Ecosystem Markets & Sustainable Agriculture:

Creating Market Quality Credits from Ecosystem Services

Presented to the

Michigan Soil and Water Conservation Society by:

Delta Institute

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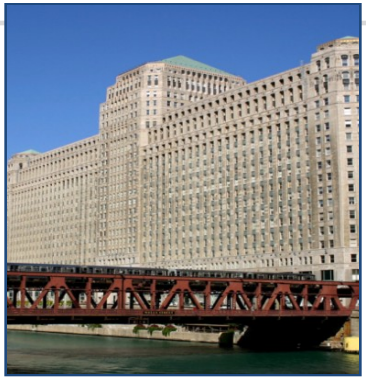
About the Delta Institute

Achieve green ratings for 100 buildings & develop 200 sustainability programs



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

Create 50 cutting-edge sustainable models for community economic development

Reduce carbon emissions by 12 million tons

Make green choices a part of mainstream thinking

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Presentation Objectives

- Discuss programmatic elements necessary for a successful ecosystem market
- Apply lessons learned from carbon offset markets to ecosystem markets

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Why Ecosystem Markets

- For landowners
  - Creating a profit motive incentivizes conservation and the protection of ecosystem services
  - Makes conservation more competitive with alternative land uses
  - For Regulated Entities
  - Achieve regulatory requirements more cost effectively than through traditional regulation
  - Buyer with high pollutant control cost can purchase pollutant reduction of treatment from a willing seller

"The marketing of ecosystem goods and services is an effort to turn recipients [who benefit for free]…into buyers, thereby providing market signals that serve to help protect valuable services" – Brown et al, 2006

Why Ecosystem Markets

Buyers

Sellers

Eligible BMP practice?

Designing an Ecosystem Market

Elements of Ecosystem Markets

1. Identification of Need
2. Policy Driver
3. Developing Market Infrastructure
4. Protocol Development
   a. Stakeholder Engagement
   b. Rules for Producer Participation
   c. Quantification of Practices
   d. Aggregation of Practices
   e. Verification of Practices
   f. Issuance of Credits
5. Registration of Credits
6. Payments for Ecosystem Services

The lessons from 8 years of carbon market development can be applied to other ecosystem markets!!

Identification of Need

- What is the issue/problem to be addressed
  - Sediment, nutrients, pathogens, heavy metals
  - Resources – NRCS Rapid Watershed Assessments, Watershed Management Plans, MDNR, EPA, USDA
- Identify target areas & consider scale
  - Sub-watersheds, single watersheds, multiple watersheds
  - Look for areas underserved by current programs
- Is a market approach the right mechanism for addressing the problem
  - Alternative include conservation banks, cost-share of conservation practices, government payments for conservation

Policy Driver

- Voluntary Policy Drivers
  - Threat of federal regulation, e.g. carbon offset markets
    - Chicago Climate Exchange – voluntary carbon offset and trading market established under the premise that federal regulation of greenhouse gases was likely within next 10 years
  - Public concerns, e.g. protection ground water or surface water
    - Wellhead protection
    - Soil Erosion prevention
    - Programs are often structured as direct payments to landowners who implementing certain practices

Policy Driver

- Regulatory Policy Drivers
  - Clean Water Act
    - §303(d) Total Maximum Daily Loads (TMDLs)
    - §404 Wetland Mitigation Program
    - MS_4 Programs (NPDES Permits)
  - Clean Air Act
  - U.S. EPA Areas of Concern
  - State Regulation

- Most ecosystem service payments based on government created markets or government programs
  - Ecosystem services are public goods
  - Property rights are insufficiently defined to attract private investment
  - Benefits cannot be captured by landowners

-Casey and Kroeger, 2006

Developing Market Infrastructure

- Need regulatory recognition
  - Is state or federal government willing to use credits in lieu of other regulation
  - Do states have laws that allow market mechanisms for ecosystem services
- Need an entity overseeing protocol development, monitoring, registration and trading
  - Government, non-profits organizations or for-profit organizations could take leadership
- Organizational capacity
  - Do stakeholders have the internal capacity to participate
- Data Management is crucial component of system

