Continuing Project / Final Report

Resilience of soil organic carbon to harvesting: A long-term soil productivity experiment

CAFS 20.81

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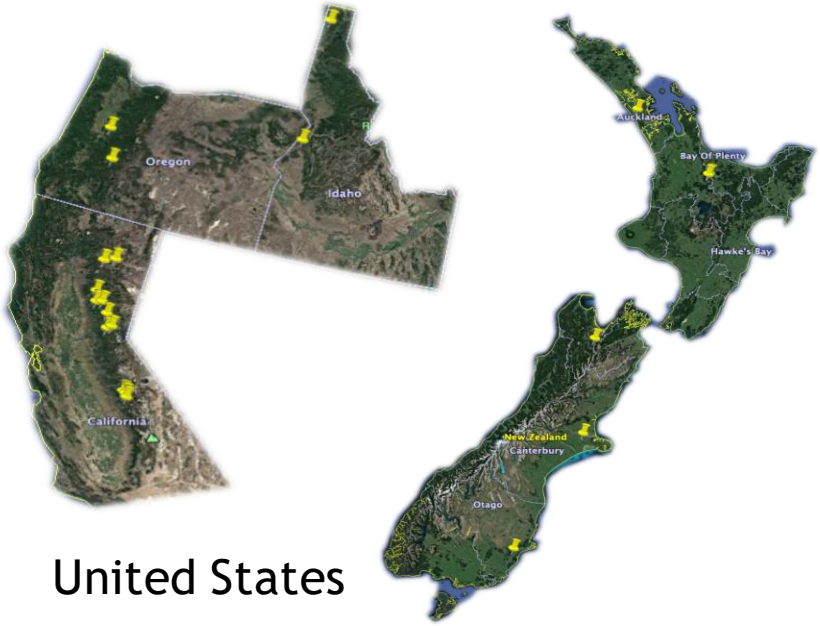
Hypotheses or Objectives

Objectives: Elucidate the mechanisms that impart resilience to forest SOC after extreme disturbances across a wide range soils and forest types of the world.

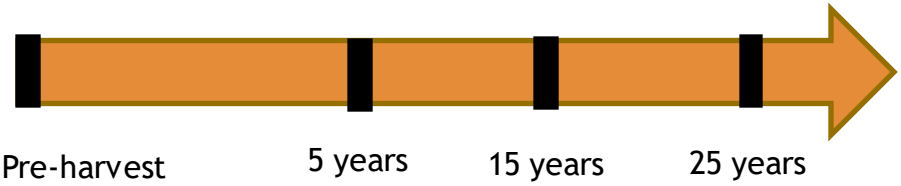
Methods



United States

New Zealand

Soil Sample Timeline



Organic Matter Removal Treatments

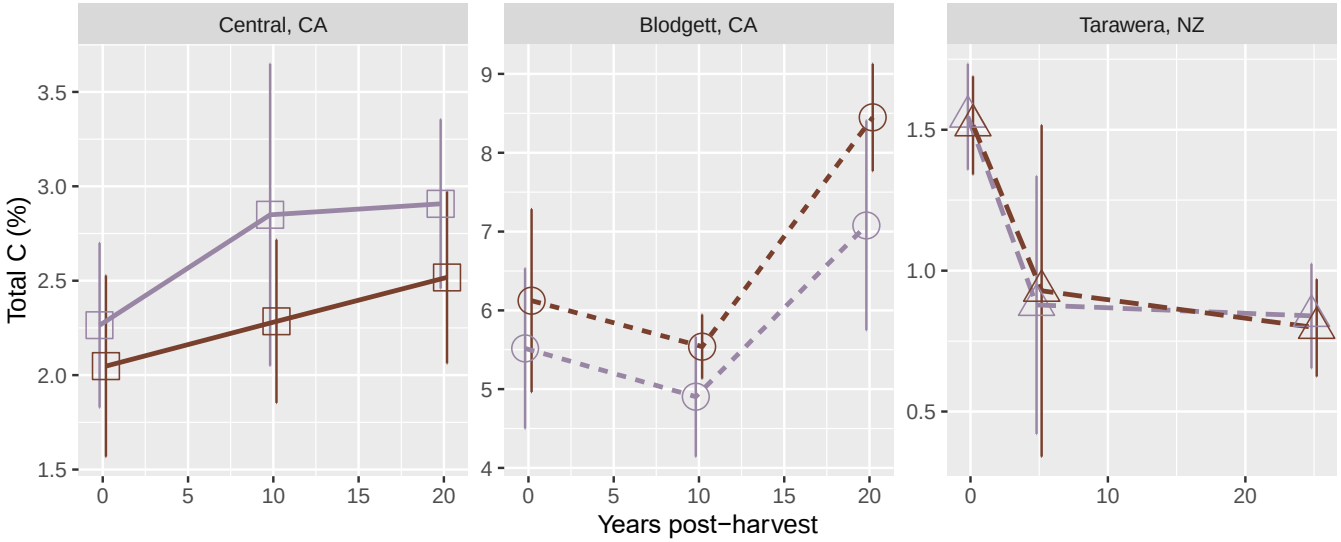
OM0 - Tree boles removed.

