2025 Annual Symposium
International Society of Forest Resource Economics (ISFRE)

Agenda and Schedule

Department of
FORESTRY AND ENVIRONMENTAL CONSERVATION

March 10-12, 2025, Hilton Myrtle Beach Resort,
Myrtle Beach, South Carolina

Program Outline & Schedule

Day (Date)	Time (Tentative)	Agenda	Room
Day 1			
Monday, March 10	5:30-7:00 PM	Registration & Social	Ball Room
Day 2			
Tuesday-March 11	7:00-8:00 AM	Breakfast	Ballroom
	8:00-8:40 AM	Welcome & Keynote Speaker	Arcadian & West AB
	8:40-9:40 AM	Concurrent Session 1A: Econometrics	Arcadian
		Concurrent Session 1B: Climate-Smart	West AB
	9:40-10:00 AM	BREAK I & Poster Set Up	Ballroom
	10:00-12:00 PM	Concurrent Session 2A: Economic Impact	Arcadian
		Concurrent Sessions 2B: Timber Industry	West AB
	12:00 -1:00 PM	LUNCH	Ballroom
	1:00-1:30 PM	Poster Session	Ballroom
	1:30-3:30 PM	Concurrent Session 3A: New Opportunities	Arcadian
		Concurrent session 3B: Timber Industry	West AB
	3:30-3:45 PM	BREAK II	Riverview
	3:45 to 5:45 PM	Concurrent Session 4A: Forest Landowners	Arcadian
		Concurrent Session 4B: Forest Products	West AB
	5:45 PM – 6:00 PM	Meeting with Poster Judges	Ballroom
Day 3			
Wednesday-March 12	7:00-8:00 AM	Breakfast & Business Meeting	Ballroom
	8:00-10:00 AM	Concurrent Session 5A: Flash Presentation	Arcadian
		Concurrent Session 5B: Flash Presentation	West AB
	10:00-10:30 AM	BREAK I & Announcement	Ballroom
	10:30-12:00 PM	Concurrent Session 6A: Forest Disturbances	Arcadian
		Concurrent Session 6B: Invasive Species	West AB
	12:00 AM-12:30 PM	Closing & Thank You.	Ballroom
	End!!		

Day 1, Field Tour: Lewis Ocean Bay Heritage Preserve, 2575 International Dr., Conway, SC 29526. Vans will leave the Hilton Hotel lobby at 3:15 PM.

Keynote Speaker

Dr. Sun Joseph Chang, Ph.D.

Professor of Forest Economics and Management
School of Renewable Natural Resources
Louisiana State University, Baton Rouge, LA 70803

Dr. Chang earned his Ph.D. in Forestry from the University of Wisconsin – Madison, following a MFS in Forestry from Harvard University in 1975 and a Bachelor's degree in Forestry from National Chung-Hsing University in Taiwan. His academic journey reflects a deep commitment to understanding and optimizing the sustainable management and use of forest resources.

Dr. Chang's research focuses on forest economics, timberland investment analysis, forest valuations and taxation as well as the application of quantitative methods to forest management. He is widely recognized for his pioneering work in developing dynamic programming models and economic optimization techniques tailored to forestry, which have been adopted by academics and practitioners alike. His scholarship has been published extensively in leading journals, including Forest Science, Canadian Journal of Forest Research, Forest Policy and Economics, and Journal of Forest Economics, cementing his reputation as a thought leader in the discipline.

In addition to his research, Dr. Chang is a dedicated educator, teaching courses in forest resource economics, forest management, and quantitative methods. His graduate students have gone on to influential roles in academia, government, and the private sector. His commitment to student success is matched by his service to the profession, including editorial roles with prominent forestry journals and active participation in organizations such as the Society of American Foresters.

In 2022, Dr. Chang was elected a fellow of the Society of American Foresters for his contribution to research advance and forestry education. Beyond academia, he has consulted with industry and government agencies, applying his expertise to real-world challenges in forest policy and sustainable resource management. Residing in Baton Rouge, Louisiana, Dr. Chang continues to advance the science and practice of forestry, bridging theoretical innovation with practical application.

Concurrent Session Details

Session (Time)	Author/Title (Oral Presentations)
1A (8:40 – 9:40 AM), Arcadian	
1.	Chukwuemeka Valentine Okolo, Oregon State University, OR. Title: Credit Market Dynamics, Reduced Greenhouse Gas, and Carbon Intensity Targets: Insights from the Oregon Clean Fuels Program for Sustainable Development.
2.	Stephanie Chizmar, USDA Forest Service, Southern Research Station, NC. Title: An Econometric Analysis of the Softwood Stumpage Market in Subregions of the U.S. South.
1B (8:40 – 9:40 AM), West AB	
3.	Raju Pokharel, Michigan State University, MI. Title: Assessing the Economic Tradeoffs of Various Forest Management Activities to Enhance Carbon Sequestration Efforts in Pennsylvania and Maryland.
4.	Bindu Paudel, Purdue University, IN. Title: Sweet on "Green"? Gen-Z's Willingness to Pay for Climate-Friendly Maple Syrup.
2A (10:00 – 12:00 PM), Arcadian	
5.	Neelam Chandra Poudyal, University of Tennessee, Knoxville, TN. Title: Economic Value of Recreation Access and Natural Amphibian Biodiversity at the Great Smoky Mountain National Park.
6.	Sabhyata Lamichhane, Mississippi State University, MS Title: Assessing the Impact of Hurricane Michael on Forest-Based Employment: A Causal Inference Approach.
7.	David Rossi, Forisk Consulting, NC. Title: The impact of Mill Closures on Local Logging Employment in the United States.
8.	Changyou Sun, Mississippi State University, MS. Title: Federal and State Tax Deduction for Conservation Easements: Regulations, Disputes, and Abuses.
2B (10:00 – 12:00 PM), West AB	
9.	Jacek Siry, Warnell School of Forestry and Natural Resources, UGA, GA. Title: Integrated Timber Investment Returns, Wood Fiber Stumpage Costs, and Forest Carbon Offset Costs for Global Planted Forests.
10.	Sushma Bhattarai, Mississippi State University, MS. Title: Landowners' Preferences for Chronic Wasting Disease (CWD) Management: A Discrete Choice Experiment Approach.
11.	Bandana Subedi, University of Arkansas at Monticello, AR. Title: Regional Drivers of Primary Wood Processing Mills in the West Gulf Coastal Region.
12.	Thomas Ochuodho, University of Kentucky, UK. Title: Cross-Laminated Timber Production and Potential Economic Impacts in Kentucky.
3A (1:30 – 3:30 AM), Arcadian	
13.	Rafal Chudy, Journal of Forest Business Research, Norway. Title: The Effect of Improved Forest Management through Continuous Cover Forestry Model on the Investment Profitability, Harvest and Carbon Fluxes as Compared to Clearcut Regime – Case Study from Poland.

14. Parag Kadam, Clemson University, SC. Title: 'Planning Over Programs': Challenges and Opportunities Affecting the Participation of Underserved Producers in the Conservation Reserve Program Across the Southeastern United States.
15. John Foppert, Paul Smith's College, NY. Title: The Economic Logic of Thinning: General Principles and Applications to Maple Timber and Syrup Production.
16. Ashok Kumar Chaudhary, Clemson University, SC. Title: What are the Drivers of Re-enrollment in the Conservation Reserve Program among Producers in the Southeastern United States?
3B (1:30 – 3:30 PM), West AB
17. Ichchha Thapa, Michigan State University, MI. Title: Investigating Mass Timber Opportunities in Wisconsin from an Optimization and Economic Impact Perspective.
18. Sanjeev Sharma, Clemson University, SC. Title: Comparative Analysis of Forest Management Practices for Carbon Sequestration: Evaluating ACR and CAR Offset Methodologies in South Carolina.
19. Stella Z. Schons, Virginia Tech, VA. Title: The Economics of Stacking Payments for Ecosystem Services in Forest Landscapes.
20. Sofwaan Bakary, University of Tennessee, Knoxville, TN. Title: Economic Contribution of Tennessee's Forestry Sector: Insights from Ten Major Counties.
4A (3:45 – 5:45 PM), Arcadian
21. Richard H Manner, North Carolina State University– SOFAC, NC. Title: The Forest as a Portfolio: An application of climate-aware tree growth models and portfolio selection to forest composition in the southeastern United States.
22. Kathryn Gazal, West Virginia University. Title: Family Forest Landowners' Views on Forest Carbon Programs in Central Appalachia.
23. Junyeong Choi, University of Arkansas at Monticello, AR. Title: Private Landowners' Willingness to Pay for Feral Swine Control Programs in the West Gulf Region.
24. Hosne Ara Akter, University of Georgia, GA. Title: Harvesting Overstocked Biomass for Wildfire Risk Reduction and Producing Sustainable Aviation Fuel in the Southeastern United States.
4B (3:45 – 5:45 PM), West AB
25. Samuel Scott, University of Montana - Forest Industry Research Program, MT. Title: New Methods for Estimating the Relationship Between Timber Harvest and Economic Outcomes in the Forest Products Industry.
26. Noel Perceval Assogba, University of Tennessee, TN. Title: Price Movements in Stumpage and Lumber Markets: An Elasticity Perspective.
27. Shivan Gc, Michigan State University, MI. Title: Quantifying the Distribution of Family Forest Ownership Classifications for US Federal Income Tax.
28. Sonika Poudel, Oklahoma State University, OK. Title: Social Acceptance of Carbon-based Forest Management in Marginal Land by NIPF Landowners in Oklahoma.

5A (8:00 – 10:00 AM), Arcadian (Flash Presentations)
29. Richard Mei, Duke University, NC. Title: Timberland as a Biological Bond
30. Courtney Deviney, North Carolina State University, NC. Title: Understanding Forest and Farm Landowners' Willingness to Participate in Traditional and Nature Based Solution Cost Share Programs: Insights from a Landowner Survey in North Carolina.
31. Jianheng Zhao, University of Maine, ME. Title: Landowner Practices and Climate Conditions Shape Tree Species Diversity in Maine, USA.
32. Nan Zhang, Duke University, NC. Title: Optimizing Forest Management under Conservation Easements using Markov Chains.
33. Maddie Watts, Oklahoma State University, OK. Title: Attitudes Toward Benefits and Risks of Supplemental Feeding of Wildlife in Oklahoma and Landowner Willingness to Pay.
34. Prabin Bhusal, North Carolina State University, NC. Title: Did the COVID-19 pandemic Influence Forest Landowners' Engagement in Communication Networks and Education Activities? Insights from a Regional Landowner Survey in the Southern United States?
35. Olakunle E. Sodiya, North Carolina State University, NC. Title: The Impact of Plantation Investment and Production on Regional Carbon Stocks.
36. Sagar Chhetri, University of Arkansas at Monticello, AR. Title: Key Drivers of Pine Harvesting at the County Level in Arkansas.
37. Srija Vakiti, Oak Ridge Institute for Science and Education, NC. Title: Sub-Regional Analysis of North American Forest Product Mill Employment.
38. Ana Cubas-Baez, North Carolina State University, NC. Title: Planning for the Future: What Drives Forest Legacy Decisions in the Southern United States.
39. Andrew Zhai, Duke University, NC. Title: Evaluating the Impact of the SocioBosque Program on Deforestation: Evidence from the Ecuadorian Amazon.
40. Kate Grala, Geosystems Research Institute, Mississippi State University, MS. Title: The Economic Impacts of Coastal Flooding on Mills and their Timber Procurement Zones.
5B (8:00 – 10:00 AM), West AB (Flash Presentations)
41. Manuja Jayasundara, University of Georgia, GA. Title: Migrant Labor in the US forest sector: Examining Vulnerabilities in the H-2B Guest Worker Program.
42. Konstantinos G. Papaspyropoulos, Aristotle University of Thessaloniki, Greece. Title: Strengthening the Link Between Forest Economics, ESG Frameworks and Sustainability Reporting.
43. Raju Pokharel, Michigan State University, MI. Title: Cost-benefit of voluntary carbon projects: Demonstrating an online tool for landowner decision support.

