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Submitted via www.regulations.gov

Attention Docket ID No.: USDA-2021-0003

Dear Mr. Hohenstein:

Thank you for this opportunity to provide feedback to the U.S. Department of Agriculture (USDA) regarding the Request for Information (RFI) on USDA's Climate-Smart Agriculture and Forestry Strategy, as directed by the *Executive Order on Tackling the Climate Crisis at Home and Abroad*. Our feedback highlights the significant role agricultural cooperatives and their farmer-owners can play in combatting climate change.

Since 1929, NCFC has been the voice of America's farmer-owned cooperatives. NCFC members include regional and national cooperatives, which in turn consist of nearly 2,000 local farmer cooperatives across the country. Farmer cooperatives – businesses owned, governed, and controlled by farmers and ranchers – are an important part of the success of America's agricultural supply chain.

NCFC has an extremely diverse membership, which we view as one of our sources of strength – our members span the country, supply nearly every agricultural input imaginable, drive innovation, develop new technologies, provide credit and related financial services, and market a wide range of commodities and value-added products. Our membership includes:

Marketing cooperatives – which handle, process and market virtually every commodity grown and produced in the United States.

Bargaining cooperatives – which bargain to help their farmer members obtain reasonable prices for the commodities they produce.

Farm supply cooperatives – those engaged in the manufacture, sale and/or distribution of farm supplies and inputs, as well as energy-related products, including ethanol and biodiesel.

Credit cooperatives – include the banks and associations of the cooperative Farm Credit System that provide farmers and their cooperatives with a competitive source of credit and other financial services, including export financing.

America's farmer cooperatives and their farmer-owners are on the frontlines of a changing climate. As stewards of the land, they have enormous opportunities to drive solutions that reduce greenhouse gas emissions, increase carbon sequestration and storage, build resilience to the changing climate and drive sustainability across the supply chain. As a founding member of the Food and Agriculture Climate Alliance (FACA), we are proud to be part of the solution by:

1. Supporting voluntary, market- and incentive-based policies.
2. Advancing and accelerating science-based outcomes.
3. Promoting resilience and helping rural economies better adapt to climate change.

Over the past year, FACA members have worked to find areas of common policy interest and formulated over 40 specific policy recommendations. Many of these recommendations fall within the scope of questions in the Request for Information and are supported by NCFC.

The FACA policy recommendations and full list of members can be viewed at www.agclimatealliance.com.

More information about NCFC can be found at www.ncfc.org.

1. Climate-Smart Agriculture and Forestry Questions

A. How should USDA utilize programs, funding and financing capacities, and other authorities, to encourage the voluntary adoption of climate-smart agricultural and forestry practices on working farms, ranches, and forest lands?

Existing USDA policies and programs can encourage voluntary adoption of agricultural practices that sequester carbon, reduce greenhouse gas emissions, and promote resilience. NCFC recommends that USDA take the following actions, utilizing programs and policies currently in place.

I. Incentivize Contracts that Improve Soil Health

The Natural Resources Conservation Service (NRCS) should prioritize new applications and existing Conservation Stewardship Program (CSP) and Environmental Quality Incentives Program (EQIP) contracts that result in demonstrated positive soil health, carbon sequestration, and resilience outcomes where appropriate and in-line with local conservation priorities. This will ensure that positive climate benefits will be identified as part of current and new CSP and EQIP contracts, encouraging producers to continue to adopt new soil health and climate stewardship measures.

Farmers that receive financial assistance from the NRCS programs to adopt soil health and other climate-smart practices will often seek to simultaneously or subsequently participate in carbon or ecosystem services credit markets. In that instance, we believe farmers should be allowed to retain the value paid for that credit even where an NRCS or other conservation program provided the initial incentive to transition to a carbon-sequestering or emissions mitigating practice. Such a policy will undoubtedly create more incentives for farmers to adopt and sustain the use of climate-smart agricultural practices.

II. Study the Interaction Between Crop Insurance and Soil Health

USDA should conduct a study to review the impact of soil-improving practices on crop productivity and on crop insurance coverage, liabilities, and premium rates. USDA should also identify potential policies or modifications to crop insurance to accelerate the voluntary adoption of climate-smart farming practices. This study will help identify additional ways to assist producers in adopting science-based climate stewardship practices, while ensuring that any steps taken are driven by data and consistent with appropriate underwriting practices. We would urge USDA to consult with growers and industry representatives as a part of this process.

