# Project Part 1

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```r
knitr::opts_chunk$set(echo=TRUE)
knitr::opts_chunk$set(cache=TRUE, autodep=TRUE)
knitr::opts_chunk$set(fig.align="center", fig.pos="H")

library(doParallel)
cl <- makePSOCKcluster(parallel::detectCores(logical = FALSE))
registerDoParallel(cl)

library(tidyverse)
library(tidymodels)
library(discrim)
```

## Data loading

```r
files <- c(
  "orthovnir057_ROI_NON_Blue_Tarps.txt",
  "orthovnir078_ROI_NON_Blue_Tarps.txt",
  "orthovnir067_ROI_NOT_Blue_Tarps.txt",
  "orthovnir069_ROI_NOT_Blue_Tarps.txt"
)

non_not_blue_data <- map_dfr(files, ~ {
  read_fwf(
    file = .x,
    col_positions = fwf_widths(
      widths = c(6, 6, 10, 12, 12, 10, 12, 5, 5, 5),
      col_names = c("ID", "X", "Y", "Map_X", "Map_Y", "Lat", "Lon", "B1", "B2", "B3")
    ),
    skip = 8
  ) %>%
    mutate(Class = str_extract(.x, "(NON_Blue_Tarps|NOT_Blue_Tarps)"))
})
```

```r
blue_files <- c(
  "orthovnir069_ROI_Blue_Tarps.txt",
  "orthovnir067_ROI_Blue_Tarps.txt",
  "orthovnir078_ROI_Blue_Tarps.txt"
)

blue_data <- map_dfr(blue_files, ~ {
  read_fwf(
    file = .x,
    col_positions = fwf_widths(
```

```
      widths = c(5, 6, 10, 12, 11, 10, 12, 5, 5, 5),
      col_names = c("ID", "X", "Y", "Map_X", "Map_Y", "Lat", "Lon", "B1", "B2", "B3")
    ),
    skip = 8
  ) %>%
    mutate(Class = "Blue_Tarps")
})
```

```
holdout_data <- bind_rows(
  non_not_blue_data %>% select(Lat, Lon, B1, B2, B3, Class),
  blue_data %>% select(Lat, Lon, B1, B2, B3, Class)
)

glimpse(holdout_data)
```

```
## Rows: 2,004,177
## Columns: 6
## $ Lat   <dbl> 18.52267, 18.52267, 18.52267, 18.52267, 18.52267, 18.52267, 18.5~
## $ Lon   <dbl> -72.44399, -72.44399, -72.44399, -72.44399, -72.44399, -72.44399~
## $ B1    <dbl> 104, 101, 103, 107, 109, 103, 100, 98, 97, 99, 103, 104, 101, 96~
## $ B2    <dbl> 89, 80, 87, 93, 99, 73, 79, 70, 73, 79, 84, 86, 83, 79, 77, 82, ~
## $ B3    <dbl> 63, 60, 69, 72, 68, 53, 56, 51, 56, 61, 63, 62, 61, 58, 56, 59, ~
## $ Class <chr> "NON_Blue_Tarps", "NON_Blue_Tarps", "NON_Blue_Tarps", "NON_Blue_~
```