Healthy Soils, Climate Resilience and Water

The Big Picture

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Outline

- CEC and Food System Work
- Carbon Farming Basics
- The Soil, Climate, **Water** Connection
- Existing Efforts
- Scaling Up Locally– Opportunities and Barriers
- Next Steps & Conclusion

Community Environmental Council

SANTA BARBARA COUNTY
FOOD ACTION PLAN

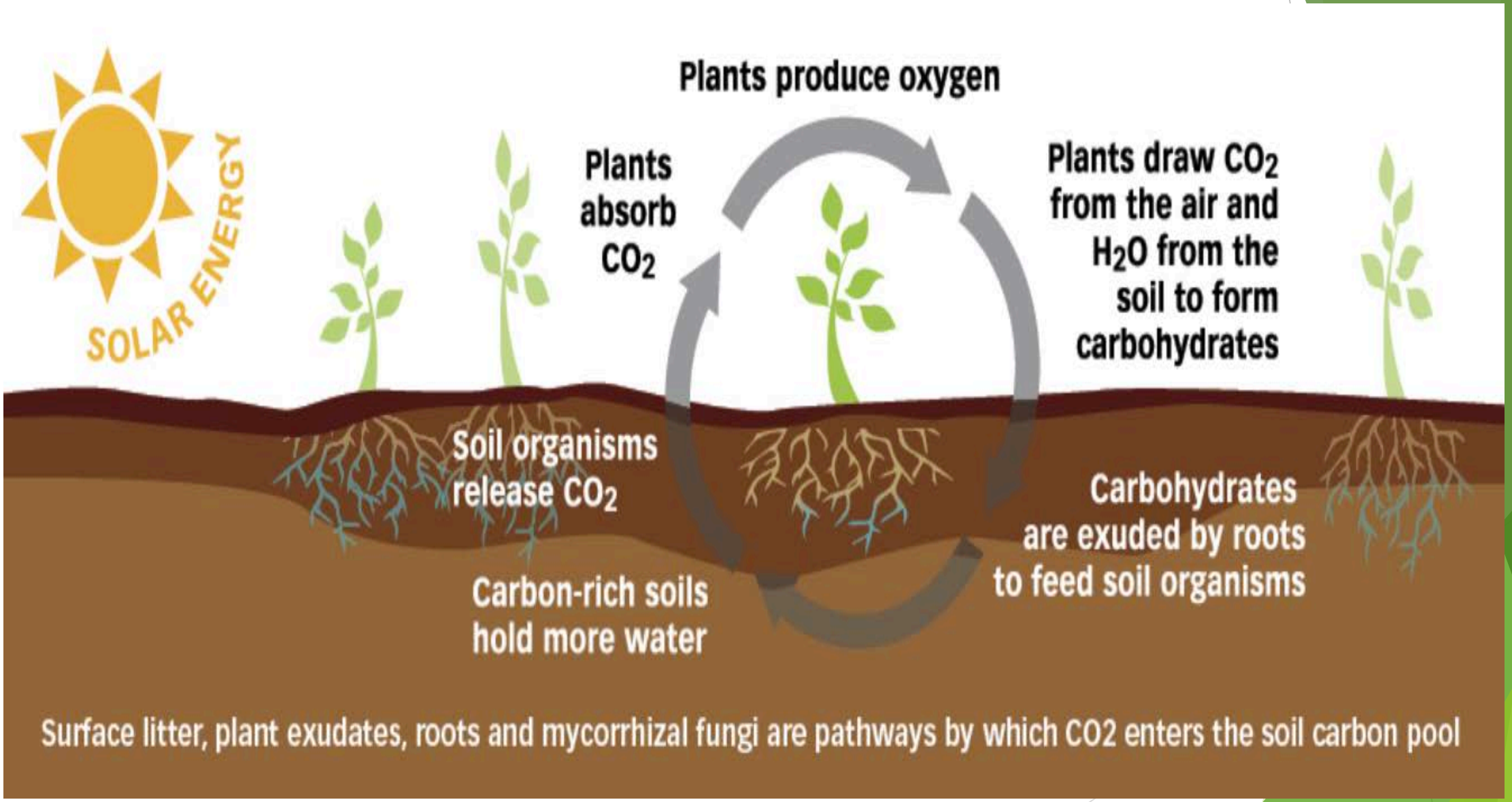
For healthy people, a healthy economy and a healthy environment

