KBS-LTER at 30:
Looking to the Future

KBS LTER
Kellogg Biological Station
Long-term Ecological Research

Ecological Theory and Working Lands

On Stakeholders



KBS-Long Term Ecological Research

gradient of landuse intensity

Main Cropping System Experiment
(Established 1989)

Most Intense

Conventional *(T1)*

No-till *(T2)*

Reduced input *(T3)*

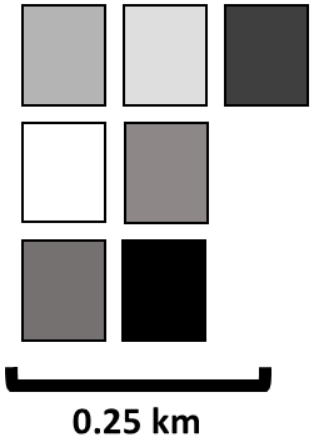
Organic *(T4)*

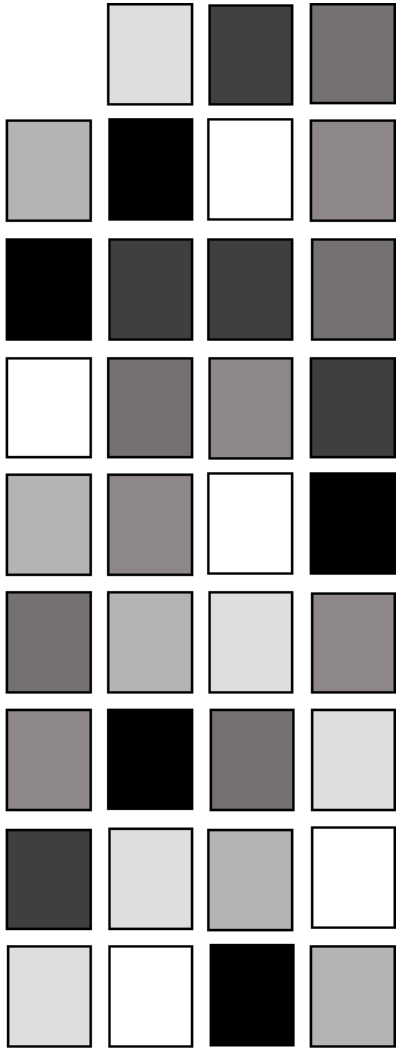
Perennial hardwood *(T5)*

Perennial herbaceous *(T6)*

Least Intense

Conservation lands *(T7)*





On the need for Long-Term

Conversion from Conventional to No-Till

Most Intense

Conventional *(T1)*

No-till *(T2)*

