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Climate, Energy, and Economic Win-Wins in the Farm Bill

Wednesday, May 10, 2023

About EESI

Non-partisan Educational Resources for Policymakers

A bipartisan Congressional caucus founded EESI in 1984 to provide non-partisan information on environmental, energy, and climate policies

Direct Assistance for Equitable and Inclusive Financing Program

In addition to a full portfolio of federal policy work, EESI provides direct assistance to utilities to develop “on-bill financing” programs

Commitment to Diversity, Equity, Inclusion, and Justice

We recognize that systemic barriers impede fair environmental, energy, and climate policies and limit the full participation of Black, Indigenous, people of color, and legacy and frontline communities in decision-making

Sustainable Solutions

Our mission is to advance science-based solutions for climate change, energy, and environmental challenges in order to achieve *our vision of a sustainable, resilient, and equitable world*.

Policymaker Education

Briefings and Webcasts

Live, in-person and online public briefings, archived webcasts, and written summaries

Climate Change Solutions

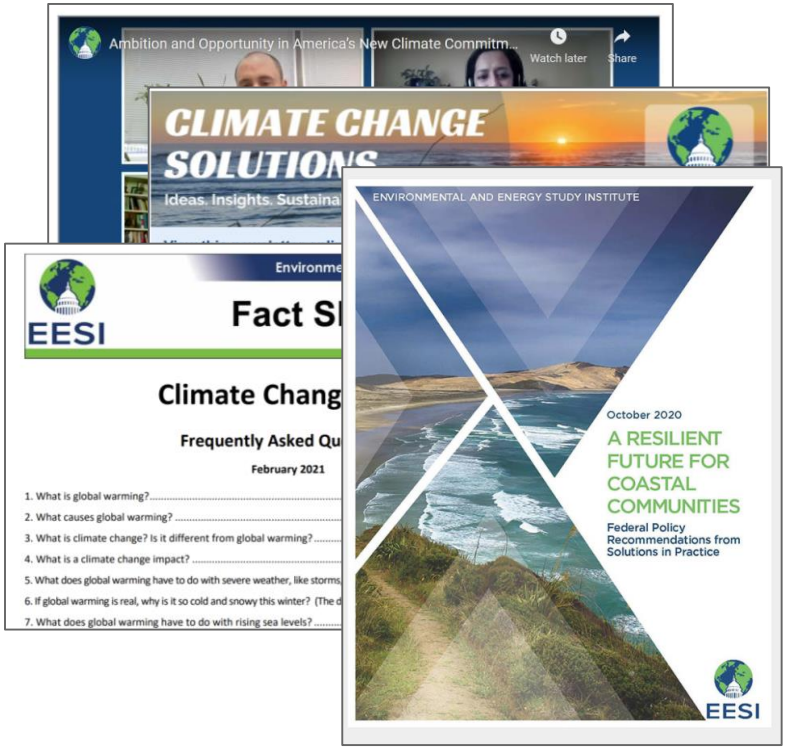
Bi-weekly newsletter with everything policymakers and concerned citizens need to know, including a legislation and hearings tracker

Fact Sheets and Issue Briefs

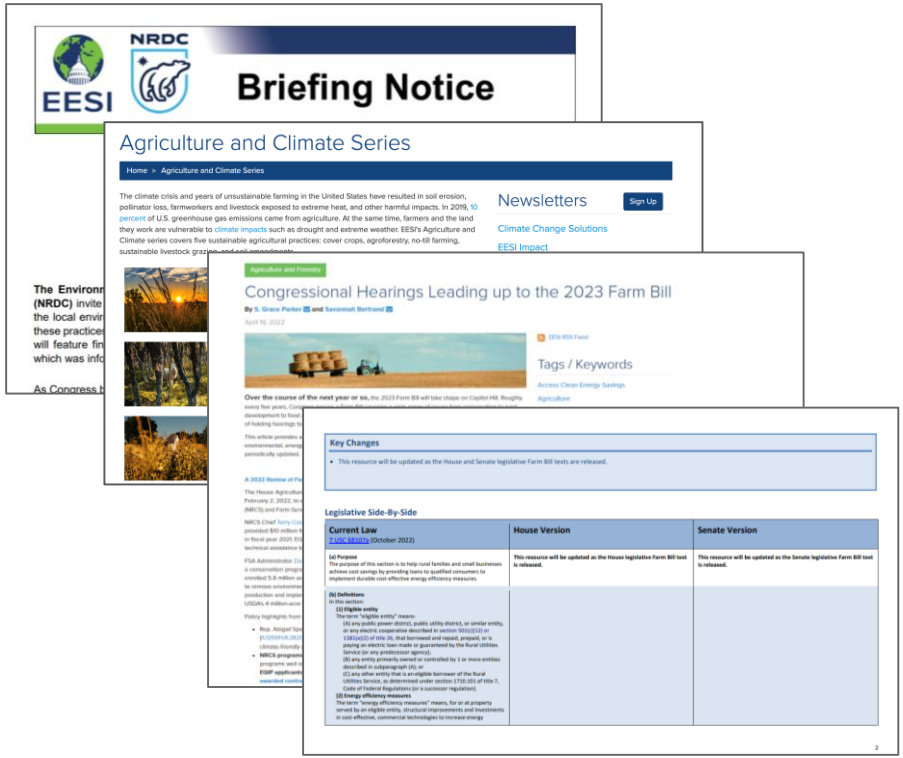
Timely, objective coverage of environmental, clean energy, and climate change topics

Social Media (@EESIOnline)

Active engagement on Twitter, Facebook, LinkedIn, and YouTube



EESI Farm Bill Resources



- Congressional briefings
- Articles and podcasts
- *Climate Change Solutions* newsletter special editions
- Farm Bill hearing tracker
- Legislative side-by-side-by-sides

All resources available at: www.eesi.org/2023-farm-bill

Briefing Series: Farm Bill in Focus

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Every Other Wednesday

The Process and Path Forward for Passing a Bipartisan Farm Bill | Recording Available

Climate, Energy, and Economic Win-Wins in the Farm Bill | May 10, 1:30-3:00 PM EDT

Unlocking Rural Economies: Farm Bill Investments in Rural America | May 24, 2:00-3:30 PM EDT

