Add a basemap to a R markdown report using ggmap

Learning Objectives

After completing this tutorial, you will be able to:

- Overlay 2 rasters in R

What you need

You need `R` and `RStudio` to complete this tutorial. Also you should have an `earth-analytics` directory setup on your computer with a `/data` directory with it.

- install **devtools**: `install.packages('devtools')`
- install **ggmap** from github: `devtools::install_github("dkahle/ggmap")`
- How to Setup R / RStudio
- Setup your working directory

```
# load raster and rgdal libraries for spatial data
library(raster)
library(rgdal)
```

Overlay rasters in R

Here, we will cover overlaying rasters on top of a hillshade for nicer looking plots in R. To overlay a raster will will use the add=T argument in the R plot() function. We will use alpha to adjust the transparency of one of our rasters so the terrain hillshade gives the raster texture! Also we will turn of the legend for the hillshade plot as the legend we want to see is the DEM elevation values.

```
# open raster DTM data
lidar_dem <- raster(x="data/week3/BLDR_LeeHill/pre-flood/lidar/pre_DTM.tif")

# open dem hillshade
lidar_dem_hill <- raster(x="data/week3/BLDR_LeeHill/pre-flood/lidar/pre_DTM_hill.tif")

# plot raster data
plot(lidar_dem_hill,
     main="Lidar Digital Elevation Model (DEM)\n overlayed on top of a hillshade",
     col=grey(1:100/100),
     legend=F)

plot(lidar_dem,
     main="Lidar Digital Elevation Model (DEM)",
     add=T, alpha=.5)
```

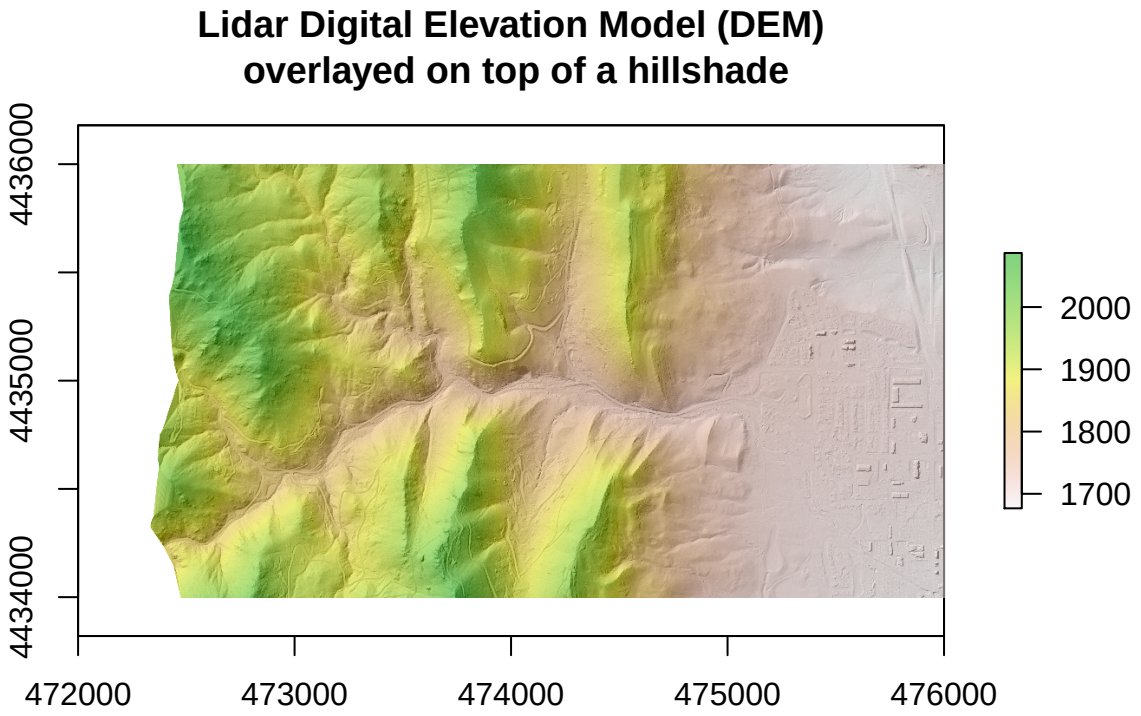

Figure 1: overlay plot