Reduced input *(T3)*

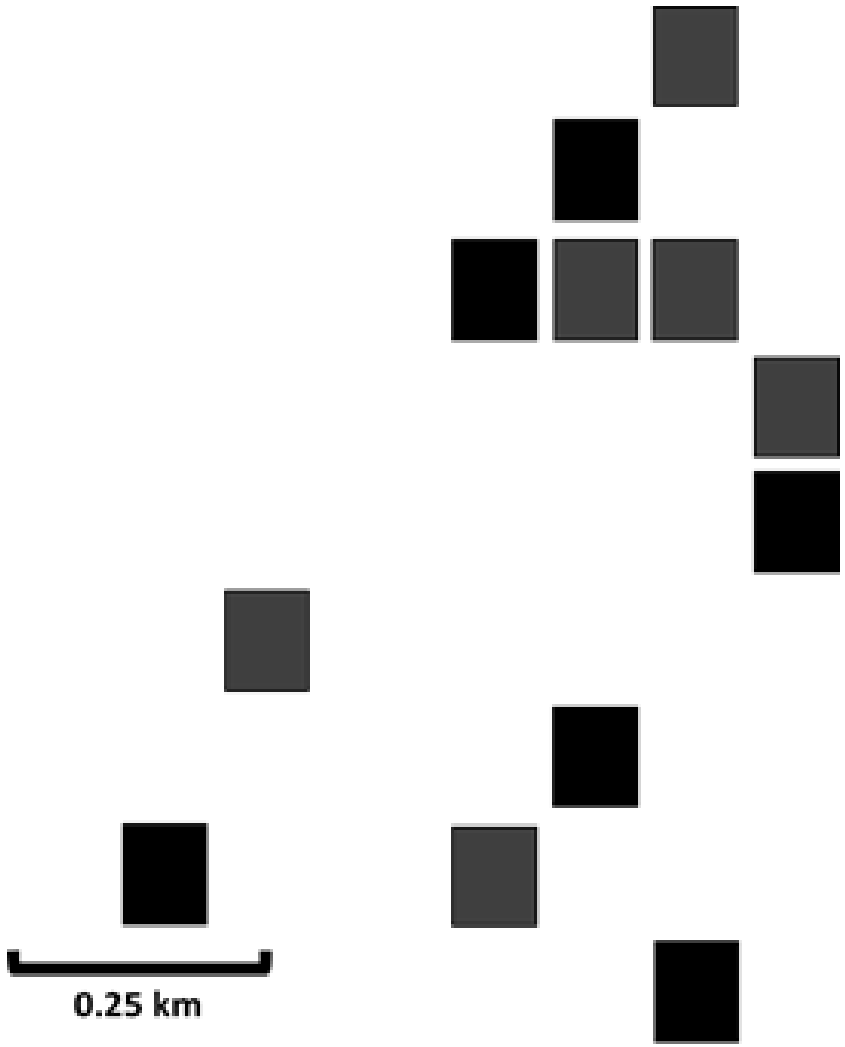
Organic *(T4)*

Perennial hardwood *(T5)*

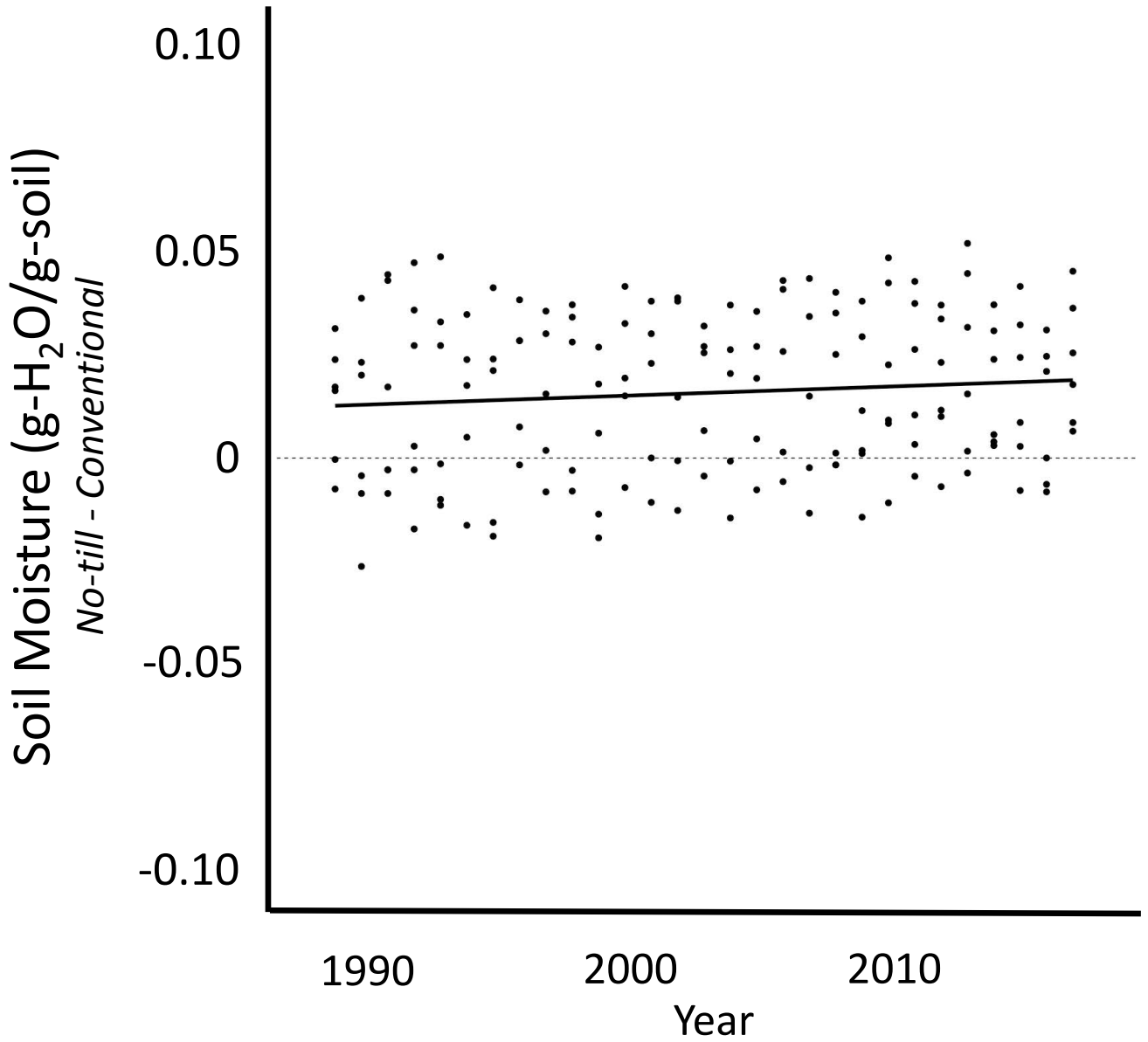
Perennial herbaceous *(T6)*

Least Intense

Conservation lands *(T7)*

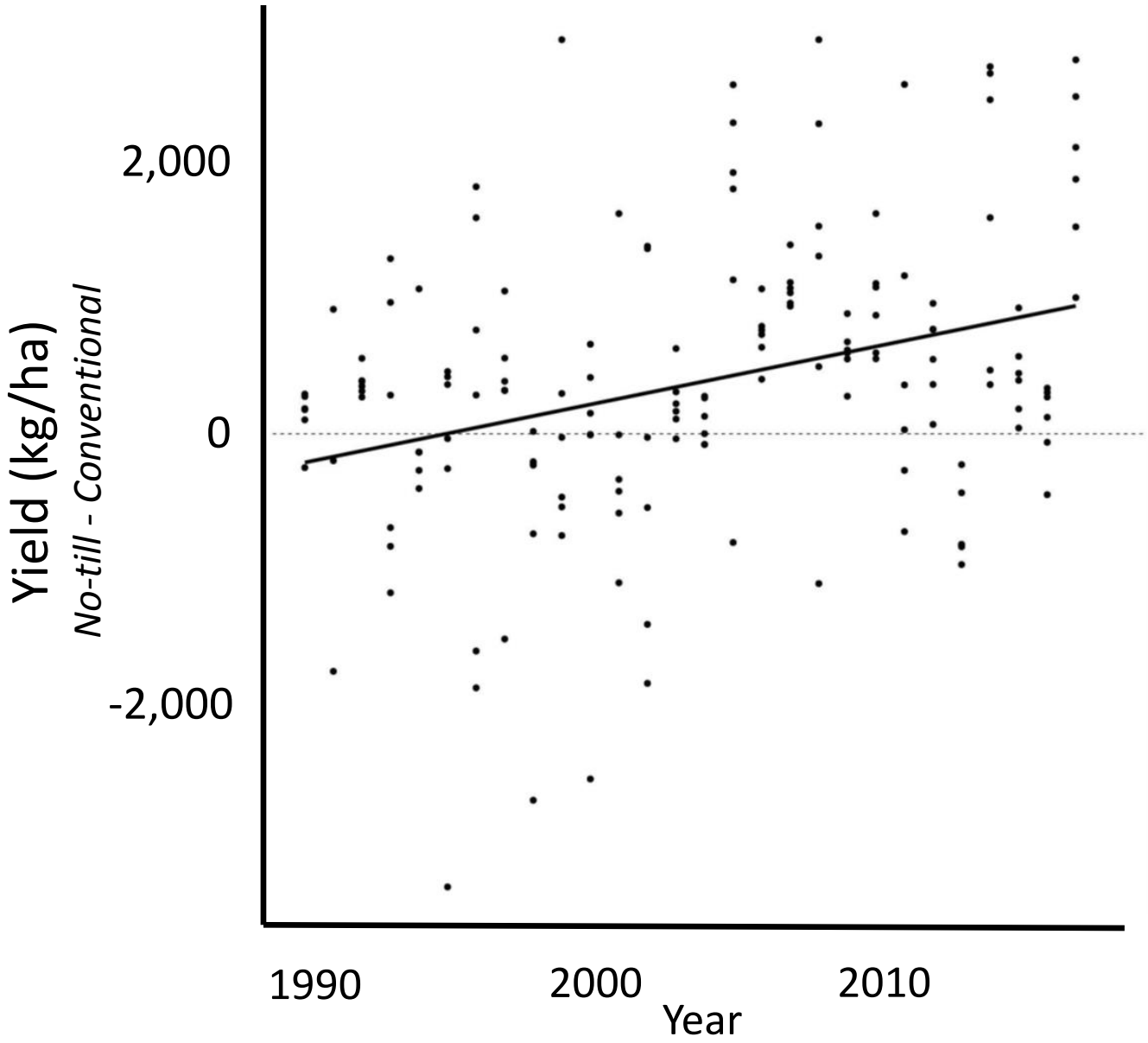


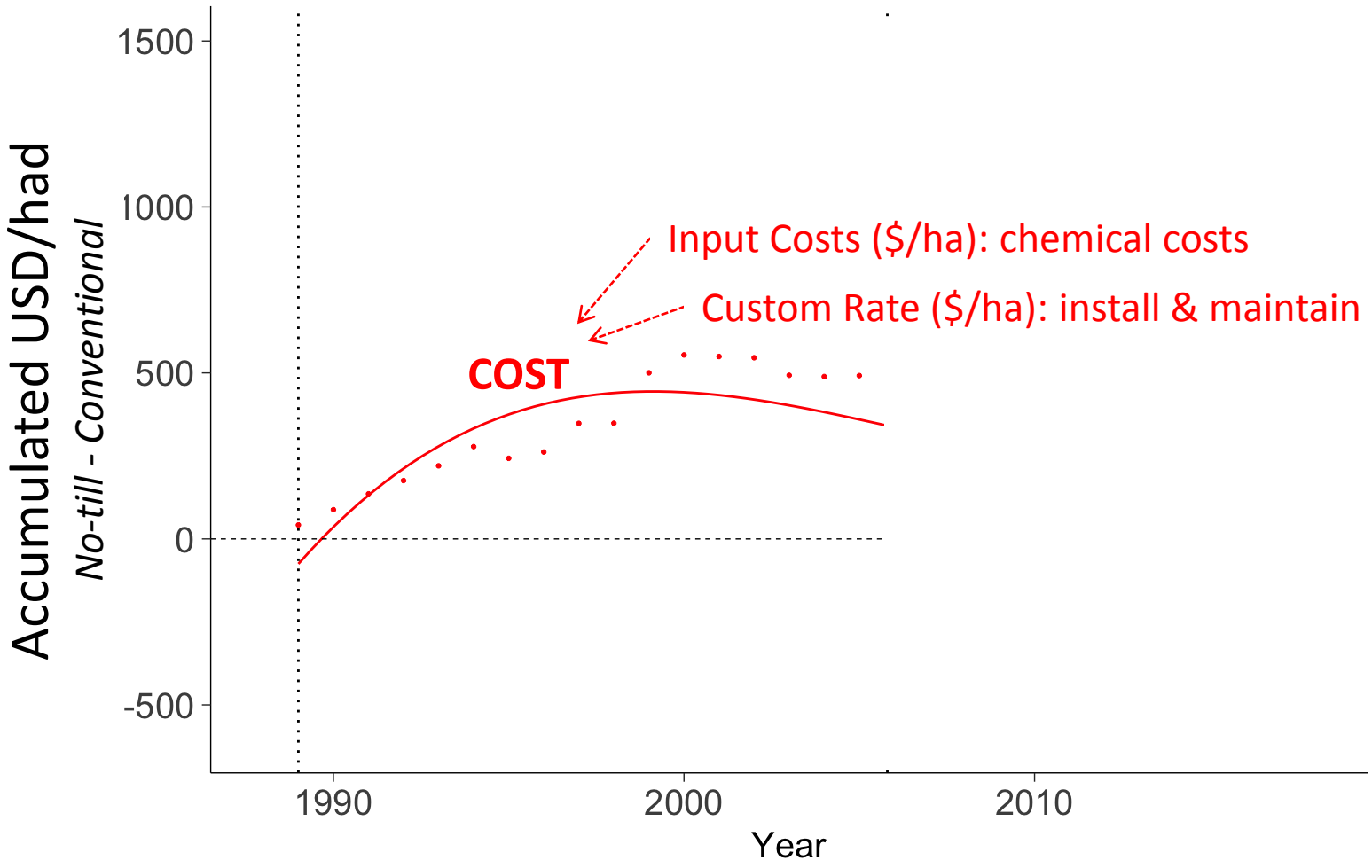
No-Till benefits Environment: Soil Moisture

