



C-AGG April 2019 Sacramento, CA Meeting Summary

Tuesday 9 – Wednesday 10 April 2019
Hyatt Regency Sacramento, Sacramento, CA

Presentations and materials available: <https://www.c-agg.org/event/2019-april-sacramento-ca>

Contents

Meeting Overview	2
Meeting Sponsors	2
Welcome & Introductions.....	3
Session 1: Ecosystem Services Market Consortium: Markets for Agriculture	3
Session 2: CDFA Program Updates: Climate Smart Agriculture Incentives Programs at CDFA.....	3
Session 3: Sustainable Agricultural Lands Conservation Program Updates	4
Session 4: Carbon: Where Does it Belong?	4
Session 5: Using Targeted Efforts to Improve Soil Health	5
Session 6: 4R Practice Implementation: Environmental and Economic Impacts.....	5
Session 7: Temporal Changes in SOC, Tillage, and Land Use Across the US	6
Session 8: Operational Tillage Information System (OptIS): Using Remote Sensing Data to Map Conservation Ag Practices.....	6
Session 9: US Climate Alliance (USCA) and Agriculture.....	6
Session 10: Equipping USCA States for Natural and Working Lands Mitigation: Agriculture Policy and Practice Support	7
Session 11: Illinois State Update	7
Session 12: Partnerships and Programs to Improve Sustainable Agriculture in SD.....	8
Session 13: National Climate Change Policy Initiatives and Agricultural Imperatives	8



Meeting Overview

C-AGG participants met April 9 – 10, 2019 for C-AGG’s annual Sacramento, CA meeting. C-AGG Executive Director Debbie Reed opened and facilitated the 2-day meeting. Debbie Reed, presenting on behalf of the Ecosystem Services Market Consortium, and Bruce Knight of Strategic Conservation Solutions provided an overview of the Ecosystem Services Market Consortium and Markets for Agriculture. Geetika Joshi of the CA Department of Food and Agriculture (CDFA) provided updates on CDFA programs including the Alternative Manure Management Program (AMMP), the Dairy Digester Research and Development Program (DDRDP), and the Healthy Soils Program (HSP). Virginia Jameson from the CA Department of Conservation spoke on the Sustainable Agricultural Lands Conservation (SALC) Program. George Davis of Porter Creek Vineyard and CA Farmers Union gave a presentation on carbon and soils from a farmer’s perspective. Shefali Mehta of the Soil Health Partnership (SHP) provided an update on SHP’s programs and progress to improve soil health. The Fertilizer Institute’s Sally Flis presented on the 4R program and implementing fertilizer practice changes. David E Clay, SD State University; Ron Alverson, SD corn and soybean producer; and Hui Xu of Argonne National Laboratory spoke on temporal changes in soil organic carbon, tillage, and land use across the US. Dave Gustafson of the Conservation Technology Information Center (CTIC) highlighted the OpTIS system (Operational Tillage Informational System) which uses remote sensing data to map conservation agriculture practices. Day 2 began with a short recap of the first day. Claire Jahns of the US Climate Alliance Natural and Working Lands Initiative and Ryan McCarthy of the CA Air Resources Board and Short-Lived Climate Pollutants Initiative spoke on the US Climate Alliance and agriculture. Anna Harmon of Arizona State University, Thayer Tomlinson of C-AGG, and Jennifer Moore-Kucera of American Farmland Trust presented on how supporting the US Climate Alliance states through a US agriculture policy toolkit. Travis Deppe provided an update on the Illinois Corn Growers Association activities to improve soil health. Jim Ristau of the SD Corn Growers and Chad Bloom of SD State Pheasants Forever highlighted partnerships and programs to improve sustainable agriculture in South Dakota. Jerry Hinkle from the Citizen’s Climate Lobby and Giana Amador from Carbon180 provided viewpoints on national climate change policy initiatives and agriculture.

Meeting Sponsors

C-AGG thanks the Sacramento meeting Silver sponsors: CA Department of Food and Agriculture (CDFA), The Fertilizer Institute (TFI), the Soil Health Partnership (SHP), and Vivayic; as well as Bronze Sponsors: Almond Board of California, Conservation Technology Information Center (CTIC), Dagan, Newtrient, Nutrien, and The Nature Conservancy (TNC).



