GLOBAL RESEARCH ALLIANCE ON AGRICULTURAL GREENHOUSE GASES

Country report : FRANCE

Presentation to IRG Annual Meeting
Cali, 5 February 2019

GRA contributions

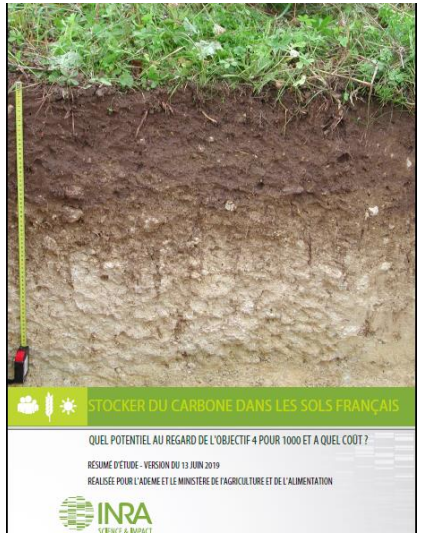
- IRG co-chair
- Field scale network co-chair (and past C&N modeling cross-cutting group)
- Contributions to CRG and LRG

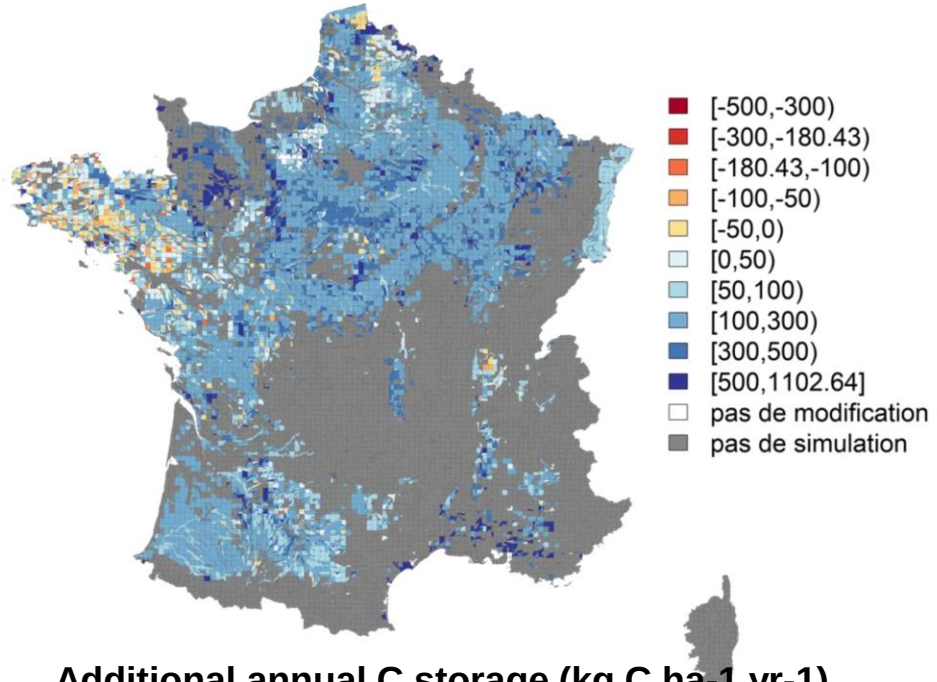
A high potential for soil C sequestration in arable soils

30 millions tons CO_2 eq per year
(3.3 per mil increase for agricultural areas,
more than 5 per mil for croplands only)

Potential is higher when initial soil C is low

A marginal cost often less than 50 € per ton CO_2





Additional annual C storage (kg C ha-1 yr-1) on 0-30 cm for expansion of cover crops, longer grass leys and additional use of organic fertilizers