44. Puneet Dwivedi, Clemson University, SC. Title: Biochar Economics for Private Landowners with Payments from Carbon Markets and Federal Incentives.
45. Richard H Manner, North Carolina State University, NC. Title: The Sub-Regional Timber Supply Model (SRTS): A New Platform, New Carbon Calculations, and a Prospective on the Forest Sector in the Southeastern United States.
46. Ram Kumar Adhikari, Mississippi State University, MS Title: Assessing Hurricane Impacts on Timber Supply Costs: A Case Study of Pine Sawmills in Mississippi.
47. Samjhana Panthi, Mississippi State University, MS. Title: Impact of Timber Price Trends and Volatility on Loblolly Pine Plantation Optimal Rotation Age in the US South.
48. Michelle Thompson, Clemson University, SC. Title: Sustainable Use and Value of U.S. Forests: Findings from the Montreal Process Criteria Indicators.
49. Puskar Khanal, Clemson University, SC. Title: Understanding Climate-Smart Forestry: Insights from Forestry Professionals in the Southern Region.
6A (10:30 – 12:00 PM), Arcadian
50. Stephanie Chizmar, USFS Southern Research Station, NC. Title: Evaluating the Economic Impacts of Forest Damages from Hurricane Michael: An Application of a Computable General Equilibrium Model.
51. Bindu Paudel, Purdue University, IN. Title: Additionality of Conservation Cost-Sharing in Private Investment for Invasive Species Management.
52. Sonia Bruck, U.S. Forest Service - Southern Research Station, NC. Title: Exploring Socio-Economic Characteristics of Native American tribes: The Impact on Fire Management Programs and Un-intended Fire Ignitions.
6B (10:30 – 12:00 PM), West AB
53. Robert K. Grala, Department of Forestry, Mississippi State University, MS. Title: Impacts of Hurricanes, Wildfires, and Socioeconomic Factors on the Presence of Invasive Plants in Mississippi.
54. Naresh Khanal, Oregon State University, OR. Title: Prioritizing Restoration Efforts: Identifying High-Risk Areas for Enhanced Fire Resilience in Malheur and Wallowa-Whitman National Forests.
55. Sayeed R. Mehmood. School of ENR, The Ohio State University, OH Title: A Look at Family Forest Owners' Perception of Barriers to Invasive Species Control.
Poster Presentations (Ball Room)
56. Ichchha Thapa, Michigan State University, MI. Title: Prospects of Mass Timber Manufacturing in Michigan. 57. Carson Raper, Oklahoma State University, OK. Title: Exploring Landowner Acceptability of Carbon-Based Forest Management in Marginal Lands.

58. Bandana Subedi, University of Arkansas at Monticello, AR.
    Title: Suitability Analysis for the Potential Locations for Wood Processing Mills in West Gulf Coastal Plain.
59. Kamana Chamlagain, University of Arkansas at Monticello, AR,
    Title: From Passion to Profession: Understanding the Career Values that Drive Individuals into Forest and Natural Resource Sectors.
60. Arati Paudel, University of Arkansas at Monticello, AR.
    Title: Understanding the Public Perception of Multi Story Wood Buildings: A Scoping Review.
61. Naresh Khanal, Oregon State University, OR.
    Title: Prioritizing Restoration Efforts: Identifying High-Risk Areas for Enhanced Fire Resilience in Malheur and Wallowa-Whitman National Forests.
62. Michelle Thompson, Clemson University, SC.
    Title: Sustainable Use and Value of U.S. Forests: Findings from the Montreal Process Criteria Indicators.
63. Mahesh Tiwari, University of Georgia, GA.
    Title: Forest Product Companies' Willingness to Invest (WTI) in Ecosystem Services Projects.
64. Kripa Neupane, Penn State University, PA.
    Title: Landowner Willingness for Carbon Payment Participation in Pennsylvania and Virginia.
65. Bailey Johns, University of Arkansas at Monticello, AR.
    Title: Forest Landowner Carbon Market Participation and the Role of Property Taxation.
66. Onyinye Choko, University of Georgia, GA.
    Title: Investigating the Relationship between Nonindustrial Private Forest (NIPF) Landowners and Logging Businesses in the US South.
67. Konstantinos G. Papaspyropoulos, Aristotle University of Thessaloniki, Greece.
    Title: Thematic Evolution and Citation Dynamics of the Faustmann Forest Economics Model: A Text Analytics Review.
68. Bindu Paudel, Purdue University, IN.
    Title: Additionality of Conservation Cost-Sharing in Private Investment for Invasive Species Management.

ORAL PRESENTATION

1A (8:40 – 9:40 AM), Arcadian

1. Credit Market Dynamics, Reduced Greenhouse Gas, and Carbon Intensity Targets: Insights from the Oregon Clean Fuels Program for Sustainable Development

Chukwuemeka Valentine Okolo*, Andres Susaeta, John Sessions

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Abstract
This study explores the dynamics of credit markets and reduced greenhouse gas in relation to carbon intensity reduction targets within the Oregon Clean Fuels Program framework. Our study employed robust ordinary least squares (OLS), autoregressive conditional heteroskedasticity (ARCH), quantile regression models, and fully modified ordinary least squares (FMOLS). The study found a robust negative relationship between bioenergy, reduced greenhouse gas, low carbon transport, and average carbon intensity. For every 1% increase in bioenergy innovation, reduced greenhouse gas, and low carbon transport, carbon intensity dropped by 0.870%, 0.115%, and 0.0171%, respectively. Factoring in total credits, credit value, credit transferred, and average price per credit further emphasized the effectiveness of market-driven policies in reducing carbon intensity. When we introduced ARCH and Quantile models, we still found consistency in these relations across different levels. FMOLS regression indicates that these variables can have a sustained, consistent effect on reducing carbon intensity in the long run. A predictive model (autoregressive integrated moving average ARIMA) showed a strong correlation between fitted and actual carbon intensity values, highlighting the success of Oregon's Clean Fuels Program in achieving emission reduction goals. The study emphasizes the significant role of Oregon's Clean Fuels Program in promoting a sustainable, low-carbon economy through carbon market mechanisms.
Keywords: Credit Market Dynamics; Reduced Greenhouse Gas; Ethanol Carbon Intensity; Oregon Clean Fuels Program; Bioenergy; Low Carbon Transportation

2. An Econometric Analysis of the Softwood Stumpage Market in Subregions of the U.S. South

Jesse D. Henderson[1], Stephanie Chizmar[1*], Shaun M. Tanger[2], Bruno Kanieski da Silva[3], Rajan Parajuli[4]

[1]USDA Forest Service, Southern Research Station

[2]University of Arkansas Monticello

[3]University of Georgia

[4]North Carolina State University

* stephanie.chizmar@usda.gov

Abstract

Previous studies have established that timber supply is generally inelastic with respect to price. Elasticities from these studies have been used in timber supply models to examine market responses to a wide range of policies and natural disturbances. However, many of the supporting studies preceded significant changes in the US forest industry, suggesting the possibility timber supply may have experienced structural shifts. New econometric analyses are therefore needed to examine this question. The purpose of this paper is to first disentangle the methodological, theoretical considerations, and practical data processes that are needed for a contemporary econometric analysis of timber supply. Based on these arguments, we then develop an econometric model to explain harvest choice using plot-condition Forest Inventory and Analysis (FIA) data. The harvest choice model is compared to timber basin scale models.

Keywords: softwood, econometrics, harvest choice, timber supply, harvest probability

1B (8:40 – 9:40 AM), West AB

3. Assessing the economic tradeoffs of various forest management activities to enhance carbon sequestration efforts in Pennsylvania and Maryland.

Raju Pokharel
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Michigan State University

Abstract
Forests are vital in mitigating climate change by sequestering atmospheric carbon dioxide. State forest agencies can enhance these benefits through sustainable management practices on public lands and by supporting private landowners with technical assistance and financial incentives. This study evaluates the financial tradeoffs of various forest management strategies compared to a business-as-usual (BAU) scenario using the output from the Carbon Budget Model of the Canadian Forest Sector (CBM-CFS3). Results show that scenarios like afforestation, restocking, and silvopasture provide higher net present value (NPV) when carbon revenue is included despite initially lower returns than BAU. In Maryland and Pennsylvania, scenarios such as controlled deer browsing and silvopasture outperformed BAU in NPV when accounting for carbon sequestration. Extended or altered rotations, while ecologically beneficial, showed higher economic tradeoffs than other management strategies. Active forest management with diversified strategies, such as portfolio approaches, produced the best balance between economic and ecological goals. These strategies enhance carbon sequestration, improve NPV, and support climate change mitigation more effectively than BAU or single management approaches. Actively managed forests with diverse prescriptions produce superior benefits for climate mitigation and forest productivity. The findings underscore the importance of active management and collaboration among policymakers, foresters, and stakeholders to optimize forest carbon benefits while maintaining ecological and economic balance.

4. Sweet on "Green"? Gen-Z's Willingness to Pay for Climate-Friendly Maple Syrup

Bindu Paudel*, Mo Zhou
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Abstract
In recent years, growing concerns about the impact of food production and consumption contributing to climate change have driven up demand for climate-conscious food products. In response, carbon footprint eco-labels have emerged as a key tool for industry-stakeholders and businesses to communicate the climate-friendly attributes of their products or services. However, uncertainty remains about whether younger demographics are willing to pay for climate-friendly food products, particularly concerning those derived from forests. In this study, we employ discrete choice modeling to uncover Gen-Z consumers' preferences for maple syrup produced with a reduced carbon footprint under three eco-labels: self-claimed, verified by a voluntary conservation program, and certified by a third-party. Additionally, we segmented the target group into two clusters using hierarchical cluster analysis based on the level of subjective knowledge. Our findings reveal that Gen-Z consumers have a higher willingness to pay (WTP) for maple syrup under carbon-footprint-labels compared to the organic alternative. Moreover, those with greater subjective knowledge demonstrate an even stronger WTP, highlighting the role of eco-labeling and consumer awareness in shaping purchasing decisions among younger demographics.

Key words: Carbon footprint, Eco-labels, Willingness to pay

2A (10:00 – 12:00 PM), Arcadian

5. Economic value of recreation access and natural amphibian biodiversity at the Great Smoky Mountain National Park

Neelam C. Poudyal[1]*, Ram K. Adhikari[2]*, Kevin Cavasos[1]

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[2]College of Forest Resources, Mississippi State University, Starkville, MS
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Abstract
Protected areas are typically located in landscapes containing natural biodiversity of significant environmental and cultural significance. Recreational visitation to such areas adds challenge in conservation because of anthropogenic pressure that threat the natural biodiversity. Great Smoky Mountain National Park (GSMNP) is the highest visited protected area in the nation and is located in the global hotspot of amphibian biodiversity. Since management of protected areas and conservation of biodiversity therein incurs significant cost, demonstrating the benefit of recreational access and public value of biodiversity is critical for conservation agencies to justify using public funds for conservation efforts and maintaining public use. While input-output (IO) analysis with visiting spending data has shown the benefit of visitation to the local communities, the net benefit of access to the visitors themselves is unknown. To fill this gap in knowledge, this study employed a revealed preference approach (travel cost method) and stated preference method (willingness to pay survey) to the data collected from an on-site survey of visitors at GSMNP (n = 1,439) and estimated the net economic benefit of recreation access and visitor willingness to pay (WTP) to protect amphibian biodiversity therein. Estimates from zero-truncated negative binomial model implied a substantial amount of net economic benefits ($134/trip per person) to visitors and that the demand for GSMNP visit was also influenced by their visit motivations and extent of engagement in amphibian-related recreation. In addition, interval regression model results showed that visitors were willing to pay $10.55/trip in donation to ensure the persistence of amphibian biodiversity in GSMNP. Determinants of individual WTP included the perceived threat to amphibians from pathogen transmission in natural areas they visit, their self-assessed familiarity with general knowledge about amphibians, the level of importance they placed on the benefits to humans from amphibian biodiversity, and annual household income. This presentation will highlight individual and aggregate estimates of economic benefit of protected area access for recreation and societal value of protecting amphibian biodiversity. Findings are also useful in assessing the viability of a visitor-supported mechanism to fund projects mitigating anthropogenic threats to amphibian biodiversity.

Keywords: travel cost, contingent valuation, protected areas, biodiversity, WTP

6. Assessing the Impact of Hurricane Michael on Forest-Based Employment: A Causal Inference Approach

Sabhyata Lamichhane[1]*, Arpita Nehra[2], Rajan Parajuli[3], Stephanie Chizmar[4], Consuelo Brandeis[4], Thomas Ochuodho[5]
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[2]Department of Forest Resources, University of Minnesota
[3]Department of Forestry and Environmental Resources, North Carolina State University
[4]USDA Forest Service, Southern Research Station
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Abstract
Hurricanes are a significant threat to forest-based economies, yet the causal relationship between hurricane impacts and forest economics remain underexplored. This study assesses the effects of Hurricane Michael on forest-based employment in U.S. South using county-level data from 2015 to 2023. Employing a propensity score weighting approach, we examine employment data from the Bureau of Labor Statistics for forest industries as the dependent variable, alongside a range of exogenous variables characterizing counties by economic base, mill capacity, forest resources, and population. Treated counties in Florida and Georgia were classified into three treatment levels based on wind speed: moderate (≥39 mph), severe (≥58 mph), and catastrophic (≥74 mph). The control group consists of counties across the U.S. South with comparable timber production volumes. Our preliminary results reveal heterogeneous impacts based on the severity of hurricane damage and county characteristics. Severe damage counties exhibited a significant negative impact on employment in wood product manufacturing and paper manufacturing. Conversely, forestry and logging employment showed a significant positive effect in moderately impacted counties. These findings underscore the nuanced relationship between hurricane-induced disruptions and forest-based economic sectors, providing critical insights for policymakers and stakeholders in developing resilience strategies for forest-dependent communities.

