New evaluation criteria for digital soil mapping products from an user's point of view

Philippe Lagacherie, Léa Courteille

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Usual evaluations of soil mapping products

- Purity of soil maps *(Beckett and Webster 1971, Marsman and de Gruijter, 1986)*

- Uncertainty measures of DSM products *(Heuvelink, 2014)*

Soil map producer oriented evaluations that imperfectly match the user's requirements

User-oriented evaluation criteria

- Relevance: the degree to which the map is related to the user's expectations
- Integrity: the quality of being honest
- Intelligibility : the quality of being possible to understand

User-oriented evaluations of available mapping products in Languedoc-Roussillon (south of France)

A conventional Soil map

Etude et Gestion des Sols, pages 67 - 82 67

Les banques régionales de données-sols

Exemple du Languedoc-Roussillon

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* INRA Science du Sol , Place Viala , 34060 Montpellier cedex 1
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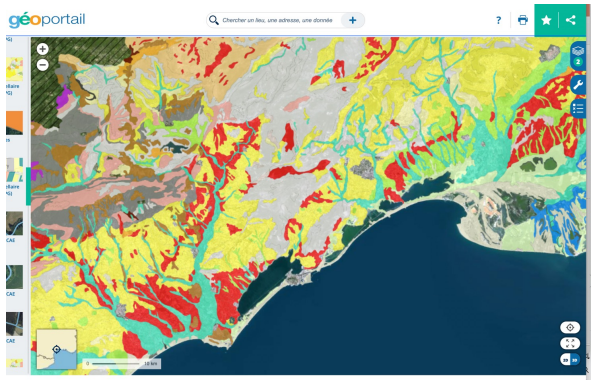

A GlobalSoilMap product

Contents lists available at ScienceDirect

Geoderma

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Using quantile regression forest to estimate uncertainty of digital soil mapping products

Kévin Vaysse [a,b], Philippe Lagacherie [b,*]

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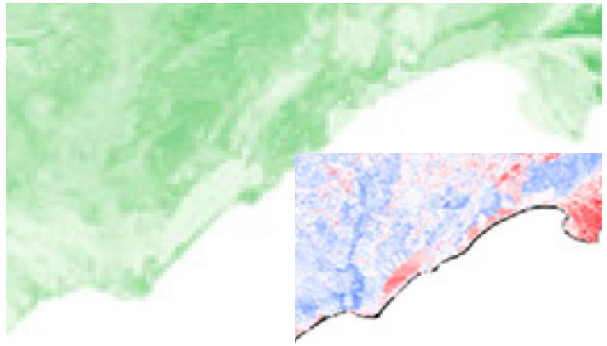
[b] UMR LISAH – INRA, 2 place Pierre Viala, 34060 Montpellier Cedex 1, France



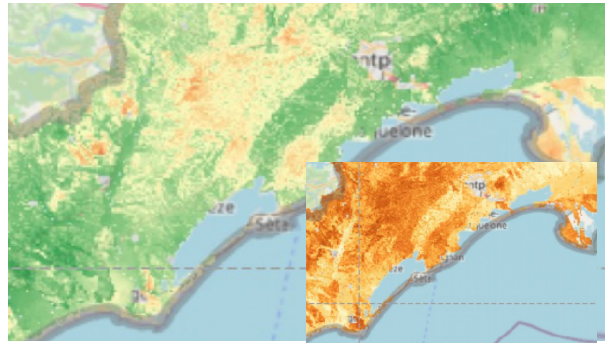
A digital map of a soil quality index

ORIGINAL ARTICLE

European Journal of Soil Science WILEY

A multivariate approach for mapping a soil quality index and its uncertainty in southern France

M. E. Angelini [1,2] | G. B. M. Heuvelink [3,4] | P. Lagacherie [2]



1990 2015 2020

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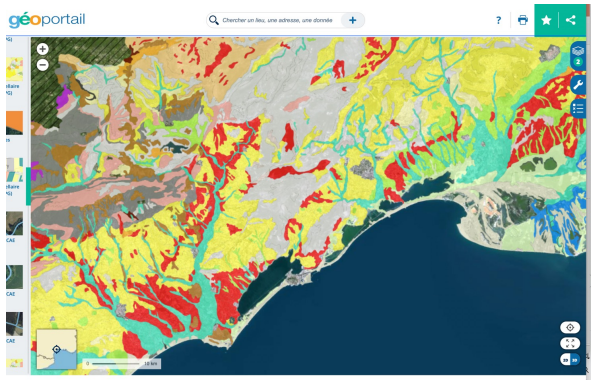

