Under the Radar:

Degradation in Canada's Boreal Forest and Climate Consequences

Anthony Swift and Courtenay Lewis
Natural Resources Defense Council

Intact Forests in the 21st Century Conference, Oxford, June 18-20, 2018

Boreal Caribou Range Boundaries

“A forest that has been harvested is still a forest. Forest land that temporarily has no trees—for example, after harvesting… is still considered a forest, because trees grow back.”

The State of Canada's Forests Annual Report
Natural Resources Canada, 2017

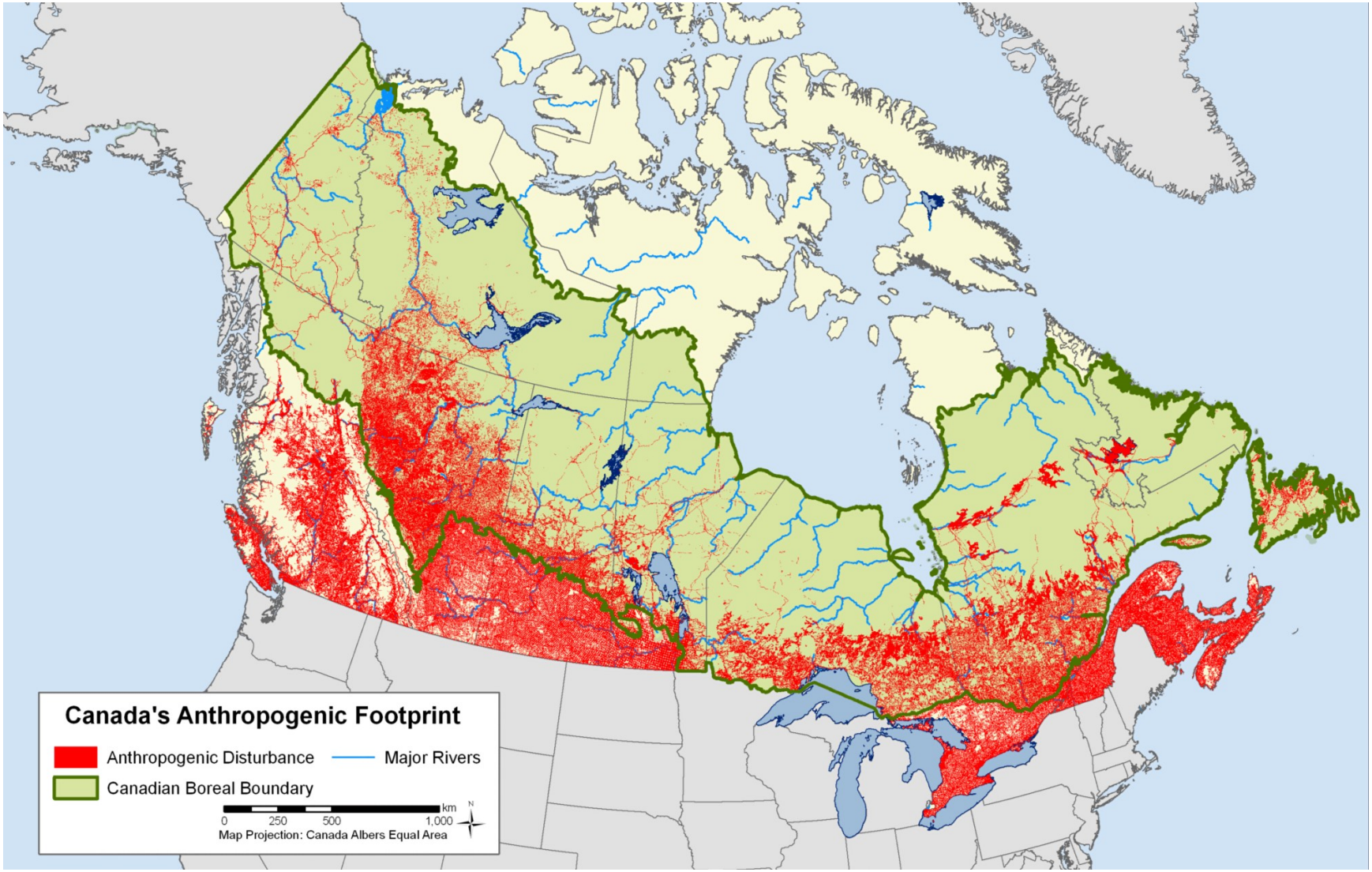
“When regrowth does not balance removals, it leads to a degradation of forest carbon stocks.”

Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change

“Selective logging was responsible for 15–19% higher carbon emissions than reported from deforestation (clear-cutting) alone.”

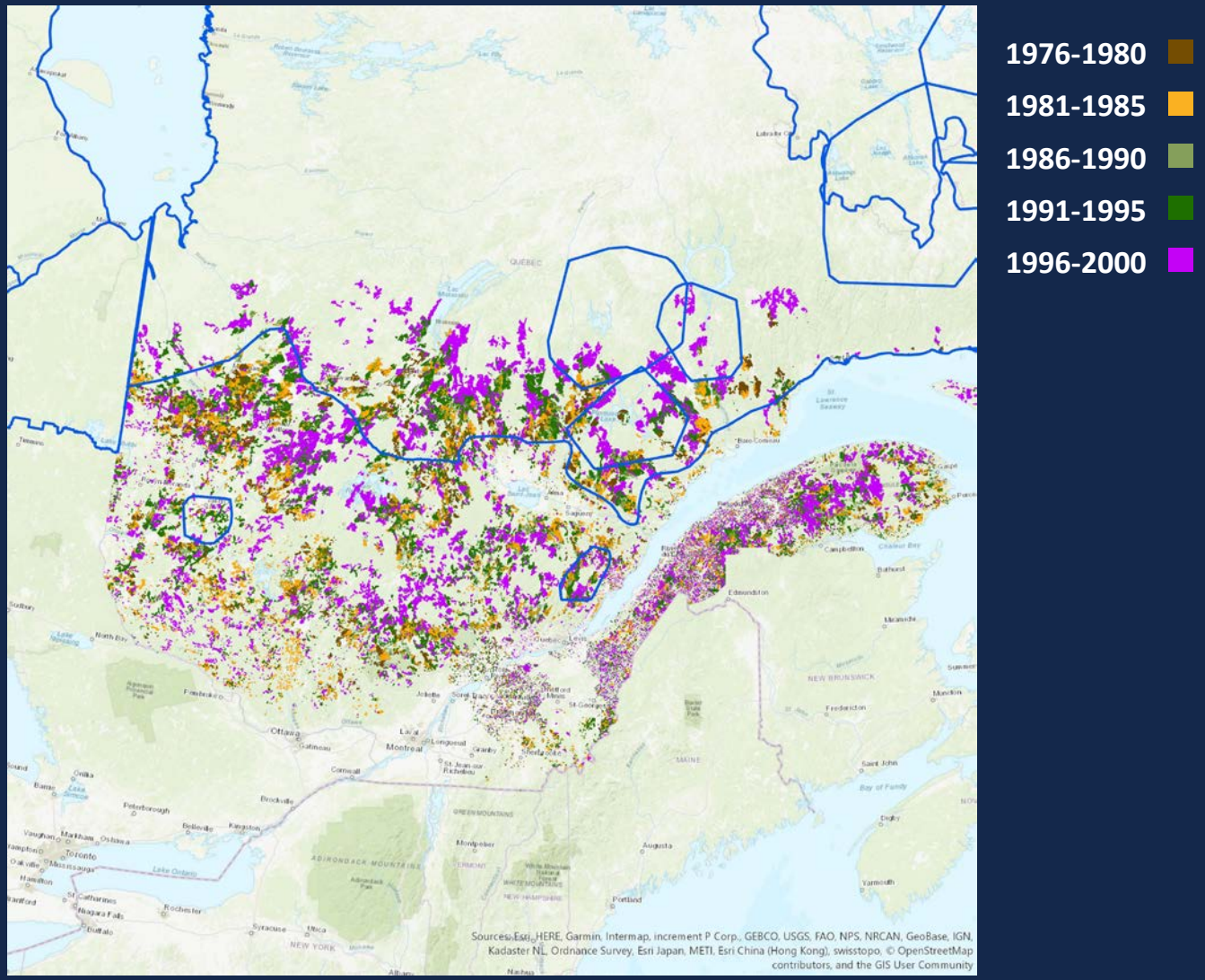
Huang M., and G. P. Asner (2010). Long-term carbon loss and recovery following selective logging in Amazon forests. Global Biogeochemical Cycles