Key words: Causal inference, Economic impact, Forest industries, Natural disasters

7. The impact of mill closures on local logging employment in the United States

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Abstract
U.S. logging employment fell 16% since the start of 2014. State forestry agencies, forest industry analysts, and policymakers may benefit from understanding how manufacturing investments and divestments impact logging employment in their region. Timberland owners are also interested in the availability of loggers, as labor shortages can raise the cost of logging operations and negatively impact timber harvest income. However, the extent of changes in local logging employment from shocks to local wood processing capacity has not yet been measured using quasi-experimental methods. To measure these impacts, we leverage Forisk mill data tracking closures in primary wood product manufacturing facilities (including sawmills, panel mills, pulp/paper mills, and bioenergy facilities) in the U.S. from 2019 to 2024 and data from the Bureau of Labor Statistics on county-level logging employment across wood procurement basins. This enables us to apply a regression discontinuity design to estimate the impact of mill closures in the wood products sector on employment in the logging and timber harvesting sectors across a mill's local wood procurement area. Results suggest there is no immediate impact on logging employment across a mill's procurement basin in the quarter of a mill closure, but there is an expected cumulative impact over the two years following the closure.

Keywords: logging employment, logging sector, wood products, mill capacity, regression discontinuity design.

8. Federal and State Tax Deduction for Conservation Easements: Regulations, Disputes, and Abuses

Authors: Changyou Sun, Yanshu Li, Bin Mei, Catherine Clutter, and Eric McConnell

Oral presenter: Changyou Sun, Professor, Mississippi State University
CS258@msstate.edu

Abstract: A conservation easement is a voluntary legal agreement in which a landowner donates or sells certain property rights to a qualified third party, such as a nonprofit organization or government agency. These agreements, which can be temporary or perpetual, are designed to protect land for environmental, agricultural, or historical purposes. Landowners may receive tax benefits, direct payments, or both. However, disputes over federal and state income tax deductions associated with conservation easements have become increasingly common. In this study, the patterns in tax-related disputes were analyzed through 147 legal cases identified from the Westlaw database. The cases were categorized by geographic distribution, changes over time, land valuation, and the primary issues in contention. Key areas of dispute included easement valuation, adherence to federal tax regulations, and the involvement of stakeholders such as nonprofit organizations, landowners, and third parties. Land characteristics in the cases were also examined, including the size, pre- and post-easement values, and primary uses of the land (e.g., agriculture, forestry, or residential purposes). The findings highlight the complexities of current conservation easement policies and underscore the need for clearer regulations. Standardizing evaluation methods and addressing ambiguities in tax deduction rules could reduce litigation, enhance policy integrity, and encourage the broader adoption of conservation easements.

2B (10:00 – 12:00 PM), West AB

9. Integrated Timber Investment Returns, Wood Fiber Stumpage Costs, and Forest Carbon Offset Costs for Global Planted Forests

Frederick Cubbage, Rafael Rubilar, Patricio Mac Donagh, Bruno Kanieski Da Silva, Adriana Bussoni, Virginia Morales, Gustavo Balmelli, Vitor Afonso Hoeflich, Roger Lord, Jacek Siry*, Carmelo Hernández, Pu Zhang, Ha Tran Thi Thu, Richard Yao, Peter Hall, Jaana Korhonen, Luis Díaz-Balteiro, Roque Rodríguez-Soalleiro, Robert Davis, Rafal Chudy, Rafael De La Torre, Gabriel Jaime Lopera, Somvang Phimmavong, Sebastián Garzón, and Ana Cubas-Baez

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Abstract
This presentation will discuss our research on integrated timber investment returns, wood stumpage costs, and forest carbon production costs in 2023 for a representative selection of about 15 countries and 45 planted species/ management regimes, using capital budgeting criteria, at a real discount rate of 8%, without land costs. Despite a large amount of disparate research, few if any studies have provided integrated estimates of investments, wood fiber costs, and forest carbon offset costs using fundamental primary data and production economics approaches. We built on our prior research that estimated present values and internal rates of return for timber investments, using average plantation forest growth and yield, input management costs, and timber products prices by selected country and species. From that production economics approach for forest management, we extended the calculations to estimate average stumpage costs for wood fiber per cubic meter per rotation. In addition, we calculated the costs to produce forest carbon offsets in terms of the now traditional CO2e metric. The results of these investment returns, wood fiber costs, and forest carbon storage equivalent cost estimates were fascinating. Timber investment internal rates of return ranged from 4% to more than 20%, with the northern hemisphere ranging from 3%-11%; South America from 8% to 14%, and Asia from 8% to more than 20%. Wood production costs were generally less in South America, at less than $5 per m3, but temperate forests also were often less than $10 per m3. Asia had some of the highest wood production costs at more than $15 to $20 per m3. Forest carbon costs per CO2e approximated wood production costs in numeric values, albeit for the different CO2e metric. The results can be used for private, government, or nongovernment investments and for public policy intervention considerations.

Keywords: timber investments, benchmarking, capital budgeting, planted forests, carbon mitigation

10. Landowners' preferences for chronic wasting disease (CWD) management: A discrete choice experiment approach

Sushma Bhattarai
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Abstract
Effective management of chronic wasting disease (CWD) in areas with predominantly privately-owned cervid habitats relies heavily on landowner cooperation. However, despite the development of various best management practices (BMPs) to limit CWD spread, their adoption by landowners remains limited. Given the societal benefits of CWD control, understanding the role of incentives in motivating a greater BMP implementation is crucial for developing effective CWD management programs. This study used a stated preference choice experiment survey of 948 landowners with forestry parcels in CWD-positive counties in Mississippi and Tennessee to analyze the trade-offs between willingness to adopt CWD BMPs and monetary incentives. The higher level of monetary incentive significantly increased the likelihood of BMP implementation. Landowners' willingness to accept (WTA) an incentive ranged from $9 per acre per year for providing access to hunters to harvest deer to limit CWD spread to $53 per acre per year for allowing an up-to-80% deer population reduction. Thus, achieving aggressive population reduction goals on private lands likely will be considerably more costly than promoting hunting access for CWD reduction within current bag limits. The findings highlighted the importance of tailored monetary incentives and flexible disease management strategies for securing landowner cooperation in CWD management. Policymakers and wildlife managers can use these results to design more effective incentive structures that accommodate landowner preferences for different BMPs and consider the relative cost-efficiency of incentive programs.

11. Regional Drivers of Primary Wood Processing Mills in the West Gulf Coastal Region

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Abstract
In the West Gulf Coastal Plain (WGCP), the primary wood processing mills (PWPMs) decreased by 15% between 2018 and 2022. The closure resulted from market shifts, policy changes, and transportation costs, with transportation expenses comprising up to 13% of raw material costs. While infrastructure, labor availability, and resource accessibility are crucial factors for mill establishment, the influence of these variables varies across regions. This study examines the distribution and factors influencing the establishment of PWPMs in the WGCP region. The analysis integrates socio-demographic, transportation, and forest resource characteristics at the county level. The negative binomial regression model revealed that resource availability and average working wage were positive and statistically significant in the location of PWPMs. For softwood-using mills (SWPMs), the growth-to-rain ratio of softwood was negative and statistically significant, while the average working wage was positive and statistically significant. The findings suggest that the mills are established in resource-rich areas where the laborers have promising wages. These findings provide actionable insights for policymakers and industry stakeholders, helping to enhance resource utilization and foster a resilient forest products sector in the WGCP. Also, it encourages future studies that include variables such as resource cost, density of roads and railways, taxes, and other intrinsic and extrinsic factors that might influence the establishment of mills.

Keywords: Primary Wood Processing Mills, Negative Binomial Regression, West Gulf Coastal Plain

12. Cross-Laminated Timber Production and Potential Economic Impacts in Kentucky

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Abstract
Cross-laminated timber (CLT) has emerged as a viable alternative to conventional construction materials due to its sustainability benefits. While softwoods are traditionally used in CLT production, the underutilization of hardwood species offers untapped potential for CLT production. The objective of this study is therefore to assess potential economic impacts of select hardwood species for CLT production and use in building construction in Kentucky. A Computable General Equilibrium (CGE) modeling framework, implemented in the General Algebraic Modeling System (GAMS), is applied to assess the potential economic impacts. Key outputs of this study will include macroeconomic variables such as Gross Regional Product (GRP), labor employment and capital investments, household income and welfare, commodity prices, sectoral demand and supply, industrial outputs and trade; thus providing a comprehensive economy-wide potential impacts. These results will guide strategies to promote hardwood CLT production and use in construction industry for sustained economic growth of the forest sector and the entire economy.
Keywords: Cross-laminated timber, hardwoods, CGE, economic impacts.

3A (1:30 – 3:30 AM), Arcadian

13. The effect of improved forest management through continuous cover forestry model on the investment profitability, harvest and carbon fluxes as compared to clearcut regime – case study from Poland

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Abstract
Improved forest management (IFM), particularly continuous cover forestry (CCF), is gaining attention for mitigating climate change by enhancing forest carbon sequestration and maintaining soil carbon storage. CCF is presented as an alternative to clearcutting, offering productivity, ecological and social benefits. As a representative European Scots pine case, Poland was used for evaluating CCF's profitability, harvest rates, and carbon fluxes compared to traditional clearcutting. We used discounted cash flow models to assess the potential benefits of transitioning even-aged Scots pine stands to a continuous cover forestry regime. Like most forest investment analyses, the profitability, and carbon sequestered and stored, as well harvested wood volumes, depend on the stand management regimes applied. At the assumed 5% discount rate, Clear Cut Forest management usually had higher Land Expectation Values (LEVs). CCF usually had higher internal rates of return (IRRs) for lower land acquisition prices of 8000 EUR or less. For land prices of 9000 to 11000 EUR, IRRs varied considerably by the age stands were transitioned to CCF. Land costs of 8000 EUR or less generally had profitable Scots pine management regimes at 5%; 9000 EUR or more land costs would require a lower discount rate of about 4% or less to break even. Purchasing older forests, which then produced earlier harvest revenues, were more profitable. Clearcut management always produced moderately more wood per ha than CCF, but since CCF had fewer input costs, the costs per ton of CO2e were similar between both management regimes, as were wood production costs.

Keywords: Clear Cut Management, continuous cover forestry (CCF), DCF analysis, improved forest management (IFM), Poland, Scots pine

14. Biochar Economics for Private Landowners with Payments from Carbon Markets and Federal Incentives

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Abstract
Considering biochar's potential for carbon sequestration and healthy soils, this study evaluates the economic viability of biochar projects for private landowners in the southeastern United States. Our analysis incorporates biochar manufacturing in existing wood-consuming paper mills, transportation, and application costs, along with federal incentives, carbon credit revenues and transactions as well as percentage profit sharing with landowners. Baseline economic analysis found a potential $6.81/ha profit per wet ton of biochar for landowners. Economic simulations of 10,000 scenarios incorporating randomized +/- 20% variability in key parameters demonstrate that the highest costs arise from biochar manufacturing and transportation. At the same time, significant revenue sources include federal support and carbon market income. Sensitivity analysis reveals that net profit is most associated with manufacturing costs (correlation of -0.658), federal incentives (correlation of 0.677), carbon credit pricing (correlation of 0.300), and transportation costs (correlation of -0.126). Findings indicate that almost 95% of simulations yield positive profits for a hypothetical property of one hectare, with 72.43% and 37.18% of the scenarios showing a net profit of more than $500 and $1000, respectively. On the other hand, the current average values of manufacturing costs, NRCS support, and carbon prices are very close to the limits when landowners do not make any profit. This emphasizes that lower manufacturing costs, more federal support, and higher carbon credit prices are essential for landowners' profitability. This study's insights into the economic dynamics of biochar can guide policymakers and stakeholders, especially private landowners, in creating more resilient, profitable biochar markets.

Keywords: Biochar; Economic Analysis; Carbon Markets; Federal Incentives; Landowners; United States

15. The economic logic of thinning: General principles and applications to maple timber and syrup production

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Abstract
In hardwood silviculture, tree selection, thinning intensity, and other partial cutting decisions often matter more than the timing of end-of-rotation harvests. The field of forest economics, however, has devoted most of its attention to this last question and very little to the others. This paper aims to address that gap, supplying silviculturalists and forest managers with a more robust economic logic to draw on when planning and implementing thinnings, and inviting forest economists to root more of our analyses in stand dynamics. First, we articulate the economic logic of thinning as general principles and then illustrate these with numerical examples of timber and non-timber production. To derive these general principles, we begin our analysis with archetypal stand developmental patterns, starting with "ideal" stands, which are impossibly, perfectly homogenous and result in stagnation; then "pure" single-species, even-aged stands, where variability in site quality, growing space, and other factors drive crown-class differentiation; and finally, stratified, mixed-species stands, where functional differences in height growth patterns, shade tolerance, and other traits induce sorting into distinct canopy strata. We then offer basic models and some new supporting terminology to conceptualize the marginal payoffs and opportunity costs of different categories of thinning methods, according to their relation to stand developmental pathways. We illustrate the logic of these models with simple examples representing a small group of maple trees managed, in one case, for timber, and then for syrup production.

