

different_year_lengths

```
library(tidyverse)
```

```
## Warning: package 'tidyverse' was built under R version 3.3.3
```

```
## Loading tidyverse: ggplot2
```

```
## Loading tidyverse: tibble
```

```
## Loading tidyverse: tidyr
```

```
## Loading tidyverse: readr
```

```
## Loading tidyverse: purrr
```

```
## Loading tidyverse: dplyr
```

```
## Warning: package 'ggplot2' was built under R version 3.3.3
```

```
## Warning: package 'tibble' was built under R version 3.3.3
```

```
## Warning: package 'tidyr' was built under R version 3.3.3
```

```
## Warning: package 'readr' was built under R version 3.3.3
```

```
## Warning: package 'purrr' was built under R version 3.3.3
```

```
## Warning: package 'dplyr' was built under R version 3.3.3
```

```
## Conflicts with tidy packages -----
```

```
## filter(): dplyr, stats
```

```
## lag():      dplyr, stats
```

```
theme_krementz <- function()
```

```
{
```

```
  theme(axis.text.x = element_text(size = 12, color = "black"),
```

```
        axis.text.y = element_text(size = 12, color = "black"),
```

```
        axis.title.y = element_text(size = 20), plot.background = element_blank(),
```

```
        panel.border = element_blank(), panel.grid.major = element_line(colour = NA),
```

```
        panel.grid.minor = element_line(colour = NA), title = element_text(size = 20),
```

```
        panel.background = element_rect(fill = "white"), axis.line.x = element_line(colour = "black"),
