

e-SOTER

Regional pilot platform as EU contribution to a Global Soil Observing System

Applications of e-SOTER related to major soil threats

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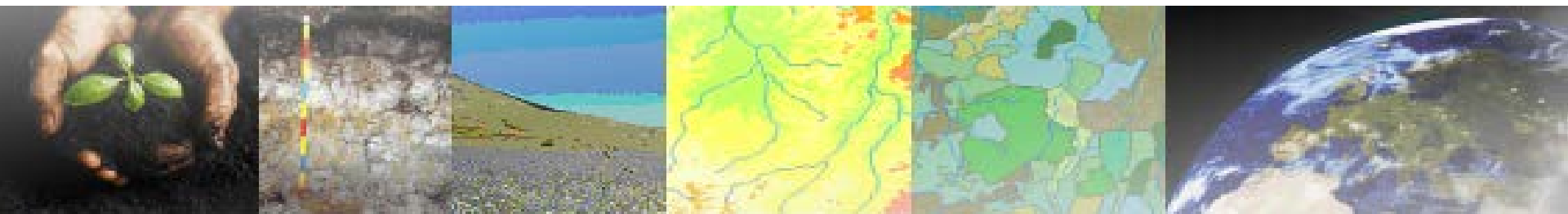
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Ulrich Schuler (BGR)

Joël Daroussin (INRA)

Vít Penížek, Tereza Zadarova, Jozef Kozak (CULS)

Rachid Moussadek and colleagues (INRA-Maroc)



Objectives

- To provide examples of how e-SOTER can be used to evaluate threats to soils
- To investigate whether use of the e-SOTER database will improve evaluation of threats to soil quality and performance compared with using data from legacy soil maps and databases.