Keywords: Silvicultural economics; optimal thinning; stand dynamics; sugarbush silviculture

16. What are the drivers of re-enrollment in the Conservation Reserve Program among producers in the southeastern United States?

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Abstract

The Conservation Reserve Program (CRP) provides an annual rental payment for a contract period of 10-15 years for enrolling highly erodible agricultural lands for conservation in the United States. However, producers' re-enrollment in the CRP has been decreasing since 2017. Therefore, examining the financial and non-financial drivers of CRP re-enrollment is crucial for the program's long-term success. This study explores factors influencing re-enrollment in CRP in the southeastern United States through a Partial Least Squares Structural Equation Modeling method. We noticed that motivation to participate in conservation and past experiences with the CRP process positively affected re-enrollment in CRP. In contrast, CRP market-related and process-related challenges negatively impacted re-enrollment in CRP. Our findings imply that the Farm Service Agency (FSA) could motivate conservation-oriented producers to increase re-enrollment in CRP by providing information on various CRP aspects (e.g., sign-up ranking process, rules and regulations, etc.) and allowing adjustments during mid-contract management. Furthermore, FSA should increase awareness of CRP initiatives, reduce technical barriers, and provide timely support to producers for increasing their re-enrollment in CRP.

Keywords: Private conservation program; Environmental benefits; Challenges; Re-enrollment; Partial Least Squares Structural Equation Modeling

17. Investigating Mass Timber Opportunities in Wisconsin from an Optimization and Economic Impact Perspective

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Abstract
The net annual growing stock on forestlands over the past decade in Wisconsin presents the importance to explore markets for emerging forest products like mass timber to benefit forest landowners and managers. This study aims to identify potential location and assess feedstock availability for a mass timber facility in Wisconsin, and evaluate the economic impact at the regional, state, and county levels. We employed a transportation logistics modeling approach to estimate the forest products market extent and competition while minimizing feedstock procurement costs for the potential mass timber facility in Wisconsin. We used a distance, time, and cost-based optimization model to optimize feedstock procurement costs between forest plots and sawmills first, followed by sawmills and potential mass timber locations, and finally potential locations and cities. We identified potential location for mass timber facility in Wisconsin assigning different weights to supply and demand factors while also considering distance, time, and cost metrics for optimization including feedstock availability in the procurement zone. To assess the economic impact of the mass timber production, we used the IMPLAN model at the state, county, and regional levels. This study underscores the adequate availability of feedstock to support mass timber production in Wisconsin and highlights the significant economic impacts that a mass timber production facility could make to the state's economy. These findings provide valuable insights for advancing the growing mass timber momentum in the Midwest.

Keywords: mass timber, optimization, economic impact, demand, supply

18. Comparative Analysis of Forest Management Practices for Carbon Sequestration: Evaluating ACR and CAR Offset Methodologies in South Carolina

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Abstract

South Carolina (SC) encompasses diverse forest ecosystems, each with unique capacities for carbon sequestration. A substantial portion of these forests are under private ownership, making landowner management practices pivotal for maintaining and enhancing forest carbon stocks. Forest management strategies can significantly increase carbon storage over time, presenting an opportunity for landowners to participate in carbon markets while contributing to climate change mitigation. This study seeks to inform forest landowners about effective management practices to maximize carbon sequestration. Using data from the Clemson Experimental Forest, projections were made for 183 forest plots categorized as pine, mixed hardwood, or hardwood, over a 100-year period utilizing the Forest Vegetation Simulator (FVS). Thirteen distinct silvicultural scenarios were modeled to evaluate their impact on carbon storage and financial returns. Carbon offsets were assessed using improved forest management protocols from the Climate Action Reserve (CAR) and the American Carbon Registry (ACR), with analyses conducted under voluntary and regulatory market price assumptions. Results indicated that for pine forests, clear-cutting with artificial regeneration over 100 years yielded the highest net present value (NPV), while thinning from below at 15, 30, and 45 years maximized carbon storage. For hardwood forests, thinning from below, clear-cutting, and artificial regeneration produced the highest NPV, with thinning from below consistently achieving the highest carbon sequestration. In mixed hardwood stands, the irregular shelterwood method yielded the highest NPV, while thinning from below at the same intervals was most effective for carbon storage. Across scenarios, ACR protocols consistently generated more offsets than CAR ($p < 0.05$). This analysis offers valuable insights for landowners exploring carbon market opportunities and understanding the implications of various management practices on carbon dynamics. Despite the primary role of timber as a revenue source, carbon markets present a promising avenue for landowners to diversify income while addressing climate change. This study underscores the importance of integrating carbon markets into forest management strategies to achieve sustainable economic and environmental outcomes.

19. The Economics of Stacking Payments for Ecosystem Services in Forest Landscapes

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Abstract

Payments for ecosystem services (PES) schemes are public or private programs that create incentives for restoration of ecosystems, often involving markets where credits are paid per ecosystem service unit produced. Stacking refers to ecosystem services produced from the same land unit but traded in different markets; this may increase land values while ensuring sustained production of these services by private actors and mitigation of negative impacts from landowners focusing on only one ecosystem service. We study PES stacking for water quantity and carbon sequestration/storage together with timber production, and identify conditions where stacking can achieve conservation goals from landowner and policy perspectives. We develop a forest land value model that extends Hartman (1976) to allow for ecosystem services that are substitutes or complements through time to varying degrees. We apply this model using data from five physiographic regions of Virginia together with carbon sequestration and water production data to explore the effects of stacking PES on optimal forest rotation ages and land expectation values under different conditions where the two ecosystem services may be substitutes (i.e. higher carbon storage leads to lower water yield) or complements depending on where land is located. We find stacking PES for water and carbon sequestration generates higher land values and shorter optimal rotation ages when landscape and forest conditions involve ecosystem services that are substitutes. When the ecosystem services are complements, stacking payments generates longer optimal rotation ages and can lower land values and timber production, thereby disincentivizing landowners.

Keywords: Stacking, payments for ecosystem services, forest carbon, water credits

20. Economic Contribution of Tennessee's Forestry Sector: Insights from Ten Major Counties

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Abstract
The forestry sector plays a key role in Tennessee's economy, contributing to employment, income generation, and overall economic growth. Using IMPLAN software and 2022 data, we estimated the economic impact of the forestry sector in ten counties across all four state regions. The results show these counties contribute over $12 billion annually in output, representing 53% of the state's total forest sector contribution. They provide more than 22,000 direct jobs and generate an estimated $2 billion in labor income. The primary solid wood products, wood-based power, secondary solid wood products, and the pulp, paper, and paperboard industries were the key contributors. These findings highlight the substantial role of the wood-based sectors across all regions, emphasizing their critical impact on Tennessee's economic performance.

Keywords: Forestry Sector, Economic Contribution, County, Tennessee.

21. The Forest as a Portfolio: An application of climate-aware tree growth models and portfolio selection to Forest in the southeastern United States

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Abstract
According to the IPCC's 2023 Synthesis Report on Climate Change, global temperatures have risen approximately 1C since the pre-industrial period, and there is significant uncertainty around future climate projections. Additionally, IPCC and related scientific literature find that the forestry sector is both vulnerable to and already feeling the effects of climate change. This work sets out to accomplish two goals. The first is contribute a new modeling approach that accounts for intra-annual variability of weather patterns on tree growth using signal processing and statistical techniques. The second uses these models, in conjunction with climate projections, to develop a portfolio view of the forest through the lens of a changing and uncertain climate future. We leverage publicly available data from the USFS's FIA Database, ORNL's DAYMET, and NASA's NEX-GDDP-CMIP6 to train models and then simulate future growth based on 88 climate projections. Our models consider species-level reactions to site characteristics and weather patterns across the southeastern United States. Finally, we compare the performance of roughly 4.6 million forest compositions, across four species, considering financial returns to timber and carbon production. A Markowitz Portfolio Selection framework is used to explore the trade-offs between expected return and the variance. The performance of different species and their relative prevalence in portfolios along the efficient frontier is considered. We find planted Loblolly Pine monocultures provide high levels of return and variance, and the opportunity to de-risk exists through species diversification.;

Keywords: Climate, Forest, Economics, Risk, Modeling

22. Family forest landowners' views on forest carbon programs in Central Appalachia

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Abstract
Forests provide the ecosystem service of carbon sequestration that mitigates climate change, and forest landowners are presented with new opportunities to earn revenue for actively managing their land to increase the rate of carbon sequestered. These programs started in West Virginia and surrounding states, but little research has been done to understand these landowners' forest management goals and willingness to participate in these programs. To identify the barriers for family forest landowners to participate in forest carbon programs, we surveyed landowners in West Virginia, Southeast Ohio, and Eastern Tennessee. The survey included a dichotomous choice experiment in which respondents were asked to choose whether they would enroll in one or neither of five pairs of hypothetical forest carbon programs. The hypothetical programs were described by four attributes: $ paid per acre per year, contract length, harvest restrictions, and program administrator. The levels of the attributes varied among hypothetical program scenarios. We also evaluated how landowner demographics, management goals, and past management activity influenced their willingness to enroll in forest carbon programs.
Our results show that landowners are more likely to enroll in programs that have the greatest payment, shortest contract length, least amount of harvest restrictions, and administered by a government agency opposed to non-profit or private company. Landowners were also more likely to consider enrolling in a forest carbon offset program if they were younger landowners, had higher levels of education, lived on their property, and found it highly important to keep their land forested.

23. Private Landowners' Willingness to Pay for Feral Swine Control Programs in the West Gulf Region

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Abstract
Feral swine (FS) are one of the most destructive invasive species in the West Gulf Region, causing extensive ecological and economic damage. Understanding private landowners' willingness to pay (WTP) for FS control programs is essential for developing and implementing effective FS management strategies and policies. Using mail survey data collected from private landowners in Arkansas, Louisiana, and East Texas, this study estimated landowners' WTP for feral swine control programs while identifying factors that influence their payment decisions. The results showed that landowners' WTP ranged from $1 to $10 (95% confidence interval), with 43.8% respondents who were willing to pay $1/acre/year, 16.9% for $2/acre/year, 6.6% for $5/acre/year, 4.0% for $10/acre/year, 1.5% for $20/acre/year, and 5.0% for over $20/acre/year. Potential factors that influence private landowners' WTP were also analyzed to better understand their decision-making process. Additionally, the association between WTP and FS-induced damage was examined and compared across different groups of landowners, informing landowners' outreaching and assistance programs for feral swine management.

Keywords: Feral swine, invasive species management, willingness to pay, private landowners, West Gulf Region

24. Harvesting Overstocked Biomass for Wildfire Risk Reduction and Producing Sustainable Aviation Fuel in the Southeastern United States

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Abstract
Utilizing biomass harvested from overstocked forestlands to produce Sustainable Aviation Fuel (SAF) can achieve the goal of decarbonizing the aviation sector while protecting the forestlands from wildfire hazards. This study formulated a supply chain optimization model of SAF derived from biomass harvested from overstocked private forestlands in Alabama, Florida, Georgia, and South Carolina. A mixed integer linear programming model was developed for optimizing the SAF supply chain and simulated for 10 years to identify the number and location of biomass processing units (BPU) and biorefineries. Around 10.7 million t of softwood biomass and 6.9 million t of hardwood biomass are available from 1.7 million hectares of overstocked private forestlands across the region for SAF production. The unit production cost of the SAF supply chain was $2.08 L-1, out of which the capital investment cost of the biorefinery comprised much of the total cost. The model suggested 154 BPUs and 33 biorefineries to support 25% of the demand share of SAF in the selected airports of the region. The carbon intensity of the SAF supply chain was 845.3 g CO2e L-1, providing 67% of the emission reduction potential related to conventional aviation fuel (CAF). Our analysis also revealed that subsidies from federal policies supporting SAF production in the region for 10 years would equal $13.23 billion, which is lower than the total societal benefits in terms of the value ($9.95 billion) of 440 million metric tons of merchantable timber saved from wildfire risks and the avoided social cost of carbon ($18.15 billion) stored in the merchantable timber.

Keywords
Aviation Sector, Climate Change, Sustainable Bioenergy Development, Tradeoffs, Wildfire Risk

25. New Methods for Estimating the Relationship Between Timber Harvest and Economic Outcomes in the Forest Products Industry

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Abstract
The economic impacts of the forest products industry are an important consideration in the forest policy making and forest planning process. Employment and worker wages are reasonable metrics for economic outcomes in this context. Past research has estimated direct response coefficients (DRCs) to express the relationship between timber harvest and economic outcomes in the United States. Recent changes to Timber Products Output (TPO) methods and availability allow us to re-visit DRCs using additional econometric techniques, including panel regression analysis to produce elasticity estimates. Here we present the results of the effort, compare previous and current methods, and present some basic applications for land planners and managers.

