FOREST

Forest Economy, Sustainability, and Technology

FOREST OPPORTUNITIES IN MAINE

The Forest Sector and Rural Community Needs

A Partnership between FOR/ME, the University of Maine's Center for Research on Sustainable Forests & Maine EPSCoR

FOR/MAINE

Strong forest. Strong economy. Strong communities.

Center for Research on Sustainable Forests

MAINE EPSCoR

THE UNIVERSITY OF MAINE

Maine EPSCoR at the University of Maine develops statewide partnerships between higher education institutions, industry, government, and others to effect lasting improvements to Maine's R&D infrastructure, capacity, and national competitiveness.

umaine.edu/epscor

MAINE EPSCoR

The University of Maine's **Center for Research on Sustainable Forests (CRSF)** leads forest research to enhance our understanding of Maine's forest resources in an increasingly complex world. CRSF's mission is to conduct and promote leading interdisciplinary research on issues affecting the management and sustainability of northern forest ecosystems and Maine's forest-based economy.

crsf.umaine.edu

Center for Research on Sustainable Forests

Forest Opportunity Roadmap/Maine (FOR/Maine) is a unique cross-sector collaboration between industry, communities, government, education, and non-profits, which have come together to to assess Maine's current industry, assets and readiness, and determine a strategy to capitalize on new opportunities.

formaine.org

FOR/MAINE

The **Forest-based Opportunities for Resilient Economy, Sustainability, and Technology (Maine-FOREST)** researchers seek to expand on the University of Maine's comprehensive research capacity to build a program that considers the entire forest socio-ecosystem across all potential dimensions within the broader context of rural economic and livelihood diversification.

crsf.umaine.edu/ maine-forest

Forest Economy, Sustainability, and Technology

FOREST

FOR/MAINE Maine-FOREST Engagement Meeting

Introduction

On July 10, 2023, members of the University of Maine's EPSCoR team were invited to attend a meeting of the Forest Opportunity Roadmap / Maine (FOR/Maine) Executive Council in Augusta, ME. FOR/Maine, formed in 2018 after the closure of several paper mills in the state, is a collaborative organization that brings together representatives from the forest industry, state and local governments, schools, and nonprofits to help guide Maine to strategically adapt and capitalize on changing markets in the global forest economy. The Executive Council includes representatives from each of the aforementioned sectors who are collaborating on a roadmap for Maine's forestry future with additional recent assessment studies and strategic plans.

At this meeting, the Maine-FOREST Track-1 planning grant team was invited to discuss opportunities and needs that National Science Foundation (NSF) research funding might address in the context of Maine's forest sector and related rural communities. Further, council members were provided information on the state's Science & Technology plan (Maine Innovation Economy Action Plan) and the future of NSF EPSCoR flagship programming.

FOR/Maine members were asked to discuss their interests for future NSF EPSCoR proposals, to help ensure that the Maine-FOREST team develops proposals that will effectively advance Maine's economy if awarded.

ATTENDEES

Aaron Weiskittel (University of Maine)

Alex Ingraham (Pingree Associates)

Barb Hayslett (Rep. Jared Golden's Office)

Ben Tucker (Sen. Angus King's Office)

Beth Campbell (Maine EPSCoR)

Bri Bowman (Maine Development Foundation)

Carol Woodcock (Sen. Susan Collins' Office)

Charlotte Mace (Maine Department of Economic and Community Development)

Chris Fife (Weyerhaeuser)

Connor Horton (The Nature Conservancy)

Donna Cassese (SAPPI)

Edie Smith (Sen. King's Office)

Heather Johnson (Maine Department of Economic and Community Development)

Jake Ward (University of Maine)

Jeanne Christie (Rep. Chellie Pingree's Office)

John Bryant (K2QC Consulting LLC)

John Cashwell (BBC Lands LLC)

Nate Rooney (Maine EPSCoR)

Pat Strauch (Maine Forest Products Council)

Patty Cormier (Maine Forest Service)