OM2 – All aboveground biomass removed. Bare soil exposed.

Major Findings

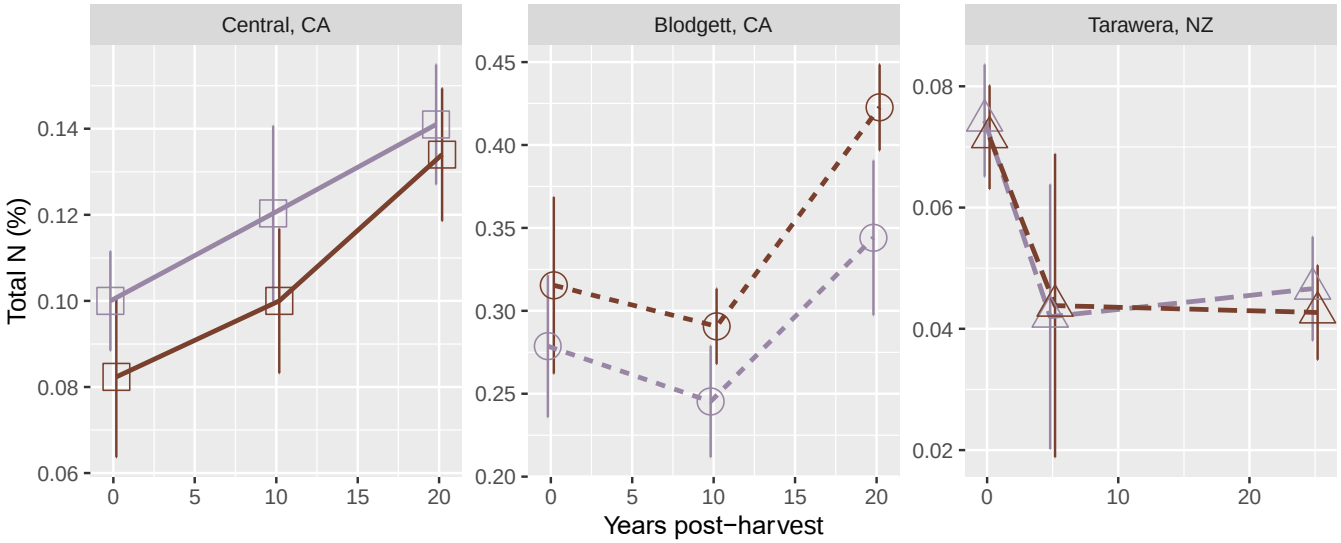
Carbon

Soil Carbon and Nitrogen are dynamic after harvesting



Nitrogen

But, C & N don't behave the same on all sites…