Linking the Food System to Climate Change

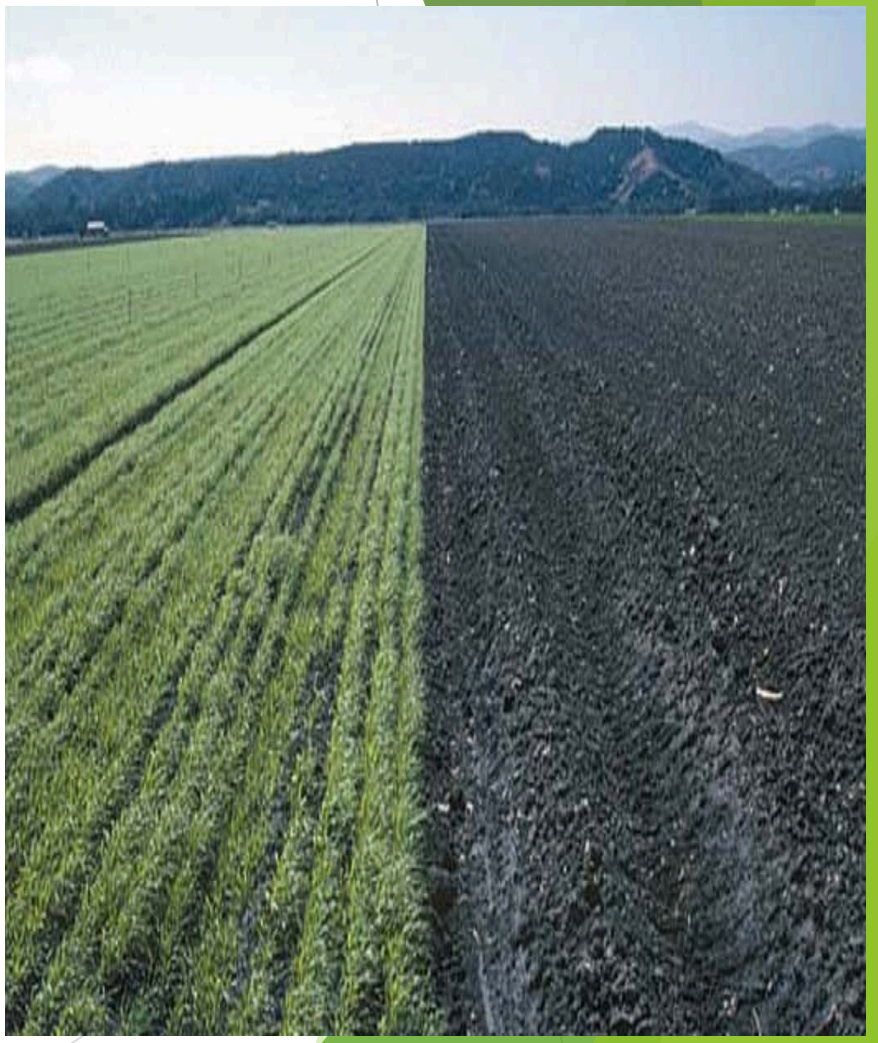
CARBON FARMING PARTNERS

- Cachuma Resource Conservation District
- California Carbon Project
- CalPoly University
- Carbon Cycle Institute
- Community Environmental Council
- LegacyWorks Group
- Santa Barbara Air Pollution Control District
- Santa Barbara Foundation
- Ted Chamberlin Ranch
- UC Berkeley
- UC Davis
- UC Extension
- UC Santa Barbara
- USDA Natural Resources Conservation Service

THE CARBON CYCLE



FARMING AND CLIMATE CHANGE?



WHY SOILS?

Improve plant health and crop yields*

Soil organic matter suppresses disease organisms and increases plant nutrient availability and uptake.

Increase water retention and infiltration*

Healthy soil can hold up to 20 times its weight in water. Increasing soil organic matter 1% can increase soil available water holding capacity by 3.7%.

Prevent erosion and reduce sediment and dust*

Soil organic matter helps build soil aggregate stability and structure and make it more resistant to wind or water erosion.

Sequester carbon and reduce greenhouse gas emissions*

Soils contain approximately 75% of the carbon pool on land—three times more than the amount stored in living plants and

Improve water quality*

Increasing soil organic matter increases infiltration and biological activity that make soil a more effective filter.

