

Carbon Trading: A Joint Effort Between the Delta Institute, Illinois and Michigan



Fast Facts

Activity: No tillage, conservation tillage, grass planting, afforestation, reforestation and forest management

Launch Date: Agriculture/afforestation: Jan 2006; Managed Forest: Aug 2007

Purpose: Help a diverse pool of private agricultural and forest landowners access carbon markets and provide incentives for environmental stewardship and carbon sequestration

Forest Ownership: Private non-industrial; no minimum acreage requirement

Scope: 349,548 acres; 1,288 landowners in IL and MI

Market: Chicago Climate Exchange (CCX)

Protocol: CCX: 1) Continuous Conservation Tillage and Conversion to Grassland Soil Carbon Sequestration, and 2) Forest Sequestration

Registry: CCX

Aggregator: The Delta Institute

Verifier: CCX-approved Contractor

Payment Mechanism: Connection to existing market platform through non-profit aggregation; "pools" calculated on a yearly basis

Climate Benefits: 1,093,382 t/CO₂ sequestered

Co-Benefits: Sustainable forest management, watershed protection, reduced runoff and erosion, wildlife habitat, source of income

Overview

The Delta Institute Carbon Trading Program provides an innovative example of a joint effort between state agencies, non-governmental organizations, and private businesses to connect private landowners to carbon markets to provide incentives for environmental stewardship and carbon sequestration on agricultural and forest land. Owned and operated by the Delta Institute, the Carbon Trading Program aggregates credits generated on agricultural and forest land, trades those credits on the Chicago Climate Exchange, and distributes revenue to participating landowners. Landowners from at least 16 U.S. states now participate in Delta's Carbon Trading Program; however, Illinois and Michigan are unique in that state agencies not only helped to initiate and develop the program, but continue to dedicate resources critical to the program's success within their respective states.

This case study describes the Carbon Trading Program and the partnership between the Delta Institute, Illinois, and Michigan that developed the program and continues to support it within each state. In Illinois, the program is known as the Illinois Conservation & Climate Initiative. In Michigan the program goes by two names: the Michigan Conservation & Climate Initiative and the Michigan Working Forest Carbon Offset Program. We describe the administrative partnerships and programmatic structure unique to these programs, as well as the development of the programs, challenges encountered along the way, and lessons learned. We also provide data on participation and cost, and detail the roles of players in bringing carbon offset projects to market.

The Program

Delta’s Carbon Trading Program allows farmers and landowners to earn greenhouse gas emissions credits for conservation tillage, grass and tree planting, and forest management (1, 2). Because credits are sold on the Chicago Climate Exchange (CCX), the program uses CCX protocols and standards. There are two distinct protocols, market chains, and hence “sides” to the program. One side offers carbon credits for agricultural soil carbon capture through no-till/conservation tillage, grass planting and afforestation. The other offers carbon credits for sequestration through reforestation and management of existing forests, including “working forests” that produce wood products.

From the perspective of the Delta Institute, the Carbon Trading Program functions as a whole, and Delta administers the Illinois Conservation and Climate Initiative (ICCI) in Illinois and the Michigan Conservation and Climate Initiative (MCCI) in Michigan. The sides diverge into two separate programs in Michigan, where the managed forest portion of the program is referred to as the Michigan Working Forest Carbon Offset Program, and the agricultural/afforestation side is referred to as MCCI. The working forest program is supported by the MI Forest Stewardship Program, whereas the MI Department of Agriculture supports MCCI. In Illinois, the IL Environmental Protection Agency provides primary support for both portions of the program under the name of ICCI. However, IL state agency websites emphasize agricultural lands, whereas the working forest lands are more prominently placed on MI state agency websites. Enrollment follows the same trend, with a stronger emphasis on managed forests in MI and agricul-

tural lands in IL. This distinction is due to multiple reasons, one of which is different resource utilization patterns in the states. The watersheds of the Mississippi, Ohio, Illinois and Wabash Rivers provide fertile farm land in Illinois; in 1997, 80% of the total Illinois land area was utilized by farms (3). In contrast, Michigan’s 19.3 million acres of forests cover over 50% of the land area of the state and represent an integral part of the state’s cultural heritage (4).

The agricultural/afforestation and the managed forest sides of the program use different accounting methods and require a different combination of procedures from participants (see Box A). Yearly carbon accrual through conservation tillage/grass planting is assigned a fixed rate and through afforestation is calculated with look-up tables. Yearly carbon accrual for reforestation and managed forests is calculated using the U.S. Forest Service Forest Vegetation Simulator modeling software.

