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Merging Maine's forest past and forest future

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It may seem like a surreal roadtrip to travel from a muddy logging operation deep in Maine's woodlands to the floor of the U.S. Senate and back to a climate controlled laboratory in Orono, where wood is sheared into tiny nanofibers, eaten by experimental enzymes or cooked down into sugars that will re-emerge as new wood bioproducts. The logging site, Congress and the lab may offer the most creative partnerships for sustaining forest lands in Maine as well as forests throughout the world. For many generations of Maine residents and visitors, the woods, waters and wildlife of Maine's forests are its defining cultural and economic heartland. Because new products made from wood fiber (bioproducts) have the potential to ensure Maine's forest values for future generations, a partnership between Congress, the forest and the laboratory may prove essential.

Maine is the most forested state in our country; over 90 percent is forested, hosting a great biodiversity of tree and plant species, thousands of rivers, lakes and ponds, a diverse (but struggling) forest products sector and an essential recreation economy where wildlife-related activity alone contributes more than \$900 million in state revenue.

Most Maine forests that provide these values are owned by private landowners who seek opportunities to earn income for shareholders and investors. Recent economic recommendations from the Brookings report are clear that retention of "place" and our state's natural resources are essential economic tools. The fast evolving field of wood bioproducts offers new economic formulas to support the retention of Maine's forests as undeveloped landscapes, but only if the science also includes sustainable strategies and technologies that will ensure an intact and healthy forest. People in Maine will not accept biomass harvesting strategies that sacrifice forest health or displace current forest-based economies.

Using National Science Foundation funding to create a Forest Bioproducts Research Initiative (FBRI), the University of Maine is marshaling a broad array of scientists and state partnerships to create fossil fuel reduction solutions grounded in sustainable forest management. The most talked about bioproducts are fuels like ethanol but perhaps the most dramatic opportunity lies in the fact that almost everything that is now made from petroleum can also be made from wood: fuels, energy, plastics, chemicals, composites, coatings, and wood, unlike fossil fuels, can also be used in food, medicines, and cosmetics.

The science of ethanol extraction from cellulose (wood fiber) creates new knowledge and production technology that teaches us how to take wood apart and put it back together in creative and valuable ways. Ultimately, the most lucrative Maine bioproducts niche may not be fuels at all but wood biomass gathered and harvested in Maine, transported short distances to existing local mills retrofitted as biorefineries where a variety of bioproducts are produced to quickly meet supply and market demands.

An added bioproduct benefit may be emerging carbon trading markets seeking new ways to reward landowners for retaining forest lands. Maine projects that use sustainably harvested wood to create bioproducts that substitute for "energy dense" products (petroleum based) will be purchased by industries and socially conscious consumers to offset CO2 emissions.

In June, Maine Sen. Susan Collins offered a successful amendment to an energy bill (co-sponsored by Sen. Olympia Snowe) that passed the Senate. Her amendment provides \$275 million for biofuels and bioproducts research and \$60 million to advance scientific understanding of abrupt climate change. Scientists at the University of Maine helped write this amendment, and the language reflects Sen. Collins' goals as well as the research priorities of UMaine's Forest Bioproducts Research Initiative.

Her amendment supports research that develops "low carbon fuels ... and bioproducts" that "target regional feedstocks" (local forests, in this case), creates "demonstration facilities" (so that investors can move forward with confidence) and for the first time in a national debate on energy policy, interjects specific language about the importance of creating solutions that do not negatively impact "wildlife habitat, biodiversity, water and air quality, or rural and regional economies."

We think Sens. Collins and Snowe should be proud of the next generation of forest pioneers experimenting in UMaine's labs and testing sustainable harvesting strategies in Maine forests. Some of them are the third generation of families who own forest lands in Maine's north woods; on weekends they hang up their lab coats and return home to the muddy road and the woodlot. They symbolize a hopeful process for merging Maine's forest past and forest future even as we are challenged with creating solutions (and bioproducts) that offer nonpolluting, sustainable choices for people on planet earth.

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