Keywords: Employment, wages, forest economics, econometrics, forest products

26. Price movements in stumpage and lumber markets: an elasticity perspective

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Abstract
Prices play a central role in the forest products market by determining the distribution of welfare between buyers and producers. This study analyzes the response of stumpage prices to changes in the lumber market using data from 2015 to 2024. The results suggest that price changes in the hardwood and softwood lumber markets are transmitted differently to the stumpage market.

Keywords: Price movement, stumpage, hardwood lumber, softwood lumber, markets.

27. Quantifying the distribution of family forest ownership classifications for US federal income tax.

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Abstract
Family Forest ownerships are classified in federal income tax law as either personal use, investment, or trade or business, and this classification determines the tax rates, deductions, credits, and filing requirements that apply. Tax classification, therefore, has implications for landowners' overall profit potential and the economic sustainability of forest management. However, the relative proportion of family forest owners in each tax classification has never been estimated before, though many studies have looked at the typologies of family forest owners based on their forest management behavior, including participation in policy tools in the past. We develop a novel framework for categorizing family forest owners within discrete tax classifications. By leveraging the data from the National Woodland Owner Survey, we estimate the distribution of owners across tax classification and account for the area of forestland covered under various tax provisions. Additionally, we construct logit models to understand demographic and ownership variables associated with the likelihood of landowners belonging to different tax classifications. The estimates based on our categorization criteria to replicate tax classifications indicate that approximately 12% of family forestlands held in parcels of four hectares or more across the country may be owned by business owners, 49% by investment owners, and 39% by personal use owners. Variations in demographic and forest ownership characteristics were noted among landowners estimated to fall under different tax classifications. The findings of the study are expected to have implications for tax policy and sustainable forest management in the country.

Keywords: Tax Classification, Federal Income Tax, Family Forest Owners

28. SOCIAL ACCEPTANCE OF CARBON-BASED FOREST MANAGEMENT IN MARGINAL LAND BY NON-INDUSTRIAL PRIVATE FOREST LANDOWNERS IN OKLAHOMA

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Abstract
In Oklahoma, most land is owned by Non-Industrial Private Forest (NIPF) landowners. Carbon-based forest management program success depends on landowner involvement and program acceptance. Limited research has focused on landowner acceptance of afforestation and reforestation programs for carbon-based forest management on marginal land. Our study focuses on understanding the factors influencing NIPF landowners' willingness to use carbon-based forest management in Oklahoma. Data was collected through mailed questionnaires using the Tailored Design Method (TDM) to enhance response rates. Structural Equation Modeling (SEM) was employed to analyze the data, utilizing both SEM Builder and command-based interfaces in Stata software. Results revealed landowners' behavior intention to participate in carbon-based forest management is influenced by complex interactions between socioeconomic and environmental factors. Behavior intention was significantly correlated with norms and perceived ability but not with attitude. Attitude demonstrated a strong positive correlation with norms but a weak and non-significant correlation with perceived ability. Norms exhibited a moderate positive correlation with perceived ability. Behavior intention showed significant positive correlations with norms and perceived ability, while its correlation with attitude was not significant. Although the direct effect of attitude on behavior intention was not significant, its indirect effect, mediated by norms and perceived ability, was both positive and statistically significant. These findings highlight the importance of adopting conservation-oriented norms and enhancing perceived ability to increase landowner engagement in carbon-based forest management initiatives.

Keywords: Carbon-based forest management, Marginal land, social acceptance, climate change mitigation, non-industrial private forest landowners.

29. Timberland as a biological bond

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Abstract

While timberland is an alternative asset class that has its own unique investment return drivers, we demonstrate that timberland is analogous to a fixed income in many ways. Like a bond, timberland can generate a stream of cash flows throughout its investment term. These cash flows are based on the biological growth and harvest of timber. Because forest growth can be projected with a reasonable degree of accuracy and is independent of outside market forces, it is shown that timberland behaves more like a bond than a stock. The same as fixed income instruments, timberland prices are inversely related to interest rates and risk. Mature forests and highly productive sites, which are comparable to high coupon rate bonds, have a lower duration than young forests and lowly productive sites, which are comparable to low coupon rate bonds, because a greater proportion of a mature or productive forest's cash flows are paid in early years. Moreover, many strategies used in the management of bond portfolios can be applied directly to timberland. What differentiates timberland from bonds is that timberland is an illiquid real asset, that timberland investors or managers can exert a direct influence on the returns, and that timberland is born with many embedded real options.

30. Understanding Forest and Farm Landowners' Willingness to Participate in Traditional and Nature Based Solution Cost Share Programs: Insights from a Landowner Survey in North Carolina

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Abstract
Financial incentive programs have long been crucial in promoting sustainable land management, including practices like soil conservation, water quality improvement, and biodiversity protection However, challenges persist in aligning these programs with landowner values and preferences, suggesting that greater understanding of landowner motivations and perspectives is critical for improving program participation and effectiveness. This study explores landowners' willingness to participate in financial incentive programs by considering the significance of landowners' intrinsic values, the differences in intrinsic values between forest and farm landowners, and how the differences in their values lead to differing experiences that influence the desire for financial compensation. We conducted a survey of 2000 landowners across four physiographic regions in North Carolina, to collect data on landowner backgrounds, program participation, satisfaction, and requested incentives. We found that while landowners held varying values all programs were significantly affected by the reasons of ownership, future management plans, and key landowner demographics. A comparison and analysis of respondent's participation in specific programs such as the Forest Development Program, Environmental Quality Incentive Program, and Conservation Reserve Program provided insight to application and enrollment percentages and highlighted the need for assessment of payment amounts and information. This study highlights key factors in landowner values, management influences, and desires that lead to program participation with insight on areas of improvement for the successful implementation of current and future programs.

Keywords: Intrinsic values, participation, financial incentive programs, reimbursement rates, current financial incentive programs

31. Landowner practices and climate conditions shape tree species diversity in Maine, USA

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Abstract

Understanding the interplay between landownership, climate conditions, and harvesting strategies is essential for promoting tree species diversity and ensuring sustainable forest ecosystems. This study examines how landownership types and climate gradients influence tree species diversity across Maine, USA, using forest inventory data. Our results suggest that southern Maine, with its milder climate, supports greater tree species diversity compared to northern Maine, where colder conditions and boreal-dominated forests result in lower diversity. Family-owned forests consistently exhibited the highest diversity, driven by less intensive management strategies. In contrast, corporate-owned forests, concentrated in northern Maine, displayed lower diversity, likely reflecting more uniform management practices. Harvesting activities showed varied impacts on biodiversity. While most ownership types and climate zones demonstrated no significant changes in tree species diversity before and after harvesting, corporate-owned lands in the northern region experienced a notable decline in diversity of ten years post-harvest. Consequently, it is essential to develop management strategies that effectively balance economic objectives while mitigating long-term biodiversity losses.

Keywords: climate, diversity, forest, harvesting, landowner, Maine

32. Optimizing forest management under conservation easements using Markov chains

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Abstract

Conservation easements have emerged as an innovative mechanism to preserve forest ecosystems while allowing for certain resource uses. However, evaluating their long-term ecological and economic outcomes involves uncertainty. In this study, we apply a discrete-time Markov chain framework to model the transition status of natural southern pine forests under multiple conservation easement scenarios. The baseline scenario is defined by timber profit maximization, while alternative easement scenarios prioritize biodiversity or carbon credits. By examining the trade-off among timber income, biodiversity and carbon value, the findings underscore how conservation easements influence forest management decisions and landowner strategies under constraints.

Keywords: Conservation easement; transition matrix; biodiversity; Markov decision

33. Attitudes Toward Benefits and Risks of Supplemental Feeding of Wildlife in Oklahoma and Landowner Willingness to Pay

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Abstract
Mycotoxins in wildlife supplemental feeds pose health risks to wildlife and humans who consume wildlife products, and at least 25% of the world's food crops are contaminated with mycotoxins according to the Food and Agricultural Organization of the United Nations. While much is known about what mycotoxins are and how they affect human and wildlife health, there has been little research on the human dimensions of mycotoxin contamination. Our study aims to contribute to this gap in knowledge by examining Oklahoma landowners' attitudes toward supplemental feeding of wildlife and mycotoxin contamination and eliciting their willingness to pay for USDA-certified supplemental feed. To address these factors, we utilized a survey instrument sent to 3,000 landowner addresses. Results suggest that a majority of landowners (~69%) are unfamiliar with mycotoxin contamination in wildlife supplemental feed. It was also determined that many landowners (80.5%) are not willing to pay $3 per pound of certified feed, although most landowners are somewhat-very concerned about health impacts from contaminated meat, economic losses, and impacts to the state wildlife agency. Generally, there was no major agreement or disagreement when considering the wildlife agency's response to mycotoxin contamination, except slight agreement that the agency will respond to contamination in a timely manner. We recommend increasing outreach and education on the risks of supplemental feeding and mycotoxins in forms easily accessible to the public to address the gap in landowner knowledge.

Keywords: wildlife, human dimensions, mycotoxins, supplemental feeding

34. Did the COVID-19 pandemic Influence Forest Landowners' Engagement in Communication Networks and Education Activities? Insights from a Regional Landowner Survey in the Southern United States?

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Abstract
The COVID-19 pandemic has potentially influenced forest landowners' engagement in communication networks and educational activities in the Southern United States, where family forest owners (FFOs) account for approximately 60% of private forestland. However, analysis of these impacts is inadequate. We employed the Multiple Indicator-Multiple Causation model (MIMIC model) to examine the influence of the COVID-19 pandemic on forest landowner characteristics associated with the likelihood of engagement in communication networks and educational activities in the Southern United States. We collected data by conducting a mail survey of landowners in 13 Southern States. The results show that approximately 51% of respondents are likely to engage in communication networks and educational activities for management assistance, education, and involvement with associations and cooperatives over the next decade. Landowners with larger forest holdings, who acquired properties through purchases, had ownership motivations like enjoying scenery or timber, and are likely to enroll in green certification, cost-share programs, and preferential tax incentives over the next 10 years were positive significant predictors of engagement. Landowners who faced COVID-19 disruption but returned to normal and used more education networks during the pandemic compared to the pre-pandemic period were significantly associated with higher engagement. Contrary to some previous studies, age was not a significant determinant of engagement in our model, and the ethnicity of White and European landowners had a strong negative correlation. Our findings provide insights into how the pandemic shaped landowners' preferences and participation in these activities, as well as how these trends compare with pre-pandemic engagement patterns.

Key Words: Forest landowners, COVID-19 impact, MIMIC model, Covariates

35. The Impact of Plantation Investment and Production on Regional Carbon Stocks

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Abstract
Efforts to limit global warming to 1.5oC by the end of this century involve highlighting the importance of carbon sequestration by forests and forest products. Forests are vital to the health of our planet, playing a crucial role in maintaining biodiversity, regulating climate, providing ecosystem services, and forest resources for human use. Planted forests (PF), in particular, have gained increasing attention as a way to meet the growing demand for wood products while reducing pressure on natural forests, and sequestering carbon to support climate goals. The expansion of PF areas and the production of industrial roundwood can potentially mitigate harvest pressure on carbon-dense naturally regenerated systems and increase total carbon and the value of forestland in productive regions when properly implemented. However, plantation establishment can reduce endemic biodiversity richness and negatively impact grassland ecosystem functioning when poorly implemented. Currently, the net impact of past investments in PF and industrial roundwood supply on regional forest carbon stocks remains unclear. In this study, we reviewed PF area, industrial roundwood, and carbon stock trends. We employed quadrant analysis to understand how the relationships between regional shifts in PF area and industrial roundwood production are related to carbon stored on the landscape from 1990-2020 and compare different regions based on their carbon and forest changes. Our results show that some of these shifts capture more carbon on the landscape, while others do not. Also, our results include a geographical breakdown of these trends and how regional policies may influence these outcomes.

Keywords: Planted Forest Area, Industrial Roundwood Production, Carbon Stock, Forest Investment, Global and Regional Trends

36. Key drivers of pine harvesting at the county level in Arkansas

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Abstract
Since Arkansas ranks as 2nd most forestry-dependent state, timber harvesting is a cornerstone of its economy and rural community well-being. However, the extent to which the timber is harvested is yet to be explored. The study examines key drivers of timber harvest in Arkansas, as reported via severance tax data. In this study, we used panel data covering 75 counties and four two-year intervals from 2017-2023. We found that the quantity of timber harvested in Arkansas has been declining since 2020. The findings revealed that the presence of active wood-utilizing mills and saw timber prices had a positive significant effect on pine timber harvest at the county level, whereas COVID had a negative significant effect. These findings imply that market dynamics are an essential driver for timber production and collection of severance tax. Enhancing competitiveness of primary forest product industry and exploring alternative markets for wood products can help increase timber production and contribute to rural economy.
Keywords: timber harvesting, sawmill, timber price, panel data model

37. Sub-Regional Analysis of North American Forest Product Mill Employment

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Abstract

North American forest product mill capacity, which measures the order of magnitude for production, has generally trended up over the past decade. However, on the margin, capacity has shifted between regions within the United States and between the United States and Canada. These shifts lead to changes in the level of employment, which may impact regional economies. We analyze these capacity changes in the US and Canada over years 2009 to 2023, and we develop models to evaluate the impacts of capacity changes and economic trends on sawmill employment.

