Biomass Plots

Kara Dobson

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TITLE: Biomass plots

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DATA INPUT: Data imported as csv files from shared Google drive L0 folder

DATA OUTPUT: Visualizations of biomass data

PROJECT: warmXtrophic

DATE: March 2022

```r
# Clear all existing data
rm(list=ls())

#Load packages
library(tidyverse)
```

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.0 --
```

```
## v ggplot2 3.3.2     v purrr   0.3.4
## v tibble  3.0.3     v dplyr   1.0.2
## v tidyr   1.1.2     v stringr 1.4.0
## v readr   1.3.1     v forcats 0.5.0
```

```
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```

```r
library(plotrix)
library(ggpubr)

# Get data
Sys.getenv("L1DIR")
```

```
## [1] "/Volumes/GoogleDrive-117472253521803368412/Shared drives/SpaCE_Lab_warmXtrophic/data/L1/"
```

```r
L1_dir<-Sys.getenv("L1DIR")
list.files(L1_dir)

## [1] "ANPP"            "climate_data"     "CN"
## [4] "Greenness"       "herbivory"        "HOBO_data"
## [7] "PAR"             "phenology"        "plant_composition"
## [10] "SLA"

kbs_biomass_21 <- read.csv(file.path(L1_dir, "ANPP/kbs_biomass_2021_L1.csv"))
