Accelerating the statewide adoption of climate-smart agriculture

2023

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Scaling Resilient and Climate-Beneficial Agriculture through Local and Regional Partnerships

October 11, 2023

Torri J. Estrada

Carbon Cycle Institute

The Center for Regenerative Agriculture and Resilient Systems, California State University, Chico

California Association of Resource Conservation Districts

Marin Carbon Project

NCAT National Center for Appropriate Technology

CalCAN California Climate & Agriculture Network

BIPOC Agroecology Network

Fibershed — Local Fiber, Local Dye, Local Labor

COMET-Farm — NRCS USDA NREL Colorado State University

UC CE

California Food + Farming Network

USDA NRCS U.S. Department of Agriculture Natural Resources Conservation Service

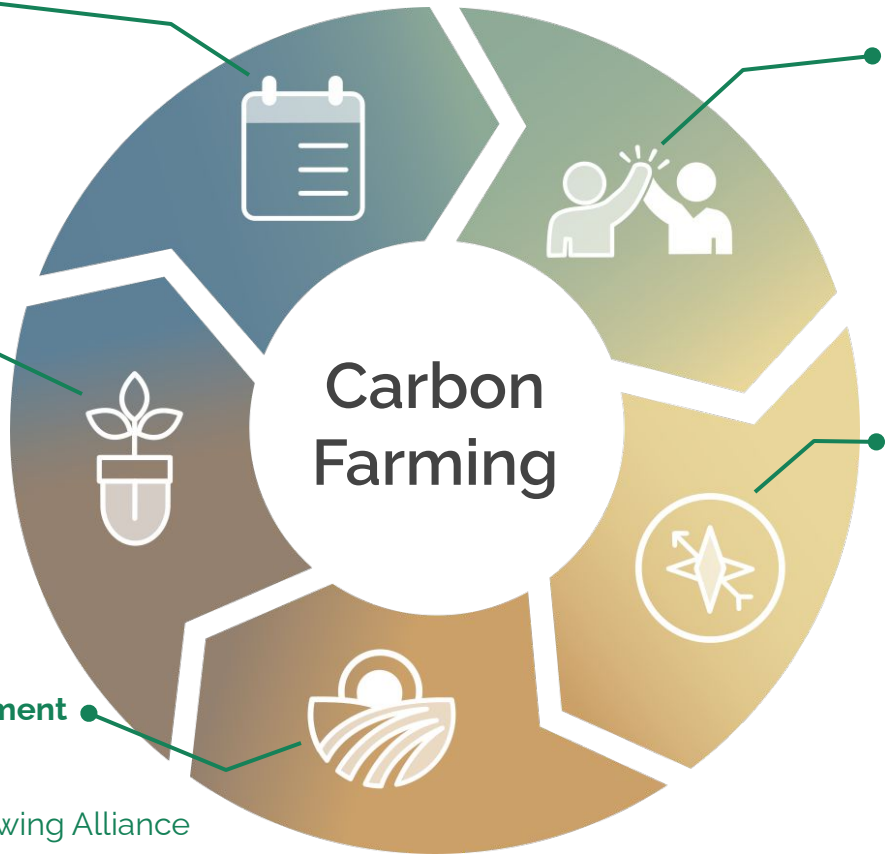
NWL Coalition

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

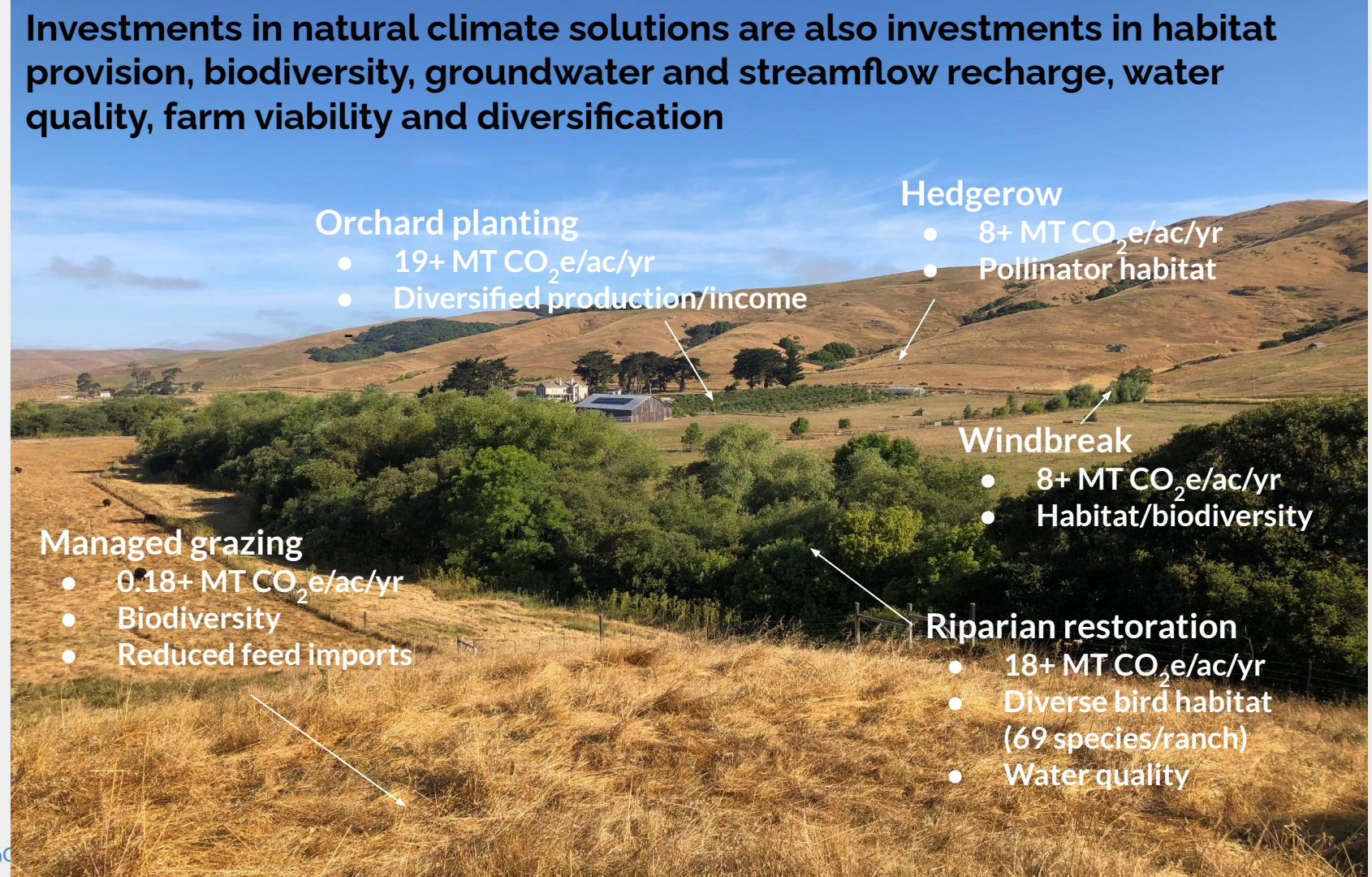
Ag Sector Partnership Development
- Fibershed
- Organic Valley
- Straus Family Creamery
- California Sustainable Winegrowing Alliance



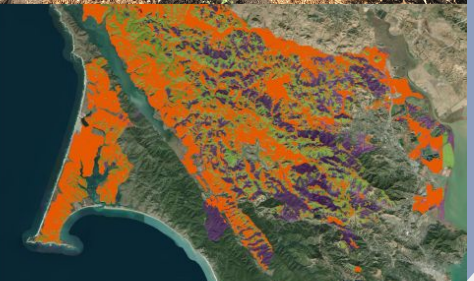
Workforce Training/Education
- California: 80 planners trained annually
- Chico State CRARS
- Cal Poly
- California Farm Demonstration Network
- National training

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)

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

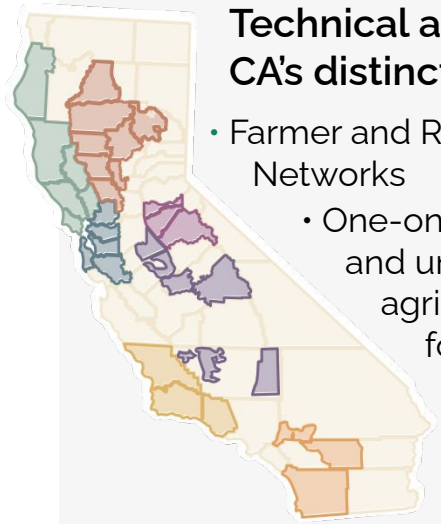


Facilitating scaled action and partnerships at local and regional scales



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

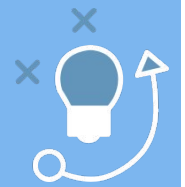
Workforce of trained and experienced agricultural conservation planning professionals