soil erosion by water

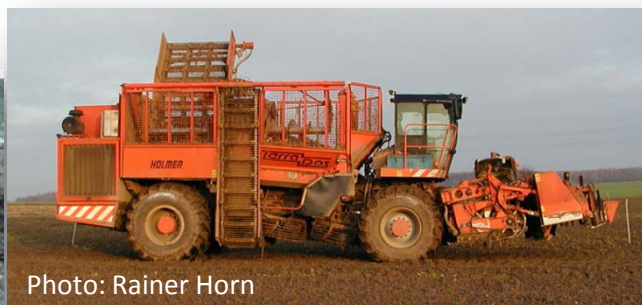


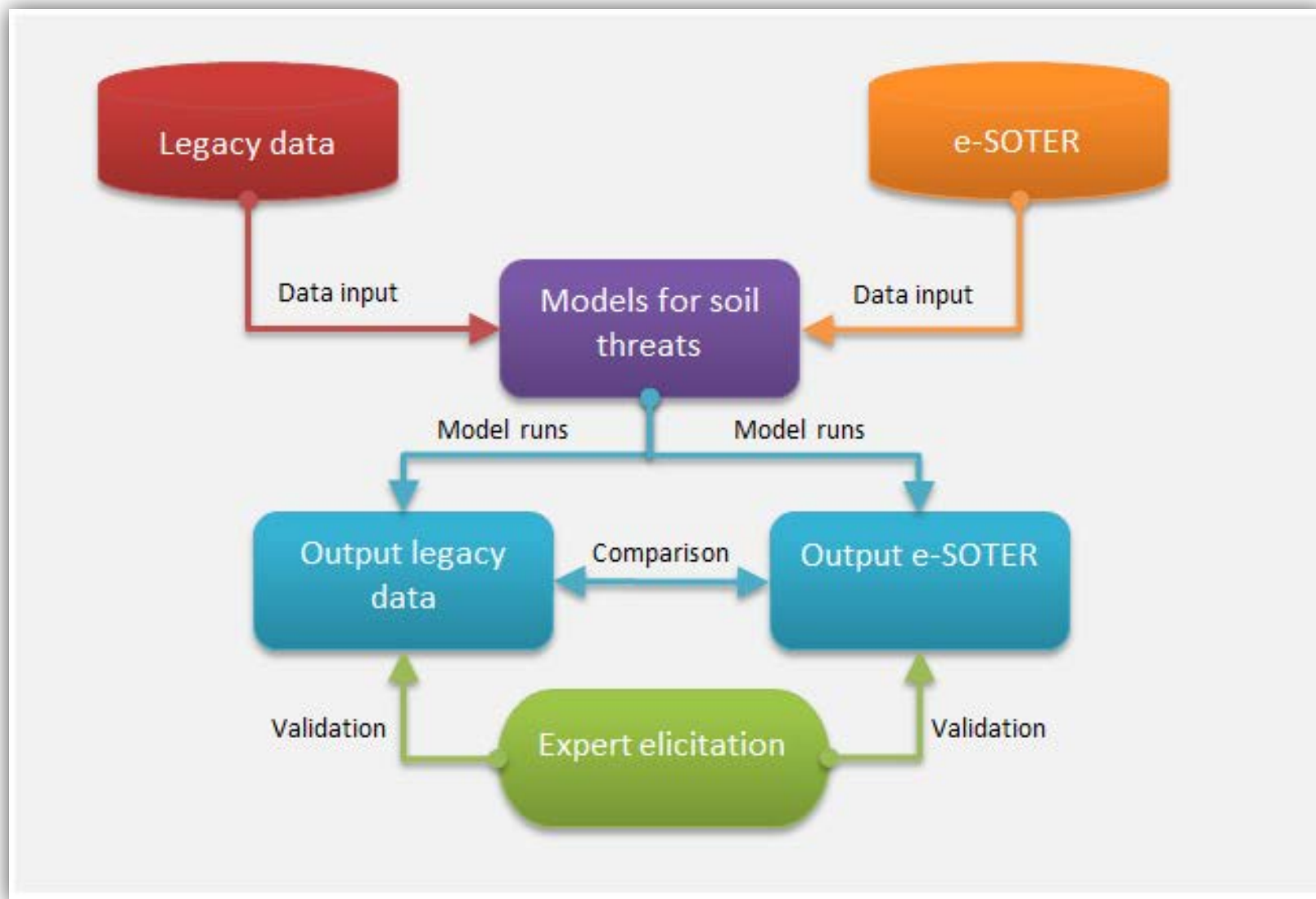
Photo: Rainer Horn

soil compaction

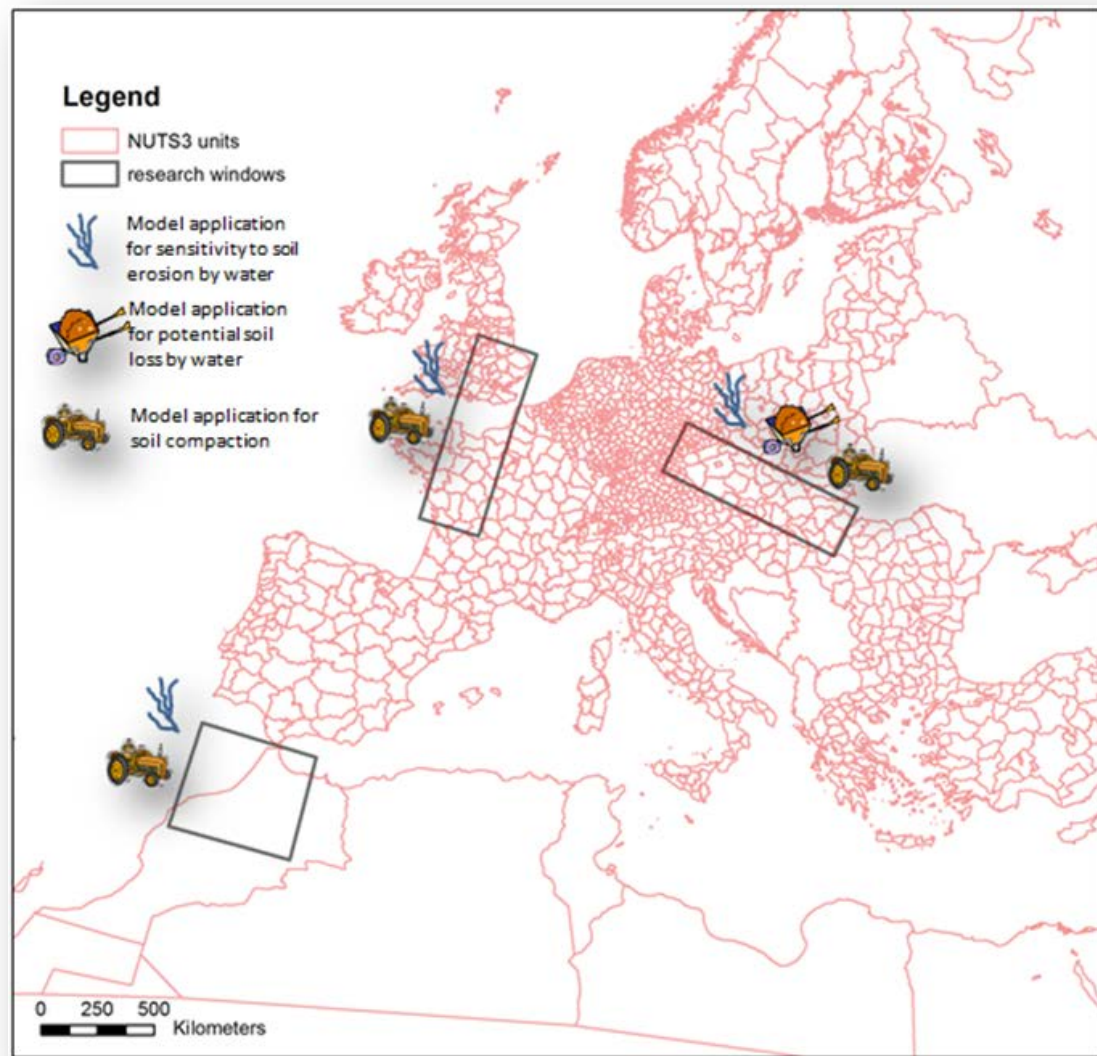


Photo: Rainer Horn

Approach



Methods – model applications



Soil erosion

- Soil sensitivity to water erosion (MESALES, BGR2)
