

Accessing the US Carbon Market

Update of Michigan Carbon Programs



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about us

Mission: Improve Environmental Quality and Promote Community Economic Development in the Great Lakes Region

Programs:

- Pollution Prevention & Energy Efficiency
 - Policy development, technical assistance, green design, implementation financing
- Brownfield Redevelopment
 - Financing, land assembly, site control, remediation
- Sustainability & Community Development
 - Sustainable purchasing, organic food systems, environmental training
- Emissions Trading Markets
 - Creating community benefits through aggregation and trading of carbon offset credits on the Chicago Climate Exchange



about me

Education

BS Forestry – Michigan State University

MS Environmental Law – Vermont Law School

Work Experience

US Forest Service

- Mt Hood NF
- Tongass NF
- Huron-Manistee NF
- Southern Research Station

Private Industry

- Rothig Forest Products



what is global warming

- Gases form a blanket around the earth, trapping heat from the sun within the earth's atmosphere
- Six primary greenhouse gases
 - Carbon dioxide
 - Methane
 - Nitrous Oxide
 - Sulfur Hexafluoride
 - Perfluorocarbons
 - Hydroflurocarbons



global carbon dioxide cycle

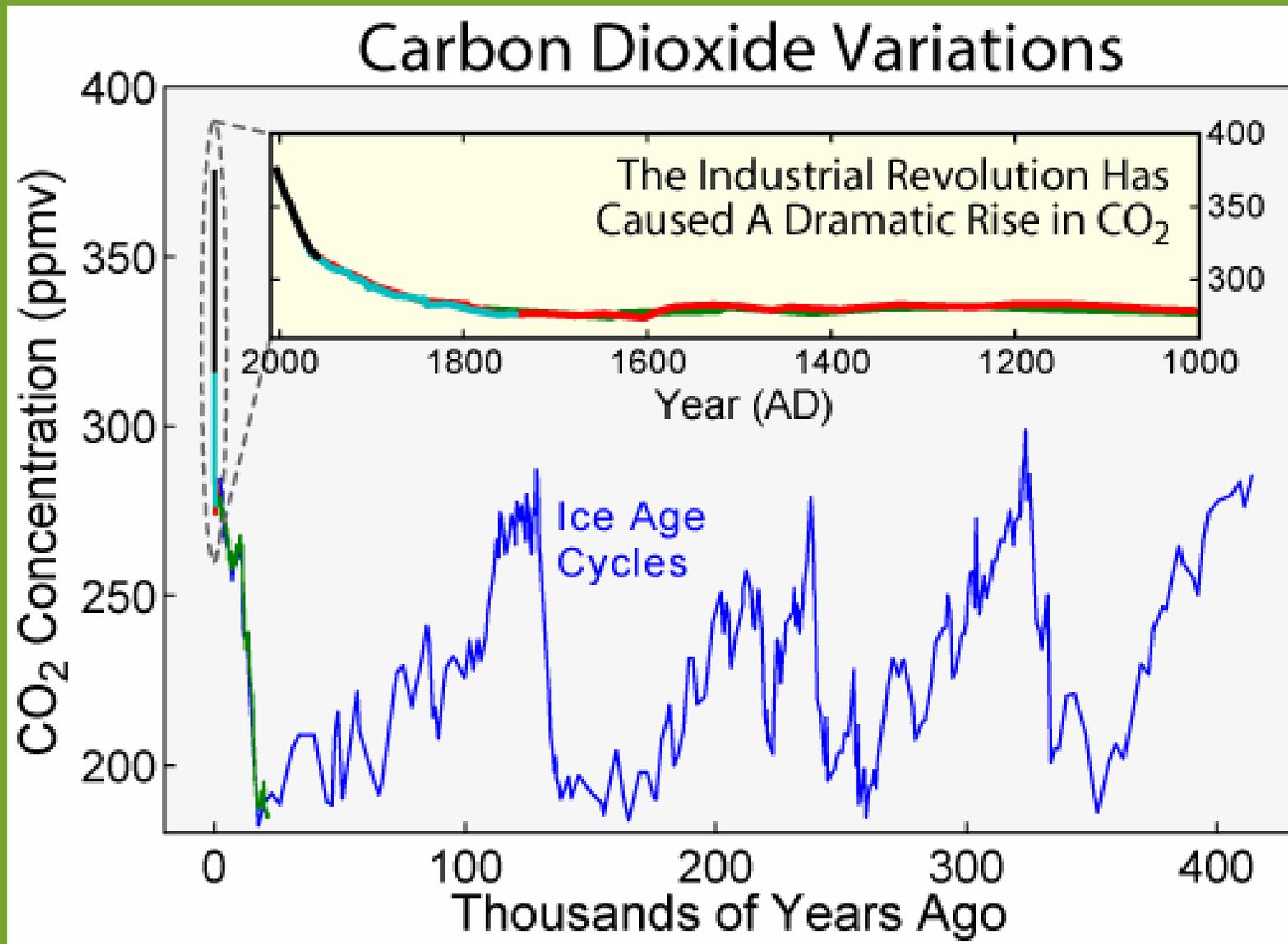


Illustration courtesy of Globalwarmingart.com

global carbon dioxide cycle

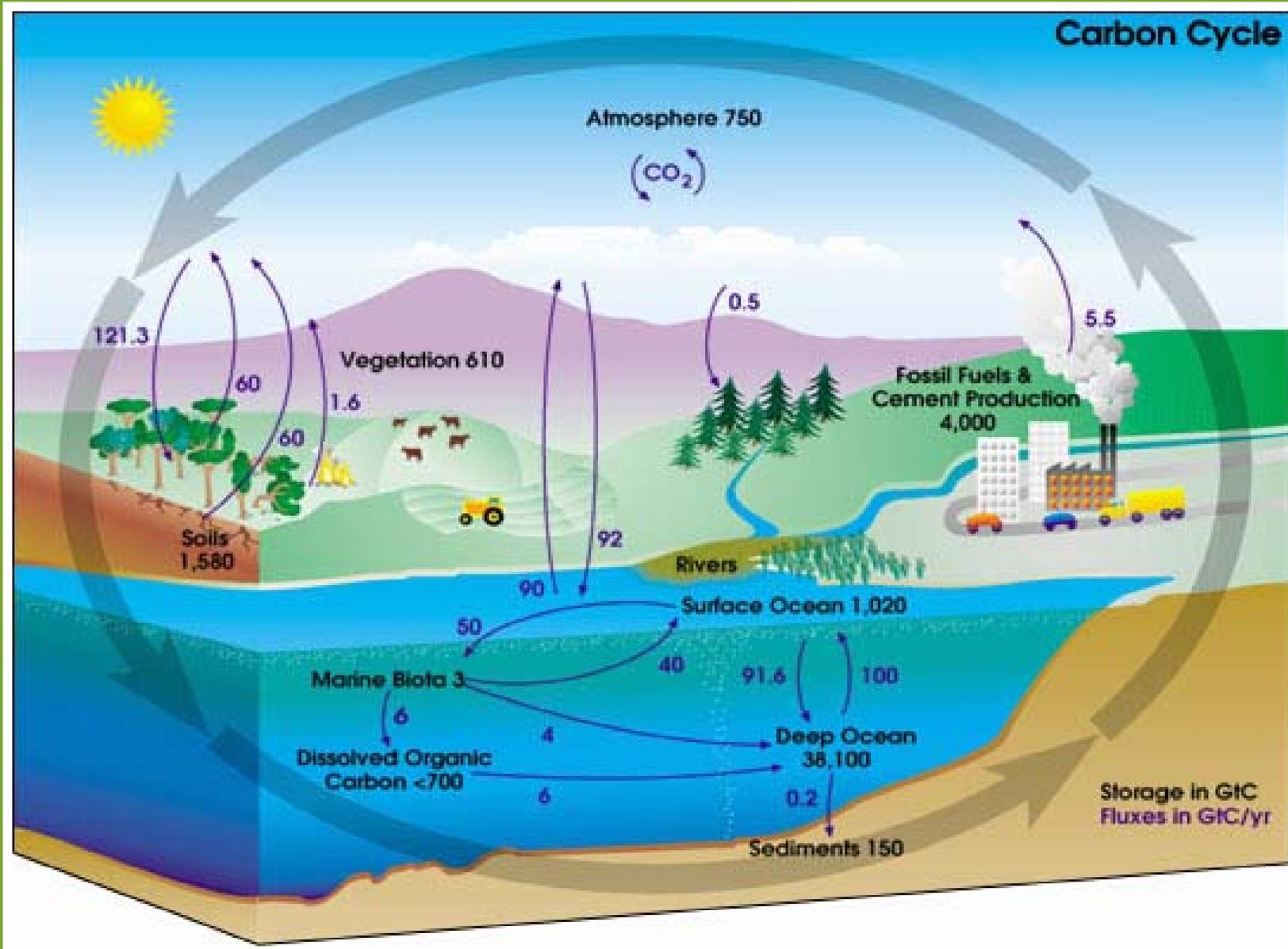


Illustration courtesy of NASA Earth Science Enterprise

emissions trading markets

Origin – 1990 Amendments to Clean Air Act

Environmental Problem - Acid Rain

Solution – Cap-and-Trade mechanism to regular sulfur dioxide emissions from power plants

