Statistical analyses

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Contents

Required data sets

```
WD <- ".."
PATH_OUTPUT <- file.path(WD, "Outputs")
PATH_FUNC <- file.path(WD, "Functions")
source(file.path(PATH_FUNC, "stepAIC_gam.R"))

NLOG_VE <- read.csv(file.path(PATH_OUTPUT, "NLOG_VE.csv"), head = T)
NLOG_VE_sup_zero <- read.csv(file.path(PATH_OUTPUT, "NLOG_VE_sup_zero.csv"), head = T)
NLOG_VE_sup_zero_Moz <- read.csv(file.path(PATH_OUTPUT, "NLOG_VE_sup_zero_Moz.csv"), head = T)
NLOG_VE_sup_zero_North <- read.csv(file.path(PATH_OUTPUT, "NLOG_VE_sup_zero_North.csv"), head = T)

NLOG_VE_zero <- read.csv(file.path(PATH_OUTPUT, "NLOG_VE_zero.csv"), head = T)

NLOG_VE_zero_Moz <- read.csv(file.path(PATH_OUTPUT, "NLOG_VE_zero_Moz.csv"), head = T)
NLOG_VE_zero_North <- read.csv(file.path(PATH_OUTPUT, "NLOG_VE_zero_North.csv"), head = T)

dfMN_epi<-read.csv(file.path(PATH_OUTPUT, "MN_epi_mean.csv"), header = T)
dfMN_u<-read.csv(file.path(PATH_OUTPUT, "MN_umeso_mean.csv"), header = T)
dfMN_mu<-read.csv(file.path(PATH_OUTPUT, "MN_mumeso_mean.csv"), header = T)
dfMN_ml<-read.csv(file.path(PATH_OUTPUT, "MN_mlmeso_mean.csv"), header = T)
dfMN_hml<-read.csv(file.path(PATH_OUTPUT, "MN_hmlmeso_mean.csv"), header = T)

df_eff <- read.csv(file.path(PATH_OUTPUT, "df_eff.csv"), head = T)
df_eff_new <- read.csv(file.path(PATH_OUTPUT, "df_eff_new_100.csv"), head = T)
df_eff_new_50 <- read.csv(file.path(PATH_OUTPUT, "df_eff_new_50.csv"), head = T)
df_eff_new_150 <- read.csv(file.path(PATH_OUTPUT, "df_eff_new_150.csv"), head = T)

# For the Sensitivity analysis (T = 10)

NLOG_VE_zero_Moz_10 <- NLOG_VE_zero_Moz[NLOG_VE_zero_Moz$NumOBS>=10,]
NLOG_VE_zero_North_10 <- NLOG_VE_zero_North[NLOG_VE_zero_North$NumOBS>=10,]
NLOG_VE_sup_zero_Moz_10 <- NLOG_VE_sup_zero_Moz[NLOG_VE_sup_zero_Moz$NumOBS>=10,]
NLOG_VE_sup_zero_North_10 <- NLOG_VE_sup_zero_North[NLOG_VE_sup_zero_North$NumOBS>=10,]
```

I : Correlations between environmental variables (Kendall tests)

Related to Figure A1 (values not directly displayed in the paper nor in the Appendix)

```
cor.test(NLOG_VE$chlamean, NLOG_VE$sstmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$chlamean and NLOG_VE$sstmean
## z = -29.109, p-value < 2.2e-16
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## -0.6110713
```

```
cor.test(NLOG_VE$chlamean, NLOG_VE$slamean, method = "kendall")
```

```
##
```

```
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$chlamean and NLOG_VE$slamean
## z = -8.6507, p-value < 2.2e-16
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## -0.1816017
```

```r
cor.test(NLOG_VE$chlamean, NLOG_VE$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$chlamean and NLOG_VE$SSCImean
## z = 2.9851, p-value = 0.002834
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##       tau
## 0.0626664
```

```r
cor.test(NLOG_VE$chlamean, NLOG_VE$FSLEmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$chlamean and NLOG_VE$FSLEmean
## z = -0.10262, p-value = 0.9183
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.00215417
```

```r
cor.test(NLOG_VE$chlamean, NLOG_VE$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$chlamean and NLOG_VE$MNmean
## z = 2.9369, p-value = 0.003315
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.06165382
```

```r
cor.test(NLOG_VE$sstmean, NLOG_VE$slamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$sstmean and NLOG_VE$slamean
## z = 9.6618, p-value < 2.2e-16
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##      tau
## 0.202829
```

```r
cor.test(NLOG_VE$sstmean, NLOG_VE$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$sstmean and NLOG_VE$SSCImean
## z = -3.5028, p-value = 0.0004604
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.07353311
```

```r
cor.test(NLOG_VE$sstmean, NLOG_VE$FSLEmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$sstmean and NLOG_VE$FSLEmean
## z = -2.3986, p-value = 0.01646
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.05035328
```

```r
cor.test(NLOG_VE$sstmean, NLOG_VE$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$sstmean and NLOG_VE$MNmean
## z = -0.87781, p-value = 0.38
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.01842775
```

```r
cor.test(NLOG_VE$slamean, NLOG_VE$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$slamean and NLOG_VE$SSCImean
## z = 2.3377, p-value = 0.0194
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.04907495
```

```r
cor.test(NLOG_VE$slamean, NLOG_VE$FSLEmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$slamean and NLOG_VE$FSLEmean
## z = -2.7577, p-value = 0.005822
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
```

```
##         tau
## -0.05789104
```

```r
cor.test(NLOG_VE$slamean, NLOG_VE$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$slamean and NLOG_VE$MNmean
## z = -1.1702, p-value = 0.2419
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.02456582
```

```r
cor.test(NLOG_VE$SSCImean, NLOG_VE$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$SSCImean and NLOG_VE$MNmean
## z = -5.0693, p-value = 3.993e-07
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## -0.1064183
```

```r
cor.test(NLOG_VE$FSLEmean, NLOG_VE$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$FSLEmean and NLOG_VE$SSCImean
## z = 2.5494, p-value = 0.01079
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.05351802
```

```r
cor.test(NLOG_VE$FSLEmean, NLOG_VE$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE$FSLEmean and NLOG_VE$MNmean
## z = -12.301, p-value < 2.2e-16
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## -0.2582345
```