- Potential soil loss (BGR1)

Soil compaction

- Inherent susceptibility to subsoil compaction (Jones)

Input variables



Soil erosion

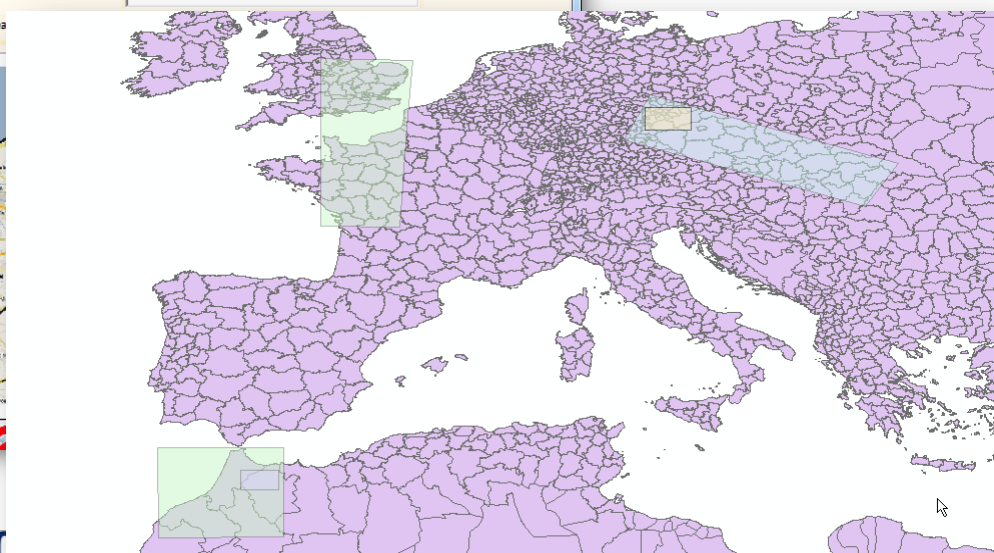
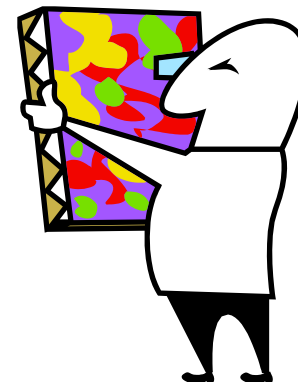
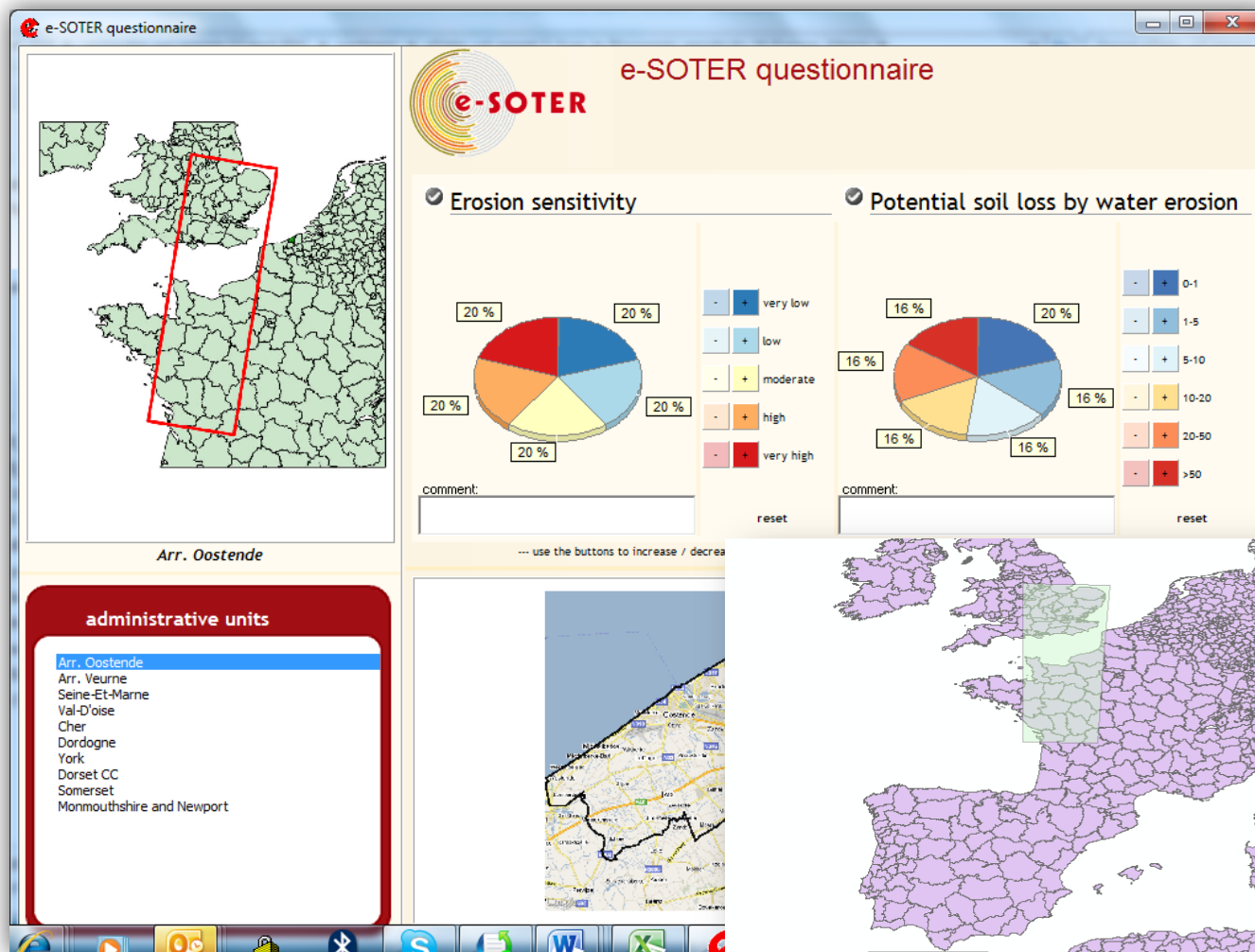
- Soil surface texture
- Coarse fragments
- Parent material