Peggy Daigle (East Millinocket Board of Selectman)

Peter DelGreco (Maine & Company)

Ryan Bushey (Louisiana-Pacific)

Scott Madden (Madden Timberlands)

Shane Moeykens (Maine EPSCoR)

Steve Schley (Pingree Associates)

Steve Shaler (University of Maine)

Tom Doak (Maine Woodland Owners)

Wade Merritt (Maine International Trade Center)

Yellow Light Breen (Maine Development Foundation)

BUSINESS FINLAND

Bioeconomy Trade and Study mission from The United States to Finland

When: May 21- 27 2023

Contact: [email]

Version of March 2023

Finland as a Forestry Reference Case Study

Members of the FOR/Maine Executive Council had the opportunity to travel to Finland in spring 2023 and meet with forest industry leaders. The trip included tours of mills and other forest-product facilities and inspired thoughtful discussions about the similarities and differences between the forest industries in Maine and Finland.

Many of the components for Finland's successful wood-building ecosystem also exist in Maine, but key differences lie in the social license to operate and public acceptance of intensive forestry. Finland provides significant state support that helps enable the industry, and the public in turn has enthusiasm for wood and forest products that reinforces state support. Finland also encourages collaboration between the forest industry and art institutions, which brings together young people and other creative individuals in an ongoing discussion about forestry in the nation.

Maine's forests differ from Finland's in several key ways:

- The forests of Maine are rich in biodiversity that is not as visible in the forests in Finland.
- Finland has four commercially managed species of trees, Maine has 39.
- Relative to the US, forest management is much simpler in Finland. That is, the industry as a whole is connected to the forest, such that a mill operator could approach a landowner and discuss the number of trees on a parcel of land which are ready and available for commercialization.
- Finland utilizes a logging training school that provides education opportunities in the industry for anyone who might be interested. The school offers a two-year training program to ages 16 and up, including programming for young adults as well as professionals looking to make a career change. Finland has exported this training school model to other nations and has shown willingness to do the same in the United States.

A key takeaway from the trip was the high level of automation on display in Finland, where several facilities are run by much fewer staff than might be expected. An outcome of Finland's investment in the industry as a way for the state to generate revenue has allowed for quicker turnover of technology and greater efficiencies in its use. The public display and access to forest products and their applications across multiple sectors, not just in building and housing, serve to encourage buy-in for the industry from the general public. Finally, Finland also invests heavily into research and development for the forest sector, with strong support for universities, national laboratories, and a network of researchers linked to the industry.

