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Request for Public Input About Implementation of the Inflation Reduction Act Funding

Dear Chief Cosby,

Thank you for the opportunity to submit comments to the Natural Resources Conservation Service (NRCS) on implementation of the Inflation Reduction Act (IRA). The IRA will be critical in facilitating the adoption of climate-smart practices and quantifying reductions of greenhouse gas (GHG) emissions in a way that will further strengthen agriculture's role as part of the climate solution. NRCS can develop systems of quantification and target funding to improve soil health and function, sequester carbon, cut GHG emissions, reduce nitrogen losses, maximize improvements in soil carbon, and ideally shift the agricultural sector from a GHG source to a GHG sink. This is a once in a generation opportunity to not just get conservation practices on the ground, but to do so in a way that improves our collective scientific understanding of conservation impacts on atmospheric GHGs, carbon sequestration, and soil health, allowing us to target practices and systems to maximize resource conservation outcomes.

Founded in 1980, American Farmland Trust (AFT) takes a holistic approach to agriculture, focusing on the land itself, the agricultural practices used on that land, and the farmers and ranchers who do the work. AFT has a 40-year history of conducting research, working with farmers and ranchers, and collaborating with NRCS, and is currently engaged in numerous cooperative agreements with the agency across the nation. This depth of experience gives AFT unique insights into NRCS's work, the challenges that NRCS faces, as well as how it can build systems to overcome them.

These recommendations are made with a goal of deploying IRA funding to quantify the mitigation impacts of climate-smart practice implementation and maximize improvements to soil carbon and reductions in GHGs across the country. We recognize and appreciate the shared goal of helping all farmers and ranchers adopt and successfully maintain climate-smart practices in a way that supports their bottom line and improves climate mitigation, making agriculture part of the climate solution now and in the future.

This is one of three comments submitted by AFT in response to this Request for Information (RFI). This document responds to Question 1 and Question 3 outlined in the RFI, on quantification systems and how best to target IRA funding. A second document responds to Question 4 and Question 5 on program delivery and partnerships. A third document, prepared in collaboration with land trusts and public Purchase of Agricultural Conservation Easement (PACE) programs, covers the role of ACEP-ALE.

Question 1: What systems of quantification should NRCS use to measure the carbon sequestration and carbon dioxide, methane, and nitrous oxide emissions outcomes associated with activities funded through IRA

Recommendation 1: Create an interoperable database to facilitate data collection, analysis, and reporting across programs and agencies

AFT suggests that an interoperable, integrated national database be developed as the foundation of any system that addresses field-based outcomes quantification. Such a database would require a standard dataset schema. One example of an existing schema that can be leveraged and expanded is the Soil Health Demonstration Trial Minimum Dataset required by NRCS Conservation Innovations Grant (CIG) soil health projects and the associated database that has been in development. Such a database would be functional within NRCS, across EQIP (including CIG), CSP, RCPP, Partnership for Climate-Smart Commodities (PCSC) projects, and others. Its functionality should build on the planned and in-progress Producer Operations Data System. It should connect with the Conservation Assessment Ranking Tool (CART), which is already leveraging work toward standardized data structures to enable Application Programming Interface (API) transmission of operation data between public and private data systems. This will, importantly, also minimize the data entry burden for farmers and service providers.

This recommendation for interoperability leverages the concept of an agricultural "data wallet," conceptualized by OpenTEAM. In short a "data wallet" of producer data is owned by the producer, in a standard interoperable data format that allows the producer to securely import and export their operation's data across federal, state, public, and private systems they choose to use. This database should be designed to be functional across USDA to leverage resources at ARS, NRCS, RMA, FSA, and others; and to be interoperable with data held by other government agencies (e.g., EPA, DOE, USGS).

An interoperable database could satisfy many purposes, including creating a national data clearinghouse for the calibration and validation data essential for improving and expanding models that estimate soil carbon changes and GHG emissions associated with farm conservation practices. NRCS could look to the publicly available ecological database of the National Ecological Observatory Network (NEON Data Portal) funded by the National Science Foundation (NSF) as an example of a nationally standardized measurement, data collection, and data management database.

Because NRCS programs are voluntary, such an agricultural database must address privacy and data ownership concerns. Producers and landowners should be given the opportunity to opt into sharing the data collected on their land with the larger scientific community. Assurances should be made at the opt-in point to producers regarding protection of privacy and how their data will be used.