II : Differences between the environmental variables according to NLOG $= 0$ or NLOG > 0 (Wilcoxon tests)

Related to Figure 3

```r
wilcox.test(NLOG_VE_zero_Moz$chlamean,NLOG_VE_sup_zero_Moz$chlamean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz$chlamean and NLOG_VE_sup_zero_Moz$chlamean
## W = 76, p-value = 0.4224
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North$chlamean,NLOG_VE_sup_zero_North$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North$chlamean and NLOG_VE_sup_zero_North$chlamean
## W = 115167, p-value = 0.01914
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz$slamean,NLOG_VE_sup_zero_Moz$slamean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz$slamean and NLOG_VE_sup_zero_Moz$slamean
## W = 17, p-value = 0.01859
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North$slamean,NLOG_VE_sup_zero_North$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North$slamean and NLOG_VE_sup_zero_North$slamean
## W = 103661, p-value = 0.6666
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz$SSCImean,NLOG_VE_sup_zero_Moz$SSCImean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz$SSCImean and NLOG_VE_sup_zero_Moz$SSCImean
## W = 49, p-value = 0.5881
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North$SSCImean,NLOG_VE_sup_zero_North$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North$SSCImean and NLOG_VE_sup_zero_North$SSCImean
## W = 113386, p-value = 0.05569
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz$FSLEmean,NLOG_VE_sup_zero_Moz$FSLEmean)
```

```
##
##  Wilcoxon rank sum exact test
```

```
##
## data:  NLOG_VE_zero_Moz$FSLEmean and NLOG_VE_sup_zero_Moz$FSLEmean
## W = 64, p-value = 0.8569
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North$FSLEmean,NLOG_VE_sup_zero_North$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North$FSLEmean and NLOG_VE_sup_zero_North$FSLEmean
## W = 99400, p-value = 0.1448
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz$MNmean,NLOG_VE_sup_zero_Moz$MNmean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz$MNmean and NLOG_VE_sup_zero_Moz$MNmean
## W = 78, p-value = 0.3639
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North$MNmean,NLOG_VE_sup_zero_North$MNmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North$MNmean and NLOG_VE_sup_zero_North$MNmean
## W = 108503, p-value = 0.4616
## alternative hypothesis: true location shift is not equal to 0
```

Related to Table A1 (Sensitivity Analysis)

```r
wilcox.test(NLOG_VE_zero_Moz_10$chlamean,NLOG_VE_sup_zero_Moz_10$chlamean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz_10$chlamean and NLOG_VE_sup_zero_Moz_10$chlamean
## W = 11, p-value = 0.5333
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North_10$chlamean,NLOG_VE_sup_zero_North_10$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North_10$chlamean and NLOG_VE_sup_zero_North_10$chlamean
## W = 24779, p-value = 0.02911
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz_10$slamean,NLOG_VE_sup_zero_Moz_10$slamean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz_10$slamean and NLOG_VE_sup_zero_Moz_10$slamean
## W = 2, p-value = 0.4
```

```
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North_10$slamean,NLOG_VE_sup_zero_North_10$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North_10$slamean and NLOG_VE_sup_zero_North_10$slamean
## W = 21747, p-value = 0.8078
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz_10$SSCImean,NLOG_VE_sup_zero_Moz_10$SSCImean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz_10$SSCImean and NLOG_VE_sup_zero_Moz_10$SSCImean
## W = 0, p-value = 0.1333
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North_10$SSCImean,NLOG_VE_sup_zero_North_10$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North_10$SSCImean and NLOG_VE_sup_zero_North_10$SSCImean
## W = 24144, p-value = 0.09415
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz_10$FSLEmean,NLOG_VE_sup_zero_Moz_10$FSLEmean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz_10$FSLEmean and NLOG_VE_sup_zero_Moz_10$FSLEmean
## W = 1, p-value = 0.2667
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North_10$FSLEmean,NLOG_VE_sup_zero_North_10$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North_10$FSLEmean and NLOG_VE_sup_zero_North_10$FSLEmean
## W = 22690, p-value = 0.6097
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_Moz_10$MNmean,NLOG_VE_sup_zero_Moz_10$MNmean)
```

```
##
##  Wilcoxon rank sum exact test
##
## data:  NLOG_VE_zero_Moz_10$MNmean and NLOG_VE_sup_zero_Moz_10$MNmean
## W = 11, p-value = 0.5333
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(NLOG_VE_zero_North_10$MNmean,NLOG_VE_sup_zero_North_10$MNmean)
```

```
##
```

```
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_zero_North_10$MNmean and NLOG_VE_sup_zero_North_10$MNmean
## W = 21380, p-value = 0.5913
## alternative hypothesis: true location shift is not equal to 0
```

