Tutorial - Geospatial data - Part 2

Ariane Ducellier

2024-11-19
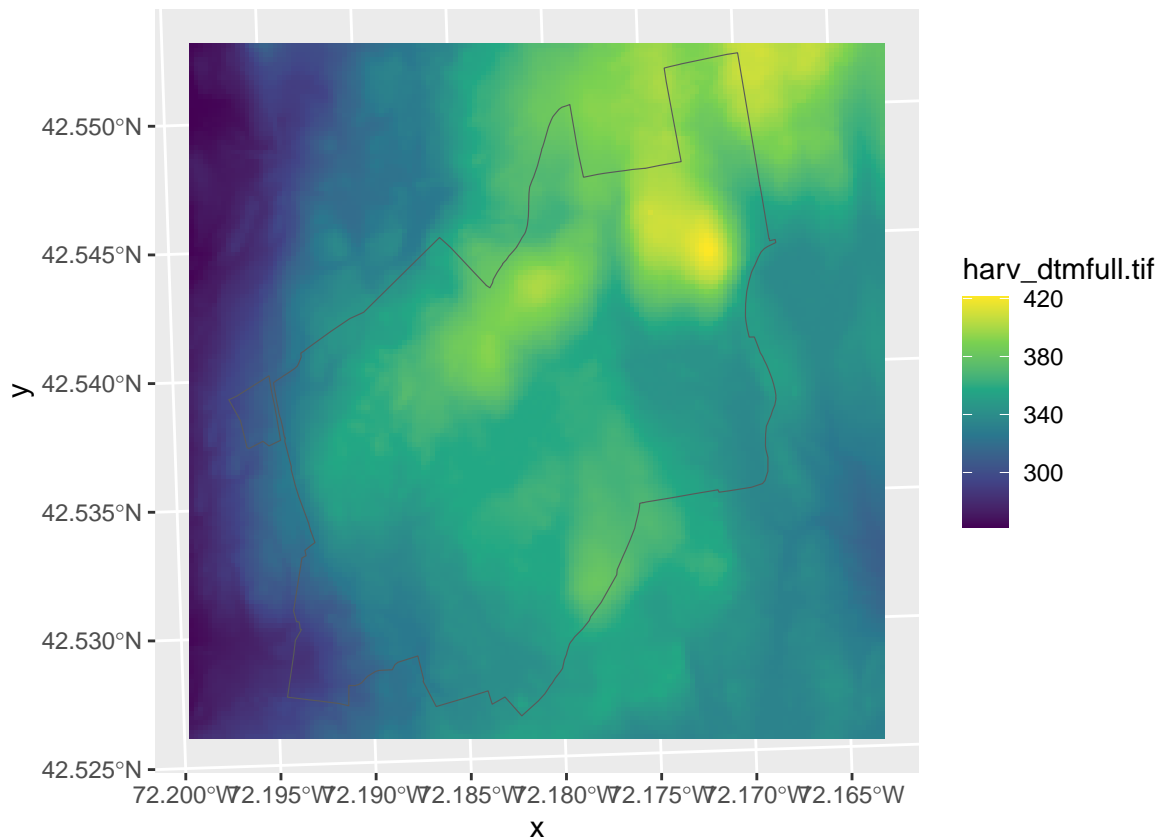
Load R packages

```r
library(stars)
library(sf)
library(ggplot2)
```

Reading vector and raster data

```r
harv_boundary <- read_sf("../../data/harv/harv_boundary.shp")
harv_dtm <- read_stars("../../data/harv/harv_dtmfull.tif")
```

```r
ggplot() +
  geom_stars(data = harv_dtm) +
  scale_fill_viridis_c() +
  geom_sf(data = harv_boundary, fill = "transparent")
```

Cropping the raster data using the boundary from the vector data

```
harv_dtm_cropped <- st_crop(harv_dtm, harv_boundary)
```
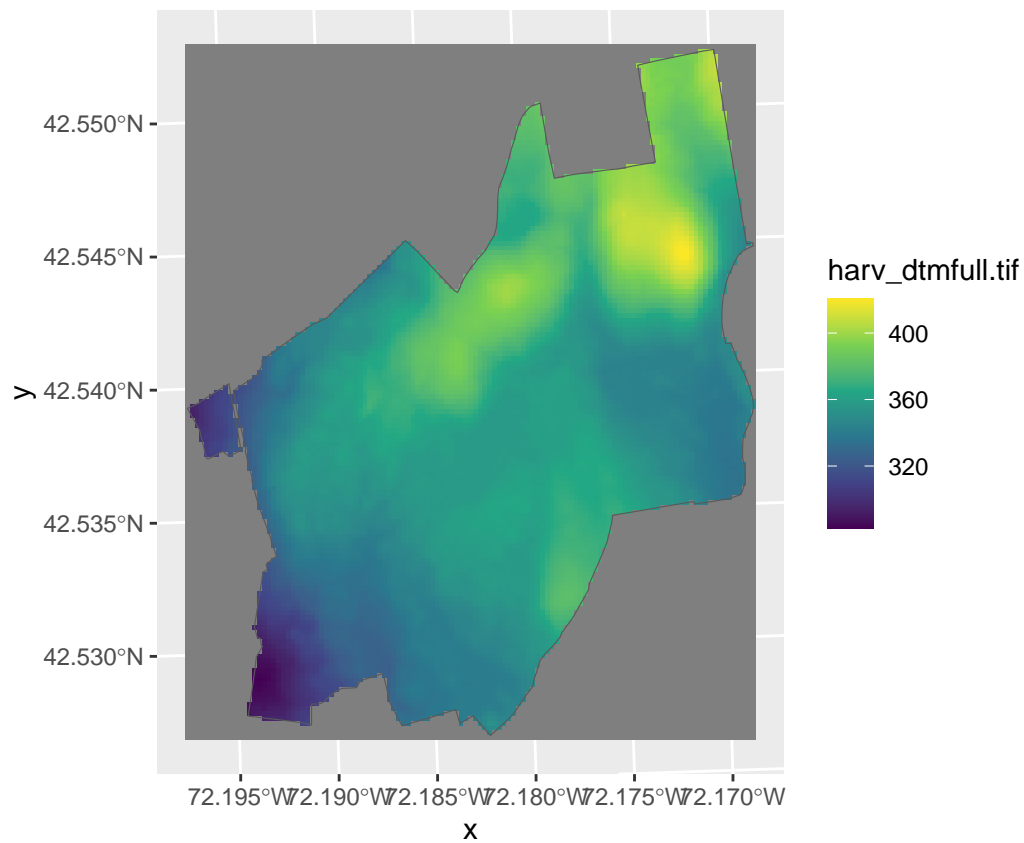
```
harv_dtm
```

```
## stars object with 2 dimensions and 1 attribute
## attribute(s):
##                      Min.  1st Qu.  Median     Mean 3rd Qu.      Max.