Keywords: North America, forest products, employment, mill capacity, timber demand

38. Planning for the Future: What Drives Forest Legacy Decisions in the Southern United States

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Abstract

Since nearly 90% of the forestland in the Southern United States is under private ownership, land transfer decisions of private forest owners significantly impact the long-term sustainability of forests in the region. These decisions are shaped by various social, economic, and personal factors, including landowners' deep attachment to their forestland. Key decisions, such as selling or transferring forestland to heirs, are also impacted by external disruptions like the COVID-19 pandemic. This study examines the impacts of the pandemic on the likelihood of selling or gifting forestland within the next decade, focused on private landowners in the Southern United States. Drawing from a regional survey of forest landowners, we analyzed the systematic relationships between land transfer intentions and their objectives, motivations, and the pandemic's impacts while assessing the influence of landowner characteristics, motivations, legacy planning behaviors, and socio-demographic factors. Our findings reveal that only 14% of the respondents reported interest in selling or disposing of their forestland in the next 10 years, 25% reported concerns related to buying forestland, and 11% reported concerns about selling their forestland, both at reasonable rates in the next ten years. This study contributes to the literature on forestland transfer, providing actionable insights for organizations and agencies to develop targeted policies and outreach initiatives that support private landowners in navigating challenges and opportunities in land transfer decisions.

Keywords: Private Forest Landowners, Land Transfer, COVID-19 Impacts, Long-term Forest Planning

39. Evaluating the impact of the SocioBosque program on deforestation: Evidence from the Ecuadorian Amazon

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Abstract
Deforestation in tropical regions generates significant negative externalities at both local and global scales. Payments for Ecosystem Services (PES) programs, such as Ecuador's SocioBosque, aim to mitigate deforestation by providing financial incentives to landowners. However, the voluntary, non-random nature of enrollment complicates impact evaluation. This study uses long-term remotely sensed forest data and Difference-in-Differences (DID) estimators to rigorously assess the impact of the SocioBosque program in Ecuador's Amazon provinces, extending the timeframe and testing control similarity assumptions crucial for causal inference. Our results show that collective PES contracts significantly reduce deforestation in general, while individual contracts have no significant effect. The effectiveness of the program varies by geographic location, with upstream regions showing greater reductions in deforestation than downstream areas. Institutional capacity is identified as a critical mechanism, as areas with stronger governance and community organization experience greater reductions in deforestation. Higher levels of program participation are associated with stronger community engagement and enforcement, enhancing the overall effectiveness of the program in mitigating deforestation. We also find spillover effects, with deforestation pressures shifting from program areas to non-program areas. Our research provides actionable insights for improving PES design and implementation in global developing countries.
Keywords: Payments for Ecosystem Services (PES), SocioBosque program, deforestation, institutional capacity, spillover effects

40. The economic impacts of coastal flooding on mills and their timber procurement zones

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Abstract
The coastal forestry sector in the southern U.S. is frequently exposed to extreme weather events such as hurricanes and high-tide flooding. These events disrupt the forestry infrastructure, lower the timber recovery rates for harvest purposes, and decrease timber availability for processing. These events can also decrease the economic resilience of coastal communities whose economic development relies heavily on the forestry sector. Despite the frequent negative impacts, there is a limited understanding of how coastal flooding affects wood-processing mills and their supply chains. This study used the geographic information systems (GIS) workflows to quantify the effects of coastal flooding on timber availability within 25-, 50-, and 75-mile procurement zones in Alabama, Florida, Georgia, Louisiana, Mississippi, and Texas. The analysis incorporated various flooding scenarios, trucking routes, bridge locations, untraversable road segments, and forest areas inaccessible due to flooding. In the most conservative scenario, the timber volume loss, based on a timber availability reduction within the 25-mile procurement, ranged from 570,000 tons to 800,000 tons annually, which corresponded to $11 million and $17 million, respectively. The study developed actionable tools, such as interactive online story maps and dashboards, to help decision-makers develop strategies for increasing the resilience of the coastal forest sector by optimizing timber transport routes to minimize costs and disruptions, as well as identifying resilient sites for new mill locations. The developed geospatial workflows can be adapted for other sectors and coastal infrastructure operations, offering coastal communities critical tools to enhance their economic resilience.

Keywords: coastal flooding, economic resilience, GIS, mills, timber procurement

41. Migrant Labor in the US forest sector: Examining Vulnerabilities in the H-2B Guest Worker Program

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Abstract
Transnational labor migration has been a key factor in meeting labor demands in developed countries, with migrant workers from the Global South playing a crucial role in various industries. However, concerns are frequently raised about labor exploitation and the precarious nature of migrant employment. The United States is a leading global timber producer, with vast areas dedicated to forestry and significant economic activity supporting local employment. However, the industry heavily relies on migrant workers to fill forestry jobs that are often challenging to staff with local labor. These workers enter the U.S. through the H-2B visa program, which grants temporary, non-agricultural guest workers permission to perform "unskilled" labor. Their responsibilities include planting, nursery work, pine straw collection, fire suppression, herbicide application, thinning, and brush clearing. Migrant workers in this sector encounter numerous challenges, including harsh working conditions, inadequate housing, job insecurity, wage theft, visa-related difficulties, and social isolation. Drawing on global literature on migrant labor, we analyze how the structure of the H-2B guest worker program contributes to these vulnerabilities. Specifically, we identify four key factors: the power imbalance between employers and workers, financial dependence, social isolation, and the temporary nature of employment. Within these themes, we examine how visa restrictions that bind workers to a single employer, weak enforcement of labor protections, dependance on employers, limited social life, job insecurity, language barriers, and remote accommodations heighten worker vulnerability. Recognizing these structural issues can help policymakers develop a more comprehensive approach to addressing the challenges faced by migrant workers.

42. Strengthening the Link Between Forest Economics, ESG Frameworks and Sustainability Reporting

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Abstract
One of the main subfields of Forest Economics is Forest Business Economics, which plays a crucial role in adapting general microeconomic theory to the forest industry and related businesses. This subdiscipline contributes not only to academic research but also to practical applications in the forest sector. As a socioeconomic discipline, Forest Business Economics has helped develop and apply key socioeconomic indicators relevant to forest management and forest business operations. For over two decades, sustainability reporting, originally rooted in accounting, has gained prominence as a tool for assessing businesses' non-financial performance in environmental, social, and governance (ESG) areas. Several frameworks, both voluntary (e.g., Global Reporting Initiative) and mandatory (e.g., the European Corporate Sustainability Reporting Directive and the recently suspended U.S. SEC Climate Disclosure Rules), provide ESG indicators to help industries measure their impacts and assess environmental, social and climate risks. Forest economists are equipped to analyze and utilize ESG data, yet research on the nexus between forest economics, ESG frameworks, and sustainability reporting remains limited. This study reviews existing literature identifies challenges and barriers to integrating these disciplines, and proposes future research directions to strengthen their connection.

Keywords: forest business economics; sustainability accounting; forest industry; CSRD; GRI.

43. Cost-benefit of voluntary carbon projects: Demonstrating an online tool for landowner decision support

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Abstract

I will present the tool we are developing to assist landowners in estimating and managing forests for carbon sequestration and participating in forest carbon markets. The link to the webinar on the same topic is as follows:
https://www.canr.msu.edu/socioeconomics/Workshops/Building-forest-carbon-and-market-decision-support/webinars
The link to the beta version of the tool is as follows;
https://msuresecon.com/fct

44. The Sub-Regional Timber Supply Model (SRTS); A new platform, new carbon calculations, and a prospective on the forest sector in the southeastern United States

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Abstract
The Sub-Regional Timber Supply Model (SRTS) is a widely used timber supply model that has undergone two key changes for 2025. The first is a re-platforming of the model from a stand-alone Visual Basic application into a Microsoft Excel Add-in. As a result, the code has been opened up to more developers via Excel's built-in VBA editor and new functionality in the form of workflow wizards have been added to aid in the setup and execution of model runs. We are leveraging the Solver Add-in, which allows developers to interact with the goal program framework and offers limited exploration of how changes to model parameters influence results. The second is a brand new, streamlined carbon conversion logic leveraging the carbon results from the recently release National-Scale Volume and Biomass modeling system. We present a statistical approach for estimating carbon coefficients that convert the acreage and volume on the landscape into estimates of five carbon pools (All Live, Standing Dead, Understory Aboveground, and Coarse/Fine Wood Debris). We discuss this approach, which uses USFS's FIA plot- and county-level data and k-means clustering and show the sensitivity of coefficients to clustering assumptions. Finally, we present market, forest inventory, and carbon projections for the U.S. south using SRTS 2025 under baseline, low, and high forest product demand growth pathways in line with the socioeconomic and climate scenarios presented in the 2020 RPA Assessment.;

Keywords: Forestry, modeling, market, SRTS, projections

45. Assessing Hurricane Impacts on Timber Supply Costs: A Case Study of Pine Sawmills in Mississippi

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Abstract
The location of primary forest product manufacturers depends on the availability of raw materials, proximity to transportation networks, the presence of secondary forest product manufacturers, and market accessibility. However, natural disturbances—particularly wildfires, pests and diseases, and extreme climate events—can have a substantial impact on the primary forest product industry by generating shocks in the supply chain, causing many firms to struggle for long-term survival. Using the Forest Inventory and Analysis (FIA) program and other publicly available market data, this study analyzes how an extreme climate event, such as a hurricane, can affect the timber procurement zone and timber supply costs for pine sawmills in Mississippi. A mixed-integer programming model was employed to quantify how hurricane damage altered the transportation distance for timber procurement and, consequently, the overall supply costs of raw materials over the planning horizon. Initial findings indicate that while salvage operations benefitted certain sawmills in the short run, hurricane damage led to increased timber supply costs in the long run due to the expanded procurement zone for raw materials. These findings will help primary forest product manufacturers develop cost-minimization strategies, such as relocating to another business cluster or diversifying their outputs.

Keywords: facility location, mixed integer programming, natural disturbance, timber procurement zone

46. Planning Over Programs': Challenges and Opportunities Affecting the Participation of Underserved Producers in the Conservation Reserve Program Across the Southeastern United States

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Abstract

Black and female agricultural producers have historically been underrepresented in federal conservation programs, including the Conservation Reserve Program (CRP), where only 3.5% of participants in 2022 were from underserved populations. This study examined factors influencing the participation of underserved landowners in the CRP across six southeastern U.S. states using mixed methods and demographic analyses. Lack of knowledge emerged as the most significant barrier, followed by limited resources, lack of trust in government, and complex program requirements. Additional challenges included family priorities and non-conservation motivations. The study identified solutions to enhance participation, including improving awareness, fostering communication, increasing community involvement, and simplifying program requirements. Notably, Black producers were found to be more likely to participate in the CRP than White producers, and farm- and pastureland operators without land ownership also showed higher likelihoods of enrollment. However, female producers were less familiar with the program compared to males, highlighting a critical knowledge gap. The findings emphasize the need to address historical inequities by overcoming knowledge and resource barriers, building trust, simplifying access, and empowering underserved communities through targeted outreach and

community engagement. Proactive, needs-based planning that aligns with community preferences can increase participation and ensure the CRP meets both conservation and social equity goals. Expanding the inclusion of Black and female landowners in the CRP supports environmental justice and enhances efforts to conserve environmentally sensitive lands.

Keywords: Conservation, Equity, Stakeholder Groups, Sustainable Development, Underserved Landowners, Working Solutions

47. Impact of Timber Price Trends and Volatility on Loblolly Pine Plantation Optimal Rotation Age in the US South

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Abstract
Timber price trends, volatility, and their impacts on optimal harvesting decisions were determined for loblolly pine plantations in the southern United States (US). Maximum land expectation values (LEVs) were calculated using discounted cash flow (DCF) analysis across a range of real, before-tax discount rates, site indexes, and planting densities. Annual percentage rates of change (APRs) of real quarterly pine stumpage prices in $/tonne over 25 to 40 years were determined for pine sawtimber (PST), chip-n-saw (CNS), and pulpwood (PPW) obtained from the Timber Mart-South. Volatility was described by the trend models' mean square errors. Price trends and volatilities were incorporated into the DCF analyses to determine the implications of long-term pine stumpage market stochasticity on maximum LEV and optimal rotation. The negative price trends over the past 25 to 40 years reduced optimal rotation ages and maximum LEVs compared with the base case of assuming constant timber prices. Investing in pine timberland with low site quality was not advised across planting densities if a 6% minimum rate of return was required. A key finding was discovering the same was true at 5% when timber prices were considered stochastic; constant timber prices did not reveal this outcome. Overall, these findings show how the market through timber price operates to affect not only timber supply in the short run but also timberland valuation in the long run.

