

# Spatial assignment of test sample

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## Input

Website Identifier: 164

## Isotope values of test sample

Table 1: Isotope values of test sample

13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-18.7	10.6	17.4	-25.3	9.8

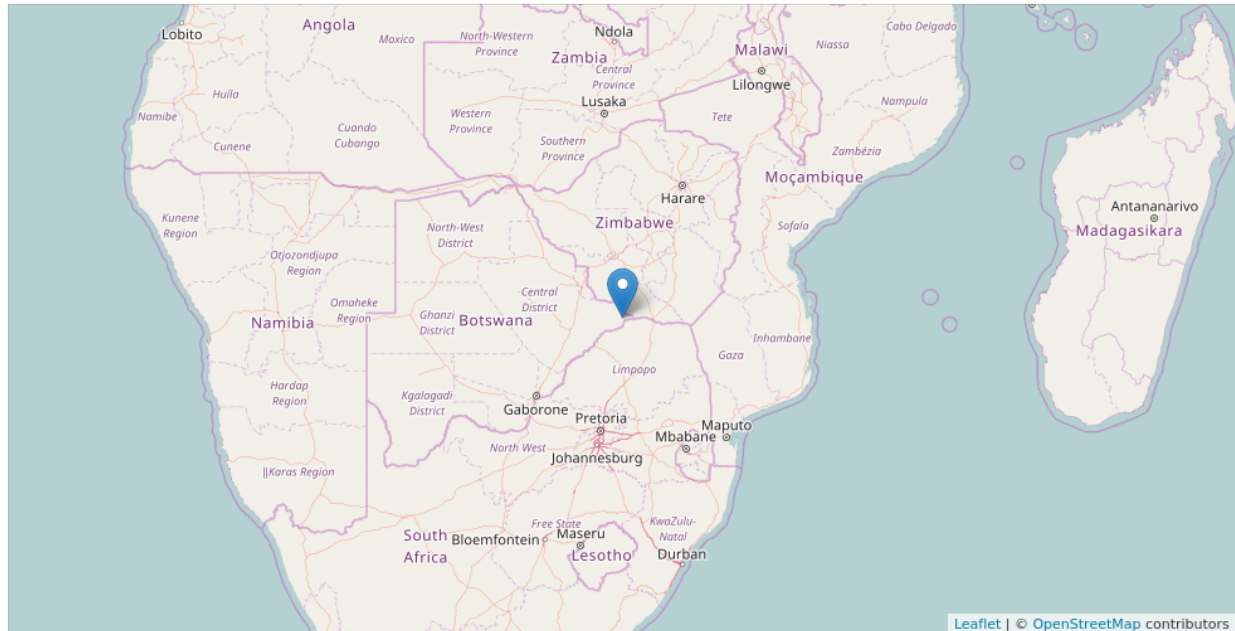
## Output

### 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**

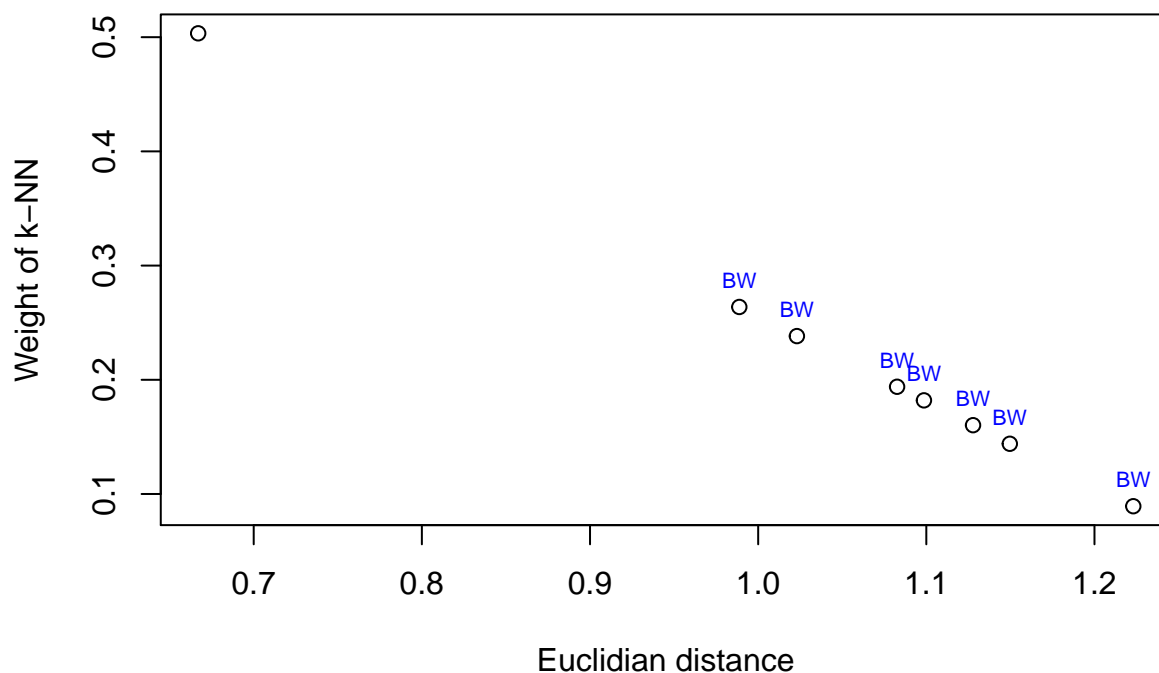
## Map of best fitted reference sample



### 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	-22.2	Botswana, Mathathane area	-18.9	10.8	18.5	-21.8	10.3
28.91	-22.2	Botswana, Mathathane area	-19.1	12.2	17.2	-30.8	10.1
28.91	-22.2	Botswana, Mathathane area	-18.5	11.0	19.4	-25.9	10.2
28.91	-22.2	Botswana, Mathathane area	-19.9	10.9	17.5	-29.9	12.4
23.34	-19.8	Botswana, Maun area	-18.4	10.0	16.9	-34.2	11.8
28.91	-22.2	Botswana, Mathathane area	-19.6	9.6	16.9	-33.7	11.0
28.91	-22.2	Botswana, Mathathane area	-19.9	11.6	18.9	-27.9	10.7
28.91	-22.2	Botswana, Mathathane area	-18.6	11.8	18.4	-16.4	11.3

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

“0.81318, 0.47731, 0.31014, 0.12252, 0.00589, 0.00506, 0.00052, 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**”