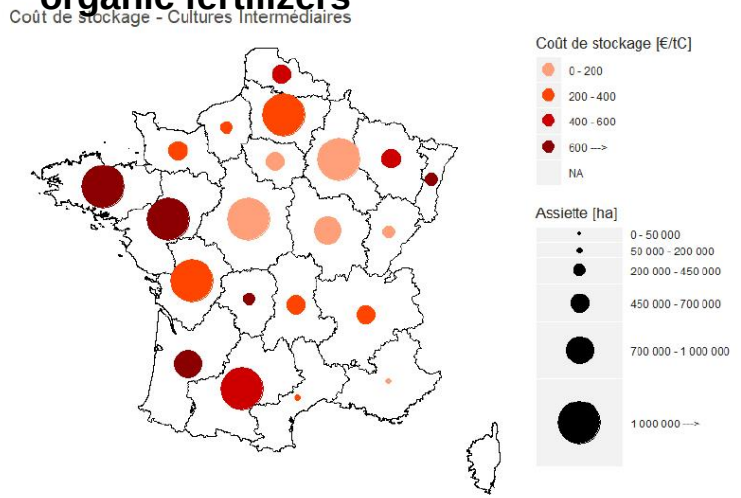
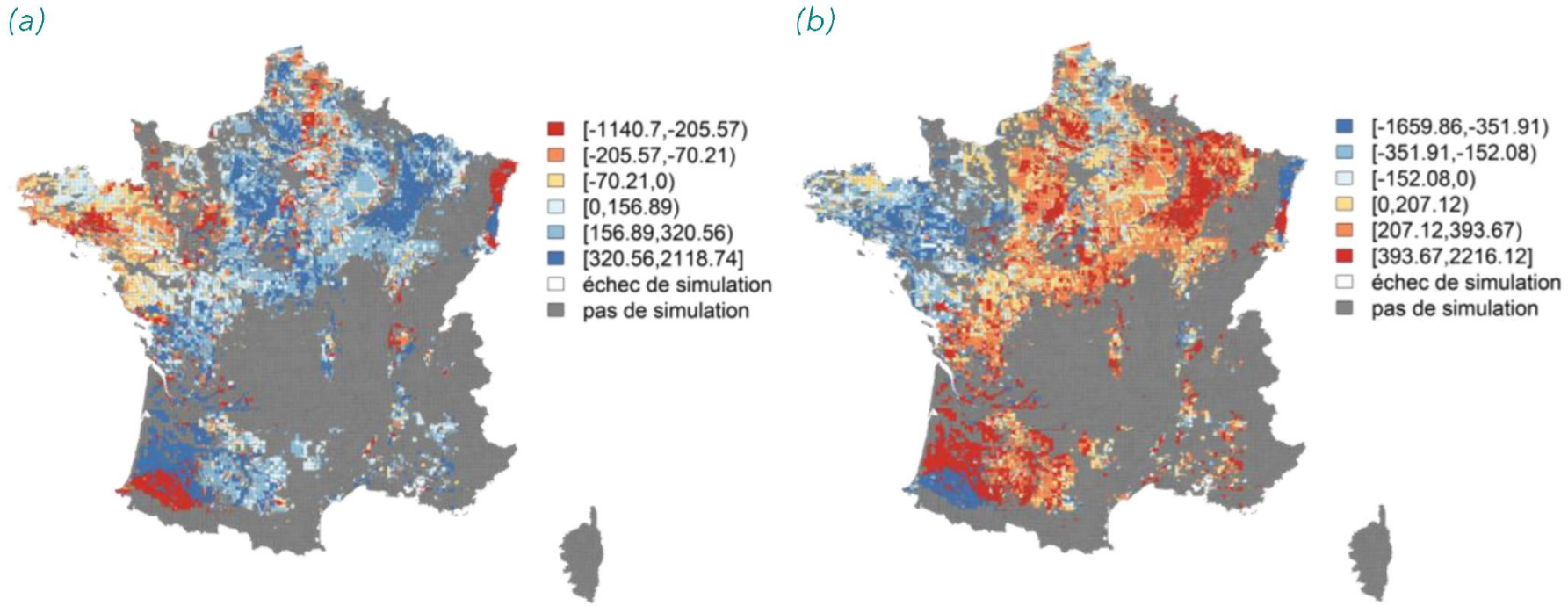
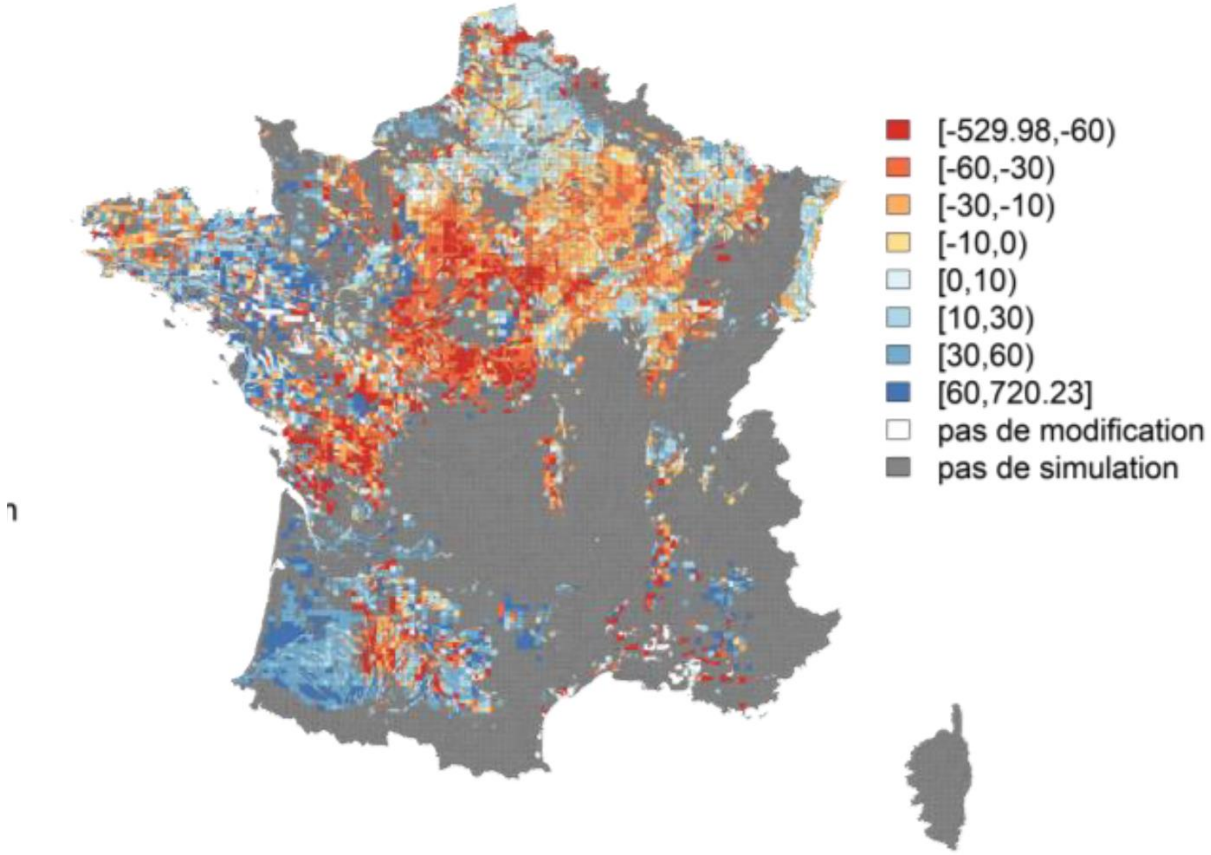


