



AGORO CARBON USA CROPLAND PROGRAM

Document Prepared by Agoro Carbon Alliance

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1 PROJECT DETAILS

1.1 Summary Description of the Project

Agoro Carbon USA Cropland Program is a grouped VCS project implemented by Agoro Carbon Alliance. The program's geographic area is delineated by political borders of the USA (excluding Alaska and Hawaii) and includes only cropland. The initial project instances are located in the following USA states: California, Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Oregon, South Dakota, Texas, Washington, California.

The program will implement a package of regenerative agricultural land management activities. The Agoro Carbon USA Cropland Program will promote reduced and zero tillage, cover cropping, improved nitrogen (N) fertiliser management and potentially also other regenerative agricultural practices on cropland in the USA as a means to reduce GHG and decarbonize agriculture. The implementation of these practices will lead to increases in carbon sequestration rates in the soil, reduced soil disturbance and soil erosion, improved crop residue and water management, as well as potentially reducing the total usage of fossil fuels.

The main objective of the program is to provide the financial, agronomic and educational support needed for growers to adopt new farming practices that not only produce agricultural products in a sustainable and profitable way, but also have a positive impact on climate change. During the project period, enrolled farmers will be assisted by the Agoro Carbon agronomic team to implement these project activities to transition from conventional to regenerative farming systems. Agoro Carbon's scientifically-based program is designed to overcome existing barriers that otherwise prevent the adoption of improved land management practices. Through its carbon credit program, Agoro Carbon provides farmers with financial incentives through the issuance of carbon credits.

The baseline practices are the "business as usual" agricultural management practices made by a farmer prior to implementing the practice changes associated with their participation in Agoro Carbon's program. These include, but are not limited to conventional nitrogen fertiliser application and conventional tillage practices, and the absence of cover cropping. For each field within the project area, past management practices (i.e. tillage, planting, harvest, and fertilisation events) over a three-year look-back period are recorded in order to determine the baseline scenario.

The project activity is following approved VCS methodology VM0042, Methodology for Improved Agricultural Land Management Version 1.0.

The project is anticipated to include ca. 170,000 acres of cropland. Using conservative estimates, we estimated 34,840 tons CO₂e per year of carbon removals and reductions to be achieved on average. In addition to the contribution to the Sustainable Development Goal (SDG) 13 Climate Action, the project activity will contribute to the following SDGs: Zero Hunger (SDG 2), Quality

education (SDG 4), Clean Water and Sanitation (SDG 6) and Decent Work and Economic Growth (SDG 8).

1.2 Sectoral Scope and Project Type

VCS Sectoral Scope applicable to the project is Scope 14: Agriculture Forestry and Other Land Use (AFOLU). The Project activity is a grouped project and is using the VCS methodology: "VM0042, Ver 1.0, Methodology for Improved Agricultural Land Management" (ALM).

1.3 Project Eligibility

The grouped project is eligible under the scope of the VCS Program for the following reasons:

The project reduces GHG emissions which are included in the six accepted Kyoto Protocol greenhouse gases and accepted under the applied VCS methodology.

The project activity is following approved VCS methodology VM0042, Methodology for Improved Agricultural Land Management Version 1.0.

The project will implement a package of regenerative agricultural land management activities.

The project activity exclusively involves practices that constitute a change to historically common agricultural practices, which result in the sequestration, reduction and removal of greenhouse gases.

The project activity does not feature on the list of projects that are explicitly excluded project activities under the terms of Verra (VCS Standard, v4.2, Table 1).

The grouped project is eligible because it meets with the rules and requirements of the VCS Program criteria for GHG projects and programs.

1.4 Project Design

The project includes multiple locations or project activity instances, and is developed as a grouped project.

☐ The project includes a single location or installation only

☐ The project includes multiple locations or project activity instances, but is not being developed as a grouped project

☒ The project is a grouped project

1. Eligibility Criteria

The inclusion of new project activity instances into the Program will be eligible for the inclusion in this grouped project provided that they demonstrate applicability of the eligibility criteria below:

Criterion no.	Inclusion Criterion
1	The farmer has entered into a legal relationship with Agoro Carbon Alliance and signed the contract for the enrollment into the Program. A new project instance must introduce or implement one or more new changes to pre-existing agricultural management practices- zero tillage, reduced tillage, nitrogen management or cover cropping.
2	Project activities of the project instance must be implemented on land that is cropland at the project start date and remains cropland throughout the project crediting period.
3	The project area of the project instance must not have been cleared of native ecosystems within the 10-year period prior to the project start date.
4	The project instance shall occur within the geographic area defined in the project description and be defined using a unique geodetic polygon recorded as a KML file and may be aggregated with multiple landowners.
5	The project activity of the project instance is not expected to result in a sustained reduction of greater than 5% in productivity, as demonstrated by peer-reviewed and/or published studies on the activity in the region or a comparable region.
6	The project activity does not occur on wetlands.
7	The baseline of the project instances will be the continuation of pre-project agricultural management practices, which is the most plausible baseline scenario. Project practices have not been already implemented on the acres enrolled in the Program within the past 3 years.
8	Carbon sequestration potential of the project instances, including estimation of the project baseline, project emissions and leakage, will be done in the consistent manner using modelling and/or measurement approaches, as specified in the PDD.
9	Project instances will follow the Monitoring Plan established in the PDD and meet the applicability criteria of VM0042 methodology.

10	Project instances will face the same barriers for implementation as defined during the project additionality assessment in Section 3.5 of the PDD, and will also fulfil the requirements to the common practice analysis defined on the project level.
11	The farmer implementing a project activity is not receiving and will not receive any other third-party or governmental Carbon Credits or payments in exchange for undertaking the regenerative practices on the acres submitted in the program. The farmer also has not sold or transferred the carbon rights in relation to the implementation of the project activity(ies) to any third party and the project instance is not a part of any other carbon project.
12	Project instances will have a start date at the same date or later than the grouped project (i.e. the Program) start date

Table 1: List of eligibility criteria for the inclusion of new project activity instances into the Program.

1.5 Project Proponent

Organisation name	Agoro Carbon Alliance
Contact person	Giulia Sartori
Title	Head of Carbon Project Development
Address	100 North Tampa Street Suite 3200, Tampa, United States 33602
Telephone	+1 888 682 2726
Email	carbonprojects@agorocarbon.com

1.6 Other Entities Involved in the Project

There are no other entities; the project is implemented by Agoro Carbon Alliance.

1.7 Ownership

Agoro Carbon Alliance (hereafter “the Project Proponent”) has the ownership and legal right of the project activities. The project ownership consists of a “Carbon Credit Generation Agreement” whereby each farmer transfers title to the credits and the environmental attributes to Agoro Carbon. The Project Proponent has the ownership and legal right of developing and presenting the projects leading to the GHG emission reduction and removal, and each farmer has the legal

right to control and operate the project activities occurring at farm level either via ownership, lease or other title to the land. This is demonstrated via an attestation of property rights attached to the Carbon Credit Generation Agreement, certification that is signed individually by each farmer.

Project ownership is proved by an enforceable and irrevocable agreement with the holder of the statutory, property or contractual right in the land, vegetation or conservation or management process that generates GHG emission reductions or removals which vests project ownership in the project proponent.

1.8 Project Start Date

Project start date is 01/08/2021, this date is selected as it reflects the initial implementation of activities under the first instance of the grouped project that led to the generation of GHG emission removals.

1.9 Project Crediting Period

The project activity instances included in the Agoro Carbon USA Cropland Program fall in the AFOLU project category 'ALM' (Agricultural Land Management). The project focuses on GHG emission removals through the sequestration of SOC, as well as emission reductions through the reduction of N₂O, CH₄ and/or fossil-derived CO₂ emissions. For this reason, the project crediting period is 20 years, starting from 01/08/2021 up to 31/07/2041. This crediting period may be renewed four times with a total project crediting period not to exceed 100 years.

1.10 Project Scale and Estimated GHG Emission Reductions or Removals

The estimated annual GHG emission reductions/removals of the project within the first instance are:

- ☐ <20,000 tCO₂e/year
- ☒ 20,000 – 100,000 tCO₂e/year
- ☐ 100,001 – 1,000,000 tCO₂e/year
- ☐ >1,000,000 tCO₂e/year

Quantification of the potential GHG impact of regenerative agriculture is challenging due to heterogeneity in management practices and variation in the physical environment. The project is anticipated to include ca. 170,000 acres of cropland. Using conservative estimates, we estimated 34,840 tons CO₂e per year of carbon removals and reductions to be achieved on average. This estimation was calculated based on average carbon sequestration potential for each farmer using recognized and well-known publicly available modelling tool COMET Planner (Available at:

<http://comet-planner-cdfahsp.com/>) as well as calculations of emission reductions generated from nitrogen management and/or from fuel consumption reduction at the farm level.

Project Scale	
Project	
Large project	X
Year	Estimated GHG emission reductions or removals (tCO ₂ e)
2021	34,840
2022	34,840
2023	34,840
2024	34,840
2025	34,840
2026	34,840
2027	34,840
2028	34,840
2029	34,840
2030	34,840
2031	34,840
2032	34,840
2033	34,840
2034	34,840
2035	34,840
2036	34,840
2037	34,840
2038	34,840
2039	34,840
2040	34,840

2041	34,840
Total estimated ERs	696,796
Total number of crediting years	20
Average annual ERs	34,840

1.11 Description of the Project Activity

Agriculture, as an industry, accounts for an estimated 10% of the total U.S. greenhouse gas (GHG) emissions, including carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) emissions (USDA-ERS). Climate change has the potential to adversely impact U.S. agricultural productivity at local and regional scales through alterations in rainfall patterns, more frequent occurrences of climate extremes (including high temperatures or drought), altered patterns of pest pressure, and changes in seasonal and diurnal temperature patterns. These impacts will affect national and international markets; the prices of food, fibre, and energy; agricultural incomes; and the environment.

