

1                   Appendix S3 - Code for Figure 4

2           From zero to infinity: minimum to maximum diversity of the planet by  
3                                   spatio-parametric Rao's quadratic entropy

4

5                                   January 16, 2021

```

6
7 library(ggplot2) 1
8 library(rasterdiv)
9 x1 <- matrix(c(255, 128, 1, 255, 128, 1, 255, 128, 1),ncol=3) 3
10 x2 <- matrix(c(10, 10, 10, 10, 50, 50, 50, 50, 50),ncol=3)
11 p1 <- paRao(x1,window=3,np=1,na.tolerance=0.1,dist_m=" 5
12 euclidean",alpha=2)
13 p2 <- paRao(x2,window=3,np=1,na.tolerance=0.1,dist_m="
14 euclidean",alpha=2)
15 alphas <- seq(0,30,1) 7
16 out1 <- paRao(x1,window=3,np=1,na.tolerance=0.1,dist_m="
17 euclidean",alpha=alphas)
18 out2 <- paRao(x2,window=3,np=1,na.tolerance=0.1,dist_m=" 9
19 euclidean",alpha=alphas)
20 r1 <- sapply(out1, function(y) {y[2,2]})
21 r2 <- sapply(out2, function(y) {y[2,2]}) 11
22 ggp <- rbind.data.frame(
23 cbind.data.frame(raop=r1,alphas,"Time frames"=rep("t0",length 13
24 (alphas))),
25 cbind.data.frame(raop=r2,alphas,"Time frames"=rep("tn",length
26 (alphas))))
27 15
28 pdf("landscapes.pdf")
29 ggplot(ggp, aes(x=alphas, y=raop,col='Time frames')) + 17
30 geom_line(size=2,alpha=0.6) +
31 geom_point(cex=3,pch=21) + 19
32 theme_bw() +
33 xlab("alpha") + 21
34 ylab("Parametric Rao") +
35 theme(axis.text.x = element_text(size=14), axis.text.y = 23
36 element_text(size=14)) +
37 theme(axis.title.x = element_text(size=16), axis.title.y
38 = element_text(size=16))+
39 theme(legend.position="top",legend.title=element_text( 25
40 size=14),legend.text=element_text(size=14))
41 dev.off()
42 27
43
44 29
45 #####
46 31
47 #### Second graph
48 33
49 library(raster)
50 library(rasterdiv) 35
51 library(ggplot2)
52 37
53 x1 <- matrix(c(255, 128, 1, 255, 128, 1, 255, 128, 1),ncol=3)
54 x2 <- matrix(c(10, 10, 10, 10, 50, 50, 50, 50, 50),ncol=3) 39

```

```

55 x3 <- matrix(c(rep(20,3),rep(250,6)),ncol=3)
56 alphas <- seq(0,30,1)
57 out1 <- paRao(x1,window=3,np=1,na.tolerance=0.1,dist_m="
58   euclidean",alpha=alphas)
59 out2 <- paRao(x2,window=3,np=1,na.tolerance=0.1,dist_m="
60   euclidean",alpha=alphas)
61 out3 <- paRao(x3,window=3,np=1,na.tolerance=0.1,dist_m="
62   euclidean",alpha=alphas)
63 r1 <- sapply(out1, function(y) {y[2,2]})
64 r2 <- sapply(out2, function(y) {y[2,2]})
65 r3 <- sapply(out3, function(y) {y[2,2]})
66 ggp <- rbind.data.frame(
67   cbind.data.frame(raop=r1,alphas,"Time frames"=rep("t0",length
68     (alphas))),
69   cbind.data.frame(raop=r3,alphas,"Time frames"=rep("tn",length
70     (alphas))))
71
72 pdf("landscapes2.pdf")
73 ggplot(ggp, aes(x=alphas, y=raop,col='Time frames')) +
74   geom_line(size=2,alpha=0.6) +
75   geom_point(cex=3,pch=21) +
76   theme_bw() +
77   xlab("alpha") +
78   ylab("Parametric Rao") +
79   theme(axis.text.x = element_text(size=14), axis.text.y =
80     element_text(size=14)) +
81   theme(axis.title.x = element_text(size=16), axis.title.y
82     = element_text(size=16))+
83   theme(legend.position="top",legend.title=element_text(
84     size=14),legend.text=element_text(size=14))
85   ggsave("~/paRao_comparison1.png",dpi=600,scale=0.5,width
86     =10,height=10)
87 dev.off()

```

↑  
Temporal dimension