umbs_biomass_21 <- read.csv(file.path(L1_dir, "ANPP/umbs_biomass_2021_L1.csv"))
kbs_biomass_21 <- kbs_biomass_21 %>% dplyr::select(-X) # get rid of "X" column that shows up (could fix
umbs_biomass_21 <- umbs_biomass_21 %>% dplyr::select(-X)

# making separate dataframe for biomass - easier in plots
kbs_biomass_only <- kbs_biomass_21 %>%
        select(-cover) %>%
        drop_na(weight_g)
umbs_biomass_only <- umbs_biomass_21 %>%
        select(-cover) %>%
        drop_na(weight_g)

# remove uninformative species
kbs_biomass_live <- kbs_biomass_only[!grepl("Litter", kbs_biomass_only$species),]
umbs_biomass_live <- umbs_biomass_only[!grepl("Litter", umbs_biomass_only$species),]
umbs_biomass_live <- umbs_biomass_live[!grepl("Standing_Dead", umbs_biomass_live$species),]
umbs_biomass_live <- umbs_biomass_live[!grepl("Surface_Litter", umbs_biomass_live$species),]

# keeping species found only in w and a
kbs_biomass_live2 <- kbs_biomass_live %>%
        group_by(species) %>%
        filter(all(c('warmed', 'ambient') %in% state))
umbs_biomass_live2 <- umbs_biomass_live %>%
        group_by(species) %>%
        filter(all(c('warmed', 'ambient') %in% state))

### Overall averages btwn treatments - barplot
biomass_sum_k <- kbs_biomass_live %>%
        group_by(state) %>%
        summarize(avg_weight = mean(weight_g, na.rm = TRUE),
                  se = std.error(weight_g, na.rm = TRUE))

## `summarise()` ungrouping output (override with `.groups` argument)

ggplot(biomass_sum_k, aes(x = state, y = avg_weight, fill = state)) +
        geom_bar(position = "identity", stat = "identity", col = "black") +
        geom_errorbar(aes(ymin = avg_weight - se, ymax = avg_weight + se), width = 0.2,
                      position = "identity") +
        scale_fill_manual(values = c("#a6bddb", "#fb6a4a")) +
        scale_x_discrete(labels=c("ambient" = "A", "warmed" = "W")) +
        theme_classic()
```
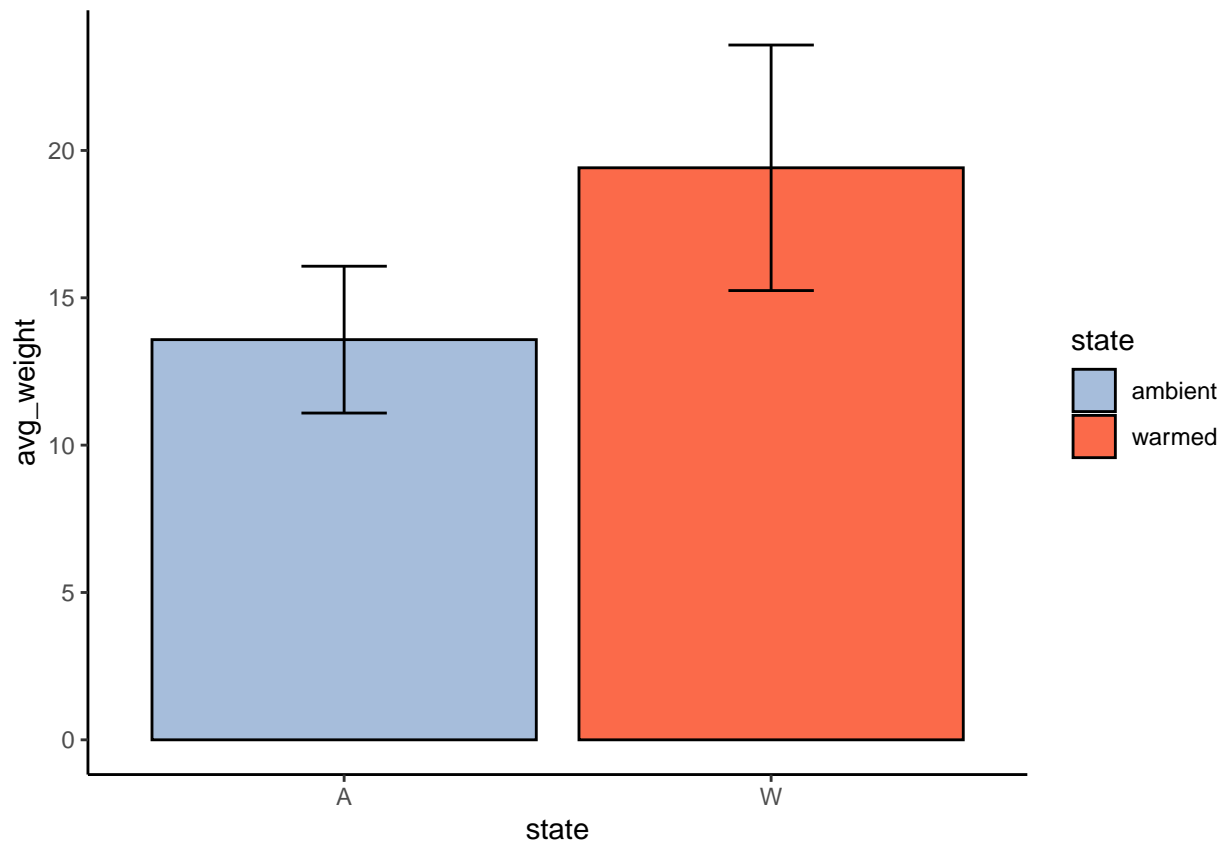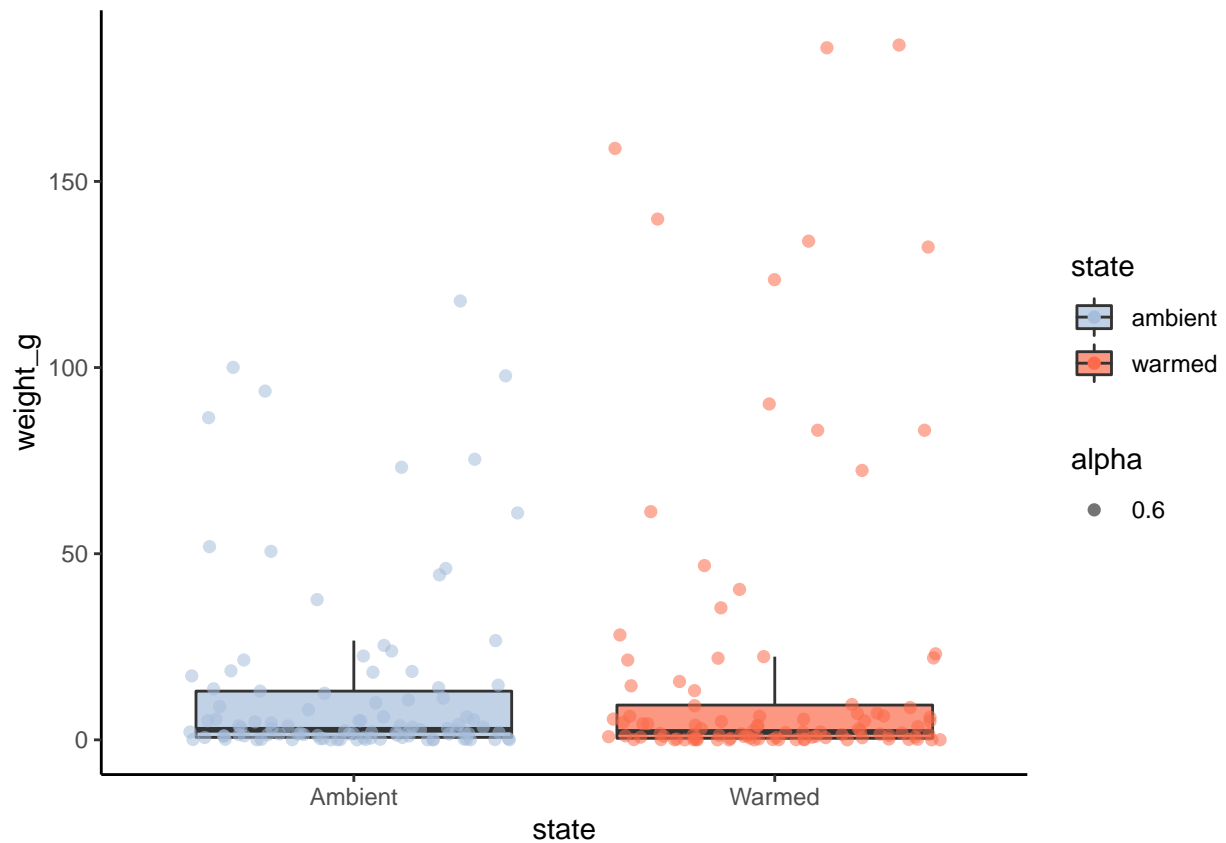
```
biomass_sum_u <- umbs_biomass_live %>%
        group_by(state) %>%