While agriculture emits GHG, it also provides opportunities to reduce existing GHGs in the atmosphere. The Agoro Carbon USA Cropland Program will promote improved agricultural land management (IALM) practices, including reduced and zero tillage, cover cropping and improved nitrogen (N) fertiliser management on cropland in the USA as a means to reduce GHG and decarbonize agriculture. The implementation of these practices will lead to reduced soil disturbance and soil erosion, improved crop residue and water management, as well as potentially reducing the total usage of fossil fuels. These practices could, in turn, increase overall fertiliser and water use efficiency and potentially improve profitability at the farm level, whilst building resilience into farming systems. The project is a wide-ranging collaborative initiative between Agoro Carbon and farmers designed to channel carbon offset revenue to farmers and supporting those farmers with agronomic knowledge on regenerative practices.

The main objective of the program is to provide the financial, agronomic and educational support needed for growers to adopt new farming practices that not only produce agricultural products in a sustainable and profitable way, but also have a positive impact on climate change. During the project period, enrolled farmers will be assisted by the Agoro Carbon agronomic team to implement these project activities to transition from conventional to a regenerative farming system. Agoro Carbon's scientifically based program is designed to overcome existing barriers that prevent adoption of improved land management practices. The Agoro's Carbon program farmers have an opportunity to generate carbon credits as a financial means to support their practice changes. The program is designed to expand over time and cover a range of farmers

and farming activities in the USA to help drive the critical transition to a future dominated by resilient and sustainable agricultural systems.

Farmers who participate in the program are required to adopt one or more changes to current agricultural management practices. A change constitutes adoption of a new practice (e.g., adoption of one of the pre-defined agricultural land management practices listed below in this section of this document), cessation of a pre-existing practice (e.g., conventional tillage) or adjustment to a pre-existing practice that could lead to GHG emissions reductions and/or an increase of carbon sequestration.

The program is designed as a grouped project so that following the validation and registration, new farmers, provided that their activities meet the eligibility criteria defined in section 1.4 of this document, can continue to subscribe to the program. The initial project activity instances are located in the United States involving around 79 farms on an area of roughly 170,000 acres.

The project activity includes the implementation of the following types of regenerative agricultural practice(s) by the farmers:

Type 1. Implementing Reduced Tillage/Improving Current Tillage Practices

The vast majority of farmers in the United States practice some form of conventional tillage that results in a significant amount of soil disturbance, and thereby an increased CO₂ influx to the atmosphere. Reducing tillage mitigates these negative effects of tillage while improving the long-term soil health for the farmer. This improved agricultural practice includes one of the key concepts as outlined by USDA-NRCS¹ for improving soil health and carbon sequestration, and it involves the reduction of soil disturbance (usually shallow and without full soil inversion) from



farmers' existing tillage practice (e.g. conventional tillage to reduced tillage). This includes reduction in the number of tillage passes, reduced tillage depth, strip-till, and no-till to reduce overall soil disturbance.

Farmers participating in the program to change their current tillage practices to reduced/improved tillage to sequester soil organic carbon which will in turn improve soil

health. The combination of returning crop residues to the soil and reduced soil disturbance, in the long term, improves the carbon content of the soil and thereby improves soil fertility, soil structure, and water-holding capacity.

¹https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/soils/health/?cid%3Dnrcs142p2_053874

Type 2. Implementing Zero-Till/No-Till

No-till or zero till is defined as the absence of tillage operations from harvest of the previous crop to harvest of the current crop. Minimal soil disturbance only happens at time of planting without overturning the soil. As a result, we recommend to farmers who participate in the Project to implement no-tillage to avoid 1) a separate band application of fertiliser, 2) mechanical cover crop termination (with the exception of crimping), 3) tillage to suppress weeds or incorporate residue. Tillage can be implemented for remediating rutted wheel track areas created by irrigation systems.



Type 3. Implementation of cover cropping

Planting cover crops effectively sequesters soil organic carbon in addition to improving soil health and water quality. Cover crops are usually planted to protect the soil, retain soil moisture, recycle residual nutrients and sequester carbon rather than for the purpose of being harvested; although



they could also potentially be harvested via livestock grazing, which would further enhance carbon sequestration. Cover crops can include grasses, brassicas, legumes and other broadleaf species, and can be annual or perennial plants. Popular cover crops include cereal rye, clover, vetch and oilseed radish. They can be mono or poly culture (mixture of many species).

By joining Agoro Carbon USA Cropland Program, farmers are required to plant cover crops to increase soil organic carbon stocks and the reduction of net N₂O emissions if, depending on the cover crop species, a grower is able to reduce the amount of synthetic-N fertiliser applied. Leguminous cover crops are able to fix atmospheric-N and, along with brassica cover crops, provide an optimal ratio of carbon to nitrogen so that their decomposed residues

add to the plant-available nitrogen pool.

Type 4. Implementation of Nitrogen fertiliser rate reduction

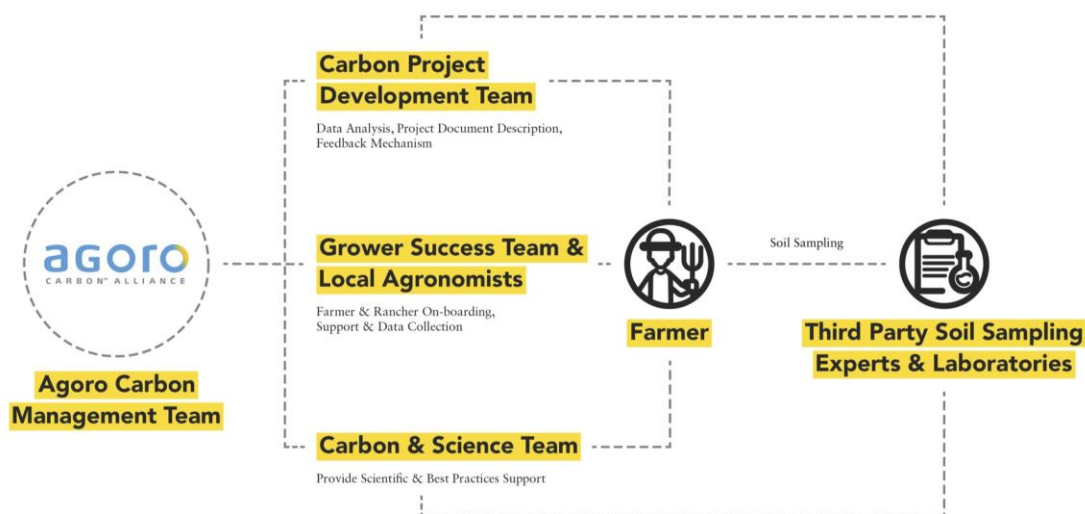
Reducing nitrogen application rates lowers N₂O emissions to the atmosphere and contributes to an overall reduction of GHG emissions. Agriculture plays a major role in N₂O emissions, because of nitrogen fertiliser application. The application of N fertilisers increases available nitrogen, which enhances both nitrification and denitrification rates increasing the production of N₂O. The reduction of synthetic and/or organic nitrogen fertiliser application therefore results in a substantial net reduction of N₂O emissions. To qualify for a nitrogen rate reduction in the program, a grower needs to demonstrate a reduction in their nitrogen rate from baseline.



In addition to the practices described above, additional practices eligible under VM0042, such as grazing cover crop and residues, and promoting crop rotations, could be implemented in the scope of project activity.

Farmers participating in the Agoro Carbon USA Cropland Program will submit information and records detailing their baseline practices and inputs (e.g. N fertiliser application rate) through the Agoro Carbon data management platform. These data will be standardised to quantify the carbon removed from the atmosphere. Quantification of GHG emissions reduced and/or removed from the atmosphere will be done by applying VCS approved monitoring and quantification methodologies.

2. Project organisational setup



There is no REDD+ component to the project and the project is not located within a jurisdiction covered by any jurisdictional REDD+ program.

1.12 Project Location

The program's geographic area is delineated by political borders of the USA (excluding Alaska and Hawaii) and includes only cropland.

The initial instances are located in the following USA states: California, Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Minnesota, Missouri, Nebraska, Oregon, South Dakota, Texas, Washington, California.

The KML/shapefiles files of each of the project instances will be provided at the individual project documentation during validation.

1.13 Conditions Prior to Project Initiation

The baselines practices are the “business as usual”, agricultural management practices made by the farmer prior to implementation of improved agricultural land management practices. These include, but are not limited to, conventional nitrogen fertiliser and tillage management practices and the absence of cover cropping. For each field within the project area, past management practices (i.e. tillage, planting, harvest, and fertilisation events) over a three-year look-back period are recorded in order to determine the baseline scenario. Baseline emissions/stock changes are then modelled or (for SOC stock change only) directly measured in baseline control sites subject to the annual schedule of activities. The crops and practices assumed in the baseline scenario are re-evaluated as required by the VCS Standard and revised, if necessary, to reflect current agricultural production in the region.

Topography

The geographic map of the project area is presented below:



Figure 1: Topographic map of the Contiguous United States. Source: Nations Online Project.²

Climate

Due to its large size and wide range of geographic features, the United States contains examples of nearly every global climate. The climate is subtropical in the southern United States, semiarid in the Great Plains west of the 100th meridian, Mediterranean in coastal California and arid in the Great Basin, parts of the Northwest, and the Southwest.

The Great Basin and Columbia Plateau (the Intermontane Plateaus) are arid regions that lie in the rain shadow of the Cascades and Sierra Nevada. Precipitation averages less than 15 inches (38 cm). The Southwest is a hot desert, with temperatures exceeding 100 °F (37.8 °C) for several weeks at a time in summer. The Southwest and the Great Basin are also affected by the monsoon from the Gulf of California from July to September, which brings localised but often severe thunderstorms to the region.

Much of California, particularly the agriculture-rich Central Valley, consists of a Mediterranean climate, with occasional excessive rainfall from October to April and nearly no rain the rest of the year. In the Pacific Northwest rain falls year-round, but is much heavier during winter and spring. The mountains of the west receive abundant precipitation and very heavy snowfall. The Cascades are one of the snowiest places in the world, with some places averaging over 600 inches (1,524 cm) of snow annually, but the lower elevations closer to the coast receive very little snow³.