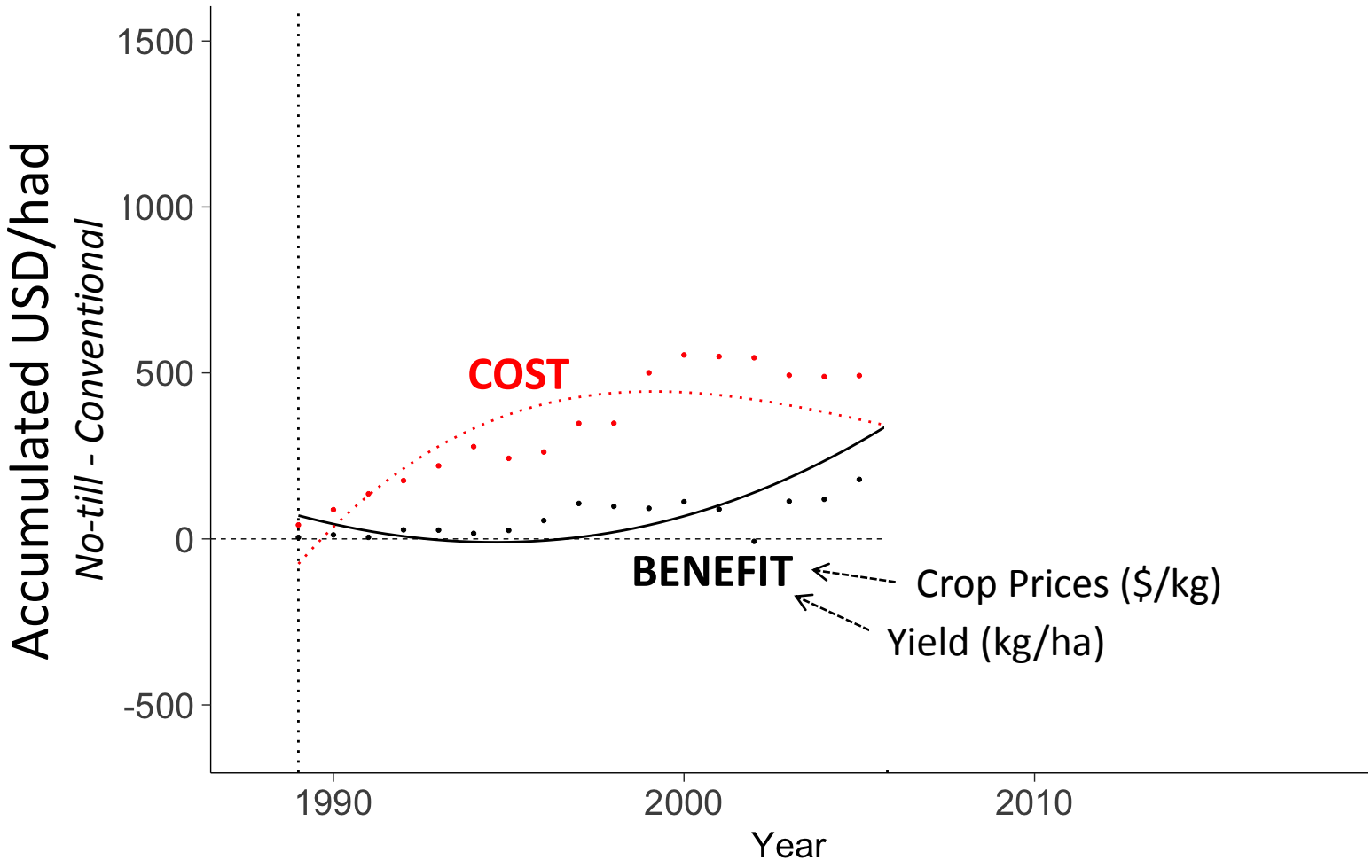


Thanks to Sarah Cusser

No-Till benefits Farmers: Yield



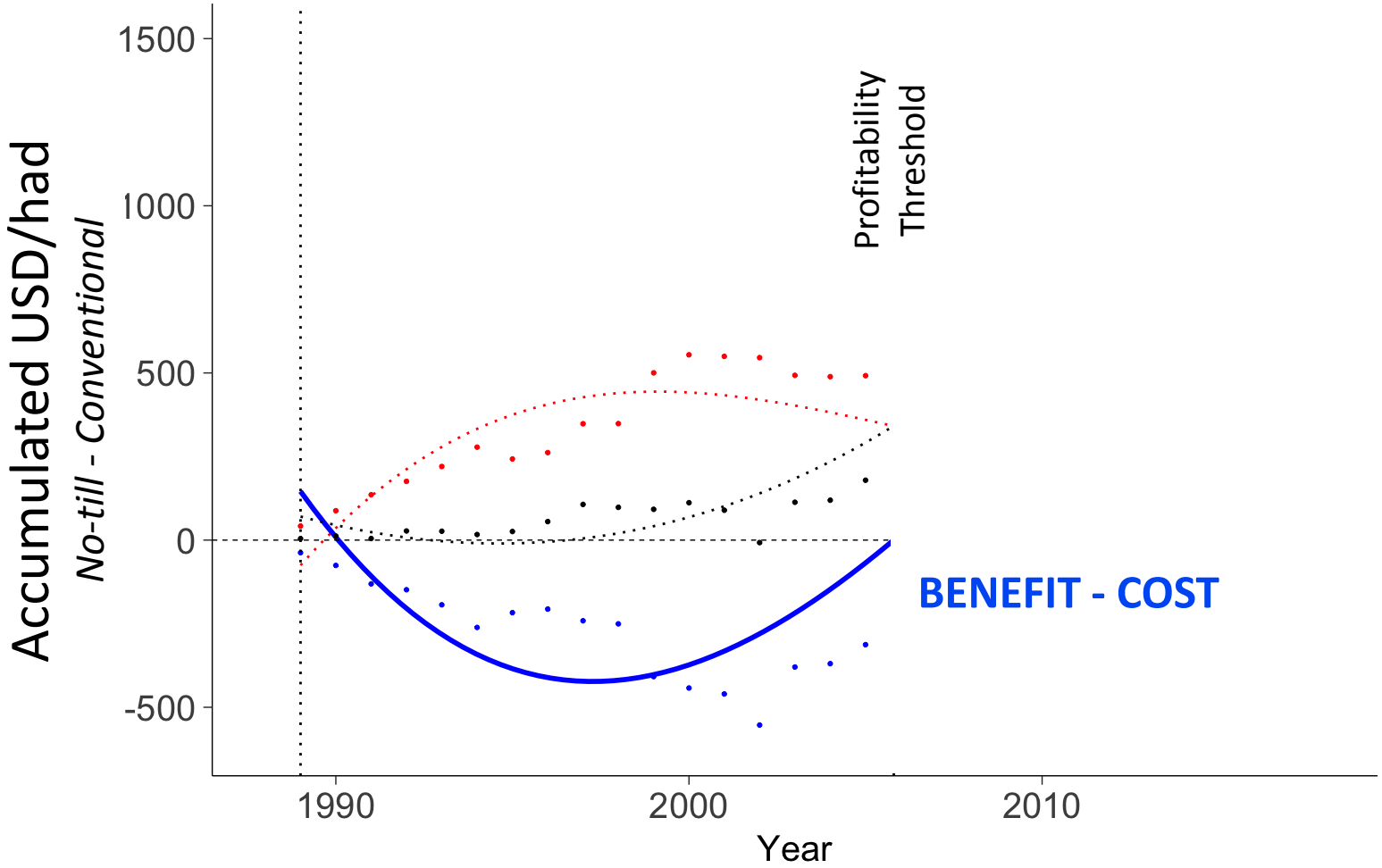

Accumulated USD/had
No-till - Conventional
1500
1000
500
0
-500
1990
2000
2010
Year
Input Costs ($/ha): chemical costs
Custom Rate ($/ha): install & maintain
COST


Accumulated USD/had
No-till - Conventional
1500
1000
500
0
-500
COST
BENEFIT
Crop Prices ($/kg)
Yield (kg/ha)
1990
2000
2010
Year

Convert to No-Till?

