SporePatchinessNearshoreOffshoreComparisons

Elizabeth Davenport

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# Initial stuff, including loading packages and importing data

##loading packages

library(here)  
library(rstatix)  
library(ggplot2)  
library(tidyverse)  
library(dplyr)  
library(ggpubr)

## loading files

# Tell R where files are stored  
here::i\_am("scripts/SporePatchinessNearshoreOffshoreComparisons.Rmd")  
  
# Load Files  
a <- readr::read\_csv(here("data/CV\_Walsh\_Locations.csv"))  
b <- readr::read\_csv(here("data/CV\_LilAp\_Locations.csv"))  
c <- readr::read\_csv(here("data/CV\_Cedar\_Locations.csv"))

##Walsh Comparisons

#### Walsh Round 1  
w1 = a %>%  
 filter(Round =="1")  
  
wl1 <- as.factor(w1$Location)  
wcv1 <- w1$CV  
  
## creating a data frame  
wdf1<- data.frame(wl1,wcv1)  
  
## Wilcoxon Test  
wtest<-compare\_means(wcv1 ~ wl1, data = wdf1, method="wilcox.test", paired = FALSE)  
wtest

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv1 Basin Intermediate 0.711 1 0.71 ns Wilcoxon  
## 2 wcv1 Basin Nearshore 0.558 1 0.56 ns Wilcoxon  
## 3 wcv1 Intermediate Nearshore 0.814 1 0.81 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 2  
w2 = a %>%  
 filter(Round =="2")  
  
wl2 <- as.factor(w2$Location)  
wcv2 <- w2$CV  
  
## creating a data frame  
wdf2<- data.frame(wl2,wcv2)  
  
## Wilcoxon Test  
wtest2<-compare\_means(wcv2 ~ wl2, data = wdf2, method="wilcox.test", paired = FALSE)  
wtest2

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv2 Basin Intermediate 0.208 0.62 0.21 ns Wilcoxon  
## 2 wcv2 Basin Nearshore 1 1 1.00 ns Wilcoxon  
## 3 wcv2 Intermediate Nearshore 0.374 0.75 0.37 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 3  
w3 = a %>%  
 filter(Round =="3")  
  
wl3 <- as.factor(w3$Location)  
wcv3 <- w3$CV  
  
## creating a data frame  
wdf3<- data.frame(wl3,wcv3)  
  
## Wilcoxon Test  
wtest3<-compare\_means(wcv3 ~ wl3, data = wdf3, method="wilcox.test", paired = FALSE)  
wtest3

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv3 Basin Intermediate 0.857 1 0.86 ns Wilcoxon  
## 2 wcv3 Basin Nearshore 0.857 1 0.86 ns Wilcoxon  
## 3 wcv3 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 4  
w4 = a %>%  
 filter(Round =="4")  
  
wl4 <- as.factor(w4$Location)  
wcv4 <- w4$CV  
  
## creating a data frame  
wdf4<- data.frame(wl4,wcv4)  
  
## Wilcoxon Test  
wtest4<-compare\_means(wcv4 ~ wl4, data = wdf4, method="wilcox.test", paired = FALSE)  
wtest4

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv4 Basin Intermediate 0.401 0.8 0.40 ns Wilcoxon  
## 2 wcv4 Basin Nearshore 0.143 0.43 0.14 ns Wilcoxon  
## 3 wcv4 Intermediate Nearshore 0.763 0.8 0.76 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 5  
w5 = a %>%  
 filter(Round =="5")  
  
wl5 <- as.factor(w5$Location)  
wcv5 <- w5$CV  
  
## creating a data frame  
wdf5<- data.frame(wl5,wcv5)  
  
## Wilcoxon Test  
wtest5<-compare\_means(wcv5 ~ wl5, data = wdf5, method="wilcox.test", paired = FALSE)  
wtest5

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv5 Basin Intermediate 1 1 1.00 ns Wilcoxon  
## 2 wcv5 Basin Nearshore 0.413 1 0.41 ns Wilcoxon  
## 3 wcv5 Intermediate Nearshore 0.686 1 0.69 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 6  
w6 = a %>%  
 filter(Round =="6")  
  
