x, knit = FALSE, ..., options = NULL)
```

Arguments

<code>...</code>	<code>tmap</code> objects or one list of <code>tmap</code> objects. The number of multiples that can be plot is limited (see details).
<code>ncol</code>	number of columns
<code>nrow</code>	number of rows
<code>widths</code>	vector of column widths. It should add up to 1 and the length should be equal to <code>ncol</code> .
<code>heights</code>	vector of row heights. It should add up to 1 and the length should be equal to <code>nrow</code> .
<code>sync</code>	logical. Should the navigation in view mode (zooming and panning) be synchronized? By default FALSE.
<code>asp</code>	aspect ratio. The aspect ratio of each map. Normally, this is controlled by the <code>asp</code> argument from <code>tm_layout()</code> (also a <code>tmap</code> option). This argument will overwrite it, unless set to NULL. The default value for <code>asp</code> is 0, which means that the aspect ratio is adjusted to the size of the device divided by the number of

	columns and rows. When asp is set to NA, which is also the default value for <code>tm_layout()</code> , the aspect ratio will be adjusted to the used shapes.
<code>outer.margins</code>	<code>outer.margins</code> , numeric vector four or a single value. If defines the outer margins for each multiple. If will overwrite the <code>outer.margins</code> argument from <code>tm_layout()</code> , unless set to NULL.
<code>height</code>	height of the arranged output. Only used in the interactive modes ("view", "maplibre", "mapbox"). A bare number is interpreted as pixels; a string is used as-is (e.g. "80vh"). The default NULL fills the available viewport height.
<code>x</code>	a <code>tmap_arrange</code> object (returned from <code>tmap_arrange()</code>).
<code>options</code>	options passed on to <code>knitr::knit_print()</code>
<code>knit</code>	should <code>knitr::knit_print()</code> be enabled, or the normal <code>base::print()</code> function?

Details

The global option `tmap.limits` controls the limit of the number of facets that are plotted. By default, `tmap_options(tmap.limits = c(facets.view=4, facets.plot=64))`. The maximum number of interactive facets is set to four since otherwise it may become very slow.

Examples

```
tm1 = tm_shape(World) + tm_polygons("HPI")
tm2 = tm_shape(metro) + tm_bubbles(size = "pop2020")

tmap_arrange(tm1, tm2)
```

<code>tmap_design_mode</code>	<i>Toggle design overlay</i>
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Description

When the so-called "design mode" is enabled, the composition of the plot is shown explicitly in plot mode. The used color codings is printed in the console as well as information about plot size and aspect ratio.

Usage

```
tmap_design_mode(design.mode)
```

Arguments

<code>design.mode</code>	Logical value that determines the design mode. If omitted then the design mode is toggled.
--------------------------	--

Details

This function sets the global option `tmap.design.mode`. It can be used as toggle function without arguments.

See Also

[tmap_options\(\)](#)

tmap_devel_mode	<i>Toggle developer diagnostics</i>
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Description

When the so-called "development mode" is enabled, helpful messages and timings are printed in the console

Usage

```
tmap_devel_mode(devel.mode)
```

Arguments

devel.mode	logical value that determines the development mode. If omitted then the development mode is toggled.
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tmap_icons	<i>Specify icons</i>
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Description

Specifies icons from a png images, which can be used as markers in thematic maps. The function `marker_icon()` is the specification of the default marker.

Usage

```
tmap_icons(
  file,
  names = NULL,
  width = 48,
  height = 48,
  keep.asp = TRUE,
  just = c("center", "center"),
  merge = NA,
  as.local = TRUE,
  ...
)

marker_icon()
```

Arguments

file	character value/vector containing the file path(s) or url(s).
names	names to be given to the icons. Useful when icons are assigned to factor levels.
width	width of the icon. If keep.asp, this is interpreted as the maximum width.
height	height of the icon. If keep.asp, this is interpreted as the maximum height.
keep.asp	keep the aspect ratio of the png image. If TRUE and the aspect ratio differs from width/height, either width or height is adjusted accordingly.
just	justification of the icons relative to the point coordinates. The first value specifies horizontal and the second value vertical justification. Possible values are: "left" , "right", "center", "bottom", and "top". Numeric values of 0 specify left alignment and 1 right alignment. The default value of just is c("center", "center").
merge	merge icons to one icon list (see return value)? If FALSE, a list is created per file. By default TRUE, unless names are specified.
as.local	if the file is a url, should it be saved to local temporary file?
...	arguments passed on to leaflet::icons() . When iconWidth, iconHeight, iconAnchorX, and iconAnchorY are specified, they override width and height, and just.

Value

icon data (see [leaflet::icons\(\)](#))

See Also

[tm_symbols\(\)](#)

tmap_last

Retrieve the last map to be modified or created

Description

Retrieve the last map to be modified or created. Works in the same way as `ggplot2::last_plot()`, although there is a difference: `tmap_last()` returns the last call instead of the stacked [tmap-elements](#).

Usage

```
tmap_last()
```

Value

call

See Also

[tmap_save\(\)](#)

tmap_leaflet

Export tmap to the mode's native object

Description

- tmap_grob() returns a [grob](#) object ("plot" mode)
- tmap_leaflet() a [leaflet](#) object ("view" mode).

Usage

```
tmap_leaflet(x, show = FALSE, ...)
```

```
tmap_grob(x, asp = NA, scale = NA, show = FALSE, ...)
```

Arguments

x	a tmap object.
show	show the map?
...	Arguments passed on to print.tmap
	return.asp should the aspect ratio be returned?
	vp viewport (for "plot" mode)
	knit A logical, should knit?
	in.shiny A logical, is the map drawn in shiny ?
	proxy A logical, if in.shiny, is tmapProxy() used?
	options A vector of options
asp, scale	the desired aspect ratio and scale of the map. Only applicable for "plot" mode.

Value

- tmap_grob() returns a [grob](#) object ("plot" mode)
- tmap_leaflet() a [leaflet](#) object ("view" mode). In case small multiples are shown, a list is returned.

Examples

```
map = tm_shape(World) + tm_polygons()
tmap_leaflet(map, show = TRUE)
```

tmap_mode	<i>Get or set tmap mode</i>
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Description

- `tmap_mode()` gets (no argument) or sets the current mode.
- `ttm()` toggles between the two most recent modes.
- `ttmp()` same as `ttm()`, then calls `tmap_last()`.
- `rtm()` rotates through all modes in the pool.
- `rtpm()` same as `rtm()`, then calls `tmap_last()`.
- `tmap_mode_pool()` restricts which modes are cycled by `ttm()` and `rtm()`. Call without arguments to inspect the current pool, or pass `NULL` to reset.

It is recommended to use `tmap_mode()` in scripts and `ttm()/ttmp()` in the console.

Usage

