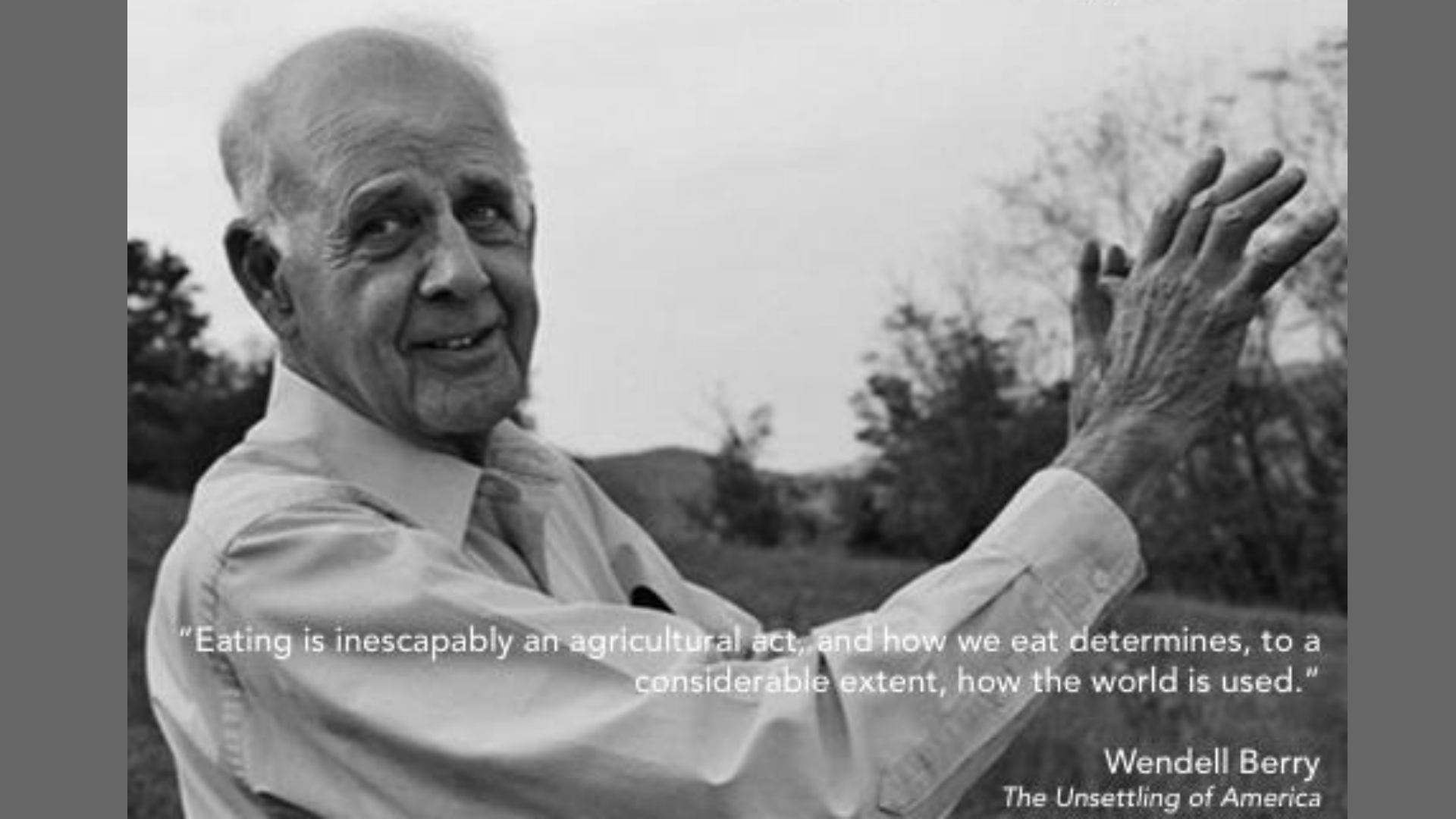


# Regenerative Farm Planning to Solve the Water Supply Gap

Tanner Starbard



Mad Agriculture



"Eating is inescapably an agricultural act, and how we eat determines, to a considerable extent, how the world is used."

Wendell Berry  
*The Unsettling of America*

# Regenerative Agriculture

A wide-angle photograph of a golden wheat field at sunset. The sun is low on the horizon, creating a warm, golden glow and long shadows. The wheat stalks are in the foreground, and the field extends to the horizon under a sky with scattered clouds.

Farming and Ranching with Nature



# Why Regenerative Agriculture?

- Farmer Livelihood
- Environmental Impacts
- Nutrition and Health









# REGENERATIVE AGRICULTURE SHIFTS THE PARADIGM



Compete with Nature

Disturb Soil

Monoculture

Reductionist



Partner with Nature



Protect Soil



Diversity



Holistic

# Water for the Recovery of the Climate - A New Water Paradigm



M. Kravčík, J. Pokorný, J. Kohutiar,  
M. Kováč, E. Tóth

“While attention thus far has focused on the impact of climate changes on the water cycle, the altered paradigm recommends concentrating attention on the impact of changes in the water cycle on climate changes”



# Water for the Recovery of the Climate - A New Water Paradigm



M. Kravčík, J. Pokorný, J. Kohutiar,  
M. Kováč, E. Tóth

Rainwater is an inconvenience and needs to be quickly removed.

The main source and reserve of water is surface water.

