

THE MICROSOFT PROJECT: STUDY OF THE MICROPLASTIC CONTAMINATION IN SOIL SAMPLES FROM 42 DIFFERENT SITES IN FRANCE.

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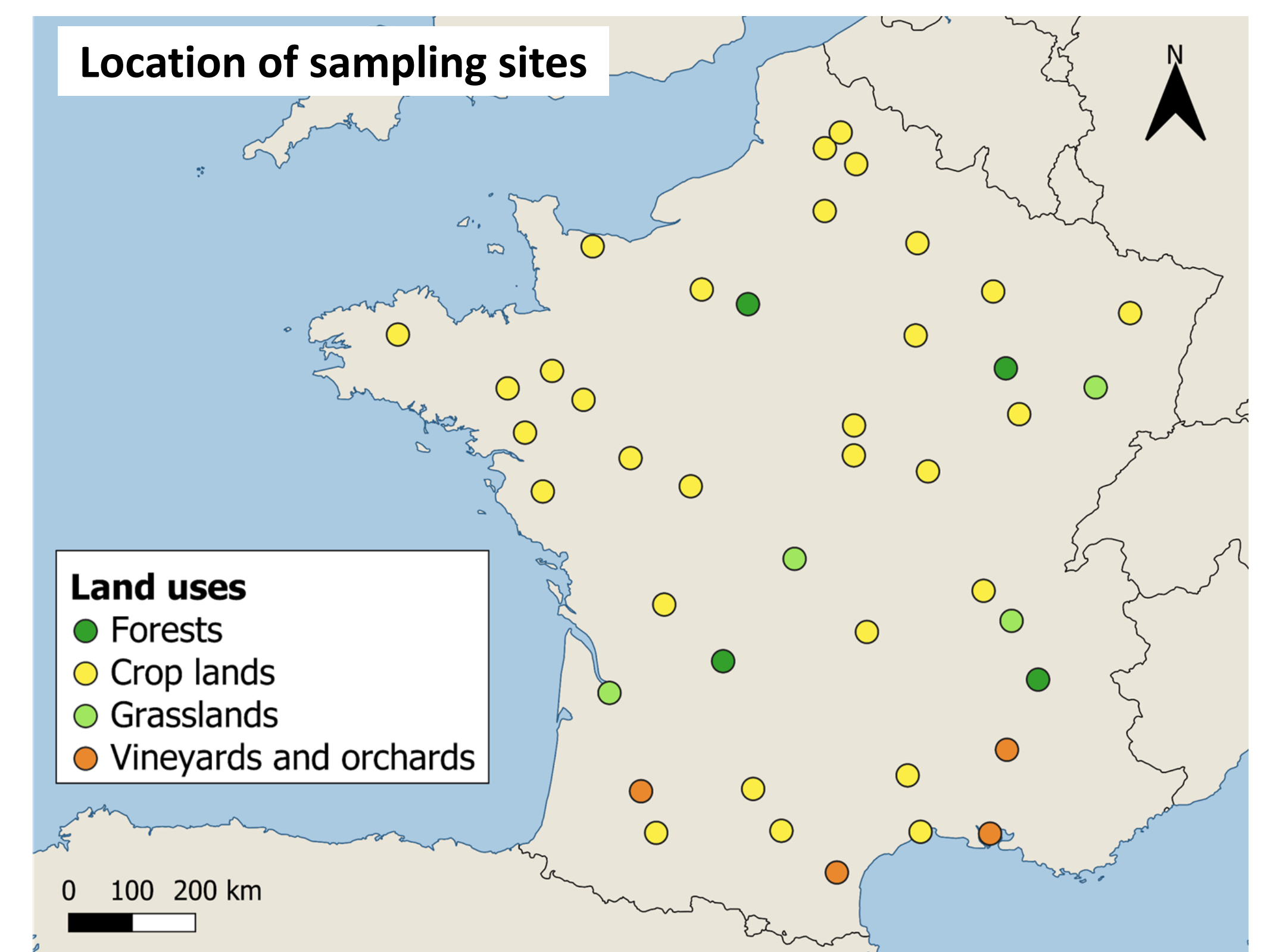
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ISSUES

- Recent studies have revealed the **presence of microplastics (MP) in various terrestrial ecosystems**, from the most urbanized and industrialized areas to the most remote areas.
- Main sources of plastic in soils include: land application of contaminated **sewage sludge** and **compost**, **plastic mulching**, **wastewater irrigation**, **atmospheric deposition**, **littering** and **surface runoff** [1].
- **Estimates of MP concentrations and chemical natures are still limited and differ between studies.** In France, only a few studies have tackled the issue of MP contamination in soils.

