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Disaggregation of legacy soil maps at regional scale in France. Comparison of DSMART and Random Forest

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MAPPING OF SOILS AND THEIR PROPERTIES USING LEGACY SOIL MAPS

Comparison of DSMART and Random Forest

*Joint workshop for Digital Soil Mapping and GlobalSoilMap
12-15 March 2019
Santiago*

Context

Soil polygon maps

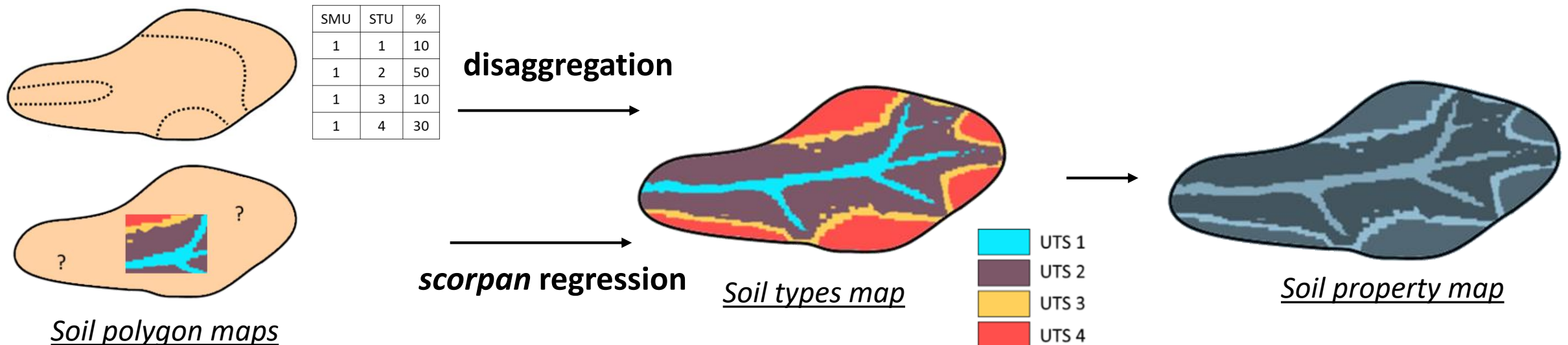
- Cover major part of french territory
- Different scales 1:250 000 ; 1:50 000
- Rich source of information about soil

But ..

- Spatial support and extent is not always adapted to demand

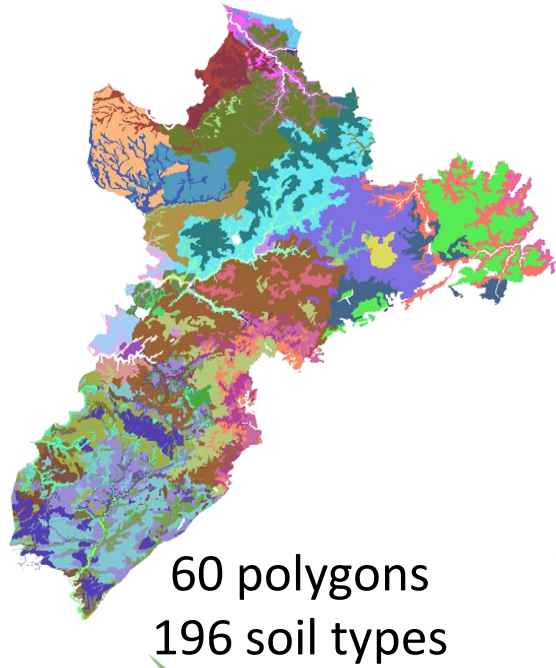
» Objective : **Increase spatial resolution** of soil maps and to **map soil properties**

» How ? We tested and compared two methods :