III : Correlations between NLOG and environmental variables (Kendall tests)

Related to Figure 4 and Table A2

```r
cor.test(NLOG_VE_sup_zero_Moz$NLOG_stand, NLOG_VE_sup_zero_Moz$chlamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz$NLOG_stand and NLOG_VE_sup_zero_Moz$chlamean
## z = 0.23208, p-value = 0.8165
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.03002341
```

```r
cor.test(NLOG_VE_sup_zero_North$NLOG_stand, NLOG_VE_sup_zero_North$chlamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North$NLOG_stand and NLOG_VE_sup_zero_North$chlamean
## z = -1.6806, p-value = 0.09284
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.06397448
```

```r
cor.test(NLOG_VE_sup_zero_Moz$NLOG_stand, NLOG_VE_sup_zero_Moz$slamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz$NLOG_stand and NLOG_VE_sup_zero_Moz$slamean
## z = 1.7317, p-value = 0.08333
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##       tau
## 0.2240209
```

```r
cor.test(NLOG_VE_sup_zero_North$NLOG_stand, NLOG_VE_sup_zero_North$slamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North$NLOG_stand and NLOG_VE_sup_zero_North$slamean
## z = -2.6827, p-value = 0.007302
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
```

```
##        tau
## -0.1021221
```

```r
cor.test(NLOG_VE_sup_zero_Moz$NLOG_stand, NLOG_VE_sup_zero_Moz$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz$NLOG_stand and NLOG_VE_sup_zero_Moz$SSCImean
## z = -0.053557, p-value = 0.9573
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.00692848
```

```r
cor.test(NLOG_VE_sup_zero_North$NLOG_stand, NLOG_VE_sup_zero_North$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North$NLOG_stand and NLOG_VE_sup_zero_North$SSCImean
## z = -0.27776, p-value = 0.7812
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.01057315
```

```r
cor.test(NLOG_VE_sup_zero_Moz$NLOG_stand, NLOG_VE_sup_zero_Moz$FSLEmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz$NLOG_stand and NLOG_VE_sup_zero_Moz$FSLEmean
## z = 1.0533, p-value = 0.2922
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##       tau
## 0.1362601
```

```r
cor.test(NLOG_VE_sup_zero_North$NLOG_stand, NLOG_VE_sup_zero_North$FSLEmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North$NLOG_stand and NLOG_VE_sup_zero_North$FSLEmean
## z = 0.31528, p-value = 0.7526
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.01200141
```

```r
cor.test(NLOG_VE_sup_zero_Moz$NLOG_stand, NLOG_VE_sup_zero_Moz$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz$NLOG_stand and NLOG_VE_sup_zero_Moz$MNmean
## z = -0.44631, p-value = 0.6554
```

```
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.05773734
```

```r
cor.test(NLOG_VE_sup_zero_North$NLOG_stand, NLOG_VE_sup_zero_North$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North$NLOG_stand and NLOG_VE_sup_zero_North$MNmean
## z = 0.40283, p-value = 0.6871
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.01533404
```

```r
wilcox.test(NLOG_VE_sup_zero_Moz$NLOG_stand, NLOG_VE_sup_zero_North$NLOG_stand)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  NLOG_VE_sup_zero_Moz$NLOG_stand and NLOG_VE_sup_zero_North$NLOG_stand
## W = 8263.5, p-value = 8.327e-11
## alternative hypothesis: true location shift is not equal to 0
```

Related to Table A3 (Sensitivity Analysis)

```r
cor.test(NLOG_VE_sup_zero_Moz_10$NLOG_stand, NLOG_VE_sup_zero_Moz_10$chlamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz_10$NLOG_stand and NLOG_VE_sup_zero_Moz_10$chlamean
## T = 49, p-value = 0.7472
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.07692308
```

```r
cor.test(NLOG_VE_sup_zero_North_10$NLOG_stand, NLOG_VE_sup_zero_North_10$chlamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North_10$NLOG_stand and NLOG_VE_sup_zero_North_10$chlamean
## z = -1.1247, p-value = 0.2607
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.05666636
```

```r
cor.test(NLOG_VE_sup_zero_Moz_10$NLOG_stand, NLOG_VE_sup_zero_Moz_10$slamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz_10$NLOG_stand and NLOG_VE_sup_zero_Moz_10$slamean
```

```
## T = 51, p-value = 0.5906
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##       tau
## 0.1208791
```

```r
cor.test(NLOG_VE_sup_zero_North_10$NLOG_stand, NLOG_VE_sup_zero_North_10$slamean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North_10$NLOG_stand and NLOG_VE_sup_zero_North_10$slamean
## z = -2.7253, p-value = 0.006425
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## -0.1373181
```

```r
cor.test(NLOG_VE_sup_zero_Moz_10$NLOG_stand, NLOG_VE_sup_zero_Moz_10$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz_10$NLOG_stand and NLOG_VE_sup_zero_Moz_10$SSCImean
## T = 48, p-value = 0.8299
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.05494505
```

```r
cor.test(NLOG_VE_sup_zero_North_10$NLOG_stand, NLOG_VE_sup_zero_North_10$SSCImean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North_10$NLOG_stand and NLOG_VE_sup_zero_North_10$SSCImean
## z = -0.89997, p-value = 0.3681
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##         tau
## -0.04534526
```

```r
cor.test(NLOG_VE_sup_zero_Moz_10$NLOG_stand, NLOG_VE_sup_zero_Moz_10$FSLEmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz_10$NLOG_stand and NLOG_VE_sup_zero_Moz_10$FSLEmean
## T = 49, p-value = 0.7472
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.07692308
```

```r
cor.test(NLOG_VE_sup_zero_North_10$NLOG_stand, NLOG_VE_sup_zero_North_10$FSLEmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
```

```
##
## data:  NLOG_VE_sup_zero_North_10$NLOG_stand and NLOG_VE_sup_zero_North_10$FSLEmean
## z = -0.16791, p-value = 0.8667
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##          tau
## -0.008460391
```

```
cor.test(NLOG_VE_sup_zero_Moz_10$NLOG_stand, NLOG_VE_sup_zero_Moz_10$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_Moz_10$NLOG_stand and NLOG_VE_sup_zero_Moz_10$MNmean
## T = 46, p-value = 1
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.01098901
```

```
cor.test(NLOG_VE_sup_zero_North_10$NLOG_stand, NLOG_VE_sup_zero_North_10$MNmean, method = "kendall")
```

```
##
##  Kendall's rank correlation tau
##
## data:  NLOG_VE_sup_zero_North_10$NLOG_stand and NLOG_VE_sup_zero_North_10$MNmean
## z = 0.27663, p-value = 0.7821
## alternative hypothesis: true tau is not equal to 0
## sample estimates:
##        tau
## 0.01393834
```

