

Urban Forestry & Voluntary Carbon Markets



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Urban Forestry Context



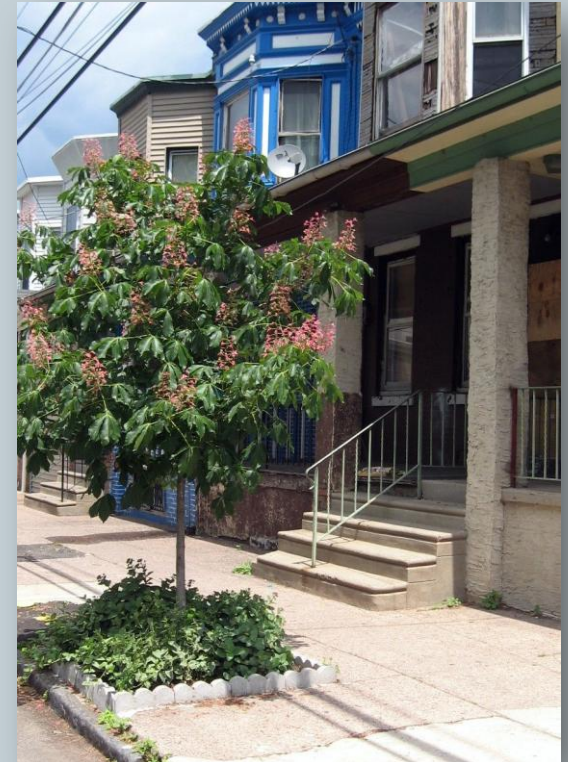
- 220 million U.S. residents live in cities (79% of total population) (Nowak et al., 2010)
- “Urban” definition
 - 50,000 people or more, or
 - 500 or more people per square mile
- 3.1% of U.S. land
- What is an urban forest?



Urban Forestry Context



- Roughly 35% urban land covered by urban forest
- Estimated 3.8 billion trees (Nowak et al., 2010)
- Multiple co-benefits of urban trees:
 - ✓ storm water mitigation
 - ✓ urban habitat creation
 - ✓ avoided emissions from heating and cooling
 - ✓ property values increases
 - ✓ air quality enhancement
 - ✓ crime rate mitigation
 - ✓ community revitalization
 - ✓ volunteerism
 - ✓ noise abatement
 - ✓ soil quality



Urban Forestry Context



- Protocols for Urban Forestry VCM projects:
 - ✓ One project ever registered on CCX
 - ✓ Climate Action Reserve released first version of Urban Forestry Project Protocol in 2010; no registered projects
- U.S. urban trees: estimated 700 million tons stored and 22.8 million tons sequestered annually (Nowak et al., 2003)



Background



Background



- New Jersey Tree Foundation
- Camden, NJ
- Urban Airshed Reforestation Program





Master's Research



- *Understanding the Role of Domestic Urban Forestry in Voluntary Markets*
- What are the barriers and opportunities for urban forestry groups in accessing these markets?
- Are there funding opportunities?
- Models for engagement

Urban Forestry Case Studies

- Available at www.uvm.edu/forestcarbon/UCF



**Carbon Emissions Offsets from Urban Forests:
Michigan State University and
the Chicago Climate Exchange**

Fast Facts

Activity: Carbon Accounting and Urban Forest Management

Launch Date: 2009

Purpose: To offset the greenhouse gas emissions from Michigan State University's T.B. Simon Power Plant.

Tree Ownership: All trees included in the project are on land owned by Michigan State University.

Funding: A small grant was awarded to an undergraduate research assistant to work on the project. Other wise, no direct funding was involved.

Market: Internal carbon offset

Protocol: The Chicago Climate Exchange's (CCX) Forest Carbon Sequestration Protocol was used for this project. Specifically, the CCX Afforestation/Reforestation: Widely Spaced Tree Plantings guidelines were used for the campus trees and the CCX Sustainably Managed Forest Project guidelines were used for the forested natural areas.

Aggregator: None used

Verifier: The project was audited internally by CCX staff.