The Future of Forestry in the Farm Bill | June 07, 2:00-3:30 PM EDT

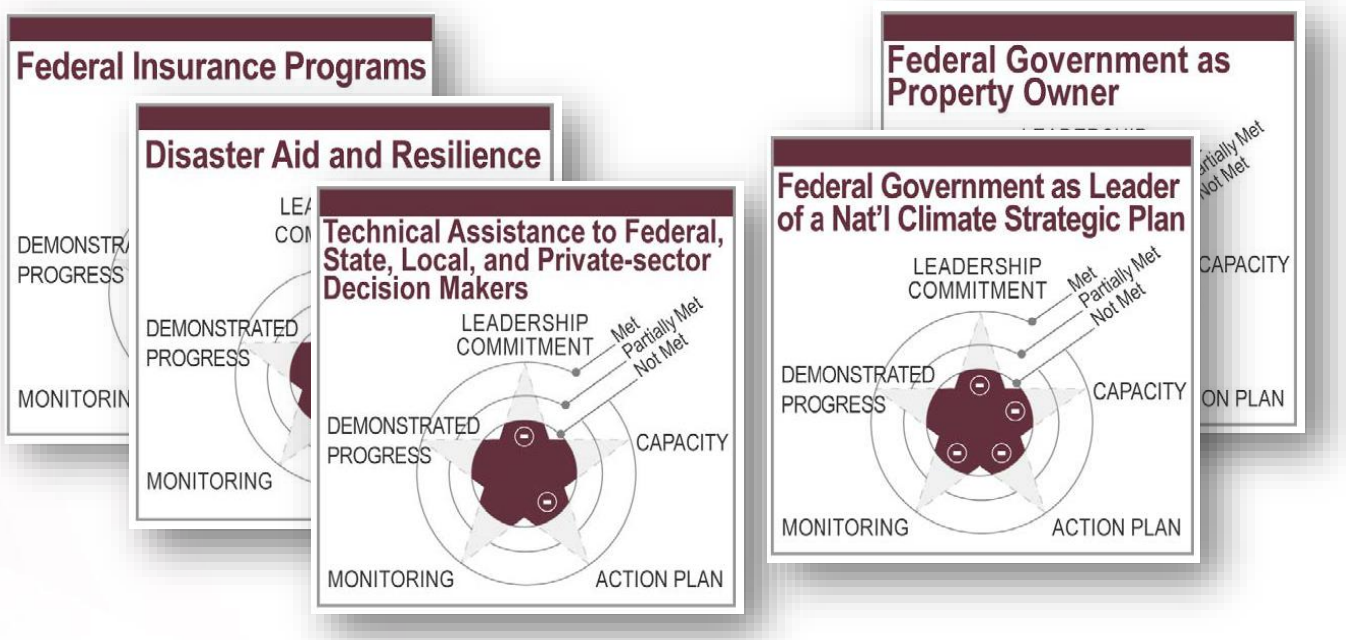
Conservation Practices from Farms to Forests and Wetlands | June 21, 2:00-3:30 PM EDT

GAO's Work on Climate Resilient Agriculture

EESI

Micah McMillan and Joe Thompson
Natural Resources and Environment Team
U.S. Government Accountability Office

GAO's High Risk Series: Limiting the Federal Government's Fiscal Exposure by Better Managing Climate Change Risks



High-Risk Series: Efforts Made to Achieve Progress Need to Be Maintained and Expanded to Fully Address All Areas (GAO-23-106203)

Two Categories of Recommendations

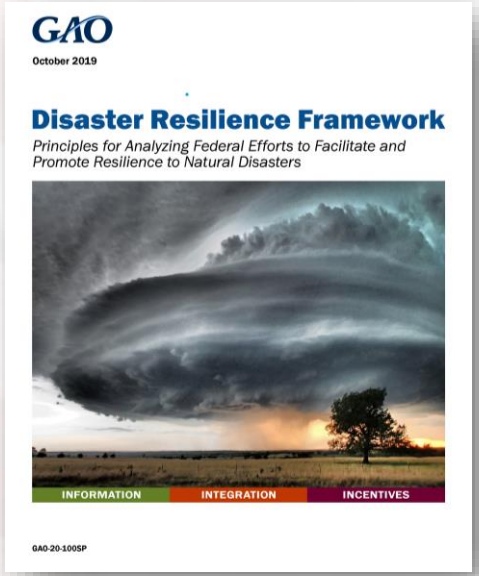
Agency Mainstreaming

- Water systems
- Roads and bridges
- Defense facilities
- Energy infrastructure
- Superfund sites
- Agriculture

New Institutions

- National Climate Information System
- Identify high-priority adaptation projects
- Address climate migration

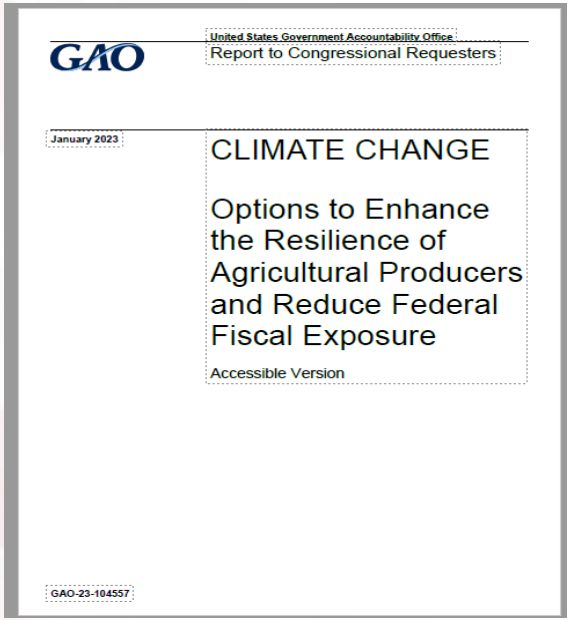
Disaster Resilience Framework



- Framework organized around 3 principles—information, integration, and incentives—and a series of questions.
- Framework principles can help:
  - Officials that manage federal agencies/programs consider actions they might take to increase resilience to natural hazards.
  - Analyze or identify gaps in existing federal efforts.

Disaster Resilience Framework: Principles for Analyzing Federal Efforts to Facilitate and Promote Resilience to Natural Disasters (GAO-20-100SP)

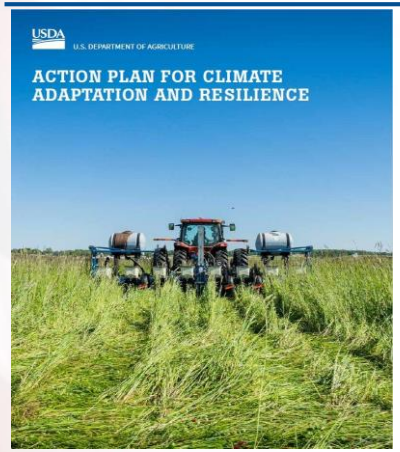
Climate Resilient Agriculture: USDA Actions

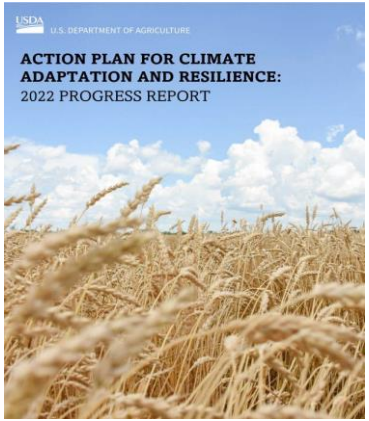


- **Federal fiscal exposure**:
  - Crop insurance program.
  - Agricultural disaster relief programs.
- **Objectives**:
  - Actions USDA has taken to enhance producer resilience.
  - Policy options available to USDA to enhance producer resilience.
- **Methodology**:
  - Literature review.
  - Interviews with experts and key stakeholders

Climate Change: Options to Enhance the Resilience of Agricultural Producers and Reduce Federal Fiscal Exposure (GAO-23-104557)

Climate Resilient Agriculture: USDA Actions





- **Information**
  - Climate Hubs regional vulnerability assessments.
- **Integration**
  - *Action Plan for Climate Adaptation and Resilience*
  - 13 agency level adaptation plans
- **Indirect Incentives**
  - Conservation programs.
  - Inflation Reduction Act of 2022.