The program is designed to accept small-scale participants as well as large landholders. To accomplish this, the aggregation services of The Delta Institute are essential. Delta accepts or denies applications during enrollment periods, which last roughly a year, and assigns pool numbers to landowners who join during a particular enrollment period. Credits are sold by pool, not by individual landowners. Landowners sign a contract ending in 2012, and CO2 accrual is calculated on an individual basis each year of the contract life, beginning with the baseline year. The year in which the carbon was sequestered is the “vintage” of the associated carbon credits, and payments are made annually, though Delta reserves the right to delay sale until more favorable market conditions prevail. This means that landowners in pool three could have, for example, vintage 2007 and 2008 credits registered with the CCX. Delta has sold several vintage years entirely, and, as of 2009, several

pools featuring multiple vintage years were registered with the CCX and are awaiting sale (1, 2, 5).

A. Program Requirements

	Ag/Affor	Man For	Cost Frequency	Cost
Third-Party Verification	Yes	Yes	Semi-annual, back-end	Varies
Management Plan	No	Yes	One-time, up-front	Varies
Third-Party Certification	No	Yes	Either, up-front	Varies
Baseline Inventory	No	Yes	One-time, up-front	Varies
Delta Aggregation Fee (% of gross revenue)	Yes	Yes	Annual, back-end	Ag/Affor=8% Man For=10%
CCX Trading Fee	Yes	Yes	Annual, back-end	.20/tCO2
Conservation Easement	No	No	-	None
Letter of Intent (15 yr. agreement)	Yes	Yes	-	None
Re-inventory	No	Yes	CO2 loss only	Varies
20% Reserve Pool—released at contract end	Yes	Yes	Annual, back-end	None

Sources: 1) Delta Institute. (2009). *Managed Forest Carbon Offset and Trading Program Enrollment Instructions*. 2) Delta Institute. (2009). *Application for Participation in Chicago Climate Exchange Forestry Offset Pool*.

Partners and their Roles

The Carbon Trading Program is owned and operated by the Delta Institute. State agencies played a central role in the development of the program and continue to support it within their respective states under the names of ICCI, MCCI, and the MI Working Forest Carbon Offset Program. Local and national conservation programs, consulting foresters, and Soil and Water Conservation

Districts are also important partners. Although only the central partners and their operational roles are described here, a full list of partners is available on the MCCI website.

Delta Institute: The Delta Institute is a 501(c)(3) nonprofit organization formed in 1998 to work on environmental quality and community economic development projects in Illinois and the Great Lakes region. Headquartered in Chicago, the Delta Institute is an aggregator with the CCX and trades carbon credits on the CCX trading platform.

The Delta Institute's primary goal is to generate improvements in local water quality. According to Todd Parker, Associate at the Delta Institute, carbon trading is seen as an opportunity to fund conservation practices that improve water quality. By implementing sound ecological practices that further its primary mission, Delta hopes to "transform the Great Lakes region into the center of the emerging green economy," says Parker.

Delta worked with state agencies in IL and MI and consulting foresters in MI to develop the Carbon Trading Program's operations, as well as the managed forest protocol now used by the CCX. As the administrator of the program, Delta has primary responsibility for reviewing and approving applications, arranging for the verification and registration of credits through the CCX, monitoring and initiating yearly measurements of carbon accrual, and distributing payments. Delta works closely with state agencies and partners to carry out its duties and to locate good candidates for the program.

Chicago Climate Exchange: The CCX operates a voluntary cap-and-trade system. Parties motivated to reduce their greenhouse gas emissions can join the CCX and, as Members, make a legally binding commitment to meet annual emissions reduction targets. Those Members who reduce below the targets have surplus allowances to sell or bank; those who emit above the targets comply by purchasing excess allowances from other Members or carbon offset credits. Part of Member commitments can be met by purchasing credits generated through land-based carbon sequestration, such as soil conservation and forest growth, through programs like the Carbon Trading Program. Offset credits are purchased by both Members and non-Members, and transactions occur either as a "commoditized" purchase where the source of the offsets is unknown, or on a project-by-project basis where the source is known and, at times, purposefully arranged. Verifiers and protocols used to create carbon credits must be approved by the CCX.

Illinois Environmental Protection Agency: The IL Environmental Protection Agency provided start-up funds

(\$20,000) and staff support to initiate ICCI. The agency continues to support the ICCI through outreach/marketing, education, consultation with the ICCI Advisory Group, and coordination of the ICCI with conservation programs and the Soil and Water Conservation Districts. Conservation programs include the Conservation Reserve Program, the Conservation Security Program and the Conservation Reserve Enhancement Program.

