Ecosystem Markets

Opportunities, Challenges, Best Practices

NALN Soil Health Stewards | 09/10/2021

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Background - *What are ecosystem markets?*

Driven by consumer demand. → Payments to protect, restore or mitigate for impacts to ecosystems. → Practices are often part of traditional state and federal incentive programs. → Market payments are generated via outcomes verified at the field level and are not necessarily practice-specific. → Markets exist for carbon sequestration, GHG reductions, water quality and others.

https://ilsustainableag.org/ecomarkets/

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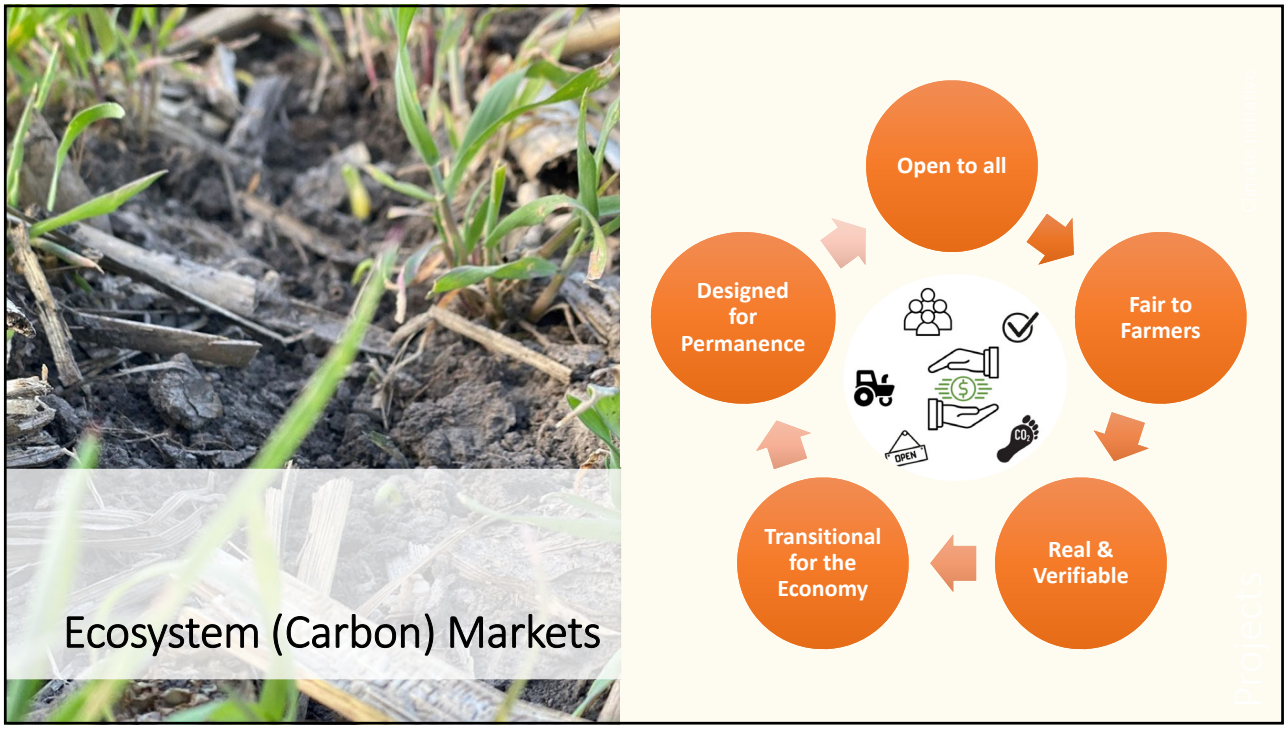

