

Spatial assignment of test sample

December 14, 2016

Contents

Input	1
Isotope values of test sample	1
Output	1
Model	1
Map of best fitted reference sample	2
Best fitted reference entries	3
Testing robustness of assignment: Wilcoxon signed rank test	3
P-values for the k nearest neighbours in Wilcoxon Test	3
Goodness of fit of test sample:	4

Input

Website Identifier: 352

Isotope values of test sample

Table 1: Isotope values of test sample

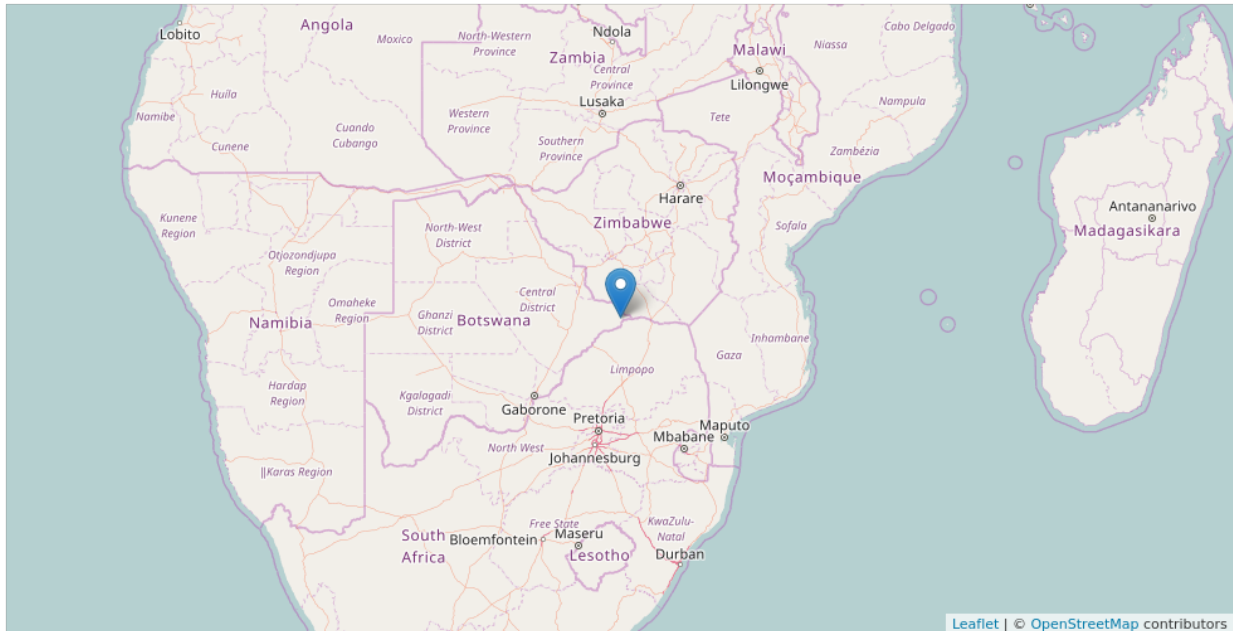
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-19.8	9.8	18.3	-27.2	12

Output

Model

```
##
## Call:
## train.kknn(formula = fmla, data = ivory.train, kmax = 15, distance = 2, kernel = knl)
##
## Type of response variable: nominal
## Minimal misclassification: 0.3765867
## Best kernel: triangular
## Best k: 15
Classifier: country_code
```