Florida has a subtropical climate in the northern part of the state and a tropical climate in the southern part of the state. Summers are wet and winters are dry in Florida. Annually, much of

² https://www.nationsonline.org/oneworld/map/usa_map.htm

³ https://en.wikipedia.org/wiki/Geography_of_the_United_States

Florida, as well as the Deep South, are frost-free. The mild winters of Florida allow a massive tropical fruit industry to thrive in the central part of the state, making the US second to only Brazil in citrus production in the world⁴.

The Map in Figure 2 below presents the precipitation distribution in the continental USA. As it can be seen here, the highest precipitation is observed in the western part of the state of Washington, and the lowest in the Mojave Desert of Arizona and California.



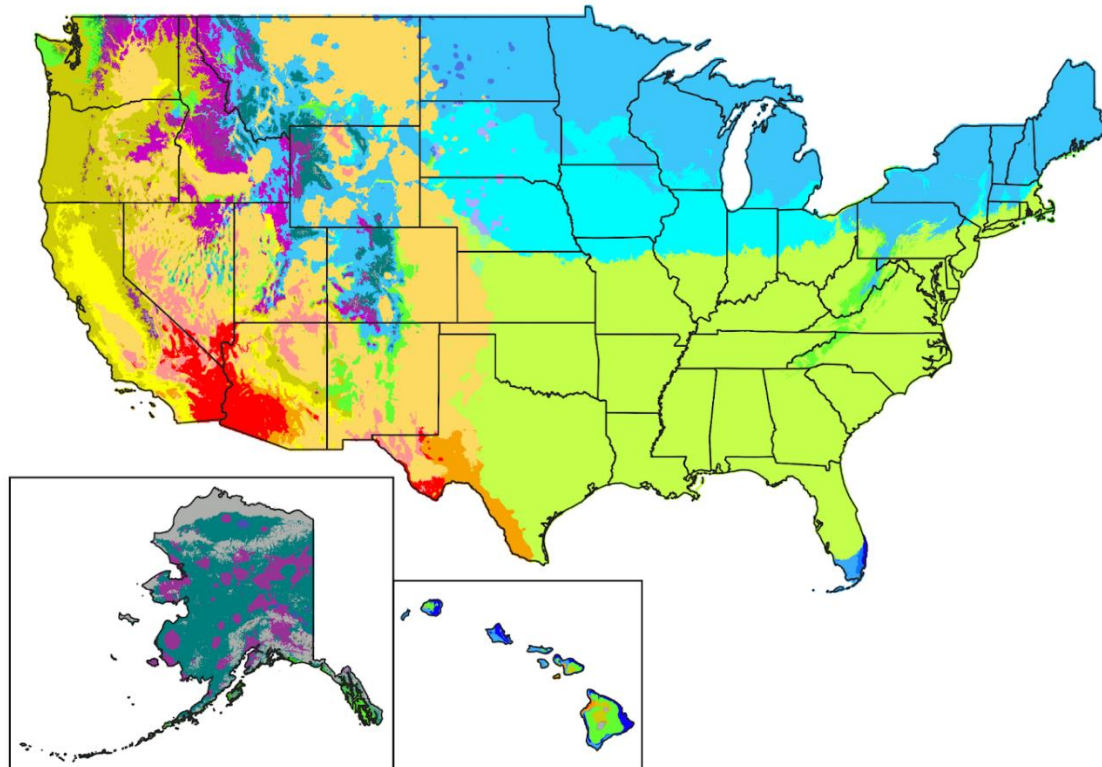
Figure 2: Average precipitation in the lower 48 states of the USA.⁵

According to the Köppen climate classification, which is one of the most widely used climate classification systems, the USA could be divided in a number of classes, as presented on Figure 3 below.

⁴ https://en.wikipedia.org/wiki/Geography_of_the_United_States

⁵ https://en.wikipedia.org/wiki/Climate_of_the_United_States#/media/File:Average_precipitation_in_the_lower_48_states_of_the_USA.png

Köppen Climate Types of the United States



Köppen Climate Type

Af (Rainforest)	Csc (Cold-summer mediterranean)	Dwa (Hot-summer humid continental)
Am (Monsoon)	Cwa (Humid subtropical)	Dwb (Warm-summer humid continental)
Aw (Savanna)	Cwb (Subtropical highland)	Dwc (Dry-winter subarctic)
BWh (Hot desert)	Cfa (Humid subtropical)	Dfa (Hot-summer humid continental)
BWk (Cold desert)	Cfb (Oceanic)	Dfb (Warm-summer humid continental)
BSh (Hot semi-arid)	Cfc (Subpolar oceanic)	Dfc (Subarctic)
BSk (Cold semi-arid)	Dsa (Hot-summer mediterranean continental)	ET (Tundra)
Csa (Hot-summer mediterranean)	Dsb (Warm-summer mediterranean continental)	EF (Ice-cap)
Csb (Warm-summer mediterranean)	Dsc (Dry-summer subarctic)	

Data sources: Climate normals from PRISM Climate Group, Oregon State University, <https://prism.oregonstate.edu/>;
Outline map from US Census Bureau

Data periods: 1991-2020 (Contiguous United States); 1981-2010 (Alaska); 1971-2000 (Hawaii)

Figure 3: Köppen Climate Types Classification of USA.⁶

The southeastern USA is characterised by a hot-humid climate, with hot dry moving towards the western part of the US whereas, the west coast is marine. The Northern and central parts are classified as rather cold or mixed -humid areas.

⁶https://en.wikipedia.org/wiki/Climate_of_the_United_States#/media/File:K%C3%B6ppen_Climate_Types_US_50.png

Hydrology

The United States has an extensive inland waterway system, much of which has been improved for navigation and flood control and developed to produce hydroelectricity and irrigation water. Some of the world's largest dams, artificial lakes, and hydroelectric power plants are on U.S. rivers. The Mississippi-Missouri river system (3,890 mi/6,300 km long), is the longest in the United States and the second longest in the world. With its hundreds of tributaries, chief among which are the Red River, the Ohio, and the Arkansas, the Mississippi basin drains more than half of the nation. The Yukon, Columbia, Colorado, and Rio Grande also have huge drainage basins. Other notable river systems include the Connecticut, Hudson, Delaware, Susquehanna, Potomac, James, Alabama, Trinity, San Joaquin, and Sacramento⁷.

The major river system in the United States is that formed by the Mississippi and its two major tributaries, the Ohio and Missouri rivers. This giant network drains about 41 percent of the 48-state area, including all or part of 31 states (and two Canadian provinces). The combined Missouri--Mississippi River is about 3,700 miles (5,970 kilometres) long, a distance surpassed only by the Nile and Amazon rivers. Barges can navigate the rivers upstream to Minneapolis--St. Paul, Minnesota; Pittsburgh, Pennsylvania; and Sioux City, Iowa. New Orleans, Louisiana, located near the mouth of the Mississippi, was one of the nation's leading seaports before Hurricane Katrina's devastating blow in 2005⁸.

Dependence on a river is illustrated by current problems along the Missouri. Severe drought during the first decade of the twenty-first century has caused the river's flow to reach a critically low level. Recreational use, hydroelectric energy production, barge traffic, and even the domestic water supply of some riverside communities has been severely affected as a result.

Many eastern rivers are of local importance. The Hudson River has played a very significant role in the growth of New York City. In the Southeast, the Tennessee, Cumberland, and other rivers were transformed by one of the world's most massive reclamation projects. Beginning in 1933, during the Great Depression, the Tennessee Valley Authority (TVA) built nearly 50 dams on this drainage system⁹. Their construction spurred the regional economy by creating jobs for tens of thousands of people in one of the nation's poorest regions. The dams also gave the area a clean and inexpensive source of energy(hydroelectric), controlled flooding that had long plagued the region, and created reservoirs that provide many recreational opportunities.

In the Southwest, the Rio Grande and Colorado Rivers flow southward across desert landscapes. Both streams are of far greater importance than their relatively small volume of water might suggest. In fact, millions of people, huge cities, and billions of dollars in agricultural production depend on their flow. The Rio Grande flows from the Colorado Rockies, through central New Mexico, and into Texas, where it forms the border between the United States and Mexico.

⁷ <https://www.infoplease.com/encyclopedia/places/north-america/us/united-states/physical-geography>

⁸ <https://geography.name/physical-geography-2/>

⁹ <https://geography.name/physical-geography-2/>

The Colorado River is controlled by eight dams and reservoirs, including Glen Canyon Dam and Lake Powell on the Utah--Arizona border and Hoover Dam and Lake Mead just east of Las Vegas, Nevada. Huge water diversion projects have artificially supported the Southwest's booming population and economic growth. Phoenix and Tucson, Arizona, draw water from the Colorado River, as do California's Los Angeles basin, San Diego, and the agriculturally productive Imperial Valley. Las Vegas, the nation's fastest--growing city, also depends on Colorado for its water supply. Coastal southern California also obtains water from streams that flow from the Sierra Nevada¹⁰.

The Great Salt Lake and Alaska's Iliamna are the largest U.S. lakes outside the Great Lakes and Lake of the Woods, which are shared with Canada (Lake Michigan and Iliamna are the largest freshwater lakes entirely within the United States). The Illinois Waterway connects the Great Lakes with the Mississippi River, and the New York State Canal System links them with the Hudson¹¹.



Figure 4: Major river basins in the USA¹²

¹⁰ <https://geography.name/physical-geography-2/>

¹¹ <https://www.infoplease.com/encyclopedia/places/north-america/us/united-states/physical-geography#:~:text=The%20conterminous%20United%20States%20may,and%20the%20Pacific%20Mountain%20System.>

¹² <https://www.dailymail.co.uk/sciencetech/article-3860062/The-veins-America-Stunning-map-shows-river-basin-US.html>

In many parts of the country, competing demands for water create stress in local and regional watersheds. The map below shows a “water supply stress index” for the U.S. based on observations, with widespread stress in much of the Southwest, western Great Plains, and parts of the Northwest. Watersheds are considered stressed when water demand (from power plants, agriculture, and municipalities) exceeds 40% (water supply stress index of 0.4) of available supply¹³.