III. Ensure Livestock Producers Can Participate in CIG On-Farm Trials

Feed, genetics and nutrition management should be eligible under the Conservation Innovation Grant (CIG) On-Farm Trial Program. CIG on-farm trials are a critical tool for farmers to try out and prove new practices with reduced risk. While trials around feed additives and genetics are not explicitly excluded, it is not clear that they are included. Inclusion will provide additional opportunities for farmers to test the newest technologies and evaluate the impact within their operation.

IV. Incorporate Food Waste Education into Existing Nutrition Programs and Materials

Food loss and waste across the supply chain contributes to climate change—wasted food also wastes resources and ends up in the landfill as a methane emitter. Education about food waste reduction and prevention strategies is not only imperative to help reduce greenhouse gas emissions but can also help extend the budgets of low-income Americans.

The Food and Nutrition Service (FNS) should explicitly include food waste in the list of program priorities for the Food and Agriculture Service Learning Program. Specific activities to assist food waste reduction could include education on appropriate portion sizes and the proper storage of perishable goods. In addition, food waste education should be added to the list of program goals for the Expanded Food and Nutrition Education Program under “food resource management.”

Food waste prevention and reduction should also be incorporated into all materials geared toward teachers and students through Team Nutrition education materials as well as Foods in Schools product information sheets. Schools are an important setting to shape the behavior of a newer generation of consumers.

In addition to utilizing existing authorities, USDA should also look to new strategies and approaches to encourage the voluntary adoption of climate-smart agriculture practices. Specifically, USDA should consider the following:

I. Climate-Smart Working Lands Conservation Practice Standards

One of NRCS’ greatest strengths since its creation has been its attempt to champion “working lands” conservation. This includes working with production agriculture and farmers’ and ranchers’ needs to have affordable conservation measures available to them that are practical and fit well with their production systems while being optimized for resource conservation. We

believe this same emphasis and spirit can be brought to helping us move further into climate-smart agriculture. One of the key areas of NRCS programming to guide this work is its Conservation Practice Standards. We appreciate the work that NRCS has been doing since the passage of the 2018 farm bill to review, issue draft revisions for public comment, and then issue final revised standards. We know it takes a great deal of time, effort, and resources for national staff to do this work. Yet we cannot emphasize how important it is, and we encourage the agency to create an active, rolling process to work with agricultural and conservation science communities as well as farming and ranching stakeholders to identify ways in which national standards can be revised to reflect the challenges of bringing working lands conservation into partnership with climate-smart agriculture.

For example, NRCS must recognize feed and nutrition management as a critical tool to reducing agricultural emissions. Row crop producers can receive assistance for conservation planning on their farms to address climate and resource concerns, but there is no assistance for farmers and ranchers working to reduce emissions from their animals. NRCS should establish conservation practices to reflect feed management, genetics, and nutrition planning.

Another example is how to best use modern precision agriculture equipment as an important conservation tool. Quantifiable climate benefits are achieved through the adoption of modern precision agricultural tools such as auto-guidance, section control, variable rate, telematics/analytics, and precision irrigation. Measurable benefits include reduced fuel use, more efficient use of cultivated lands and other carbon gains achieved through the optimization of inputs and water.

Properly accounting for these climate benefits would give producers additional incentives to adopt precision agricultural tools.

A streamlined conservation practice approval process that better keeps up with rapidly changing technology will hopefully free up additional conservation program funds in a timelier manner.

A critical element of making “working lands, climate-smart agriculture” successful is to ensure that the resulting practices being promoted and supported do not cause producers to run afoul of their eligibility for crop insurance coverage. We encourage USDA to create a standing, interagency working group to properly integrate working lands conservation practices, where appropriate, with the Good Farming Practices policies of the crop insurance program. Working lands, climate-smart agriculture must succeed. Crop insurance must be actuarially sound, affordable, and widely available. Attention must be paid to ensure that these two critical objectives are always being met, with a minimum of confusion and disruption in the grower community.

II. Improve and Expand NRCS Technical Assistance

Technical assistance is critical to assist farmers and ranchers with planning and implementing conservation practices. NCFE supports a conservation technical initiative focused on increasing climate resilience and reducing net greenhouse gas emissions. USDA should recruit and train additional NRCS professionals and technical service providers (TSP) needed to provide on-the-ground support to producers seeking to proactively manage and implement climate-smart

practices and technologies. To better scale manure management technologies, more support is needed to install and operate anaerobic digesters, covers with flares, solid separators, and other climate-smart manure management systems.

NRCS historically provided Conservation Technical Assistance (CTA) to farmers and ranchers outside of the cost share or financial assistance programs, and in the process played a key role in enabling and assisting farmers who wanted to adopt conservation practices on their operations without otherwise getting government funding. NRCS still provides CTA today, but pressures on its available discretionary funding, and the rapid expansion since the early 2000s in the scope of the conservation financial assistance programs like EQIP and CSP, has now linked a significant proportion of NRCS technical assistance activities to practices receiving financial assistance. Yet there remains a substantial number of growers who could be customers of traditional CTA, without financial assistance, should that be available. This demand will grow as the opportunities for the sale of credits in carbon markets grows.

