Accelerating the statewide adoption of climate-smart agriculture

2023

Torri Estrada, Carbon Cycle Institute
Devin Best, Upper Salinas-Las Tablas RCD

Michael Larcher, cBrain
Erin Pearse, Initiative for Climate Leadership and Resilience
Scaling Resilient and Climate-Beneficial Agriculture through Local and Regional Partnerships

October 11, 2023

Torri J. Estrada

Carbon Cycle Institute
MISSION

The Carbon Cycle Institute advances the carbon cycle as the fundamental organizing concept underlying land management and on-farm conservation in our efforts to mitigate and adapt to the global climate crisis.

Carbon Cycle Institute
CCI's Core Strategies and Impacts

Planning Tools & Guidance
- COMET-Planner
- National Online Curriculum
- NRCS Carbon Plan Adoption
- CDFA Carbon Plan Adoption
- Online Planning Platform (in development)

Policy & Public Funding
- CDFA Healthy Soils
- NRCS Programs/Practices
- NWL Scoping Plan
- DOC Funding
- Coalition Building

Ag Sector Partnership Development
- Fibershed
- Organic Valley
- Straus Family Creamery
- California Sustainable Winegrowing Alliance

Workforce Training/Education
- California: 80 planners trained annually
- Chico State CRARS
- Cal Poly
- California Farm Demonstration Network
- National training

Farm Planning & Partnerships
- 27 Counties with Local Programs
- 236 plans completed or in-progress
- 5 County Agricultural Climate Action Plans
- 7 Regional Hubs in development (42 RCDs)

Carbon Farming
Investments in natural climate solutions are also investments in habitat provision, biodiversity, groundwater and streamflow recharge, water quality, farm viability and diversification.

**Orchard planting**
- 19+ MT CO$_2$e/ac/yr
- Diversified production/income

**Hedgerow**
- 8+ MT CO$_2$e/ac/yr
- Pollinator habitat

**Windbreak**
- 8+ MT CO$_2$e/ac/yr
- Habitat/biodiversity

**Managed grazing**
- 0.18+ MT CO$_2$e/ac/yr
- Biodiversity
- Reduced feed imports

**Riparian restoration**
- 18+ MT CO$_2$e/ac/yr
- Diverse bird habitat (69 species/ranch)
- Water quality
Facilitating scaled action and partnerships at local and regional scales

Informing policy, programs, strategies & targets at the State scale
Regional Hubs

Technical and Financial Assistance Hubs in each of CA's distinct agricultural regions

- Farmer and Rancher Outreach, Education, and Demonstration Networks
  - One-on-one technical assistance helping to reduce risk and uncertainty in adoption of climate beneficial agricultural practices and enhanced opportunities for co-learning between producers and planners
  - Scaling implementation: regional grant proposals, increased EQIP enrollment, project management, reporting, and verification

Support for market development (PES, value-added, supply chains, etc.) through carbon farm planning tools and guidance, implementation and MRV services

Healthy, resilient agricultural landscapes, rural communities and economies

Workforce of trained and experienced agricultural conservation planning professionals

Ensuring all California farmers and ranchers have support in transitioning to climate resilient production systems.

Local and Regional Agricultural Climate Action and Resilience Planning Framework and Partnerships to fully engage agriculture in mitigation and adaptation efforts
Establishing RCD Regional Carbon Farming/Soil Hubs

- 6 regional coordinators
- Statewide Coordinator (CARCD)
- Hub governance team
- Onboarding & training cohort process
- Regional assessments
## Regional Coordinator Positions