FOR/Maine
Publications
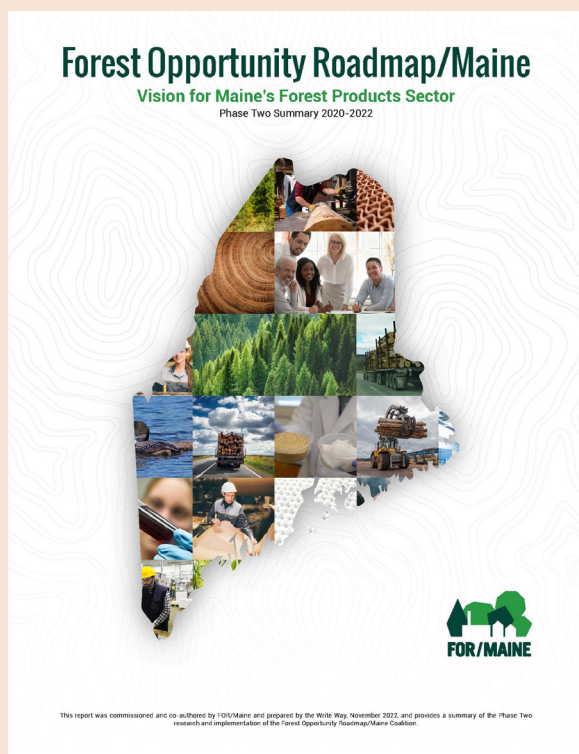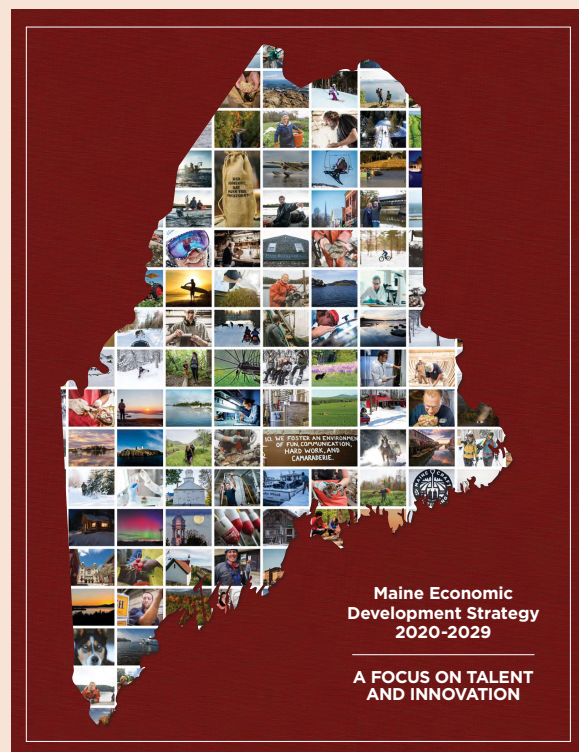
WHAT IS THE FOREST BIOECONOMY?
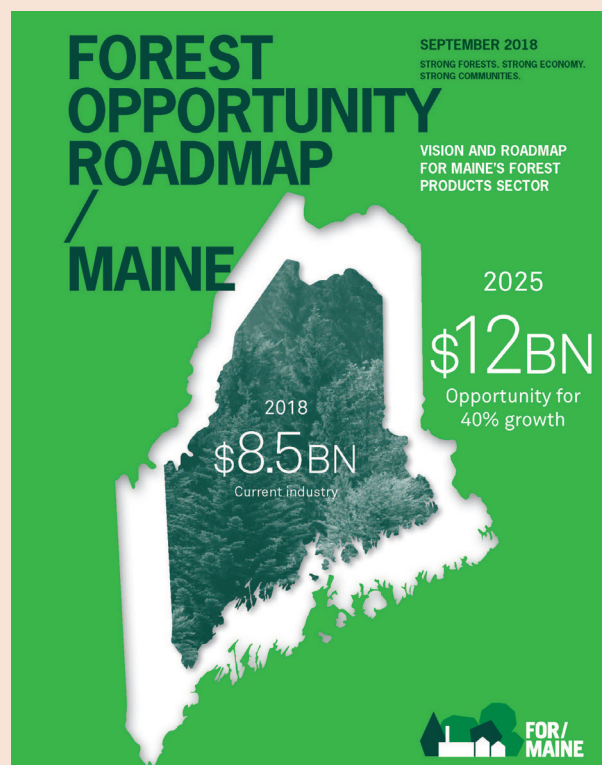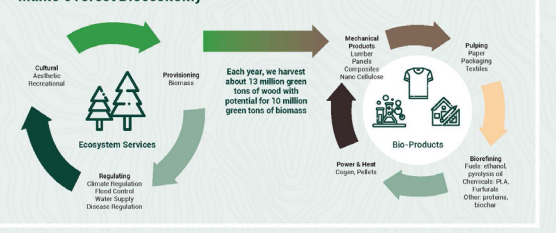
What is a Bioeconomy?

The bioeconomy uses renewable biological resources from land and sea—such as fish, forests, and micro-organisms—to produce energy, food, and value-added materials.

A **forest bioeconomy** encompasses traditional sectors such as forestry, paper and wood products, as well as new emerging industries such as textiles, chemicals, new packaging and building products, biopharma, and services related to these products—and forest services spanning recreation, hunting, tourism, carbon storage, biodiversity. A circular bioeconomy maintains the value of products, materials, and resources as long as possible, and minimizes generation of waste—while sustainably managing forests.