We encourage USDA to assess the need for traditional CTA in assisting growers wanting to adopt climate-smart practices without financial assistance, and then use the assessment to determine how to increase these NRCS capacities accordingly. That assessment should include an evaluation of the training and experience needed by NRCS field staff to successfully play this role for producers. More NRCS field staff training will likely be needed, given how quickly farming technologies and practices are evolving and the complexity of these systems. That assessment should consider the valuable role that TSPs, who also have been supported through the financial assistance programs, could play in meeting this private demand for technical assistance. TSPs will be well suited to filling certain gaps in NRCS expertise, doing so more efficiently. We anticipate a role for both NRCS field staff and TSPs in this regard. Discretionary funding for the NRCS CTA program likely will be a major limiting factor. The assessment should document for Congress and stakeholders the need for such funding.

III. Ensure Biotechnology is Part of the Climate Solution

Agricultural biotechnology needs to be a part of any climate change discussion. Innovative biotechnology allows new plant varieties and animal breeds to continue to produce more with less—less water, less land, fewer inputs, and lower emissions. With the publication of USDA's final SECURE Rule in August of 2020, the regulatory framework for USDA is set. However, we believe that there are other areas where USDA can assist with furthering the adoption of biotechnology and its corresponding benefits. For example, as part of its responsibility under the Coordinated Framework, USDA should continue to be proactive in encouraging the Environmental Protection Agency (EPA) and the Food and Drug Administration (FDA) to publish risk- and science-based biotechnology regulations and guidance that foster innovation and increase the overall adoption of new biotechnologies.

Agriculture has already achieved notable and well documented environmental improvements through the adoption of crop varieties improved through biotechnology. Existing genetic innovations have improved soil health and greatly decreased greenhouse gas (GHG) emissions by enabling improved tillage practices and limiting the number of passes required through a field. Enzyme and microbial additives to animal feed have increased the nutritional value of feed and reduced emissions from livestock. Nitrogen-fixing bacteria and other soil microbiome

innovations improve crop efficiency, reduce conventional inputs, and promote soil carbon sequestration. To quantify these benefits, a 2020 study found that biotechnology-derived crop varieties globally reduced GHG emissions by the equivalent of 15.27 million cars in 2018.⁴ Newer innovations, such as biostimulants and microbial technologies, can also increase root growth, thus binding greater amounts of carbon to the soil. Improved animal genetics can help livestock adapt to a changing climate and contribute to reduced GHG emissions.

Finally, to facilitate greater adoption of climate-smart biotechnology innovations that can improve environmental outcomes, it is important that international markets have consistent, science-based rules for biotechnology products that do not impede access to innovation. To truly enable agriculture to be a solution to climate change, innovation is essential and trade policy must be incorporated into a comprehensive climate strategy and prioritized to address barriers to innovation.

IV. Provide a Science-Based Regulatory Pathway to Streamline Animal Biotechnology Approvals

Improved animal genetics is a critical tool as livestock producers adapt to a changing climate. Ensuring a risk- and science-based approval process for animal biotechnology products will help farmers and ranchers better insulate themselves and food production from the risks of climate change and contribute to GHG reductions. Improvements in animal genetics to produce more meat or milk could allow for reduced emissions per animal and a reduction in the total number of animals in production, thus reducing the aggregate environmental impact. The use of technologies, such as gene editing, could enable such improvements to be made quickly.

V. Move the AgStar Program to USDA

The AgStar program should be moved from EPA to USDA. Many farmers and ranchers already participate in other USDA programs. We believe this shift will encourage increased participation in AgStar, resulting in increased access to technical assistance for producers evaluating the feasibility of installing a methane digester.

VI. Fund Climate Pilot Programs Using the CCC

As founding members of FACA, we support climate-related pilot programs utilizing the Commodity Credit Corporation (CCC) Charter Act. Any funding for activities out of the CCC should not jeopardize the funding of the core farm bill programs that farmers rely upon. Specific guidance regarding pilot programs is detailed later in the document.

