

Products

- Release of data entry template and publically available ARS Data Portal:
 - <https://gpsr.ars.usda.gov/natres>
- Common protocols for greenhouse gas emissions, soil properties and related measurements:
 - <https://www.ars.usda.gov/anrds/gracenet/gracenet-protocols/>

Liebig, Franzluebbers, Follett, eds. 2012, *Managing agricultural greenhouse gases*. Academic Press.

Del Grosso et al. 2013, *JEQ*. 42:1274-1280.

- Contributions to greenhouse gas inventories:
 - https://www.usda.gov/oce/climate_change/greenhouse.htm
 - <https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks>
 - https://www.usda.gov/oce/climate_change/estimation.htm

Related Efforts

- USDA-ARS-REAP (Resilient Economic Agricultural Practices)
- USDA-ARS-AgAR (Agricultural Antibiotic Resistance)
- USDA-ARS-CEAP (Conservation Effects Assessment Project)
- USDA-ARS-NUOnet (Nutrient Use and Outcome Network)
- USDA-ARS-Livestock GRACenet
- USDA-ARS-LTAR (Long-Term Agroecosystem Research)
- USDA-ARS-Soil Biology Network
- MAGGnet (Managing Agricultural Greenhouse Gases Network)

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ARS National Programs

- Soil and Air
- Agricultural System Competitiveness and Sustainability

www.ars.usda.gov/research/programs.htm

ARS MISSION

The Agricultural Research Service conducts research to develop and transfer solutions to agricultural problems of high national priority and provides information access and dissemination to

- ensure high-quality, safe food and other agricultural products,
- assess the nutritional needs of Americans,
- sustain a competitive agricultural economy,
- enhance the natural resource base and the environment, and
- provide economic opportunities for rural citizens, communities, and society as a whole.

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Greenhouse gas Reduction through Agricultural Carbon Enhancement network

GRACenet

A research program to assess soil carbon sequestration and greenhouse gas mitigation by agricultural management

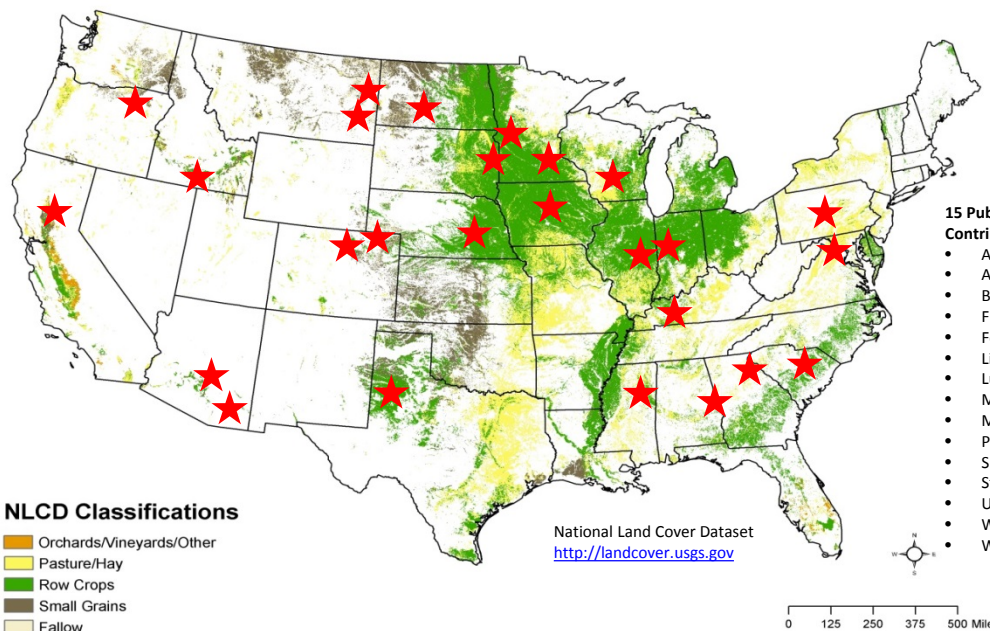


United States Department of
Agriculture-
Agricultural Research Service

GOAL

To identify and develop agricultural strategies to enhance soil carbon sequestration and reduce greenhouse gas emissions and to provide a scientific basis for carbon credit programs, to reduce net emission of greenhouse gas and improve environmental quality.

★ Current GRACEnet/REAP Locations



- 15 Public Data Contributors**
- Ames, IA
 - Auburn, AL
 - Bowling Green, KY
 - Florence, SC
 - Fort Collins, CO
 - Lincoln, NE
 - Lubbock, TX
 - Mandan, ND
 - Morris, MN
 - Pendleton, OR
 - Sidney, MT
 - St. Paul, MN
 - University Park, PA
 - Watkinsville, GA
 - West Lafayette, IN

- 26 Pre-Release Data Contributors**
- Ames, IA
 - Auburn, AL
 - Beltsville, MD
 - Bowling Green, KY
 - Brookings, SD
 - Davis, CA
 - Florence, SC
 - Fort Collins, CO
 - Kimberly, ID
 - Lincoln, NE
 - Lubbock, TX
 - Mandan, ND
 - Maricopa, AZ
 - Marshfield, WI
 - Miles City, MT
 - Morris, MN
 - Nunn, CO
 - Pendleton, OR
 - Sidney, MT
 - Starkville, MS
 - St. Paul, MN
 - Tucson, AZ
 - University Park, PA
 - Urbana, IL
 - Watkinsville, GA
 - West Lafayette, IN

APPROACH

Consistent protocols for soil, trace gas and plant sampling are used across the network.

Assessment within GRACEnet follows four location-specific scenarios:

1. Business as usual in production agriculture for various areas of the country.
 - What is the carbon accumulation/loss rate under typical agricultural management?
2. Maximizing carbon sequestration rate.
 - What can be done to reach the highest carbon sequestration rate?

3. Minimizing net greenhouse gas emission.
 - Agriculture is the main source of nitrous oxide and methane to the atmosphere. Practices will be developed to reduce the emission of these gases. What can be done to reach the highest carbon sequestration rate?
4. Maximizing environmental benefits by improving water, air, and soil quality.
 - This scenario investigates management systems to optimize both agricultural and environmental benefits, by sequestering soil carbon and decreasing greenhouse gas emissions.

OBJECTIVES

1. Evaluate status and direction of change in soil carbon for typical and alternative agricultural systems.



2. Determine net greenhouse gas emission (carbon dioxide, methane and nitrous oxide) of current agricultural systems for typical and alternative agricultural systems.



3. Determine the environmental effects (water, air and soil quality) of agricultural systems developed to reduce greenhouse gas emission and increase soil carbon storage.

