TUCPzoops

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Ecosystem impacts of the TUCP

The 2023 TUCP is going to change X2 from March through May. Let's analyze the relationship between X2 and CPUE of the 12 most common zooplankton taxa caught by EMP from 1995-2021

```
zoops = Zoopsynther(Data_type = 'Community', Sources = "EMP", Size_class = c("Meso", "Macro"))
```

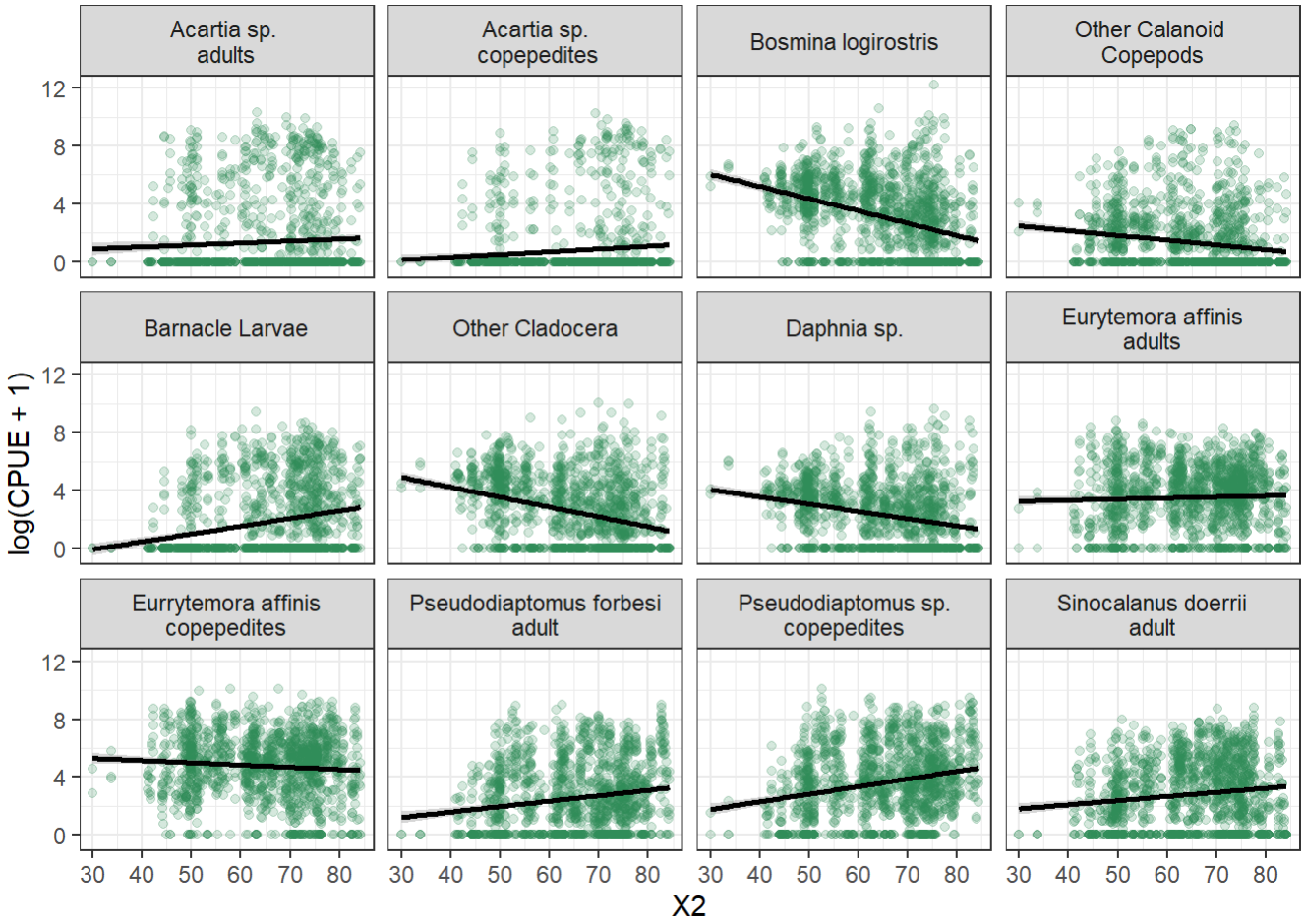
```
## [1] "No disclaimers here! Enjoy the clean data!"
```

```
zoops2 = filter(zoops, Undersampled == F, month(Date) %in% c(3,4,5), Year %in% c(1995:2021))

taxa = group_by(zoops2, Taxlifestage) %>%
  summarize(tot = sum(CPUE))
toptax = arrange(taxa, by = -tot)[1:12,]

zoops3 = filter(zoops2, Taxlifestage %in% toptax$Taxlifestage) %>%
  left_join(X2) %>%
  mutate(Taxa = factor(Taxlifestage, levels = sort(unique(Taxlifestage)),
                       labels = c("Acartia sp. \nadults","Acartia sp.\n copepedites", "Bosmina l
ogirostris",
                                  "Other Calanoid \nCopepods", "Barnacle Larvae", "Other Cladoce
ra",
                                  "Daphnia sp.", "Eurytemora affinis\nadults", "Eurrytemora affi
nis\ncopepedites",
                                  "Pseudodiaptomus forbesi\nadult", "Pseudodiaptomus sp.\ncopepe
dites", "Sinocalanus doerrii\nadult")))
```

```
## Joining, by = "Date"
```