VII. Climate Advantageous Inputs

For years, farmers and ranchers have incorporated conservation practices into production because it is good for their farms, it is good for the environment and it is the right thing to do. This is the essence of “working lands conservation.” It is important and practical to fully acknowledge that many of the most promising conservation practices for addressing climate change are highly contingent on the availability of safe, effective herbicides, and other crop protection technologies. Herbicides are fundamental elements of conservation tillage and cover crop systems, the foundational practices of climate-smart agriculture. Before modern herbicides

⁴ <https://www.tandfonline.com/doi/full/10.1080/21645698.2020.1773198>

became available, widespread tillage had to be practiced to achieve economical and effective weed control in crop fields. As a result, soil erosion was far higher, as was the loss of soil organic matter and energy use to pull tillage equipment in multiple passes through farm fields. All of this represents a significant GHG emissions footprint. Much of the gains made over the last three decades in reduced erosion, increased soil carbon, reduced mineral phosphorus losses, reduced on-farm energy use⁵, and reduced net GHG emissions are directly attributable to conservation tillage, which is itself directly attributable to modern herbicides and the related practices.

The same explosive growth in conservation tillage use, with all its intended benefits, is now underway with the adoption of cover crops.⁶ Herbicides have made this growth possible, through their ability to help keep the cover crop in the field and the soil protected right up until a cash crop can be planted, and then effectively and affordably deal with subsequent weed pressures in the cash crop.

As a result, we strongly encourage USDA, working with counterparts at EPA and other agencies, to actively support and promote continued innovations in crop protection products like these herbicides. Innovations can help reduce non-target impacts, improve crop productivity, and maximize the benefits toward meeting climate objectives. We encourage USDA to support a strong, science-based risk/benefit regulatory system that ensures access to safe and effective tools while also promoting biodiversity.

VIII. Prioritize Rural Broadband Connectivity

Critical to the expansion and success of improving on-farm sustainability is the accessibility and utilization of next-generation technology, supported by strong broadband connectivity. This connectivity is essential yet currently lagging far behind in rural America. According to Federal Communications Commission (FCC) estimates, more than 14 million Americans lack internet connectivity. By some estimates, the number of Americans without access to high-speed internet is even higher than FCC projections – experts believe the number could be twice as high.⁴

Connectivity at the farm gate allows farmers to connect equipment to GPS, ensure machinery is using the most efficient routes, and better optimize the production system. Connectivity enables usage of drones to reduce fuel costs, variable rate application to reduce input use and more. A 2019 USDA report⁵ found that 40 percent less fuel is used due to variable rate technologies and 20 to 50 percent less water and 80 percent less chemicals are used due to precision agriculture. Environmental improvements in agriculture and broadband connectivity must go hand-in-hand.

⁵ USDA's Economic Research Service reported in 2018 (Tillage Intensity and Conservation Cropping in the United States) that conservation tillage was used on roughly 65 percent of corn acres (in 2016), 70 percent of soybean acres (2012), 67 percent of wheat (2017), and 40 percent of cotton (2015) acres.

⁶ ERS reported earlier this year ([Cover Crop Trends, Programs, and Practices in the United States](#)) that farmers reported planting 15.4 million acres of cover crops, which was a 50-percent increase compared to the 10.3 million acres reported in 2012.

⁴ [BroadbandNow, 2020](#)

⁵ [USDA, American Broadband Initiative](#), 2019

B. How can partners and stakeholders, including State, local and Tribal governments and the private sector, work with USDA in advancing climate-smart agricultural and forestry practices?

I. Reimagine Extension

Farmers and ranchers are increasingly looking to their farmer-owned cooperatives, the private sector, state, academic, and other on-the-ground organizations for information on new practices and methods that help them adapt, mitigate, and become more resilient to climate change.

The Cooperative Extension network would benefit from partnering with these trusted advisors to maximize reach and enhance program delivery. As such, we recommend that USDA better integrate with private sector partners, such as farmer-owned cooperatives, agricultural retailers, seed, and feed companies, and with Extension services to help train, demonstrate and disseminate information on new, climate-smart practices and programs. Examples of work by private sector partners and Extension could include hosting field days and educational seminars.

II. Streamline Technical Service Provider Certification

Technical assistance from trusted partners and on-the-ground support is critical to help farmers and ranchers overcome administrative barriers that impede the adoption of climate-smart practices. Staffing and resources are recognized challenges facing NRCS, which is why we support a streamlined process for TSP certification. TSPs expand the availability of technical experts that can work with producers and landowners on conservation planning and implementation. Specifically, USDA should streamline certified crop advisers' ability to become TSPs.

III. Public-Private Partnership Focused on Food Loss and Waste Education

USDA can help educate consumers on food loss and waste prevention strategies. The public has become better educated on the issue over the past five years, but ongoing efforts tend to focus more on awareness and less on solutions. A joint effort between USDA and the business community could change this focus toward addressing the issue in concrete ways that can be measured and reported more easily. Modeled after the Partnership for Food Safety Education, this new effort would include consumer-facing outreach and could also serve an important secondary function of helping to educate the public on how food is produced. New efforts can build on existing ones, such as the ongoing Ad Council campaign on food waste and EPA's "Food: Too Good to Waste" effort.