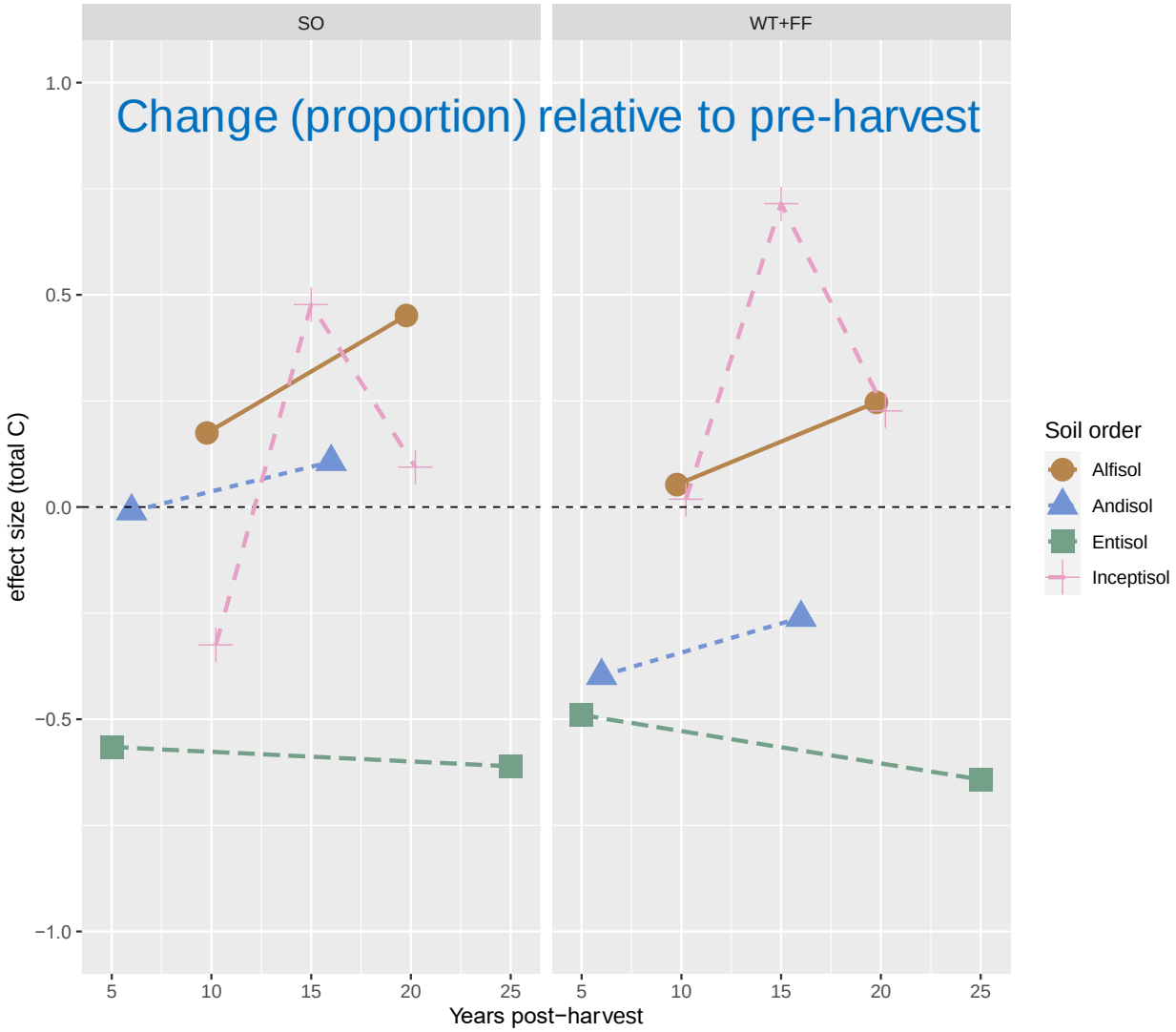


Major Findings

Can we predict the response based on soil order???

- Entisols = vulnerable to harvest
- Andisols = vulnerable to high intensity harvest
- Alfisols and Inceptisols = resistant/resilient to harvest *(Alfisols increase?)*

