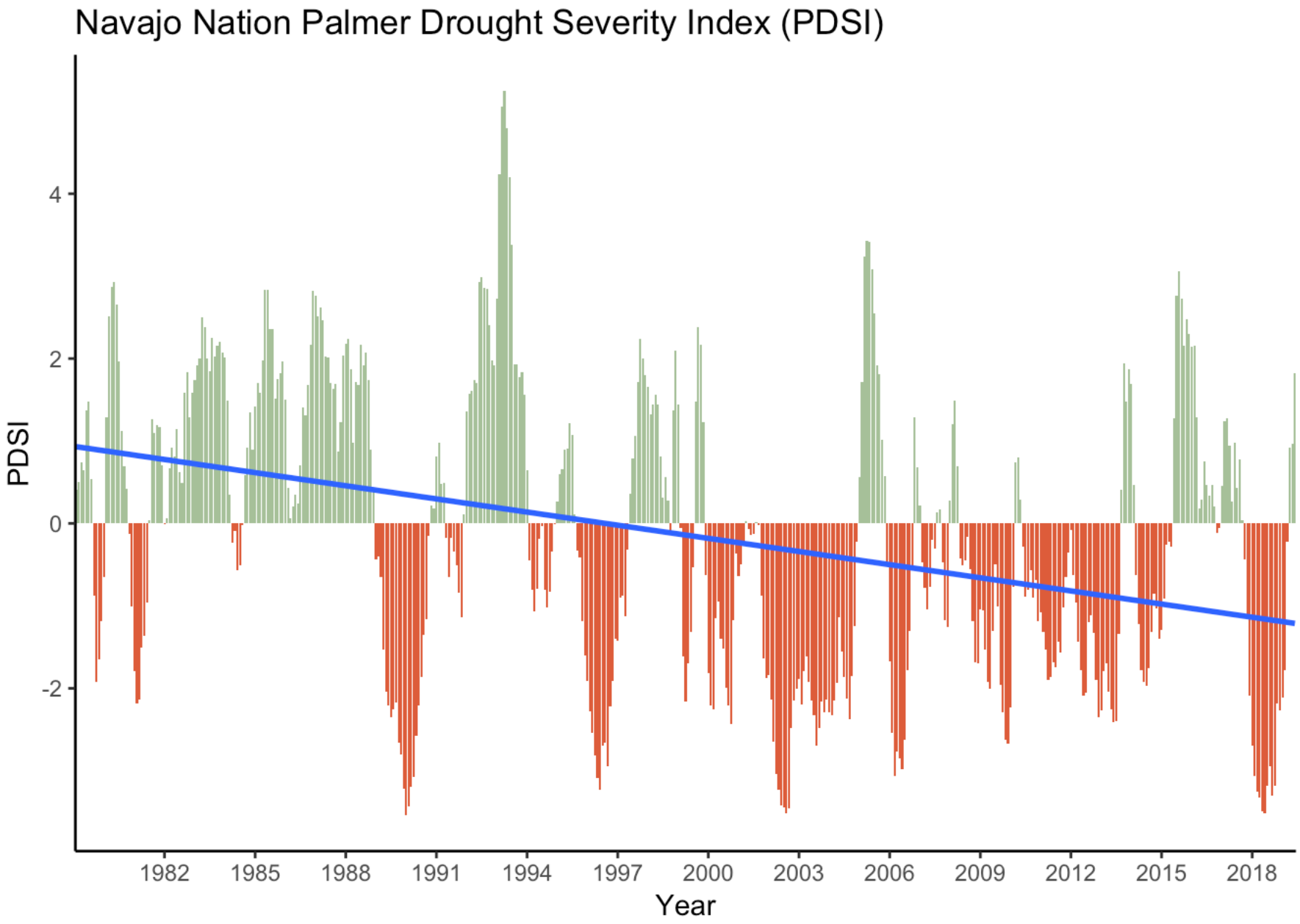
PDSI_final

AnnaClaire Marley

8/2/2019

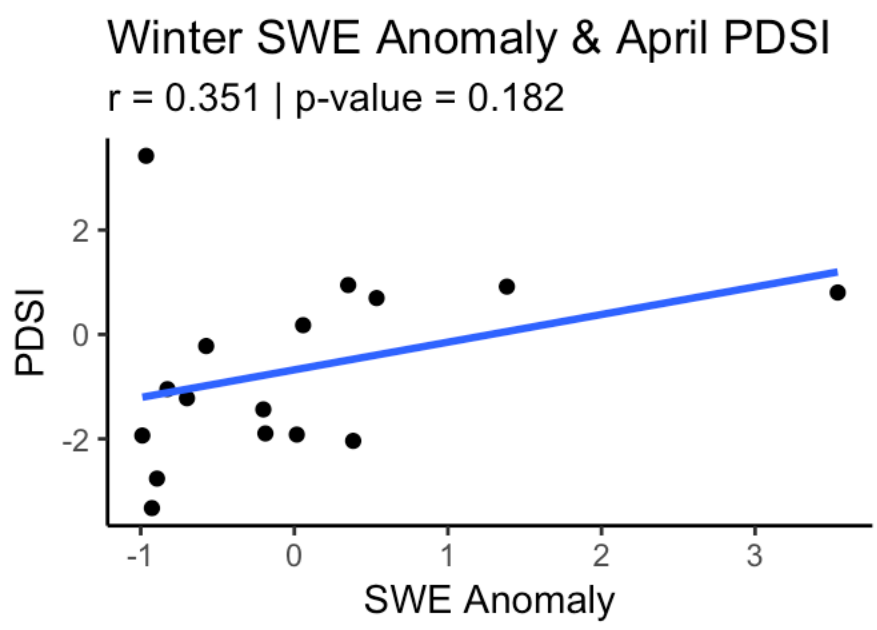
Finalized version of the PDSI markdwon

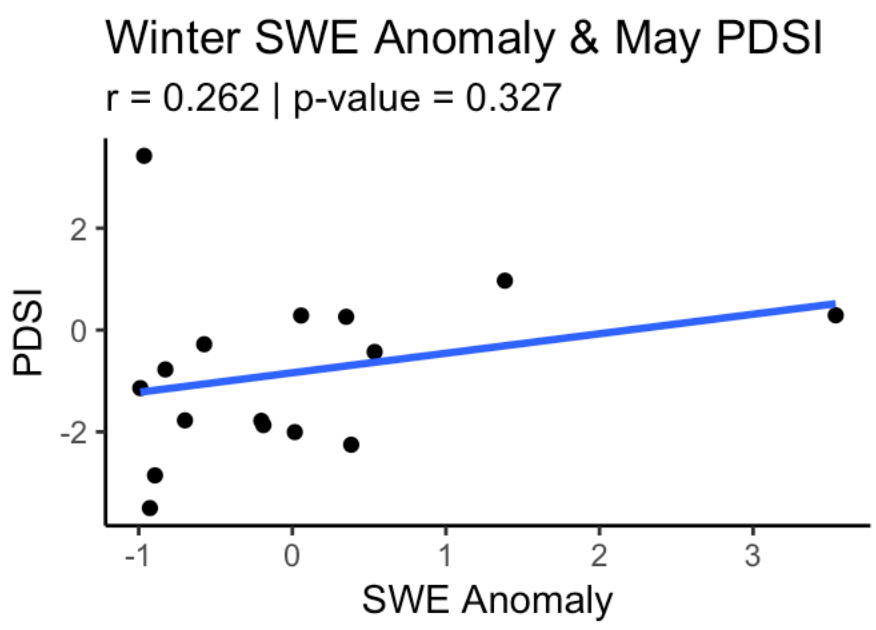
Whole Navajo Nation

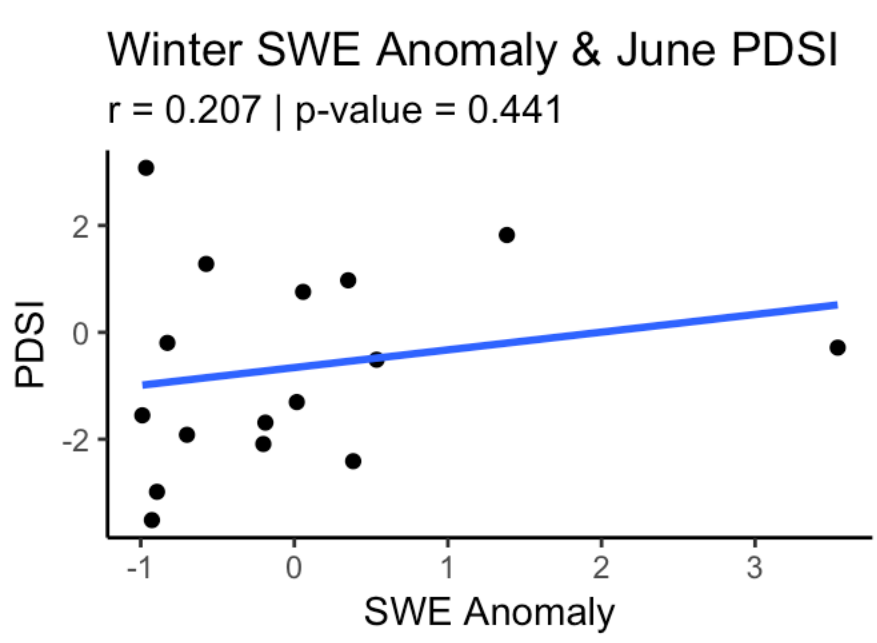


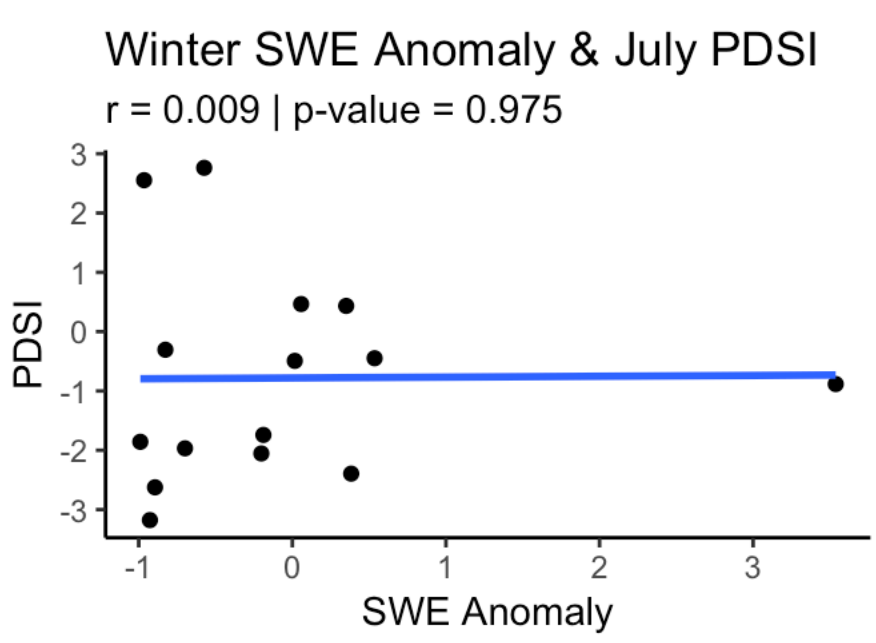
```
##
## Call:
## lm(formula = nn_mnth_pdsi$pdsi ~ nn_mnth_pdsi$date)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -3.8867 -1.2088 -0.0772  1.2816  5.0680
##
## Coefficients:
##                       Estimate Std. Error t value Pr(>|t|)
## (Intercept)         1.414e+00  2.046e-01   6.908 1.55e-11 ***
## nn_mnth_pdsi$date -1.455e-04  1.779e-05  -8.179 2.55e-15 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.67 on 483 degrees of freedom
## Multiple R-squared:  0.1216, Adjusted R-squared:  0.1198
## F-statistic: 66.89 on 1 and 483 DF,  p-value: 2.552e-15
```

- 1980s appeared to be more wet and then starting in 2000 there is a tendency to be in drought