<table>
<thead>
<tr>
<th>Regional Hub</th>
<th>Coordinator</th>
</tr>
</thead>
<tbody>
<tr>
<td>North Coast Hub</td>
<td>Emilie Winfield</td>
</tr>
<tr>
<td>Statewide Coordinator, CARCD</td>
<td>Elena Bischak</td>
</tr>
<tr>
<td>Central Sierra Hub</td>
<td>Matthew Lunn</td>
</tr>
<tr>
<td>Sacramento Valley Hub</td>
<td>Christina Harrington</td>
</tr>
<tr>
<td>South Central Coast Hub</td>
<td>Josh Kouri</td>
</tr>
<tr>
<td>Southern California Hub</td>
<td>Rachel Pettit</td>
</tr>
<tr>
<td>San Joaquin Valley Hub</td>
<td>Alexandria Miranda</td>
</tr>
</tbody>
</table>
- Knowledge & resource sharing: equipment, staff, developing programs, building infrastructure
- Peer to peer learning and problem solving between farmers and agricultural support organizations
- Collaborative grant proposals
- Regional assessments and planning: carbon sequestration potential, adaptation planning, needs assessments, ag community engagement
Regional Assessments: Participatory strategy development

Led by local agricultural conservation organizations
- Facilitating agricultural community voice and participation
- Enabling partnerships with County Staff, Ag Commissioner, Farm Bureau, etc.
- Building capacity of local ag organizations for increased technical assistance, project management, and program development

Place-based and community-driven process
- Estimate biophysical potential
  - field-based planning data
  - geospatial data
  - implementation data
- Engage producers throughout the process
  - Hold workshops, focus groups, interviews
  - Build awareness & agency among ag community
  - Understand needs and barriers, inform measures, ag goals and implementation targets
- Develop measures, implementation targets and countywide ag goals
### Implementation Targets

**2030 Moderate Adoption Goal:**
7,900 MT CO$_2$e yr$^{-1}$ sequestration

**2045 Moderate Adoption Goal:**
13,577 MT CO$_2$e yr$^{-1}$ sequestration

### Supporting Measures

<table>
<thead>
<tr>
<th>ACTIONS</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>L-1.1</td>
<td>Carbon farming investments  Implement a County funding program, such as Santa Clara County’s Agricultural Resilience Incentive, for farmers and ranchers to implement and maintain climate beneficial practices.</td>
</tr>
<tr>
<td>L-1.2</td>
<td>External funding programs for carbon farming - Support the San Mateo Resource Conservation District (SMRCD) and other land partners to leverage private, regional, state, and federal funding for producers’ implementation of climate beneficial agricultural practices. - Develop a program or mechanism for San Mateo County businesses, philanthropic institutions, and supportive community members to support local carbon farming projects.</td>
</tr>
<tr>
<td>L-1.3</td>
<td>Compost procurement Where feasible, County-procured compost through SB 1383 compliance should be made available to producers at a reduced cost or for free.</td>
</tr>
<tr>
<td>L-1.4</td>
<td>Cost saving methods Explore opportunities for establishing a bulk purchasing program for cost savings, such as for cover crop seed.</td>
</tr>
<tr>
<td>L-1.5</td>
<td>Climate-beneficial communications Assess potential of a communication or labeling program to raise awareness of climate beneficial agricultural practices of San Mateo County producers, potentially as part of As Fresh As It Gets. Assess potential of such program to increase revenue for producers.</td>
</tr>
<tr>
<td>L-1.6</td>
<td>Public benefit communications Assess and report the estimated public benefits and cost savings provided by climate beneficial agricultural practices to the agricultural and larger San Mateo County communities.</td>
</tr>
<tr>
<td>L-2.1</td>
<td>Technical assistance provider support Support the SMRCD and other land partners in providing technical assistance to agricultural producers to scale carbon farming and GHG reducing practices. Support adequate staffing for technical assistance providers to undertake outreach, planning, implementation, monitoring, and maintenance.</td>
</tr>
<tr>
<td>L-2.2</td>
<td>On-farm research and demonstration Support trials, research, and monitoring by the SMRCD and other land partners to refine local data on carbon sequestration and GHG reduction occurring from existing and new climate beneficial practices.</td>
</tr>
<tr>
<td>L-2.3</td>
<td>Educational opportunities for land managers Support the SMRCD and other land partners in providing educational opportunities to assist producers in evaluating and adopting climate beneficial agricultural practices.</td>
</tr>
</tbody>
</table>
Regional agricultural planning efforts are expanding

