



## Using hand-feel soil texture as a proxy for Digital Soil Mapping predictions of soil particle-size distribution

Anne C Richer-De-Forges, D. Arrouays, Songchao Chen, Román Dobarco, Zamir Libohova, Pierre Roudier, B. Minasny, Guillaume Martelet, Laura Poggio, Marine Lacoste, et al.

### ► To cite this version:

Anne C Richer-De-Forges, D. Arrouays, Songchao Chen, Román Dobarco, Zamir Libohova, et al.. Using hand-feel soil texture as a proxy for Digital Soil Mapping predictions of soil particle-size distribution. 22nd World Congress of Soil Science - Glasgow 2022, Jul 2022, Glasgow, United Kingdom. hal-03745895

**HAL Id: hal-03745895**

**<https://hal.inrae.fr/hal-03745895>**

Submitted on 4 Aug 2022

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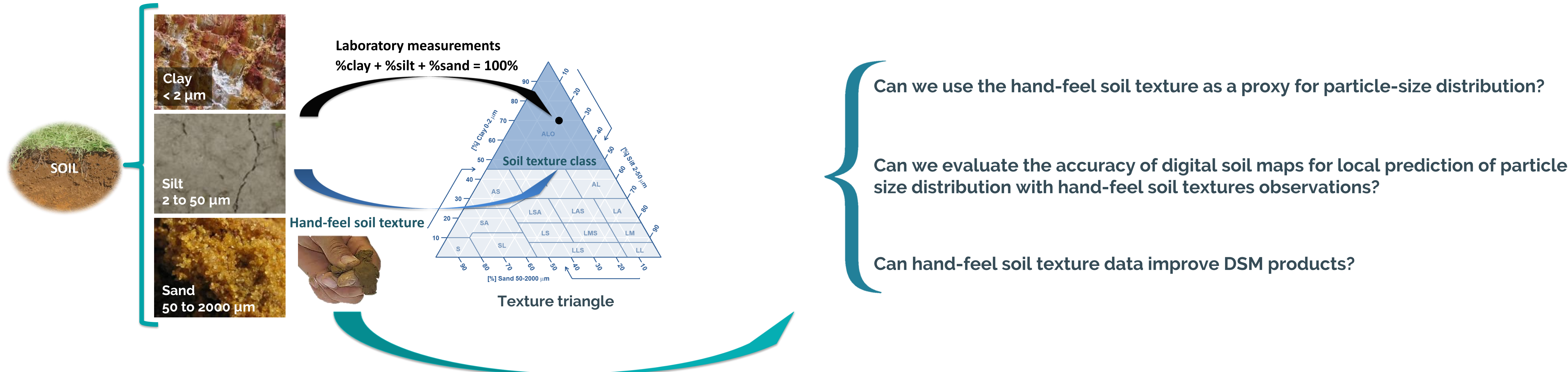
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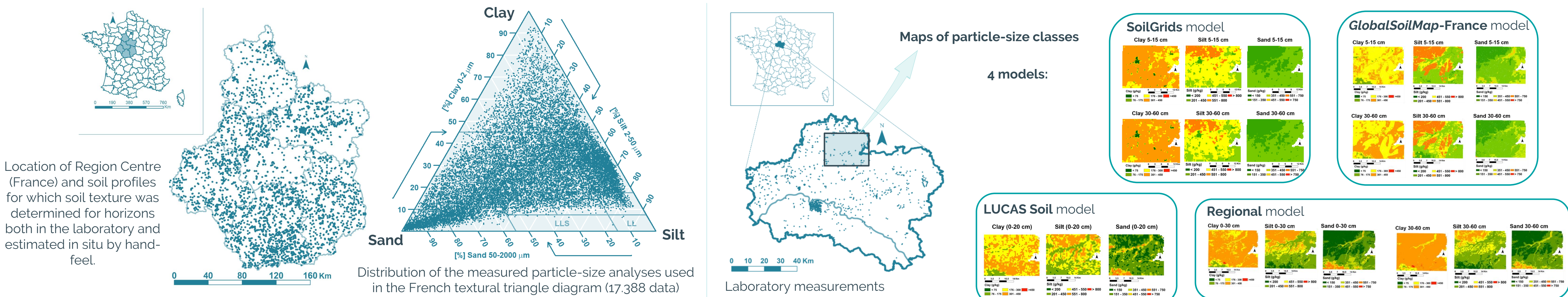
# Using hand-feel soil texture as a proxy for Digital Soil Mapping predictions of soil particle-size distribution