```
tmap_mode(mode = NULL, silent = FALSE)

ttm()

rtm()

tmap_mode_pool(modes = NULL, silent = FALSE)

ttmp()

rtpm()
```

Arguments

<code>mode</code>	A string specifying the mode. See <code>tmap_options()</code> for available modes.
<code>silent</code>	Should the mode be switched silently? Default <code>FALSE</code> .
<code>modes</code>	Character vector of mode names (minimum 2), or <code>NULL</code> to reset.

Details

The default modes are "plot" (static, graphics device) and "view" (interactive, browser or RStudio Viewer). Additional modes such as "maplibre" and "mapbox" become available when **tmap.mapgl** is loaded.

Value

- `tmap_mode()` returns the current mode invisibly when called without argument, otherwise the previous mode.
- `ttm()`, `rtm()` return the previous mode invisibly.
- `tmap_mode_pool()` returns the previous pool invisibly.

References

Tennekes, M., 2018, tmap: Thematic Maps in R, Journal of Statistical Software, 84(6), 1-39, [doi:10.18637/jss.v084.i06](https://doi.org/10.18637/jss.v084.i06)

See Also

- `.doc_see_also_modes()`
- `tmap_last()` to show the last map
- `tm_view()` for viewing options
- `tmap_leaflet()` for obtaining a leaflet widget
- `tmap_options()` for tmap options

Examples

```
current.mode = tmap_mode()

tmap_mode("plot")

tm_shape(World) + tm_polygons("HPI")

tmap_mode("view")

tm_shape(World) + tm_polygons("HPI")

ttm()

tm_shape(World) + tm_polygons("HPI")

tmap_mode(current.mode)
```

tmap_options

Global tmap options

Description

Get or set the tmap options globally. For map specific options, we recommend to use `tm_options()` or `tm_layout()` via which the layout-related options can be set. `tmap_options()` functions similar to `base::options()`.

Usage

```
tmap_options(
  ...,
  crs,
  facet.max,
  facet_levels.max,
  free.scales,
```

```
raster.max_cells,  
raster.warp,  
show.messages,  
show.warnings,  
output.format,  
output.size,  
output.dpi,  
animation.dpi,  
value.const,  
value.na,  
value.null,  
value.blank,  
values.var,  
values.range,  
value.neutral,  
values.scale,  
scales.var,  
scale.misc.args,  
continuous.nclass_per_legend_break,  
continuous.nclasses,  
label.format,  
label.na,  
scale,  
asp,  
bg,  
bg.color,  
outer.bg,  
outer.bg.color,  
frame,  
frame.color,  
frame.alpha,  
frame.lwd,  
frame.r,  
frame.double_line,  
outer.margins,  
inner.margins,  
inner.margins.extra,  
meta.margins,  
meta.auto_margins,  
between_margin,  
panel.margin,  
xlab.show,  
xlab.text,  
xlab.size,  
xlab.color,  
xlab.rotation,  
xlab.space,  
xlab.fontface,
```

```
xlab.fontfamily,  
xlab.alpha,  
xlab.side,  
ylab.show,  
ylab.text,  
ylab.size,  
ylab.color,  
ylab.rotation,  
ylab.space,  
ylab.fontface,  
ylab.fontfamily,  
ylab.alpha,  
ylab.side,  
panel.type,  
panel.wrap.pos,  
panel.xtab.pos,  
unit,  
color.sepia_intensity,  
color.saturation,  
color_vision_deficiency_sim,  
text.fontface,  
text.fontfamily,  
r,  
component.position,  
component.offset,  
component.stack_margin,  
component.autoscale,  
component.resize_as_group,  
component.frame_combine,  
component.stack,  
legend.stack,  
chart.stack,  
component.equalize,  
component.frame,  
component.frame.color,  
component.frame.alpha,  
component.frame.lwd,  
component.frame.r,  
component.bg,  
component.bg.color,  
component.bg.alpha,  
legend.show,  
legend.orientation,  
legend.position,  
legend.width,  
legend.height,  
legend.reverse,  
legend.na.show,
```

```
legend.title.color,  
legend.title.size,  
legend.title.fontface,  
legend.title.fontfamily,  
legend.title.alpha,  
legend.xlab.color,  
legend.xlab.size,  
legend.xlab.rot,  
legend.xlab.fontface,  
legend.xlab.fontfamily,  
legend.xlab.alpha,  
legend.ylab.color,  
legend.ylab.size,  
legend.ylab.rot,  
legend.ylab.fontface,  
legend.ylab.fontfamily,  
legend.ylab.alpha,  
legend.text.color,  
legend.text.size,  
legend.text.fontface,  
legend.text.fontfamily,  
legend.text.alpha,  
legend.frame,  
legend.frame.color,  
legend.frame.alpha,  
legend.frame.lwd,  
legend.frame.r,  
legend.bg,  
legend.bg.color,  
legend.bg.alpha,  
legend.only,  
legend.absolute_fontsize,  
legend.settings.portrait,  
legend.settings.landscape,  
add_legend.position,  
chart.show,  
chart.plot.axis.x,  
chart.plot.axis.y,  
chart.position,  
chart.width,  
chart.height,  
chart.reverse,  
chart.na.show,  
chart.title.color,  
chart.title.size,  
chart.title.fontface,  
chart.title.fontfamily,  
chart.title.alpha,
```

```
chart.xlab.color,  
chart.xlab.size,  
chart.xlab.fontface,  
chart.xlab.fontfamily,  
chart.xlab.alpha,  
chart.ylab.color,  
chart.ylab.size,  
chart.ylab.fontface,  
chart.ylab.fontfamily,  
chart.ylab.alpha,  
chart.text.color,  
chart.text.size,  
chart.text.fontface,  
chart.text.fontfamily,  
chart.text.alpha,  
chart.frame,  
chart.frame.color,  
chart.frame.alpha,  
chart.frame.lwd,  
chart.frame.r,  
chart.bg,  
chart.bg.color,  
chart.bg.alpha,  
chart.object.color,  
title.size,  
title.color,  
title.fontface,  
title.fontfamily,  
title.alpha,  
title.padding,  
title.frame,  
title.frame.color,  
title.frame.alpha,  
title.frame.lwd,  
title.frame.r,  
title.position,  
title.width,  
credits.size,  
credits.color,  
credits.fontface,  
credits.fontfamily,  
credits.alpha,  
credits.padding,  
credits.position,  
credits.width,  
credits.height,  
compass.north,  
compass.type,
```

```
compass.text.size,  
compass.size,  
compass.show.labels,  
compass.cardinal.directions,  
compass.text.color,  
compass.color.dark,  
compass.color.light,  
compass.lwd,  
compass.margins,  
compass.position,  
inset.position,  
logo.height,  
logo.margins,  
logo.between_margin,  
logo.position,  
inset_map.height,  
inset_map.width,  
inset_map.margins,  
inset_map.between_margin,  
inset_map.position,  
inset_map.frame,  
inset.height,  
inset.width,  
inset.margins,  
inset.between_margin,  
inset.frame,  
inset.bg,  
inset.bg.color,  
inset.bg.alpha,  
inset_grob.height,  
inset_grob.width,  
inset_gg.height,  
inset_gg.width,  
scalebar.breaks,  
scalebar.width,  
scalebar.allow_clipping,  
scalebar.text.size,  
scalebar.text.color,  
scalebar.text.fontface,  
scalebar.text.fontfamily,  
scalebar.color.dark,  
scalebar.color.light,  
scalebar.lwd,  
scalebar.size,  
scalebar.margins,  
scalebar.position,  
grid.show,  
grid.labels.pos,
```