wl6 <- as.factor(w6$Location)  
wcv6 <- w6$CV  
  
## creating a data frame  
wdf6<- data.frame(wl6,wcv6)  
  
## Wilcoxon Test  
wtest6<-compare\_means(wcv6 ~ wl6, data = wdf6, method="wilcox.test", paired = FALSE)  
wtest6

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv6 Basin Intermediate 0.0952 0.29 0.095 ns Wilcoxon  
## 2 wcv6 Basin Nearshore 0.111 0.29 0.111 ns Wilcoxon  
## 3 wcv6 Intermediate Nearshore 0.556 0.56 0.556 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 7  
w7 = a %>%  
 filter(Round =="7")  
  
wl7 <- as.factor(w7$Location)  
wcv7 <- w7$CV  
  
## creating a data frame  
wdf7<- data.frame(wl7,wcv7)  
  
## Wilcoxon Test  
wtest7<-compare\_means(wcv7 ~ wl7, data = wdf7, method="wilcox.test", paired = FALSE)  
wtest7

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv7 Basin Intermediate 0.548 1 0.55 ns Wilcoxon  
## 2 wcv7 Basin Nearshore 0.548 1 0.55 ns Wilcoxon  
## 3 wcv7 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 8  
w8 = a %>%  
 filter(Round =="8")  
  
wl8 <- as.factor(w8$Location)  
wcv8 <- w8$CV  
  
## creating a data frame  
wdf8<- data.frame(wl8,wcv8)  
  
## Wilcoxon Test  
wtest8<-compare\_means(wcv8 ~ wl8, data = wdf8, method="wilcox.test", paired = FALSE)  
wtest8

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv8 Basin Intermediate 0.0159 0.048 0.016 \* Wilcoxon  
## 2 wcv8 Basin Nearshore 0.0159 0.048 0.016 \* Wilcoxon  
## 3 wcv8 Intermediate Nearshore 0.421 0.42 0.421 ns Wilcoxon

##basin significantly patchier than intermediate  
##basin significantly patchier than nearshore  
  
#### Walsh Round 9  
w9 = a %>%  
 filter(Round =="9")  
  
wl9 <- as.factor(w9$Location)  
wcv9 <- w9$CV  
  
## creating a data frame  
wdf9<- data.frame(wl9,wcv9)  
  
## Wilcoxon Test  
wtest9<-compare\_means(wcv9 ~ wl9, data = wdf9, method="wilcox.test", paired = FALSE)  
wtest9

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv9 Basin Intermediate 0.00794 0.024 0.0079 \*\* Wilcoxon  
## 2 wcv9 Basin Nearshore 0.00794 0.024 0.0079 \*\* Wilcoxon  
## 3 wcv9 Intermediate Nearshore 0.310 0.31 0.3095 ns Wilcoxon

##basin significantly patchier than intermediate  
##basin significantly patchier than nearshore  
  
#### Walsh Round 10  
w10 = a %>%  
 filter(Round =="10")  
  
wl10 <- as.factor(w10$Location)  
wcv10 <- w10$CV  
  
## creating a data frame  
wdf10<- data.frame(wl10,wcv10)  
  
## Wilcoxon Test  
wtest10<-compare\_means(wcv10 ~ wl10, data = wdf10, method="wilcox.test", paired = FALSE)  
wtest10

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv10 Basin Intermediate 0.421 0.84 0.421 ns Wilcoxon  
## 2 wcv10 Basin Nearshore 0.690 0.84 0.690 ns Wilcoxon  
## 3 wcv10 Intermediate Nearshore 0.0952 0.29 0.095 ns Wilcoxon

##all nonsignificant  
  
#### Walsh Round 11  
w11 = a %>%  
 filter(Round =="11")  
  
wl11 <- as.factor(w11$Location)  
wcv11 <- w11$CV  
  
## creating a data frame  
wdf11<- data.frame(wl11,wcv11)  
  
## Wilcoxon Test  
wtest11<-compare\_means(wcv11 ~ wl11, data = wdf11, method="wilcox.test", paired = FALSE)  
wtest11

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv11 Basin Intermediate 0.0317 0.063 0.0317 \* Wilcoxon  
## 2 wcv11 Basin Nearshore 0.00794 0.024 0.0079 \*\* Wilcoxon  
## 3 wcv11 Intermediate Nearshore 1 1 1.0000 ns Wilcoxon

