

# Plant Composition Diversity Plots

Moriah

June 29, 2022

COLLABORATORS: Phoebe Zarnetske, Mark Hammond, Pat Bills, Kara Dobson

DATA INPUT: Plant composition diversity measures from warmX Google drive L2 folder DATA OUTPUT:  
Plots of Plant composition diversity at KBS and UMBS - Rmd and PDF located in Github folder PROJECT:  
warmXtrophic

```
## [1] "ambient" "warmed"
```

```
## [1] "warmed"  "ambient"
```

```
## [1] "ambient" "warmed"
```

```
## [1] "warmed"  "ambient"
```

```
## [1] "ambient" "warmed"
```

```
## [1] "warmed"  "ambient"
```

```
## [1] "ambient" "warmed"
```

```
## [1] "warmed"  "ambient"
```

```
## [1] "ambient" "warmed"
```

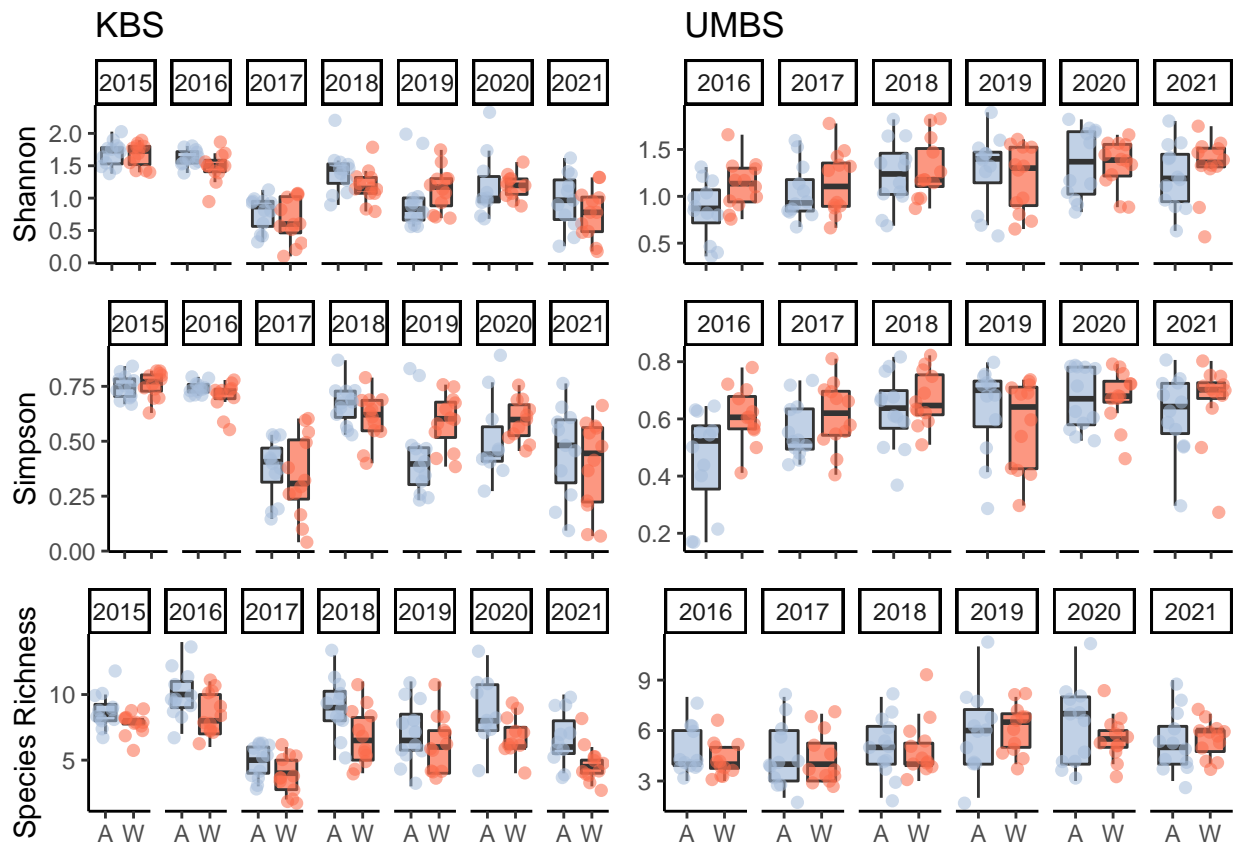
```
## [1] "warmed"  "ambient"
```

```
## [1] "ambient" "warmed"
```

```
## [1] "warmed"  "ambient"
```