Rainwater is an asset that needs to be retained in soil/plants.

The main source and reserve of water is groundwater.



Controlling Nature



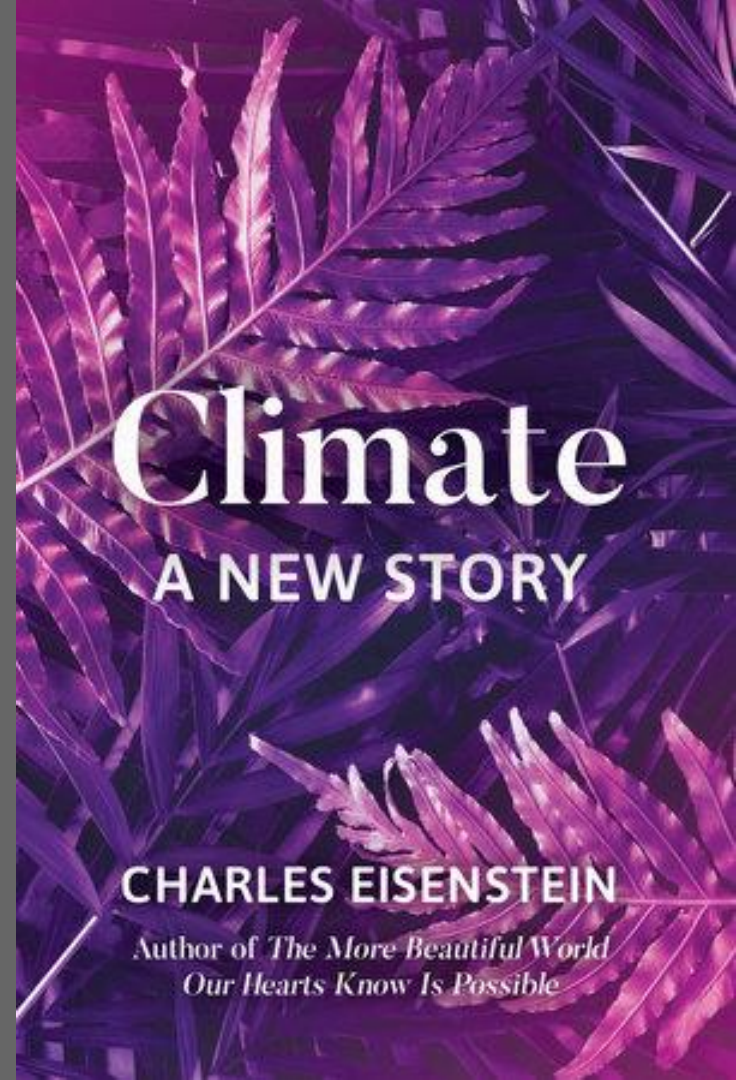
Partnering with Nature



“If the FIGHT against climate change is a war, it’s clear which side is winning...

“I want to question the assumption that we can and should motivate the public with fear-based appeals to self interest...

“The ecological crisis is calling us to a deeper kind of revolution.”



“If everyone focused their love, care, and commitment on protecting and regenerating their local places, while respecting the local places of others, then a side effect would be the resolution of climate change.”



