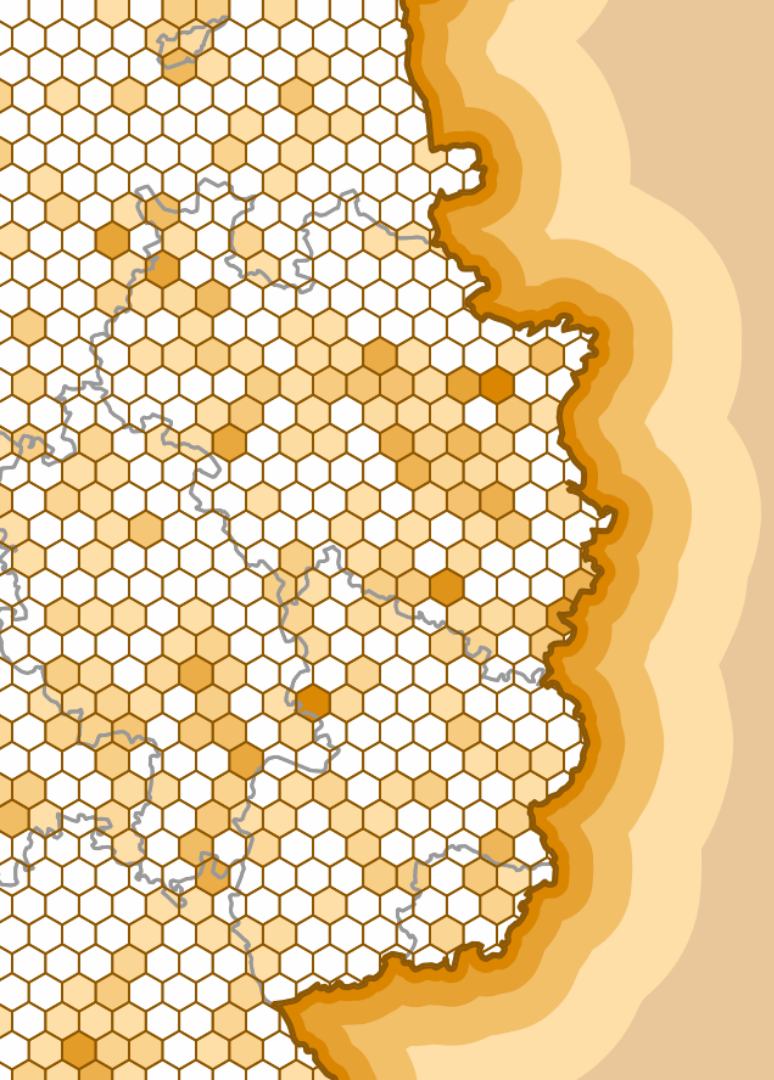


#30DAYMAPCHALLENGE

THE GOOD, THE BAD AND THE UGLY OF CRAFTING MAPS WITH GGPLOT2

Dr. Cédric Scherer

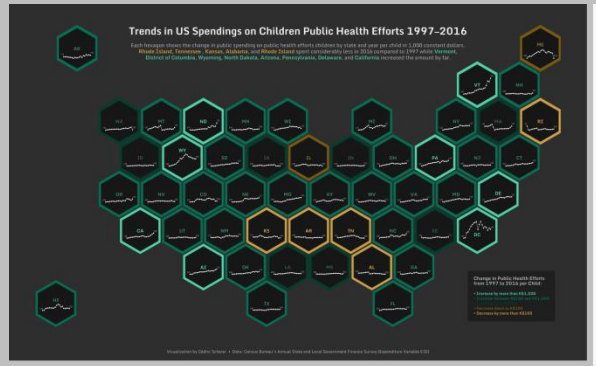
RLadies Bangalore • December 16, 2021

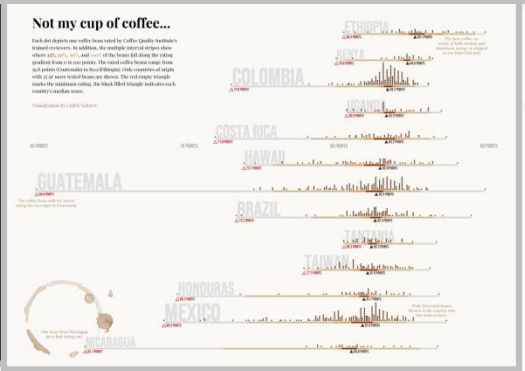
CÉDRIC SCHERER

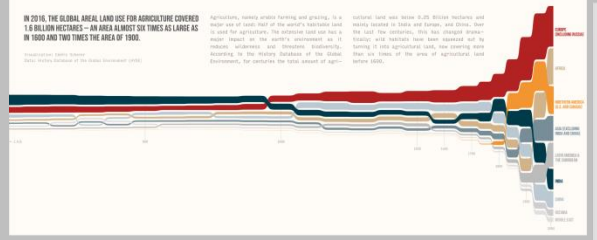
Independent Data Visualization Specialist
Computational Ecologist at IZW Berlin

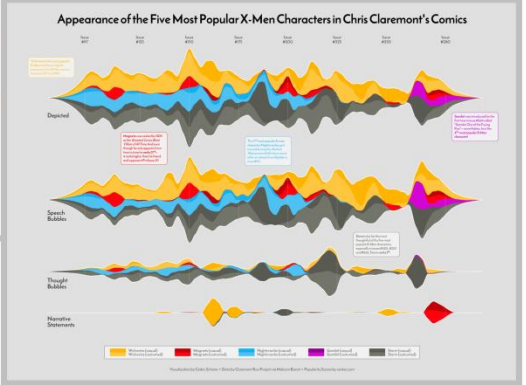
Consulting **Coaching** **Coding**

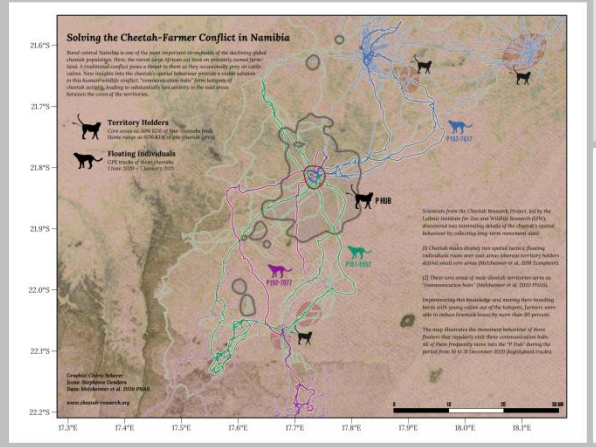
cedricscherer.com @CedScherer @z3tt @cedscherer

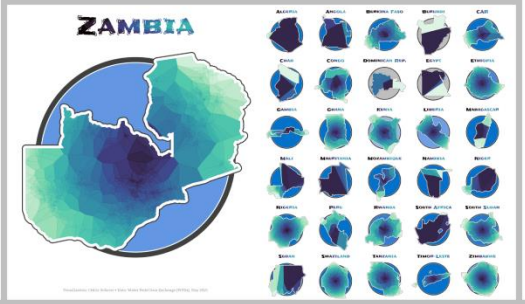










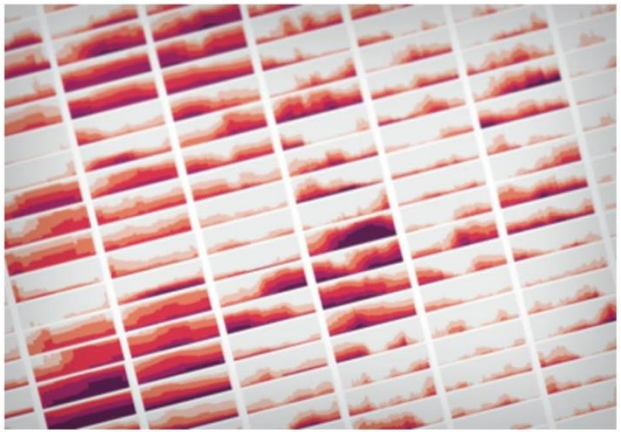


CLIMATE CHANGE

Climate Change Drives Escalating Drought

The past two decades have seen some of the most extreme dry periods in U.S. history

By Clara Moskowitz, Cédric Scherer, Georgios Karamanis | Scientific American November 2021 Issue



Credit: Cédric Scherer and Georgios Karamanis

#30DayMapChallenge

1. Points
2. Lines
3. Polygons
4. Hexagons(!)
5. Raster
6. Blue
7. Red
8. Green
9. Yellow
10. Black and white
11. Elevation
12. Movement
13. Tracks
14. Boundaries
15. Names
16. Places
17. Zones
18. Globe
19. Urban
20. Rural
21. Environment
22. Built environment
23. Population
24. Statistics
25. Climate
26. Hydrology
27. Resources
28. Funny
29. Experimental
30. Home

#30DayMapChallenge

Official categories for November 2021

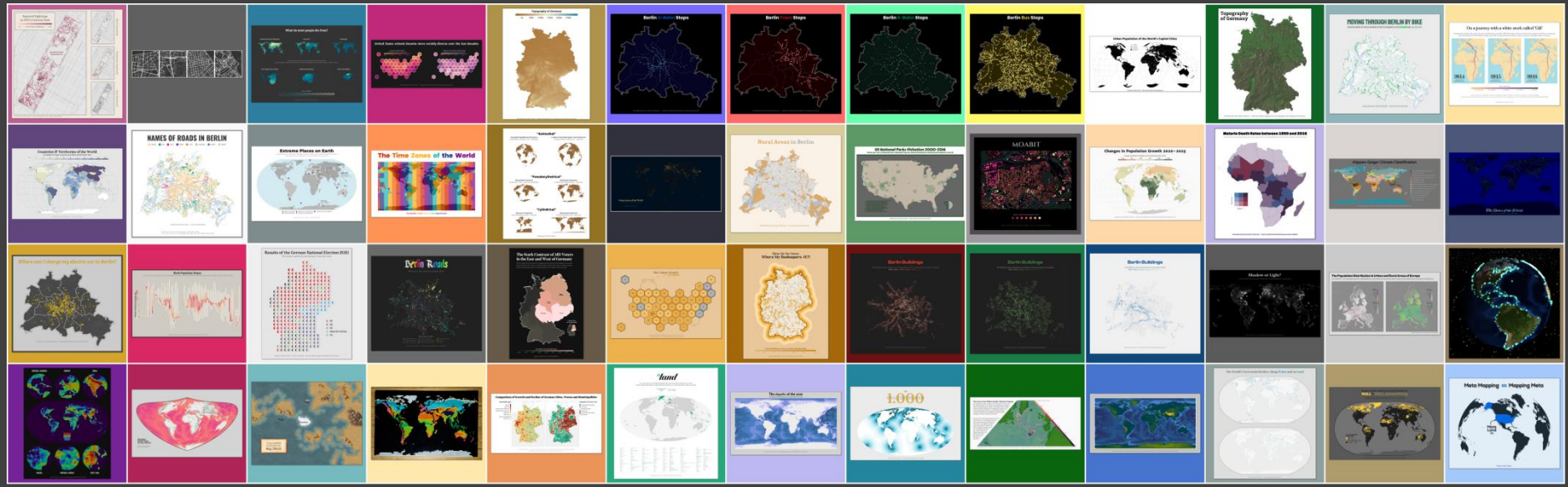
1	Points	16	Urban/rural
2	Lines	17	Land
3	Polygons	18	Water
4	Hexagons	19	Island(s)
5	Data challenge 1: OpenStreetMap	20	Movement
6	Red	21	Elevation
7	Green	22	Boundaries
8	Blue	23	Data challenge 3: GHSL
9	Monochrome	24	Historical map
10	Raster	25	Interactive map
11	3D	26	Choropleth map
12	Population	27	Heatmap
13	Data challenge 2: Natural Earth	28	The Earth is not flat
14	Map with a new tool	29	*NULL*
15	Map made without using a computer	30	Metamapping day

Create a map with the daily themes in November and post to social media using hashtag #30DayMapChallenge

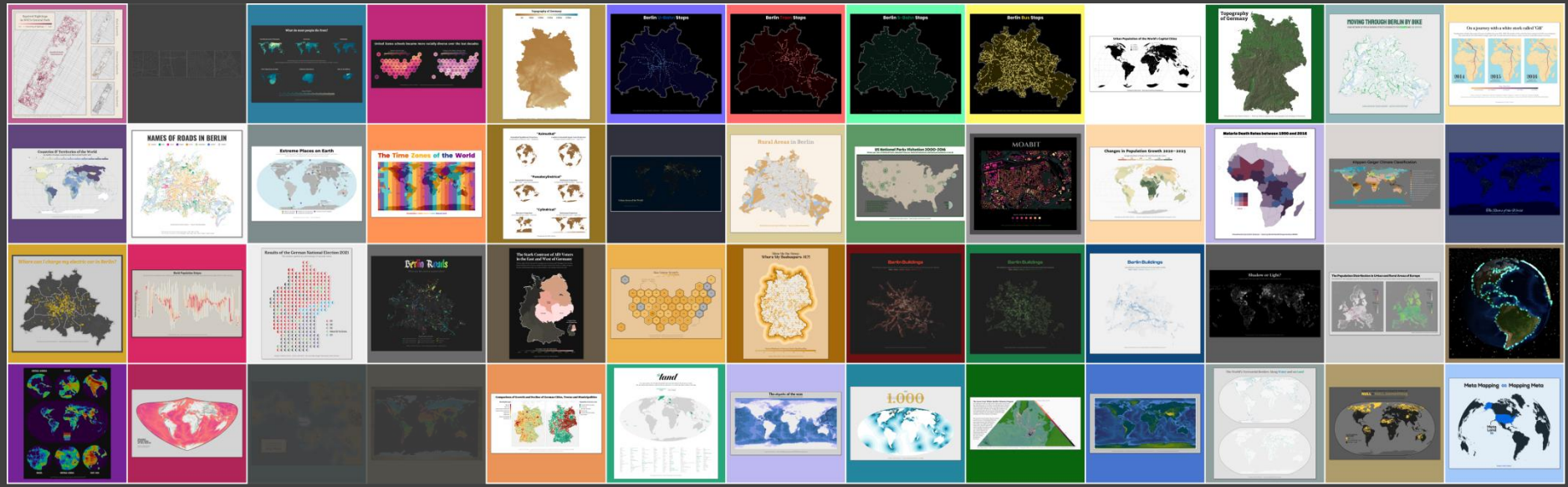
More information on GitHub: https://github.com/tjukanovt/30DayMapChallenge

@tjukanov

52 Contributions

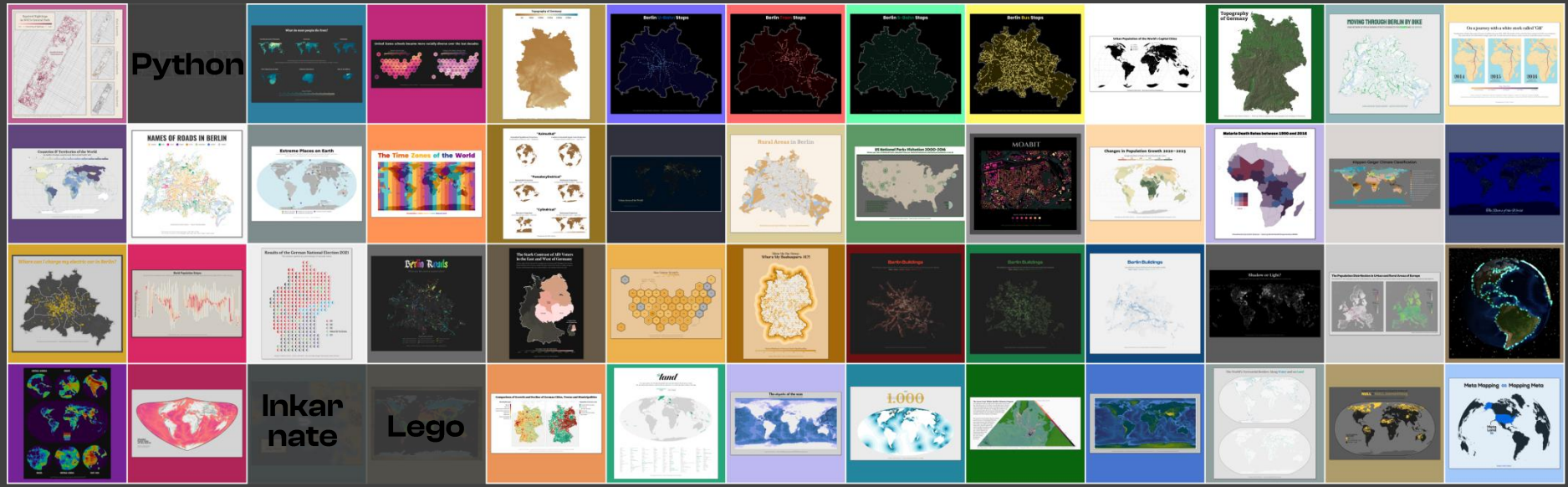


52 Contributions



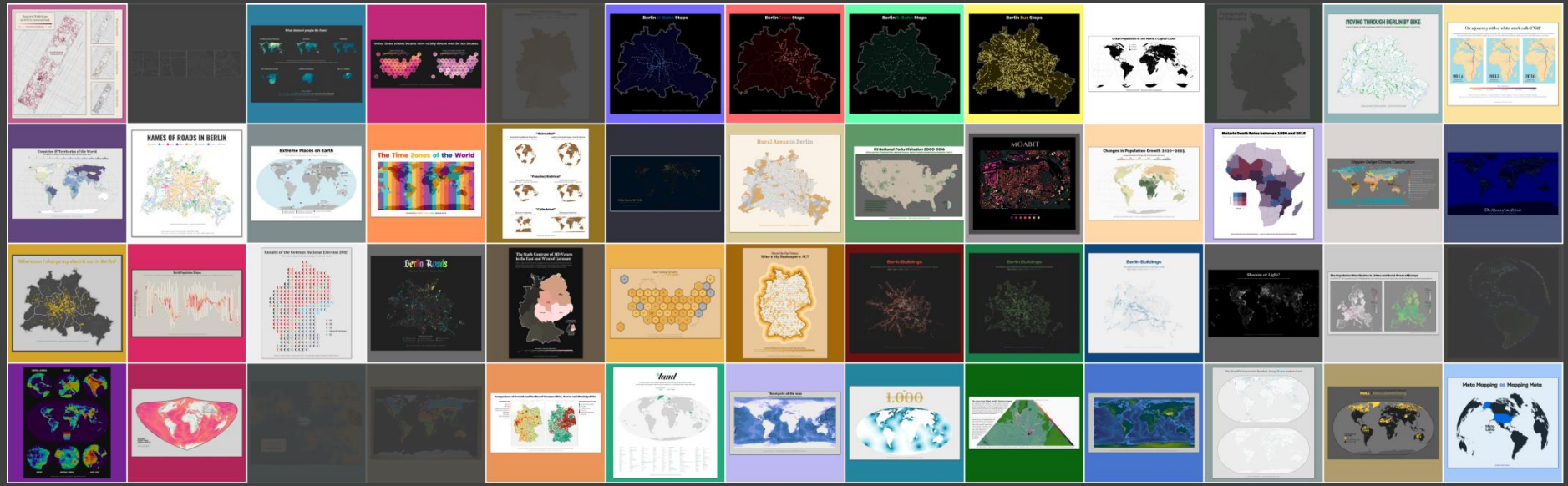
49 crafted in R

52 Contributions



49 crafted in R

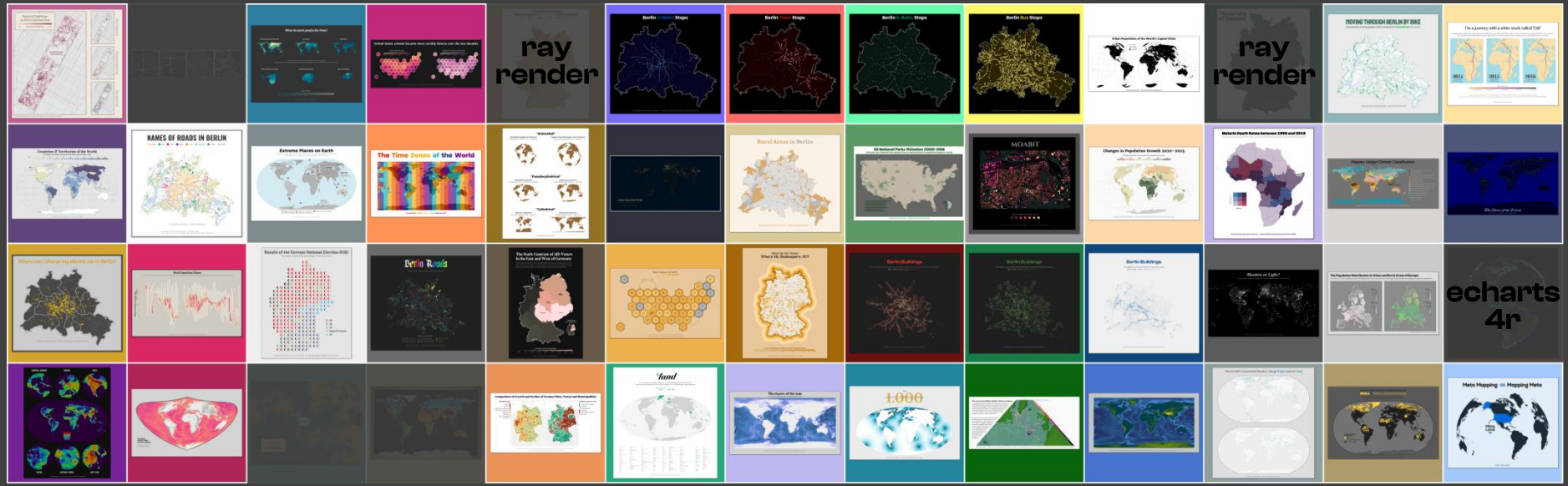
52 Contributions



49 crafted in R

46 crafted with the help of ggplot2

52 Contributions



49 crafted in R

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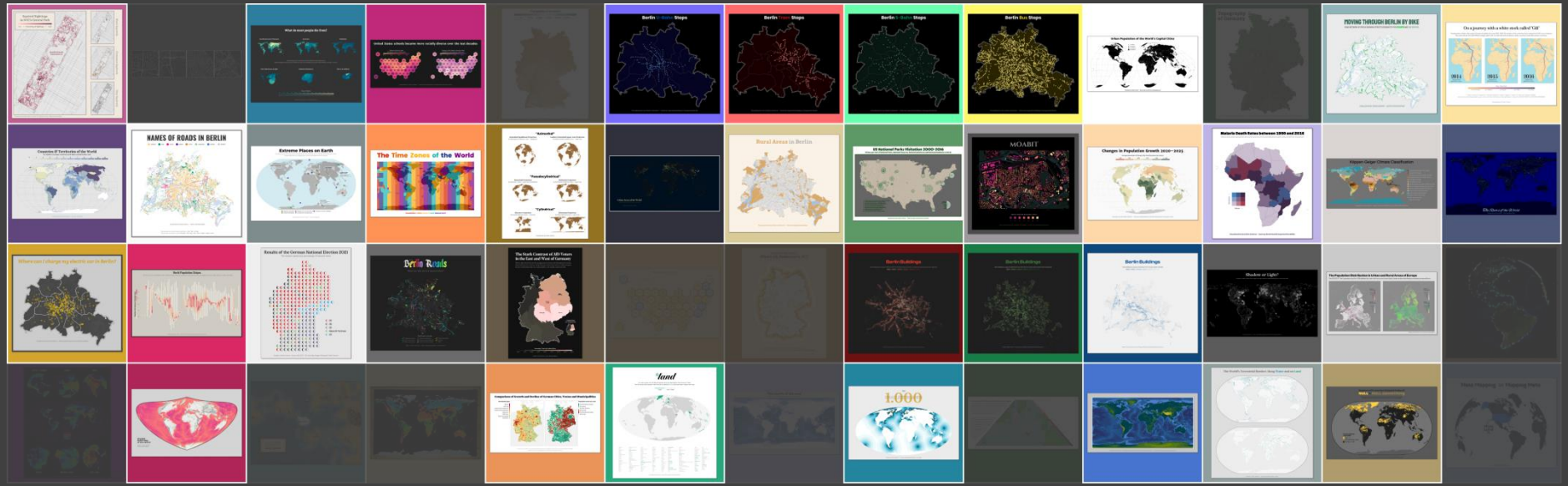
52 Contributions



