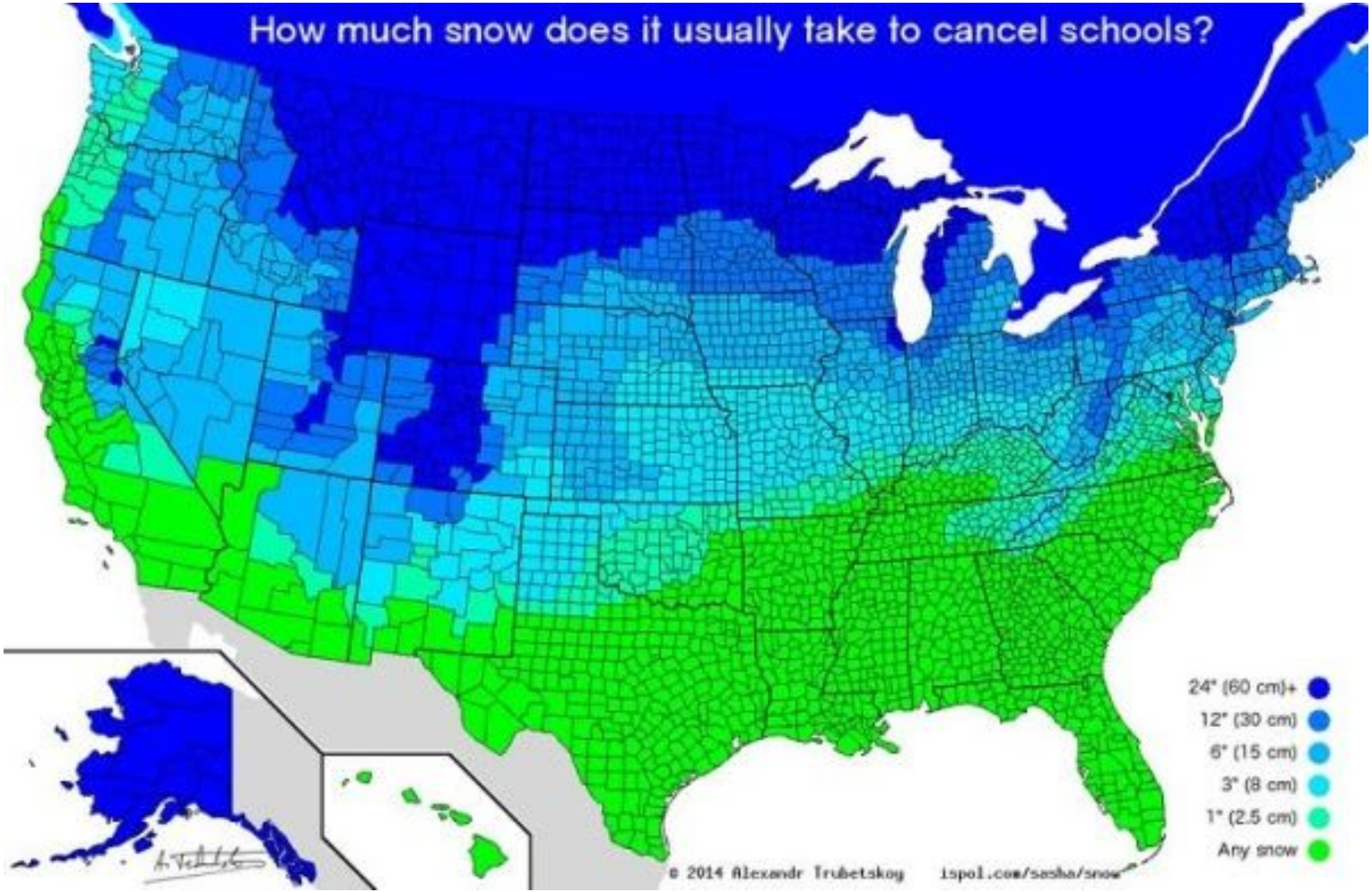