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

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

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

Regional Hub	
North Coast Hub - **Emilie Winfield**	
Statewide Coordinator, CARCD - **Elena Bischak**	
Central Sierra Hub - **Matthew Lunn**	
Sacramento Valley Hub - **Christina Harrington**	
South Central Coast Hub - **Josh Kouri**	
Southern California Hub - **Rachel Pettit**	
San Joaquin Valley Hub - **Alexandria Miranda**	

- 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

Example: San Mateo County Climate Action Plan

Ag sector emissions ~7,000 MT $CO_2e\ yr^{-1}$
or ~1.5% of total County emissions

Implementation Targets

2030 Moderate Adoption Goal:
7,900 MT $CO_2e\ yr^{-1}$ sequestration

2045 Moderate Adoption Goal:
13,577 MT $CO_2e\ yr^{-1}$ sequestration

Supporting Measures

ACTIONS		DESCRIPTION
L-1.1	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.
L-1.2	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.
L-1.3	Compost procurement	Where feasible, County-procured compost through SB 1383 compliance should be made available to producers at a reduced cost or for free.
L-1.4	Cost saving methods	Explore opportunities for establishing a bulk purchasing program for cost savings, such as for cover crop seed.
L-1.5	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*.[12] Assess potential of such program to increase revenue for producers.
L-1.6	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.
L-2.1	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.
L-2.2	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.
L-2.3	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.

Regional agricultural planning efforts are expanding

RCDs working directly with their counties on Ag Climate Action & Resiliency Planning

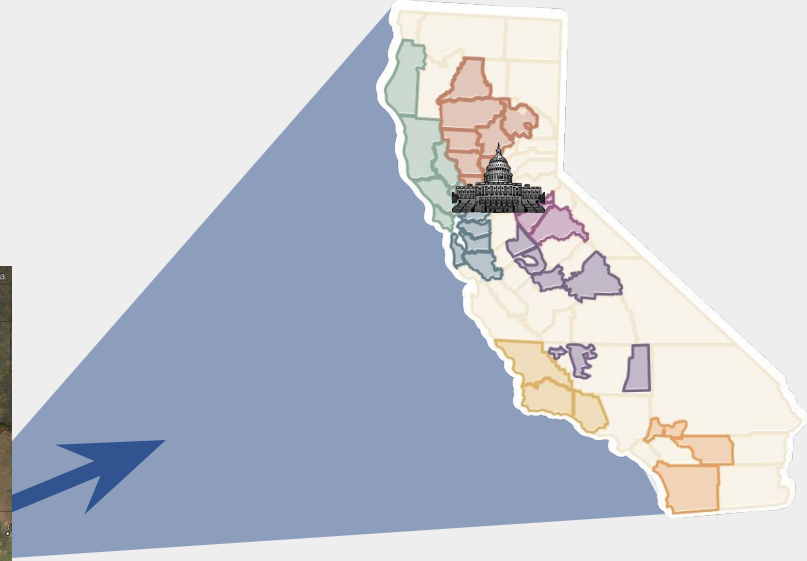
- Alameda RCD
- Cachuma RCD
- Coastal San Luis Obispo RCD
- Gold Ridge RCD
- Napa RCD
- RCD of Greater San Diego
- Sonoma RCD
- Yolo RCD

DOC SALC funded Ag Chapter Development through RCDs

- Contra Costa County
- Marin County
- Mendocino County
- San Mateo County
- Santa Clara County

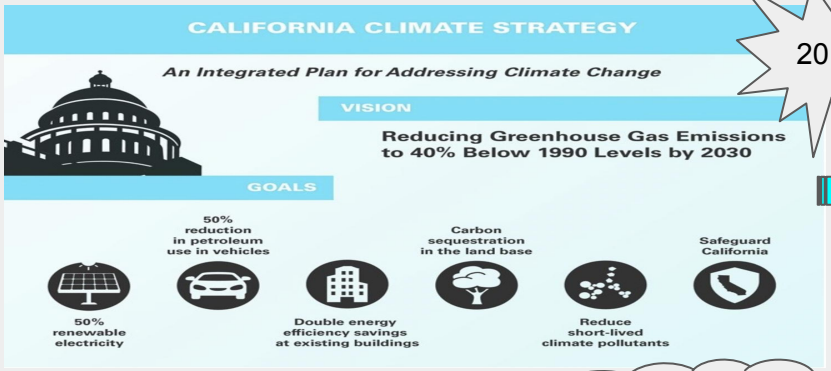
but limited by funding, local capacity and understanding of intersections between agriculture & climate change

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)



2015

WCB State of California Wildlife Conservation Board

SB 1386

Coastal Conservancy STATE of CALIFORNIA

Re-evaluate by 2018, CALAND

State of California
AIR RESOURCES BOARD
2017 CLIMATE CHANGE SCOPING PLAN UPDATE
Resolution 17-46
December 14, 2017

15-20 MMT by 2030

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

CalEPA · natural resources · cdfa · CARB · Strategic Growth Council

Newsom

COVID

Nichols/ARB

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

SB 27, 2021

CCS > NWL

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
December 2022

2022 Scoping Plan for Achieving Carbon Neutrality

GGRF, State Budget and Climate Bonds

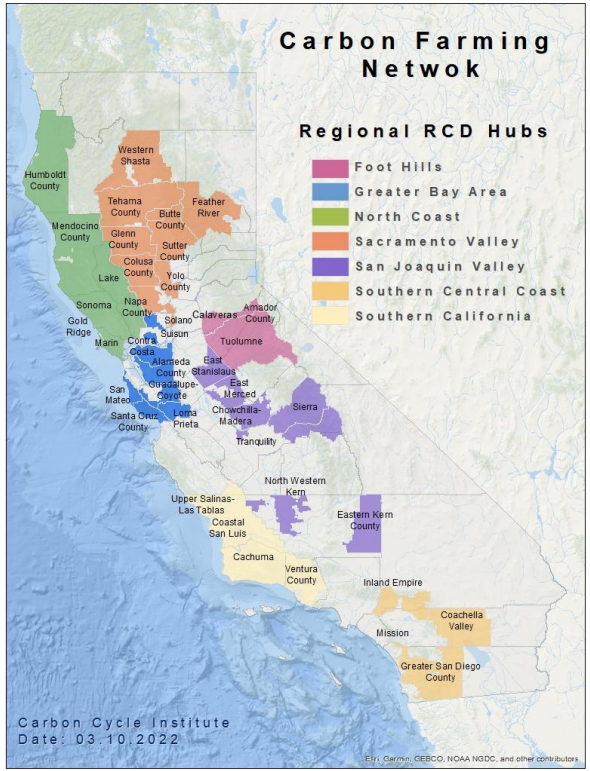
AB 408 (Wilson), AB 1567 (Garcia), SB 867 (Allen)

- 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.

