Sampling Design

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First we load the spatial packages

```
library("raster", lib.loc="~/R/win-library/3.2")
```

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

```
library("rasterVis", lib.loc="~/R/win-library/3.2")
```

```
## Loading required package: lattice
## Loading required package: latticeExtra
## Loading required package: RColorBrewer
```

```
library("maps", lib.loc="~/R/win-library/3.2")
library("maptools", lib.loc="~/R/win-library/3.2")
```

```
## Checking rgeos availability: FALSE
##      Note: when rgeos is not available, polygon geometry     computations in maptools depend on gpcli
##      which has a restricted licence. It is disabled by default;
##      to enable gpclib, type gpclibPermit()
```

```
library("rgdal", lib.loc="~/R/win-library/3.2")
```

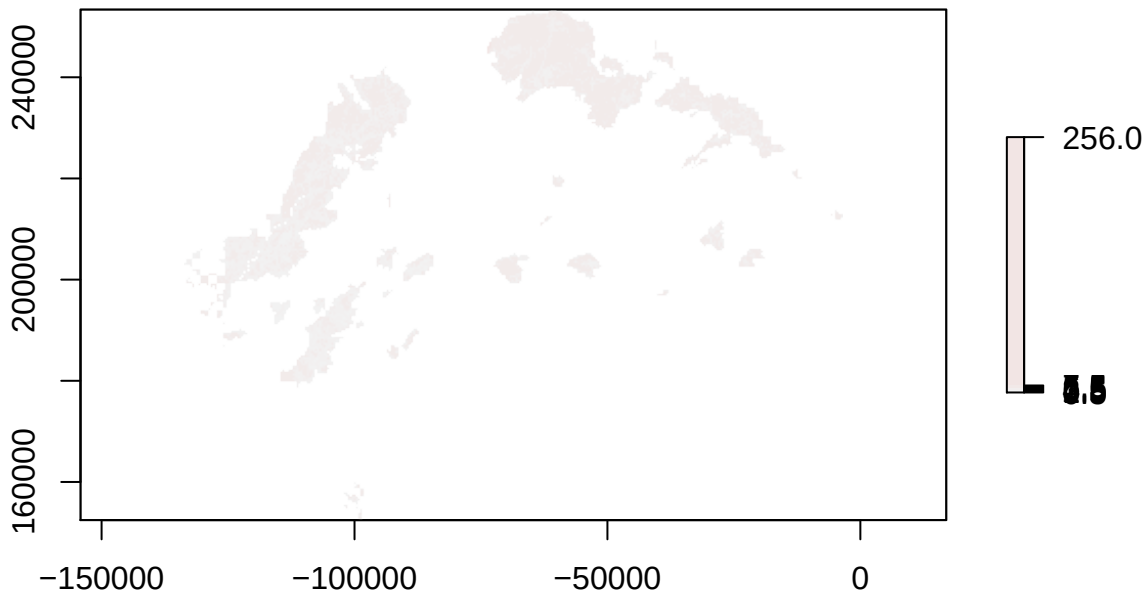
```
## rgdal: version: 0.9-2, (SVN revision 526)
## Geospatial Data Abstraction Library extensions to R successfully loaded
## Loaded GDAL runtime: GDAL 1.11.2, released 2015/02/10
## Path to GDAL shared files: C:/Users/usuario/Documents/R/win-library/3.2/rgdal/gdal
## GDAL does not use iconv for recoding strings.
## Loaded PROJ.4 runtime: Rel. 4.9.1, 04 March 2015, [PJ_VERSION: 491]
## Path to PROJ.4 shared files: C:/Users/usuario/Documents/R/win-library/3.2/rgdal/proj
```

read rasters

```
bc <- readGDAL("C:/Users/usuario/Bats_California/layers/burn_canopy.asc")
```

```
## C:/Users/usuario/Bats_California/layers/burn_canopy.asc has GDAL driver AAIGrid
## and has 250 rows and 322 columns
```