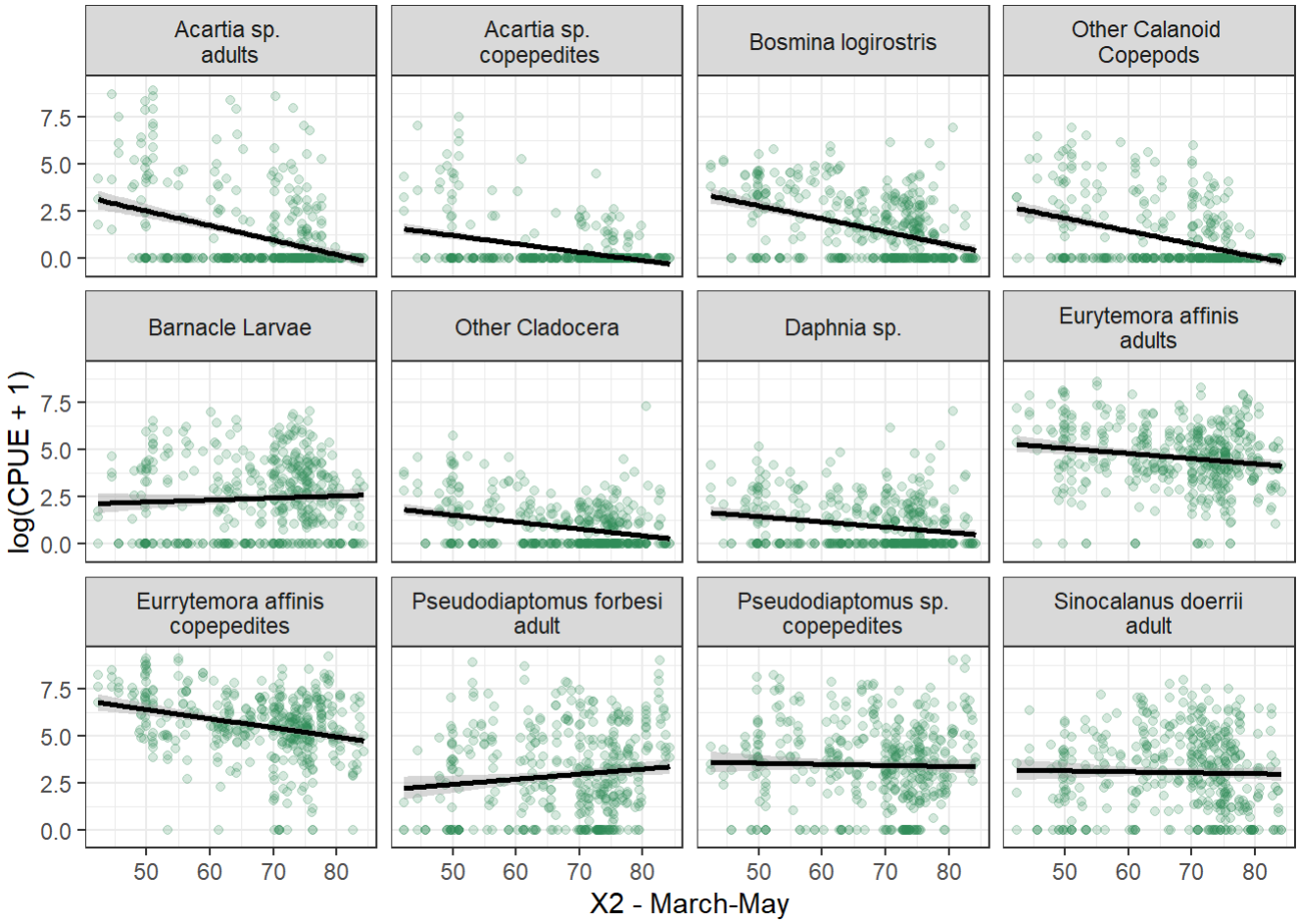
```
ggplot(zoops3, aes(x = X2, y = log(CPUE+1)))+geom_point(alpha = 0.2,
                                                        color = "seagreen")+geom_smooth(method =
"lm", color = "black")+
  facet_wrap(~Taxa)+theme_bw()
```

```
## `geom_smooth()` using formula = 'y ~ x'
```



