Indices de Moran para agronomia

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Datos (área)

```
library(readxl)
XPABLO <- read_excel("C:/Users/usuario/Desktop/RCOMPUTACION/XPABLO.xlsx")
View(XPABLO)
```

Matriz de distacia

```
dist_matrix <- as.matrix(dist(cbind(XPABLO$Long, XPABLO$Lat)))
which.max(dist_matrix)
```

```
## [1] 401
```

```
max(dist_matrix)
```

```
## [1] 0.3325182
```

```
min(dist_matrix)
```

```
## [1] 0
```

Inversa de la distancia

```
dist_matrix_inv <- 1 / dist_matrix # Element wise
diag(dist_matrix_inv) <- 0
```

Indices de Moran para los datos de suelo de XPABLO

```
MO<-Moran.I(XPABLO$MO, dist_matrix_inv)
MO
```

```
## $observed
## [1] 0.03383751
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004260001
##
## $p.value
## [1] 0
```

```
Ca<-Moran.I(XPABLO$Ca, dist_matrix_inv)
Ca
```

```
## $observed
## [1] 0.08097882
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004258728
##
## $p.value
## [1] 0
```

```
Mg<-Moran.I(XPABLO$Mg, dist_matrix_inv)
Mg
```

```
## $observed
## [1] 0.1182113
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004245059
##
## $p.value
## [1] 0
```

```
K<-Moran.I(XPABLO$K, dist_matrix_inv)
K
```

```
## $observed
## [1] 0.05641711
##
## $expected
## [1] -0.002487562
##
## $sd
```

```
## [1] 0.004259623
##
## $p.value
## [1] 0
```

```
Na<-Moran.I(XPABLO$Na, dist_matrix_inv)
Na
```

```
## $observed
## [1] 0.04451665
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.00425096
##
## $p.value
## [1] 0
```

```
CICE<-Moran.I(XPABLO$CICE, dist_matrix_inv)
CICE
```

```
## $observed
## [1] 0.08050854
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004260977
##
## $p.value
## [1] 0
```

```
CE<-Moran.I(XPABLO$CE, dist_matrix_inv)
CE
```

```
## $observed
## [1] 0.02558721
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004253062
##
## $p.value
## [1] 4.081979e-11
```

```r
Fe<-Moran.I(XPABLO$Fe, dist_matrix_inv)
Fe
```

```
## $observed
## [1] 0.02331882
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004260057
##
## $p.value
## [1] 1.380351e-09
```

```r
Cu<-Moran.I(XPABLO$Cu, dist_matrix_inv)
Cu
```

```
## $observed
## [1] 0.08823719
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004262639
##
## $p.value
## [1] 0
```

```r
Zn<-Moran.I(XPABLO$Zn, dist_matrix_inv)
Zn
```

```
## $observed
## [1] 0.03185606
##
## $expected
## [1] -0.002487562
##
## $sd
## [1] 0.004257763
##
## $p.value
## [1] 6.661338e-16
```