Climate Change: Options to Enhance the Resilience of Agricultural Producers and Reduce Federal Fiscal Exposure (GAO-23-104557)

Climate Resilient Agriculture: Potential Options

1. Collect data on practices that enhance climate resilience.
2. Expand technical assistance to prioritize and promote climate resilience.
3. Prioritize climate resilience in whole-farm conservation planning.
4. Expand the capacity and expertise of USDA's Climate Hubs.
5. Develop an agricultural climate resilience plan that addresses regional needs.
6. Establish standards for climate-resilient agricultural operations.
7. Revise the Natural Resources Conservation Service's Conservation Practice Standards to include climate resilience.
8. Expand conservation program eligibility to include and prioritize climate resilience.
9. Expand the capacity of USDA's conservation programs.
10. Research the feasibility of incorporating climate resilience into crop insurance rating.
11. Require producer adoption of climate-resilient practices to receive crop insurance premium subsidies.
12. Offer crop insurance premium subsidies for climate-resilient operations.
13. Require producer adoption of climate-resilient practices to maintain Farm Bill Title I program eligibility.

Climate Change: Options to Enhance the Resilience of Agricultural Producers and Reduce Federal Fiscal Exposure (GAO-23-104557)

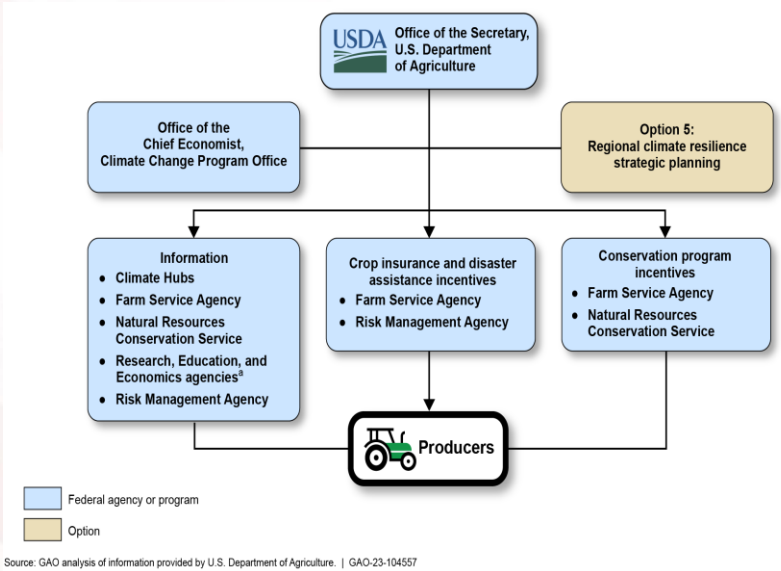
Climate Resilient Agriculture: Potential Options

Source: USDA

- Implementing multiple options:
  - Most potential to improve producer resilience
  - Leverages strengths and addresses limitations.
  - Timing and sequence are important.
- USDA unsure of statutory authority and resource needs for implementation.
- Comprehensive analysis would help:
  - Identify planning priorities
  - Inform Congressional decisionmaking.

Climate Change: Options to Enhance the Resilience of Agricultural Producers and Reduce Federal Fiscal Exposure (GAO-23-104557)

Climate Resilient Agriculture



Source: GAO analysis of information provided by U.S. Department of Agriculture. | GAO-23-104557

We recommended:

USDA should analyze options to enhance the climate resilience of agricultural producers and integrate them into USDA's future climate resilience prioritization and planning efforts. The analysis should:

- Explain USDA's decision to prioritize or not prioritize the options.
- Identify any additional authority and resources needed for implementation.

Climate Change: Options to Enhance the Resilience of Agricultural Producers and Reduce Federal Fiscal Exposure (GAO-23-104557)

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Agroforestry

Resilient Working Lands for Climate, Water, Biodiversity & Food Security

Audrey Epp Schmidt

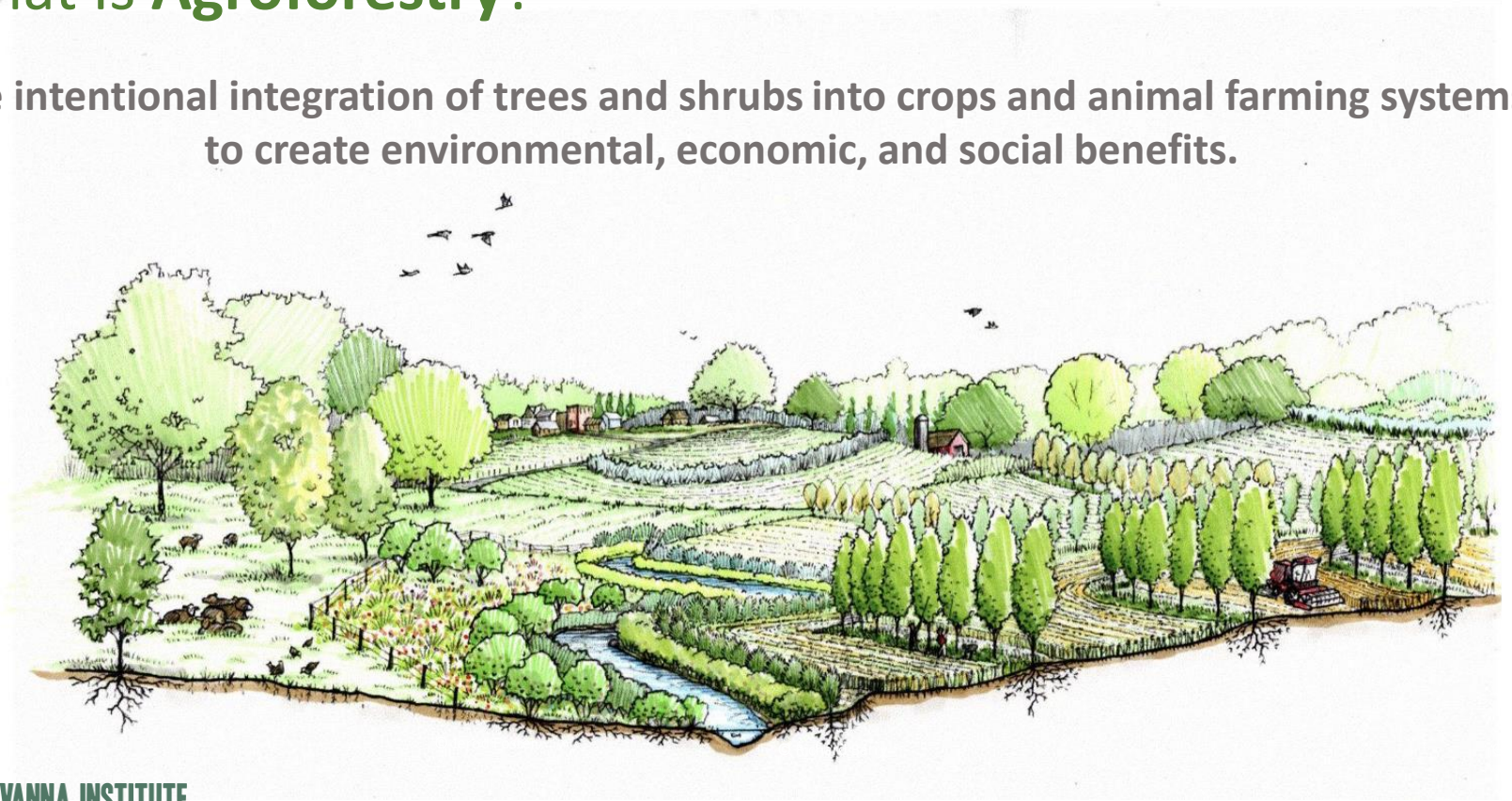
Agroforestry Program Manager, North America

Our Vision

A world where the diversity of life thrives, and people act to conserve nature for its own sake and its ability to fulfill our needs and enrich our lives.