# Climate

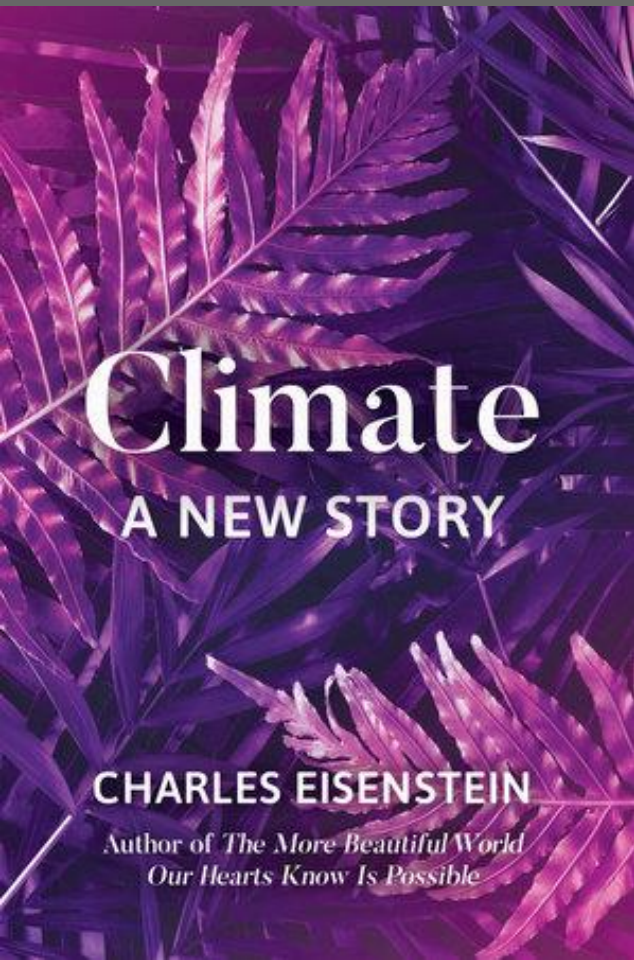
A NEW STORY

**CHARLES EISENSTEIN**

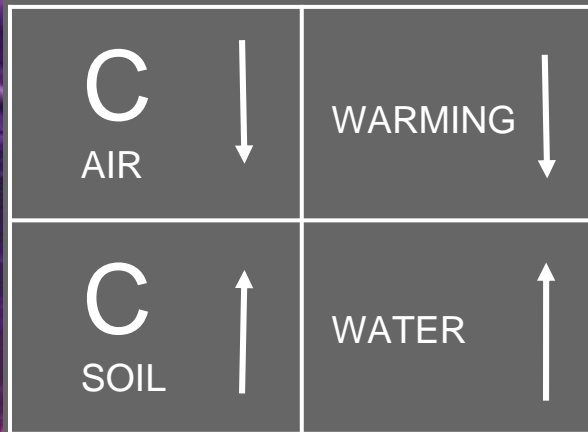
*Author of The More Beautiful World  
Our Hearts Know Is Possible*



# Carbon, Climate, and Soil



## Mitigation



## Resilience

## Water for the Recovery of the Climate - A New Water Paradigm



M. Kravčík, J. Pokorný, J. Kohutiar,  
M. Kováč, E. Tóth

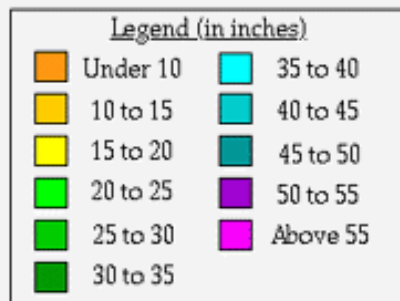


Effective Rainfall: How much it rained vs how much was retained



## Average Annual Precipitation

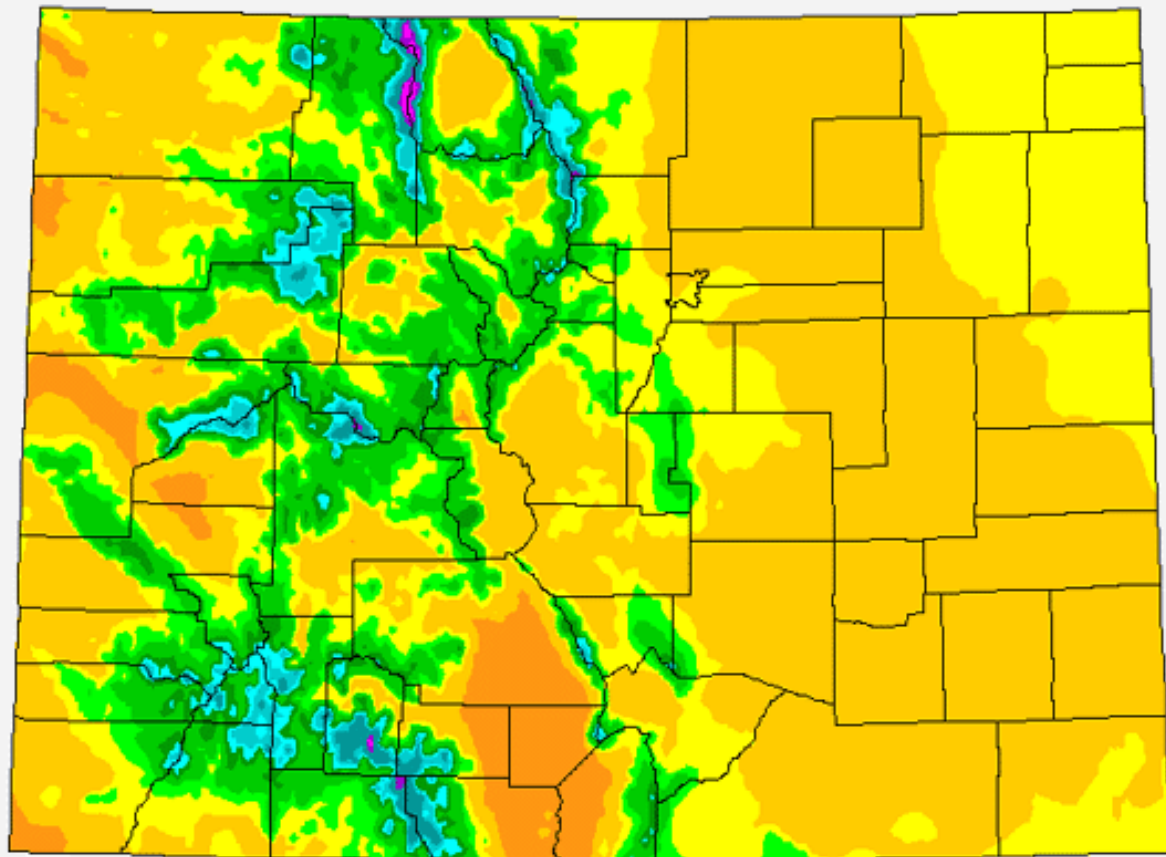
### Colorado



This is a map of annual precipitation averaged over the period 1961-1990. Station observations were collected from the NOAA Cooperative and USDA-NRCS Snotel networks, plus other state and local networks. The PRISM modeling system was used to create the gridded estimates from which this map was made. The size of each grid pixel is approximately 4x4 km. Support was provided by the NRCS Water and Climate Center.