49 crafted in R

46 crafted with the help of ggplot2

40 crafted with ggplot2 w/o post-processing

52 Contributions

49 crafted in R

46 crafted with the help of ggplot2

40 crafted with ggplot2 w/o post-processing

52 Contributions

28 in 2019

24 in 2021

49 crafted in R

46 crafted with the help of ggplot2

40 crafted with ggplot2 w/o post-processing

IDEAS

DATA

TRICKS

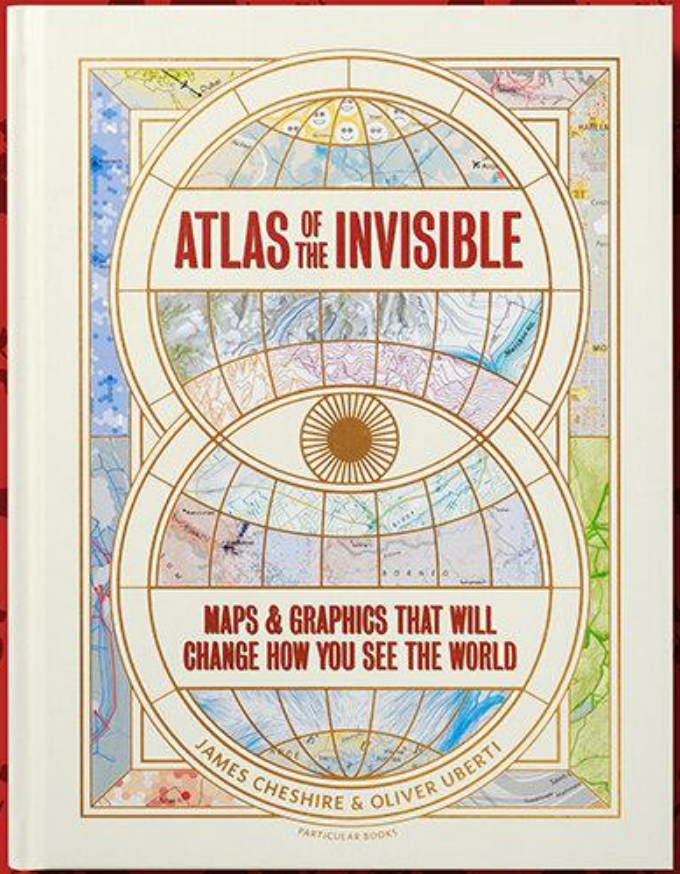
EXTENSIONS

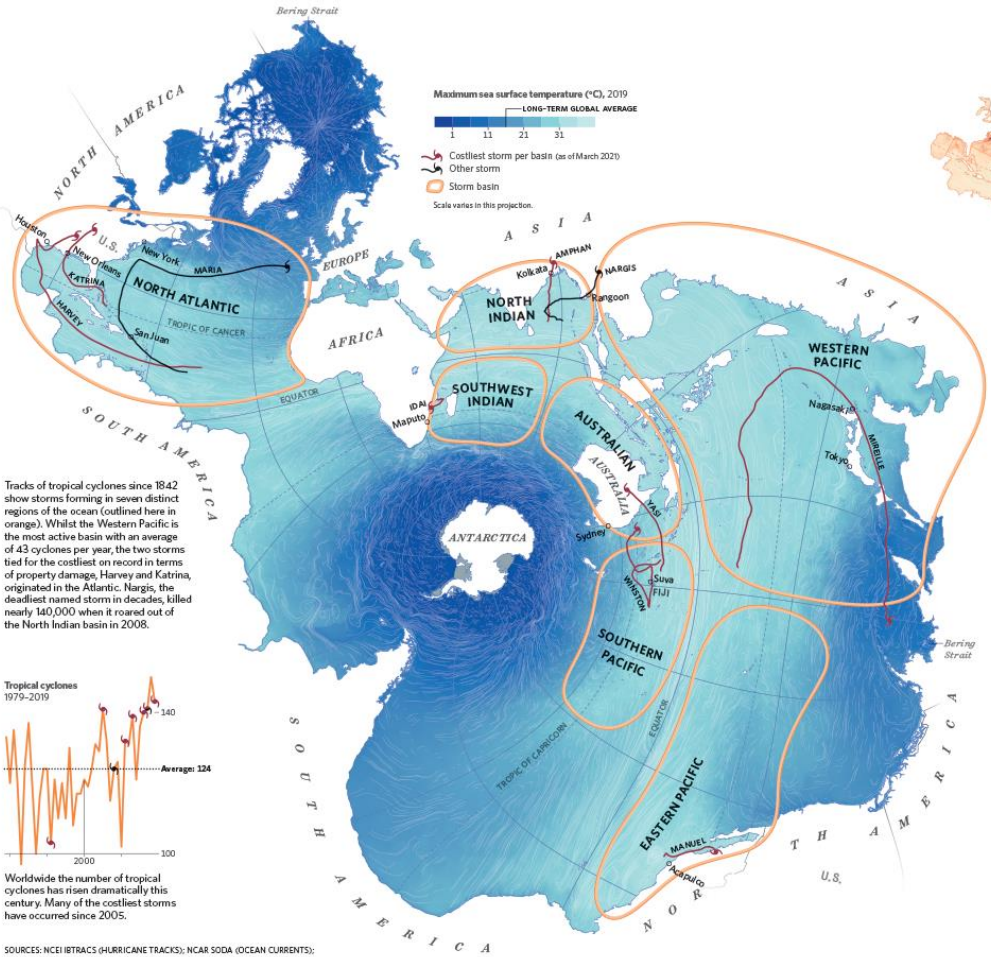
IDEAS

DATA

TRICKS

EXTENSIONS

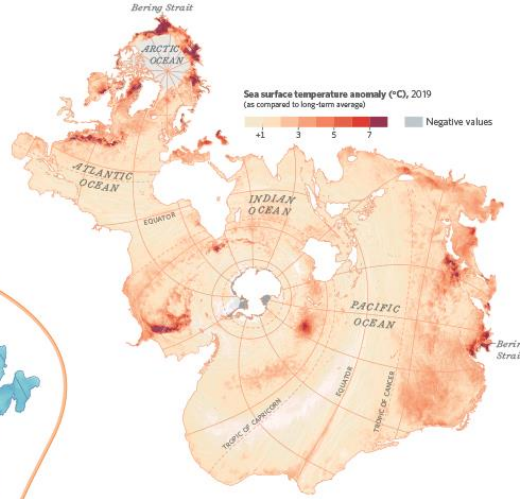

ATLAS OF THE INVISIBLE
MAPS & GRAPHICS THAT WILL CHANGE HOW YOU SEE THE WORLD
JAMES CHESHIRE & OLIVER UBERTI
PARTICULAR BOOKS



Tracks of tropical cyclones since 1842 show storms forming in seven distinct regions of the ocean (outlined here in orange). Whilst the Western Pacific is the most active basin with an average of 43 cyclones per year, the two storms tied for the costliest on record in terms of property damage, Harvey and Katrina, originated in the Atlantic. Nargis, the deadliest named storm in decades, killed nearly 140,000 when it roared out of the North Indian basin in 2008.

Worldwide the number of tropical cyclones has risen dramatically this century. Many of the costliest storms have occurred since 2005.

SOURCES: NCEI IBTRACS (HURRICANE TRACKS); NCAR SODA (OCEAN CURRENTS); NOAA CORAL REEF WATCH (TEMPERATURE DATA); WIKIPEDIA (CHART)

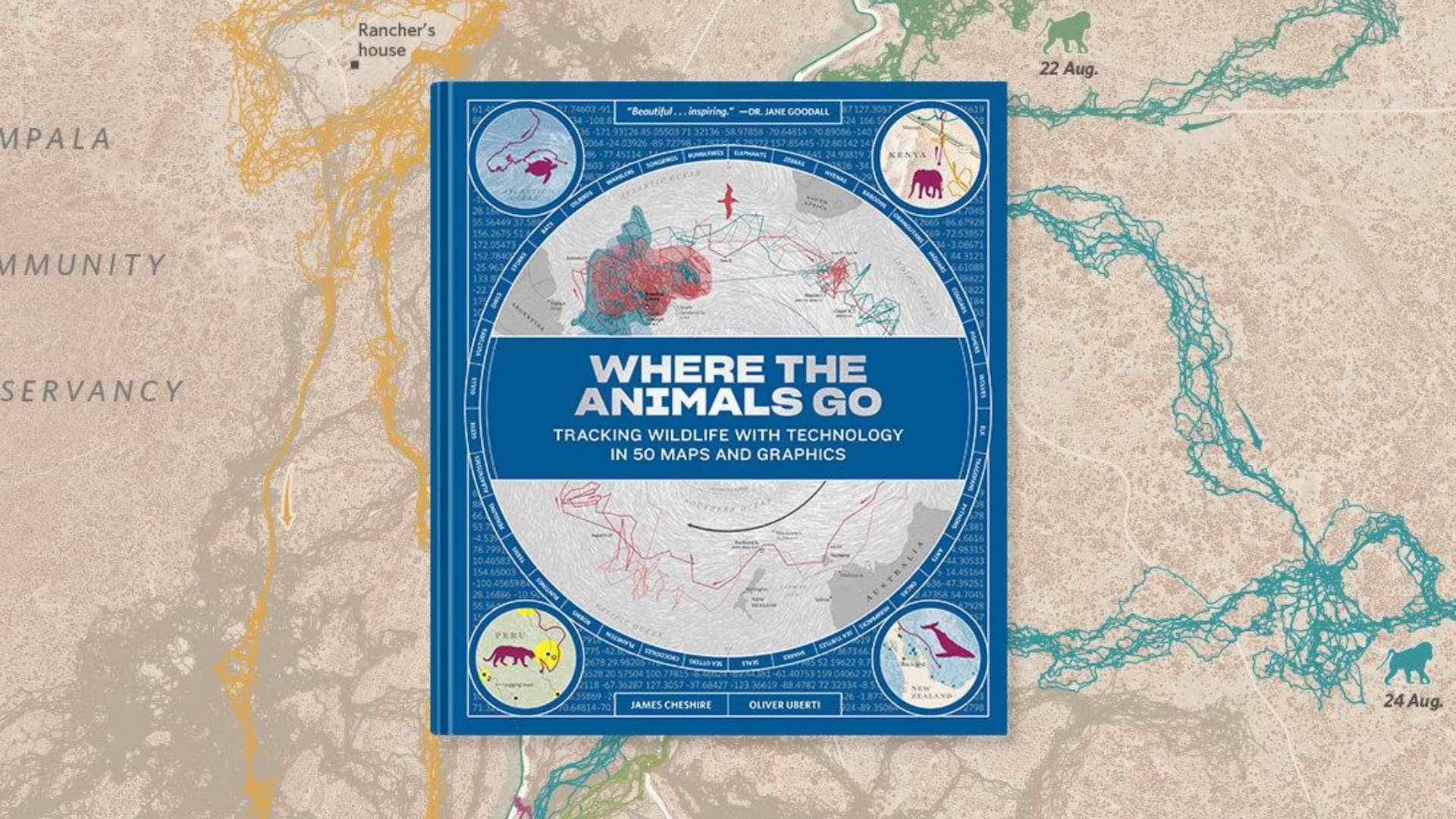


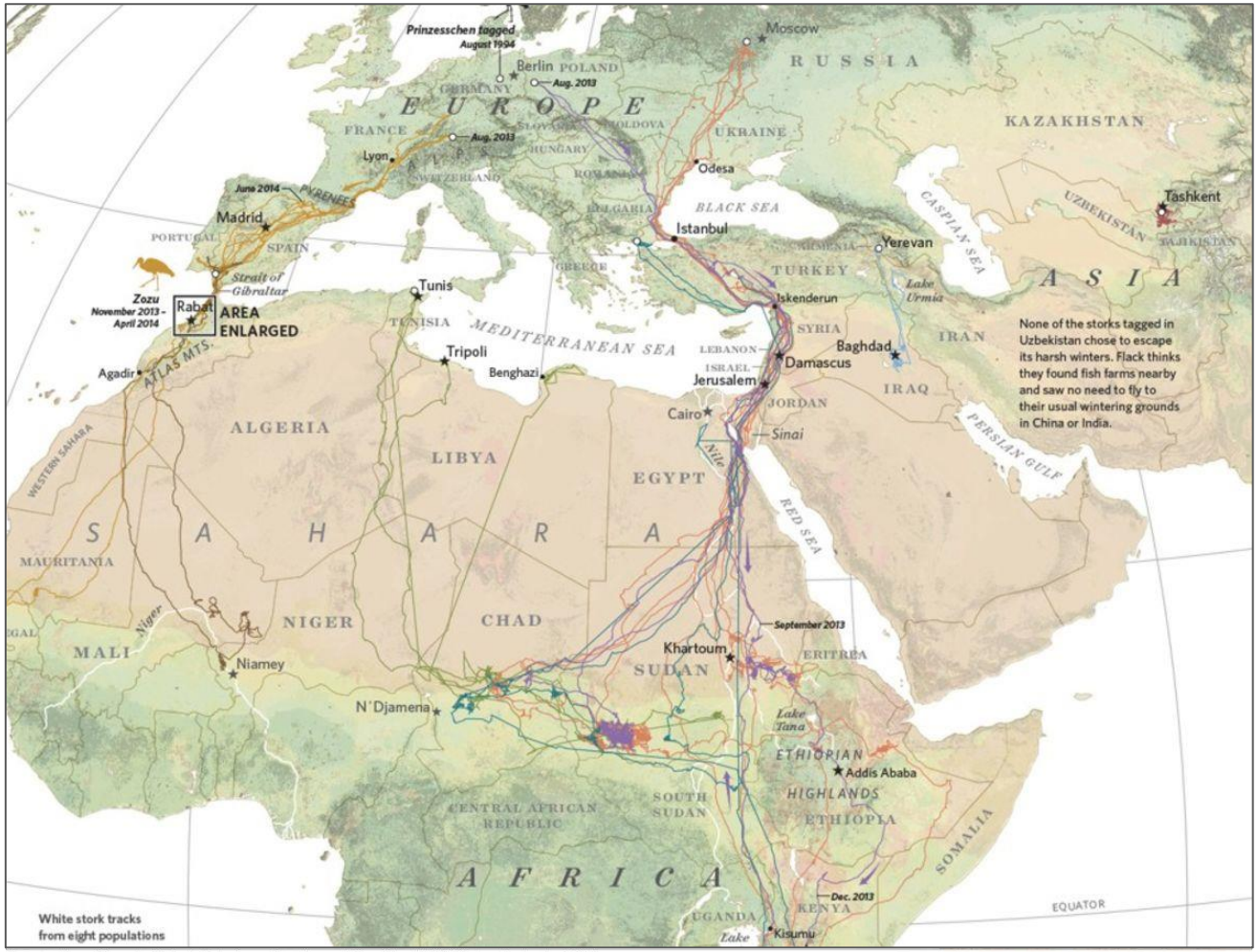
ONE STORMY SEA

No shore is sheltered from the ripple effects of global heating.

Sit in the sun in a dark suit and you will feel the ocean's burden. All day, every day, this singular mass absorbs solar energy. In the past fifty years it has also soaked up more than its fair share of the excess heat trapped by greenhouse gas emissions. This map views the world's oceans as an interconnected body of water – one whose surface temperatures are increasing rapidly. In 2019, waters in the Arctic exceeded their historical average by seven degrees Celsius (see above).

Like heads of a hydra the effects multiply. Melting sea ice and sea level rise, the ones you hear about most, we examine on pages 166–71. Other consequences are more insidious. Warmer water holds less oxygen, kills heat-sensitive species, pumps more moisture into the air and disrupts ocean and atmospheric currents. In turn hundreds of hypoxic 'dead zones' have jeopardized fisheries and food chains; half of Australia's Great Barrier Reef has died; storms have swelled in size, force and saturation; and these monster storms are lingering longer after landfall. Hurricane Harvey, the wettest storm in US history, hung around Houston for four days in 2017, dumping well over a metre of rain and costing $125 billion in damage.

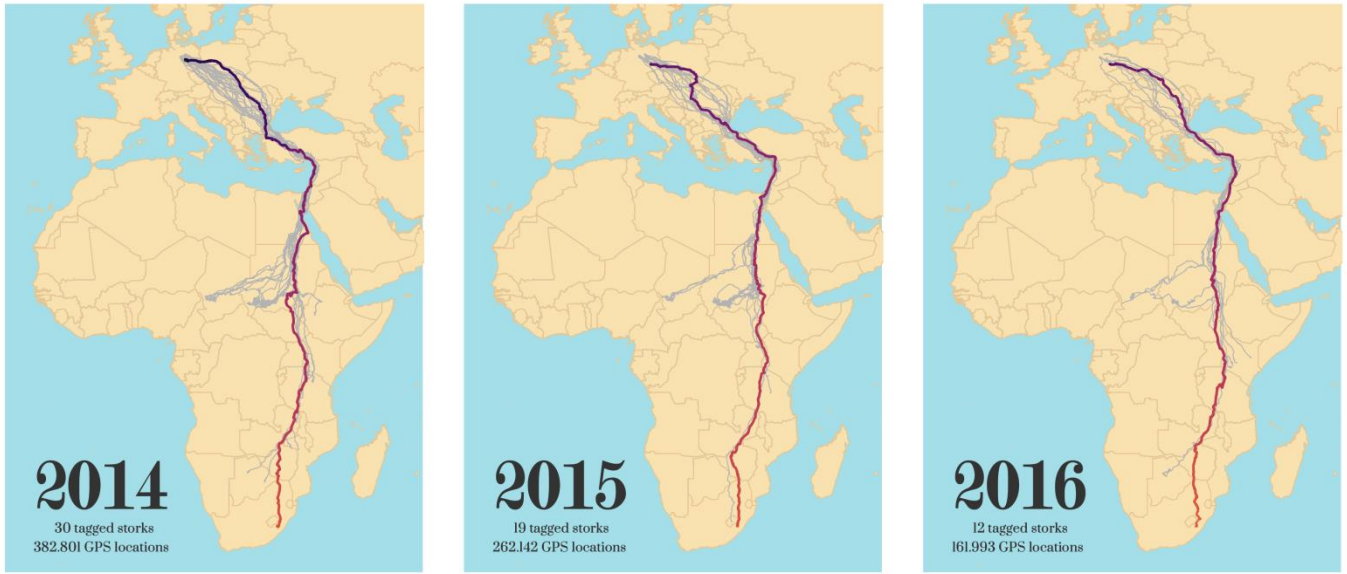

Rancher's house
MPALA
MMUNITY
SERVANCY
22 Aug.
24 Aug.
"Beautiful . . . inspiring." —DR. JANE GOODALL
WHERE THE ANIMALS GO
TRACKING WILDLIFE WITH TECHNOLOGY IN 50 MAPS AND GRAPHICS
JAMES CHESHIRE
OLIVER UBERTI



Excerpted from *Where the Animals Go* by James Cheshire and Oliver Uberti (WW Norton, September 2017)

On a journey with a white stork called "Gili"

Tracking data of adult white storks (*Ciconia ciconia*) for the years 2014–2016. The position of the storks has been estimated via GPS every 5 minutes. The stork with the ID 2421/HH847, lovingly called "Gili", travelled the furthest distance all the way from South Africa back to Germany.