Building economic resilience and agroecological adaptation

through

Recarbonization and reducing GHG emissions

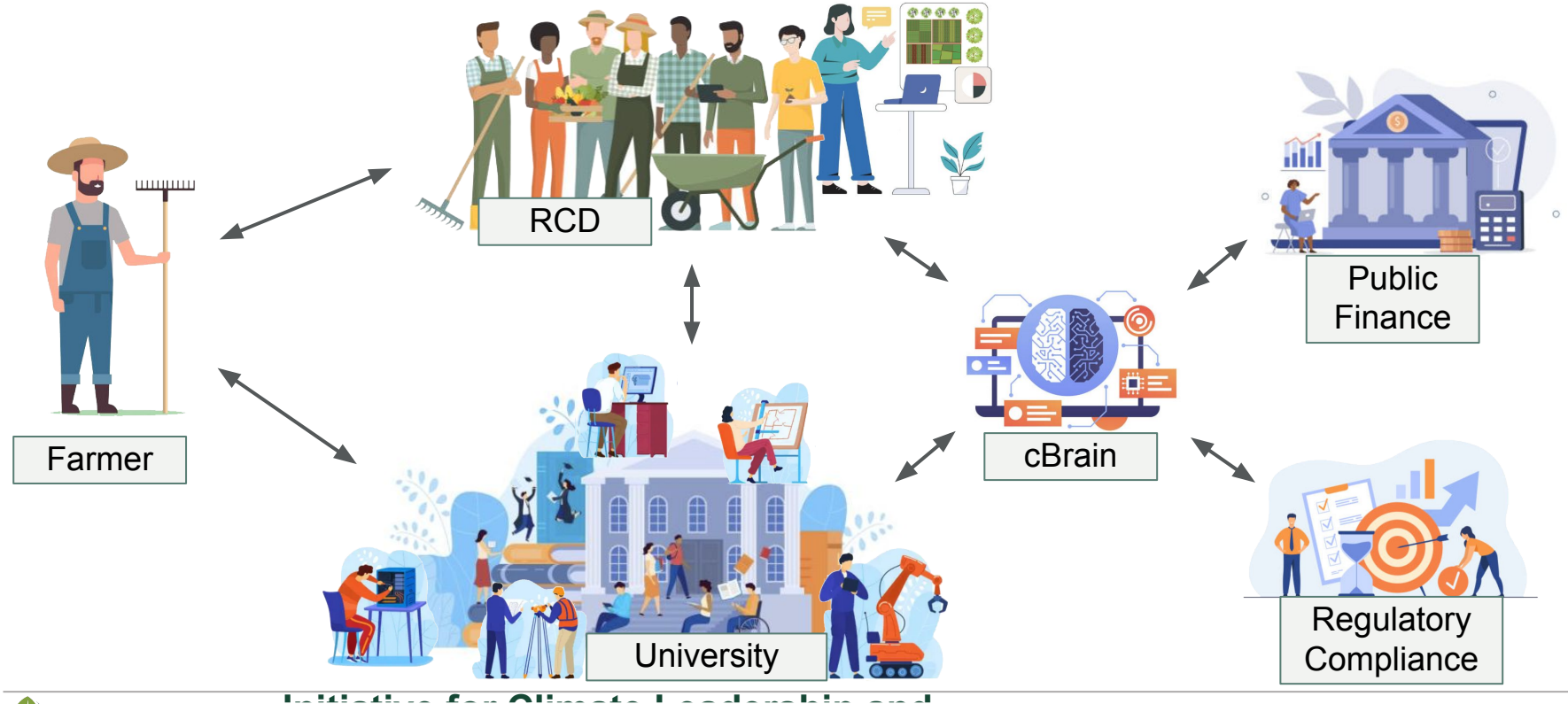
contributing to

Global climate change mitigation

testrada@carboncycle.org

Carbon Cycle Institute

Sustainable Land Initiative (SLI)



Sustainable Land Initiative (SLI)

UPPER SALINAS-LAS TABLAS
RESOURCE
CONSERVATION DISTRICT

Devin Best- Executive Director

Initiative for Climate Leadership and

California's' Best Kept Secret

RCD's role in Conservation

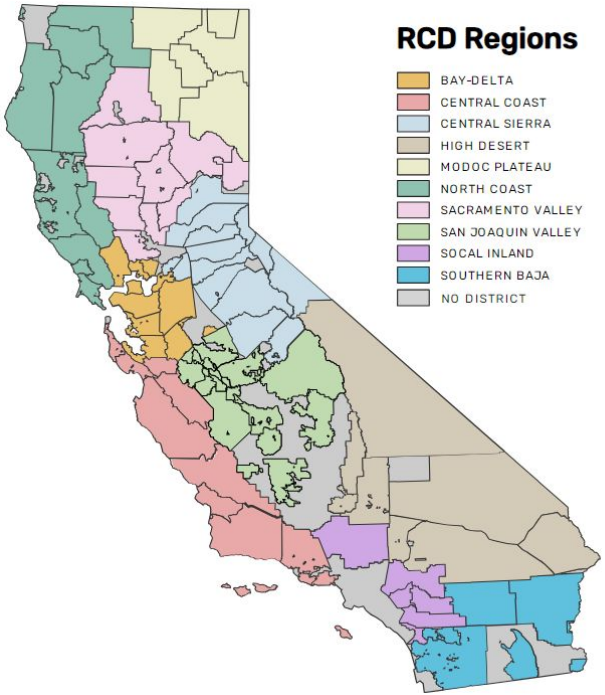
Non-regulatory special district

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



Sustainable Land Initiative

Mission and Vision of SLI

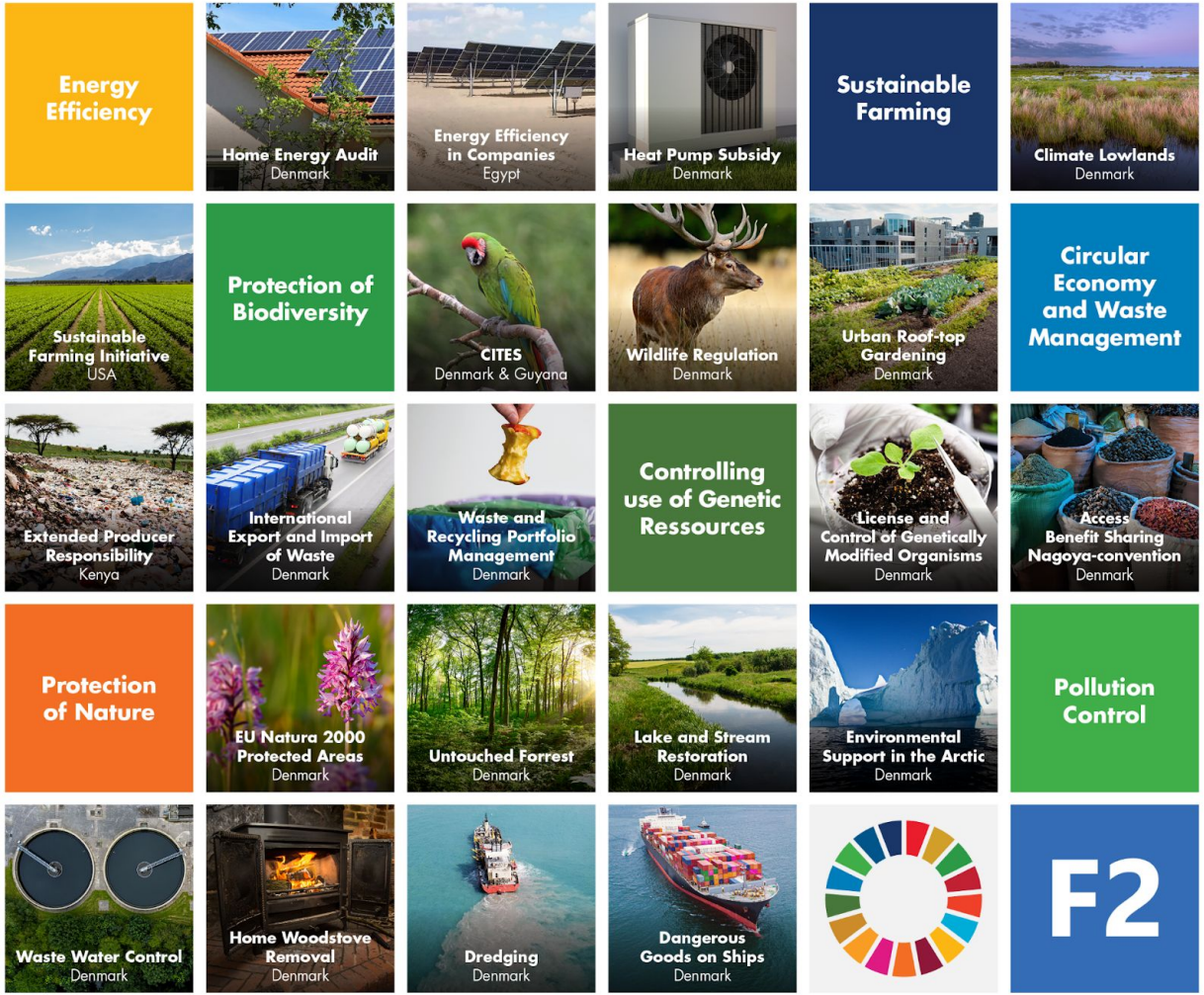
- Decrease time to funding, time to implementation
- Reduce costs, risks, to farmer
- Reduce administrative burden on RCD staff
- Increase RCD throughput
- Connection to CCI regional hub program and plans for growth

