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A CASE STUDY ON THE PRACTICE OF CARBON OFFSET PROJECTS IN MICHIGAN: FOREST PRACTITIONERS' PERSPECTIVES

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By

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Abstract

This report examines the practice of carbon offset programs on private nonindustrial forestlands in the state of Michigan ass. Previously, the state of Michigan provided technical assistance for enrollment in carbon offsets through the Michigan Working Forest Carbon Offset Program, but this program has now been discontinued. Currently, private companies and nongovernmental organizations are developing projects throughout the state with nonindustrial private landowners. This descriptive analysis in this case study examines the roles of different forest practitioners who are working on carbon offsets, including private consulting foresters and foresters within Michigan public agencies. I review the academic and grey literature on practitioners, analyze the interviews for themes, and provide policy recommendations.

Chapter 1: Forest practitioners' role in carbon offsetting in Michigan's forest management programs and beyond

1.2 Introduction

Forest carbon offsets pay landowners for specific land use practices that reduce or sequester carbon emissions. These practices may include harvest deferrals, tree planting, or restoration techniques. In the 1990s, intergovernmental negotiations created forest carbon programs as a mechanism for emissions reductions (Corbera et al., 2009). Globally, these voluntary incentive programs were primarily available to industrial owners with large forest holdings. Not until 2007 did nonindustrial owners of small forest parcels (family forests) in Michigan become eligible. This report asks: 1) how do carbon offset programs for family forests function in the context of Michigan's existing forest management programs? 2) How do private and public forestry consultants (hereafter called practitioners) interpret their roles in implementing carbon offset projects on family forests? How do they navigate complex relationships with family forest owners, public service foresters, and policymakers? 3) What specific actors and institutions are involved in these projects, and have they changed?

1.3 Context

Of Michigan's 20 million acres of forestland, 11 million acres are owned by private landowners. The Michigan Department of Natural Resources (MDNR) administers multiple incentive-based forest programs aimed at improving management of these private lands. In 2007, the agency created the Michigan Working Forest Carbon Offset Program to assist private landowners in accessing carbon markets. However, Michigan phased this program out in June 2011, after the Chicago Climate Exchange closed (Beddoe & Danks, 2013).

Currently, no Michigan agency provides technical assistance to private landowners to access carbon markets. Yet carbon offset projects have continued to grow in Michigan, with over 800,000 acres currently enrolled in carbon credits. Because the state no longer provides formal technical assistance, private consultants and NGOs (nongovernmental organizations) have expanded their roles to meet the needs of landowners interested in carbon credits. Understanding how these diverse actors navigate and participate in forest programs, and identifying constraints and opportunities they face, can help better integrate carbon offsets into Michigan's forest management.

1.4 Report Outline

Chapter 1 provides a background on the basics of carbon offsets, the markets that exist, and their recent history in the United States and in Michigan. This chapter describes the context of the different public programs administered by state agencies in the state of Michigan focused on forest management. This includes an overview of a past carbon offset program developed for private landowners. The chapter includes a literature review about the role of forest practitioners in forest carbon offsets. I define the gaps in the

existing literature and contrast that with literature on forest landowners using the database Scopus.

Chapter 2 asks: how do forest practitioners (both private and public) interpret their roles in developing carbon offsets projects from beginning to finish? The chapter focuses on the perspectives of private and public forest practitioners in the enrollment, monitoring, and verification stages of carbon offsets following the discontinuation of the Michigan Working Forest Carbon Offset Program. Because carbon offsets on family forests are new, this analysis uses semi-structured interviews to interpret how different actors describe the process of developing carbon offsets projects on nonindustrial private forestlands. Chapter Two explains the case study, and describes the codes generated from analysis of semi-structured interviews. The chapter triangulates the codes through document analysis through coding white papers with the interview codes.

Chapter 3 summarizes the findings from previous chapters and offers recommendations for future research. By understanding the practitioner's role in communicating with other practitioners from the beginning, verification, and monitoring processes, this report contributes to building best practices and policymaking for assistance programs. Based on the explanatory analysis from the semi-structured interviews and document analysis, I provide policy recommendations for the state agencies.

1.5 Statement of the Problem

Between 2020 and 2021, the global carbon offset marketplace grew four-fold from $520 million to over $2 billion in response to the articulation of Article 6 at COP26 in Glasgow (Forest Trends, 2022).[1] In the Great Lakes states, a study by Fancy et al. (2022) calculates that the region's private forests could yield $5.5 billion to $55 billion from carbon reforestation offset credits by 2050 if 10% of eligible private forests were enrolled. The Great Lakes region's extensive forest systems support biodiversity, ecosystem services, tourism and the forest products industry. Michigan's 20.1 million acres contribute to a $13.4 billion timber economy, and a $43.1 billion tourism economy (Michigan.gov). The forest products industry employs 90,000 people directly and indirectly in Michigan, including 150 registered foresters, 800 logging and trucking firms, and 300 wood product manufacturers.

Federal, state, local, and tribal governments manage public forests for multiple uses, and administer incentive programs on private lands. Beginning in 1924, Michigan legislators created incentive programs to encourage stable timber supplies, control wildfire, and forest health diseases, and provide wildlife habitat and biodiversity (Whitney, 1987; Hibbard et al., 2003; Zupko, 2020). Such state incentive programs have increased forest cover and carbon stocks in Michigan since the forest protection period between 1920-1950 (Daigneault et al., 2019; Birdsey et al., 2006; Whitney, 1987). The carbon stocks in the region's forest cover have been increasing for decades (Kurtz et al., 2013). According to US Forest Service data on private lands, Michigan holds 21.89 metric tons of carbon per acre on average and sequesters 1.61 metric tons of carbon dioxide per acre on average (USFS, 2021).[2] Enrolling these carbon stocks into carbon markets could change forest management practices in the region.

State agencies play critical roles in administering forest management programs and working with private landowners, forest product companies, and private consulting foresters.[3] However, public institutions' role in private forest carbon offsets are not well understood (Shen et al., 2023). The state of Michigan offers a useful case study because the majority of the state's forestlands are in private ownership (Butler et al., 2015).

Forest carbon markets in the United States are experiencing rapid growth in enrollment. According to Kaarakka et al., (2022), the American Carbon Registry and Climate Action Reserve (the largest registries in North America) have 257 forest carbon projects registered covering 8,442,750 acres. According to the American Carbon Registry, as of 2023, approximately 800,000 acres of Michigan's private forestlands were enrolled in carbon offset programs.[4]

Until recently, carbon credits had been available only to industrial forestlands with over 1,500 acres, primarily because of high transaction costs and verification costs for smaller holdings (Cacho et al., 2013; Kaarakaka et al., 2021). New technologies such as drone-operated remote sensing, however, have lowered verification costs, while aggregation of small parcels may be lowering enrollment costs. Emerging forest carbon programs now allow enrollment of forest parcels as small as one acre, with a contract length of as little as a single year (NCX.com).[5]

The federal government has not implemented national guidelines or programs for navigating these markets for private lands, leaving a policy vacuum (Smith, 2012). A recent Congressional Research Service report (2021) highlighted existing federal policy questions about the roles different federal agencies have in assisting landowners with funding and technical consultation, and the constraints such agencies face in assisting landowners. Because of the absence of clear federal guidelines, some state governments have stepped in to regulate private carbon markets. Irland and Hagan (2021) refer to state's implementation of programs as the "laboratory of democracy" approach. Michigan has influenced state-level carbon offsetting policy through enrolling public lands in carbon credits and developing past programs for technical assistance for private landowners. Maine, Washington, Vermont, and California have intervened in compliance and voluntary markets to assist private landowners enrolling in these markets.[6] Given the federal government's constraints with participation in carbon markets, studying carbon offsets at the state-level is appropriate.

Public agencies in several states (including Michigan) have designed programs to assist private landowners with enrolling lands in carbon offset markets (Miller et al., 2015). Michigan's program was piloted in 2006 and developed in partnership with the Delta Institute, an NGO (Beddoe & Danks, 2013). The MDNR discontinued the program in 2011 due to low interest, low carbon prices, and the closing of the Chicago Climate Exchange that had traded the credits (Miller et al., 2015; Beddoe & Danks, 2013). There is growing interest in carbon offsets, higher carbon prices, and new programs for family forest owners to enroll their forestlands in the voluntary market (Fancy et al., 2021).

As reviewed below, the literature on carbon offsets has focused on technical methodologies and landowners' willingness to enroll in carbon programs rather than on the implementation of projects. There is a gap in the academic literature focusing on the

description of forest practitioners' perspectives on developing and monitoring these emerging programs. Clarifying forest practitioners' roles can help provide context for state-level policymaking. This report describes the context of different actors and institutions in providing technical assistance to landowners, and policy coherency of forest management programs in Michigan and at the state-level (Pan et al., 2021; Irland & Hagan, 2020; Shen et al., 2023).

1.6 Background

Forests play an important role in the global carbon cycle through biomass and soil carbon sequestration (FAO, 2020; Tubiello et al., 2021). According to the United Nations Intergovernmental Panel on Climate Change (IPCC), deforestation (when forests are converted to non-forest uses such as agriculture) and forest degradation (when forests lose their capacity to provide ecosystem services) contribute 23% of global carbon emissions. Natural climate solutions are conservation or restoration-based activities taken to reduce emissions or increase carbon storage through expansion, modification, or protection of land cover (Griscom et al., 2017). These specific land practices might mitigate 21% of United States emissions and 30% of global emissions by 2030 (Griscom et al., 2017; Fargione et al., 2018).

Carbon offsets may reduce carbon dioxide emissions in the atmosphere by avoiding harvests, allowing forests to sequester (or absorb) carbon and store it in trees and soil. The IPCC classifies carbon offsets as a type of "Agriculture Forestry and Other Land Use" action for natural climate solutions to reduce the impact of global climate change. "Forestry and Other Land Use" projects make up 46% of the total carbon credits traded in the voluntary carbon markets (Ecosystem Marketplace, 2022).

Governments, the private sector, nongovernmental organizations, and financial institutions have invested substantial resources into financing forest carbon projects to meet the Paris Climate Agreement goals for mitigating global warming below 2° C by the end of the century (Griscom et al., 2017). Globally, governments are creating programs to meet nationally determined contributions in climate negotiations (Griscom et al., 2020), and corporations are investing to boost corporate responsibility (Streck, 2021; World Bank, 2022).[7]

The most influential forest carbon programs, the UNFCCC's REDD and REDD+, have been critiqued for their top-down decision-making and project implementation that marginalizes local and Indigenous peoples (Thompson et al., 2014). For example, to develop carbon credits on forestlands, the landowner must agree to sell their carbon rights to the buyer. The history of REDD and REDD+ are contentious because of the criticism that they violate the principles of free prior and informed consent by local peoples (Karsenty et al., 2014; Corbera et al., 2011). Allegations of corruption in programs and registries, and allegations that certain offset programs have actually become carbon emitters, have affected public perception of offsets.[8] Other investigations have found that offset projects can become large carbon emitters.[9] Because some of the world's largest emitters utilize carbon offsets, and because some programs may actually sequester little carbon, forest carbon offsets are coming under increasing scrutiny. Theoretically, forest carbon offsets

represent fixed emission removals that compensate for the release of emissions by the buyer (Broekhoff et al., 2019). For these reductions to become credits, two conditions must be met. First, carbon offsets must be transferable in marketplaces where the carbon can be accurately accounted for. Second, carbon offsets must be verified and tracked by third parties and backed up by independent accreditors to ensure that the credit creates real emission reductions. Carbon credits generated in offset projects that meet these conditions have credibility for the developer and the buyer of the credits. Registries are institutions that maintain standards and accountability for maintaining projects that ensure that carbon offset projects deliver climate benefits. The third parties account for the monitoring, reporting, and verification (MRV) that define compliance with the methodologies (World Bank, 2022).

The three main versions of carbon offsets include: avoided conversion, improved forest management, and reforestation or afforestation. (Broekhoff et al., 2019; Kaarakka et al., 2021). Avoided conversion projects must show that projects would halt land use change from forests to non-forested conditions; improved forest management projects are a specific set of silvicultural actions taken to improve the carbon storage in a forest that would not take place without the project. Reforestation and afforestation projects generate credits through tree planting; reforestation restoration projects are conducted in areas that previously sustained forests, afforestation projects plant trees in areas that have not been forested (Kaarakka et al., 2021; O'Connor & Gaertner, 2018).[10] In the United States and globally, improved forest management projects are the most common due to the diverse silvicultural and restoration techniques they include (Kaarakka et al., 2021).

