



June 17, 2020

Senate Democrats' Special Committee on the Climate Crisis
Hart Senate Office Building
Washington, DC 20515

RE: Request for input on extreme weather and climate change

Dear Senators:

I am writing on behalf of the North America Climate Smart Agriculture Alliance (NACSAA) to provide input in response to the questions you posed in your May 18th letter to rural leaders and agriculture stakeholders. To briefly introduce NACSAA, our members include [over 70 partners](#) in the agriculture, food production, equipment manufacturing, life science and conservation sectors, collectively engaging in global agricultural climate conversations according to a common set of [guiding principles](#). The formation of NACSAA was North America's agriculture and rural communities' response to the complex threats and risks of climate change; this diverse group of agricultural thought leaders and organizations from across the continent has joined together to create a platform for inspiring, educating, and equipping agricultural partners to innovate effective local adaptations to climate challenges.

Among NACSAA's guiding principles, the first and most important to consider is that "farmers must be at the center of all discussions and decision-making," and the second is that there is no "silver bullet" to enhance the resilience and potential to mitigate climate change presented by agriculture.

In the past, NACSAA has presented its perspective to the U.S. House of Representatives through [testimony](#) in late 2019 and an early 2020 tranche of [enabling policy suggestions](#) for the House Select Committee on the Climate Crisis. The coalition additionally has a long history of global engagement with the United Nations Framework Convention on Climate Change (UNFCCC)'s landmark agricultural program, the Koronivia Joint Work on Agriculture (KJWA). In developing these suggestions, NACSAA offers a collective body of work which – though not every partner may endorse every item on the list – presents a composite consensus of important climate change enabling policies evolving from North American agricultural stakeholders.

NACSAA thanks Chairman Brian Schatz, the Hon. Tammy Baldwin and other members of the Senate Democrats' Special Committee on the Climate Crisis for the opportunity to provide further input on agriculture's potential to contribute solutions to climate crisis.

Question 1: What challenges do you face from weather extremes? (...)

As documented in the [Fourth National Climate Assessment Report, Volume II](#), climate change presents numerous challenges to sustaining and enhancing crop productivity, livestock health, ecosystem integrity and the economic vitality of rural communities. Among the report's key messages: food and forage production are declining in regions experiencing increased frequency and duration of drought; the degradation of irreplaceable soil and water resources will expand as extreme precipitation events increase across our agricultural landscapes; challenges to human, crop and livestock health are growing due to the increased frequency and intensity of high temperature extremes and related spread of pests and crop and animal diseases; and key modes of communication, transportation, water, and sanitary infrastructure are vulnerable to disruption from climate stressors.

In central Ohio where I farm, we have recently experienced several of the most difficult growing seasons that I can remember during my farming career. 2018 was almost a record wet year, delaying planting by weeks. This was followed by six rain events during the growing season of over two inches each, and then by a fall that contained virtually no harvest days during the whole month of November. We finally finished field work shortly before Christmas. 2019's spring planting was again delayed by weeks because of wet and saturated soils. This was followed by a very dry July and August, greatly restricting plant growth and delaying maturity. Some yields were down 20 to 30% from historical numbers. Abnormally wet weather conditions this spring once again delayed planting.

Elsewhere, a large swath of the country experienced record winter precipitation in 2019, in some areas up to 200 percent above normal, leading to major flooding. Spring flooding across the Midwest left many fields unplanted, resulting in about \$2 billion of losses in uninsured stored crops. Cool, wet springs across the Midwest and Ohio River Valley delayed planting, which meant changes in which crops were planted. The Mississippi River rose to historical levels and left acres of fields in Mississippi inaccessible – even for wildlife. Early fall blizzards and early freezes damaged crops in the Dakotas and Upper Midwest. The 2016 California drought was also devastating, resulting in \$247 million loss of farm-gate revenues and up to \$600 million in spillover value lost to the rest of the economy. North Carolina farmers and livestock growers experienced more than \$1.1 billion in losses from Hurricane Florence in 2018. And the list goes on.