C. How can USDA help support emerging markets for carbon and greenhouse gases where agriculture and forestry can supply carbon benefits?

Farmers, ranchers, and forest owners must be at the table and active participants in conversations on policies and programs that affect them and their operations. FACA has called for voluntary policies that achieve the highest adoption of appropriate climate-smart practices on the greatest number of acres in order to sequester carbon, reduce greenhouse gas emissions, and build climate resilience. A carbon bank led by the USDA is one of many policy mechanisms to help make progress toward these goals.

Now more than 70-members strong, FACA has developed more detailed recommendations for how a USDA-led voluntary carbon bank could help reduce barriers that may prevent participation in voluntary carbon markets and the deployment of critical climate infrastructure on working lands. These consensus recommendations build on the [core recommendations released in November of 2020](#).

The following outlines goals and objectives for a USDA-led carbon bank. FACA recommend that a USDA-led carbon bank begin by pursuing those objectives through pilot projects focused on the following four areas:

- Developing, improving, and scaling climate-smart agriculture practices.
- Encouraging widespread adoption of climate-smart practices and critical climate infrastructure.
- Establishing carbon accounting criteria and standards.
- Engaging with and providing equitable opportunities for minority, socially disadvantaged, and small-scale producers.

Objectives and Goals

Information gained from the pilots should be used by USDA to work with Congress and stakeholders to create a durable foundation for a carbon bank that gains bipartisan support and leverages private investment for agricultural and forest land-based carbon sequestration and greenhouse gas emission reductions.

The carbon bank should work to scale voluntary adoption of climate-smart agricultural and forestry practices to promote climate change resilience and mitigation across public and private, natural, and working lands. The carbon bank should invest in approaches that reduce barriers to participation by farmers, ranchers, and forest owners in carbon credit trading programs, and provide confidence in the practices and verification of sequestration and reduction activities. The carbon bank should avoid undermining carbon markets.

A USDA carbon bank should advance the following objectives:

1. Maintain the confidence of farmers, ranchers, forest owners and carbon credit purchasers in the value of climate-smart agricultural and forestry practices across the diversity of agricultural and forest production types, regions, and sizes.
2. Ensure opportunities for participation in the carbon bank by all interested farmers, ranchers, and forest owners.
3. Encourage coordination, cooperation and consistency across federal agencies and departments, and with states, public research institutions and other stakeholders.

Pilot Project Areas of Focus

As a critical first step toward the development of a carbon bank, USDA should act quickly to establish pilot projects that advance the objectives above and address key issues and barriers that farmers, ranchers, and forest owners face as they implement practices to sequester carbon, reduce emissions and increase the resilience of their land. Those efforts and information about them can help inform voluntary carbon markets and a USDA-led carbon bank as it develops.

Pilot projects should be prioritized to build out critical climate infrastructure and enable participation by all producers and landowners. Existing carbon markets may not provide opportunities to all farmers,

growers, ranchers, and forest owners due to regional differences, crop and production types, total acreage under crop production, farm and forest size, and other factors.

Pilot projects should focus on the following four areas:

1. Develop, improve, and scale critical climate infrastructure and climate-smart practices.
 - a. Deploy critical climate infrastructure, which includes soil health and livestock management systems, carbon and carbon equivalent data gathering and analytical tools, access to improved genetics, nursery and seedling production capacity development and cover crop seed production.
 - b. Scale climate-smart agricultural practices that reduce, directly capture, or sequester greenhouse gas emissions. Examples of such practices include improved energy efficiency, increased supply chain efficiency, enhanced manure management, new technologies such as feed additives and improved genetics and other livestock, soil, crop, and forest management practices.
2. Encourage widespread adoption of climate-smart practices and critical climate infrastructure.
 - a. Facilitate short- and long-term financial and technical support for farmers, ranchers and forest owners who adopt climate smart practices and critical climate infrastructure.
 - b. Support and promote projects that have important climate benefits but are not well suited to a carbon market.
 - c. Reduce producer risk, disincentives, and barriers to engaging in climate-smart agricultural and forestry practices.
 - d. Ensure producers have information about the benefits of climate-smart practices, as well as information and assistance for the adoption of climate-smart practices.
3. Establish carbon accounting criteria and standards.
 - a. Develop consistent and credible criteria for permanence, reversal risks, additionality, leakage, uncertainty, and project aggregation. Use these criteria to account for the carbon impacts of climate-smart agricultural and forestry practices and project types, set minimum standards to provide needed benchmarking of protocols, and embed flexible mechanisms to update standards over time as better approaches become widely available.
 - b. Use the best available science to foster innovation in programs and protocols to scale landowner and producer participation in carbon bank projects and broader carbon markets and programs. This can be accomplished by setting parameters to maintain rigor in carbon outcomes while reducing unnecessary burdens on landowners and producers. Ensure periodic reviews and updates to the minimum standards.
 - c. Make aggregate data from carbon bank and other USDA and federal agricultural carbon sequestration and emissions reductions programs centrally located and publicly available, while also maintaining high protections for producer privacy.
4. Engage with and provide equitable opportunities for minority, socially disadvantaged, and small-scale producers.
 - a. Provide targeted technical support, land ownership and legal support, aggregation mechanisms, and assistance for overcoming other barriers to participation faced by small, minority, traditionally underserved farmers, ranchers, and forest owners.