Degradation across Canada



Source: International Boreal Conservation Campaign

Degradation in Quebec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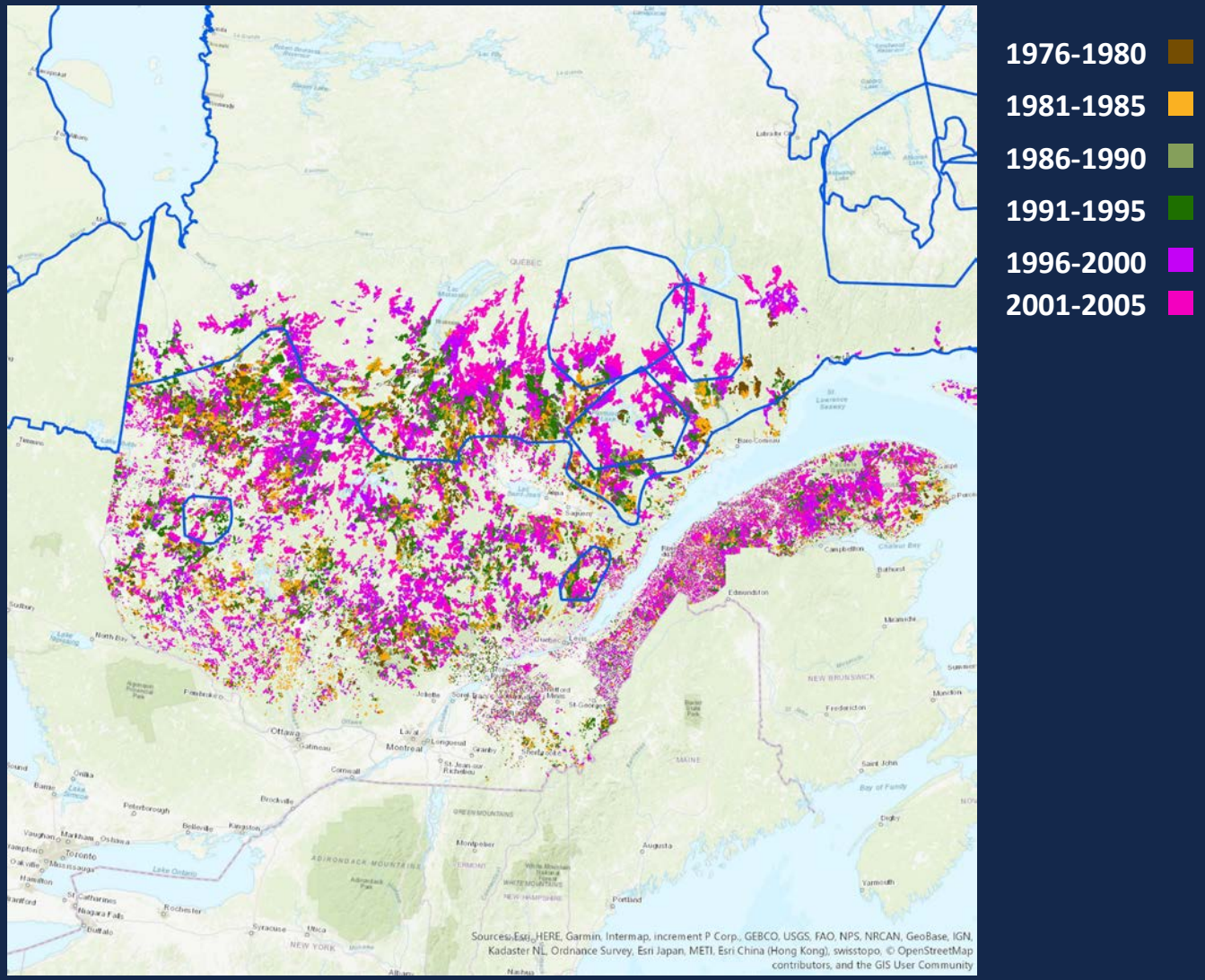
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community