

# The Green Economy and Midwest Agriculture



Perspectives on the Future of Agriculture  
Federal Reserve Bank of Chicago  
December 1, 2009

# Transform the Great Lakes Region into a Vital Center of the Green Economy



# 2020 Goals



**Achieve green ratings for 100 buildings & develop 200 sustainability programs**



**Make green choices a part of mainstream thinking**



**Generate \$250 million in investments for pollution prevention, remediation, and reuse**

# 2020 Goals



**Create 50 cutting-edge sustainable models for community economic development**

**Reduce carbon emissions by 12 million tons by forging unique partnerships, enacting climate change programs, and promoting energy efficient practices**





**The environment is only one  
aspect  
of a sustainable agricultural  
system**

# Grass Bioenergy



- Delta completed feasibility study in 2008 for a coal-based utility.
- Potential growers expected utility to help establish and purchase biomass, but utility was not prepared to shoulder the full burden.
- USDA Biomass Crop Assistance Program (BCAP) now lists over 250 conversion plants for grass/waste material/woody biomass.
  - 1 IL, 1 IN, 3 IA, 8 MI, 5 WI
- Perennial polycultures are the most ecologically beneficial; can be established now for feed and fuel with potential for food crops.

Production Flowchart and Annualized Costs for Miscanthus and Switchgrass

	Seed/ Rhizomes	Field Prep	Maintenance	Harvest	Transport	Storage	Combustible Biomass
	\$/Acre	\$/Acre	\$/Acre	\$/Acre	\$/Acre	\$/Acre	\$/Ton
<b>Miscanthus</b>							
Khanna et al.	9.97	10.81	19.47	272.66	66.36	36.90	8.39 <b>49.57</b>
Delta	26.75	20.89	40.58	340.49	172.67	46.03	8.38 <b>77.28</b>
AWI	16.27	-	22.78	297.77	74.77	TBD	10 <b>62.39</b>
<b>Switchgrass</b>							
Khanna et al.	6.60	9.03	28.18	84.58	19.23	10.06	2.43 <b>64.81</b>
Delta	14.50	15.69	55.38	106.61	50.47	12.67	2.45 <b>104.21</b>
AWI	19.84	-	30.17	122.78	28.87	TBD	4 <b>110.32</b>
Duffy	7.98	6.44	23.63	129.31	14.75	66.68	4 <b>93.66</b>
Perrin et al.	12.23	-	28.56	32.48	91.00	-	2.83 <b>58.04</b>

# Grass Bioenergy Opportunities



- **Conversion plants are highly scalable.**
  - ▶ **Home heating to direct use (up to 20% w/o retrofit) in co-fired boilers**
- **Much of infrastructure already exists (though with constraints).**
  - ▶ **Harvesting equipment, drying and storage, truck/rail shipping**
- **New federal support addressing grower vs. end-user impasse.**
- **Project revenue is more likely to recycle throughout community.**
  - ▶ **Local conversion plant has a strong incentive to source biomass from as close as possible, keeping investment in local economy**
  - ▶ **Opportunity for local entrepreneurship throughout the supply chain**
- **Potential to shift the landscape (roughly 25 mn acres for corn ethanol alone) to perennials while enhancing the bottom line.**
  - ▶ **Further benefits in terms of reducing fossil and chemical inputs, water quantity and quality, habitat, soil organic matter, etc.**

**The value of agricultural  
production should not be  
measured solely in terms of yield**



# Carbon Aggregation



In 2005, the Illinois Environmental Protection Agency asked Delta if we could assist in figuring out how to link agricultural producers to the carbon market.



\$20,000 grant enabled us to create the Illinois Conservation and Climate Initiative by forming an innovative partnership with the State, several agencies, SWCDs, and a wide-ranging advisory committee. The initial focus was conservation tillage.