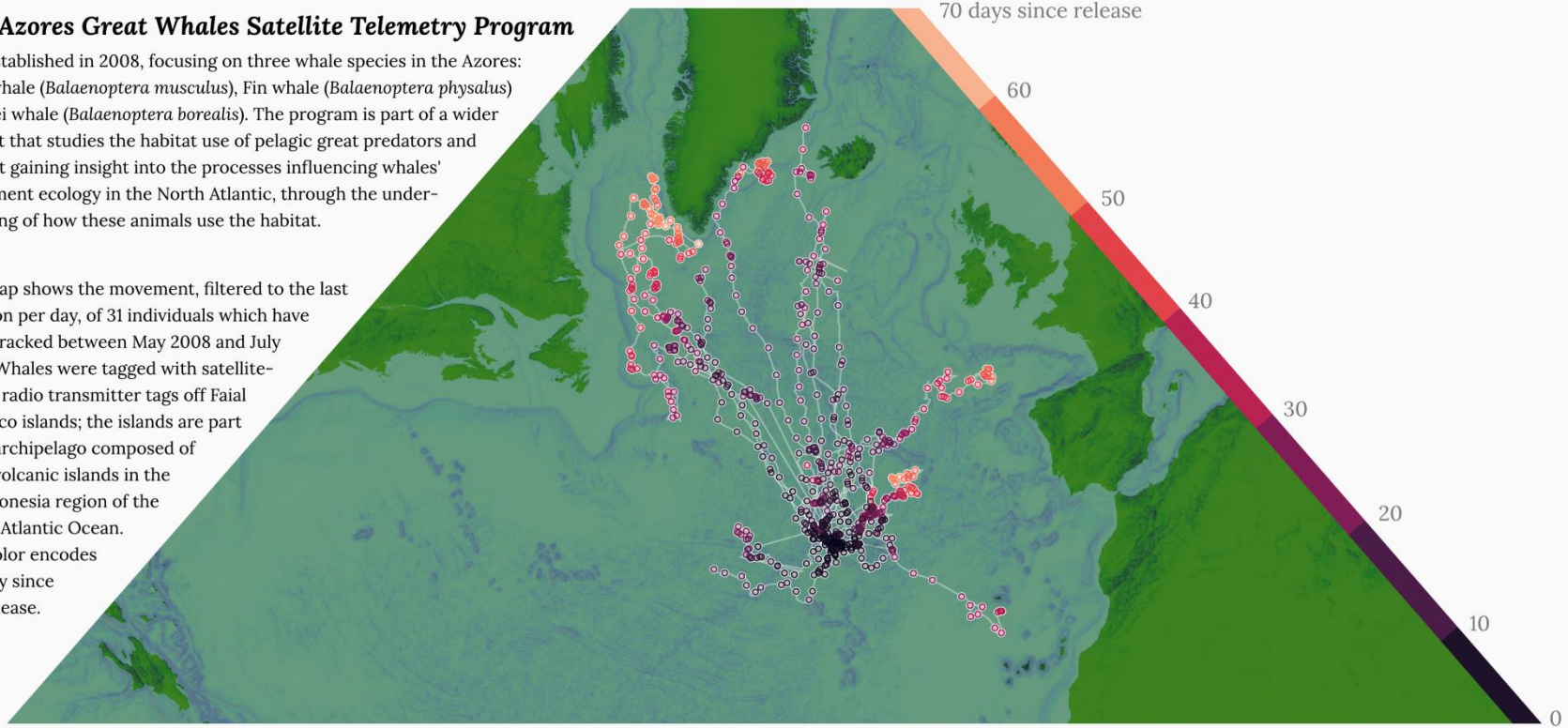
Rotics S., Kaatz M., Turjeman S., Zurell D., Wikelski M., Sapir N., Eggers U., Fiedler W., Jeltsch F. & Nathan R. (2018)
Early arrival at breeding grounds: Causes, costs and a trade-off with overwintering latitude. *J. Anim. Ecol.* 87:1627–1638. doi: 10.1111/1365-2656.12898.

Visualization by Cédric Scherer

The Azores Great Whales Satellite Telemetry Program

was established in 2008, focusing on three whale species in the Azores: Blue whale (*Balaenoptera musculus*), Fin whale (*Balaenoptera physalus*) and Sei whale (*Balaenoptera borealis*). The program is part of a wider project that studies the habitat use of pelagic great predators and aims at gaining insight into the processes influencing whales' movement ecology in the North Atlantic, through the understanding of how these animals use the habitat.

The map shows the movement, filtered to the last location per day, of 31 individuals which have been tracked between May 2008 and July 2016. Whales were tagged with satellite-linked radio transmitter tags off Faial and Pico islands; the islands are part of an archipelago composed of nine volcanic islands in the Macaronesia region of the North Atlantic Ocean. The color encodes the day since the release.



Map: Cédric Scherer • Data: Azores Great Whales Satellite Telemetry Program • Publications: Silva et al. 2013 *PLoS ONE*; Silva et al. 2014 *PLoS ONE*; Prieto et al. 2014 *Endanger. Species Res.*

The Mountain Lions Trapped by Roads

MOUNTAIN LIONS IN SOUTHERN CALIFORNIA are having what Hollywood might call a 'moment'. The A-lister among them is P-22, a 6-year-old male who lives alone in the hills of Griffith Park. In the past three years, he's been papped walking past the HOLLYWOOD sign; hiding under a house; and prowling the Los Angeles Zoo, where, the next day, keepers also discovered a dismembered koala.

Thirty years ago, such close encounters would have resulted in a dead cat. Today, L.A. residents are becoming more comfortable with the idea of an apex predator in the neighbourhood. 'When people see P-22, they treat him like a celebrity,' says Winston Vickers, a wildlife veterinarian at University of California, Davis. As people learn more about these animals – also known as pumas, cougars and panthers – they begin to think of them less like marauders and more like mascots. You can now buy T-shirts with P-22's likeness or follow him on Twitter (@GPMountainLion).

In the late 1980s, scientists began radio tracking and modelling the movements of mountain lions in the Santa Ana Mountains, southeast of L.A. They realized the animals were effectively marooned on an island, surrounded by freeways and ever-encroaching human development. Vickers and his

Mountain lions are wide-ranging animals. In Southern California, freeways restrict their movements. Here we show five of the 74 cats that researchers have tracked since 2001. Only one has ever crossed Interstate 15.

M56
On 7 March 2010, this young male left the Santa Ana Mountains in search of a new home territory. He travelled south along the beach and up Route 76 before crossing Interstate 15 to explore the Peninsular Ranges.
In late April, M56 killed eight sheep in Jatapul Valley. The landowner obtained a depredation permit. On the night of April 28, a trapper captured and shot M56.

M122
Adult males will kill or threaten males that do not leave their home ranges. M122 was born near Murrieta and dispersed to claim territory in the northwestern foothills.

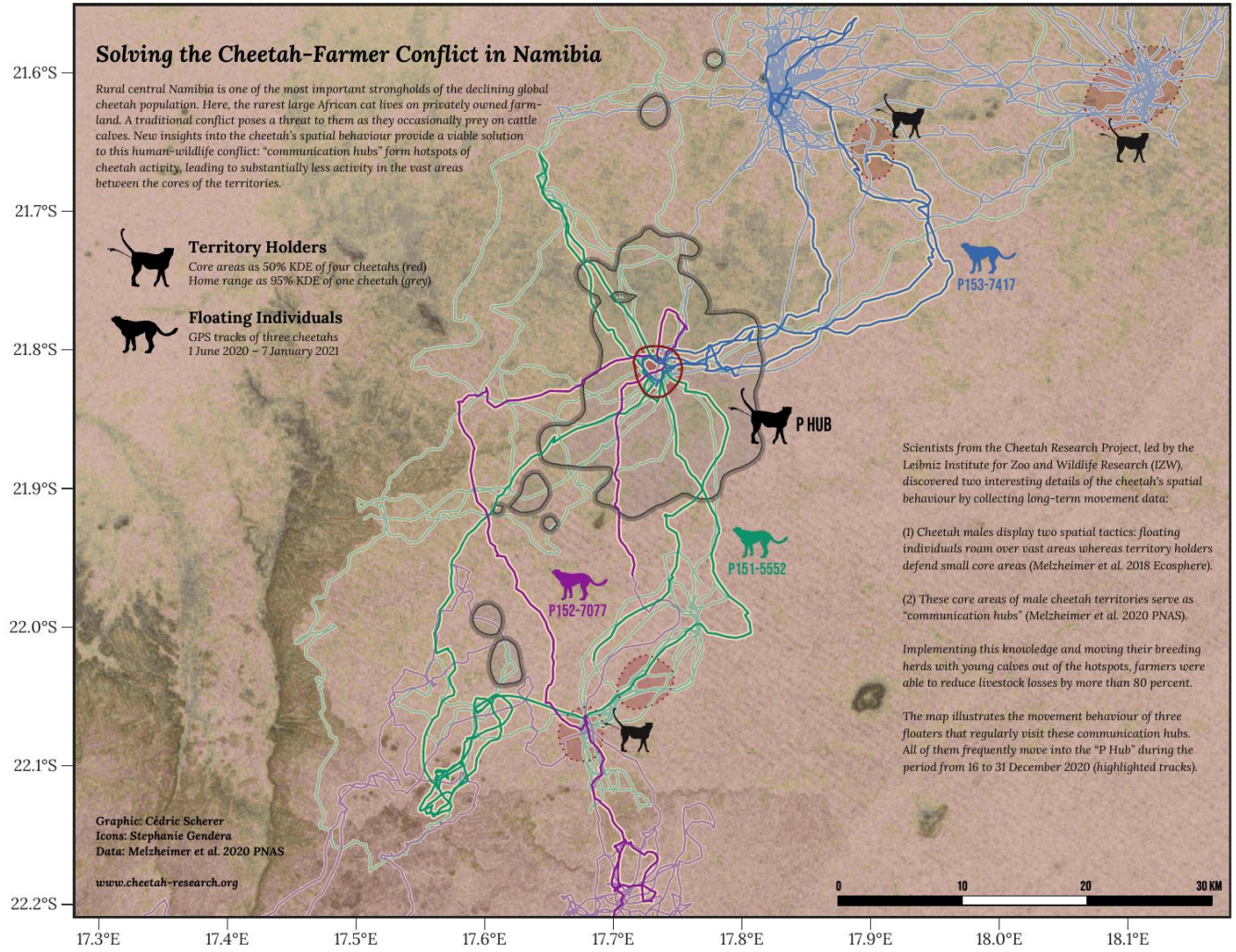
F50
F50 was living with her offspring in the western Santa Ana Mountains until she was hit by a car on Highway 74 near where her daughter F62 and a male kitten were also hit.

F18
Typically, females don't disperse as far as males. F18 is an exception. She walked 100 kilometres to the San Jacintos near Palm Springs and then came back to reside in San Diego County.

M53
In summer 2009, this young male crossed into Mexico via the Parque-to-Park Linkage at least three times. He roamed 69 kilometres south of the border before he was struck and killed by a car in Mexico.

SOURCES: T. WINSTON VICKERS AND WALTER BOYCE, UNIVERSITY OF CALIFORNIA, DAVIS; BRIAN COHEN, THE NATURE CONSERVANCY; SRTM; USGS

Excerpted from *Where the Animals Go* by James Cheshire and Oliver Uberti (WW Norton, September 2017)


Solving the Cheetah-Farmer Conflict in Namibia
Rural central Namibia is one of the most important strongholds of the declining global cheetah population. Here, the rarest large African cat lives on privately owned farmland. A traditional conflict poses a threat to them as they occasionally prey on cattle calves. New insights into the cheetah's spatial behaviour provide a viable solution to this human-wildlife conflict: "communication hubs" form hotspots of cheetah activity, leading to substantially less activity in the vast areas between the cores of the territories.
Territory Holders
Core areas as 50% KDE of four cheetahs (red)
Home range as 95% KDE of one cheetah (grey)
Floating Individuals
GPS tracks of three cheetahs
1 June 2020 – 7 January 2021
P HUB
P153-7417
P151-5552
P152-7077
Scientists from the Cheetah Research Project, led by the Leibniz Institute for Zoo and Wildlife Research (IZW), discovered two interesting details of the cheetah's spatial behaviour by collecting long-term movement data:
(1) Cheetah males display two spatial tactics: floating individuals roam over vast areas whereas territory holders defend small core areas (Melzheimer et al. 2018 Ecosphere).
(2) These core areas of male cheetah territories serve as "communication hubs" (Melzheimer et al. 2020 PNAS).
Implementing this knowledge and moving their breeding herds with young calves out of the hotspots, farmers were able to reduce livestock losses by more than 80 percent.
The map illustrates the movement behaviour of three floaters that regularly visit these communication hubs. All of them frequently move into the "P Hub" during the period from 16 to 31 December 2020 (highlighted tracks).
Graphic: Cédric Scherer
Icons: Stephanie Gendera
Data: Melzheimer et al. 2020 PNAS
www.cheetah-research.org
0
10
20
30 KM
21.6°S
21.7°S
21.8°S
21.9°S
22.0°S
22.1°S
22.2°S
17.3°E
17.4°E
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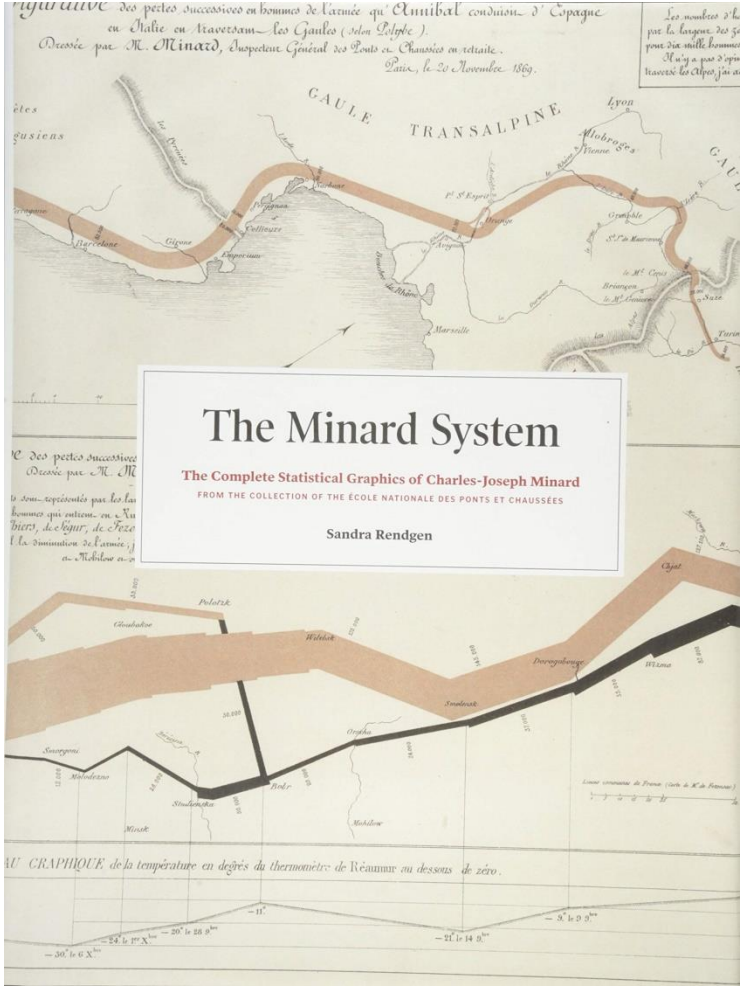
18.0°E
18.1°E

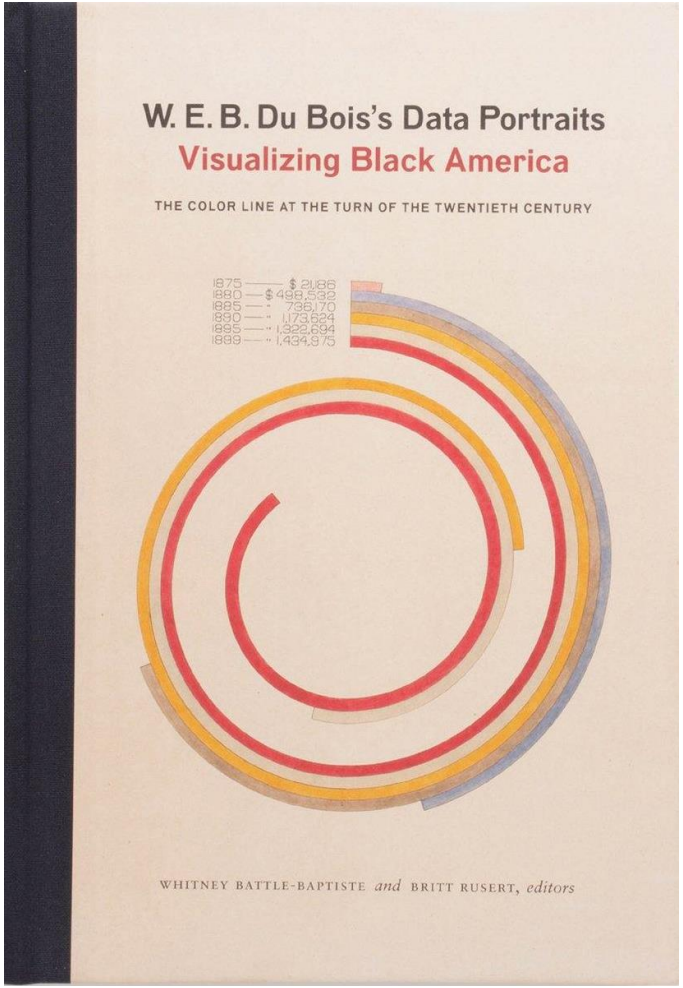


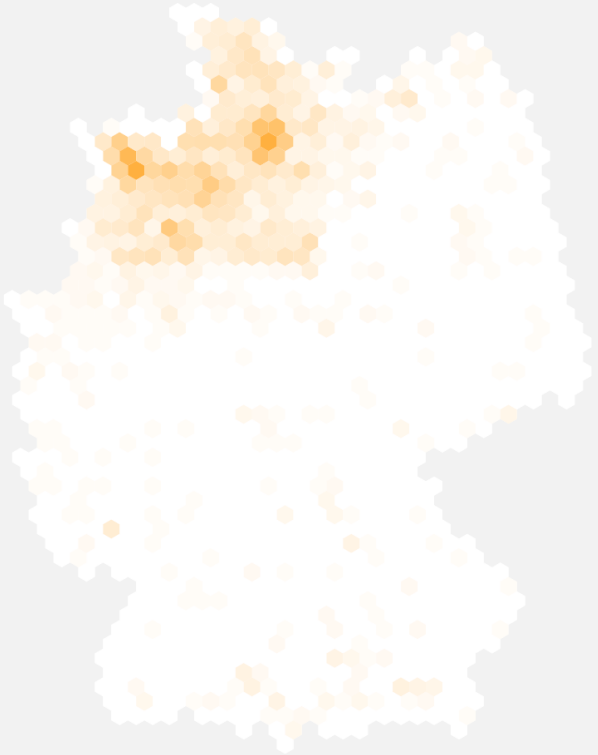
The Minard System

The Complete Statistical Graphics of Charles-Joseph Minard

FROM THE COLLECTION OF THE ÉCOLE NATIONALE DES PONTS ET CHAUSSÉES

Sandra Rendgen





ALLE STRASSENNAMEN MIT ...

ALTER MOOR STRICH

AHLENMOORSTRASSE

BEKHAUSERMOOR WEG

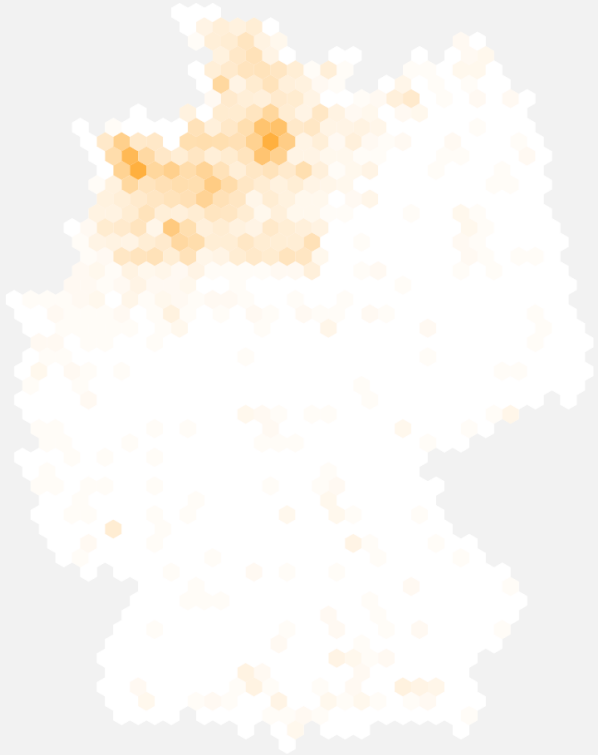
Grimme Online Award NOMINIERT 2018

Straßenbilder

Mozart, Marx und ein Diktator

25. JANUAR 2018

Straßennamen zeichnen Bilder unserer Erinnerung. Ob Römer, Kaiser, Sozialisten: Alle hinterließen Spuren. Wir zeigen Muster, die sich in den 450.000 Namen verbergen.