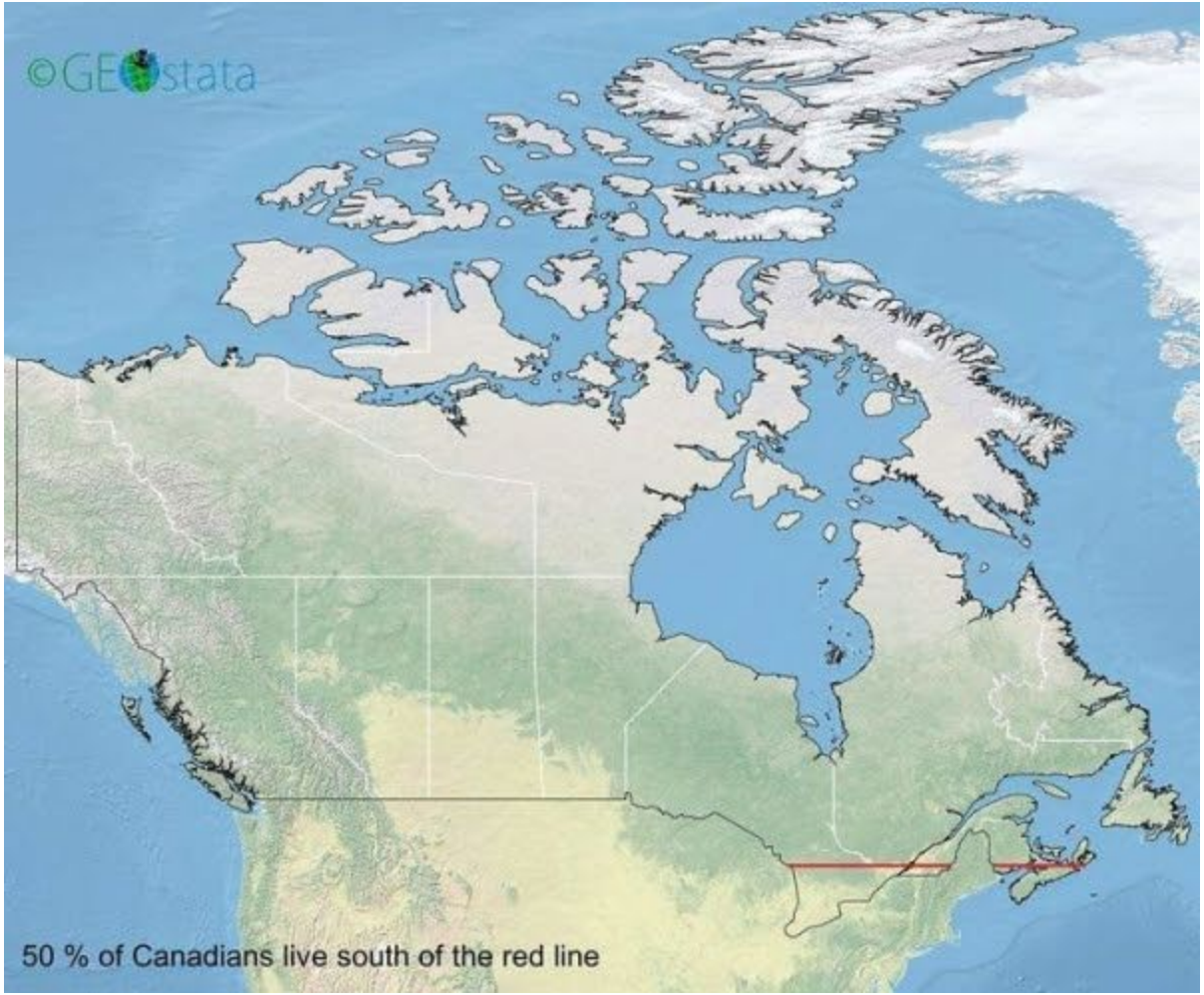
Maps