```

```
        axis.line.y = element_line(colour = "black"), strip.background = element_rect(fill = "white",  
                                                                                       color = "black"),
```

```
}
```

```
load("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_numyears2.Rdata")
```

```
#load("~/../Dropbox/negative_population_trends/10ksims_freq2_spp20_numyears2.Rdata")
```

```
#load("~/../Dropbox/negative_population_trends/10ksims_freq5_spp20_numyears2.Rdata")
```

```
# 1. True distribution of trends from all simulated populations
```

```
# 2. Distribution of trends from 2 randomly chosen populations
```

```
# 3. Distribution of trends from the two populations with the largest abundance at the start of sampling
```

```
# sampling every year
```

```
# 4. Same as 3 but sampling every 2 yr
```

```
# 5. Same as 3 but sampling every 5 yr
```

```
y2bar1 <- year1$real_values_all_pops %>% mutate(bar=1)
```

```
y2bar2 <- year1$sampled_values_random %>% mutate(bar=2)
```

```

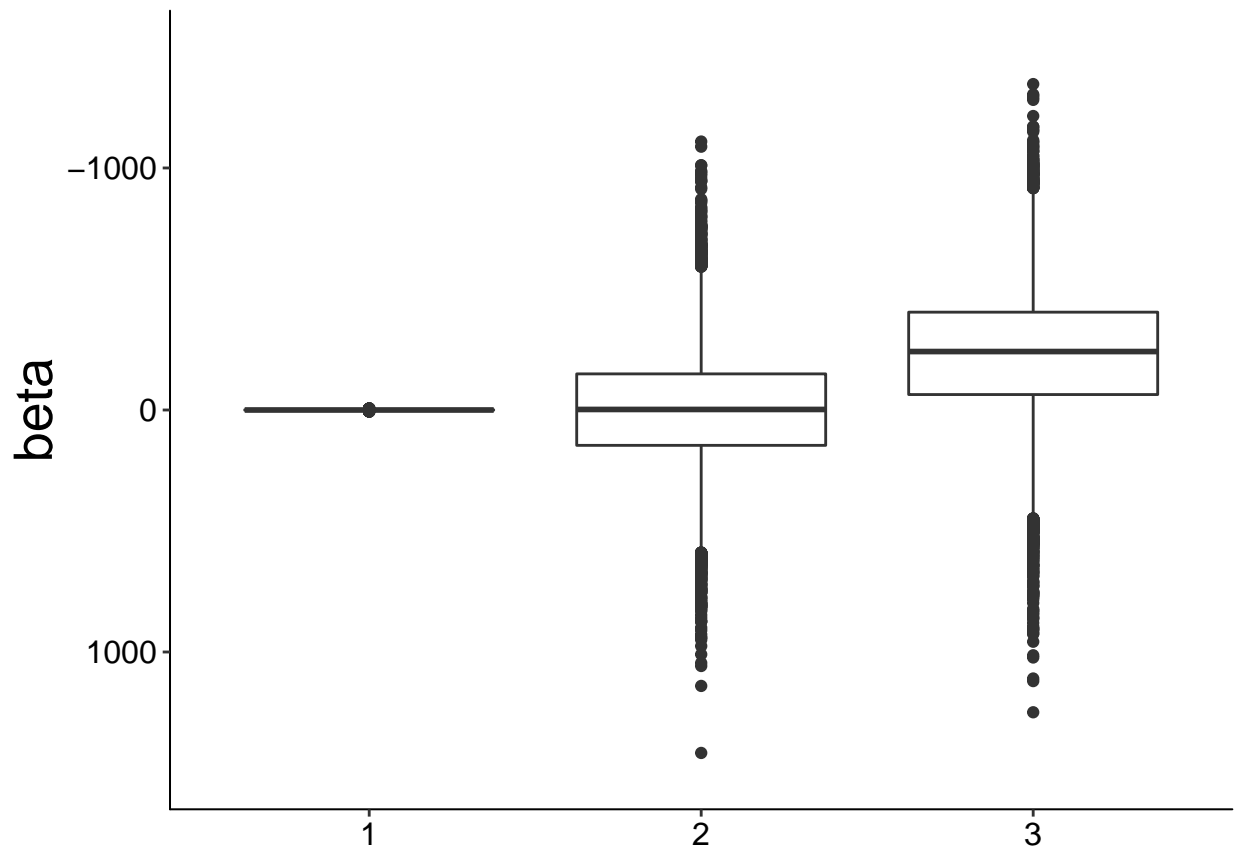
y2bar3 <- year1$sampled_values_highest %>% mutate(bar=3)

y2 <- rbind(y2bar1, y2bar2, y2bar3)

write.csv(y2, file=~/.Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears2.csv", row.names=FALSE)

(panel12 <- ggplot()+
  geom_boxplot(data=y2, aes(x=factor(bar), y=beta))+
  theme(axis.title.x=element_blank())+
  theme_kremetz()+
  ylim(1500,-1500))

```



```