ALLE STRASSENNAMEN MIT …

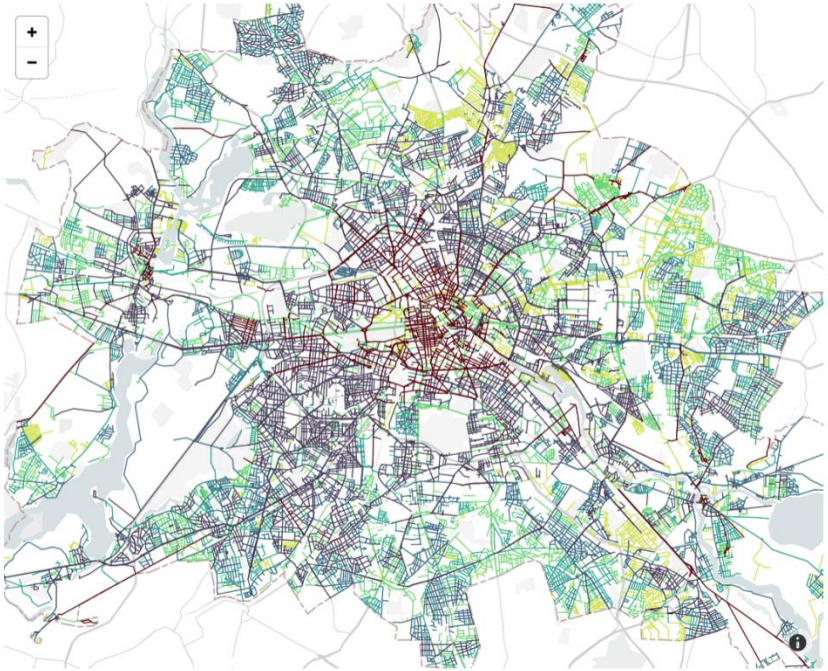
ALTER MOOR STRICH

AHLEN**MOOR**STRASSE

BEKHAUSER**MOOR** WEG

Wie alt sind die heutigen Berliner Straßennamen?

Straßen in Berlin wurden im Laufe der Geschichte häufig umbenannt, viele sogar mehrfach – etwa nach dem Ende der NS-Zeit und nach dem Fall der Mauer. Das Ergebnis ist ein Stadtplan, in dem neue und jahrhundertealte Straßennamen vielfach nebeneinander stehen.



Zeige Straßennamen aus allen Epochen

vor 1896

1870–1918 *Kaiserreich*

www.zeit.de/feature/strassenverzeichnis-strassennamen-herkunft-deutschland-infografik

NAMES OF ROADS IN BERLIN

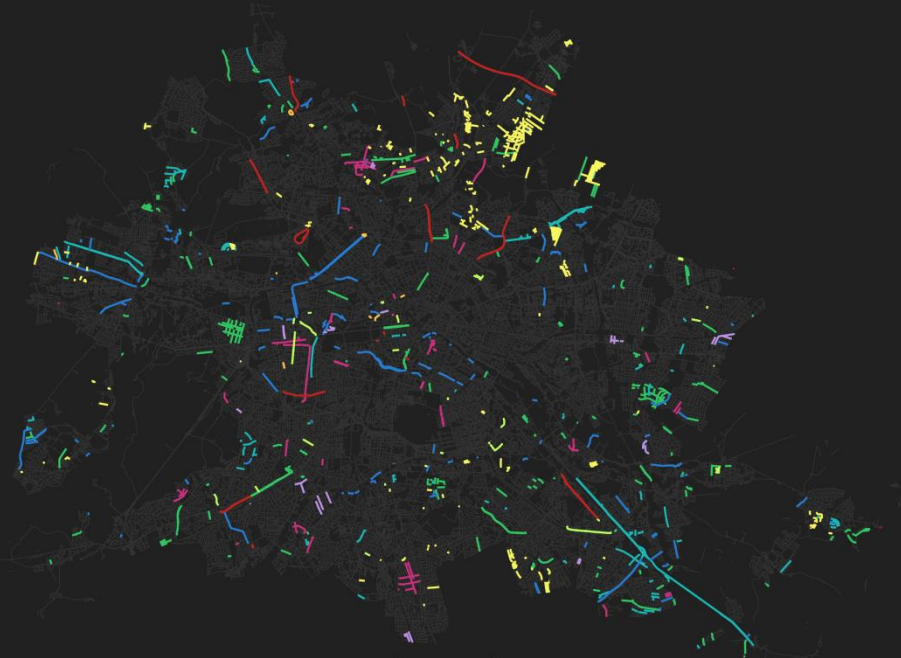
STRAßE WEG ALLEE DAMM PLATZ CHAUSSEE WATER[1] OTHER[2]

Visualization by Cédric Scherer • Data by OpenStreetMap

[1] Road-type names that are related to close-by water bodies, i.e. **"See"**, **"Ufer"**, and **"Steg"**
[2] Other road type names include for example **"Promenade"**, **"Pfad"**, **"Ring"**, **"Zeile"**, **"Gasse"**, **"Brücke"**, **"Graben"**, and **Hof**

Berlin Roads

What are the streets named after?



Road name contains...

- *Common tree species*
- *Common bird species*
- *Water-related terms*
- *Famous German poets*
- *Famous German composers*
- *Famous German scientists*
- *German chancellors*
- *Numbers*
- *Berlin*

Map: Cédric Scherer • Data: OpenStreetMap contributors

Berlin Roads

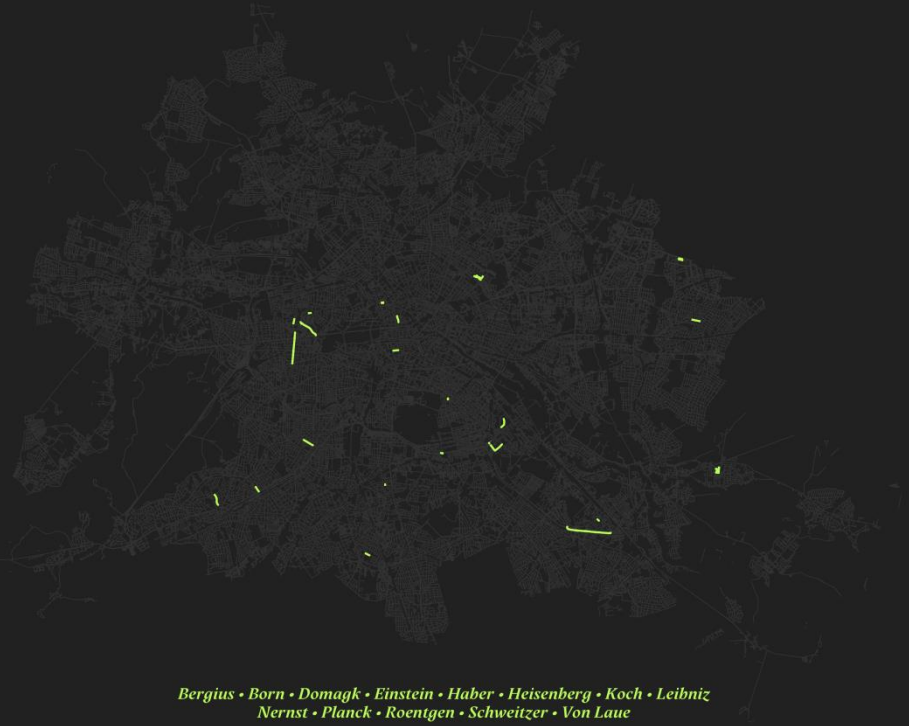
containing ***common bird species*** in their names

Adler • Amsel • Bussard • Blaumeise • Drossel • Falke • Fasan
Fink • Habicht • Kohlmeise • Lerche • Meise • Milan • Nachtigall
Rotkehlchen • Schwalbe • Spatz • Specht • Sperber • Taube • Zeisig

Map: Cédric Scherer • Data: OpenStreetMap contributors

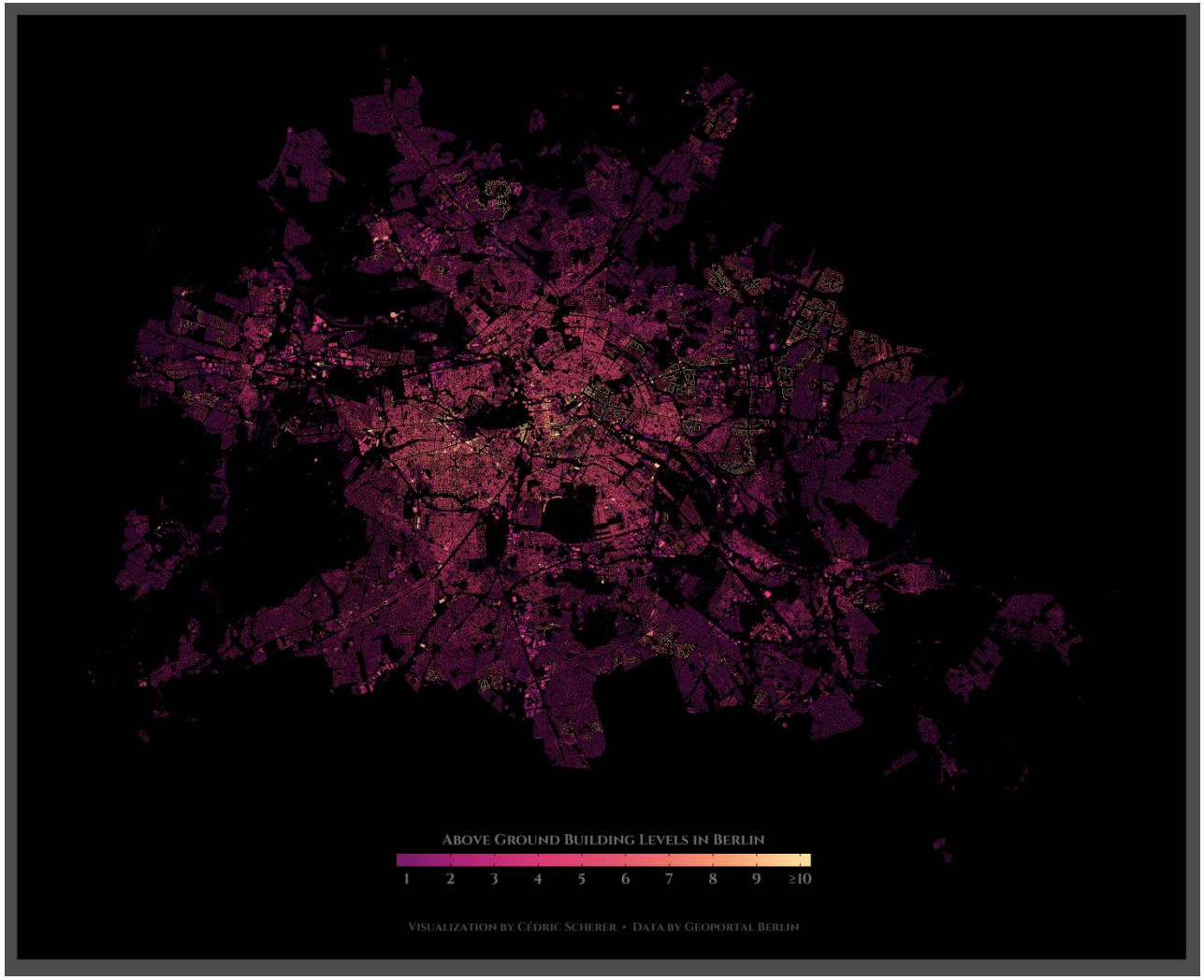
Berlin Roads

containing *famous German scientists* in their names



Bergius • Born • Domagk • Einstein • Haber • Heisenberg • Koch • Leibniz
Nernst • Planck • Roentgen • Schweitzer • Von Laue

Map: Cédric Scherer • Data: OpenStreetMap contributors


Above Ground Building Levels in Berlin
1 2 3 4 5 6 7 8 9 ≥10
Visualization by Cédric Scherer • Data by Geoportal Berlin

Bē

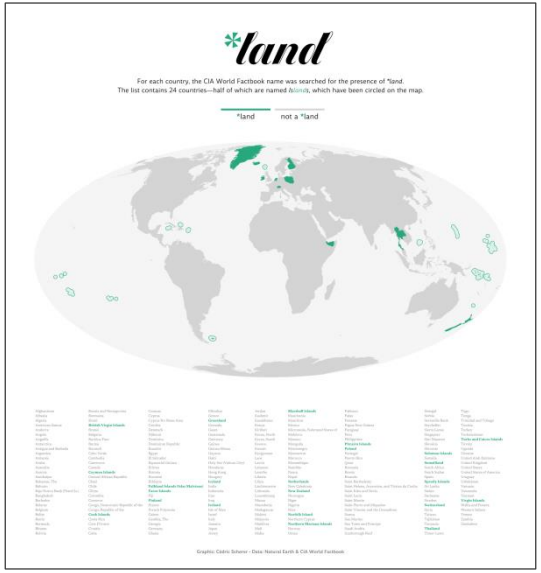
IDEAS

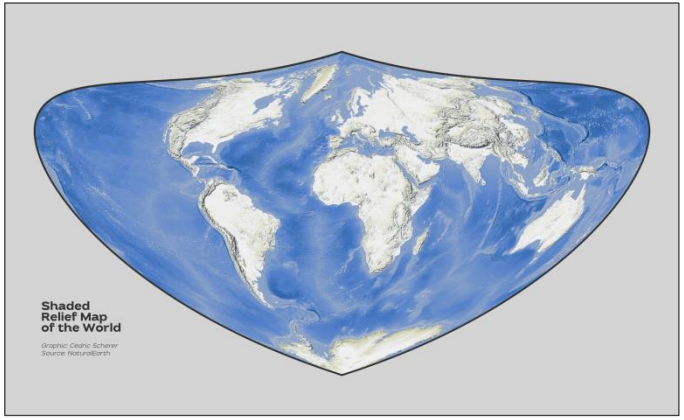
DATA

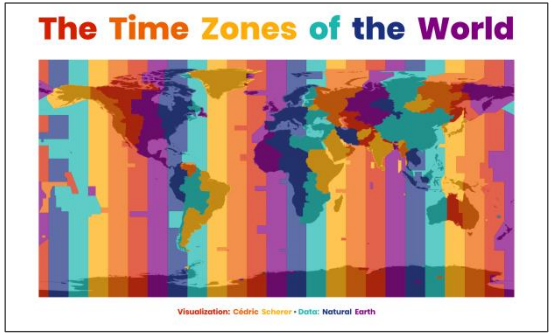
TRICKS

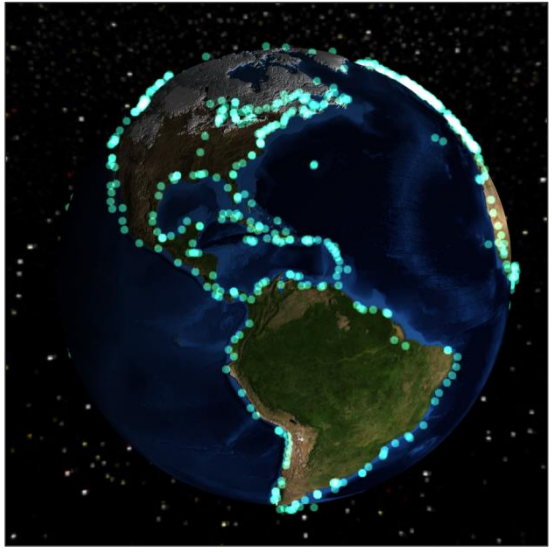
EXTENSIONS

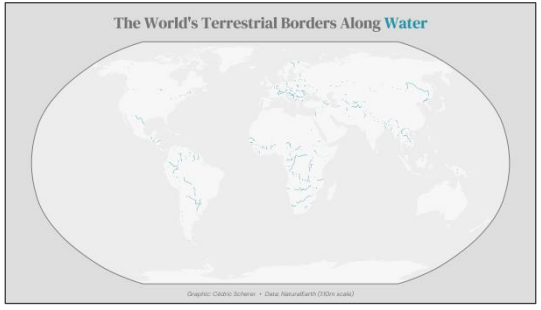
NaturalEarth

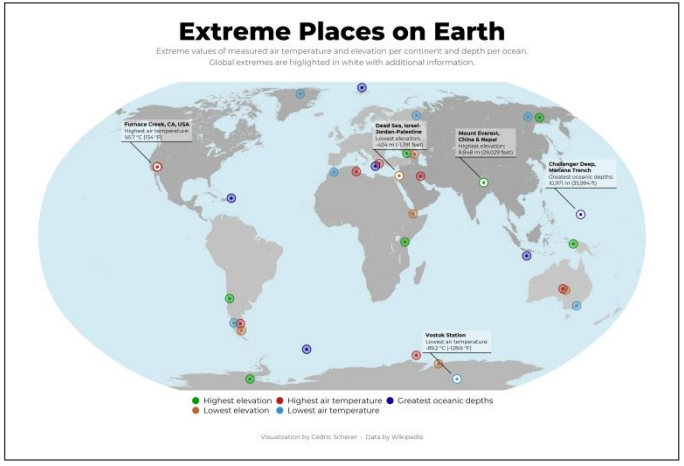




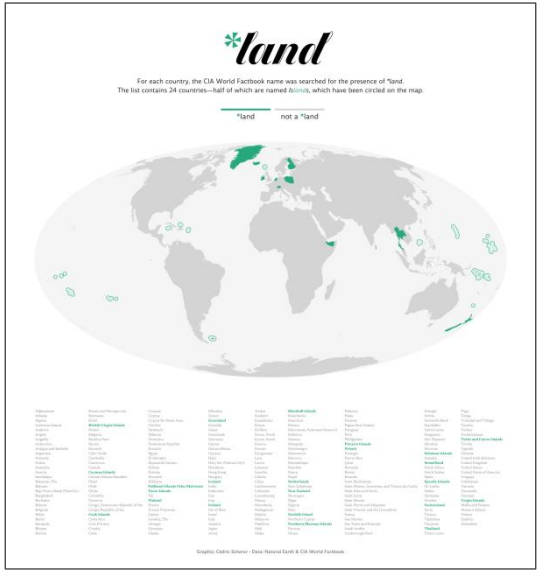


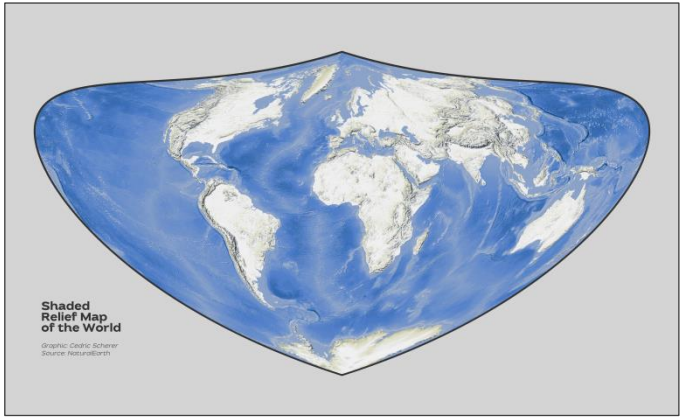


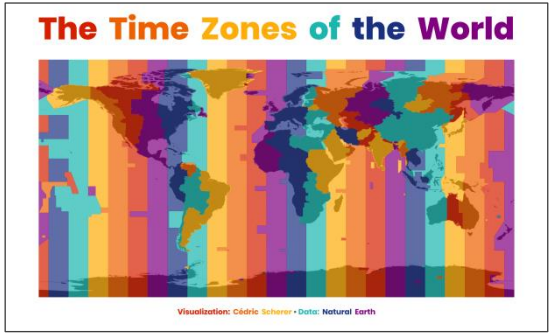


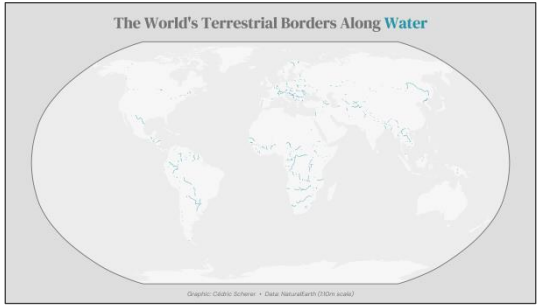


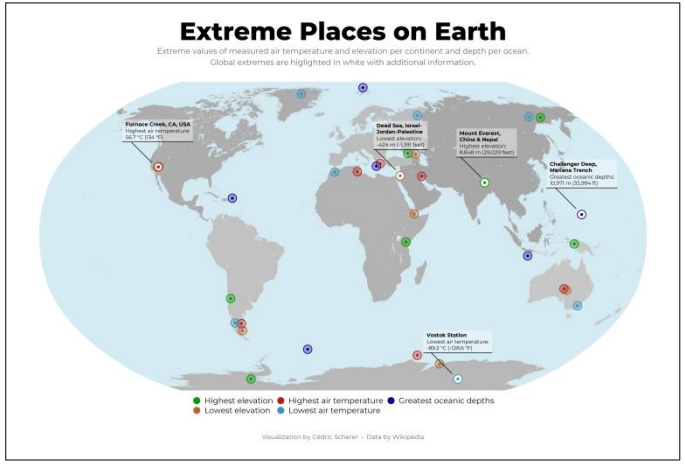
NaturalEarth

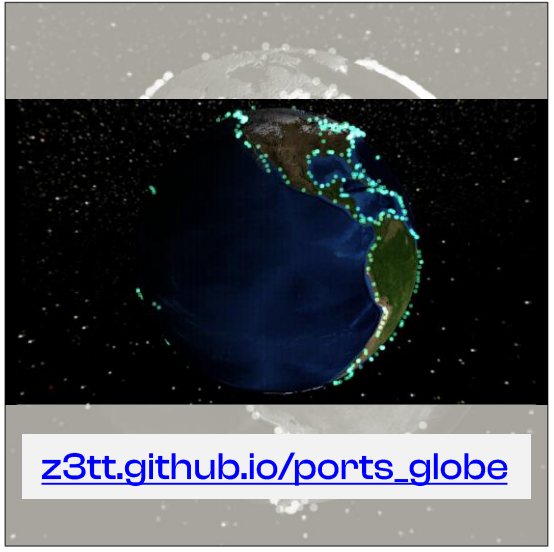












CRAN 0.1.0 downloads 321K downloads 13K/month Peer Reviewed repo status Active

build failing build passing

rOpenSci: The *rnaturalearth* package

An R package to hold and facilitate interaction with Natural Earth map data.