##intermediate significantly patchier than basin  
##nearshore significantly patchier than basin  
  
#### Walsh Round 12  
w12 = a %>%  
 filter(Round =="12")  
  
wl12 <- as.factor(w12$Location)  
wcv12 <- w12$CV  
  
## creating a data frame  
wdf12<- data.frame(wl12,wcv12)  
  
## Wilcoxon Test  
wtest12<-compare\_means(wcv12 ~ wl12, data = wdf12, method="wilcox.test", paired = FALSE)  
wtest12

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 wcv12 Basin Intermediate 0.730 0.73 0.730 ns Wilcoxon  
## 2 wcv12 Basin Nearshore 0.0556 0.11 0.056 ns Wilcoxon  
## 3 wcv12 Intermediate Nearshore 0.0159 0.048 0.016 \* Wilcoxon

##intermediate significantly patchier than nearshore

## LilAp Comparisons

#### LilAp Round 1  
l1 = b %>%  
 filter(Round =="1")  
  
ll1 <- as.factor(l1$Location)  
lcv1 <- l1$CV  
  
## creating a data frame  
ldf1<- data.frame(ll1,lcv1)  
  
## Wilcoxon Test  
ltest<-compare\_means(lcv1 ~ ll1, data = ldf1, method="wilcox.test", paired = FALSE)  
ltest

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv1 Basin Intermediate 0.663 1 0.66 ns Wilcoxon  
## 2 lcv1 Basin Nearshore 0.157 0.47 0.16 ns Wilcoxon  
## 3 lcv1 Intermediate Nearshore 0.522 1 0.52 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 2  
l2 = b %>%  
 filter(Round =="2")  
  
ll2 <- as.factor(l2$Location)  
lcv2 <- l2$CV  
  
## creating a data frame  
ldf2<- data.frame(ll2,lcv2)  
  
## Wilcoxon Test  
ltest2<-compare\_means(lcv2 ~ ll2, data = ldf2, method="wilcox.test", paired = FALSE)  
ltest2

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv2 Basin Intermediate 0.468 1 0.47 ns Wilcoxon  
## 2 lcv2 Basin Nearshore 0.465 1 0.47 ns Wilcoxon  
## 3 lcv2 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 3  
## cannot analyze round 3 because didn't sample nearshore because of thunderstorm in field  
  
#### LilAp Round 4  
l4 = b %>%  
 filter(Round =="4")  
  
ll4 <- as.factor(l4$Location)  
lcv4 <- l4$CV  
  
## creating a data frame  
ldf4<- data.frame(ll4,lcv4)  
  
## Wilcoxon Test  
ltest4<-compare\_means(lcv4 ~ ll4, data = ldf4, method="wilcox.test", paired = FALSE)  
ltest4

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv4 Basin Intermediate 0.902 1 0.90 ns Wilcoxon  
## 2 lcv4 Basin Nearshore 1 1 1.00 ns Wilcoxon  
## 3 lcv4 Intermediate Nearshore 0.760 1 0.76 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 5  
l5 = b %>%  
 filter(Round =="5")  
  
ll5 <- as.factor(l5$Location)  
lcv5 <- l5$CV  
  
## creating a data frame  
ldf5<- data.frame(ll5,lcv5)  
  
## Wilcoxon Test  
ltest5<-compare\_means(lcv5 ~ ll5, data = ldf5, method="wilcox.test", paired = FALSE)  
ltest5

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv5 Basin Intermediate 0.110 0.33 0.11 ns Wilcoxon  
## 2 lcv5 Basin Nearshore 0.532 1 0.53 ns Wilcoxon  
## 3 lcv5 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 6  
l6 = b %>%  
 filter(Round =="6")  
  
ll6 <- as.factor(l6$Location)  
lcv6 <- l6$CV  
  
## creating a data frame  
ldf6<- data.frame(ll6,lcv6)  
  
## Wilcoxon Test  
ltest6<-compare\_means(lcv6 ~ ll6, data = ldf6, method="wilcox.test", paired = FALSE)  
ltest6

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv6 Basin Intermediate 0.886 1 0.89 ns Wilcoxon  
## 2 lcv6 Basin Nearshore 0.486 1 0.49 ns Wilcoxon  
## 3 lcv6 Intermediate Nearshore 0.886 1 0.89 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 7  
l7 = b %>%  
 filter(Round =="7")  
  