In the last decade, the bioeconomy has taken on a much larger role, with strategies and policies designed around the world to support its development. At the beginning of 2018, a quarter of the world's countries (49) were pursuing bioeconomy development in their policy strategies. The most significant emerging wood-based product markets are in construction, textile, chemical, and biofuel industries, and a number of small upstream niche markets such as cosmetics, food additives, and pharmaceuticals. Industry boundaries are flexible, as chemical, energy, and forest industries use some of the same feedstocks and develop products for the same markets.

Maine's Forest Bioeconomy

Maine Economic Development Strategy 2020-2029

A FOCUS ON TALENT AND INNOVATION

Forest Opportunity Roadmap/Maine

Vision for Maine's Forest Products Sector
Phase Two Summary 2020-2022

FOREST OPPORTUNITY ROADMAP / MAINE

SEPTEMBER 2018
STRONG FORESTS. STRONG ECONOMY. STRONG COMMUNITIES.

VISION AND ROADMAP FOR MAINE'S FOREST PRODUCTS SECTOR

2025
$12BN
Opportunity for 40% growth

2018
$8.5BN
Current industry

FOR/MAINE

FOR/Maine Activities & Opportunities

The FOR/Maine group has partnered with the Maine Department of Labor (DOL) to promote the forest industry. This partnership is working towards developing career pathways throughout the industry that will be mainstreamed into the state's workforce platform and online career portal, with the hope that this will help improve public awareness about forest product careers. The FOR/Maine's workforce development committee has sought to identify priority occupations throughout the industry and build skills development programs for individuals interested in those occupations.

In addition to the DOL partnership, FOR/Maine has been hosting focus groups throughout the state to identify public perceptions of the industry and aid in connecting communities to training. Four focus groups were held in Livermore Falls, Bangor, Presque Isle, and Machias. Key takeaways surrounded the reported perceptions of the forest industry, which represent a challenge for the field to overcome. The public in Maine views forest product occupations as volatile and unattractive. Industry participants emphasized the strong need for drivers and a new commercial driver's license program, and the need to develop interchangeable skills across industries to ensure workers have options as they enter a more volatile landscape for employment.

To address education challenges, FOR/Maine is working to develop an industry-based course that will be held through Washington County Community College (WCCC). The Sunrise County Economic Council and WCCC are developing this program based on an existing course at WCCC that introduces students to the lobster industry, building on the success of that structure to support the forest industry. The program will be held online and provide a credential upon completion. At the secondary level, there has been a resurgence in high school training programs, with Brewer High School and Washington County both reviving their training courses for students interested in forestry.

FOR/Maine is also working to attract new businesses to Maine, speaking with both domestic and international groups about investment opportunities in the state. Feedback has been mixed, with companies expressing concerns about the macroeconomic conditions in the state and a lack of surety of the regulatory environment, as well as the cost of raw material for forest products. The state's 10-Year Economic Development Strategy (2020-2029) presents a regulatory continuity and predictability plank that will help ease some of these concerns.