Provides :

1. access to a pre-downloaded subset of Natural Earth v4.1.0 (March 2018. vector data commonly used in world mapping
2. easy subsetting by countries and regions
3. functions to download other Natural Earth vector and raster data
4. a simple, reproducible and sustainable workflow from Natural Earth data to rnaturalearth enabling updating as new versions become available
5. clarification of differences in world maps classified by countries, sovereign states and map units
6. consistency with Natural Earth naming conventions so that rnaturalearth users can use Natural Earth documentation
7. data in 'sf' or 'sp' formats

The Natural Earth website structures vector data by scale, category and type. These determine the filenames of downloads. rnaturalearth uses this structure to facilitate download (like an API).

Install rnaturalearth

Install from CRAN :

Links

View on CRAN

Browse source code

Report a bug

License

MIT + file LICENSE

Citation

Citing rnaturalearth

Developers

Andy South

Author, maintainer

rnaturalearth

```
rnaturalearth::ne_countries()
```

rnaturalearth

```
rnaturalearth::ne_countries(scale = 10, returnclass = 'sf')
```

rnaturalearth

```
rnaturalearth::ne_countries(scale = 10, returnclass = 'sf')

rnaturalearth::ne_countries(scale = 110, returnclass = 'sp')
```

rnaturalearth

```
sf_world <- ne_countries(scale = 10, returnclass = 'sf')
```

rnaturalearth

```
sf_world <- ne_countries(scale = 10, returnclass = 'sf')

ggplot(sf_world) +
  geom_sf()
```

rnaturalearth

```
sf_world <- ne_countries(scale = 10, returnclass = 'sf')

ggplot(sf_world) +
  geom_sf() +
  coord_sf(
    crs = '+proj=moll'
  )
```

rnaturalearth

```
rnaturalearth::ne_download(
  category = "physical", type = "geography_regions_polys"
)

rnaturalearth::ne_download(
  category = "physical", type = "ocean"
)

rnaturalearth::ne_download(
  category = "physical", type = "wgs84_bounding_box"
)
```

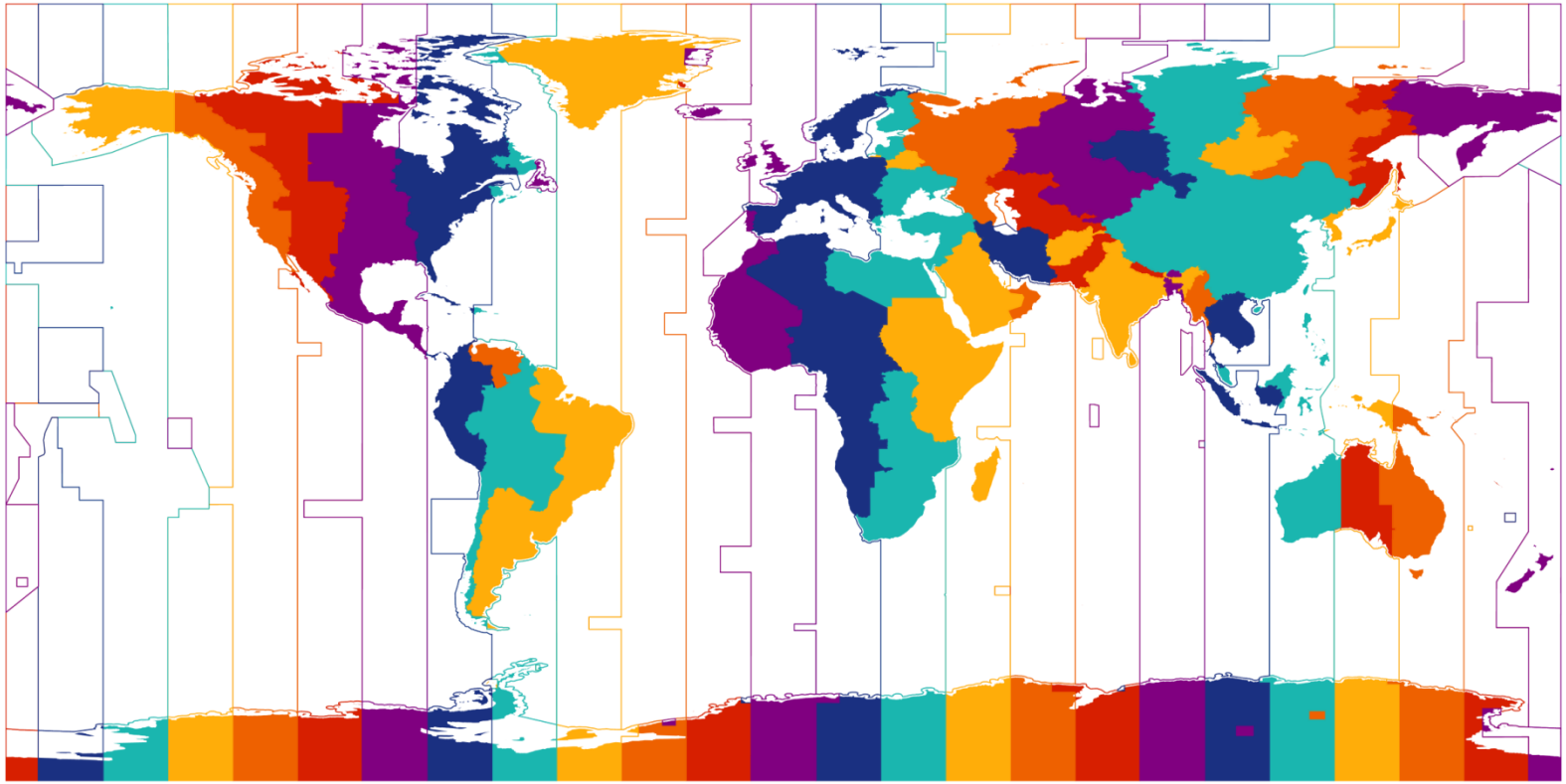
rnaturalearth

```
rnaturalearth::ne_download(
  category = "cultural", type = "urban_areas"
)

rnaturalearth::ne_download(
  category = "cultural", type = "ports"
)

rnaturalearth::ne_download(
  category = "cultural", type = "time_zones"
)
```

The Time Zones of the World



Visualization: Cédric Scherer • Data: Natural Earth

rnaturalearth

```
rnaturalearth::ne_download(
  category = "raster", type = "MSR_50M"
)
```

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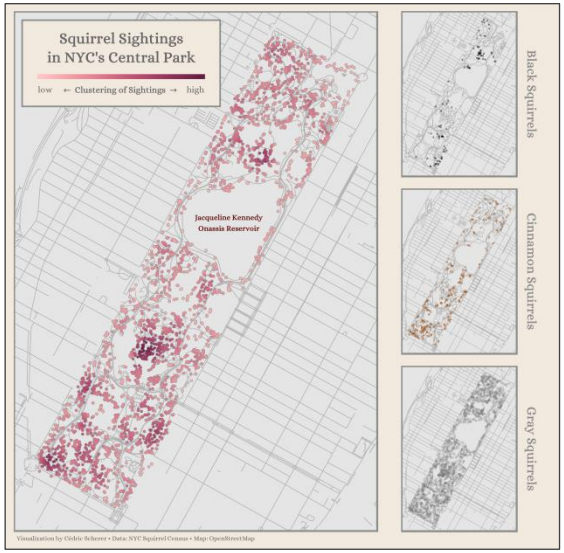

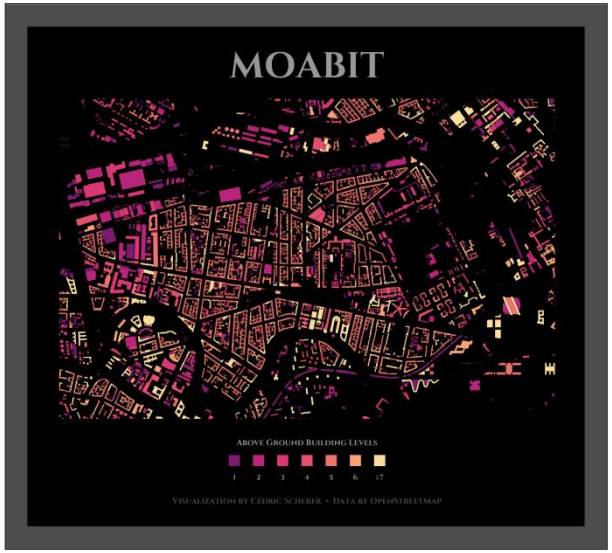

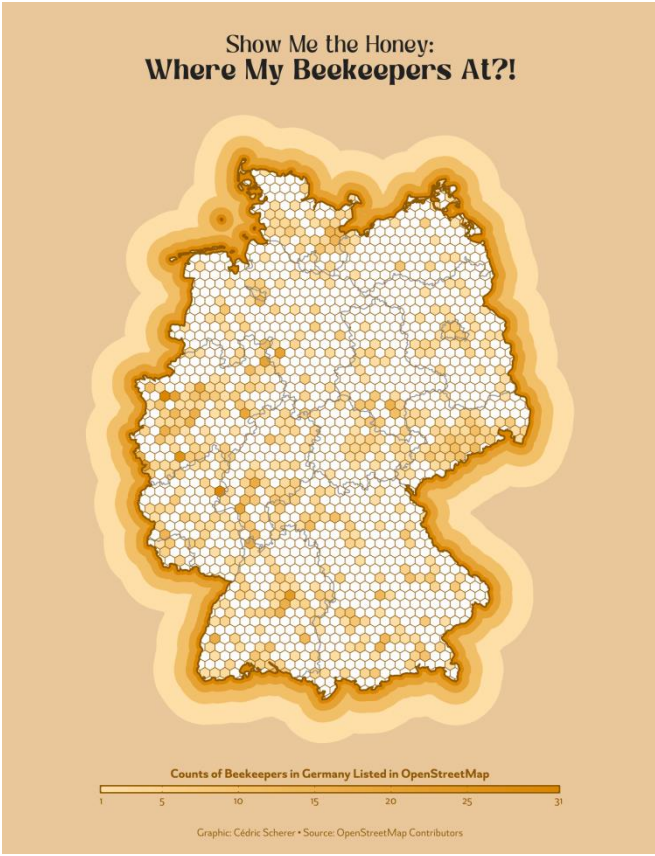

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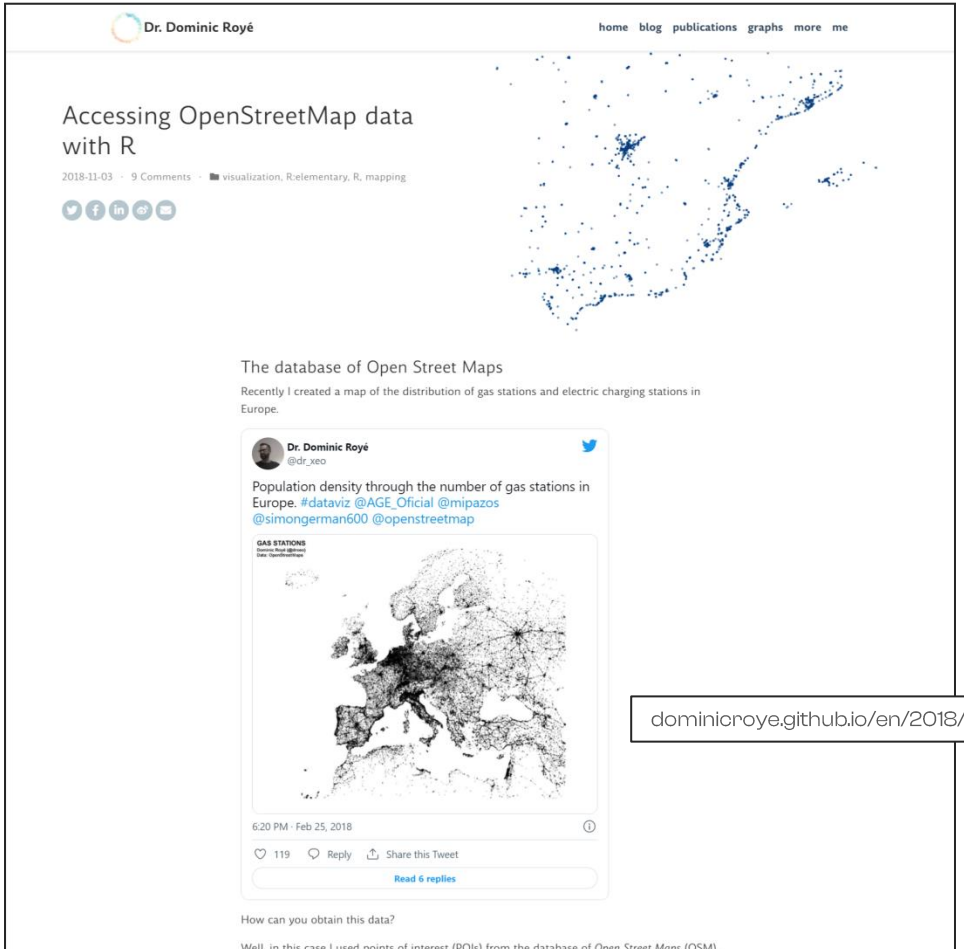

dominicroye.github.io/en/2018/accessing-openstreetmap-data-with-r

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Dr. Dominic Royé

home blog publications graphs more me

Accessing OpenStreetMap data with R

2018-11-03 · 9 Comments · visualization, R:elementary, R, mapping

The database of Open Street Maps

```r
#bounding box for the Iberian Peninsula
m <- c(-10, 30, 5, 46)

#building the query
q <- m %>%
      opq (timeout = 25*100) %>%
         add_osm_feature("name", "Mercadona") %>%
         add_osm_feature("shop", "supermarket")

#query
mercadona <- osmdata_sf(q)

#final map
ggplot(mercadona$osm_points)+
  geom_sf(colour = "#08519c",
          fill = "#08306b",
          alpha = .5,
          size = 1,
          shape = 21)+
  theme_void()
```

dominicroye.github.io/en/2018/accessing-openstreetmap-data-with-r

How can you obtain this data?

Well, in this case I used points of interest (POIs) from the database of *Open Street Maps* (OSM)

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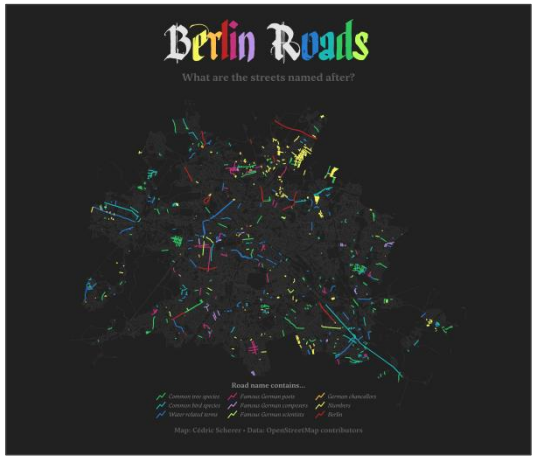

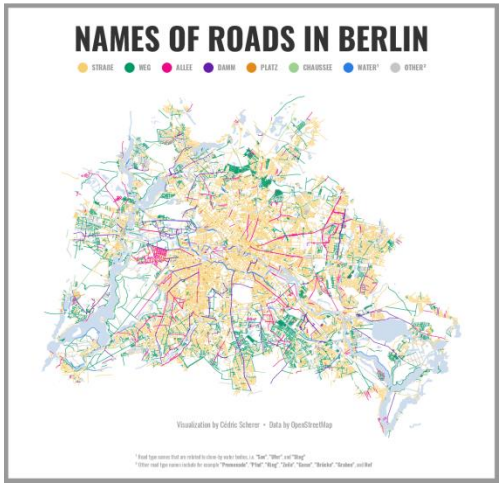

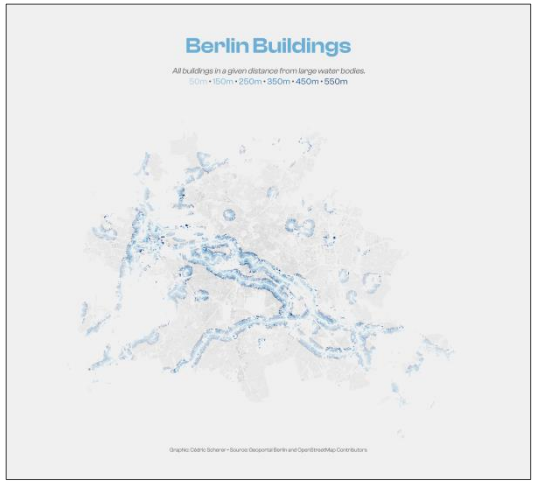

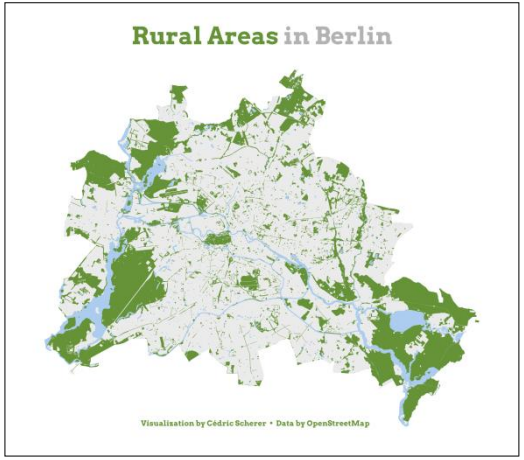

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Commonly Used Formats

- berlin-latest.osm.pbf, suitable for Osmium, Osmosis, imposm, osm2pgsql, mkgmap, and others. This file was last modified 18 hours ago and contains all OSM data up to 2021-12-13T21:21:54Z. File size: 64 MB; MD5 sum: dde2c5ca73ad6711af4b6bbd1bb8e8f7.
- berlin-latest-free.shp.zip, yields a number of ESRI compatible shape files when unzipped. (Format description PDF) This file was last modified 18 hours ago. File size: 95 MB; MD5 sum: 78368c8b7a81d950e85a1845bcfa2aa2.

Other Formats and Auxiliary Files

- berlin-latest.osm.bz2, yields OSM XML when decompressed; use for programs that cannot process the .pbf format. This file was last modified 3 days ago. File size: 99 MB; MD5 sum: 6ded59a425a36aa39ee2c9d328fc83a7.
- ~~berlin-internal.osh.pbf~~ The history file contains personal data and is available on the internal server only. See notice above for further information.
- .poly file that describes the extent of this region.
- .osc.gz files that contain all changes in this region, suitable e.g. for Osmosis updates
- raw directory index allowing you to see and download older files

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No sub regions are defined for this region.

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- berlin-latest-free.shp.zip, yields a number of ESRI compatible shape files when unzipped. (Format description PDF) This file was last modified 18 hours ago. File size: 95 MB; MD5 sum: 78368c8b7a81d950e85a1845bcfa2aa2.

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- ~~asia-latest-free.shp.zip~~ is not available for this region; try one of the sub-regions.

Other Formats and Auxiliary Files

- asia-latest.osm.bz2, yields OSM XML when decompressed; use for programs that cannot process the .pbf format. This file was last modified 4 days ago. File size: 19.7 GB; MD5 sum: e6570ba7b683a07775d74474193bd7db.
- ~~asia-internal.osh.pbf~~ The history file contains personal data and is available on the internal server only. See notice above for further information.
- .poly file that describes the extent of this region.
- .osc.gz files that contain all changes in this region, suitable e.g. for Osmosis updates
- raw directory index allowing you to see and download older files

Sub Regions

Click on the region name to see the overview page for that region, or select one of the file extension links for quick access.