Cap-and-Trade Basics:

- Government caps the level of SO₂ emissions and distributes permits in one-ton increments for its release
- Each power plant must have enough permits to cover annual emissions
- Power plants that cannot cover annual emissions must either reduce emissions or buy surplus permits from other sources
- The government reduces the cap frequently, increasing the value of a permit
- Over time, becomes more economical to reduce emissions than to continue buying permits

Results:

- 1980 – emissions at 17.5 million tons
- 2010 – cap set at 8.95 millions tons
- Market price - \$535/ton



Data Courtesy of EvolutionMarkets.com

Chicago Climate Exchange (CCX®)

- Voluntary, private, member-based, cap-and-trade market for the reduction of greenhouse gases
- Self-regulated market with legally binding emission reduction targets
- Cap is the member's average annual emissions from 1998-2001
- Phase 1 Members – 4% reduction by 2006; 6% by 2010
- Phase 2 Members – 6% by 2010

The Delta Institute is an Associate Member and Registered Aggregator on the Chicago Climate Exchange

- Over 300 Members
 - Ford, Dow Chemical, DTE Energy, DuPont, Eastman Kodak, Waste Management, Cargill, International Paper, Michigan State University, City of Chicago, State of New Mexico
- Emission Reduction Results
 - 2003 – 32,806,900 mT (9.0%)
 - 2004 – 42,711,000 mT (12.1%)
 - 2005 – 32,540,200 mT (9.7%)
 - 2006 – 20,819,600 mT (5.9%)



the role of carbon offsets

- Carbon offsets are a new commodity that has developed as a result of the carbon market
 - Basic concept – past emissions can be reduced or future emissions prevented through various activities
 - Prevention of future emissions
 - Conservation tillage – limits the release of carbon through low impact agricultural practices
 - Anaerobic manure digesters – capture methane (a powerful greenhouse gas), allowing it to be used for energy or flared into CO₂, a less potent greenhouse gas
 - Landfill gas & Coal bed methane
 - Grass planting – prevents soil disturbance, while storing some CO₂
 - Reduction of past emissions
 - Tree planting – CO₂ removed from atmosphere via photosynthesis and sequestered within the tree
- Members can “offset” a ton of emissions by purchasing a ton of credits
- Members can use offset credits to meet 3% of their 6% target

accessing the emerging carbon market

Michigan Conservation & Climate Initiative

- Joint program between the Delta Institute, Michigan Association of Conservation Districts and Michigan Department of Agriculture
 - Landowners enroll lands with eligible conservation practices, earn offset credits
 - Delta Institute aggregates credits from multiple landowners and sells the credits on behalf of the landowner
 - www.michiganclimate.org

Managed Forest Carbon Offset Program

- Joint program between the Delta Institute and the Michigan Department of Natural Resources
 - Landowners enroll existing forestlands and receive carbon credits for maintaining or improving the carbon sequestration potential of the trees
 - A much higher standard and more intensive program
 - www.deltacarbon.org

