Climate Conservation Solutions Initiative

The Role of Forests in the Northwoods

Driving through northern Wisconsin reveals the dominance of forests on the landscape. At each vista, trees stretch to the horizon in an unchanging canopy from year to year.

We expect a lot of benefits from forests in the northwoods: growth of trees to sustain the forest products industry; collect and infiltrate rain and melting snow to recharge groundwater, reduce downstream floods, and protect water quality of lakes and rivers; produce oxygen through photosynthesis to improve air quality; and extend shade to cool the air and forest floor. Forests also provide wildlife habitat to protect biodiversity.

Forest canopies dominate the horizon in the northwoods.

Another forest benefit is mitigation of extreme climate change impacts by drawing down the concentration of carbon dioxide in the atmosphere. Carbon is stored in trees as they grow, in soil, and in buildings and products made of wood.

Forests are vulnerable to a changing climate and will require changes in management practices to continue storing more carbon.

Warming temperatures, increasing frequency of intense bursts of rain that provide a larger share of total annual precipitation, and higher evaporation rates are stressing the health of forests and limiting the ability of forests to provide all benefits.

Though precipitation totals are rising in northern Wisconsin, most of the increase is occurring in spring and winter. On top of that, much of the water from heavy rains runs off forest floors instead of soaking into the ground.

Road damage in northern Wisconsin from a 2016 extreme storm event. *Photo by Jeff Peters / AP*

All those factors combined are increasing the risk of summer droughts in future years.

Less infiltration of water during heavy storms in northern Wisconsin also has resulted in more immediate damage to public transportation infrastructure. Widespread intense downbursts of rain flowing downhill can form fast-moving torrents that have washed out bridges, highways, and marinas in recent years.

Winters have warmed more than other seasons in northern Wisconsin, reducing snowfall totals and the duration of snow cover, and increasing the number of deer surviving the season.

With less snow and fewer extremely frigid days, there is less need for deer to conserve energy and keep warm by sheltering under dense evergreen growth in winter. That, in turn, is expected to increase browsing of young trees preferred by deer – sugar maple, white oak, northern red oak and white pine – in the understory of forests and reduce regeneration of those species.

Heavy deer browse on young oak.
Photo by Ron Eckstein

While maintaining a diversity of tree species is key to helping forests adapt to climate change, loss of species and declining diversity indicates a forest is vulnerable to climate change.

Some of the common tree species with poor capability to withstand changes to climate down the road include black spruce, tamarack, balsam fir, balsam poplar, and black ash.

Sugar maple and yellow birch are known to be susceptible to frost root damage because of their shallow roots. Less snow and a shorter length of snow cover will reduce protection of those species from freezing temperatures.

Variability and fluctuations in temperatures are affecting maple sugaring operations.
Photo by PBS Wisconsin

Sugar maple is considered capable of handling climate changes statewide, yet it is expected to decline in northern Wisconsin from loss of suitable habitat due to frost damage and deer browsing.

The maple syrup industry in Wisconsin, in turn, will be impacted by a warming climate in several ways. The season for collecting sap will start earlier in the year but researchers forecast that will result in greater variability in weather, collection of sap, and syrup production.

Currently, the broad forests of northern Wisconsin are among the most productive and stable carbon storehouses.

How can those forests continue to store carbon, and more of it, to mitigate severe impacts of climate change while helping northern communities adapt?

The forestry working group of the Wisconsin Initiative on Climate Change Impacts (WICCI) recommends the following measures for public and private forest owners: keep

forests as forests; restore forest cover through tree planting where appropriate; update forest plans and manage forests to address climate risks; support use of wood products; and increase tree nursery capacity to boost forest restoration and assist migration of tree species in response to a changing climate.

There are several other well-known practices that could be applied to forests, regardless of ownership. Among them: selecting site-adapted species to optimize growing space; thinning trees for optimal growth; extending the time between cuts or deciding not to cut.

A growing tree is a carbon sponge. Bigger trees store more carbon than smaller ones. Old-growth forests are carbon storehouses.

Expanding old-growth forests stands a better chance of success in select areas. Soils in northern Forest and Florence counties, for example, are suitable for managing mature and old-growth hardwood forests.

A Forest County privately-owned conservation easement with soils that can support old-growth forests.

Land trusts have a role to play in keeping forests as forests by working with private landowners to place restrictions on future development of their forests and woodlots through conservation easements.

Conservation easements can ensure private forests safeguard connections to nearby federal, state and county forests, providing wildlife with safe corridors between preferred habitats and the space needed to roam and adapt to a changing climate.

NWLT will work with willing landowners to preserve private woodlands, especially those that adjoin already-protected forests, to help sustain this valuable resource and our northwoods communities.

The Northwoods Land Trust's (NWLT) **Climate Conservation Solutions Initiative** aims to accelerate the pace of conservation in northern Wisconsin through raising awareness and support of natural solutions to our changing climate.