<table>
<thead>
<tr>
<th>DOC SALC funded Ag Chapter Development through RCDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Contra Costa County</td>
</tr>
<tr>
<td>Mendocino County</td>
</tr>
<tr>
<td>Santa Clara County</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>RCDs working directly with their counties on Ag Climate Action &amp; Resiliency Planning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alameda RCD</td>
</tr>
<tr>
<td>Cachuma RCD</td>
</tr>
<tr>
<td>Coastal San Luis Obispo RCD</td>
</tr>
<tr>
<td>Gold Ridge RCD</td>
</tr>
<tr>
<td>Napa RCD</td>
</tr>
<tr>
<td>RCD of Greater San Diego</td>
</tr>
<tr>
<td>Sonoma RCD</td>
</tr>
<tr>
<td>Yolo RCD</td>
</tr>
</tbody>
</table>

but limited by funding, local capacity and understanding of intersections between agriculture & climate change
Facilitating scaled action and partnerships at local and regional scales

Informing policy, programs, strategies & targets at the State scale
Foundational CA Climate Policies and Programs (following AB32)

**CALIFORNIA CLIMATE STRATEGY**

An Integrated Plan for Addressing Climate Change

**VISION**

Reducing Greenhouse Gas Emissions to 40% Below 1990 Levels by 2030

**GOALS**

- 50% renewable electricity
- 50% reduction in petroleum use in vehicles
- Carbon sequestration in the land base
- Reduce short-lived climate pollutants
- Safe and clean California
- 60% energy efficiency savings in existing buildings

**State of California AIR RESOURCES BOARD**

2017 CLIMATE CHANGE SCOPING PLAN UPDATE

Resolution 17-46
December 14, 2017

**AB 2649 => 1757/NWL EAC**

Organized Hubs with strong regional assessments to provide an opportunity to inform state goals and strategies from the ground up

**CALIFORNIA AIR RESOURCES BOARD**

2022 Scoping Plan for Achieving Carbon Neutrality

**SB 1386**

Re-evaluate by 2018, CALAND

**EO: N-82-20 CSLS - 30x 30**

**SB 27, 2021**

**CCS > NWL**

**2015**

**healthy soils program**

**Coastal Conservancy STATE OF CALIFORNIA**

**January 2019 DRAFT California 2030 Natural and Working Lands Climate Change Implementation Plan**

**Nichols/ARB**

**N-82-20 CSLS - 30x 30**

**NORTHWESTERN LATEX**

**15-20 MMT by 2030**

**State of California Wildlife Conservation Board**

**N-82-20 CSLS - 30x 30**

**Nichols/ARB**

**2022 Scoping Plan for Achieving Carbon Neutrality**

©CarbonCycleInstitute
GGRF, State Budget and Climate Bonds
AB 408 (Wilson), AB 1567 (Garcia), SB 867 (Allen)

- Historically, CA has funded climate programs, including those in the agricultural sector, via GGRF. Several climate pillars have guaranteed annual funding out of GGRF; GGRF has under-performed in recent years and ends in 2030.