ll7 <- as.factor(l7$Location)  
lcv7 <- l7$CV  
  
## creating a data frame  
ldf7<- data.frame(ll7,lcv7)  
  
## Wilcoxon Test  
ltest7<-compare\_means(lcv7 ~ ll7, data = ldf7, method="wilcox.test", paired = FALSE)  
ltest7

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv7 Basin Intermediate 1 1 1.00 ns Wilcoxon  
## 2 lcv7 Basin Nearshore 0.832 1 0.83 ns Wilcoxon  
## 3 lcv7 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 8  
l8 = b %>%  
 filter(Round =="8")  
  
ll8 <- as.factor(l8$Location)  
lcv8 <- l8$CV  
  
## creating a data frame  
ldf8<- data.frame(ll8,lcv8)  
  
## Wilcoxon Test  
ltest8<-compare\_means(lcv8 ~ ll8, data = ldf8, method="wilcox.test", paired = FALSE)  
ltest8

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv8 Basin Intermediate 0.0317 0.095 0.032 \* Wilcoxon  
## 2 lcv8 Basin Nearshore 0.421 0.42 0.421 ns Wilcoxon  
## 3 lcv8 Intermediate Nearshore 0.151 0.3 0.151 ns Wilcoxon

##basin significantly less patchy than intermediate  
  
#### LilAp Round 9  
l9 = b %>%  
 filter(Round =="9")  
  
ll9 <- as.factor(l9$Location)  
lcv9 <- l9$CV  
  
## creating a data frame  
ldf9<- data.frame(ll9,lcv9)  
  
## Wilcoxon Test  
ltest9<-compare\_means(lcv9 ~ ll9, data = ldf9, method="wilcox.test", paired = FALSE)  
ltest9

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv9 Basin Intermediate 0.556 1 0.56 ns Wilcoxon  
## 2 lcv9 Basin Nearshore 1 1 1.00 ns Wilcoxon  
## 3 lcv9 Intermediate Nearshore 0.539 1 0.54 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 10  
l10 = b %>%  
 filter(Round =="10")  
  
ll10 <- as.factor(l10$Location)  
lcv10 <- l10$CV  
  
## creating a data frame  
ldf10<- data.frame(ll10,lcv10)  
  
## Wilcoxon Test  
ltest10<-compare\_means(lcv10 ~ ll10, data = ldf10, method="wilcox.test", paired = FALSE)  
ltest10

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv10 Basin Intermediate 0.413 1 0.41 ns Wilcoxon  
## 2 lcv10 Basin Nearshore 0.556 1 0.56 ns Wilcoxon  
## 3 lcv10 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 11  
l11 = b %>%  
 filter(Round =="11")  
  
ll11 <- as.factor(l11$Location)  
lcv11 <- l11$CV  
  
## creating a data frame  
ldf11<- data.frame(ll11,lcv11)  
  
## Wilcoxon Test  
ltest11<-compare\_means(lcv11 ~ ll11, data = ldf11, method="wilcox.test", paired = FALSE)  
ltest11

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv11 Basin Intermediate 0.690 1 0.69 ns Wilcoxon  
## 2 lcv11 Basin Nearshore 1 1 1.00 ns Wilcoxon  
## 3 lcv11 Intermediate Nearshore 0.690 1 0.69 ns Wilcoxon

##all nonsignificant  
  
#### LilAp Round 12  
l12 = b %>%  
 filter(Round =="12")  
  
ll12 <- as.factor(l12$Location)  
lcv12 <- l12$CV  
  
## creating a data frame  
ldf12<- data.frame(ll12,lcv12)  
  
## Wilcoxon Test  
ltest12<-compare\_means(lcv12 ~ ll12, data = ldf12, method="wilcox.test", paired = FALSE)  
ltest12

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 lcv12 Basin Intermediate 0.151 0.45 0.15 ns Wilcoxon  
## 2 lcv12 Basin Nearshore 1 1 1.00 ns Wilcoxon  
## 3 lcv12 Intermediate Nearshore 0.222 0.45 0.22 ns Wilcoxon