Three conditions must be met to ensure that carbon projects reduce greenhouse gas emissions: *additionality*, *permanence*, and avoidance of *leakage*. *Additionality* means that the implementation of the carbon offset projects will create additional carbon storage over the baseline carbon in a "business-as-usual" scenario. The baseline is the amount of carbon that would have been sequestered under a business-as-usual scenario (Winrock International, 2022). Accurate carbon measurement ensures that the payments for the prescribed land practices are additional and created through the project. One key principle of additionality is that they carbon offset enrollments should not include situations where forests could not feasibly have been harvested in the absence of carbon offsets (Broekhoff et al., 2019).*Permanence* is the concept that analyzes the time scale of carbon storage on a project. One example is where increasing forest stocking for carbon storage, or over-crediting, increases the risk of wildfire and reduces ecological resiliency and long-term carbon sequestration risk (Littlefield et al., 2022; Badgley et al., 2022). *Leakage* occurs when a forest carbon offset project push harvests elsewhere (Pan et al., 2022).

The credits generated in forest carbon projects are bought and traded in either compliance or voluntary marketplaces. Compliance markets are regulated by set emission allowances, such as cap-and-trade schemes, where an authority issues credits to firms to meet the capped emissions (Ecosystem Marketplace). The California Air and Resources Board and European Emission Trading systems are prime examples of these regulatory markets that utilize Agriculture Forestry and Other Land Use credits. Voluntary

marketplaces sell credits from forest carbon projects to corporations seeking to meet carbon neutrality pledges.

Because of the lack of central governance within voluntary markets, nongovernmental organizations have tried to create centralized institutions to enforce standards (Kreibich & Hermwille, 2021; Streck, 2021). The Taskforce for Scaling Voluntary Carbon Markets is a group of private industries that works to find ambitious, flexible climate solutions in line with the Paris Agreement through private investments. The board members include development banks, investors, and advisory watchdogs. The task force includes players "throughout the value chain" on the supply and demand side. Another significant actor is the Voluntary Carbon Market Initiative which comprises businesses, NGOs, and governments committed to increasing the accountability and integrity of the voluntary carbon market from the "supply side."

The acreage included in forest carbon offsets is typically constrained by transaction costs, which has limited current carbon projects to industrial forestlands in the United States. The average size of improved forest management projects (IFM) is between 1,500-5,500 acres, respectively (Kaarakka et al., 2021).[11] Previously, compliance projects such as the California Air and Resource Board (CARB), that have 100- year contracts, made transaction costs too high for lower acreage projects.

Aggregation carbon projects work to reduce costs, pay for upfront development, and the project monitoring for small forest parcels. According to the registry the Climate Action Reserve, "aggregation involves the bundling of either multiple projects into one group or multiple activities into a single project for the purposes of project development and verification." Companies and nongovernmental organizations that have expertise and capital make these projects possible. Keeton (2015) argues that new aggregation-based projects have lessened constraints that limited nonindustrial forest owners from participating in carbon transactions.

Technological advances in forest modeling and geospatial analysis, such as remote sensing and drones, reduce the costs of inventory and monitoring which have reduced the costs of enrolling small forest parcels in carbon offset programs. These technologies have increased the viability of aggregation projects for small forest parcels, in part by overcoming the barriers of transaction costs that had prevented family forest owners with small holdings from participating (Pan et al., 2022). But aggregation projects present new challenges for project developers, verification, and relations with neighboring landowners (Pan et al., 2022). Uncertainty about carbon markets is another factor constraining the enrollment of nonindustrial forestlands (Pan et al., 2022; Kerchner & Keeton, 2015).

The state of Michigan administers several forest management programs targeted at the 185,698 nonindustrial private forest owners who own 10,607,555 acres of forests in Michigan (Michigan Department of Natural Resources, 2023). Such programs include tax-incentive programs that lower taxes for prescribed land uses and technical assistance programs that help landowners access information, resources, and expertise. The two major tax-incentive programs are the Commercial Forest Program, managed by the Michigan Department of Natural Resources (MDNR), and the Qualified Forest Program, managed by the Michigan Department of Agriculture and Development (MDARD). Both agencies provide public outreach to landowners with service foresters, use of

conservation districts, and programs such as the Forest Stewardship program, which connects landowners with forestry professionals to write plans, evaluate forest resources, and access cost-sharing opportunities for forest management plans.

1.7 Table 1.1 Carbon programs and tax incentive programs in Michigan.

Table 1.1 Comparison of tax-incentive programs with carbon programs available in Michigan

Program	Minimum Acreage	Contract Length	Compatible with Tax-Incentive Programs	Compatible with Forest Carbon offsets	Forest Management Plan needed
Commercial Forests Program	40	40 years	Perpetuity, unless withdrawn	*Under review	Yes
Qualified Forest Program	20	20 years	Yes	Yes	Yes
NCX	1	1 year	Yes	N/a	No
Family Forest Carbon Program	30	20 years	Yes	N/a	Yes
Forest Carbon Works	40	60 years	Yes	N/a	Yes
Finite Carbon's Core Carbon	40	40 years	No	N/a	No

In 2006 the MDNR launched a technical assistance program, the Michigan Working Forest Carbon Offset Program, for private landowners to access the emerging carbon markets. The project partnered with a non-governmental organization, the Delta Institute, to serve as the aggregator to trade forest carbon credits through the Chicago Climate Exchange.[12] The MDNR developed the program structure to work through the existing forest management program, the Forest Stewardship Program, which is the first of its kind to integrate management programs with carbon offsets (Beddoe & Danks, 2013). To recruit landowners to participate in the program, consulting foresters contracted with the Forest Stewardship Program and contacted feasible landowners to provide information and technical assistance.

Currently, the State of Michigan Attorney General's office is reviewing the MDNR's Commercial Forest Program to determine if forest carbon offsets coexist with the contractual obligations and legal basis of a forest product for the Michigan Commercial Forest Program, a tax-incentive program (MDNR personal communication, 2023).[13] This ongoing legal analysis suggests that forest carbon programs may be affecting the public sector's program administration, and relationships between public service foresters and the institutions working in conservation and forest products industries.

1.8 Policy Context

Public policy has been defined as the actions that governments choose to take or not (Dye, 1972), or actions to maintain the status quo (Howlett & Ramesh, 2003). Government design policies using policy instruments such as financial incentives or regulation to accomplish desired outcomes. For instance, Brukas and Sallnäs (2012) defined forest management plans as a type of policy instrument used by government on private lands. Policy implementation of an instrument is based on decision-making and formulation in the policy process. Administrators or other actors involved in policy implementation develop preferences for policy instruments based on past success and the chance of policy failure (Howlett et al., 2009, p.173). This report seeks to describe public and private actors involved in policy implementation of carbon offset projects. Previously, public agencies were involved in the policy design, but now are taking on new roles.

The following chapters examine forest management on private lands, through examining the public and private programs that operate in Michigan and the actors and institutions that work on them. The goal is to contribute to understanding the state agencies and the actors involved in these programs and how forest management in Michigan is influenced by voluntary programs. The report seeks to identify past goals and current goals for implementing carbon offsetting programs in Michigan to determine the effectiveness (Raynor & Howlett, 2007). Also, studying the integration of older programs into current ones can clarify these dynamics and understand how new government arrangements can be developed, and better understand what drives the emergence of new government arrangements (Raynor & Howlett, 2007). This case study can provide insights into how forest carbon programs influence the existing forest governance networks and can inform policy implementation (Abrams, 2019).

Through exploring the history and continued influence of the Michigan Working Forest Carbon Offset Program on current practices, future programs can integrate the lessons learned from past policy design. Investigating the policy mixes of voluntary and regulatory instruments like incentive programs can provide greater insights into the Michigan DNR’s available policy tools. Through practitioners' perspectives, this study can better understand the policy legacy of the program and how it can inform future policy making or path dependence (Kern & Howlett 2004). This report looks at the shift in technical assistance to contribute towards understanding policy dismantling (Bauer & Knill, 2014).

This report engages with social forestry through the perspectives of street-level bureaucrats working on conservation planning with public programs. Street-level bureaucrats' experience is critical to policy implementation and understanding the outcomes of policy design (Lipsky, 1980). Research on street-level bureaucrats shows that including direct experience of street-level bureaucrats can better inform the effectiveness of public programs (Maupin, 1993). The analysis examines how the integration of voluntary carbon offset programs on non-industrial lands fits into the practices of cross-boundary coordination and communication in forest management. This report examines the role that public institutions play in forest carbon markets, which needs to be better understood (Shen et al., 2022). This description focuses on how private and public actors communicate and work together in carbon offset projects through informal communication. This is important because Knoot and Rickenbach (2014) find that little is known about private-public partnerships in forest management. Knoot and Rickenbach (2014) argue that private foresters are increasingly fulfilling on-the-ground roles that state agency foresters have in the past, and public agency foresters are tasked with more administrative roles.

Understanding the tacit knowledge from program managers and practitioners that have been active in carbon management, whether early adopters or not, can provide important insights into street-level bureaucracy in forest management. This is critical because of the changing forest sector revenue and its impact on policy dynamics (Sheppard et al., 2020). These perspectives provide opportunities for studying agenda setting through the Inflation Reduction Act and roll out of the Infrastructure Bill, which provides hundreds of millions of dollars available for carbon offsets and emergent markets for private landowners (Cooper & MacFarlane, 2022). This case study can inform public policy research within the context of the different stakeholders adapting to the new markets and shifting networks, such as consulting foresters and forest product professionals.

The policy context of forest carbon offsets on private lands in the state of Michigan is influenced by the shifting forest products industry, the administrative constraints of the current forest management model, and policies being enacted at the state and federal levels. According to the Bloomberg (Elgin, 2022) investigation, current industrial compliance and voluntary carbon offsets include over 800,000 acres of Michigan forests, roughly 4% of the state's forest resources. The recent launch of nonindustrial forest programs may influence the state's forest management. In 2021, Michigan House Bill 5422 and Bill 6067 were introduced to the house, seeking to restrict the DNR's sale of credits on state forestlands.[14] However, these bills did not pass and allowed for the development of a pilot project, the Big Wilds carbon project in Michigan's Pigeon River State Forest, advancing the development of more carbon projects on state lands (Michigan DNR, 2023).

At the federal level, Senator Debbie Stabenow (MI) co-introduced Senate Bill S. 1107, the Rural Forest Markets Act, which would have created a Rural Forests Investment Program providing technical assistance through non-governmental organizations to provide private landowners to access emerging markets.[15] However, the bill died in Congress before it could create federal funding for small landowners. The

Inflation Reduction Act of 2022 provided $450 million for climate-focused forestry, $700 million for the Forest Service's Conservation Legacy program, and $1.5 billion allocated for urban and community forestry (American Forests, 2022). These landmark investments are key to understanding the evolving shift in climate-oriented forestry and shifts in the institutions. This case study seeks to engage with the shifting model of forest management at the state-level.

1.9 Literature Review

This literature review section describes how academic literature on carbon offsets has studied forest practitioners. The first objective of this literature review is to establish what gaps, opportunities, and key themes have been defined in the literature about forest practitioners. The second objective is to provide context about how the literature has described the relationship between forest practitioners and other institutions, specifically, landowners and policymakers. The third objective is to determine if the academic literature has focused more on the role of private landowners in carbon offsets in the United States rather than on forest practitioners.

To find relevant literature, I conducted Boolean searches on the Scopus database (Moher, 2015). The subject of the searches is the forest practitioners who work on the ground on carbon offset projects. I use keywords that look at different forestry and natural resource job titles, to find the relevant literature on these practitioners. I focus on how the literature has addressed practitioners in the process of carbon offsets rather than policy design or theoretical perspectives of carbon offsets. This literature review examines papers that utilize qualitative methodologies such as surveys, interviews, focus groups, or case studies. Although only the literature on practitioners is reviewed, the comparative Boolean searches establish how much literature is focused on the perspective of landowners versus forest practitioners using qualitative methods.

Defining Forest Practitioners

In this literature review, the term forest practitioner pertains to all professionals working in forestry sectors, including forest management, forest certification, forest products, silviculture, and biological studies of forest systems. Personnel working on ecosystem services such as forest carbon programs or third-party verifiers. The organizations span natural resource agency staff (federal, state, local. and tribal), nongovernmental organization personnel focused on forest management or conservation, or certification. Private forest company staff such as consulting foresters, forest administrators, field technicians involved in marking, inventory, or staff working on statistical and geospatial analysis. This definition encompasses all forest product workers including loggers. Biologists and ecologists that are working on forest systems are included in this. Based on this description, I utilize these criteria for determining the keywords in my Boolean operators.