- Agriculture and climate programs have received increasing funding when CA in budget surplus; next 2-3 years CA may have deficit/limited budget

- Climate Bonds have been in play for 3 years now, and seen as long-term funding option (Rivas and McGuire key)
  - $100M for RCDs to help implement NRCS and state Ag programs focused on climate change and soil health.
  - $3.4B overall ask across food and farming sectors (climate-beneficial agriculture, farmworker well-being, food infrastructure, and healthy food access/nutrition)
  - $950M for sustainable agriculture and carbon farming
State Policy Supports and Budget Priorities

1. Ambitious climate goal for the NWL sector coupled with strong, long-term support for conservation partnerships leading planning and implementation of Ag projects at scale

1. Baseline staffing and enhanced program support for the RCDs & UCCE (Climate Smart Land Strategy)

1. Workforce: State funding to create a pipeline of trained and experienced conservation planners (CSU Chico partnership)

1. Dedicated funding for local and regional agricultural climate action and resilience planning (unlocks local and regional revenue)

1. Robust planning and implementation funding tied to local and regional agricultural plans and priorities (state block grants)

1. Infrastructure investments such as compost availability, plant materials nurseries, etc.

Relies on RCDs and partners articulating their needs and the necessary building blocks at State level
Different climate impacts are felt at different scales, but it starts at the local level.

Our greatest barrier is the lack of investment in local and regional conservation partnerships as a core strategy in creating healthy, climate-resilient farming systems.

Building economic resilience and agroecological adaptation through

Recarbonization and reducing GHG emissions

contributing to

Global climate change mitigation
testrada@carboncycle.org

Carbon Cycle Institute
Sustainable Land Initiative (SLI)
Sustainable Land Initiative (SLI)

Devin Best- Executive Director

Initiative for Climate Leadership and Resilience
California's’ Best Kept Secret

RCD’s role in Conservation
Non-regulatory special district
Local entity to assist stakeholders with their land management and natural resource issues
Partner and network facilitator
Services include:
  grant writing
  permit coordination
  monitoring and reporting
  project management
  planning
  and much more

Devin Best- Executive Director
Sustainable Land Initiative

Mission and Vision of SLI

- Decrease time to funding, time to implementation
- Reduce costs, risks, to farmer
- Reduce administrative burden on RCD staff
- Increase RCD throughput
- Connection to CCI regional hub program and plans for growth
Accelerating the fight against climate change

Standard technology and process digitalization to achieve climate objectives
F2 Climate Software Solutions

- Energy Efficiency
  - Home Energy Audit
    - Denmark
  - Energy Efficiency in Companies
    - Egypt
  - Heat Pump Subsidy
    - Denmark
  - Sustainable Farming
    - Climate Lowlands
      - Denmark

- Protection of Biodiversity
  - Sustainable Farming Initiative
    - USA
  - Wildlife Regulation
    - Denmark
  - Urban Rooftop Gardening
    - Denmark
  - Circular Economy and Waste Management
    - Benefit Sharing
      - Nagoya-convention
      - Denmark

- Protection of Nature
  - Extended Producer Responsibility
    - Kenya
  - International Export and Import of Waste
    - Denmark
  - Waste and Recycling Portfolio Management
    - Denmark
  - Controlling use of Genetic Resources
    - License and Control of Genetically Modified Organisms
      - Denmark

- Pollution Control
  - EU Natura 2000 Protected Areas
    - Denmark
  - Untouched Forest
    - Denmark
  - Lake and Stream Restoration
    - Denmark
  - Environmental Support in the Arctic
    - Denmark
  - Pressure Water Control
    - Denmark
  - Home Woodstove Removal
    - Denmark
  - Dredging
    - Denmark
  - Dangerous Goods on Ships
    - Denmark
We must accelerate our speed of action.
A Danish Story

Some fun facts

• Denmark has most ambitions climate agenda in the world – 70% by 2030
• 60% of its land is used in intensive agriculture
• Denmark is flat
• Wetlands sequester more GHG than rainforest
Climate Lowlands – Process Overview

A simple, elegant process enables external users to apply for grants to restore farmlands to wetlands and automatically track the GHG reduction and financial cost.

Landowner applies for grant

Integration with GIS / business-intelligence tools

Automated business case generation
Case manager reviews landowner’s grant application for accuracy…

…and adds it to a grant funding pool for prioritization against other proposed projects.
Once application window has closed for the year, F2 generates a prioritized list of projects to receive grant funding...