## harv_dtmfull.tif  262.4644 326.6716 344.049 342.3217 362.798 420.8233
## dimension(s):
##   from  to  offset delta                       refsys point x/y
## x    1 150  730000    20 WGS 84 / UTM zone 18N FALSE [x]
## y    1 150 4715000   -20 WGS 84 / UTM zone 18N FALSE [y]
```
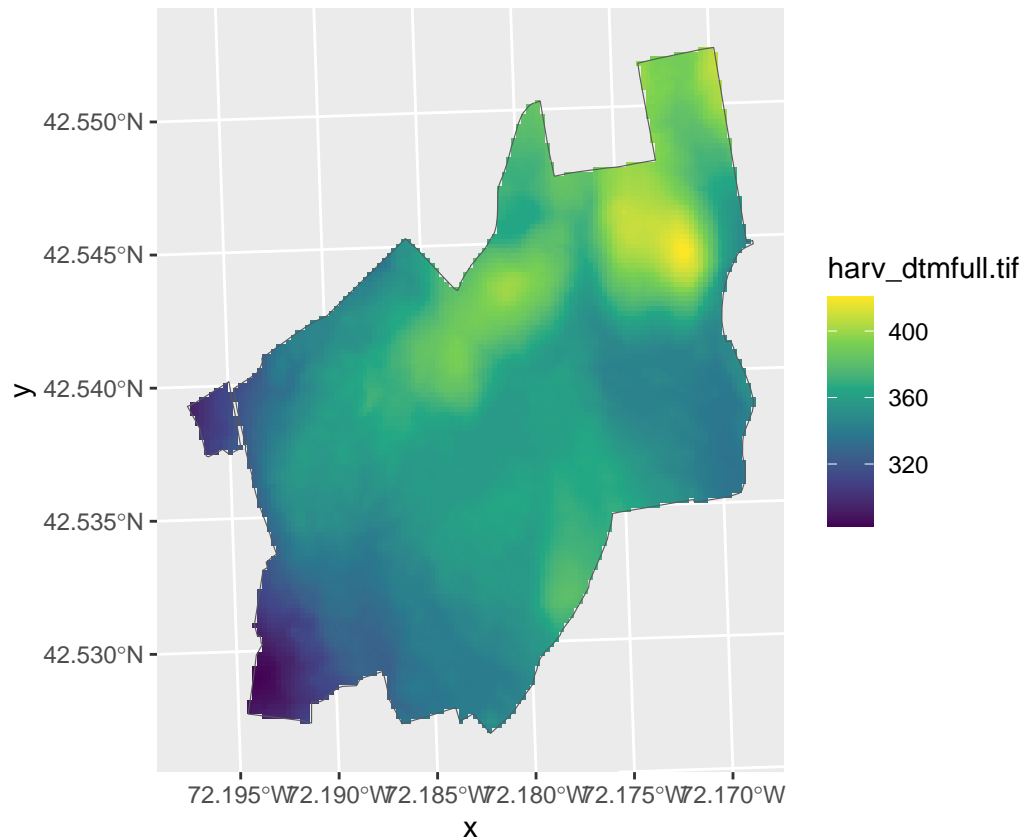
```
harv_dtm_cropped
```

```
## stars object with 2 dimensions and 1 attribute
## attribute(s):
##                      Min.  1st Qu.   Median     Mean 3rd Qu.      Max. NA's
## harv_dtmfull.tif  282.6686 343.8786 357.7104 357.562 370.615 420.8233 8039
## dimension(s):
##   from   to  offset delta                       refsys point x/y
## x    9  127  730000    20 WGS 84 / UTM zone 18N FALSE [x]
## y    2  146 4715000   -20 WGS 84 / UTM zone 18N FALSE [y]
```

```
ggplot() +
  geom_stars(data = harv_dtm_cropped) +
  scale_fill_viridis_c() +
  geom_sf(data = harv_boundary, fill = "transparent")