IV : Construction of models

Related to Figure 5, Table 3 and Figure A2

```
NLOG_VE_sup_zero_North$chlacr <- scale(NLOG_VE_sup_zero_North$chlamean)
NLOG_VE_sup_zero_North$slacr <- scale(NLOG_VE_sup_zero_North$slamean)
NLOG_VE_sup_zero_North$SSCIcr <- scale(NLOG_VE_sup_zero_North$SSCImean)
NLOG_VE_sup_zero_North$FSLEcr <- scale(NLOG_VE_sup_zero_North$FSLEmean)
NLOG_VE_sup_zero_North$MNcr <- scale(NLOG_VE_sup_zero_North$MNmean)
NLOG_VE_sup_zero_North$logNLOG <- log(NLOG_VE_sup_zero_North$NLOG_stand)

NLOG_VE_sup_zero_Moz$chlacr <- scale(NLOG_VE_sup_zero_Moz$chlamean)
NLOG_VE_sup_zero_Moz$slacr <- scale(NLOG_VE_sup_zero_Moz$slamean)
NLOG_VE_sup_zero_Moz$SSCIcr <- scale(NLOG_VE_sup_zero_Moz$SSCImean)
NLOG_VE_sup_zero_Moz$FSLEcr <- scale(NLOG_VE_sup_zero_Moz$FSLEmean)
NLOG_VE_sup_zero_Moz$MNcr <- scale(NLOG_VE_sup_zero_Moz$MNmean)
NLOG_VE_sup_zero_Moz$logNLOG <- log(NLOG_VE_sup_zero_Moz$NLOG_stand)
```

GAM for the WIO zone

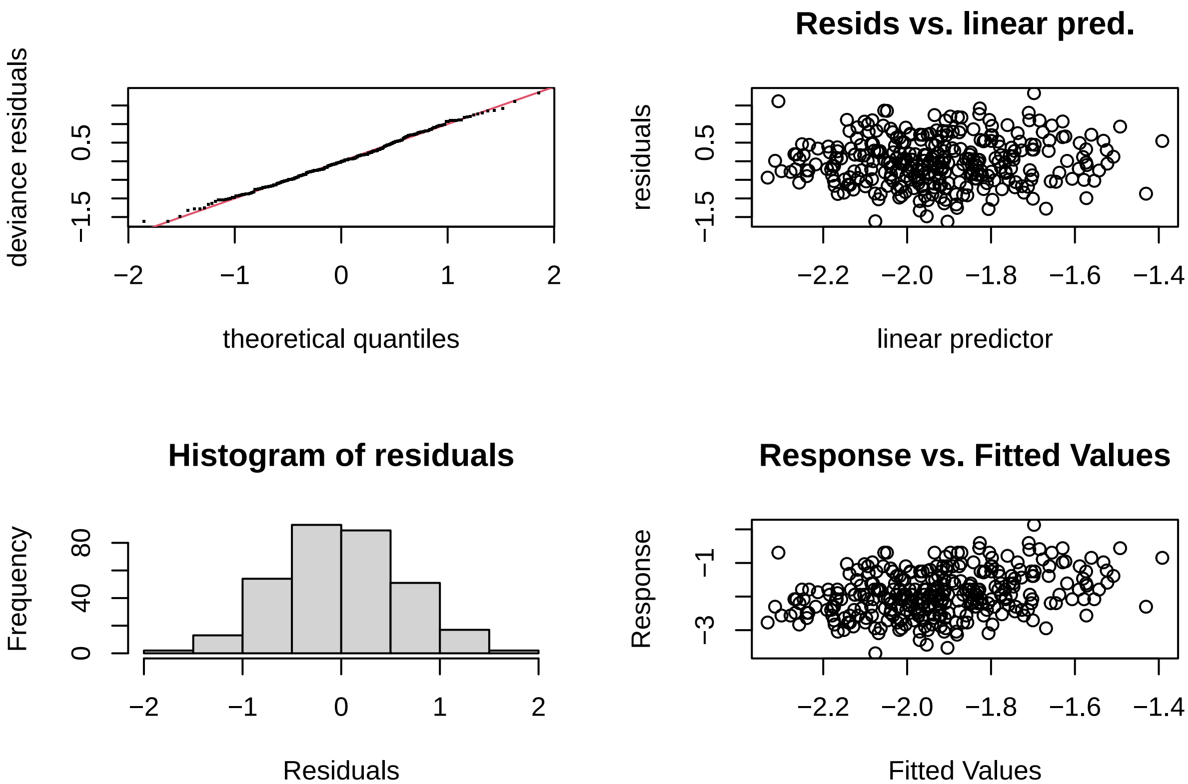
```
GAM_North <- mgcv::gam(logNLOG ~ s(chlacr) + s(slacr) + s(SSCIcr) + s(FSLEcr) + s(MNcr),
                       data = NLOG_VE_sup_zero_North)
summary(GAM_North)
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## logNLOG ~ s(chlacr) + s(slacr) + s(SSCIcr) + s(FSLEcr) + s(MNcr)
##
## Parametric coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.92506    0.03491  -55.15   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate significance of smooth terms:
##             edf Ref.df      F  p-value
## s(chlacr) 2.386  3.010  3.468 0.016256 *
## s(slacr)  1.000  1.000 15.163 0.000121 ***
## s(SSCIcr) 2.328  2.928  1.190 0.386489
## s(FSLEcr) 1.012  1.024  0.961 0.333233
## s(MNcr)   3.930  4.917  1.487 0.196153
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.0852   Deviance explained = 11.6%
## GCV = 0.40584  Scale est. = 0.3911    n = 321
```

```r
GAM_North2 <- stepAIC.gam(GAM_North)
summary(GAM_North2)
```