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St. Catharines
Portland
Augusta
Saint John
Fredericton
Moncton
Edmundston
Campbellton
Bathurst
Miramichi
Yarmouth
Digby
NEW BRUNSWICK
MAINE
NEW YORK
ADIRONDACK MOUNTAINS
GREEN MOUNTAINS
WHITE MOUNTAINS
NEW HAMPSHIRE
VERMONT
Lake Ontario
Bay of Fundy
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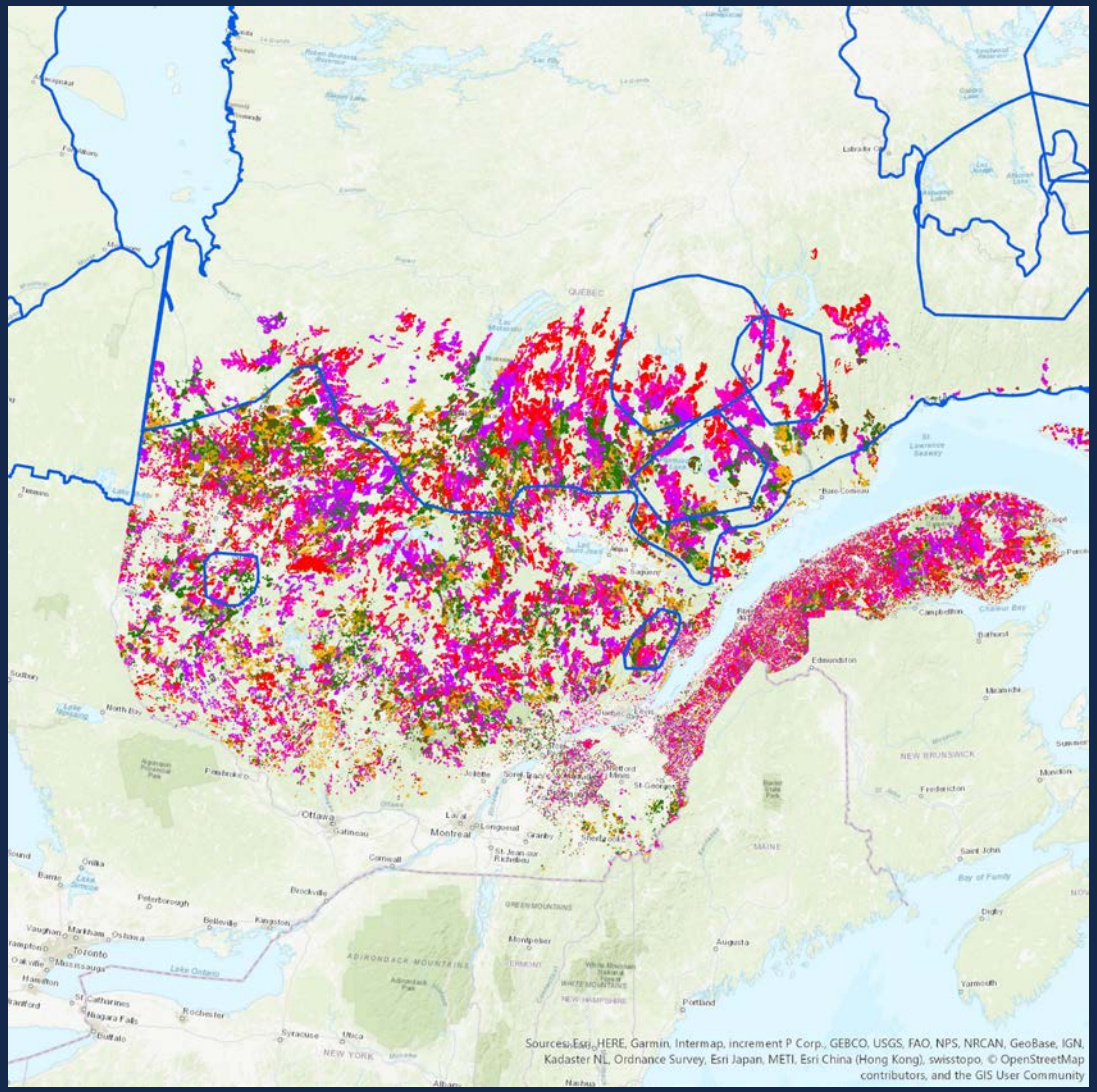
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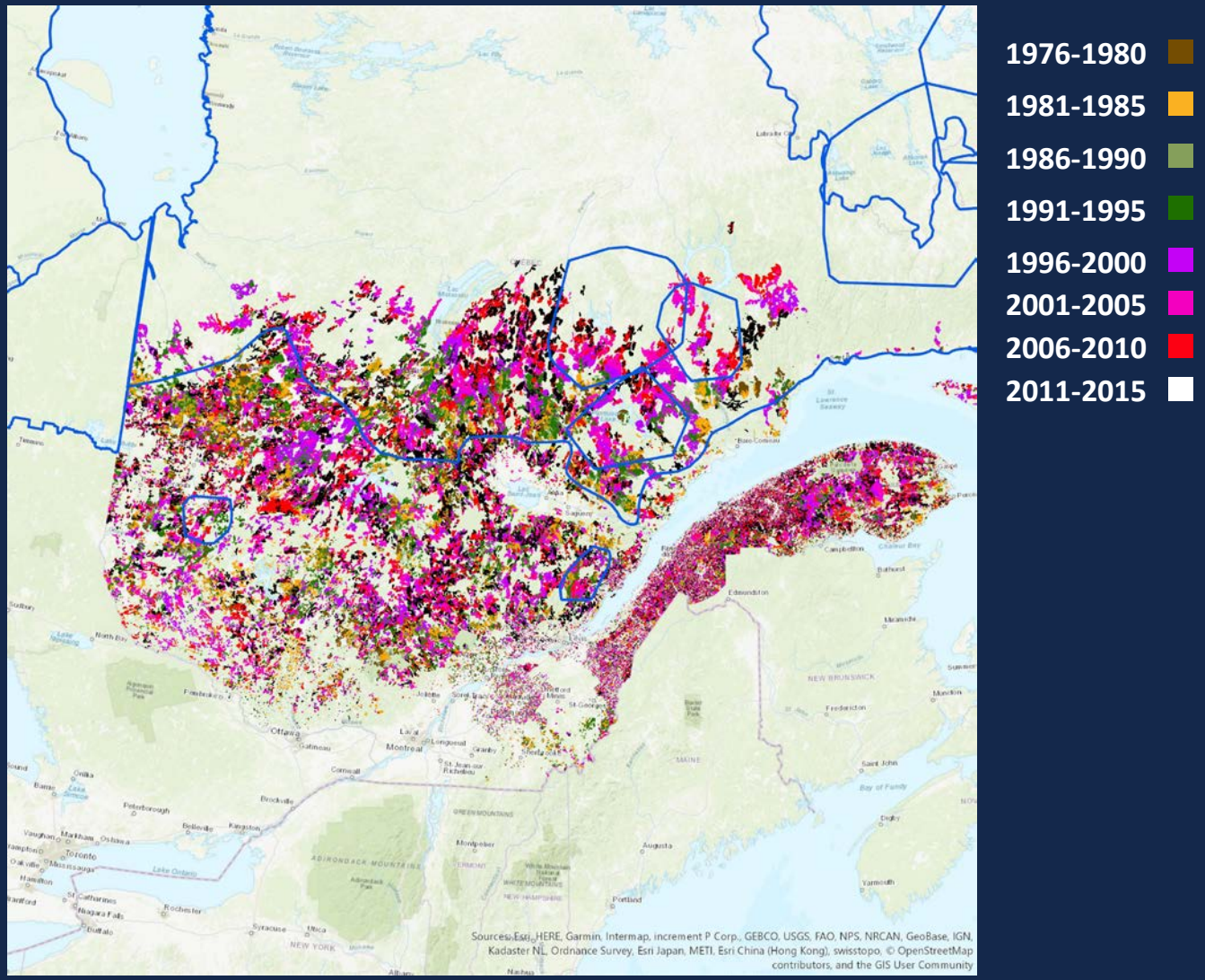
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Concerning considerations