THE MICROSOFT PROJECT

- The MicroSof project aims to establish the **first national references on the contamination of French soils by microplastics**.
- Soil samples (~1kg) from **42 different sites** under **different land uses** will be analyzed:
 - 30 samples from crop lands
 - 4 samples from forests
 - 4 samples from grasslands
 - 4 samples from vineyards and orchards



OBJECTIVES

- Develop a **protocol for the extraction and characterization of microplastics** trapped in soil samples with different characteristics.
- **Quantify** (number) and **qualify** (chemical nature, size, shape) the extracted microplastics.

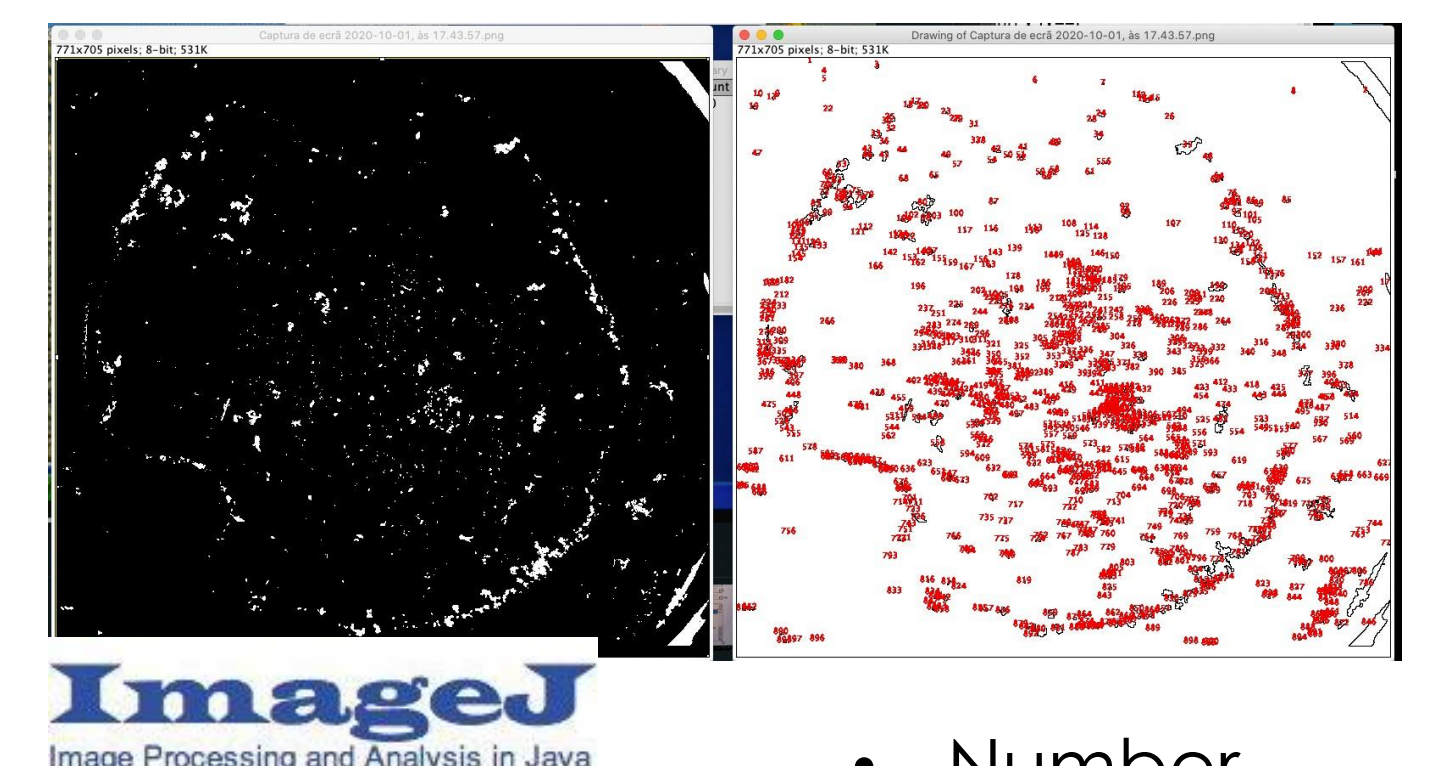


50 mL Falcons

Density: 1,8 g.cm⁻³

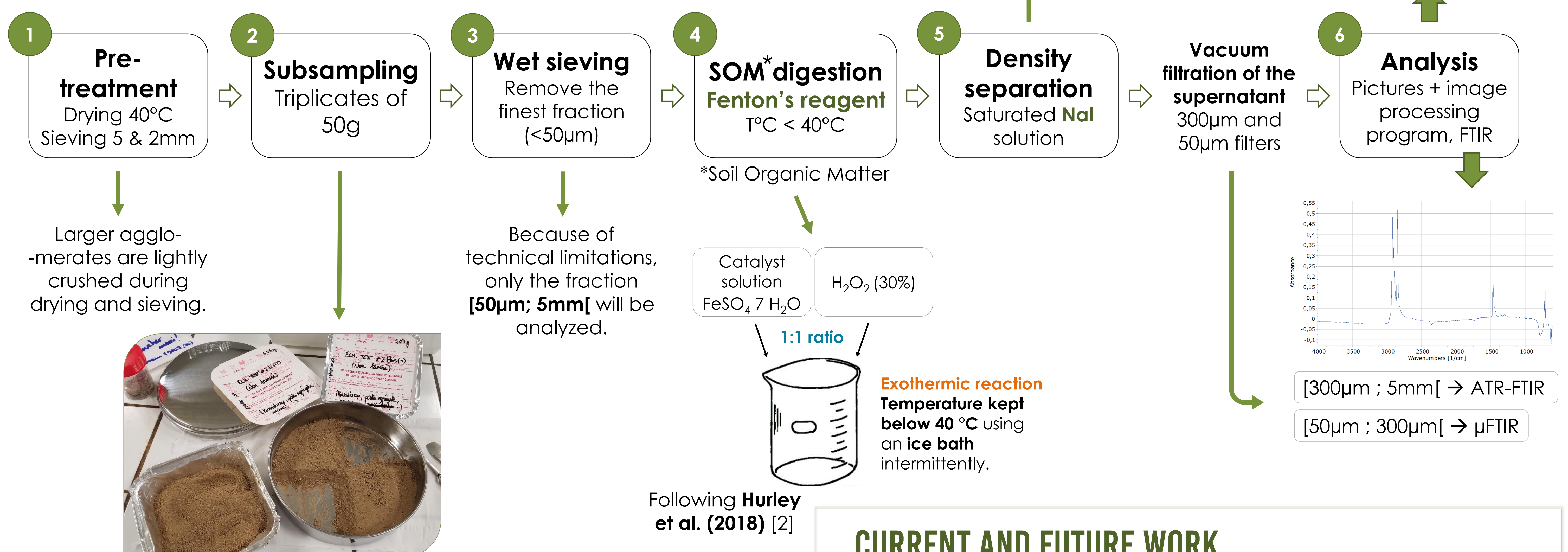
Extract all MP, even those of high density such as PVC and PET.

**Nal recycling,
up to 10 cycles [3]**



- Number
- Size
- Shape

MATERIAL AND METHODS (WORK IN PROGRESS...)



Quality controls: Positive and negative controls, use of 100% cotton lab coats and natural fiber clothing, experiments conducted in a laminar flow cabinet, samples kept covered, use of glass or stainless steel materials...

References:

- References.**
- [1] Bläsing, M., & Amelung, W. (2018). Plastics in soil: Analytical methods and possible sources. *Science of the Total Environment*, 612, 422-435.
- [2] Hurley, R. R., Lusher, A. L., Olsen, M., & Nizzetto, L. (2018). Validation of a method for extracting microplastics from complex, organic-rich, environmental matrices. *Environmental science & technology*, 52(13), 7409-7417.
- [3] Kedzierski, M., Le Tilly, V., César, G., Sire, O., & Bruzaud, S. (2017). Efficient microplastics extraction from sand. A cost effective methodology based on sodium iodide recycling. *Marine pollution bulletin*, 115(1-2), 120-129.

CURRENT AND FUTURE WORK

- Currently: validation phase of the first version of the protocol, recovery experiments using aged polymers.
- Need to adapt the protocol according to the type of soil.