The Valley of Despair

A Sustainable Path

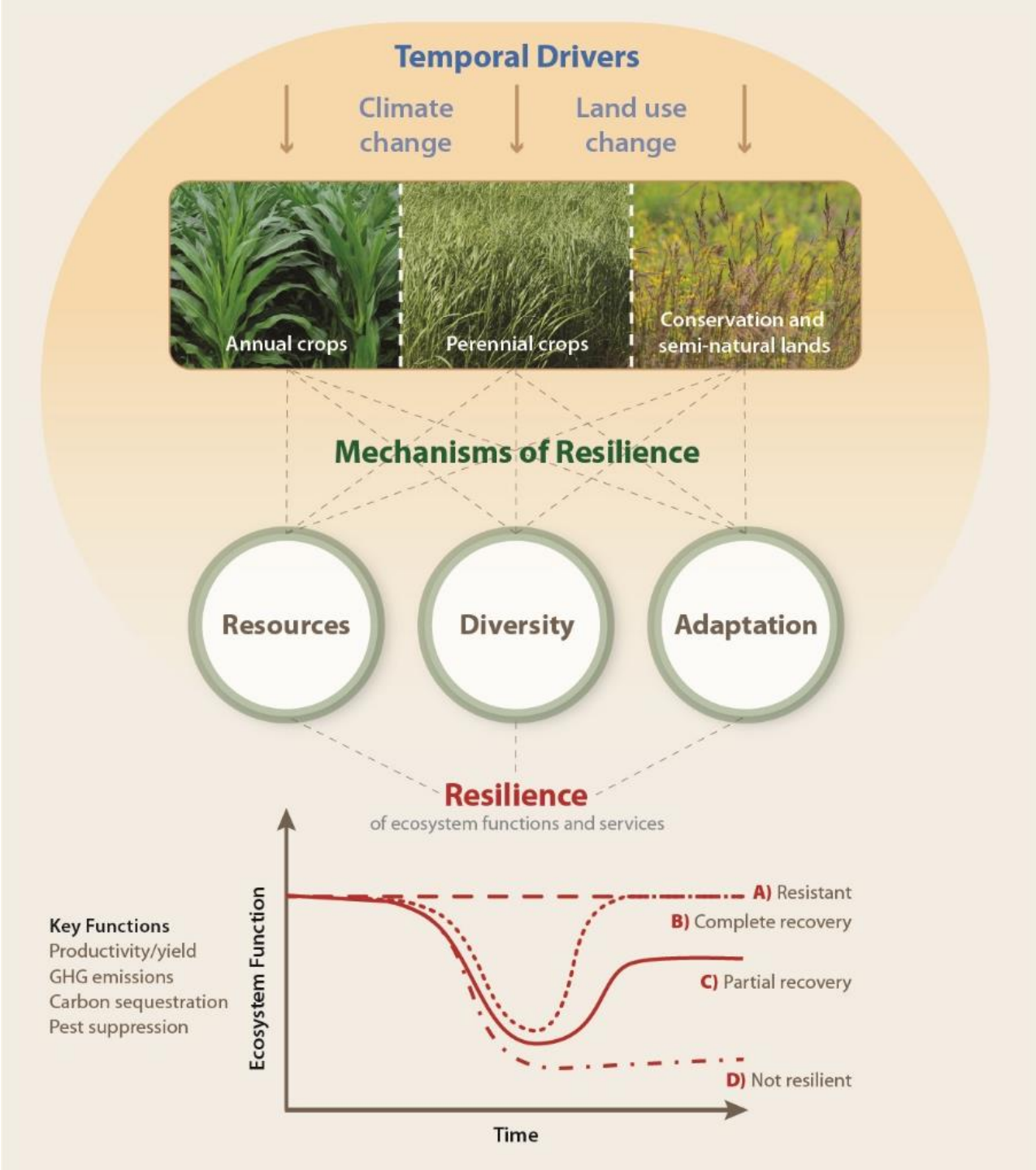


Looking forward

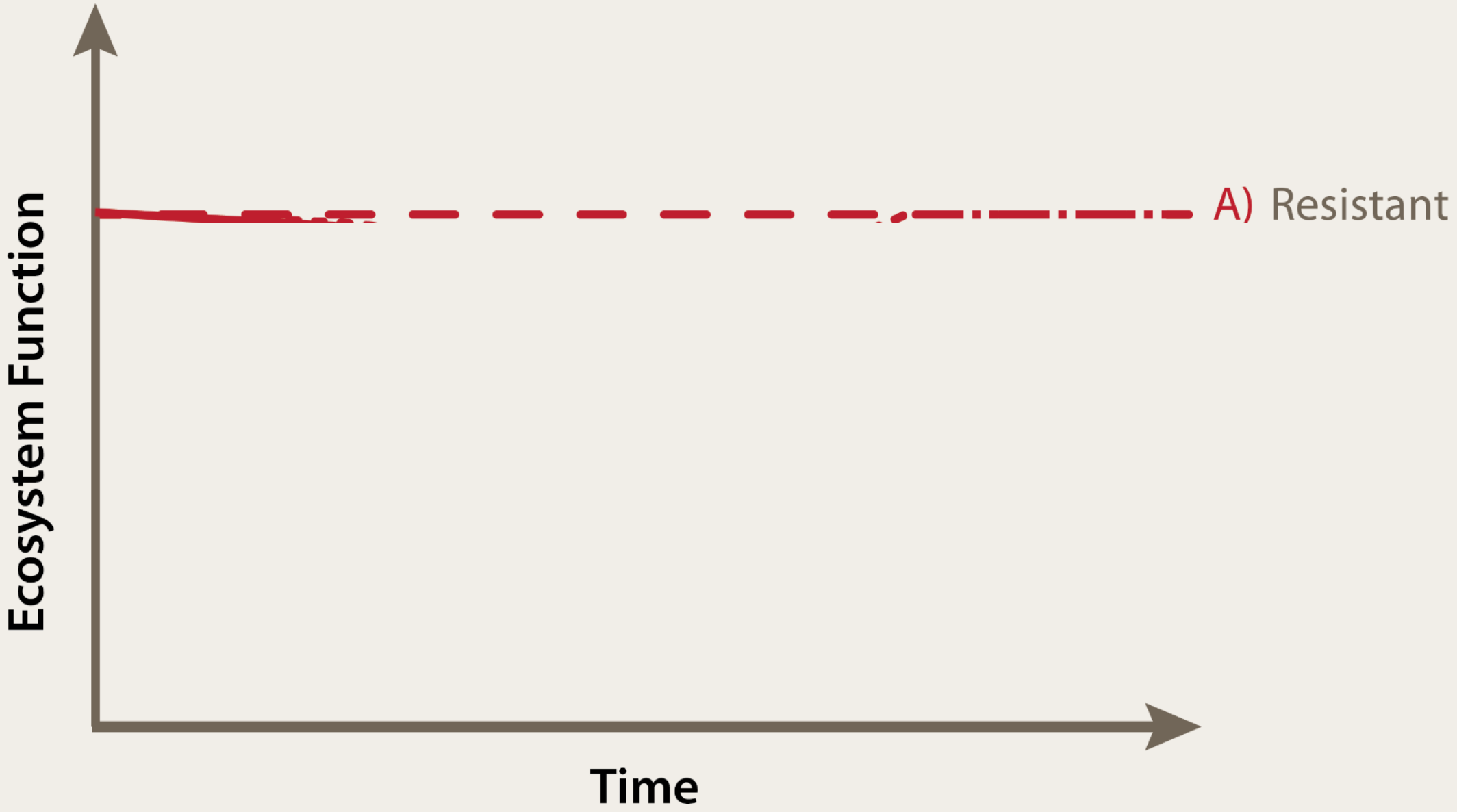
Overarching Question:

What mechanisms contribute to the resilience of ecosystem functions and services in agricultural landscapes?

KBS-LTER
Conceptual Model

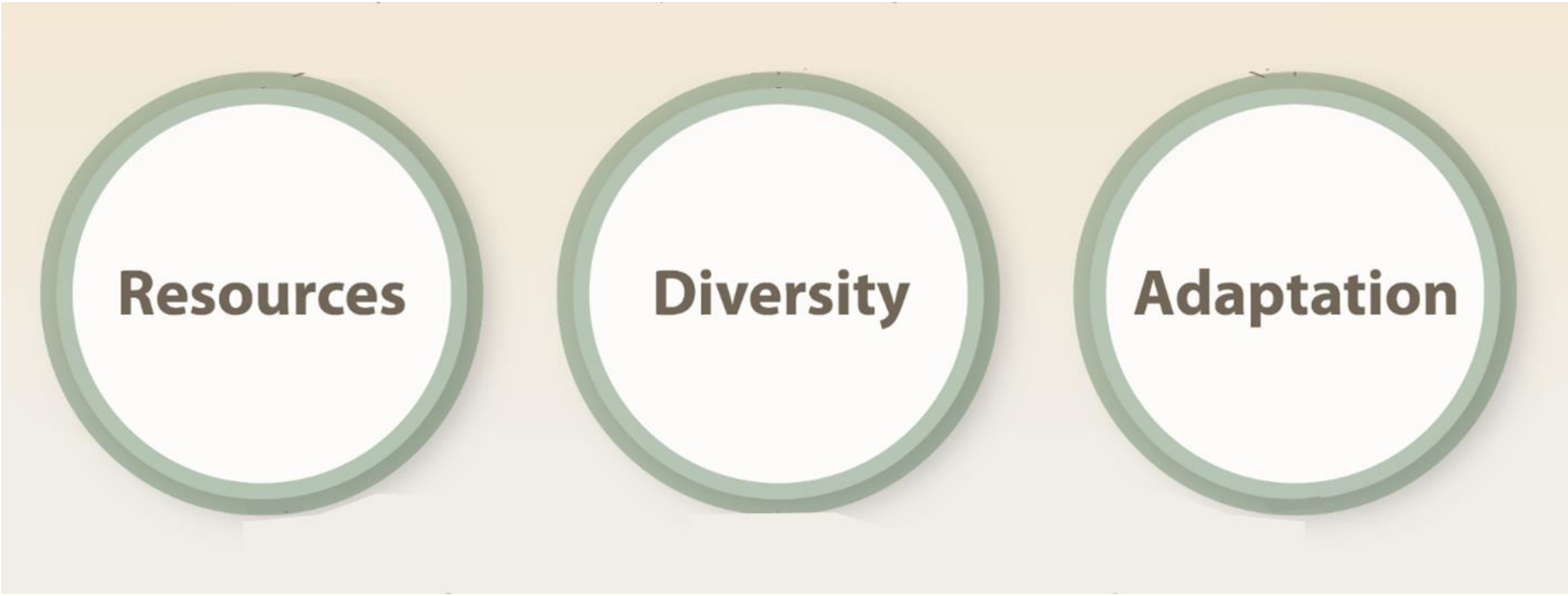


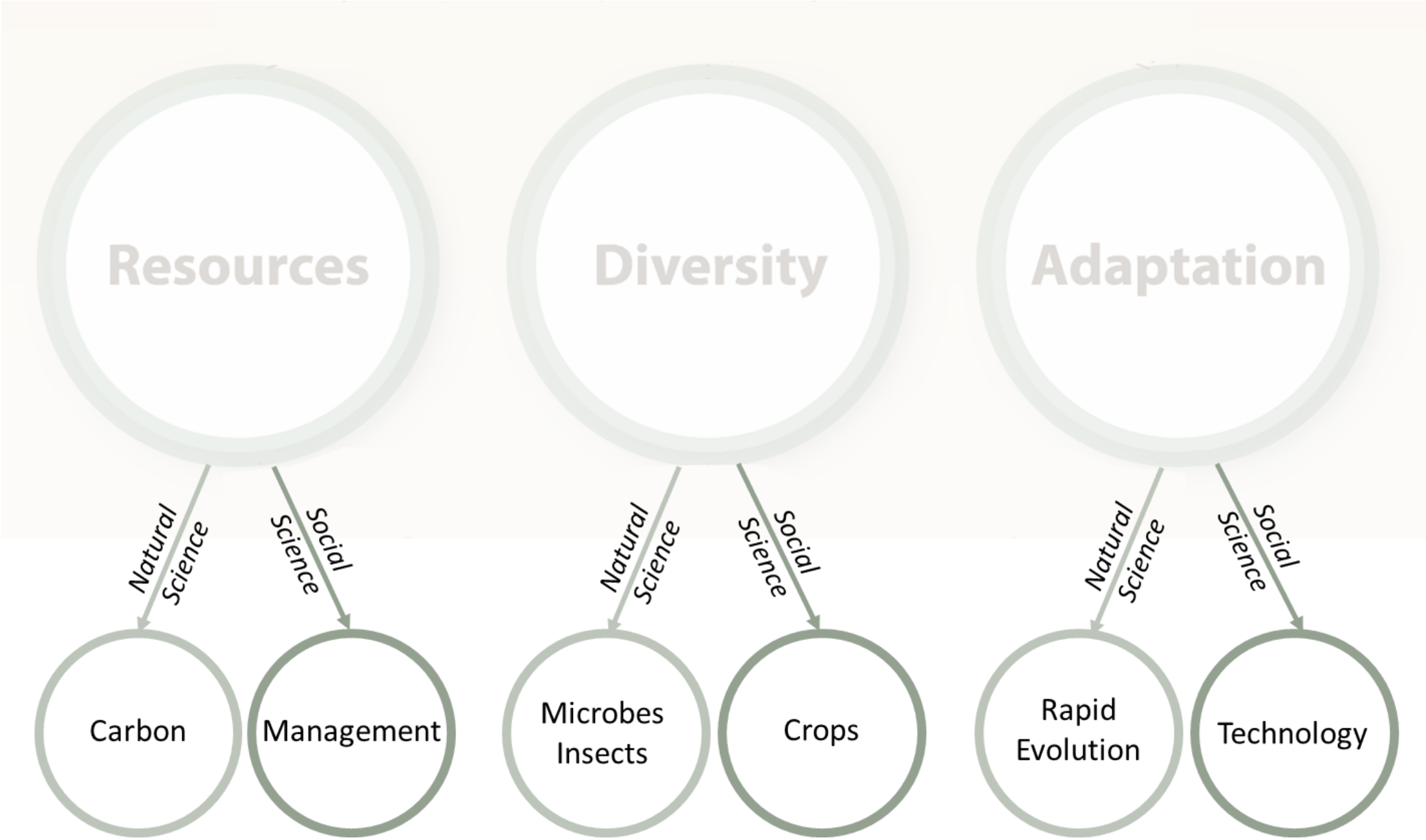
Resilience



See Carissa Gervasi's poster

Mechanisms of Resilience




Resources
Diversity
Adaptation
Natural Science
Social Science
Natural Science
Social Science
Natural Science
Social Science
Carbon
Management
Microbes Insects
Crops
Rapid Evolution
Technology

Temporal Drivers

Climate change

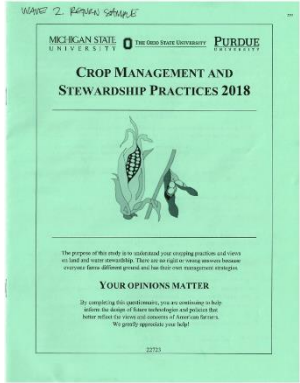
Land use change

Growing Season Drought

Diversified Landscapes

Today will feature other KBS-LTER Experiments

- Panel Farmer Survey
  (established 2017)


WAVE 2 RAPIDAN SAMPLE

MICHIGAN STATE UNIVERSITY | THE OHIO STATE UNIVERSITY | PURDUE UNIVERSITY

CROP MANAGEMENT AND STEWARDSHIP PRACTICES 2018

The purpose of this study is to understand your cropping practices and views on land and water stewardship. There are no right or wrong answers because everyone farms different ground and has their own management strategies.

YOUR OPINIONS MATTER

By completing this questionnaire, you are continuing to help inform the design of future technologies and policies that better reflect the views and concerns of farmer-can farmers. We greatly appreciate your help!

22723

- Bioenergy Cropping System Experiment
  (established 2008)

- Conservation Lands Experiment
  (established 2016)