What Is **Agroforestry**?

The intentional integration of trees and shrubs into crops and animal farming systems to create environmental, economic, and social benefits.



SAVANNA INSTITUTE

Agroforestry Practices

Alley Cropping

Wind Breaks

Silvopasture

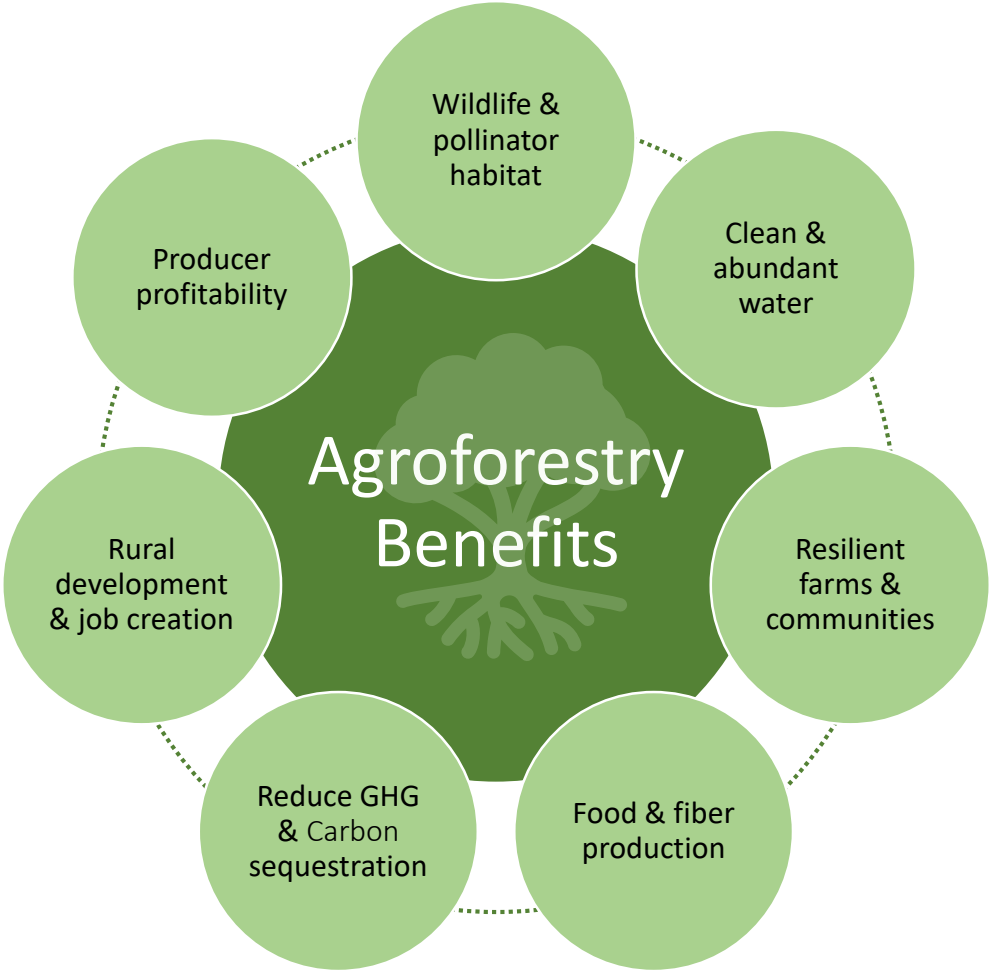
Riparian Buffers

Forest Farming

Photo Source: USDA National Agroforestry Center

Why **Agroforestry**?

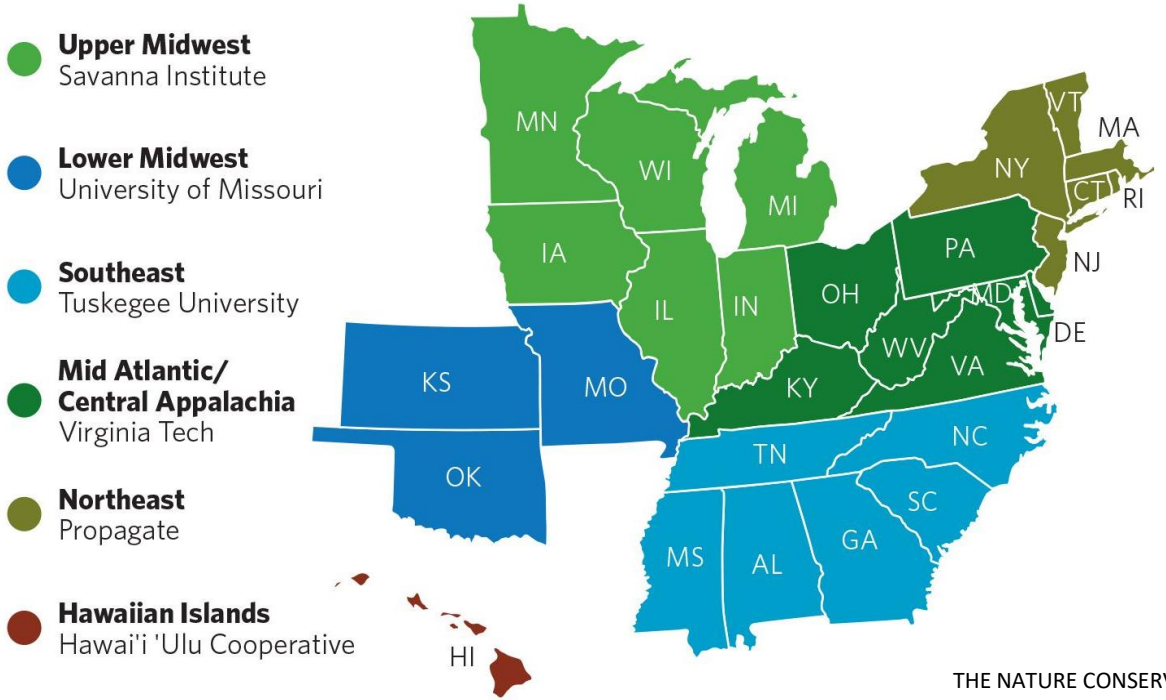
Widespread adoption of agroforestry practices will benefit climate and nature and support the well-being of farmers, ranchers and communities.