1.10 Literature Search and Selection

Forest practitioners:

(TITLE-ABS-KEY ("forestry practitioner" OR "state forestry agency" OR "forestry practitioners" OR "forest practitioner" OR "forest practitioners" OR "forestry professional" OR "forestry professionals" OR "forest professional" OR "forestry professionals" OR "forester" OR "foresters" OR "forest product manager" OR "forest product managers" OR "forest scientist" OR "forest scientist" OR "forest ecologist" OR "forest ecologists" OR "forest biologist" OR "forest biologists" OR "forestry worker" OR "forestry workers" OR "forest workers" OR "forest worker" OR "forest product worker" OR "forest workers" OR "forestry administrator" OR "forestry administrators" OR "forest administrator" OR "forest administrators" OR "forest administration" OR "forestry administration" OR "natural resource manager" OR "natural resource managers" OR "resource management professionals" OR "resource management professional")) AND ("carbon credit" OR "carbon credits" OR "carbon offsets" OR "carbon offset" OR "carbon program" OR "carbon programs" OR "carbon management" OR "carbon project" OR "carbon projects" OR "voluntary market" OR "voluntary markets" OR "voluntary projects" OR "voluntary project" OR "voluntary offset" OR "voluntary offsets" OR "compliance offset" OR "compliance offsets" OR "compliance project" OR "compliance projects")

Table 1.2 Papers reviewed on forest carbon practitioners from Scopus database

Author	**Publication date**	**Citations**	**Method**	**Subject**	**Location**
Caldwell et al.	2014	6	Case Study	Foresters and landowners	California
Kumer and Urbanc	2020	10	Focus Group	Forester and stakeholders	Slovenia
Yang et al.	2016	4	Survey	Foresters	Sichuan, China
Wade and Mosley	2011	16	Survey	Foresters	United States
Littlefield and D'Amato	2022	5	Case study	Natural resource managers	Michigan, Minnesota, New England
Moser et al.	2022	1	Focus groups and interviews	Natural resource managers	Minnesota
Miner et al.	2021	5	Focus Groups	Forest owners, foresters, nonprofits, gov.	Georgia
McBride et al.	2019	12	Interviews	Natural resource managers	New England
Nerfa et al.	2021	8	Survey	Forest carbon practitioners	15 tropical countries

Miller et al.	2014	4	Survey	Public natural resource managers	United States
Poudyal et al.,	2010	28	Survey	Public Natural Resource Managers	United States

Landowner/Forest owner:

(TITLE-ABS-KEY ("woodland owner" OR "Forestland owner" OR "forest owners" OR "private landowners" OR "Private forest owner" OR "family forest owners" OR "family forests" OR "family forest" OR "nonindustrial private landowners" OR "smallholders" OR "smallholders")) AND (("carbon credit" OR "carbon credits" OR "carbon offsets" OR "carbon offset" OR "carbon program" OR "carbon programs" OR "carbon management" OR "carbon project" OR "carbon projects" OR "voluntary market" OR "voluntary markets" OR "voluntary projects" OR "voluntary project" OR "voluntary offset" OR "voluntary offsets" OR "compliance offset" OR "compliance offsets" OR "compliance project" OR "compliance projects")) AND ("willingness to accept" OR "willingness to pay" OR "incentive")

1.11 Inclusions and Exclusions

Forest Practitioners

Following Moher (2015) methods of criteria for inclusion and exclusion, I utilized the first operators to narrow my search to 105 documents. Within these identified, I added the following operators: ("Interview" OR "survey" OR "focus group" OR "case study") to yield qualitative papers focused on practitioners. This selection included 61 papers. Within these I removed 42 papers for being irrelevant. Then I read the abstract of the remaining 19 papers. This limited selection to the final ten papers that I reviewed.

Landowners/Forest owners

Following Moher's (2015), I yielded 180 papers with keywords for forest landowners. I excluded 14 papers down to 166 that were not journal articles. Within this search, I added the selection for qualitative methods using the following operators: ("case study" OR "interview" OR "survey" OR "focus group"). This excluded 30 papers down to 136. After reviewing the papers, 31 papers were not applicable and removed. This left 105 papers with relevant methods that met the criteria for review.

Landowners versus Practitioners

The searches have two distinctions, one is the differences between the landowner and practitioners subject and their variations that is be queried, the second is an additional statement for the landowners that includes the keyword for "willingness to pay." Without the addition of this statement, the result produced 440 papers. The topical query on carbon projects remained the same for both searches. The main difference is the subject, landowner, is that the landowner query contained 11 different subjects "landowner" OR

"forest owner"), much fewer. In contrast, the practitioner query contained 36 subjects ("forest worker" OR "forest administrator," etc.) to capture a wide range of perspectives from forest practitioners. I utilized this to test if there is less literature on practitioners. After the following exclusion, I was left with 105 papers versus 11 papers to review compared to the practitioner results. This confirmed that there is more literature being generated about landowners.

Setting of Reviewed papers

This literature review of ten papers is based on the reported experiences from practitioners in sixteen different countries, primarily the United States. Nerfa et al. (2021) include survey results from practitioners in Australia, Bolivia, Costa Rica, Ecuador, Columbia, South Africa, Indonesia, India, Madagascar, Guatemala, Panama, Peru, Sri Lanka, Kenya, Vietnam, and Hawaii. Fan et al. (2021) is a case study in China's Sichuan province. Moser et al. (2022) conducts a case study on practitioners in the US state of Minnesota. Littlefield and D'Amato (2022) examine the Great Lakes region and Northeastern region of the United States, Miner et al. (2021) is a case study in the US state of Georgia. Miller et al. (2015), Poudyal (2010), and Wade and Moseley (2011) are national surveys of the United States. McBride et al. (2019) focus on the northeastern states of the United States. Caldwell et al. (2014) examine practitioners in California.

The first research question is: What core themes emerge in the literature on carbon offsets and private practitioners?

1.12 Theme 1: New Tradeoffs.

The first theme in the papers is *new tradeoffs*. Several researchers found that while carbon management has created opportunities for novel land management, it has also created new tradeoffs. This theme directly includes the associated limitations of these types of management practices for ecological values and organizational structures. Littlefield and D'Amato (2022) examine the opportunities for land managers to draw on conservation strategies to increase carbon sequestration while maintaining biodiversity and wildlife management. The case studies explore ways silvicultural methods or other technical land use prescriptions complement long-term land planning. Moser et al. (2022) shows that carbon markets present opportunities for afforestation and longer-rotation stand management that addresses forest health through improved forest management carbon credits. Littlefield and D'Amato (2022) focus on the tradeoffs associated with carbon management on ecosystem management. Primarily, permanent long-term carbon storage necessitates active management of disturbance-dependent ecosystems. Moser et al. (2022) addresses the complicated nature of tradeoffs between the additionality of carbon projects, the stocking level of baselines, and the need for active management in overstocked or disturbance-dependent forest types.

Caldwell et al. (2014) frame the steady growth of the compliance market with the voluntary market as an opportunity for foresters to benefit from multiple-use forest management economically. Poudyal (2010) shows that urban forest administrators have the capacity to implement carbon storage on municipal lands and that they can

complement climate change adaptation work already being carried out. The context for tradeoffs beyond the United States is quite different; compliance projects in other countries, like the CDM project in Sichuan, China, present more complicated challenges for foresters working on carbon projects. Fan et al. (2016) find that the forester's involvement in carbon sequestration projects is based on the costs of information, forecasted income, and socio-economic status. Differences between implementation and forester forest owners seem less defined in the context. The opportunities for participation in carbon markets for private companies, nongovernmental organizations, or public agencies represent changes in ecosystem management goals and the organizational structure for land management.

1.13 Theme Two: New Relationships.

The second theme that emerges is *new relationships*. Several researchers found that carbon offset projects create new relationships between foresters and private landowners. This theme encapsulates foresters' different roles in forest management, accessing markets, and communicating with landowners. Forest practitioners indicated that they needed to strategically approach emerging markets to capitalize on conservation outcomes and the economic role. Wade and Mosely (2011) find that practitioners cited issues with trust in carbon markets, landowners' trust, and issues with accessing immature markets. The surveyed foresters identified a lack of transparent processes and rules as barriers to enrolling landowners. Regarding conservation planning, McBride (2019) finds that natural resource professionals perceive carbon credits as a practical strategy for advancing future conservation with private landowners not involved in current forest management networks.

The literature suggests that different relationships have developed between private landowners and forest practitioners in the global south versus the United States. Nerfa et al. (2021) provide examples of the potential to transform community support through investing in integrated carbon projects and community engagement in tropical forests. They argue that organizational structures that include landowners can create more resilient projects with stakeholders to reduce unintended outcomes with wood harvesting and wildfire. Forest practitioners describe the opportunity for integrating project monitoring with local communities to increase organizational resilience, increase permanence, reduce leakage, and solve cross-boundary issues on private lands (Nerfa et al., 2021, p. 4). Conversely, Littlefield and D'Amato (2022) provide examples of landowner support for carbon storage and markets and even bills passed in Massachusetts trying to restrict wood cutting in the state. Miner (2021) determines that female forester owners have different preferences for forest carbon markets compared to male private foresters and governmental and nongovernmental organizational staff working on forest management. This suggests that gender, demographics, and geography all inform the values of landowners and forest practitioners working on carbon projects.

1.14 Theme Three: Role of Public Managers.

The third theme that emerges is the *changing role of public managers*. Several researchers found that public managers face different constraints and hold different objectives based on their location and level of government. In the United States, public administrators have very different roles than other forest practitioners. Moser et al. (2022) finds Minnesota's local, state, federal, and tribal governments have many different legal, economic, organizational, and scientific strategies that determine how they engage with carbon markets. Miner's (2021) survey of four forest stakeholder groups determines that state agency officials prioritized income opportunities and were much less interested in new markets, including carbon markets, than landowners and nongovernmental organizations. Littlefield and D'Amato (2022) address the complexity of communicating to the public the ecological tradeoffs with carbon storage maximization and public pressure reducing wood harvesting and forest management. These differing priorities reflect important distinctions between identified objectives that inform the role of government intervention.

1.15 Theme Four: Contradictions.

The fourth theme that emerges is *contradictions*. Researchers find that forest practitioners perceive contradictions between the carbon offset projects and the intended outcome of emission removals. These contradictions include carbon offsets that fail to address their intended purpose, fail to improve the ecological conditions of the land, or fail to meet most landowners' needs (Moser et al., 2022). Moser et al. (2022) also finds that forest management programs may already be indirectly managing carbon.[16] Littlefield and D'Amato (2022) and Moser et al. (2022) argue that carbon management in particular ecosystems contradicts management goals and reduces the adaptive capacity of multiple forest types. Miller et al. (2015) argue that state agency foresters do not see the value in investing in carbon markets because there is little interest among forest landowners; thus, investing in assistance contradicts serving the majority of landowners. Similarly, Miner (2021) determines that private foresters are invested in utilizing the existing networks for forest management and forest products rather than exploring new markets, including carbon markets. Wade and Mosley (2022) find that foresters would prefer state agencies to modify tax-incentive programs to participate in these markets. Miller et al. (2015) show that state agency foresters prefer integrating carbon offset projects through expanding technical assistance programs such as the Forest Legacy and Forest Stewardship Program. The main barriers to participation identified in the literature review include: the lack of standards at different levels of governance (Moser et al., 2022); The failure to implement projects or programs across different ownership types, which are not addressed in other papers (Moser et al., 2022); the financial costs for service providers, conservation districts, and administrators learning about markets trends and providing training on how the programs work (Miller, 2015; Wade & Mosley, 2011; Moser et al., 2022); the tradeoffs of conservation versus other types of ecosystem management (Littlefield & D'Amato, 2022; Moser et al., 2022); the costs of new

programs and contracts and cost-sharing with federal agencies (Wade & Mosely, 2011; Miller et al., 2015; Moser et al., 2022).

One of the limitations of this literature review is that some of the studies are only partially focused on carbon offset projects but deal with ecosystem services. Because my primary focus was on selecting papers that included forester practitioners, and because of the limited literature available, I included studies where carbon offsets were a component of the paper. For example, McBride (2019) discusses a menu of different ecosystem services for landscape planning. Forest practitioners are the paper's focus, but carbon offsets are not. Another limitation in this literature review is the diversity of sites. The papers examine different regions with different goals. One last limitation is that the literature review focuses on various practitioners that include private companies, municipal and state agencies, landowners involved in land management, and nongovernmental organizations. This limitation reduces the certainty of specific challenges, but the diversity of perspectives is a strength for examining an understudied and emergent marketplace.