#####
# 5
#####

load("~/.Dropbox/negative_population_trends/10ksims_freq1_spp20_numyears5.Rdata")
#load("~/.Dropbox/negative_population_trends/10ksims_freq2_spp20_numyears5.Rdata")
#load("~/.Dropbox/negative_population_trends/10ksims_freq5_spp20_numyears5.Rdata")

# 1. True distribution of trends from all simulated populations
# 2. Distribution of trends from 2 randomly chosen populations
# 3. Distribution of trends from the two populations with the largest abundance at the start of sampling
# sampling every year
# 4. Same as 3 but sampling every 2 yr

```

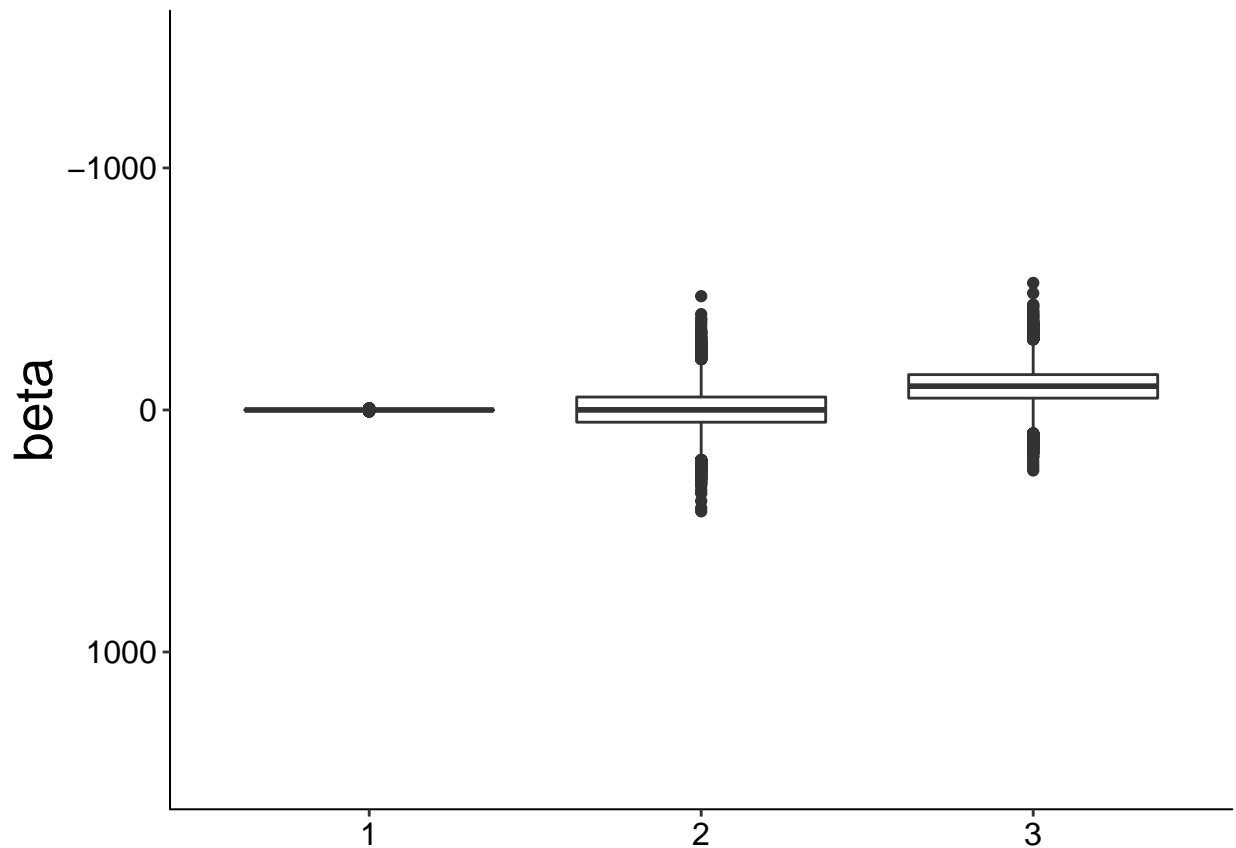
```
# 5. Same as 3 but sampling every 5 yr
```

```
y5bar1 <- year1$real_values_all_pops %>% mutate(bar=1)
y5bar2 <- year1$sampled_values_random %>% mutate(bar=2)
y5bar3 <- year1$sampled_values_highest %>% mutate(bar=3)
#y5bar4 <- year2$sampled_values_highest %>% mutate(bar=4)
```

```
y5 <- rbind(y5bar1, y5bar2, y5bar3)
```

```
write.csv(y5, file=~/.Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears5.csv", row.names
```

```
(panel15 <- ggplot()+
  geom_boxplot(data=y5, aes(x=factor(bar), y=beta))+
  theme(axis.title.x=element_blank())+
  theme_krementz()+
  ylim(1500,-1500))
```



```
#####
```

```
# 10
```

```
####
```

```
load("~/.Dropbox/negative_population_trends/10ksims_freq1_spp20_numyears10.Rdata")
##load("~/.Dropbox/negative_population_trends/10ksims_freq2_spp20_numyears10.Rdata")
#load("~/.Dropbox/negative_population_trends/10ksims_freq5_spp20_numyears10.Rdata")