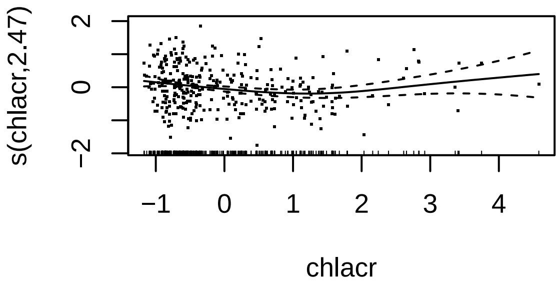
```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## logNLOG ~ s(chlacr) + s(slacr) + s(MNcr)
##
## Parametric coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -1.92506    0.03501  -54.99   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate significance of smooth terms:
##             edf Ref.df      F p-value
## s(chlacr) 2.471  3.115  3.774 0.00964 **
## s(slacr)  1.000  1.000 14.488 0.00017 ***
## s(MNcr)   4.013  5.018  1.425 0.20620
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =   0.08   Deviance explained = 10.1%
## GCV = 0.40403  Scale est. = 0.39335   n = 321
```

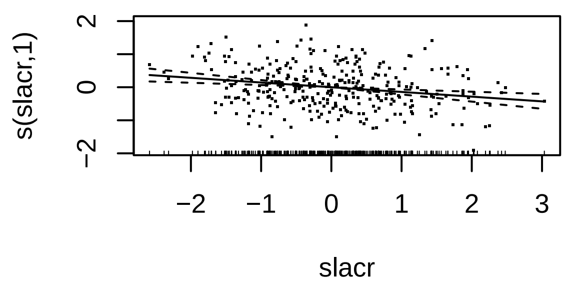
```r
par(mfrow = c(2,2))
gam.check(GAM_North2)
```

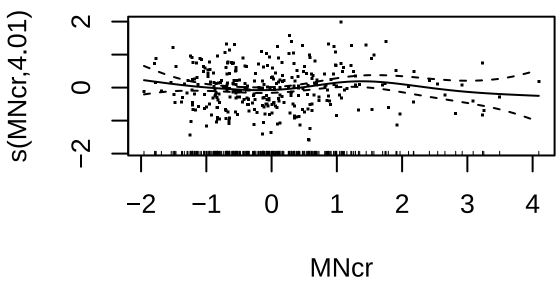



```
##
## Method: GCV   Optimizer: magic
## Smoothing parameter selection converged after 10 iterations.
## The RMS GCV score gradient at convergence was 5.517865e-08 .
## The Hessian was positive definite.
## Model rank =  28 / 28
##
## Basis dimension (k) checking results. Low p-value (k-index<1) may
## indicate that k is too low, especially if edf is close to k'.
##
##              k'  edf k-index p-value
## s(chlacr) 9.00 2.47    1.06    0.89
## s(slacr)  9.00 1.00    1.03    0.67
## s(MNcr)   9.00 4.01    1.07    0.85
```

```r
plot(GAM_North2,residuals=T,pages=1)
```