Water Stress in the U.S.

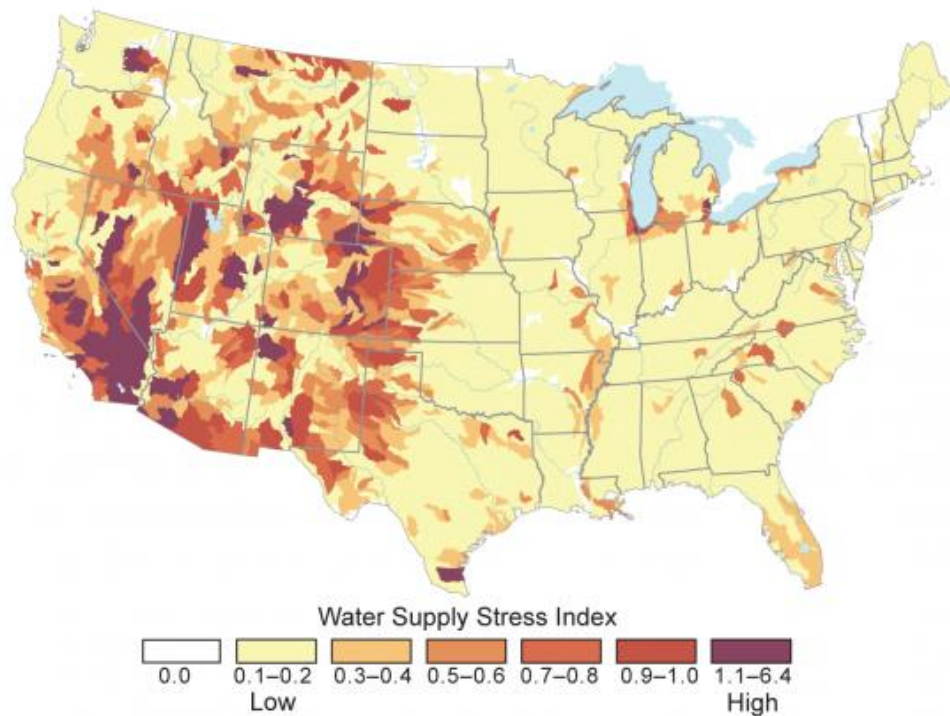


Figure 5: Map of water stress in the USA¹⁴.

Soil types

Soils are the product of climate, organisms and topography, acting on parent (geologic) material over time. Thus the great diversity of geologic materials, geomorphic processes, climatic

¹³ <https://www.globalchange.gov/browse/multimedia/water-stress-us>

¹⁴ <https://www.globalchange.gov/browse/multimedia/water-stress-us>

conditions, biotic assemblages and land surface ages in the United States is responsible for the presence of an enormous variety of mineral and organic soils.

The US soil taxonomic hierarchy includes orders, suborders, great groups, subgroups, families and series, with each series representing a unique kind of soil. In the United States, over 19,000 soil series have been identified. The percentages of land area (in the US and associated territories, etc.) occupied by soils of the twelve orders have been estimated as:

<i>Type</i>	<i>Percent</i>
<u>Alfisols</u>	14
<u>Andisols</u>	1.7
<u>Aridisols</u>	8.3
<u>Entisols</u>	12.3
<u>Gelisols</u>	8.7
<u>Inceptisols</u>	9.7
<u>Mollisols</u>	21.5
<u>Oxisols</u>	0.02
<u>Spodosols</u>	3.5
<u>Ultisols</u>	9.2
<u>Vertisols</u>	2.0

Table 2: Soil types distribution in the USA. Source: Wikipedia¹⁵

The most common soils in the USA are Mollisols and Alfisols, occupying together more than a third of the total area. The geographical distribution of the soils is presented below:

¹⁵ https://en.wikipedia.org/wiki/Soil_in_the_United_States

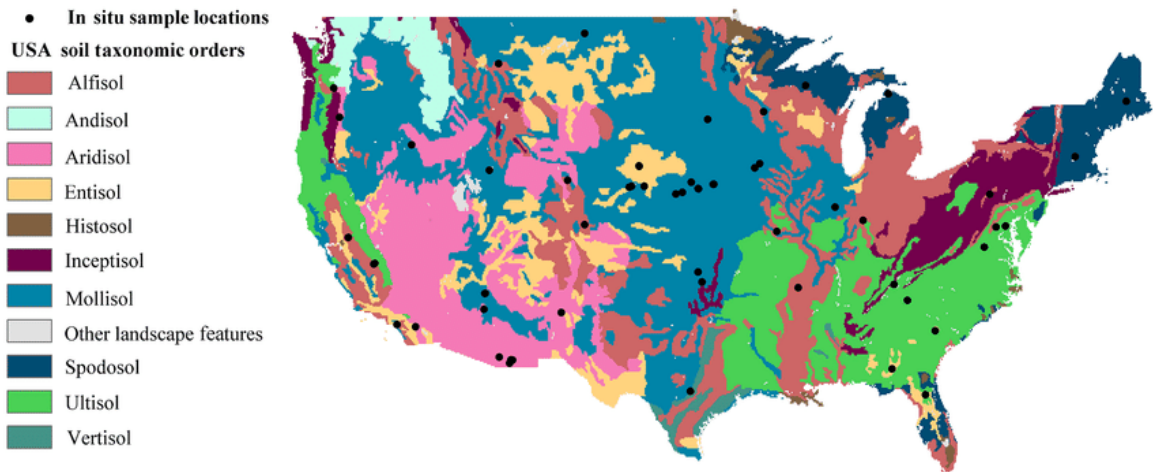


Figure 6: Map of soil taxonomic classification over the continental USA using the 12 US soil taxonomic orders (data source: United Nations, 2007), and M. Kuzila, personal communication, 2014)¹⁶.

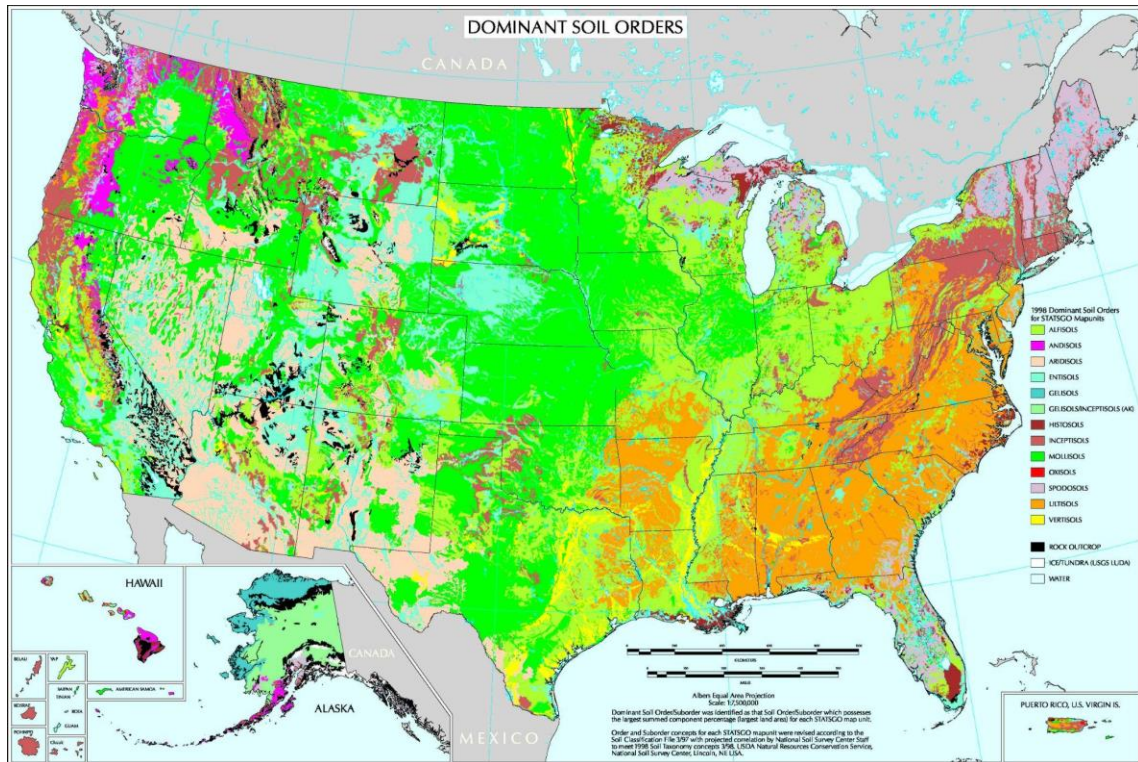


Figure 7: Map of soil taxonomic classification over the continental USA using the US soil taxonomic orders. Source: Natural Resource Conservation Service.¹⁷

¹⁶https://www.researchgate.net/figure/Map-of-soil-taxonomic-classification-over-the-continental-USA-using-the-12-US-soil_fig1_308885731

¹⁷ <https://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/survey/class/maps>

Alfisols and Inceptisols occur widely in the US, but the circumstances of their occurrence would be difficult to characterise briefly. The Alfisols have a subsurface ("B") horizon characterised by phyllosilicate clay accumulation (suggesting illuviation of such clay from above). The Inceptisols have a weakly developed B horizon as a consequence of weathering and/or other processes.

Andisols are found in areas where soils have formed from certain types of volcanic ejecta (usually pumice and/or volcanic ash).

Aridisols occur in parts of the western United States that are too dry for the growth of mesophytic plants.

Entisols, which exhibit little soil profile development, are characteristic of areas where soil parent materials have quite recently been deposited, e.g. on recent river alluvium.

