Postprocessing zoning: smoothing zones

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Contents


```
  library(geozoning)
  library(rgeos)
```

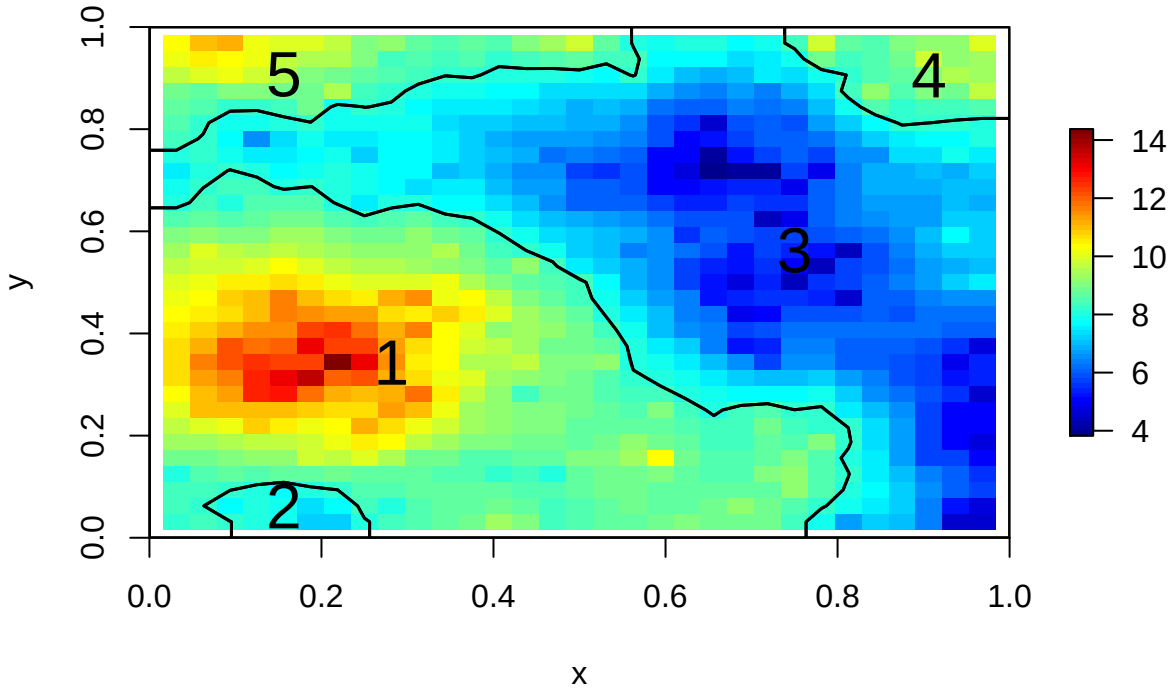
This vignette illustrates the zone and map smoothing process. It first shows why a step of zone boundary correction is required. Then the zone smoothing based on morphological erosion and dilatation is illustrated. Finally the map smothing resulting of all zone smoothing is illustrated.

Step 1: Why is CorrectBoundaryMap required

```
seed=1
map=genMap(DataObj=NULL,seed=seed,disp=FALSE,krig=2)
```

```
## [1] "DataObj=NULL, generating DataObj-seed= 1"
## [inverse distance weighted interpolation]
```

```
criti = correctionTree(qProb = c(0.5), map = map)
Z = criti$zk[[1]][[1]]$zonePolygone
lab = criti$zk[[1]][[1]]$lab
plotM(map = map, Z = Z, lab = lab, byLab = FALSE)
```




```
class(gIntersection(Z[[1]],Z[[2]])) [1]
```

```
## [1] "SpatialPolygons"
```

```
class(gIntersection(Z[[1]],Z[[5]])) [1]
```

```
## [1] "NULL"
```

```
class(gIntersection(Z[[2]],Z[[3]])) [1]
```

```
## [1] "NULL"
```

```
class(gIntersection(Z[[2]],Z[[4]])) [1]
```

```
## [1] "NULL"
```

```
res = correctBoundaryMap(Zi = Z, map = map)
Z = res$Z
class(gIntersection(Z[[1]],Z[[2]])) [1]
```

```
## [1] "SpatialLines"
```

```
class(gIntersection(Z[[1]],Z[[5]])) [1]
```

```
## [1] "NULL"
```

```
class(gIntersection(Z[[2]],Z[[3]])) [1]
```

```
## [1] "NULL"
```

```
class(gIntersection(Z[[2]],Z[[4]])) [1]
```

```
## [1] "NULL"
```