As discussed above, four themes emerged in the limited research: 1) carbon management creates opportunities for novel land management, but they create tradeoffs for ecological and organizational management; 2) carbon offset projects create new relationships between foresters and private landowners; 3) public managers face different constraints and hold different objectives based on their location and level of government; 4) practitioners perceive contradictions between the carbon offset projects and the intended outcome of emission removals. These themes indicate changes in forest management happening across multiple regions and suggest unique challenges for governments.

Pan et al. (2022) conducted an extensive meta-analysis on academic literature focused on the key challenges to forest carbon projects. Gray literature is “information produced outside of traditional publishing and distribution channels, and can include reports, policy literature, working papers, newsletters, government documents, speeches, white papers, urban plans.” They find that gray literature, rather than peer-reviewed scholarly literature, is “where considerable information about voluntary standards is published” on forest carbon projects. Nerfa et al. (2021) writes that “such as factors on the ground that cannot be described without the insight of the practitioners who are deeply involved in the project.” This key point is important for programmatic design and policymaking.

2 Chapter 2: Interviews and explanatory analysis

2.1 Introduction

This chapter asks: How do forest practitioners interpret their role in developing carbon offsets? How do these actors interpret the institutions working on forest carbon offsets and broader forest management? What actors and institutions are involved in carbon offsetting in Michigan?

Building on material from Chapter 1 that describes the institutions, programs, and history of forest management in Michigan, this chapter examines private and public forest practitioners in Michigan who work on carbon offset projects directly or indirectly. Because Michigan's Department of Natural Resources has been involved in carbon markets for over 15 years, understanding the current context of how these actors and institutions currently interact with and interpret these networks can provide useful insights for the future for program design or policy intervention. Shen et al. (2023) identify the need to understand the roles of private and public institutions in project development.

The study is framed as a single case describing current perspectives, between 2022 and 2023, with a geographic boundary of state of Michigan. The case approaches how different private, public, and nongovernmental organizations are working at the state-level to understand the "laboratory of democracy" to state polices on carbon offsets regulation and programmatic structures (Irland & Hagan, 2021). Case studies are "empirical inquiry that investigates the contemporary phenomenon in depth and within its real-life context" (Yin, 2009, p.17).

2.2 Methods

This chapter uses qualitative content analysis of semi-structured interviews, combined with document analysis of Michigan state documents (Creswell & Clark, 2017). Qualitative research can provide complex descriptions of the context (Cresswell, 2013, p. 48). The thematic coding uses inductive research design for describing the emergence of forest carbon offsets on private forestlands in Michigan and interpreting the practitioners' perspectives. Analysis of material from interviews helps understand the settings of practitioners who work in different programs and provides preliminary context (Hesse-Biber & Leavy, 2010). Documents were analyzed using Altheide et al. (2008) document analysis methods, a critical technique to descriptive case studies (Priya, 2021). NVIVO was used to extract themes from interviews and documents (Kuckartz, 2013).

2.3 Interview Methods

The project began with an initial evaluation of the literature that identified a research gap. The research on carbon offset research focus has not addressed practitioners' role in carbon offsetting in Michigan (1), has not described the increase in programs available to small forest owners (2) has not explored who is involved (is the public sector involved, are there more actors than on paper).

Michigan Technological University's Institutional Review Board approved the project on September 24 of 2022. Initial interview contacts were made at the Society of

American Foresters National Convention in Baltimore, Maryland, in the fall of 2022. These initial contacts allowed for snowball sampling with private companies, agencies, and nongovernmental organizations working in the carbon sector or involved in the contracts or compliance. Following each interview, I asked for potential contacts that the interviewees thought was important for understanding the landscape of carbon in the region. These contacts were made with emails that requesting participation in a research interview and detailed the project in a short-narrative format, and with a document from the Institutional Review Board. Each interviewee signed a written consent form with an electronic signature and returned it to me.

I conducted semi-structured interviews beginning in October 2022 and completed them in June 2023. All interviews were conducted via Zoom platforms and lasted between 30 minutes and an hour and a half. All interviews were recorded onto the local computer as audio files. I uploaded each file into Otter.ai, a software application that transcribes the audio and allows the user to listen to the transcript. Within Otter.ai, I cleaned the transcripts to catch inaccurate words and reduce filler such as "hmm, um, etc." The transcripts were then converted into a TXT file. During the interviews, all interviewees were offered a finished transcript to review for accurate representation. The transcripts were uploaded as TXT files into NVivo for iterative coding and analysis (QSR International Pty Ltd 2020). Through iterative coding in NVIVO, I identified 42 distinct codes that were integrated into theoretical codes.

2.4 Document Analysis Methods

Bowen (2009) synthesizes the uses of documents to increase the rigor of qualitative research through multiple methods through triangulation. According to Bowen (2009), by using institutional documents or reports, the researcher can "corroborate findings across data sets" to complement other types of qualitative research methods and reduce the bias of one type of method. Charmaz (2006) refers to "extant texts," such as public records or literature that can be incorporated into the analysis of the collected data to find differences between how organizations act versus how they claim to: "provide useful statements about an organization's professed images and claimed objectives-the front stage view aimed to shape its public reputation" (Charmaz, 2006, p. 52). The document analysis was used to determine the saturation of the interviews and theoretical coding process.

In Pan et al.'s (2022) meta-analysis of the literature on carbon offsets, they state that there are limitations to their research due to not investigating the gray literature on the topic. In this project, I seek to reduce the limitations of semi-structured interview analysis by analyzing the eight white papers on forest carbon offset projects through the codes that emerged in my analysis of the interview texts. The document analysis selected eight papers that are divided into three different groups of documents. The first group of papers compare two of the Michigan DNR's forest action plans from 2010 and 2020. These are analyzed to understand the strategic change in the agency following the implementation of the MI Working Forest Carbon Offset Program and how they are nested within other forest management objectives of the agency. The second group of

papers are project reports on the MI Working Forest Carbon Offset Program by third-party researchers and published by the Delta Institute, the aggregator of the program. The first paper reports on the progress of the pilot program, and the second paper analyzes the program after the discontinuation (Beddoe & Danks, 2009; Beddoe & Danks, 2013). This analysis tracks changes between the active program period and the completion of the program. The third set of papers are white papers that focus on state-level carbon projects to understand variation in programs at the state-level. This includes two state-level focused paper (Macleod et al., 2021; Danks, 2019), one paper on the feasibility of Michigan's carbon project on public forestlands (Willis et al., 2019), and a systematic review of state-level carbon programs (Macleod et al., 2021; Lohman et al., 2022; Danks, 2019)

The first objective of the document analysis was to triangulate the codes that emerged in the interview analysis. These codes are used in the explanatory analysis. See table 2.3 in the Appendix for the papers. All the documents were queried for the codes developed in NVivo and coded with the codes developed in the interview texts (Kuckartz, 2013; Owen, 2014). The second objective was to analyze change in agendas of the strategic Forest Action plans between 2010 and 2020, I used word frequency queries to examine for words and phrases related to the program, carbon offset projects, and access to the emerging markets. I used key words grouped as synonyms for the following: 'Access,' 'Assistance,' 'Carbon,' 'Consulting,' 'Climate,' 'Markets,' 'Outreach,' and 'Program.' For the second set of papers looking at the MI Working Forest Carbon Offset Program from 2009 and 2013, I used word frequency queries to understand differences in the program development from pilot to maturation of the program. I used synonym groupings for the following key words: "Agency," 'Landowner,' 'Outreach,' 'Partner,' 'Practitioner,' and 'Program.' These were selected to see if the reports focus changed from practitioners and the actions of technical consultation or information to different technical administration or actors, not practitioners. The third set of papers were coded to see if new codes emerged beyond the codes that emerged in my interview codes. In the first set of white papers that I analyzed (the program reports on MI Working Forest Carbon Offset Program), I compared the frequency of key words in the two documents to compare changes in key actors. Comparison of the second set of documents helped me identify the state's shifting strategies regarding forest carbon.

2.5 Saturation

When using inductive social science methods, evaluating the quality of the data takes careful consideration (Aldiabat & Le Navanec, 2018, p.247; Charmaz & Thornberg, 2021, p. 310). I utilized the Mills and Berks (2022) manual to manage my data, memo, and codebook, and to construct my explanatory analysis. I tested for data saturation through the methodology of Aldiabat & Le Navenec (2018). My first measure for ensuring data saturation was by iteratively coding each interview to build hierarchical coding structures through open coding (Charmaz & Thornberg, 2021, p. 308; Aldiabat & Le Navanec, 2018). Before I analyzed all the interview texts together, I coded the interviews after each memo was completed. To keep track of the emerging codes and

findings, I used the Mills & Birks (2022) technique for memos. To evaluate the interview codes, I used Bowen's (2008) approach for using document analysis and added triangulation of my findings with a multi-method comparison of texts (Aldiabat & Le Navanec, 2018).

2.6 Reflexive position statement on carbon offsets

For approaching this research on carbon offsets, it is important to acknowledge the degree of contention that is associated with carbon offsets projects. I believe that forest-based carbon offsets can offer an important mechanism for emission removals in climate change responses by governments, but they cannot be substituted for substantive legally binding climate actions. I approach these projects from perspective of a practitioner. I have a degree in forestry; I am associated with professional societies in forestry; and I have professional experience in civil service and nongovernmental organizations. In my interviews with practitioners, I tried to broach the scandals associated with carbon offsets, in order to talk honestly about the complexity, weaknesses, and opportunities of offsets. Also, I approached this project with the belief that finding best practices from practitioners' direct experiences is important. Additionally, I seek to make practical observations to inform future forest management. This position was used in my memoing process to track my findings and improve the techniques for data saturation (Aldiabat & Le Navanec, 2018, p.255). Also, this statement is informed by Owen (2014) for approaching controversial research topics.

2.7 FOIA Methods

Through personal communication with DNR staff and administrators, I learned that in 2007 the Michigan DNR had established a policy on integrating carbon credits into Michigan's Commercial Forest Program. I submitted a Freedom of Information Act on June 4th of, 2023, and I received a response to my request on July 11th, 2023. The materials included electronic communication from the then State Forester, Danna LaCourt, that determined a policy on section 511 of Michigan's Commercial Forest Act for the Commercial Forest Program. The FOIA request included four different documents between public administrators and forest practitioners clarifying the policy. The first set of electronic communication dates to 2007 and contains subsequent communication from 2017, 2021, and 2023.

2.8 Results

This interview analysis is based on NVIVO analysis of 17 semi-structured interviews conducted with forest practitioners. Practitioners included employees from private consulting firms, carbon developers, carbon programs, nongovernmental organizations, state agency administrators, a tribal natural resource department, and researchers and scientists involved in program development.

2.9 Explanatory Analysis Results

This case study is a synthesis of forest practitioners' perspectives on carbon offsets projects involved in forest management in the state of Michigan. Based on the data collected from the interviewees and document analysis, and several codes (or core themes) that emerged from the NVIVO analysis, I constructed an explanatory narrative.[17] The narrative addresses the three research questions: how are forest practitioners interpreting their role in forest carbon offset projects, how do their projects fit into the forest management model, and what actors are involved and has changed since the closing of the Chicago Climate Exchange?

The narrative is this: following the closure of the Chicago Climate Exchange and the Michigan DNR's programs, state agencies strategically transitioned away from publicly providing technical assistance for carbon markets. This shift led to private companies taking on the role previously fulfilled by the agency. However, there has been a recent shift as state agencies are again collaborating with private landowners to develop carbon projects, resulting in confusion about the state's role. Forest practitioners are now *responding* to landowner demand to enroll in family forest lands, departing from their previous role of *prescribing* carbon markets to owners. These changes in programmatic structure have created policy incoherence between public forest management programs and private carbon offset programs on private forest lands.

The four major theoretical codes that inform this narrative are the following: 1) confusion over state agencies' activity in forest carbon markets on private and public lands; 2) issues with confidentiality in forest carbon offset markets that reduce communication and coordination; 3) the self-regulation of carbon markets; 4) and the changing relationships between forest practitioners and landowners with forest-based revenue streams. Below, I offer syntheses of the higher-level theoretical codes to explain how other codes are integrated in the analysis.

