

# Spatial assignment of test sample

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## Input

Website Identifier: 236

### Isotope values of test sample

Table 1: Isotope values of test sample

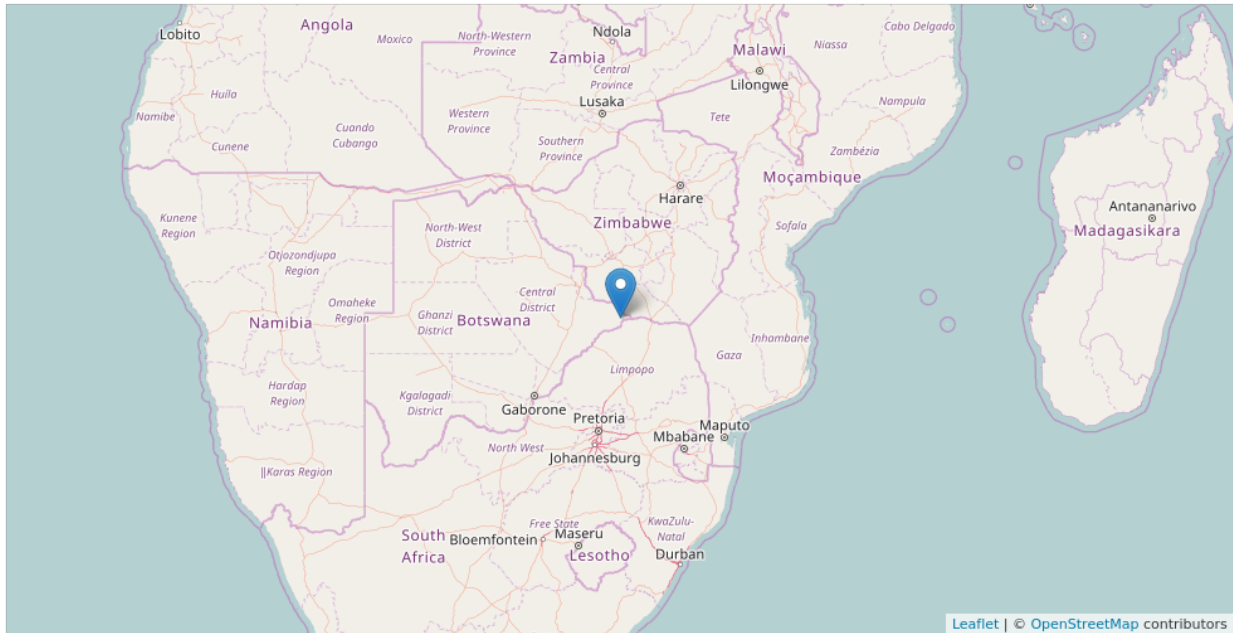
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-20.1	12	17.1	-28.9	9.4

## 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
```

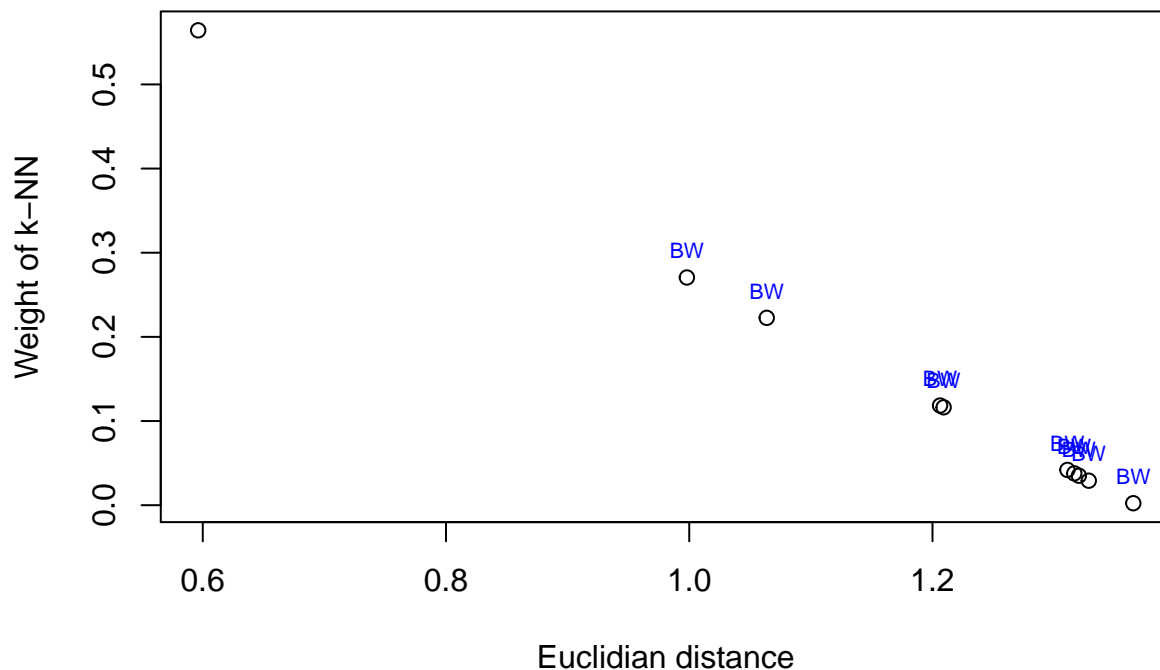
## Map of best fitted reference sample



### 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	-19.1	12.2	17.2	-30.8	10.1
28.91	-22.20	Botswana, Mathathane area	-19.9	11.6	18.9	-27.9	10.7
28.91	-22.20	Botswana, Mathathane area	-19.9	10.9	17.5	-29.9	12.4
28.91	-22.20	Botswana, Mathathane area	-21.6	10.5	16.9	-33.2	10.5
27.73	-21.89	Botswana, Mmadinare area	-21.4	10.2	17.1	-27.7	8.0
23.34	-19.80	Botswana, Maun area	-19.5	11.5	19.2	-31.7	11.6
27.57	-21.65	Botswana, Francistown area	-21.0	9.7	16.9	-32.5	10.1
28.91	-22.20	Botswana, Mathathane area	-18.9	10.8	18.5	-21.8	10.3
28.91	-22.20	Botswana, Mathathane area	-21.7	10.6	18.2	-24.0	8.5
23.34	-19.80	Botswana, Maun area	-20.3	10.9	17.9	-37.0	12.5

Country of prediction: BW

### Testing robustness of assignment: Wilcoxon signed rank test

If  $p\text{-value} > 0.05$ , 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

“0.7471924, 0.1225240, 0.0291590, 0.0043372, 0.0019061, 0.0000528, 0.0000176, 0.0000131, 0.0000096, 0.0000070”

### 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**”