MEETING AGENDA
January 19, 2017

Public Meeting
9:30 AM to 4 PM
California Department of Food and Agriculture
Main Auditorium
1220 N Street, Sacramento, CA 95814
916-654-0433

REMOTE ACCESS
Webinar information
Registration URL: https://attendee.gotowebinar.com/register/440078809406019329
Webinar ID: 790-659-139
Please note the webinar is on listen-only mode. For verbal questions and comments, please attend the meeting in person. An opportunity to provide written comments following the meeting will be provided.

Presentation materials will be posted at the following link prior to the meeting: https://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html

EFA SAP MEMBERSHIP
https://www.cdfa.ca.gov/oefi/efasap/
Don Cameron, Terranova Ranch, Member and Chair
David Bunn, PhD, Resources Agency, DOC, Member
Emily Wimberger, CalEPA, ARB, Member
Vicky Dawley, Tehama RCD, Member
Scott Couch, CalEPA, State Water Board, Member
Jocelyn Bridson, MSc, Rio Farms, Member
Jeff Dlott, PhD, SureHarvest, Member
Judith Redmond, Full Belly Farms, Member
Julie Alvis, Resources Agency, Member
Luana Kiger, MSc, Subject Matter Expert
Doug Parker, PhD, Subject Matter Expert

1. Introductions Chair Cameron
2. Welcome message for new members Karen Ross, Secretary CDFA
3. Minutes from previous meeting
4. The State Water Efficiency and Enhancement Program (SWEEP)
   • Update on overall program
   • Update on next solicitation
   Scott Weeks
4. DWR-CDFA Joint Pilot Project
   • Update on overall program
   Martin Berbach (DWR) and Carolyn Cook, MSc (CDFA)
5. Healthy Soils Program
   • Proposed programmatic framework for implementation
   • Timeline of activities
   • ARB quantification methodologies
   Geetika Joshi, PhD (CDFA)
   Bailey Smith (ARB)
7. Public Comments on Healthy Soils Program Chair Cameron
8. Next meeting and location

Amrith (Ami) Gunasekara, PhD, CDFA Liaison to the Science Panel
All meeting facilities are accessible to persons with disabilities. If you require reasonable accommodation as defined by the American with Disabilities Act, or if you have questions regarding this public meeting, please contact Amrith Gunasekara at (916) 654-0433.
More information at: http://cdfa.ca.gov/Meetings.html and http://www.cdfa.ca.gov/EnvironmentalStewardship/Meetings_Presentations.html
CALIFORNIA DEPARTMENT OF FOOD AND AGRICULTURE (CDFA)
ENVIRONMENTAL FARMING ACT SCIENCE ADVISORY PANEL

University Cooperative Extension Office
1432 Abbott Street
Salinas, CA 93901

August 26, 2016
1 PM to 4 PM

MEETING MINUTES

Panel Members

Don Cameron, Member and Chair
Jocelyn Bridson, MSc., Member
David Mallory (ARB), Member
Jeff Dlott, PhD. Member
David Bunn (Bruce Gwynne) (Natural Resources Agency), Member
Doug Parker, PhD., Subject Matter Expert

State Agency Staff

Bailey Smith (ARB)
Bonnie Soriano (ARB)
Amrith Gunasekara, PhD., CDFA
Geetika Joshi, PhD., CDFA
Carolyn Cook, MSc. CDFA
Scott Weeks, CDFA
Katie Filippini, MSc. CDFA

AGENDA ITEM 1 - Introductions

The meeting was called to order at 1:10 PM by the Chair, Mr. Don Cameron. Introductions were made. Present at the meeting were all the members noted above under “Panel Members”. A quorum was established.

AGENDA ITEM 2 - Updates

Minutes
Chairman Cameron introduced the minutes from the May 18, 2016 meeting. A motion was made by Ms. Bridson to accept the minutes as presented by CDFA staff and the motion was seconded by Mr. Gwynne representing Mr. Bunn. The motion was moved by all members present and accepted without further changes.
SWEEP - State Water Efficiency and Enhancement Program

Ms. Katie Filippini and Mr. Scott Weeks, new hires to the SWEEP, provided an update on the State Water Efficiency and Enhancement Program (SWEEP) including the most recent status of the ongoing drought, which is now in its fifth year. They noted recent developments with the latest June 2016 solicitation for applications. Application information was provided to the panel members; 268 completed grant applications totaling $34 million with an average amount of $128,000 per project requested. The funding cap was established at $200,000 for this round. CDFA has $17 million to allocate for projects. CDFA also provided an update on past SWEEP awards verification activities. Staff and Dr. Gunasekara facilitated questions from the members.

CDFA noted to the members that the California Climate Action Network had provided a report critically evaluating SWEEP including providing several recommendations on how to improve the program. CDFA staff noted that the report will be reviewed and recommendations taken into consideration for the next SWEEP solicitation.