Richer-de-Forges A.C.<sup>1,2</sup>, Arrouays D.<sup>1</sup>, Chen S.<sup>3</sup>, Román Dobarco M.<sup>4,5</sup>, Libohova Z.<sup>6</sup>, Roudier P.<sup>7</sup>,  
Minasny B.<sup>4,5</sup>, Martelet G.<sup>8</sup>, Poggio L.<sup>9</sup>, Lacoste M.<sup>2</sup>, Mulder V.L.<sup>10</sup>, Bourennane H.<sup>2</sup>

## Introduction

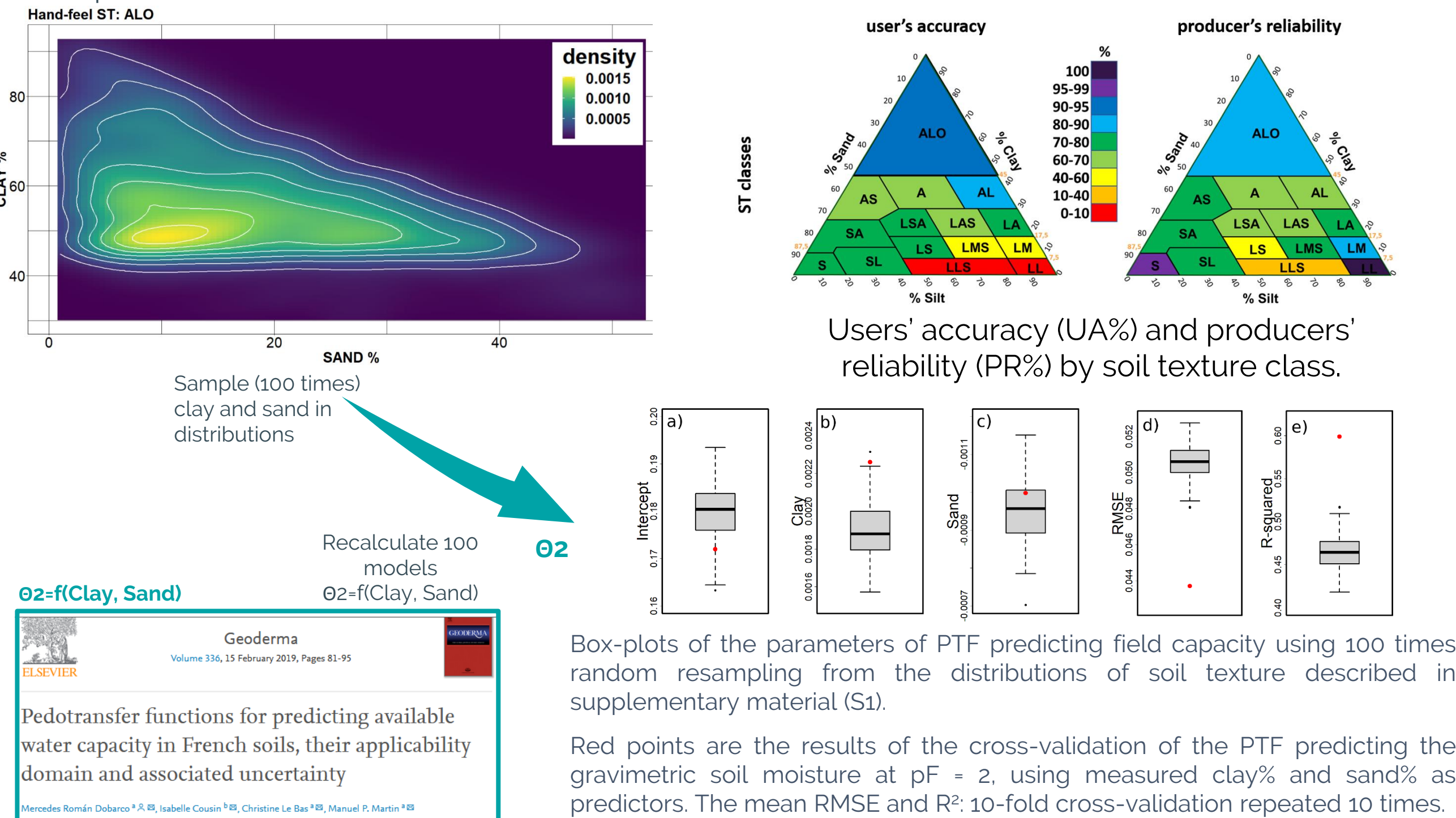


## Material & methods

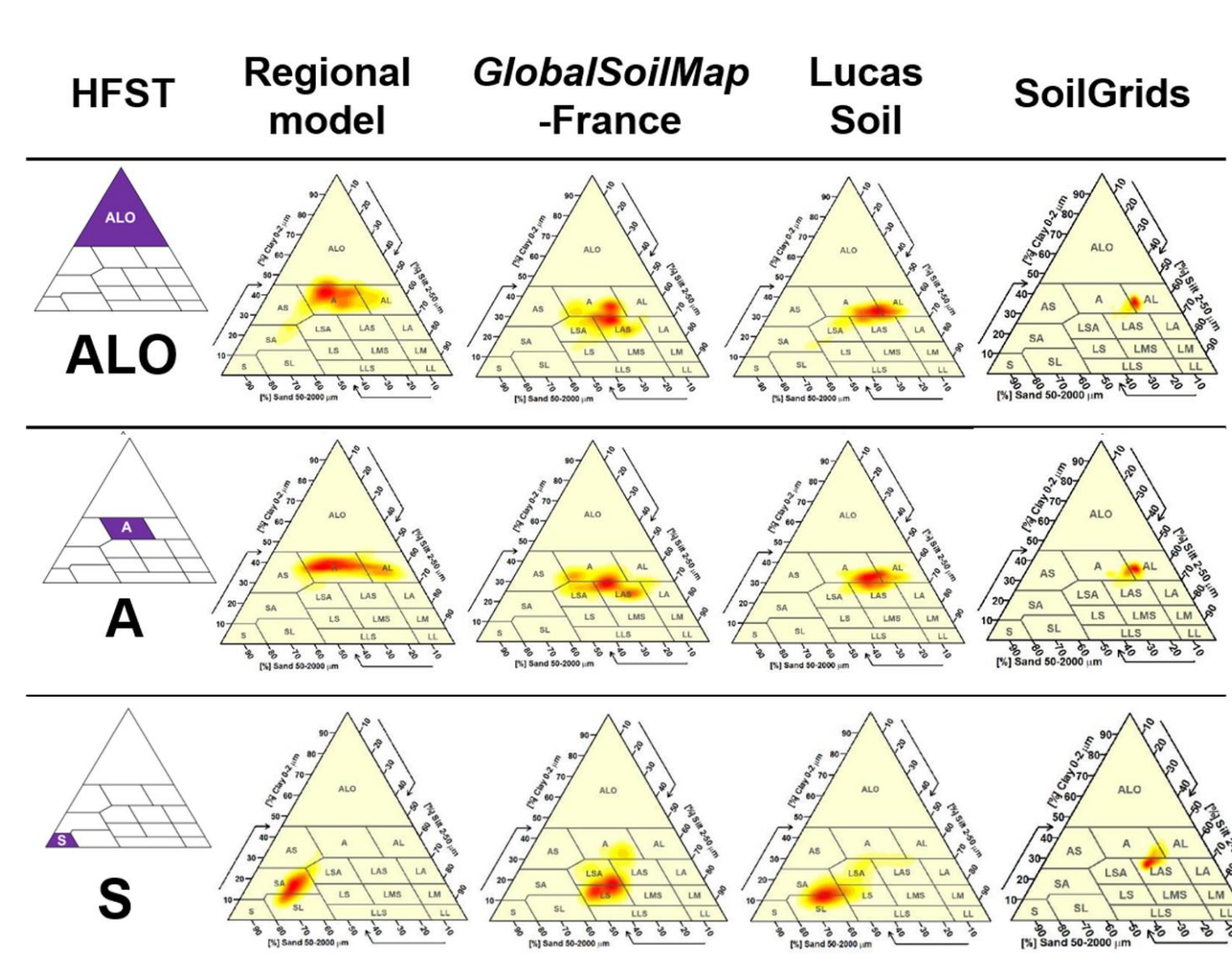


## Results

Joint distributions of the LAST particle size distribution for each hand-feel soil texture class. Example for ALO class:



Richer-de-Forges A.C., Arrouays D., Chen S., Román Dobarco M., Libohova Z., Roudier P., Minasny B., Bourennane H. (2022). Hand-feel soil texture and particle-size distribution in central France. Relationships and implications. CATENA 106155. <https://doi.org/10.1016/j.catena.2022.106155>



Density of the predicted topsoil particle size distributions by the DSM models for each observed hand feel soil texture class on the Pithiviers 1:50,000 soil map. The classes with purple colour in the first column indicate the HFST classes.