Improve biological diversity and wildlife habitat*

At least a quarter of the world's biodiversity lives in the soil; healthy soils improve habitats and other natural resources.

SOIL CLIMATE WATER CONNECTION

"Each 1 percent increase in soil organic matter helps soil hold ~ 20,000 more gallons of water per acre."

Source: NRDC

SOIL HEALTH PRACTICES

REDUCE SOIL DISTURBANCE

Soil disturbance can be the result of physical, chemical or biological activities. Physical soil disturbance, such as tillage, results in bare and/or compacted soil that is destructive and disruptive to soil microbes, and it creates a hostile environment for them to live. Misapplication of farm inputs can disrupt the symbiotic relationships between fungi, other microorganisms, and plant roots.

DIVERSIFY SOIL BIOTA

A diverse and fully functioning soil food web provides for nutrient, energy, and water cycling that allows a soil to express its full potential. Increasing the diversity of a crop rotation and cover crops increases soil health and soil function, reduces input costs, and increases profitability.

KEEP A LIVING ROOT GROWING THROUGHOUT THE YEAR

Healthy soil is dependent upon how well the soil food web is fed. Providing plenty of easily accessible food to soil microbes helps them cycle nutrients that plants need to grow. Sugars from living plant roots, recently dead plant roots, crop residues, and soil organic matter all feed the many and varied members of the soil food web.

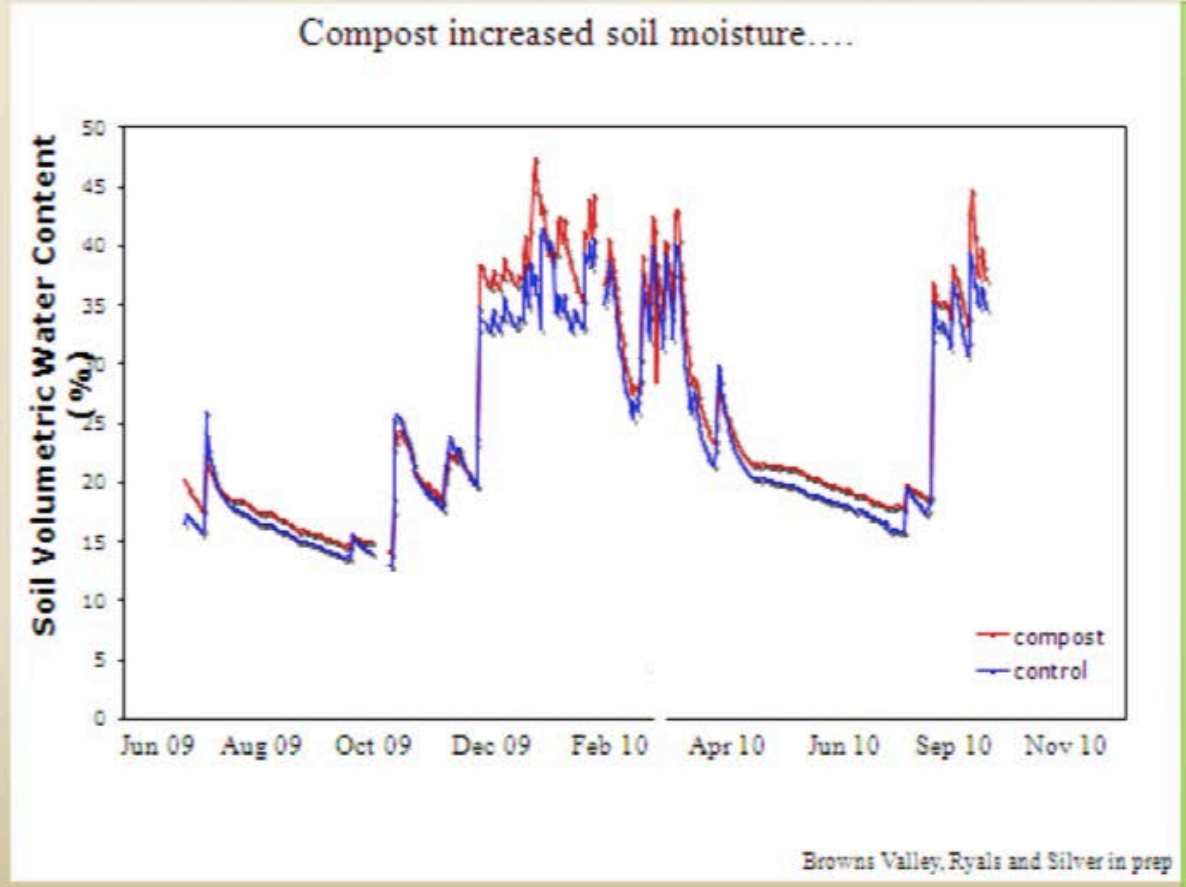
KEEP THE SOIL COVERED AS MUCH AS POSSIBLE