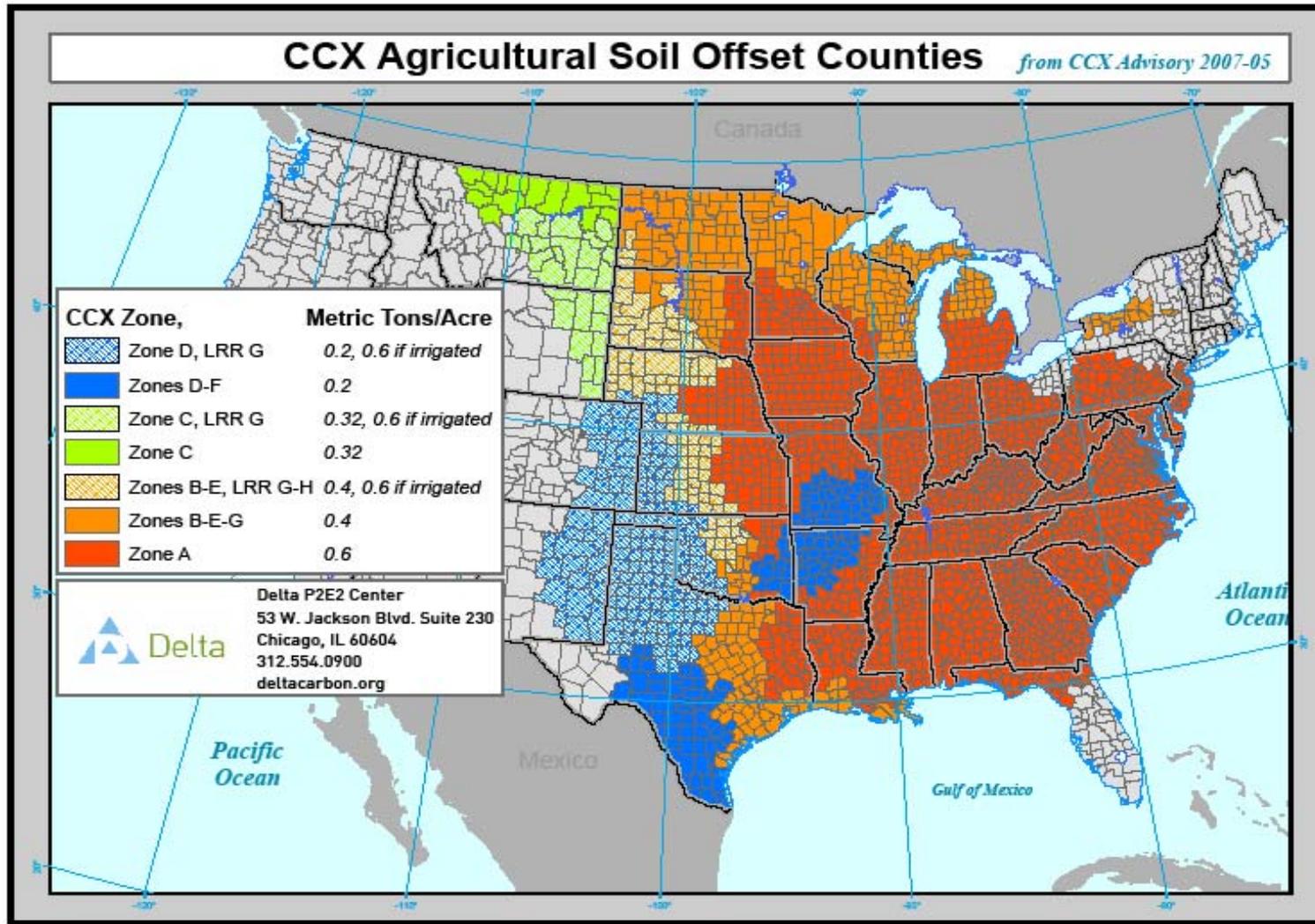
MCCI advisory committee

- Corn Marketing Program of Michigan
- Office of Governor Jennifer Granholm
- Michigan Agri-Business Association
- Michigan Association of Conservation Districts
- Michigan Department of Agriculture
- Michigan Department of Environmental Quality
- Michigan Department of Natural Resources
- Michigan Environmental Council
- Michigan Farm Bureau
- Michigan Soybean Promotion Committee
- Michigan State University Extension
- Michigan United Conservation Clubs
- Pheasants Forever
- The Nature Conservancy
- USDA - Farm Service Agency
- USDA - Natural Resources Conservation Service

MCCI program eligibility

1. Conservation Tillage (no-till)
 - Credited at 0.4 or 0.6 tons per acre per year
 2. Permanent Grass Plantings
 - Credited at 1.0 tons per acre per year, if established after 1/1/99
 3. Tree Plantings
 - Credited between 1 - 3 tons per acre per year, depending on species, if established after 1/1/90
 4. Methane Collection (manure digesters)
 - Credited at 21 tons per every ton of methane destroyed
- Contractual commitment through 2012
 - No enrollment costs; enrollment assistance available through local conservation district offices
 - Annual credit sales at the market price
 - CRP/CREP lands are eligible

soil offset eligibility



Benefits of soil offsets

1. Provides financial incentives for the implementation conservation measures
 - Continuous Conservation tillage
 - 75% reduction in run-off
 - 98% reduction in sediment loss
 - 95% reduction in nitrogen losses
 - 92% reduction in phosphorous losses
 - 80% reduction in pesticide losses
2. Generates additional revenue for landowners
 - Pay property taxes
 - Protect family farms
 - Provide revenue for stewardship activities