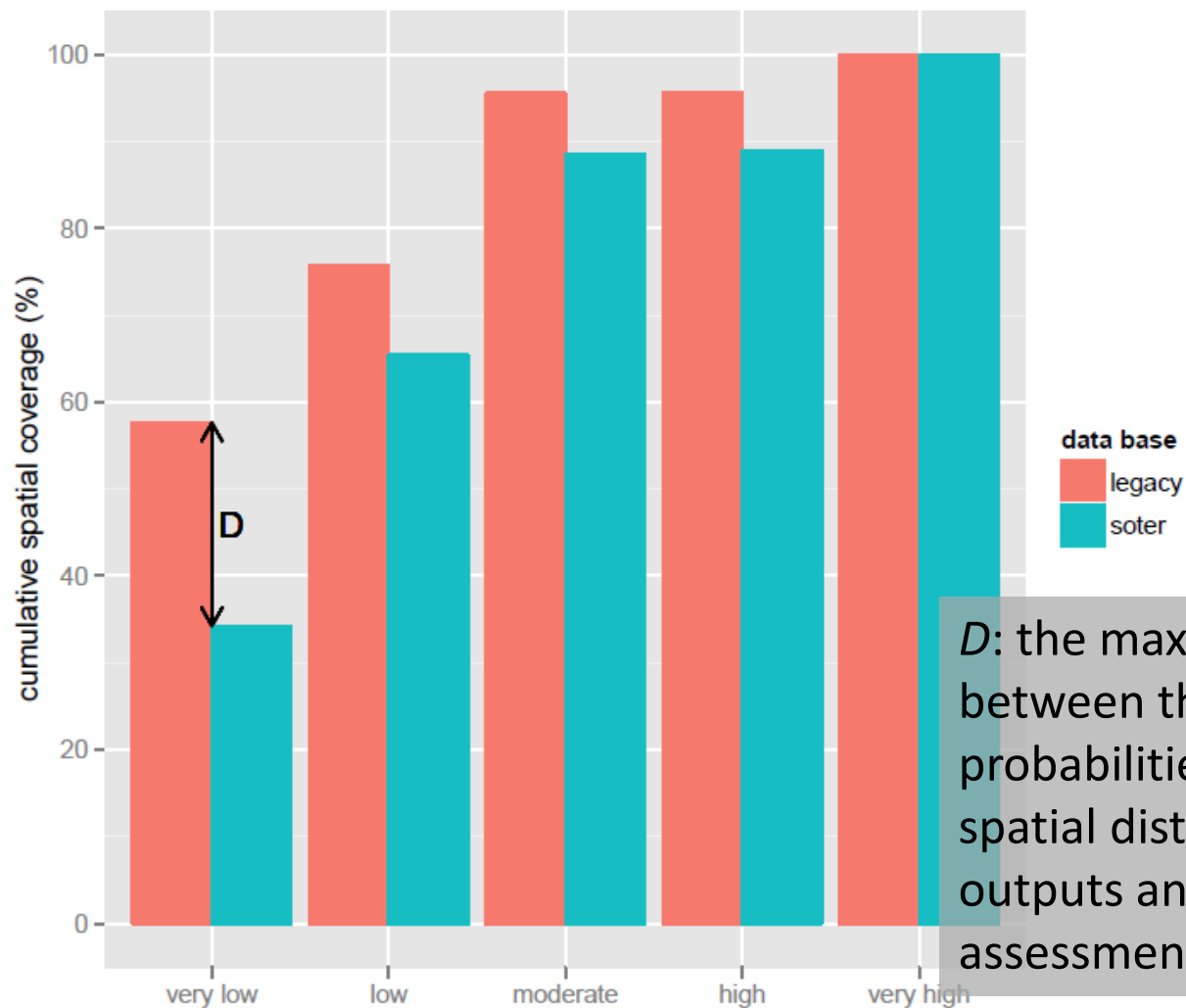
Soil compaction

- Subsoil texture
- Packing density
- Bulk density
- Clay content

Expert elicitation



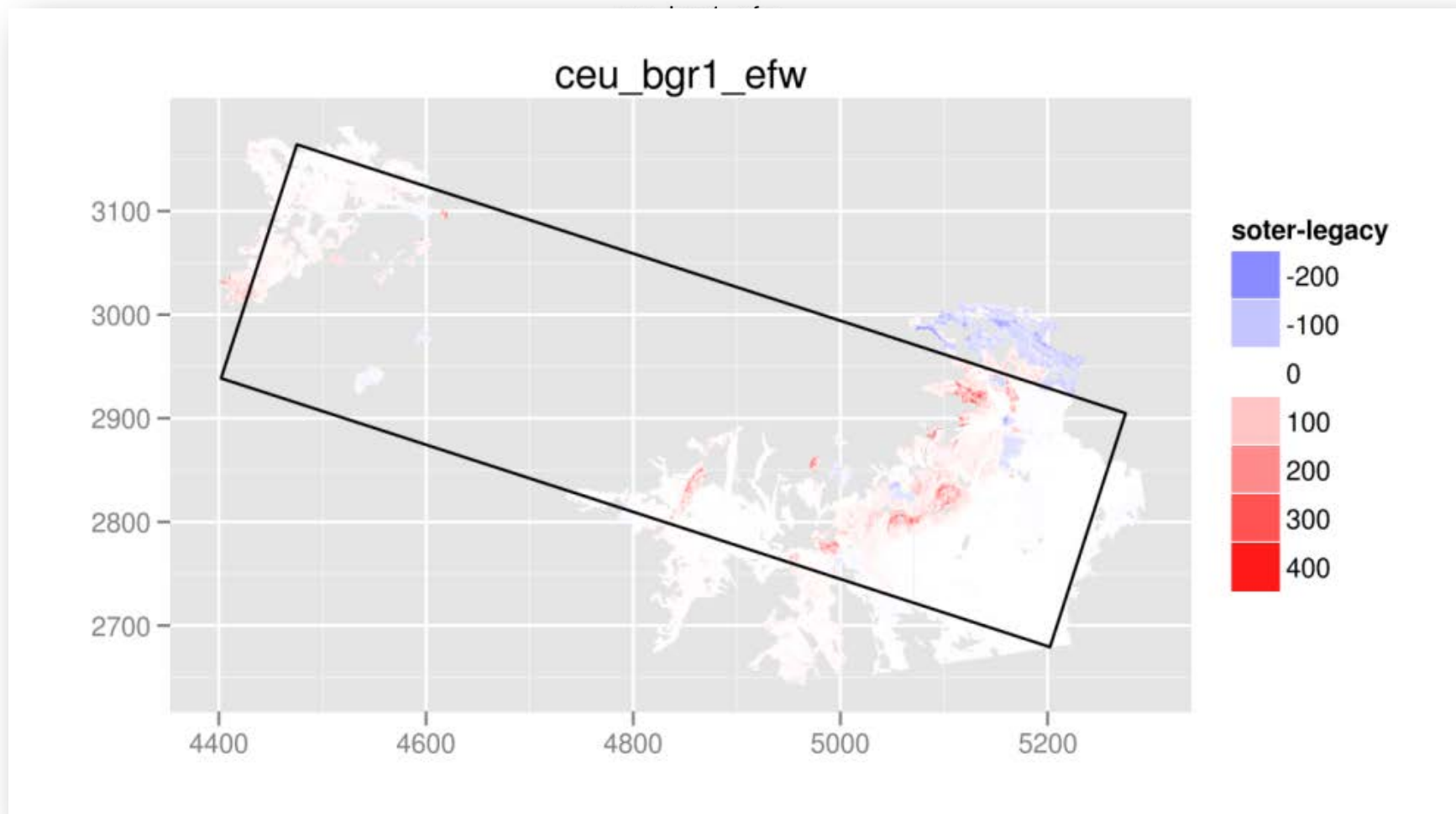
Analysis



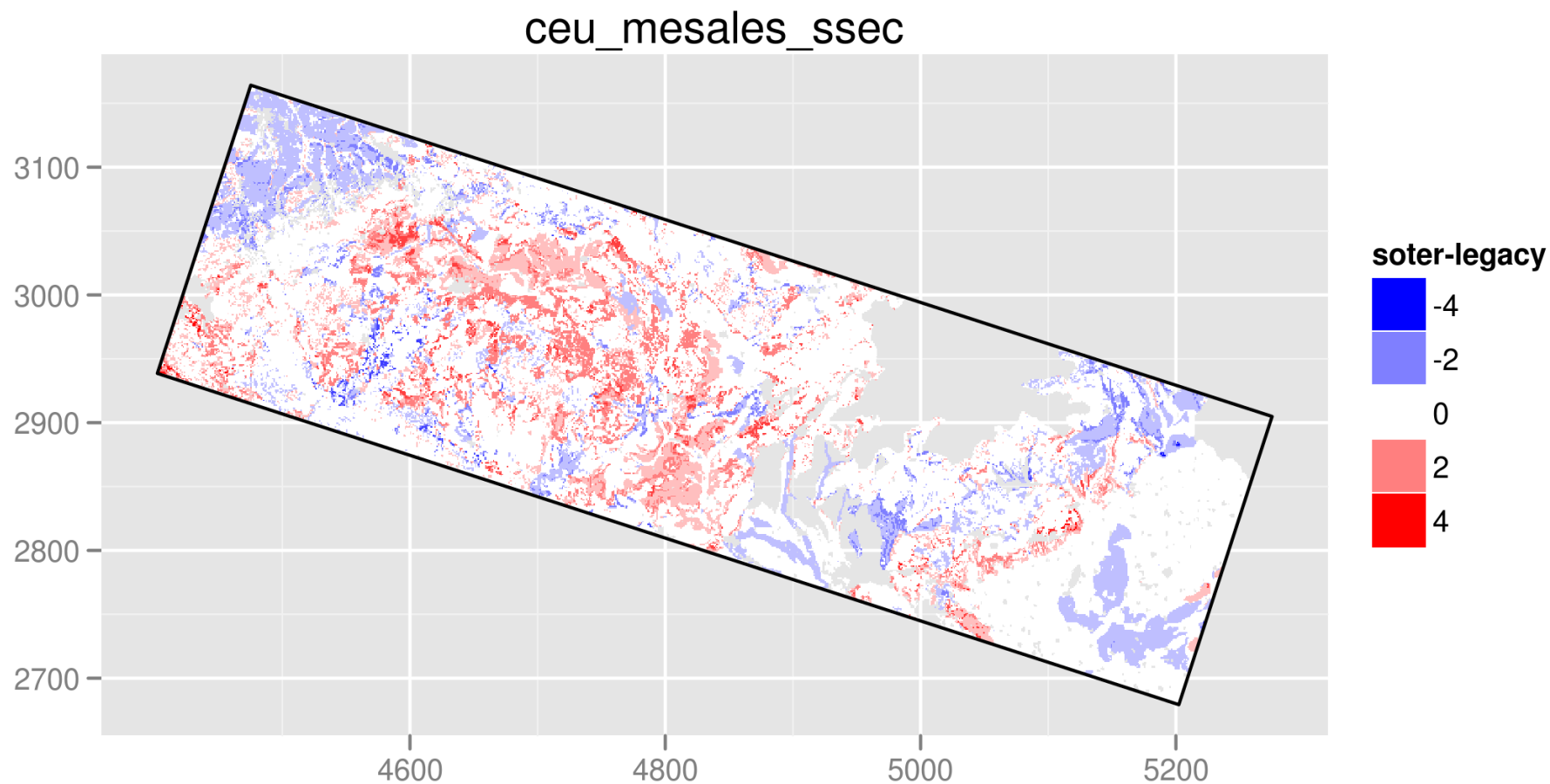
D: the maximum difference between the cumulative probabilities of the (discrete) spatial distributions of model outputs and/or expert assessments