In order for this database to track the climate mitigation effects of NRCS-supported activities and how they contribute to the EPA GHG Inventory, all stakeholders (e.g., NRCS, inventory scientists, farmers, carbon credit markets) need a unified spatial database for tracking field enrollment to avoid double counting. Climate markets and corporate sustainability programs struggle to determine whether or not their interventions result in additional practice adoption. By creating a spatially and temporally-specific practice adoption dataset in a standardized, interoperable format, USDA could aid and improve private-sector efforts and assure the public that taxpayer dollars and private funds are resulting in meaningful and credible climate mitigation outcomes.

To do so, USDA should ensure that the database includes the release of the Common Land Unit spatial database so everyone uses common field boundaries, rather than relying on carbon project developers to independently define fields that may result in conflicting field boundaries. Using the agricultural "data wallet" approach described above, farm fields not previously enrolled in federal programs can easily be added to the national database. NRCS, or a third party, could host the database to enable project developers to certify whether a field is eligible to be enrolled, and for which practices, to check on and then demonstrate additionality. This portion of the database could be designed to ensure privacy is maintained. Some of the development work of this concept is being funded by, and could be leveraged from, the Partnership for Climate Smart Commodities (PCSC) projects.

Recommendation 2: Adopt current standardized quantification methods and leverage, support, and expand long-term monitoring sites and activities.

a) Adopt standardized methods for field-based quantification and analysis

NRCS and USDA should adopt established, standardized methods for field-based outcomes quantification and analysis of soil organic carbon stocks and GHG emissions on long-term field sites across the country. Data collected should include baseline assessments to facilitate national comparability across datasets of soil organic carbon stock (soil carbon and bulk density at depth), and emissions of nitrous oxide (N_2O) and methane (CH_4). Baseline assessment protocol should build upon the existing activities for soil health assessment and monitoring, including NRCS Soil Health Management (CPA 116 and DIA 162) and Soil Health Testing (CEMA 216). Exemplary field-based, ecosystem process quantification methods have been used at NSF's Long-term Ecological Research (LTER) sites, including the row-crop focused LTER at the W.K. Kellogg Biological Station (KBS) at Michigan State University. KBS is also a Long-term Agroecosystem Research (LTAR) site. The long-term monitoring protocols from KBS LTER could be adapted to the LTAR sites to help quantify climate mitigation benefits from conservation practices on agricultural land across the U.S.

b) Support and expand long-term public research sites in cooperation with ARS

The collection of long-term data is necessary to address the need for standardized quantification of climate mitigation outcomes, and more long-term experimental research farms like KBS are needed. Unlike private farms which change management practices regularly, experimental farms can continue the same management treatments for decades, thus facilitating robust long-term data collection. Consistent management and monitoring activities at LTARs and LTERs enable the statistical detection of processes and patterns despite the high spatial and temporal variability of ecosystem processes such as soil organic carbon accrual and soil nitrous oxide emissions.

A network of long-term research farms that are representative of various soil, climate, production types, and management systems, all following standardized measurement protocols, will allow the detection of changes in slow processes like soil carbon accrual, despite weather variability. Compared to private farms which change management practices over time, such sites can easily be compared to illuminate how climate and soil type affect conservation practice efficacy. This data can also be used to improve models employed to quantify climate-smart practice impacts, with validation provided by complementary private monitoring sites, as described below. A wealth of short-term data from farms could be forthcoming if farmers are able to choose to share their data from PCSCs, carbon market projects, and greenhouse gas insetting in corporate supply chains. Rather than making the same measurements as private companies, we suggest complementing those efforts with long term measurements at LTAR sites to compare what companies are estimating through models with real, long-term data.

c) Develop long-term monitoring sites with private working landowners

NRCS is perfectly positioned to develop complementary, long-term applied research sites to collect data from willing landowners of private working lands. This would expand the LTAR Network beyond the established 18 ARS locations to include a greater diversity of soils, systems, and microclimates. These voluntary sites would allow for data collection at the field scale and the integration of those data at landscape and ecosystem scales through a minimum dataset schema and an interoperable database, as suggested above. With a minimum dataset and well-maintained partnerships, some of the challenges of data collection and analysis on working operations can be overcome and provide essential data related to real-world operations. Further, this data could also help inform a Life Cycle Assessment (LCA) of the climate benefits of on-farm climate-smart systems, including fertilizer, lime, seed, pesticide, and fuel manufacturing, transportation, and application costs. The creation of these partnerships could be facilitated through a program similar to the USDA-ARS-NRCS Edge-of-Field monitoring sites, such as the Edge-of-Field Monitoring Ohio Network.