D. What data, tools, and research are needed for USDA to effectively carry out climate-smart agriculture and forestry strategies?

Ongoing public and private investment in the research and development of new methods and technologies have the potential to enhance the sustainability of agriculture, protect the environment and our global food system. For U.S. farmers and ranchers to lead in the future, we must have access to every tool available to address pressing challenges caused by climate change, such as severe weather events and rapidly evolving pests and diseases. We must do this while simultaneously meeting societal expectations for reductions in the use of inputs and increasing new varieties of healthy and affordable food, feed, biofuel, and fiber options. Access to and the development of technology is essential for confronting these challenges.

I. Build-Out a National, On-Farm Soil Monitoring Network

NCFC supports the build-out of a national, on-farm soil monitoring network to track soil health and resource indicators over time, including soil carbon sequestration. We recommend building the network to include 5,000-7,000 Natural Resource Inventory (NRI) sites across the U.S. These sites would be tested on a rotating, interval basis to provide an ongoing, statistically relevant data stream that could be used to inform carbon modeling and farm-planning tools such as the COMET tool. We understand that NRCS entered into an agreement with Colorado State University to pilot this network, but full build-out was ultimately suspended.

II. Revitalize and Expand the Collection of Weather Observation Stations in Rural America

Accurate and timely weather forecasts are critical for agriculture to reach its climate-smart potential. Almost every aspect of agricultural field work is made less efficient, and therefore less successful in terms of climate and environmental performance, if producers make decisions based on inaccurate weather forecasts. In addition, general rural safety and welfare is highly dependent on accurate and rapid forecasts of life- and property-threatening extreme weather events.

Precise and representative observational data are critical to achieving the goal of accurate and timely weather forecasts. For over a century, the U.S. has led the world in the collection of observational weather data. During the time when most of the country's population was rural, farmers were enlisted in a cooperative network to manually track daily temperature and rainfall data to send to state and federal weather authorities. This network persists today in the National Weather Service's (NWS) Cooperative Observer Program, which has a few thousand participants. Yet observations of rural weather conditions have declined for decades as average farm sizes grow, farmland is developed for non-farming purposes, and families that collected data for generations leave farming.

The private sector is now attempting to fill these data gaps; one method uses models that can extrapolate from observed data points to estimate weather conditions in areas for which there no longer is observational data. Those models are only as accurate as the data they are built from, and research shows that in terms of informing agronomic decisions, observational data outperforms estimated values based on less-than optimally representative analyses.

Considering this, we encourage USDA to work with its counterparts at NWS and other agencies to explore the following:

1. Additional funding in rural areas to reinforce the participation of current members and greatly expand the number of new members in the NWS Cooperative Observer Program.
2. Funding to the land-grant universities, Historically Black Colleges and Universities, Hispanic-Serving Institutions, and other public universities and institutions as appropriate that are willing to augment the Cooperative Observer Program state and regional weather "mesonets."
3. Funding to expand the network of observations of soil moisture content, especially in the arid regions of the country, to the extent needed to help agriculture manage drought and related climate conditions.
4. Investigate how new technologies, rural broadband, cloud computing, and related developments could work in these contexts to create the next generation of an advanced climate observation network useful to rural America.

III. USDA Research Trials

The Agricultural Research Service (ARS), Agricultural Experiment Stations (1860s), and Agricultural Research Programs (1890s) at land-grant universities have a vast network of on-farm research, soil test facilities, research laboratories, and scientists and technicians that can be leveraged to provide critical answers to research questions around regional and crop- and livestock-specific measures to adapt, mitigate and become more resilient to climate change. ARS, in coordination with the Experiment Stations, Agricultural Research Programs, and the private sector, could help create universal standards for measurement protocols.