Inconsistent standards:

“Each province and territory has its own regeneration standards and regulations, addressing such factors as species composition, density and stocking levels.”

(The State of Canada's Forests, Natural Resources Canada, 2017)

Time lag:

“Clear-cut harvesting resets stand age to 0; this changes the rate of carbon accumulation in biomass as young trees accumulate little biomass in the first 30 to 40 years. ”

(Government of Canada National Inventory Report, 1990-2016)

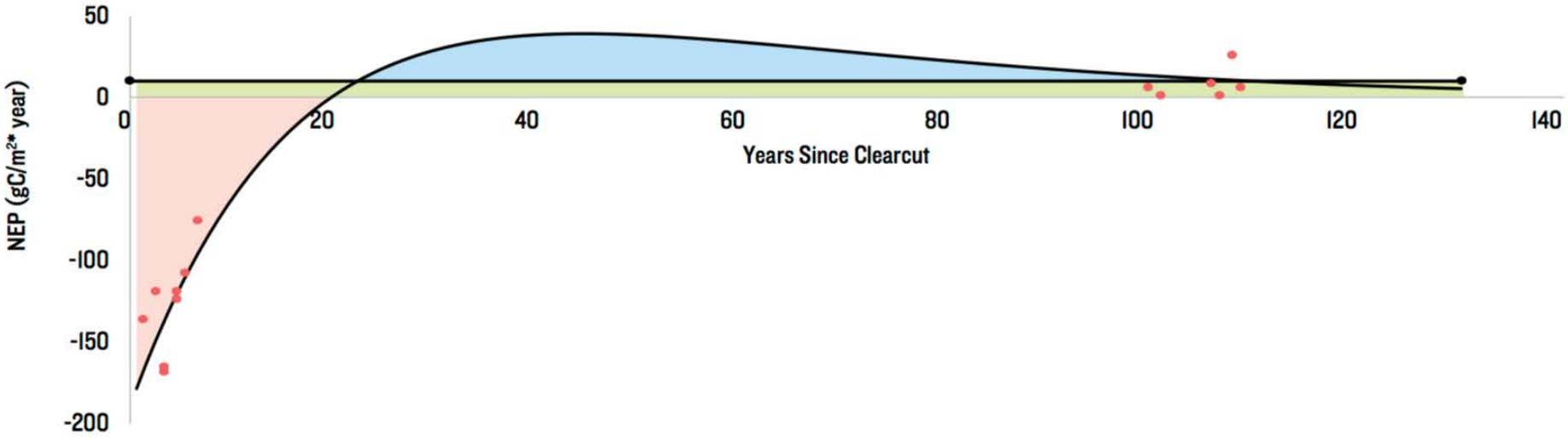
Protecting the boreal is a global opportunity