Illinois Department of Natural Resources and Department of Agriculture: Both the Department of Natural Resources and Agriculture participated in the development of program application forms and continue to provide outreach as well as consultation with the ICCI Advisory Group.

Michigan Department of Natural Resources Forest Stewardship Program: The Forest Stewardship Program is a national conservation program funded by the U.S. Forest Service and carried out by states. MI's Forest Stewardship Program provided start-up funds (\$150,000) and staff support to initiate the Michigan Working Forest Carbon Offset Program and to develop the managed forest protocol. The Forest Stewardship Program continues to provide financial support to the working forest program, as well as outreach/marketing, education, consultation with the MCCI Advisory Group, and coordination of the working forest program with participating consulting foresters and with the Forest Stewardship Program management plan cost-share program.

Michigan Department of Agriculture: The Department of Agriculture provides support to the agriculture/afforestation portion of MCCI through outreach/marketing, education, consultation with the MCCI Advisory Group, and coordination of MCCI with conservation programs and the Soil and Water Conservation Districts.

Soil and Water Conservation Districts: The Soil and Water Conservation District Associations in both MI and IL work with landowners participating in the agriculture/afforestation portion of the program to complete paperwork and communicate with Delta. In addition, they act as the CCX-approved verifier for the programs.

Consulting Foresters: Consulting foresters work closely with landowners participating in the Michigan Working Forest Carbon Offset Program and the managed forest portion of ICCI to complete the requirements of the programs, as well as recruit new participants.

Start-up: Agriculture in Illinois

Delta's Carbon Trading Program originated when IL Environmental Protection Agency director Dick Breckenridge and associate director Ron Burke approached the Delta Institute late in 2005 about aggregating offset credits through an existing CCX protocol for conservation tillage, grass planting and afforestation.

The agency was interested in promoting water quality and conservation practices in the state. According to Breckenridge, both he and Burke believed that a carbon credit program for agricultural lands would further such interests. Both had a background in carbon sequestration and had examined other successful examples close by, primarily the Iowa Farm Bureau Carbon Credit Aggregation Pilot Project (<http://www.iowafarmbureau.com/special/carbon/default.aspx>) and the National Farmer's Union Carbon Credit Program in North Dakota (<http://carboncredit.ndfu.org>) and Nebraska (<http://www.nebraskafarmersunion.org/>).



Breckenridge considered different options for an aggregator, including IL commodity groups and the Farm Bureau. Because the IL Environmental Protection Agency already worked with Delta on a number of policy initiatives, and because Delta has an established reputation in the region and experience working with the CCX, the Delta Institute emerged as a worthy choice. The Delta Institute didn't have a carbon program at the time; however, they were very interested in the potential this program held for ecological enhancement and economic development.

The agency provided Delta with start-up funds in the amount of \$20,000, legal and staff assistance, and outreach. The development of ICCI for agricultural lands took about 6 months, the ease of which was attributed to pre-existing relationships that were drawn on to operationalize the program. These included a relationship between Delta and the CCX, between Delta and state agencies, and between state agencies and the IL Soil and Water Conservation Districts. The fact that the CCX had been selling credits from an existing offset program for conservation tillage, grass planting, and afforestation for years also paved the way for a quicker development process. Memorandums of Understanding outlining roles and responsibilities were drafted between Delta and the IL Environmental Protection Agency and the IL Departments of Agriculture and Natural Resources.

The model developed for the ICCI agriculture/afforestation program integrates Soil and Water Conserva-

tion Districts as the local entry point for landowners and targets national and state conservation program participants for enrollment, such as the Conservation Reserve Program, the Conservation Security Program and the Conservation Reserve Enhancement Program (though participation in one of these programs isn't required). Whether contact is initiated by the conservation districts, state agencies or Delta, most agricultural landowners are eventually referred to their local conservation districts, which provide assistance with paperwork and perform the verification. This process not only gives the program a county presence, but it taps into a pool of conservation-minded landowners who are more likely to be interested.

An important feature of the program is the fact that payments from conservation programs and ICCI are "stackable", in that a landowner can receive payments for a conservation practice from both ICCI and, for example, the Conservation Reserve Enhancement Program. On its face, the purpose of the Carbon Trading Program is to connect farmers and private forest landowners to carbon markets; however, partners in both states recognized that the ICCI and MCCI/MI Working Forest Carbon Offset Program are also designed to further enrollment in conservation programs beyond what government payments or cost sharing would incentivize. According to Breckenridge, "Stackability is a key concept that we envisioned...as a way to further incentivize those programs. Our ultimate goal is to have farmers making decisions based upon the market place...beyond what the government programs might incentivize. Then we will have a truly sustainable program."