IV. Better Utilization of and Linkage with the Climate Hubs

USDA should ensure cross-regional collaboration between the hubs and within the agencies conducting climate research including: NRCS, ARS, Farm Service Agency, Risk Management Agency, National Institute of Food and Agriculture (research and Extension), Economic Research Service, National Agricultural Statistics Service, and U.S. Forest Service.

In addition, USDA should add an emphasis throughout the regions or establish a new hub or sub-hub focused on feed and manure management. Pasture and grazing are currently included.

We also support the creation of a new field experiment network through the hubs to evaluate and further develop region-specific best management practices for soil carbon sequestration and net GHG reduction in the agriculture sector. This research should be jointly conducted by USDA and land-grant universities.

Lastly, we support formally linking Extension with the Climate Hubs to better connect farmers and ranchers with on-the-ground experts in climate science that will assist in planning and application.

V. Public-Sector Genetics Research

To mitigate the effects of climate change, ensure climate resiliency, and continue to achieve environmental gains, public-sector research should support farmers' and ranchers' access to

improved genetics developed using a range of breeding methods, including gene editing, genomic enabled predictive breeding, and genetic engineering.

VI. Pasture/Grazing Analysis

Improved pasture and grazing management has the potential to play a substantial role in terrestrial carbon sequestration. More needs to be done to develop protocols and to deploy prescribed pasture and grazing practices to reduce emissions.

NRCS, in coordination with the research agencies, should identify regions and practices with the greatest potential for carbon sequestration and methane and nitrous oxide emissions reduction, and should support research, development, and widespread use of decision-support tools for climate and land stewardship outcomes. In addition, NRCS state office priorities should support technical assistance to grazing land managers in high-priority regions (developed in coordination with the National Grazing Lands Coalition).

NCFC also supports research and development efforts to improve enteric fermentation/forage intake estimation models.

VII. Research Infrastructure Upgrades

It is critical to invest in climate research and development by providing land-grant universities funding to upgrade their research infrastructure, including brick-and-mortar facilities and computing capabilities and networks. This will position U.S. agricultural to lead in developing climate innovations that provide new economic opportunities for farmers, ranchers, and landowners.

E. How can USDA encourage the voluntary adoption of climate-smart agricultural and forestry practices in an efficient way, where the benefits accrue to producers?

Broadly speaking, USDA climate policies must be developed with all of agriculture in mind, regardless of size, geographic region, or commodity. There is no one-size-fits-all solution. Instead, solutions must be flexible to accommodate the diversified needs of our industry.

USDA climate policies must also balance maximizing profitability of farmers and ranchers along with environmental outcomes. Climate policies must be producer- and landowner-led and incentive-based to provide our industry with the tools needed to combat the effects of climate change, promote resilience and drive sustainability throughout the supply chain.

2. Biofuels, Wood and Other Bioproducts, and Renewable Energy Questions

A. How should USDA utilize programs, funding and financing capacities, and other authorities to encourage greater use of biofuels for transportation, sustainable bioproducts (including wood products), and renewable energy?

Biofuels

Biofuels have a role to play as we work together to reduce the GHG footprint of the U.S. transportation sector. Agricultural best practices and production methods have the potential to reduce the life cycle emissions of biofuels. Comprehensive approaches to reducing emissions should recognize the relative

benefits of biofuels based on their full life cycle emissions and encourage continual improvements in biofuel carbon intensity to ensure increasing benefits over time. Looking forward, renewable fuel and/or bioenergy policy should be market-based and provide clear, simple, and consistent eligibility criteria across all feedstocks.

The EPA should update its modeling on the life cycle emissions of transportation fuels. The modeling should reflect technological advances in the U.S. biofuels industry and data on current agriculture production practices to measure the carbon intensity of biofuels more accurately, such as included in the Department of Energy's (DOE) Argonne National Lab Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET). USDA possesses practical knowledge and expertise on biofuels and innovative farming techniques and, thus, should be consulted throughout the assessment process. NCFE supports the use of the best available and latest science.

In addition, we support the continuation of the Higher Blends Infrastructure Incentive Program (HBIIIP). Consistent funding for this program is a path to provide businesses with the certainty they need to increase investments in agricultural renewable energy infrastructure. NCFE also supports increased funding for the program to support projects that connect agricultural renewable energy sources to distribution.

B. How can incorporating climate-smart agriculture and forestry into biofuel and bioproducts feedstock production systems support rural economies and green jobs?

The U.S. biofuels industry currently supports nearly 300,000 green jobs across the agricultural supply chain – from farmers to plant workers.