Sub Region	Quick Links		
	.osm.pbf	.shp.zip	.osm.bz2
Afghanistan	[.osm.pbf] (78 MB)	[.shp.zip]	[.osm.bz2]
Armenia	[.osm.pbf] (34.7 MB)	[.shp.zip]	[.osm.bz2]
Azerbaijan	[.osm.pbf] (30.9 MB)	[.shp.zip]	[.osm.bz2]
Bangladesh	[.osm.pbf] (254 MB)	[.shp.zip]	[.osm.bz2]
Bhutan	[.osm.pbf] (16.3 MB)	[.shp.zip]	[.osm.bz2]

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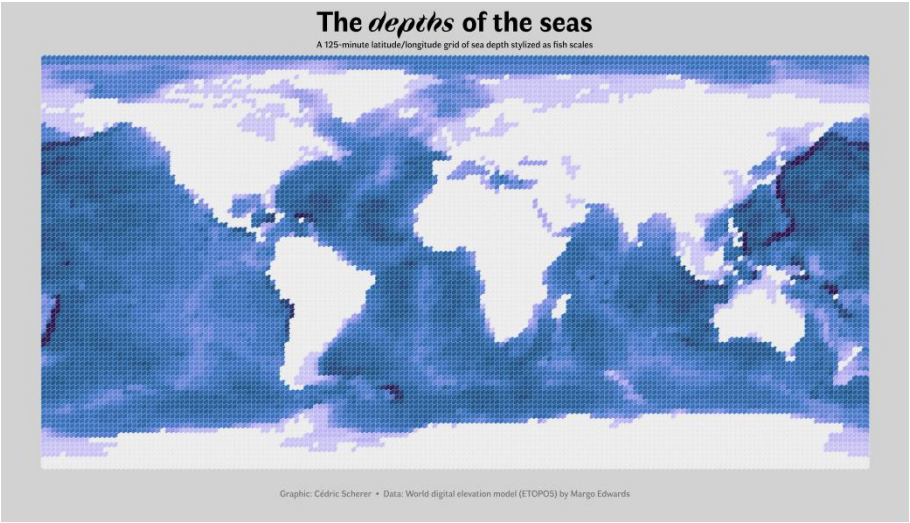
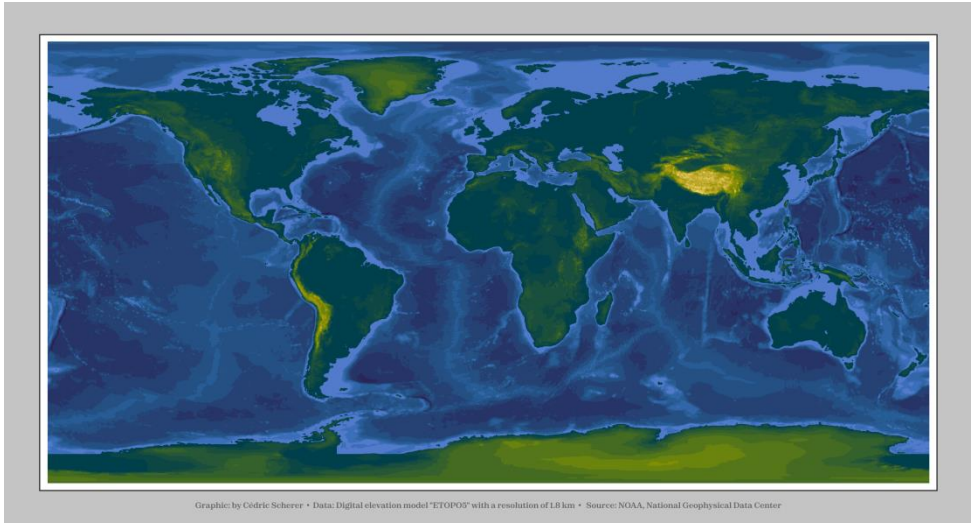
ETOPO5

World Digital Elevation Model

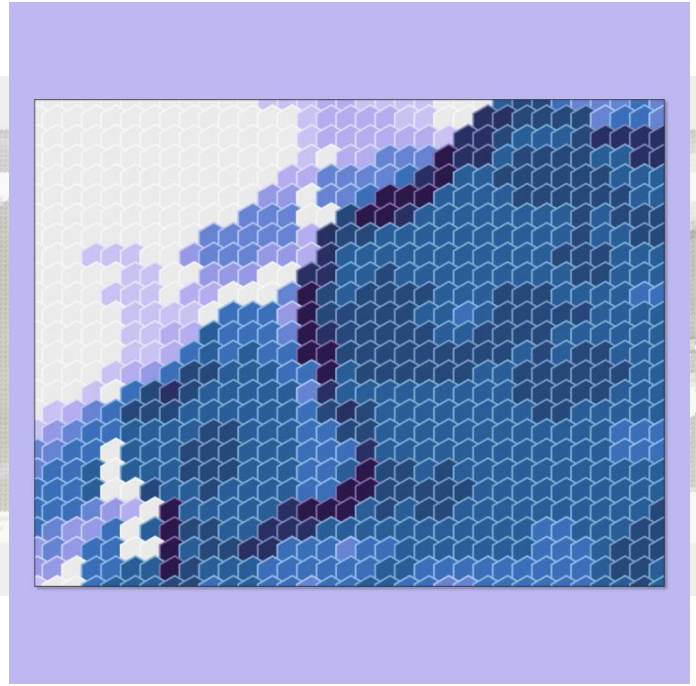


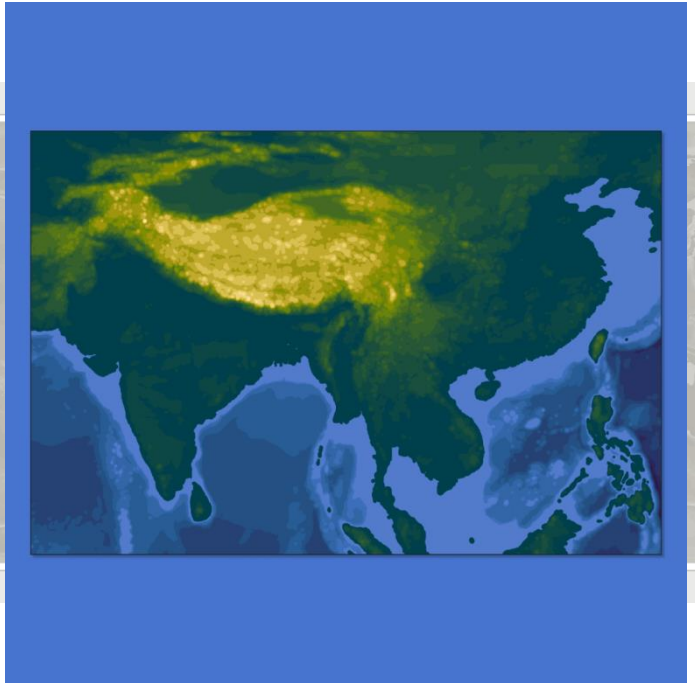


eea.europa.eu/data-and-maps/data/world-digital-elevation-model-etopo5

ETOPO5

World Digital Elevation Model

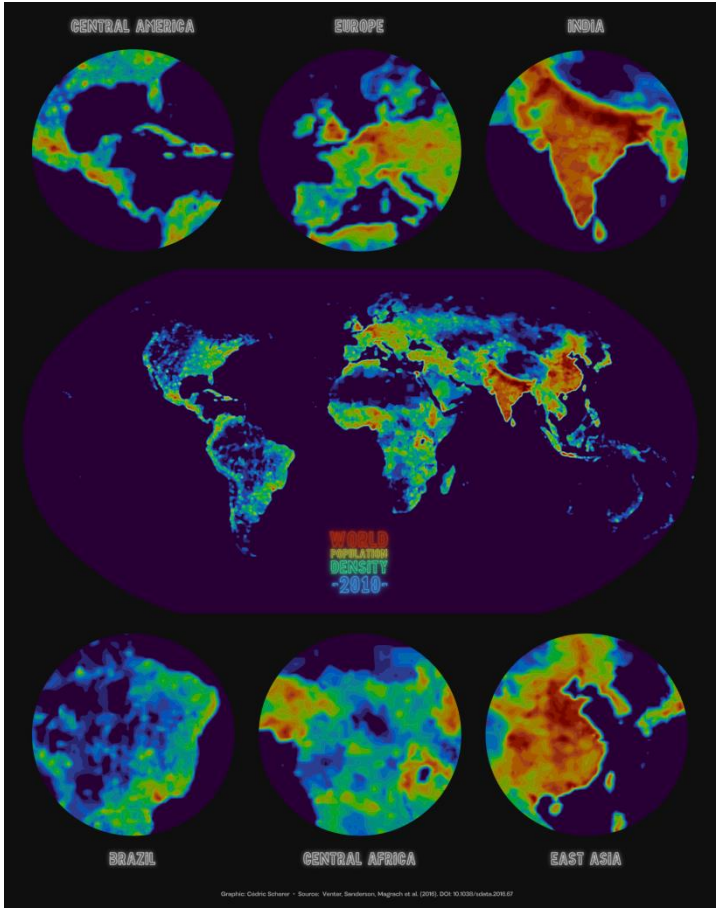


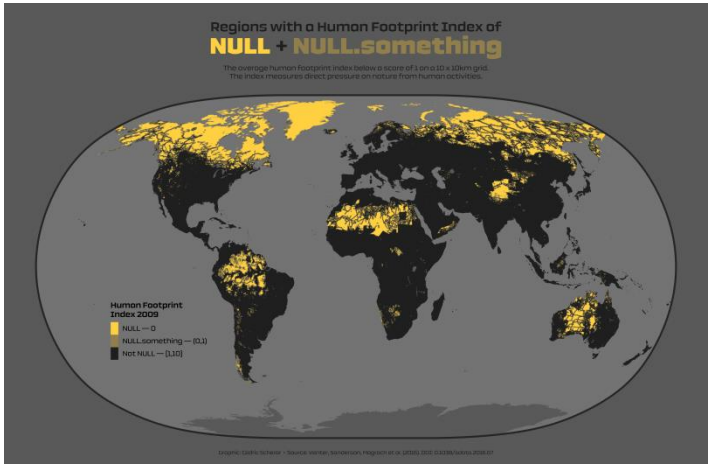


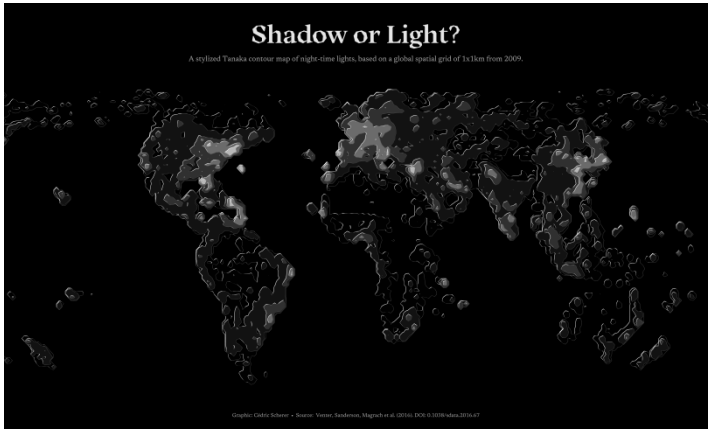
eea.europa.eu/data-and-maps/data/world-digital-elevation-model-etopo5

Venter et al. 2016

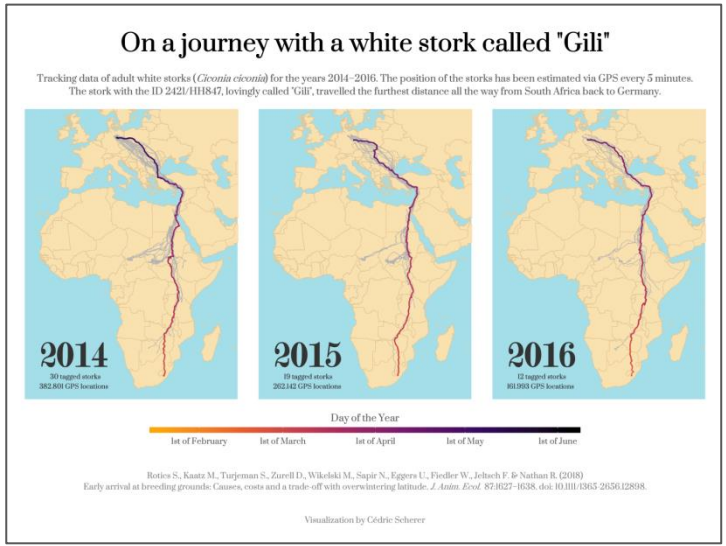
Sci Data 3, 160067. DOI: 10.1038/sdata.2016.67

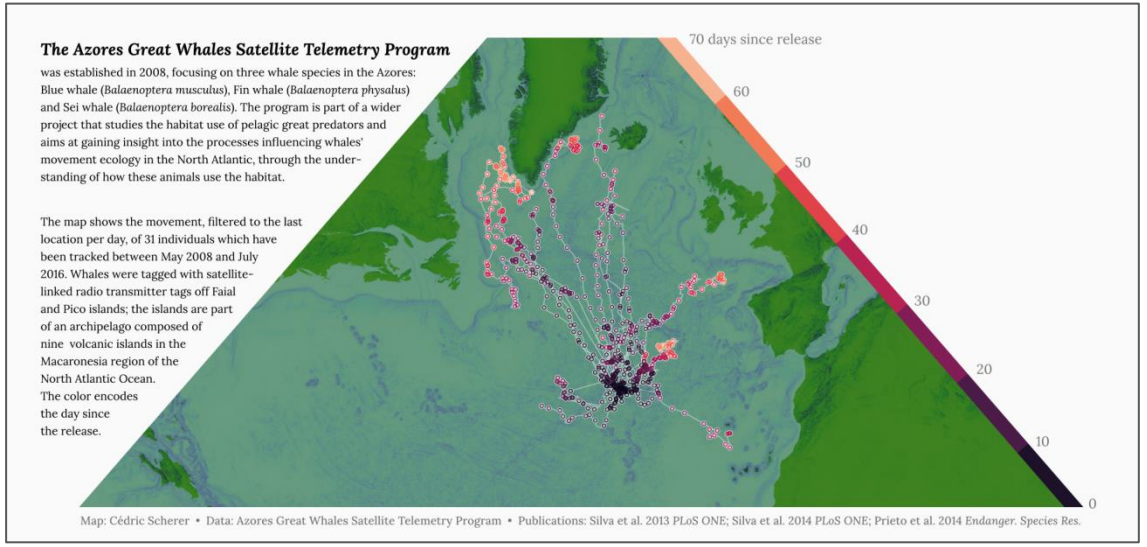






Movebank


On a journey with a white stork called "Gili"
Tracking data of adult white storks (*Ciconia ciconia*) for the years 2014–2016. The position of the storks has been estimated via GPS every 5 minutes.
The stork with the ID 2421/HH847, lovingly called "Gili", travelled the furthest distance all the way from South Africa back to Germany.
2014
30 tagged storks
382.801 GPS locations
2015
19 tagged storks
262.142 GPS locations
2016
12 tagged storks
161.993 GPS locations
Day of the Year
1st of February
1st of March
1st of April
1st of May
1st of June
Roties S., Kaatz M., Turjeman S., Zurell D., Wikelski M., Sapir N., Eggers U., Fiedler W., Jeltsch F. & Nathan R. (2018)
Early arrival at breeding grounds: Causes, costs and a trade-off with overwintering latitude. *J. Anim. Ecol.* 87:1627–1638. doi: 10.111/1365-2656.12898.
Visualization by Cédric Scherer


The Azores Great Whales Satellite Telemetry Program
was established in 2008, focusing on three whale species in the Azores: Blue whale (*Balaenoptera musculus*), Fin whale (*Balaenoptera physalus*) and Sei whale (*Balaenoptera borealis*). The program is part of a wider project that studies the habitat use of pelagic great predators and aims at gaining insight into the processes influencing whales' movement ecology in the North Atlantic, through the understanding of how these animals use the habitat.
The map shows the movement, filtered to the last location per day, of 31 individuals which have been tracked between May 2008 and July 2016. Whales were tagged with satellite-linked radio transmitter tags off Faial and Pico islands; the islands are part of an archipelago composed of nine volcanic islands in the Macaronesia region of the North Atlantic Ocean. The color encodes the day since the release.
70 days since release
60
50
40
30
20
10
0
Map: Cédric Scherer • Data: Azores Great Whales Satellite Telemetry Program • Publications: Silva et al. 2013 PLoS ONE; Silva et al. 2014 PLoS ONE; Prieto et al. 2014 *Endanger. Species Res.*

More Data Sources

EuroStat

GHSL (Global Human Settlement Layer)

USGS Global Island Explorer

Wikipedia

FIS Broker (Geoportal Berlin)

...

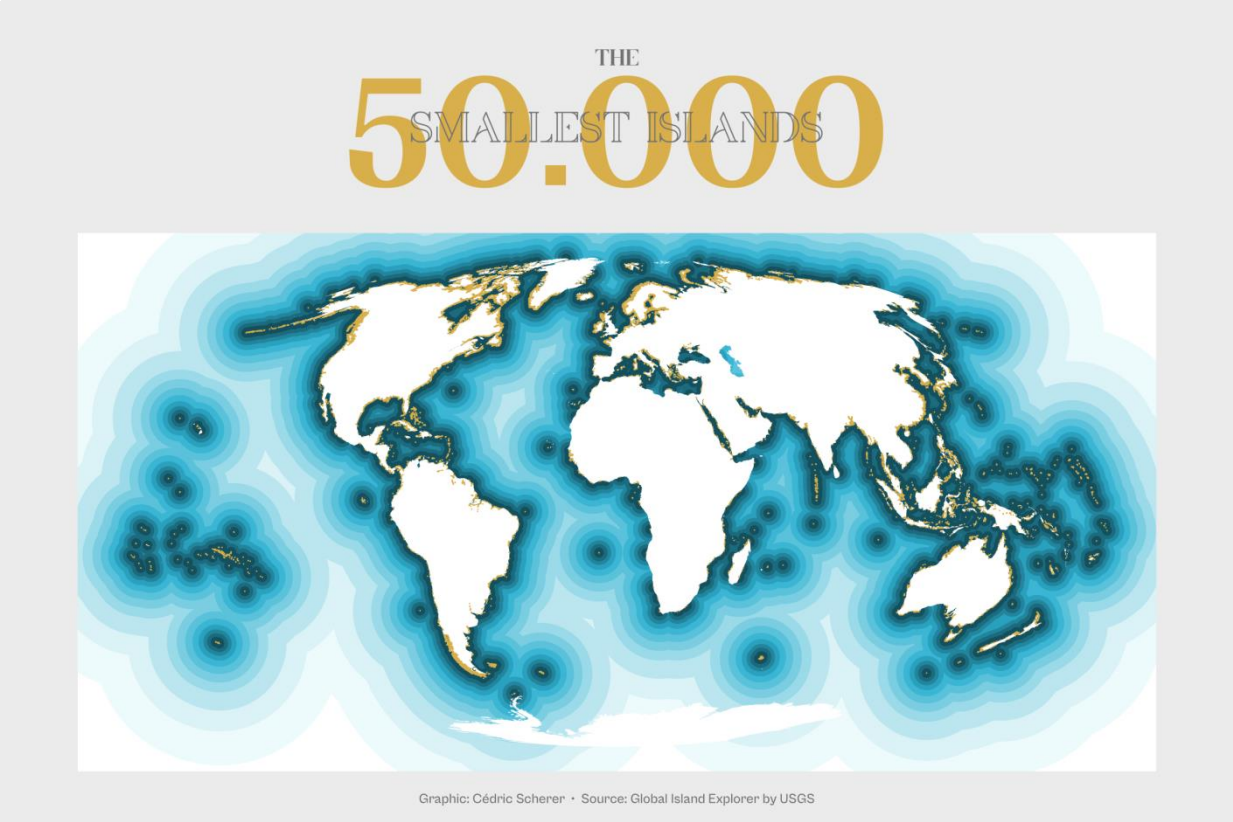
IDEAS

DATA

TRICKS

EXTENSIONS

Draw a Nice Sphere

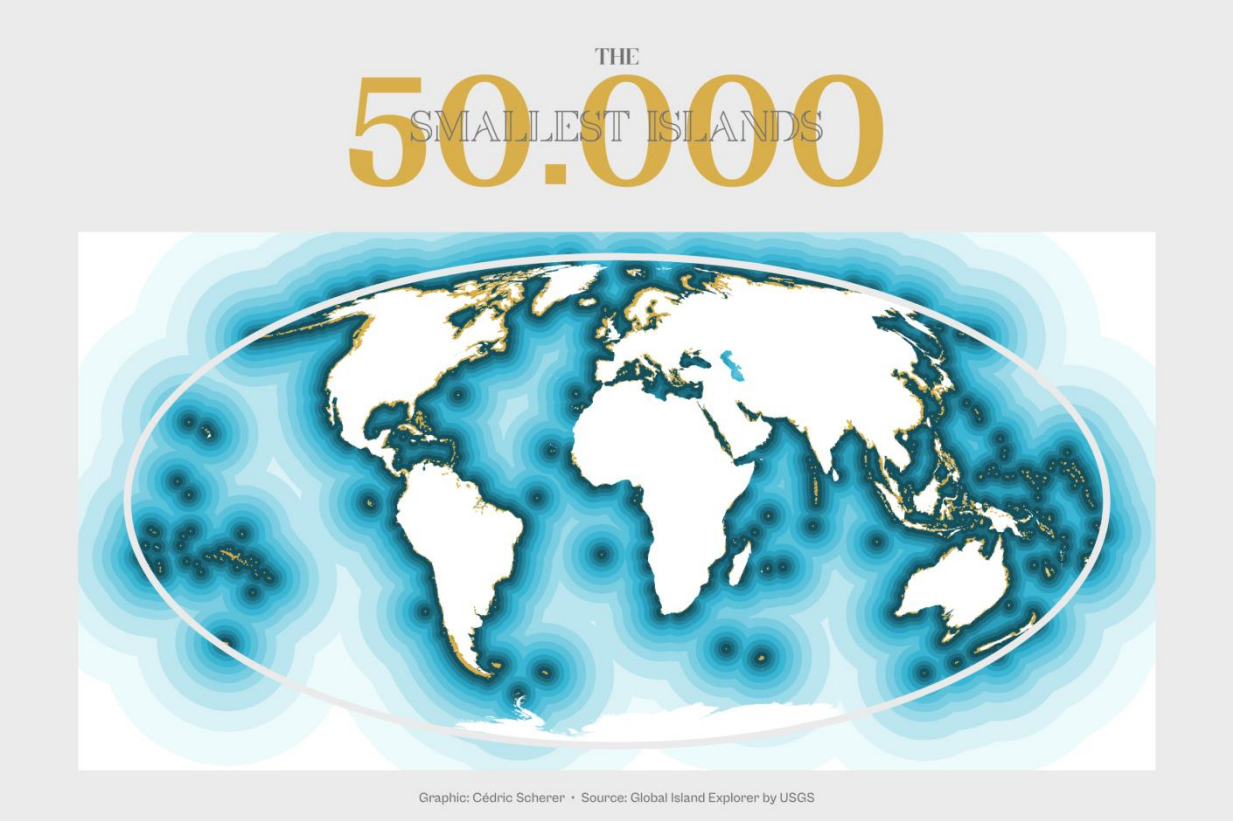


Draw a Nice Sphere

```
sf_sphere <-
  rnaturalearth::ne_download(
    scale = 10, category = "physical",
    type = "wgs84_bounding_box", returnclass = "sf"
  ) %>%
  st_transform(crs = st_crs(sf_islands))
```