Most common foreign birth country of US residents, excluding Mexico


BOEING
intel
Walmart
SANFORD HEALTH
MAYO CLINIC
St Luke's
Avera Health Plans
UW
SUNY
UPMC
MGM GRAND
Intermountain Healthcare
Nebraska Lincoln
The University of Iowa
KU
KANSAS
UNM
PROVIDENCE
BIGGEST EMPLOYERS


How much snow does it usually take to cancel schools?
24" (60 cm)+
12" (30 cm)
6" (15 cm)
3" (8 cm)
1" (2.5 cm)
Any snow
© 2014 Alexandr Trubetskoy
ispol.com/sasha/snow


©GEOstata
50 % of Canadians live south of the red line

The orange and red colored regions have roughly equal populations

The population of the states colored blue is roughly that of LA county

ggmap

get_map

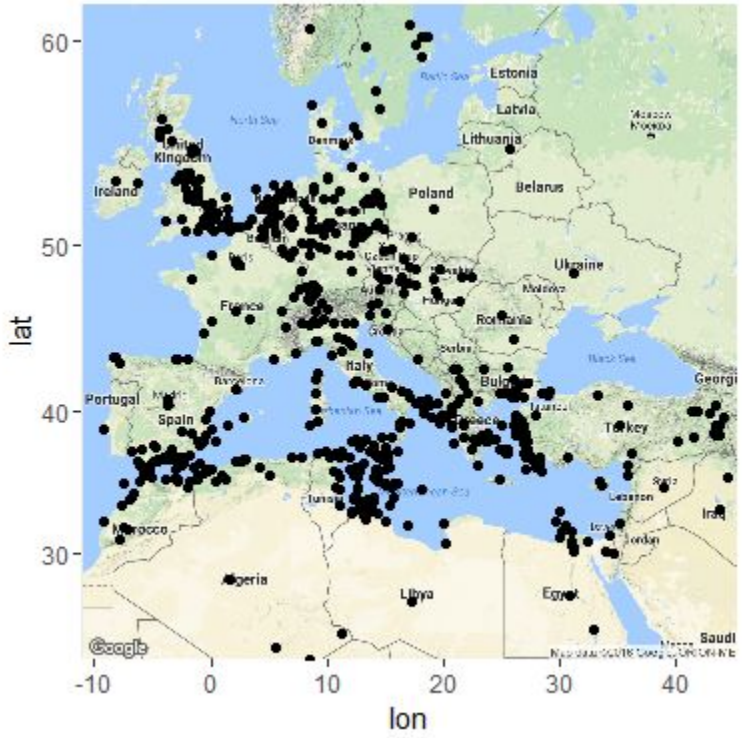
Arguments

location	an address, longitude/latitude pair (in that order), or left/bottom/right/top bounding box
zoom	map zoom, an integer from 3 (continent) to 21 (building), default value 10 (city). openstreetmaps limits a zoom of 18, and the limit on stamen maps depends on the maptype. "auto" automatically determines the zoom for bounding box specifications, and is defaulted to 10 with center/zoom specifications. maps of the whole world currently not supported.
scale	scale argument of get_googlemap or get_openstreetmap
maptype	character string providing map theme. options available are "terrain", "terrain-background", "satellite", "roadmap", and "hybrid" (google maps), "terrain", "watercolor", and "toner" (stamen maps), or a positive integer for cloudmade maps (see ?get_cloudmademap)
source	Google Maps ("google"), OpenStreetMap ("osm"), Stamen Maps ("stamen"), or CloudMade maps ("cloudmade")
force	force new map (don't use archived version)
messaging	turn messaging on/off

Migrants

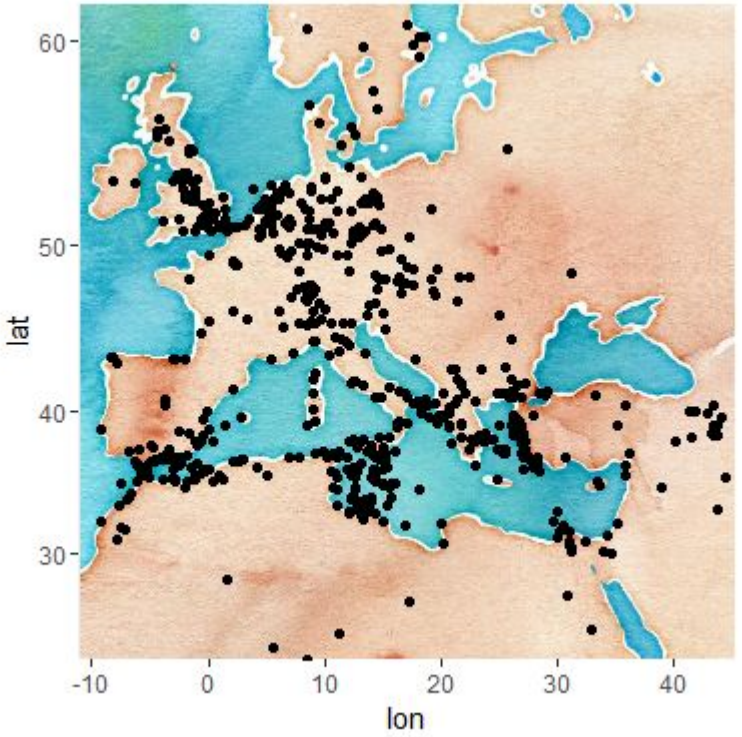
```
map <- get_map(location
= c(17, 45), zoom = 4)

ggmap(map) +
  geom_point(data =
migrants,
aes(longitude,
latitude))
```