        summarize(avg_weight = mean(weight_g, na.rm = TRUE),
                  se = std.error(weight_g, na.rm = TRUE))

## `summarise()` ungrouping output (override with `.groups` argument)

ggplot(biomass_sum_u, aes(x = state, y = avg_weight, fill = state)) +
        geom_bar(position = "identity", stat = "identity", col = "black") +
        geom_errorbar(aes(ymin = avg_weight - se, ymax = avg_weight + se), width = 0.2,
                      position = "identity") +
        scale_fill_manual(values = c("#a6bddb", "#fb6a4a")) +
        scale_x_discrete(labels=c("ambient" = "A", "warmed" = "W")) +
        theme_classic()
```
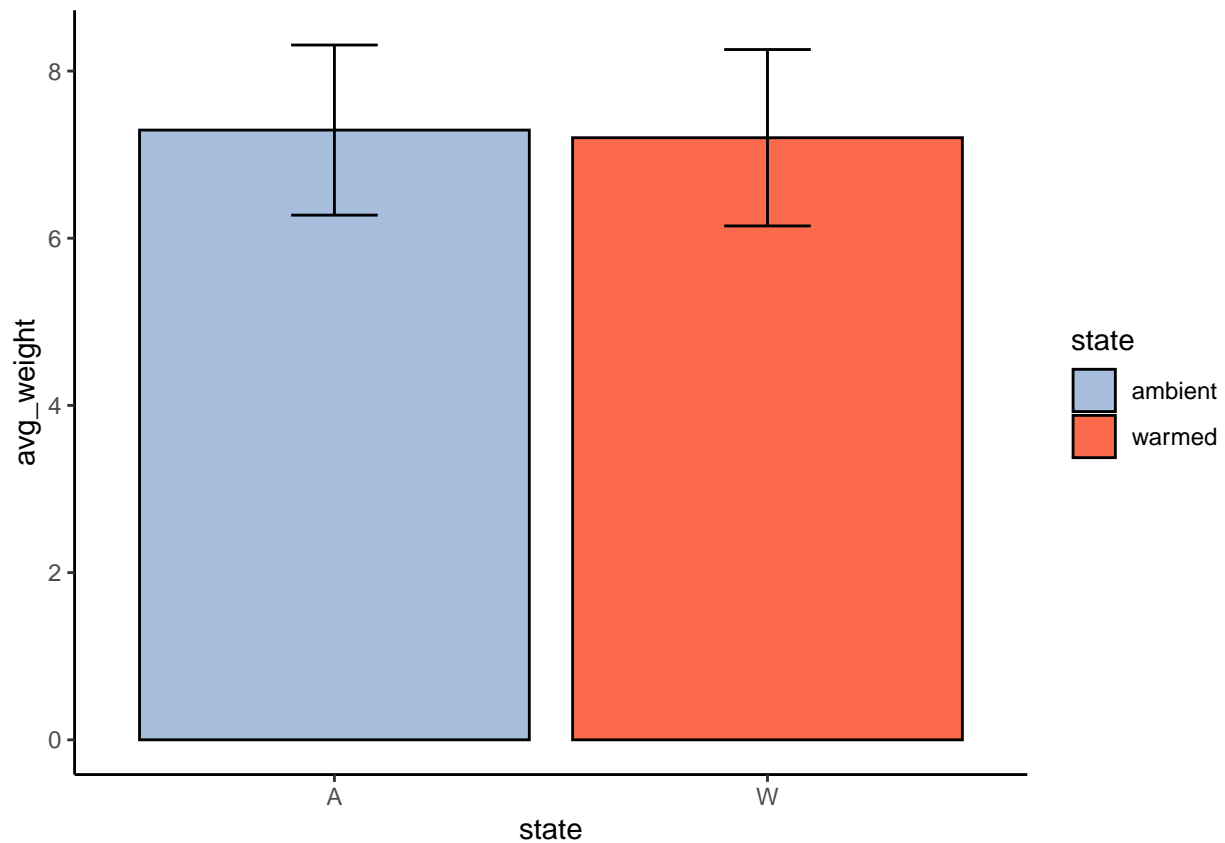
```
### Overall averages btwn treatments - boxplot
ggplot(kbs_biomass_live, aes(x = state, y = weight_g, fill=state)) +
                geom_boxplot(outlier.shape=NA, alpha=0.7) +
                geom_jitter(aes(alpha=0.6, color=state, fill=state), shape=16, size=2) +
                scale_color_manual(values = c("#a6bddb", "#fb6a4a")) +
                scale_fill_manual(values = c("#a6bddb", "#fb6a4a")) +