Accelerating the fight against climate change

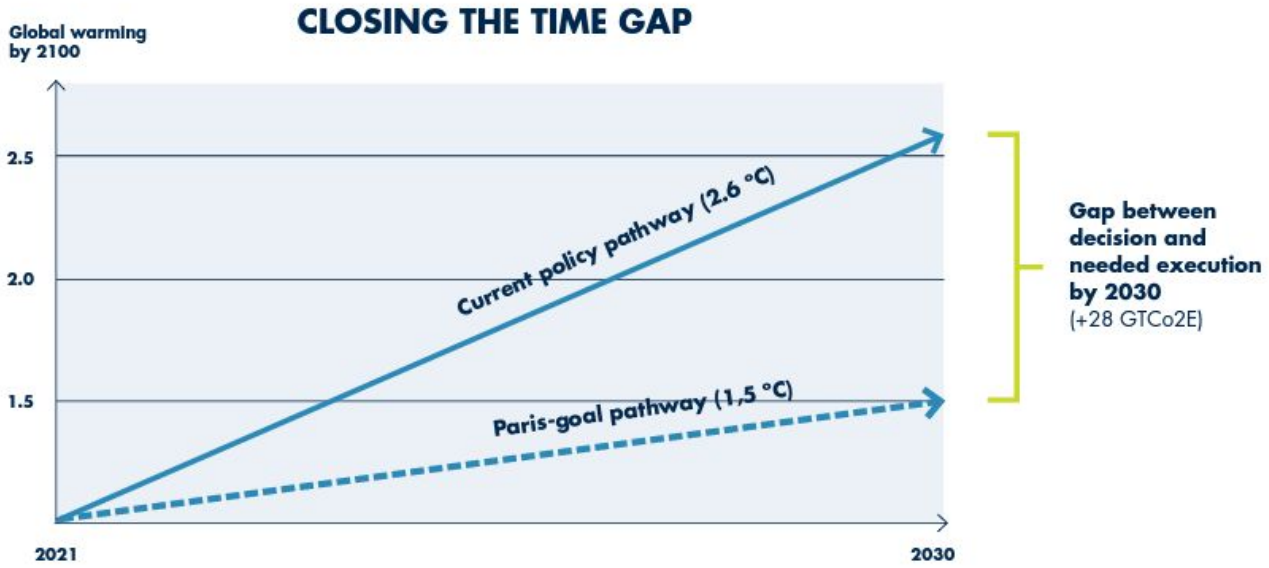
Standard technology and process digitalization to achieve climate objectives

cBRAIN

F2 Climate Software Solutions



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

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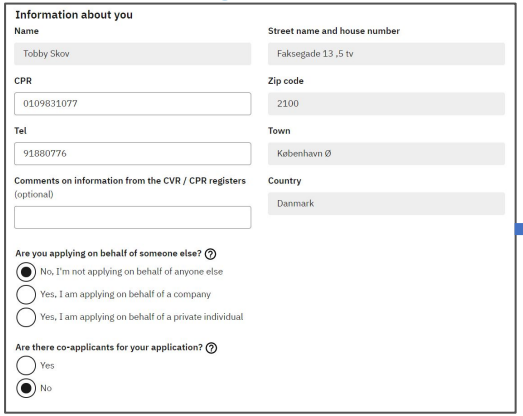
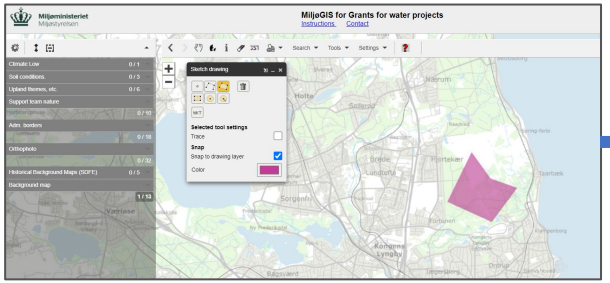
A simple, elegant process enables external users to apply for grants to restore farmlands to wetlands and automatically track the GHG reduction and financial cost

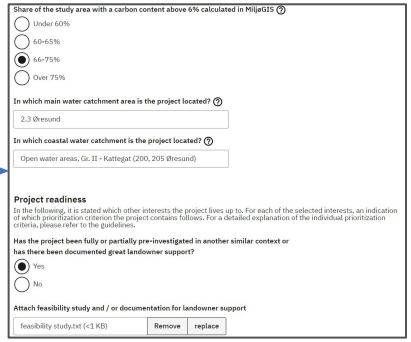
Landowner applies for grant



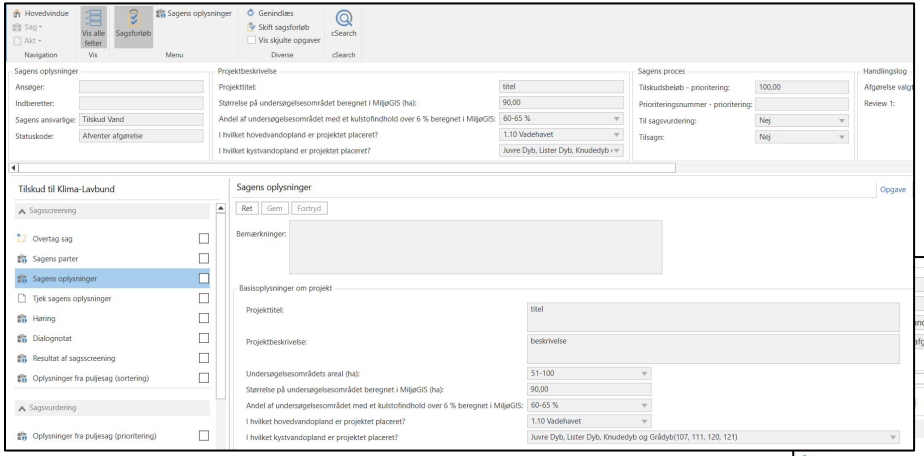
Integration with GIS / business-intelligence tools

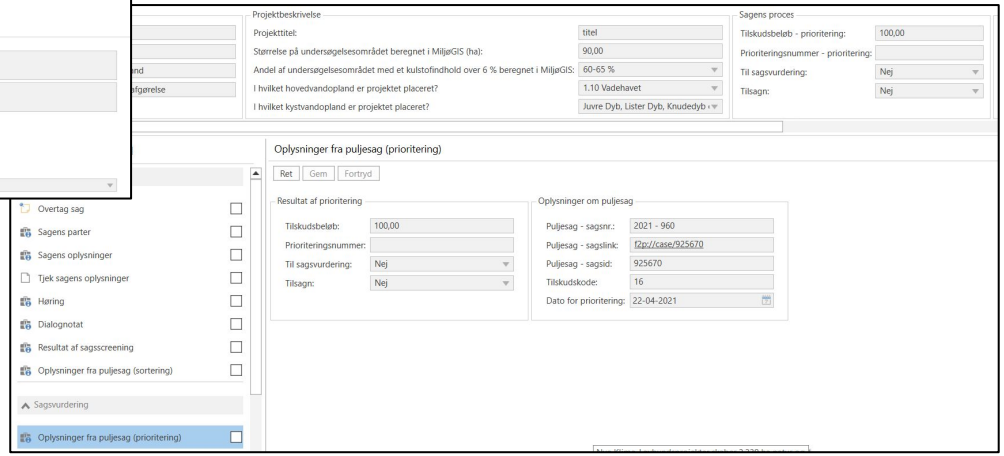


Automated business case generation



Portfolio Management Solution (1 of 2)





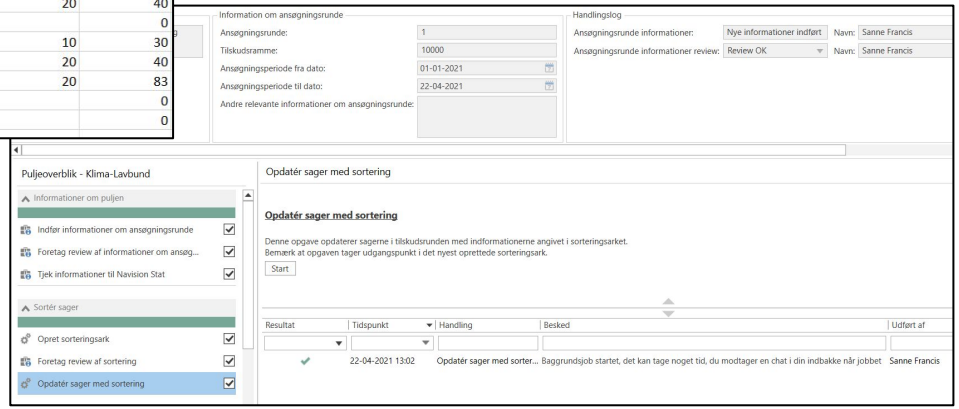
Case manager reviews landowner's grant application for accuracy…

…and adds it to a grant funding pool for prioritization against other proposed projects.