48. Sustainable Use and Value of U.S. Forests: Findings from the Montreal Process Criteria Indicators

Michelle J. Thompson*, Sonia R. Bruck, Stephanie J. Chizmar, Gregory E. Frey, Jesse D. Henderson, Wayne Zipperer

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Abstract
The Montreal Process Criteria and Indicators was developed to provide a common framework for countries to report on their national forests. We completed data and geospatial analysis for four of the Montreal Process Criteria Indicators under Criterion 6: Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits to Meet the Needs of Societies to better understand the socioeconomic value of forests. The U.S.'s reporting on these indicators has not been entirely reproducible, making it difficult to determine changes between reporting years. We developed methods using publicly available data sources, allowing future researchers to quantify trends over time. We explored four different indicators valuing: 1. trade of non-wood products, 2. subsistence-use, 3. cultural and spiritual values, and 4. importance of forests to people (6.31, 6.39, 6.43, and 6.4). First, we found that imports and exports of non-wood forest products increased from 2002 to 2021. Second, we describe how legislation including the Tribal Co-management of Federal Lands has changed the amount of land that could be used for subsistence purposes. Third, as of March 2023, 43.5% of all forested land in the U.S. is defined as protected, and can be used for social, cultural, and spiritual purposes. And fourth, using the National Visitor Use Monitoring Survey (NVUM), we found that between 2013 and 2019 there was an increase in the amount spent per mile traveled to visit National Forests in Alaska and the southern regions, but a decrease in the amount spent to visit the Pacific Coast and Rocky Mountain regions.

Keywords: Montreal Process, sustainability, socioeconomic, society

49. Understanding Climate-Smart Forestry: Insights from Forestry Professionals in the Southern Region

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Ensuring that American forest ecosystems continue providing vital ecosystem services - wood, fiber, wildlife habitat, biodiversity, clean air, and water - requires current operations to be more resilient to climate change and other disturbances such as drought, invasive species, and wildfires. In the southern region, forests occupy about 40% of the land while producing over 57% of the total U.S. timber volume and over 18% of the world's pulpwood, but these productive forests are under threat from the increasing frequency and intensity of climate change stressors in the region. Forests contribute toward climate change mitigation through carbon sequestration, but it would require implementing new climate-resilient forestry operations to sustain forest benefits into the future growing environments. Implementing climate-smart and resilient forestry (CSF) practices have become essential to changing weather patterns, temperature regimes, and weather disturbances to ensure food and fiber security. In partnership with SE Climate Hub, this project team of forestry research & Extension specialists from 1862 & 1890 land-grant institutions aims to develop and deliver science-based climate-smart forestry Extension education to landowners, professionals and natural resource managers, and Extension agents across the Southern United States.

Keywords: Ecosystem, Disturbance, Resilience, Adaptation

50. Evaluating the Economic Impacts of Forest Damages from Hurricane Michael: An Application of a Computable General Equilibrium Model

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Abstract
The forest industry is a vital component of local economies and the regional economy in the U.S. South. Tree damage and mortality from natural disasters such as pest outbreaks, fire, and hurricanes can negatively affect the regional timber supply, economic returns to landowners, and forest ecosystem services. Following hurricanes and other damaging events, salvage harvesting may allow landowners to recoup potential economic losses in the short run. As climate change is expected to create conditions favorable for more frequent and intense hurricanes, there is a need to assess the economic impacts of salvage harvesting on the timber industry as well as other linked industries. Using a computable general equilibrium (CGE) model to assess economy-wide tradeoffs of supply and demand, we estimated the impacts of various salvage harvest counterfactuals using data on salvage harvesting following Hurricane Michael. Hurricane Michael devastated parts of the U.S. South in 2018, including forestlands in Florida and Georgia. We assessed economy-wide impacts of implemented increased timber supply from salvage harvests. Results highlight impacts on both micro- and macro-economic indicators including commodity prices and quantities, trade, gross domestic product, household income, and welfare.

Key words: Natural disturbance, timber supply, CGE model, economy-wide impacts

51. Additionality of Conservation Cost-Sharing in Private Investment for Invasive Species Management

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Abstract
With growing environmental concerns over biological invasion, federal spending on invasive plant management has increased in recent years, prompting many non-industrial private forest (NIPF) landowners to participate in voluntary conservation programs for financial assistance to defray some of their management costs. However, the extent to which these cost-sharing programs stimulate additional private investment in invasive plant management remains unclear. This study examines additionality in private investment using survey data from over four hundred NIPF landowners in the U.S. Central hardwood region. We employ a two-stage control function approach to address self-selection bias resulting from program enrollment. Additionality is estimated by constructing counterfactual private investment levels for both participating and nonparticipating landowners, using the estimated parameters of the second-stage model. Our findings reveal positive additionality, suggesting that enrolling in cost-share programs encourages higher private investment among participating landowners in invasive plant management. Moreover, non-participating landowners would likely increase their investment if they enrolled. These findings support the role of financial incentives in enhancing conservation efforts and sustainability.

Key words: Additionality, Cost-share program, Invasive plant management, Private Investment

52. Exploring socio-economic characteristics of Native American tribes: The impact on fire management programs and un-intended fire ignitions

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Abstract
Accidental and arson fire ignitions are the leading causes of wildfires reported on Tribal lands of the United States, accounting for more than 80% of total annual wildfires on average. Wildfires of this nature can be more destructive than naturally ignited ones, because they tend to occur in more densely populated areas, spread quickly, and burn more acres, resulting in human casualties, poor water and air quality, and potential degradation of several ecosystem services. In this study, we utilize several data sources, including detailed monthly reports on specific fire management program efforts, reported wildfire ignition counts and their attributed causes, and Census Bureau data for 20 Tribal land units to explore how socio-economic characteristics of the Tribal units may correlate with different fire ignition causes and prevention efforts. Reflecting on previous studies on the topic, we explore, for example, if weak labor markets and higher poverty are positively correlated with ignition counts across the range of fire causal categories.

Key Words: Wildfire Prevention; Arson Wildfires; Tribal Lands; Law Enforcement; Small Sample Methods

53. Impacts of hurricanes, wildfires, and socioeconomic factors on the presence of invasive plants in Mississippi

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Abstract
Mississippi's coastal forests are frequently exposed to extreme weather events, such as hurricanes, coastal flooding, and wildfires, that can exacerbate the spread of invasive plants. Despite extensive ecological and economic losses, it is not clear what socioeconomic factors facilitate the invasive plant spread in coastal forests and what management prescriptions would be most effective in mitigating the spread. This study quantified the relationship between invasive plants in Mississippi's coastal forests and hurricanes, wildfires, prescribed burns, and socioeconomic factors. The analysis utilized a geospatial hot spot analysis and multivariate regression modeling to identify hot spots of invasive plants. Invasive plants were more likely to be present in areas in proximity to a county road, highway, railway, and coastline areas exposed to hurricane impacts. They were less likely to occur in areas that had a greater forest percentage cover, older-aged forests, in proximity to a most recent wildfire, and further away from a city. Results will help identify the measures needed to control the presence of invasive plants, prioritize landscape-level mitigation strategies, lower mitigation expenditures, and maintain healthy forest ecosystems.

Keywords: coastal forests, extreme weather, geospatial analysis, invasive plants, regression modeling

54. Prioritizing restoration efforts: identifying high-risk areas for enhanced fire resilience in Malheur and Wallowa-Whitman National Forests

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Abstract
Forests are responsible for providing ecosystem services and supporting livelihoods. Since the implementation of the Northwest Forest Plan (NWFP) in 1994, the priority of forest management has shifted from timber production to focusing more on conserving old-growth forests to protect Northern Spotted Owls in Oregon and Washington. An increase in the frequency and intensity of wildfires, intensified by climate change, poses a significant threat to forests in these regions. This study aims to identify high-risk areas within the Malheur and Wallowa-Whitman National Forests requiring immediate restoration to enhance fire resilience. Utilizing Forest Inventory and Analysis (FIA) data, Sentinel-2 imagery, and historical fire records, existing fuel conditions will be quantified first, desired future conditions (DFC) for fire-resilient forests will be defined second, and finally areas needing immediate intervention will be assessed. Additionally, the study will calculate the volume of wood to be harvested as a part of a restoration and using the existing road networks and working sawmills in the region, we will optimize transportation costs associated with the harvesting process.
By prioritizing restoration efforts, we aim to reduce wildfire risks and promote healthier forest ecosystems, offer a strategic framework for sustainable forest management and in the long run enhance fire resilience in the face of climate change-induced challenges.

Keywords: Fire resilience, Restoration prioritization, Wildfire management, Sustainable Forest Management, Climate adaptation

55. A Look at Family Forest Owners' Perception of Barriers to Invasive Species Control

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ABSTRACT

Invasive species are a major concern because they cause ecological and economic damage by changing the ecosystem structure and composition. They also hinder the recruitment and establishment of native trees and plants in the understory. It is estimated that the worldwide damage from invasive species in general is over $1.4 trillion and costs the U.S. over $138 billion each year. In the U.S. there are around 25,000 non-native plants, which cause over $34 billion worth of damage each year. In southeast Ohio, the Ohio Interagency Forestry Team was formed to include representatives from United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS), USDA Forest Service (FS), Ohio Department of Natural Resources (ODNR) Division of Forestry, ODNR Division of Wildlife, The Ohio State University, and Central State University for the purpose of ensuring healthy succession of forests in the area. Since the presence of invasive plants hinders the establishment of native trees such as oaks, the control of these species is critical to future sustainability of oaks in the region. This paper will present the results of a survey of family forest owners in Ohio. The forest owners often point to several barriers to invasive species control including, financial reasons, lack of knowledge, and lack of time. We explore these perceived barriers and examine differences between forest owners who face them.

POSTER PRESENTATION

56. Prospects of Mass Timber Manufacturing in Michigan

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Abstract
With its abundant forest resources, adoption of mass timber building codes, and recognition of mass timber in the state's climate plan, Michigan has opportunity to establish itself as a hotspot for a regional mass timber producer in the region. This study investigates both the demand and supply dynamics of mass timber manufacturing in Michigan. We examined perceived knowledge and the support as demand-related factors through standardized surveys with different stakeholders in the mass timber industry across the Great Lakes states. Our findings revealed significant differences in perception and support to mass timber based on of demographics such as education, average annual income, and employment status among Michigan residents'. We also found significant differences among professionals' perceived knowledge and their confidence influencing the wide adoption of mass timber. For the supply side components, we identified potential locations, estimated feedstock availability, and assessed optimal supply pathways from 2023 to 2025 for mass timber manufacturing in Michigan across two feedstock supply models using the Land Use and Resource Allocation (LURA) model. We identified two potential locations for mass timber facility in Michigan and estimated the total hauling costs for mass timber production across two supply models for each potential location. This study offers insights on the perceived knowledge gap among stakeholders and cost-efficiency trade-offs between locations and business models to manufacturers and decision-makers make informed decisions for mass timber production in Michigan.

Keywords: mass timber, Great Lakes, demand, supply, procurement

57. Exploring Landowner Acceptability of Carbon-Based Forest Management in Marginal Lands

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Abstract
Global warming is responsible for numerous current and expected future natural resource issues. Of these issues, climate change is a prominent, notable problem that will require modernized improved management strategies to mitigate its impact. Since forests are responsible for occupying the largest carbon pool on the planet, addressing the management of these resources becomes a high priority due to the function that forests play in the reduction of carbon emissions. A survey was administered to help understand landowners' opinions on carbon-based forest management in marginal lands in Oklahoma. The data indicated that only around 24% of people were interested in getting involved in a carbon-based forest management program. Notably, when individuals were questioned about various concerns related to getting involved in carbon-based forestry on marginal lands, nearly 51% of respondents indicated that they were very concerned about losing their independence to manage their property as they see fit. Nearly 72% of landowners were somewhat or very concerned about possible changes in the carbon market policies. Results further suggest that younger and female respondents were slightly more concerned about policy changes. These findings suggest that implementing outreach and educational opportunities for landowners related to carbon-based forest management and surrounding programs would be beneficial. Understanding landowner opinions and concerns related to carbon management programs will help in the development of future carbon projects on marginal lands.