For information on the PRISM modeling system, visit the SCAS web site at  
<http://www.ocs.orst.edu/prism>

The latest PRISM digital data sets created by the SCAS can be obtained from the Climate Source at  
<http://www.climatesource.com>



Copyright 2000 by Spatial Climate Analysis Service,  
Oregon State University



**MAD  
AG!**



VISION

Design

Action

Adaptation



## Farm Enterprise and Family

Where do you want your operation to be in 20 years?

What kind of lifestyle does your family want to have?

# VISION

# Design

# Action

# Adaptation

## The Land

How do you observe your land?

What does the land want to be?



Vision

DESIGN

Action

Adaptation



### Farm Enterprise

Balance the risks and costs of adopting new practices and enterprises with the values derived from their implementation.



Vision

DESIGN

Action

Adaptation

The Land

Ecological outcomes modeled  
and projected

ROI of soil carbon, nutrient  
availability, water, habitat,  
resilience, and beauty.

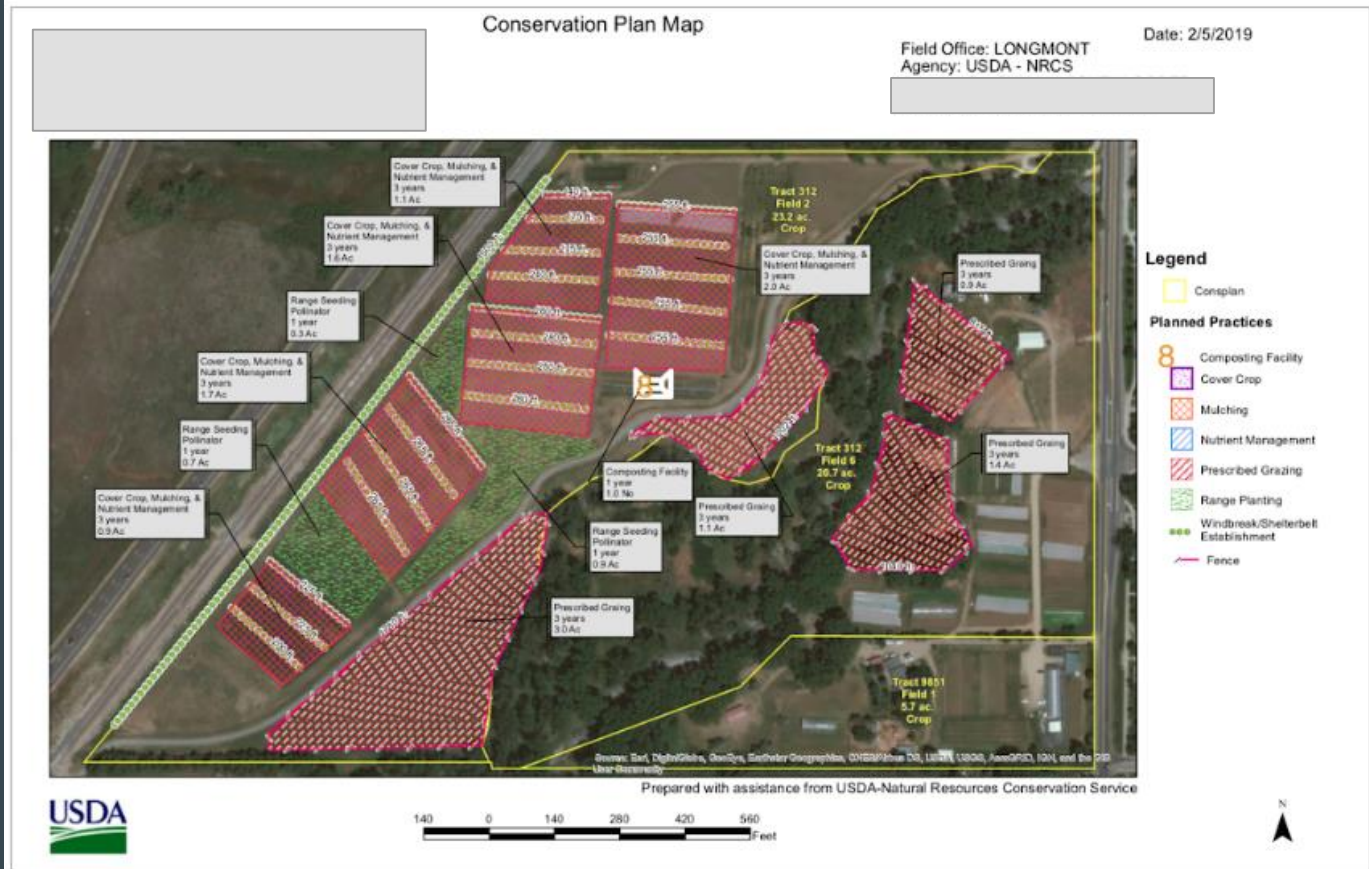


# Vision

# DESIGN

# Action

# Adaptation



# Vision

# Design

# ACTION

# Adaptation

## Bennett Property Carbon Farm Plan

Prepared by Mad Agriculture

Property Owner: City of Boulder

Property Management: Marcus McCauley, McCauley Family Farms

Acreage: 124.5



Image 1. Aerial images taken over the Bennett Property looking toward the east.

## Farm Enterprise

Partner with organizations involved in cost sharing

Create and tell the story of farming operations for premium markets

Good stewardship is good business.