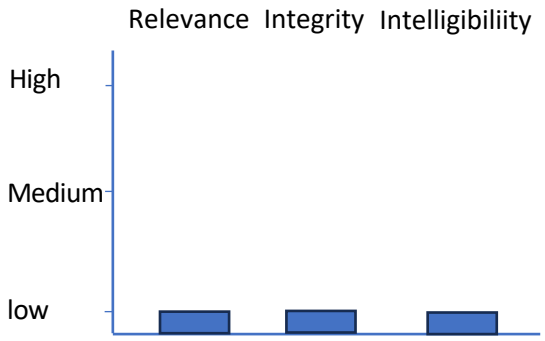

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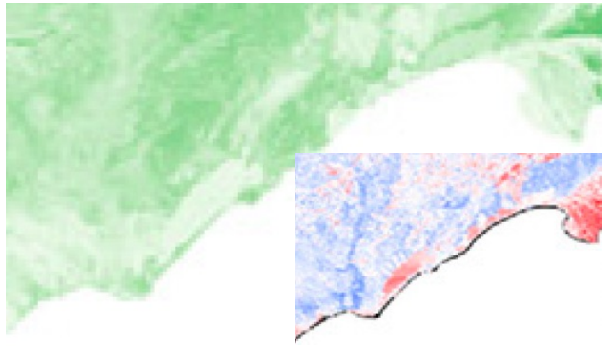

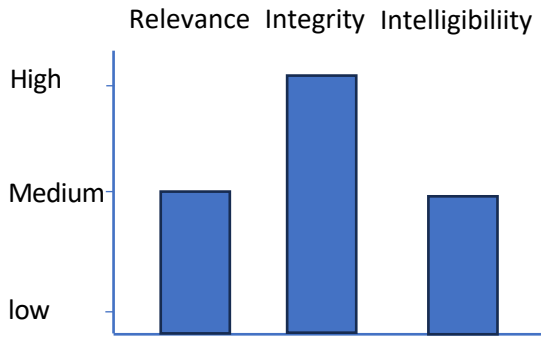

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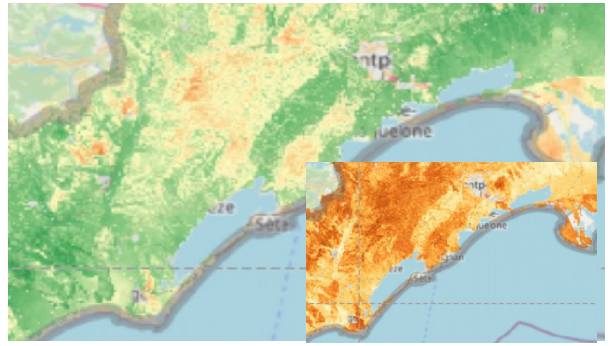

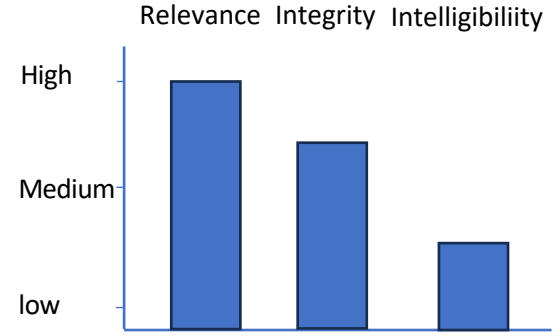

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On the road to implementing user-oriented evaluation criteria

- Relevance
  - Making progresses in Mapping soil functions and soil quality (Challenge 7)
  - Extend DSM applications to new properties required by users (deep soil layers, biological properties etc …)
- Integrity
  - Improve the mapping of uncertainties on soil property and soil function mapping
- Intelligibility
  - Searching more intuitive visualizations to communicate uncertainty *(next communication)*
  - Increase the traceability of the mapping approaches
    - Develop tools for understanding machine learning predictions (challenge 3)
    - Develop dynamic users interfaces to communicate complex mapping contents
  - Involve users in the mapping process through participative approaches
    - Soil data collection
    - Soil function assessements

Conclusions

- Evaluating DSM products is fine. Evaluating them from an user's point of view is even finer
- Relevance, integrity and intelligibility can be the three pillars of an user-oriented evaluation of DSM products
- Pedometricians have a lot to bring for increasing the user-perceived quality of DSM products
- Close collaboration with future users is mandatory (co-construction)