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Carbon Offsets

Measurable reduction of GHG emissions from an activity or project

Used to compensate for emissions occurring elsewhere

Typically measured in metric tonnes (2,205 lbs) CO2e

Includes CO2, methane, N2O

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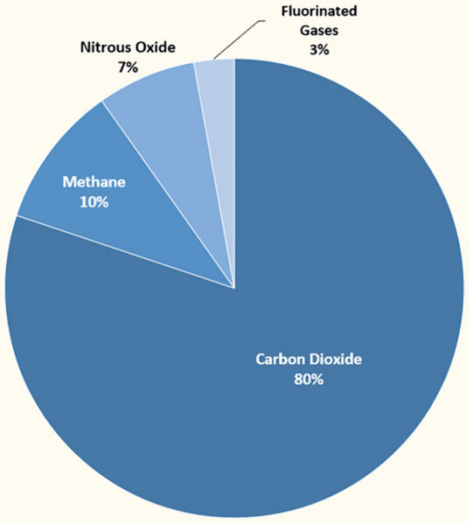
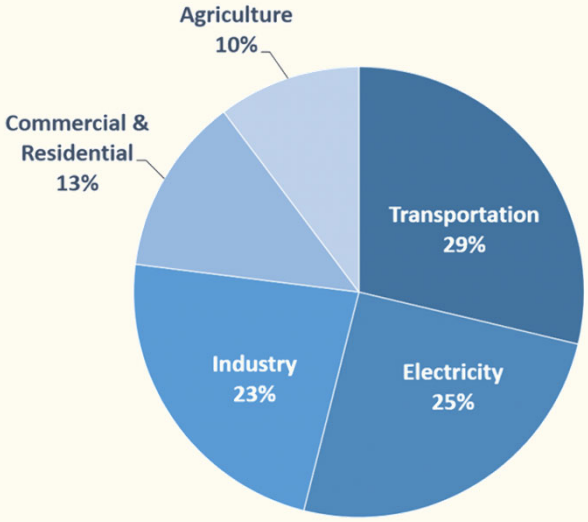
Overview of U.S. Greenhouse Gas Emissions in 2019



Sources of U.S. Greenhouse Gas Emissions in 2019



https://www.epa.gov/ghgemissions/inventory-us-greenhouse-gas-emissions-and-sinks

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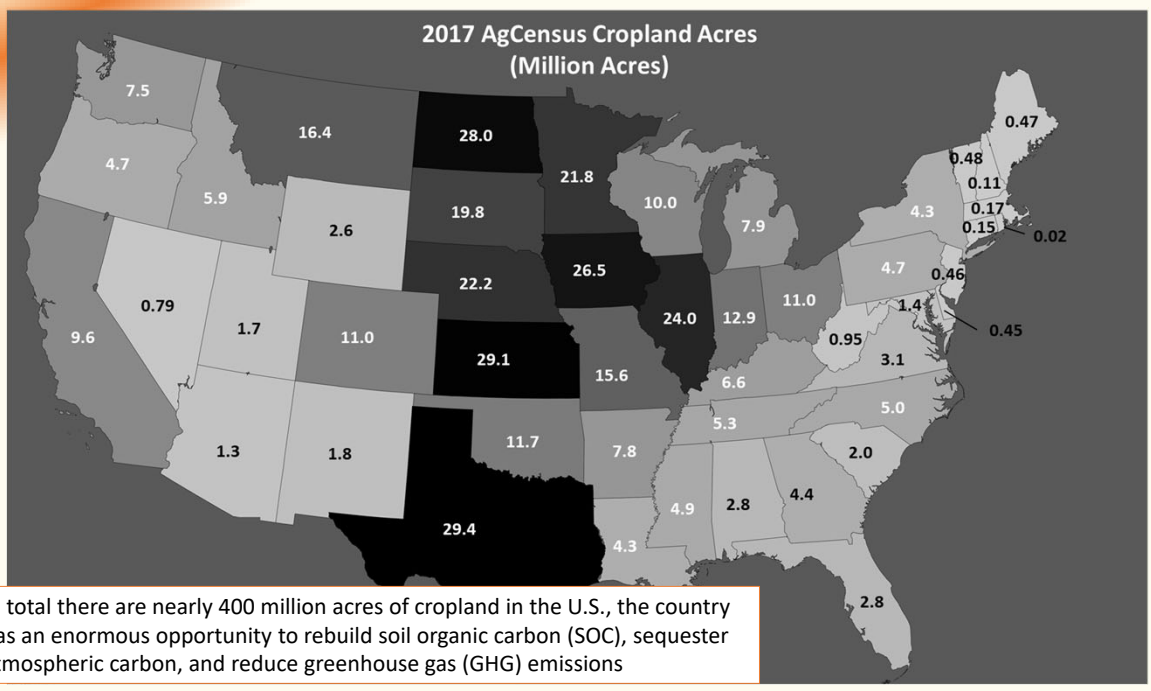
2017 AgCensus Cropland Acres (Million Acres)



In total there are nearly 400 million acres of cropland in the U.S., the country has an enormous opportunity to rebuild soil organic carbon (SOC), sequester atmospheric carbon, and reduce greenhouse gas (GHG) emissions

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How much carbon can my farm store?