Methane Digester Eligibility Requirements

1. Eligible Systems

- Covered anaerobic digesters
- Complete-mix
- Plug-flow
- Covered lagoons



2. Project must be surplus to U.S. regulation and activated after January 1, 1999

3. Baseline manure mgt practice must be liquid manure

- Liquid/slurry storage
- Pit storage below animal confinements
- Uncovered anaerobic lagoons

4. Must demonstrate clear ownership rights of the environmental attributes

5. All projects must be independently verified by approved, third-party, CCX verifier

Methane Digester Program Specs

1. Qualifying projects may earn credits for years 2003-2010
 - Retroactive credits for older projects
2. Offsets issued at a rate of 21 metric tons CO₂ per ton of methane combusted
3. Offsets are issued at a rate equal to the lesser of the metered amount and a per animal default methane emissions rate
 - Many digesters increase methane production, allowing for digesters to produce more methane than would be normally created in their absence
 - CCX only awards credits for methane destruction below what would have been emitted in the absence of the system
4. Agricultural entities that have significant direct GHG emissions, must join CCX as a member and commit to the reduction schedule before they can register offset projects

Benefits of Methane Digesters

1. Selling energy to third party or using energy on-site does not preclude project from receiving carbon credits, provided the project owner has retained ownership of GHG rights
2. Methane collection projects that include electricity generation may also qualify for Emission Offset Credits from Renewable Energy based on displaced emissions
 - 0.4 mT per megawatt hour
 - Project owners must demonstrate ownership of environmental attributes
 - Can't earn credits to meet local or state obligations, i.e. renewable portfolio standards
 - To prevent double counting, owner must surrender any Renewable Energy Credits (RECs) earned by the project
3. New Income Source
 - Carbon credits, renewable energy credits
 - Electricity sales
4. Reward for sustainable farming
5. Improved environmental quality
 - Reduce odors



Benefits of Methane Digesters

1. Methane projects are highly desirable!!!
2. Benefits are easily quantified and permanent, if projects are adequately documented and verified
3. Environmental benefits could be used in multiple trading schemes
 - Chicago Climate Exchange
 - Regional Greenhouse Gas Initiative – RGGI
 - California Trading Program
4. Of all the agricultural offset opportunities, methane projects will most certainly be allowed in the future regulated market

Michigan Forest Carbon Offset & Trading Program

Basic Elements

- Non-industrial working forest.
- Carbon inventory that meets the program criteria.
- Sustainability Certification
 - American Tree Farm Group Certification
 - SFI
 - FSC
- Management is occurring according to a sustainable forest management plan.
 - Forest Stewardship Plan most common
- No minimum acreage requirement, but landowners with less than 150 acres may not recoup their initial costs over contract period
- Technical Assistance Revolving Loan Fund
 - Landowners can request fund to pay initial carbon inventory costs
 - Must repay fund, interest free, upon each credit sale

managed forest carbon enrollment process

1. Landowners sign contract through 2010 and enroll land
2. Inventory forest stands using qualified forester
3. Delta enters inventory data into CCX-approved computer model to establish carbon baseline
 - Delta 'grows' the forest stand each year to determine growth, rate of sequestration
4. Landowners provide annual updates of changes in carbon stocks
5. Verification by third-party, perhaps in-field
6. Delta sells the credits with net profits returned to landowners
 - Aggregation & Data Management Fee – 10% of gross revenue
 - CCX Trading Fee - \$0.20 per ton
 - Technical Assistance Debt
 - Verification fees