```
grid.x,  
grid.y,  
grid.n.x,  
grid.n.y,  
grid.crs,  
grid.col,  
grid.lwd,  
grid.alpha,  
grid.labels.show,  
grid.labels.size,  
grid.labels.col,  
grid.labels.fontface,  
grid.labels.fontfamily,  
grid.labels.rot,  
grid.labels.format,  
grid.labels.cardinal,  
grid.labels.margin.x,  
grid.labels.margin.y,  
grid.labels.space.x,  
grid.labels.space.y,  
grid.labels.inside_frame,  
grid.ticks,  
grid.lines,  
grid.ndiscr,  
mouse_coordinates.position,  
minimap.server,  
minimap.toggle,  
minimap.position,  
panel.show,  
panel.labels,  
panel.label.size,  
panel.label.color,  
panel.label.fontface,  
panel.label.fontfamily,  
panel.label.alpha,  
panel.label.bg,  
panel.label.bg.color,  
panel.label.bg.alpha,  
panel.label.frame,  
panel.label.frame.color,  
panel.label.frame.alpha,  
panel.label.frame.lwd,  
panel.label.frame.r,  
panel.label.height,  
panel.label.rot,  
qtm.scalebar,  
qtm.minimap,  
qtm.mouse_coordinates,
```

```

    earth_boundary,
    earth_boundary.color,
    earth_boundary.lwd,
    earth_datum,
    space,
    space.color,
    space_overlay,
    check_and_fix,
    basemap.show,
    basemap.server,
    basemap.alpha,
    basemap.zoom,
    tiles.show,
    tiles.server,
    tiles.alpha,
    tiles.zoom,
    attr.color,
    crs_extra,
    crs_global,
    crs_basemap,
    use_gradient,
    use_browser,
    use_WebGL,
    control.position,
    control.bases,
    control.overlays,
    control.collapse,
    set_bounds,
    set_view,
    set_zoom_limits,
    use_circle_markers,
    leaflet.options,
    title = NULL,
    main.title = NULL,
    main.title.size = NULL,
    main.title.color = NULL,
    main.title.fontface = NULL,
    main.title.fontfamily = NULL,
    main.title.position = NULL,
    fontface = NULL,
    fontfamily = NULL
  )

  tmap_options_mode(
    mode = NA,
    style = NULL,
    mode.specific = TRUE,
    default.options = FALSE
  )

```

```
)

tmap_options_diff()

tmap_options_reset()