```

```

# 1. True distribution of trends from all simulated populations
# 2. Distribution of trends from 2 randomly chosen populations
# 3. Distribution of trends from the two populations with the largest abundance at the start of sampling
# sampling every year
# 4. Same as 3 but sampling every 2 yr
# 5. Same as 3 but sampling every 5 yr

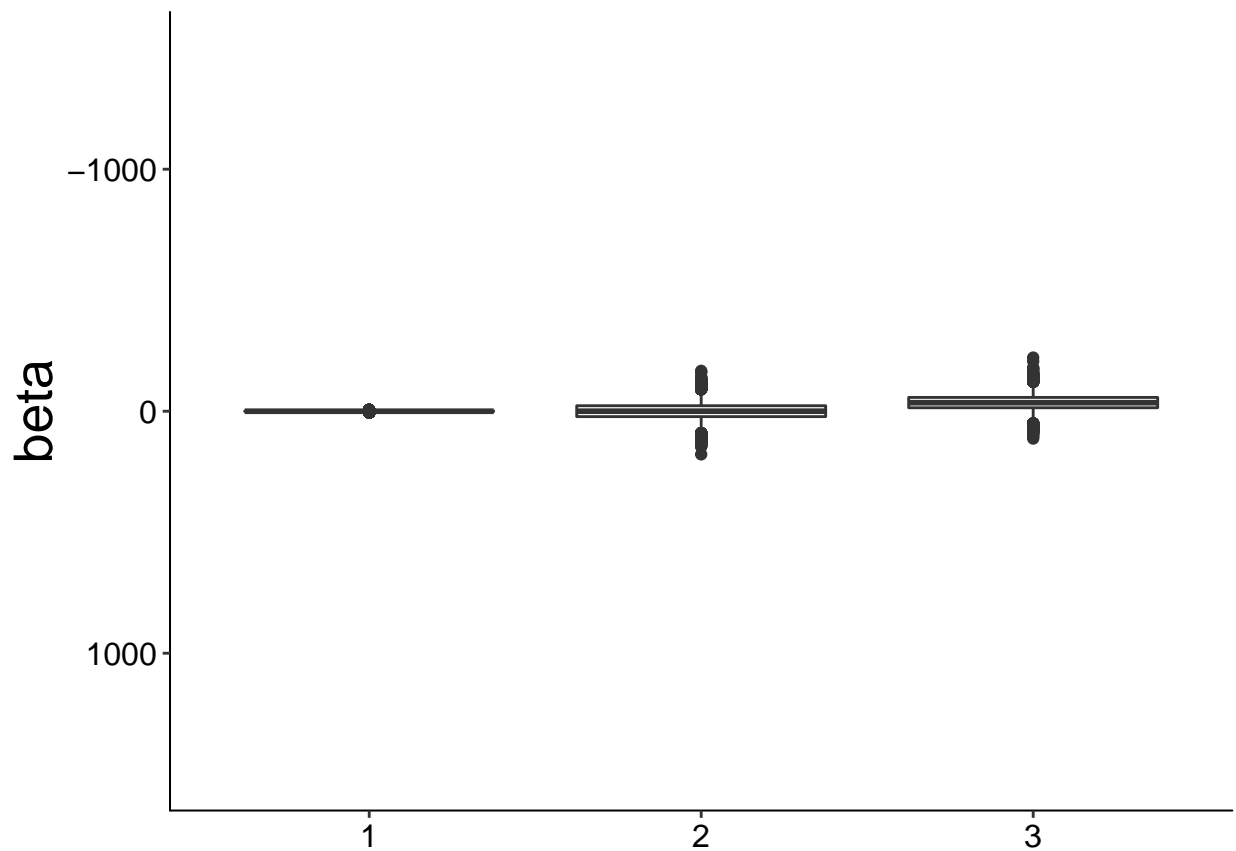
y10bar1 <- year1$real_values_all_pops %>% mutate(bar=1)
y10bar2 <- year1$sampled_values_random %>% mutate(bar=2)
y10bar3 <- year1$sampled_values_highest %>% mutate(bar=3)
#y10bar4 <- year2$sampled_values_highest %>% mutate(bar=4)
#y10bar5 <- year3$sampled_values_highest %>% mutate(bar=5)

y10 <- rbind(y10bar1, y10bar2, y10bar3)#, y10bar4, y10bar5)

write.csv(y10, file=~/.Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears10.csv", row.names=FALSE)

(panel10 <- ggplot()+
  geom_boxplot(data=y10, aes(x=factor(bar), y=beta))+
  theme(axis.title.x=element_blank())+
  theme_krementz()+
  ylim(1500,-1500))

```



```

#####
# 20
####

```

```

load("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_numyears20.Rdata")
#load("~/../Dropbox/negative_population_trends/10ksims_freq2_spp20_numyears20.Rdata")
#load("~/../Dropbox/negative_population_trends/10ksims_freq5_spp20_numyears20.Rdata")