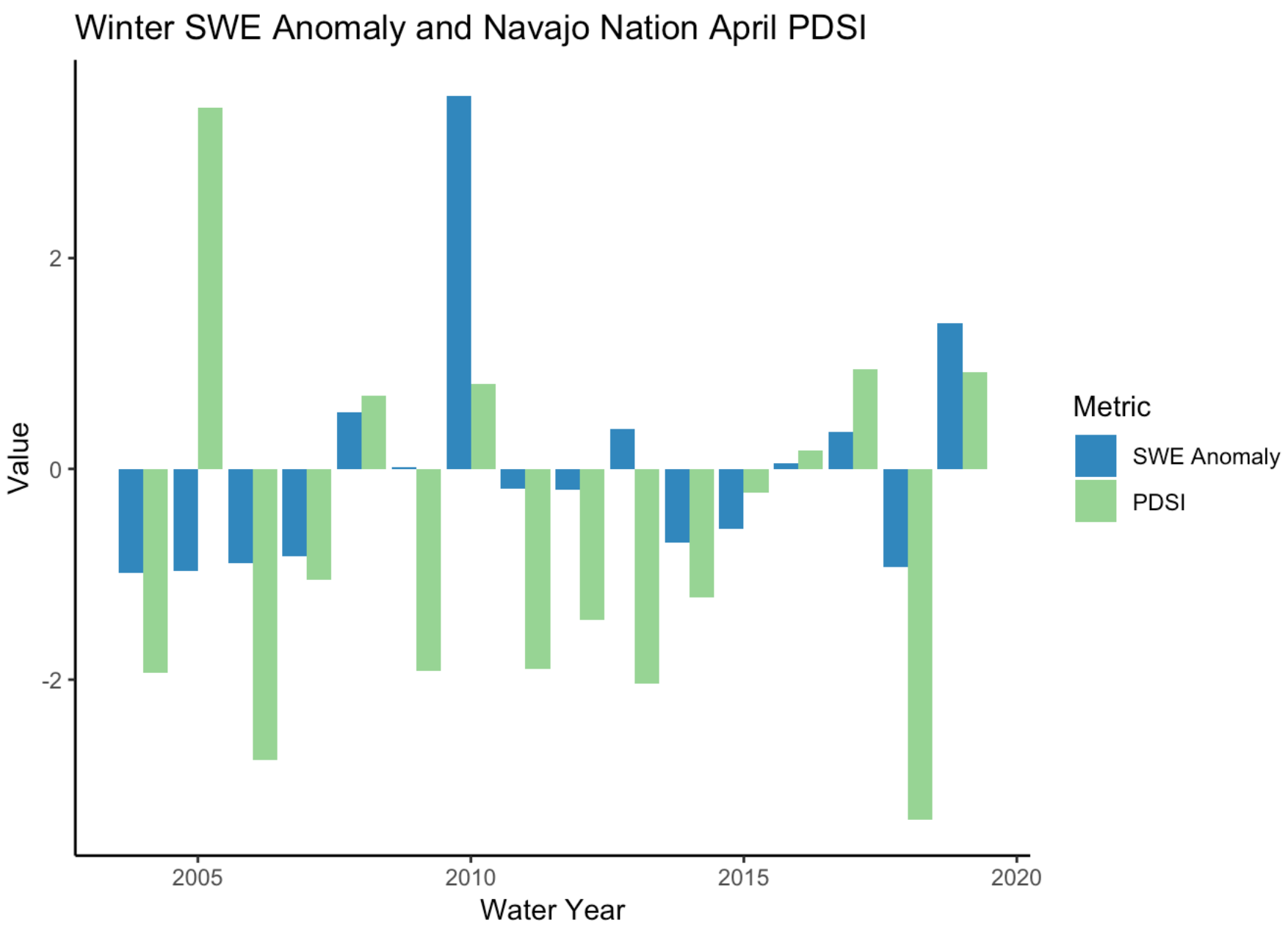








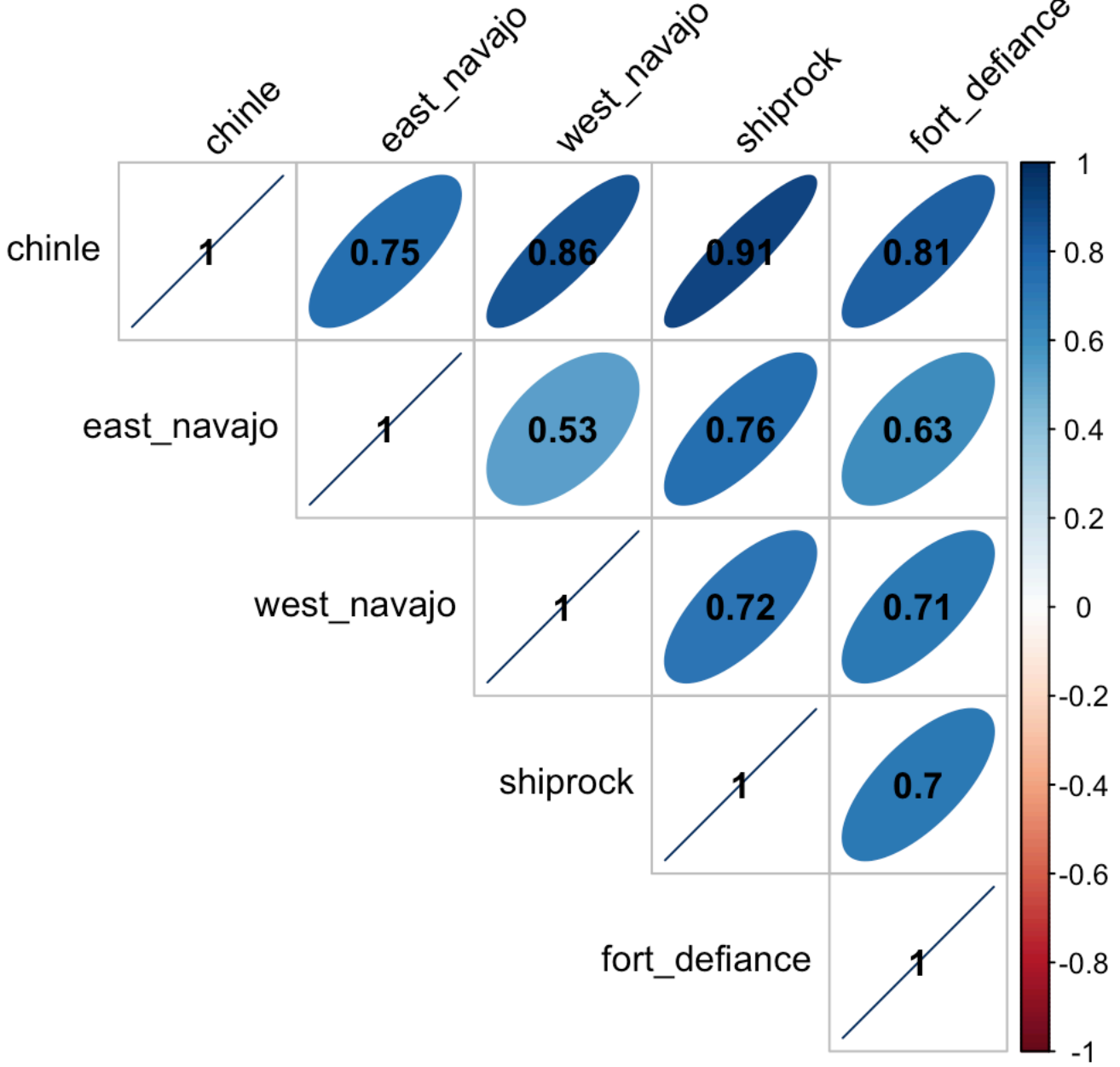
- High elevation winter swe anomaly is most correlated to Navajo Nation April PDSI
- the statistical significance isnt great for any of the correlations though



- *April* positive swe & positive spi / positive swe: 71.429%
- *April* negative swe & negative spi / negative swe: 88.8888889%
- *April* total same sign: 81.25%

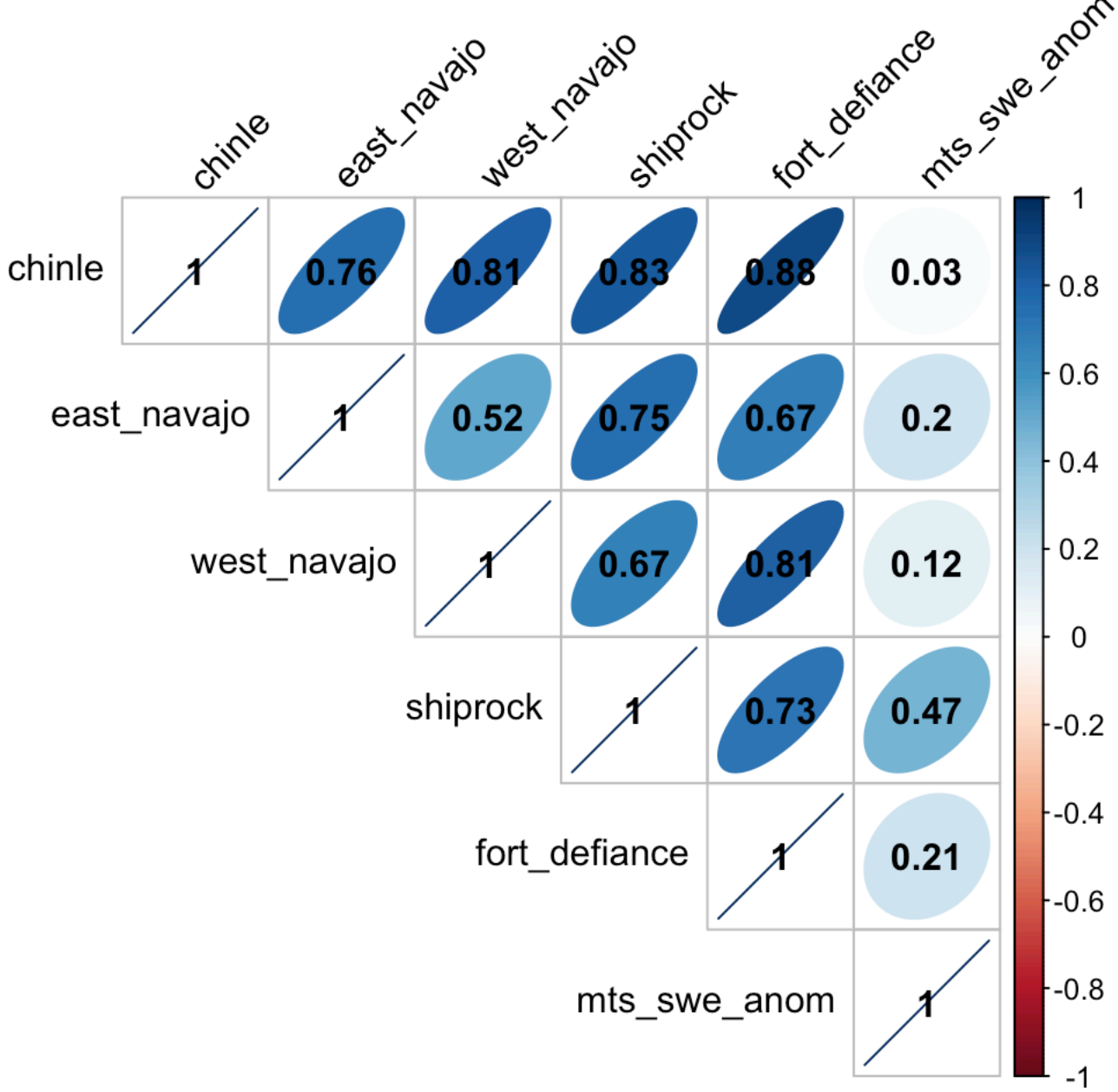
