

Products

- Release of public 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 published:
Del Grosso et al. 2013, *JEQ*. 42:1274-1280.

Liebig, Franzluebbers, Follett, eds. 2012, *Managing agricultural greenhouse gases: Coordinated agricultural research through GRACEnet to address our changing climate*. Academic Press.

- Contributions to greenhouse gas inventories:
http://www.usda.gov/oce/climate_change/Quantifying_GHG/USDATB1939_07072014.pdf
http://www.usda.gov/oce/climate_change/AFGG_Inventory/USDA_GHG_Inv_1990-2008_June2011.pdf

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)
- USDA-ARS-Livestock GRACEnet
- USDA-ARS-LTAR (Long-Term Agroecosystem Research)
- MAGGnet (Managing Agricultural Greenhouse Gases Network)

GRACEnet Steering Committee

Steve Del Grosso, USDA-ARS-PA, Fort Collins, CO
Chair Steering Committee
Phone: (970) 492-7281
Steve.Delgrosso@ars.usda.gov

David Archer, USDA-ARS-PA, Mandan, ND
Phone: (701) 667-3048
David.Archer@ars.usda.gov

Michel Cavigelli, USDA-ARS-BARC, Beltsville, MD
Phone: (301) 504-8327 ext. 330
Michel.Cavigelli@ars.usda.gov

Jorge Delgado, USDA-ARS-PA, Fort Collins, CO
Phone: (970) 492-7260
Jorge.Delgado@ars.usda.gov

Jane Johnson, USDA-ARS-MWA, Morris, MN
Phone: (320) 589-3411
Jane.Johnson@ars.usda.gov

Kerri Steenwerth, USDA-ARS-PWA, Davis, CA
Phone: (530) 752-7535
Kerri.Steenwerth@ucdavis.edu

Rod Venterea, USDA-ARS-MWA, St. Paul, MN
Phone: (612) 624-7842
Rod.Venterea@ars.usda.gov

Jeff White, USDA-ARS-PWA, Maricopa, AZ
Phone: (520) 316-6368
Jeffrey.White@ars.usda.gov

Website: <https://www.ars.usda.gov/anrds/>

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

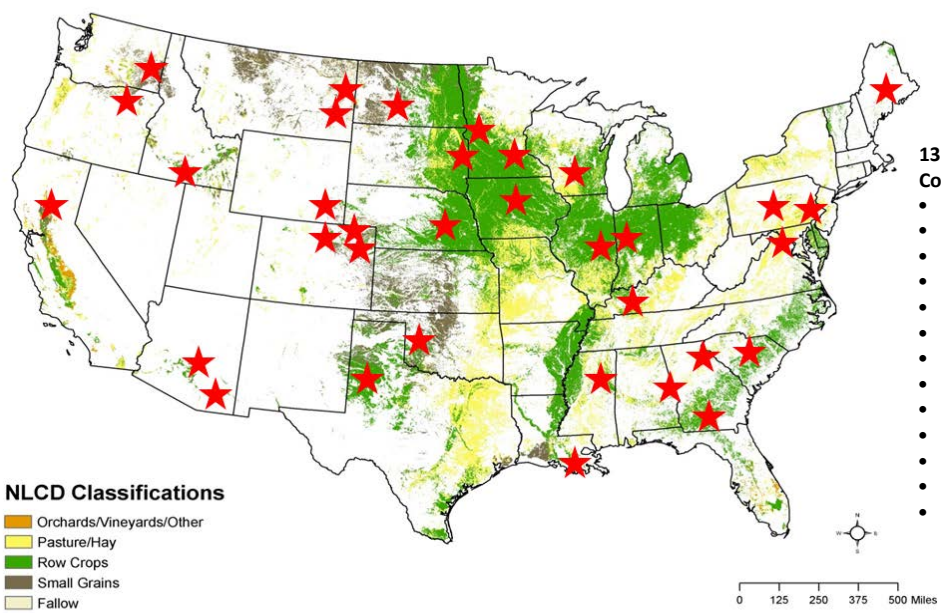


United States Department of
Agriculture-
Agricultural Research Service

GOAL

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

★ GRACEnet Field Sites



NLCD Classifications

- Orchards/Vineyards/Other
- Pasture/Hay
- Row Crops
- Small Grains
- Fallow

National Land Cover Dataset

<http://landcover.usgs.gov>

25 Pre-Release Data Contributors

- Auburn, AL
- Beltsville, MD
- Bowling Green, KY
- Brookings, SD
- Cheyenne, WY
- Clay Center, NE
- Davis, CA
- Fort Collins, CO
- Lincoln, NE
- Lubbock, TX
- Mandan, ND
- Maricopa, AZ
- Marshfield, WI
- Miles City, MT
- Morris, MN
- Nunn, CO
- Pendleton, OR
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- Starkville, MS
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- Tucson, AZ
- University Park, PA
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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 decrease 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.