The Next Leap: Forests in Michigan

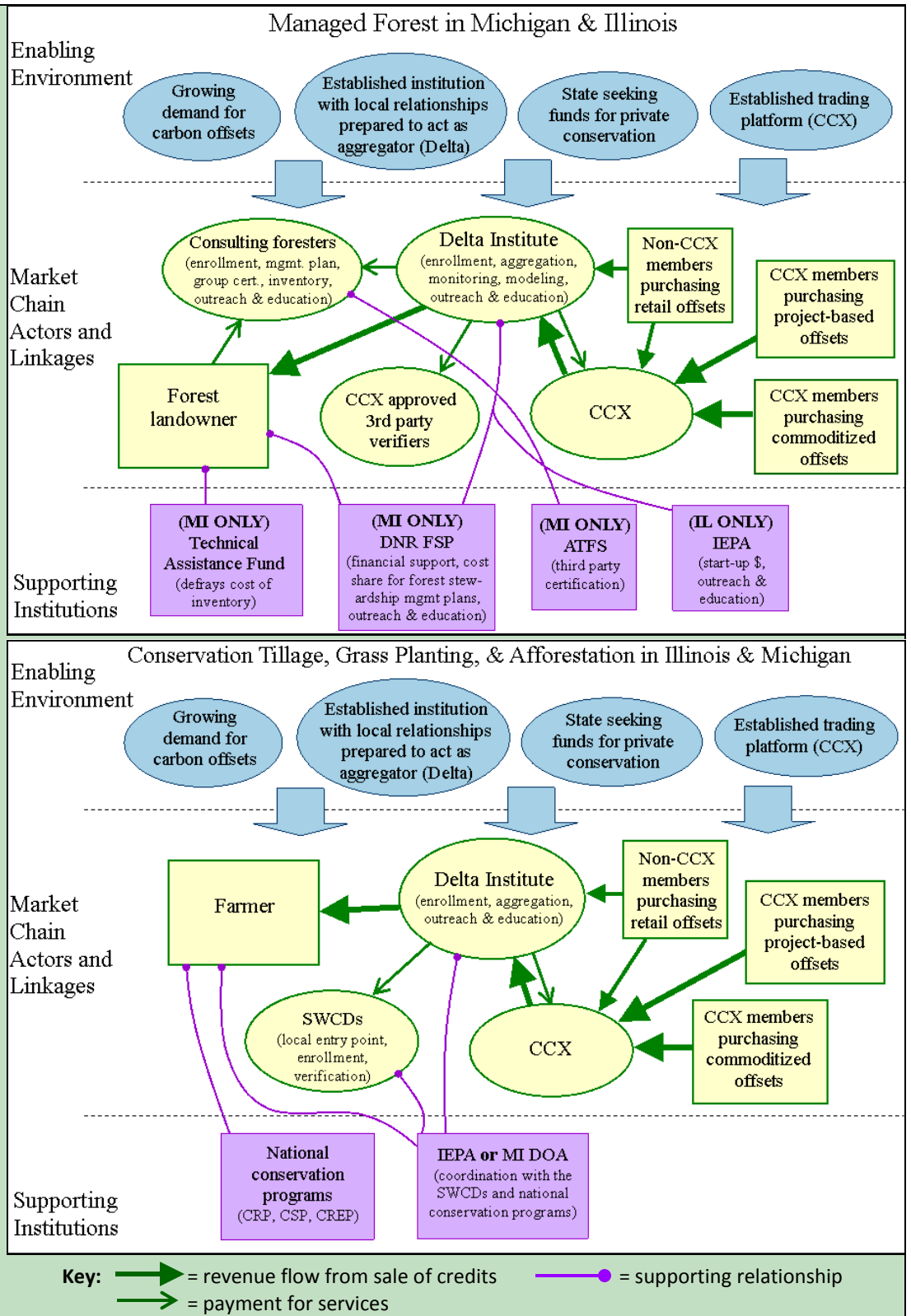
Once ICCI for agricultural lands was up and running, Delta submitted a proposal to the MI Department of Natural Resources Forest Stewardship Program for a pilot project to establish a framework for quantifying the carbon sequestration benefits from sustainably managed forestlands. At the time, neither Parker nor Debra Huff, administrator of the MI Forest Stewardship Program, were aware of any program or protocol in the country for carbon credits from existing managed forests. The Department of Natural Resources awarded Delta with a \$150,000 Forest Stewardship Grant in the fall of 2006, initiating the

B. Market Chain Map

The market mapping technique used in this report was adapted from research conducted by the Food & Agriculture Organization of the United Nations and Policy Innovation Systems for Clean Energy Security (7). In the Market Chain Actors & Linkages section, the left-side square represents carbon offset producers, the right-side squares offset purchasers, and the circles intermediaries. The enabling environment represents the surrounding set of circumstances that helped bring the program about. The supporting institutions are not directly a part of the market chain, but provide vital services or support.