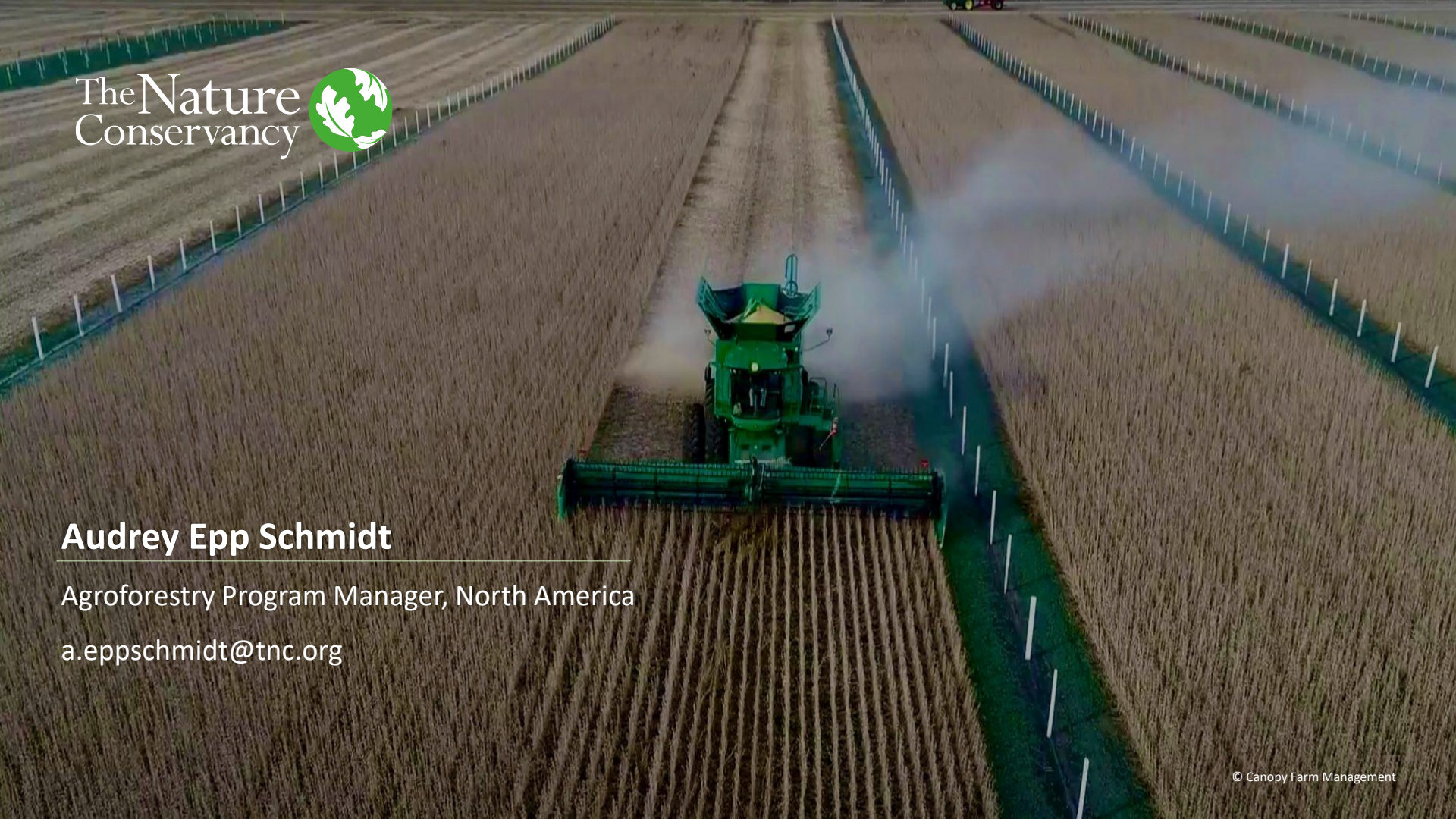
Partnerships for Climate-Smart Commodities Grant

Expanding Agroforestry Production & Markets for Producer Profitability & Climate Stabilization

$60M • 5 Years • 29 States • 27 Partners




The Nature Conservancy
© Canopy Farm Management



Audrey Epp Schmidt

Agroforestry Program Manager, North America

a.eppschmidt@tnc.org


HOPE
CENTER

Context

- The average income of a Blue Island resident is $18,867 a year. The US average is $28,555 a year.
- The average income of a Robbins resident is $14,801 a year. The US average is $28,555 a year.
- Food apartheid is a concern for these two predominately Black and Brown communities that are food deserts.
- Unemployment is also an obstacle, with both cities have unemployment rates close to twice the national average.


WINGS OF HOPE
HOPE GARAGE
HOPE GARDEN
HOPE CENTER
HOPE CENTER
HOPE CENTER
HOPE TECHNOLOGY
HOPE MEDIA

Hope Garage

Hope Tech


HOPE
GARDEN
HOPE
CENTER


TRAIN TRACKS
PUBLIC ALLEY
PARKING LOT
NEIGHBORING BACKYARDS


Saving/ Budgeting

Agriculture, Solar, and the AgriSolar Clearinghouse: A Win-Win for the Farm Bill

STACIE PETERSON, PHD, NATIONAL CENTER FOR APPROPRIATE TECHNOLOGY
ENERGY PROGRAM DIRECTOR

AgriSolar Clearinghouse

What is Agrisolar?

- Agrisolar is the co-location of agriculture and solar within the landscape.
- Solar developments will cover over 3 million acres in 10 years.
  - If these lands become energy-only production it will impact farms, habitat, soil health, and communities.
- There is tremendous opportunity for low-impact solar development that is complementary with sustainable agriculture, known as AgriSolar.
- It includes solar co-located with crops, grazing, beekeeping, pollinator habitat, aquaculture, dairies, and crop processing.
- In addition to photovoltaics, it also includes concentrated solar.
- Other terms include: agrivoltaics, dual-use, co-location, agri-pv

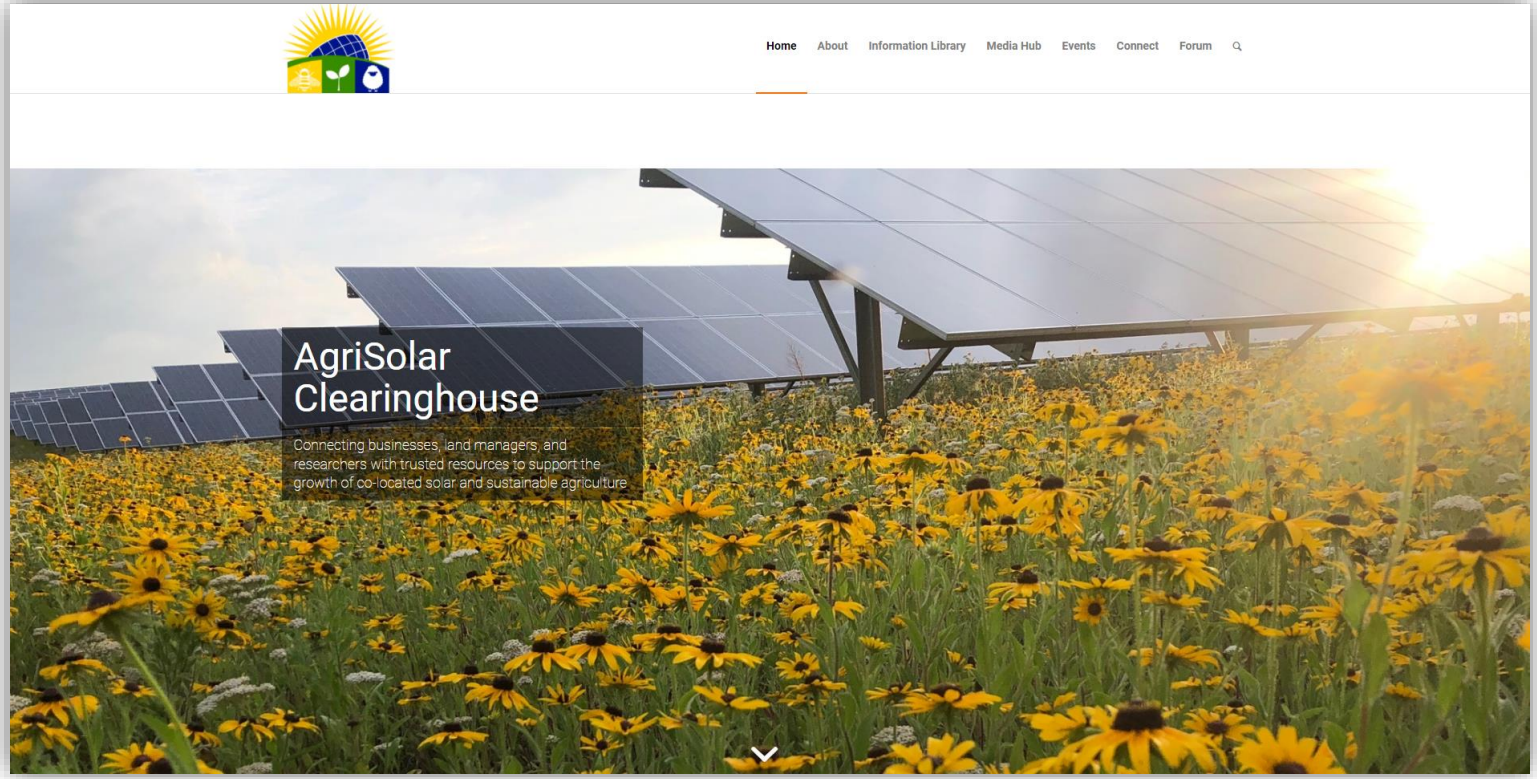
With Agrisolar, You Harvest the Sun Twice.