# 1. True distribution of trends from all simulated populations
# 2. Distribution of trends from 2 randomly chosen populations
# 3. Distribution of trends from the two populations with the largest abundance at the start of sampling
# sampling every year
# 4. Same as 3 but sampling every 2 yr
# 5. Same as 3 but sampling every 5 yr

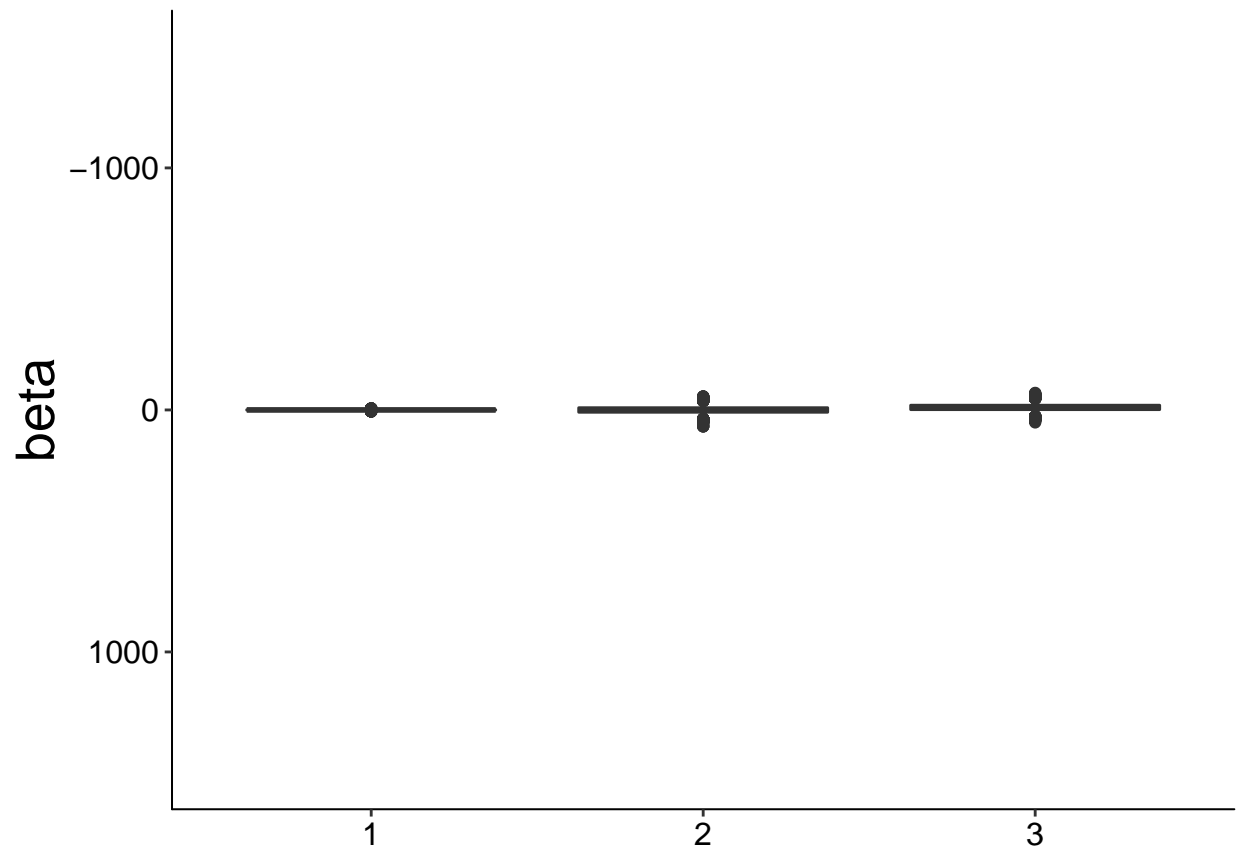
y20bar1 <- year1$real_values_all_pops %>% mutate(bar=1)
y20bar2 <- year1$sampled_values_random %>% mutate(bar=2)
y20bar3 <- year1$sampled_values_highest %>% mutate(bar=3)
#y20bar4 <- year2$sampled_values_highest %>% mutate(bar=4)
#y20bar5 <- year3$sampled_values_highest %>% mutate(bar=5)

y20 <- rbind(y20bar1, y20bar2, y20bar3)#, y20bar4, y20bar5)

write.csv(y20, file("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears20.csv", row.names=FALSE))

(panel120 <- ggplot()+
  geom_boxplot(data=y20, aes(x=factor(bar), y=beta))+
  theme(axis.title.x=element_blank())+
  theme_krementz()+
  ylim(1500,-1500))

```



```
#####
# 40
####

#
#
# load("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_numyears40.Rdata")
# load("~/../Dropbox/negative_population_trends/10ksims_freq2_spp20_numyears40.Rdata")
# load("~/../Dropbox/negative_population_trends/10ksims_freq5_spp20_numyears40.Rdata")

# 1. True distribution of trends from all simulated populations
# 2. Distribution of trends from 2 randomly chosen populations
# 3. Distribution of trends from the two populations with the largest abundance at the start of sampling
# sampling every year
# 4. Same as 3 but sampling every 2 yr
# 5. Same as 3 but