Some TASCC stuff: here is Inj-A, which is Cl, NO3, and PO4

```{r}

#Let's declare some variables

NaCl\_inj <- 4017

Cl\_inj <- NaCl\_inj\*(0.607)

KH2PO4\_inj <- 78

PO4\_P\_inj <- KH2PO4\_inj\*(0.228)

NaNO3\_inj <- 46

NO3-N\_inj <- NaNO3\_inj\*(0.165)

Q <- 151

Q\_m3s <- Q/1000

w <- 3

dist <- 260

p\_cl\_inj <- (PO4\_P\_inj/Cl\_inj)

log\_p\_cl\_inj <- log(p\_cl\_inj)

#Now background correct the BTC data

bg\_n <- min(i8$NO3\_N)

i8 <- mutate(i8, bg\_n = NO3\_N - bg\_n)

bg\_p <- 2.5

i8 <- mutate(i8, bg\_p = PO4\_P - 2.5)

i8 <- mutate(i8, Cl = Cl\*1000)

bg\_cl <- 2450

i8 <- mutate(i8, bg\_cl = Cl - 2450)

#create a vector of nutrient to conservative tracer ratios

i8 <- mutate(i8, p\_cl = bg\_p/bg\_cl)

i8 <- mutate(i8, log\_p\_cl = log(p\_cl))

i8 <- mutate(i8, diff = log\_p\_cl - log\_p\_cl\_inj)

i8 <- mutate(i8, kw = diff/dist)

i8 <- mutate(i8, sw = -1/kw)

#remove outliers through visual inspection. It is often necessary to remove values on the tails.

i8 <- mutate(i8, sw = replace (sw, which(sw<0), NA))

i8 <- mutate(i8, sw = replace (sw, which(sw>1000), NA))

sw.lm = lm(sw ~ PO4\_P, data=i8)

summary(sw.lm)

```

```{r}

ggplot(i8, aes(x = PO4\_P, y = sw)) +

geom\_point(size = 3) +

theme\_few() +

stat\_smooth(aes(group = 1), method='lm', color = 'black')

Sw.lm = lm(sw\_add\_mb ~ PO4\_P, data=i8)

summary(Sw.lm)

```

df <- mutate(df, t = as.numeric(Time))

df <- df %>%

group\_by(Inj) %>%

mutate(dt = Time - lag(Time))

##Enforce non-negativity. This is a double check as we've already done this with removing nut/cl values above the injectate value.

df <- mutate(df, sw\_no3 = replace (sw\_no3, which(sw\_no3<0), NA))

df <- mutate(df, dt = Time - 13:02)