d) Review and revise the 2014 USDA Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity Scale Inventory (the "blue book")

AFT suggests that USDA lead the review and revision of the 2014 Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity Scale Inventory (also known as the "blue book") by convening a panel of interdisciplinary public and private quantification experts who

understand current scientifically-based methods and models. This would not only allow for the inclusion of practices with new or improved estimates (e.g., biochar applications to agricultural and forest soils) since the edition was published eight years ago, but would create an opportunity to include the most accurate and standardized methods for field-scale measurement and monitoring as well.

e) Create a publicly funded tool to integrate satellite data with robust Quality Assurance/Quality Control (QA/QC)

Satellite data, like that from NASA/USGS's Landsat Program and other publicly funded satellites, are being used to determine winter cover crop presence as well as density and tillage intensity based on residue left on the surface. AFT recommends publicly funding this tool with robust QA/QC (perhaps coupled with Cropland Data Layer ground truthing) to support NRCS's ability to track successful practice implementation on the ground. This will also help modelers to estimate the ecological impacts of implementation, even if the implementation data is aggregated to watershed or county scales to protect privacy concerns. The satellite data would be integrated with field measurements through modelling.

Question 3: How should NRCS target IRA funding to maximize improvements to soil carbon, reductions in nitrogen losses, and the reduction, capture, avoidance, or sequestration of carbon dioxide, methane, or nitrous oxide emissions, associated with agricultural production?

Recommendation 1: Develop additional practice system improvements to mitigate climate change

IRA funding will enable NRCS to maximize carbon sequestration and GHG reductions associated with agricultural production while achieving other conservation co-benefits. AFT recommends that NRCS target funding to the most effective practices and enhancements, and systems of both for these purposes.

a) Add CPS 336 Soil Carbon Amendment to the FY2023 List of Climate-Smart Agriculture and Forestry (CSAF) Practices, and make this list of practices eligible for IRA funding in FY2023 and beyond

AFT strongly supports the addition of the Conservation Practice Standard Soil Carbon Amendment (Code 336) to the FY2023 Climate-Smart Agriculture and Forestry (CSAF) Mitigation Activities List, and recommends that this list of practices be eligible for IRA funding in FY23 and beyond. Sustainably sourced, fit-for-purpose biochar and other soil carbon amendments improve crop yield and soil health while also increasing resilience to drought and extreme rainfall events. Biochar, specifically, increases a soil's capacity to sequester carbon through negative priming, reduces N_2O emissions,[i] and reduces methane in flooded or acidic soils.[ii] Scaling up biochar, compost, and other soil carbon amendment applications in agriculture can also provide a mechanism to transform food and wood wastes into resources for climate benefit. This has the added benefits of diverting these materials (and associated methane emissions) from landfills and reducing wildfire risk. Furthermore, scaling up a

pyrolysis biochar bioenergy industry,[iii] will leverage the significant potential GHG emission reduction benefits, estimated at 95 Tg CO_2e per year for maximum climate mitigation potential in the U.S.,[iv] while also producing sustainable fuels.

c) *Target IRA funding to the most impactful practices, enhancements, and systems of each, including integrating agroforestry and intercropping with grazing and annual cropping systems*

AFT recommends creating new bundles and/or a strategic initiative to promote the integration of practices and enhancements which, when adopted together, can magnify climate benefits. One example of this is incorporating agroforestry practices as part of crop and livestock production systems to maximize carbon sequestration in biomass. This would provide numerous co-benefits, including supporting native pollinators, biodiversity, and landscape-scale system resiliency to pathogen, economic, and weather shocks predicted to increase with climate change. Similarly, the timely development of practices and enhancements that incorporate innovative approaches to build soil carbon, reduce nitrogen losses, and reduce GHG emissions — such as intercropping to improve soil health (E328N) — are critical to continued improvements. Finally, promoting practices that both mitigate GHG emissions and help farmers adapt to climate change will simultaneously build agricultural resilience while maintaining the agricultural GHG sink potential and ensuring continued and consistent productivity.

d) *Target funding to promote spatial, temporal, and soil health system-adapted precision nitrogen management*

Given that direct nitrous oxide (N_2O) emissions make up 56.5% of agriculture's GHG emissions in CO_{2e}, it is unlikely that agricultural systems can become long-term GHG sinks without a precision management approach that enables farmers to economically reduce unneeded and poorly timed nitrogen applications.[v] AFT strongly suggests that NRCS create an outreach campaign that addresses nitrogen management as a climate-smart practice. The campaign should be coordinated with new practice enhancements or bundles for CPS Nutrient Management (Code 590), Comprehensive Nutrient Management Plans, and Nutrient Management Plans. Such an effort should be designed to reduce application rates of nitrogen fertilizer based on a nitrogen accounting approach that includes systems of conservation practices, and which uses precision techniques.