Linear model for the MOZ zone

```
LM_Moz <- lm(logNLOG ~ chlacr + slacr + SSCIcr + FSLEcr + MNcr, data = NLOG_VE_sup_zero_Moz)
LM_Moz2 <- stepAIC(LM_Moz)
```

```
## Start:  AIC=-3.19
## logNLOG ~ chlacr + slacr + SSCIcr + FSLEcr + MNcr
##
##          Df Sum of Sq    RSS     AIC
## - chlacr  1   0.05227 18.136 -5.0998
## - FSLEcr  1   0.09244 18.176 -5.0335
## - SSCIcr  1   0.35652 18.440 -4.6007
## - MNcr    1   0.43575 18.519 -4.4721
## <none>                18.083 -3.1864
## - slacr   1   1.43521 19.518 -2.8952
##
## Step:  AIC=-5.1
## logNLOG ~ slacr + SSCIcr + FSLEcr + MNcr
##
##          Df Sum of Sq    RSS     AIC
## - FSLEcr  1   0.12561 18.261 -6.8928
## - SSCIcr  1   0.32672 18.462 -6.5642
## - MNcr    1   0.56817 18.704 -6.1744
## <none>                18.136 -5.0998
## - slacr   1   1.38581 19.521 -4.8908
##
## Step:  AIC=-6.89
## logNLOG ~ slacr + SSCIcr + MNcr
##
##          Df Sum of Sq    RSS     AIC
## - SSCIcr  1   0.47470 18.736 -8.1229
```

```
## - MNcr    1   0.50722 18.768 -8.0709
## <none>                18.261 -6.8928
## - slacr   1   2.16105 20.422 -5.5374
##
## Step:  AIC=-8.12
## logNLOG ~ slacr + MNcr
##
##         Df Sum of Sq    RSS     AIC
## - MNcr   1   0.14633 18.882 -9.8895
## <none>               18.736 -8.1229
## - slacr  1   1.81132 20.547 -7.3543
##
## Step:  AIC=-9.89
## logNLOG ~ slacr
##
##         Df Sum of Sq    RSS     AIC
## <none>               18.882 -9.8895
## - slacr  1    1.9138 20.796 -8.9932
```

```
summary(LM_Moz2)
```

```
##
## Call:
## lm(formula = logNLOG ~ slacr, data = NLOG_VE_sup_zero_Moz)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.6327 -0.7608  0.1928  0.4182  1.5526
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.7212     0.1499  -4.810 4.66e-05 ***
## slacr         0.2569     0.1525   1.685    0.103
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.8212 on 28 degrees of freedom
## Multiple R-squared:  0.09203,    Adjusted R-squared:  0.0596
## F-statistic: 2.838 on 1 and 28 DF,  p-value: 0.1032
```

Sensitivity analysis

Related to Table A4

```
NLOG_VE_sup_zero_North_10$chlacr <- scale(NLOG_VE_sup_zero_North_10$chlamean)
NLOG_VE_sup_zero_North_10$slacr <- scale(NLOG_VE_sup_zero_North_10$slamean)
NLOG_VE_sup_zero_North_10$SSCIcr <- scale(NLOG_VE_sup_zero_North_10$SSCImean)
NLOG_VE_sup_zero_North_10$FSLEcr <- scale(NLOG_VE_sup_zero_North_10$FSLEmean)
NLOG_VE_sup_zero_North_10$MNcr <- scale(NLOG_VE_sup_zero_North_10$MNmean)
NLOG_VE_sup_zero_North_10$logNLOG <- log(NLOG_VE_sup_zero_North_10$NLOG_stand)

GAM_North_10 <- mgcv::gam(logNLOG ~ s(chlacr) + s(slacr) + s(SSCIcr) + s(FSLEcr) + s(MNcr),
                          data = NLOG_VE_sup_zero_North_10)
GAM_North2_10 <- stepAIC.gam(GAM_North_10)
summary(GAM_North2_10)
```

```
##
## Family: gaussian
## Link function: identity
##
## Formula:
## logNLOG ~ s(chlacr) + s(slacr)
##
## Parametric coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept) -2.14733    0.04738  -45.32   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Approximate significance of smooth terms:
##             edf Ref.df     F p-value
## s(chlacr) 2.293  2.867  3.48 0.01463 *
## s(slacr)  1.000  1.000 11.59 0.00082 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## R-sq.(adj) =  0.0846   Deviance explained = 10.1%
## GCV = 0.42072  Scale est. = 0.41085   n = 183
```

```
NLOG_VE_sup_zero_Moz_10$chlacr <- scale(NLOG_VE_sup_zero_Moz_10$chlamean)
NLOG_VE_sup_zero_Moz_10$slacr <- scale(NLOG_VE_sup_zero_Moz_10$slamean)
NLOG_VE_sup_zero_Moz_10$SSCIcr <- scale(NLOG_VE_sup_zero_Moz_10$SSCImean)
NLOG_VE_sup_zero_Moz_10$FSLEcr <- scale(NLOG_VE_sup_zero_Moz_10$FSLEmean)
NLOG_VE_sup_zero_Moz_10$MNcr <- scale(NLOG_VE_sup_zero_Moz_10$MNmean)
NLOG_VE_sup_zero_Moz_10$logNLOG <- log(NLOG_VE_sup_zero_Moz_10$NLOG_stand)

LM_Moz_10 <- lm(logNLOG ~ chlacr + slacr + SSCIcr + FSLEcr + MNcr, data = NLOG_VE_sup_zero_Moz_10)
LM_Moz2_10 <- stepAIC(LM_Moz_10)
```

```
## Start:  AIC=3
## logNLOG ~ chlacr + slacr + SSCIcr + FSLEcr + MNcr
##
##          Df Sum of Sq    RSS    AIC
## - slacr   1   0.00035 7.3611 1.0002
## - SSCIcr  1   0.05522 7.4160 1.1042
## - FSLEcr  1   0.14838 7.5092 1.2790
## - MNcr    1   0.23117 7.5920 1.4325
## - chlacr  1   0.39774 7.7585 1.7363
## <none>                7.3608 2.9996
##
## Step:  AIC=1
## logNLOG ~ chlacr + SSCIcr + FSLEcr + MNcr
##
##          Df Sum of Sq    RSS      AIC
## - SSCIcr  1   0.05533 7.4165 -0.89493
## - FSLEcr  1   0.16587 7.5270 -0.68781
## - MNcr    1   0.23292 7.5941 -0.56365
## - chlacr  1   0.39739 7.7585 -0.26368
## <none>                7.3611  1.00022
##
## Step:  AIC=-0.89
```

```
## logNLOG ~ chlacr + FSLEcr + MNcr
##
##          Df Sum of Sq    RSS      AIC
## - FSLEcr  1   0.13207 7.5486 -2.64781
## - MNcr    1   0.17972 7.5962 -2.55972
## - chlacr  1   0.35889 7.7754 -2.23335
## <none>                7.4165 -0.89493
##
## Step:  AIC=-2.65
## logNLOG ~ chlacr + MNcr
##
##          Df Sum of Sq    RSS     AIC
## - MNcr    1   0.05315 7.6017 -4.5496
## - chlacr  1   0.33613 7.8847 -4.0379
## <none>                7.5486 -2.6478
##
## Step:  AIC=-4.55
## logNLOG ~ chlacr
##
##          Df Sum of Sq    RSS     AIC
## - chlacr  1   0.29199 7.8937 -6.0219
## <none>                7.6017 -4.5496
##
## Step:  AIC=-6.02
## logNLOG ~ 1
```

```
summary(LM_Moz2_10)
```

```
##
## Call:
## lm(formula = logNLOG ~ 1, data = NLOG_VE_sup_zero_Moz_10)
##
## Residuals:
##     Min      1Q  Median      3Q     Max
## -1.2832 -0.6011  0.1044  0.5573  1.3448
##
## Coefficients:
##             Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.5086     0.2083  -2.442   0.0297 *
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 0.7792 on 13 degrees of freedom
```

