Session 3 – SOC prediction maps; results for Wallonia
Bas van Wesemael
Geo-referenced SOC data set

Distribution of validation point dataset across Wallonia

Geo-referenced SOC data set in Wallonia (n= c. 10,000 per year)

Network for routine soil fertility analysis in agricultural soils
Geo-referenced SOC data set

Linking reference data set to predicted pixels

Composite samples (0-20 cm) based on soil series

Requacarto
Model attribution accuracy

Worldsoils composite mask for Wallonia (2019-2021)
## Confusion matrix of reference point data for model attribution

<table>
<thead>
<tr>
<th>Prediction</th>
<th>Point data (validation set)</th>
<th>Accuracy</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Croplands</td>
<td>Grasslands</td>
<td></td>
</tr>
<tr>
<td>Bare soil</td>
<td>7886</td>
<td>108</td>
<td>(0.93, 0.94)</td>
</tr>
<tr>
<td>Permanently vegetated</td>
<td>495</td>
<td>1666</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>26</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>No Information Rate</td>
<td></td>
<td></td>
<td>0.83</td>
</tr>
<tr>
<td>P-Value [Acc &gt; NIR]</td>
<td></td>
<td></td>
<td>2.2e-16</td>
</tr>
<tr>
<td>Kappa</td>
<td></td>
<td></td>
<td>0.80</td>
</tr>
</tbody>
</table>
Validation of 2019-2021 pixel values against corresponding reference data
SOC map accuracy

SOC map 2015-2019

Worldsoils SOC map 2019-2021

https://geoportail.wallonie.be/home.html
Andries et al. 2021: An accuracy of 90% means that out of 100 fields, the EO-based measurement would need to match (within uncertainties) the assessments of SOC obtained via traditional methods for at least 90 fields.

For 2019: 43% of the reference SOC data within the CI 90
Map reliability

Uncertainty ratio map for croplands
Worldsoils protocol with regional data

RMSE 2.7 g/kg
Thank you!

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