##all nonsignificant

## Cedar Comparisons

#### Cedar Round 1  
c1 = c %>%  
 filter(Round =="1")  
  
cl1 <- as.factor(c1$Locations)  
ccv1 <- c1$CV  
  
## creating a data frame  
cdf1<- data.frame(cl1,ccv1)  
  
## Wilcoxon Test  
ctest<-compare\_means(ccv1 ~ cl1, data = cdf1, method="wilcox.test", paired = FALSE)  
ctest

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv1 Basin Intermediate 1 1 1.00 ns Wilcoxon  
## 2 ccv1 Basin Nearshore 0.389 1 0.39 ns Wilcoxon  
## 3 ccv1 Intermediate Nearshore 0.389 1 0.39 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 2  
c2 = c %>%  
 filter(Round =="2")  
  
cl2 <- as.factor(c2$Locations)  
ccv2 <- c2$CV  
  
## creating a data frame  
cdf2<- data.frame(cl2,ccv2)  
  
## Wilcoxon Test  
ctest2<-compare\_means(ccv2 ~ cl2, data = cdf2, method="wilcox.test", paired = FALSE)  
ctest2

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv2 Basin Intermediate 0.398 1 0.40 ns Wilcoxon  
## 2 ccv2 Basin Nearshore 1 1 1.00 ns Wilcoxon  
## 3 ccv2 Intermediate Nearshore 0.549 1 0.55 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 3  
c3 = c %>%  
 filter(Round =="3")  
  
cl3 <- as.factor(c3$Locations)  
ccv3 <- c3$CV  
  
## creating a data frame  
cdf3<- data.frame(cl3,ccv3)  
  
## Wilcoxon Test  
ctest3<-compare\_means(ccv3 ~ cl3, data = cdf3, method="wilcox.test", paired = FALSE)  
ctest3

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv3 Basin Intermediate 0.286 0.86 0.29 ns Wilcoxon  
## 2 ccv3 Basin Nearshore 0.486 0.97 0.49 ns Wilcoxon  
## 3 ccv3 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 4  
c4 = c %>%  
 filter(Round =="4")  
  
cl4 <- as.factor(c4$Locations)  
ccv4 <- c4$CV  
  
## creating a data frame  
cdf4<- data.frame(cl4,ccv4)  
  
## Wilcoxon Test  
ctest4<-compare\_means(ccv4 ~ cl4, data = cdf4, method="wilcox.test", paired = FALSE)  
ctest4

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv4 Basin Intermediate 1 1 1.00 ns Wilcoxon  
## 2 ccv4 Basin Nearshore 0.841 1 0.84 ns Wilcoxon  
## 3 ccv4 Intermediate Nearshore 0.841 1 0.84 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 5  
c5 = c %>%  
 filter(Round =="5")  
  
cl5 <- as.factor(c5$Locations)  
ccv5 <- c5$CV  
  
## creating a data frame  
cdf5<- data.frame(cl5,ccv5)  
  
## Wilcoxon Test  
ctest5<-compare\_means(ccv5 ~ cl5, data = cdf5, method="wilcox.test", paired = FALSE)  
ctest5

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv5 Basin Intermediate 0.421 0.86 0.42 ns Wilcoxon  
## 2 ccv5 Basin Nearshore 0.286 0.86 0.29 ns Wilcoxon  
## 3 ccv5 Intermediate Nearshore 0.413 0.86 0.41 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 6  
c6 = c %>%  
 filter(Round =="6")  
  
cl6 <- as.factor(c6$Locations)  
ccv6 <- c6$CV  
  
## creating a data frame  
cdf6<- data.frame(cl6,ccv6)  
  
## Wilcoxon Test  
ctest6<-compare\_means(ccv6 ~ cl6, data = cdf6, method="wilcox.test", paired = FALSE)  
ctest6

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv6 Basin Intermediate 0.486 1 0.49 ns Wilcoxon  
## 2 ccv6 Basin Nearshore 0.486 1 0.49 ns Wilcoxon  
## 3 ccv6 Intermediate Nearshore 0.343 1 0.34 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 7  
c7 = c %>%  
 filter(Round =="7")  
  
