Spatial assignment of test sample

November 24, 2016

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Input

Website Identifier: Blind 4_ZW

Isotope values of test sample

Table 1: Isotope values of test sample

<table>
<thead>
<tr>
<th></th>
<th>13C/12C</th>
<th>15N/14N</th>
<th>18O/16O</th>
<th>2H/1H</th>
<th>34S/32S</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test</td>
<td>-19.6</td>
<td>7.9</td>
<td>16.2</td>
<td>-36.3</td>
<td>7.5</td>
</tr>
</tbody>
</table>

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:

- Country: CD
- Region: Central Africa
- CITES: Appendix I
- Lat: 3.71
- Lon: 29.12
Best fitted reference entries

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

<table>
<thead>
<tr>
<th>lon</th>
<th>lat</th>
<th>location</th>
<th>13C/12C</th>
<th>15N/14N</th>
<th>18O/16O</th>
<th>2H/1H</th>
<th>34S/32S</th>
</tr>
</thead>
<tbody>
<tr>
<td>29.12</td>
<td>3.71</td>
<td>Dem. Rep. Congo, Gangala</td>
<td>-20.1</td>
<td>7.5</td>
<td>17.0</td>
<td>-33.0</td>
<td>7.1</td>
</tr>
<tr>
<td>19.52</td>
<td>4.14</td>
<td>Dem. Rep. Congo, Bosobolo</td>
<td>-20.0</td>
<td>7.9</td>
<td>17.5</td>
<td>-38.8</td>
<td>6.4</td>
</tr>
<tr>
<td>29.09</td>
<td>3.40</td>
<td>Dem. Rep. Congo, Gangala na Bodio</td>
<td>-19.7</td>
<td>8.2</td>
<td>17.5</td>
<td>-29.9</td>
<td>7.7</td>
</tr>
<tr>
<td>14.35</td>
<td>-5.17</td>
<td>Dem. Rep. Congo, Lukungu Vallei</td>
<td>-20.0</td>
<td>7.9</td>
<td>17.5</td>
<td>-43.5</td>
<td>7.3</td>
</tr>
<tr>
<td>25.26</td>
<td>3.40</td>
<td>Dem. Rep. Congo, Api</td>
<td>-20.2</td>
<td>8.1</td>
<td>17.4</td>
<td>-33.6</td>
<td>5.1</td>
</tr>
<tr>
<td>29.50</td>
<td>0.45</td>
<td>Dem. Rep. Congo, Beni</td>
<td>-18.2</td>
<td>8.6</td>
<td>17.4</td>
<td>-34.3</td>
<td>6.7</td>
</tr>
</tbody>
</table>

Country of prediction: CD

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

“0.982865, 0.590745, 0.045875, 0.003153, 0.000141, 0.000031”
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”