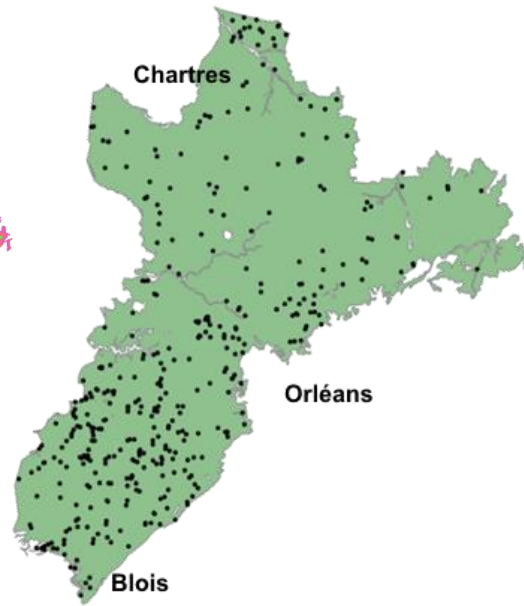


Data available

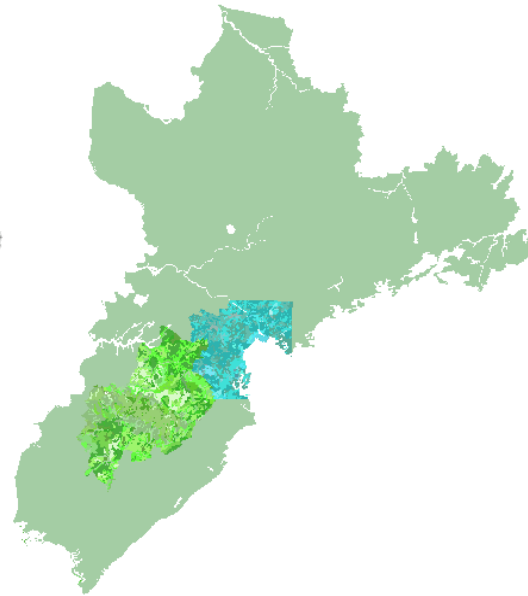
Legacy soil map



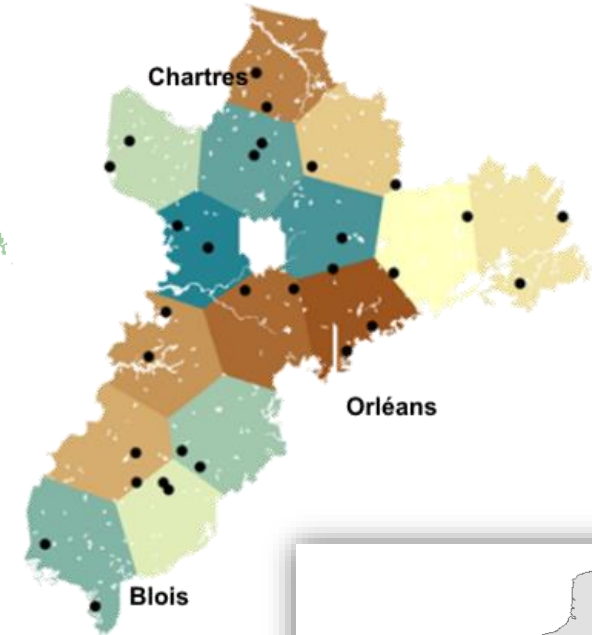
435 soil profiles for calibration



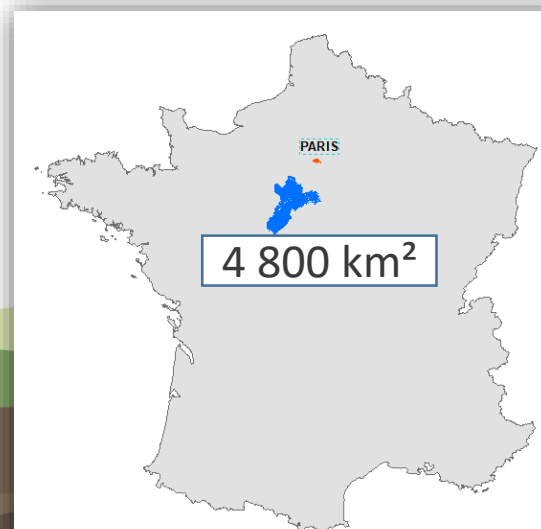
1:50 000 soil maps



30 soil profiles for validation using probability sampling

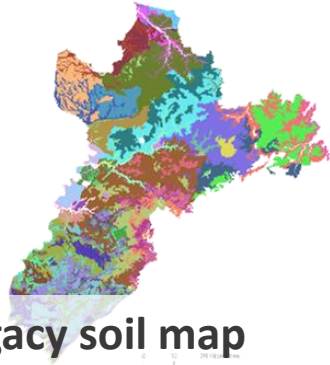


+ 24 Covariates



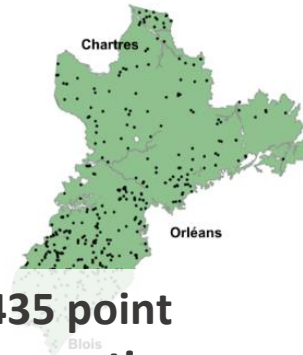
Disaggregation with DSMART

Input

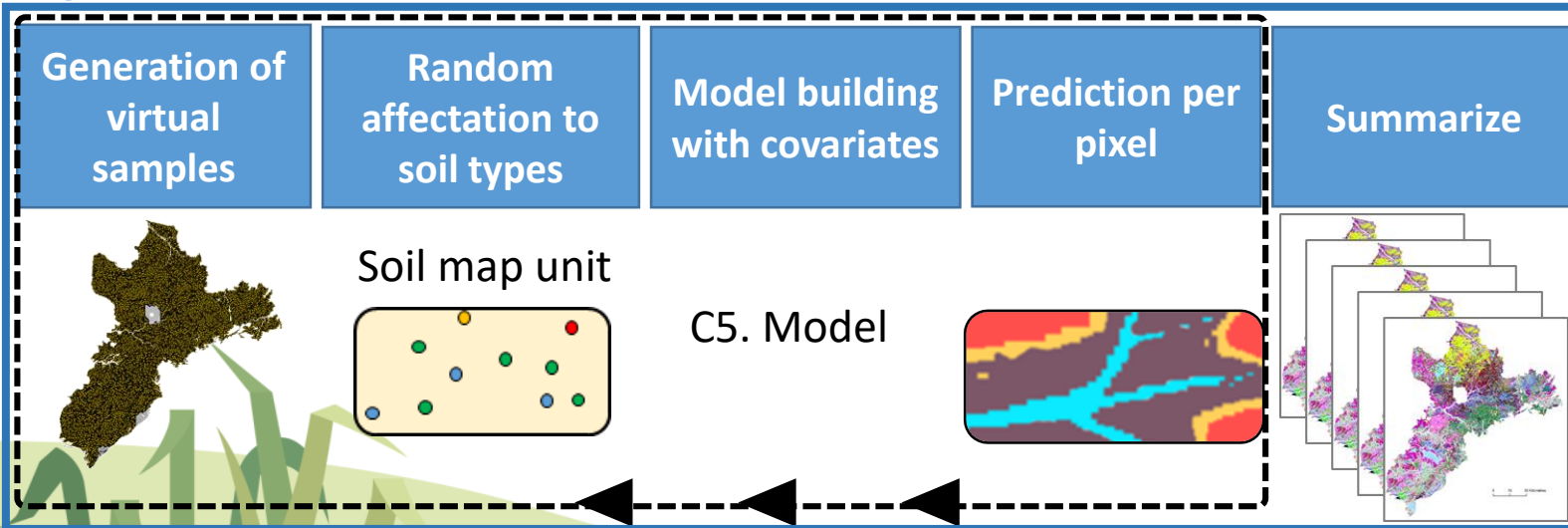