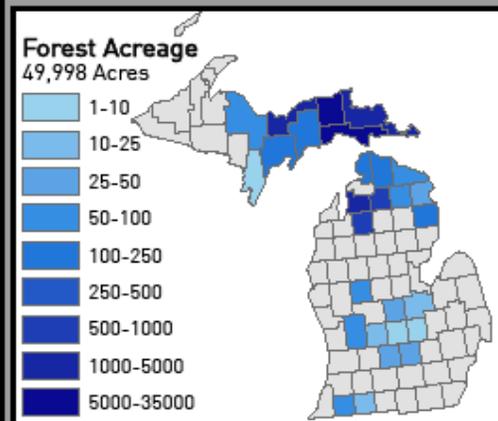
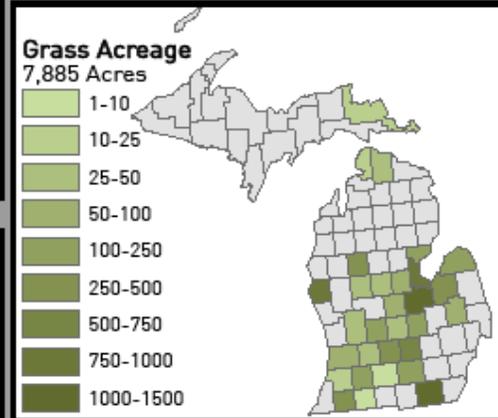
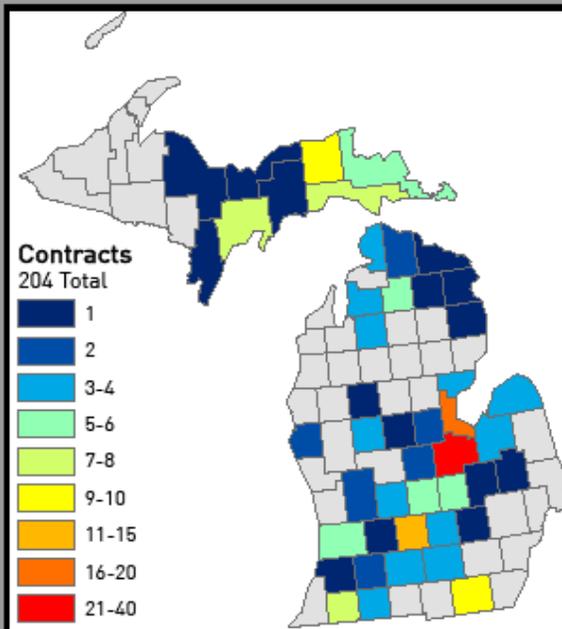
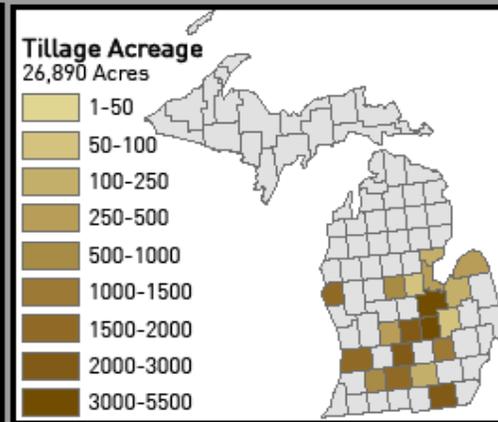
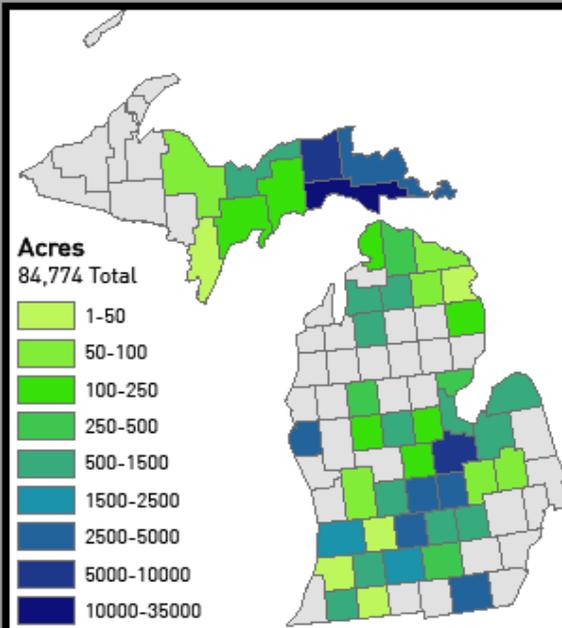
MCCI & Managed Forest Enrollments

Acreage Submitted	All	MCCI Pool III	Managed Forest	Unassigned
Total Acres	84,774	30,629	48,619	5,526
Grass Acres	7,885	6,898	-	987
Tillage Acres	26,890	22,934	-	3,956
Forestry Acres	49,998	797	48,619	583



MCCI Enrollment Information by County

as of November 1, 2007



conservation tillage example

Conservation tillage practices on 1,000 acres of land is equivalent to approximately 600 metric tons of CO₂. 20% or 120 metric tons is placed in a reserve pool.