Results – Model outputs

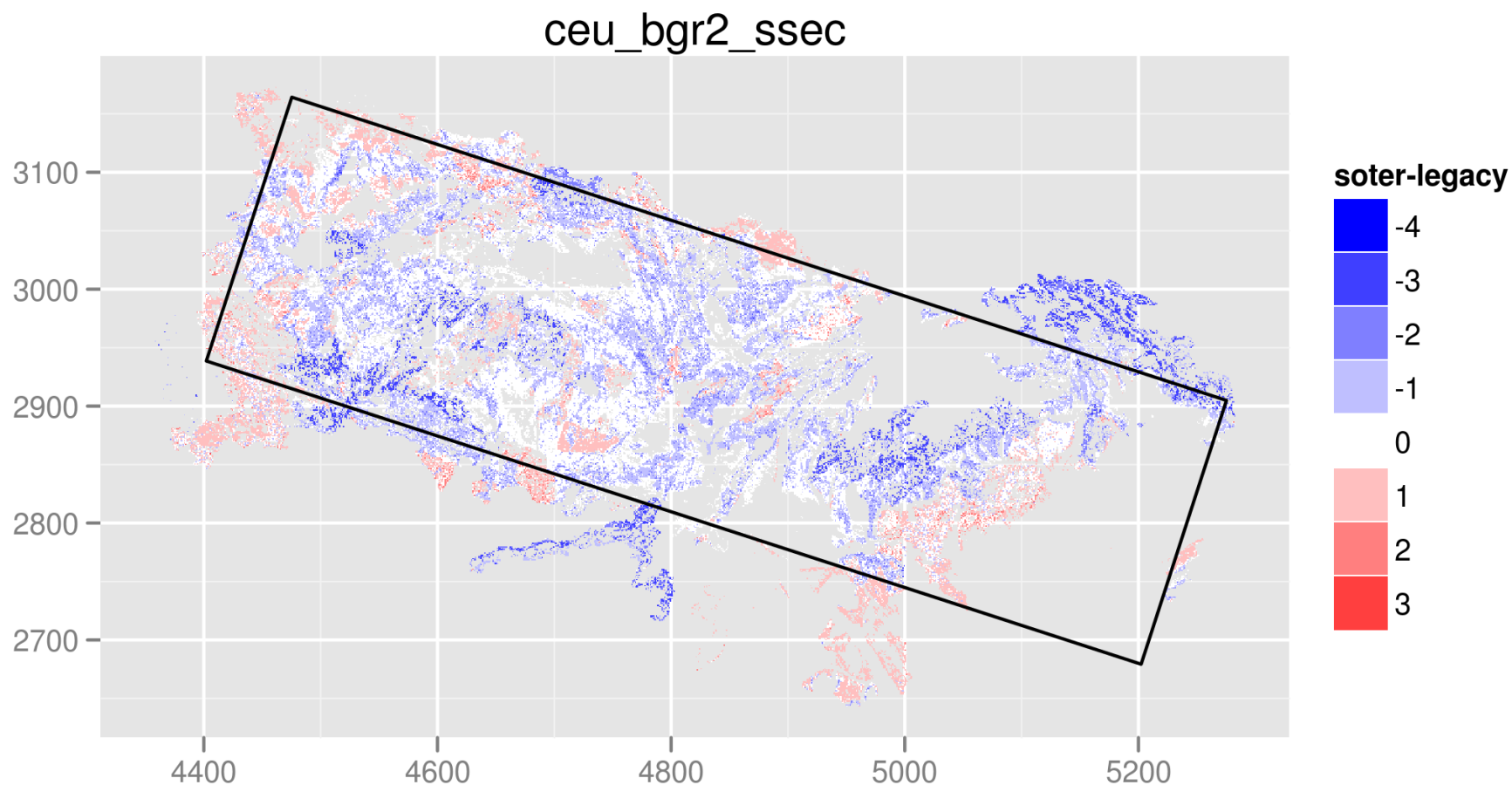
Potential soil loss-CEU window



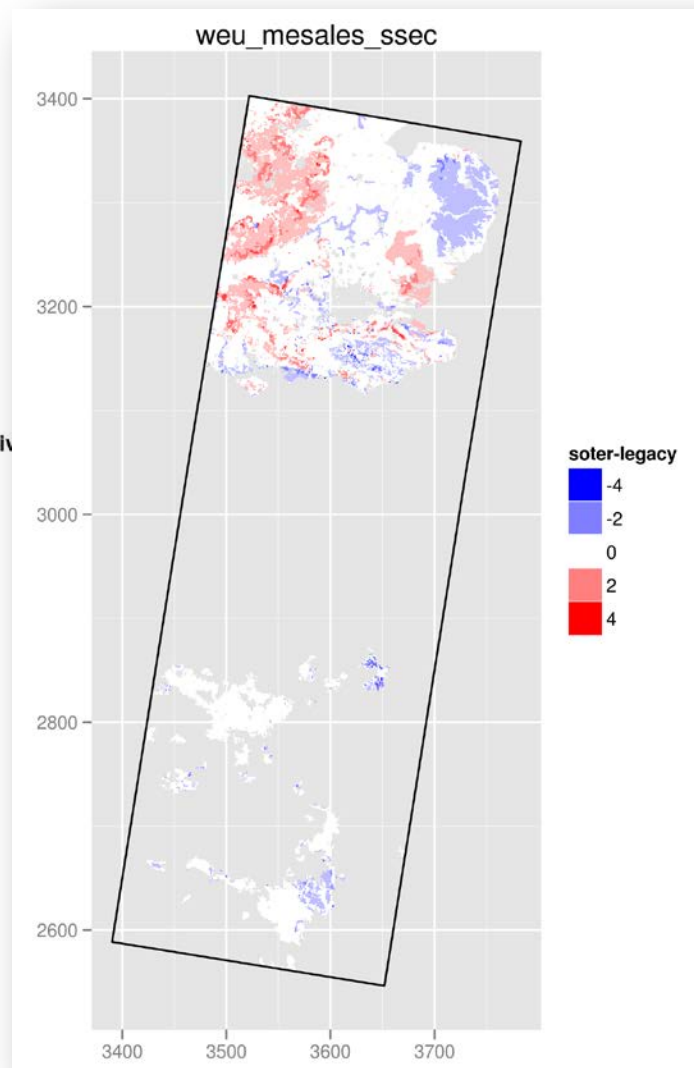
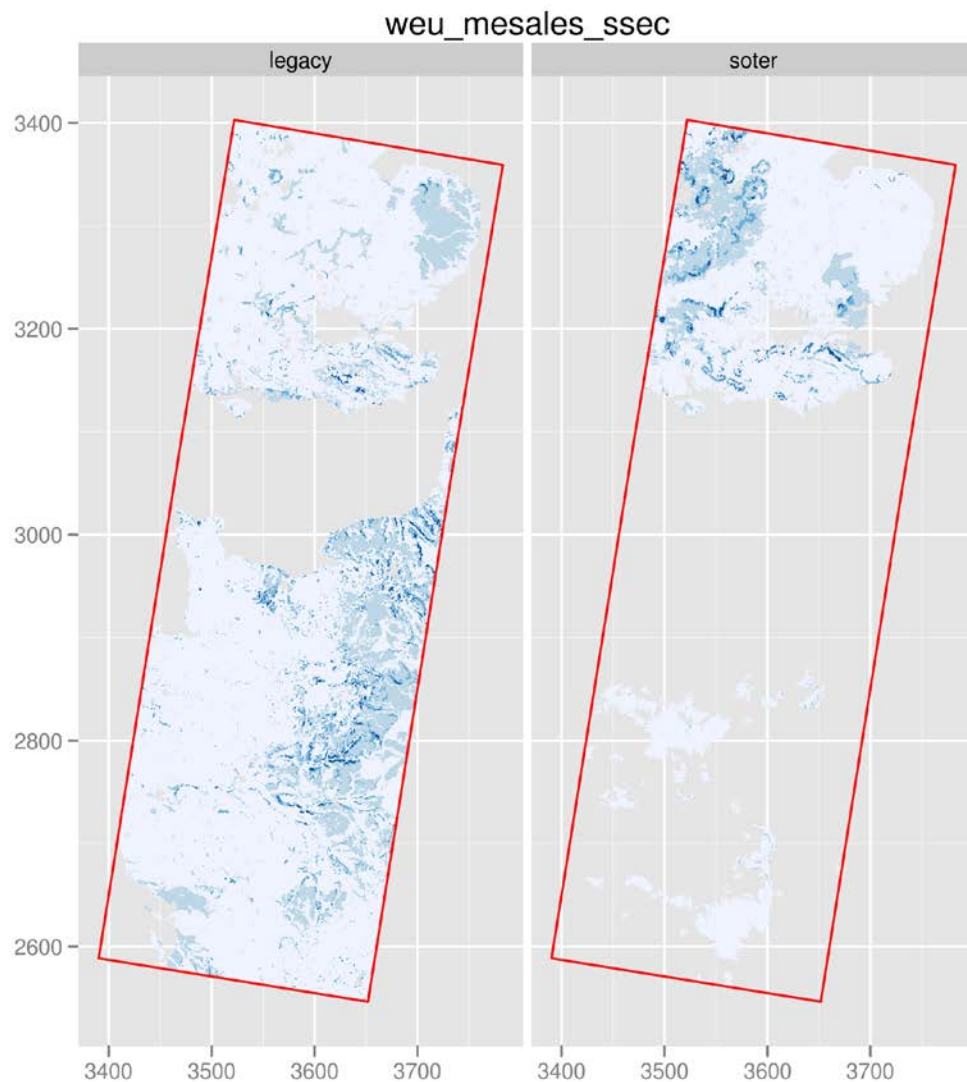
Sensitivity to water erosion – CEU window



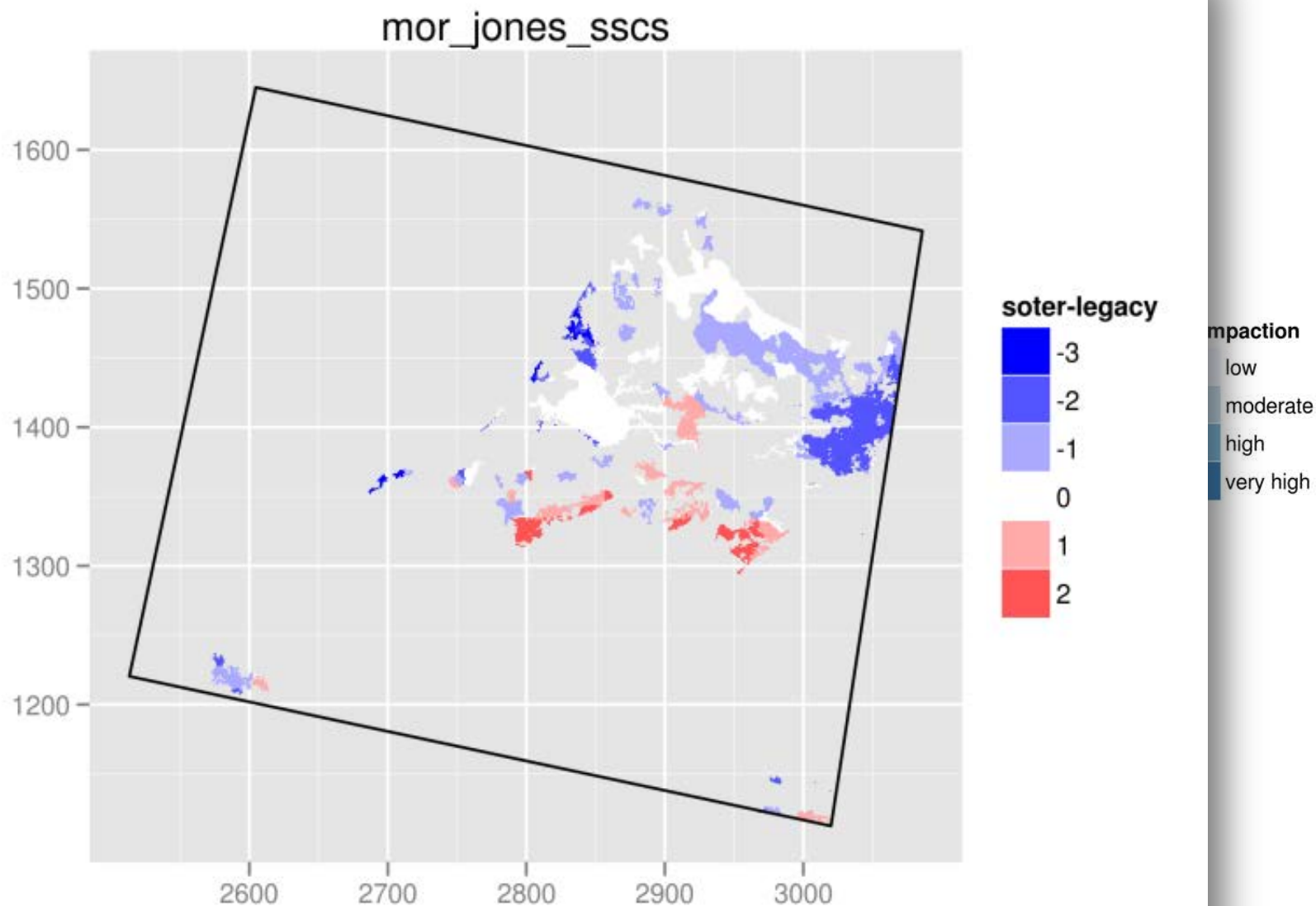
Sensitivity to water erosion – CEU window