Portfolio Management Solution (2 of 2)

	A	B	C	D	E	Q
1	Sagsnummer	Areal ansøgt (ha)	Statuskode	Type af afgørelse	Undersøgelsesområdets areal (ha)	Point i alt
2	2021 - 5	90	Afventer prioritering	Afventer	20	40
3	2021 - 6	90	Afventer prioritering	Afventer	20	40
4	2021 - 7	90	Afventer prioritering	Afventer	20	40
5	2021 - 8	90	Afventer prioritering	Afventer	20	60
6	2021 - 17	90	Afventer prioritering	Afventer	20	40
7	2021 - 18	90	Afventer prioritering	Afventer	20	40
8	2021 - 22	90	Afventer prioritering	Afventer	20	61
9	2021 - 26	90	Afventer prioritering	Afventer	20	60
10	2021 - 128	90	Afventer prioritering	Afventer	20	40
11	2021 - 129	90	Afventer prioritering	Afventer	20	40
12	2021 - 130	90	Afventer prioritering	Afventer	20	81
13	2021 - 134	90	Afventer prioritering	Tilsagn	20	40
14	2021 - 142			Afventer		0
15	2021 - 150	15	Afventer prioritering	Afventer	10	30
16	2021 - 152	88	Afventer prioritering	Afventer	20	40
17	2021 - 153	99	Afventer prioritering	Afventer	20	83
18	2021 - 155		Afventer sagsvurdering	Afventer		0
19	2021 - 949		Afventer sagsvurdering	Afventer		0

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

RCDs identify environmental projects

Inventory of Environmental Investment Opportunities

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

Enabling a Central Coast Carbon Farm Hub

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)

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Where we are going

Procesess we can add

River restoration – immense GHG sequestration potential

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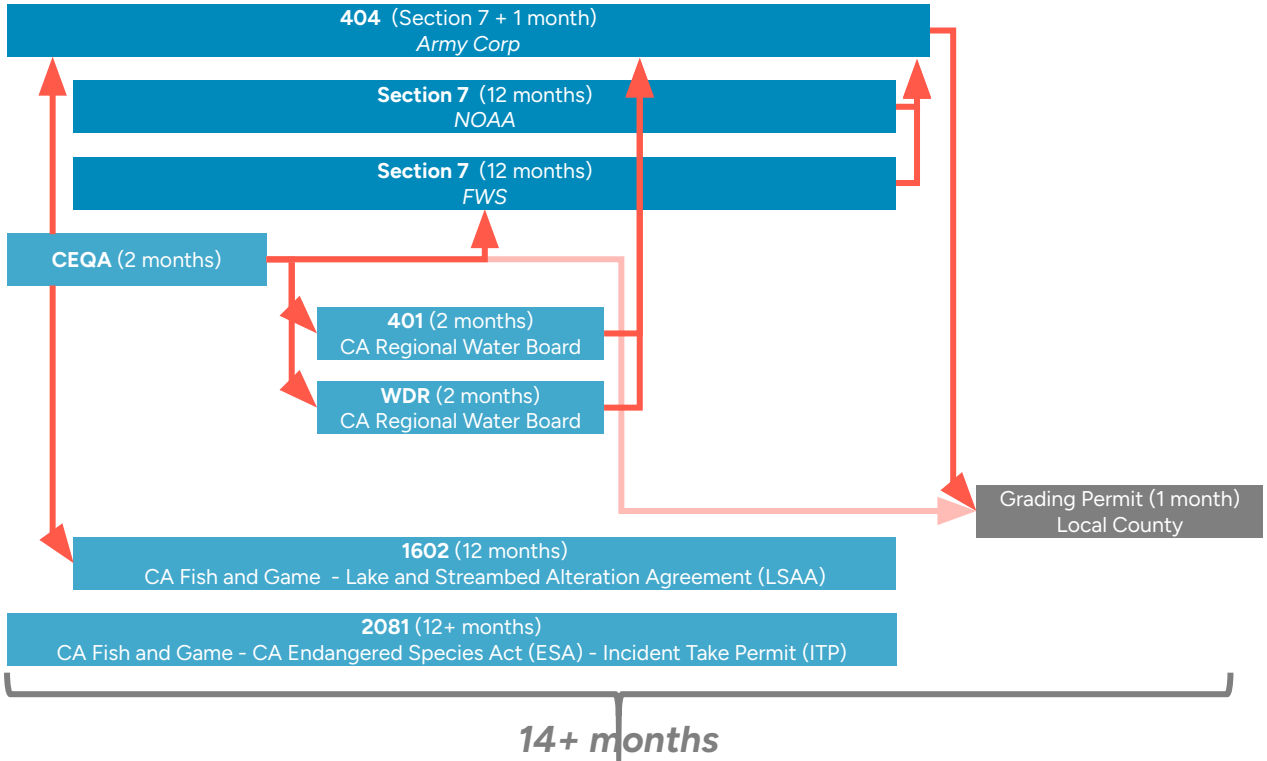
Salinas River

Beaver Dam Analog

Process Based Restorations – Permitting requirments 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.

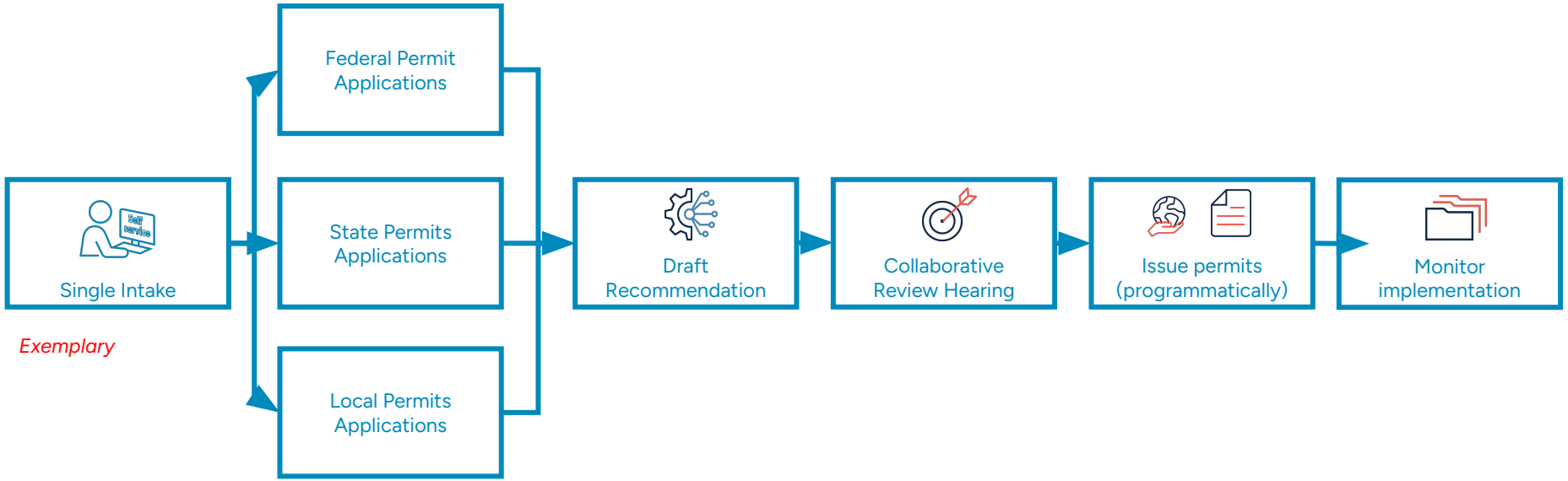


Critical assumptions

- 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.