Soil cover conserves moisture, reduces temperature, intercepts raindrops (to reduce their destructive impact), suppresses weed growth, and provides habitat for members of the soil food web that spend at least some of their time above ground.

Source: California Department of Food and Agriculture

EXAMPLE: COMPOST

Compost Results - Moisture

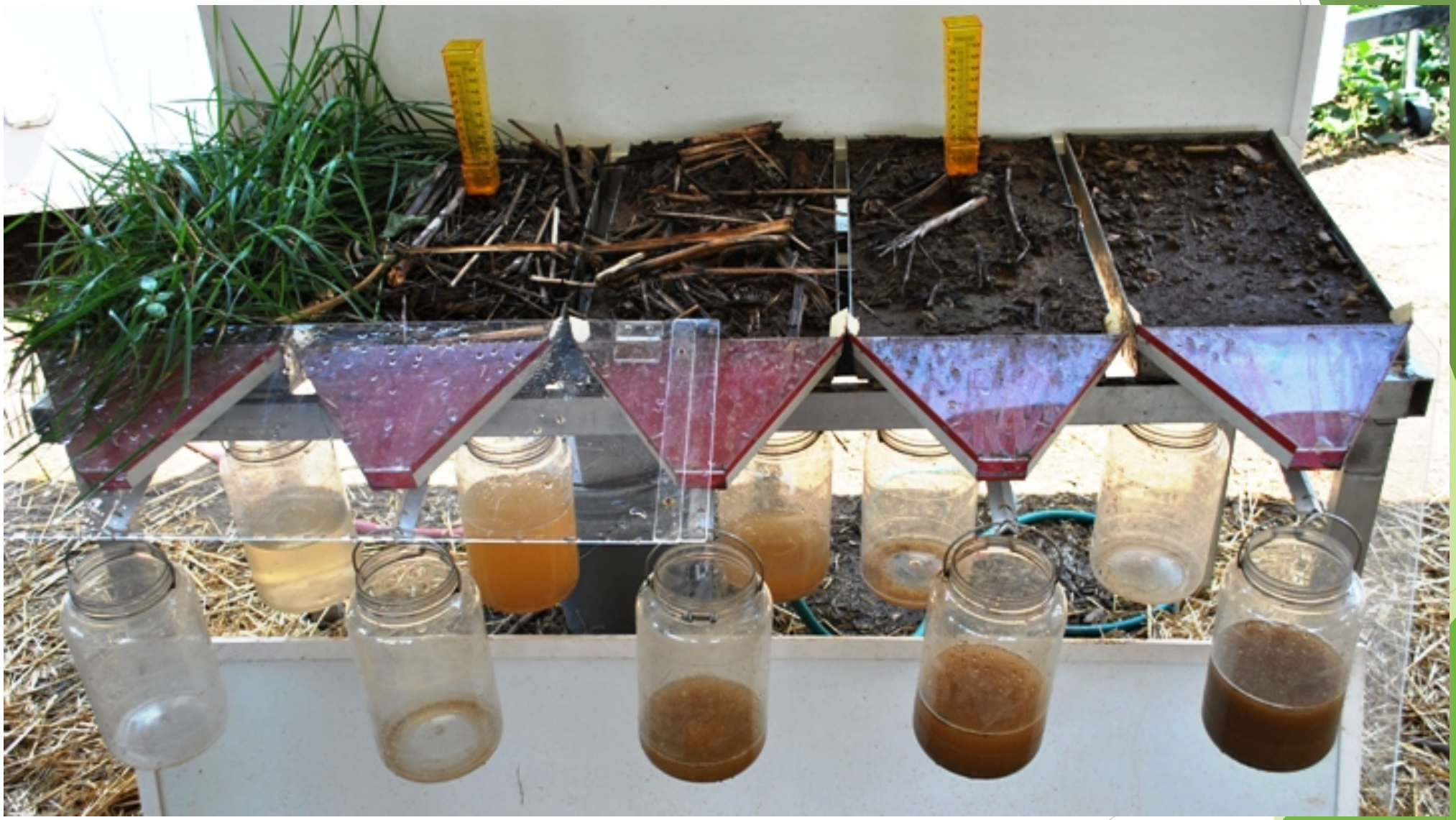