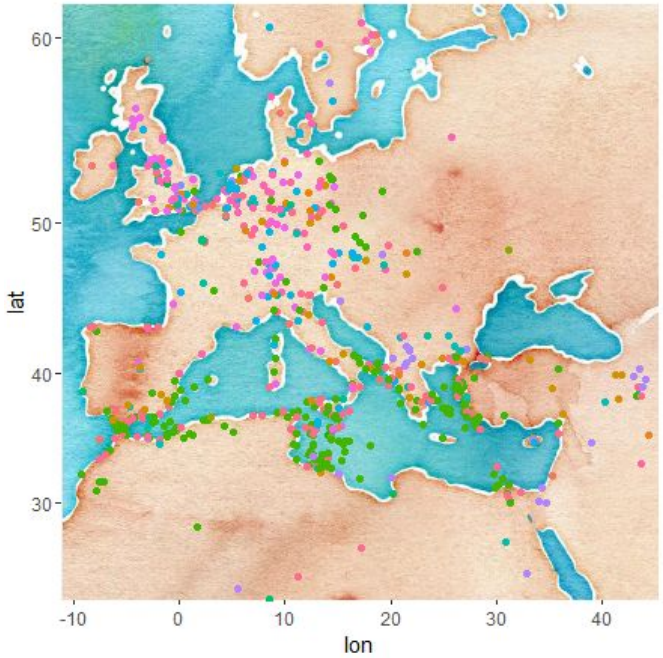


Migrants

```
map <- get_map(location
= c(17, 45), zoom = 4,
maptype = "watercolor")
```