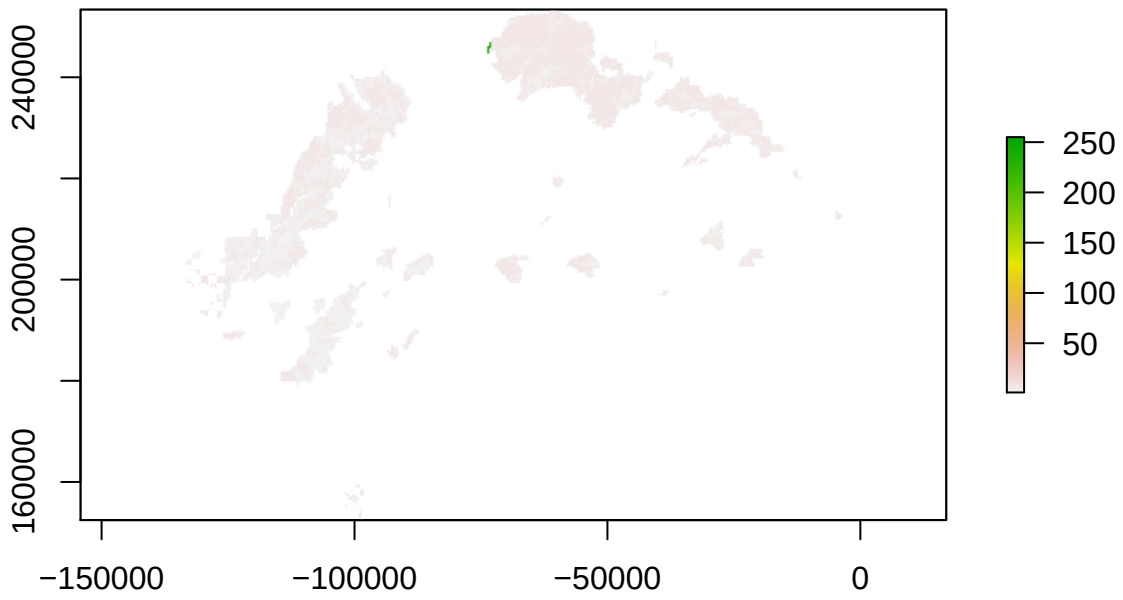
```
bc<-raster (bc)
plot(bc, breaks= c(0.5,1.5,2.5,3.5,4.5,5.5,6.5,7.5,256))
```




```
bb <- readGDAL("C:/Users/usuario/Bats_California/layers/burn_basal.asc")
```

```
## C:/Users/usuario/Bats_California/layers/burn_basal.asc has GDAL driver AAIGrid
## and has 250 rows and 322 columns
```

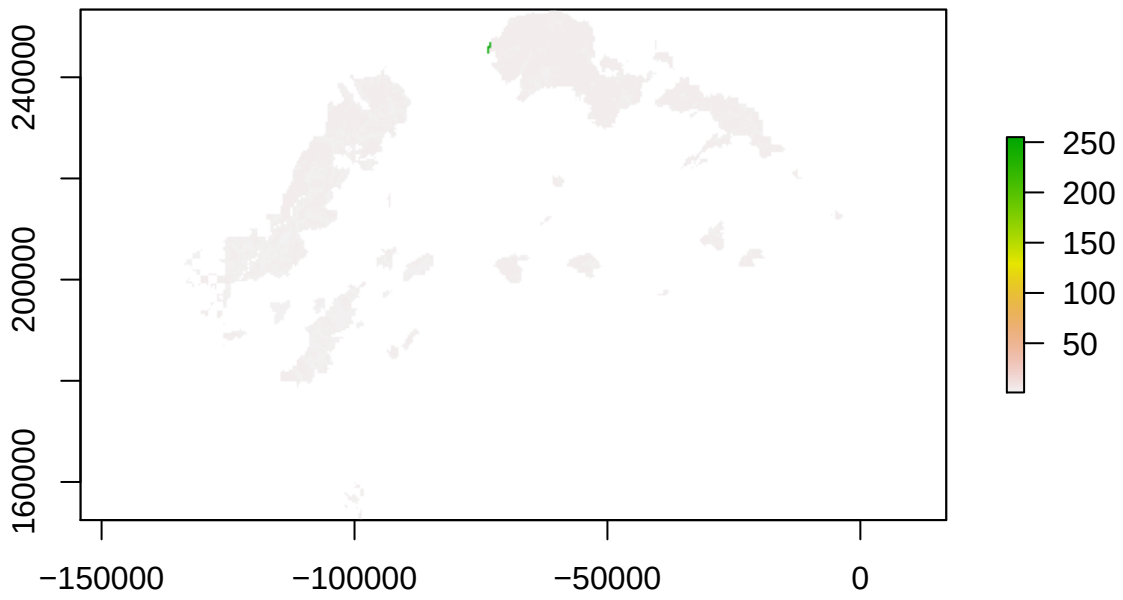
```
bb<-raster (bb)
plot(bb)
```




```
bs <- readGDAL("C:/Users/usuario/Bats_California/layers/burn_severity.asc")
```

```
## C:/Users/usuario/Bats_California/layers/burn_severity.asc has GDAL driver AAIGrid
## and has 250 rows and 322 columns
```