Acronyms

ATFS: American Tree Farm System
 CRP: Conservation Reserve Program
 CSP: Conservation Security Program
 CREP: Conservation Reserve Enhancement Program.
 DNR FSP: MI Department of Natural Resources Forest Stewardship Program
 IEPA: Illinois Environmental Protection Agency
 MI DOA: MI Department of Agriculture
 SWCDs: Soil and Water Conservation Districts



creation of the Michigan Working Forest Carbon Offset Program.

The MI Forest Stewardship Program decided to participate in and fund the pilot project because, according to Huff, Delta's proposal was a good fit for its mission. Such a program had potential to enhance sustainable forest management practices and provide an additional incentive to retain lands for private forest owners in MI. Further-

more, the project represented a unique opportunity to encourage citizens to recognize the value of carbon sequestration as an important ecosystem service.

During the pilot project, the technical rules and guidelines for the program, which address issues of ecological and economic viability, were developed jointly by Delta, the Department of Natural Resources, the Forest Stewardship Program and Michigan-based private forestry

consultants, Grossman Forestry Company and Forest Resources Services, LLC. The program committed itself to private, non-industrial landowners by making that designation a requirement. MOU contracts were drawn between Delta and the two consulting foresters. In August 2007 the program was formally approved by the CCX forestry board. Thirty-six landowners representing 48,665 acres were recruited during the pilot project, the majority of which were recruited through Grossman Forestry Company.

The model created that first year incorporated the two consulting foresters and the MI Forest Stewardship Program into a close working affiliation with Delta, which worked well in four ways. First, the partnership helped to reduce or defray upfront costs for the landowner. The managed forest protocol requires a forest management plan, 3rd-party certification, an



inventory and third-party verification. Third-party verification costs come out of the proceeds of the sale and, thus, are not an upfront cost; however, the development of a management plan, 3rd-party certification, and an inventory can be. The two consulting foresters provided a pool of landowners with whom they had an existing client relationship and who were already actively managing their forests. Therefore, the landowners were more likely to be interested in the program and were more likely to have already completed a management plan and 3rd-party certification.

For these landowners, the only additional upfront cost was an inventory; however, the working forest program pilot project also featured a \$75,000 revolving technical assistance fund that defrayed 100% of inventory costs until credits were sold, the money for which came from the initial Forest Stewardship Program \$150,000 grant. That meant that all up-front costs were either non-existent or defrayed. According to partners, this fund was, and continues to be, a critical piece of the success of the working forest program; it made the difference between joining and not joining for many.

Second, the model worked well in terms of 3rd-party certification. Certification in particular can be a major hurdle for small- to medium-sized landowners. The two consulting foresters, in addition to possessing credentials accepted by the CCX, are two of the three foresters in MI to possess Independently Managed American Tree Farm Groups (IMGs) under the American Forest Foundation's Standards of Sustainability. IMGs are maintained by consulting foresters whose programs have been certified by the American National Standards Institute-American Soci-

ety of Quality National Accreditation Board. Up until the summer of 2009, an IMG Tree Farm certification was the only option for landowners participating in the Carbon Trading Program that was both affordable *and* accepted by the CCX. All of the enrolled forestlands received 3rd-party certification through them at an affordable price (6). According to partners, the managed forest portion of the program in IL has been severely limited because no IMGs exist in IL.

Third, the incorporation of the Forest Stewardship Program's cost-sharing incentives for management plans benefited both participants and the Forest Stewardship Program. Those who adopt a forest stewardship plan benefit from a 50% fee cost-sharing. Conversely, the Forest Stewardship Program has experienced an increase in enrollment, in part due to the fact that a forest

stewardship plan is required to access technical assistance funds. However, according to Gerald Grossman, owner of Grossman Forestry Company, as many as half of the inquiries into the MI Working Forest Carbon Offset Program end up adopting a forest stewardship plan without participating in the program. Grossman says that, for many of these people, such as those with smaller acreages or skewed forest stand structures, the working forest program isn't practical (see discussion under "Lessons Learned"). "But that doesn't matter," says Grossman. "We got them in the door... so it's been another avenue to encourage landowners to take advantage of an existing program."

Finally, the consulting foresters provided a single point of contact for the flow of information between the landowners and the aggregator, which increased operational efficiency.