Agencies

Correlation of PDSI monthly averages for the Agencies



Correlation between high elevation winter swe anomaly and the monthly average PDSI of the agencies

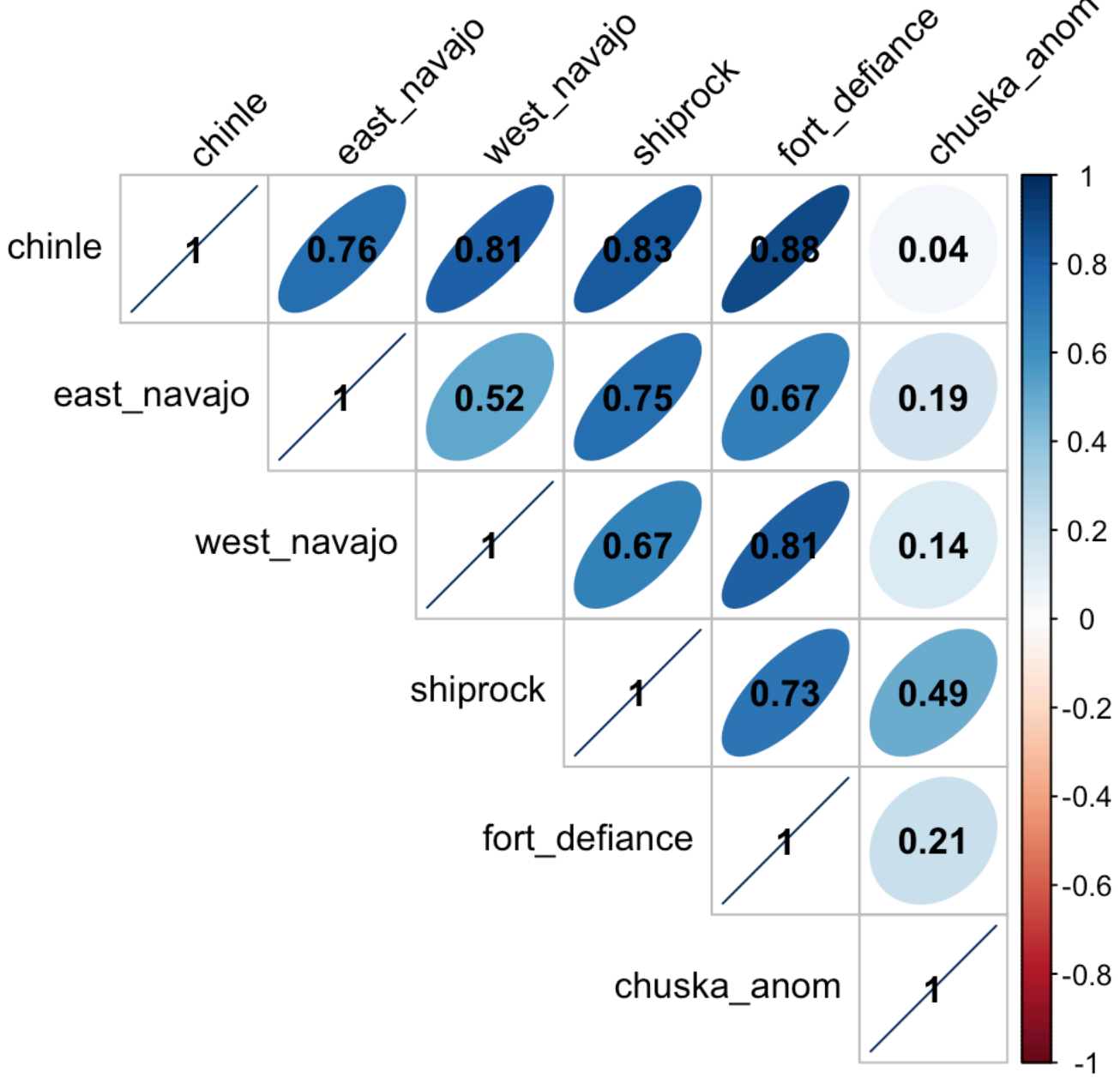
April SPI & All Mts Winter Swe Anomaly



- Shiprock PDSI seems to be most correlated high elevation winter swe anomaly

Correlation between Chuska winter swe anomaly and the monthly average PDSI of the agencies

