CalCAN
CALIFORNIA CLIMATE & AGRICULTURE NETWORK

Liane Randolph, Chair
California Air Resources Board
Sacramento, CA 95812

January 5, 2022

Re: Natural and Working Lands Modeling Scenarios

Dear Chair Randolph,

I write on behalf of the California Climate and Agriculture Network (CalCAN), a coalition of the state's leading sustainable and organic agriculture organizations. We appreciate the opportunity to comment on the draft Natural and Working Lands (NWL) Modeling Scenarios to inform the 2022 Scoping Plan Update.

We reviewed the scenarios with several of our science advisors who are involved with climate change and agriculture modeling. Currently, the draft scenarios are very general and vague in their descriptions, which presents some challenges in offering constructive feedback. We suggest a meeting of climate change and agriculture researchers and CARB staff to further discuss the scenarios. California is home to many of the country's leading scientists in this space and we recommend that CARB take advantage of that brain trust to further develop the agriculture, land use, and grasslands modeling scenarios.

Below we offer our comments, which are aimed at better understanding how the modeling scenarios will ultimately inform the 2022 Scoping Plan Update. We appreciate the efforts of CARB to include robust climate strategies to reduce greenhouse gas emissions and increase carbon sinks in our state's natural and working lands. We look forward to advancing this important work with you.

Sincerely,

Jeanne Merrill
Policy Director

Comments:

1. **Conduct Separate Land Use Scenarios Modeling**

We strongly support the inclusion of land use scenarios modeling for agriculture, but we recommend conducting the modeling separately from the agricultural management practices modeling. This will allow a better understanding of how land use changes may impact the overall ability of agriculture to act as a carbon sink. We recommend having three scenarios that look at the avoided conversion of agricultural lands to urban and other non-agricultural uses, including reducing conversion by 50 percent, 75 percent, and 100 percent. We align our comments with the Santa Clara Valley Open Space Authority and support looking at all conversion pressures on agricultural land and not just SGMA related conversions.

2. **Clarify Agriculture Scenarios: Scenarios Should Include all Relevant GHG Emissions, Increasing Scale of Practices**

Many of the agricultural management practices that increase carbon sequestration and reduce overall greenhouse gas emissions provide multiple environmental benefits, including drought tolerance and increased biodiversity. Rather than try to develop drought or biodiversity focused scenarios, as proposed in the draft NWL scenarios, we suggest developing modeling scenarios that bring in multiple management practices and scale them up across three scenarios to better understand the impacts of those practices across low to ambitious scales. This will give the state and stakeholders a better sense of where we can collectively set our ambitions in the next few years as we look to turn our working lands from net sources to sinks.

It is critical to include nitrous oxide (N20) and methane (CH4) emissions in the modeling in addition to stored carbon. To move agriculture from net source to net sink requires a reduction in N20 and CH4 emissions, and we must understand the relationships across all relevant greenhouse gas emissions, not just carbon; greenhouse gas emissions do not operate in silos but are part of holistic, biologically system.

We suggest the following scenarios for cropland acres:

Practice	**Low scenario: Percent of acres under healthy soils management**	**Moderate Scenario: Percent of acres under healthy soils management**	**Maximum Scenario: Percent of acres under healthy soils management**
Cover crops	20%	25%	33%
Mulching	20%	25%	33%
No Till	10%	15%	20%
Reduced Till	15%	20%	25%
Compost on cropland	25%	50%	75%
Riparian herbaceous cover	2%	3%	4%
Hedgerows	2%	3%	4%
Riparian forest buffer	2%	3%	4%

Windbreak establishment	2%	3%	4%
Avoided synthetic N fertilizer	10%	25%	50%
Silvopasture	1%	2%	3%
Prescribed grazing	5%	10%	15%
Dairy and livestock manure transitioned from wet manure handling and storage to dry manure handling and storage, including manure composting	20%	30%	50%
Organic agriculture	20 percent of CA agricultural land	30 percent of CA agricultural land	50 percent of CA agricultural land

We provide more details in Appendix A, which is from a letter we sent on July 20, 2018 to CDFA and CNRA to inform the draft Natural and Working Lands Climate Change Implementation Plan.

3. Strengthen Grasslands Scenarios

Our comments here are based on feedback from one of our science advisors, who is a rangeland ecologist and works on climate change issues. We suggest the following changes to the Grasslands Scenarios:

Scenario 1: This should be changed to maximizing short-term carbon through increasing species with deeper roots or N fixers (e.g. restoring native perennial grasses and legumes). Propose setting a minimum of 5 percent of grassland acres restored with native perennials and legumes for this scenario.

Scenario 2: We do not know what is meant by restoration of grasslands; more detail is needed. To improve climate resilience and increase carbon stocks, we need to get more carbon into the soil through grass species with deeper roots or N fixers as described above. Propose setting a minimum of 10 percent of native perennials and legumes plantings for this scenario.

