Case Study 5

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1. Import packages and get data

```
library(spData)
```

```
## To access larger datasets in this package, install the spDataLarge
## package with: 'install.packages('spDataLarge',
## repos='https://nowosad.github.io/drat/', type='source')'
```

```
library(tmap)
library(sf)
```

```
## Linking to GEOS 3.10.2, GDAL 3.4.2, PROJ 8.2.1; sf_use_s2() is TRUE
```

```
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------------- tidyverse 1.3.2 --
```

```
## v ggplot2 3.3.6      v purrr   0.3.4
## v tibble  3.1.8      v dplyr   1.0.10
## v tidyr   1.2.1      v stringr 1.4.1
## v readr   2.1.2      v forcats 0.5.2
## -- Conflicts ------------------------------------------- tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```
library(units)
```

```
## udunits database from /Library/Frameworks/R.framework/Versions/4.2-arm64/Resources/library/units/sha
```

```
#load 'world' data from spData package
data(world)
# load 'states' boundaries from spData package
data(us_states)
albers="+proj=aea +lat_1=29.5 +lat_2=45.5 +lat_0=37.5 +lon_0=-96 +x_0=0 +y_0=0 +ellps=GRS80 +datum=NAD83
```

2. Target polygons

```
world=st_transform(world,albers)
us_states=st_transform(us_states,albers)
NY=us_states[17,]
Canada=world%>%filter(name_long == 'Canada')
```
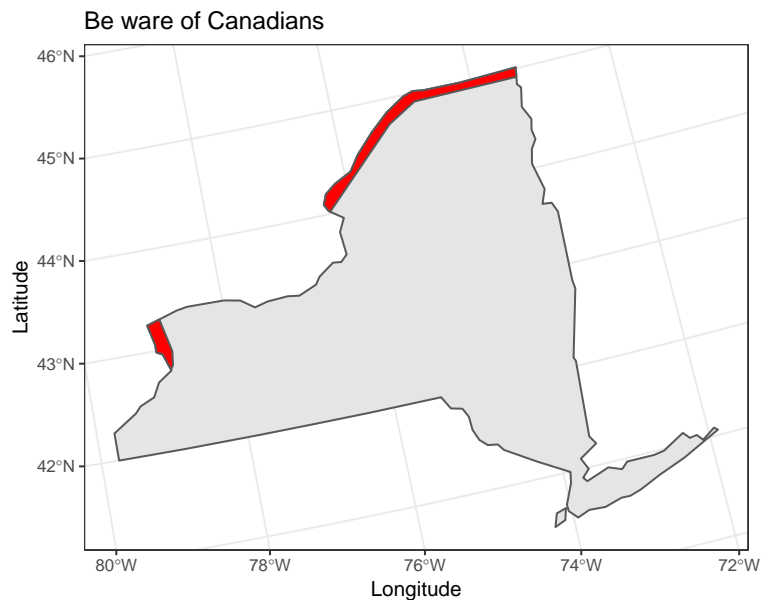
3. Buffering

```
distance=set_units(10,km)
Canada_buffer=st_buffer(Canada,distance)
```

4. Results

```
intersected=st_intersection(NY,Canada_buffer)
```

```
## Warning: attribute variables are assumed to be spatially constant throughout all
## geometries
```

```
ggplot()+
  geom_sf(data=NY)+
  geom_sf(data=intersected,fill='red')+
  xlab('Longitude')+
  ylab('Latitude')+
  ggtitle('Be ware of Canadians')+
  theme_bw()
```

```
area_cal=st_area(intersected)
units(area_cal)=as_units('km^2')

area_cal
```

3495.19 [km^2]

Area result is 3495.19 km^2.