Protocol Development:
Stakeholder Engagement

- Engage technical experts
  - Academia, Government, Industry, Non-profits with experience in water quality, agricultural production and land conservation
- Facilitate a collaborative stakeholder process
  - Leverage knowledge in protocol development, verification, and market infrastructure
- Producer outreach (potential sellers)
  - Work with local partners, like SWCDs & Extension offices, agricultural professionals
- Identify potential buyers

Protocol Development:
Rules for Producer Participation

- Simple, standardized agreements
  - Agreements for sellers, buyers, aggregators
- Establish time frame for producer participation
  - 5 years is common, but depends on practice
  - May have to accommodate NPDES permitting or other regulatory requirements
- Procedures for developing eligible practices, selling credits and reporting results
  - Documentation of practices, e.g. FSA-578 or CCC-509 forms
  - Maps of eligible practices
  - Direct market access or representative market access

Protocol Development:
Quantification of Practices

- Literature review to identify best practices
- Define baseline to which eligible practices are compared
- Use scientific procedures or modeling to quantify benefits
  - Look to publicly available models that are well understood (RUSLE)
  - Quantification methodologies must be reasonably accurate and relatively inexpensive
    - Looking for relative accuracy, not precision
- Quantification should be standardized or simple enough to be performed by producer or aggregator
  - Producer shouldn't have to hire an expert to quantify eligible practices
- Ensure additionality, i.e. practices are newly implemented or an extension of expiring government program

Protocol Development:
Aggregation of Practices

- Combine many small projects into one large project
  - Minimizes transaction costs for buyers and sellers
  - Aggregated projects may access returns to a scale that creates additional value
    - Buyers may be willing to pay a premium if projects are contiguous or within a single sub-watershed - "the sum is worth more than the parts"
  - Aggregated projects less risky due to diversification of eligible practices
  - Aggregation can also create a critical mass of projects in one area, potentially offering advantages from a community development/rural sustainability perspective.
- Develop rules and responsibilities for those entities who wish to aggregate

-Hartwell and Aylward et al (2010)

Protocol Development:
Verification of Practices

- Monitoring and verification of practices is critical to creating a credible market and viable financial instrument
  - Robust verification program adds legitimacy and provides assurances to regulators that implemented practices are viable
- Verification should be straightforward and relatively inexpensive
  - Verifying accuracy, not precision – need to minimize transaction costs
- Verification should use standardized procedures to ensure consistency between verification entities
  - ISO-14064
- Verification should be performed by third party entities

Protocol Development:
Issuance of Credits

- Define the financial instrument or "currency"
  - Chicago Climate Exchange – Carbon Financial Instruments (CFIs) – 1 CFI = 100 metric tons of carbon storage, regardless of the eligible practice
  - Common unit of trade should be defined
- Credits should be generated and used within same time period to comply with permit limits
- Develop means of managing uncertainty
  - Location ratios, delivery ratios, uncertainty ratios (CCX approach) for water quality markets
  - Insurance products
  - Buffer pools