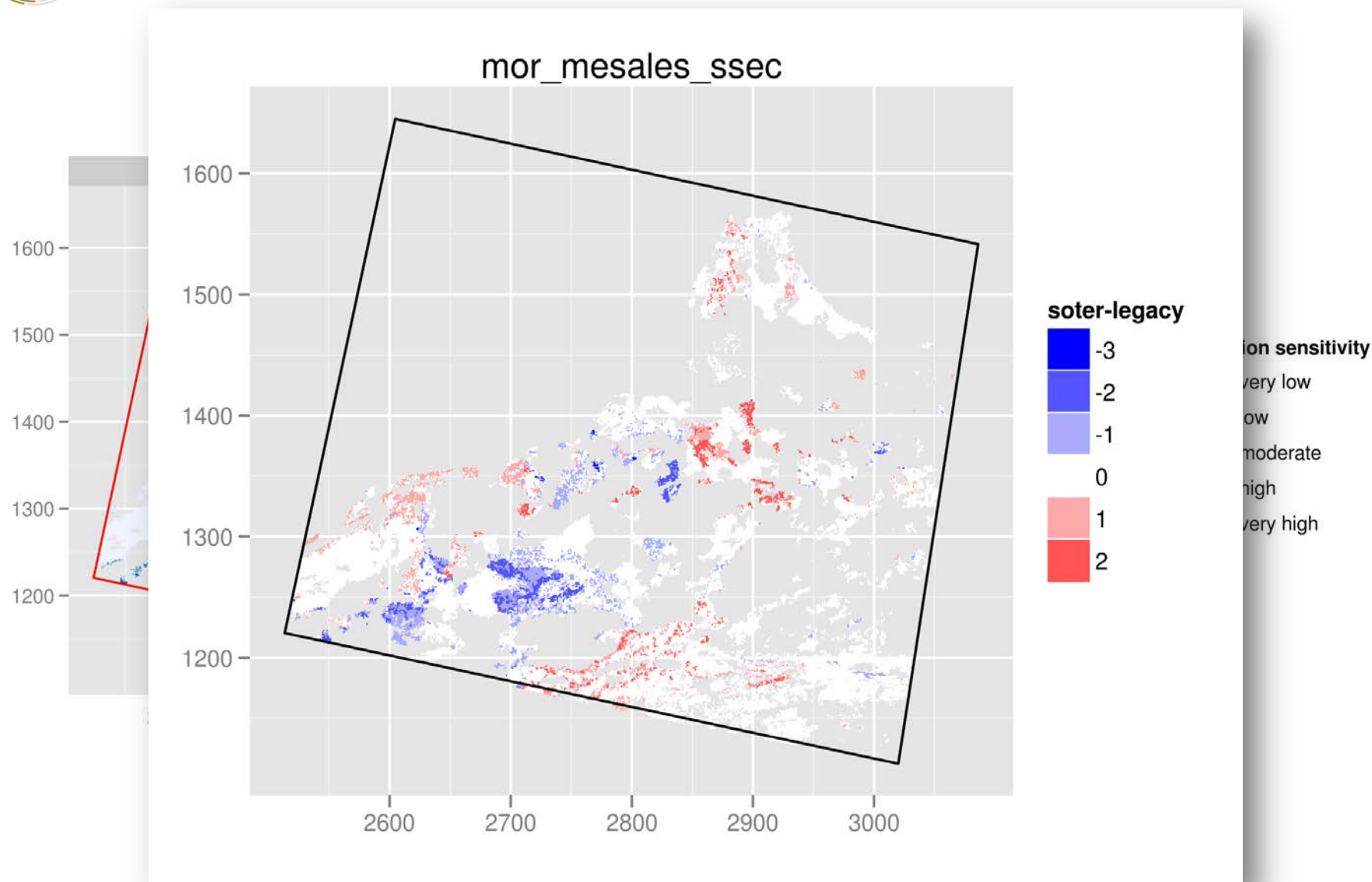


Sensitivity to water erosion – WEU window



Susceptibility to soil compaction – MOR window

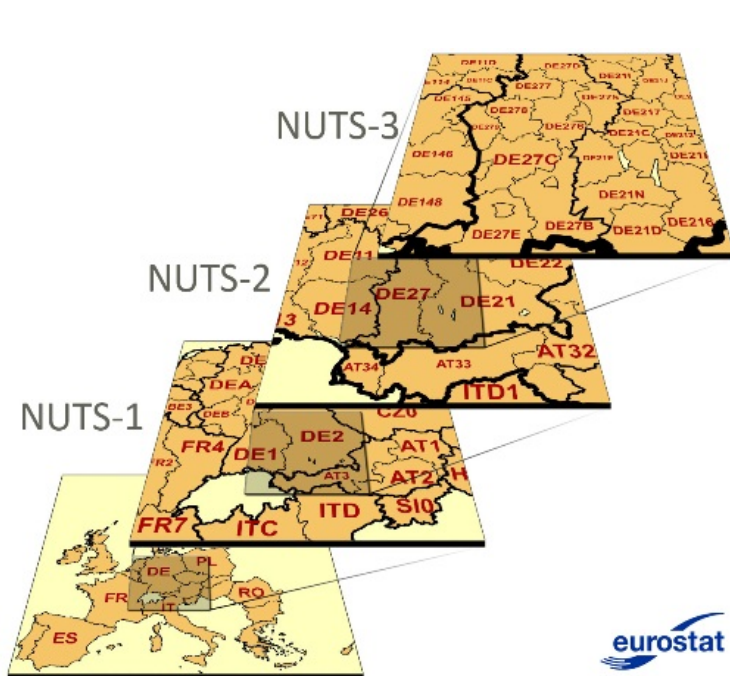




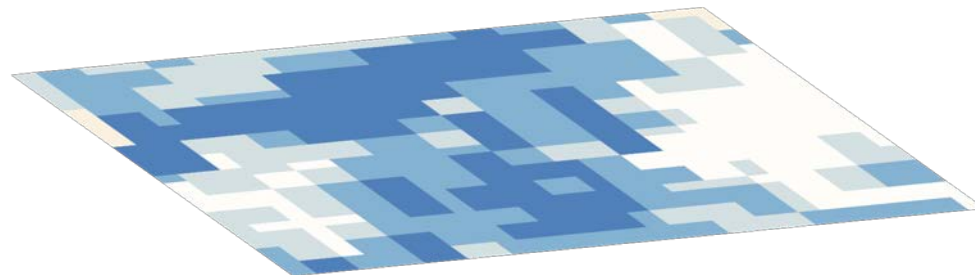
Comparison model - expert