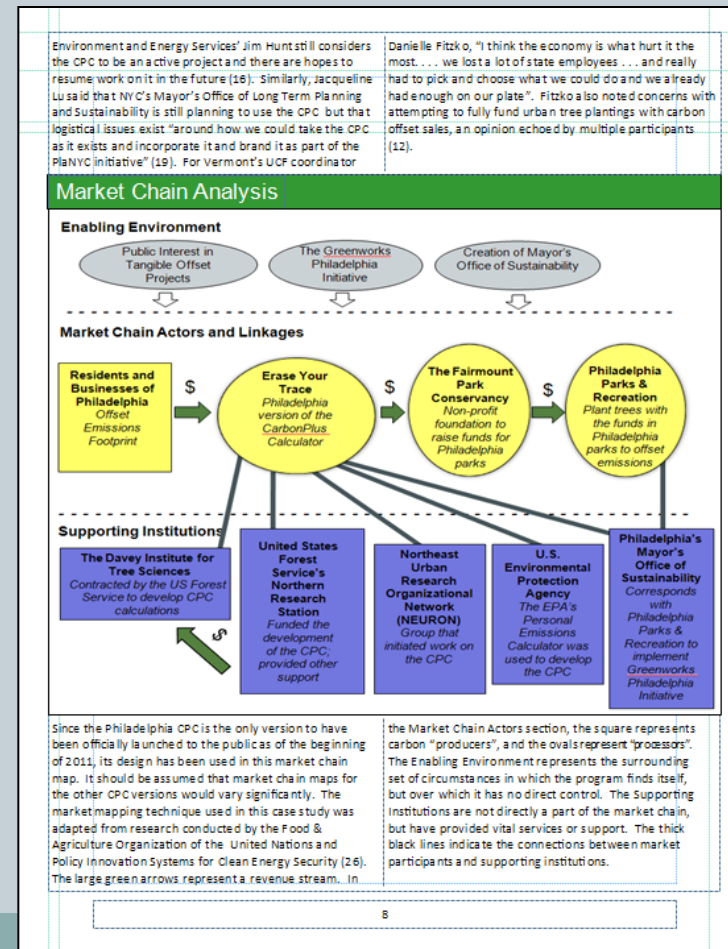
Payment Mechanism: There was no payment mechanism for this internal offset project. The total carbon sequestered by the MSU trees was subtracted from the emissions of the campus power plant and put towards the annual emissions reduction target of the university.

Climate Benefits: In 2009 221.8 tons of CO₂ equivalent (tCO₂e) were reported as sequestered by the campus trees from 2003–2009 and in 2010 54 tCO₂e were sequestered by the campus trees and 54 tCO₂e were sequestered by the forested natural areas.

Co-Benefits: MSU students gained forestry methodology experience and MSU demonstrated the applicability of the CCX protocol to urban forests.

Overview

In November 2009 Michigan State University (MSU) submitted the first ever proposal to the Chicago Climate Exchange (CCX) for an urban forestry project. Under the lead of Dr. David MacFarlane, Associate Professor of Forestry at MSU and member of the CCX's forestry committee, the project's focus was to quantify the carbon sequestered by trees planted on campus since 1990 and those managed in three large university natural areas. MSU, a CCX institutional member since 2007, then used the carbon offsets internally towards its overall greenhouse gas (GHG) emissions reduction target of 6% compared to 2000 emissions. This project incorporated an extensive existing campus tree inventory and database, undergraduate researchers, collaboration across campus, and an expansion of the CCX carbon sequestration look-up table for individual tree species (14).