In the face of these local disasters, NACSAA's farmer-led, continent-wide Alliance focuses its efforts on helping both producers and the value chain utilize climate smart agriculture (CSA) strategies to enhance the adaptive capacity of North America's food system. Strategies range from minor adjustments in existing production to major changes in agricultural systems and best management practices, and are organized around the three CSA pillars:

Pillar One: *Sustainable intensification of production and ecosystem integrity*

Pillar Two: *Adaptations that build resiliency*

Pillar Three: *Systems that allow farmers to retain and sequester carbon or reduce greenhouse gas emissions and simultaneously improve profitability*

The use of a CSA framework is foundational to any agricultural climate strategy. By letting farmers lead and focusing on the economic viability of farming operations as they respond to the changing climate, policymakers can encourage win-win scenarios in which agriculture presents a solution for climate

impacts while improving environmental resilience, building strong rural communities, engaging consumers, and ensuring public health and access to nutritious food.

Question 2: What are the most important reasons for acting to improve resiliency and slow the impacts of changes to climate? (...)

Farmers and ranchers are directly impacted by climate change, and as an industry are also uniquely positioned to help deliver solutions. Disastrous events due to extreme weather are becoming more frequent, and their cost is enormous. Farmers and ranchers have taken steps to prepare for disasters – but despite their best efforts, the scale of these events has led to widespread crop damage and losses. Weather-related changes make it riskier to raise livestock and produce crops – and require greater resilience. Rising temperatures can reduce the fertility of livestock, reduce their rate of gain, and likewise reduce crop yields. Weather changes have increased the length of the frost-free period (and corresponding growing season), increased precipitation and heavy downpours, and increased frequency of extreme weather events like droughts, floods, fires, and heat waves. These are not things science is telling us will happen. These challenges are happening now and we are struggling mightily to adapt.

There is another compelling reason to act to build resiliency: many steps farmers can take in service to this, the second pillar of CSA, also work towards CSA's third pillar of greenhouse gas reduction and mitigation. The Special Committee's own Hon. Sheldon Whitehouse was a co-sponsor of the recently introduced [Growing Climate Solutions Act](#), legislation which acknowledges and celebrates that “at scale,” the soil-strengthening practices that help farmers adapt to a changing climate can also “sequester carbon at as low as \$10 per MtCO₂e, making [these practices] the most cost effective carbon sequestration method currently available.” The Act may or may not move forward. But as a single technical certification program to promote carbon sequestration practices, it represents only the beginning for the CSA enabling policies needed to realize the full potential of agricultural solutions to climate change.

It is impossible to overstate how important land-based solutions like the ones we have discussed will be to address global climate change going forward into the future. Dr. Rattan Lal of Ohio State University – the 2020 World Food Prize Laureate, a Nobel Prize-winning expert on soil carbon management and an IPCC report contributor – predicts that properly managed soil, vegetation and animal systems worldwide could achieve 157 parts per million of CO₂ drawdown per year by the next century - nearly 40% of 2018's global atmospheric carbon levels. Enabling policies that address climate change through agriculture and forestry can unlock the huge, untapped potential for America's farms to lead the way towards this goal through both economic and environmental sustainability.

Agriculture is a diverse industry, encompassing a range of farm scales and agro-ecosystem landscapes. Generalized regional climate conditions do not well represent individual farmers' local weather and climate experiences and their varied impacts on different topographies and agricultural systems. Thus, individual farms in each state and geographic region of the U.S. are best served through unique adaptation strategies that enable farmers to co-manage for resources, productivity, profitability and ecosystem health. Their efforts will be most successful when success is defined by outcomes and not prescriptive practices. The complexity of this stewardship – which requires an “all tools in the toolbox” approach and prioritizes farmer access to multiple choices and innovations – may seem overwhelming to those looking for an oversimplified “silver bullet” solution, but complex problems are a farmer's bread and butter.

Question 3: Are there existing tools for farmers, ranchers and communities such as those at the U.S. Department of Agriculture in their Natural Resources Conservation Service or Farm Service Agency that would help your area be more resilient? (...)