Vision

Design

**ACTION**

Adaptation

The Land

- ❖ Compost
- ❖ Rotational Grazing
- ❖ Crop Rotations
- ❖ Cover Crops
- ❖ Keyline Design
- ❖ Habitat Areas
- ❖ Riparian Zones



Vision

Design

Action

ADAPTATION



The Land

Seasonal, annual, and multi-year assessments create new priorities for land regeneration

Vision

Design

Action

ADAPTATION

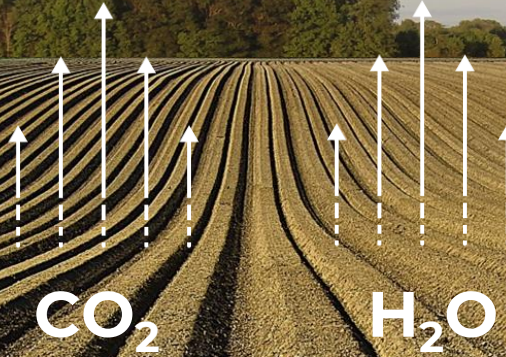
## Farm Enterprise

As a farming system aligns more with nature, the effort to control, the energy to restore, and cost to produce goods and services are reduced





Degenerative\*



CO<sub>2</sub>

H<sub>2</sub>O

**TILL**

\*In general this practice leads to degeneration of soil health.

Regenerative\*



CO<sub>2</sub>

H<sub>2</sub>O



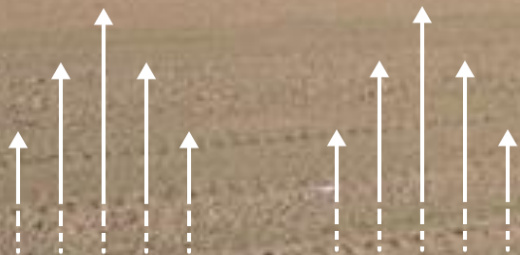
**No-Till**

\*In general this practice leads to regeneration of soil health.

KISS  
-the-  
GROUND



Degenerative\*



CO<sub>2</sub>

H<sub>2</sub>O

# Bare Soil



Regenerative\*



CO<sub>2</sub>

H<sub>2</sub>O

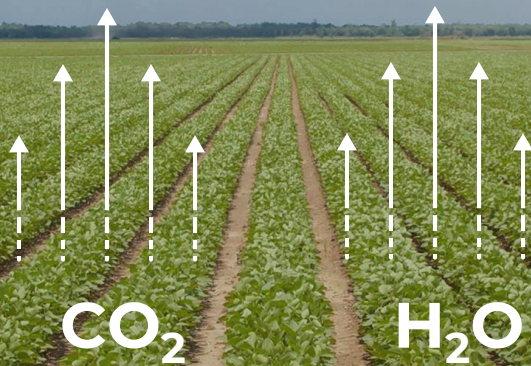
# Cover Crops



KISS  
- the -  
GROUND



Degenerative\*



# Annual

\*In an otherwise conventional system, this practice leads to degeneration of soil health.

Regenerative\*



$\text{CO}_2$

$\text{H}_2\text{O}$



# Perennial

\*In concert with other regenerative practices can help rebuild healthy soil.

KISS  
-the-  
GROUND



Degenerative\*



CO<sub>2</sub>

H<sub>2</sub>O



**No  
Windbreaks**

\*In an otherwise conventional system, this practice leads to degeneration of soil health.

Regenerative\*



CO<sub>2</sub>

H<sub>2</sub>O



**Windbreaks**

\*In concert with other regenerative practices can help rebuild healthy soil.