tmap_options_save(style)
```

Arguments

...	List of tmap options to be set, or option names (characters) to be returned (see details)
crs	Map crs (see tm_shape()). NA means the crs is specified in tm_shape() . The crs that is used by the transformation functions is defined in tm_shape() .
facet.max	Maximum number of facets in a static plot (rows x columns); animation frames are not counted.
facet_levels.max	Maximum number of facet levels processed across all faceting dimensions, animation frames included (rows x columns x frames). Default 1e5.
free.scales	For backward compatibility: if this value is set, it will be used to impute the free arguments in the layer functions
raster.max_cells	Maximum number of raster grid cells. Can be mode specific <code>c(plot = 3000, view = 1000, 1000)</code> (the last value is the fall back default)
raster.warp	Should rasters be warped or transformed in case a different projection (crs) is used? Warping creates a new regular raster in the target crs, whereas transforming creates a (usually non-regular) raster in the target crs. The former is lossy, but much faster and is therefore the default. When a different projection (crs) is used, a (usually) regular raster will be
show.messages	Show messages?
show.warnings	Show warnings?
output.format	Output format
output.size	Output size
output.dpi	Output dpi
animation.dpi	Output dpi for animations
value.const	Default visual value constants e.g. the default fill color for <code>tm_shape(World) + tm_polygons()</code> . A list is required with per map variable a value.
value.na	Default visual values that are used to visualize NA data values. A list is required with per map variable a value.
value.null	Default visual values that are used to visualize null (out-of-scope) data values. A list is required with per map variable a value.
value.blank	Default visual values that correspond to blank. For color these are <code>"#00000000"</code> meaning transparent. A list is required with per map variable a value.

<code>values.var</code>	Default values when a data variable is mapped to a map variable, e.g. a color palette. A list is required with per map variable a value.
<code>values.range</code>	Default range for values. See <code>values.range</code> of tm_scale_categorical() . A list is required with per map variable a value.
<code>value.neutral</code>	Default values for when a data variable is mapped to a map variable, e.g. a color palette. A list is required with per map variable a value.
<code>values.scale</code>	Default scales (as in object sizes) for values. See <code>values.range</code> of tm_scale_categorical() . A list is required with per map variable a value.
<code>scales.var</code>	Default scale functions per map variable and type of data variable. A list is required with per map variable per data type.
<code>scale.misc.args</code>	Default values of scale function-specific arguments. A list is required with per scale function and optional per map variable.
<code>continuous.nclass_per_legend_break</code>	The number of continuous legend breaks within one 'unit' (label). The default value is 50.
<code>continuous.nclasses</code>	the number of classes of a continuous scale. Should be odd. The default value is 101.
<code>label.format</code>	Format for the labels. These are the default values for tm_label_format()
<code>label.na</code>	Default label for missing values.
<code>scale</code>	Overall scale of the map
<code>asp</code>	Aspect ratio of each map. When <code>asp</code> is set to NA (default) the aspect ratio will be adjusted to the used shapes. When set to 0 the aspect ratio is adjusted to the size of the device divided by the number of columns and rows.
<code>bg</code>	Draw map background?
<code>bg.color</code>	Background color of the map.
<code>outer.bg</code>	Draw map background (outside the frame)?
<code>outer.bg.color</code>	Background color of map outside the frame.
<code>frame</code>	Draw map frame?
<code>frame.color</code>	The color of the frame.
<code>frame.alpha</code>	The alpha transparency of the frame.
<code>frame.lwd</code>	The line width of the frame. See <code>graphics::par</code> , option 'lwd'.
<code>frame.r</code>	The r (radius) of the frame.
<code>frame.double_line</code>	The double line of the frame. TRUE or FALSE.
<code>outer.margins</code>	The margins of the outer space (outside the frame). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inner.margins</code>	The margins of the inner space (inside the frame). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).

<code>inner.margins.extra</code>	The extra arguments of the margins of the inner space (inside the frame). A list of arguments.
<code>meta.margins</code>	The margins of the 'meta' space (reserved for outside map components). A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>meta.auto_margins</code>	The <code>auto_margins</code> of the 'meta' space (reserved for outside map components).
<code>between_margin</code>	Margin between the map.
<code>panel.margin</code>	The margin of the panel.
<code>xlab.show</code>	The visibility of the xlab. TRUE or FALSE.
<code>xlab.text</code>	The text of the xlab.
<code>xlab.size</code>	The size of the xlab.
<code>xlab.color</code>	The color of the xlab.
<code>xlab.rotation</code>	The rotation of the xlab.
<code>xlab.space</code>	The space of the xlab. In terms of number of text line heights.
<code>xlab.fontface</code>	The font face of the xlab. See <code>graphics::par</code> , option 'font'.
<code>xlab.fontfamily</code>	The font family of the xlab. See <code>graphics::par</code> , option 'family'.
<code>xlab.alpha</code>	The alpha transparency of the xlab.
<code>xlab.side</code>	The side of the xlab.
<code>ylab.show</code>	The visibility of the ylab. TRUE or FALSE.
<code>ylab.text</code>	The text of the ylab.
<code>ylab.size</code>	The size of the ylab.
<code>ylab.color</code>	The color of the ylab.
<code>ylab.rotation</code>	The rotation of the ylab.
<code>ylab.space</code>	The space of the ylab. In terms of number of text line heights.
<code>ylab.fontface</code>	The font face of the ylab. See <code>graphics::par</code> , option 'font'.
<code>ylab.fontfamily</code>	The font family of the ylab. See <code>graphics::par</code> , option 'family'.
<code>ylab.alpha</code>	The alpha transparency of the ylab.
<code>ylab.side</code>	The side of the ylab.
<code>panel.type</code>	The type of the panel.
<code>panel.wrap.pos</code>	The panel positions for wrapped facets created with <code>tm_facets_grid()</code> . One of "left", "right", "top" (default) or "bottom".
<code>panel.xtab.pos</code>	The panel positions for grid facets created with <code>tm_facets_grid()</code> . Vector of two, where the first determines the locations of row panels ("left" or "right") and the second the location of column panels ("top" or "bottom").
<code>unit</code>	Unit of the coordinate
<code>color.sepia_intensity</code>	The <code>sepia_intensity</code> of the color.

<code>color.saturation</code>	The saturation of the color.
<code>color_vision_deficiency_sim</code>	Color vision deficiency simulation. Either "protan", "deutan", or "tritan".
<code>text.fontface</code>	The font face of the text. See <code>graphics::par</code> , option 'font'.
<code>text.fontfamily</code>	The font family of the text. See <code>graphics::par</code> , option 'family'.
<code>r</code>	The r (radius) (overall).
<code>component.position</code>	The position of the component. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>component.offset</code>	The offset of the component.
<code>component.stack_margin</code>	The <code>stack_margin</code> of the component.
<code>component.autoscale</code>	The autoscale of the component.
<code>component.resize_as_group</code>	The <code>resize_as_group</code> of the component.
<code>component.frame_combine</code>	The <code>frame_combine</code> of the component.
<code>component.stack</code>	The stack of the component.
<code>legend.stack</code>	The stack of the legend.
<code>chart.stack</code>	The stack of the chart.
<code>component.equalize</code>	The equalize of the component.
<code>component.frame</code>	The frame of the component.
<code>component.frame.color</code>	The color of the frame of the component.
<code>component.frame.alpha</code>	The alpha transparency of the frame of the component.
<code>component.frame.lwd</code>	The line width of the frame of the component. See <code>graphics::par</code> , option 'lwd'.
<code>component.frame.r</code>	The r (radius) of the frame of the component.
<code>component.bg</code>	The bg of the component.
<code>component.bg.color</code>	The color of the bg of the component.
<code>component.bg.alpha</code>	The alpha transparency of the bg of the component.

<code>legend.show</code>	The visibility of the legend. TRUE or FALSE.
<code>legend.orientation</code>	The orientation of the legend.
<code>legend.position</code>	The position of the legend. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>legend.width</code>	The width of the legend.
<code>legend.height</code>	The height of the legend.
<code>legend.reverse</code>	The reverse of the legend.
<code>legend.na.show</code>	The visibility of the na of the legend. TRUE or FALSE.
<code>legend.title.color</code>	The color of the title of the legend.
<code>legend.title.size</code>	The size of the title of the legend.
<code>legend.title.fontface</code>	The font face of the title of the legend. See <code>graphics::par</code> , option 'font'.
<code>legend.title.fontfamily</code>	The font family of the title of the legend. See <code>graphics::par</code> , option 'family'.
<code>legend.title.alpha</code>	The alpha transparency of the title of the legend.
<code>legend.xlab.color</code>	The color of the xlab of the legend.
<code>legend.xlab.size</code>	The size of the xlab of the legend.