C. How can USDA support adoption and production of other renewable energy technologies in rural America, such as renewable natural gas from livestock, biomass power, solar, and wind?

I. Enhance Rural Energy for America Program Participation

Farmer-owned cooperatives should be made eligible to participate in the Rural Energy for America Program (REAP) to further enhance participation. Currently, only farmers and rural small businesses are eligible to apply for REAP grants and loan guarantees to install renewable energy systems. Often, local, rural cooperatives do not qualify under the definition of a rural small business due to the unique ownership structure of the cooperative—automatically eliminating them from eligibility. Expanding eligibility to automatically include cooperatives would increase the adoption of methane digester and other renewable energy projects such as wind, solar and/or efficiency projects operated and financed through farmer-owned cooperatives. Given the strong network of producers within a co-op's membership, these projects could be scaled to encompass several farms to increase the effectiveness and impact of energy projects. Allowing farmer-owned cooperatives to be a trusted partner with producers in utilizing REAP benefits would break down several barriers currently preventing producers from installing highly effective technologies on their farms.

Additionally, Rural Development should coordinate with NRCS to develop an application that is streamlined and less burdensome for farmers to navigate. Applications and additional information also should be readily available in Farm Service Agency field offices.

II. Conduct a National, On-Farm Energy Study

We encourage USDA to conduct a comprehensive, nationwide study focusing on energy efficiency adoption, rural renewable energy production, and biofuels deployment. The study should identify barriers to adoption and opportunities to increase on-farm energy efficiency and renewable energy use including but not limited to solar, wind, biomass, biofuels, and biogas. This data collected should be considered as the Department looks to improve the delivery and efficacy of its energy programs.

III. Reestablish the Biogas Opportunities Working Group

We support reestablishing the interagency Biogas Opportunities Working Group, which should be led by USDA and include participation from the DOE, EPA, as well as livestock, dairy, and nonprofit stakeholders. The working group should be directed to remove barriers to technology adoption, identify funding opportunities sources, integrate renewable natural gas into a clean energy strategy, and work with the AgStar Program to enhance technical assistance.

3. Addressing Catastrophic Wildfire Questions

Severe wildfire is a reality that must be addressed. While fires are a natural and important part of many forest ecosystems in the United States, severe wildfire is caused by a set of complicated and compounding factors including dry weather cycles exacerbated by the effects of climate change, decades of fire exclusion and fuel buildup in many forests, and lack of adequate resources to realistically address wildfire risk.

In particular, we urge USDA and other agencies to focus on the following areas:

1. Wildfires are a natural part of many forest and rangeland ecosystems but have gotten more severe and frequent because of multiple factors that include changing land-use patterns, the role of human-ignited fires, decades of fire suppression in the U.S., and the effects of climate change, leading to catastrophic events, particularly in the western United States.
2. These catastrophic events have a multitude of impacts, harming areas vital for rural livelihoods, rural economies, and environmental considerations like water quality and availability, habitat, carbon storage and sequestration, and many other ecosystem services.
3. Great work is being done to address wildfires through collaboration, including restoring landscapes to mitigate and adapt to climate, with Indigenous communities, and basing practices on sound science. Particular attention is needed to further spur the adoption of sound forestry and grassland practices in effected communities to improve the health, resilience, and fire resistance of these resources. The need for the adoption of practices will only grow as climate change further stresses resources and the people that reside in these communities. USDA and its state, local, and Tribal government partners also should consider the impacts on rural communities affected by wildfires and make grants available to replace damaged farm equipment and fencing lost to wildfires to ensure agriculture can recover as quickly as possible.
4. Policies should recognize that wildfires do not respect boundaries, so all agriculture stakeholders across ownership types (federal, state, private, tribal, etc.) as well as the

environmental and conservation communities and land-use communities – including grazing permittees – should be at the table to craft solutions.

5. There is a need for research on the food safety consequences of the presence of wildfire ash or residues of fire-retardants in fresh produce. Research also is needed to understand the most effective ways to remove wildfire ash and fire-retardant residues from fresh produce.

4. Environmental Justice and Disadvantaged Communities Questions

We are committed to working with the federal government, and within our own membership and networks, to support current and future farmers and ranchers of all genders, races, creeds, religions, sexual orientations, and backgrounds. USDA must commit to having a broad, diverse, and inclusive stakeholder group actively participate in the climate policy-decision making process. USDA programs and incentives should be structured inclusively and designed to equitably distribute benefits and burdens of climate and agriculture policies.

NCFC appreciates the opportunity to provide feedback and remains available for further discussions with the agency if additional input is needed.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ch F Conner', written in a cursive style.

Charles F. Conner
President & CEO
National Council of Farmer Cooperatives