Spatial assignment of test sample

November 24, 2016

Contents

Input

Website Identifier: 081-T

Isotope values of test sample

Table 1: Isotope values of test sample

13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-22.1	10.9	18.8	-32.4	16.3

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
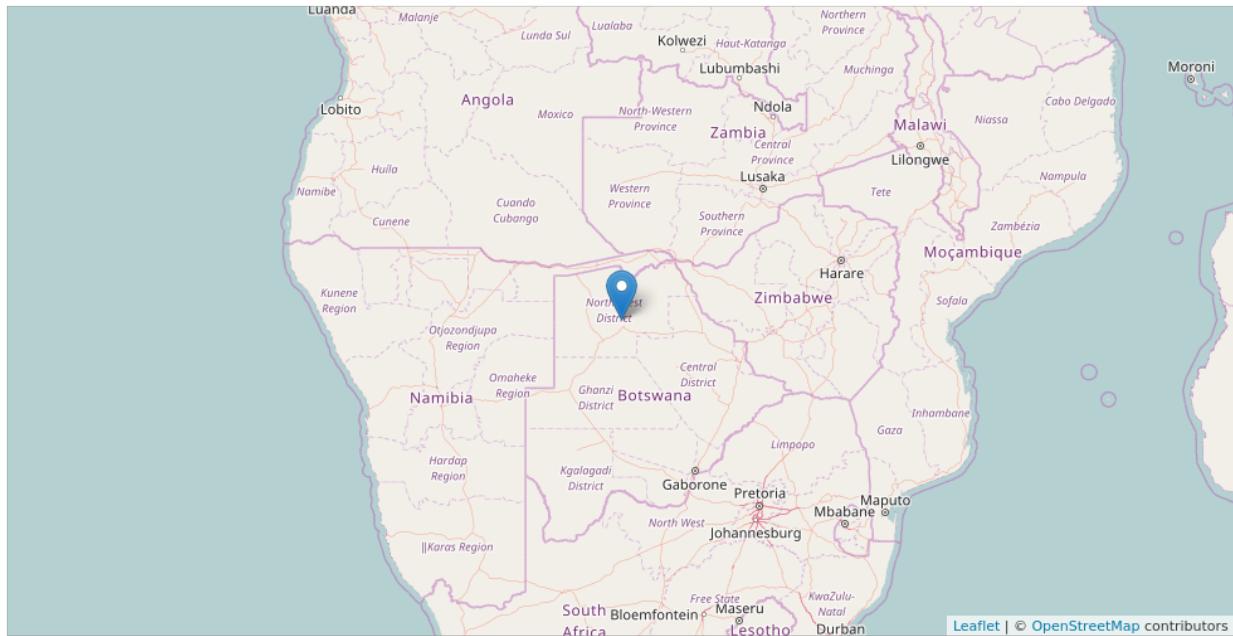
Best fitted reference sample:

- Site: Botswana, Maun area
- Country: BW
- Region: Southern Africa
- CITES: Appendix II
- Lat: -19.8
- Lon: 23.34

Assignment of test sample to nearest neighbours
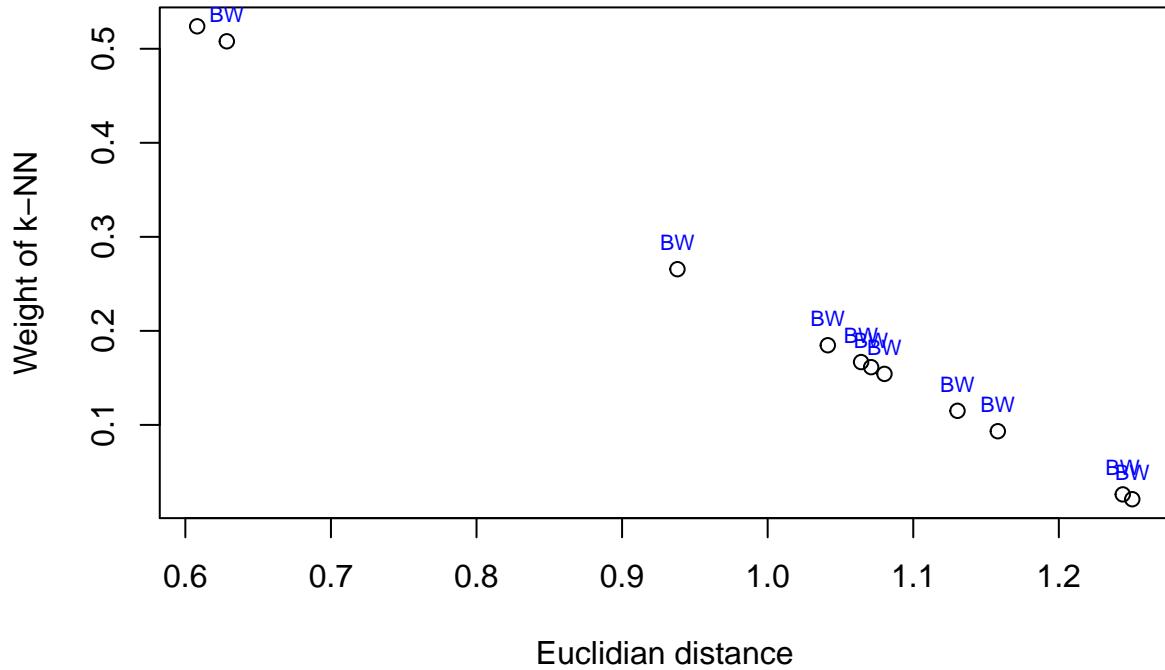
Best fitted reference entries

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
23.34	-19.80	Botswana, Maun area	-21.6	10.6	19.7	-33.6	15.4
23.34	-19.80	Botswana, Maun area	-21.8	11.1	18.6	-37.0	14.9
27.57	-21.65	Botswana, Francistown area	-21.4	10.0	19.5	-39.0	17.0
27.57	-21.65	Botswana, Francistown area	-21.5	9.7	20.2	-36.4	16.4
23.34	-19.80	Botswana, Maun area	-20.7	10.9	19.5	-34.4	14.0
23.34	-19.80	Botswana, Maun area	-20.8	10.3	19.7	-29.1	14.4
27.57	-21.65	Botswana, Francistown area	-21.3	9.5	19.4	-30.5	14.2
25.81	-24.72	Botswana, Gaborone	-20.6	11.2	20.0	-27.0	15.6
21.93	-21.72	Botswana, Ghanzi area	-20.9	10.0	17.9	-35.0	13.9
23.34	-19.80	Botswana, Maun area	-20.3	11.1	17.7	-37.2	14.9
27.57	-21.65	Botswana, Francistown area	-21.9	8.8	20.1	-32.3	16.7

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

"0.59074, 0.06295, 0.05677, 0.04110, 0.02292, 0.01784, 0.00790, 0.00589, 0.00111, 0.00063, 0.00042"

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**"