Further, NRCS—in collaboration with ARS and universities—should continue to model and develop decision support tools for cover crop nitrogen contribution estimation that are available nationally. NRCS should develop these to be interoperable with farm management software, and to be site-, temporally, and spatially adapted. This could be done in a precision framework that accounts for the impact on nitrogen mineralization, denitrification, and availability of: NRCS should develop these to be interoperable with farm management software, and to be site-, temporally, and spatially adapted. This could be done in a precision framework that accounts for the impact on nitrogen mineralization, denitrification, and availability of:

a) cover crop biomass and composition;
b) seasonally variable preceding temperature and moisture conditions;
c) soil type and soil health status;

d) other soil and nitrogen management; and
e) crop growth status

Lastly, there is great potential for NRCS to support in-season N monitoring through a combination of pre-side-dress nitrate testing and dynamic simulation modeling by creating a new Conservation Evaluation and Monitoring Activity or adding this to existing activities. Data collected through such activities should be integrated into the interoperable database framework discussed above and made available for the calibration of dynamic simulation models that inform precision N management decision support tools.

<u>Recommendation 2</u>: Target IRA funding to existing watershed-based water quality projects to achieve a triple win: clean up locally impaired waterbodies, achieve local climate resilience, and improve area farmer economic viability

Given that many of the climate-smart practices also promote water quality and maximize improvements to soil carbon and reductions in nitrogen losses, AFT recommends that NRCS also target IRA funding to watershed-based water quality projects. Many of the nation's water quality projects have ambitious practice adoption goals for reduced tillage, cover crops, nutrient management, conservation crop rotation, wetlands restoration, vegetative and tree buffers, and other climate-smart and water quality-protecting practices.

These practices not only reduce nitrogen losses into agricultural ditches, streams, lakes, and bays, they also increase farmer resilience to increasingly intense and frequent rainfall and flooding events. Soil health practices in particular can improve a farmer's bottom line through reductions in fertilizer and chemical inputs and are increasingly associated with improvements in yield stability and even increases in yield.

Specifically, IRA funding could be targeted to:

a) The approximately 600 agriculturally-oriented EPA 319 projects across the country that are working in partnership with NRCS to achieve measurably cleaner water. These projects use Nine Element Watershed Management plans and water quality monitoring to document progress toward removing the waterbody from the Impaired Waters List
b) RCPP projects, Mississippi River Basin Initiative (MRBI) projects, and the many National Water Quality Initiative (NWQI) watersheds that are currently focused on water quality through the adoption of soil health practices.[vi] By targeting the climate-smart practice funds to these watershed-based projects, NRCS will increase the visibility and understanding of the environmental co-benefits associated with climate-smart agricultural practices.

<u>Recommendation 3</u>: Establish expectations, work plans, and supporting systems and protocols for each entity, as appropriate, involved in implementing the Inflation Reduction Act (IRA)

Given that roughly $20 billion in IRA funds are to be distributed among four main federal conservation programs (i.e., EQIP, RCPP, CSP, and ACEP) and $300 million is for NRCS to measure climate outcomes associated with conservation practices, there are a number of

stakeholders both inside and outside the agency that will play a role in helping to ensure the IRA is a success for agriculture and for climate mitigation. To increase the likelihood of that success, AFT recommends that NRCS establish expectations for each of these entities, create work plans, where appropriate, and disseminate supporting systems and monitoring protocols. A handful of such entities and associated opportunities are highlighted below.

a) NRCS Conservation Effects Assessment Program (CEAP) staff

The NRCS CEAP team should include more GHG outcomes quantification in their regional and national modeling analyses, which has been previously focused on estimating erosion, sediment, nitrogen, and phosphorus water- and wind-related losses from farm fields. In its recent 2022 national report, CEAP generated estimates of a few climate-related outcomes such as soil carbon gains and tons of carbon dioxide equivalent (CO_2-eq) associated with reductions in diesel fuel use. IRA funding allocated for data collection and quantification provides CEAP an unprecedented opportunity to add additional methodological approaches to its farmer survey data sampling and modeling analyses, and to generate modeled estimates of all the climate-related outcomes.