Step 2: Smoothing a zone

```
seed=1
```

Generate map with simulated data

```
map=genMap(DataObj=NULL,seed=seed,disp=FALSE,krig=2)
```

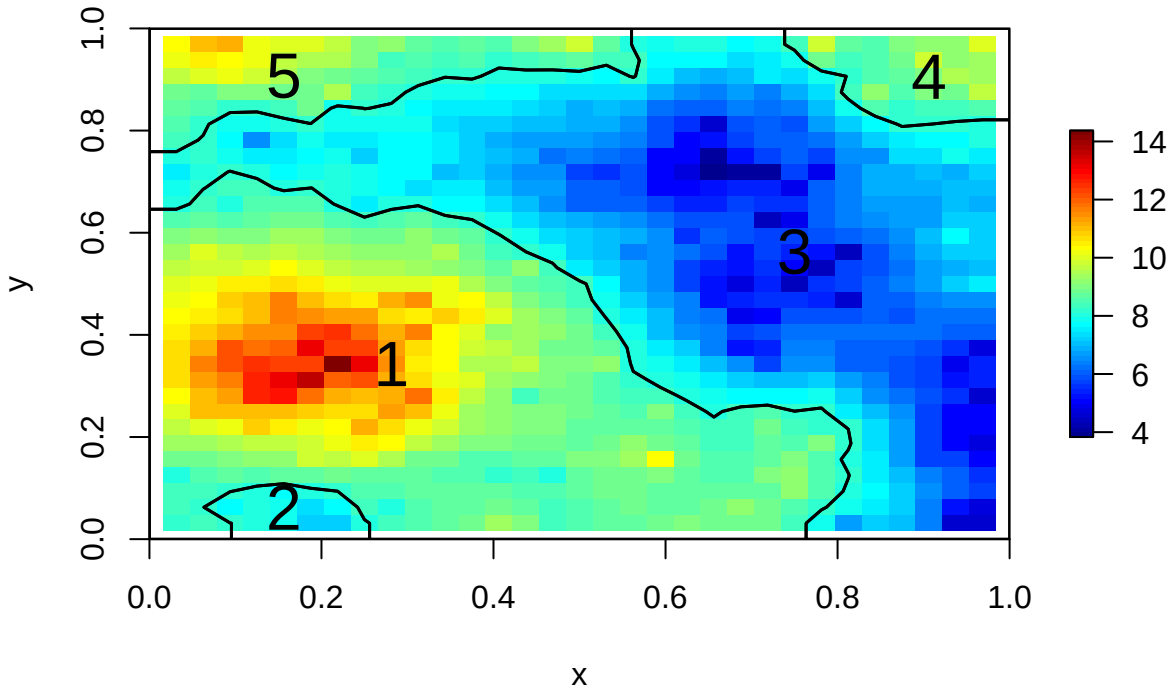
```
## [1] "DataObj=NULL, generating DataObj-seed= 1"
## [inverse distance weighted interpolation]
```

Generate zoning

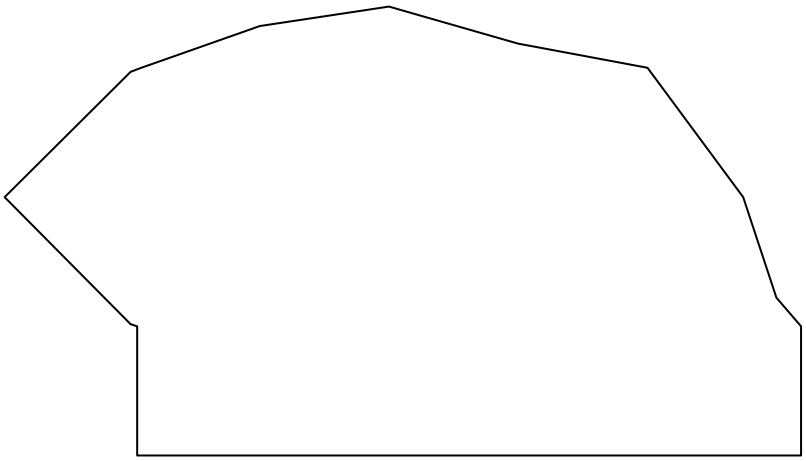
```
criti = correctionTree(qProb = c(0.5), map = map)
Z = criti$zk[[1]][[1]]$zonePolygone
lab = criti$zk[[1]][[1]]$lab
```

Correct zone boundaries

```
res = correctBoundaryMap(Zi = Z, map = map)
Z = res$Z
# map boundary after correction
boundary = Z[[1]]
for(i in 2:length(Z)){
  boundary = gUnion(boundary, Z[[i]])
}
#plot map
plotM(map = map, Z = Z, lab = lab, byLab = FALSE)
```