Migrants

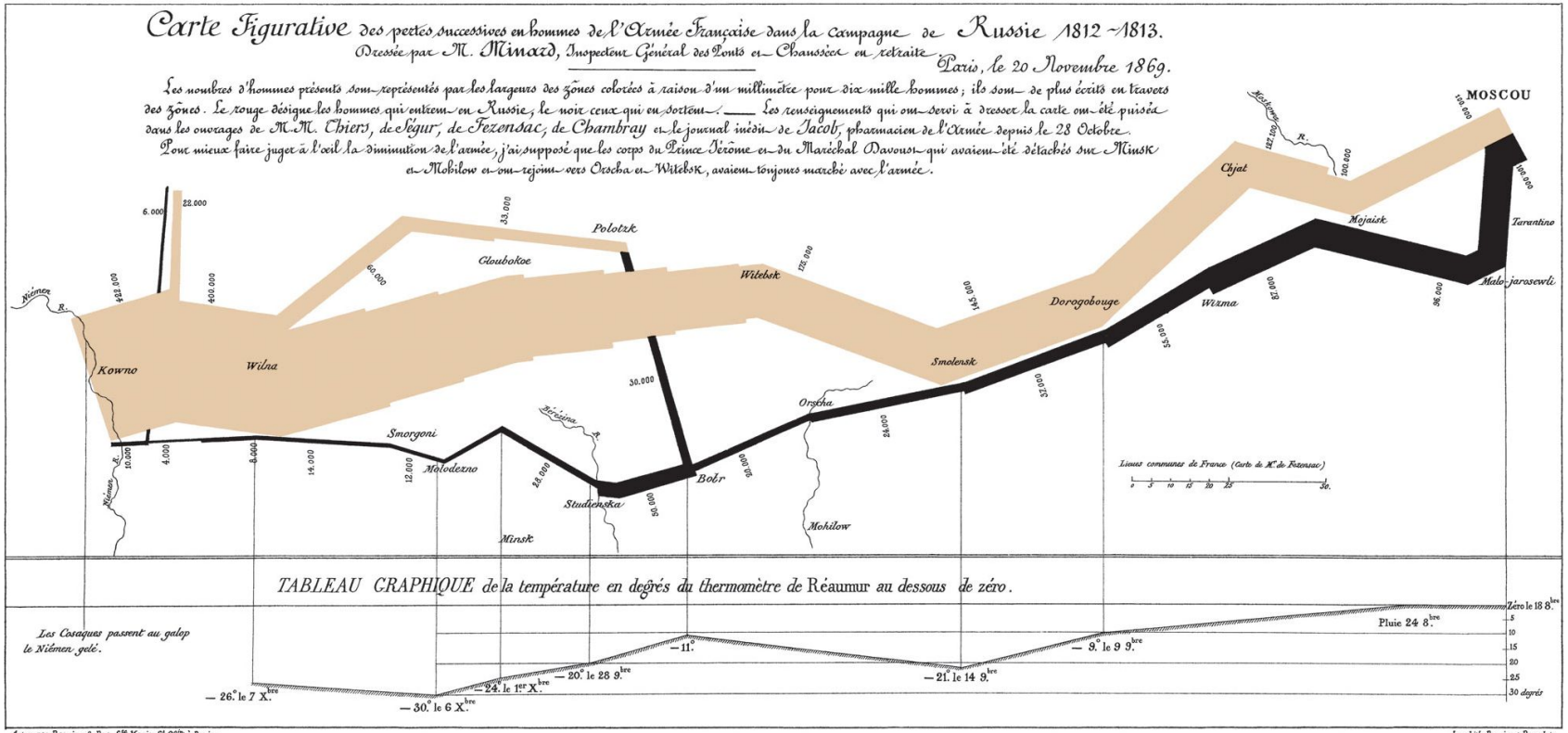


cause_of_death

- asphyxiated
- attacked by animals
- bled to death due to barbed wire
- blown in minefield
- burned
- burned or asphyxiated due to arson attack
- car accident
- crushed
- died (presumably) from ill treatments
- died after a fight
- died because of dangerous undeclared work
- died from dehydration
- died in childbirth
- died of a shock
- died of kidney failure
- died of suddent infant death
- drowned
- drowned or thirst
- electrocuted
- executed
- exhaustion
- exhaustion or thirst
- fall
- frozen
- heart failure
- heat exhaustion
- hypothermia
- hypothermia and dehydration
- illness
- killed by bomb
- lack of medical care
- murdered
- police violence
- run over
- run over by a bus
- run over by a car
- run over by a train
- run over by a truck
- shot
- shot by the police
- starved
- starved or died from dehydration
- suffocated or drowned
- suicide
- suicide - hanged
- suicide - hungerstrike
- suicide - jumped from building
- suicide - jumped from train
- suicide - jumped in water
- suicide - other
- suicide - put on fire
- suicide - under train
- unknown
- wrong medical treatment, overdose

Napoleon’s March

The Minard Map: "Best statistical graphic ever"



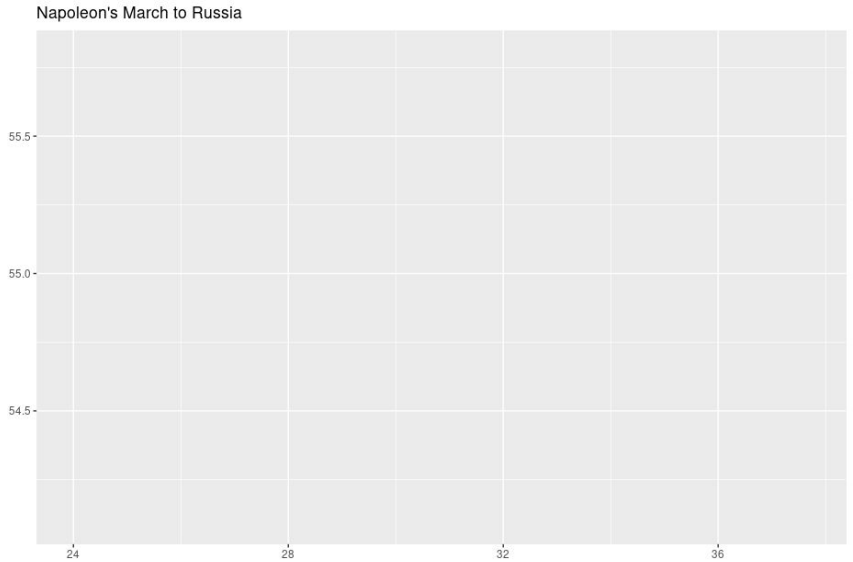
The Minard Map

Load the libraries and the data

```
library(dplyr)
library(ggplot2)
library(scales)
library(ggmap)

# this part looks a bit different in the handout
minard <- read.csv("minard.csv", row.names = 1,
stringsAsFactors = FALSE)
```