CBRAIN

Solution – Consistent Programatic Permitting Pathway for Watershedwide PBR



Exemplary

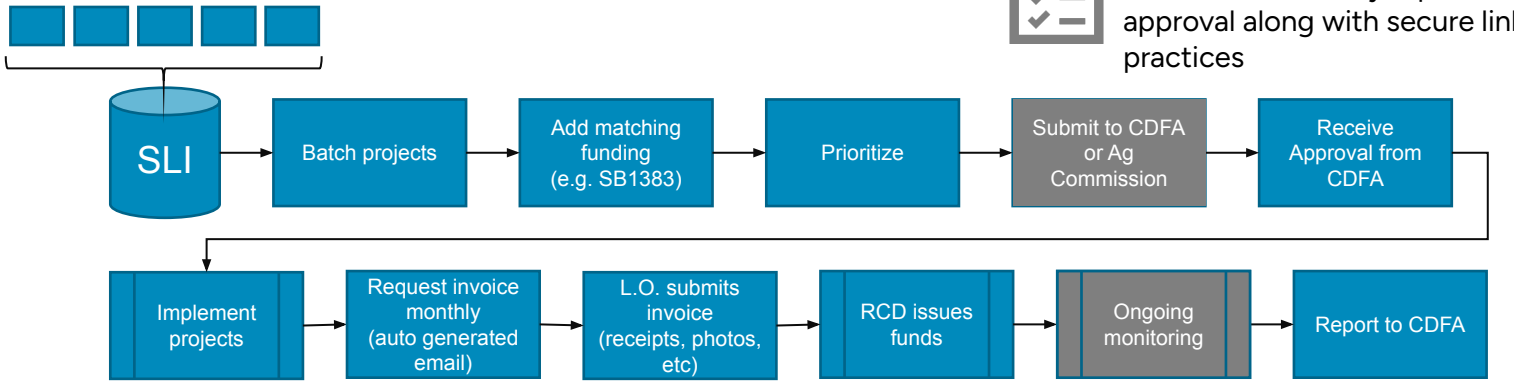
Could we get permits in weeks rather than years?

CBRAIN

Block grant administration

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

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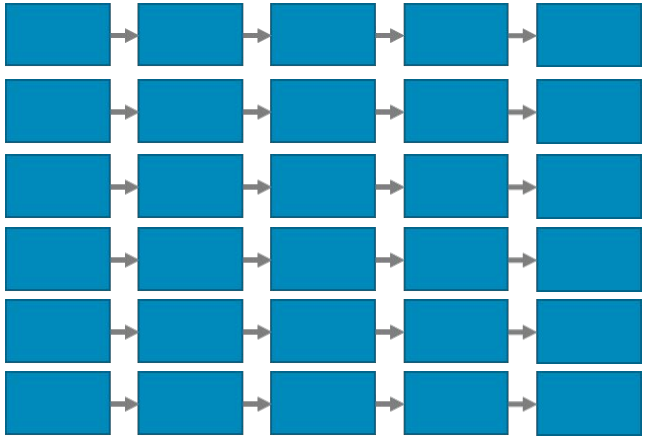
A sustainable land platform

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



Certification – organic cannabis

Equipment – regional equipment share

Permitting – riparian restoration

Block grant administration - SWEEP

Block grant administration - HSP

SLI

Process Library

RCDs can rapidly develop and adopt new processes to drive sustainability

Sustainable Land Platform

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*

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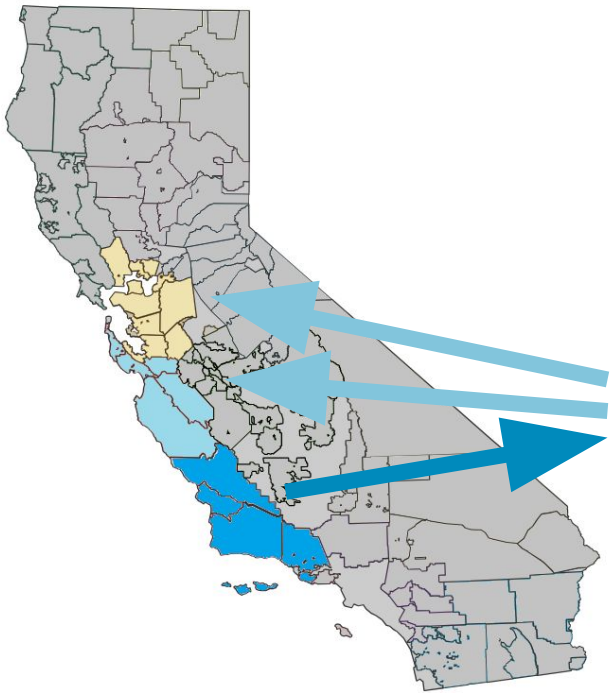
Scaling the solution

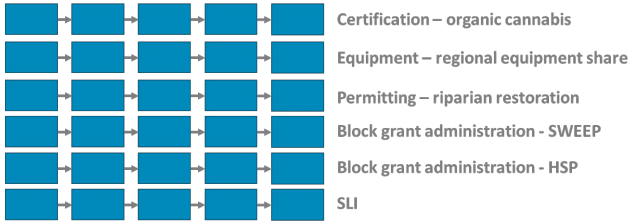
Each region in California can adopt and implement the platform rapidly and as new processes are added by one region, the entire state benefits.



Dashboard for Regional or State Transparency

Marketplace for Sustainability

CEQA Mitigation
Investment
bonds
Carbon Markets



Sustainable Land Platform

UPPER SALINAS-LAS TABLAS RESOURCE CONSERVATION DISTRICT

cBrain's Belief – "Winning Slowly is losing"

If we don't accelerate our speed of action, we fail at achieving our climate objectives

GREETING FROM THE CEO

Winning slowly is losing

2022 was in many ways a year of challenges. Some were foreseeable, others we couldn't have imagined. The geopolitical divides have grown, making global problem solving increasingly difficult – sometimes even impossible. We need cooperation now more than ever. Yet we are faced with a polarisation of the world order, and the parameters we usually base our work on are changing.

But we don't solve our problems by shying away from them. We need to recognize them, face them, and collaborate to solve them. This was clear when cBrain participated in the UN General Assembly in New York, where the theme was "In a world of new challenges, we need to build on what unites us". Or when we were at World Economic Forum in Davos, where the theme was "Cooperation in a Fragmented World".

Good news can be hard to find. This also applies to the climate crisis. We are losing sight of the 1.5-degree target. We are indeed still moving in the wrong direction, but on the solution side we see opportunities. cBrain participated and discussed this at length during the COP27 conference in Egypt. cBrain has a particular interest and many solutions to show in the climate software space. We believe that digitalization is a key enabler to do more and better. Fast track digitalization can close the time gap from initial political decision to its execution and real-life impact on greenhouse gas emissions, biodiversity and protection of nature. We see opportunities to fight back on the global climate agenda.

We have shown that with our standard software platform, we can help countries accelerate the green transition through faster and smarter approval processes or through automated permits and inspections. We have illustrated some of these solutions in this report. This year, COP27 also provided a breakthrough on the long overdue issue of Loss & Damage. Here we also see digitalization as a decisive factor to ensure implementation and execution.