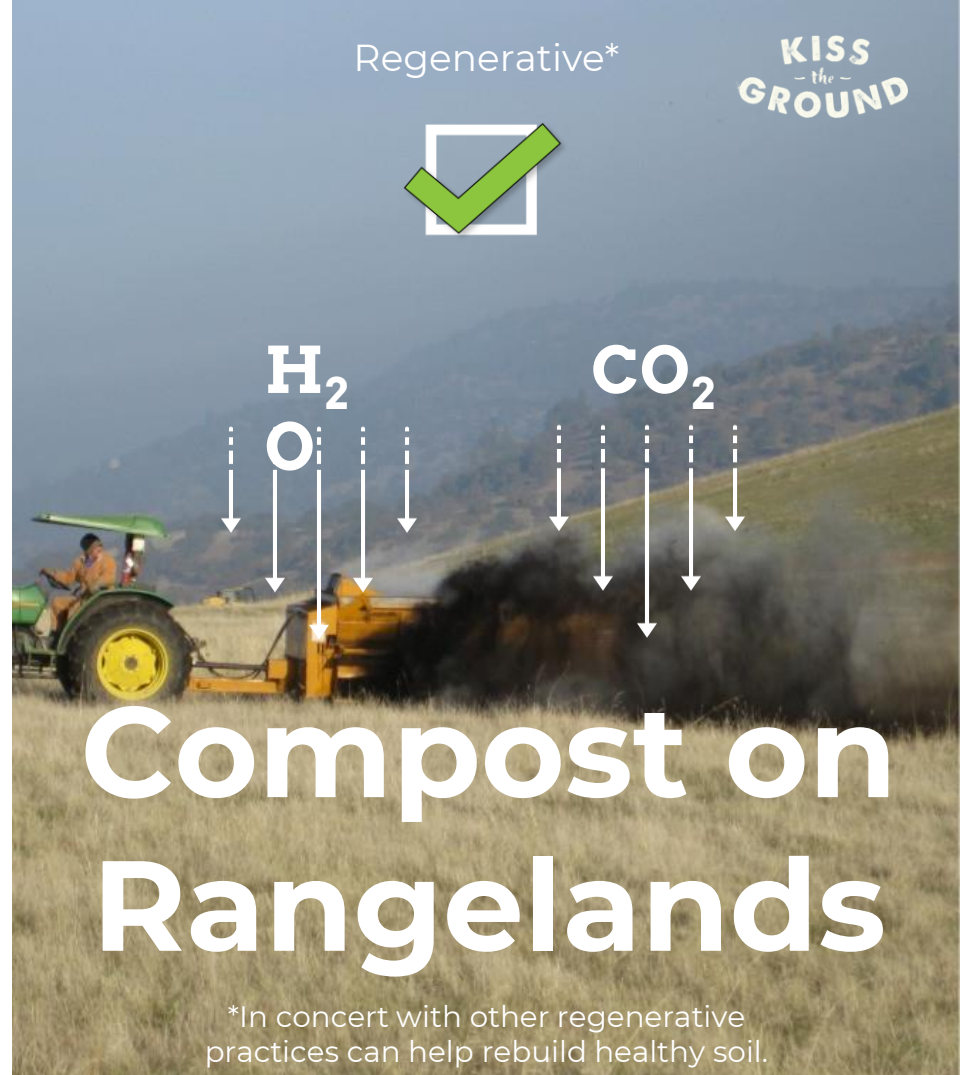
Degenerative



# Organics in Landfills

Regenerative\*

KISS  
-the-  
GROUND



# Compost on Rangelands

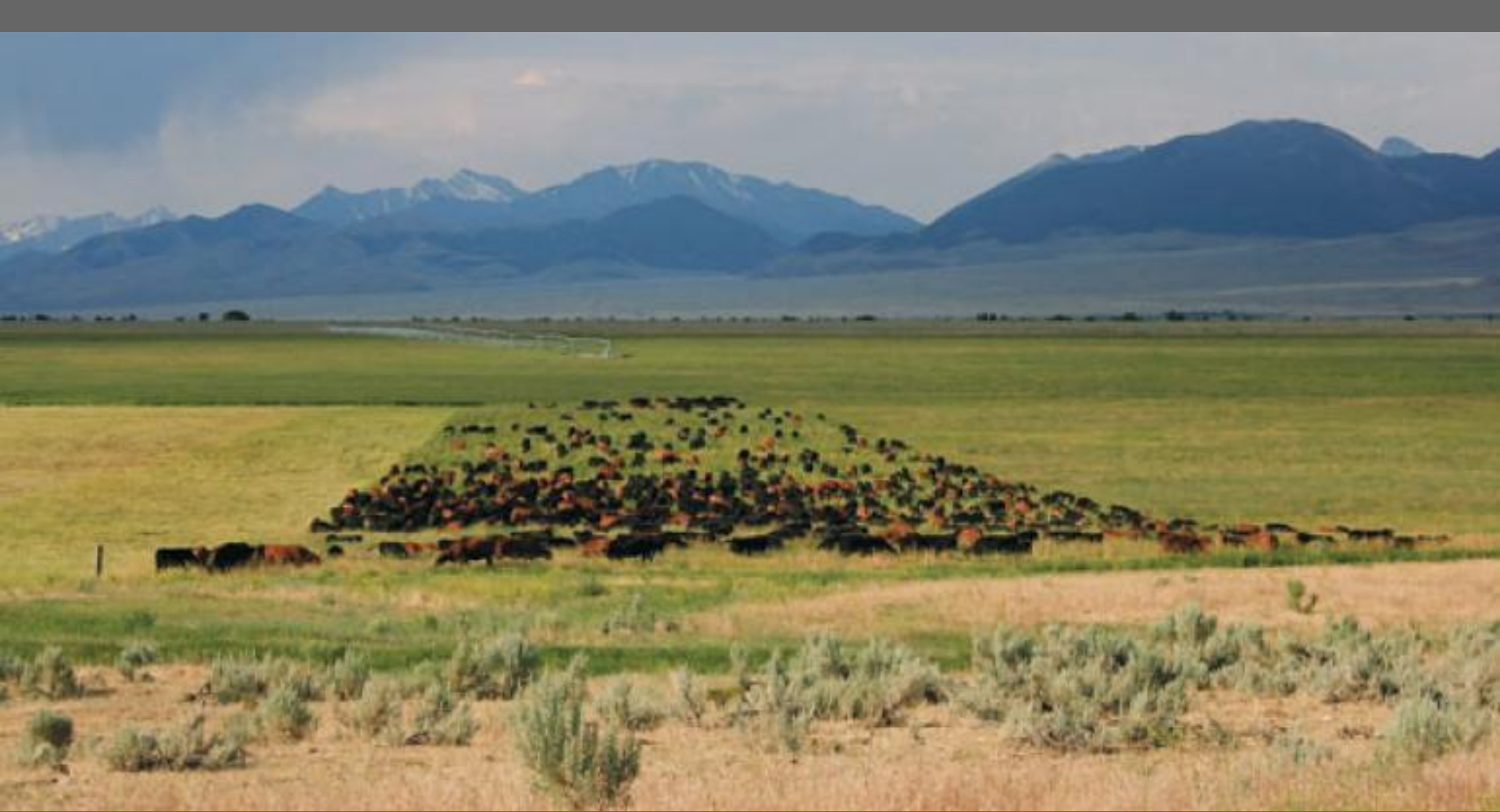
\*In concert with other regenerative practices can help rebuild healthy soil.