...and F2 updates each application case to indicate whether it was approved for funding. F2 also updates the financial ERP system to record the money was spent.
20% of Nation's GHG Reduction
California is 10x larger than Denmark
The process for identifying sustainable projects

A fully digital means of rapidly identifying and validating potential projects based on carbon impact, cost or additional benefits.

- A simple form for landowners or RCDs employees to complete
- Critical data for RCDs to screen whether to do a site visit
- Accelerates identification and prioritization of properties

- A consistent checklist for RCD analysis that directly informs funding sources
- Ability to capture data consistently on laptop or clipboard in the field
- Automate report creation

- Prioritized list of projects for landowner sign-off based on consistent scientific measures (COMET-Planner)
- All information necessary for seamless grant applications
Vision – RCDs become the local engine of improving working land sustainability & achieving environmental goals

Enabling a Central Coast Carbon Farm Hub

Regional value created

- **Increased funding**: regional collaboration and consistent execution increases the ability to secure funding
- **Accelerated speed**: rapid access to funding, expertise and equipment
- **Improved quality**: landowners gain access to technical expertise and equipment
- **Reduced cost**: agency collaboration and economies of scale increase impact per dollar spent
- **Better experience**: RCDs navigate the bureaucratic environment to secure funding and permitting on behalf of landowners
- **Automated reporting**: agencies seamlessly track how their collaboration impacts their climate objectives (CAPs, CEQA, SB 1383)
- **Success against climate impacts**: increasing the speed and ability to implement sustainable land practices exponentially increases our ability to counteract climate impacts
A regional sustainability hub – current projects

SLI is actively creating a regional ecosystem for RCDs, governments and universities to collaborate to achieve environmental objectives

**RCDs identify environmental projects**

**Inventory of Environmental Investment Opportunities**

- **SB1383** – SLO County is leveraging SLI inventory to meet state mandates for compost
- **Equipment** – Cal Poly University is building sustainable ag equipment for use by the region.
- **Monitoring** – Cal Poly will measure impact of practices locally to provide accurate carbon accounting
- **Implementation** – Central Coast is pursing $10M in grant funding to rapidly implement SLI projects ($5M HSP, and $5M SWEEP)
Where we are going

Processes we can add
River restoration – immense GHG sequestration potential

Salinas River

Beaver Dam Analog
Process Based Restorations – Permitting requirements for BDAs on Central Coast

Process-based restoration on California waterways involves eight permits + CEQA from six agencies at three levels of government, will take minimum of 14+ months, and could be cost prohibitive.

Critical assumptions
- 404 regional general applies (24 + months)
- US ESA – Section 10 and SHA not applicable
- CEQA EIR not applicable (12 to 18 months)
- County Grading Permit – allows programmatic permit (similar to partners in restoration) – otherwise cost and time prohibitive.
Solution – Consistent Programatic Permitting Pathway for Watershedwide PBR

- Federal Permit Applications
- State Permits Applications
- Local Permits Applications

Draft Recommendation → Collaborative Review Hearing → Issue permits (programmatically) → Monitor implementation

Could we get permits in weeks rather than years?
Block grant administration

There is considerable money flowing towards climate initiatives, however, administering those funds is tedious and prevents many RCDs from pursuing block grants.

Block Grant Administration

Digital control – Granting agency receives email with summary report of practices for approval along with secure link to approve practices.

Exemplary

Transparency – Granting agency has visibility into status of all projects in real time from a secure dashboard.
A sustainable land platform

By adding processes, the Central Coast is creating a platform for rapid environmental innovation

Tried and True Methodology – Danish EPA is currently using this approach to digitize 250 external and internal processes.

