

## Six Panel ETA

2023-07-26

*Generates Six Panel Scatter Plot of CCDC vs LSAT Data*

Read in Raster Data

```
#CCDC Data
ccdc_newmexico <- raster("D:\\Average_ETA\\CCDC_ETA\\ccdc_ETA_newmexico.tif")
ccdc_california <- raster
("D:\\Average_ETA\\CCDC_ETA\\ccdc_ETA_california.tif")
ccdc_arizona <- raster("D:\\Average_ETA\\CCDC_ETA\\ccdc_ETA_arizona.tif")
ccdc_colorado <- raster ("D:\\Average_ETA\\CCDC_ETA\\ccdc_ETA_colorado.tif")
ccdc_oregon <- raster("D:\\Average_ETA\\CCDC_ETA\\ccdc_ETA_oregon.tif")
ccdc_idaho <- raster ("D:\\Average_ETA\\CCDC_ETA\\ccdc_ETA_idaho.tif")

#LSAT Data
lsat_newmexico <- raster("D:\\Average_ETA\\lsat_ETA\\lsat_ETA_newmexico.tif")
lsat_california <- raster
("D:\\Average_ETA\\lsat_ETA\\lsat_ETA_california.tif")
lsat_arizona <- raster("D:\\Average_ETA\\lsat_ETA\\lsat_ETA_arizona.tif")
lsat_colorado <- raster ("D:\\Average_ETA\\lsat_ETA\\lsat_ETA_colorado.tif")
lsat_oregon <- raster("D:\\Average_ETA\\lsat_ETA\\lsat_ETA_oregon.tif")
lsat_idaho <- raster ("D:\\Average_ETA\\lsat_ETA\\lsat_ETA_idaho.tif")
```

Reformat data into data frames

```
names <- c("Value", "Data", "State")

df_ccdc_NM <- data.frame(values(ccdc_newmexico))
df_ccdc_NM$Data <- "CCDC"
df_ccdc_NM$State <- "New Mexico"
df_ccdc_NM<- setNames(df_ccdc_NM, names)

df_ccdc_CA <- data.frame(values(ccdc_california))
df_ccdc_CA$Data <- "CCDC"
df_ccdc_CA$State <- "California"
df_ccdc_CA<- setNames(df_ccdc_CA, names)

df_ccdc_CO <- data.frame(values(ccdc_colorado))
df_ccdc_CO$Data <- "CCDC"
df_ccdc_CO$State <- "Colorado"
df_ccdc_CO<- setNames(df_ccdc_CO, names)

df_ccdc_OR <- data.frame(values(ccdc_oregon))
df_ccdc_OR$Data <- "CCDC"
df_ccdc_OR$State <- "Oregon"
```

```

df_ccdc_OR<- setNames(df_ccdc_OR, names)

df_ccdc_ID <- data.frame(values(ccdc_idaho))
df_ccdc_ID$Data <- "CCDC"
df_ccdc_ID$State <- "Idaho"
df_ccdc_ID<- setNames(df_ccdc_ID, names)

df_ccdc_AZ <- data.frame(values(ccdc_arizona))
df_ccdc_AZ$Data <- "CCDC"
df_ccdc_AZ$State <- "Arizona"
df_ccdc_AZ<- setNames(df_ccdc_AZ, names)

df_lsats_NM <- data.frame(values(lsats_newmexico))
df_lsats_NM$Data <- "lsats"
df_lsats_NM$State <- "New Mexico"
df_lsats_NM<- setNames(df_lsats_NM, names)

df_lsats_CA <- data.frame(values(lsats_california))
df_lsats_CA$Data <- "lsats"
df_lsats_CA$State <- "California"
df_lsats_CA<- setNames(df_lsats_CA, names)

df_lsats_CO <- data.frame(values(lsats_colorado))
df_lsats_CO$Data <- "lsats"
df_lsats_CO$State <- "Colorado"
df_lsats_CO<- setNames(df_lsats_CO, names)

df_lsats_OR <- data.frame(values(lsats_oregon))
df_lsats_OR$Data <- "lsats"
df_lsats_OR$State <- "Oregon"
df_lsats_OR<- setNames(df_lsats_OR, names)

df_lsats_ID <- data.frame(values(lsats_idaho))
df_lsats_ID$Data <- "lsats"
df_lsats_ID$State <- "Idaho"
df_lsats_ID<- setNames(df_lsats_ID, names)

df_lsats_AZ <- data.frame(values(lsats_arizona))
df_lsats_AZ$Data <- "lsats"
df_lsats_AZ$State <- "Arizona"
df_lsats_AZ<- setNames(df_lsats_AZ, names)

#make long data frame for ggplot
scatterdataLong <- rbind(df_ccdc_AZ, df_ccdc_CA, df_ccdc_CO, df_ccdc_ID,
df_ccdc_NM, df_ccdc_OR, df_lsats_AZ, df_lsats_CA, df_lsats_CO, df_lsats_ID,
df_lsats_NM, df_lsats_OR)

scatterdataCCDC <- rbind(df_ccdc_AZ, df_ccdc_CA, df_ccdc_CO, df_ccdc_ID,
df_ccdc_NM, df_ccdc_OR)

```

```

scatterdataCCDC <- setNames(scatterdataCCDC, c("CCDC", "Data", "State"))

scatterdataLSAT <- rbind(df_lsats_AZ, df_lsats_CA, df_lsats_CO, df_lsats_ID,
df_lsats_NM, df_lsats_OR)
scatterdataLSAT <- setNames(scatterdataLSAT, c("LSAT", "Data", "State"))

scatterdataCCDC$LSAT <- scatterdataLSAT$LSAT
scatterdata <- scatterdataCCDC
head(scatterdata)

##           CCDC Data   State      LSAT
## 1 1.399270 CCDC Arizona 0.9579030
## 2 1.640618 CCDC Arizona 0.9480563
## 3 1.243992 CCDC Arizona 0.9592622
## 4 1.293549 CCDC Arizona 0.9719066
## 5 1.265263 CCDC Arizona 0.9543162
## 6 1.342415 CCDC Arizona 1.0648997

```

Generate log scale and scatter plot

```

pal <- inlmisc::GetTolColors(30, scheme = "cork0") #alt colors cork0, roma0,
broc0, vik0, bam0

## Warning: 'inlmisc::GetTolColors' is deprecated.
## Use 'GetColors' instead.
## See help("Deprecated") and help("inlmisc-deprecated").

my_breaks = c(1, 7, 55, 400, 3000)
ggplot(scatterdata, aes(x=LSAT, y=CCDC)) +
  geom_hex(bins = 200) + scale_fill_continuous() + ggtitle("2019 Average
ETA")+
  xlab("Observed (mm/d)") + ylab("CCDC (mm/d)") +
  ylim(c(0, 6.5)) + xlim(c(0, 6.5))+
  coord_fixed() +
  scale_fill_gradientn(name = "Count", trans = "log", breaks = my_breaks,
colours = pal)+ # log scale
  geom_abline(color="blue") + theme_minimal()+
  facet_wrap(~ State)

## Scale for fill is already present.
## Adding another scale for fill, which will replace the existing scale.

## Warning: Removed 15679 rows containing non-finite values
(`stat_binhex()`).

## Warning: Removed 392 rows containing missing values (`geom_hex()`).

```

## 2019 Average ETA