sampling every 5 yr
#
# y40bar1 <- year1$real_values_all_pops %>% mutate(bar=1)
# y40bar2 <- year1$sampled_values_random %>% mutate(bar=2)
# y40bar3 <- year1$sampled_values_highest %>% mutate(bar=3)
# y40bar4 <- year2$sampled_values_highest %>% mutate(bar=4)
# y40bar5 <- year3$sampled_values_highest %>% mutate(bar=5)
#
# y40 <- rbind(y40bar1, y40bar2, y40bar3), y40bar4, y40bar5)
#
```

```

#
#
# (panel40 <- ggplot()+
#   geom_boxplot(data=y40, aes(x=factor(bar), y=beta))+
#   theme(axis.title.x=element_blank())+
#   theme_krementz())

#####
# 50
####

load("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_numyears50.Rdata")
##load("~/../Dropbox/negative_population_trends/10ksims_freq2_spp20_numyears20.Rdata")
#load("~/../Dropbox/negative_population_trends/10ksims_freq5_spp20_numyears20.Rdata")

# 1. True distribution of trends from all simulated populations
# 2. Distribution of trends from 2 randomly chosen populations
# 3. Distribution of trends from the two populations with the largest abundance at the start of sampling
# sampling every year
# 4. Same as 3 but sampling every 2 yr
# 5. Same as 3 but sampling every 5 yr

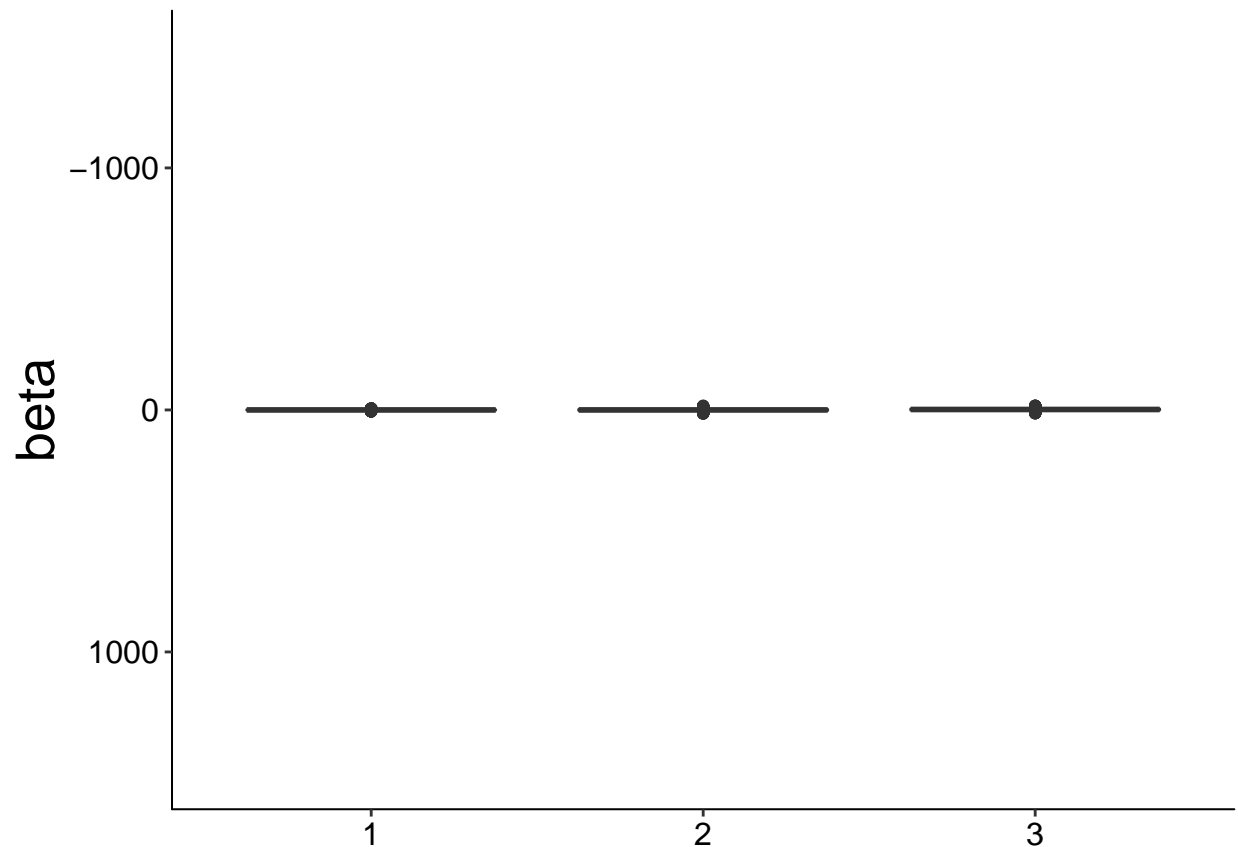
y50bar1 <- year1$real_values_all_pops %>% mutate(bar=1)
y50bar2 <- year1$sampled_values_random %>% mutate(bar=2)
y50bar3 <- year1$sampled_values_highest %>% mutate(bar=3)
#y20bar4 <- year2$sampled_values_highest %>% mutate(bar=4)
#y20bar5 <- year3$sampled_values_highest %>% mutate(bar=5)