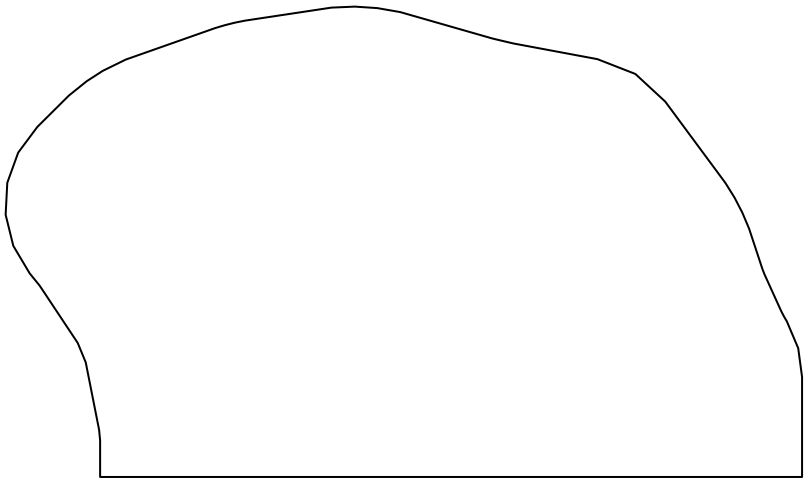

```
# smoothing
zone = Z[[2]]
plot(zone)
```



```
newZone = smoothingZone(z = zone, width = 0.05, boundary = boundary)
```

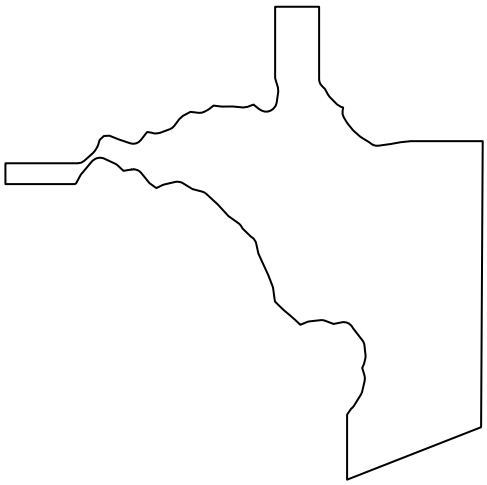
```
## [1] "widthExt 0.05"
## [1] "widthInt 0.025"
```

```
plot(newZone)
```

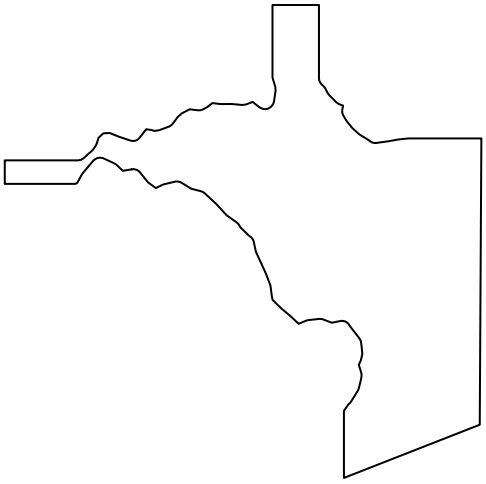


Compute maximum width for zone smoothing

```
widthMax = cal.max.width.Zone(z = Z[[3]], step = 0.001, widthMax = 0.05, boundary = boundary, erosion =
zone = zone.extended(z = Z[[3]], boundary = boundary)
erosion1 = gBuffer(zone ,width = - (widthMax + 0.002) ,joinStyle="ROUND",capStyle = "ROUND")
erosion2 = gBuffer(zone ,width = - (widthMax - 0.002) ,joinStyle="ROUND",capStyle = "ROUND")
plot(erosion1)
```



```
plot(erosion2)
```