IT DEPENDS!

- Farm and field level characteristics and management including soil type, climate, topography, crop rotation and productivity, residue and nutrient management.
- No-till specific management including depth of previous tillage practices
- Cover crop specific management including number of sequential years planting a cover crop, how long the cover crop is grown before termination, and cover crop species.

PRACTICE	NATIONAL RANGE (AVG.)
No-till (NT)	0.03 – 1.07 (0.49)
Cover Crops (CC)	-0.03 – 1.50 (0.37)

NT: The largest SOC increases are associated with temperate locations and well-drained soils.

CC: The largest SOC increases are associated with temperate locations, fine-textured soils, and mixed species plantings of cover crops.

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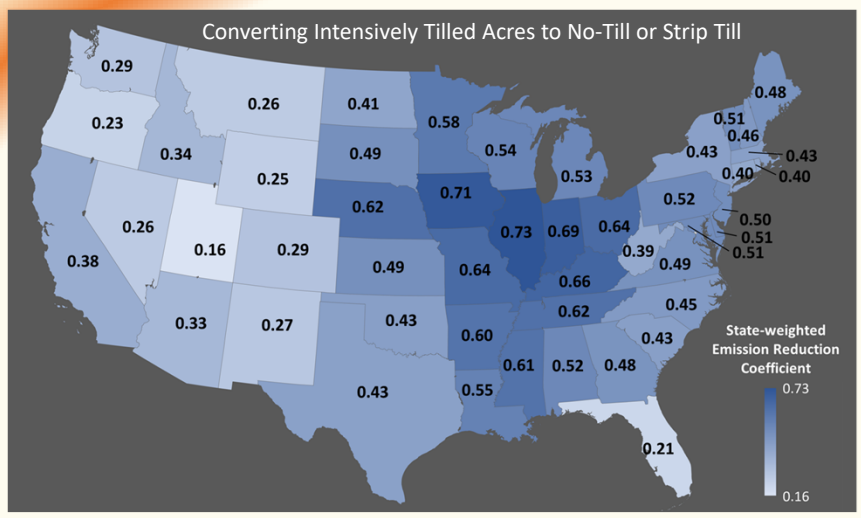

State-weighted average emission reduction coefficients (tonnes CO2e ac-1 y-1) with adoption of no-till or strip-till practices on acres formerly under intensive tillage. Weighted emission reduction coefficients generated using The CaRPE Tool, version 2.03. Values are scaled to the state level and reflect average ERCs across all counties and weighted for cropland acres. They are intended for comparative purposes only.

 # tonnes CO2e / ac / yr
OH = 0.64
PA = 0.52
MD = 0.51

https://farmlandinfo.org/publications/combating-climate-change-on-us-cropland/

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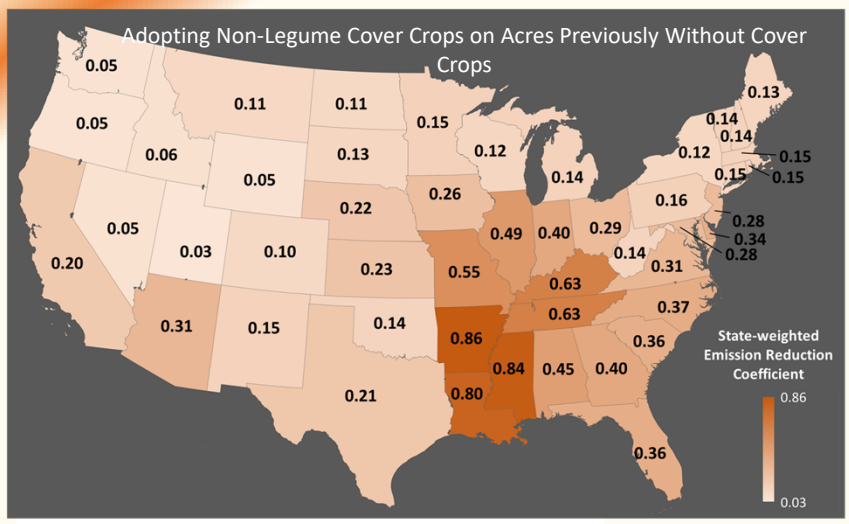

State-weighted average emission reduction coefficients (tonnes CO2e ac-1 y-1) with adoption of non-legume cover crop with 25% fertilizer nitrogen reduced. Weighted emission reduction coefficients generated using The CaRPE Tool, version 2.03. Values are scaled to the state level and reflect average ERCs across all counties and weighted for cropland acres. They are intended for comparative purposes only.

https://farmlandinfo.org/publications/combating-climate-change-on-us-cropland/

 # tonnes CO2e / ac / yr
OH = 0.29
PA = 0.16
MD = 0.28

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Recap of CO2e Potential

There is general consensus around the range of GHG reduction potentials for several cropland management practices (previous modeling studies and meta-analyses)

There are nearly 400 million acres of cropland in the U.S., presenting farmers with an **unparalleled opportunity to increase soil carbon sequestration and reduce greenhouse gas emissions while improving water quality and building on-farm resiliency and profitability**.