Healthy Soils Incentive Program

Dr. Joshi provided an overview of a framework for a Healthy Soils Incentive Program if funding is allocated. The Healthy Soils Program will be designed to provide incentives to farms and ranchers to build carbon and reduce greenhouse gases on agricultural lands. The program will include a list of USDA NRCS practices that have quantified greenhouse gas reductions so growers could choose which practice to implement and obtain financial incentives for its implementation through the CDFA Healthy Soils Program. Discussion ensued including comments from the Science Panel members. Members noted that a one-page summary on each practice might be helpful to describe each practice, its benefits and also co-benefits. Comments from the public included discussion on grant award size and recognize benefits already being done by growers.

Compost Application Rates to Support the CDFA Healthy Soils Incentive Program

Dr. Gunasekara provided information through a presentation on the application of compost on agricultural lands to support a CDFA Healthy Soils Incentive Program. This work is a continuation of work completed through previous Science Panel meetings where a literature review, white paper report and public comment was facilitated to establish compost use application rates to support a CDFA Incentive Program that is designed to build soil organic matter in California agricultural operations. CDFA has made several changes to the white paper report since the May 2016 Science Panel meeting. Those changes were presented to the members and were based on public comment letters. A comparison of the initially proposed application rates for compost on cropland and rangeland were presented along with another table showing the changes. Members noted that the conventional and organic rates were the same and therefore suggested combining those categories together might be helpful and lead to less confusion. Mr. Gwynne, representing Dr. Bunn, noted the importance of maintaining native plant communities as compost is added to working lands. These application rates
are not regulatory requirements; rather they are the rates that will be incentivized through financial support as part of the CDFA Healthy Soils Incentive Program. Dr. Gunasekara noted that additional compost can be applied beyond what will be incentivized by CDFA. Public comment was facilitated. Members moved to accept the final report. A motion was made by Mr. Gwynne representing Dr. Bunn from the Natural Resources Agency. The motion was seconded by Mr. Jeff Dlott. The motion was moved by all members present and accepted without further changes.

AGENDA ITEM 3
Informational Presentations

Two informational presentations were included in this agenda. They included a presentation by Dr. Parameswaran on work that is being completed though Trace Genomics to evaluate the health of soil through microbial genomics.

Mr. Adar and Dr. Shoub provided an informational presentation on AutoAgronom which focuses on the development of plant root systems which improve overall plant growth.

AGENDA ITEM 4 and 5 – Public Comment and future meetings
Public comment was facilitated followed by discussion. The date and location of the next meeting is November 18, 2016 and will be in Modesto, California. Chair Cameron adjourned the meeting at 4:35 PM.

Respectfully submitted by:

__________________________________________
Amrith Gunasekara, Ph.D. Date
MEETING MINUTES

Panel Members

Don Cameron, Member and Chair
Jocelyn Bridson, MSc., Member
David Mallory (ARB), Member
Jeff Dlott, PhD. Member (phone)
Judith Redmond, Member
David Bunn, PhD. (Bruce Gwynne) (Natural Resources Agency), Member
Doug Parker, PhD., Subject Matter Expert
Luana Kiger, Subject Matter Expert (phone)

State Agency Staff

Bailey Smith (ARB)
Bonnie Soriano (ARB)
Amrith Gunasekara, PhD., CDFA
Geetika Joshi, PhD., CDFA
Carolyn Cook, MSc. CDFA
Scott Weeks, CDFA
Martin Berbach, DWR

AGENDA ITEM 1 - Introductions

The meeting was called to order at 1:02 PM by the Chair, Mr. Don Cameron. Introductions were made. Present at the meeting were all the members noted above under “Panel Members”. A quorum was established.

AGENDA ITEM 2 - Updates

Minutes

Dr. Gunasekara noted that minutes from the last meeting in August will be presented at the January Science Panel meeting given several recent edits. Dr. Gunasekara noted that recent legislation had increased the membership on the panel from five members to
nine members. All new members will join the panel for the first time at the January, 2017 Science Panel meeting in Sacramento.

**AGENDA ITEM 3 - Healthy Soils Incentive Program**

Dr. Joshi provided an overview of a framework for a Healthy Soils Incentive Program. She noted that in September, 2016, CDFA received $7.5 million from the Climate Investments Programs in the recent 2015-2016 state budget. The Healthy Soils Program will be designed to provide incentives to farms and ranchers to build carbon and reduce greenhouse gases on agricultural lands. The program will include a list of USDA NRCS practices that have quantified greenhouse gas reductions so growers could choose which practice to implement and obtain financial incentives for its implementation through the CDFA Healthy Soils Program. Discussion ensued including comments from the Science Panel members. Questions by Ms. Redmond on compost use and rates as part of a CDFA Healthy Soils Program were facilitated. Comments from the public were also facilitated.