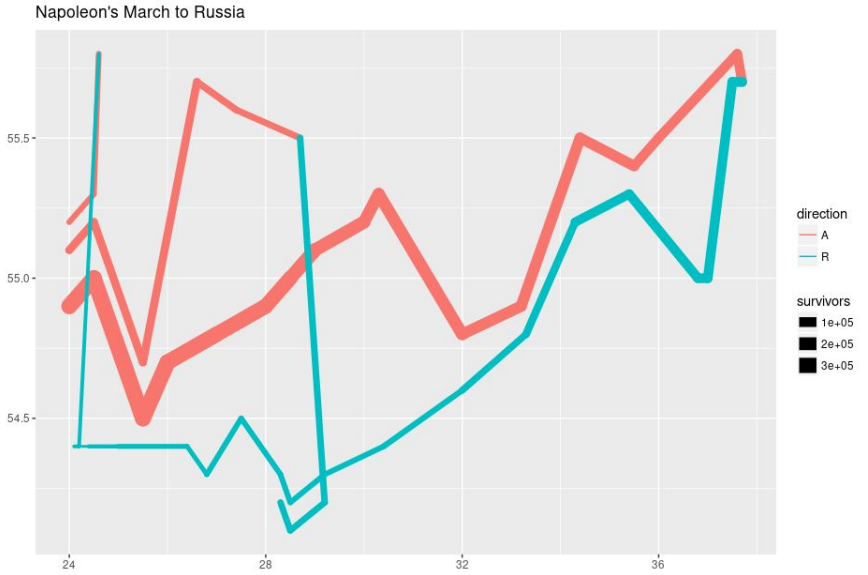
The Minard Map



Create the first layer:
background and titles

```
layer1 <- ggplot(data = troops,
                 aes(x = long, y=lat)) +
  xlab("") + ylab("") +
  ggtitle("Napoleon's March to Russia")
```

The Minard Map



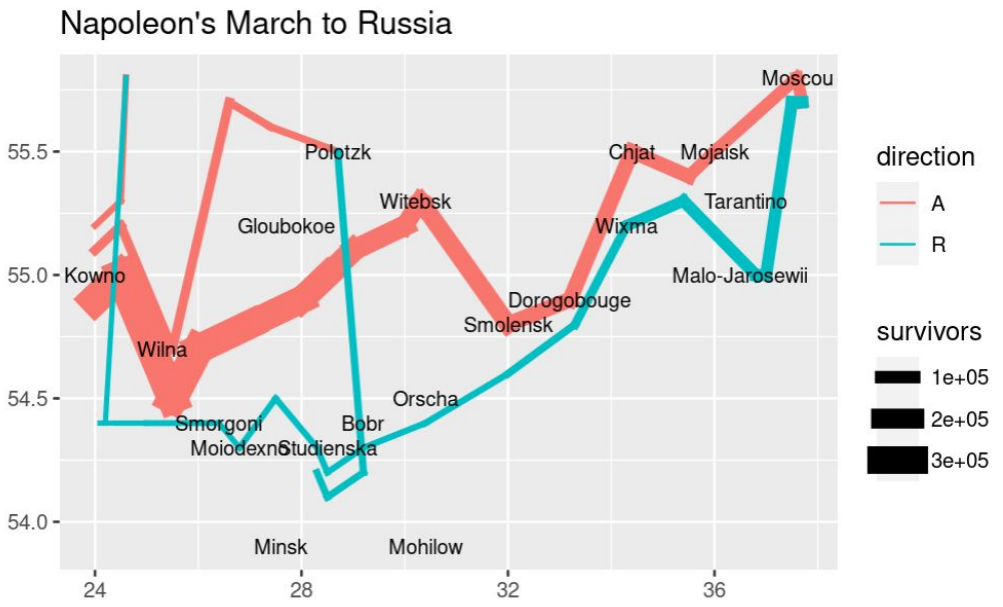
Create the second layer:
The troops data

```
layer2 <- geom_path(
  data = troops,
  aes(linewidth = survivors,color = direction,
      group = division),
  lineend = "square",
  linejoin = "round")
```