Now let's filter it to just the low salinity zone

```
## `geom_smooth()` using formula = 'y ~ x'
```



It might be easier to show annual averages instead of all the points

```
#maybe annual averages?
Zoopan = group_by(zoops3, Taxa, Year) %>%
  summarize(CPUE = mean(CPUE), X2 = mean(X2))
```

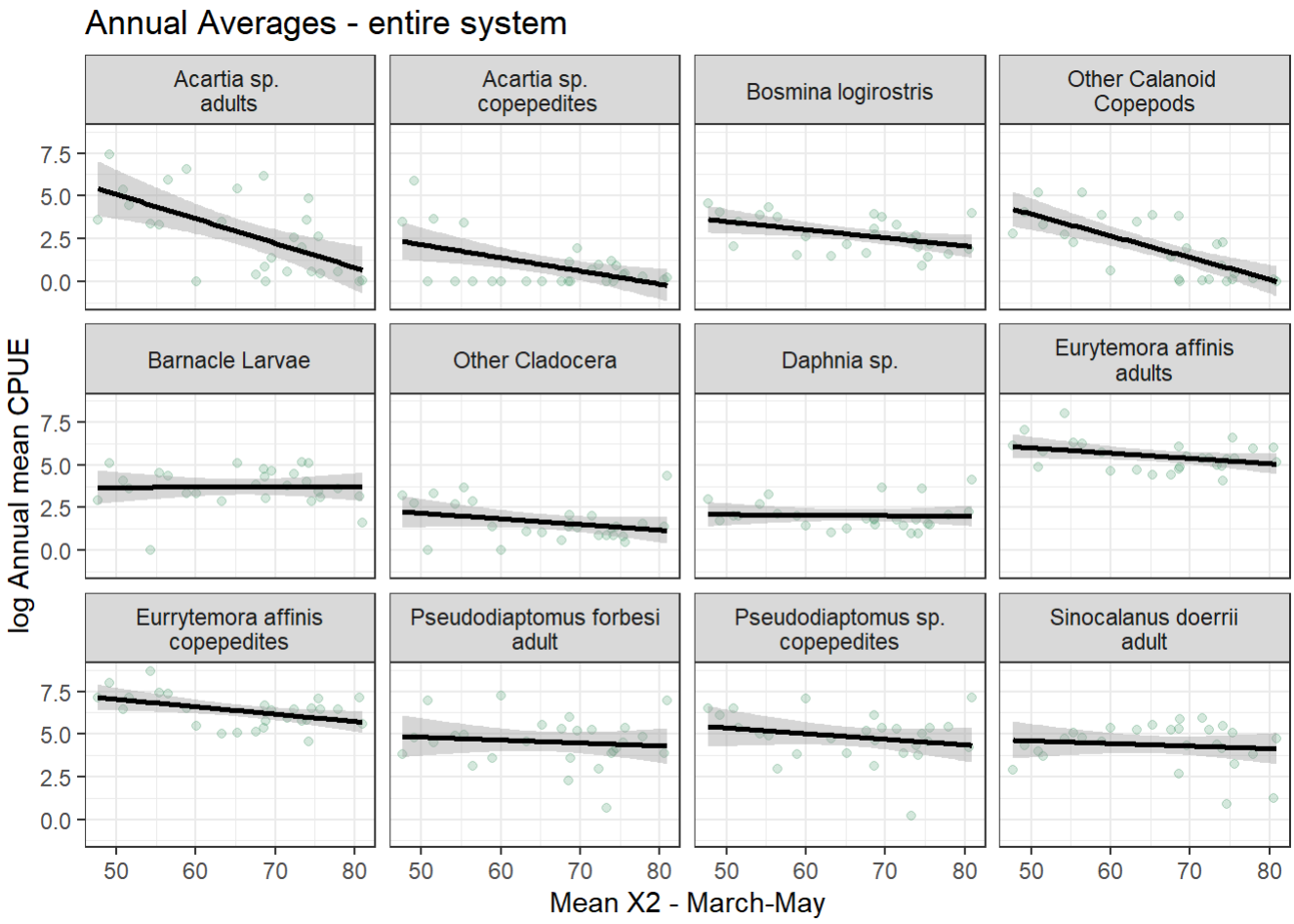
```
## `summarise()` has grouped output by 'Taxa'. You can override using the
## `.groups` argument.
```

```
ZoopanLSZ = group_by(zoopsLSZ, Taxa, Year) %>%
  summarize(CPUE = mean(CPUE), X2 = mean(X2))
```

```
## `summarise()` has grouped output by 'Taxa'. You can override using the
## `.groups` argument.
```