Histosols are organic soils lacking permafrost within 100 cm of the surface; they are characteristically formed on wet sites, e.g. bogs, some fens and some muskeg areas. Some Histosols have been drained, especially to permit cultivation¹⁸.

In the US, Mollisols occur mostly on the Great Plains, and in some areas of the west. There is a considerable variety of Mollisols, including soils very closely resembling the Chernozem ("black earth") of eastern Europe (parts of Russia, the Ukraine and neighbouring regions), and the Chernozemic soils of the Canadian prairies.

Oxisols occur only in tropical environments, which have a very limited extent in the US.

Spodosols often occur under coniferous forest in cool, moist climates, such as southeastern Alaska, the Great Lakes region, the northeastern states, and higher elevations of the northwestern states. Spodosols are also found in warm, moist environments such as Florida and in fact are the most prominent soil order of the state. Spodosols have a B horizon containing a relatively high concentration of illuviated aluminium with accompanying illuviated organic matter, and in many cases, illuviated iron. Such horizons form under certain acidic leaching conditions influenced by acid decomposition products of litter accumulations under certain tree and/or shrub species. The Spodosols correspond to the Podzols of Russia, Central Europe and Northern Europe and to the Podzolic soils found in much of Canada's boreal forest.)

Ultisols are rather extensive in warm, humid regions of the US. They tend to represent rather advanced soil development, and thus are found on relatively old land surfaces.

Vertisols are not extensive in the US, being confined to areas where there is a great abundance of swelling clays, e.g. montmorillonite, that cause churning of soils as a consequence of wetting and drying cycles¹⁹.

¹⁸ https://www.wikiwand.com/en/Soil_in_the_United_States

¹⁹ https://www.wikiwand.com/en/Soil_in_the_United_States

Ecosystems

In the United States a list of ecoregions has been developed by the U.S. Environmental Protection Agency (EPA) and the Commission for Environmental Cooperation (CEC). The Commission's 1997 report, *Ecological Regions of North America*, provides a framework that may be used by government agencies, non-governmental organisations, and academic researchers as a basis for risk analysis, resource management, and environmental study of the continent's ecosystems. In the United States, the EPA and the United States Geological Survey (USGS) are the principal federal agencies working with the CEC to define and map ecoregions. Ecoregions may be identified by similarities in geology, physiography, vegetation, climate, soils, land use, wildlife distributions, and hydrology.

The classification system for ecoregions has four levels, but only Levels I and III are shown on this list. Level I divides North America into 15 broad ecoregions; of these, 12 lie partly or wholly within the United States

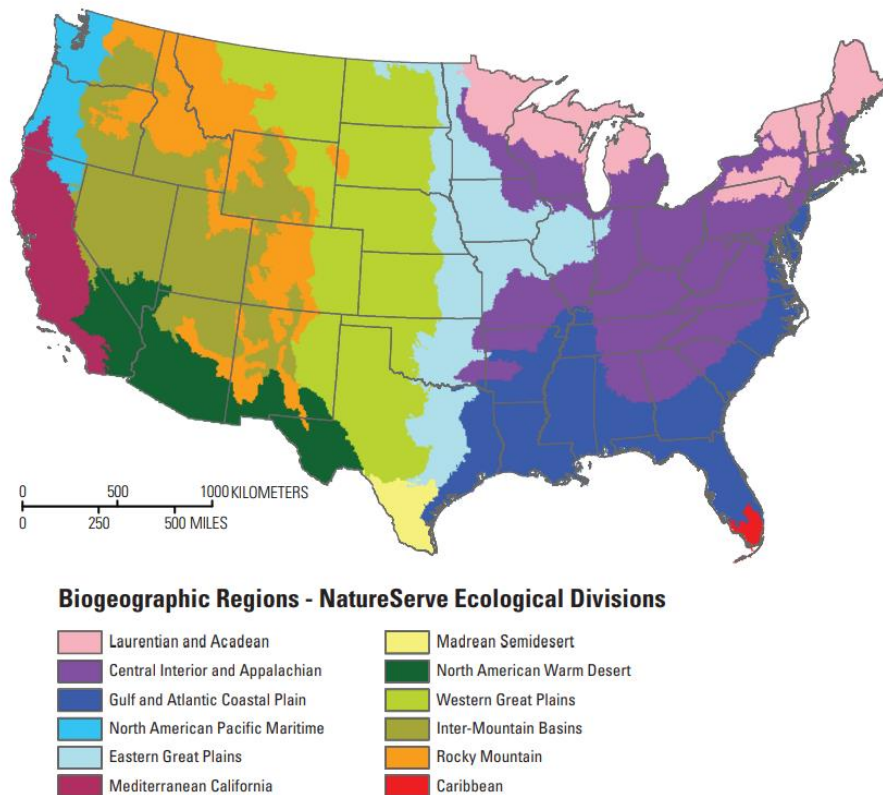


Figure 8. Map of the conterminous United States showing NatureServe's ecological divisions (Comer and others, 2003), modified from Bailey (1998b) and identifying broad areas of phytogeographic similarity (general homogeneity of vegetation assemblages). Source: USGS²⁰.

²⁰ <https://pubs.usgs.gov/pp/1768/pp1768.pdf>

The distribution of the ecosystems in the continental USA is presented on Figure 9 below.

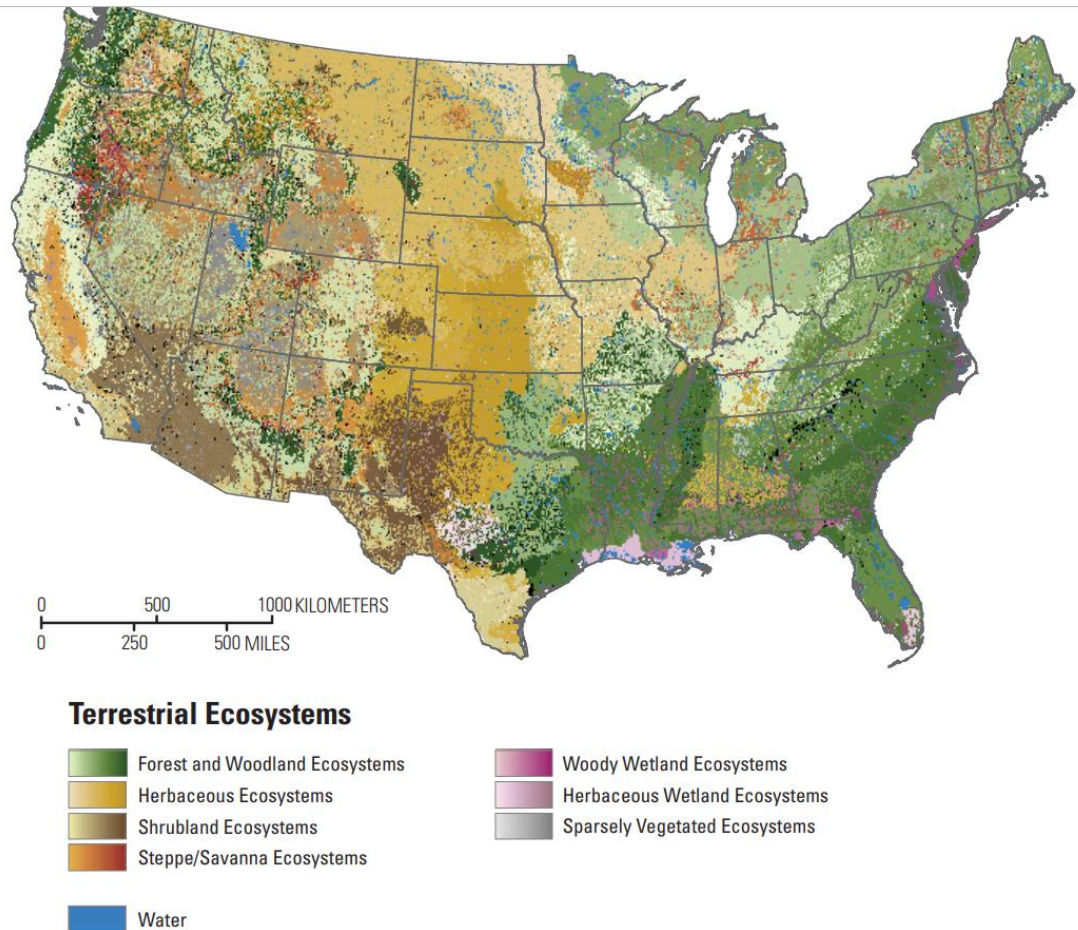


Figure 9. Map of the conterminous United States.²¹

The map in Figure 9 shows terrestrial ecosystems that were deductively modelled through biophysical stratification of the area into ecosystem footprints (physically distinct areas) and subsequent attribution of these footprints with a NatureServe ecosystem type. For this map, 419 NatureServe ecosystems were mapped, each with multiple spatial occurrences; in the figure explanation, the ecosystems are shown grouped by general biome categories²².

Agricultural Land use

²¹ <https://pubs.usgs.gov/pp/1768/pp1768.pdf>

²² <https://pubs.usgs.gov/pp/1768/pp1768.pdf>

Although agricultural activity occurs in every state in the USA, most of the cultivated cropland (excluding California) is concentrated in three major regions of the U.S: 1) the Corn Belt (Iowa, Illinois, Indiana, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, and South Dakota), 2) the Wheat Belt (Colorado, Kansas, Oklahoma, Oregon, Montana, Nebraska, Texas, Idaho, and Washington) 3) the Cotton Belt (Alabama, Arkansas, Georgia, Louisiana, Mississippi, Oklahoma, North and South Carolina, Tennessee, Texas) where cotton and rice are the major crops grown along with few other miscellaneous crops. The distribution of the cultivated land in the USA is shown on Figure 10 below.