Draw a Nice Sphere

```
rnaturalearth::ne_download(category = "physical", type = "wgs84_bounding_box")
```



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sf_bbox <-
  sf_sphere %>%
  st_bbox() %>%
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```

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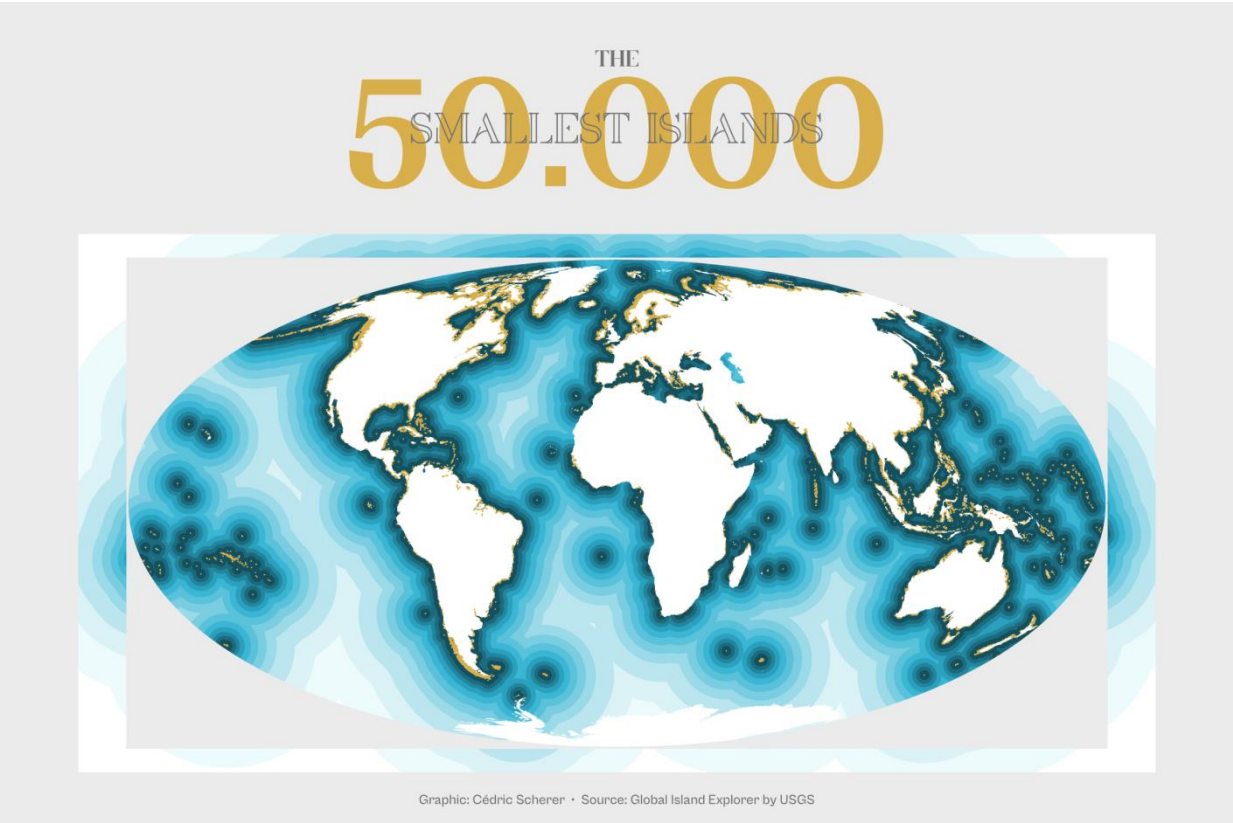
  ) %>%
  st_transform(crs = st_crs(sf_islands))

sf_bbox <-
  sf_sphere %>%
  st_bbox() %>%
  st_as_sfc()

sf_outside <- st_difference(sf_bbox, sf_sphere)
```

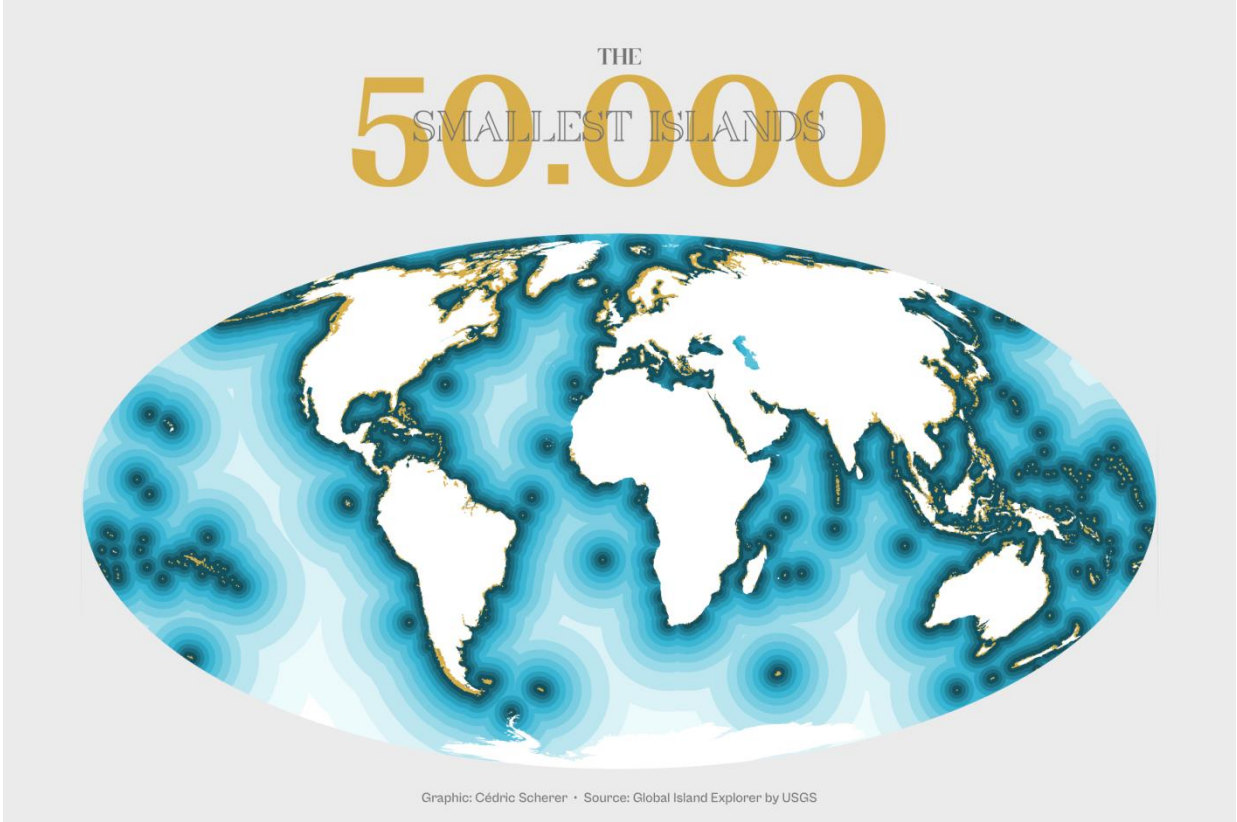
Draw a Nice Sphere

```
ggplot(sf_islands) + ... + geom_sf(data = sf_outside)
```

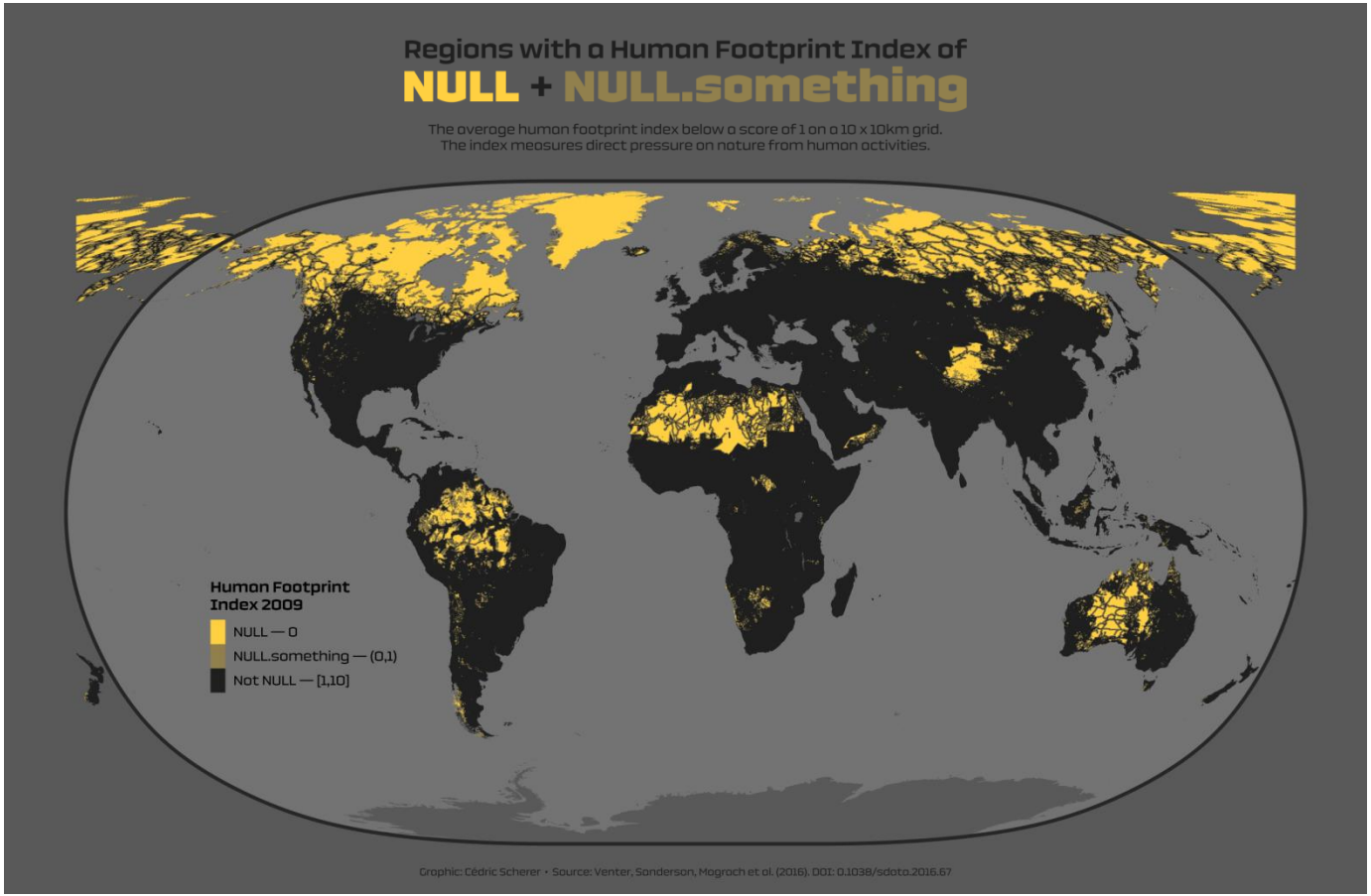


Draw a Nice Sphere

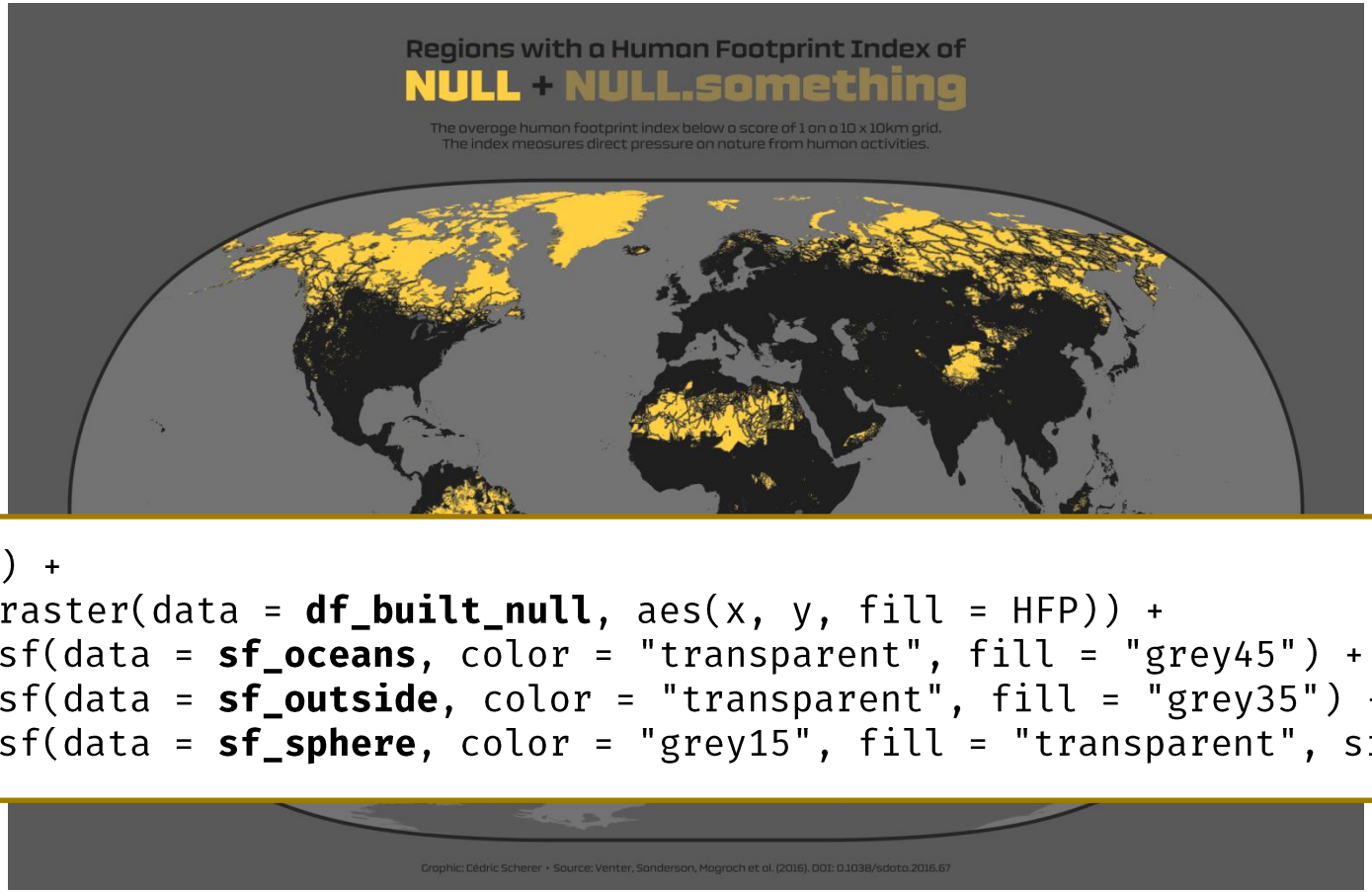
```
ggplot(sf_islands) + ... + coord_sf(expand = FALSE)
```



Draw a Nice Sphere

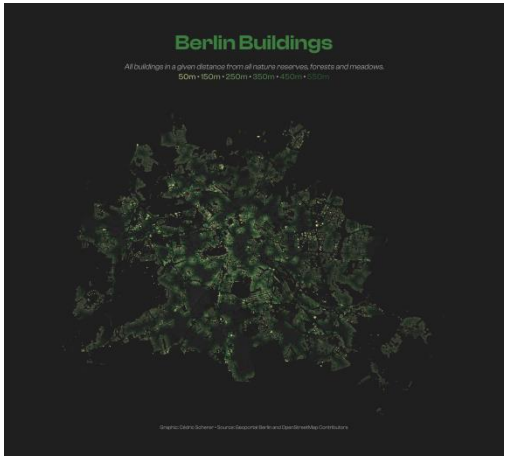


Draw a Nice Sphere




```
ggplot() +
  geom_raster(data = df_built_null, aes(x, y, fill = HFP)) +
  geom_sf(data = sf_oceans, color = "transparent", fill = "grey45") +
  geom_sf(data = sf_outside, color = "transparent", fill = "grey35") +
  geom_sf(data = sf_sphere, color = "grey15", fill = "transparent", size = 2)
```

Extract Polygons



Extract Polygons

```
## buffer main roads
sf_roads_buffer_50 <- st_buffer(sf_roads, dist = 50)
```

Extract Polygons

```
## buffer main roads
sf_roads_buffer_50 <- st_buffer(sf_roads, dist = 50)

## rasterize buffered main roads
ras_bbox <- raster(nrow = 1800, ncol = 4320, extent(sf_main))

ras_roads_50 <- fasterize::fasterize(sf_roads_buffer_50, ras_bbox)
```

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ras_roads_50 <- fasterize::fasterize(sf_roads_buffer_50, ras_bbox)

## extract buildings that overlap with buffers
buildings_roads_50 <- exactextractr::exact_extract(ras_roads_50, sf_buildings, "sum")
```

Extract Polygons

```
## buffer main roads
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ras_bbox <- raster(nrow = 1800, ncol = 4320, extent(sf_main))

ras_roads_50 <- fasterize::fasterize(sf_roads_buffer_50, ras_bbox)

## extract buildings that overlap with buffers
buildings_roads_50 <- exactextractr::exact_extract(ras_roads_50, sf_buildings, "sum")

## add info to original sf object
sf_buildings$buildings_roads_50  <- buildings_roads_50
```

IDEAS

DATA

TRICKS

EXTENSIONS

Interesting Extension Packages

Getting Spatial Data

{rnaturalearth}

{osmdata}

{osmextract}

{elevatr}

Interesting Extension Packages

Handling + Transforming Spatial Data

{terra}

{stars}

{exactextractr}

{cartogram}

Interesting Extension Packages

Crafting Maps

{stars}

{ggnewscale}

{patchwork}

{rayrender}

{echarts4r}

The GOOD

The BAD

The UGLY

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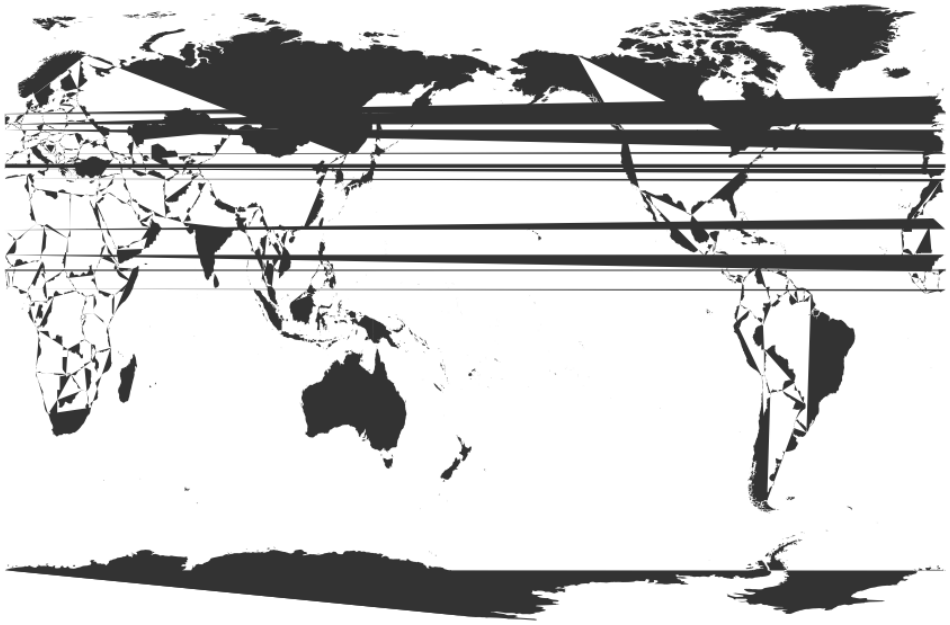
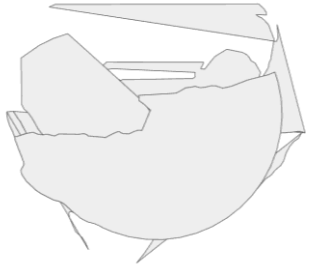
* Sometimes very slow
* Map transformations may cause problems
* Fiddling around with technical details

The UGLY





pieterprovoost.be/blog/fixing-projection-issues

geocompr.robinlovelace.net/reproj-geo-data.html

```
xlims = c(-280, 80)
ylims = c(-55, 75)

df_map <- map_data('world', wrap = xlims, ylim = ylims)

ggplot(df_map, aes(long, lat, group = group)) +
  geom_polygon() +
  coord_map("gilbert", xlim = xlims, ylim = ylims)
```

```
xlims = c(-70, 290)
ylims = c(-55, 75)

df_map <- map_data('world', wrap = xlims, ylim = ylims)

ggplot(df_map, aes(long, lat, group = group)) +
  geom_polygon() +
  coord_map("gilbert", xlim = xlims, ylim = ylims)
```