Process are now being shared with:
• US EPA (Permitting)
• US White House (Permitting)
• Guyana (CITES) – implemented 2021
Scaling the solution

Each region in California can adopt and implement the platform rapidly and as new processes are added by one region, the entire state benefits.
cBrain’s Belief – “Winning Slowly is losing”

If we don’t accelerate our speed of action, we fail at achieving our climate objectives.
Contact Information

Michael Larcher, Solution & Sustainability Lead
North America

San Luis Obispo, CA and Washington, D.C.
Michael.larcher@cbrain.com
Sustainable Land Initiative (SLI)
University Support

EPIC model for service learning

- Single point of contact on campus for clients
- Campus coordinator understands campus resources, structure, and limitations
- Coordinator works with client to develop a scope of work
  - Tasks should align with learning objectives of existing courses
- Work is executed as a contract
- Client is an active partner through the process

EPIC Model - https://epicn.org
University Support

http://climate.calpoly.edu

Advantages over classical service learning model

- Project retains value to client
- Students benefit from rich experiential learning
  - Meaningful: help community
  - Resumé building, network building
  - More equitable for disadvantaged students
- Faculty have a project provided for their class
  - May benefit research program
  - Scholarship of engagement
- Client gets rapid, low-cost turnaround
  - Students don’t require support
  - Faculty require minimal support

EPIC Model - https://epicn.org
How ICLR supports the Sustainable Land Initiative

SLI OPERATIONAL PHASES

1. Intake: Businesses request support
2. Assess: Identify & quantify sustainable practices
3. Prioritize practices
4. Implement practices
5. Measure regional impact

SLI EXPANSION PHASES

1. Recruit RCDs
2. Recruit Farmers
3. Recruit Campuses

SLI MMRV

1. Life-cycle CO2
2. Soil Health
3. Ecosystem Service
4. Economic Yield

Initiative for Climate Leadership and Resilience

Erin Pearse - Director
University Support

How ICLR supports SLI Operational Phases

- **Intake and Outreach**
  - Software Engineering students build web platform
  - Agricultural Communication students develop outreach videos for web & social media
  - Spanish students translate materials

- **Funding**
  - Faculty assist with identifying grant opportunities and developing grant proposals
  - Advancement teams on campus can assist with donor cultivation

http://climate.calpoly.edu
University Support

How ICLR supports SLI Operational Phases

- Equipment

Professor Matt Haberland
BRAE 421-422 Equipment Engineering.
Design and fabrication of specialized agricultural components and equipment.
2 lectures, 2 laboratories.

http://climate.calpoly.edu
University Support

How ICLR supports SLI MMRV

- Measurement, Monitoring, Reporting, Verification
  - Soil chemists record impact of CSA practices on soil health
  - Restoration Ecology students assess ecosystems services
  - Grad students focused on Life-Cycle Analysis study changes to farm operation GHG profiles
  - Agribusiness team conducts case studies of economic yield and water usage
University Support

http://climate.calpoly.edu

How ICLR supports SLI Expansion

- Education and professional development for producers
  - Grad students in Natural Resources develop curricula for CSA workshops
  - Grad students in Natural Resources develop community of practice to facilitate peer-to-peer education among producers

- Education and professional development for RCD staff
  - Faculty collaborate with CCI to develop curricula and train RCD staff to develop climate-smart farm plans
University Support

How ICLR supports SLI development

- Carbon suitability mapping (forthcoming)
  - Natural Resources students develop GIS-based app to identify suitable locations for landscape-scale applications of CSA

- Regulatory streamlining (forthcoming)
  - Faculty collaborate with RCD to identify most direct permitting pathways, for incorporation into cBrain workflow
  - Standardizing Beaver Dam Analogs (BDA) as an accepted & approved conservation practice
Thanks!

Torri Estrada
- testrada@carboncycle.org
- https://carboncycle.org

Devin Best
- devin@us-ltrcd.org
- https://us-ltrcd.org

Michael Larcher
- mil@cbrain.com
- https://cbrain.com

Erin Pearse
- epearse@calpoly.edu
- https://climate.calpoly.edu