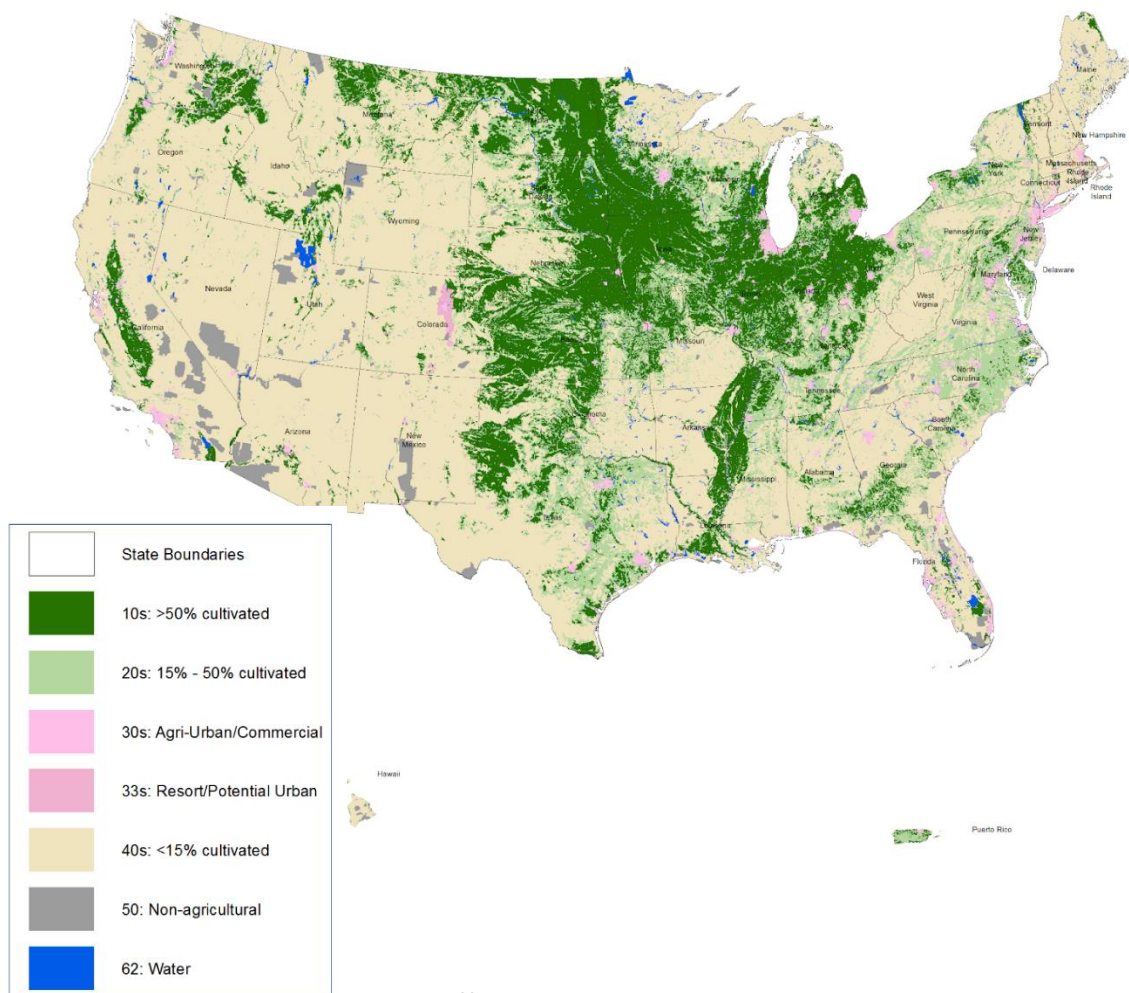


Figure 10. Land use strata in the USA.²³

The corn belt, which is located in the midwest region of the U.S., is characterised by having a combination of the most productive soils (i.e.fertile mollisols) and favourable climatic conditions in the U.S for growing corn and soybean. The most recent USDA survey data indicates around 91 million acres are devoted to corn production and 83 million acres to soybean each year in this region, with these two crops typically grown in a 2-year rotation of alternating corn and soybean

²³ https://www.nass.usda.gov/Research_and_Science/stratafront2b.php

planting. These two crops are grown primarily under rain-fed conditions in the eastern corn belt and irrigated conditions in the west (i.e. Kansas and Nebraska).

The soils in the western Wheat belt states are, in general, less productive than those in the corn belt and climate conditions are more arid and water-limited; both of which limit crop yields. There are around 44 million acres devoted annually to either spring or winter wheat production, with spring wheat production primarily located in the northern states (i.e. Montana and North Dakota).

The soils of the southern Cotton belt are in general highly weathered due to excessive precipitation and, hence, are less productive than the Corn belt soils. Most of the crops produced in this region are grown under rainfed conditions. Cotton is planted on around 12 million acres and rice is grown on 3 million acres annually.

The distribution of primary crops across the US is presented on Figure 11 below.

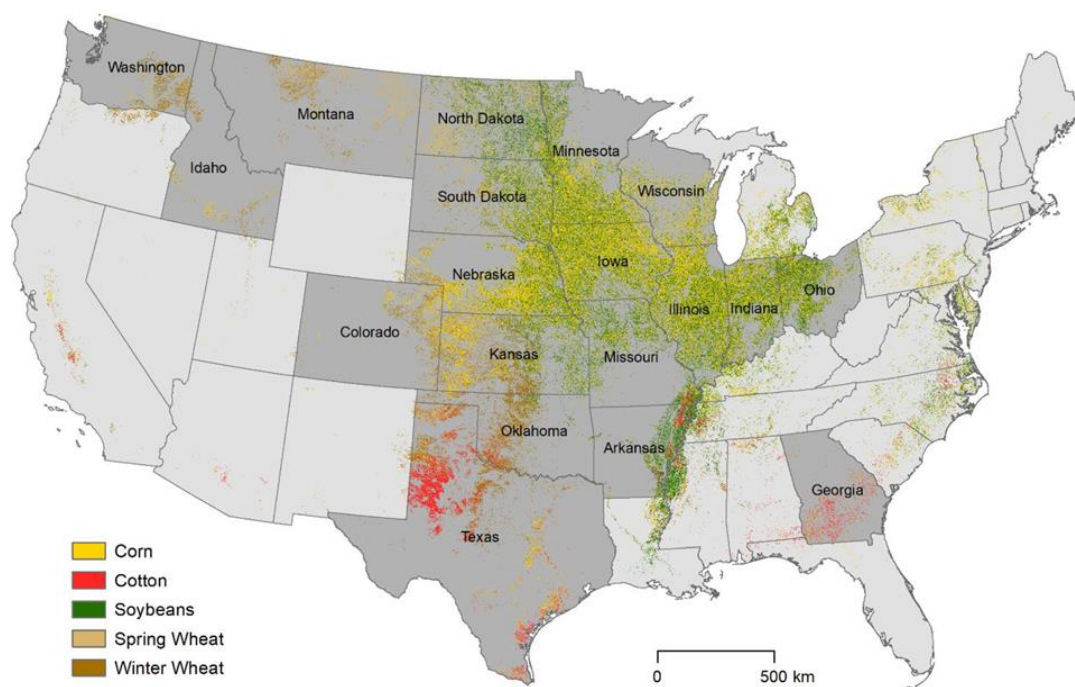


Figure 11: Map of the distribution of primary crops across the US.²⁴

Soil Organic Carbon

SOC originally comes from atmospheric CO₂ that is captured by plants through the process of photosynthesis. The amount of SOC is a balance of C inputs and C losses of organic material. SOC is a complex of organic C compounds in the form of Soil Organic Matter (SOM). SOM includes everything in or on the soil that is of biological origin, irrespective of origin or state of

²⁴ Johnson, D.M.; Rosales, A.; Mueller, R.; Reynolds, C.; Frantz, R.; Anyamba, A.; Pak, E.; Tucker, C. USA Crop Yield Estimation with MODIS NDVI: Are Remotely Sensed Models Better than Simple Trend Analyses? Remote Sens. 2021, 13, 4227. <https://doi.org/10.3390/rs13214227>

decomposition. It includes plant and animal remains in various states of decomposition, cells and tissues of soil organisms, and substances from plant roots and soil microbes. The ultimate product of the decomposition process is humus, an amorphous array of compounds highly resistant to further decomposition. Many organic compounds in the soil are intimately associated with inorganic soil particles. In agricultural soils, soil organic C content is usually less than 5% and decreases with soil depth²⁵.

SOC is controlled by many factors that have complex interactions. These factors include soil properties, climate conditions (temperature and precipitation), land use and management practices. In natural ecosystems, rainfall and temperature are primary factors determining plant biomass input and subsequent decomposition of SOC for a given soil type. When sufficient water is provided, higher temperatures lead to faster decomposition of soil organic matter, less storage of C in the slow and passive pools, and greater loss of C through respiration. In warm climates, soil generally contains less organic soil C than in cold climates. Any management practices that impact the microbial activity and decomposition rate and those that enhance productivity and return of plant residues to the soil affect the amounts of organic C stored in the soils. Management practices such as tillage accelerate the decomposition rate of SOC by making the organic matter more available to soil microorganisms to decompose. Minimum or no tillage with residue retention has shown higher potential to maintain and or reintroduce C into soils, compared to tillage.

Estimation of SOC stock in the USA was made with the Rapid Carbon Assessment (RaCA), which was initiated by the USDA-NRCS Soil Science Division in 2010 with the following objectives:

- To develop statistically reliable quantitative estimates of amounts and distribution of carbon stocks for U.S. soils under various land covers and to the extent possible, differing agricultural management.
- To provide data to support model simulations of soil carbon change related to land use change, agricultural management, conservation practices, and climate change. To provide a scientifically and statistically defensible inventory of soil carbon stocks for the U.S.²⁶.