Tuesday, April 9, 2019

Welcome & Introductions

Debbie Reed, C-AGG Executive Director, provided a welcome and thanked the meeting sponsors. She reviewed the three main objectives for the meeting which included: (1) in the context of existing and future public and private programs to promote soil health, agricultural resilience, and sustainability, identify common challenges, and seek to collectively meet or overcome them; (2) identify technologies that we can collectively support and develop to help better quantify, monitor, track, and verify ecosystem service outcomes from agriculture; and (3) seek ways to collectively support and promote the work of state and subnational policies and programs (such as the US Climate Alliance and CA programs) and provide a bridge to private sector initiatives to help build soil health, agricultural sustainability, and resilience.

Session 1: Ecosystem Services Market Consortium: Markets for Agriculture

[Bruce Knight, Strategic Conservation Solutions, and Debbie Reed, C-AGG](#), introduced the Ecosystem Services Market Consortium (ESMC). ESMC's mission is to advance ecosystem service markets that incentivize farmers and ranchers to improve soil health systems that benefit society. They have 50,000 acres already in a pilot and are working with the Soil Health Institute as a science advisor. ESMC is developing protocols that specify the requirements to quantify, monitor, report, verify, and register farm- and ranch-based ecosystem service credits (soil C, water quality, water quantity) based on soil health improvements on working agricultural lands. The protocols must be farmer-based, farmer-facing, science-based, outcomes-based, standards driven, transparent and open, and must recycle and upcycle by assessment and innovation. They are developing a tiered and modular protocol design to meet accounting and reporting needs. ESMC will also develop a monitoring, reporting, and verification (MRV) platform to enable cost-effective, scalable MRV of outcomes-based attributes. This platform will also store and manage data. Knight and Reed spoke about the official launch of the ESMC and highlighted the founding circle members and legacy partners. They reviewed the organizational framework and discussed ESMC's key research themes as the organization scales up.

Session 2: CDFA Program Updates: Climate Smart Agriculture Incentives Programs at CDFA

[Geetika Joshi, CA Department of Food and Agriculture \(CDFA\)](#), highlighted CDFA's programs to support climate smart agriculture. The Healthy Soils Program (HSP) is divided into the Incentives Program (to date \$3.9 million has been awarded to 77 projects) and Demonstration Projects (to date \$2.1 million has been awarded to 26 projects). The HSP management practices build soil carbon and reduce agricultural GHG emissions through direct incentives and demonstration projects. All the 28 HSP practices match USDA practice standards, except for compost application which was designed specifically for CA. CDFA and California Air Resources Board (ARB) use COMET Planner for estimates on GHG reductions from USDA practice standards, except for compost application (they use the DNDC model). Tracking and verification is done through farm visits to ensure the practices are appropriately applied. Joshi highlighted CDFA's dairy and livestock methane reduction programs—the Dairy Digester Research and Development Program (DDRDP)

and Alternative Manure Management Program (AMMP). Based on stakeholder feedback, CDFA introduced a demonstration project in DDRDP and AMMP for new technologies for demonstrations. New technology demonstrations require research partners to show the potential for GHG reductions based on practices. The State Water Efficiency and Enhancement Program (SWEET) is the oldest program in the climate smart agriculture suite of programs and it supports technologies that reduce GHG and improve water savings. CDFA estimates the cumulative impacts (since inception) of the climate smart agriculture program investment of \$213.8 million in 838 projects is a GHG reduction of \$1.5 million MTCO₂e per year—accounting for 4.4% of total CA agricultural GHG emissions. Joshi noted that Assembly Bill 2377 (AB 2377) requires CDFA to establish a new technical assistance grant program to help farmers utilize the climate smart agriculture program offerings. The assistance includes outreach, education, project planning, application assistance, project implementation, and reporting assistance.

Session 3: Sustainable Agricultural Lands Conservation Program Updates

[Virginia Jameson, CA Department of Conservation](#), gave an update on the California Sustainable Agricultural Lands Conservation (SALC) program's work to map and monitor CA's farmland and conservation easements. With this mapping, they see that CA loses 50,000 acres of farmland annually to other uses (such as development). Funded through annual appropriations under the Greenhouse Gas Reduction Fund (GGRF), SALC provides planning grants for cities, counties, special districts, and Local Agency Formation Commissions and their partners to protect agricultural land resources under threat of conversion. They also provide agriculture conservation easement grants to protect pieces of property under threat of conversion. SALC's conversion threats assessment includes ten risk thresholds which include proximity to a city, university, and other development source. Jameson highlighted the case of Santa Clara County which created a plan to address zoning and an agricultural economic development strategy through easements and stakeholder buy in. SALC was created in 2014; since inception it awarded \$124 million to protect 90,700 acres. Their projects span 31 counties from San Luis Obispo to Siskiyou (with less interest to date in the southern part of the state).