V : Sampling bias analysis (Wilcoxon tests)

Related to Figure B1 and Table B1

```
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$chlamean,
            df_eff_new[df_eff_new$Zone=="MOZ",]$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$chlamean and df_eff_new[df_e
```

```
## W = 17346, p-value = 0.8243
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$chlamean,
            df_eff_new[df_eff_new$Zone=="WIO",]$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$chlamean and df_eff_new[df_ef
## W = 5662803, p-value < 2.2e-16
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$slamean,
            df_eff_new[df_eff_new$Zone=="MOZ",]$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$slamean and df_eff_new[df_ef
## W = 13008, p-value = 0.02058
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$slamean,
            df_eff_new[df_eff_new$Zone=="WIO",]$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$slamean and df_eff_new[df_ef
## W = 4464271, p-value = 0.0004014
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$SSCImean,
            df_eff_new[df_eff_new$Zone=="MOZ",]$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$SSCImean and df_eff_new[df_e
## W = 12782, p-value = 0.01437
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$SSCImean,
            df_eff_new[df_eff_new$Zone=="WIO",]$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$SSCImean and df_eff_new[df_e
## W = 5023539, p-value = 0.01286
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$FSLEmean,
            df_eff_new[df_eff_new$Zone=="MOZ",]$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
```

```
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$FSLEmean and df_eff_new[df_ef
## W = 16079, p-value = 0.604
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$FSLEmean,
            df_eff_new[df_eff_new$Zone=="WIO",]$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$FSLEmean and df_eff_new[df_ef
## W = 4709018, p-value = 0.3672
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$micronec_epi,
            df_eff_new[df_eff_new$Zone=="MOZ",]$micronec_epi)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$micronec_epi and df_eff_new[d
## W = 15102, p-value = 0.2756
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$micronec_epi,
            df_eff_new[df_eff_new$Zone=="WIO",]$micronec_epi)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$micronec_epi and df_eff_new[d
## W = 5555892, p-value < 2.2e-16
## alternative hypothesis: true location shift is not equal to 0
```

```r
#### Medians ####

## CHLA
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$chlamean)
```

```
## [1] 0.1420248
```

```r
median(df_eff_new[df_eff_new$Zone=="MOZ",]$chlamean)
```

```
## [1] 0.149243
```

```r
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$chlamean, na.rm = T)
```

```
## [1] 0.1421674
```

```r
median(df_eff_new[df_eff_new$Zone=="WIO",]$chlamean, na.rm = T)
```

```
## [1] 0.1185572
```

```r
##SLA
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$slamean, na.rm = T)
```

```
## [1] 0.05356562
```

```r
median(df_eff_new[df_eff_new$Zone=="MOZ",]$slamean, na.rm = T)
```

```
## [1] 0.08351484
```

```r
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$slamean, na.rm = T)
```

```
## [1] 0.08050547
```

```r
median(df_eff_new[df_eff_new$Zone=="WIO",]$slamean, na.rm = T)
```

```
## [1] 0.0873375
```

```r
## SSCI
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$SSCImean, na.rm = T)
```

```
## [1] 0.210268
```

```r
median(df_eff_new[df_eff_new$Zone=="MOZ",]$SSCImean, na.rm = T)
```

```
## [1] 0.2746189
```

```r
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$SSCImean, na.rm = T)
```

```
## [1] 0.1457387
```

```r
median(df_eff_new[df_eff_new$Zone=="WIO",]$SSCImean, na.rm = T)
```

```
## [1] 0.1368096
```

```r
## FSLE
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$FSLEmean, na.rm = T)
```

```
## [1] -0.08942094
```

```r
median(df_eff_new[df_eff_new$Zone=="MOZ",]$FSLEmean, na.rm = T)
```

```
## [1] -0.08674571
```

```r
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$FSLEmean, na.rm = T)
```

```
## [1] -0.04727591
```

```r
median(df_eff_new[df_eff_new$Zone=="WIO",]$FSLEmean, na.rm = T)
```

```
## [1] -0.04734167
```

```r
## MN
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$micronec_epi, na.rm = T)
```

```
## [1] 0.4837844
```

```r
median(df_eff_new[df_eff_new$Zone=="MOZ",]$micronec_epi, na.rm = T)
```

```
## [1] 0.570126
```

```r
median(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$micronec_epi, na.rm = T)
```

```
## [1] 0.3711865
```

```r
median(df_eff_new[df_eff_new$Zone=="WIO",]$micronec_epi, na.rm = T)
```

```
## [1] 0.3305469
```

