Executive Summary

The Carbon the World Forgot

Conserving the Capacity of Canada's Boreal Forest Region to Mitigate and Adapt to Climate Change

Authors

Matt Carlson, M.Sc.
Ecologist, Canadian Boreal Initiative

Jeff Wells, Ph.D.
Science and Policy Director, Boreal Songbird Initiative

Dina Roberts, Ph.D.
Staff Scientist, Boreal Songbird Initiative

See the full report for a complete list of sources used

CANADIAN BOREAL INITIATIVE

BOREAL SONGBIRD INITIATIVE

www.borealbirds.org

Executive Summary

Executive Summary

Although the Kyoto Protocol represented a giant step forward in climate change policy, it was deficient with respect to how it addressed the continuing release of biotic (non-industrial) carbon—estimated by most experts as contributing nearly 20 percent of global man-made carbon emissions. The protocol fails to fully address carbon release caused by the disturbance of ecosystems by humans. Efforts are underway to address this shortcoming, but the current effort focuses almost exclusively on the fate of tropical forest tracts in developing nations.

Boreal forest in Labrador GARTH LENZ

Boreal Forests: The World's Largest Terrestrial Carbon Bank

Boreal forests circle the globe at subarctic latitudes, cover more than 10 percent of the world's land area, and harbor half of the world's remaining intact wilderness tracts. These vast undeveloped areas provide a stronghold for the world's largest and healthiest populations of northern mammals like caribou, bear, wolves and moose, as well as migratory songbirds and waterfowl. Perhaps even more importantly, boreal forest regions store more carbon than any other terrestrial ecosystem, almost twice as much per acre as tropical forests. Yet, for reasons that are unclear, boreal forests seem to be the carbon the world forgot.

As with tropical and temperate forests, boreal forests sequester and store carbon in surface vegetation, but in addition have accumulated and conserved annual increments of carbon for millennia in associated soils, permafrost deposits, wetlands and peatlands. The carbon stored below ground in the boreal forest dwarfs the surface carbon in the trees, a fact that has not always been fully appreciated. Recent studies reviewed in this report find that previous global carbon accounting vastly underestimated the amount and depth of organic carbon stored below the surface of boreal forests.

When boreal forest vegetation or soils are disturbed, carbon is released, climate change is accelerated, and biotic carbon storage is diminished. Keeping boreal forest carbon reservoirs intact forestalls and limits initiation of feedback loops that could greatly accelerate the pace of climate change.

Boreal conservation contributes not only to reducing the rate of climate change (i.e., mitigation) but also to minimizing its adverse effects (i.e., adaptation). The unprecedented rate of climate change expected in northern regions has profound implications. Anticipated impacts are diverse and include rapid northward shifting of habitat, increased fire and insect outbreaks, altered phenology, and degraded aquatic systems. Fortunately, Canada's Boreal Forest is better suited than most to withstand such changes due to its intactness. Intact ecosystems will help buffer species from a changing climate, while also permitting species migrations needed to track shifting habitat. Canada's Boreal Forest is already a haven for species that have been extirpated from more southern areas, and this role will only increase in the future as species are pushed north by climate change.

Executive Summary

The global boreal forest presents the world's best opportunity to apply conservation as a climate change strategy.

Policies that match the scientific understanding of the region's importance for mitigation and adaptation are urgently needed, especially in a new climate change agreement or future international frameworks.

New Policies Needed to Protect Boreal Forests

Two simple changes to the protocol that would have far-reaching beneficial impacts are inclusion of all below-ground carbon sources (including degradation of peatlands) and mandatory accounting of all carbon emissions from forest management. These changes alone would motivate large improvements in the management of biotic carbon. In addition, requiring that biotic carbon projects have a positive or neutral affect on biodiversity and ecosystem services would help maintain the capacity of ecosystems to adapt to climate change.

The global boreal forest presents the world's best opportunity to apply conservation as a climate change strategy, both to avoid release of the region's vast carbon stores and thereby further accelerate climate change, as well as to maintain the ecological integrity necessary to buffer the impacts of climate change on the flora and fauna of the region. Moreover, the wealthy, developed world countries that control large areas of the boreal forest—Canada, the United States and the Scandinavian nations– have strong rule of law and fewer competing needs, two considerations that bolster the odds of successful environmental protection efforts. As the world works toward a new climate change agreement, and focuses on controlling emissions from deforestation and land-use changes in the tropics, it is essential that the potential contributions of boreal forests be more fully considered.