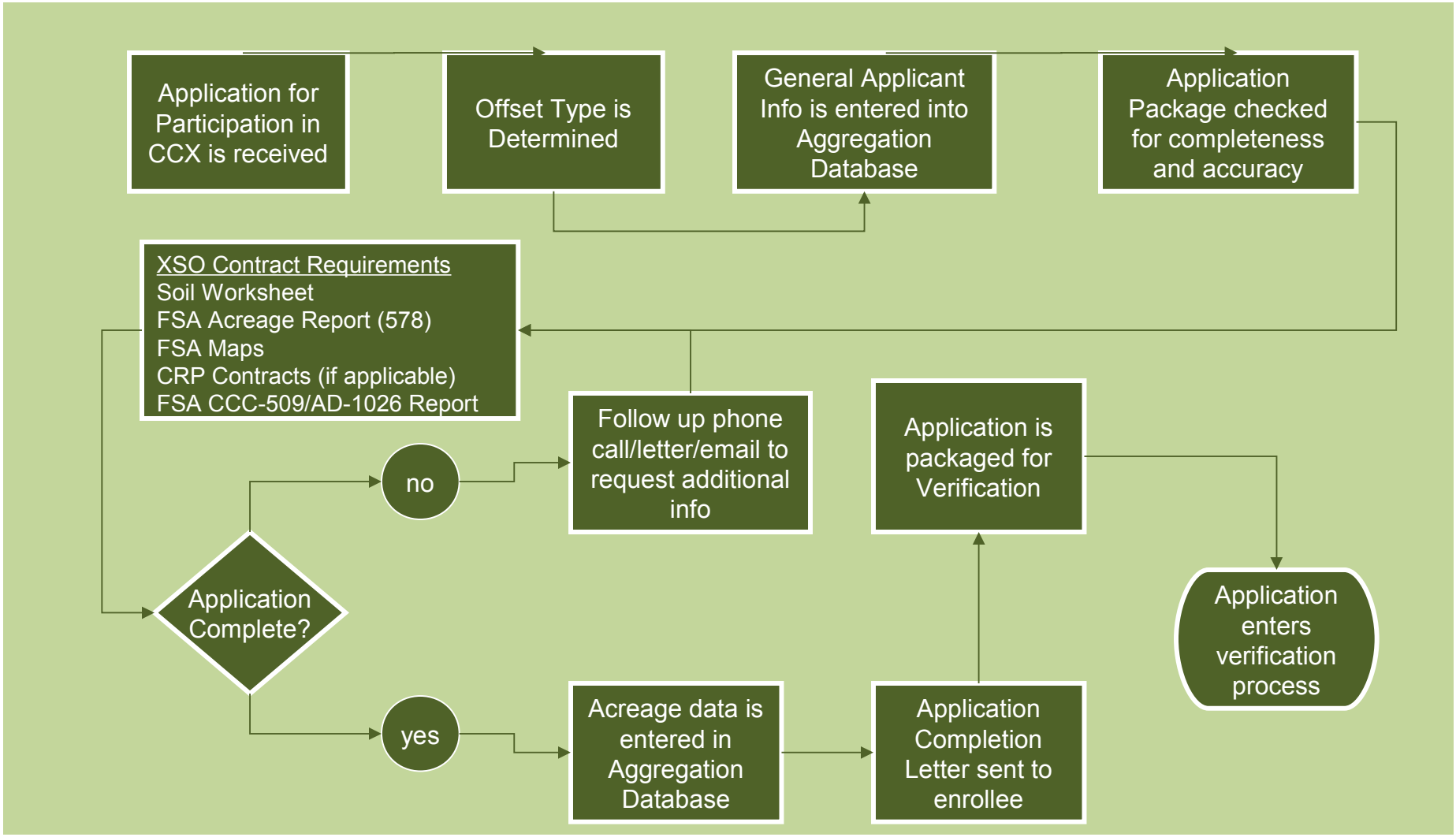
Registration of Credits

- Procedures for registration and tracking of credits from eligible practices
  - Centralized registry and trading platform streamlines transactions, improves transparency, and reduces costs
  - Allows for price discovery and valuation
  - Prevents double-counting
- Important to have clear and simple trading rules