Where We Are Today

Box B (previous page) provides a market chain mapping for both the agricultural/afforestation and the managed forest portions of the Carbon Trading Program as they existed at the time of this study. The programs have solidified and grown since their formative years. The forest management protocol created by the MI Working Forest Carbon Offset Program pilot project served as the basis for the Sustainably Managed Forest protocol released by CCX in December 2007. Delta consolidated its work with IL and MI and created the Carbon Trading Program, which it owns and operates. Landowners from 14 other states are

enrolled; according to Parker, “Folks are signing up despite the low CCX price. It’s amazing how people want to be a part of it and prepare themselves for the future.”

Delta used its own funding to set up the agriculture/afforestation side of the program in MI and the managed forest side in IL. These programs use linkages between state agencies and other partners similar to their counterparts. Steve Shine, conservation programs manager of the MI Department of Agriculture, also evaluated several aggregation options for conservation tillage/grass planting/afforestation in MI, and chose Delta for reasons similar to those of the IL Environmental Protection Agency. One notable difference between the two states is that the managed forest portion of the program in IL does not work with the IL Forest Stewardship Program and does not offer a technical assistance fund. The newness of the program and the fact that no private forester in IL possesses an IMG Tree Farm Certification has resulted in low enrollment.

The MI Working Forest Carbon Offset Program has moved beyond the pilot project phase. The MI Department of Natural Resources Forest Stewardship Program awarded the Delta Institute another grant in June 2008, this time a 3-year grant for \$63,000 through the U.S. Forest Service’s Northeastern Area State & Private Forestry Competitive Grant Program. The purpose of the grant is to promote carbon-related outreach and education in MI; the funding has helped the Delta Institute conduct outreach beyond what would normally occur through the consulting foresters. Additional consulting foresters have been brought on board, as well as a third forestry business with an IMG Tree Farm Certification in MI, Green Timber Consulting Foresters.

Delta has completely sold vintage years from several pools from the agricultural/afforestation portion since 2006 in IL and MI. Perhaps more of an accomplishment was the sale of the first managed forest vintage year (2007) in pool one (i.e., the pilot phase) in the fall of 2008.

C. Enrollment through Aug 2009			
	National Program	ICCI	MCCI/MWFP
Total Acreage	382,471	173,282	176,197
Total Landowners	1,363	900	388
Ag/Affor Acreage	246,364	171,980	51,821
Ag/Affor Landowners	1,232	894	285
Managed Forest Acreage	136,053	1,302	124,376
Managed Forest Landowners	131	6	103

Source: Parker, T. (2009) Personal communication

D. Accomplishments through Aug 2009				
	Acreage - Smallest to Biggest	Acreage – Average per contract	Tons CO2 Sequestered ¹	Gross Sales Revenue Generated
Program Nationally	1 – 34,000	280	1,209,900	\$2,484,343
IL Ag/Affor	1 – 3,450	192	502,900	\$1,499,445
IL Man For	69-477	228	2,982	0
MI Ag/Affor	1 – 5,313	181	76,200	\$242,080
MI Man For	20 – 34,000	1,207	511,300	\$469,230

1. Existing biomass on enrolled lands

Source: Parker, T. (2009) Personal communication

After administrative fees and \$55,000 for repayment of the technical assistance fund, the initial 34 landowners, representing 48,665 acres, earned \$334,097 for that year, averaging out to about \$6.80 per acre. See Boxes C and D for information on enrollment, CO2 sequestered, and revenue generated through August 2009.

Lessons Learned

Scale vs. Cost: Partners on both sides of the program recognize that the program is not economically viable for the smallest participants. Partners stated that it may not be practical to enroll landowners with fewer than 100, 60, or even 20 acres, depending on highly variable factors. Revenues are based on a fluctuating market price as well as the volume of credits produced, which in turn is highly dependent on soil productivity and forest stand structure. Costs are highly sensitive to the ownership acreage and, in the case of managed forests, existing data (management plans, digital type maps and past inventories).

Costs/revenues also depend on the protocol in question. Since the agricultural/afforestation side does not require a management plan, inventory, or forest certification, it is essentially a cost free entry for the landowner, whereas all these are potential up-front costs for managed forest participants. However, reforestation and forest management offer potentially higher carbon sequestration rates than grass planting and afforestation, and therefore greater payoff potential, according to Parker. The technical assistance fund has helped MI forest landowners overcome up-front costs related to inventories. The next hurdle could prove to be that the program is now starting to tap into landowners outside the pools provided by the Conservation Reserve Program and the Conservation Reserve Enhancement Program lists, and the consulting foresters. These landowners will need more assistance, education

and preparation.

