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SOCLE PROJECT, GENERAL FRAMEWORK FOR SOIL CARBON AND SOIL FUNCTION IN LCA

1st Soil quality indicators in Life Cycle Assessment Workshop
30th August, Bordeaux, France

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Background and research question

- SOCLE, Soil Organic Carbon changes in LCA, which Evaluations to improve environmental assessments?

ADEME REACTIF project – Cirad + Arvalis + Idele + Agrotransfert RT



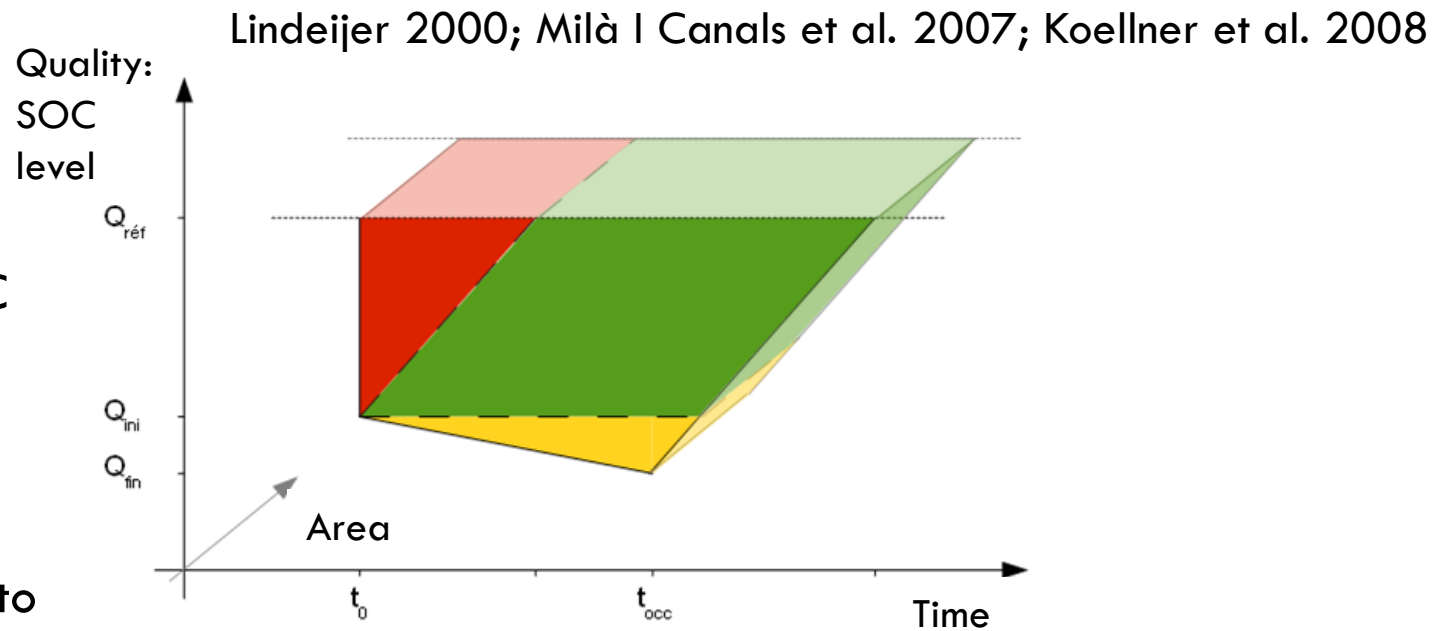
2015-2017

- Objectives:
 - ▣ Review/recommendations on how to model in LCA:
LULUC x agri. practices \Rightarrow Δ SOC \Rightarrow GHG
 - ▣ Feasibility/sensitivity for various agricultural products

Method and data

□ Focus on SOC and issues related to LCA framework

- Defining references
- Modelling SOC changes linked to practices
- Characterising impacts linked to SOC changes and GHG



- Defining relaxation times
- Accounting for SOC dynamics
- Ensuring time consistency between SOC dynamics and impact characterisation

Preliminary outputs

- SOC levels
 - ▣ Natural vs dynamic references Milà i Canals et al. 2007...
 - ▣ Reversible vs irreversible changes
 - ▣ Influence of agri. practices (tillage, inputs, rotation...) + soil depth IPCC 2006, Ogle et al. 2005...
 - ▣ GHG impact assessment:
 - Regional characterisation factors
 - Link $\Delta\text{SOC} \Rightarrow \Delta\text{Albedo} \Rightarrow \text{GHG impact}$
 - Synergies/antagonisms between GHGs/soil functions

Preliminary outputs

- SOC dynamics
 - ▣ Relaxation dynamics: $f(\text{soil, climate, practices})$
 - ▣ Consistency in modelling C residence times in both soil and atmosphere
 - ΔSOC dynamics and agri. practices influence
 - Residence time and GWP assessment consistency
Brandão et al. 2013; Levasseur et al. 2010; Levasseur & Brandão 2014...

Outlook

- Next steps
 - ▣ To wrap up review outputs and recommendations
 - ▣ To test proposed guidelines on contrasted chains: temperate/tropical; annual/perennial; crop/livestock
 - Data availability
 - Sensitivity to agri. practices
 - Potential help from models ⇒ projects Csopra, AEGES...
- Synergies/consistency with the other soil function modelling in LCA