## Combining diversity indices - state only

### Boxplot

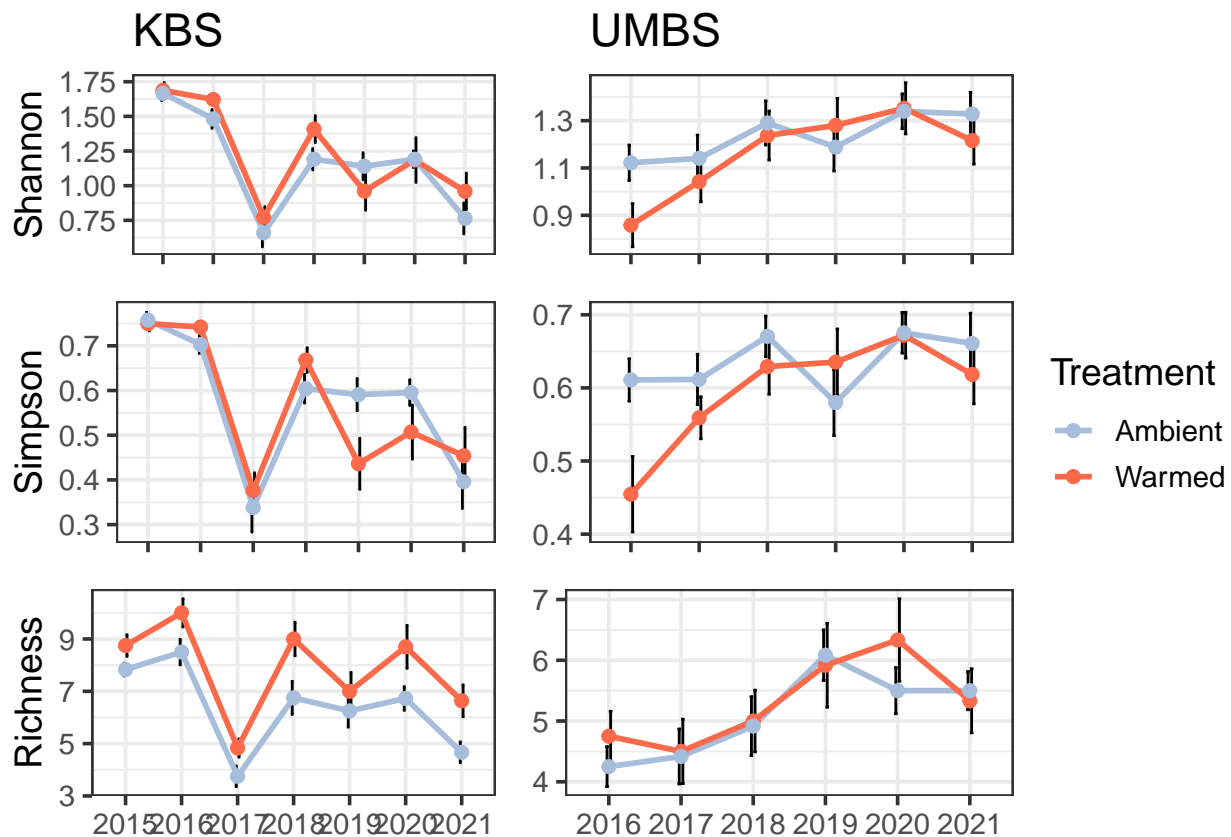


## pdf

## 2

## Combining diversity indices - state only

### Line plot



```
## pdf
## 2
```

## Combining diversity indices - all treatments

### Line plot with insecticide - code from Kara

```
# Shannon
sum_shannon_i$year <- as.factor(sum_shannon_i$year)
sum_shannon_i$full_treat <- paste(sum_shannon_i$state, sum_shannon_i$insecticide, sep="_")
sum_shannon_line_i <- function(loc) {
  shannon_plot <- subset(sum_shannon_i, site == loc)
  return(ggplot(shannon_plot, aes(x = year, y = avg_shannon, group=full_treat, linetype=full_treat)) +
    geom_errorbar(aes(ymin=avg_shannon-se, ymax=avg_shannon+se), width=.1, position="dodge") +
    geom_line(size = 1) +
    geom_point(size = 2) +
    scale_color_manual(name="Treatment",
      values = c("#a6bddb", "#a6bddb", "#fb6a4a", "#fb6a4a"),
      labels=c("Ambient + Herbivory", "Ambient + Reduced Herbivory",
        "Herbivory + Reduced Herbivory", "Herbivory + Reduced Herbivory"),
    ) +
    scale_linetype_manual(name="Treatment",
      values = c("solid", "solid", "dashed", "dashed"),
      labels=c("Ambient + Herbivory", "Ambient + Reduced Herbivory",
        "Herbivory + Reduced Herbivory", "Herbivory + Reduced Herbivory"),
    )
  )
}
```

```

                                values = c("solid", "dashed", "solid", "dashed"),
                                labels=c("Ambient + Herbivory", "Ambient + Reduced Herbivory"),
labs(x = NULL, y = "Shannon", title = loc) +
theme_bw(14))
}
sum_shannon_line_i_kbs <- sum_shannon_line_i("KBS")
sum_shannon_line_i_kbs <- sum_shannon_line_i_kbs + theme(axis.text.x=element_blank())
sum_shannon_line_i_umbs <- sum_shannon_line_i("UMBS")
sum_shannon_line_i_umbs <- sum_shannon_line_i_umbs + labs(y=NULL) + theme(axis.text.x=element_blank())

#Simpson
sum_simpson_i$year <- as.factor(sum_simpson_i$year)
sum_simpson_i$full_treat <- paste(sum_simpson_i$state, sum_simpson_i$insecticide, sep="_")
sum_simpson_line_i <- function(loc) {
  simpson_plot <- subset(sum_simpson_i, site == loc)