Smoothing all zones in zoning

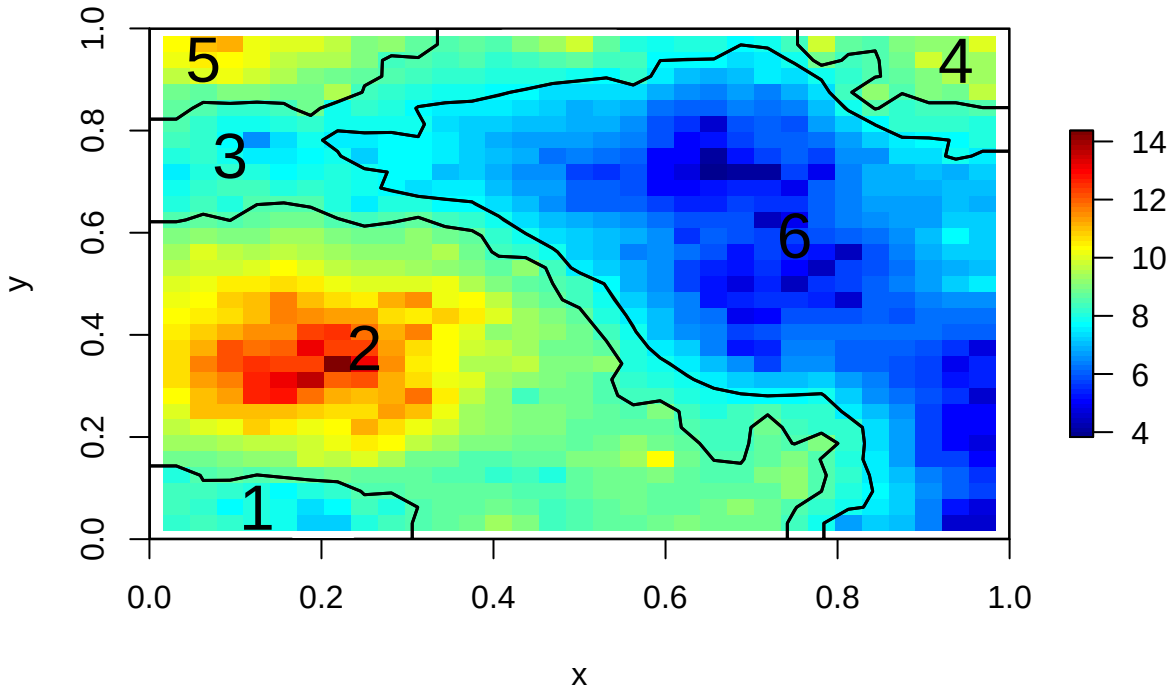
```
seed=1
map=genMap(DataObj=NULL,seed=seed,disp=FALSE,krig=2)
```

```
## [1] "DataObj=NULL, generating DataObj-seed= 1"
## [inverse distance weighted interpolation]
```

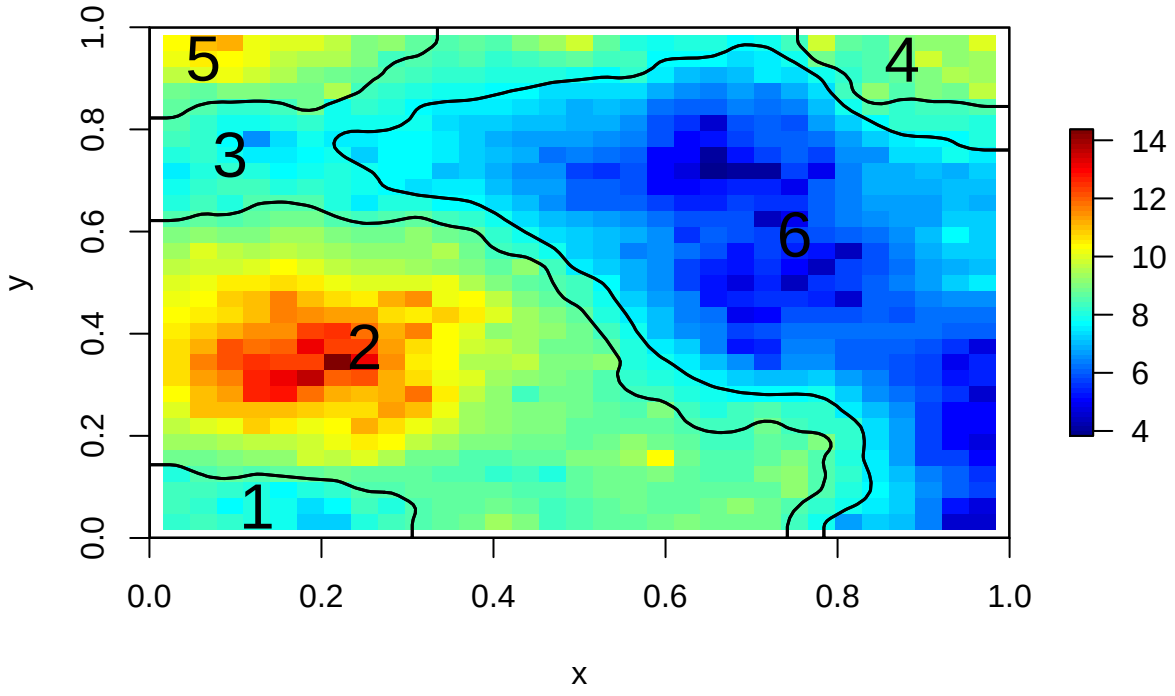
```
criti = correctionTree(qProb = c(0.4,0.6), map = map)
Z = criti$zk[[2]][[1]]$zonePolygone
newZ = smoothingMap(Z = Z, width = 0.05, map = map, disp = TRUE)
```

```
## [1] "nbZ.special<=2"
## [1] "nbZ.special = 2"
## [1] "smooth: 1"
## [1] "widthExt 0.05"
## [1] "widthInt 0.025"
## [1] "smooth: 4"
## [1] "widthExt 0.05"
## [1] "widthInt 0.025"
## [1] "smooth: 5"
## [1] "widthExt 0.05"
## [1] "widthInt 0.025"
## [1] "smooth: 6"
## [1] "widthExt 0.05"
## [1] "widthInt 0.025"
## [1] "union: 2 1"
## [1] "union: 3 4"
## [1] "union: 3 5"
## [1] "union: 3 6"
## [1] "before last zone: 2"
## [1] "widthExt 0.05"
## [1] "widthInt 0.025"
## [1] "remove: 1"
## [1] "last zone: 3"
## [1] "remove: 2"
## [1] "remove: 4"
## [1] "remove: 5"
## [1] "remove: 6"
```

```
plotM(map = map, Z = Z, lab = 1:length(Z))
```




```
plotM(map = map, Z = newZ, lab = 1:length(newZ))
```