Experts: NUTS3-units

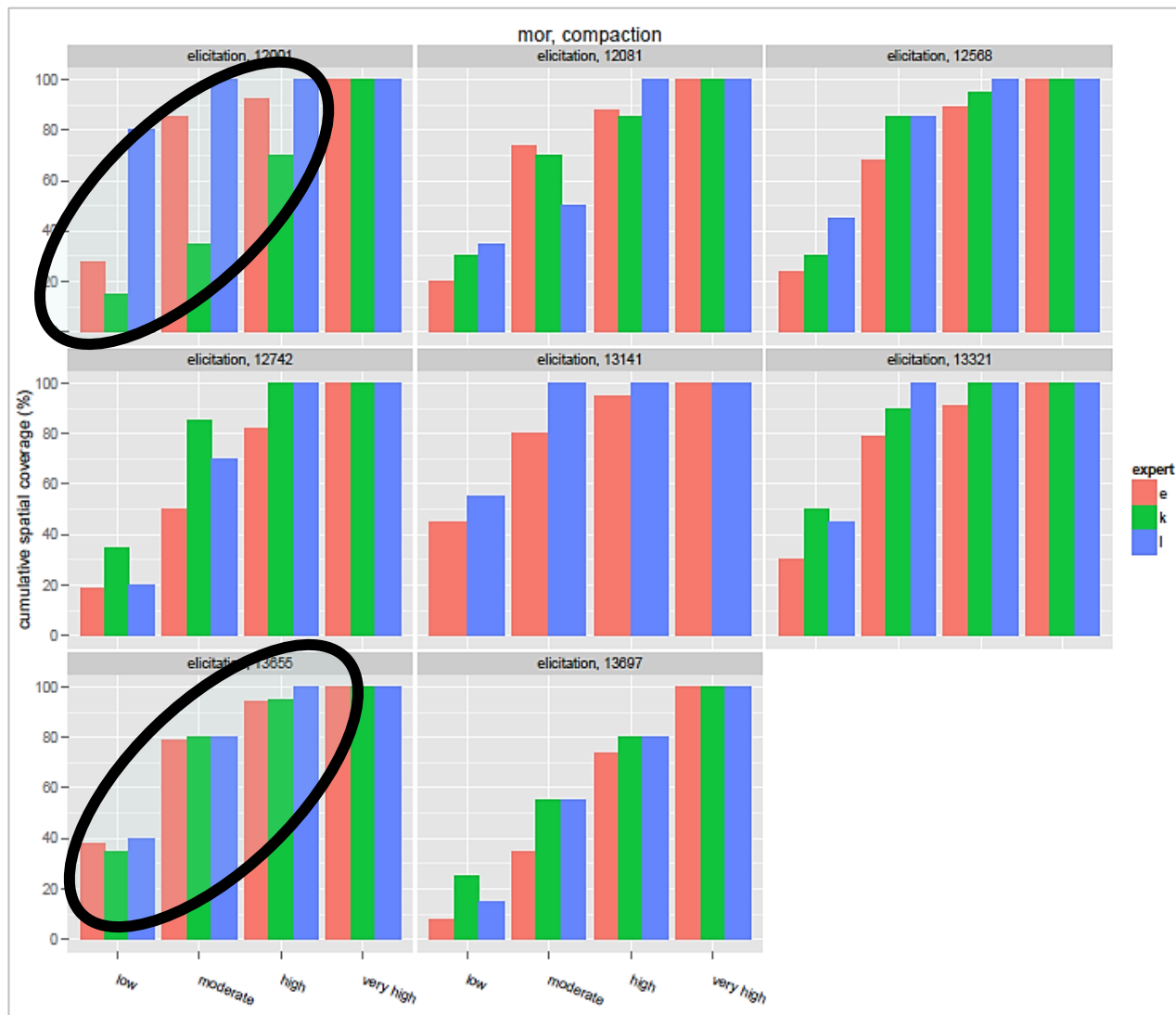


eurostat



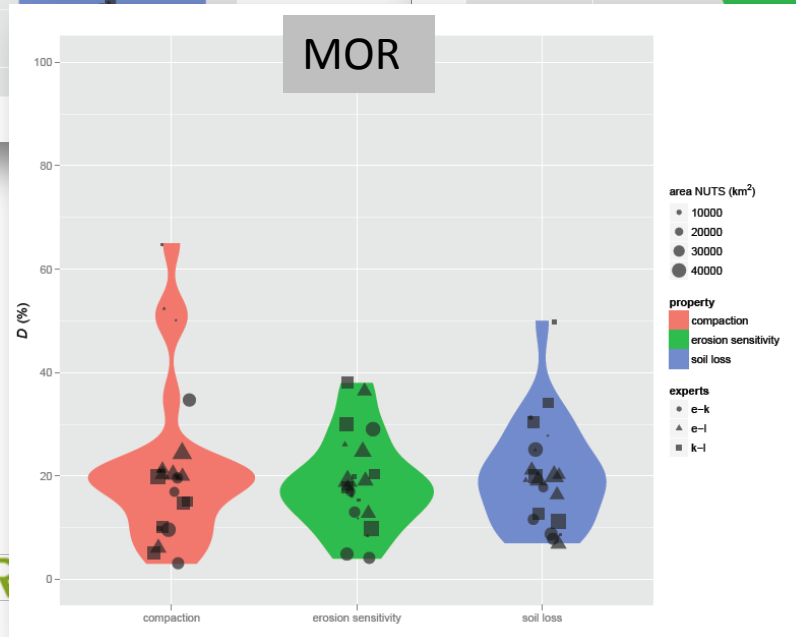
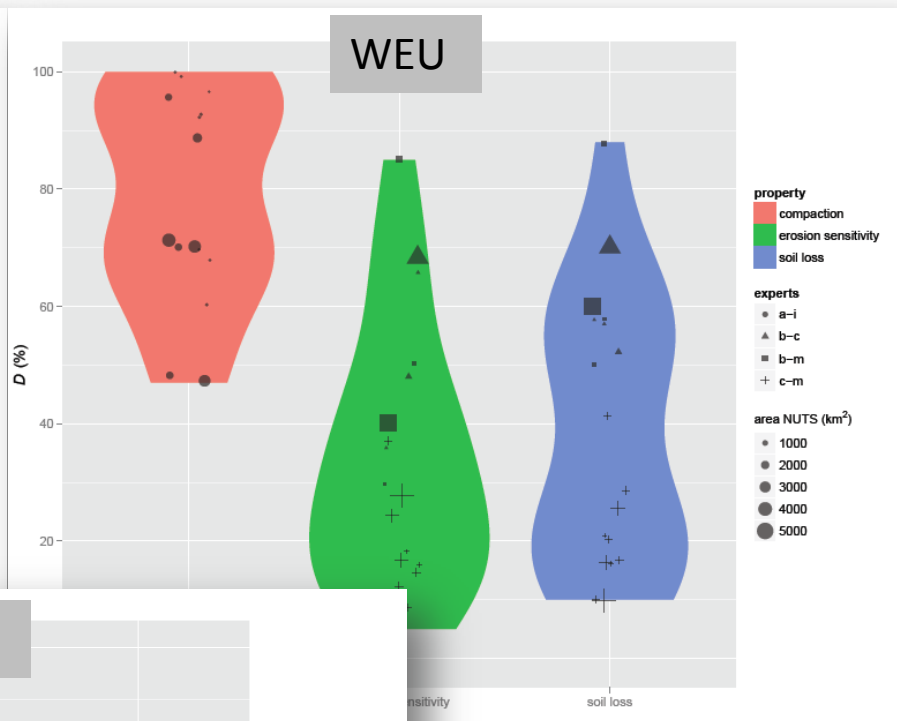
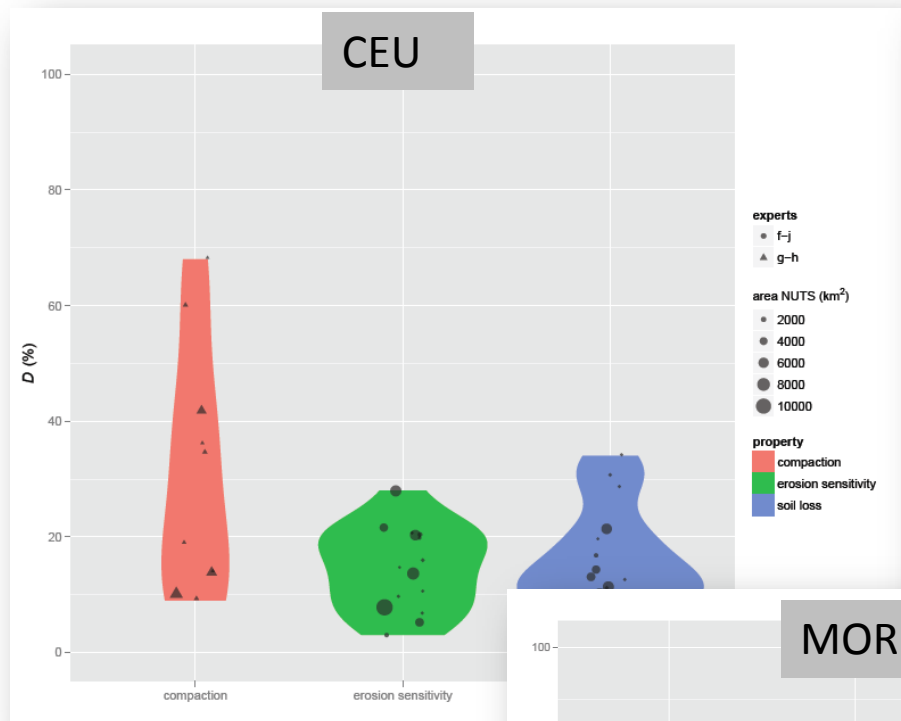
Model: 1*1 km² pixels