2.10 Code 1: State Agencies Role Integrating Carbon Offsets into Forest Management

The first theoretical code, *State Agencies Integrating Carbon Offsets into Forest Management,* represents forest practitioners' interpretation of agencies' role in carbon offsets projects in Michigan and what has changed since the end of the Chicago Climate Exchange. This code highlights how agencies view carbon offsets in terms of forest management and describes how other institutions work with public agencies on carbon offsets. This theoretical code contains two additional codes: the *MDNR Carbon Offset Project* and the *Paying for More than Carbon* Code. The former is a case on the "Big Wild Project" on public forestlands, and the latter is practitioners' description of how carbon offsets are being or should be used as strategic tools for reasons other than carbon storage. The *Paying for More than Carbon code* is included because it examines land planning and the role of public programs. The MDNR Carbon Offset code is included because it examines the role of public agencies in carbon projects.

MDNR Carbon Offset Project

Forest practitioners maintain different perspectives about the role state agencies should play with forest carbon to carry out forest management. Since the closing of the Chicago Climate Exchange and the subsequent MI Working Forest Carbon Offset Program, carbon developers, timber companies, and the forest products industry have all interpreted the state's strategy differently. In an interview with an MNDR program administrator, they detailed the set of two bills proposed in the legislature in 2021 and 2022, House Bill 5422 and House Bill 6067, respectively:[18]

> Michigan Association of Timbermen worked with their legislators to introduce two bills last year, one that just explicitly prohibited the state of Michigan from selling carbon. And then once they realized that was dead on arrival, they submitted a second bill that said, well, if the state is going to sell carbon, it should do these three things, which we're already doing. So that was kind of pointless. But the loggers are concerned; they're worried that America wants to lock up the forests and grow carbon and not send wood to the mill, and they should be concerned about that.

The administrator described the first bill as a reaction to the proposed creation of the first carbon offset project on state forestlands, the Pigeon River Country State Forest, known as "the Big Wild" project. The contention over this project is that it is the first project in the country developed on state lands.[19]

In the interview with Finite Carbon (a large carbon project developer), the operations manager involved in the contracts mentioned that they declined the Pigeon River project for multiple reasons. One reason was that the project was controversial because "the most pronounced issue of significance in the state of Michigan on carbon is the state doing a Carbon Project on state forest lands." Also, the interviewee described that Finite Carbon "declined to do that project because we didn't feel as though that project was clearly additional and in high integrity. We didn't feel there was any change in management of those forests that would represent a net increase in carbon outcome in the end." This view from the administrator suggests a disconnect between how the forest products industry, carbon developers, and public agencies interpret the value that forest carbon projects bring to forest management.

The interviewee from Michigan Timber Association explained that they are worried about the regional forests becoming saturated with carbon credits. The interviewee detailed the confused reaction of loggers and other forest product practitioners that attended a training for licensing purposes by a Michigan DNR administrator. They raised questions about how the agencies and foresters should communicate the role of forest carbon offsets, stating: "how do we how do we best tell the story about forest management and mechanized forest management compared to other types of forest management, and how to help landowners make sure that they're getting what they need for a healthy forest?" They followed by asking critical questions about land available for harvest and how it will be sustained: "are they relying on the Forest Service, the DNR? I'm wondering if this carbon stuff is going to force timber producers to engage in a much heavier level of reforestation to continue harvesting and in smaller

areas." They framed an increase in forests enrolled carbon credits as an interruption to harvests and a threat to business and their model for forest management.

Paying for More than Carbon

The second code, *paying for more than carbon*, reflects forest practitioners' interpretation of carbon offsets as a strategy to accomplish diverse forest management or land planning goals. This code describes how private, public, and nongovernmental organizations define carbon offset as a tool to provide land tenure, funding opportunities, and other types of stewardship, not just carbon storage.[20] These excerpts focused on the services provided through the land use prescriptions and compliance with a specific type of carbon offset program, not stressing the emission reductions or climate goals. I found multiple variations in the transcripts that reflected the use of carbon offsets to accomplish a suite of different values that are associated with forest management.[20]

The most common example that forest practitioners described was using carbon offsets to secure land tenure, reduce fragmentation, and "keeping forests as forests." A Michigan DNR forest administrator described enrollment in compliance market carbon offsets such as the California Air and Resource Board projects as a type of conservation easement: "If people want to pass land down to the next generation, and we talk a lot about legacy in the American Tree Farm system we want family, forest landowners to keep that land in the family. And if a current landowner defines their ecological values, and then locks that up with a 100-year contract with California, that they're getting paid." This quote represents the use of carbon offsets to accomplish long-term forest conservation. The administrator suggests that carbon offsets may decrease land use changes through payments to the landowner (which conservation easements do not provide). Another forest administrator from the Michigan Department of Rural Development described carbon offsets as a potential way to increase secure land tenure and avoid fragmentation: "this is a good opportunity for landowners to keep their forests intact." These quotes all describe the enrollment in carbon offsets as a way to accomplish forest management goals that public forest management programs such as Qualified Forest Program and Commercial Forest Program were also designed to accomplish.

Practitioners working for private companies shared the perspective that carbon programs could secure land tenure and reduce forest loss. Before mentioning the value of reducing land use change, the Forest Carbon Works interviewee mentioned that a forest management plan was necessary to enroll in the program. They described the value beyond carbon as any action they can take to "incentivize landowners to keep forests, forests, keep larger forests intact, if that means more money to pay taxes to keep legacies secure, I think that's great. And if that means allowing landowners to both get carbon payments and being in a tax program, and they can do it, awesome." Forest Carbon Works' program contains extensive stipulations for participation, such as having a forest management plan and abiding by certified Forest Stewardship Council regulations if a commercial harvest were to be scheduled on the property. An interviewee from NCX, another forest carbon program, stated that they are paying for more than payments for carbon storage and, "we like to think of ourselves not a preservation anti-management organization, but more as something designed for active forest management managers or

actively managed forests." Similarly, an interviewee from Forest Carbon Works framed the complicated tradeoffs between integrating active management in the program as "finding the balance between management in the carbon program is one of is a challenge" for maximizing economic value, carbon storage, and stewardship. These illustrative quotes encapsulate many of the codes about delivering forest management through the voluntary carbon marketplace.

Another value that forests practitioners described was the potential for carbon offsets projects to allow adaptation or other stewardship activities on enrolled forestlands. An interviewee from Keweenaw Bay Indian Community Natural Resource Department stated:

> We entered all the acreage that qualifies for the carbon program, and we are sustainably managing all of that. And we are doing wildlife enhancement, and doing restoration and diversification plantings, and the carbon program is kind of an extra, it's something we're enrolled in. The requirements are met already by our ecological forestry and management approach. And it's not a specific project that I have to plan for.

A public agency forest scientist stressed the complexity of managing for long-term carbon storage in disturbance-prone ecosystems. They emphasize that programs create great opportunities for implementing climate adaptation land management that does not maximize carbon storage in the short-term:

> Approaching carbon credits as a suite of different values to create good adaptation while also creating high-quality carbon credits. And I know people don't think as much about disturbances in the Great Lakes region, which I think is a big mistake, is you're talking about at what cost if you're incentivizing carbon committed like the California Air and resource credits, there's been massive over-crediting. And so, there's tradeoffs.

An interviewee from NCX, a private carbon program, conceptualized their one-year deferral payments for carbon storage as a way of supporting forest management. The interviewee described the program as the opposite of "preservation, anti-management organization, but more as something designed for active forest management managers or actively managed forests." All three of these perspectives on utilizing incentives for increasing carbon storage are not solely focused on the carbon itself but on other services that programs can deliver through enrolling in them.

Another service I identified in the *Paying for More than Carbon* Code included the ability to fund existing forest management work. In an interview with a Michigan DNR Forest administrator, they detailed the opportunities that federal funding from the Infrastructure Bill and Inflation Reduction Act creates for funding forest management, even if the funds are intended for carbon storage or emergent markets. They explained that carbon can pay for forest management in ways that the department is focused on. The opportunity for them is that they "see the writing on the wall that carbon can pay for other good forestry… carbon, the pot of gold…I'm going to be applying for these funds. So, I can do bigger and better technical assistance, talking about clean water and carbon and the full suite of managing and protecting Michigan's private forests." This perspective reflected the fact that funding at the federal level is impacting how states set

their agendas and structure their programs. The administrator described that the funds from carbon programs could accomplish public services:

> They are in a very unique opportunity to educate and inform and inspire landowners in better ways than I can. I have zero advertising budget, these guys have huge advertising budgets, and these guys have an opportunity to inspire more landowners to think about taking good care of their land for ecological and economic benefits. That's my day job. And he's got more money and influence and power and capacity to deliver this than I do with the little $200,000 grant from the Forest Service every year that the DNR spends mostly on my salary.

This perspective from a public agency administrator details the complexity that the public sector faces with delivering forest management with the assistance of private companies and nongovernmental organizations to bridge the budgetary constraints and capacity.

The distinction between how private companies, public agencies, and nongovernmental agencies communicate is not black-and-white. The quotes in this code show that there is communication happening between the public and the design of the programs. The MDARD forest administrator highlighted this dynamic when they shared their involvement in consultation with the American Forest Foundation:

> sitting in a room and hearing from a couple of brand new AFF staffers on this new program, and they were still at the time, I think trying to figure out some of the science behind the practices, but they sort of pitched the idea of paying for practice not paying for carbon specifically.

Public forest practitioners and administrators were consulted with in the design of these programs, it was not just a purely privately designed program operating without public agencies. In the interview with the Nature Conservancy (a partner in the Family Forest Carbon Program), the interviewee mentioned an extensive scoping process with multiple public agencies. This is important for thinking about the services they are providing that forest management programs seek to deliver and potentially compete with.

In the document analysis**,** the code ***State Agencies Role Integrating Carbon Offsets into Forest Management*** was triangulated in the MDNR State Action Plans for 2010 and 2010**.** There is a discrepancy between the two documents: where the 2010 Forest Action Plan dedicates a large portion to planning for the Michigan Work Forest Carbon Offset Program and describing the objectives for its growth. Then, the 2020 Forest Action Plan makes no mention of the dissolved program, or the development of forest carbon offset projects on public lands, namely the Big Wild Project. However, there is language associated with carbon market access and technical assistance for private landowners as a strategic objective. The lack of continuity in the 2020 Forest Action Plan and not mentioning the piloting of the project on public lands suggests strategic incoherence. The theoretical code describes the role state agencies are taking to integrate forest carbon offsets into the model of forest management and potential tensions that exist between different agendas and project implementation.

2.11 Code 2: Self-regulation of the Carbon market

Because of a lack of federal or state regulations governing forest carbon programs, the forest carbon industry is essentially self-regulating. Several interviewees discussed the ways this has influenced their works. A practitioner with Finite Timber characterized this dynamic as such: "we are unfortunately or fortunately, depending on how you look at it, working in a self-regulated industry. Okay, so there's no standards, and companies can say and do what they please and defend their product's quality to their liking." In interviewee with the Michigan Timbermen Association described the confusion resulting from this self-regulation:

> But you might know just as much as I do on how it works. I think one of the questions that I have or left those trainings with is, who is the driver of these carbon programs? Who is selling the landowner on them? Who's signing people up? And how do we engage with whoever that is, if they even exist? Are there salesmen going around, meeting with large landowners?

This example illustrates the perspectives of the forest products industry grappling with how to navigate future scenarios for timber markets. This confusion over how these markets operate has created disconnects between actors involved in carbon offsets and may help explain the reasoning behind the House Bill that sought to ban the sale of carbon offsets on state lands.

Self-regulation has created opportunities for actors that are early adopters that have experience with the fluctuations, such as the private consulting firm Green Timber. In the interview, while discussing NCX's innovative 1-year deferral contracts, they explained the caution the company uses for navigating new methodologies. The crash of the Chicago Climate Exchange informed the projects they take on and the methodologies they work with:

> I've been standing by and watching. We really learned a lot. In 2008, when we got involved, we dove right into the Chicago Climate Exchange, we enrolled a ton of our clients at that time. And it just fell apart so fast. And it just left a lot of landowners hanging. And I'm concerned about some of these small land or non-industrial private landowner programs or opportunities that they might do the same. I'm just kind of watching to see how this goes before we start recommending it to our clients.