**AGENDA ITEM 4 - State Water Efficiency and Enhancement Program (SWEEP)**

Mr. Scott Weeks, provided an update on the State Water Efficiency and Enhancement Program (SWEEP). Application numbers for the most recent round of SWEEP were provided for informational purposes. He noted that CDFA had received an additional $7.5 million as part of the state budget which was moved in September, 2016. CDFA suggested to the Science Panel that reducing the total grand award size from $200,000 to $100,000 would suit the next solicitation better, given the smaller amount of funds allocated to SWEEP compared to previous awards (e.g., $7.5 million in 2016 compared to $40 million in 2015). CDFA had also received comments from several stakeholders and these comments were summarized and discussed at the Science Panel meeting. Mr. Weeks noted that CDFA SWEEP staff is engaging on a media project to highlight the benefits of SWEEP and improve the programs visibility. CDFA was encouraged to highlight a diversity of farmers including women and growers in disadvantaged communities. Mr. Weeks and Dr. Gunasekara facilitated questions from the members and the public. Mr. Cameron suggested surveying the applicants and recipients of SWEEP to understand the barriers, ease of use for water and greenhouse gas calculations and technical assistance needs.

Ms. Smith provided an update on the Quantification Methodology (QM) for the next solicitation of SWEEP. She noted recent updates and changes to the QM tool that supports the program’s application requirements. The QM public comment period was November 18, 2016 to December 2, 2016 and stakeholders and the public were open to comments on numerous aspects of the tool.

A motion was requested by Dr. Gunasekara on the total award amount per application. The suggestion by CDFA was to reduce the total award amount from $200,000 to $100,000. A motion was made by Mr. Gwynne and seconded by Mr. Mallory. Public comment was facilitated. The motion was passed by all members present.
AGENDA ITEM 5 – DWR-CDFA Joint Pilot Project

Mr. Berbach and Ms. Cook provided an update on the DWR-CDFA joint pilot project involving funding for both agricultural water suppliers and agricultural operations. The pilot grant program will combine $3 million in funding from DWR’s Proposition 1 fund for agricultural water suppliers to pressurize the delivery of water directly to growers. This will modernize water deliveries to match technological upgrades by growers to create more efficient irrigation systems. CDFA’s State Water Efficiency and Enhancement Program will provide an additional $3 million for growers to receive that water and utilize it through technologies such as drip, subsurface drip, and micro-sprinkler irrigation systems. Water suppliers will be responsible for submitting the applications and this pilot project requires a 50% cost share unless Disadvantaged Communities (DAC) or Economically Distressed Areas (EDA) status is claimed and documented. Ms. Smith provided information on the ARB Quantification Methodology developed for the program. A timeline of activities was also provided for this program.

AGENDA ITEM 6 – Habitat Exchange Program

Dr. Gunasekara noted that he was unable to secure staff from the Environmental Defense Fund to speak on this program due to previous engagements and will work to include the topic in future meetings.

AGENDA ITEM 7 – Public Comment and future meetings

Public comment was facilitated and followed by discussion. The date and location of the next meeting is January 19, 2017, and will be in Sacramento, California. Chair Cameron adjourned the meeting at 4:10 PM.

Respectfully submitted by:

Amrith Gunasekara, Ph.D. Date
SWEEP BACKGROUND

• **$10 million**: Emergency Drought Legislation Bill - SB 103 signed by Governor Brown on March 1, 2014

• **$10 million**: AB 91 allocated additional funds March 27, 2015

• **$40 million**: Budget Act of 2015, Item 8570-001-3228 (Chapter 321, Statutes of 2015) appropriate funds from the Greenhouse Gas Reduction Fund

• **7.5 million**: AB1613 (Chapter 370, Statutes 2016)

“...to invest in irrigation and water pumping systems that reduce water use, energy use and greenhouse gas emissions.”
SWEEP AUTHORITY

• **Environmental Farming Act of 1995**
  Division 1, Part 1, Chapter 3, Article 8.5, Sections 560-568, Section 566 (a)

  “The department shall establish and oversee an environmental farming program. The program shall provide incentives to farmers whose practices promote the well-being of ecosystems, air quality, and wildlife and their habitat”
PROJECT TYPES

Water Conservation
- Sensors for Irrigation Scheduling *(weather, soil or plant based)*
- Micro-Irrigation or Drip Systems

AND

GHG Reductions
- Fuel Conversion
- Improved Energy Efficiency
- Low Pressure Systems
- Variable Frequency Drives
- Reduced Pumping
**SWEEP 2016 ROUND 1**