- Once with the solar panel and again with crops, forage, honey, and habitat.
- It can help you get the most productivity out of your land, while also supporting the crops, community, and ecosystem around it.
- When designed and managed with best practices, AgriSolar can:
  - Diversify farm revenue,
  - Increase rural energy independence,
  - Decrease crop irrigation by half in heat-stressed areas,
  - Increase solar panel efficiency,
  - Promote grazing as vegetation management,
  - Increase soil organic matter and carbon accrual,
  - Improve ecosystem health and support native species,
  - Triple local pollinators like bees, butterflies, birds, and bats.

Federal Program That Support AgriSolar

- U.S. Department of Energy Solar Energy Technology's Office:
  - AgriSolar Clearinghouse
  - Innovative Solar Practices Integrated with Rural Economies and Ecosystems (InSPIRE)
  - Foundational Agrivoltaic Research for Megawatt Scale (FARMS) projects
- USDA Partnerships for Climate-Smart Commodities
  - University of Texas Rio Grande Valley: Validating Agrivoltaic Technology with Underserved Agricultural Producers (NCAT/AgriSolar Clearinghouse is a partner)
  - University of Arizona Climate Smart Food
  - Low Carbon Beef
- REAP
- Hopefully more soon!

Welcome to the AgriSolar Clearinghouse



An NCAT-developed, U.S. Department of Energy -funded relationship-building, information-sharing network.
Funding ends May 2024

AgriSolar Clearinghouse Features

- Information Library
- Original Media
  - Best practices
  - Short film series
  - Technical assistance pieces
  - Fact sheets
  - Case studies and atlas
  - Financial assistance state-by-state map
  - Podcast serial
- Media Hub
- Individualized Technical Assistance
- Education
  - Webinars
  - Self-paced tutorials
  - In-person and virtual presentations
- User Forum
- Events
- Field Trips and Farm to Table Events

Recent Publications

Policy Approaches for Dual-Use and Agrisolar Practices

By Heidi Kolbeck-Urlacher, Center for Rural Affairs
April 2023

CENTER for RURAL AFFAIRS

CONTENTS

INTRODUCTION

As demand for clean energy increases, solar deployment is expected to rise. Because utility-scale solar requires considerable land use, many state and local governments are prudently discussing the impact future solar development will have on agricultural lands. The practice of dual-use solar, which refers to allowing two uses to be accomplished in the same space, can address concerns about solar on agricultural land.[1]

Agrisolar, also called agrivoltaics, is the co-location of agriculture and solar within the landscape. It includes solar co-located with crops, grazing, beekeeping, pollinator habitat, aquaculture, and farm or dairy processing. In addition to photovoltaics, it also includes concentrated solar installations.[2] The practice of combining agriculture and solar energy systems can provide numerous economic and environmental benefits. This includes improving economic viability for landowners and agricultural entities, providing beneficial ecological services, and expanding siting

1 Marieb, Dugan. "Dual-use Solar in the Pacific Northwest: A Way Forward." Renewable Northwest, 2019, Accessed March 2023.
2 Personal communication, Stacie Peterson, Energy Program Director, National Center for Appropriate Technology, March 2023.

AGRISOLAR POLICY GUIDE

TABLE OF CONTENTS

Introduction

The AgriSolar Policy Guide was designed to facilitate policy learning and innovation in the United States. By collating existing initiatives and key provisions, this guide serves as a resource for regulators, land use planners, decision makers, and others who are interested in state of the art agrisolar policy. The AgriSolar Clearinghouse is impartial towards policy; the intention of this guide is not to advocate for certain initiatives, but to provide a central platform for education and engagement. The goal of this guide is to support policy innovation for better co-location.

The policy initiatives included in this guide were selected to feature a full suite of state-level and a sampling of county-level regulatory strategies across different types of agrisolar practices (crops, grazing, and pollinator habitat). These policy initiatives showcase a range of approaches to drive innovation in farmland solar, including market mechanisms, scoring systems, mandates, and voluntary programs.

Despite the diversity of approaches, one common goal persists across all initiatives: to promote the expansion of renewable energy in a manner that mitigates impacts to farmland. To that end,

AgriSolar Ownership: A Guide for Farmers, Ranchers, Communities, and Landowners to Co-locate Agricultural Production and Solar Generation

By Carl Bertsen, NCAT Energy Engineer
May 2023

CONTENTS

ABSTRACT

This guide serves as an introduction to the solar industry, relative to agrisolar development in the United States, community programs, and solar ownership or lease opportunities for homes, farms, and ranches. It covers ownership options for small-scale, single-user solar installations, community solar installations that distribute power throughout a community, and utility-scale installations that sell power to the utility, as well as common utility-scale land-lease components for landowners looking to allow a developer to construct and operate a solar installation on a portion of their land. Finally, using nationwide average statistics on production and cost, the guide offers a financial snapshot of a utility-scale solar installation.

INTRODUCTION

This guide serves as an introduction to the solar industry, relative to agrisolar development in the United States, community programs, and solar ownership or lease opportunities for homes, farms, and ranches. The guide will touch on single-user systems in the 5kW – 50kW range, medium-scale solar projects in the 50kW and larger range, and utility-scale solar sites that are larger than 1MW. Utility and community solar power generation involves complex ownership structures where the solar site, solar power generating array, and power distribution network may be owned by different entities.