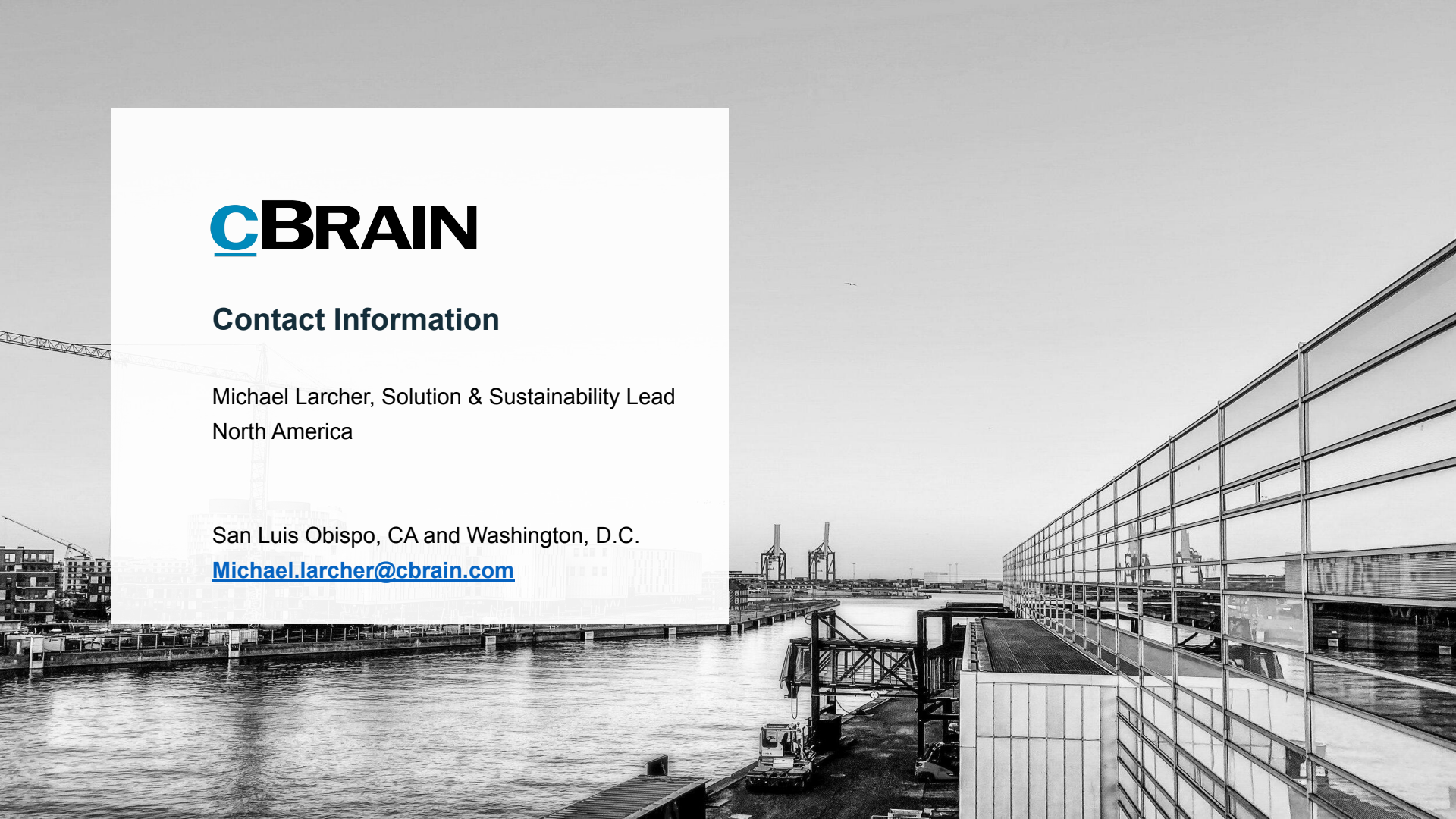
Democracy has never been the only game in town, but more than two decades after the transitions that ended the Cold War, trust in democracy continues to decline. Over the past decade, the erosion of the liberal democratic order has worsened, and authoritarian powers are on the rise. The failure of existing institutions to address pressing societal concerns, increasing polarization, and growing inequality have fuelled insecurity, and major democracies' mismanagement of the COVID-19 pandemic has provided further mistrust to the democratic governance we hold so very dear.

At cBrain, we see it as one of our key endeavors – in Public-Private-Partnerships – to help rebuild trust in our democracy by ensuring the efficiency of the public sector. By moving swiftly from paper to digital administrations, authorities will be able to work better, with more fairness and less corruption.

That is also why we have signed the Copenhagen pledge on tech for democracy. We believe that technology can increase transparency and accountability in governments. Be it on the climate agenda or on the foundations of our democracy. Digitalization is a beacon of light in a world shrouded by dark clouds.

Per Tejs Knudsen, CEO

cBRAIN



Contact Information

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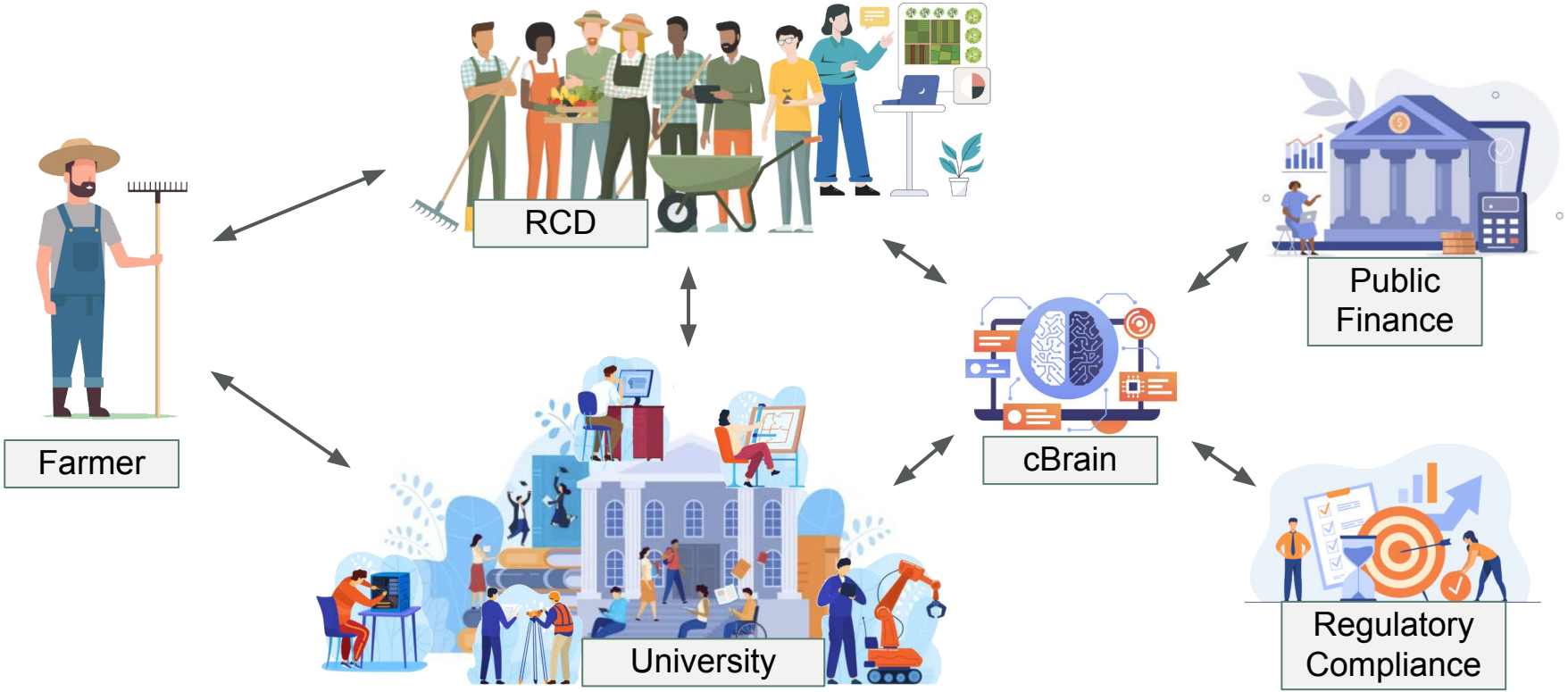
Sustainable Land Initiative (SLI)



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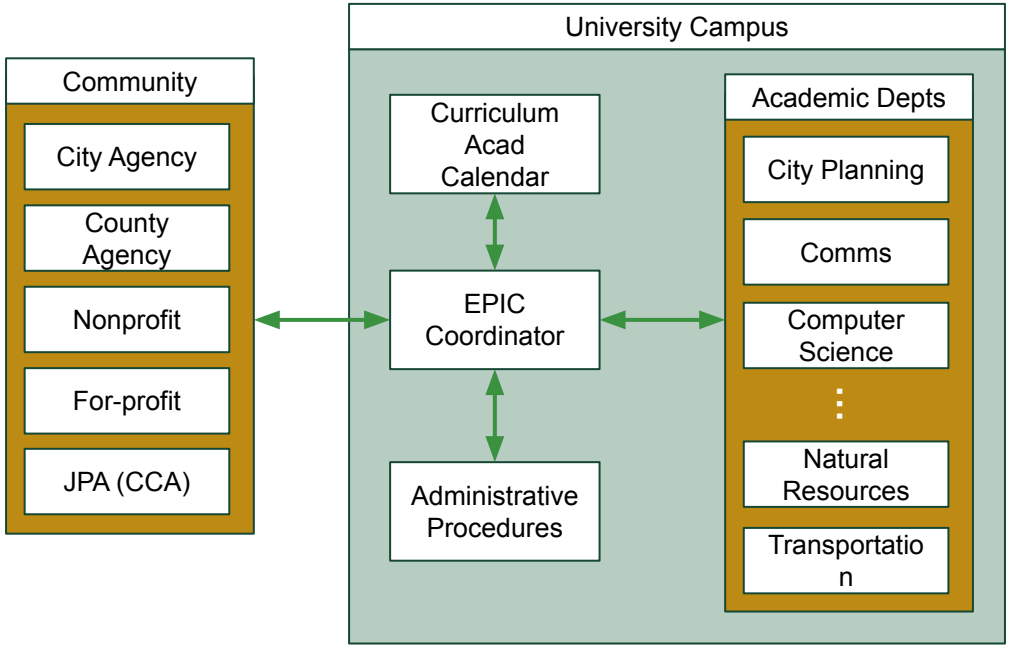
EPIC model for service learning