Richer-de-Forges A.C., Arrouays D., Poggio L., Chen S., Lacoste M., Budiman B., Libohova Z., Roudier P., Mulder V.L., Nédélec H., Martelet G., Lemerrier B., Lagacherie P., Bourennane H. (online 5 July 2022). Hand-feel soil texture observations to evaluate the accuracy of digital soil maps for local prediction of particle size distribution. A case study in central France. Pedosphere. <https://doi.org/10.1016/j.pedsph.2022.07.009>

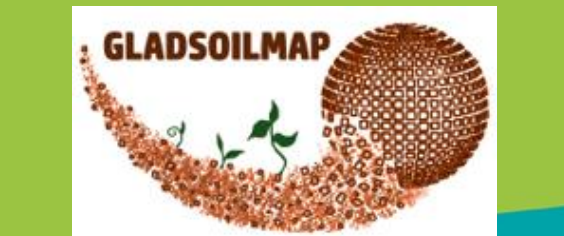
## Conclusion

- Hand-feel soil texture and particle-size distribution are compared using a large database
- The overall accuracy of hand-feel soil texture class allocation was 73%
- Most discrepancies were explained by very fine and coarse sand content
- Predicting soil water retention at pF<sub>2</sub> using hand-feel texture gave satisfactory results
- Various digital soil mapping (DSM) products are evaluated for local use
- Numerous hand-feel soil texture data (HFST) are used for this purpose
- Low cost HSFT proved efficient to evaluate the accuracy of DSM products
- Simple and visual methods are proposed to achieve this goal
- Broader-scale DSM products were generally less reliable than local ones.
- Can hand-feel soil texture data improve DSM products?
- Work is still ongoing.

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Loire Valley Institute for Advanced Studies



This work (or part of this work) has been supported by LE STUDIUM Loire Valley Institute for Advanced Studies through its LE STUDIUM Research Consortium Programme

- INRAE, InfoSol Unit, 45075, Orléans, France
- INRAE, URSOLS, 45075, Orléans, France
- ZJU-Hangzhou Global Scientific and Technological Innovation Center, Hangzhou 311200, China
- The University Sydney, School Life & Environmental Sciences, Eveleigh, NSW 2015, Australia
- Sydney Institute of Agriculture, Eveleigh, NSW 2015, Australia
- US Department of Agriculture-Agricultural Research Service, Dale Bumpers Small Farms Research Center, AR, USA
- Manaaki Whenua -- Landcare Research, Private Bag 11052, Manawatu Mail Centre, Palmerston North 4442, New Zealand
- BRGM, Orléans, France
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