An important workstream identified to the House Select Committee was the expansion of financial assistance which promotes and assists voluntary, locally led, incentive-based conservation efforts. These may vary by conservation district to avoid “one-size-fits-all” policies but should especially support proven practices such as 4R nutrient stewardship, no-till and cover crops and on-farm technologies such as methane digesters. Suggestions under this workstream include:

- Double the nation’s climate resilience investments into farms made through the 2018 Farm Bill and/or through such programs as the Agricultural Conservation Easement Program (ACEP), the Conservation Reserve Program (CRP), the Conservation Stewardship Program (CSP), the Environmental Quality Incentives Program (EQIP), the Regional Conservation Partnership Program (RCPP), the Rural Energy for America Program (REAP) and the Watershed Planning and Flood Prevention Program (PL 83-566).
- Enroll an additional 100 million acres of farmland to federal working lands programs by 2030, with a focus on implementing sustainable practices to maximize ecosystem services and carbon sequestration as indicated by their outcomes in each specific geography.
- Increase general funding for cost sharing of nutrient management, conservation tillage, cover crop, soil health and biogas programs administered through federal programming.
- Create a Section 48 investment tax credit for nutrient recovery systems that can remove nitrogen and phosphorus particles from animal manure, and another, permanent investment tax credit for anaerobic digesters for multiple uses, as in the Agriculture Environmental Stewardship Act (H.R. 3744).
- Expand federal tools, including the soil health provision in the 2018 Farm Bill, to incentivize and measure soil health improvements, improve protocols for measuring the gains in soil carbon from soil health improvements and support development of markets for soil carbon capture and storage.

In the meantime, adaptation to changing weather and climate entails a suite of management strategies based on short- and longer-term production and conservation goals and perceptions of uncertainty and risk associated with changing conditions¹. There are several strategies to adjust federal crop insurance programs to incentivize and expedite adoption of CSA practices to mitigate uncertainty and risks:

- Adopt crop insurance system changes to incentivize and reward growers for adopting and utilizing conservation practices and strengthen data management systems at USDA, enabling more comprehensive understanding of best management practices for risk mitigation.
- Require the Risk Management Agency and Federal Crop Insurance Corporation at USDA to consider the climate impact of practices when establishing policies and premiums. Recognize climate-smart practices with proven effectiveness in the relevant geography (such as cover cropping, crop rotation, alley cropping, integrated livestock-crop systems, etc.) as “good farming practices” that are “generally recognized” by agricultural experts.
- Offer discounts to federal crop insurance users whose practices offer de-risking opportunities. Allow financial regulators to use conservation practices (i.e. practices which indicate a foresighted manager) as a benchmark for determining the risk weighting of a borrower.
- Programmatically treat carbon-reduction practices as risk reducing.

Current programs already recognize that technical assistance for farmers is critical to implementation but are often underfunded for their needs. Congress should direct the rebuilding of capacity (both resources and staffing) for NRCS, state conservation agencies and local conservation districts to provide much needed technical assistance in writing and implementing CSA plans, by:

- Enabling NRCS to expediently access technical knowledge available in the private sector to complement and expand staff reach and expertise.
- Fully implementing 2018 Farm Bill provisions intended to extend staff coverage, such as allowing qualified non-Federal entities to certify technical service providers.
- Using contract representatives such as Certified Crop Advisors and agronomists to alleviate the backlog of requests for NRCS help.
- Increasing investments in NRCS and annual appropriations for the Conservation Technical Assistance (CTA) program and any other programs that help cost-share conservation practices for landowners.

Question 4a: What are the most promising opportunities for land managers to benefit from climate action that are based on tools, such as conservation practices, that are currently in use?

It must be restated that NACSAA, representing North American farmers, has engaged with global climate conversations by stressing the CSA framework in policy development. There is an important reason for this: while adaptation for resilience and mitigating and avoiding greenhouse gas emissions are critically necessary responses of the agriculture industry to the changing climate, these goals are impossible without the first pillar of climate smart production, which describes using *sustainable* practices to intensify the multiple benefits of healthy productive agricultural systems and ecosystem integrity.

Properly executed, Pillar One is a reminder that no practice, tool or policy, no matter how beneficial, holds any promise until one of the co-benefits it intensifies is farmer livelihoods. All of NACSAA's recommendations come back to the need for farmers to be valued for, and thus profit from, outcomes that provide solutions from the land. When viewed through this lens, pursuing climate action through promoting existing tools has a bright future. Where it makes the most sense for their back fields and bottom lines in these difficult times, farmers will willingly pursue achieving climate goals with a suite of the proven, pragmatic practices in use around them that will best fit their operations and objectives.