The instability of the self-regulated market produces different responses from early adopters that navigated instability in the marketplace, such as Lyme Timber. In the interview with the Great Lakes Lyme chapter, they reiterated that they would not enroll working forestlands until carbon prices were more competitive for the northern hardwoods they are harvesting. They characterized it as such: "When carbon makes financial sense, that will be something that they would definitely look at doing. But until the finances work to where it competes with that the ongoing working forest model, that's going to remain the way it is." This description reflects the CEO's public stance about the controversies associated with carbon offsets.[21]

The self-regulation of these carbon programs creates complexities for public agencies to work with private practitioners because of the volatility and the lack of standards.[22] The MDNR program administrator explained that carbon is "a boom-and-

bust circular thing. Prices are rising rapidly right now, but they will crash. CCX is not going to be an outlier. I'm pretty sure there's going to be a cyclical up and down in the future." This quote reflects the agency's sense that because there are no standards, there are risks with working with a specific program and issues with "picking winners and losers." This perspective suggests that the self-regulated market creates instability in forest management.

Code 3: Shifting Revenue Streams

The theoretical code, *Shifting Revenue Streams*, describes forest practitioners' perspectives working on carbon offsets after the closing of the Chicago Climate Exchange. This set of codes groups together forest practitioners' reported changes in carbon prices, incentives for carbon compared to other forest products as revenue streams, and the competition between the two. This includes how forest practitioners navigate this dynamic with landowners, their business models, and other public and private institutions. Previously, in the Michigan Working Forest Carbon Offset Program, consulting foresters conducted outreach to enroll landowners in the carbon offset program (Beddoe & Danks, 2013; Miller et al., 2015). When carbon prices increased after the closing of the Chicago Climate Exchange, for example, landowners' demand for carbon offsets influenced public and private forest practitioners. This theoretical code addresses the research question's section of the enrollment and feasibility portions of carbon offset projects.

Private foresters are adapting to marketplace changes to meet the needs of clients in carbon offset projects from larger market forces. Consulting foresters shared that their work is increasingly involved in carbon offset projects. An interviewee from Compass Land Consultants, a Michigan-based firm, shared that they have been spending more time working on these projects in the last few years. They reported that small acreage projects are "exploding and seems it's here to stay. Think there's going to be a future in the smaller landowner aggregate projects." The interviewee described that they are working on both industrial and non-industrial carbon projects. An interviewee from Green Timber consulting forestry firm echoed this, stating that there is a lot of "excitement and opportunity" for new aggregation-based projects due to international negotiations legitimizing the voluntary carbon market.[23] According to Green Timber, the new aggregation methodology launched by the American Carbon Registry enabled this, which is "really helpful in encouraging smaller landowners to enter into the carbon space."[24]

Private consulting firms are changing the services that they are providing to address carbon as an important revenue stream. The interviewee from Green Timber stated that they are responding to the changes in the marketplace to meet landowners' demand for aggregation, working with smaller land parcels than when the Chicago Climate Exchange was active:

> The ways of aggregating have been continuously evolving. And we're actually hoping to be able to offer an aggregation option for our clients as well. But a lot of the carbon market, it is evolving. And so, more and more opportunities keep popping up, and changes to protocols happen, kind of on a regular basis, you have

> to stay up with it. We were aggregating back in the Chicago Climate Exchange. But that was a quite different program, a quite different time.

The interviewee from Compass Land Consultants described that from a technical standpoint, enrollment is now much more feasible. For Green Timber and Compass, they are adapting to the market chain of demand from landowners, developers, and the institutions creating these methodologies.

The interviewee from Finite Carbon described the perspective of a carbon developer, stating that the market is shifting to access the demand for small landowner aggregation. Finite Carbon has its own small landowner carbon program, Core Carbon, which they were unable to discuss in detail because of the launch of their new methodology at the time of the interview. But they mentioned that these types of carbon projects are competing with other small acreage timber sales:

> It'll be something that'll come up a lot more now, with this Family Forest Carbon Program, now that there's actually an opportunity for smaller landowners to enroll in this type of thing. It's another source of possible revenue for them. So, I'm sure it'll start to be a more common topic, when we are doing some of these smaller timber sales or management plans. That'll come up a lot more now.

The interviewee from Finite Carbon mentioned that the Nature Conservancy and American Forest Foundation's Family Forest Carbon Program, a competitor, to their newly launched Core Carbon, was developed to meet this significant demand for the type of project as a revenue source for landowners.[25] Finite Carbon is a major industrial carbon developer, which is now launching programs to capitalize of these projects, many how different actors and institutions. They stated that the "bad thing is, at current carbon prices, people are running, not walking to this space as an investment opportunity. And that can create some conflicts." They framed this rapid investment in the opportunity as an incentive to "engineer a program that maybe isn't as high quality in an effort to maximize profits" because the "revenue streams and create returns on investment through carbon" is so lucrative.

Public foresters are having to address the demand for carbon offsets projects through forest management technical assistance programs. The forest administrator from the Michigan Department of Regional Development reported that landowners were requesting assistance with navigating carbon offsets projects while enrolled in the public program:

> Once I started hearing from the field from the Conservation District foresters that landowners were asking about it, they were reading the articles in the Audubon Society magazine, or they were reading the articles in local papers about these carbon markets coming online. And that's when we started saying, okay, we've got something here that we really ought to become experts in, or at least serviceable in this space.

This forest administrator determined that training and working with other private programs was necessary to stay current with new standards and procedures. The training is intended to equip landowners with means to keep "forests intact and new revenue sources to continue to enjoy their forest. And so that's the foundation I approach it from." They went on to explain that they integrate this into technical training with public Forest

Assistance Program foresters at conservation districts to address these questions about compliance and new programs.

Interviewees with the Keweenaw Bay Indian Community and Michigan DNR administrator reported that they are both navigating ways to provide technical assistance from landowners demanding information on these new non-industrial carbon programs. The interviewee with the Michigan DNR stated that they were working to address this issue through different programs, especially the Forest Stewardship program. Previously, the MI Working Forest Carbon Offset Program operated through this program. They characterized the integration of carbon and ecosystem service information as such:

> Forest stewardship plans are fairly comprehensive. They go over a lot of ecological aspects, as well as the economic aspects of forest management. Carbon stocks are one of the required elements in a forest stewardship plan, but quite frankly, very few foresters spend much time addressing that, but it is a required element… there was a lot of interest in that. I've been working with landowners and foresters trying to make them aware of these new opportunities.

The DNR administrator described that they do not have sufficient programmatic funding to provide technical assistance to all the landowners for the existing programs. They added that carbon programs could assist with advocacy for stewardship if aligned with the programs. This also points out the constraints of providing more services and technical information to private landowners.

The Keweenaw Bay Indian Community Natural Resource Department interviewee mentioned that private landowners had requested information about accessing carbon markets on allotment lands. They described that "tribal members who own their own land, right and fee, are interested." They added that they assisted with managing those forestlands. The interviewee mentioned the complicated legal process with different ownership types on tribal lands, where there are "three different types of land. It can be a little cumbersome as well - as the fractionation." They described the complexity of navigating different ownership types held in trust or with multiple heirs: "That the level of project and program administration, that would really take a lot of coordination. So there, there'd have to be the investment in the workforce." They shared a similar constraint with assisting landowners as the MDNR: both have personnel and budgetary constraints.

2.12 CODE 4: Confidentiality in the Forest Carbon project is driving confusion

Forest carbon offsets projects contain more confidential information in the contracts and institutions involved in data management than other types of forest management. This dynamic creates complexities for collaboration and communication for practitioners working with other practitioners, clients, or methodologies. The issue of confidentiality has informed the role that public agencies in Michigan have with regard to carbon offset projects. Confidentiality has also influenced how private companies communicate with private and public institutions. The contracts and proprietary law restrict communication between public-private forest practitioners and between private

practitioners. There are ongoing questions about compliance with public programs that are complicated by the different competing private programs.

An example of a confidentiality issue emerged in an interview with a forest practitioner with the American Forest Foundation, who works on Family Forest Carbon Program (a joint collaborator with The Nature Conservancy). That interviewee stated, "I struggled to understand what exact pieces are specifically confidential." For more context, when I clarified the role of the two nongovernmental organizations in the program with a Nature Conservancy program manager, they let me know that American Forest Foundation had to create a company:

> They are running the contracts, all the contracts are through FFIF, which is the Family Forests Impact Fund, which is an affiliate of American Forest Foundation, they had to open their own company so their own affiliate could make it work legally.

The complexity of organizational structure is not an isolated issue. The carbon developer Anew, formerly Blue Source, explained that there are multiple other company affiliates working on the carbon projects we discussed, but they were constrained about talking about the other organization's operations. Similarly, Forest Carbon Works has a complicated organizational structure with multiple affiliates.

The interviews suggest that because of confidentiality concerns, practitioners involved in carbon projects do not always work together in intake, feasibility, implementation, and verification. For instance, in the interview with Anew, I asked if the interviewee, who works in the feasibility portion and sets the baselines, communicates with Anew staff developing the project on the ground. They stated that they did not. I asked about implementation and verification, to which they responded, "that's something I would probably leave to implementation to decide if that's a viable option because again, I'm not in contact with them." Although Anew is large developer, non-industrial carbon program staff communicated the same thing, such as Forest Carbon Works, Family Forest Carbon Program, and NCX.

The confidentiality issues with verification presented additional challenges. For example, an interviewee from SCS Global Services, a third-party environmental verifier, initially agreed to an interview but requested interview questions in advance. When I provided the questions, they decided to decline the interview. None of the other third-party certification companies I approached for interviews agreed to talk with me, possibly due to confidentiality issues.

Compared to other types of forest management, such as forest tax-incentive programs that are public information, the locations of many nonindustrial carbon offsets are protected information. For instance, NCX does not have any public register of their carbon offset enrollments. The interviewee stated:

> We have legal confidentiality for portions of our contracts, so we do not as NCX disclose specific names or locations of properties as well. So, it would be hard for someone to figure out if their neighbor were enrolled in NCX.

Similarly, the interviewee with Green Timber stated: "oftentimes, private landowners want to keep their participation in these programs confidential until it becomes public information." Privacy about the status of conserved land can have impacts on landscape-

scale planning (Rissman et al., 2017). Research has shown that cross-boundary coordination is important for public agencies' conservation planning in incentive programs.

The enrollment of carbon offsets on lands enrolled in Michigan's two tax-incentives programs (the Commercial Forest Program and the Qualified Forest Program) is legally complicated. The Attorney General of Michigan is conducting a legal analysis on section 511 of the Commercial Forest Act because many forest owners enrolled in one state tax-incentive program, the Qualified Forest Program, are enrolled in the carbon credits as well. However, at this time, lands already enrolled in the Commercial Forest Program can be enrolled in carbon programs. The forest administrator at Michigan Department of Rural Development stated:

> We've been slowly working with landowners who have brought it up to say, work with your carbon project developer, and make sure that these programs are going to be complimentary. And they're not going to be at odds where you're getting a postcard from the qualified forest program saying it's time to harvest. And you're being told by your carbon project developer that you're not supposed to be harvesting for 100 years. So, the interaction in and of itself is not expressly prohibited.

In the interview, they described they are not worried about legal issues with Qualified Forest Program because it is more flexible and does not have the same legal stipulations. The interviewee from NCX communicated that they actively communicate with agencies to ensure compliance with their contracts, stating that they do: "a fair amount of talking with agency folks to ensure that our programs fit with other current use programs out there, tax-incentive programs, and state-based regulations for timber harvesting." This shows that NCX's design of their methodology and program is working with public agencies. Further, the level of involvement of public agencies is not yet defined.

The interviewee from Forest Carbon Works detailed that their organization is not concerned with their program complying with both carbon offset enrollment and tax-incentive programs. They explained that the strict regulations for participating in their program that is oriented towards forest management reduces the chance of not complying. They mention that Massachusetts is considering carbon a forest product in one of their tax programs and that other state incentive-programs are on their radar, but for them "there's not any conflict as far as receiving a tax incentive and also receiving a carbon payment. It's challenging for landowners to do both…if that means allowing landowners to both be carbon payments, and being a tax program, and they can do it, awesome." This perspective differs from public administrators in Michigan.