Session 4: Carbon: Where Does it Belong?

George Davis, Porter Creek Vineyard and CA Farmers Union, opened his talk by highlighting where we as a global community have been, where we are moving, what we have to accomplish, and how climate change forces a thinking and paradigm shift in how humans relate to the environment. He described his journey as a farmer and grape grower; how he relied on chemicals and heavy tilling for farming before finding another way through shifting practices to focus on soil biology. With the understanding that more diversity in plant life creates more diversity in soils, Davis saw how his crops improved and highlighted how the job of farmers is to create more life without destroying life. He spoke about the book "Dirt to Soil" by a highly regarded North Dakota farmer, Gabe Brown, which highlights 5 keys to soil health: (1) limit soil disturbance; (2) keep the soil surface covered at all times; (3) build diversity of soils through crop diversity (Brown uses 15 – 25 different plants for cover crops); (4) keep roots in the soil for as long as possible; and (5) use animals to fertilize the land through rotational grazing.

Session 5: Using Targeted Efforts to Improve Soil Health

[Shefali Mehta presented on the Soil Health Partnership \(SHP\)](#), a farmer-led initiative that partners with farmers as they implement new soil health management practices with the goal of improving soil health. SHP collects on-farm data over time to enable farmers to improve economic and environmental sustainability. Their three-element focus is on-farm engagement, data and science for farmers, and communications and outreach for farmers. Mehta noted that SHP works with farmers through the year and is operating in 15 states and 1 Canadian province with 120 partner sites which allows them a large diversity of soil samples. SHP has learned that setting up accurate demonstration sites take a lot of time, but this is worthwhile to ensure that the data they capture is correct. SHP has four practice trial types in their network—cover crops, nutrient management, conservation tillage, and “other”. SHP was launched five years ago and in 2019, they look to continue to grow programs to meet the large demand for improved soil health. Some of SHP’s upcoming programs include the addition of wheat crops into the program (SHP has mainly focused on corn and soy to date), completing their Carbon Insetting framework which measures the carbon sequestration benefits of conservation management practices, increasing communications and outreach, expanding agronomic research, and providing farmers more information on the finance and economics of soil health. Mehta highlighted that soil health is a huge public good benefit, but the cost of the soil health investment falls on the farmer. Society asks the farmer to practice improved soil health which creates a public benefit but does not provide them funding for this work.

Session 6: 4R Practice Implementation: Environmental and Economic Impacts

[Sally Flis, The Fertilizer Institute \(TFI\)](#), provided an overview on TFI and their focus on nutrient use efficiency, especially nitrogen. She highlighted the 4R Nutrient Stewardship program (right source, right rate, right time, right place) and how TFI tracks the amount of GHG captured and reused on the farm through improved nutrient efficiency. The 4R research fund is providing funding to projects that are conducting meta-analyses on knowledge gaps related to the 4Rs and their environmental impact. There are gaps in a lack of complete data reporting, lack of testing of rate changes with other 4R practices, and a testing of conservation practices in terms of interactions with other practices. Research to date has shown the following: the timing of N application has a large impact on yield and N loss; the timing of N application when using an enhanced efficiency fertilizer can impact air and water losses; improved nutrient use efficiency can indicate decreased air losses of N; and the placement of P fertilizer influences P loss. TFI has a 4R Advocate Program to recognize farmers that are at the high end of practice implementation. Flis presented case studies from farmers using 4R approaches with different crops, tillage systems, and in different regions. She highlighted that when farmers are asked why they practice 4R, they note that when they get the 4Rs right, the practices improve soil health and improve on-farm expenses due to the use of less fertilizer, fewer passes in the field, and the economic benefits from improved soil health.