With this in mind, fostering the implementation of known practices that increase uptake and storage of carbon into the system is clearly an immediate, scalable way to reap dividends for both the climate and food security, while delivering multiple ecosystem service co-benefits. For example, increasing soil carbon sequestration for climate increases soil organic matter, which can enhance nutrient cycling, water retention and infiltration, support soil biodiversity, and increase crop productivity and climate resilience. These co-benefits are particularly important in my home state of Ohio, where nutrient leaching from farm fields contributes to nutrient pollution in Lake Erie. However, healthy soil and reduced land degradation increases resilience and reduces negative environmental impacts in every agricultural system. In a virtuous cycle, farmers compensated to pursue these goals would also begin saving money on fertilizer long term as fewer nutrients were lost, giving them a steadier living and letting them experiment for even better outcomes. Another example that combines economics and climate is anaerobic digesters, which capture methane emissions from livestock operations and convert them into a valuable renewable natural gas that can be sold as an alternative to fossil natural gas.

Question 4b: What new tools and strategies have the most potential for improving resiliency and sequestering carbon?

Today, most new technologies coming with the newest precision tools are tied directly to access to broadband services as well as satellite and/or phone service. The policy touching on research should support and encourage system-level, integrated science research on climate risks; adaptation innovations; the economic value and effectiveness of CSA production practices; decision-making at farm and landscape level management, and methods to align market incentives with desired environmental practices and outcomes. A few priorities for this work are to:

- Involve farmers and stakeholders in continuous purposeful multi-directional stakeholder-research-outreach-extension relationships to ensure research reflects the dynamic nature of shifting agricultural systems under climate change and stakeholder real-life priority challenges and opportunities.
- Invest in research for technology and management tools aimed at more efficient application of fertilizers and other crop inputs, such as precision equipment and 4R nutrient stewardship; research in animal feed that is aimed at reducing livestock emissions; public breeding programs to provide farmers with regionally adapted seeds and practices; and towards energy and emissions reduction practices and technologies.
- Expand the Conservation Innovation Grant through USDA NRCS and/or create other programs to support data collection to establish the impact of conservation practices on soil health and farmer economic sustainability.
- Assess potential mitigation and adaptation practices for agricultural lands, with a focus on soil health, and work to determine their economic viability, potential to maintain or intensify agricultural production, and carbon sequestration potential.
- Pursue new climate mitigation options for livestock producers including manure analysis and the use of manure to sequester carbon and improve soil health, as well as new approaches to livestock feed management and feed amendments that can reduce enteric emissions and subsequently reduce greenhouse gas emissions from livestock production.

Question 4c: What are the key barriers to adoption of these practices? Are there solutions you would recommend prioritizing?

A big challenge for EQIP and CSP farm bill programs, co-ops, and other ways to get help and funding for conservation purposes is the shortage of the NRCS staff who are charged to put these plans together for farmers. These experts are the only employees at USDA who actually visit the farms themselves, and this process takes time. Using Ohio as an example again, other farmers near me already know that several Ohio counties don't even have a representative from NRCS to facilitate applications, and the wait time for an NRCS representative to design a nutrient management plan or designate a wetland might be up to two years or more. We are not the only ones. Using contract third party service providers such as Certified Crop Advisors could be an important first step to alleviate this backlog of requests for help.

Centering policy on which specific outcomes are being pursued is also important. For instance, the adoption of cover crops – a well-documented practice to build soil health in many parts of the country – has not historically been emphasized in federal programming. For both cover crops and other practices (such as no-till planting, which on a site-specific basis can decrease risks associated with soil and nutrient loss over time), neither federal agencies nor legislation have thus far targeted them to

incentivize adoption. In fact, due to short-sighted program requirements, farmer innovation is sometimes disincentivized entirely. It is also worth considering how many barriers are simply due to tying so many programs to an overburdened, understaffed NRCS. Other policy approaches exist: the private insurance world, where demonstrating risk reduction frequently leads to customer discounts, provides one example of how a simple change in policy could give farmers who use Federal Crop Insurance more diverse incentives to implement carbon storing practices.