Compost application

- Increases soil water holding capacity by 17-25% (only 1 application)
- Boosts climate resiliency

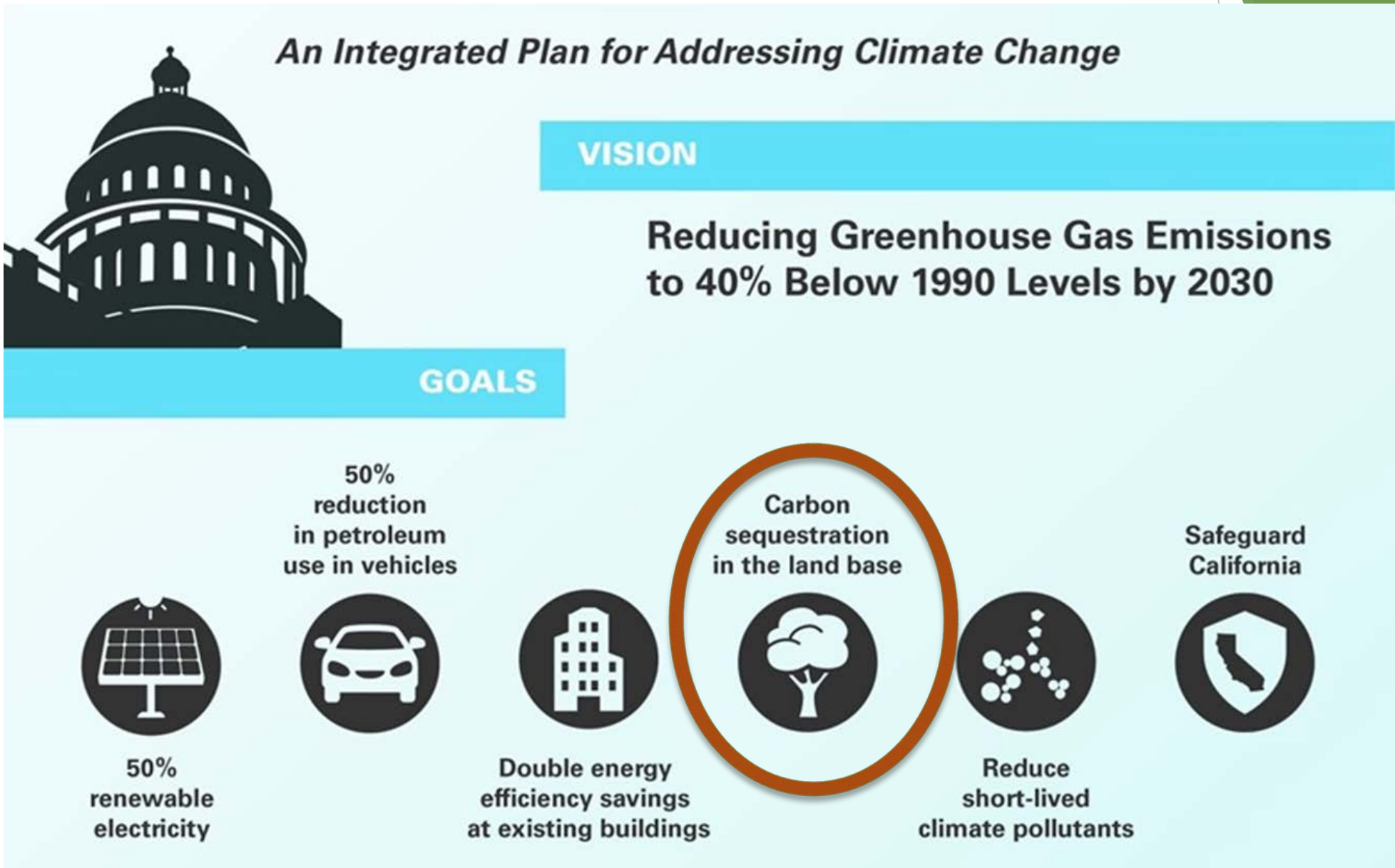
Source: Marin Carbon Project

EXAMPLE: COVER CROP



Source: Madison County Soil Conservation District

EXISTING EFFORTS: CALIFORNIA CLIMATE STRATEGY



Santa Barbara County Air Pollution Control District

EXISTING EFFORTS CONT.