y50 <- rbind(y50bar1, y50bar2, y50bar3)#, y20bar4, y20bar5)

write.csv(y50, file("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears50.csv", row.names=FALSE))

(panel150 <- ggplot()+
  geom_boxplot(data=y50, aes(x=factor(bar), y=beta))+
  theme(axis.title.x=element_blank())+
  theme_krementz()+
  ylim(1500,-1500))

```



```
#####
# 100
####

load("~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_numyears100.Rdata")

# 1. True distribution of trends from all simulated populations
# 2. Distribution of trends from 2 randomly chosen populations
# 3. Distribution of trends from the two populations with the largest abundance at the start of sampling
# sampling every year
# 4. Same as 3 but sampling every 2 yr
# 5. Same as 3 but sampling every 5 yr

y100bar1 <- year1$real_values_all_pops %>% mutate(bar=1)
y100bar2 <- year1$sampled_values_random %>% mutate(bar=2)
y100bar3 <- year1$sampled_values_highest %>% mutate(bar=3)
#y20bar4 <- year2$sampled_values_highest %>% mutate(bar=4)
#y20bar5 <- year3$sampled_values_highest %>% mutate(bar=5)

y100 <- rbind(y100bar1, y100bar2, y100bar3)#, y20bar4, y20bar5)

write.csv(y100, file="~/../Dropbox/negative_population_trends/10ksims_freq1_spp20_nyears100.csv", row.names=FALSE)

(panel100 <- ggplot()+
  geom_boxplot(data=y100, aes(x=factor(bar), y=beta))+
  theme(axis.title.x=element_blank())+
  theme_krementz()+
  theme(axis.title.y="beta"))
```



```
ylim(1500,-1500))
```