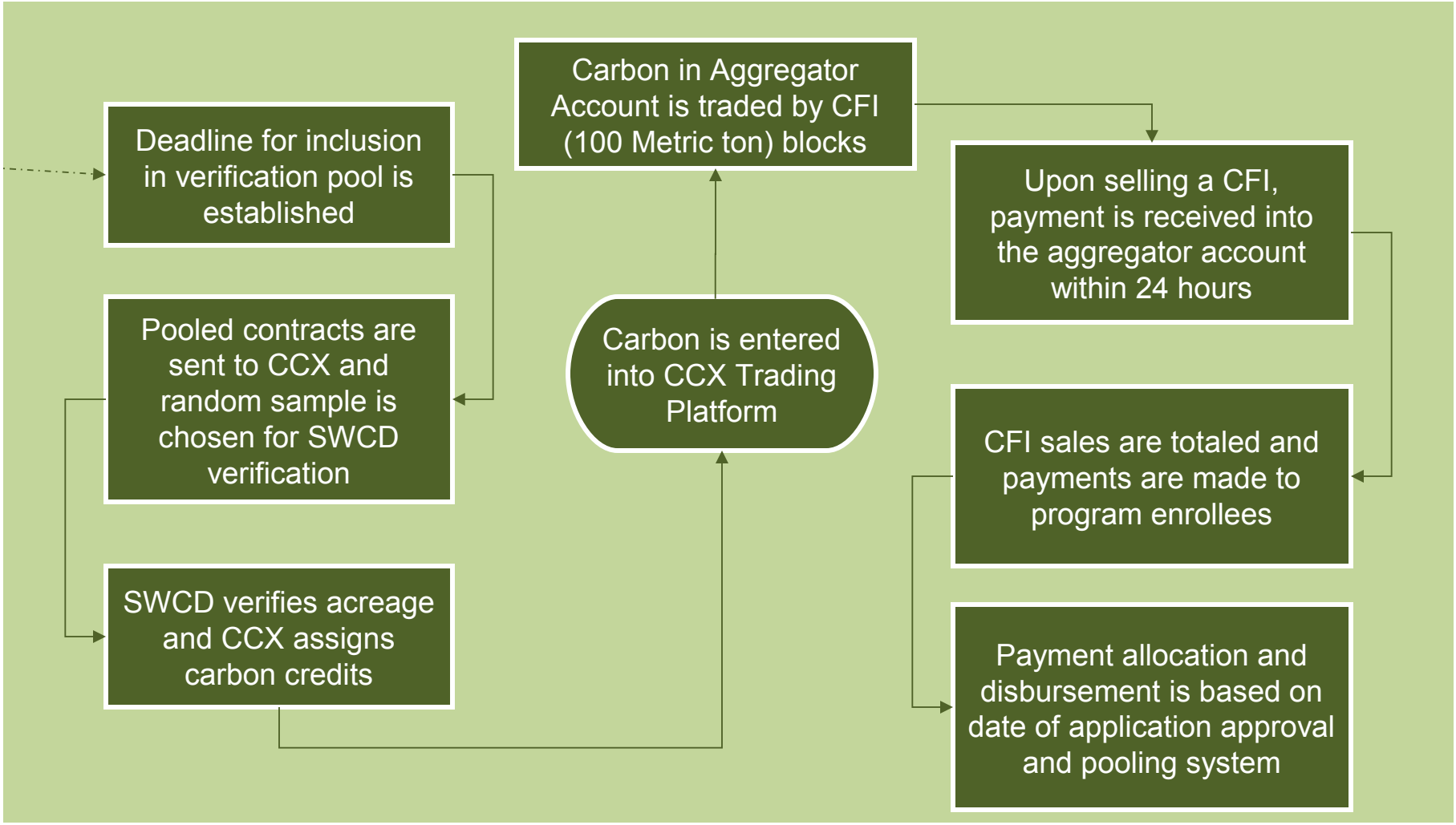
Payments for Ecosystem Services

- Bi-lateral trades, directly between sellers (producers) and buyers
  - Common in voluntary carbon markets
  - Allows buyer to purchase credits from specific practices
- Anonymous trades, via electronic trading platform
  - Most extensively used in Chicago Climate Exchange
  - Aggregators sell credits on behalf of producers – return revenue, minus transaction fees
- Retail sales
  - Consumers buy and "retire" credits
- Auctions
  - Common in regulatory carbon markets, like Regional Greenhouse Gas Initiative

Ecosystem Market Flow



Ecosystem Market Flow



Sustaining Demand for an Ecosystem Market

- Policy driver is the most crucial element
  - Without regulatory driver, no incentive for participation
- Trading must demonstrate measureable improvements
  - Quantification of eligible practices needs to be reasonably accurate
  - Verification & monitoring must be robust, yet cost effective
- Trading process must be transparent
- Continued support from agricultural community
  - Outreach and education to producers is on-going
- Continued support from regulatory agencies

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