The FOR/Maine group also partnered on a successful NSF Engines Development Award proposal led by the Northern Forest Center, Coalition of Northern Forest Innovation & Research. Along with University of Maine researchers, FOR/Maine will collaborate with other research institutions and community organizations across Northern New England to devise new forest products and management strategies. The project focus is on the development of the bioeconomy and an assessment of how New Hampshire, Vermont, and Maine can collaborate towards a shared vision of a forest products development roadmap in the region. Areas of focus will include planning and alignment within the region, use-inspired development, translating innovation into practice, and aligning workforce development with current and future opportunities in the forest products industry.
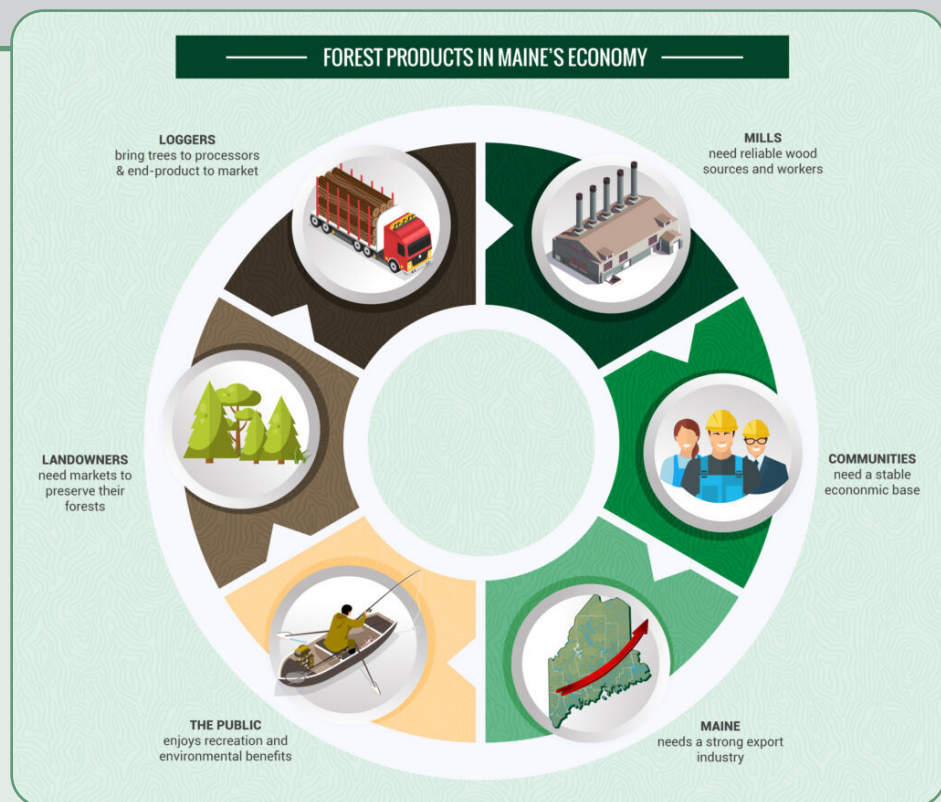
Infographic courtesy FOR/Maine.

University of Maine & Maine EPSCoR

Representatives from the University of Maine and Maine EPSCoR were invited to present information on the 2023 Maine Innovation Economy Action Plan (i.e., the state's Science & Technology plan) as well as the NSF EPSCoR E-CORE and E-RISE programs, with a particular focus on research and development in the forest sector. The FOR/Maine council was asked to provide feedback and ideas on how the five goals of the Science & Technology plan could tie-in to the industry. It was noted that Maine has been weighted towards service and tourism sectors in recent decades and a pivot to building a stronger manufacturing presence could aid the state's GDP. Although there are building blocks to work with in the state, such as the Maine Technology Institute and the FOR/Maine council, state government funding will be important for developing and incorporating new technologies in Maine's heritage industries.

FOR/Maine council members reflected on the lack of R&D funding from larger corporations, which is common nationally in most sectors, due to a focus on newer companies and the risk-averse nature of those more established firms in Maine. However, larger corporations may be able to use R&D budgets and external funding sources to accelerate their R&D programs and bring new innovations to the market on an advanced timeline.