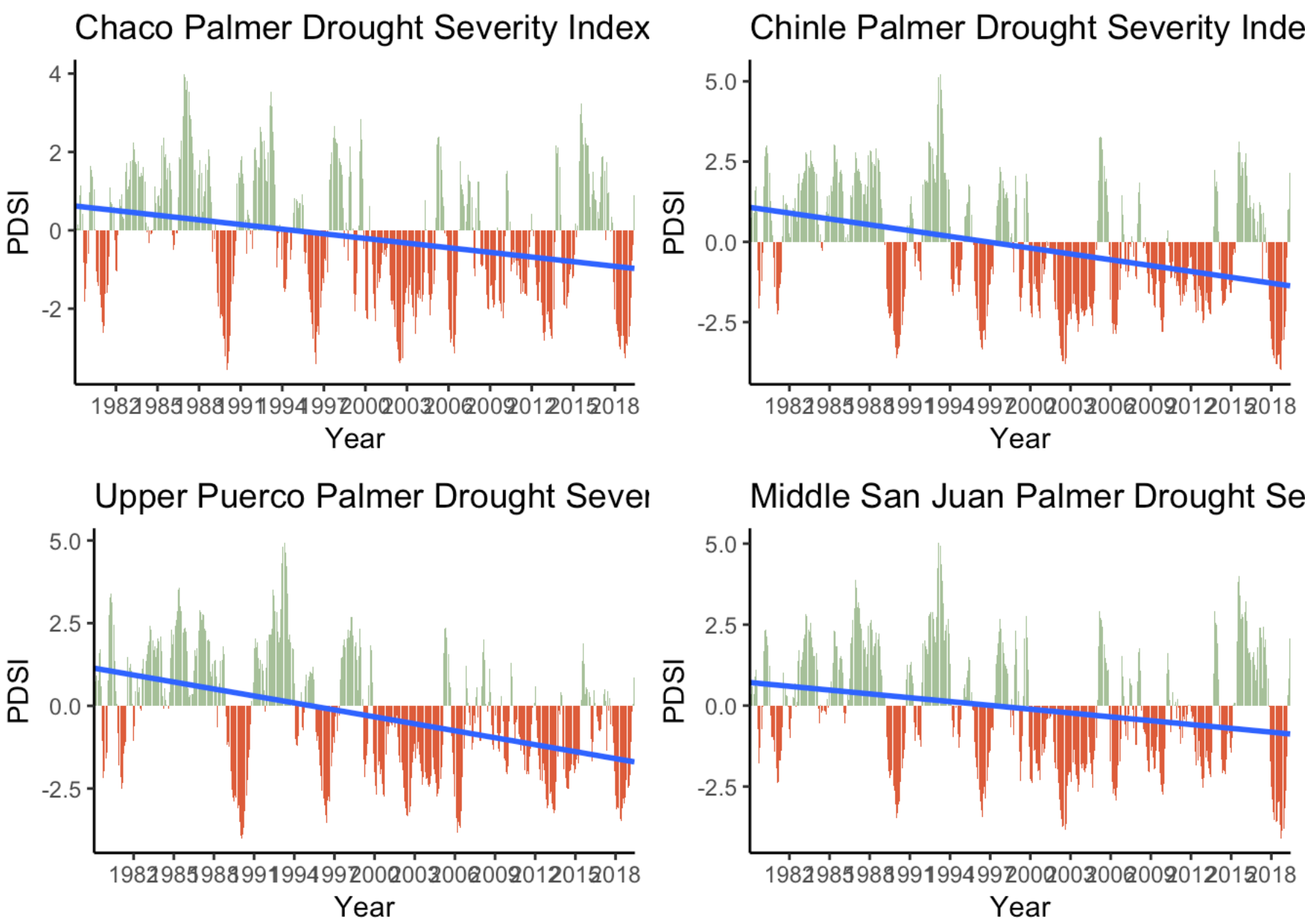
April SPI and Chuska SWE Winter Anomaly



- Shiprocks April PDSI is most correlated to CHuska winter swe anomaly

Watersheds

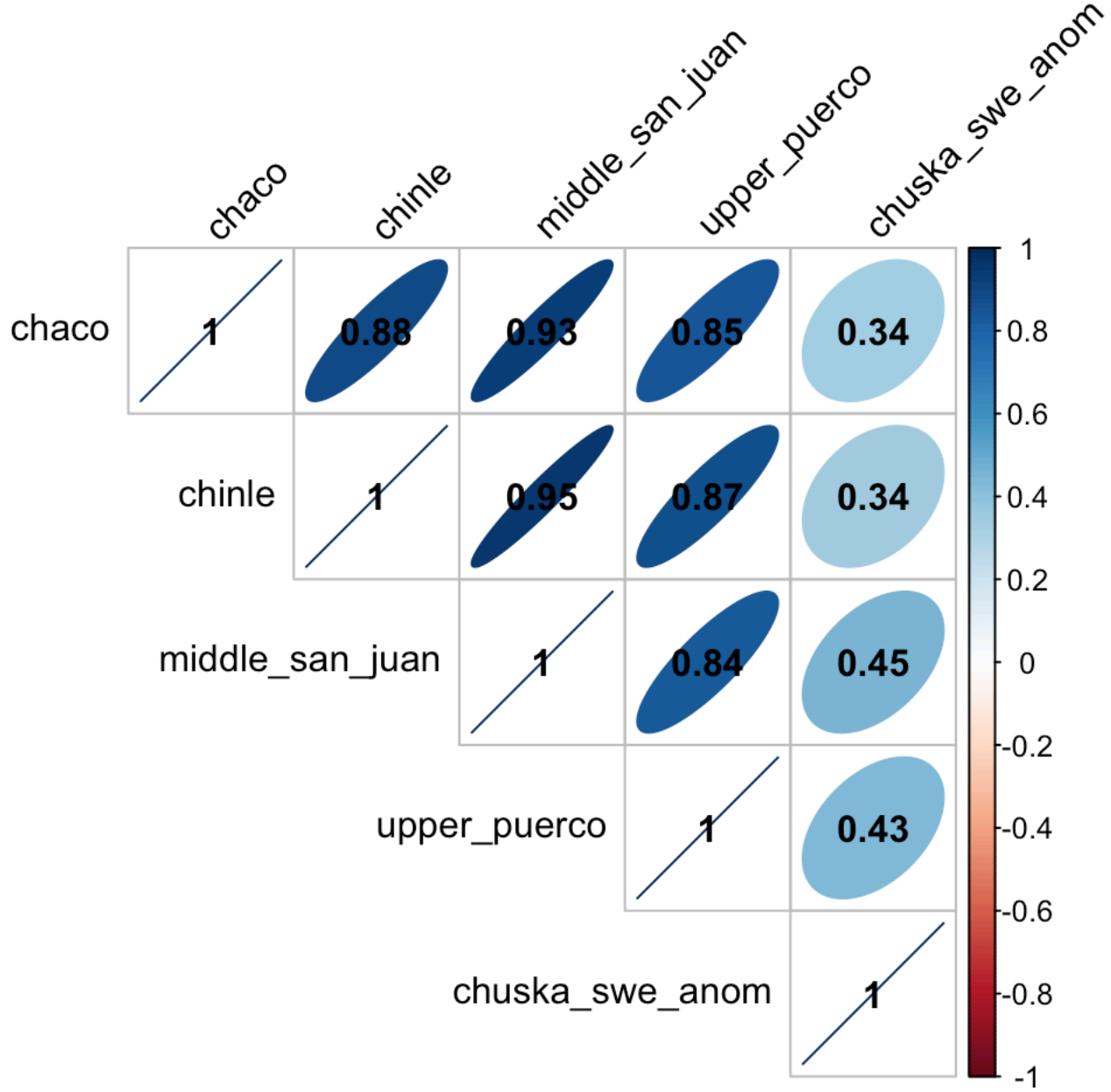
Watershed PDSI timeseries (1981-present)