# MARIN CARBON PROJECT







1963



Savory Institute  
HOLISTIC MANAGEMENT

2003



# Dirt to Soil

**One Family's Journey into  
Regenerative Agriculture**

**Gabe Brown**



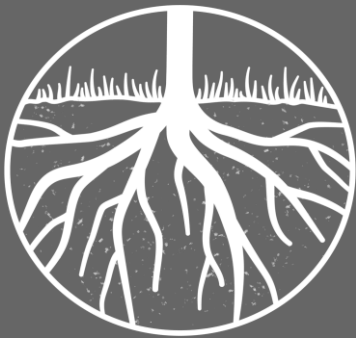


# 5 PRINCIPLES

KISS  
-the-  
GROUND



**Least  
Disturbance**



**Living  
Root**



**Soil  
Armor**

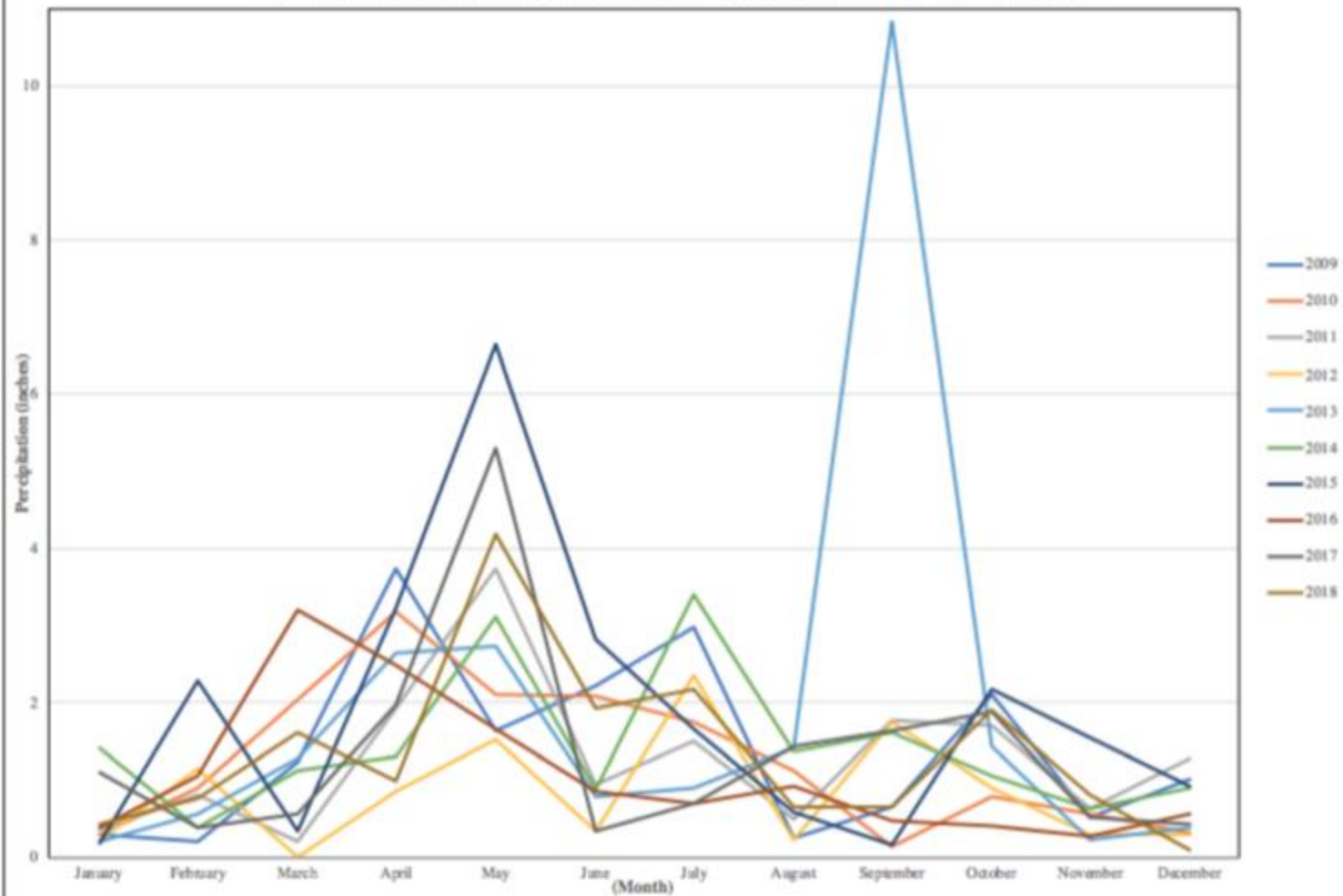


**Animal  
Integration**



**Increased  
Biodiversity**

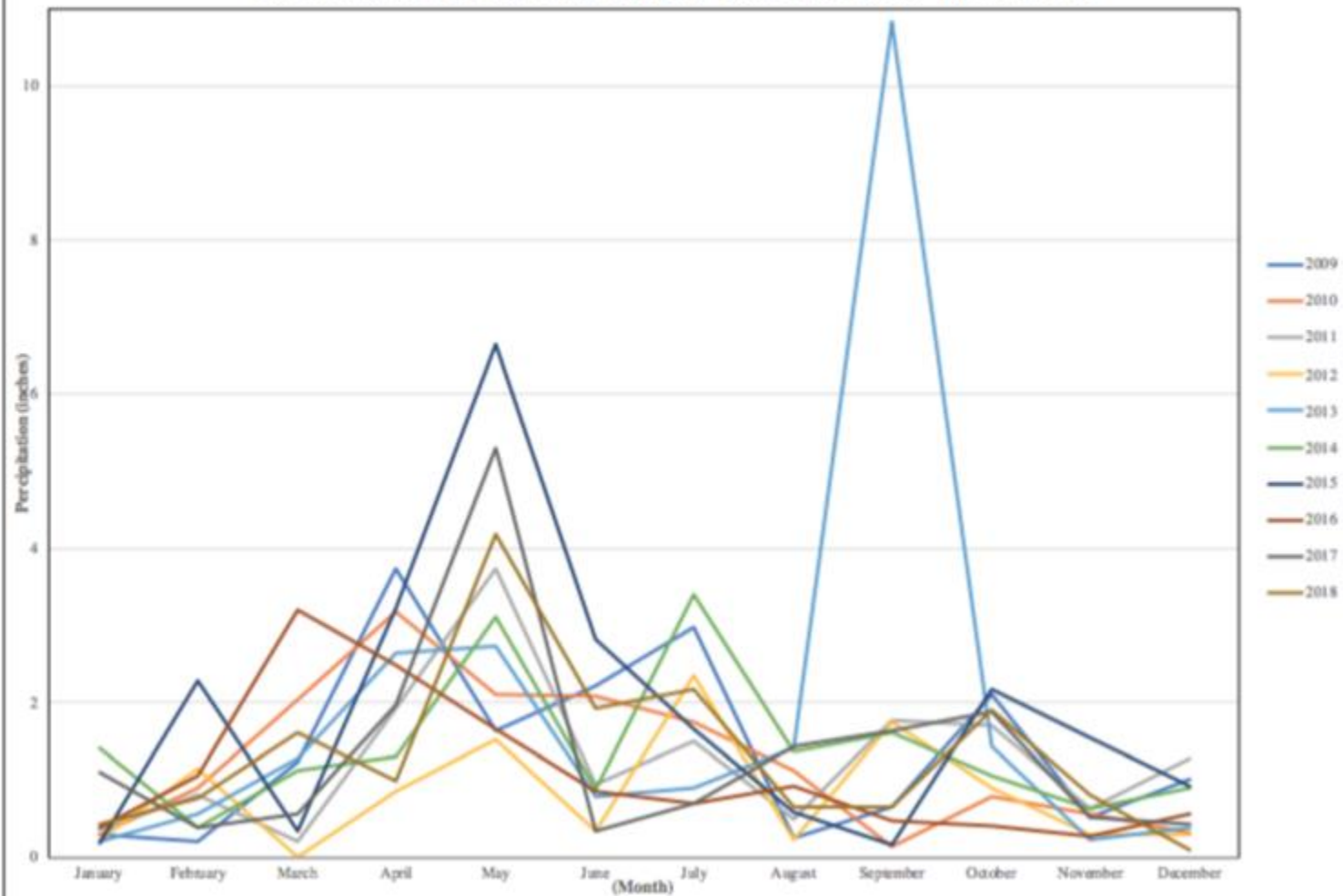
Precipitation: Black Cat, 2009-2018  
Location: Oxford Rd Lat: 40.1263 Lon: -105.2223 Elev: 5194ft







Precipitation: Black Cat, 2009-2018  
Location: Oxford Rd Lat: 40.1263 Lon: -105.2223 Elev: 5194ft