Discussions about the NSF E-CORE and E-RISE programs centered on proposed projects to evaluate the state's research and development capacity over time. Metrics proposed to measure the state's research capacity included the number of faculty, percentage of research personnel, number of degree programs, number of research centers, and the percentage of funding dedicated to research in forestry related technologies (Figure 1). Feedback from the council suggested that the state should be looking to compare itself not only to regional competitors, but to states with

Forest Sector R&D Capacity Metric	EPSCoR						Non-EPSCoR				
	ME	ID	MT	NH	SC	VT	GA	IN	MI	OR	WA
# of faculty	X 26	✓ 47	✓ 47	! 30	✓ 47	✓ 47	✓ 70	✓ 36	X 27	✓ 121	✓ 36
% of R&D personnel	! 1.63	! 1.92	✓ 4.02	! 1.09	✓ 6.65	✓ 3.07	X 0.84	X 0.27	X 0.34	✓ 2.66	X 0.25
Extension Faculty	X 0	✓ 5	! 3	✓ 12	! 2	✓ 5	✓ 50+	✓ 25	✓ 14	✓ 40	✓ 10
Degree Programs	✓ 6	! 2	! 3	! 2	! 3	X 1	✓ 5	! 3	! 3	✓ 14	✓ 5
Research Centers	! 5	! 3	✓ 10	! 3	✓ 10	! 3	! 4	✓ 11	✓ 6	✓ 6	✓ 7
% R&D Ag and Natural Resources to Total	✓ 19.28	✓ 45.51	! 17.19	✓ 9.22	✓ 13.74	✓ 14.23	✓ 23.10	✓ 18.07	✓ 17.95	✓ 35.45	! 1.75
% R&D to Forest Sector GDP	X 0.90	✓ 2.22	✓ 2.74	✓ 2.33	X 0.29	✓ 3.62	X 0.74	! 1.69	! 1.57	! 1.20	X 0.32

X = below average ! = average ✓ = above average

Figure 1. Comparison of forest sector R&D state capacity across both EPSCoR and non-EPSCoR jurisdictions.

larger, more developed forestry sectors, such as Arkansas, Alabama, Mississippi, Pennsylvania, and Wisconsin. This broader comparison should further strengthen the R&D capacity assessment.