SMU	STU	%
1	1	10
1	2	50
1	3	10
1	4	30

Composition of Soil Map Units

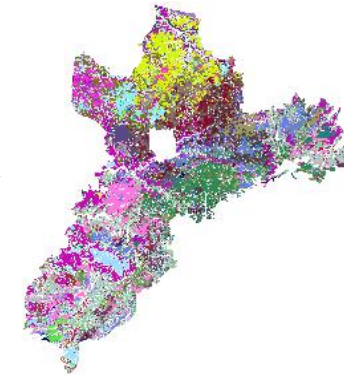


DSMART



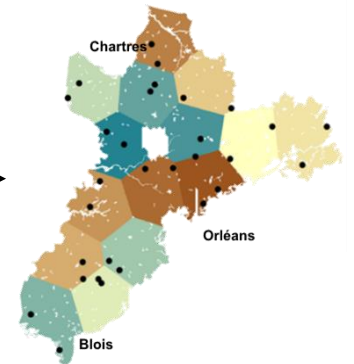
Odgers et al., 2014

Output



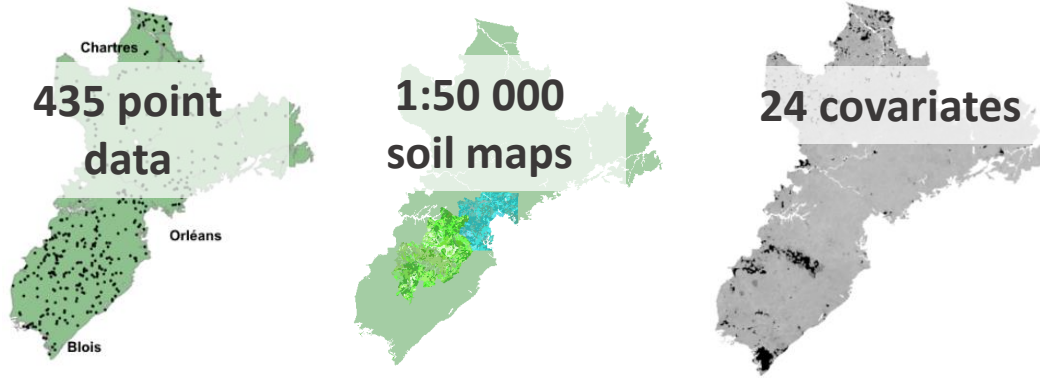
Validation

30 points



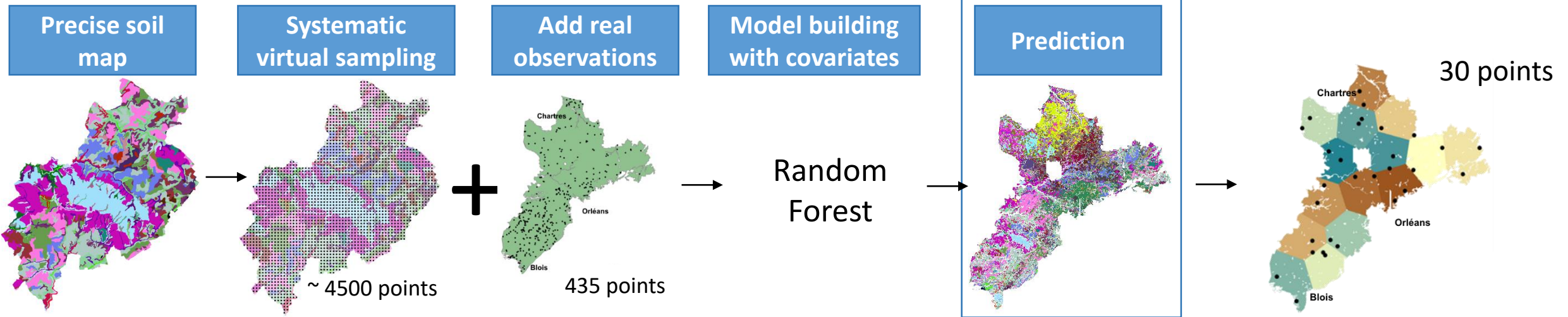
scorpan regression with Random Forest

Input



Output

Validation



Collard et al., 2014

Results

	Map of soil types	
	Purity (%)	Conf.Int – 90%
Dominant soil type map	33,33	[19,9 ; 46,8]
DSMART	33,33	[17,8 ; 48,8]
R.F.	26,67	[13,2 ; 40,1]

Validation with 30 points based on probability sampling

Conclusion : Take home message

DSMART	<i>scorpan</i> regression
Same performance than the original map	
The covariates did not capture soil spatial variability	
Intense computational load	Efficient computational load
Pedological context is a DSM challenge <i>new sensors ?</i>	
Implementation of soil / landscapes rules	New 50 000 map

Thank you for your attention