Conservation tillage has many benefits:

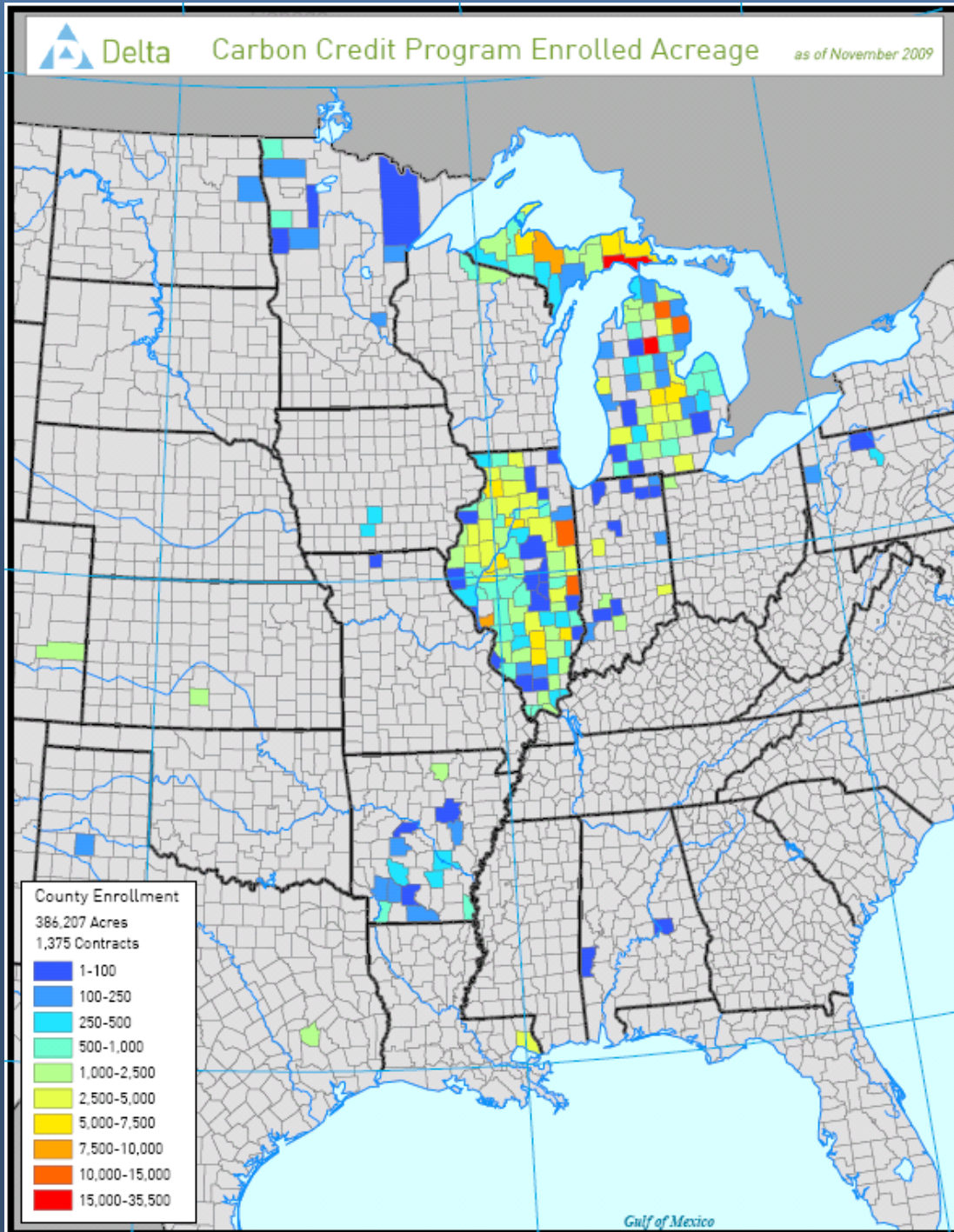
Soil enrichment • Improved drought resistance • Lower soil surface temperatures • Less passes on field reduces production costs • Soil conservation • Decreased sedimentation, nutrient and chemical runoff • Does not significantly affect crop yields

Delta needed to understand the agricultural system, identify key organizations to help with implementation, and understand the greenhouse gas market.

# Aggregation Enrollment

Acreage Submitted	All States
Total	386,207
Grass Acreage	49,866
Tillage Acreage	171,693
Forestry Acreage	24,977
Managed Acreage	139,671

Contracts Submitted	All States
Total	1,375
Soil	807
Grass	500
Tillage	127
Grass & Tillage	180
Forestry	426
Managed	142



# Program Results



- Expanded into Michigan with a similar program, and into 16 other states.
- Returned over \$2 million in revenue to enrollees.
- Developed new CCX protocol for Sustainably Managed Forests, as well as new applications of Energy Efficiency and Ozone-Depleting Substance Destruction Protocol.
- Established mechanism for creating and pooling similar projects of almost any size and type.