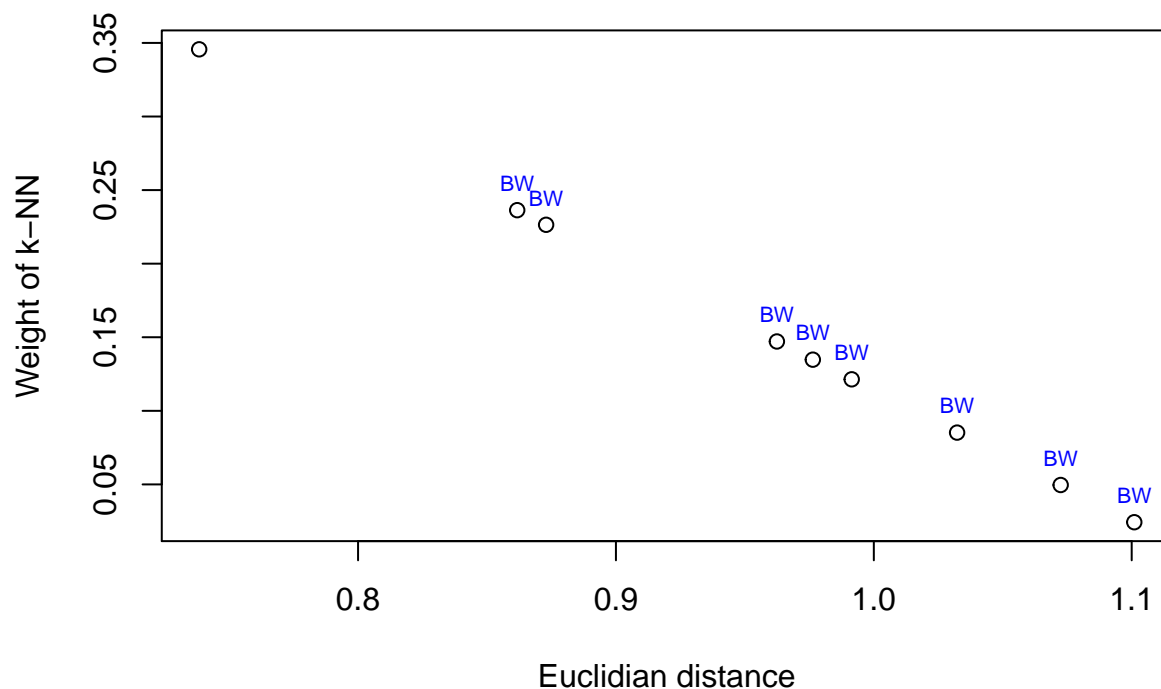
Map of best fitted reference sample



Best fitted reference sample:

- Site: Botswana, Mathathane area
- Country: BW
- Region: Southern Africa
- CITES: Appendix II
- Lat: -22.2
- Lon: 28.91

Assignment of test sample to nearest neighbours



Best fitted reference entries

Table 2: Details of best fitted reference entry (row 1) and other fitted entries within best classifier

lon	lat	location	13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
28.91	-22.20	Botswana, Mathathane area	-19.9	10.9	17.5	-29.9	12.4
27.57	-21.65	Botswana, Francistown area	-20.2	8.9	19.6	-28.3	12.9
28.91	-22.20	Botswana, Mathathane area	-20.4	10.3	18.7	-34.6	11.0
27.73	-21.89	Botswana, Mmadinare area	-21.1	10.3	17.1	-27.2	12.8
28.91	-22.20	Botswana, Mathathane area	-19.6	9.6	16.9	-33.7	11.0
28.91	-22.20	Botswana, Mathathane area	-18.9	10.8	18.5	-21.8	10.3
28.91	-22.20	Botswana, Mathathane area	-19.9	11.6	18.9	-27.9	10.7
23.34	-19.80	Botswana, Maun area	-19.5	11.5	19.2	-31.7	11.6
21.93	-21.72	Botswana, Ghanzi area	-20.9	10.0	17.9	-35.0	13.9

Country of prediction: BW

Testing robustness of assignment: Wilcoxon signed rank test

If p-value > 0.05, the test concludes that the isotope signature of the test sample is similar to the respective nearest neighbour reference sample.

P-values for the k nearest neighbours in Wilcoxon Test

“0.779995, 0.747192, 0.682954, 0.353554, 0.158309, 0.102309, 0.017844, 0.009115, 0.000068”

Goodness of fit of test sample:

- good fit: if $p > 0.05$ for at least two tested nearest neighbour reference samples;
- moderate fit: if $p > 0.05$ for at least one tested nearest neighbour reference samples;
- uncertain: if $p > 0.05$ for none of the tested nearest neighbour reference samples.

Assumption: At least two nearest reference samples are available.

Overall goodness of fit of test sample: “**good fit**”