**FUNDING**
- $16 million awarded
- $9.5 million in matching funds

**ACREAGE**
- 128 projects
- 27,300-acres impacted
- 213-acres average project size

**BENEFITS**
- GHG Reductions: 5,635 MT CO$_2$e/yr
- Water Savings: 1541 ac-ft/yr
SWEEP 2016 ROUND 2

**FUNDING**
- $22 million awarded
- $11 million in matching funds

**ACREAGE**
- 167 projects
- 31,949 acres impacted
- 191 acres average project size

**BENEFITS**
- GHG Reductions: 11,103 MT CO$_2$e/yr
- Water Savings: 2220 ac-ft/yr
SWEEP 2016 Rd1 & Rd2

• Awarded $38 million with $20.5 million in matching funds
• 305 Projects with 59,249 acres impacted
• GHG Reduction equivalent to taking 3536 cars off the road
• Water Savings of 1855 Olympic Swimming pools
SWEEP 2017

• $7.5 million from AB1613
• Reduction of total grant from $200,000 → $100,000
  • More project with less money
• New and Improved Calculators
  • SWEEP Irrigation Water Savings Assessment Tool
  • SWEEP GHG Emission Reduction Calculator
APPLICATION REQUIREMENTS

• Applicants must establish a baseline water use and GHG emissions from the current system and project savings due to the project. Supporting documentation is required including:
  • Energy bills
  • Water Use Calculator Tool
  • Pump Tests

• Awardees must maintain records for 3 years and agree to verifications site visit

ARB GHG Calculator Tool
## SWEEP 2017 TIMELINE

<table>
<thead>
<tr>
<th>Item</th>
<th>Proposed Dates*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Request for Applications (RFA) released</td>
<td>January 31&lt;sup&gt;st&lt;/sup&gt;</td>
</tr>
<tr>
<td>Grant Application Workshops (CDFA)</td>
<td>February 6&lt;sup&gt;th&lt;/sup&gt; - 10&lt;sup&gt;th&lt;/sup&gt;</td>
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<tr>
<td>Application Workshops  (3&lt;sup&gt;rd&lt;/sup&gt; Party)</td>
<td>February 13&lt;sup&gt;th&lt;/sup&gt; - March 13&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Last day to submit application</td>
<td>March 14&lt;sup&gt;th&lt;/sup&gt;</td>
</tr>
<tr>
<td>Announce Awardees</td>
<td>May</td>
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</tbody>
</table>
TECHNICAL ASSISTANCE WORKSHOPS

$25,000

• Currently accepting applications for Technical Assistance Workshops
• $2,500-5,000 per institution
• News Release on January 13, 2017

Required

• Have an Irrigation systems expert available
• Internet access for applicant assistance
• Having at least one workshop in a DAC
These Fresno Technical Assistance Workshops were taught in three languages (Hmong, Spanish, and English) Incorporated Univision TV and directly impacted 60 individuals.
AWARDED PROJECT EXAMPLE

Henry Pruitt Anderson, III SWEEP Project
$150,000 - Tulare CA

80 Acres of almonds
- Changing from flood to drip irrigation
- Installation of soil moisture sensors and weather stations
- Solar array and VFD and flowmeter

- Estimated Water Savings of 23.9 acre in/year/acre
- GHG Savings of 0.0130 MT CO$_2$e/year/acre
COLLABORATION WITH RESOURCE CONSERVATION DISTRICT

• Contracted with the RCDs to conduct onsite project verifications

• RCDs verify projects were implemented in accordance with the Grant Agreement SOW and take photos of project components

Brian Hockett, NW Kern RCD
Thank you for the time and your attention

Scott Weeks – Environmental Scientist, CDFA
Scott.Weeks@cdfa.ca.gov

Carolyn Cook – Senior Environmental Scientist, CDFA

Crystal Myers – Office of Grants Administration, CDFA

Kyle Montero – Office of Grants Administration, CDFA

Geetika Joshi – Senior Environmental Scientist, CDFA

Amrith (Ami) Gunasekara – Manager, OEFI, CDFA
The Joint Program

The grant funding provided in this joint program is intended to address multiple goals including:

1) Water use efficiency, conservation and reduction
2) Greenhouse gas emission reductions
3) Groundwater protection
4) Sustainability of agricultural operations and food production.

It is also anticipated that there will be benefits to water and air quality, groundwater security, surface water conservation, and improved nutrient management and crop health through this program.
The Joint Program

A program to:

1. Incentivize the pressurization of the delivery of water to farms

2. Facilitate the use of surface water on farms where currently groundwater is the main source for irrigation

3. Incentivize efficient on-farm irrigation systems that increase water use efficiency and reduce greenhouse gases

4. Encourage the use of on-farm water management tools such as soil moisture sensors, plant sensors and weather stations.
The Joint Program and Funding

Conveyance
Funded by DWR
Prop 1 funding - $3 million

Farms
Funded by CDFA
GGRF - $3 million
The Joint Program - DWR
The Joint Program - CDFA
Application Process