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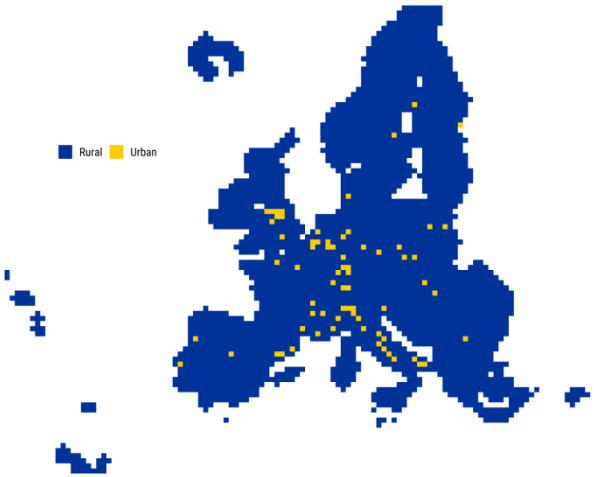
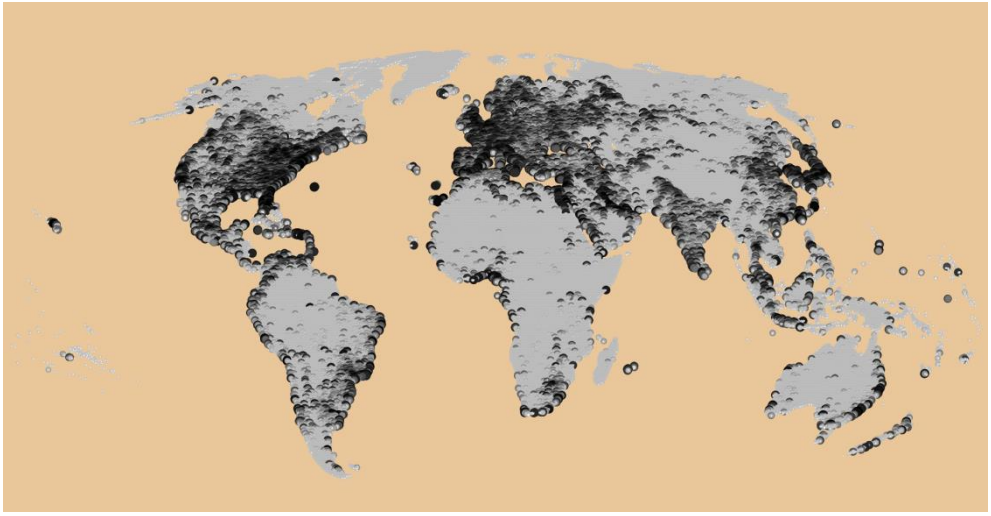
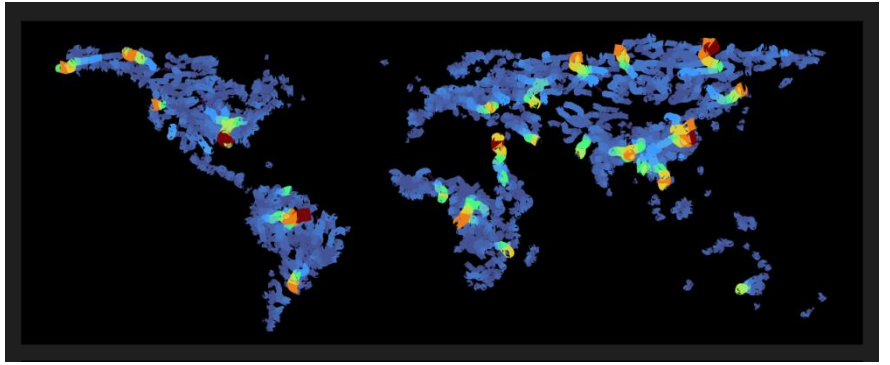

Rural
Urban





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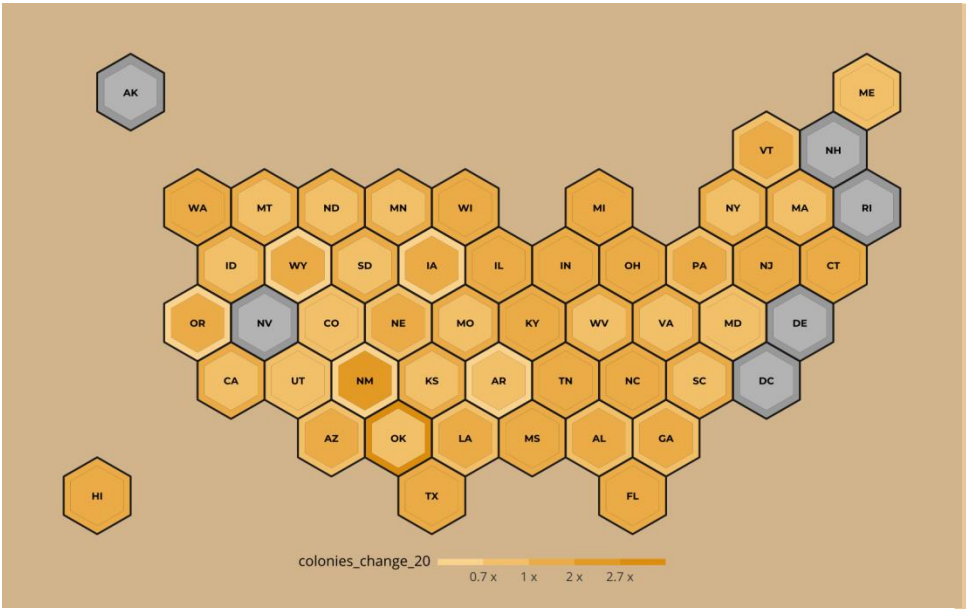
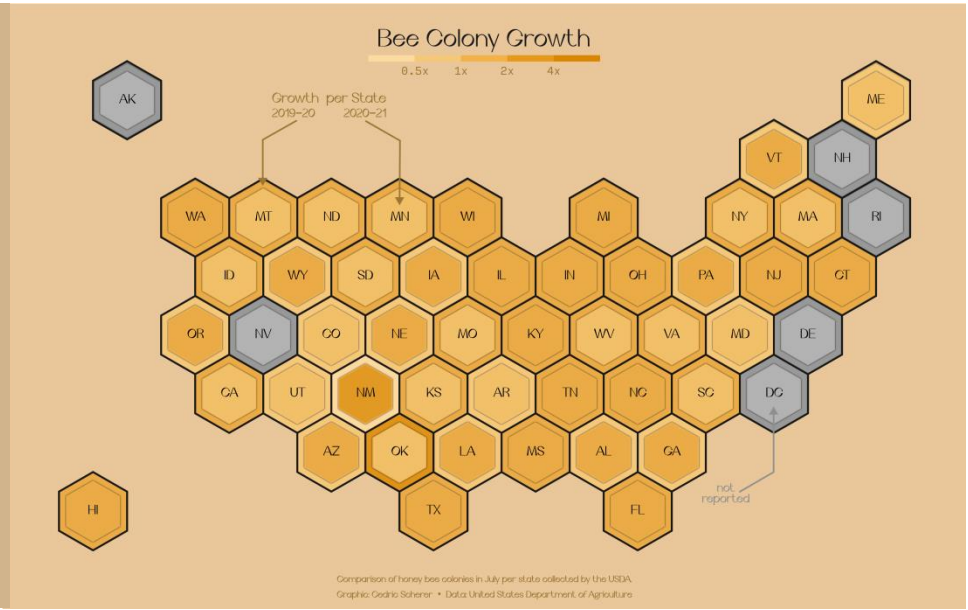
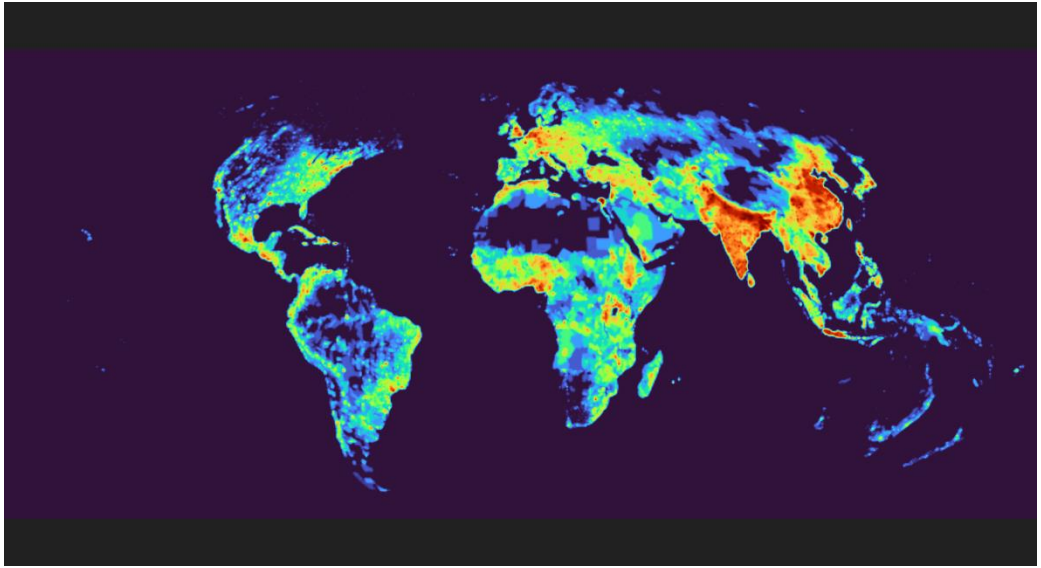
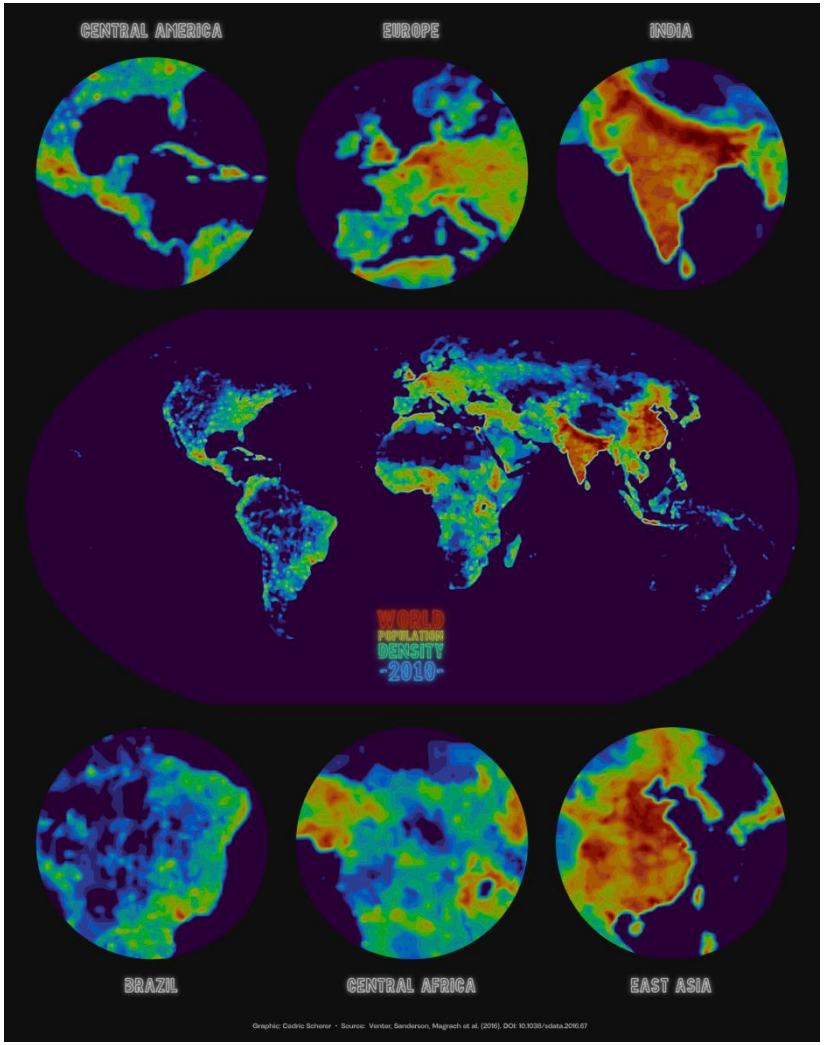
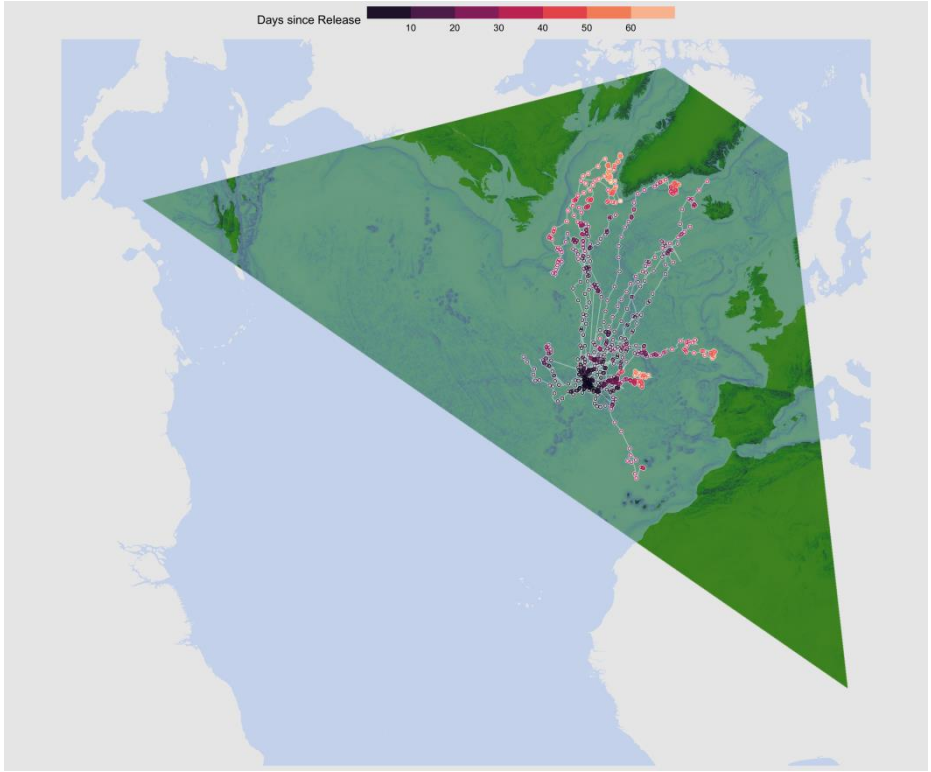

AK
ME
VT
NH
WA
MT
ND
MN
WI
MI
NY
MA
RI
ID
WY
SD
IA
IL
IN
OH
PA
NJ
CT
OR
NV
CO
NE
MO
KY
WV
VA
MD
DE
CA
UT
NM
KS
AR
TN
NC
SC
DC
AZ
OK
LA
MS
AL
GA
HI
TX
FL
colonies_change_20
0.7 x
1 x
2 x
2.7 x


Bee Colony Growth
0.5x
1x
2x
4x
Growth per State
2019–20
2020–21
AK
ME
VT
NH
WA
MT
ND
MN
WI
MI
NY
MA
RI
ID
WY
SD
IA
IL
IN
OH
PA
NJ
CT
OR
NV
CO
NE
MO
KY
WV
VA
MD
DE
CA
UT
NM
KS
AR
TN
NC
SC
DC
AZ
OK
LA
MS
AL
GA
HI
TX
FL
not reported
Comparison of honey bee colonies in July per state collected by the USDA.
Graphic: Cedric Scherer • Data: United States Department of Agriculture




CENTRAL AMERICA
EUROPE
INDIA
WORLD
POPULATION
DENSITY
2010
BRAZIL
CENTRAL AFRICA
EAST ASIA
Graphic: Cédric Scherer • Source: Venter, Sanderson, Magrach et al. (2016). DOI: 10.1038/sdata.2016.67



The Azores Great Whales Satellite Telemetry Program

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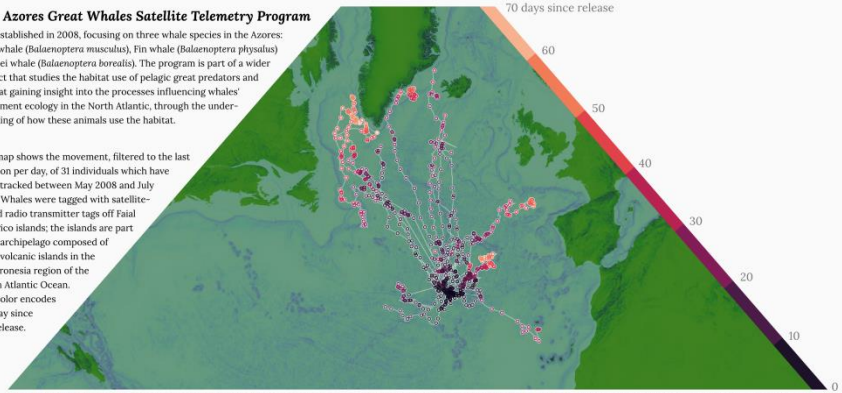

Map: Cédric Scherer • Data: Azores Great Whales Satellite Telemetry Program • Publications: Silva et al. 2013 *PLoS ONE*; Silva et al. 2014 *PLoS ONE*; Prieto et al. 2014 *Endanger. Species Res.*

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04_hexagons_beekeepers_germany 1

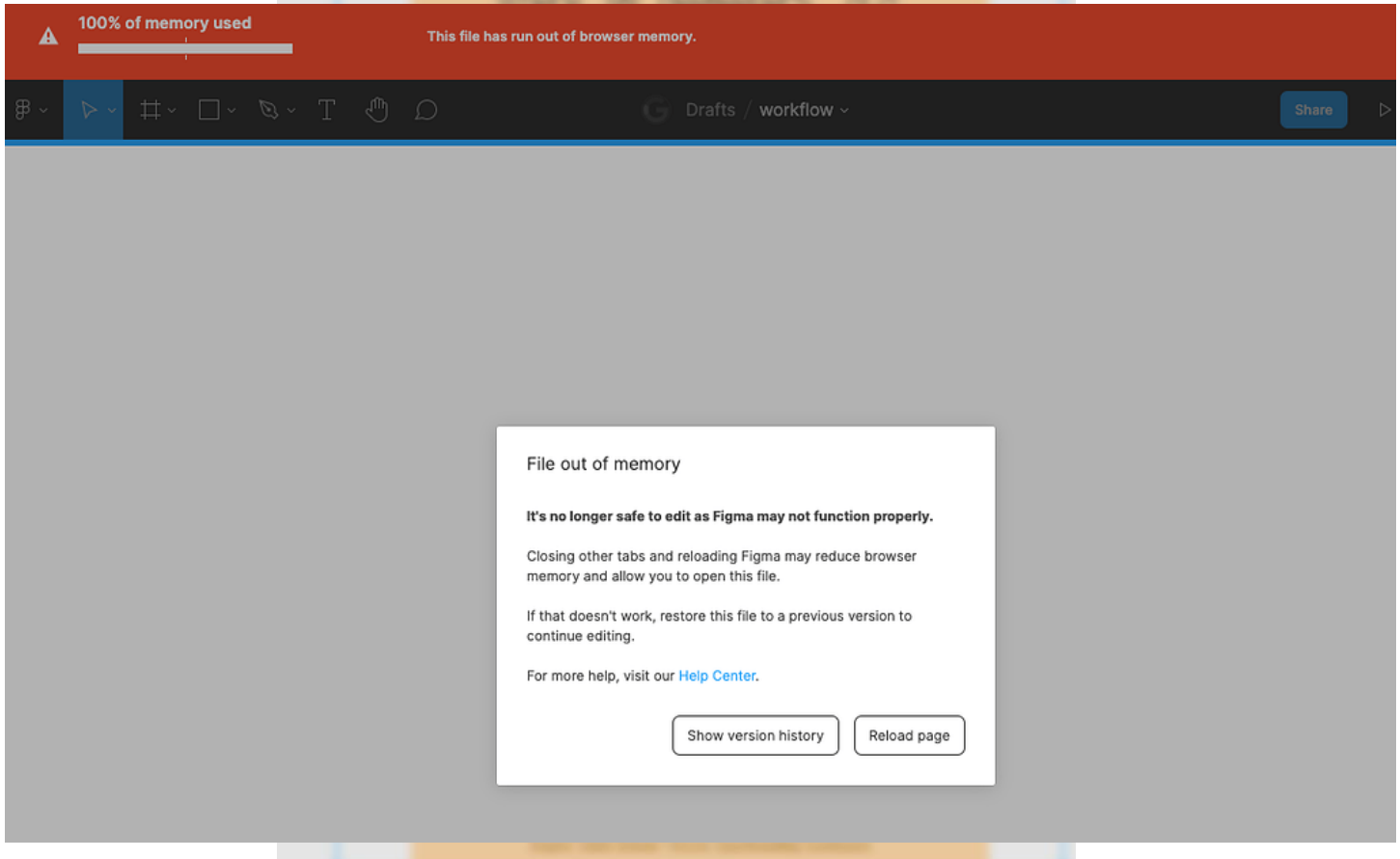
Show Me the Honey:
Where My Beekeepers At?!

Counts of Beekeepers in Germany Listed in OpenStreetMaps

1 5 10 15 20 25 31

Graphic: Cédric Scherer • Source: OpenStreetMap Contributors

1080 × 1404


100% of memory used
This file has run out of browser memory.
Drafts / workflow
Share
File out of memory
It's no longer safe to edit as Figma may not function properly.
Closing other tabs and reloading Figma may reduce browser memory and allow you to open this file.
If that doesn't work, restore this file to a previous version to continue editing.
For more help, visit our Help Center.
Show version history
Reload page

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The First #30DayChartChallenge

A Summary of Inspiring Contributions, Our Learnings, and About the Value of Challenges in General

Dr. Cédric Scherer • Data Visualization Lisboa • May 20 2021

@CedScherer • @DatavisLisboa • #vislis

youtu.be/ckOAWmOblyM

My Favorite ggplot2 Extension Packages

Dr. Cédric Scherer

RLadies Tunis
July 8th 2021

youtu.be/8ikFe82Mb1I

ggplot Wizardry

My Favorite Tricks and Secrets for Beautiful Plots in R

Dr. Cédric Scherer
Freelancing Data Visualization Designer

Image: Freepik.com

Outlier DATA VISUALIZATION SOCIETY

github.com/Z3tt/OutlierConf2021

THANK YOU

www.cedricscherer.com

CedScherer cedricpscherer

Buy me a coffee