cl7 <- as.factor(c7$Locations)  
ccv7 <- c7$CV  
  
## creating a data frame  
cdf7<- data.frame(cl7,ccv7)  
  
## Wilcoxon Test  
ctest7<-compare\_means(ccv7 ~ cl7, data = cdf7, method="wilcox.test", paired = FALSE)  
ctest7

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv7 Basin Intermediate 0.0635 0.19 0.063 ns Wilcoxon  
## 2 ccv7 Basin Nearshore 0.151 0.3 0.151 ns Wilcoxon  
## 3 ccv7 Intermediate Nearshore 0.190 0.3 0.190 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 8  
c8 = c %>%  
 filter(Round =="8")  
  
cl8 <- as.factor(c8$Locations)  
ccv8 <- c8$CV  
  
## creating a data frame  
cdf8<- data.frame(cl8,ccv8)  
  
## Wilcoxon Test  
ctest8<-compare\_means(ccv8 ~ cl8, data = cdf8, method="wilcox.test", paired = FALSE)  
ctest8

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv8 Basin Intermediate 1 1 1.00 ns Wilcoxon  
## 2 ccv8 Basin Nearshore 0.730 1 0.73 ns Wilcoxon  
## 3 ccv8 Intermediate Nearshore 0.902 1 0.90 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 9  
c9 = c %>%  
 filter(Round =="9")  
  
cl9 <- as.factor(c9$Locations)  
ccv9 <- c9$CV  
  
## creating a data frame  
cdf9<- data.frame(cl9,ccv9)  
  
## Wilcoxon Test  
ctest9<-compare\_means(ccv9 ~ cl9, data = cdf9, method="wilcox.test", paired = FALSE)  
ctest9

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv9 Basin Intermediate 0.690 1 0.69 ns Wilcoxon  
## 2 ccv9 Basin Nearshore 0.556 1 0.56 ns Wilcoxon  
## 3 ccv9 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 10  
c10 = c %>%  
 filter(Round =="10")  
  
cl10 <- as.factor(c10$Locations)  
ccv10 <- c10$CV  
  
## creating a data frame  
cdf10<- data.frame(cl10,ccv10)  
  
## Wilcoxon Test  
ctest10<-compare\_means(ccv10 ~ cl10, data = cdf10, method="wilcox.test", paired = FALSE)  
ctest10

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv10 Basin Intermediate 0.222 0.44 0.222 ns Wilcoxon  
## 2 ccv10 Basin Nearshore 0.0952 0.29 0.095 ns Wilcoxon  
## 3 ccv10 Intermediate Nearshore 0.421 0.44 0.421 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 11  
c11 = c %>%  
 filter(Round =="11")  
  
cl11 <- as.factor(c11$Locations)  
ccv11 <- c11$CV  
  
## creating a data frame  
cdf11<- data.frame(cl11,ccv11)  
  
## Wilcoxon Test  
ctest11<-compare\_means(ccv11 ~ cl11, data = cdf11, method="wilcox.test", paired = FALSE)  
ctest11

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv11 Basin Intermediate 0.834 1 0.83 ns Wilcoxon  
## 2 ccv11 Basin Nearshore 0.712 1 0.71 ns Wilcoxon  
## 3 ccv11 Intermediate Nearshore 1 1 1.00 ns Wilcoxon

##all nonsignificant  
  
#### Cedar Round 12  
c12 = c %>%  
 filter(Round =="12")  
  
cl12 <- as.factor(c12$Locations)  
ccv12 <- c12$CV  
  
## creating a data frame  
cdf12<- data.frame(cl12,ccv12)  
  
## Wilcoxon Test  
ctest12<-compare\_means(ccv12 ~ cl12, data = cdf12, method="wilcox.test", paired = FALSE)  
ctest12

## # A tibble: 3 x 8  
## .y. group1 group2 p p.adj p.format p.signif method   
## <chr> <chr> <chr> <dbl> <dbl> <chr> <chr> <chr>   
## 1 ccv12 Basin Intermediate 0.905 0.9 0.905 ns Wilcoxon  
## 2 ccv12 Basin Nearshore 0.222 0.44 0.222 ns Wilcoxon  
## 3 ccv12 Intermediate Nearshore 0.0317 0.095 0.032 \* Wilcoxon

##intermediate significantly patchier than nearshore