1. One application from agricultural water supplier with farmer applications included
2. Show significant decrease in use of on-farm groundwater pumps to reduce GHGs
3. Water and GHG savings to be quantified by agricultural water supplier through the use of a GHG Calculator developed by the CA Air Resources Board

https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/cdfa_jointsweep_finalqm_16-17.pdf (PDF)
https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/cdfa_jointsweep_finalcalc_16-17.xlsx (.xlsx)
<table>
<thead>
<tr>
<th>Activity</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Draft Request for Applications Released</td>
<td>August 26, 2016</td>
</tr>
<tr>
<td>Public Comment Workshops</td>
<td>September 27, 28, &amp; 29, 2016</td>
</tr>
<tr>
<td>Public Comment Period Closed</td>
<td>September 30, 2016</td>
</tr>
<tr>
<td>Release of Final Request for Applications</td>
<td>January 17, 2017</td>
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<tr>
<td>Application Workshop</td>
<td>January 23, 2017</td>
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<tr>
<td>Applications Due</td>
<td>April 21, 2017</td>
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</tbody>
</table>
THANKS......

http://www.water.ca.gov/wuegrants/AgWUEPilot.cfm

Contacts
Fethi Benjemaa, DWR Fethi.Benjemaa@water.ca.gov
Marty Berbach, DWR Martin.Berbach@water.ca.gov
Carolyn Cook, CDFA Carolyn.Cook@cdfa.ca.gov
Amrith Gunasekara, CDFA Amrith.Gunasekara@cdfa.ca.gov
HEALTHY SOILS INCENTIVES PROGRAM

Geetika Joshi, PhD
Senior Environmental Scientist

ENVIRONMENTAL FARMING ACT – SCIENCE ADVISORY PANEL
JANUARY 19, 2017
SACRAMENTO
PRESENTATION OUTLINE

- Healthy Soils Initiative
- Healthy Soils Program
  - Objective & Funding
  - Program Development Process
  - Draft program framework including:
    - Current status
    - Allocation of funds to incentive and demonstration projects, proposed award amounts
    - Potential management practices for incentives program
    - Timeline
HEALTHY SOILS INITIATIVE

- More than 400 agricultural commodities in California, including unique specialty crops.
- California remained the No. 1 state in cash farm receipts in 2015, with $47 billion in revenue from 76,400 farms and ranchers (#1 for more than 50 years).
- Some of the most fertile and diverse agricultural soils: soils are fundamental plant growing medium.
- Meeting with Governor’s Office and administration on initiative.
- Interagency meetings with several agencies and departments:
  - CalEPA; DPR, CalRecycle, State Water Resources Control Board, Regional Water Quality Control Boards; Natural Resources Agency; Department of Conservation, SGC
- Webpage and list-serv for California Healthy Soils Initiative; short and long term actions document: (insert weblink)
Healthy Soils Program: Objective and Funding

Objective: To build soil carbon and reduce agricultural GHG emissions through incentives.

CDFA appropriated $7.5 million in FY 2016-17 to develop and administer a new incentive and demonstration program on the CA Healthy Soils Initiative from the Greenhouse Gas Reduction Fund.

Funds must be encumbered by June 30, 2018 and expended/liquidated by June 30, 2020 (AB 1613, Section 13).

Funds allocation:

- Incentive projects (50%; $3.75M)
- Demonstration projects (40%; $3M)
- Remainder funds: administrative cost (10%; $0.75M)
PROGRAM DEVELOPMENT PROCESS

Initial Program Framework → EFA-SAP → Revise Framework

Feedback from Various Partners:
- Public Workshops, Farmers & Ranchers, Sister Agencies, Academia

Inputs from:
- EFA-SAP
- ARB
- Public and stakeholders
- Agency Documents and Research Literature

Finalized Grant Solicitation and Quantification Methodology → Review of Submitted Applications → Award of Grant Funds → GHG Emissions Reduction Verification

Continued

Commenced Jan 19, 2017
Eligibility: California farmers and ranchers. Projects must be located in CA and result in GHG reductions from agricultural practices for a specified time period, quantifiable using a method determined by ARB.

Projects funded under this solicitation to use one or more of the eligible USDA-NRCS Conservation Practice Standards identified in the grant solicitation, and/or compost application.

An agricultural operation to only submit one application using a unique tax identification number per round of funding to allow wide distribution of funds.

Proposed award amount: Maximum $25,000 per project (approx. 150 projects supported).
MANAGEMENT PRACTICES TENTATIVELY INCLUDED FOR INCENTIVES

Tentatively included:

- Improved Fertilizer Management (590a)
- Mulching (484)
- Cropland Compost Application (Not an NRCS Practice)
- Grassland Compost Application (Not an NRCS Practice)
- Herbaceous Cover:
  - Herbaceous Wind Barriers (603)
  - Vegetative Barriers (601)
- Riparian Herbaceous Cover (390)
- Contour Buffer Strips (332)
- Field Border (386)
- Filter Strip (393)
- Woody Cover:
  - Windbreak/shelterbelt establishment/renovation (380)
  - Riparian Forest Buffer (391)
  - Hedgerow Planting (422)
  - Silvopasture (381)
Per SB 862, the California Air Resources Board (ARB) is required to develop quantification methods (QM) for agencies receiving Greenhouse Gas Reduction Fund (GGRF) appropriations.