²⁵ <https://apps.ecology.wa.gov/publications/documents/1507005.pdf>

²⁶ https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/home/?cid=NRCS142P2_054164

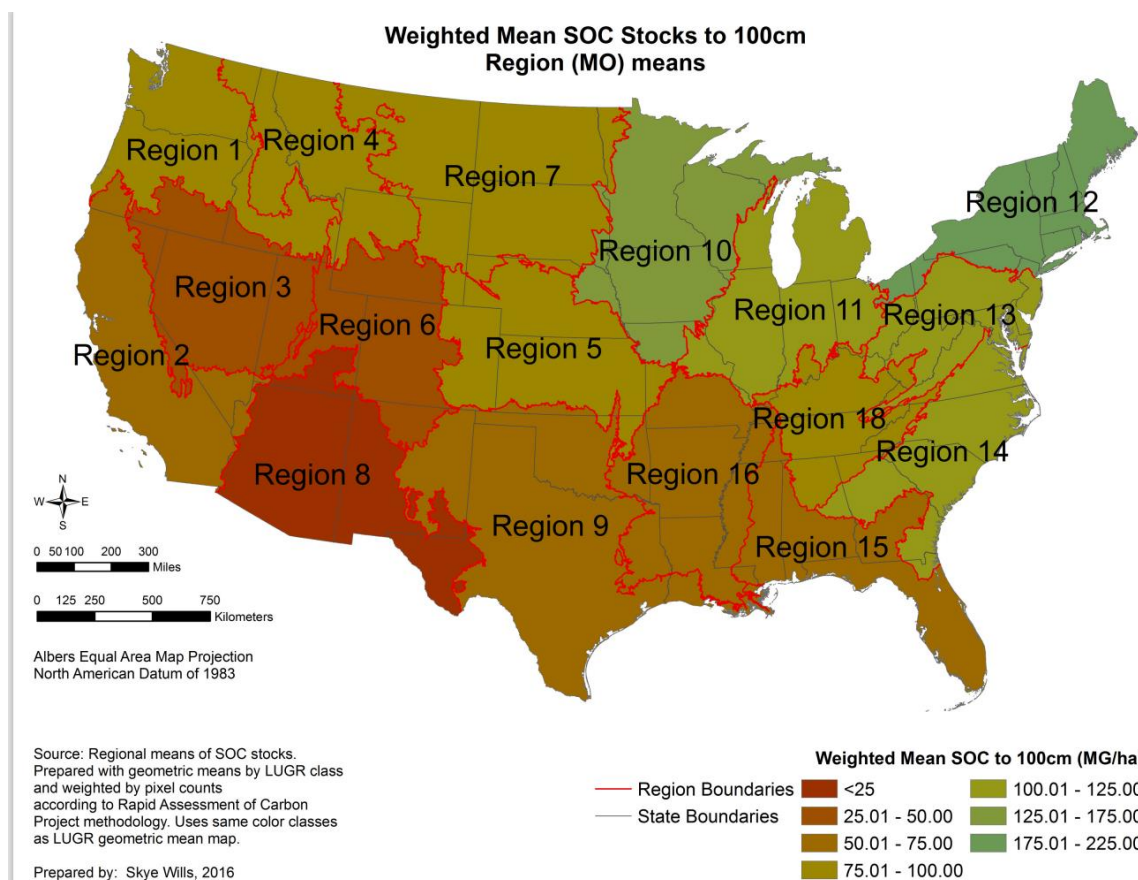


Figure 12: Map of soil organic carbon stocks in USA regions.²⁷

As visible from Figure 12, highest SOC content in soils could be observed in several regions in the north-eastern part of the USA.

The baseline scenario of the project is the same as the conditions and agricultural practices specific for each project instance existing prior to the project initiation. Section 2.4 (Baseline Scenario) will describe this in more detail.

1.14 Compliance with Laws, Statutes and Other Regulatory Frameworks

The Agoro Carbon USA Cropland Program is designed and implemented in compliance with all applicable local, state, and federal laws, statutes, and regulatory frameworks ("Applicable Laws"). The project proponent has further determined that the activities and approaches of the proposed project are not prohibited by any Applicable Law.

²⁷ https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_052842.pdf

All farmers participating in the project agree and are contractually obligated to comply with any Applicable Laws relevant to that farm. The Applicable Laws applicable to any given farm may include, without limitation, those related to: labor and employment, land use, water use, protection of the environment, and others. Relevant environmental laws that may apply to individual farms, depending on activity, may include:

- Clean Air Act (CAA) and state equivalents
- Clean Water Act (CWA) and state equivalents, including wetlands protection requirements
- Endangered Species Act (ESA) and state equivalents
- Migratory Bird Treaty Act (MBTA)
- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and similar state laws governing chemicals
- Federal Food, Drug, and Cosmetics Act (FFDCA)

Each farm has a legal obligation to comply with any Applicable Laws, as well as a contractual obligation with the project proponent to adhere to and comply with Applicable Laws.

There are no laws, regulations, or other requirements at the federal, state, or local level that require the adoption and implementation of the regenerative agriculture and other practices contemplated by this Project. As a result, the project can demonstrate a regulatory surplus in accordance with VCS requirements.

1.15 Participation under Other GHG Programs

1.15.1 Projects Registered (or seeking registration) under Other GHG Program(s)

The project, or any of its project components, has not been registered or is not seeking registration under any other GHG programs.

1.15.2 Projects Rejected by Other GHG Programs

Agoro Carbon USA Cropland Program is a new project and has not been submitted or rejected by any other GHG programs.

1.16 Other Forms of Credit

1.16.1 Emissions Trading Programs and Other Binding Limits

There are no compliance emissions trading programs in the USA concerning agriculture. The current emission trading schemes such as The Regional Greenhouse Gas Initiative (RGGI) or Californian Cap-and-Trade Program in their scope are covering industries and do not impose GHG emission caps on agriculture. The only applicable mechanisms related to the reduction of GHG emissions are voluntary carbon schemes, such as e.g. VCS and Gold Standard.

1.16.2 Other Forms of Environmental Credit

The program, or any of its program components, have not been registered nor is it seeking registration under any other GHG programs.

There are several voluntary programs in the USA which reward farmers for their efforts and provide subsidies schemes, such as CSP (Conservation Stewardship Program)²⁸ and Environmental Quality Incentives Program²⁹ of the USDA. When enrolling cropland to the Project, farmers confirm in the contract with the Project proponent, that they are not receiving any other third-party or governmental Carbon Credits or other forms of environmental credits or payments in exchange for undertaking the regenerative practices on the acres submitted to the Program. The farmers also confirm that they have not sold or transferred the carbon rights in relation to the implementation of the project activity(ies) to any third party and the project instance is not a part of any other carbon project.

This will be controlled during the verification process through the control of the geographical location of the project instances and the available information on any other participation of the same fields in any other scheme or program.

3. 1.17 Sustainable Development Contributions

Project activities will contribute to:

- 1) Improved soil health and increased cropland resilience to extreme weather events
- 2) Reduced input costs and increased profit potential from the same acreage
- 3) Operational benefits including, but not limited to, more consistent year to year yields or potentially increased yields in the long term.
- 4) Increase in biodiversity and other ecological benefits

The project is expected to contribute to the following sustainable development goals SDGs:



²⁸ <https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/programs/financial/csp/?cid=nrcseprd1297344>

²⁹ <https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/programs/financial/eqip/>

Goal 2 - End hunger, achieve food security and improved nutrition and promote sustainable agriculture. The farmers participating in the project are mostly small-scale and/or family farmers and will receive the economic reward for their participation in the project. This financial incentive provided will help to offset the risks related to the implementation of the practices and contribute to the purchase of new technologies or inputs needed for the practice implementation, where appropriate. Thus, the project will contribute to the SDG target 2.3 “By 2030, increase the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment”³⁰. Although most of our farmers are not women or indigenous people, most are family run farms which are often handed down from generation to generation. The corresponding indicator here will be the amount of financial rewards provided to the farmers during each monitoring period (Indicator 2.3.2). This corresponds to the U.S. SDG Indicator 2.3.2: “Indicator 2.3.2: Average income of small-scale food producers, by sex and indigenous status”³¹

At the same time, implementation of regenerative agricultural practices promoted by the program will contribute to the Target 2.4 “By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought, flooding and other disasters and that progressively improve land and soil quality”. The relevant and monitored indicator here will be the Indicator 2.4.1 “Proportion of agricultural area under productive and sustainable agriculture, which will be defined”, which will correspond to the land area enrolled into the Program. This indicator is also reported by the US government.

Goal 4 - Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. The farmers participating in the project will receive the agronomic advice and support. This is especially important, as many farmers in the USA are over 60 years old, and there is a need to improve the skills of the younger farmers. Thus, the project will contribute to the SDG target 4.4 “By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship”³². The indicator PF-4.1 of the approximate proportion of farmers (m/w) along the value chain who will receive training/agronomic support/advice per year will be applied. This

³⁰<https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Funstats.un.org%2Fsdgs%2Findicators%2FGlobal%2520Indicator%2520Framework%2520after%25202022%2520refinement.English.xlsx&wdOrigin=BROWSELINK>

³¹ <https://sdg.data.gov/2-3-2/>

³² <https://sdgcompass.org/business-indicators/>

corresponds to the U.S. SDG Indicator 4.3.1: “Participation rate of youth and adults in formal and non-formal education and training in the previous 12 months, by sex”³³.

Goal 6: Clean Water and Sanitation. The project activity is expected to improve soil health which improves water infiltration and water holding capacity, thus improving the quality of water that reaches water bodies from the project area. The project will be measuring bulk density and soil organic carbon. Bulk density is an indicator of soil porosity and soil compaction, which impact the soil’s water retention capacity³⁴. Soil organic matter is an indicator of improved soil structure and nutrient holding capacity. Soils that are held together through increased organic matter are less likely to erode through wind or water and create nutrient runoff to waterways. Ground and surface water quality may improve by creating a better water filter due to better soil structure, water infiltration, and biological activity³⁵³⁶. Soil organic matter and bulk density are both indicators measured within each soil sampling.

Goal 8: Decent Work and Economic Growth. The project activity is expected to improve productivity by producing more consistent yields from year to year or potentially increasing yields, as well as to increase croplands’ resilience to drought and floods, thus improving the viability of the crop operations (project participants) that depend on the croplands. Thus, the project activity contributes to the target 8.2 “Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors”³⁷. As the relevant indicator for this target will serve the increase in yield on the long term, which will be monitored. The data will be collected by conducting interviews with the farmers.