Question 4d: What challenges do you see in the balance of food and fiber production with the incorporation of additional resiliency and carbon sequestration activities? Are there tools or strategies that could help reduce the difficulty of these challenges?

The most important implementation challenge is to help farmers integrate the results of research; farmer experiences and their articulated needs; and technology investments to develop accessible, pragmatic, and affordable decision-making approaches, that utilize the range of low, mid, and high-tech tools and strategies and effectively connect land managers at farm and landscape scales with data, knowledge and resources. To make sure information is in farmers' hands, Congress should:

- Incentivize the development of tools, technologies, information and training that enables farmer decision makers to address complex farm-level and landscape-scale challenges (exacerbated by climate risks) and balance management for production, profitability and ecosystem integrity.
- Put in place institutional processes for governments and other bodies to reevaluate and adjust policies and regulations based on producer inputⁱⁱ. Create effective feedback mechanisms to alert policy makers to changing conditions, conflicting and ambiguous regulations, and unduly burdensome bureaucratic paperwork, and expedite policy updates that improve farmer decision making and uptake of innovative sustainable production approaches.
- Involve and incentivize government, the private sector, and civil society collaborations to encourage agriculture and its value-chains to innovate and develop efficient, effective products in support of agricultural and ecosystem co-productivity.
- Empower USDA's network of Climate Hubs to work with land grant university extension offices and other USDA agencies and partners. Fund these partnerships sufficiently to develop and deliver science-based, region-specific information and technologies to enable climate-informed decision-making by agricultural and natural resource managers.
- Provide additional federal support to help states develop and implement comprehensive adaptive management and ecosystem service action plans to sustainably intensify production, enhance the resilience of agriculture and improve soil, water and other environmental resources and services.

Question 4e: What types of recognition, certification, compensation, or other acknowledgement would be most useful to promote the use of conservation practices that are particularly effective at reducing climate change?

NACSAA urges Congress to support a carbon pricing mechanism that also provides payments to farmers for carbon fixation in their soil, with valuation contingent on science-based evidence for time length of capture (i.e. higher values for fixation 12 or more inches below the soil surface). Carbon pricing mechanisms should:

- Permit lenders to use carbon credits as part of a borrower’s cash flow statement, allowing producers to include net GHG emission credits as income when applying for loans.
- Quantify the carbon sequestration benefits of CSA practices such as manure injection to enable cover crop growth; further quantify the balance between greenhouse gas emissions and potential carbon sequestration in the agricultural sector.

Farmers also must be recognized for the full suite of services they provide to the land, including food, feed, fuel and fiber, but also climate benefits and other ecosystem services. The development of the following policies could support quantified ecosystem benefits and a voluntary, market-based, private-sector funding mechanism/incentive for ecosystem services:

- Move to adjust U.S. agricultural cost assistance (via combined international support, public good investments, payments to producers, international trade policy in a carbon-conscious future market, and other mechanisms) towards incentivizing climate adaptation and mitigation in agriculture and the broader food system. Take forward recommendations for scaling up and mainstreaming CSA, improve opportunities for leveraging further agricultural investments.
- Provide tax incentives for farmers who adopt conservation Best Management Practices (BMPs) and other emission and runoff mitigation practices on farm.
- Authorize tax incentives or federal transferable tax credits between landowners who own the land and farmers who lease the land for farming. Allow for an exchange of tax credits for climate mitigation best management practices.
- Revise the provisions of the USDA Conservation Reserve Program’s 7 CFR § 1410.63 “Permissive Uses” to clearly articulate that “the sale of carbon, water quality, or environmental credits is permitted by CCC,” instead of the current provision that indicates they “may be permitted.”
- Permit the sale of ecosystem credits generated by farmer or rancher actions on federal lease land resulting from private actions.

Question 5: What technical assistance is most important for agricultural producers in your region? Who is best suited to deliver technical assistance? (...)