Session 7: Temporal Changes in SOC, Tillage, and Land Use Across the US

[David E Clay, SD State University, Ron Alverson, SD Corn and Soybean Producer, and Hui Xu, Argonne National Laboratory](#), spoke on corn stover and soil organic carbon. Hu noted that corn stover has a high potential as biofuel feedstock, but excessive stover removal may reduce soil quality. A recent data meta-analysis showed that the removal of stover results in lower soil organic carbon accumulations over time. The analysis highlighted that the intensity of corn stover removal (in terms of removal rate) is more important than tillage practices for soil organic carbon accrual rates. Clay provided a perspective on the South Dakota landscape and highlighted how land use is changing. He said that no till and crop diversification are very common in SD and that soils have sequestered a huge amount of carbon. He and colleagues found that this improved soil health has a direct impact on a farmer's economic bottom line as well as the ability to survive natural disasters. Alverson provided a farmer's perspective on soil health and corn farming in South Dakota. He highlighted the history of farming management practices—moving from intensive tillage to no-till systems and moving from heavier rates of fertilizer application to practicing efficient nitrogen fertilizer use. Long term reduced tillage and other management practices have improved the soil health, increased soil organic carbon, and increased wildlife on the farm.

Session 8: Operational Tillage Information System (OpTIS): Using Remote Sensing Data to Map Conservation Ag Practices

[Dave Gustafson, Conservation Technology Information Center \(CTIC\)](#), provided an overview of CTIC and its leadership in providing conservation tillage data. He noted that surveys such as the Crop Residue Management (CRM) survey, conducted by USDA-NRCS from 1989 to 2004, became too tedious and labor intensive to continue. With the interest in conservation practices growing, and new ecosystem service markets and water quality trading markets, the ability to affordably verify conservation practice implementation at larger scales is imperative. Developed by Applied GeoSolutions, OpTIS technology uses publicly available remote sensing data to map and monitor adoption of tillage practices and cover crops at field-scale. [The data is available from CTIC at no cost.](#) OpTIS technology allows users the ability to measure soil health baselines and trends, provide inputs to water quality models (local and basin-scale), provide inputs to biogeochemical models (e.g. DayCent, DNDC, etc.) to estimate GHG emissions and changes in soil carbon, target conservation efforts, and provide validation data for ecosystem services markets.

Wednesday, April 10, 2019

Session 9: US Climate Alliance (USCA) and Agriculture

[Claire Jahns, US Climate Alliance, Natural and Working Lands \(NWL\) Initiative and Ryan McCarthy, CA Air Resources Board, Short-Lived Climate Pollutants \(SLCP\) Initiative](#) gave an overview of the USCA and highlighted the coalition of 23 states/territories which have joined the Alliance to date. They noted that the NWL and SLCP are two of the nine Alliance working groups; states are part of these working groups to share best practices and lessons learned at the state level and are provided technical assistance by external organizations. Jahns highlighted that both NWL and SLCP are newer components of climate policy but can

provide large impacts. USCA states have signed the [USCA NWL Challenge](#) to commit to improve inventory methods; identify best practices for conservation and management; advance programs, policies, and incentives to reduce GHG emissions and enhance resilient carbon sequestration; and integrate actions and pathways into state GHG mitigation plans. She highlighted that many USCA states are looking at existing state programs and policies as opportunities to pilot carbon policy—and looking at how to fund policy through these existing programs. States want to see that the investments in sequestration and GHG reductions are resilient over time. McCarthy highlighted the work of the SLCP Initiative to target methane and agriculture and that overall, USCA states have been interested in SLCPs as they offer a great opportunity for emission reductions. In June 2018, the SLCP Initiative created an [SLCP Challenge and drafted an Action Roadmap](#) to provide guidance on SLCP reductions—including through agriculture.

Session 10: Equipping USCA States for Natural and Working Lands Mitigation: Agriculture Policy and Practice Support

[Thayer Tomlinson, C-AGG; Anna Harmon, Arizona State University; and Jennifer Moore-Kucera, American Farmland Trust](#), presented on C-AGG and AFT's work to support USCA states with agricultural solutions. Tomlinson provided an overview of agriculture in the 23 USCA states, noting that although the states have different agricultural systems, climates, water quality and quantity challenges, and threats to agricultural land conversion, agricultural lands contain significant opportunities to reducing GHGs through natural climate solutions. She highlighted that agricultural lands can provide low-cost and quickly feasible solutions for GHG reductions and that many of the recommended agriculture practices, such as cover crops and nutrient management, are not only practical for farmers, they include a number of co-benefits in addition to GHG reductions. Moore-Kucera highlighted specific practices and how those practices work together for system-wide increased climate mitigation and resiliency. She described the upcoming workplan by AFT and C-AGG to support USCA states through practice identification and a comprehensive literature review. Harmon highlighted the agriculture policy toolkit effort; at this time, C-AGG and AFT are identifying policies and programs driving adoption of agriculture pathways that reduce GHG emissions and increase carbon sequestration at the state, regional, and federal level. The outputs of this work are state-level policy and program profiles, interviews with each USCA state, and an analysis of programs and compilation of results. Harmon highlighted the timeline, specific outputs, and next steps of this work.