<code>legend.xlab.rot</code>	The rot of the xlab of the legend.
<code>legend.xlab.fontface</code>	The font face of the xlab of the legend. See <code>graphics::par</code> , option 'font'.
<code>legend.xlab.fontfamily</code>	The font family of the xlab of the legend. See <code>graphics::par</code> , option 'family'.
<code>legend.xlab.alpha</code>	The alpha transparency of the xlab of the legend.
<code>legend.ylab.color</code>	The color of the ylab of the legend.
<code>legend.ylab.size</code>	The size of the ylab of the legend.
<code>legend.ylab.rot</code>	The rot of the ylab of the legend.
<code>legend.ylab.fontface</code>	The font face of the ylab of the legend. See <code>graphics::par</code> , option 'font'.
<code>legend.ylab.fontfamily</code>	The font family of the ylab of the legend. See <code>graphics::par</code> , option 'family'.

<code>legend.ylab.alpha</code>	The alpha transparency of the ylab of the legend.
<code>legend.text.color</code>	The color of the text of the legend.
<code>legend.text.size</code>	The size of the text of the legend.
<code>legend.text.fontface</code>	The font face of the text of the legend. See <code>graphics::par</code> , option 'font'.
<code>legend.text.fontfamily</code>	The font family of the text of the legend. See <code>graphics::par</code> , option 'family'.
<code>legend.text.alpha</code>	The alpha transparency of the text of the legend.
<code>legend.frame</code>	The frame of the legend.
<code>legend.frame.color</code>	The color of the frame of the legend.
<code>legend.frame.alpha</code>	The alpha transparency of the frame of the legend.
<code>legend.frame.lwd</code>	The line width of the frame of the legend. See <code>graphics::par</code> , option 'lwd'.
<code>legend.frame.r</code>	The r (radius) of the frame of the legend.
<code>legend.bg</code>	The bg of the legend.
<code>legend.bg.color</code>	The color of the bg of the legend.
<code>legend.bg.alpha</code>	The alpha transparency of the bg of the legend.
<code>legend.only</code>	Should only legends be printed (so without map)?
<code>legend.absolute_fontsize</code>	The absolute fontsize of the legend. So far, only used to calculate legend dimensions
<code>legend.settings.portrait</code>	The portrait of the settings of the legend.
<code>legend.settings.landscape</code>	The landscape of the settings of the legend.
<code>add_legend.position</code>	The position of the add_legend. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>chart.show</code>	The visibility of the chart. TRUE or FALSE.
<code>chart.plot.axis.x</code>	The x of the axis of the plot of the chart.
<code>chart.plot.axis.y</code>	The y of the axis of the plot of the chart.
<code>chart.position</code>	The position of the chart. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details

<code>chart.width</code>	The width of the chart.
<code>chart.height</code>	The height of the chart.
<code>chart.reverse</code>	The reverse of the chart.
<code>chart.na.show</code>	The visibility of the na of the chart. TRUE or FALSE.
<code>chart.title.color</code>	The color of the title of the chart.
<code>chart.title.size</code>	The size of the title of the chart.
<code>chart.title.fontface</code>	The font face of the title of the chart. See <code>graphics::par</code> , option 'font'.
<code>chart.title.fontfamily</code>	The font family of the title of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.title.alpha</code>	The alpha transparency of the title of the chart.
<code>chart.xlab.color</code>	The color of the xlab of the chart.
<code>chart.xlab.size</code>	The size of the xlab of the chart.
<code>chart.xlab.fontface</code>	The font face of the xlab of the chart. See <code>graphics::par</code> , option 'font'.
<code>chart.xlab.fontfamily</code>	The font family of the xlab of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.xlab.alpha</code>	The alpha transparency of the xlab of the chart.
<code>chart.ylab.color</code>	The color of the ylab of the chart.
<code>chart.ylab.size</code>	The size of the ylab of the chart.
<code>chart.ylab.fontface</code>	The font face of the ylab of the chart. See <code>graphics::par</code> , option 'font'.
<code>chart.ylab.fontfamily</code>	The font family of the ylab of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.ylab.alpha</code>	The alpha transparency of the ylab of the chart.
<code>chart.text.color</code>	The color of the text of the chart.
<code>chart.text.size</code>	The size of the text of the chart.
<code>chart.text.fontface</code>	The font face of the text of the chart. See <code>graphics::par</code> , option 'font'.
<code>chart.text.fontfamily</code>	The font family of the text of the chart. See <code>graphics::par</code> , option 'family'.
<code>chart.text.alpha</code>	The alpha transparency of the text of the chart.

<code>chart.frame</code>	The frame of the chart.
<code>chart.frame.color</code>	The color of the frame of the chart.
<code>chart.frame.alpha</code>	The alpha transparency of the frame of the chart.
<code>chart.frame.lwd</code>	The line width of the frame of the chart. See <code>graphics::par</code> , option 'lwd'.
<code>chart.frame.r</code>	The r (radius) of the frame of the chart.
<code>chart.bg</code>	The bg of the chart.
<code>chart.bg.color</code>	The color of the bg of the chart.
<code>chart.bg.alpha</code>	The alpha transparency of the bg of the chart.
<code>chart.object.color</code>	The color of the object of the chart.
<code>title.size</code>	The size of the title.
<code>title.color</code>	The color of the title.
<code>title.fontface</code>	The font face of the title. See <code>graphics::par</code> , option 'font'.
<code>title.fontfamily</code>	The font family of the title. See <code>graphics::par</code> , option 'family'.
<code>title.alpha</code>	The alpha transparency of the title.
<code>title.padding</code>	The padding of the title. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>title.frame</code>	The frame of the title.
<code>title.frame.color</code>	The color of the frame of the title.
<code>title.frame.alpha</code>	The alpha transparency of the frame of the title.
<code>title.frame.lwd</code>	The line width of the frame of the title. See <code>graphics::par</code> , option 'lwd'.
<code>title.frame.r</code>	The r (radius) of the frame of the title.
<code>title.position</code>	The position of the title. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>title.width</code>	The width of the title.
<code>credits.size</code>	The size of the credits.
<code>credits.color</code>	The color of the credits.
<code>credits.fontface</code>	The font face of the credits. See <code>graphics::par</code> , option 'font'.
<code>credits.fontfamily</code>	The font family of the credits. See <code>graphics::par</code> , option 'family'.
<code>credits.alpha</code>	The alpha transparency of the credits.
<code>credits.padding</code>	The padding of the credits. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).

<code>credits.position</code>	The position of the credits. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>credits.width</code>	The width of the credits.
<code>credits.height</code>	The height of the credits.
<code>compass.north</code>	The north of the compass.
<code>compass.type</code>	The type of the compass.
<code>compass.text.size</code>	The size of the text of the compass.
<code>compass.size</code>	The size of the compass.
<code>compass.show.labels</code>	The labels of the show of the compass.
<code>compass.cardinal.directions</code>	The directions of the cardinal of the compass.
<code>compass.text.color</code>	The color of the text of the compass.
<code>compass.color.dark</code>	The dark of the color of the compass.
<code>compass.color.light</code>	The light of the color of the compass.
<code>compass.lwd</code>	The line width of the compass. See <code>graphics::par</code> , option <code>'lwd'</code> .
<code>compass.margins</code>	The margins of the compass. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>compass.position</code>	The position of the compass. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>inset.position</code>	The position of the inset. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>logo.height</code>	The height of the logo.
<code>logo.margins</code>	The margins of the logo. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>logo.between_margin</code>	The <code>between_margin</code> of the logo.
<code>logo.position</code>	The position of the logo. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>inset_map.height</code>	The height of the <code>inset_map</code> .
<code>inset_map.width</code>	The width of the <code>inset_map</code> .

<code>inset_map.margins</code>	The margins of the <code>inset_map</code> . A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inset_map.between_margin</code>	The <code>between_margin</code> of the <code>inset_map</code> .
<code>inset_map.position</code>	The position of the <code>inset_map</code> . A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>inset_map.frame</code>	The frame of the <code>inset_map</code> .
<code>inset.height</code>	The height of the inset.
<code>inset.width</code>	The width of the inset.
<code>inset.margins</code>	The margins of the inset. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>inset.between_margin</code>	The <code>between_margin</code> of the inset.
<code>inset.frame</code>	The frame of the inset.
<code>inset.bg</code>	The bg of the inset.
<code>inset.bg.color</code>	The color of the bg of the inset.
<code>inset.bg.alpha</code>	The alpha transparency of the bg of the inset.
<code>inset_grob.height</code>	The height of the <code>inset_grob</code> .
<code>inset_grob.width</code>	The width of the <code>inset_grob</code> .
<code>inset_gg.height</code>	The height of the <code>inset_gg</code> .
<code>inset_gg.width</code>	The width of the <code>inset_gg</code> .