**Diversification of the agricultural system is necessary to meet the changing marketplace and policy landscape**

# Local Food Systems



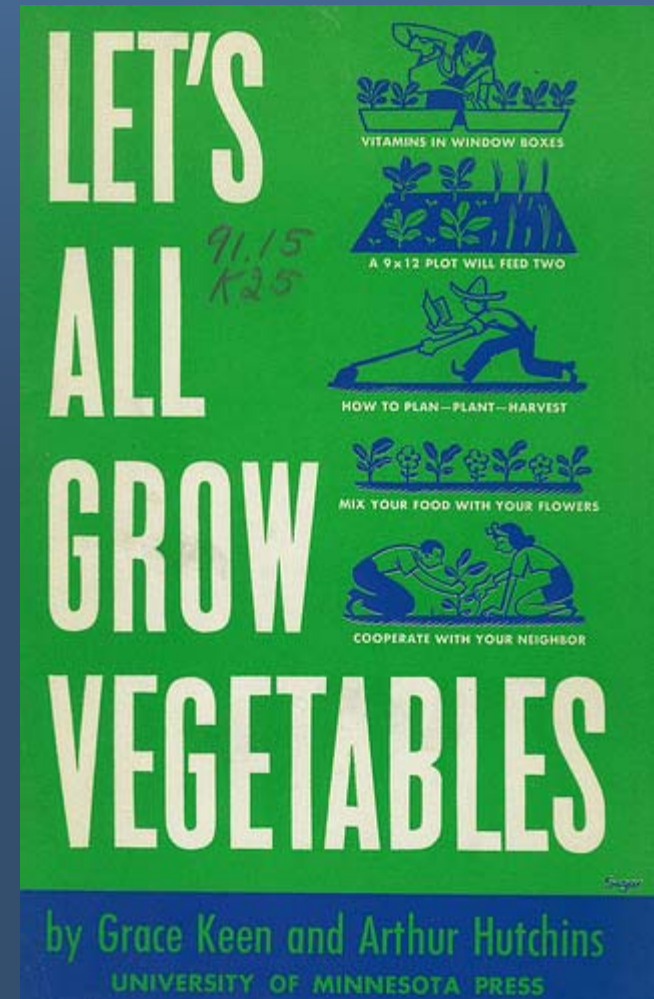
- Delta developed business plan for Windy City Harvest and Beeline/Sweet Beginnings in 2006.
- 2007 feasibility study for Lumpkin Family Foundation on east central Illinois local food capacity and enterprise development.
- Line between urban and rural agriculture is blurring.

<b><u>Trees</u></b> Apple Chinese Chestnut Pawpaw Sour Cherry Sugar Maple	<b><u>Vegetables and Roots</u></b> American Ginseng      Horseradish American Licorice      Endive Lettuce Asparagus      Iceberg Lettuce Black Mustard      Parsnip Brussel Sprouts      Peppers Carrot      Radish Celeriac      Squash, Acorn Celery      Squash, Butternut Chicory      Squash, Pumpkin Common Lespedeza      Tomato Fennel      Tomato, Cherry Garden Pea      Turnip Green Bean      Greens, Pak Choi Greens, Lamb's Quarters		<b><u>Beans</u></b> Chickpea Scarlet Runner Butter-Lima Kidney Fava Blackeyed-Cowpea Assorted Lentil
<b><u>Grain and Grass</u></b> Catnip      Clover Forages      Jungle Rice Quinoa      Sorghum Slender Wheat Western Wheatgrass Ryegrass: Ann/Peren. Rye: Spring/Summer Millets: Finger, Foxtail, Indian Barnyard, Proso, Japanese	<b><u>Herbs</u></b> Cilantro      Sweet Marjoram Sage      Summer Savor Spearmint		<b><u>Fruits</u></b> Cantaloupe Elderberry Mulberry Persimmon, Amer. Raspberry, Amer. Red Raspberry, Red Raspberry, Black Red Currant Strawberry



# Local Food Systems

- Community Supported Agriculture and organic operations now tracked in USDA Ag Census and are growing rapidly.
- Slow but steady re-emergence of processing and distribution infrastructure.
  - ▶ Growing demand from high-volume institutional buyers
- Development of local food councils to sustain interest and change policy.
- Growing diversity of sources and scale.