Initial Annual Payments – 2007-2009

Value of Offsets - 480 metric tons * \$2.00	= \$960
CCX Trading Fee – 480 metric tons * \$0.20	= \$96
Aggregation Fee - \$1,920 * 8%	= \$76.8
Total Fees*	= \$172.8
Annual Payment to Project Owner	= \$787.2

Final Payment - 2010

Value of Offsets - 960 metric tons * \$2.00	= \$1,920
CCX Trading Fee – 960 metric tons * \$0.20	= \$192
Aggregation Fee - \$3,840 * 8%	= \$153.6
Total Fees*	= \$345.6
Final Payment to Project Owner	= \$1,574.4

Total Net Revenue over Contract Period = \$3,936

* Excludes verification costs, which a landowner pays proportional to their share of the overall enrollment pool

managed forest carbon revenue projections

Model Results (mT C)	Model Results (mT CO ₂)	Reserve Pool (20%)	Additions	Removals	Net Credits
61,402	225,347	45,069	0	29,304	150,973

150,973	\$1.50	\$226,459
150,973	\$2.00	\$301,946
150,973	\$2.50	\$377,432

Observations from the First Enrollment Pool

- Conservation Districts did an amazing job promoting the program and enrolling landowners
 - Top 5 for contracts – Saginaw (37), Bay (16), Eaton (14), Lenawee (10), Cass, Delta (8)
 - Top 5 for acreage – Saginaw (6,682), Lenawee (3,662), Shiawassee (3,213), Clinton (2,851), Eaton (2,743)
- Problems
 - Too many “unassigned” contracts (17)
 - Lacking signatures, proper documentation, incomplete LOIs and enrollment worksheets
 - Not a problem when landowners work through SWCD!
 - Low density tree plantings <250 stems per acre
 - No approved CCX policy yet
 - Landowners do not respond to information requests

Programmatic changes for 2008

1. XFO changes

- New rate tables for afforestation plantings that give credit for above ground and below ground carbon storage
 - New rates appear to be significantly lower than current rates
 - Delta has asked the CCX to provide reasoning for lower rates
- 15 year commitment to maintain trees

2. Delta Launches a Retail Website for Carbon Credit Sales

- Expanding our market base to consumers
- Price is \$7.50 per ton – Can buy in 1 ton increments
 - Price is significantly lower than other entities
- Will generate greater revenue for farmers
- www.deltacarbon.org

Programmatic changes for 2008

1. Verification costs

- USDA funding for verification services is ending
- In the next pool, aggregators must deduct verification costs from sale of credits
 - Still no upfront, out-of-pocket costs for landowners
 - Amount deducted from sale is proportional to the amount of credits a landowner contributes to enrollment pool
- Verification now a direct contractual relationship between aggregator and verifier
 - MACD will negotiate rates with Delta

2. New Contracts

- Rolling, 5-year contracts from date of enrollment
- Provisions to null contract if CCX ends in 2010

managed forest carbon project results

Contact		Acreage	Stands	Sample Points		
All		48,619	272	2,895		
		Annual Net Sequestration (CO2 mT)				
Year	Baseline Carbon (mT)	Above Ground	Belowground	Total	Adj. Baseline (mT)	Rate
2007	4,334,474	188,380	36,967	225,347	4,559,822	4.63
2008	4,684,983	199,465	39,467	238,933	4,923,917	4.91
2009	4,923,917	169,728	33,473	203,202	5,127,119	4.18
2010	5,127,119	161,473	31,838	193,311	5,320,431	3.97
Tot		719,048	141,746	860,795		

Opportunities for land trusts

1. MCCI

- Prairie grass restoration
 - Land must have a crop history!
 - Eligible – bean field restored to prairie
 - Ineligible – old field restored to prairie
- Afforestation projects