#Example of smoothing zoning done on real data

```
#data(yieldMapZ)
#plotM(map = map, Z = Z3, lab = 1:length(Z3))

#res = correctBoundaryMap(Zi = Z3, map = map)
#Z = res$Z
#newZ = smoothingMap(Z = Z, width = 0.05, map = map, disp = TRUE)
#plotM(map = map, Z = newZ, lab = 1:length(newZ))
```

Session informations

```
## R version 3.4.0 (2017-04-21)
## Platform: x86_64-pc-linux-gnu (64-bit)
## Running under: Debian GNU/Linux 8 (jessie)
##
## Matrix products: default
## BLAS: /usr/lib/libblas/libblas.so.3.0
## LAPACK: /usr/lib/lapack/liblapack.so.3.0
##
## locale:
##  [1] LC_CTYPE=fr_FR.utf8       LC_NUMERIC=C
##  [3] LC_TIME=fr_FR.utf8        LC_COLLATE=fr_FR.utf8
##  [5] LC_MONETARY=fr_FR.utf8    LC_MESSAGES=fr_FR.utf8
##  [7] LC_PAPER=fr_FR.utf8       LC_NAME=C
##  [9] LC_ADDRESS=C              LC_TELEPHONE=C
## [11] LC_MEASUREMENT=fr_FR.utf8 LC_IDENTIFICATION=C
##
## attached base packages:
## [1] stats     graphics  grDevices utils     datasets  methods   base
##
## other attached packages:
## [1] rgeos_0.3-23    sp_1.2-4        ggplot2_2.2.1   geozoning_1.0.0
## [5] rmarkdown_1.6
##
## loaded via a namespace (and not attached):
##  [1] Rcpp_0.12.11             compiler_3.4.0
##  [3] plyr_1.8.4               tools_3.4.0
##  [5] xts_0.9-7                digest_0.6.12
##  [7] gstat_1.1-5              evaluate_0.10.1
##  [9] tibble_1.3.1             gtable_0.2.0
## [11] lattice_0.20-35          rlang_0.1.1
## [13] yaml_2.1.14              spam_1.4-0
## [15] stringr_1.2.0            knitr_1.17
## [17] raster_2.5-8             RandomFieldsUtils_0.3.25
## [19] fields_8.15              maps_3.1.1
## [21] rprojroot_1.2            grid_3.4.0
## [23] spacetime_1.2-0          foreign_0.8-68
## [25] deldir_0.1-14            magrittr_1.5
## [27] backports_1.1.0          scales_0.4.1
## [29] htmltools_0.3.6          intervals_0.15.1
## [31] RandomFields_3.1.50      maptools_0.9-2
## [33] colorspace_1.3-2         labeling_0.3
## [35] stringi_1.1.5            lazyeval_0.2.0
## [37] munsell_0.4.3            FNN_1.1
## [39] zoo_1.8-0
```