  return(ggplot(simpson_plot, aes(x = year, y = avg_simpson, group=full_treat, linetype=full_treat),
    geom_errorbar(aes(ymin=avg_simpson-se, ymax=avg_simpson+se), width=.1, position="dodge"),
    geom_line(size = 1) +
    geom_point(size = 2) +
    scale_color_manual(name="Treatment",
                        values = c("#a6bddb", "#a6bddb", "#fb6a4a", "#fb6a4a"),
                        labels=c("Ambient + Herbivory", "Ambient + Reduced Herbivory"),
    scale_linetype_manual(name="Treatment",
                          values = c("solid", "dashed", "solid", "dashed"),
                          labels=c("Ambient + Herbivory", "Ambient + Reduced Herbivory"),
    labs(x = NULL, y = "Simpson", title = loc) +
    theme_bw(14))
}
sum_simpson_line_i_kbs <- sum_simpson_line_i("KBS")
sum_simpson_line_i_kbs <- sum_simpson_line_i_kbs + theme(axis.text.x=element_blank()) + labs(title=NULL)
sum_simpson_line_i_umbs <- sum_simpson_line_i("UMBS")
sum_simpson_line_i_umbs <- sum_simpson_line_i_umbs + labs(y=NULL, title=NULL) + theme(axis.text.x=element_blank())

#Richness
sum_richness_i$year <- as.factor(sum_richness_i$year)
sum_richness_i$full_treat <- paste(sum_richness_i$state, sum_richness_i$insecticide, sep="_")
sum_richness_line_i <- function(loc) {
  richness_plot <- subset(sum_richness_i, site == loc)
  return(ggplot(richness_plot, aes(x = year, y = avg_richness, group=full_treat, linetype=full_treat),
    geom_errorbar(aes(ymin=avg_richness-se, ymax=avg_richness+se), width=.1, position="dodge"),
    geom_line(size = 1) +
    geom_point(size = 2) +
    scale_color_manual(name="Treatment",
                        values = c("#a6bddb", "#a6bddb", "#fb6a4a", "#fb6a4a"),
                        labels=c("Ambient + Herbivory", "Ambient + Reduced Herbivory"),
    scale_linetype_manual(name="Treatment",
                          values = c("solid", "dashed", "solid", "dashed"),
                          labels=c("Ambient + Herbivory", "Ambient + Reduced Herbivory"),
    labs(x = NULL, y = "Species Richness", title = loc) +
    theme_bw(14))
}
sum_richness_line_i_kbs <- sum_richness_line_i("KBS")
sum_richness_line_i_kbs <- sum_richness_line_i_kbs + labs(title=NULL)