The Minard Map

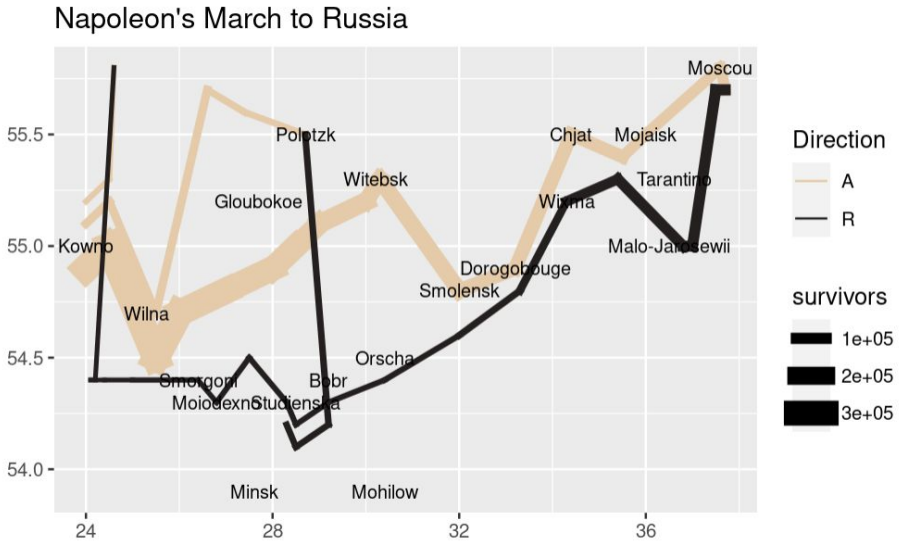
Create the third layer:
Add the cities

```
layer3 <- geom_text(
  data = cities,
  aes(label = city),
  size = 3)
```



The Minard Map

Create the fourth layer:
Adjust the colors and legends




```
layer1 + layer2 + layer3 +
  scale_size(
    "Survivors",
     range = c(1, 10),
     label = label_comma()) +
  scale_color_manual(
    "Direction",
    values = c("#e5cbaa", "#252020"))
```

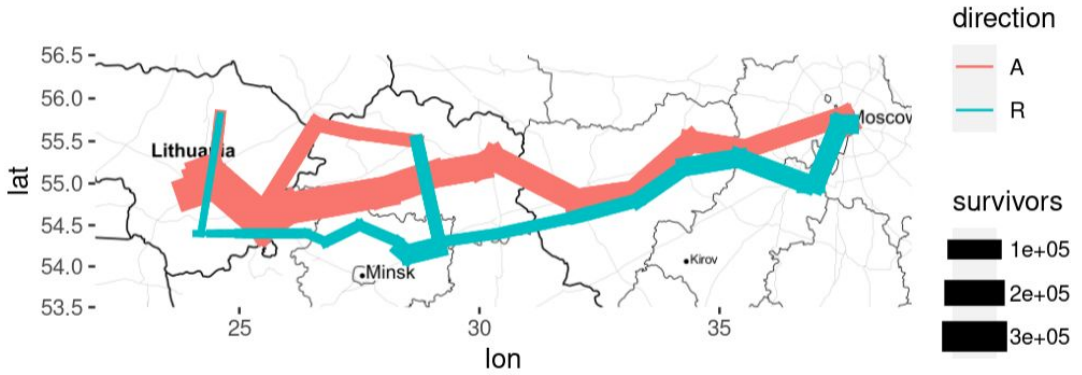
The Minard Map

Change the background to a map of Russia


```
russia <- ggmap(get_map(
    location = c(left = 22, bottom = 53.5, right =
39, top = 56.5),
    zoom = 6,
    maptype = "toner",
    source = "stamen"))
```