Tree encroachment into grasslands may be an issue in some coastal areas, but it is not relevant for most grasslands in the state. Suggest dropping this.

Scenario 3: We support improved conservation of grasslands, and similar to the land use scenarios described above, we support modeling scenarios of improved grasslands conservation with an ambitious scenario that eliminates conversion of grassland. We suggest incorporating the conservation/avoided conversion of the grasslands scenario modeling under the land use modeling described in Comment #1 above and setting similar low to high scenarios.

Scenario 4: We support modeling wildfire risk reduction in grasslands and specific practices should include prescribed grazing in late-season, prescribed and cultural burns, and mowing.

Scenario 5: Following on Scenarios 1 and 2, we suggest focusing on restoring native perennial grasses and legumes and setting an ambitious target of 20 percent of grasslands restored.

Appendix A:

This is an excerpt from a July 20, 2018 letter by CalCAN to CDFA and CNRA on the draft Natural and Working Lands Implementation Plan. We recommend that CARB work with its agency partners to update these numbers in advance of the Scoping Plan NWL modeling.

The following is a snapshot of California acres already under healthy soils practices[1]. While this is not a complete estimate of total acres or all practices, it provides evidence of the robust adoption of climate smart agricultural practices already taking place in California.

1. **Almonds:** From 2011 to 2017 California Almond Board performed a self-assessment which found that 5.6% percent of orchards plant cover crops[2]. Considering the 1,330,000 acres of almonds in California, we estimate that 74,480 acres of almond orchard are cover-cropped each year.
2. **Wine Grapes:** According to a 2015 study[3] by the California Sustainable Winegrowing Alliance, 95% of vineyards described either resident vegetation to grow or intentionally cover-cropping and/or applying compost; 61% of vineyards used reduced or no-till practices. This study represented 802 California vineyards representing 117,000 acres of wine grapes
3. **Organic Agriculture:** According to the USDA, there were 1,069,950 total acres of organic cropland, pasture and rangeland in California in 2016. The acreage of certified organic cropland has increased from 275,827 acres to 336,409 acres from 2008 to 2016.[4] Under the USDA National Organic Program, organic farms are prohibited from using synthetic fertilizers and must rely on multiple healthy soils practices to improve soil fertility for their crops and maintain productive cropping systems. In a 2010 study comparing the greenhouse gas budgets of California cropping systems, common organic practices had the greatest potential to sequester carbon.[5]
4. **Conservation Tillage Adoption:** Multiple studies have estimated acreage under conservation tillage in California ranging from 2% of Central Valley acreage in 2007[6] to a 10% statewide adoption rate in 2010.[7] Considering the lower estimate and limiting our estimate to irrigated cropland, we get a conservative estimate of 160,000 acres under reduced tillage statewide.

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[1] Here we rely on the statutory definition of healthy soils found in FAC, Div. 1, Part 1, Ch. 3, Sec. 569., "Healthy Soils means soils that enhance their continuing capacity to function as a biological system, increase soil organic matter, improve soil structure and water- and nutrient-holding capacity, and result in net long-term greenhouse gas benefits."
[2] Based on a conversation from July 2018 with Almond Board staff.
[3] See CWSA Sustainability report: https://www.sustainablewinegrowing.org/docs/2015_CSWA_Sustainability_Report.pdf
[4] See USDA NASS Organic report:
https://www.nass.usda.gov/Surveys/Guide_to_NASS_Surveys/Organic_Production/index.php
[5] De Gryze, S., et al. 2010. Simulating greenhouse gas budgets of four California cropping systems under conventional and alternative management. Ecological Applications 20(7), 1805–1819
[6] Mitchell, J., Klonsky, K., Shrestha, A., Fry, R., DuSault, A., Beyer, J., Harben, R., 2007. Adoption of conservation tillage in California: Current status and future perspectives. Animal Production Science 47, 1383-1388.
[7] Suddick, E.C., K.M. Scow, W.R. Horwath, L.E. Jackson, D. R. Smart, J.P. Mitchell, and J. Six. 2010. The potential for California agricultural crop soils to reduce greenhouse gas emissions: a holistic evaluation. Donald L. Sparks, editor. Advances in Agronomy 107:123-162. http://ucanr.edu/repository/?get=93560

5. **USDA-NRCS Environmental Quality Incentives Program (EQIP):** The NRCS EQIP program has had a large impact on California landscapes. Based on analysis of NRCS data we have found that EQIP payments supporting Healthy Soils Programs have been carried out on close to one million distinct acres in California since 1997. In 2017, EQIP contracts supporting Healthy Soils eligible practices covered at least 55,000 acres in California, up from 43,000 acres in 2016.