```

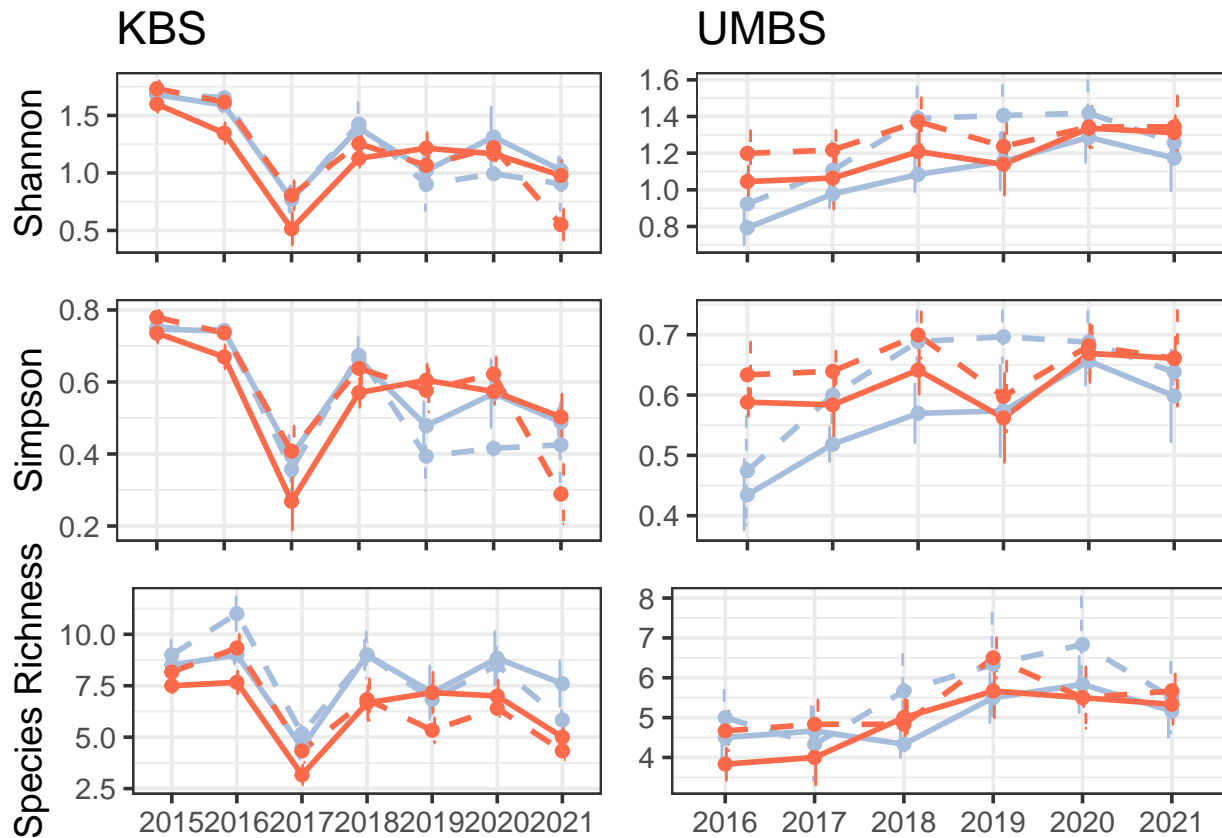
```

sum_richness_line_i_umbs <- sum_richness_line_i("UMBS")
sum_richness_line_i_umbs <- sum_richness_line_i_umbs + labs(y=NULL, title=NULL)

diversity_line_i <- ggpubr::ggarrange(sum_shannon_line_i_kbs, sum_shannon_line_i_umbs,
  sum_simpson_line_i_kbs, sum_simpson_line_i_umbs,
  sum_richness_line_i_kbs, sum_richness_line_i_umbs,
  nrow = 3, ncol = 2, legend = "none")

diversity_line_i

```



```

png("plant_comp_diversity_plots_L2_all_diversity_lineplot_insect.png", units="in", width=11, height=8,
  annotate_figure(diversity_line_i,
    left = text_grob("Ecological Diversity Indices", color = "black", rot = 90, size=15),
    bottom = text_grob("Year", color = "black", size=15))
dev.off()

```

```

## pdf
## 2

```