Figure 1

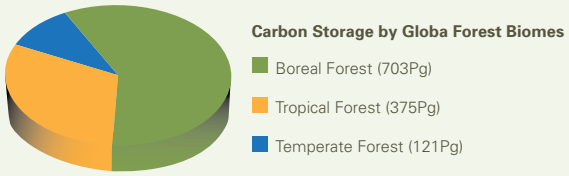
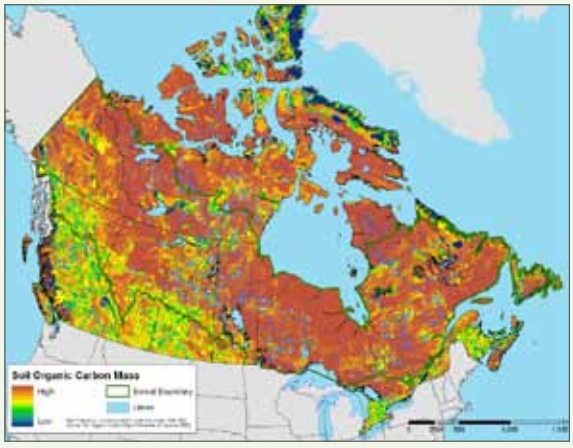


Figure 2



See pages 7 and 9 of the full report for full-size graphics

Globally only a small fraction of the boreal forest has been protected in a natural state. Meanwhile, the deleterious impacts of climate change and burgeoning industrial development in the far north threaten rapid loss of the boreal forest's ecological integrity. Common international goals for ecosystem protection, calling for a tenth of the wilderness to be reserved from development, fail to respond to the challenges or capitalize on opportunities in the boreal forest. New approaches and ideas, more extensive in their ambition and reach, will be required.

Executive Summary

Canada Leads the World in Boreal Forest Conservation
Canada is leading the way. The Canadian Boreal Forest Conservation Framework (Boreal Framework) presents a vision for protecting over one billion acres (4 million sq. km.) of carbon rich, largely intact, contiguous tracts across Canada's North. This proposal, endorsed by over 1500 scientists worldwide, strikes a balance between strict protection and tightly regulated sustainable development. It is also supported by dozens of aboriginal First Nations, resource development companies, financial institutions, and environmental groups.

Following the basic approach of the Boreal Framework, the Canadian federal government and provincial governments have protected over 125 million acres of the Canadian Boreal Forest for new parks and wildlife refuges since 2001, an unprecedented rate of progress in preserving unspoiled landscapes. Over the last two years, the provinces of Ontario and Quebec have gone further, commencing conservation planning on almost 400 million acres (1.6 million sq. km.), with the intention of setting aside at least half that area as off-limits to development, while applying strict safeguards regulating development on the remainder.

Protecting large portions of the world's remaining boreal forests, following the leadership of Canada, can make a major contribution to the amelioration of climate change from mankind's activities. This conservation strategy pays multiple benefits, safeguarding existing carbon stocks, providing ample refuge to mitigate climate-induced stress on ecosystems, and securing some of the world's most important remaining natural areas. It is easy to understand how Canada's recent boreal conservation policy decisions have won such broad-based support. What is more difficult to understand is why those polices have not been studied and emulated by other nations of the world. Perhaps the carbon the world forgot will finally be remembered.

See the full report for a complete list of sources used.

Core Messages

1. The global boreal region is the world's largest terrestrial carbon storehouse, containing almost twice as much carbon per unit area as tropical forests. To avoid accelerating climate change, it is important to avoid disturbing the boreal forest's vast carbon reservoirs.

2. Climate change has severe implications for boreal biodiversity and ecosystem services. However, Canada's Boreal Forest region is better suited than most to withstand climate impacts due to its high level of intactness.

3. Protection of intact forest ecosystems and sustainable forest management will not only maintain globally significant carbon stores, but also maintain the capacity of the boreal region to resist and adapt to climate change. This approach is embodied in the Boreal Forest Conservation Framework, which calls for the establishment of a network of large interconnected protected areas covering at least half of the Canadian Boreal Forest and the use of leading-edge sustainable development practices in the remaining areas.

4. It is essential that international policies to address climate change are consistent with scientific understanding of the boreal region's global significance. Accounting for all anthropogenic impacts to forest and peatland carbon should be mandatory, and biotic carbon projects should be required to have a positive or neutral effect on biodiversity and ecosystem services.