Figure 8. Coût de la tonne de C stockée (€/tC) et Assiette maximale technique (ha) de la pratique, par région

Climate change impacts on carbon input to soils and soil organic carbon mineralization
Difference between 2030-2060 (RCP8.5) compared to current (1983-2013) climate



Climate change impacts on SOC sequestration based on 3 practices
Difference between 2030-2060 (RCP8.5) compared to current (1983-2013) climate



Climate change impacts on SOC sequestration based on 3 practices (no significant effect on average)
Difference between 2030-2060 (RCP8.5) compared to current (1983-2013) climate

No significant effect on average. More C storage in Brittany and SW, less South of Paris

Other initiatives

- CIRCASA (coordination, Jean-François Soussana), preparing an International Research Consortium
- EJP Soil (coordination, Claire Chenu, co-coord. WUR)
- 4 per 1000
  - INRA hosts research program,
  - Member of STC (Scientific and Technical cooperation Committee)
  - National study on potential and implications of the 4 per 1000 target (INRA and ADEME)
- Soil carbon monitoring methodologies
  - NIVA H2020 project
  - How to monitor soil C stocks in the next CAP? (Test area 100x1000 kms)
  - Methodological study funded by ADEME
- FACCE JPI and GRA
  - Several Eranets (e.g. on long-term soil C monitoring with NZ, Uruguay…)
  - Thematic Annual Program on soils with participation of INRA
- Carbon offset projects in agriculture (with Climate KIC)
  - Case studies in SW France (Nataïs, pop-corn exports) and in Switzerland (CarbonCept, Flaachtal)

Synthesis

1. Monitoring networks on Soil C and GHG emissions
2. Mapping of SOC stocks and C storage
3. Mechanisms of soil C sequestration (residence time, C input by roots) and improvement of SOC dynamics models
4. Drivers and mechanisms of GHG emissions (microbial ecology of denitrification in soil) and improvements of emission models
5. Coupling of C, N, P cycles in agrosystems
6. Expertise on C storage potential