

# Spatial assignment of test sample

November 24, 2016

## Contents

<b>Input</b>	<b>1</b>
Isotope values of test sample . . . . .	1
<b>Output</b>	<b>1</b>
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: 077-T

## Isotope values of test sample

Table 1: Isotope values of test sample

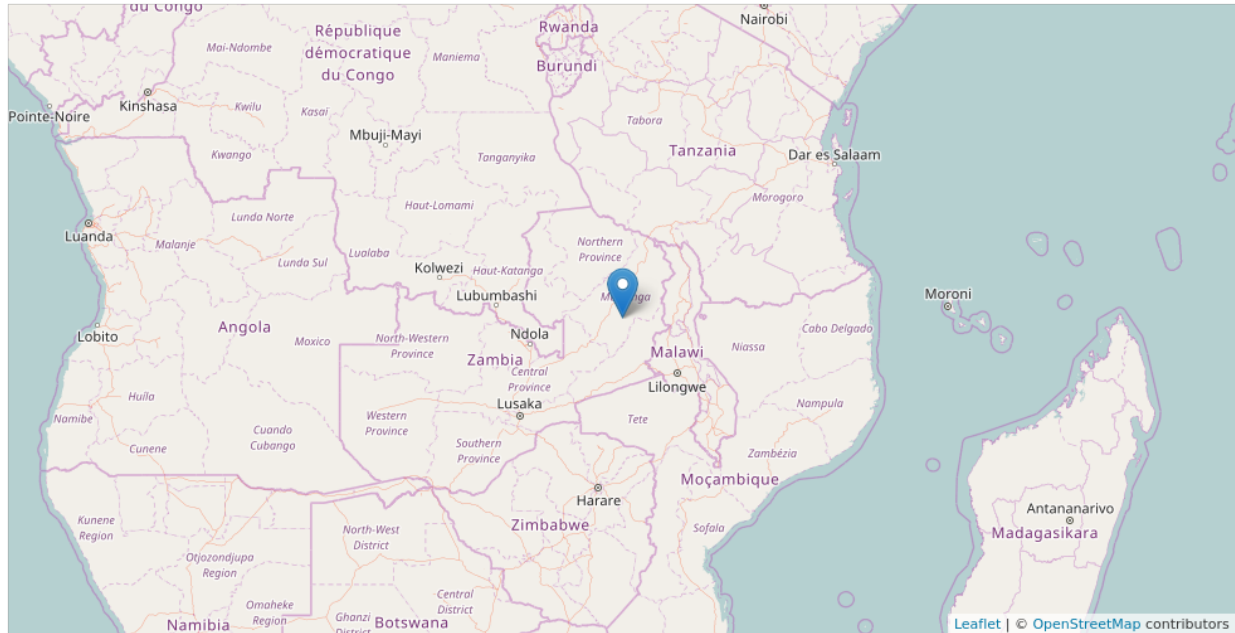
13C/12C	15N/14N	18O/16O	2H/1H	34S/32S
-22.6	9.7	19.9	-24.9	9

## 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
```

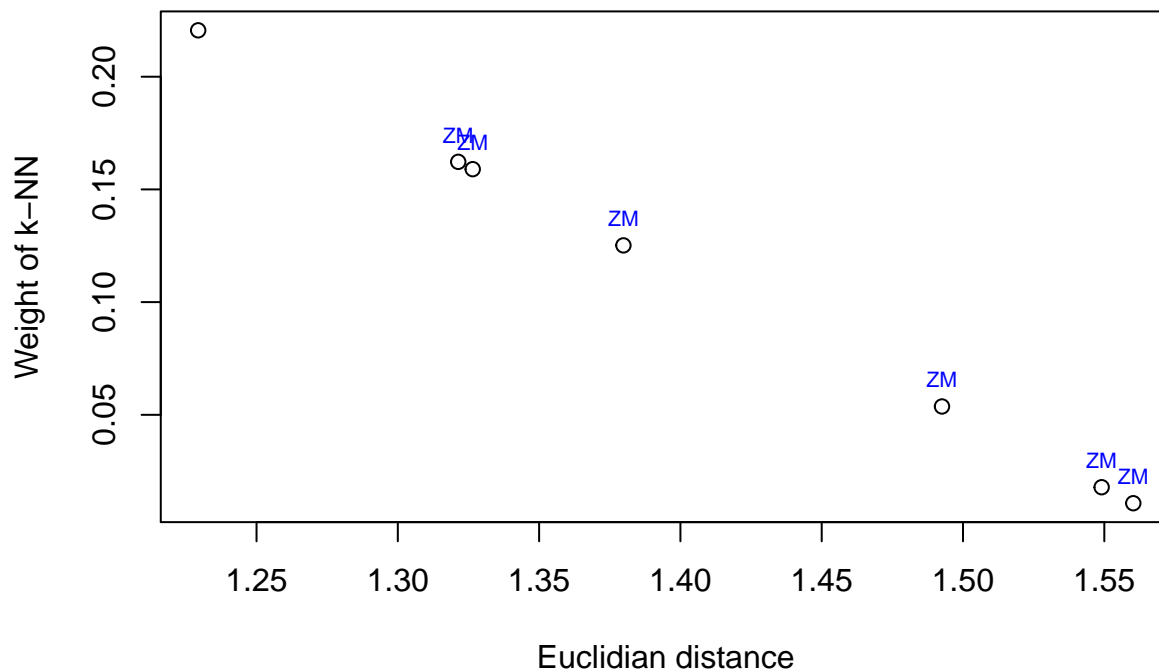
## Map of best fitted reference sample



### Best fitted reference sample:

- Site: Northeast Zambia, North Luangwa National Park
- Country: ZM
- Region: Southern Africa
- CITES: Appendix I
- Lat: -12.11
- Lon: 31.86

## 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
31.86	-12.11	Northeast Zambia, North Luangwa National	-21.5	9.6	20.0	-36.5	9.3
31.51	-12.09	Southern Zambia	-21.7	9.6	19.5	-37.9	8.6
26.06	-15.91	Southern Zambia	-22.2	8.8	19.4	-37.7	9.5
32.06	-11.38	Southern Zambia	-22.6	8.7	19.0	-37.8	8.9
25.96	-15.98	Southern Zambia	-21.9	8.7	21.2	-35.7	11.2
32.10	-12.20	Southern Zambia	-22.0	10.1	21.3	-39.2	8.9
25.79	-15.10	Southern Zambia	-21.5	10.0	21.0	-39.2	8.7

Country of prediction: ZM

### 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

“0.000068155, 0.000030664, 0.000000774, 0.000000026, 0.000000026, 0.000000026, 0.000000026”

**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: “**uncertain**”