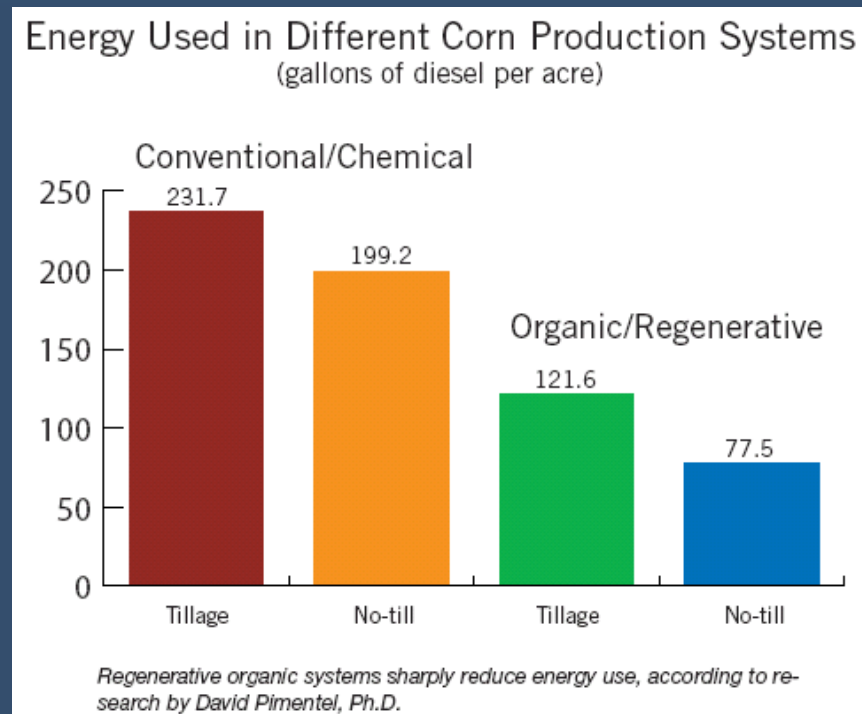




**Opportunities exist for creating robust agricultural systems to improve environmental quality, create new farm value, and increase diversity**

# Market Credit for Local Food Systems

- Growing interest in developing credit system for performance-based farming, integrating carbon and nutrient management.
  - ▶ Organic and regenerative
  - ▶ Displacement of fossil inputs (e.g. compost and biochar)
  - ▶ Runoff reduction
  - ▶ Comparative lifecycle benefits throughout the supply chain



# Stacked Payments for Agroecological Services

- Agroecology brings together human needs (food, feed, fiber, fuel, timber) and ecological improvement.
  - ▶ Managing for productive output, carbon sequestration, water quality, biodiversity, habitat, etc.
- USDA Office of Ecosystem Services & Markets anticipated to provide federal guidance and Farm Bill direction.
- Cap-and-trade legislation currently allows for credit stacking.
  - ▶ Not in Waxman-Markey (H.R.2454) or Kerry-Boxer (S.1733), but the Stabenow (S.2729) amendment is looked to for offset policy

111TH CONGRESS  
1ST SESSION

## S. 1733

To create clean energy jobs, promote energy independence, reduce global warming pollution, and transition to a clean energy economy.

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IN THE SENATE OF THE UNITED STATES

SEPTEMBER 30, 2009

Mr. KERRY (for himself and Mrs. BOXER) introduced the following bill; which was read twice and referred to the Committee on Environment and Public Works

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### A BILL

To create clean energy jobs, promote energy independence, reduce global warming pollution, and transition to a clean energy economy.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*  
3 **SECTION 1. SHORT TITLE; TABLE OF CONTENTS.**  
4 (a) SHORT TITLE.—This Act may be cited as the  
5 “Clean Energy Jobs and American Power Act”.