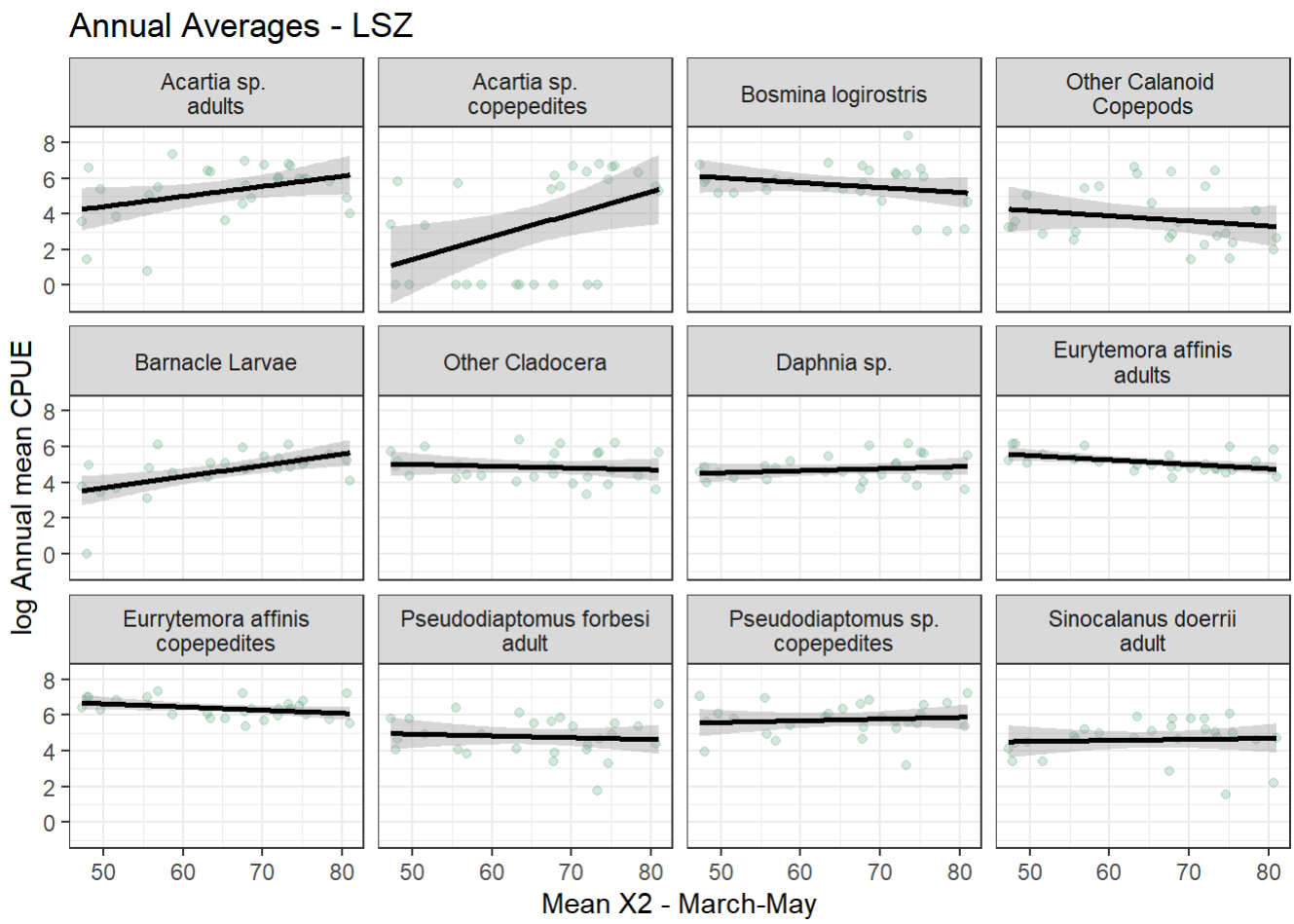
```
ggplot(ZoopanLSZ, aes(x = X2, y = log(CPUE+1)))+geom_point(alpha = 0.2,
                                                           color = "seagreen")+geom_smooth(method
= "lm", color = "black")+
  facet_wrap(~Taxa)+theme_bw()+ xlab("Mean X2 - March-May")+ylab("log Annual mean CPUE")+ggtitle
("Annual Averages - entire system")
```

```
## `geom_smooth()` using formula = 'y ~ x'
```




```
ggplot(Zoopan, aes(x = X2, y = log(CPUE+1)))+geom_point(alpha = 0.2,
                                                        color = "seagreen")+geom_smooth(metho
d = "lm", color = "black")+
  facet_wrap(~Taxa)+theme_bw()+ xlab("Mean X2 - March-May")+ylab("log Annual mean CPUE")+ggtitle
("Annual Averages - LSZ")
```

```
## `geom_smooth()` using formula = 'y ~ x'
```


Annual Averages - LSZ
Acartia sp. adults
Acartia sp. copepedites
Bosmina logirostris
Other Calanoid Copepods
Barnacle Larvae
Other Cladocera
Daphnia sp.
Eurytemora affinis adults
Eurrytemora affinis copepedites
Pseudodiaptomus forbesi adult
Pseudodiaptomus sp. copepedites
Sinocalanus doerrii adult
log Annual mean CPUE
0
2
4
6
8
50
60
70
80
Mean X2 - March-May