- 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

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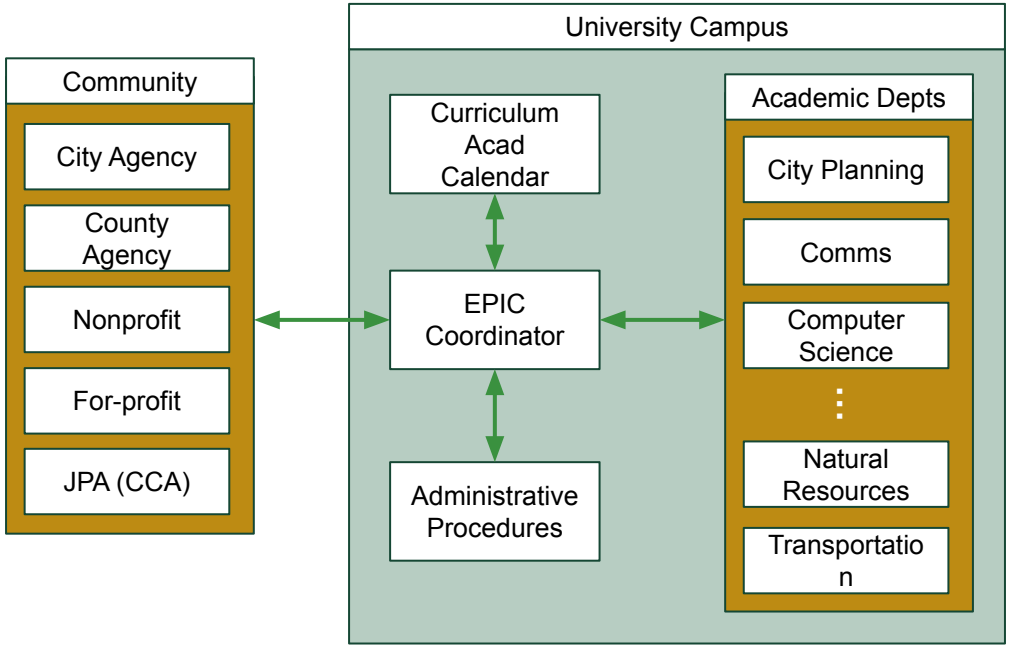
Advantages over classical service learning model

- 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

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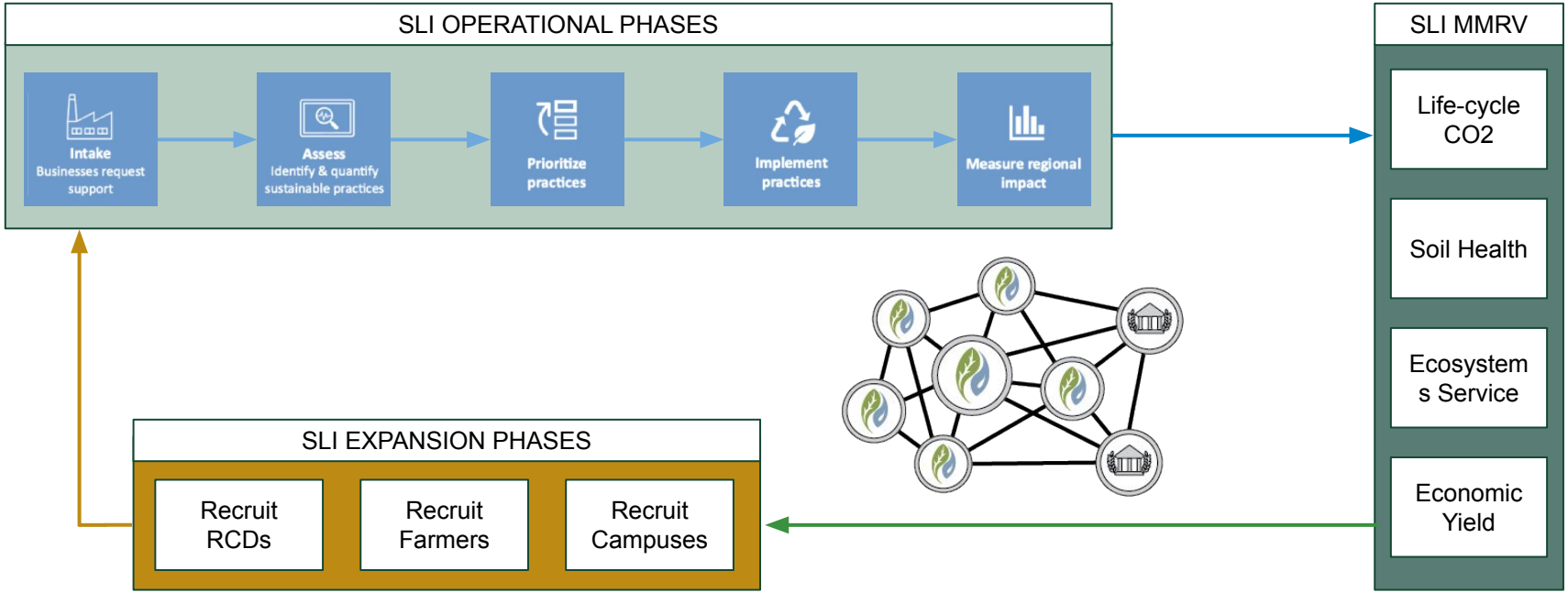
How ICLR supports the Sustainable Land Initiative



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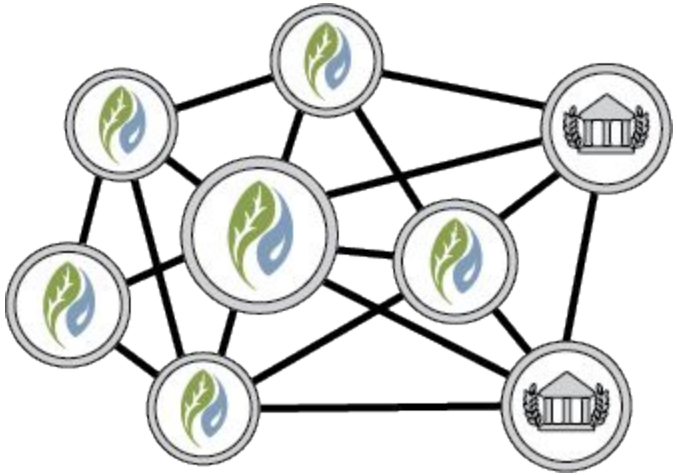
How ICLR supports SLI Operational Phases

- **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



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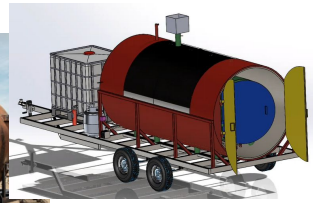
How ICLR supports SLI Operational Phases

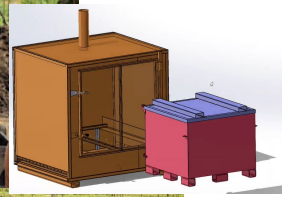
- **Equipment**

Professor Matt Haberland

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

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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

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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

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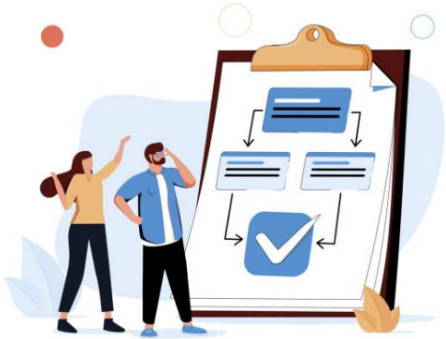
How ICLR supports SLI development

- **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!

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