Education components of the E-CORE and E-RISE programs were also discussed, including building forestry relevant skills among K-16 students and adult professionals. Planned programming includes introducing indigenous knowledge into university-level science education, the expansion of a forest ecology research network, and creating learning opportunities for Maine's educators. These programs will be aiming to pull the industry together under one umbrella for education and R&D, similar to what FOR/Maine has accomplished. Of note, the scope for the planned future programs stretch beyond the traditional forest sector by encompassing AI and computer science, which might create additional opportunities to increase career awareness in this sector. At the same time, FOR/Maine has developed a detailed workforce development plan and is working to implement it, which creates numerous synergistic opportunities that will be further explored in the coming weeks.
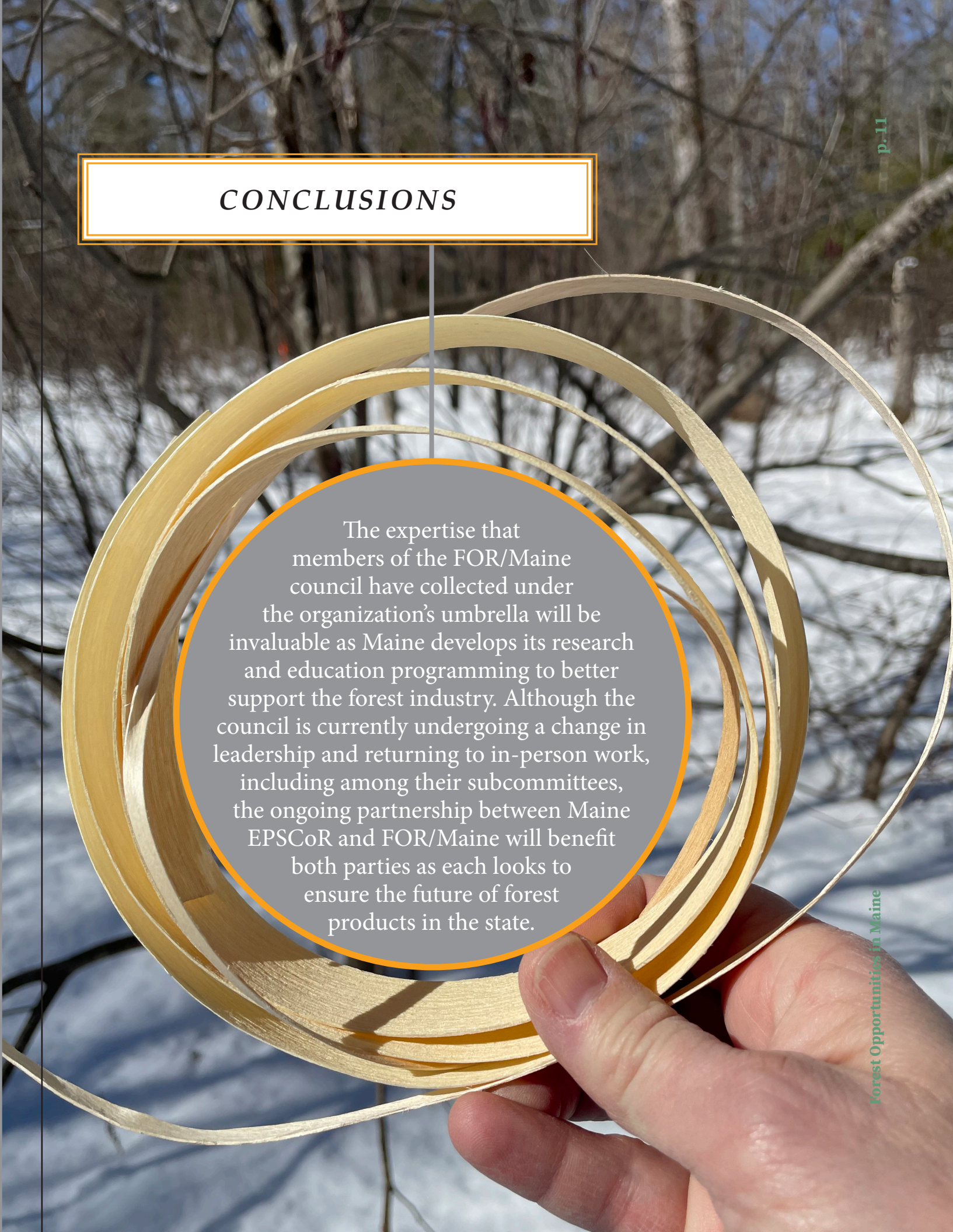
CONCLUSIONS

The expertise that members of the FOR/Maine council have collected under the organization's umbrella will be invaluable as Maine develops its research and education programming to better support the forest industry. Although the council is currently undergoing a change in leadership and returning to in-person work, including among their subcommittees, the ongoing partnership between Maine EPSCoR and FOR/Maine will benefit both parties as each looks to ensure the future of forest products in the state.
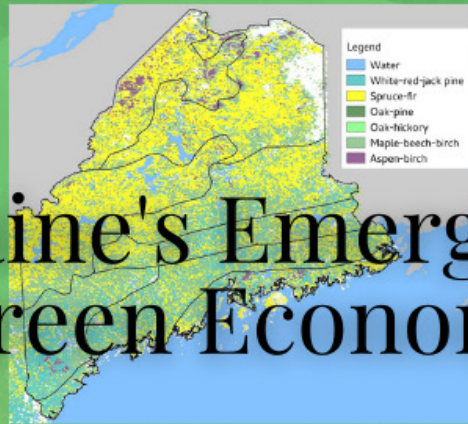
Maine's Emerging Green Economy

Economic

Robust & Diverse Economy

Innovative & Climate-Smart Green Products and Buildings

Environmental

Natural Resource Resilience in Face of Climate Change

Diversified & Inclusive Economic Development

Equitable Human–Environmental Systems

Human

Nurturing Rural Community Resilience

Legend
- Water
- White-red-jack pine
- Spruce-fir
- Oak-pine
- Oak-hickory
- Maple-beech-birch
- Aspen-birch

Report produced by the Center for Research on Sustainable Forests at the University of Maine, 2023.

Center for Research on Sustainable Forests