2. Managed Forest Program

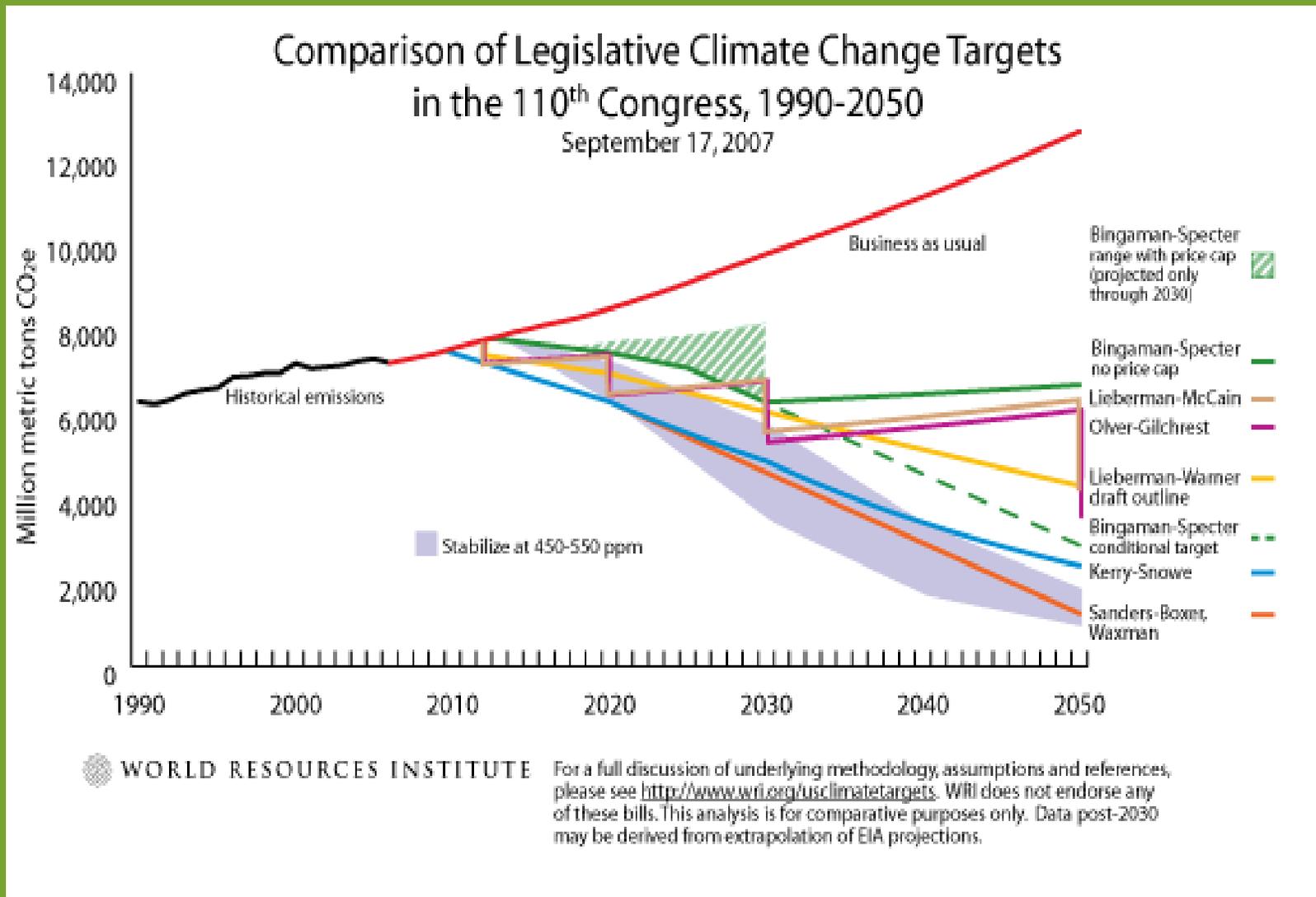
- Much harder for land trusts to participate
- Unlikely that land trusts would meet sustainability requirements
 - SFI, FSC, Am. Tree Farm Group Certification
 - Easement protected land doesn't meet this requirement, yet

the future of carbon trading

Legislation before Congress

- Climate Stewardship & Innovation Act – S.280
- Global Warming Pollution Reduction Act – S.309
- Electric Utility Cap-and-Trade Act – S.317
- Global Warming Reduction Act – S.485
- Clean Air Planning Act – S.1177
- Clean Air/Climate Change Act of 2007 – S.1168
- Climate Stewardship Act – H.R.620
- Safe Climate Act – H.R.1590 (companion to S. 309)
- America's Climate Security Act of 2007
- Lieberman-Warner Bill
 - Recently voted out of Senate Committee
 - Likely to appear on Senate Floor for vote

climate change legislation



the future of carbon trading

Possible legislative components:

- Economy-wide, cap-and-trade market with allowances for offsets
- Initial distribution of allowances via auctions – polluter pays system
 - Creates revenue recycling, with monies applied to new technology, energy efficiency, etc
- Mandatory energy efficiency goals for utilities
- Increased fuel economy standards
- Mandatory use of renewable energy & bio-based fuels
- Incentives for technological innovation
- Consumer tax incentives

Future developments:

- CCX scheduled to end in 2010, although may be extended to 2015
- CCX is positioning itself to be the trading platform in a mandatory system
- Likely future scenario:
 - Government administers the carbon market
 - CCX serves as trading platforms
- Uncertainty lies in the details!!
 - CCX standards, California standards

contact us



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Visit

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