- all of the watersheds show increasing drought towards the 21st century

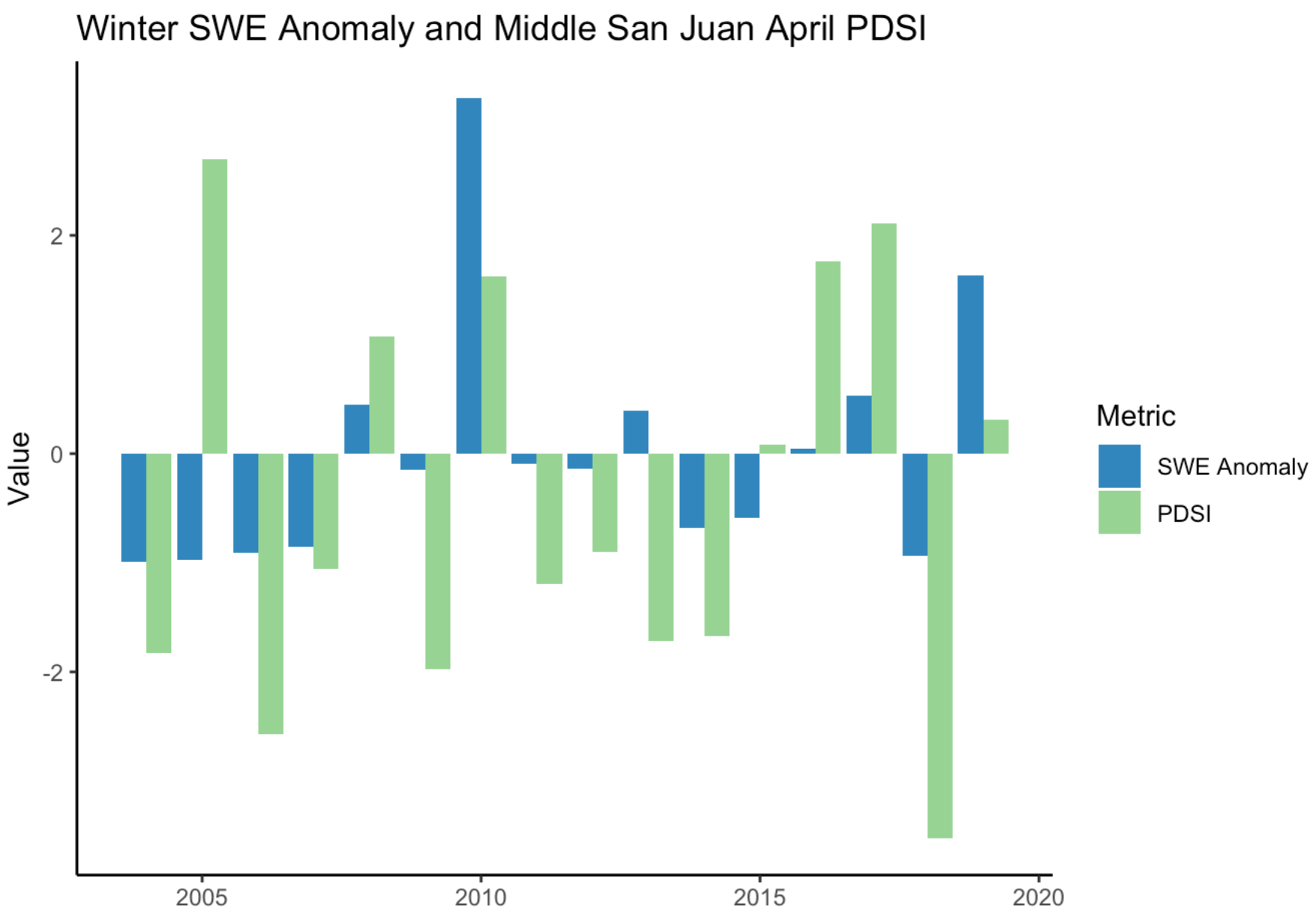
Watershed PDSI vs Chuska winter swe anomaly

April PDSI



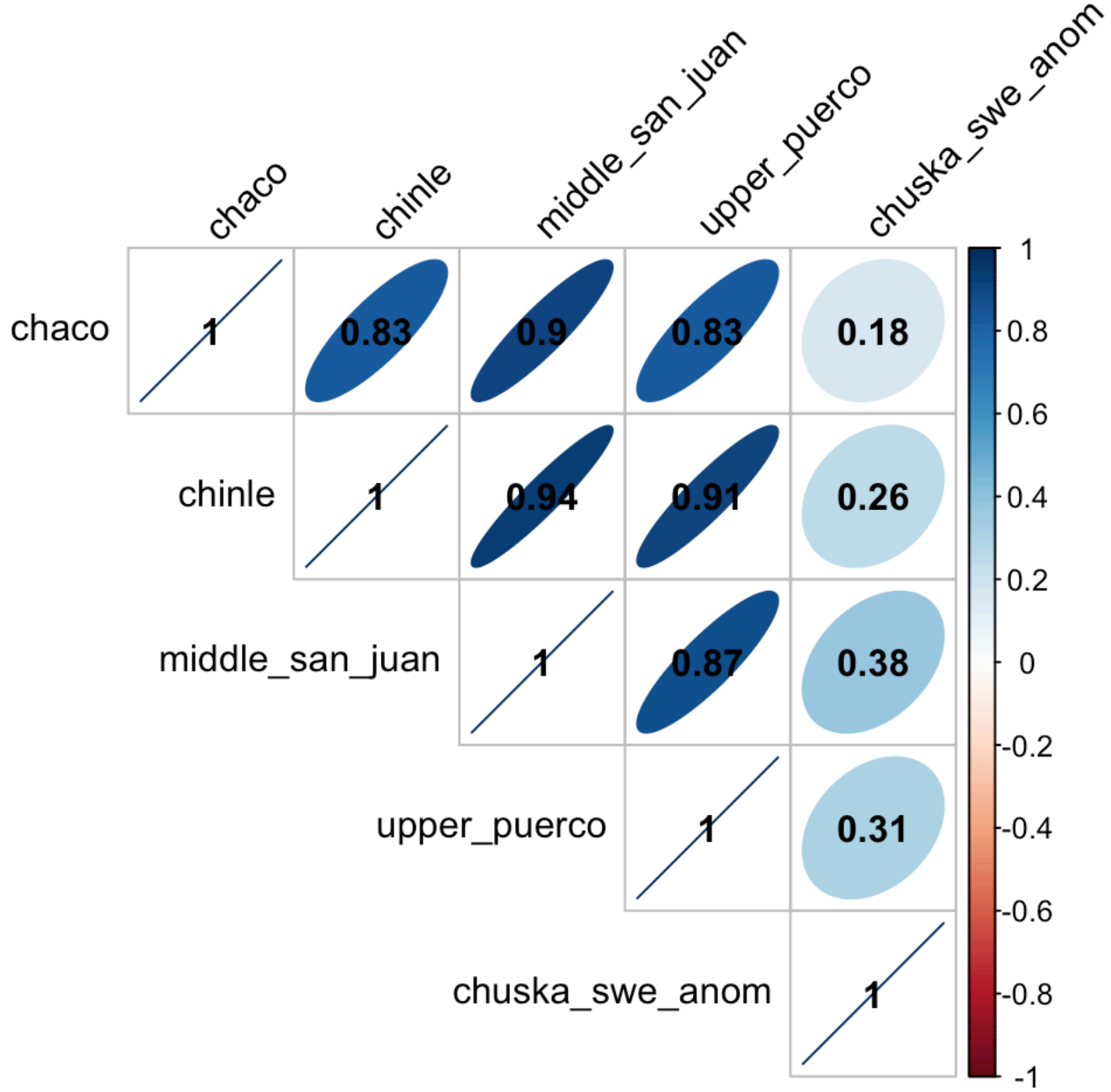
- Middle San Juan April PDSI has the highest correlation to Chuska winter swe anomaly