For over fifteen years, landowners have been enrolling lands in carbon credits already enrolled in tax-incentive programs. On September 7, 2007, the State Forester for the DNR, Danna LaCourt, created an informal policy on section 511 of Michigan's Commercial Forest Act stating that carbon credits are not commercial use, but rather a forest product which does not violate the program. In the interview with a MDNR Administrator, they described the program history as this:

> my colleague [redacted] in the DNR, who administers the commercial forest program, I know that her predecessor was concerned about carbon offsets,

> because the commercial forest program is a law that was written in 1925. 98 years ago, they were not thinking about carbon offsets, and nothing in the law addresses carbon offsets. It's a tax break in exchange for managing for commercial forest products. And a carbon offset is a commercial forest product, but the law doesn't define it as such. The tax program managers are probably a little bit confused and concerned and scared about these carbon offset projects. Because again, if the goal of improved forest management is to increase carbon stocks in the forest, not necessarily to maximize carbon stocks going to the sawmill. They think that their tax programs are property tax breaks in exchange for sending wood to the sawmill. They don't think that their programs are a tax break for increasing carbon stocks and monetizing that in the market. Both are commercial forest products; both are selling a commodity. But neither the 100-year-old Commercial Forest Program – nor the 20-year-old program, Qualified Forest Program, defined carbon offsets as a commercial commodity, and an eligible practice in exchange for a property tax break. From a policy perspective, property tax policy doesn't discuss carbon offsets. And all except for the state of Michigan, all 800,000 acres and those big projects, they're in the Commercial Forest Program, even the TNC lands. These guys are getting tax breaks for sending wood to the sawmill. But they're all saying we're going to store more wood on the landscape too. And that's going to confuse the program managers, because if the law doesn't address it.

Based on this description of the DNR's programmatic challenge with new markets working within the program, there is concern about the legality of both existing on forest parcels due to the different objectives. This apprehension that the interviewee explains why Michigan's attorney general is currently defining precisely what a commercial forest product is.

In 2007, when the informal policy was implemented, the Chicago Climate Exchange was just beginning, and the MI Working Forest Carbon Offset Program was being piloted due to high interest and carbon prices. From internal messages I obtained through the Freedom of Information Act, I learned that the contracts then were short term (4-5 years). This is less than the current average (with the exception of NCX's offsets). Since 2007, the increase in carbon prices in the voluntary market, and increase in access to more carbon programs in the state of Michigan, carbon offsets are this informal policy reflects the time period. A new policy is being articulated but due to the confidentiality of carbon offset programs the scale of how much land enrolled in both is not known. I was unable to interview any administrators or foresters working on the Commercial Forest Program because they were unable to comment during the ongoing legal analysis. Through my Freedom of Information Act Request to the MDNR, I was able to determine that this informal policy was being used until they issued the legal opinion.

The layering of the older informal policy has created confusion among forestry practitioners, the public agency itself, and the public about the Commercial Forest Program. There is also confusion about the role the state is playing in carbon offset programs. This builds on the shifting strategic planning documents in the Michigan Forest Action Plan in 2010 and 2020 that identified the MI Working Forest Carbon

Offset Program as a major "strategic theme and issue" in the strategic document. This is complicated by the 2020 Forest Action Plan not mentioning the program at all.

These theoretical codes confirm previous findings of public administration literature about administrative structures, burdens, networks. Public administrators navigate constraining and enabling structures that restrict or allow for creating policies, programs, or delegate tasks (Lynn & White, 2015). The former state forester's managerial authority to create an informal policy on the Commercial Forest Program suggests that natural resource state agencies in Michigan have managerial judgement to flexibly work within these administrative structures. Administrative capacity is informing how public agencies navigate these programs because of their budgetary capacities and limits to expertise (Moynihan, 2018). These limitations increase the administrative burdens created for providing technical assistance. The public agencies communication between private consulting foresters, clients (landowners), and private carbon programs demonstrates there are interorganizational processes between the public sector and stakeholders taking place informally. Provan and Milward (2001) describe that public sector networks need to be analyzed by their effectiveness at providing services. The quotes above illustrate that public administrators are struggling to define how they integrate technical assistance into their programs and measure success, such as with training, enrollment, or communication with the private sector.

2.13 Document Analysis Results

Set 1 of Papers: Michigan Working Forest Carbon Offset Program: 2009, 2013

Table 2.1 Word frequency MIWFCOP reports 2009, 2013

Keyword	2009 Count	2013 Count	2009 Average	2013 Average
Agency	37	45	0.76%	0.52%
Landowners	59	7	1.40%	0.10%
Consulting	34	146	0.73%	2.07%
Outreach	33	17	0.76%	0.14%
Partners	29	34	0.69%	0.43%
Program	171	275	3.88%	3.65%

This section of the document analysis analyzes the pilot report and the final report on the Michigan Working Forest Carbon Offset Program after it is dissolved. The two reports are similar in length (10 pages in the pilot; 15 pages in the final report) and written by the same authors. These keywords look for the focus of the different actors at different stages of the program development.

The (2009) pilot report recorded the keyword 'Program' 171 times, compared to 275 times in the final report (2013), but had similar weighted frequencies of 3.88% (2009) and 3.65% (2013). The frequency for 'Outreach' was 0.76% in the pilot report (2009) and 0.14% in the final report (2013), and 'Consulting' at 0.73% (2009) to 0.10% (2013). This suggests the importance of the consulting forester's role in outreach and recruitment that is highlighted in the reports for enrolling landowners. In the 2013 report, 'Landowners' frequency is higher at 2.07% (2013) compared to 1.40% (2009) which might show a change in attention of the program, or the researchers based on the program development.

Set 2 of Papers Michigan Forest Action Plan 2010, 2020:

Table 2.2 Word frequency for Forest Action Plan 2010, 2020

Keyword	2010 Count	2020 Count	2010 Average	2020 Average
Access	114	55	0.32%	0.22%
Assistance	110	26	0.26%	0.06%
Carbon	31	22	0.12%	0.14%
Climate	9	63	0.03%	0.40%
Markets	113	6	0.35%	0.03%
Opportunity	78	27	0.30%	0.17%
Program	334	360	1.12%	1.90%

In the document analysis, the selected keywords associated with forest carbon markets in the 2010 Forest Action Plan have greater weighted word frequency for "Access," "Assistance," "Opportunity," and "Markets." For instance, "Markets" is counted 113 times compared to 6 times in 2020. The 2010 Forest Action Plan's agenda is more focused on emerging markets, and technical assistance to access them. The 2020 Forest Action Plan has higher Carbon and Climate, and Program slightly. The 2020 Forest Action Plan focuses on the carbon cycle, adaptation and disturbance and mentions climate change 44 times compared to the 5 times that the 2010 Forest Action Plan

mentions climate change. This shows that the 2020 Forest Action Plan shifted from the 2010 post-MI Working Forest Carbon Offset Program.

A limitation of this analysis is some of the differences in the style of documents between the two strategic plans such as the names, 2010 Forest Resource Assessment and Strategy that is 126 pages compared to the 2020 Michigan Forest Action Plan that is 58 pages. Nonetheless, federal funding from the Forest Service requires the MDNR to address specific objectives detailed by the federal agency that are tracked in both reports (MDR, 2020). This suggests a change in strategy and prioritization of the agency's role in carbon markets.

Although the 2020 Forest Action Plan does not mention the MI Working Forest Carbon Offset Program, the document analysis found that the MDNR identifies "a legal and policy vacuum exists when it comes to private forest land in Michigan." The 2010 Forest Action plan does not mention this issue within the document, which could indicate legal and policy problems became more relevant to state agencies and public administrators in the interim. In the interviews, MDARD and MDNR administrators stated that they are working with carbon programs to make their programs comply with the public programs. These selective issues suggest that there is policy incoherence in regard to the role the state is playing with carbon offset projects.[26]

3 Chapter 3: Policy advice based on practitioner's perspectives for Michigan's forest management

In this Chapter I ask: from the two chapters' analysis of forest practitioners' perspectives, what policy recommendations can be made for state-level agencies?

3.1 Context

This report examines forest practitioners' perspectives that are working on forest carbon offset projects in the state of Michigan. I address how forest practitioners interpret how carbon offsets influence forest management in Michigan after the closing of the Chicago Climate Exchange and the MI Working Forest Carbon Offset Program. The case study investigates the rise of non-industrial carbon offset projects' impact on forest practitioners' work, how state agencies integrate carbon offsets into public forest management programs, and how private and public foresters work in the existing forest management networks. Chapter 1 of this report defines the background of forest management programs in the state and then reviews the literature on how academic has defined public and private forest practitioners' role in forest carbon offset projects. In Chapter 2, I analyze the interviews conducted with forest practitioners and document analysis of the white papers on state-level forest carbon offset projects and programs. In this final Chapter, I discuss the findings, provide policy recommendations, and define future research.

3.2 Summary of Findings

Due to the lack of federal policymaking on providing technical assistance to private landowners in the United States, state governments are working to create public programs and provide technical assistance to private landowners. Different state-level policy approaches have created a "laboratory of democracy" approach to implementing programs or providing technical assistance (Irland & Hagan, 2021). Many state-level approaches have integrated technical assistance for carbon markets into broader forest management frameworks with existing programs (Beddoe & Danks, 2009; Miller et al., 2015; Danks, 2019). This report focuses on how carbon offsets can influence forest management and policy incoherence through forest practitioners' perceptions of how things are working.

The literature review in Chapter 1 discusses the new relationships forest carbon management creates with foresters and landowners. I found that practitioners define multiple tradeoffs associated with carbon storage projects and other ecological values for biodiversity and disturbance regimes, creating complexity for public managers. The third finding in my literature review highlighted that state agencies and private practitioners prefer providing technical assistance through existing forest networks and prefer interventions that integrate programs. This reflects another challenge presented in the literature review is a concern for the trust and legitimacy in these markets for prescribing them, working with landowners based on economic, ecological, and ethical dilemmas.

In Chapter 2, I define public, private, and nongovernmental organizations involved in the forest carbon offset market, including the interaction between policymaking and programmatic forest management structures. This describes the diversity of different actors and institutions involved in the enrollment process from start to finish in carbon offset projects. In the analysis of the interviews, the Michigan DNR's strategic shift from providing technical assistance for private landowners to access carbon markets has changed the role that private companies play in forest management in the state since the closing of the Chicago Climate Exchange.

Private companies are providing program technical assistance and enrolling private landowners in carbon offsets programs, responding to the lack of government role and demand for carbon projects. Four theoretical themes emerged: 1) confusion over state agencies' activity in forest carbon markets on private and public lands; 2) issues with confidentiality in forest carbon offset markets that reduce communication and coordination; 3) the self-regulation of carbon markets; 4) and the changing relationships between forest practitioners and landowners with forest-based revenue streams. Public forest programs are now providing technical assistance to landowners, creating complicated program administration. Currently, Michigan's Commercial Forest Program and Qualified Forest Program enrolled lands can be enrolled in carbon credits. I examine the current context that Michigan's Commercial Forests Program is undergoing legal analysis by the Michigan Attorney General to determine if they are compliant with forestlands enrolled in both carbon offsets and tax incentives. I triangulate my interview analysis with white papers and internal communication through a Freedom of Information Act. I find that the previous informal policy for Michigan Commercial Forest Act is based on an outdated carbon offset program and contract lengths from 2007, and the codes generated in my interviews align with the white papers' major themes. I describe the Michigan DNR's policy incoherence with other public programs due to the integration of carbon offsets with other forest management programs.

3.3 Relevance of the Work

The state of Michigan is an early adopter of state-level action on carbon offset projects based on the creation of the MI Working Forest Carbon Offset Program for private landowners and the current offset projects on state forestlands. This description of the change in programs, policies, and participation by different actors and institutions since the Working Forest Carbon Offset Program can help understand current conditions. Describing the perspectives of forest practitioners working in forest carbon projects can determine the barriers and gaps, which can inform future policy implementation for state-level policymaking. This report identifies the on the ground interactions between private forest carbon companies, public forest programs, and informal communication. The analysis contrasts the existing policies and strategic documents with practitioners' work with public officials. This analysis of different actors and institutions working on-the-ground in carbon offset projects can provide insights into street-level bureaucrat perspectives and capacity building for public administrators managing programs. This

can provide context for policy decision-making for intervention and policy implementation.

The literature review in Chapter 1 discusses the tradeoffs associated with carbon storage projects and other ecological values for biodiversity and disturbance regimes, creating complexity for public managers. The literature review highlighted that state agency practitioners prefer integrating technical assistance working through existing forest networks. This could indicate forest practitioner preference for forest carbon offset policy design at the state-level. This insight that I identified in the literature review emerges in the interview analysis, which provides the potential for future research exploring the existing forest management programs.

3.4 Policy Recommendations

Based on the analysis of the interviews and document analysis, public and private sector forest practitioners identify barriers with confidentiality issues, self-regulated markets that pose inconsistent demand, complicated program administration for state agencies, and changing demand from landowners. The following policy recommendations could partially address these issues for the administrative structure of the MDNR. I suggest that the Michigan DNR should take substantive actions to define their participation in forest carbon markets through their strategic documents to improve crosscutting approaches to program administration:

1. The agency should articulate how its programs will assist private landowners in accessing emerging markets through their technical assistance or forest management programs.