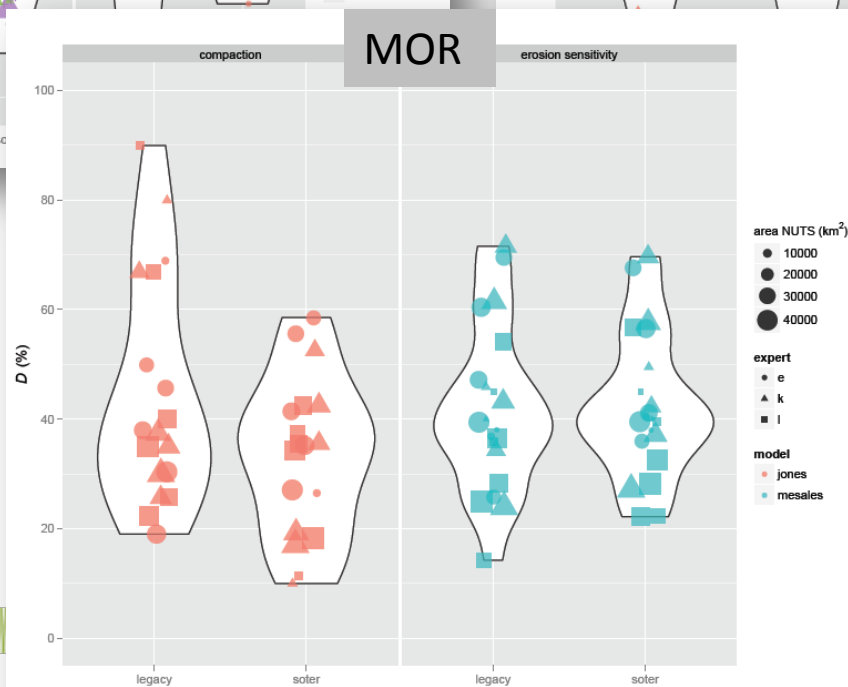
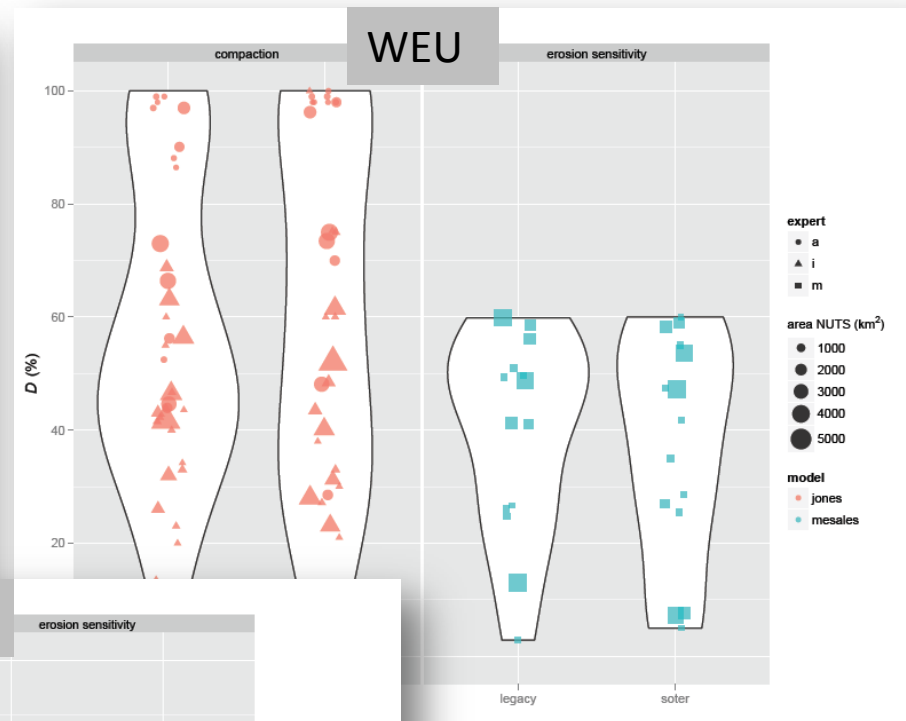
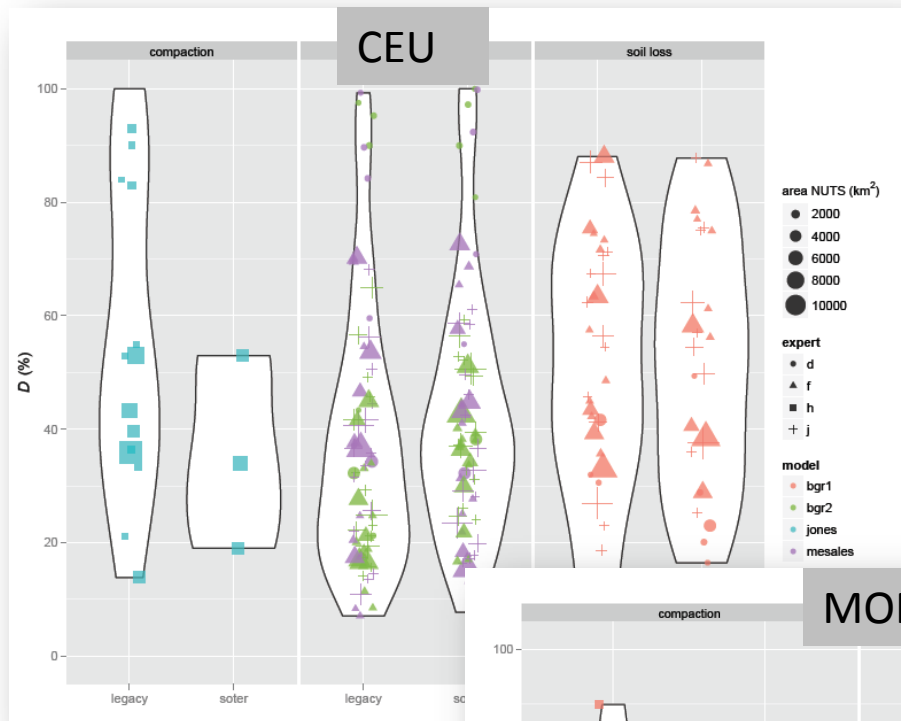


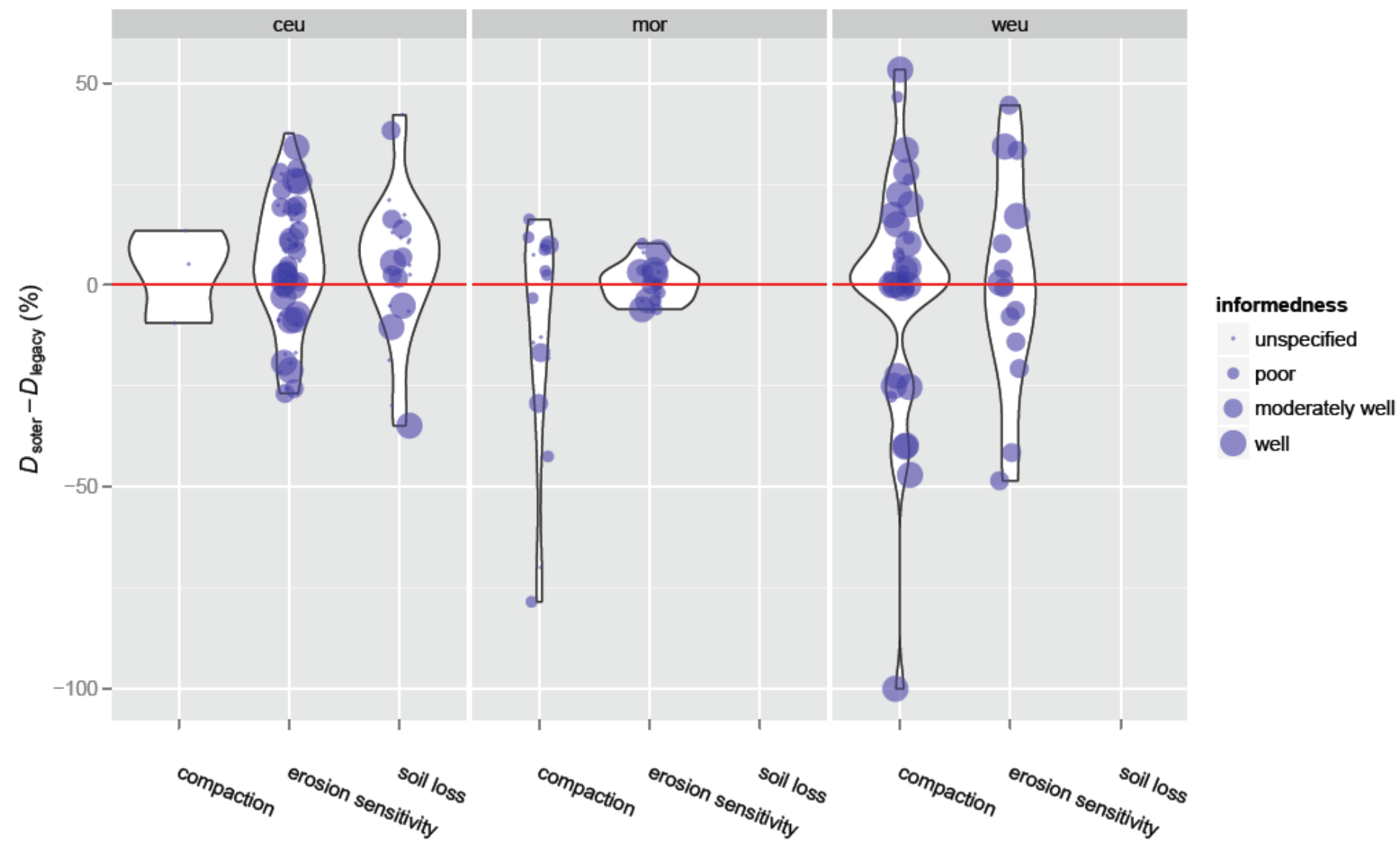


disagreement

agreement







Conclusions-Model results

- Different results for model applications using eSOTER versus legacy databases
- Missing information on input variables in the eSOTER database for considerable parts of the windows

Conclusions - Expert results

- Larger values and variation of D in the WEU window
- Larger values and variation of D for soil compaction
- No influence of area size or expert

Conclusions – model vs expert results

- Large deviation of model outputs compared to expert responses (D up till 100%)
- Model outputs based on the eSOTER database are not always better according to the experts than those based on legacy databases
- D shows no differentiation according to individual experts or the size of administrative units

Discussion

- The eSOTER database does not fully cover the administrative units in the windows
- The comparison of the databases only refers to the input variables of the models that differed between the databases
- Model outputs are on ordinal scales (ordered classes). Differences between the databases providing the model inputs may therefore be tempered.

Acknowledgements to the experts consulted

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