Many mentioned the need for higher carbon prices to ensure sustainability for the program: at minimum \$2 to \$6. According to a cost/revenue calculation in Box E, the price per tCO₂ would need to be roughly \$4.10 for the owner of 300 acres of forestland to break even in the first year of the working forest program contract. According to Grossman, for landowners already working with operationally efficient consulting foresters, a minimum of \$2.00 per tCO₂ can provide favorable financial returns based on incremental inputs and outputs.

Attempts have been made to address the issue of scale through public outreach activities and the adoption of a carbon calculator on the ICCI and MCCI websites.

Grossman spoke about the possibility of consulting foresters financing all costs associated with managed forests, but only if the price of carbon was high enough to instill greater confidence. Others mentioned other sources of assistance for up-front costs, such as management plan assistance from the Environmental Quality Incentives Program run by the Natural Resource Conservation Service.

Bottlenecks: The lack of affordable certification in IL and MI has presented a bottleneck for the program, although less so in MI because of the three MI-based consulting foresters with American Tree Farm System IMGs. This bottleneck was alleviated in MI in the summer of 2009, when the American Tree Farm System applied for and received certification for its entire state-run Tree Farm program under four regional group certifications. Now the CCX accepts all American Tree Farm System certified properties, not just IMGs, including any state tree farmer belonging to a state tree farm committee. Landowners certified through their state tree farm committee do not have a single point of contact as they do under an IMG, which, according to one partner, creates challenges for the flow of information between the landowner and the aggregator.

However, American Tree Farm System certification did not relieve this bottleneck in IL. The IL State Tree Farm committee approves new enrollees as full fledged tree farmers only after they demonstrate a commitment to sustainable forest management. To demonstrate this commitment, new landowners are given the status of "Pioneer Tree Farm" for one year. As this status does not fall under the Programme for the Endorsement of Forest Certification umbrella certification, landowners cannot participate in the CCX market during that year.

Another bottleneck is the lack of foresters with credentials that meet CCX requirements. According to these requirements, the inventory must be completed by a forester who is either licensed by their state, is a full member of the Association of Consulting Foresters,

or is certified through the Society of American Foresters. Delta has discovered that, outside of MI, finding a forester with one of those three credentials becomes difficult, which creates a bottleneck for completion of the inventories.

According to Parker, a final bottleneck is technology. Foresters often lack hand held recorders or the software needed to provide inventory data in an efficient manner. Parker asserts that those without this technology will be at a disadvantage in future markets.

Risk: Partners asserted that a lot of time was spent on outreach with less-than-intended results. Part of the problem lies in the perception among landowners that there is a high degree of economic risk associated with participation. According to partners, many landowners feel they may ultimately lose money in the event of a carbon loss. Though the Forest Carbon Reserve Pool serves as an insurance policy that limits the liability of each individual landowner, partners say that people anticipate greater risk than is actually present, particularly in the face of multiple contracts, costs, and restrictions. Delta plans to increase outreach and education about the potential economic

E. Year 1 Cost/Revenue Example¹

Michigan Working Forest Carbon Credit Program Participant with 300 acres of forest (assuming 3 tCO₂/ac/yr sequestration)

Gross Annual Tonnage:	900 tCO ₂
Gross Revenue Potential:	\$2,700 to \$19,800 ² (\$3-\$22/ac ³)
less Delta Aggregation Fee:	\$270 to \$1,980 (10%)
less CCX Trading Fee:	\$180 (\$.20/tCO ₂)
less 3rd Party Verification:	\$30 (\$.10/ac ⁴)
less 3rd Party Certification:	\$25 (IMG yearly charge at Grossman ⁴)
less Inventory:	\$2,400 ⁵ (\$8/ac ⁴)
less Management Plan:	\$675 (using 50% cost share for FSP ⁴)

equals Net Revenue Potential: = - \$880 to \$14,510

Carbon Price Required to Break Even: = \$4.10/tCO₂

1. Management plan and inventory are one-time costs. All others are annual.
2. Does not reflect reserve pool insurance against catastrophic events. 20% of annual tonnage is reserved until end of contract, upon which time it is sold and revenue transferred to landowner.
3. Based on rounded historic CCX prices: \$1-\$7.50/tCO₂.
4. Estimate based on personal communication with partners. Actual fees vary according to acreage, service provider, and pool size.
5. Technical assistance fund defrays up to \$2,000 of inventory costs until credits are sold (FSP enrollees only).

benefits of participation and the risks associated with various ecological and management approaches, so as to help overcome participant risk-aversion and misconceptions.

