RÉPUBLIQUE FRANÇAISE
Liberté Égalité Fraternité

PROGRAMME DE RECHERCHE
CARBONE ET ÉCOSYSTÈMES CONTINENTAUX

ALAMOD

Infrared spectrometry applied to soils : spectral databases and calibration transfer

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General context

Quantification of SOC by near-infrared spectroscopy (NIRS)

Interest of NIRS for SOC prediction has been reported in the literature for thirty years

An example on the RMQS database :

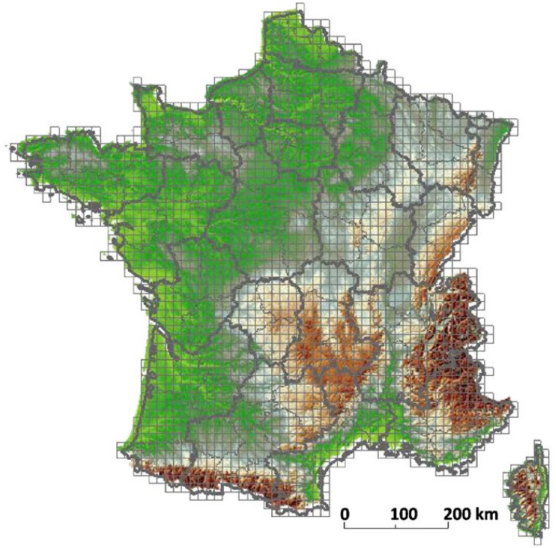
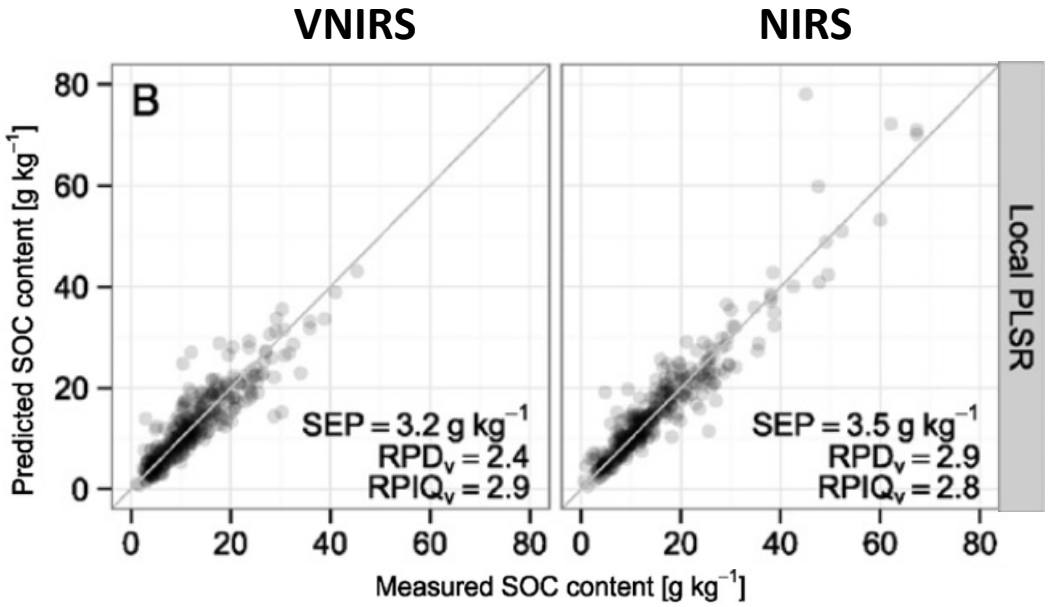


Fig. 1. The RMQS sampling grid.



From Clairotte and al., 2016

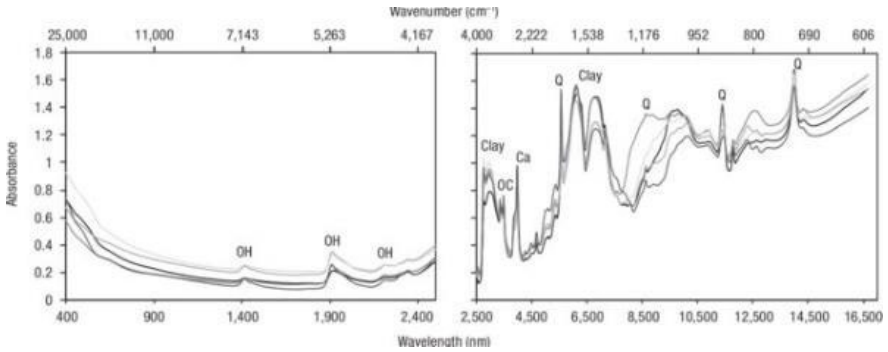
Context of my mission

Variability of instruments, sample preparations, wavelenghts…

Lab spectrometers

Field spectrometers

Different wavelengths between instruments



Different sample preparations

Step 1 : Building a spectral library

RMQS 1
3800 soil samples
NIRS – MIRS data
SOC data available

Renecofor 1 & 2
495 soil samples
NIRS – MIRS data
SOC data available

Tropical databases
Zimbabwe,
Reunion Island

+ many more…

Harmonization of the different spectral databases, containing spectra and SOC data

↳ Enhance the databases' interoperability between partners

Step 2 : Calibration transfer

How can we improve SOC predictions ?

What is it ?

Create a calibration model of SOC prediction on one instrument, and use it on **others instruments**

Many methods : corrections of the model itself, corrections of the spectra, pretreatments…

Best methods to keep the **accuracy and precision** of the initial calibration ?

Why do we do it ?

Build a **global calibration database** (multiple instruments = robust results)

Improve SOC predictions in **various contexts**

Synchronization of multiple instruments used for calibration