Urban Forestry Case Studies

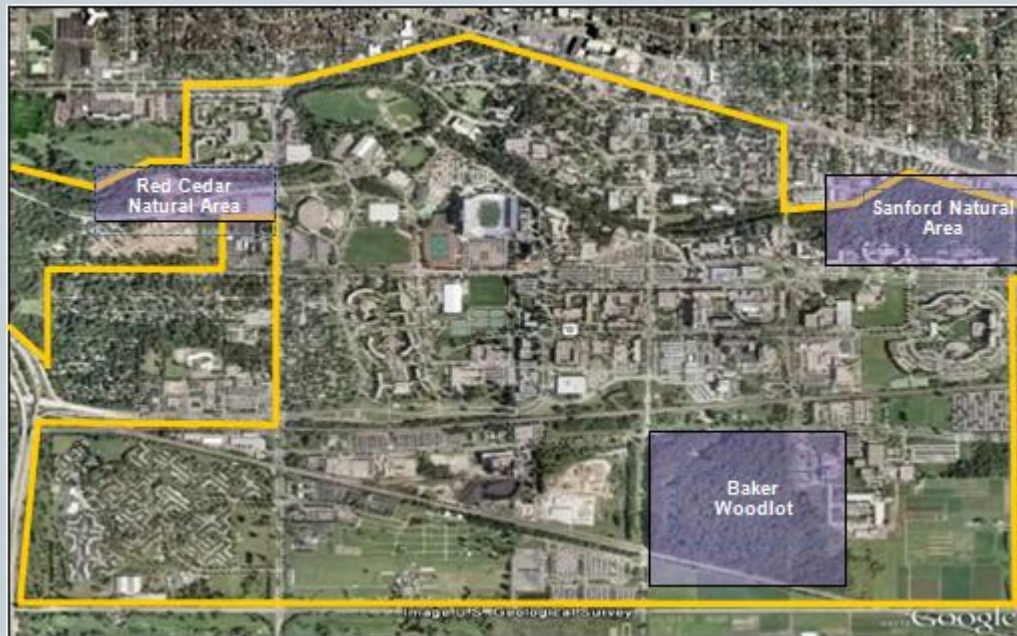
- **Sacramento Tree Foundation & Harbison-Mahoney-Higgins Builders**

- ✓ *One time project with a local building contractor*



Urban Forestry Case Studies

- **Michigan State University & the Chicago Climate Exchange**
 - ✓ *Internal carbon accounting and offsetting emissions from the campus power plant*



Urban Forestry Case Studies

- **The Cascade Land Conservancy's Carbon Mitigation Program**

- ✓ *Program to restore forested areas in Seattle area cities through carbon mitigation funds (pilot project was with Pearl Jam)*



Urban Forestry Case Studies

- **The CarbonPlus Calculator**

- ✓ *US Forest Service funded and developed for Boston, Baltimore, Philadelphia, New York City, Vermont, & Westminster, CO*

The screenshot shows the Boston CarbonPlus Calculator website. At the top, there's a header with the logo and a cityscape image. Below it, a navigation bar includes a 'Home' button. The main content area is titled 'I Want To Estimate My CO₂ Emissions For:' and features four input fields: 'My House' (with a house icon), 'My Car Travel' (with a car icon), 'My Air Travel' (with an airplane icon), and 'My Business' (with a briefcase icon). Each field has a '\$0' value. To the right, a green box displays 'My Total Emissions:' with 'CO₂ tons/yr' at '0' and 'Value:' at '\$0'. Further right, a section titled 'ACT LOCALLY!' contains three buttons: 'REDUCE My Emissions', 'OFFSET My Emissions', and 'Take The Carbon Pledge'. Below this, a large circular graphic with a globe background contains the text: 'Help create a greener Boston!', 'The Boston CarbonPlus Calculator will help you calculate your local impact on the environment and show you how, with small changes, you can make Boston greener.', and 'After calculating your impact you can offset your emissions by purchasing Boston Green Certificates.' The circular graphic is surrounded by five icons: a house, a car, an airplane, a briefcase, and a question mark, each with a corresponding label: 'Calculate your Household emissions', 'Calculate your Car emissions', 'Calculate your Air Travel emissions', 'Calculate your Business emissions', and 'More Information'.



General Findings

- Price per ton of carbon offset or mitigated ranges from \$.05 (CCX) to \$130 (CLC)
- Co-benefits of urban trees => “Premium” or “Gourmet” offsets
- Widespread uncertainty in carbon markets
- Two types of mechanisms: one-off and calculators



General Findings



- Groups seek marketing materials & voluntary carbon market guides
- Appropriate standards and feasible protocols are necessary
- Support & infrastructure needed to access the local market

Acknowledgements



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- **Collaborators**
 - Forest Carbon and Communities Workgroup
 - The Alliance for Community Trees

- **Sources**

Nowak, David J.; Stein, Susan M.; Randler, Paula B.; Greenfield, Eric J.; Comas, Sara J.; Carr, Mary A.; Alig, Ralph J. 2010. Sustaining America's urban trees and forests: a Forests on the Edge report. Gen. Tech. Rep. NRS-62. Newtown Square, PA: U.S. Department of Agriculture, Forest Service, Northern Research Station. 27 p.

Nowak, D. J. a. D. E. C. (2003). Carbon Storage & Sequestration by Urban Trees in the U.S.A. *Environmental Pollution*, 116, 381-389

All photographs were taken by Elise Schadler