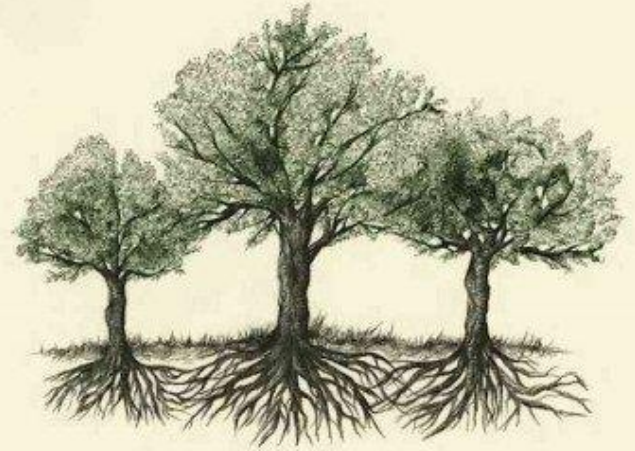


“When trees grow together, nutrients and water can be optimally divided among them all so that each tree can grow into the best tree that it can be”

foreword by TIM FLANNERY

PETER WOHLLEBEN

# The Hidden Life of TREES



What They Feel,  
How They Communicate

Discoveries from a Secret World

“For the true measure of agriculture is not the sophistication of its equipment the size of its income or even the statistics of its productivity but the good health of the land.”



THE UNSETTLING  
*of* AMERICA

CULTURE & AGRICULTURE

WENDELL BERRY







“The health of our waters is the principal measure of how we live on land.”

-Luna Leopold