Related to Table B2 (Sensitivity analysis of the sampled size)

```r
# Sampled size = 50

wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$chlamean,
            df_eff_new_50[df_eff_new_50$Zone=="MOZ",]$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$chlamean and df_eff_new_50[d
## W = 8526, p-value = 0.8664
## alternative hypothesis: true location shift is not equal to 0
```

```
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$chlamean,
            df_eff_new_50[df_eff_new_50$Zone=="WIO",]$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$chlamean and df_eff_new_50[d
## W = 2847689, p-value < 2.2e-16
## alternative hypothesis: true location shift is not equal to 0
```

```
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$slamean,
            df_eff_new_50[df_eff_new_50$Zone=="MOZ",]$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$slamean and df_eff_new_50[df_
## W = 6373, p-value = 0.01941
## alternative hypothesis: true location shift is not equal to 0
```

```
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$slamean,
            df_eff_new_50[df_eff_new_50$Zone=="WIO",]$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$slamean and df_eff_new_50[df_
## W = 2223802, p-value = 0.0003034
## alternative hypothesis: true location shift is not equal to 0
```

```
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$SSCImean,
            df_eff_new_50[df_eff_new_50$Zone=="MOZ",]$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$SSCImean and df_eff_new_50[d
## W = 6390, p-value = 0.02046
## alternative hypothesis: true location shift is not equal to 0
```

```
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$SSCImean,
            df_eff_new_50[df_eff_new_50$Zone=="WIO",]$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$SSCImean and df_eff_new_50[d
## W = 2522548, p-value = 0.01089
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$FSLEmean,
            df_eff_new_50[df_eff_new_50$Zone=="MOZ",]$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$FSLEmean and df_eff_new_50[d
## W = 7821, p-value = 0.5147
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$FSLEmean,
            df_eff_new_50[df_eff_new_50$Zone=="WIO",]$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$FSLEmean and df_eff_new_50[d
## W = 2370610, p-value = 0.5579
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$micronec_epi,
            df_eff_new_50[df_eff_new_50$Zone=="MOZ",]$micronec_epi)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$micronec_epi and df_eff_new_
## W = 7407, p-value = 0.257
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$micronec_epi,
            df_eff_new_50[df_eff_new_50$Zone=="WIO",]$micronec_epi)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$micronec_epi and df_eff_new_
## W = 2760590, p-value = 9.091e-14
## alternative hypothesis: true location shift is not equal to 0
```

```r
# Sampled size = 150

wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$chlamean,
            df_eff_new_150[df_eff_new_150$Zone=="MOZ",]$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$chlamean and df_eff_new_150[
## W = 25159, p-value = 0.7276
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$chlamean,
            df_eff_new_150[df_eff_new_150$Zone=="WIO",]$chlamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
```

```
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$chlamean and df_eff_new_150[d
## W = 8534718, p-value < 2.2e-16
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$slamean,
            df_eff_new_150[df_eff_new_150$Zone=="MOZ",]$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$slamean and df_eff_new_150[df
## W = 18545, p-value = 0.01798
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$slamean,
            df_eff_new_150[df_eff_new_150$Zone=="WIO",]$slamean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$slamean and df_eff_new_150[df
## W = 6685342, p-value = 9.958e-05
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$SSCImean,
            df_eff_new_150[df_eff_new_150$Zone=="MOZ",]$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$SSCImean and df_eff_new_150[d
## W = 18490, p-value = 0.01691
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$SSCImean,
            df_eff_new_150[df_eff_new_150$Zone=="WIO",]$SSCImean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$SSCImean and df_eff_new_150[d
## W = 7569215, p-value = 0.01144
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$FSLEmean,
            df_eff_new_150[df_eff_new_150$Zone=="MOZ",]$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$FSLEmean and df_eff_new_150[d
## W = 22778, p-value = 0.5296
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$FSLEmean,
            df_eff_new_150[df_eff_new_150$Zone=="WIO",]$FSLEmean)
```

```
##
##  Wilcoxon rank sum test with continuity correction
```

```
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$FSLEmean and df_eff_new_150[d
## W = 7136266, p-value = 0.5379
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="MOZ",]$micronec_epi,
            df_eff_new_150[df_eff_new_150$Zone=="MOZ",]$micronec_epi)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "MOZ", ]$micronec_epi and df_eff_new_1
## W = 21830, p-value = 0.3088
## alternative hypothesis: true location shift is not equal to 0
```

```r
wilcox.test(df_eff[df_eff$threshold=="Fisheries" & df_eff$Zone=="WIO",]$micronec_epi,
            df_eff_new_150[df_eff_new_150$Zone=="WIO",]$micronec_epi)
```

```
##
##  Wilcoxon rank sum test with continuity correction
##
## data:  df_eff[df_eff$threshold == "Fisheries" & df_eff$Zone == "WIO", ]$micronec_epi and df_eff_new_1
## W = 8315384, p-value = 1.874e-15
## alternative hypothesis: true location shift is not equal to 0
```