<code>scalebar.breaks</code>	See tm_scalebar()
<code>scalebar.width</code>	See tm_scalebar()
<code>scalebar.allow_clipping</code>	See tm_scalebar()
<code>scalebar.text.size</code>	The size of the text of the scalebar.
<code>scalebar.text.color</code>	The color of the text of the scalebar.
<code>scalebar.text.fontface</code>	The font face of the text of the scalebar. See <code>graphics::par</code> , option 'font'.
<code>scalebar.text.fontfamily</code>	The font family of the text of the scalebar. See <code>graphics::par</code> , option 'family'.
<code>scalebar.color.dark</code>	The dark of the color of the scalebar.

<code>scalebar.color.light</code>	The light of the color of the scalebar.
<code>scalebar.lwd</code>	The line width of the scalebar. See <code>graphics::par</code> , option 'lwd'.
<code>scalebar.size</code>	The size of the scalebar.
<code>scalebar.margins</code>	The margins of the scalebar. A vector of 4 values: bottom, left, top, right. The unit is the device height (for bottom and top) or width (for left and right).
<code>scalebar.position</code>	The position of the scalebar. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>grid.show</code>	The visibility of the grid. TRUE or FALSE.
<code>grid.labels.pos</code>	The pos of the labels of the grid.
<code>grid.x</code>	The x of the grid.
<code>grid.y</code>	The y of the grid.
<code>grid.n.x</code>	The x of the n of the grid.
<code>grid.n.y</code>	The y of the n of the grid.
<code>grid.crs</code>	The coordinate reference system (CRS) of the grid.
<code>grid.col</code>	The color of the grid.
<code>grid.lwd</code>	The line width of the grid. See <code>graphics::par</code> , option 'lwd'.
<code>grid.alpha</code>	The alpha transparency of the grid.
<code>grid.labels.show</code>	The visibility of the labels of the grid. TRUE or FALSE.
<code>grid.labels.size</code>	The size of the labels of the grid.
<code>grid.labels.col</code>	The color of the labels of the grid.
<code>grid.labels.fontface</code>	The font face of the labels of the grid. See <code>graphics::par</code> , option 'font'.
<code>grid.labels.fontfamily</code>	The font family of the labels of the grid. See <code>graphics::par</code> , option 'family'.
<code>grid.labels.rot</code>	The rot of the labels of the grid.
<code>grid.labels.format</code>	The format of the labels of the grid.
<code>grid.labels.cardinal</code>	The cardinal of the labels of the grid.
<code>grid.labels.margin.x</code>	The x of the margin of the labels of the grid.
<code>grid.labels.margin.y</code>	The y of the margin of the labels of the grid.

<code>grid.labels.space.x</code>	The x of the space of the labels of the grid.
<code>grid.labels.space.y</code>	The y of the space of the labels of the grid.
<code>grid.labels.inside_frame</code>	The <code>inside_frame</code> of the labels of the grid.
<code>grid.ticks</code>	The ticks of the grid.
<code>grid.lines</code>	The lines of the grid.
<code>grid.ndiscr</code>	The <code>ndiscr</code> of the grid.
<code>mouse_coordinates.position</code>	The position of the <code>mouse_coordinates</code> . A <code>tm_pos</code> object, or a shortcut of two values: <code>horizontal</code> (left, center, right) and <code>vertical</code> (top, center, bottom). See <code>tm_pos</code> for details
<code>minimap.server</code>	The server of the minimap.
<code>minimap.toggle</code>	The toggle of the minimap.
<code>minimap.position</code>	The position of the minimap. A <code>tm_pos</code> object, or a shortcut of two values: <code>horizontal</code> (left, center, right) and <code>vertical</code> (top, center, bottom). See <code>tm_pos</code> for details
<code>panel.show</code>	The visibility of the panel. TRUE or FALSE.
<code>panel.labels</code>	The labels of the panel.
<code>panel.label.size</code>	The size of the label of the panel.
<code>panel.label.color</code>	The color of the label of the panel.
<code>panel.label.fontface</code>	The font face of the label of the panel. See <code>graphics::par</code> , option 'font'.
<code>panel.label.fontfamily</code>	The font family of the label of the panel. See <code>graphics::par</code> , option 'family'.
<code>panel.label.alpha</code>	The alpha transparency of the label of the panel.
<code>panel.label.bg</code>	The bg of the label of the panel.
<code>panel.label.bg.color</code>	The color of the bg of the label of the panel.
<code>panel.label.bg.alpha</code>	The alpha transparency of the bg of the label of the panel.
<code>panel.label.frame</code>	The frame of the label of the panel.
<code>panel.label.frame.color</code>	The color of the frame of the label of the panel.
<code>panel.label.frame.alpha</code>	The alpha transparency of the frame of the label of the panel.

<code>panel.label.frame.lwd</code>	The line width of the frame of the label of the panel. See <code>graphics::par</code> , option <code>'lwd'</code> .
<code>panel.label.frame.r</code>	The <code>r</code> (radius) of the frame of the label of the panel.
<code>panel.label.height</code>	The height of the label of the panel.
<code>panel.label.rot</code>	Rotation angles of the panel labels. Vector of four values that determine the panel label rotation when they are placed left, top, right, and bottom. The default angles are 90, 0, 270 and 0 respectively. Note that the second value is the most common, since labels are by default shown on top (see <code>panel.wrap.pos</code>). In cross-table facets created with <code>tm_facets_grid()</code> , the first two values are used by default (see <code>panel.xtab.pos</code>).
<code>qtm.scalebar</code>	The scalebar of the qtm.
<code>qtm.minimap</code>	The minimap of the qtm.
<code>qtm.mouse_coordinates</code>	The <code>mouse_coordinates</code> of the qtm.
<code>earth_boundary</code>	The earth boundary
<code>earth_boundary.color</code>	The color of the <code>earth_boundary</code> .
<code>earth_boundary.lwd</code>	The line width of the <code>earth_boundary</code> . See <code>graphics::par</code> , option <code>'lwd'</code> .
<code>earth_datum</code>	Earth datum
<code>space</code>	Should the space be drawn? Only applicable is <code>earth_boundary</code> is enabled.
<code>space.color</code>	The color of the space.
<code>space_overlay</code>	Should the space be drawn as overlay (to make sure spatial features or rasters do not exceed the earth boundary), or as background? By default TRUE when a raster is warped.
<code>check_and_fix</code>	Should attempt to fix an invalid shapefile
<code>basemap.show</code>	The visibility of the basemap. TRUE or FALSE.
<code>basemap.server</code>	The server of the basemap.
<code>basemap.alpha</code>	The alpha transparency of the basemap.
<code>basemap.zoom</code>	The zoom of the basemap.
<code>tiles.show</code>	The visibility of the tiles. TRUE or FALSE.
<code>tiles.server</code>	The server of the tiles.
<code>tiles.alpha</code>	The alpha transparency of the tiles.
<code>tiles.zoom</code>	The zoom of the tiles.
<code>attr.color</code>	The color of the attr.
<code>crs_extra</code>	Only used internally (work in progress)
<code>crs_global</code>	The used crs for world maps

<code>crs_basemap</code>	The <code>crs_basemap</code> (overall).
<code>use_gradient</code>	Use gradient fill using linearGradient()
<code>use_browser</code>	If TRUE it opens an external browser, and FALSE (default) it opens the internal IDEs (e.g. RStudio) browser.
<code>use_WebGL</code>	use webGL for points, lines, and polygons. For large spatial objects, this is much faster than the standard leaflet layer functions. However, it can not always be used for two reasons. First, the number of map variables are limited; only fill, size, and color (for lines) are supported. Second, projected CRS's are not supported. Furthermore, it has the drawback that polygon borders are not as sharp. By default only TRUE for large spatial objects (1000 or more features) when the mentioned criteria are met. By default TRUE if no other map variables are used.
<code>control.position</code>	The position of the control. A <code>tm_pos</code> object, or a shortcut of two values: horizontal (left, center, right) and vertical (top, center, bottom). See <code>tm_pos</code> for details
<code>control.bases</code>	base layers
<code>control.overlays</code>	overlay layers
<code>control.collapse</code>	Should the box be collapsed or expanded?
<code>set_bounds</code>	logical that determines whether maximum bounds are set, or a bounding box. Not applicable in plot mode. In view mode, this is passed on to setMaxBounds()
<code>set_view</code>	numeric vector that determines the view. Either a vector of three: lng, lat, and zoom, or a single value: zoom. See setView() . Only applicable if <code>bbox</code> is not specified
<code>set_zoom_limits</code>	numeric vector of two that set the minimum and maximum zoom levels (see tileOptions()).
<code>use_circle_markers</code>	If TRUE (default) circle shaped symbols (e.g. <code>tm_dots()</code> and <code>tm_symbols()</code>) will be rendered as addCircleMarkers() instead of addMarkers() . The former is faster, the latter can support any symbol since it is based on icons
<code>leaflet.options</code>	options passed on to leafletOptions()
<code>title</code>	deprecated See tm_title()
<code>main.title</code>	deprecated See tm_title()
<code>main.title.size</code> , <code>main.title.color</code> , <code>main.title.fontface</code> , <code>main.title.fontfamily</code> , <code>main.title.position</code>	deprecated. Use the <code>title</code> . options instead.
<code>fontface</code> , <code>fontfamily</code>	renamed to <code>text.fontface</code> and <code>text.fontfamily</code>
<code>mode</code>	mode, e.g. "plot" or "view"
<code>style</code>	style, see tmap_style() for available styles

mode.specific Should only mode-specific options be returned? TRUE by default.

default.options return the default options or the current options?

Examples