Session 11: Illinois State Update

Travis Deppe, Illinois Corn Growers Association, provided an update on [IL Corn's Precision Conservation Management \(PCM\)](#) program which was developed to meet the management needs of farmers by integrating agronomic information with financial and environmental analytics. Through the PCM program, IL Corn works with 200 farmers to provide them data to facilitate practice change (from traditional practices to conservation practices)—this requires significant on the ground staff and time with farmers. Currently, the program covers 1,900 fields and 200,000 acres. When farmers join PCM, they agree to partner with IL Corn and share data with them. The data is aggregated and anonymized to demonstrate overall trends in farm income and conservation using conservation practices. Individual farmers work with a PCM specialist who helps them make decisions around when and how to implement these practices (and in a way that makes financial sense). Deppe noted that with the recent heavy rains and flooding in the Midwest, combined with low commodity prices, farms that were already struggling are severely impacted. As many corporations set

sustainability goals, it is imperative that agriculture is included as a part of these goals—especially when looking at opportunities to impact GHGs and water quality. Some supply chain companies are working with IL Corn to provide a cost share for farmers to implement conservation practices and are interested in seeing trends that come out of the aggregated PCM data.

Session 12: Partnerships and Programs to Improve Sustainable Agriculture in SD

[Jim Ristau, SD Corn Growers](#), and [Chad Bloom, SD State Pheasants Forever and Quail Forever](#) discussed their work with partnerships and programs to improve agriculture in South Dakota. They noted that this work has conserved many acres of private land which is prime habitat for pheasants and quail. Ristau highlighted the challenge with increased soil salinity—that as the water table gets closer to the soil surface, more salts come to the surface. South Dakota farmers struggle with saline soils—if soils are bad, people move off the farm. To encourage people to stay on the farm and implement conservation practices (and thus protect valuable habitat for pheasants and quail), Pheasants Forever and Quail Forever collaborated with a number of state agencies and other organizations to build a program that pays farmers \$150/acre to implement cover crops and other conservation practices. The program approaches farmers with an offer of funding and tours the farm to understand where the farm is having challenges (such as erosion, salinity, etc.). The program staff uses technology to analyze the land challenges and provides the farmer technical assistance implementing conservation practices. Ristau and Bloom discussed the Soil Health and Income Protection Pilot Program (SHIPP) which provides payments for farmers to establish grass cover on less productive cropland for a period of 3 – 5 years and noted that they are hoping to include many acres in South Dakota in this program. They highlighted Every Acre Counts program which is a collaborative between NRCS, South Dakota State University, South Dakota Habitat Conservation Foundation, and others to give agricultural producers new ways to manage low producing acres while increasing their bottom line.

Session 13: National Climate Change Policy Initiatives and Agricultural Imperatives

[Jerry Hinkle, Citizen's Climate Lobby](#) and [Giana Amador, Carbon180](#), provided an overview and assessment of national climate change policy initiatives. Hinkle gave a brief background on the Citizen's Climate Lobby and presented an overview of US climate policy noting that a key opportunity to address climate change seriously is to make polluting more expensive. He highlighted the Energy Innovation and Carbon Dividend Act where polluters pay a carbon fee and a carbon dividend check would go to all households. There are key agricultural provisions to this Act which would exempt fuels used on a farm for farming purposes, exempt any GHG emissions on a farm, and provide funds for carbon capture and storage. Hinkle noted that there is a significant opportunity at this time for the agricultural community to both reduce GHGs and sequester carbon. Amador spoke on Carbon 180 and the organization's focus on research, business, and policy. She noted that there are many conversations on climate change at the federal level on many fronts and that the conversation is a key topic among democratic party primary candidates for the 2020 presidential election. She highlighted that although energy is at the forefront of many climate debates, agriculture (as well as other natural and working lands) have the potential to offset a large amount of US emissions. She gave examples of federal programs that are funding agricultural conservation practices through the 2018 Farm Bill.