Caveats

- Research on surface soils
- Deep profile storage potential?
- Practice permanence

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Market Entities

Nori – In pilot phase, project enrollment is currently available nationwide. Two projects have sold and received payment for ~30,000 credits to date.

Indigo Ag – Project enrollment currently available in 21 states including: AR, CO, GA, IA, IL, IN, KS, KY, LA, MN, MO, MS, NC, ND, NE, OH, OK, SC, SD, TN, TX.

Soil and Water Outcomes Fund – Project enrollment currently available in select counties in Iowa, Illinois, and Ohio. Planning to expand to additional geographies in 2022.

Ecosystem Services Market Consortium (ESMC) – In pilot phase, project enrollment currently available in select U.S. regions including Corn and Soy Belt, Great Plains, Great Lakes, Pacific Northwest, and California.

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Input Providers

Bayer US Carbon Program-- $3 per acre per year for No-till and strip-till, $6 per acre per year for cover crop adoption

Corteva Carbon Initiative– Leverages Granular insights to assist farmers in earning an estimated $5-20 per acre for cover crops and reduced tillage.

Nutrien's Carbon Program– Currently testing several pilot projects to provide incentive payments for climate smart practice implementation or carbon and water outcomes.

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Data Platforms

CIBO– Offers carbon sellers and buyers an innovative, efficient carbon market by calculating the regenerative potential.

FBN/Gradable – Provides new technology and services that facilitate the scoring, sourcing and pricing of low-carbon grain.

Truterra TruCarbon– Helps growers measure and track their on-farm stewardship journey via the Truterra Insights Engine.

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Recap on Market Opportunities

There are multiple entities with ecosystem-related programs: diverse players, variety of incentives, varied payment structures, and different levels of technical support.

Caveats

- Rapidly changing landscape
- Pilot phase vs full roll-out
- New partnerships forming

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Which program is right for me?

		Ohio	Pennsylvania	Maryland
No-till	tonnes CO2e	0.64	0.52	0.51
	Payment(1)	$ 9.60	$ 7.80	$ 7.65
	EQIP(2)	$ 15.39	$ 18.02	N/A
Cover Crop	tonnes CO2e	0.29	0.16	0.28
	Payment(1)	$ 4.35	$ 2.40	$ 4.20
	EQIP(2)	$ 34.25	$ 54.17	$ 51.86

Values are per acre basis

(1) Average payment ~ $15 / tonne of CO2e
(2) 2021 EQIP Payment Schedules

Back of envelope calculation for demonstration purpose only -- not intended to represent individual farm income

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Take Away

Market incentives alone are not the most cost-effective means to accelerate practice adoption

- Not sufficient to justify management changes
- Not competitive with existing financial incentives

- May be right for a farmer already planning to change
- Increased ROI when payments are stacked

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Advice for Farmers

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Read the Fine Print!

- Does enrollment in carbon market limit eligibility for other financial inc tives?
- Contract length - is there a penalty for breaking contr arly
- Are rented lands eligible – how are programs s
- Price stability / caps – payment schedules a
- Privacy / data management should be transpar
- Verification / hidden fees – costs for third party verifi tion?

Transparency & Trust

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Resources to help you…

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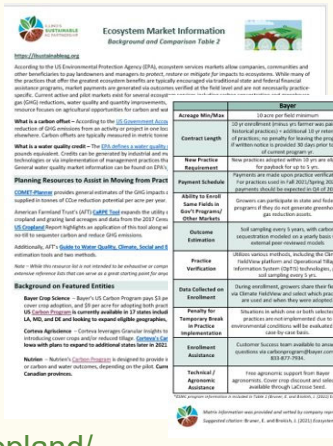

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With Gratitude

ILLINOIS SUSTAINABLE AG PARTNERSHIP

American Farmland Trust

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