```
# get all options
opt = tmap_options()

# print as a tree
if (requireNamespace("lobstr")) {
  lobstr::tree(opt)
}

# a fancy set of options:
tmap_options(
  bg.color = "steelblue",
  outer.bg.color = "salmon",
  frame.color = "purple3",
  frame.lwd = 5,
  compass.type = "8star",
  legend.bg.color = "gold",
  legend.position = tm_pos_in(pos.h = "left", pos.v = "top")
)

if (requireNamespace("lobstr")) {
  lobstr::tree(
    tmap_options_diff()
  )
}

tm_shape(World) +
  tm_polygons("footprint")

tmap_options_save("fancy")

# the default style:
tmap_style("white")

tm_shape(World) +
  tm_polygons("footprint")

tmap_style("fancy")

tm_shape(World) +
  tm_polygons("footprint")

# reset all options
tmap_options_reset()
```

tmap_overview	<i>Overview of tmap layers</i>
---------------	--------------------------------

Description

Overview of tmap layers, organized by layer type.

Usage

```
tmap_overview()
```

Value

A list of three layer types are returned: data layers, aux layers, and components.

tmap_save	<i>Save tmap to file</i>
-----------	--------------------------

Description

Save tmap to a file. This can be either a static plot (e.g. png) or an interactive map (html).

Usage

```
tmap_save(
  tm = NULL,
  filename = NA,
  device = NULL,
  width = NA,
  height = NA,
  units = NA,
  dpi = NA,
  outer.margins = NA,
  asp = NULL,
  scale = NA,
  insets_tm = NULL,
  insets_vp = NULL,
  add.titles = TRUE,
  in.iframe = FALSE,
  selfcontained = !in.iframe,
  verbose = NULL,
  ...
)
```

Arguments

tm	tmap object
filename	filename including extension, and optionally the path. The extensions pdf, eps, svg, wmf (Windows only), png, jpg, bmp, tiff, and html are supported. If the extension is missing, the file will be saved as a static plot in "plot" mode and as an interactive map (html) in another mode. The default format for static plots is png, but this can be changed using the option "output.format" in tmap_options() . If NA (the default), the file is saved as "tmap01" in the default format, and the number incremented if the file already exists.
device	graphic device to use. Either a device function (e.g., png or cairo_pdf) or a text indicating selected graphic device: "pdf", "eps", "svg", "wmf" (Windows only), "png", "jpg", "bmp", "tiff". If NULL, the graphic device is guessed based on the filename argument.
height,width	The dimensions of the plot (not applicable for html files). Units are set with the argument units. If one of them is not specified, this is calculated using the formula $asp = width / height$, where asp is the estimated aspect ratio of the map. If both are missing, they are set such that $width * height$ is equal to the option "output.size" in tmap_options() . This is by default 49, meaning that is the map is a square (so aspect ratio of 1) both width and height are set to 7.
units	units for width and height ("in", "cm", or "mm"). By default, pixels ("px") are used if either width or height is set to a value greater than 50. Else, the units are inches ("in").
dpi	dots per inch. Only applicable for raster graphics. By default it is set to 300, but this can be changed using the option "output.dpi" in tmap_options() .
outer.margins	overrides the outer.margins argument of tm_options() (unless set to NA)
asp	if specified, it overrides the asp argument of tm_options() . Tip: set to 0 if map frame should be placed on the edges of the image.
scale	overrides the scale argument of tm_options() (unless set to NA)
insets_tm	tmap object of an inset map, or a list of tmap objects of multiple inset maps. The number of tmap objects should be equal to the number of viewports specified with insets_vp.
insets_vp	viewport of an inset map, or a list of viewports of multiple inset maps. The number of viewports should be equal to the number of tmap objects specified with insets_tm.
add.titles	add titles to leaflet object.
in.iframe	should an interactive map be saved as an iframe? If so, two HTML files will be saved; one small parent HTML file with the iframe container, and one large child HTML file with the actual widget. See widgetframe::saveWidgetframe() for details. By default FALSE, which means that one large HTML file is saved (see saveWidget()).
selfcontained	when an interactive map is saved, should the resources (e.g. JavaScript libraries) be contained in the HTML file? If FALSE, they are placed in an adjacent directory (see also htmlwidgets::saveWidget()). Note that the HTML file will often still be large when selfcontained = FALSE, since the map data (polygons and

popups), which are also contained in the HTML file, usually take more space than the map resources.

verbose Deprecated. It is now controlled by the tmap option `show.messages` (see `tmap_options()`)

... additional arguments passed on to the underlying output function (see Details). For interactive (html) maps these are passed to `htmlwidgets::saveWidget()` or `widgetframe::saveWidgetframe()`. For static maps they are passed to the graphic device; the most useful are:

colormodel (pdf, eps) Color model of the output. The default is "srgb"; use `colormodel = "cmyk"` for print workflows that require CMYK. See `grDevices::pdf()`.

compression (tiff) Compression method, e.g. "lzw", "zip", or "jpeg". The default "none" can produce very large files; the lossless "lzw" or "zip" is usually a good choice for publication.

quality (jpg) JPEG quality, from 0 to 100 (default 75).

bg (all) Background color. Use `bg = "transparent"` for a transparent background (png, tiff, and svg support transparency; jpg and bmp do not).

pointsize (all) Default point size of text, which scales the text drawn by the device.

family (pdf, eps, svg), fonts (pdf, eps) Font family, and fonts to embed in the file.

antialias (png, jpg, bmp, tiff) Type of anti-aliasing, e.g. "default", "none", "gray", or "subpixel". This only applies to cairo-type devices. png always uses cairo (`type = "cairo-png"`), but jpg, bmp, and tiff use the platform default device type, so on a build without cairo support `antialias` is ignored for those formats.

Details

Extra arguments (...) are passed on to the function that writes the output. For interactive (html) maps this is `htmlwidgets::saveWidget()`, or `widgetframe::saveWidgetframe()` when `in.iframe = TRUE`. For static maps it is the graphic device: the function supplied to device, or, when `device = NULL`, the default device for the file extension: `grDevices::pdf()` ("pdf"), `grDevices::postscript()` ("eps"), `grDevices::svg()` ("svg"), `grDevices::png()` ("png"), `grDevices::jpeg()` ("jpg"/"jpeg"), `grDevices::bmp()` ("bmp"), and `grDevices::tiff()` ("tiff"). The most useful device arguments are listed under ...

Note that `filename`, `width`, and `height` are always set by `tmap_save`, as are `res` and `units` for the raster formats (png, jpg, bmp, tiff); these cannot be overridden through ... Use the `dpi`, `width`, `height`, and `units` arguments of `tmap_save` instead.

Value

the filename, invisibly, if export is successful.

Examples