ARB, in collaboration with CDFA, is developing the QM Tool.

To be presented in next section.
FRAMEWORK PROPOSED FOR DISCUSSION: INCENTIVES PROGRAM – APPLICATION

- Applicant would provide information including but not limited to:
  - Description of the proposed project.
  - Estimation of greenhouse gas (GHG) reductions according to an ARB approved methodology developed in consultation with CDFA:
    - Include baseline estimates and supporting documentation.
    - Specify the life of the project and how GHG emission reductions will continue to occur over the required timeframe.
- In finalized grant solicitations, CDFA and ARB will provide additional guidance for ongoing tracking and reporting of net GHG benefits from project activities.
CDFA will generate a list of co-benefits to be given additional consideration during application review.

Benefits to disadvantaged communities (DACs) – based on ARB guidance.
<table>
<thead>
<tr>
<th>ITEM</th>
<th>ESTIMATED DATES</th>
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<tbody>
<tr>
<td>Program framework development including Quantification Methodology</td>
<td>Nov 2016 – Apr 2017</td>
</tr>
<tr>
<td>Public Stakeholder Meetings for Program Design Feedback</td>
<td>Jan 2017 – Apr 2017</td>
</tr>
<tr>
<td>Grant solicitation released</td>
<td>May 2017</td>
</tr>
<tr>
<td>Applications proposals due</td>
<td>Jun 2017</td>
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<tr>
<td>Proposal evaluation (Technical Review)</td>
<td>Jun – Sep 2017</td>
</tr>
<tr>
<td>Announce grant awardees</td>
<td>Sep 2017</td>
</tr>
<tr>
<td>Project Implementation to begin</td>
<td>Oct 2017</td>
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</table>
Objective: Provide funding for projects that achieve net GHG benefits from soil carbon sequestration or GHG emissions reduction in the field.

Individual grant amount: Proposed maximum $250,000 per project (approx. 12 projects).

Eligibility:

- Projects must have field/on-farm component with quantifiable GHG emission reductions
- Partnerships: Ag Operations/Industry Groups + Academia and/or Non-profit organizations and/or RCDs
- Outreach and education component (e.g. Field Day) required.
- In finalized grant solicitations, CDFA and ARB will provide additional guidance for ongoing tracking and reporting of net GHG benefits from project activities.
PARTNERSHIPS FOR SOIL HEALTH THROUGH PROPOSED INCENTIVES PROGRAM

EFA-SAP → OEFI → Public Comments, Stakeholder Input

Academia and Non-profit Organizations → EFA-SAP

Farmers → CDFA

CDFA

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PROGRAM CONTACTS

Geetika Joshi, Ph.D.
Senior Environmental Scientist
Geetika.Joshi@cdfa.ca.gov

Amrith Gunasekara, Ph.D.
Science Advisor to CDFA Secretary
Manager, Office of Environmental Farming and Innovation
Amrith.Gunasekara@cdfa.ca.gov
CDFA Healthy Soils Program
FY 2016-17

Quantification Methodology Development Status
January 19, 2017
Background

- ARB is required by statute to develop quantification methodologies (QM) for Greenhouse Gas Reduction Fund (GGRF) projects
- QMs provide a mechanism to *estimate* the net GHG benefits from project implementation
- Net GHG benefits may result from:
  - Soil carbon benefits (CO₂) from storage and/or sequestration
  - Nitrous oxide (N₂O) emission reductions
  - Methane (CH₄) emission reductions
- Rely on best available science and external expertise
QM Development Principles

- **Greenhouse Gas Reduction Fund**
  - Applies at the project-level
  - Aligns with the project-types proposed for funding.
  - Estimates GHG benefits from direct, on-site practices
  - Based on scientifically sound, peer reviewed methods

- **Healthy Soils Program**
  - Includes CA land use management practices
  - Aligns with USDA/NRCS incentives and management practices
  - Available across CA cropping systems
  - Balance analytical rigor with ease-of-use
# QM Development Process

<table>
<thead>
<tr>
<th>Status</th>
<th>Task</th>
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<tr>
<td>✓</td>
<td>• Select eligible conservation management practices (CMPs)</td>
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<td></td>
<td>• Identify and evaluate existing and available resources and assessment tools</td>
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<td></td>
<td></td>
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<tr>
<td></td>
<td>• Identify resource gaps</td>
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<tr>
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<td>• Develop comprehensive QM</td>
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<tr>
<td>Q1/Q2 2017</td>
<td>• Automate QM - develop or adapt as needed an easy to use tool</td>
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<td>• QM review and public process</td>
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<td>• Provide QM resources to applicants</td>
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Quantification Approach

Selection of Conservation Practices
CDFA and ARB have identified CMPs with potential GHG benefits.