```

```
ggplot() +
  geom_stars(data = harv_dtm_cropped) +
  scale_fill_viridis_c(na.value = "transparent") +
  geom_sf(data = harv_boundary, fill = "transparent")
```

Masking instead of cropping

```
harv_dtm_masked <- st_crop(harv_dtm, harv_boundary, crop = FALSE)
harv_dtm_masked
```

```
## stars object with 2 dimensions and 1 attribute
## attribute(s):
##                      Min.  1st Qu.   Median    Mean 3rd Qu.     Max.  NA's
## harv_dtmfull.tif  282.6686 343.8786 357.7104 357.562 370.615 420.8233 13284
## dimension(s):
##   from  to  offset delta               refsys point x/y
## x    1 150  730000    20 WGS 84 / UTM zone 18N FALSE [x]
## y    1 150 4715000   -20 WGS 84 / UTM zone 18N FALSE [y]
```

```
ggplot() +
  geom_stars(data = harv_dtm_masked) +
  scale_fill_viridis_c(na.value = "transparent") +
  geom_sf(data = harv_boundary, fill = "transparent")
```
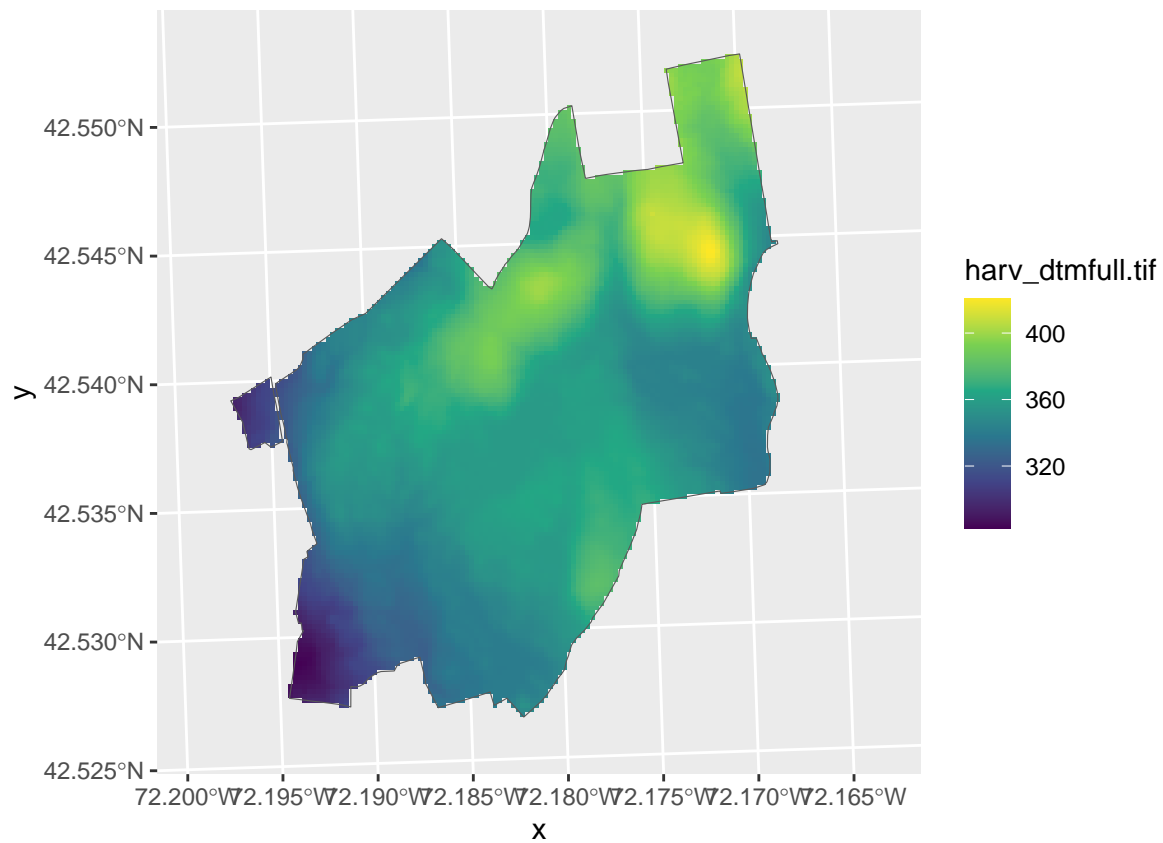
```
ggplot() +
  geom_stars(data = harv_dtm_cropped) +
  scale_fill_viridis_c(na.value = "transparent") +
  geom_sf(data = harv_boundary, fill = "transparent") +
  coord_sf(datum = st_crs(harv_dtm))
```
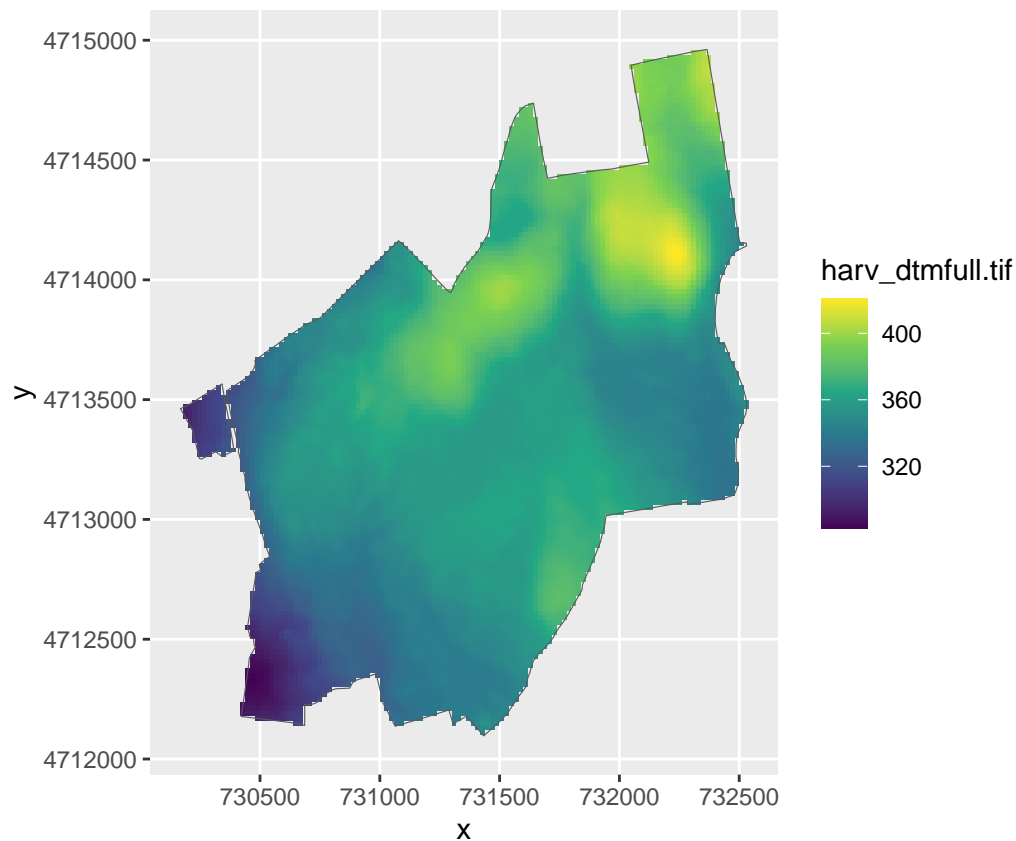
Cropping with a box

```
bbox <- st_bbox(c(xmin = 731000, ymin = 4713000, xmax = 732000, ymax = 4714000), crs = st_crs(harv_dtm))
```

```
harv_dtm_small <- st_crop(harv_dtm, bbox)
```

```
harv_soils <- read_sf("../../data/harv/harv_soils.shp")
harv_soils_small <- st_crop(harv_soils, bbox)
```

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

```
ggplot() +
  geom_stars(data = harv_dtm_small) +
  scale_fill_viridis_c(na.value = "transparent") +
  geom_sf(data = harv_soils_small, fill = "transparent")
```