Goal 13: Climate Action. The project’s primary goal is to reduce greenhouse gas emissions. Soil carbon sequestration will be modelled and measured throughout the project term. Thus, the project activity contributes to the SDG Target “13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries”, and the indicator measured will be Indicator 13.12.2 “Total GHG emissions per year, in tCO₂e”³⁸.

Summary:

³³ <https://sdg.data.gov/4-3-1/>

³⁴ https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_053260.pdf

³⁵ https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs142p2_050965.pdf

³⁶ <http://www.fao.org/3/a-i6937e.pdf>

³⁷ <https://sdgcompass.org/business-indicators/>

³⁸ <https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Funstats.un.org%2Fsds%2Findicators%2FGlobal%2520indicator%2520Framework%2520after%25202022%2520refinement.English.xlsx&wdOrigin=BROWSELINK>

SDG	Target	Indicator
SDG 2 - Zero Hunger	2.3. By 2030, double the agricultural productivity and incomes of small-scale food producers, in particular women, indigenous peoples, family farmers, pastoralists and fishers, including through secure and equal access to land, other productive resources and inputs, knowledge, financial services, markets and opportunities for value addition and non-farm employment	Amount of financial rewards provided to the farmers during each monitoring period (Indicator 2.3.2) Proportion of agricultural area under productive and sustainable agriculture (Indicator 2.4.1)
SDG 4 Quality Education	4.4 “By 2030, substantially increase the number of youth and adults who have relevant skills, including technical and vocational skills, for employment, decent jobs and entrepreneurship”	Number of farmers (m/w) along the value chain who will receive training and agronomic advice/support each year will be applied
SDG 6 Clean Water and Sanitation	6.4. “By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity” ³⁹	Increase in soil organic carbon and soil water holding capacity
Goal 8: Decent Work and Economic Growth	8.2 “Achieve higher levels of economic productivity through diversification, technological upgrading and innovation, including through a focus on high-value added and labour-intensive sectors”	Increase in yield on the long term
SDG 13 Climate Action	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries	Total GHG emissions per year, in tCO ₂ e

Table 3: Overview of the Projects contribution to SDG Goals, targets and corresponding indicators

³⁹ <https://soilhealthinstitute.org/wp-content/uploads/2016/11/case-summary-water-final-101316.pdf>
<https://journals.plos.org/plosone/article/file?id=10.1371/journal.pone.0215702&type=printable>

4. 1.18 Additional Information Relevant to the Project

1. Leakage Management

Improved ALM projects can result in leakage through new application of manure from outside the project area (i.e., manure applied in the project from outside of the project area, that was not previously applied in the historical baseline period), productivity declines, and/or the displacement of livestock outside of the project boundary. VM0042 methodology identifies following types of leakages:

Leakage from New Application of Manure from Outside the Project Area

If manure is applied in the project that was not applied in the historical baseline period, there is a risk of activity shifting leakage. To account for this type of leakage, a deduction must be applied unless:

1. The manure applied in the project is produced on-site from farms within the project area;
2. The manure can be documented to have been diverted from an anaerobic lagoon; or
3. The deduction represents the portion of the manure carbon which remains on the project area without degrading during the project term and which would have otherwise been stored in agricultural land outside of the project area

In order to account for this type of leakage, the amount of manure applied, and the sourcing of manure will be continuously monitored on each project instance. The data collection team will be responsible for the data collection and analysis on a yearly basis. Where relevant, the deduction will be applied in line with the requirements of the Section 8.4.1 of the VM0042 methodology during each monitoring, the results will be reported in the monitoring report and will be subject to verification.

Leakage from Livestock Displacement

This type of leakage is not applicable to cropland and project activity

Leakage from Productivity Declines

Market leakage is likely to be negligible because the land in the project scenario remains in agricultural production. Further, producers are unlikely to implement and maintain management practices that result in productivity declines, since their livelihoods depend on crop harvests as a source of income. Nevertheless, to ensure leakage is not occurring, the following steps will be completed by Agoro Carbon every 10 years:

Step 1: We will demonstrate that the productivity of each crop product has not declined by more than 5% in the project scenario by comparing:

Average with-project productivity (excluding years with extreme weather events) of each crop product will be compared to average pre-project productivity of the same crop product OR

The ratio of average baseline productivity to regional productivity at time t will be compared to the average ratio of project productivity to regional productivity at time t + 10 years, by crop product, using regional data from government (e.g., USDA Actual Production History (APH) data), industry, published, academic or international organization (e.g., FAO) sources.

Step 2: We will determine whether the crop/livestock productivity decline was caused by a short-term change in productivity, by excluding all data inputs from the first three years of project implementation on a farm from the analysis.

Step 3: If the productivity decline will be observed, we will determine whether the productivity decline was limited to a certain combination of factors by stratifying the analysis by:

1. Practice change category
2. Practice change category combinations
3. Crop type
4. Soil type, and/or
5. Climatic zone

If the productivity decline is limited to a certain combination of factors, then that combination will become ineligible for future crediting.

For the analysis of leakage from productivity decline, we will collect the data on the average productivity for different types of products during the monitoring phase.

2. [Commercially Sensitive Information](#)

Project participant identity, property, and financial information will be excluded from the public version of the project description due to confidentiality concerns.

3. [Further Information](#)

N/A

2 SAFEGUARDS

2.1 [No Net Harm](#)

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

2.2 Local Stakeholder Consultation

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

2.3 Environmental Impact

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

2.4 Public Comments

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

2.5 AFOLU-Specific Safeguards

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

3 APPLICATION OF METHODOLOGY

3.1 Title and Reference of Methodology

The project applies VM0042 Methodology for Improved Agricultural Land Management, v1.0 and the relevant module VMD0053 Model Calibration, Validation, and Uncertainty Guidance for the Methodology for Improved Agricultural Land Management, v1.0.

3.2 Applicability of Methodology

VM0042 Methodology in section 4 Applicability conditions defines following applicability criteria:

Criterion	Approach(es) to meet the criterion
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Projects must introduce or implement one or more new changes to pre-existing agricultural management practices which: - Reduce fertiliser (organic or inorganic) application; - Reduce tillage/improve residue management; - Introduce cover cropping	The project regenerative practices, as described in Section 1.11, are listed as eligible practices under VM0042 methodology. The project will assure that the different types of project practices will be implemented on the field. This is prescribed by the contract the farmers are signing with the Program, and will be controlled by the usage of remote sensing data, direct monitoring and where feasible by conducting the interviews with the farmers.
Any quantitative adjustment (e.g., decrease in fertiliser application rate) must exceed 5% of the pre-existing value.	The application rates of the fertiliser will be monitored and compared with the baseline usage rate to assure a minimum of 5% change.
Project activities must be implemented on land that is either cropland or grassland at the project start date and remains cropland or grassland throughout the project crediting period (i.e., land use change is not eligible, including conversion from cropland to grassland and grassland to cropland).	Farmers are obliged in the contract with Agoro Carbon to assure that the project is cropland and remains cropland during the project crediting period. This will be controlled by the usage of remote sensing data where feasible and by conducting the site visits and observations on the farms.
The project area must not have been cleared of native ecosystems within the 10-year period prior to the project start date.	This is prescribed by the contract the farmers are signing with the Program, and will be controlled by the usage of remote sensing data where feasible and by conducting the interviews with the farmers.
The project activity is not expected to result in a sustained reduction of greater than 5% in productivity, as demonstrated by peer-reviewed and/or published studies on the activity in the region or a comparable region.	Market leakage is likely to be negligible because the land in the project scenario remains in agricultural production. Further, producers are unlikely to implement and maintain management

	practices that result in productivity declines, since their livelihoods depend on crop harvests as a source of income. Nevertheless, to ensure leakage is not occurring, the following will be completed every 10 years: Average with-project productivity (excluding years with extreme weather events) of each crop/livestock product will be compared to average pre-project productivity of the same crop/livestock product OR the ratio of average baseline productivity to regional productivity at time t will be compared to the average ratio of project productivity to regional productivity at time t + 10 years, by crop/livestock product, using regional data from government (e.g., USDA Actual Production History (APH) data), industry, published, academic or international organization (e.g., FAO) sources.
The project activity cannot occur on a wetland	This is prescribed by the contract the farmers are signing with the Agoro Carbon for the participation into the Program

Where empirical or process-based models used to estimate stock change/emissions meet specific conditions: - Publicly-available - Shown in peer-reviewed scientific studies to successfully simulate changes in soil organic carbon and trace gas emissions resulting from changes in agricultural management included in the project description; - Able to support repetition of the project model simulations. - Validated per datasets and procedures detailed in VMD0053 “Model Calibration and Validation Guidance for the Methodology for Improved Agricultural Land - Management”, with model prediction error calculated using datasets and using the same parameter sets applied to estimate stock changes/emissions in the project.	The models used to estimate stock change/emissions meet specific conditions will follow the requirements of the VMD0053 “Model Calibration and Validation Guidance for the Methodology for Improved Agricultural Land Management” and will be supported by the independent 3rd party assessment and based on the results of the peer-reviewed publications.
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3.3 Project Boundary

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

3.4 Baseline Scenario

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

3.5 Additionality

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

3.6 Methodology Deviations

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

4 QUANTIFICATION OF GHG EMISSION REDUCTIONS AND REMOVALS

4.1 Baseline Emissions

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

4.2 Project Emissions

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

4.3 Leakage

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

4.4 Net GHG Emission Reductions and Removals

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

5 MONITORING

5.1 Data and Parameters Available at Validation

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

5.2 Data and Parameters Monitored

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

5.3 Monitoring Plan

This section has been omitted in accordance with the VERRA Registration and Issuance Process v4.1 - §3.1.3 – Pipeline Listing Process

2. APPENDIX

Use appendices for supporting information. Delete this appendix (title and instructions) where no appendix is required.