2. The agency could more clearly define future carbon offset projects on state forestlands, which were not mentioned in their 2020 Forest Action Plan.

3. The agency could clarify how other agencies involved in forest management can work together to provide technical assistance to private landowners, such as the MDARD. This can help state agencies reduce redundancy in their programs, and plan to participate in the programmatic structure of the Climate Plan with the Michigan Department of Environment, Great Lakes and Energy.

By clearly defining the role of carbon offsets projects on public lands in their 2030 Forest Action Plan, the MDNR might be able to reduce confusion among forest practitioners and the public. This can assist with defining the role of the agency with defining the scope of forest management programs for providing technical assistance to landowners to access these emerging private programs. This type of formal agenda setting can work to improve trust and legitimacy in forest management. Also, defining program roles in forest carbon can provide more time and collaboration for procuring grants and building partnerships to support these initiatives. Doing so can create partnerships with private-public partnerships with nongovernmental organizations with greater market expertise, which the agency did with the Delta Institute in the MI Working

Forest Carbon Offset Program. Further, this can provide time to build financial support with federal agencies that meet objective 3.1.5 to align funding sources and grant cycles with other agencies. This meets the necessary criteria for promoting access to ecosystem services and emerging markets in 3.1.1.

Public foresters providing consultation can get more robust training and specialization to assist landowners by defining program involvement in specific forest management programs. This crosscutting issue can address Objective 3.12 for training with partners in the private sector to improve knowledge of markets, programs, and methodologies for technical assistance. This reflects what MDARD and MDNR forest administrators talked about with their limited abilities for training.

Following the Attorney General Office's legal analysis of the Commercial Forest Act's definition of whether carbon offsets constitute commercial use, the agency should establish a new formal policy for enrolling Commercial Forest lands in carbon credits. The existing informal policy was established when carbon markets were immature and lasted only 4-5 years in 2007. Carbon programs' contract lengths now range from 100 years with the California Air and Resources Board credits to one year with NCX, and multiple programs lasting 40 years. A new policy can provide better support for navigating the legal compliance for practitioners, whether private carbon practitioners or public practitioners, which must work around this. Preventatively, the Qualified Forest Program that is administered by the Michigan Department of Agriculture and Rural Development should create a formal policy on carbon credit enrollment, even though they are less strict. This is due to low levels of trust in governments is already which major barrier to increasing forest management (Linda-Riehl et al., 2015). Public agencies can increase the cross- boundary capacity of public forest practitioners by increasing the greater inclusion of diverse stakeholders in policymaking, like forest product practitioners. Also, a new formal policy can create more transparency with the public so that there is no double counting and increase trust in the public, landowners, and practitioners.

3.5 Future Research

Future research with this data could utilize network analysis to map the information flow, the degree of centrality of public agency administrators, and the important actors and institutions which can assist cross-boundary communication and coordination. Studying the networks of forest practitioner networks in private-public partnerships could improve technical assistance and sustain current program goals. Future research would ideally incorporate a larger sample size in the literature reviews on forest practitioners from other databases beyond Scopus and utilize data enrichment and visualization.

Future research should quantify the density and intensity of forestry policies in Michigan to understand the perspectives of other public agency bureaucrats responding to forest carbon offsets. Also, research should incorporate policy tracing to define causal mechanisms for how the agency responded to the change in Chicago Climate Exchange. Future research should conduct surveys on public agencies and landowners to provide

more reliable findings about what is driving enrollment in carbon offset programs, and the differences between those participating and those not participating. This could lead to greater understanding of different forest practitioners and more effective ways to provide technical assistance.

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4.1 End Notes

[1] From the 2022 3rd quarter report from Forest Trends, Forestry and Land Use credits composed 46% of all traded credits in 2021 and grew fourfold from 2020 in the marketplace. Agriculture and Forestry and Land Use combined for the greatest proportion of the credits in the marketplace.

[2] These carbon stock estimates come from Forest Inventory and Analysis dataset. These estimates of carbon storage and annual carbon sequestration are lower than the average for all US states. States on the eastern seaboard have higher averages, western states lower, and Michigan has higher averages than Wisconsin and Minnesota, respectfully. USDA Forest Service. 2021. FIA DataMart 1.9.0.

[3] In Vermont's Forest Carbon Working Group white paper for the Vermont Committee on Natural Resources and Energy, they found that pro-active planning by state-level agencies plays an important role in implementing state carbon programs.

[4] See https://www.bloomberg.com/news/features/2022-04-28/public-forests-enter-the-carbon-offset- market?in_source=embedded-checkout-banner which extracted acreage from the American Carbon Registry's public project listing. These projects include the following landowners: Nature Conservancy's Michigamme Highlands project, Keweenaw Bay Indian Community's Forest Carbon Project, Huron Mountain Club's Forest Carbon project, the Molpus Woodlands project*(only one now, as of January 2023), the DNR's Pigeon River Country State Forest project, the Hiawatha Sportsmen Club, Verdant Timber's Moose Country Divide Project, Greenleaf Timber's project, Canada Creek Ranch Association's project, two separate Nature Conservancy projects on the Two Hearted River, Heartwood Forest Fund's project on the Bishop Property.

[5] See https://info.ncx.com/woodlands.

[6] Several states have developed forest carbon programs. California Air and Resource Board's Cap and Trade market has significantly influenced the United States forest carbon projects. CARB is the first cap-and-trade program in North America according to https://www.c2es.org/document/us-state-carbon-pricing-policies/. Michigan's DNR was the first state to enroll state lands in carbon offsets through the Pigeon River projects. In the state of Washington, the Command-and-Invest Program is part of the state's comprehensive strategy to reduce greenhouse gas emissions. In Vermont, the state's Forest Carbon Initiative provides incentives to landowners who participate in sustainable forest management practices that increase carbon sequestration. In Maine, the Forest Carbon Program is a voluntary, market-based initiative for private landowners to sell their carbon stocks on the voluntary carbon market.

[7] Corporate demand for carbon credits is driving the voluntary carbon market because they are seeking to strategically anticipate compliance with national regulations. World Bank State and Trends of Carbon Pricing 2023

[8] According to an investigation "research into Verra, the world's leading carbon standard for the rapidly growing $2bn (£1.6bn) voluntary offsets market, has found that, based on analysis of a significant percentage of the projects, more than 90% of their rainforest

offset credits – among the most commonly used by companies – are likely to be "phantom credits" and do not represent genuine carbon reductions https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider- worthless-verra-ao

[9] https://www.propublica.org/article/the-climate-solution-actually-adding-millions-of-tons-of-co2-into-the-atmosphere

[10] Afforestation and reforestation projects are commonly grouped together as afforestation/reforestation. According to Forest Carbon Credits A Guidebook to Selling Your Credits on The Carbon Market are the following: "projects were defined as the following "they can be defined as projects that increase carbon sequestration by establishing, increasing or restoring vegetative cover (forest or non-forest) through the planting, sowing or human-assisted natural regeneration of woody vegetation." See https://www.bu.edu/rccp/files/2009/11/Guidebook.pdf

[11] Anew Climate LLC, top industrial carbon project developer in the country, and with 11 projects in Michigan, necessitates at least 4,000 acres minimum, contiguous or noncontiguous, for developing a viable project. https://anewclimate.com/solutions/n

[12] The Chicago Climate Exchange was the first legally binding cap-and-trade carbon market in North America. The Chicago Climate Exchange served as the registry and the marketplace in the Michigan Working Forest Carbon Offset Program. The Michigan Working Forest Carbon Offset Program was a part of a larger national program that included 16 states (Beddoe & Danks, 2013

[13] The analysis will look at Michigan Compiled Laws (MCL), Act 451 of 1994, Part 511, containing the definition (MI Legislature, 1994). In subchapter four, forests (324.50101-324.53519), Sec. 51110 defines merchantable forest products.

[14] The bill was sponsored by Rep. Damoose to restrict the state from selling forest carbon offsets on state forests. HB 6067 introduced by Rep. Van Stigel sought to funnel all revenue generated on carbon offsets into Forest Development fund was referred but died in Natural Resource Committee. https://www.michigantimbermen.com/post/michigan-association-of-timbermen-government-affairs-update- 12-9-22

[15] According to the government committee Agriculture, Nutrition, and Forestry the bill would allocate $150 million for nongovernmental organizations to assist private landowners and will be https://www.agriculture.senate.gov/imo/media/doc/Rural%20Forests%20Factsheet_Final.pdf

[16] Poudyal (2010, p.435) found that most municipalities are not actively managing carbon in their initiatives and programs, which reflects that urban forests are already indirectly managing carbon.

[17] According to Birks and Mills (2022) Grounded Theory: a Practical Guide, a storyline "provides a means by which the theory can be conveyed to the reader" and framework to integrate other structures of the theory

[18] HB 5422 sought to ban the sale of carbon credits on state lands, which did not pass and stalled in committee. HB 6067 was introduced in 2022 that attempted to funnel all revenue from carbon credit sales to the Forestry Development Fund which did not pass either.

[19] According to the Michigan DNR, the project was piloted in 2020, and the forest credits were purchased in 2022 by DTE Energy.
[20] The idea of providing a "suite of ecosystem services" draws from a broad literature that conceptualizes incentive payments for one ecosystem service (Carbon, water, biodiversity) that seeks to stack or bundle multiple values together. This model of ecosystem service compensation programs is common in program design in the United States (Von Hase et al., 2018, p. 4). This analysis recognizes that trend but seeks to identify where practitioners talk about the other values in lieu of the service that is being paid for, carbon payments in this instance. For further reading see: von Hase, A., & Cassin, J. (2018). Theory and practice
of 'stacking 'and 'bundling 'ecosystem goods and services: A resource paper. *Washington, DC: Business and Biodiversity Offsets Programme (BBOP). Forest Trends*.
[21] https://www.bloomberg.com/news/articles/2022-03-17/timber-ceo-wants-to-reform-flawed-carbon- offset-market?srnd=green&sref=fyhEsXfZ
[22] This is distinct from the formation of the MDNR's partipcation in the MI Working Forest Offset Carbon Program that directly funded the program through a grant of $63,000 and a subsequent grant of $150,000 from the Forest Service. See Beddoe & Danks (2013).
[23] Articulation of Article 6. See https://www.worldbank.org/en/news/feature/2022/05/17/what-you-need-to- know-about-article-6-of-the-paris-agreement
[24] Improved Forest Management (IFM) on Non-Federal U.S. Forestlands. IFM version 2.0. See here ihttps://americancarbonregistry.org/carbon-accounting/standards-methodologies/improved-forest- management-ifm-methodology-for-non-federal-u-s-forestlands/ifm-methodology-v2-0_final_7-7-22.pdf
[25] https://corecarbon.com/#learn-more
[26] policy coherence is defined by OCED's 2019 "Recommendation of the Council on Policy Coherence for Sustainable Development." See https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0381#mainText

1 Appendix of white papers

Set 3 of Papers: triangulated theoretical codes in white papers

Table 4.1 White Papers analyzed in Document analysis

Author:	**White Paper Title:**	**Theoretical Codes:**
Michigan DNR	Michigan Forest Action Plan 2020	*Shifting Revenue*
Michigan DNR	Michigan Forest Resource Assessment and Strategy (2010 MI Forest Action Plan)	*Shifting Revenue, State Agencies Role Integrating Carbon Offsets into Forest Management*
Lohmann et al., 2020	A Menu of State Actions to Promote Forest Carbon Sequestration and Storage	*Shifting Revenue, Self- Regulation State Agencies Role Integrating Carbon Offsets into Forest Management*
Danks, 2019	Roles of US states in facilitating participation in forest carbon markets	*Shifting Revenue, State Agencies Role Integrating Carbon Offsets into Forest Management, Confidentiality*
Beddoe & Danks, 2009	Carbon Trading: A Joint Effort Between the Delta Institute, Illinois and Michigan	*State Agencies Role Integrating Carbon Offsets into Forest Management*
Beddoe & Danks, 2013	Carbon Trading: A Joint Effort Between the Delta Institute, Illinois and Michigan	*State Agencies Role Integrating Carbon Offsets into Forest Management*
Willis et al., 2019	Carbon Offsets in Michigan State Forests	*State Agencies Role Integrating Carbon Offsets into Forest Management, Self-regulation*