Middle San Juan April PDSI andC huska winter swe anomaly



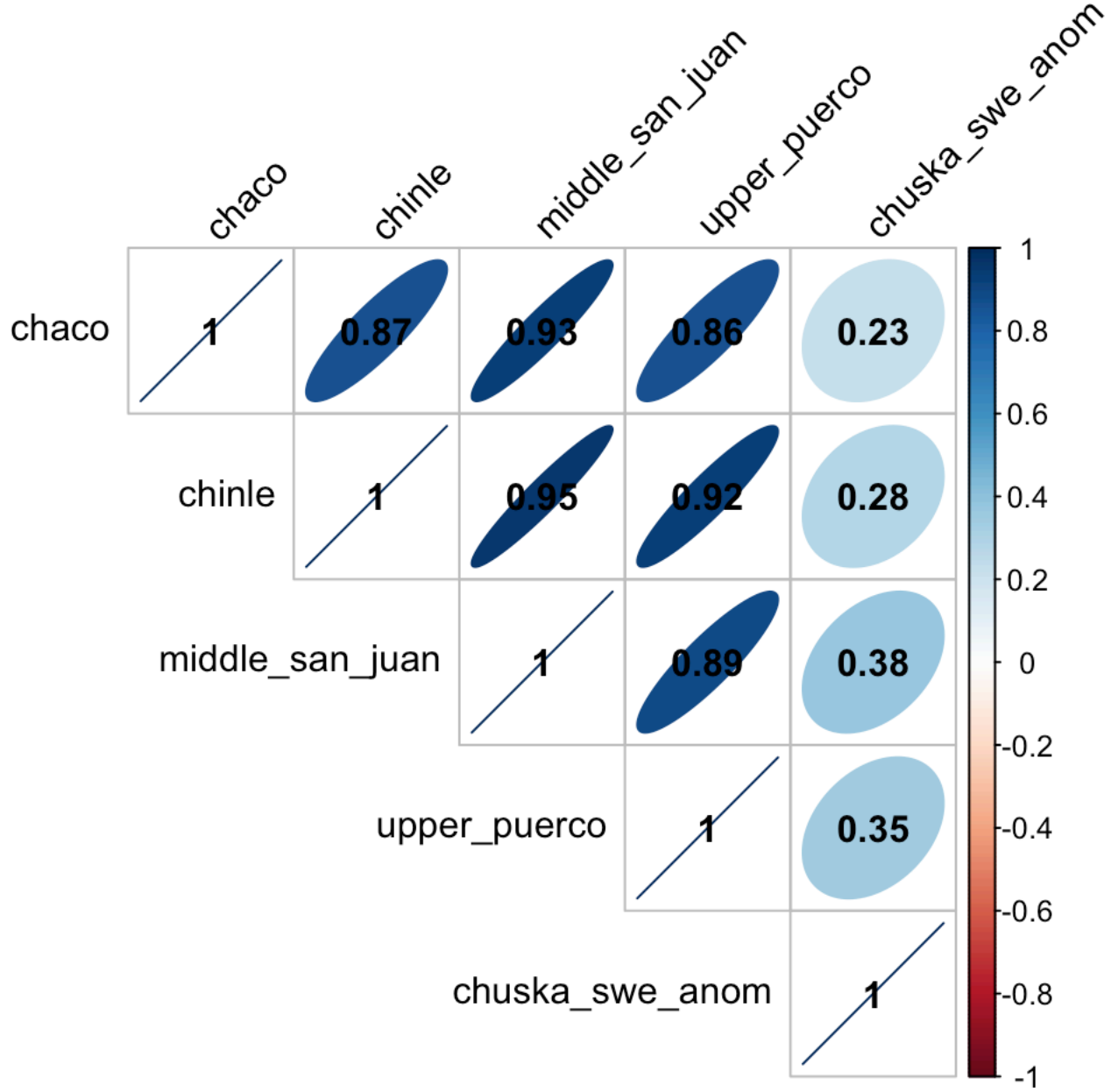
- *April* positive swe & positive spi / positive swe: 83.333%
- *April* negative swe & negative spi / negative swe: 80%
- *April* total correct: 81.25%

May

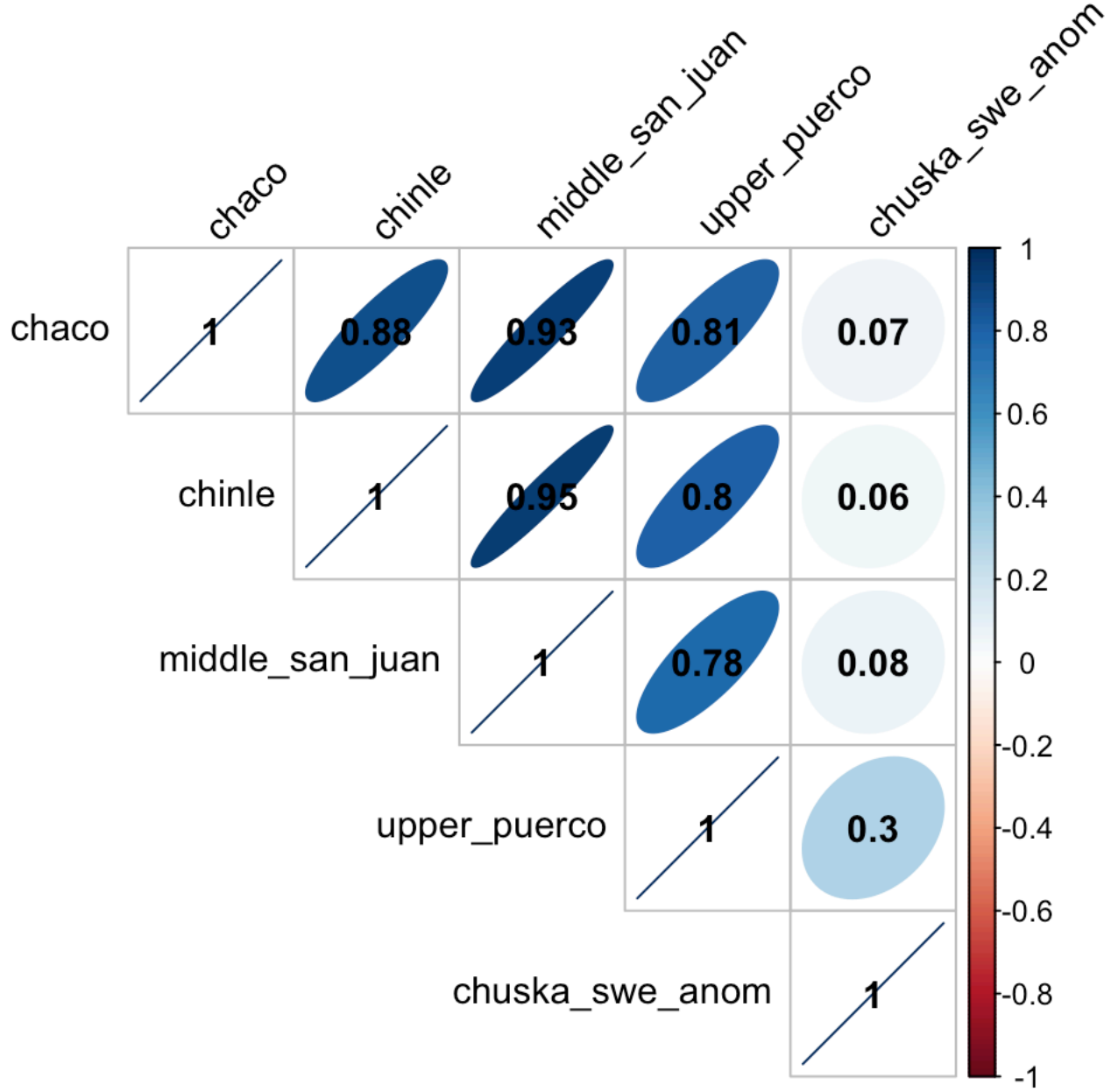


- for May PDSI, middle san juan is still most highly correlated to winter swe anomaly
- Watersheds' PDSI seem to be most highly correlated to winter swe anomaly in April