```
## Not run:
data(NLD_muni, NLD_prov)
m <- tm_shape(NLD_muni) +
```

```

    tm_fill(col="population", convert2density=TRUE,
            style="kmeans",
            title=expression("Population (per " * km^2 * ")")) +
    tm_borders("black", alpha=.5) +
tm_shape(NLD_prov) +
    tm_borders("grey25", lwd=2) +
tm_style("classic") +
tm_format("NLD", inner.margins = c(.02, .15, .06, .15)) +
    tm_scalebar(position = c("left", "bottom")) +
    tm_compass(position=c("right", "bottom"))

tmap_save(m, "choropleth.png", height = 7) # height interpreted in inches
tmap_save(m, "choropleth_icon.png", height = 100, scale = .1) # height interpreted in pixels

data(World)
m2 <- tm_shape(World) +
  tm_fill("well_being", id="name", title="Well-being") +
  tm_format("World")

# save image
tmap_save(m2, "World_map.png", width=1920, height=1080, asp=0)

# cut left inner margin to make sure Antarctica is snapped to frame
tmap_save(m2 + tm_layout(inner.margins = c(0, -.1, 0.05, 0.01)),
          "World_map2.png", width=1920, height=1080, asp=0)

# save interactive plot
tmap_save(m2, "World_map.html")

## End(Not run)

```

tmap_style

Set or get the default tmap style

Description

Set or get the default tmap style. Without arguments, the current style is returned. Also the available styles are displayed. When a style is set, the corresponding tmap options (see [tmap_options\(\)](#)) will be set accordingly. The default style (i.e. when loading the package) is "white".

Usage

```
tmap_style(style)
```

Arguments

style	Name of the style. When omitted, <code>tmap_style()</code> returns the current style and also shows all available styles. When the style is specified, <code>tmap_style()</code> sets the style accordingly. Note that in that case, all tmap options (see tmap_options()) will be reset according to the style definition. See tm_layout() for predefined styles, and <code>tmap_style_catalogue()</code> for creating a catalogue.
-------	---

Details

Note that `tm_style()` is used within a plot call (so it only affects that plot), whereas `tmap_style()` sets the style globally.

After loading a style, the options that defined this style (i.e. the difference with the default "white" style) can be obtained by `tmap_options_diff()`.

The documentation of `tmap_options()` (details and the examples) shows how to create a new style.

Value

The style before changing

See Also

- `tmap_options()` for tmap options
- `tmap_style_catalogue()` to create a style catalogue of all available styles.

Examples

```
tmap_style()

tm_shape(World) + tm_polygons("HPI")

tmap_style("cobalt")

tm_shape(World) + tm_polygons("HPI")

# for backwards compatibility, the styles of tmap versions 1-3 are also included:

tmap_style("v3")

tm_shape(World) + tm_polygons("HPI")

tmap_style("cobalt_v3")

tm_shape(World) + tm_polygons("HPI")
```

`tmap_style_catalogue` *Create a style catalog*

Description

Create a style catalog for each predefined tmap style. The result is a set of png images, one for each style.

Usage

```
tmap_style_catalogue(path = "./tmap_style_previews", styles = NA)

tmap_style_catalog(path = "./tmap_style_previews", styles = NA)
```

Arguments

path	path where the png images are stored
styles	vector of styles function names (see tmap_style()) for which a preview is generated. By default, a preview is generated for all loaded styles.

tmap_tip	<i>Print a random tip to the console</i>
----------	--

Description

Print a random tip to the console

Usage

tmap_tip()

Value

A message

World	<i>Spatial data of the world</i>
-------	----------------------------------

Description

World dataset, class [sf](#)

Usage

World

Details

Variable	Source	Description
iso_a3	NED	ISO 3166-1 alpha-3 three-letter country code (see below)
name	NED	Country name
sovereight	NED	Sovereight country name
continent	NED	Continent (primary; some countries are transcontinental)
area	NED	Area in km2
pop_est	NED	Population estimation
pop_est_dens	NED	Population estimation per km2
economy	NED	Economy class
income_grp	NED	Income group
gdp_cap_est	NED	GDP per capita (estimated)

life_exp	HPI	Life expectancy. The average number of years an infant born in that country is expected to
well_being	HPI	Well being. Self-reported from 0 (worst) to 10 (best)
footprint	HPI	Carbon footprint. Per capita greendwelling gas emissions associated with consumption and
HPI	HPI	Happy Planet Indicator. An index of human well-being and environmental impact that was
inequality	WB	Income inequality: Gini coefficient (World Bank variable SI.POV.GINI) A value of 0 repres
gender	UNDP/OWiD	Gender Inequality Index (GII) Composite metric using reproductive health, empowerment a
press	RSF	World Press Freedom Index. Degree of freedom that journalists, news organizations and ne

See sources for more detailed information about the variables.

This dataset, created Noveber 2024, is an update from the old version, which has been created around 2016. All variables from the old version are included, but updated. Furthermore, gender ineuqlity and press freedom have been added.

ISO country-code: two countries have user-assigned codes, namely: XKX is used for Kosovo (conform European Union and World Bank) (was UNK in the old version); XNC is used for Northern Cyprus (was CYN in the old version).

For some variables data were available from multiple years, but availability was different across countries. In those cases, the most recent values were taken.

Source

NED: Natural Earth Data <https://www.naturalearthdata.com/>

HPI: Happy Planet Index <https://happyplanetindex.org/>

UNDP: Human Development Report (2024) <https://hdr.undp.org/content/human-development-report-2023-24>

WB: World Bank <https://data.worldbank.org>

OWiD: Our World in Data <https://ourworldindata.org>

RSF: Reporters Without Borders <https://rsf.org/en/index>

World_rivers	<i>Spatial data of rivers</i>
--------------	-------------------------------

Description

Spatial data of rivers

Usage

World_rivers

Format

An object of class sf (inherits from data.frame) with 1632 rows and 5 columns.

Note

In tmap ≤ 3 , this dataset was called rivers.

Source

<https://www.naturalearthdata.com>

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