State/Federal Programs

- Marin Carbon Project Trial Project
- California Healthy Soils Program
- 2018 US Farm Bill
- NRCS Soil Conservation Practices
- Environmental Quality Incentives Program
  - COMET Tool

Local Programs

- Local participation in NRCS Trial Project
- **Healthy Soils Demonstration Project**
- Rancher to Rancher Program
- Air Quality CEQA Project Mitigation
- Compost Analysis

CARBON FARMING NETWORKS

TED CHAMBERLIN RANCH

Los Olivos, Santa Barbara County California

HEALTHY SOILS PROGRAM - DEMONSTRATION PROJECT

- California Department of Food and Agriculture – initiative
- Studying compost application on rangeland
- Greenhouse Gas Reductions
- Forage quality and quantity
- Water retention and drought mitigation

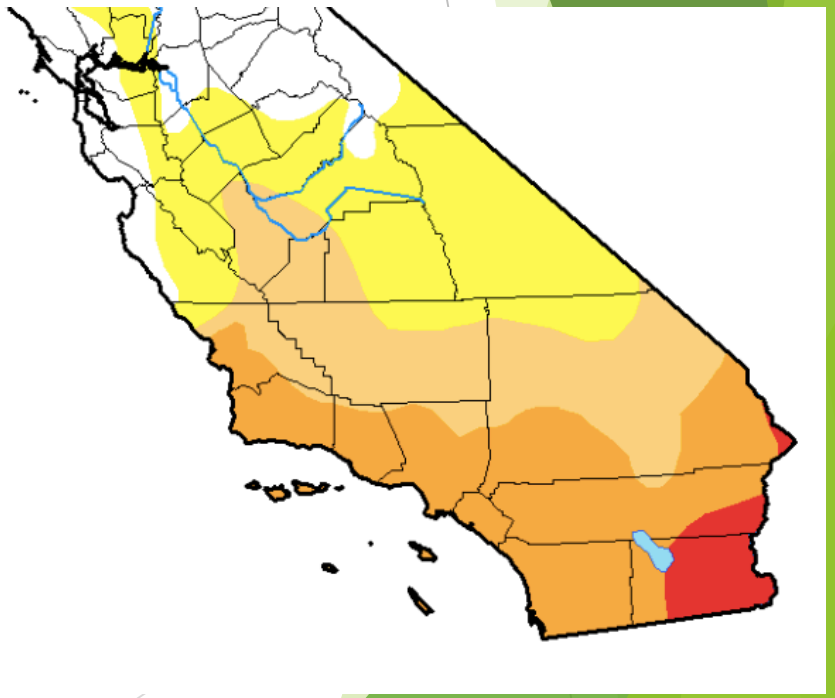
Spring Grant Kick Off March 2018

COMPOST RESULTS – FEBRUARY 2017

CENTRAL COAST - WATER CONTEXT

Emerging Climate Impacts

- Prolonged Drought → Water Supply Issues
- Flooding and soil erosion
- Seawater intrusion
- Depleted groundwater levels
- Water quality concerns
- Increased evapotranspiration



SANTA BARBARA COUNTY – SCALING UP

- Of the total acreage in the County, about **270,000** acres is suitable for compost application

If we apply compost on **15%** of those acres we could offset the County's agriculture sector's emissions.

A one-time application of compost on those acres would capture **~688 million gallons** of water, or 2000 AF.

- Source: City of Denver

CENTRAL COAST– BARRIERS

CENTRAL COAST– BARRIERS

NEXT STEPS

- Incorporate carbon farming strategies into key planning documents
- Develop regulatory resource guide for compost production, streamline policies and address regulatory barriers
- Support medium scale production of compost at the watershed scale
- Encourage small-scale onsite production of compost in agriculture


Thank you!
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