Spatial Data in R

ASRI 2021

6/17/2021

Spatial data structures

Raster Data

- pixelated data where each pixel associated with a specific location.
- associated with:
  - an **extent** (geographic area that the raster covers),
  - a **resolution** (area covered by each pixel), and
  - a **coordinate reference system (CRS)** (describes how location on a 2-D map is related to location on 3-D Earth)

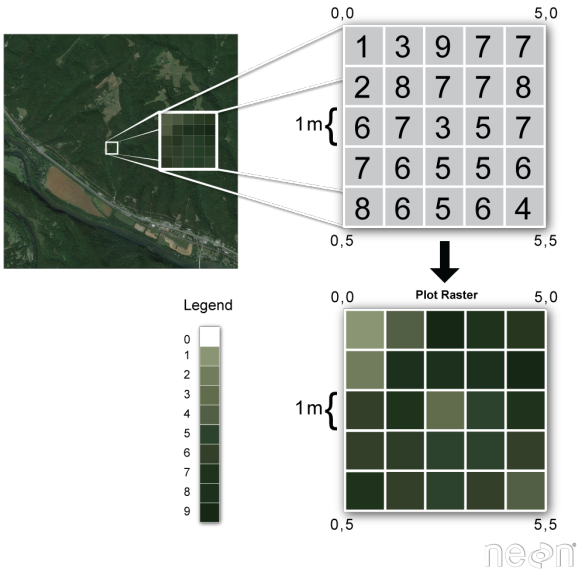

Figure 1: Image borrowed from Data Carpentry Introduction to Geospatial Concepts lesson

In R, we can explore raster files with the help of several useful packages like `raster`. To illustrate, let's download a raster of land use in Arkansas, available (here).

```
library(raster)
```

```
## Loading required package: sp
```

```
### edit this line to point to place where raster in GeoTIFF file format is stored
#ar_land_use <- raster('~/Downloads/LULC_SUMMER_CAST2004/LULC_SUMMER_CAST2004.tif')

### plot the raster
```

```
#plot(ar_land_use)

### take a look at the ar_land_use object
#ar_land_use

### raster manipulation example
#ar_rice <- calc(ar_land_use, fun=function(x){ x[x != 202] <- NA; return(x)} ) # substitute values all
```

Vector Data

- points, lines and polygons
- often stored as shapefiles (.shp)

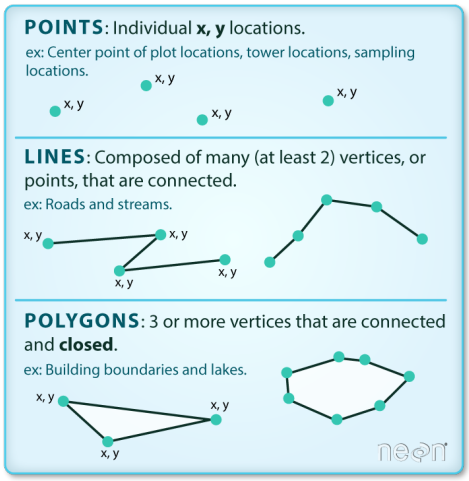

Figure 2: Image borrowed from Data Carpentry Introduction to Geospatial Concepts lesson