From 2010 to 2020, the cost of utility-scale photovoltaic (PV) systems decreased by 82%, driven mainly by lower hardware costs, and PV module prices dropped 85% (Feldman, 2021). Solar power accounted for 0.1% of all power generated in the U.S. in 2010—increasing to nearly 5% in 2022—and for 50% of new electric capacity added to the grid (SEIA, 2022). Large- or utility-scale solar installations account for most of this increased solar generation

Win-Win

- AgriSolar can be a win-win on the ground
- On farms
- For climate, energy, and the economy
- Agrisolar/agrivoltaics is a win-win for the Farm Bill
- The AgriSolar Clearinghouse can help

Thank You

Environmental and Energy Study Institute (EESI)

U.S. Department of Energy Solar Energy Technologies Office

USDA

NCAT

AgriSolar Clearinghouse team, partners, and community

Contact: agrisolar@ncat.org

We’re stronger together

Biochar

EESI
Environmental and Energy Study Institute

Kathleen Draper
biocharro2@gmail.com

Agenda

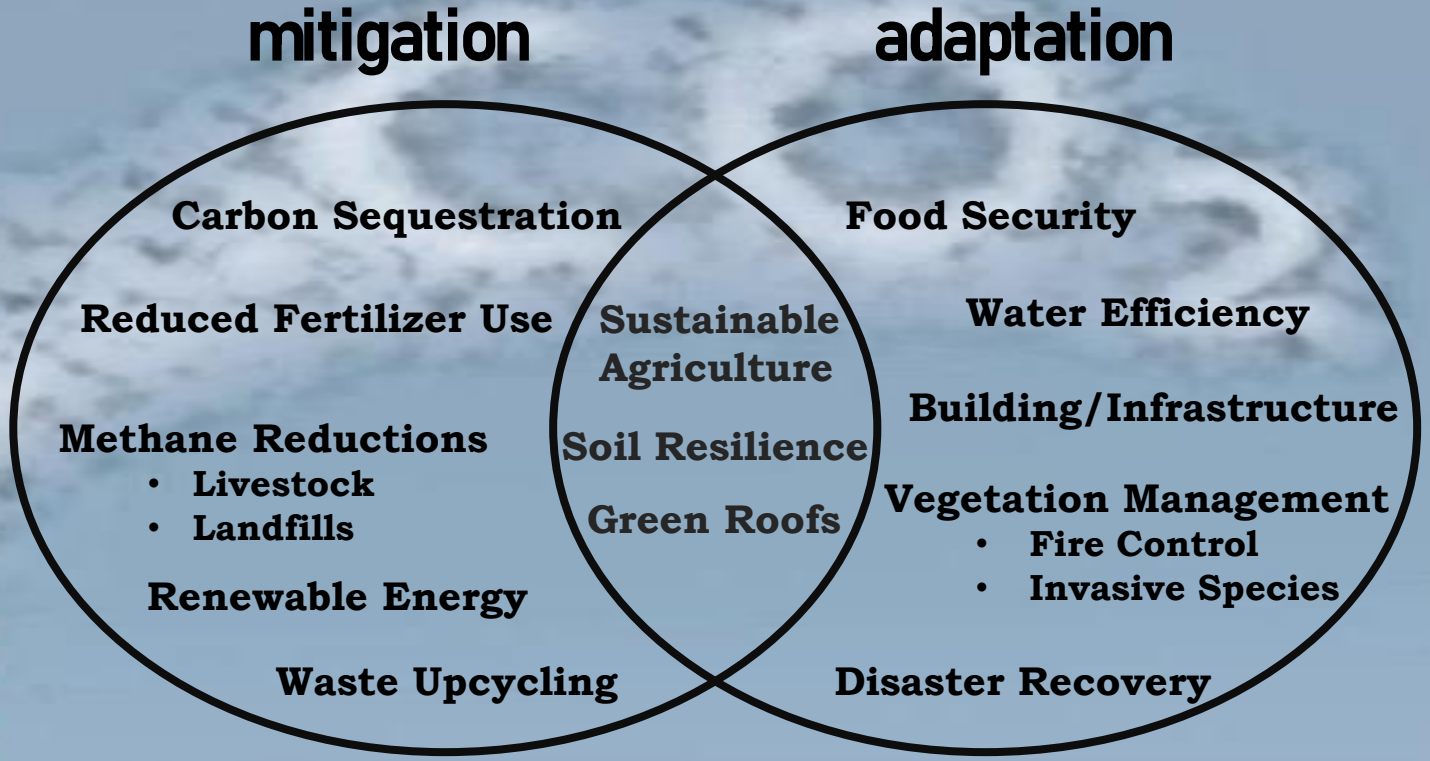
- What is Biochar?
- Biochar Production
- Biochar & Climate Change
- Composting & Biochar
- Anaerobic Digestion & Biochar
- Federal support
- Where to learn more

What is biochar?

Biochar Production

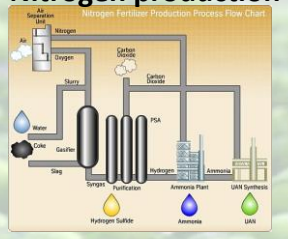
- Thermochemical conversion
- Scalability
- Co-products

Biochar & Climate Change



Climate Change: Biochar & Nitrogen

Nitrogen production



11.2. Commercial Examples | netl.doe.gov

50 – 75% LOST

Nitrogen application

Vaporization/oxidation into **AIR**

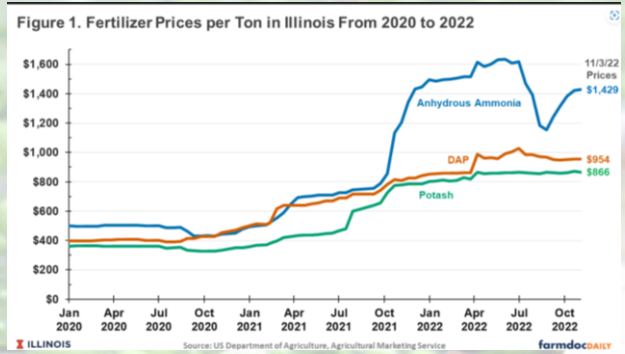
- Air pollution
  - Asthma & other health impacts
- Nitrous oxide
  - GHG 300x worse than CO2
  - In atmosphere for 100+ years

Leaching into **SOIL**

- Groundwater contamination
- Soil Acidification
- Biodiversity loss

Run-off into **WATER**

- Algal blooms (more GHGs)
- Eutrophication (fish kill)



- **N fertilizer contributes ~2% of global GHGs**
- **Uses 3 – 5% of world's fossil fuels (mostly NatGas) but projected to account for largest share of growth through 2026.**

Benefits of biochar-based N fertilizer

- Need less N fertilizer as it improves NUE => cost and carbon savings
- Less leaching & run-off
- Improves pH (mitigates soil acidification)

Composting & biochar

- Reduces GHGs
- Reduces odors
- Improves nutrient mgmt
- Reduces time to finished compost
- Enhances microbial diversity and activity
- Longer lasting carbon (eligible for carbon removal credits)
- Immobilizes potentially toxic metals, herbicides, organic pollutants