Chuska winter swe and watershed PDSI AMJ

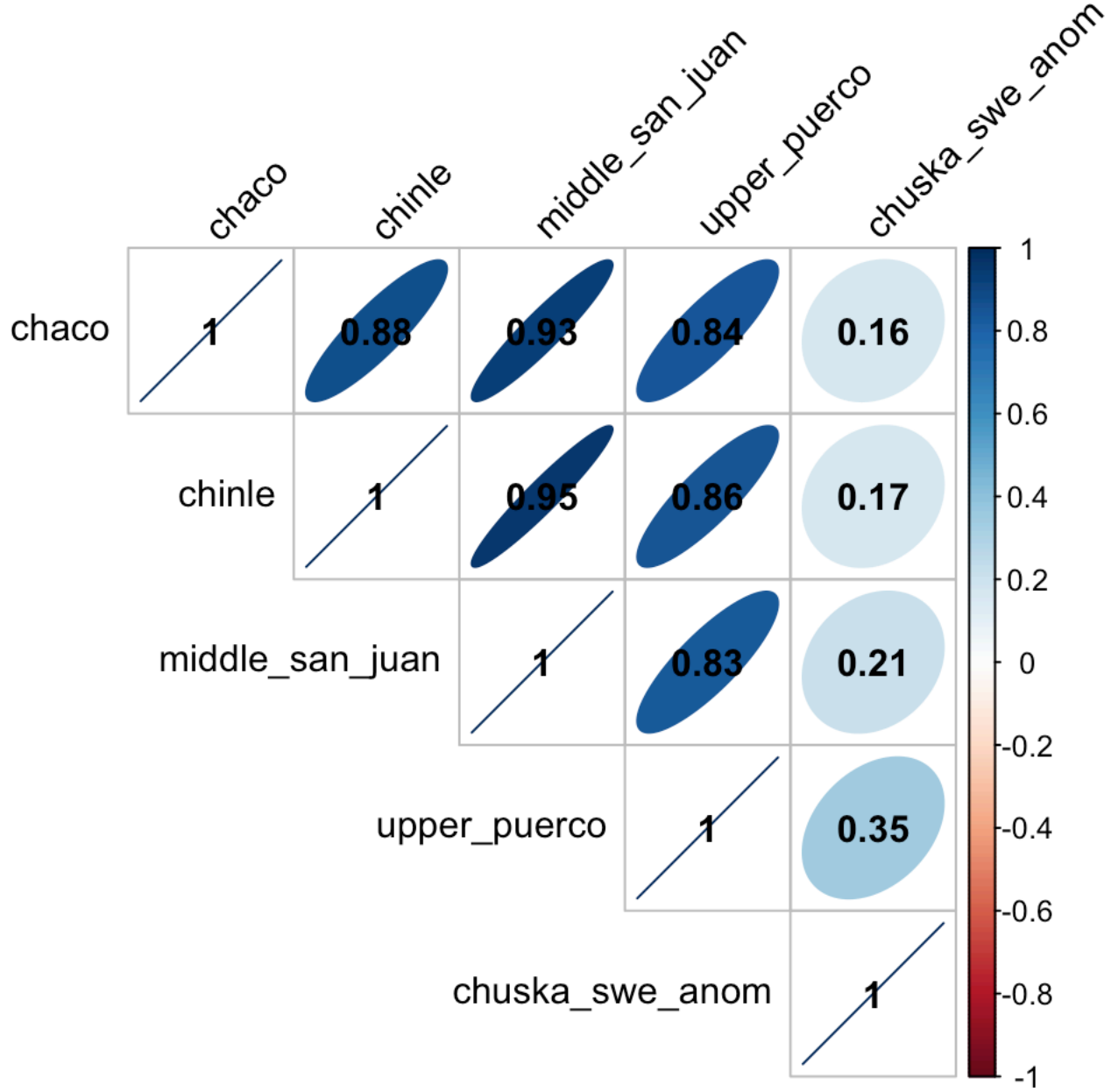


Chuska winter swe and watershed PDSI December - May (6 month PDSI)



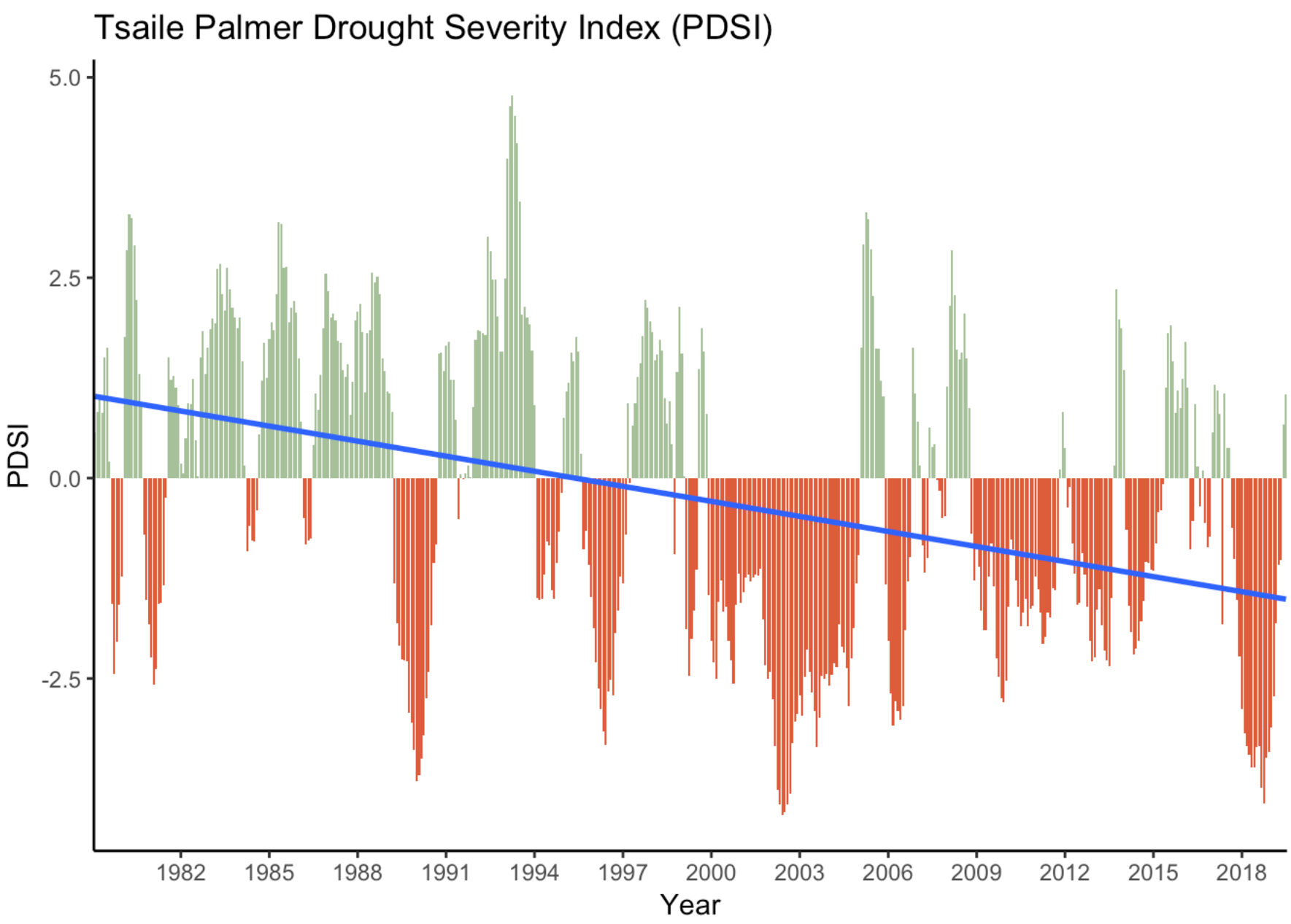
- not really correlated at all

Chuska winter swe and watershed PDSI January - June (6 month PDSI)

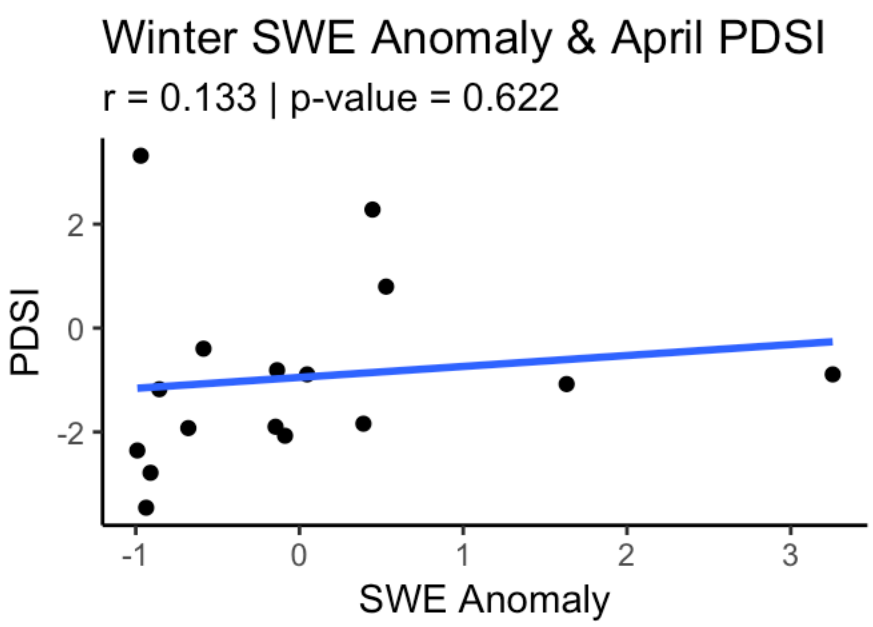


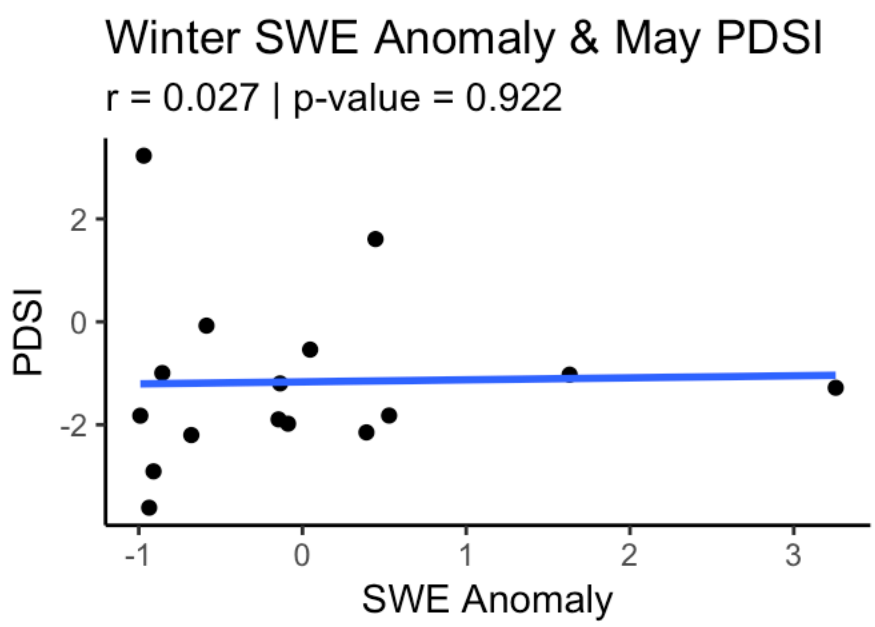
- a bit more highly correlated than Dec-May