Project Quantification
Project-level quantification of net GHG benefits based on selected conservation management practices.

Project Implementation
Applicants implement conservation management practices according to Healthy Soils Incentive Program specifications.
## Practices Included in Healthy Soils Program (NRCS Conservation Practice Standard)

<table>
<thead>
<tr>
<th>Cropland Management</th>
<th>Cropland to Herbaceous Cover</th>
<th>Cropland to Woody Cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>• No-till (329)</td>
<td>• Herbaceous Wind Barriers (603)</td>
<td>• Windbreak/Shelterbelt Establishment (380)</td>
</tr>
<tr>
<td>• Reduced-till (345)</td>
<td>• Vegetative Barriers (601)</td>
<td>• Riparian Forest Buffer (391)</td>
</tr>
<tr>
<td>• Cover Crops (340)</td>
<td>• Riparian Herbaceous Cover (603)</td>
<td>• Hedgerow Planting (422)</td>
</tr>
<tr>
<td>• Mulching (484)</td>
<td>• Contour Buffer Strips (332)</td>
<td>• Silvopasture (381)</td>
</tr>
<tr>
<td>• Improved Fertilizer Management (590)</td>
<td>• Field Border (386)</td>
<td></td>
</tr>
</tbody>
</table>
USDA Quantitative Methods

- Designed for farm-scale application
- Standard set of GHG estimation methods
- Nationally applicable methodology
- Can be used for most of the selected practices
Identify and Evaluate QM Resources and Assessment Tools

- **Quantification Methodologies**
  - *USDA Quantifying GHG Fluxes*: Widely accepted standard set of GHG estimation methods for use by USDA, landowners, and other stakeholders

- **Assessment Tools and Models**

  - [COMET Farm](https://www.comet-farm.com)
  - [DNDC Biogeochemistry Model](https://www.comet-farm.com)
  - [COMET-PLANNER](https://www.comet-planner.com)
QM Framework

- Evaluating two approaches consistent with USDA’s Quantitative Methods
  - **USDA Quantitative Methods + DNDC**
    Supported by DNDC model for nitrogen
  - **COMET Planner Update**
    Consistent with USDA Methods and supported by DAYCENT model

- Identifying resource gaps
  - Compost application (Not a NRCS Conservation Practice)
QM Framework - Option

- USDA Quantitative Methods + DNDC
  - NRCS cropland management practices and compost
  - CA specific soils, climate, and crop categories
  - Model runs provide a lookup table by practice, county, and crop category
  - GHG estimates for each practice provided through automated tool based on lookup tables
QM Framework – Option

- USDA Quantitative Methods + DNDC

Example inputs/outputs for demonstration purposes only

### California Climate Investments
Healthy Soils GHG Calculator Tool
To Determine Greenhouse Gas Emission Reductions From
California Department of Food and Agriculture (CDF)
Healthy Soils Initiative

<table>
<thead>
<tr>
<th>Project Location</th>
<th>23565 Shoreline Hwy Flamville, CA 95468</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project County</td>
<td>Mendocino</td>
</tr>
<tr>
<td>Climate Type</td>
<td>Warm Temperate Moist</td>
</tr>
<tr>
<td>Soil Type</td>
<td>Low Activity Clay Soils</td>
</tr>
</tbody>
</table>

#### Input Data for Healthy Soils Practices

<table>
<thead>
<tr>
<th>Practice Number</th>
<th>Practice</th>
<th>Practice Area (acres)</th>
<th>Years Implemented</th>
<th>Crop Type</th>
<th>C:N Ratio</th>
<th>GHG Reduction MT CO₂e/yr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CPS 329: Conventional Tillage to No-Till</td>
<td>400</td>
<td>3</td>
<td>Non-legume Hay</td>
<td></td>
<td>18</td>
</tr>
<tr>
<td>2</td>
<td>CDEA: Cropland Compost Application</td>
<td>400</td>
<td>3</td>
<td>Non-legume Hay</td>
<td>&gt; 11</td>
<td>273</td>
</tr>
</tbody>
</table>