                scale_x_discrete(labels=c("ambient" = "Ambient", "warmed" = "Warmed")) +
                theme_classic()
```

```
ggplot(umbs_biomass_live, aes(x = state, y = weight_g, fill=state)) +
        geom_boxplot(outlier.shape=NA, alpha=0.7) +
        geom_jitter(aes(alpha=0.6, color=state, fill=state), shape=16, size=2) +
        scale_color_manual(values = c("#a6bddb", "#fb6a4a")) +
        scale_fill_manual(values = c("#a6bddb", "#fb6a4a")) +
        scale_x_discrete(labels=c("ambient" = "Ambient", "warmed" = "Warmed")) +
        theme_classic()
```
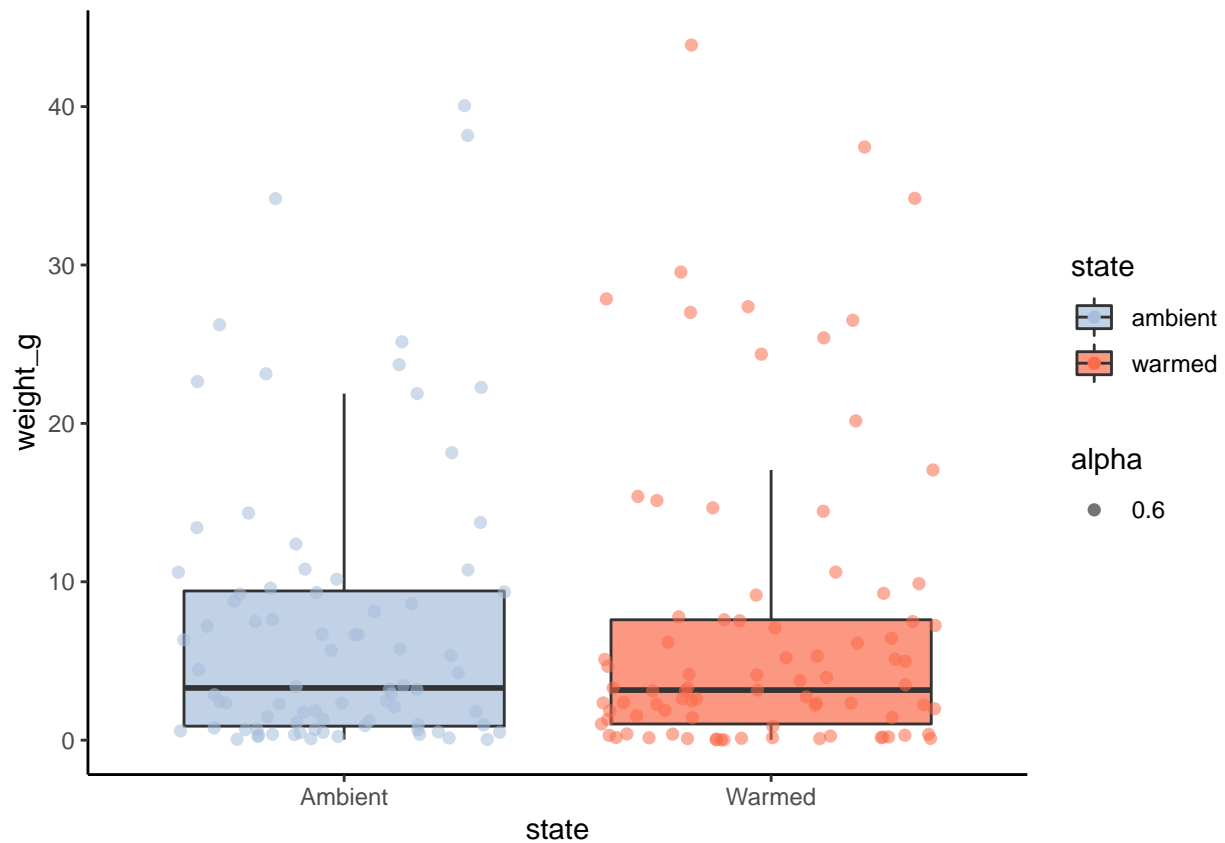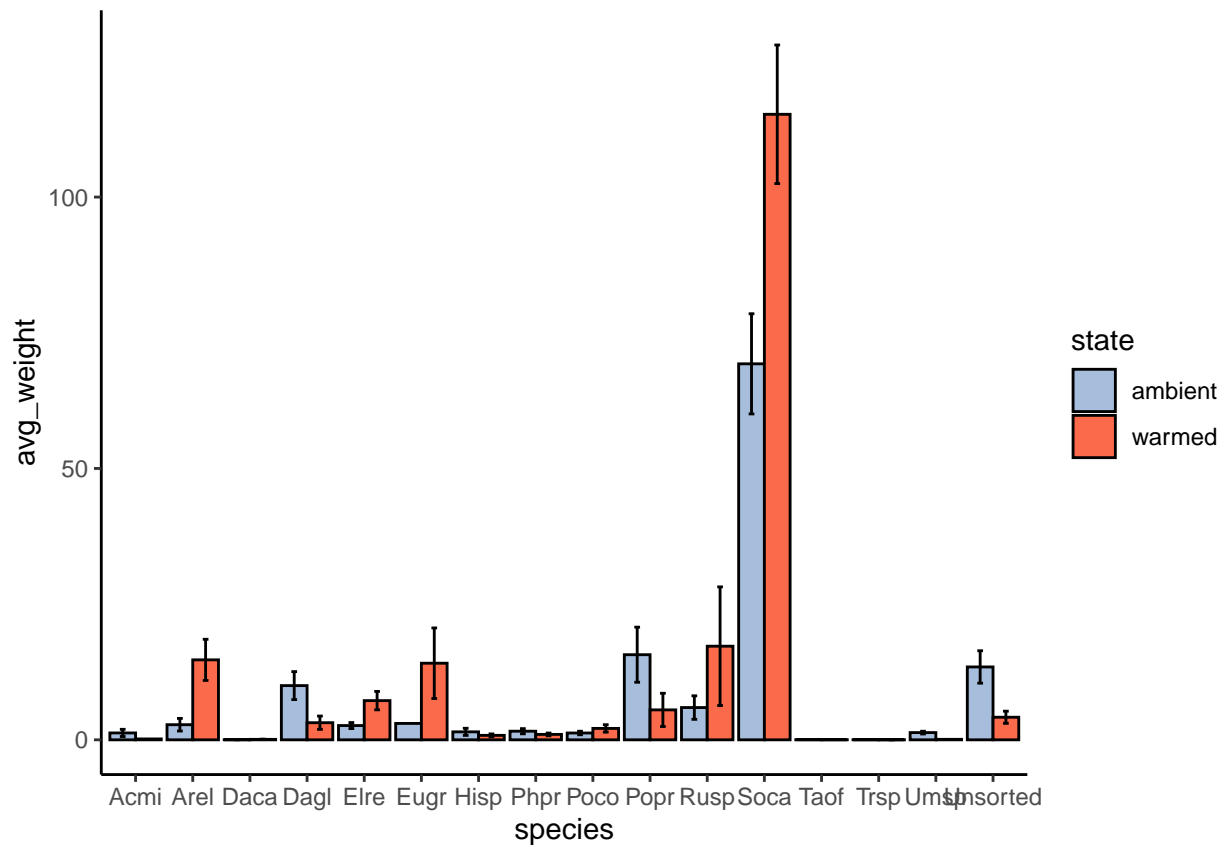
```
### Differences between warmed and ambient at a species level
biomass_spp_k <- kbs_biomass_live2 %>%
        group_by(species, state) %>%
        summarize(avg_weight = mean(weight_g, na.rm = TRUE),
                  se = std.error(weight_g, na.rm = TRUE))
```

```
## `summarise()` regrouping output by 'species' (override with `.groups` argument)
```

```
ggplot(biomass_spp_k, aes(x = species, y = avg_weight, fill = state)) +
        geom_bar(position = "dodge", stat = "identity", col = "black") +
        geom_errorbar(aes(ymin = avg_weight - se, ymax = avg_weight + se), width = 0.2,
                      position = position_dodge(0.9)) +
        scale_fill_manual(values = c("#a6bddb", "#fb6a4a")) +
        scale_x_discrete(labels=c("ambient" = "A", "warmed" = "W")) +
        theme_classic()
```

```
biomass_spp_u <- umbs_biomass_live2 %>%
        group_by(species, state) %>%
        summarize(avg_weight = mean(weight_g, na.rm = TRUE),
                  se = std.error(weight_g, na.rm = TRUE))
```

```
## `summarise()` regrouping output by 'species' (override with `.groups` argument)
```

```
ggplot(biomass_spp_u, aes(x = species, y = avg_weight, fill = state)) +
        geom_bar(position = "dodge", stat = "identity", col = "black") +
        geom_errorbar(aes(ymin = avg_weight - se, ymax = avg_weight + se), width = 0.2,
                      position = position_dodge(0.9)) +
        scale_fill_manual(values = c("#a6bddb", "#fb6a4a")) +
        scale_x_discrete(labels=c("ambient" = "A", "warmed" = "W")) +
        theme_classic()
```