The potential need to diversify the programmatic sources of technical assistance has already been discussed, but a need not yet discussed is for Congress to acknowledge – and prioritize through funding – infrastructure and practices the extreme variations in the hydrologic cycle marked by drought, evapotranspiration, increased and more intense precipitation events, erosive runoff, sediment transfers to rivers and oceans, and increasing degradation of soil and water resources. Changes in the water cycle are iteratively driven by changes in weather and climate, land uses and human land and water management leading to shifts in the timing, intensity and volume of rain and snow pack that in turn influence land surface erosion from flowing water, saturated and ponded soils, water storage capacity and flooding. It would be beneficial to:

- Review the roles of federal agencies in state water allocation procedures to avoid interference. Create a framework to better inform and defer to states, tribes and local government decisions regarding water allocation and use in light of changing climate impacts and uncertainties. Advocate for constructive ways in which the federal government can support and facilitate those decisions.

- Evaluate the climate impacts to, and current and future capacity of, key or challenged reservoirs, levees and dams; rivers, floodplains and aquifers; wetlands and productive lands to respond to changing precipitation patterns and protect associated land uses.
- Inventory and evaluate current infrastructure's capacity to ensure safe, adequate, and reliable water supplies that can be conserved, reused, stored, treated, managed and distributed in a timely manner where they are needed.
- Direct the Council on Environmental Quality (CEQ) to convene a broad-based stakeholder group to help develop a Federal climate change adaptation strategy for water resources that optimizes the authorities provided by the 2007 SECURE Water Act. Include strategies to develop and fund a body of climate-related, watershed-specific knowledge to inform planning and adoption of adaptive water management practices and infrastructure projects.
- Provide state-forward coordination frameworks between federal agencies and states to monitor water resources and develop adaptive approaches to climate change and water management; to assess and offer grants and cooperative agreements to local water authorities, governments and universities; and to streamline and enable access, research, and development for to infrastructure solutions.

Question 6: What technical assistance is most important for rural communities in your region?

NACSAA represents agriculture in North America. For those partners based in the U.S., policymakers must remember the physical structures that enable agricultural production nationwide. Investments in this area require cataloguing and facilitating priority repairs and upgrades to vital production and vulnerable inland waterways infrastructure, including levees, locks, dams, and other water systems, as well as roads, bridges, waterways, rails, utilities and others. It also encompasses enabling the use of on-farm new technology through universal in-field wireless broadband connectivity. Specifically:

- Invest in increasing the capacity of inland waterway infrastructure, including reservoirs, levees and dams; rivers, floodplains, wetlands and productive lands to respond to changing precipitation patterns and to meet the need for additional floodwater storage capacity and protection of priority land uses. Inventory and evaluate current infrastructure's capacity to ensure safe, adequate, and reliable water supplies that can be conserved, reused, stored, treated, managed and distributed in a timely manner where they are needed.
- Expand and fully fund the existing USDA Rural Utilities Service programs such as the Broadband ReConnect Program, the Rural Broadband Access Loan and Loan Guarantee Program, and the Community Connect Grant Program. As examples of expansion, adding a planning grant section in the ReConnect program would help buy down the cost of application in irrigation districts where costs provide barriers to entry, and USDA, NRCS, and FSA could use its Pilot Program to incorporate tech trials and precision agriculture infrastructure into existing farm funding or loans.
- Catalyze public-private partnerships between Internet providers, research institutions, data managers and precision ag technology providers to fully utilize modern agricultural equipment to minimize inputs and maximize productivity.
- Explore strategies to provide relief for the approximately \$7 billion in outstanding Rural Utilities Service loans supporting coal power plants if rural electric cooperatives agree to shut down those plants and invest in renewable energy generation. Offer funds through reauthorization

and revision of the Section 1603 “grants in lieu of tax credits” program that ran from 2009 to 2011 as part of the American Recovery and Reinvestment Act.

- Provide for local-level participation in the development of adaptation strategies. Include the message "the means and resources necessary for agricultural self-sufficiency, including water supplies and related infrastructure for irrigated agriculture, must be protected and enhanced to enable them to adapt to and withstand the impacts of climate change" in any national climate change adaptation or implementation strategy.
- Expand the United States Department of Energy’s 242 program to provide a production incentive for all community-scale renewable energy projects, the revenue from which would be used to invest in modernizing irrigation water delivery systems (currently limited to hydropower); significantly increase funding for this program.