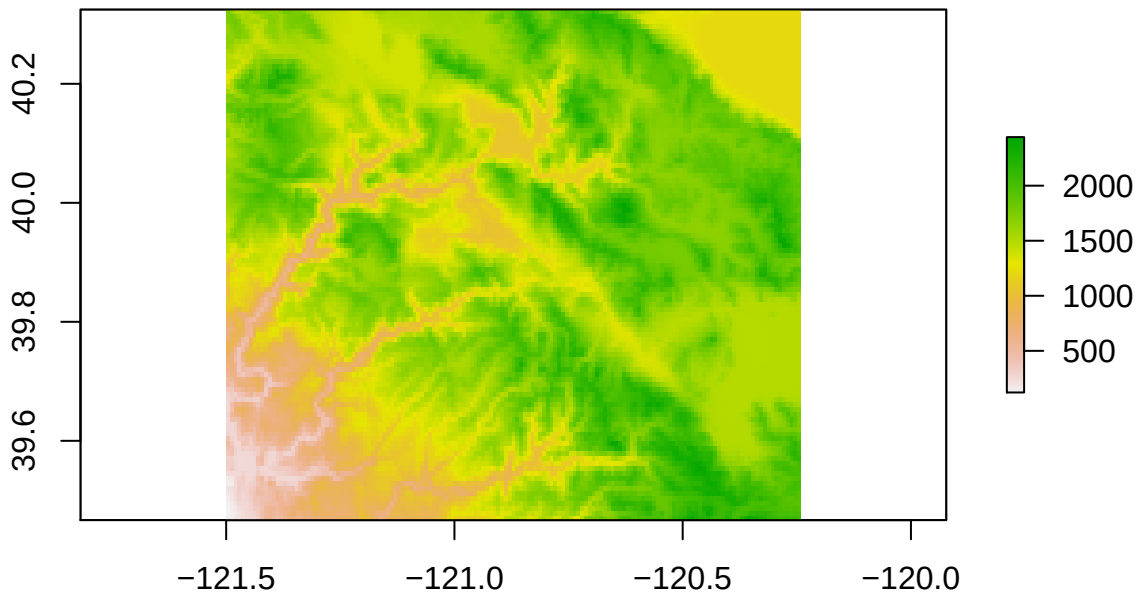
```
bs<-raster (bs)
plot(bs)
```




```
topo <- readGDAL("C:/Users/usuario/Bats_California/layers/plumastopo.asc")
```

```
## C:/Users/usuario/Bats_California/layers/plumastopo.asc has GDAL driver AAIGrid
## and has 103 rows and 151 columns
```

```
topo<-raster (topo)
plot(topo)
```