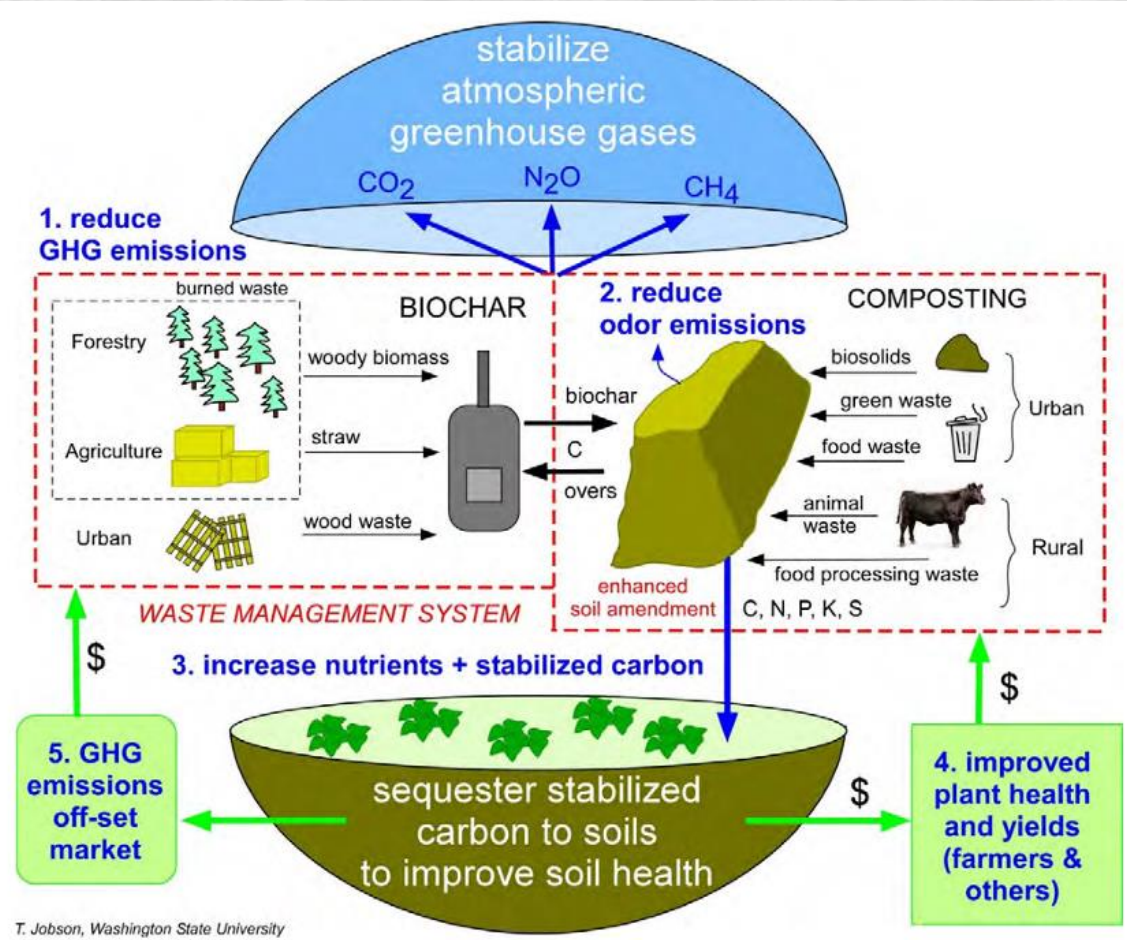
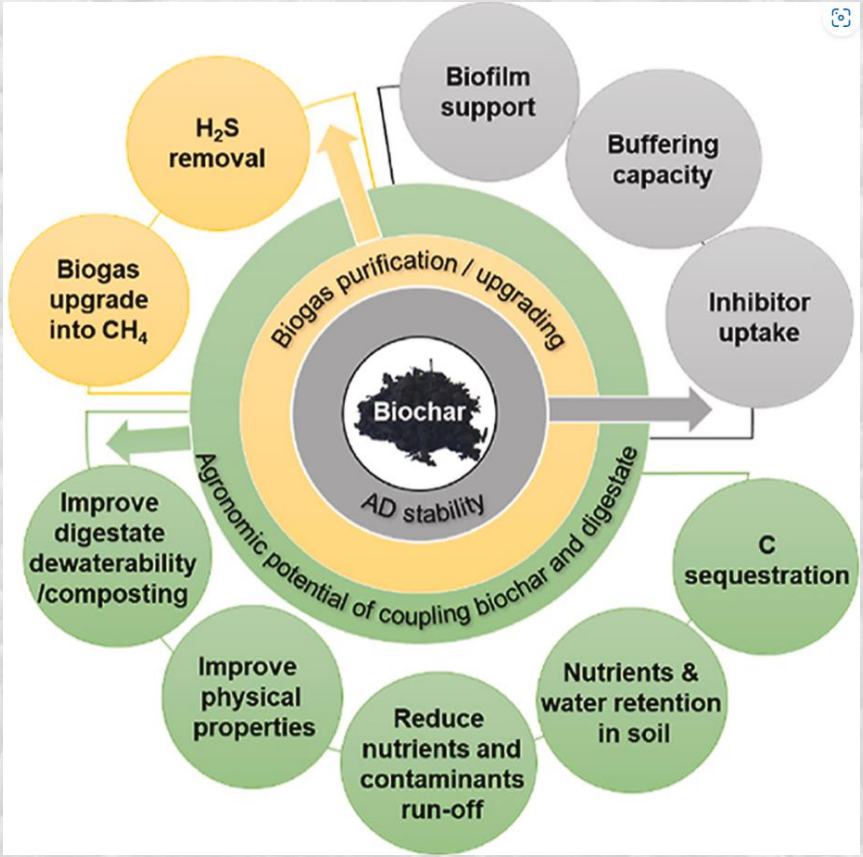


Figure 7.5. *Incorporation of biochar in composting operations can yield multiple benefits.*

Source: extension://elhekieabhbkpmcefcoobjddigjcaadp/https://s3.us-west-2.amazonaws.com/wp2.cahnrs.wsu.edu/wp-content/uploads/sites/32/2021/11/Biomass2Biochar-Chapter7.pdf

Anaerobic digestion & biochar

- Reduces volume of digestate quickly
- Improve quality & quantity of CH4
- Heat can be used to heat up digester
- Longer lasting carbon



https://www.sciencedirect.com/science/article/abs/pii/S1364032121008790#undfig1

Federal Support

- **NRCS Soil Carbon Amendment Protocol**
- **USFS support for US Biochar Initiative**

Picture credit: Pacific Biochar

Want more info?

- **IBI Biochar Academy** (June 19 – 30) & **Field Days** (June 22 – 23)
- **International Biochar Initiative**
- **US Biochar Initiative**
- **US Forest Service Webinars**

CHARpe Diem!

Kathleen Draper
biocharro2@gmail.com

Briefing Series: Farm Bill in Focus

EESI
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Every Other Wednesday

The Process and Path Forward for Passing a Bipartisan Farm Bill | Recording Available

Climate, Energy, and Economic Win-Wins in the Farm Bill | May 10, 1:30-3:00 PM EDT

Unlocking Rural Economies: Farm Bill Investments in Rural America | May 24, 2:00-3:30 PM EDT

The Future of Forestry in the Farm Bill | June 07, 2:00-3:30 PM EDT

Conservation Practices from Farms to Forests and Wetlands | June 21, 2:00-3:30 PM EDT

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What did you think of the briefing?

Please take 2 minutes to let us know at:
www.eesi.org/survey

***Materials will be available at*:**
www.eesi.org/051023farmbill

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Wednesday, May 10, 2023