Keyword: Concerns, Likert Scale

58. Suitability Analysis for the Potential Locations for Wood Processing Mills in West Gulf Coastal Plain

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Abstract
The West Gulf Coastal Plain (WGCP), Arkansas, Louisiana, Oklahoma, and Texas, is a forest-rich region with a significant role in the forest products industry. Wood Processing Mills (WPMs) are key contributors to the regional economy, converting roundwood into pulp, veneer, and lumber products. However, over the past two decades, the WGCP has experienced widespread mill closures due to shifts in market dynamics, consumer demand, and resource accessibility. Simultaneously, the region's abundant forest resources remain underutilized, highlighting the need for sustainable strategies to maximize their economic and ecological potential. This study aims to address the critical need to identify potential locations for WPMs in the WGCP to promote economic growth and sustainable resource use. The study will integrate suitability analysis with location-allocation modeling. Suitability analysis will be performed in ArcGIS Pro, and factors such as land use, growing stock availability, road networks, and current mill capacity will be evaluated. Road network analysis using location-allocation modeling will further identify facility locations that optimize raw material utilization. The study's expected outcome will provide a robust framework for strategic mill placement, improving the supply chain efficiency and balancing economic efficiency with sustainability.
Keywords: Locations, mills, suitability, West Gulf Coastal Plain, sustainability, etc.

59. From Passion to Profession: Understanding the Career Values that Drive Individuals into Forest and Natural Resource Sectors.

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Abstract
While contributing significantly to the economy, ecosystem services, and sustainable resource management, the U.S. Forest industry faces notable workforce challenges. This study, part of a larger research project about the Forest and Natural Resources (FNR) workforce analysis, aims to better understand the career values and preferences among FNR employees and students through a comprehensive survey. The study applied the career values framework to understand career values prioritized by students and current employees. The framework includes 36 items, including 8 values like social, management, specialization, mobility, independence, salary, work-life balance, and diversity. The survey analysis revealed that students and employees prioritized work-life balance, social impact, specialization, and economic stability, with mean scores above 4.0. However, significant differences in career values were observed between the FNR students and employees across several dimensions. Students showed stronger preferences for having freedom to choose their career path ($p < .05$). In contrast, employees prioritize day work independence ($p < .05$), autonomy ($p < .05$), and salary comparability ($p < .05$). Regarding mobility-related values, students showed stronger preferences for travel opportunities ($p < .001$). In contrast, employees value decision-making independently ($p < .05$). Diversity value ranks lowest in overall importance showing strong preferences among students for workplace diversity (gender $p < .001$, racial/ethnic $p < .001$).

Keywords: FNR workforce; Career values and preferences; Students; Employees; Work-life balance.

60. Understanding the public perception of Multi Story Wood Buildings: A scoping review

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Abstract
The building sector contributes significantly to global greenhouse gases, accounting for 39% of worldwide emissions. Multi-story wood buildings (MSWBs) present a sustainable alternative to traditional emissions-intensive construction materials like concrete and steel. Few studies, though, have investigated how potential customers think about MSWBs and how effective targeted communication is at changing these thoughts for the better. This study employs a concept-driven scoping review to examine consumer perceptions and concerns regarding living in a MSWB. In total, we analyzed 20 peer-reviewed articles using inclusion and exclusion criteria such as search terms and research relevance. Through qualitative content analysis, we identified emerging themes in consumer perceptions: environmental sustainability, fire safety, and human well-being. The review also highlights that perceptions vary across different demographic groups (e.g., age, education level, income, etc.), with environmental and well-being benefits resonating more with individuals familiar with MSWBs. This literature review provided guidance for the study on identifying the optimal messaging strategies to effectively communicate the benefits of MSWBs to potential residents.
Keywords: Mass timber buildings, mass timber construction, sustainable construction, public perception, message testing, scoping review

61. Prioritizing restoration efforts: identifying high-risk areas for enhanced fire resilience in Malheur and Wallowa-Whitman National Forests

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Abstract
Forests are responsible for providing ecosystem services and supporting livelihoods. Since the implementation of the Northwest Forest Plan (NWFP) in 1994, the priority of forest management has shifted from timber production to focusing more on conserving old-growth forests to protect Northern Spotted Owls in Oregon and Washington. An increase in the frequency and intensity of wildfires, intensified by climate change, poses a significant threat to forests in these regions. This study aims to identify high-risk areas within the Malheur and Wallowa-Whitman National Forests requiring immediate restoration to enhance fire resilience. Utilizing Forest Inventory and Analysis (FIA) data, Sentinel-2 imagery, and historical fire records, existing fuel conditions will be quantified first, desired future conditions (DFC) for fire-resilient forests will be defined second, and finally areas needing immediate intervention will be assessed. Additionally, the study will calculate the volume of wood to be harvested as a part of a restoration and using the existing road networks and working sawmills in the region, we will optimize transportation costs associated with the harvesting process.
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Keywords: Fire resilience, Restoration prioritization, Wildfire management, Sustainable Forest Management, Climate adaptation

62. Sustainable Use and Value of U.S. Forests: Findings from the Montreal Process Criteria Indicators

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Abstract
The Montreal Process Criteria and Indicators was developed to provide a common framework for countries to report on their national forests. We completed data and geospatial analysis for four of the Montreal Process Criteria Indicators under Criterion 6: Maintenance and Enhancement of Long-Term Multiple Socioeconomic Benefits to Meet the Needs of Societies to better understand the socioeconomic value of forests. The U.S.'s reporting on these indicators has not been entirely reproducible, making it difficult to determine changes between reporting years. We developed methods using publicly available data sources, allowing future researchers to quantify trends over time. We explored four different indicators valuing: 1. trade of non-wood products, 2. subsistence-use, 3. cultural and spiritual values, and 4. importance of forests to people (6.31, 6.39, 6.43, and 6.4). First, we found that imports and exports of non-wood forest products increased from 2002 to 2021. Second, we describe how legislation including the Tribal Co-management of Federal Lands has changed the amount of land that could be used for subsistence purposes. Third, as of March 2023, 43.5% of all forested land in the U.S. is defined as protected, and can be used for social, cultural, and spiritual purposes. And fourth, using the National Visitor Use Monitoring Survey (NVUM), we found that between 2013 and 2019 there was an increase in the amount spent per mile traveled to visit National Forests in Alaska and the southern regions, but a decrease in the amount spent to visit the Pacific Coast and Rocky Mountain regions.

Keywords: Montreal Process, sustainability, socioeconomic, society

63. Forest Product Companies' Willingness to Invest (WTI) in Ecosystem Services Projects

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Abstract

With increasing environmental concerns, forest management has become more conservation-oriented, and markets have been developed to facilitate the trade of non-physical forest products such as carbon credits and ecosystem services. The forestry sector in the eastern United States is characterized by millions of privately owned family ownerships, and a competitive market with numerous forest product companies. The shifting forest paradigm poses criticism to forest product companies for not taking action to protect ecosystem services. At the same time, forest product companies are at risk of business disruption due to the reduced supply of ecosystem services, mainly wood, water and energy. In this study, we investigated the perceptions and understanding of forest product companies on ecosystem services. We used an opinion survey to document their perceptions of ecosystem services. Based on a social theory (the theory of planned behavior), we gained an understanding into whether forest product companies are willing to invest in ecosystem services projects and what factors influence their decisions to invest. Additionally, a choice model revealed their preferences towards investing in different types of ecosystem services and the magnitude of their WTI. The findings from the study will help policymakers to design ecosystem services projects, and forest businesses to strategically invest in ecosystem services while ensuring economic returns.

Keywords: ecosystem services, forest company, forest product industry, Willingness to invest, choice model

64. Landowner Willingness for Carbon Payment Participation in Pennsylvania and Virginia

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Abstract
Investors are seeking ways to leverage private forests to mitigate climate change impacts, potentially creating new revenue opportunities for landowners through payments for managing forest health and carbon. While many landowners are open to managing their forests for multiple purposes, understanding their willingness to enroll in carbon payment programs is limited. To address this gap, we conducted a statewide survey in Pennsylvania (PA) and Virginia (VA) to examine landowners' willingness to accept carbon payment programs. Results from a random effect ordered Probit analysis show that a majority of landowners are interested in participating. Landowners are more likely to support carbon programs that enhance forest health, offer shorter contract lengths, provide high payment levels, and utilize annual payment mechanisms. Additionally, they are willing to enroll more than 75% of their forestland in these programs. These findings will help inform the design of policies and programs that incentivize landowners to engage in climate-smart forestry.

65. Forest Landowner Carbon Market Participation and the Role of Property Taxation

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Abstract
Taxation significantly influences family forest landowner decisions in the United States, particularly in the South, where property taxes directly affect forest management practices and timberland values. Preferential tax programs, introduced in the 1960s, aim to reduce these tax burdens, while more recently, carbon incentive programs have emerged to compensate landowners for carbon sequestration. While different rationales undergird the programs, both have the potential to increase value and promote carbon capture. However, enrollment rates in these programs remain low, often due to limited awareness and complex program requirements. As family forest landowners are the largest category of forest ownership in the United States, it is essential to identify possible relationships between the tax concerns of family forest landowners and their low participation in these programs. We utilize National Woodland Owner Survey data to explore if tax concerns or levels can help explain landowner participation in carbon programs. Our findings will help identify the relationship between landowner tax concerns/burdens and participation in carbon programs, which are crucial relationships for policymakers and landowners interested in encouraging carbon offsetting behavior.
Keywords: Preferential Tax Programs, Carbon Incentive Programs

66. Investigating the Relationship between Nonindustrial Private Forest (NIPF) Landowners and Logging Businesses in the US South

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Abstract
The US South is the wood basket of the world, contributing about 60% of all the wood harvested by independent loggers from over 99 million acres of forestland, owned by about 56% of family forest landowners. Logging businesses in the region supports rural economies, yet the relationship between landowners and loggers is still under-explored. Gaining a better understanding of the dynamics between both stakeholders is crucial for developing better communication and marketing strategies and strengthening logging businesses' supply chain to continuously delivery resources. Therefore, my goal is to examine the relationship between small and medium-sized landowners and loggers in the region. To do this, I will conduct interviews with landowners in Georgia whose property range from 20 to 100 acres from six randomly selected counties. These landowners will be identified through by evaluating county cutting notifications and county tax records. I will conduct the interviews using a semi-structured questionnaire aimed at obtaining data on the landowners' satisfaction with the logging businesses and identifying areas for improvement in the business relationship. Results will give insight into the landowners' satisfaction, highlighting areas for improvement, providing tools for strategic decision-making, and contribute to sustainable timber harvesting literatures.

Keywords: Family Forest Landowners, Loggers, Timber Harvesting, Timber marketing, Georgia

67. Thematic Evolution and Citation Dynamics of the Faustmann Forest Economics Model: A Text Analytics Review

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Abstract
The purpose of this paper is to conduct a literature review on the thematic evolution of research around the Faustmann natural resource economic model and its global citation dynamics. The Faustmann model originated from capital theory as a method to maximize forest land expectation value (LEV). Since then, the Faustmann model has been a cornerstone of Forest Economics and research on optimal rotation. Included in this review is research published between 1962 and 2024. The method is based on text analytics with VosViewer, using bibliographic data from Scopus. Article inclusion was determined following the PRISMA guideline, with the criteria of relevance and publication type. The aim is to graphically represent topics and global citation trends in the research body over the years. Synonymous and abbreviated terms were grouped into labels that best describe their collective meaning to reduce visual complexity while maintaining accuracy. The results include concept maps that present clusters of terms found to co-occur in the research body and global citation trends visualized in clusters of countries with strong co-citation relationships. The analysis highlights key areas of interest, including risk assessment, climate change, sustainable development, and carbon sequestration as well as countries with a dominant presence in Faustmann research. Further, an examination of previous literature reviews on the topic was conducted and found to correspond with the results of the present paper, supporting their accuracy. Based on these results, we discuss areas that warrant deeper investigation in future research, such as hybrid sylvicultural management and different climate conditions.

Keywords: Faustmann model; forest economics; literature review; text analytics; bibliographic map.

68. Additionality of Conservation Cost-Sharing in Private Investment for Invasive Species Management

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Abstract
With growing environmental concerns over biological invasion, federal spending on invasive plant management has increased in recent years, prompting many non-industrial private forest (NIPF) landowners to participate in voluntary conservation programs for financial assistance to defray some of their management costs. However, the extent to which these cost-sharing programs stimulate additional private investment in invasive plant management remains unclear. This study examines additionality in private investment using survey data from over four hundred NIPF landowners in the U.S. Central hardwood region. We employ a two-stage control function approach to address self-selection bias resulting from program enrollment. Additionality is estimated by constructing counterfactual private investment levels for both participating and nonparticipating landowners, using the estimated parameters of the second-stage model. Our findings reveal positive additionality, suggesting that enrolling in cost-share programs encourages higher private investment among participating landowners in invasive plant management. Moreover, non-participating landowners would likely increase their investment if they enrolled. These findings support the role of financial incentives in enhancing conservation efforts and sustainability.

Key words: Additionality, Cost-share program, Invasive plant management, Private Investment