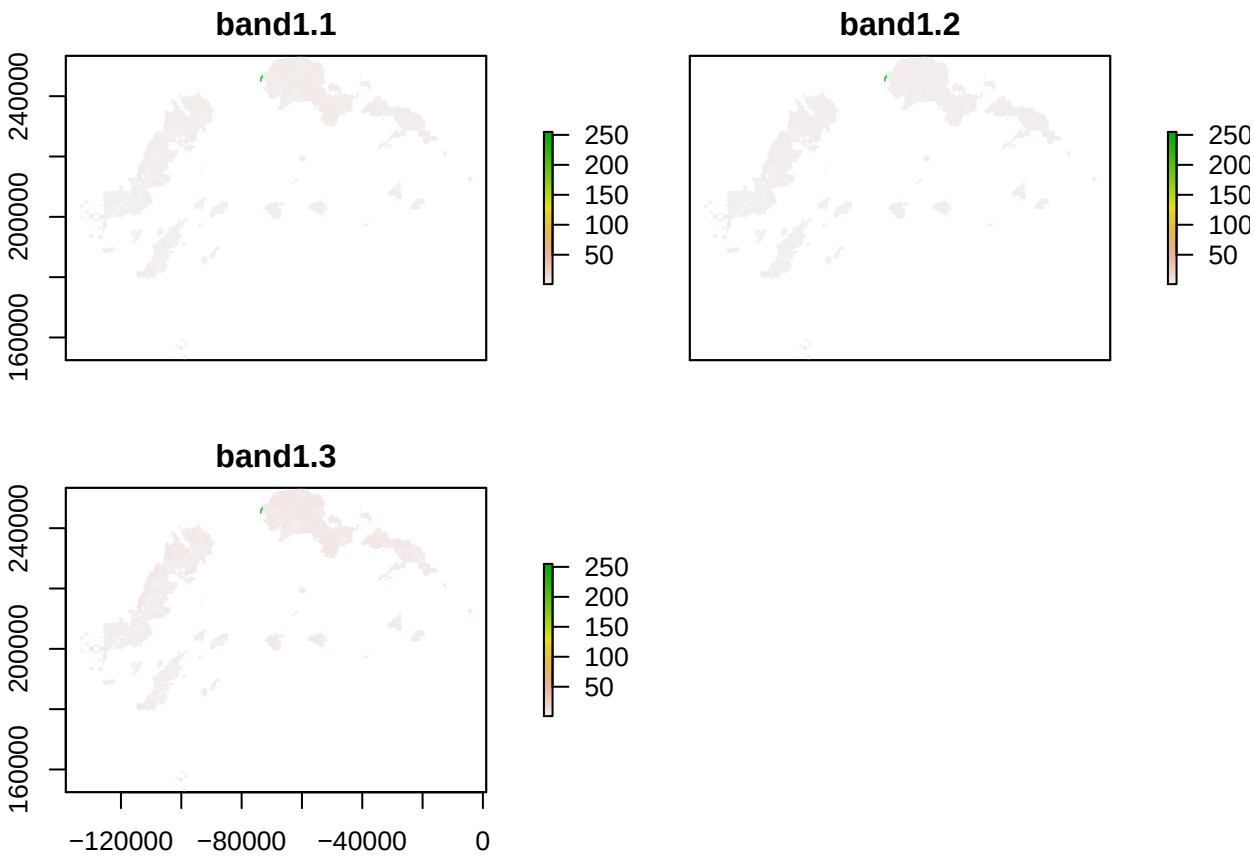



```
summary(bs)
```

```
##         band1
## Min.        1
## 1st Qu.     2
## Median      3
## 3rd Qu.     4
## Max.      255
## NA's    72282
```

Check for correlation between rasters

```
burn <-brick(bc, bs, bb)
plot (burn)
```




```
layerStats(burn, "pearson",na.rm=TRUE)
```

```
## $`pearson correlation coefficient`
##           band1.1   band1.2   band1.3
## band1.1 1.0000000 0.9935715 0.9930273
## band1.2 0.9935715 1.0000000 0.9805035
## band1.3 0.9930273 0.9805035 1.0000000
##
## $mean
##  band1.1  band1.2  band1.3
## 3.379533 3.096130 4.412266
```