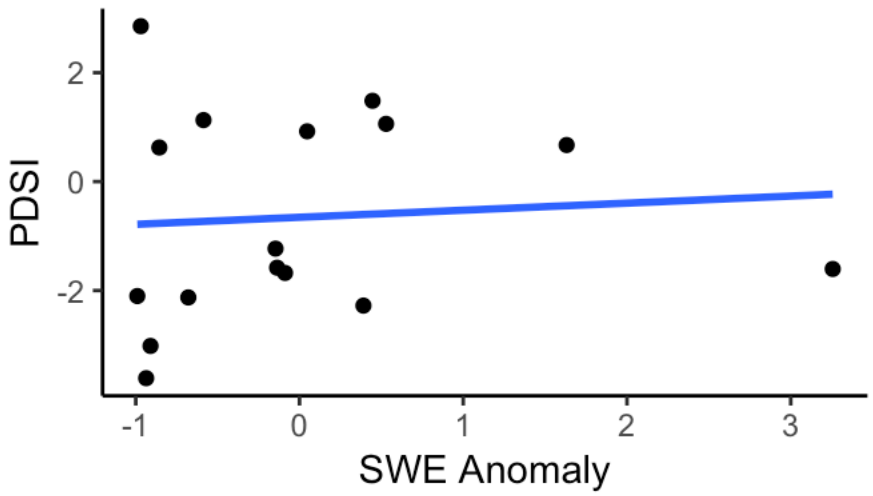
Tsaile Chapter

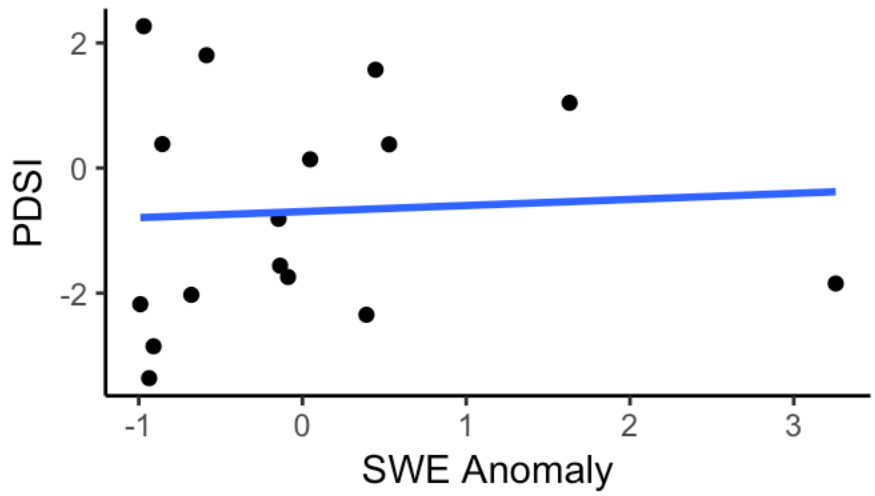



```
##
## Call:
## lm(formula = tsaile_pdsi_mnth$pdsi ~ tsaile_pdsi_mnth$date)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -4.1174 -1.3595  0.0247  1.4272  4.6402
##
## Coefficients:
##                           Estimate Std. Error t value Pr(>|t|)
## (Intercept)              1.588e+00  2.181e-01   7.282 1.34e-12 ***
## tsaile_pdsi_mnth$date -1.714e-04  1.894e-05  -9.053  < 2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 1.783 on 484 degrees of freedom
##   (1 observation deleted due to missingness)
## Multiple R-squared:  0.1448, Adjusted R-squared:  0.143
## F-statistic: 81.95 on 1 and 484 DF,  p-value: < 2.2e-16
```



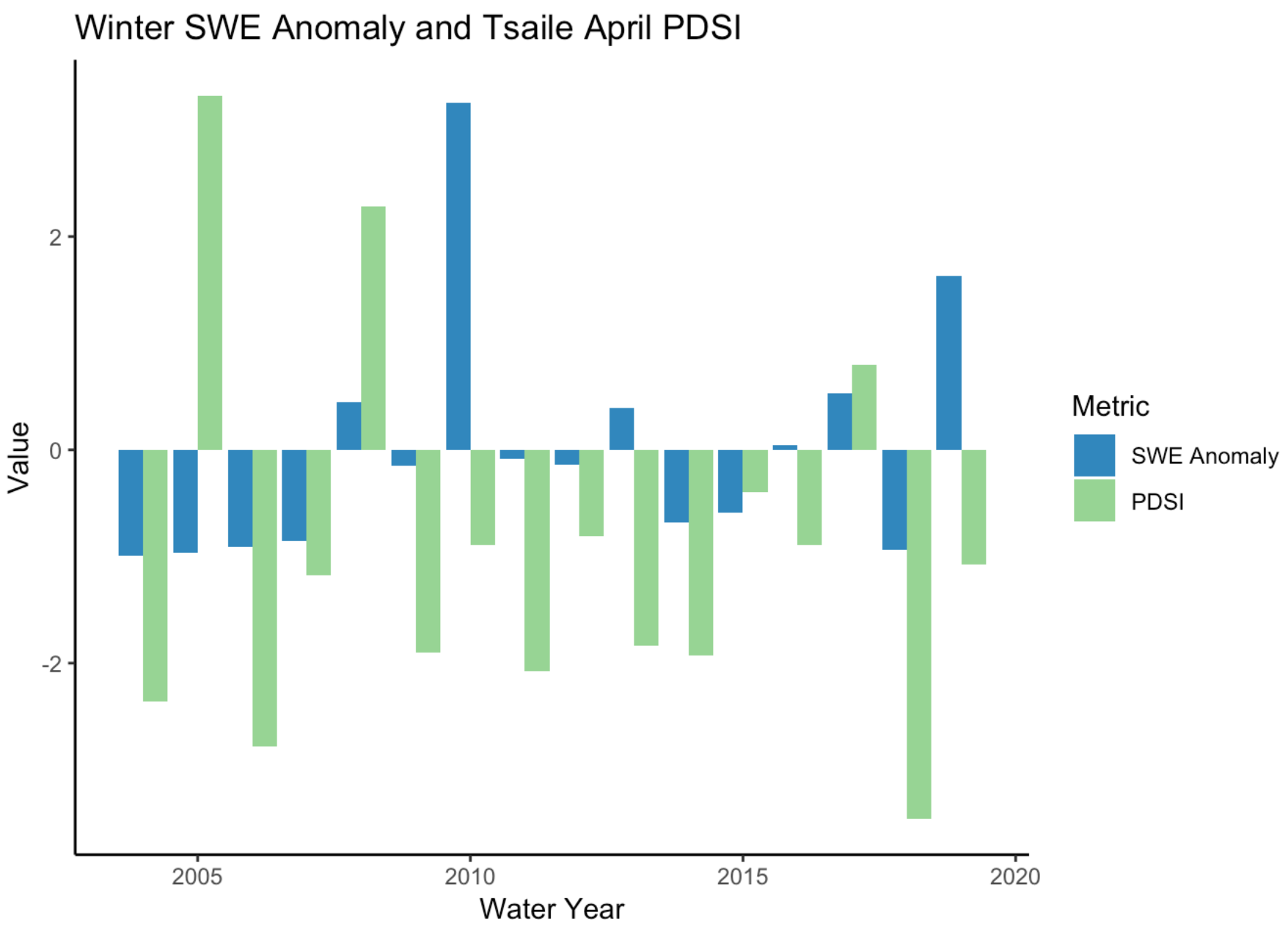






- Tsaile PDSI doesnt really ever seem to be correlated with Chuska winter swe anomaly

Tsaile April PDSI andC huska winter swe anomaly



- *April* positive swe & positive spi / positive swe: 33.333%
- *April* negative swe & negative spi / negative swe: 90%
- *April* total correct: 68.75%

But Tsaile PDSI is almost consistently always negative, so be careful about interpreting the effect of SWE here