Technical Assistance Fund: MI partners said that the MI Working Forest Carbon Offset Program technical assistance fund was critical to the success of the program. The fund was almost exhausted by the pilot project enrollment, which caused a problem for subsequent enrollments. Since the fund is replenished once credits are sold, and credits from managed forests are sold a minimum of one year after the baseline inventory is completed, the fund was severely depleted for a time. After the first sale, however, it was replenished. The program developed a cost-share provision after the pilot phase to avoid a situation where the largest landholders take the lion's share. The cost-share provision has extended the fund to assist a larger number of landowners, though each landowner receives less overall assistance.



Motivation for Participation: According to partners, many participants joined the program out of the desire to be a part of the solution to climate change. Breckenridge told the story of an owner of a few acres who, after the deduction of fees, received a check for \$1.78. Says Breckenridge, "We processed it anyway because we found that this person had a real desire to do their part." Conversely, partners all spoke about encountering skepticism regarding the existence of climate change. However, even some skeptics joined because, according to partners, the program has an inherently sellable quality, in that it provides the opportunity for conservation-minded people to be recognized and rewarded for a job well done.

The complexity of how carbon offsets work presents a steep learning curve. Says Parker, it's difficult to explain the fundamentals in a 45 minute presentation. Even for those who are knowledgeable, the concepts of carbon offset credits are controversial. Methodological concerns on the part of participants and partners are still present, despite advances being made in the area of land-based offsets. Partners spoke at length about the difficulties of determining additionality or addressing leakage on an individual level. Despite these barriers, landowners continue to express interest.

Role for State Government: Partners agreed that states can play an important role in the development and main-

tenance of carbon markets. The role of aggregator or verifier might work in a case where a state has money to appropriate to such efforts; however, partners acknowledged that in most cases states would not have this money, and so those roles might not be as commonplace. Rather, states would assist in education, outreach and coordination.

Federal Legislation: Partners expressed reservations regarding how future federal legislation would affect the Delta Carbon Trading Program, the CCX, and the future of carbon markets in general. Some speculated on what types of land-based offsets would be accepted. One partner was concerned that developers would be enticed into developing projects in other countries rather than locally, where co-benefits would accrue to the local environment. Others believed that it was important to remove barriers in future markets for owners of small- and medium-scale, non-industrial working forests.

Take Home Messages

Partners feel that, despite the complex and controversial nature of carbon offsets and the uncertainties of future markets, the Carbon Trading Program has proven to be profitable and self sustaining. Landowners want to be a part of the solution to climate change, and this program has provided them with an opportunity to do so in a way that fosters a greater understanding of and rewards for good conservation practices and carbon sequestration. Partners are also hopeful that the program could help reduce parcelization, increase participation in existing state programs, and promote ecological and economic benefits for the state.

In conclusion, key lessons that emerge from this case study are:

- ◆ The aggregation of small private landowners can be an effective way to access carbon markets.
- ◆ Small private landowners can be motivated to engage in carbon markets by the opportunity to be rewarded for good stewardship, the chance to earn revenue, and the desire to "do one's part" to address climate change.

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- ◆ Carbon prices need to be higher for the smallest landowners to effectively participate in carbon markets.
- ◆ It's important to use existing operational infrastructure to cut costs and increase efficiency, the latter being critical to the feasibility of the program.
- ◆ State agencies were effective at outreach and marketing, though they could be more effective with additional funding.
- ◆ Tapping into existing pools of landowners who have demonstrated tendencies towards conservation can increase efficiencies initially.
- ◆ It's important to identify barriers (e.g., upfront costs) and ways to overcome those barriers (e.g., the technical assistance fund) during the development phase.
- ◆ Engaging on-the-ground practitioners (e.g., consulting foresters and Soil and Water Conservation Districts) will help operationalize the program.

State agency partners affirmed their commitment to build upon the precedent started by ICCI, MCCI, and the MI Working Forest Carbon Offset Program. The IL Environmental Protection Agency is continuing to look for opportunities to stack other market incentives onto ICCI. Breckenridge spoke about creating new markets for ecosystem services that could augment existing programs, such as payments for water nutrient enhancement. The MI Forest Stewardship Program is exploring the potential to achieve landscape-scale sustainable forest management through landscape-based aggregation of multiple ecosystem services.

The development of ICCI, MCCI, and MI Working Forest Carbon Offset Program presents a compelling case of non-governmental organizations, public entities, and private businesses working together to help landowners achieve greater stewardship of their land. This case study suggests that if individual landowners have sufficient support, they will join efforts to address climate change. Carbon markets could offer a piece of that support.

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