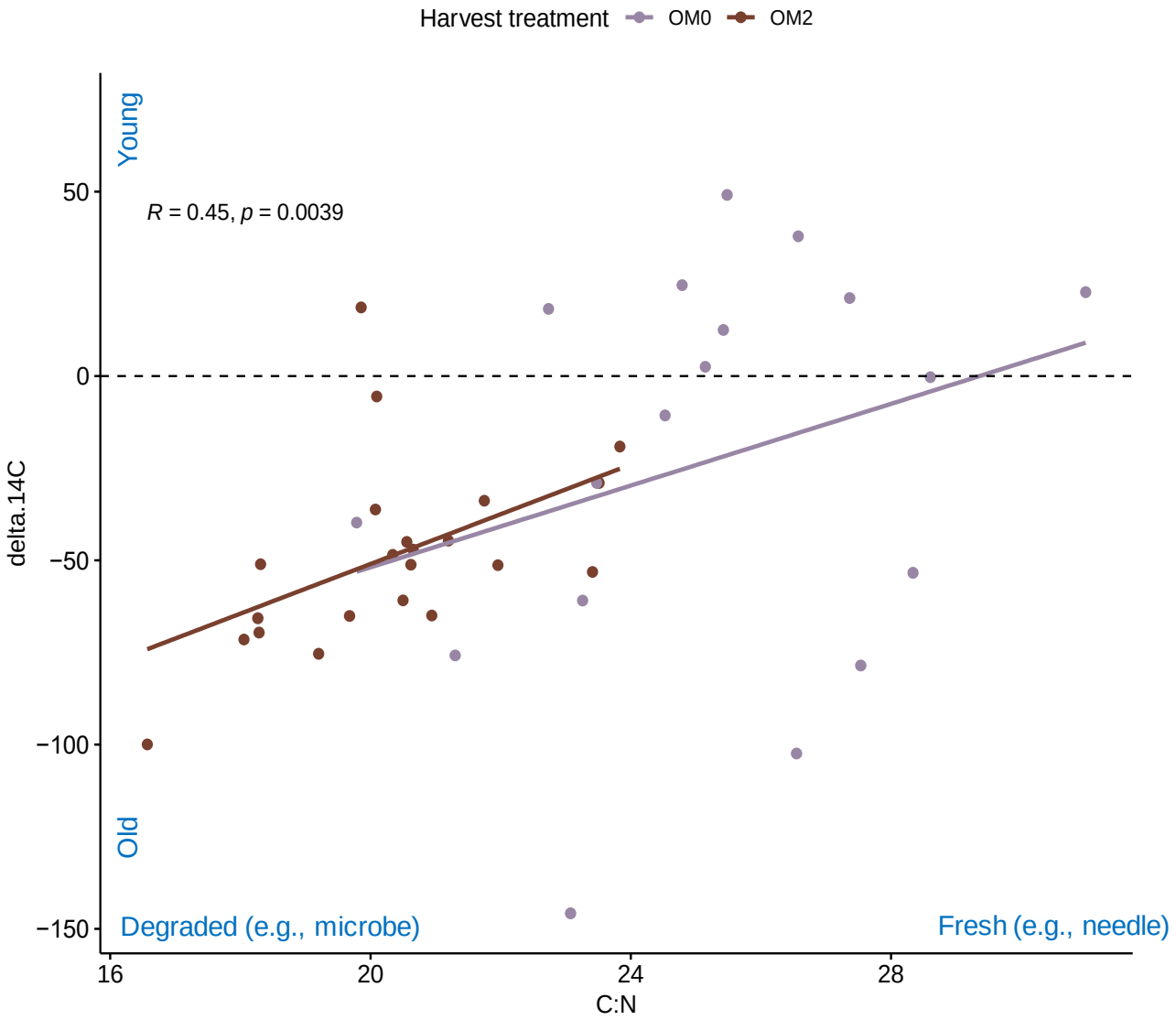
Why?
What are the mechanisms governing this response?



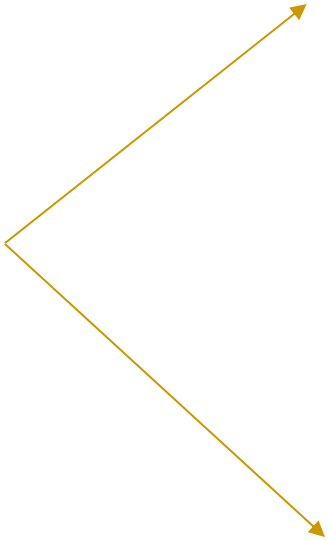
Major Findings

While there are differences in $\Delta^{14}C$ and C:N between the treatments – the relationship is the same.

Are these ”rules” the same across treatments, soils, sites, etc.?



Factors that govern response of soil organic matter to harvesting



ID vulnerable, resistant, resilient soils

ID opportunities for increasing soil carbon through forest management

Future Plans

Lab Work and Data Analysis

- Finish CuO
- Biomarker
- 14C abundances
- Stable isotopes
- BPCA

- Important Deadlines
  - SSSA Presentation November, 022
  - Steph's defense Summer 2023

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CAFS