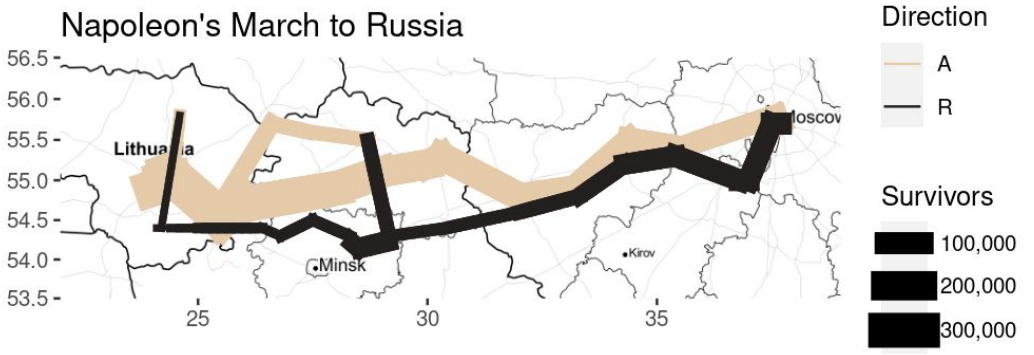
The Minard Map

Create the second layer:
The troops data




```
russia_layer2 <- geom_path(
  data = troops,
  aes(x = long, y = lat, size = survivors, color =
direction, group = division),
  lineend = "square",
  linejoin = "round")
```

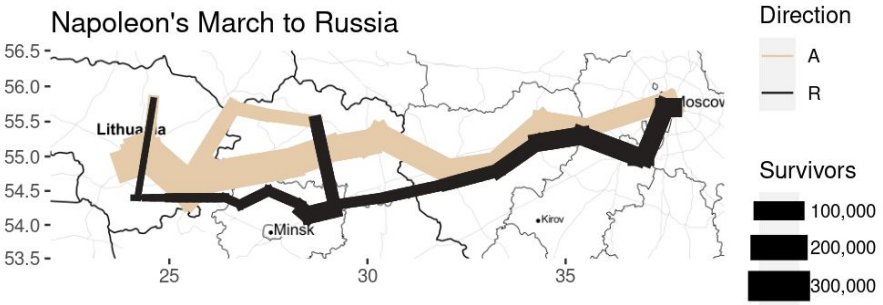
The Minard Map

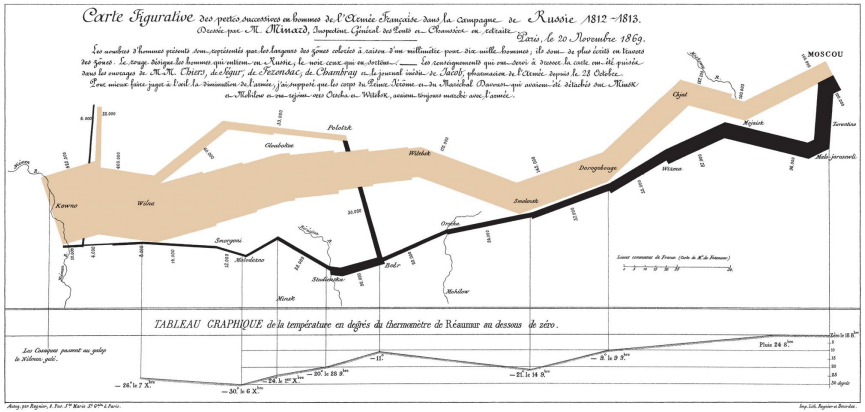


Adjust the colors and legends

```
russia + russia_layer2 + xlab("") + ylab("") +
  ggtitle("Napoleon's March to Russia") +
  scale_size("Survivors",
             range = c(1, 7),
             label = label_comma()) +
  scale_color_manual(
    "Direction",
    values = c("#e5cbaa", "#252020"))
```

Comparison


Napoleon's March to Russia
56.5
56.0
55.5
55.0
54.5
54.0
53.5
25
30
35
Minsk
Kirov
Direction
A
R
Survivors
100,000
200,000
300,000


Carte figurative des pertes successives en hommes de l'Armée Française dans la campagne de Russie 1812-1813.
Dressée par M. Minard, Inspecteur Général des Ponts et Chaussées en retraite.
Paris, le 20 Novembre 1869.
MOSCOU
Smolensk
Wilna
Kowno
TABLEAU GRAPHIQUE de la température en degrés du thermomètre de Réaumur au dessous de zéro.