And, though most CEAP national and regional analyses are not reflections of NRCS spending but instead reflect farm conservation practice adoption in general (based on extrapolations from farmer surveys), CEAP has begun providing this direct program evaluation service for the regional and watershed-based MRBI and NWQI initiatives via FY2021 progress reports. CEAP has modeled MRBI and NWQI outcomes for nitrogen, phosphorous, and sediment for water quality, and AFT recommends that it do so for climate outcomes of its agency-funded practices as well.

b) NRCS & Colorado State University developers of COMET-Planner

Many conservation professionals within and outside the agency regard COMET-Planner Tool as the quickest and easiest modeling tool to generate rough, yet reasonable, estimates of the carbon dioxide, nitrous oxide, methane, and total greenhouse gas emissions (reported as carbon dioxide equivalent tonnes per year) associated with the number of acres of conservation practices selected from tool drop-down menus. There is now not only an opportunity, but a need to update the COMET-Planner tool to address recognized shortcomings and increase the reliability of the tool's GHG emissions reduction estimates.

For example, reviews of the downloadable, nation-wide COMET-Planner dataset (Version 3.0, Build 1) indicate the nitrous oxide emissions may be unrealistic when the majority of counties' emission reduction coefficients for "reducing synthetic N fertilizer rate by 15% on non-irrigated croplands" are negative. In other words, COMET-planner is currently estimating that fertilizer reduction will *increase* N_2O emissions, which is counter to prevailing biophysical research demonstrating that reducing nitrogen fertilizer rates results in reduced N_2O emissions.[vii, viii] In addition, this IRA funding opens the window of opportunity to account for the much-needed GHG reduction outcomes of precision nitrogen management as described above, which are not currently reflected in COMET-Planner options or in the downloadable dataset.

c) RCPP project managers

Given that RCPP prioritizes projects that commit to quantifying outcomes, NRCS should provide those project managers with the guidance that Congress has required to help them model and monitor the GHG reductions and additional resource concern outcomes from those projects. The above recommendations on minimum dataset collection protocols, the interoperable database, and updating of the 2014 USDA Quantifying Greenhouse Gas Fluxes in Agriculture and Forestry: Methods for Entity Scale Inventory will contribute to this effort. Additionally, the 2003 USDA National Water Quality Handbook: Water-Life's Most Essential Element monitoring protocol manual should be updated in collaboration with EPA and USGS which have more recent manuals. Furthermore, AFT offers its 2020 A Guide to Water Quality, Climate, Social, and Economic Outcomes Estimation Tools: Quantifying Outcomes to Accelerate Farm Conservation Practice Adoption report as an interim resource tool the RCPP managers can use to model outcomes.

d) CIG EQIP project managers

AFT recommends expanding the existing minimum soil health dataset to also include minimum data requirements for GHG and water quality outcomes, and providing similar guidance as presented above for RCPP project managers to CIG EQIP project managers.

e) NRCS conservation district staff implementing the EQIP, CSP, and ACEP contracts

Because the majority of IRA funds will be administered by the thousands of NRCS county staff through EQIP, CSP, and ACEP contracts (i.e., *not* associated with RCPP or CIG), AFT recommends that NRCS ensure integration and automated usability of the COMET-Farm Tool into the NRCS CART and conservation planning activities to generate modeled estimates of the GHGs associated with the adopted practices. In addition, the agency should take the opportunity to include NRCS conservation planning and implementation data to populate the interoperable dataset to enable national level calibration and validation activities.

Recommendation 4: Address conservation practice data sharing concerns between NRCS and RCPP and PCSP project managers

Given the desire to transform conservation practice data into greenhouse gas, water quality, and soil health outcomes, NRCS should improve the manner in which it reports out to its external partners the numbers, types, locations, and timeframes of practices being adopted in RCPP and PCSP projects. Project managers need the information in a timely fashion to then transform it into modeled outcomes.

Conclusion

Thank you for the opportunity to submit comments on the implementation of IRA funding and for your consideration of these recommendations. AFT looks forward to working with NRCS to support IRA implementation and advance the adoption of climate-smart agricultural practices across the nation.

Respectfully submitted,

American Farmland Trust

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