111TH CONGRESS  
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## H. R. 2454

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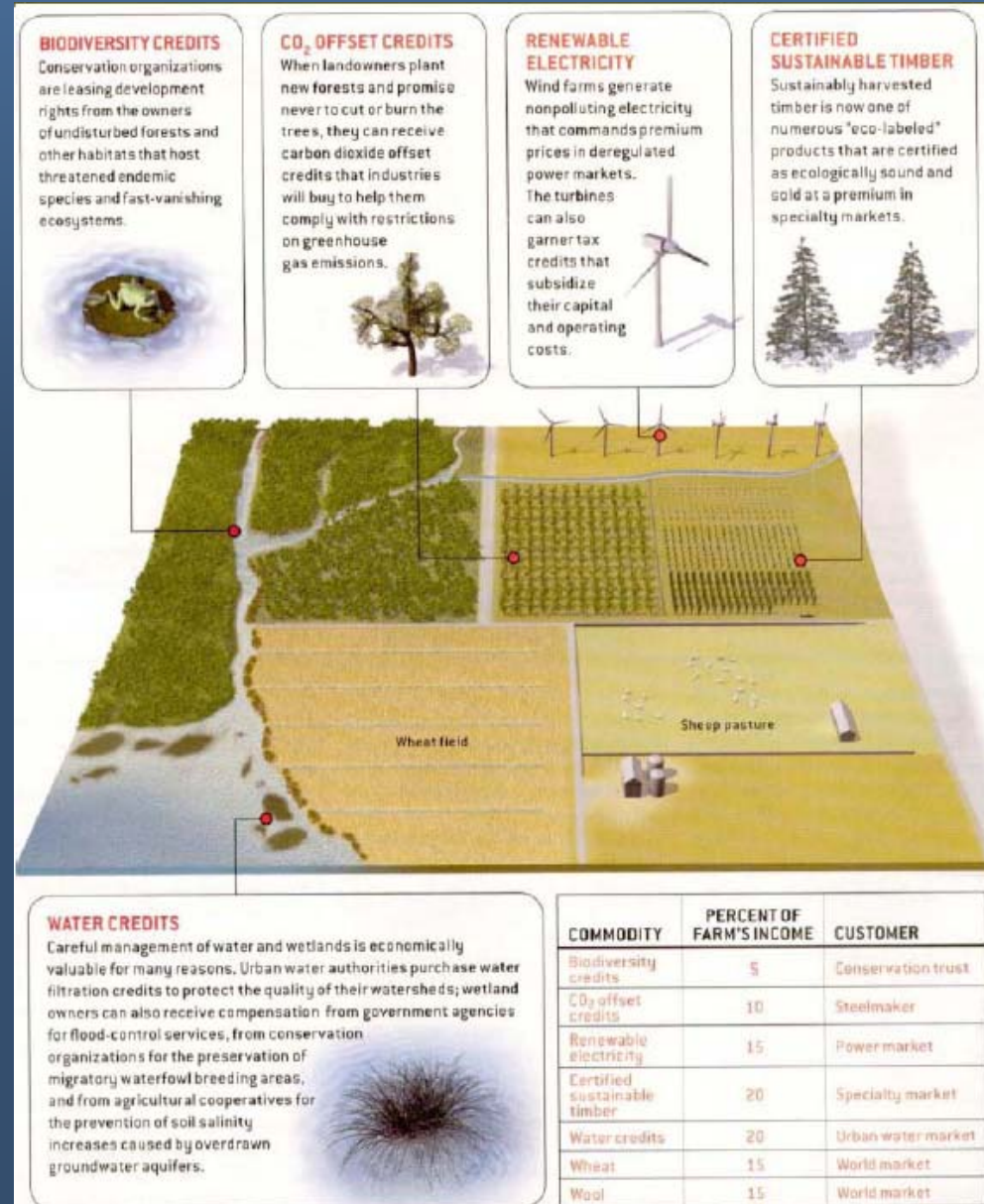
### AN ACT

To create clean energy jobs, achieve energy independence, reduce global warming pollution and transition to a clean energy economy.

1 *Be it enacted by the Senate and House of Representa-*  
2 *tives of the United States of America in Congress assembled,*

# Our Next Steps

- Continue to develop bottom-up pilots.
  - ▶ Gain on-the-ground experience that can be applied at scale
  - ▶ Incorporate existing and emerging federal/market programs and policies
- Constructively engage agriculture interests and partner with them to become a big part of the solution.
- Create a shared vision for a desirable and resilient future.





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