Question 7: A wide range of solutions have been proposed to slow climate change, and there are additional strategies that could be developed. What approaches to policy and action to reduce the severity of climate change and the impacts of severe weather would you be most interested in seeing put in place? (...)

Early action and immediate “big return” steps to accelerate climate solutions from agriculture include but are not limited to:

- Increasing federal funding for conservation tillage, cover crop, and biogas programs administered through the USDA NRCS, Environmental Quality Incentives, Conservation Stewardship and Regional Conservation Partnership Programs;
- Rebuilding the capacity of NRCS, state conservation agencies and local conservation districts to provide much needed technical assistance in writing and implementing CSA plans; providing funding to our nation’s land-grant colleges to expand CSA research and extension work;
- Ensuring that rural areas have access to broadband internet service to enable CSA precision agriculture technologies;
- Restoring USDA’s ability to conduct agricultural and economic research in support of CSA; and
- Enabling, through proper funding, USDA’s network of Climate Hubs to develop and deliver science-based, region-specific information and technologies, with USDA agencies and partners, to agricultural and natural resource managers that enable climate-informed decision-making, and to provide access to assistance to implement those decisions.

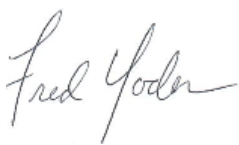
In addition, an important CSA Pillar Three greenhouse gas mitigation pathway not yet discussed – which provides the co-benefits of a market for agricultural products and reduced carbon emissions built into the product’s very use – is the offsetting of fossil fuel emissions by using biomass to produce renewable energy and biobased products. Because bioenergy emits far fewer greenhouse gases than its petroleum equivalents, broader use can help mitigate climate change. Those benefits were strongly underlined by a USDA study released last year showing that emissions from corn-based ethanol are about 39 percent lower than from gasoline, which also states that when ethanol is produced at refineries powered by natural gas, greenhouse gas emissions are even lower, running around 43 percent below gasoline.

To pursue the reduction of carbon through market adjustments and production diversification opportunities to expand bio-based fuels for transportation and electricity production:

- Establish a national Low Carbon Octane Standard for light duty vehicle fuel (minimum 98 RON E25) resulting in -30% GHGs relative to baseline gasoline. Support the move to alternative fuels such as higher-level blends of ethanol (E20+) and B20 biodiesel for efficiency and air quality purposes.
- Make clear that all ethanol blends with gasoline are permitted under the Clean Air Act and require DOE to produce, within 90 days of enactment and in consultation with EPA, recommendations from the Co-Optima program on optimal liquid fuel blends for climate change, air quality, and public health.
- Uphold the integrity of the RFS to further reduce emissions in the transportation sector.
- Direct USDA to collaborate with the Department of Energy to develop regionally appropriate renewable energy sources and technologies; feed stocks for biofuels and other biomass energy sources; engines that run solely on ethanol; uses for distillers' grain; and production of fuels and fertilizers from renewable energy sources.
- Expand operational renewable natural gas production and methane recovery (either direct as scrubbed biogas to pipeline quality or generation of electricity) from livestock operations, crop production and other industries which produce organic waste. Mechanisms available include making further funding and educational opportunities available through EPA/USDA's AgSTAR program, enabling ag/energy industry partnerships and adding compliance targets for organic waste to renewable energy portfolio standard laws.

Thank you for your recognition of the need to advance recommendations that will enable agricultural economic sustainability and benefit farmers, ranchers and foresters as well as the planet. Should you have any questions or need further information, please do not hesitate to contact me or NACSAA's coordinating body [Solutions from the Land](#). With your assistance, U.S. agriculture can be at the forefront of resolving food system, energy, environmental and climate challenges and achieving global sustainable development goals.

Sincerely,



Fred Yoder, Chairman
North America Climate Smart Agriculture Alliance

ⁱ Morton et al. 2015. Upper Midwest Climate Variations: Farmer Responses to Excess Water Risks. *Journal of Environmental Quality* 44:810-822

ⁱⁱ Glass, L M and J Newig. 2019. Governance for achieving the Sustainable Development Goals: How important re participation, policy coherence, reflexivity, adaption and democratic institutions? *Earth System Governance* 2:100031