### USDA+DNDC Emissions Reductions kg-CO₂e/ac./yr.

<table>
<thead>
<tr>
<th>Crop</th>
<th>Cover Crop (lbs)</th>
<th>Cover Crop (lbs)</th>
<th>15% N Reduct</th>
<th>N Inhibit</th>
<th>15% N Reduce + Inhibit</th>
<th>High N Compost</th>
<th>Low N Compost</th>
<th>No Till</th>
<th>Reduced Till</th>
<th>Range-land Compost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alfalfa</td>
<td>226</td>
<td>234</td>
<td>291</td>
<td>650</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>299</td>
<td>148</td>
<td>39</td>
<td>87</td>
<td>125</td>
<td>317</td>
<td>674</td>
<td>157</td>
<td></td>
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<tr>
<td>Barley</td>
<td>385</td>
<td>183</td>
<td>206</td>
<td>669</td>
<td>781</td>
<td>257</td>
<td>631</td>
<td>87</td>
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<td></td>
</tr>
<tr>
<td>Corn, wheat</td>
<td>182</td>
<td>180</td>
<td>315</td>
<td>213</td>
<td>574</td>
<td>276</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Cotton</td>
<td>141</td>
<td>78</td>
<td>25</td>
<td>31</td>
<td>59</td>
<td>189</td>
<td>584</td>
<td>175</td>
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<td></td>
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<tr>
<td>Faba &amp; Lentils</td>
<td>72</td>
<td>36</td>
<td>14</td>
<td>23</td>
<td>36</td>
<td>78</td>
<td>429</td>
<td>196</td>
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<tr>
<td>Fruit trees</td>
<td>191</td>
<td>156</td>
<td>20</td>
<td>35</td>
<td>52</td>
<td>195</td>
<td>538</td>
<td>97</td>
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<tr>
<td>Fruit vegetables</td>
<td>242</td>
<td>153</td>
<td>45</td>
<td>49</td>
<td>83</td>
<td>165</td>
<td>541</td>
<td>39</td>
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<tr>
<td>Non-legume hay</td>
<td>108</td>
<td>43</td>
<td>36</td>
<td>194</td>
<td>214</td>
<td>320</td>
<td>682</td>
<td>44</td>
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<tr>
<td>Nuts</td>
<td>186</td>
<td>115</td>
<td>28</td>
<td>91</td>
<td>104</td>
<td>188</td>
<td>530</td>
<td></td>
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<tr>
<td>Pasture</td>
<td>16</td>
<td>108</td>
<td>118</td>
<td>184</td>
<td>529</td>
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<tr>
<td>Rangeland</td>
<td>148</td>
<td>120</td>
<td>163</td>
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<tr>
<td>Forage crops</td>
<td>132</td>
<td>124</td>
<td>35</td>
<td>46</td>
<td>69</td>
<td>155</td>
<td>488</td>
<td>122</td>
<td></td>
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<tr>
<td>Grass从来</td>
<td>184</td>
<td>177</td>
<td>31</td>
<td>35</td>
<td>59</td>
<td>166</td>
<td>519</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sedges and sedges</td>
<td>86</td>
<td>73</td>
<td>24</td>
<td>33</td>
<td>58</td>
<td>225</td>
<td>573</td>
<td>237</td>
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<tr>
<td>注重迁移</td>
<td>127</td>
<td>76</td>
<td>23</td>
<td>43</td>
<td>65</td>
<td>148</td>
<td>510</td>
<td>147</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woody</td>
<td>40</td>
<td>117</td>
<td>144</td>
<td>150</td>
<td>510</td>
<td>113</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Example inputs/outputs for demonstration purposes only
QM Framework - Option

- COMET-Planner 2017 Update
  - In progress
  - Consistent with USDA Quantitative Methods
  - Uses COMET-Farm functionality, based on DAYCENT modeling
  - Updated for California to include MLRA, soil types, climate, and cropping systems
QM Framework - Option

- COMET-Planner 2017 Update – example output

<table>
<thead>
<tr>
<th>NRCS Conservation Practices (Click Practice Name for Documentation)</th>
<th>Enter Acreage</th>
<th>Carbon Dioxide</th>
<th>Nitrous Oxide</th>
<th>Methane</th>
<th>Total CO₂-Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windbreak/Shelterbelt Establishment (CPS 380) - Replace a Strip of Cropland with Woody Plants</td>
<td>50 ac</td>
<td>310</td>
<td>16</td>
<td>N.E.²</td>
<td>330</td>
</tr>
<tr>
<td>Cover Crop (CPS 340) - Add Legume Seasonal Cover Crop to Irrigated Cropland</td>
<td>950 ac</td>
<td>290</td>
<td>-130</td>
<td>0</td>
<td>160</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>600</td>
<td>-114</td>
<td>0</td>
<td>486</td>
</tr>
</tbody>
</table>
Quantification Tools Provided to Applicants

- Document + calculator tool will be posted [https://www.arb.ca.gov/ccq-quantification](https://www.arb.ca.gov/ccq-quantification)

- Quantification assistance available – questions about the tool can be directed to GGRFprogram@arb.ca.gov

- QM development includes a public process
Next Steps

- Beta-test COMET-Planner update and review technical documentation
- Finalize draft QM and easy-to-use tool
- Facilitate public comment process in coordination with CDFA
- Provide status updates and QM development to EFA-SAP