GIS Example with R

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0.1 Tools

Using the invaluable libraries `sp, rgdal, raster`.

```
require(raster)
require(rgdal)
```

0.2 Loading data

Using `raster` we check to see what kind of data we can load...

```
wd <- paste(getwd(), "/data", sep = "/")
files <- list.files(wd)
files <- files[-grep("hdr", files)]
files <- files[-grep("floodmap", files)]
num.files <- length(files)
cat("found ", num.files, " files to plot\n")

## found  5  files to plot

files

## [1] "depth"         "Depth0.flt"    "depth2"        "velocity"
## [5] "Velocity0.flt"

num.files <- ceiling(num.files/2) * 2
```

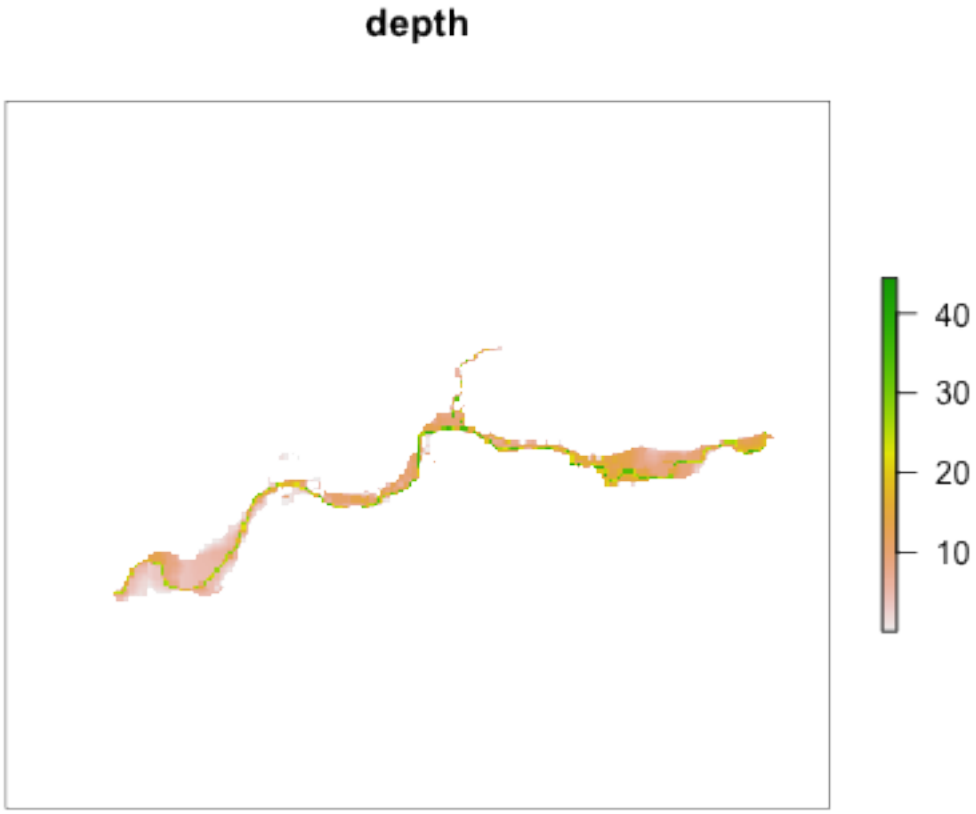
We have some .flt files, as well as some other mysterious .adf rasters:

```
list.files(paste(wd, "depth", sep = "/"))

## [1] "dblbnd.adf"   "hdr.adf"      "log"          "metadata.xml"
## [5] "prj.adf"      "sta.adf"      "w001001.adf"  "w001001x.adf"
```

We can plot them, for example

```
filename <- "depth"
r <- raster(paste(wd, filename, sep = "/"))
plot(r, main = filename, axes = FALSE)
```



All of the flts and adf would work (not executed)

```
op <- par(mfrow = c(2, num.files/2))
for (filename in files) {
    r <- raster(paste(wd, filename, sep = "/"))
    plot(r, main = filename)
}
par(op)
```

Great, so we can import and plot .flt and .adf (geodatabase?) files using `rgdal` and `raster`!

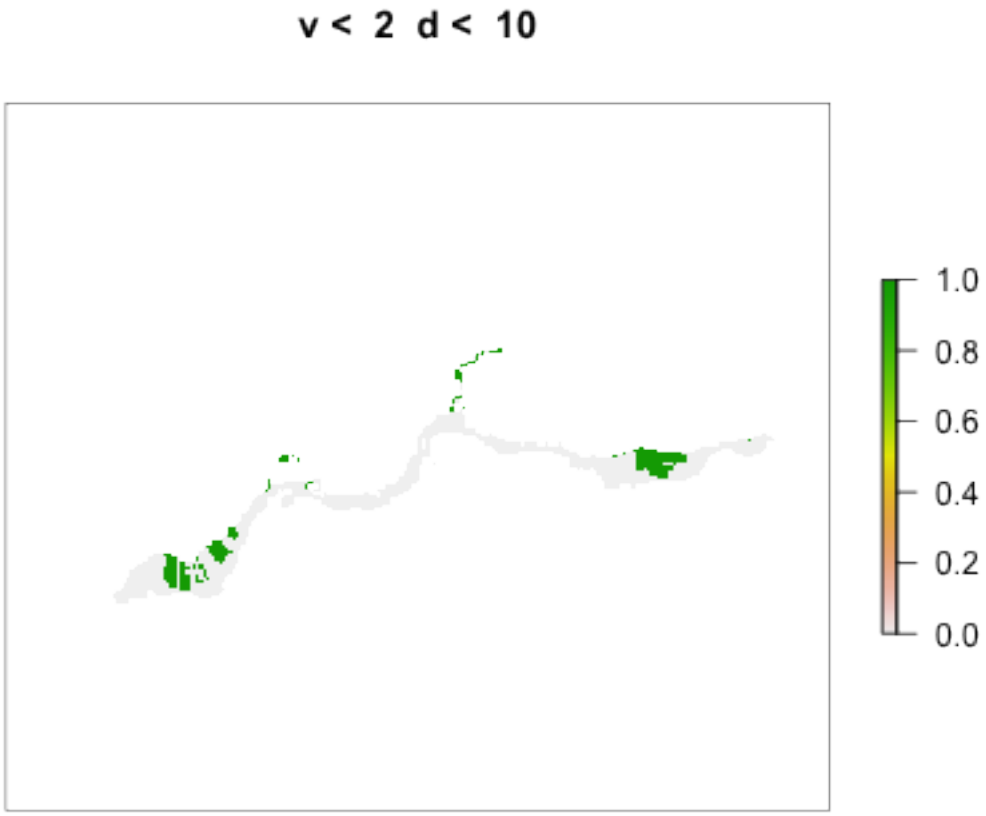
0.3 Raster math

From now on, I focus loading and usint `.flt` files.

Depth:

```
r.d <- raster(paste(wd, "depth0.flt", sep = "/"))
r.v <- raster(paste(wd, "velocity0.flt", sep = "/"))

d.max <- 10
v.max <- 2
velocity.depth <- (r.v < v.max) * (r.d < d.max)
plot(velocity.depth, axes = FALSE, main = paste("v < ",
    v.max, " d < ", d.max))
```




```
## stacking example...
# s.dv <- stack(r.d,r.v)
```

How this was made

```
require(knitr)  ### the package
knit(paste(getwd(), "gis_example.Rnw", sep = "/"))  ## to run
```