Boreal is one of the world's most powerful carbon sinks

Biome	Tons CO2 per hectare
Wetland	686
Boreal Forest	408
Temperate Grassland	243
Tropical Forest	242
Temperate Forest	153
Tropical Savanna	147
Tundra	134
Cropland	82

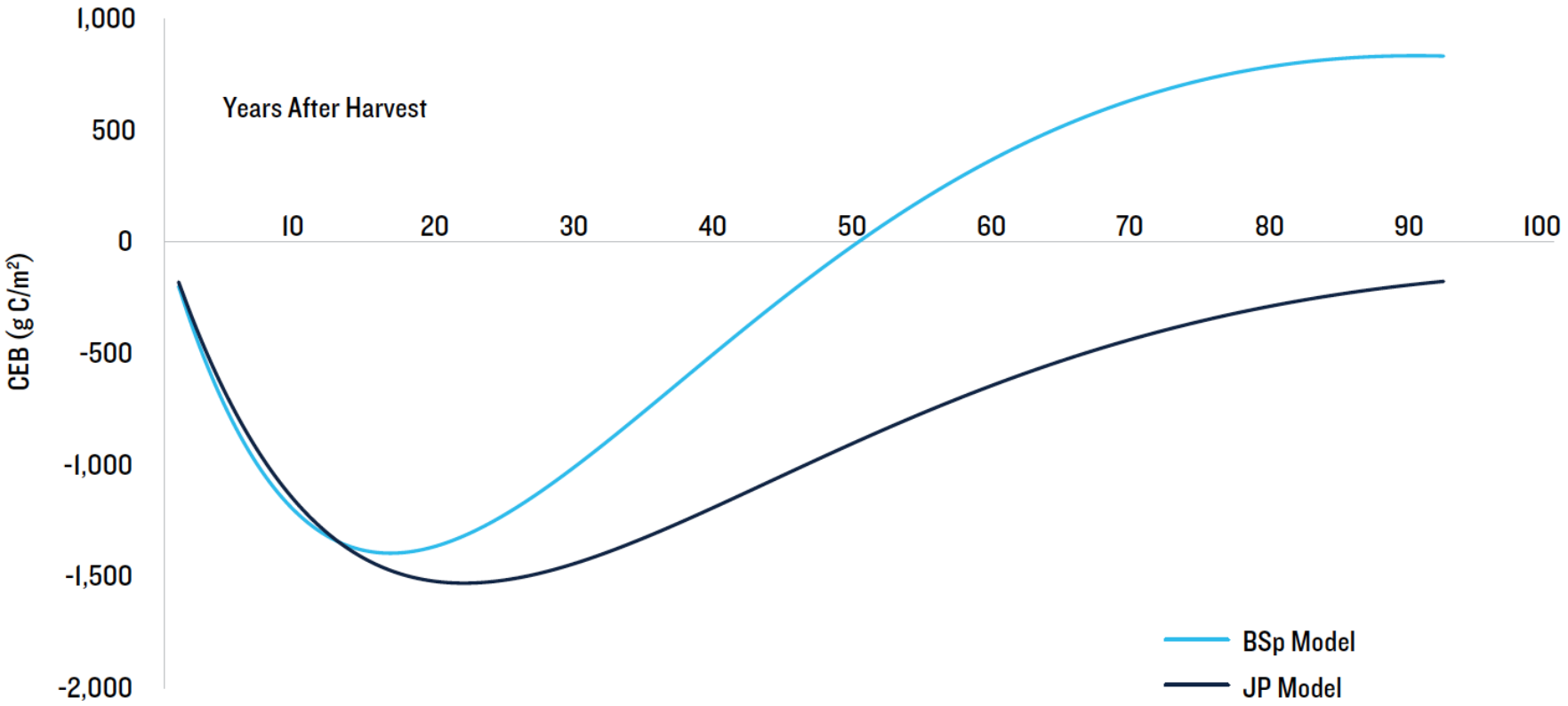
Source: IPCC: Special Report on Land Use, Land Use Change and Forestry, 2000

Example response from Black Spruce forest ecosystem (Quebec NEP data)



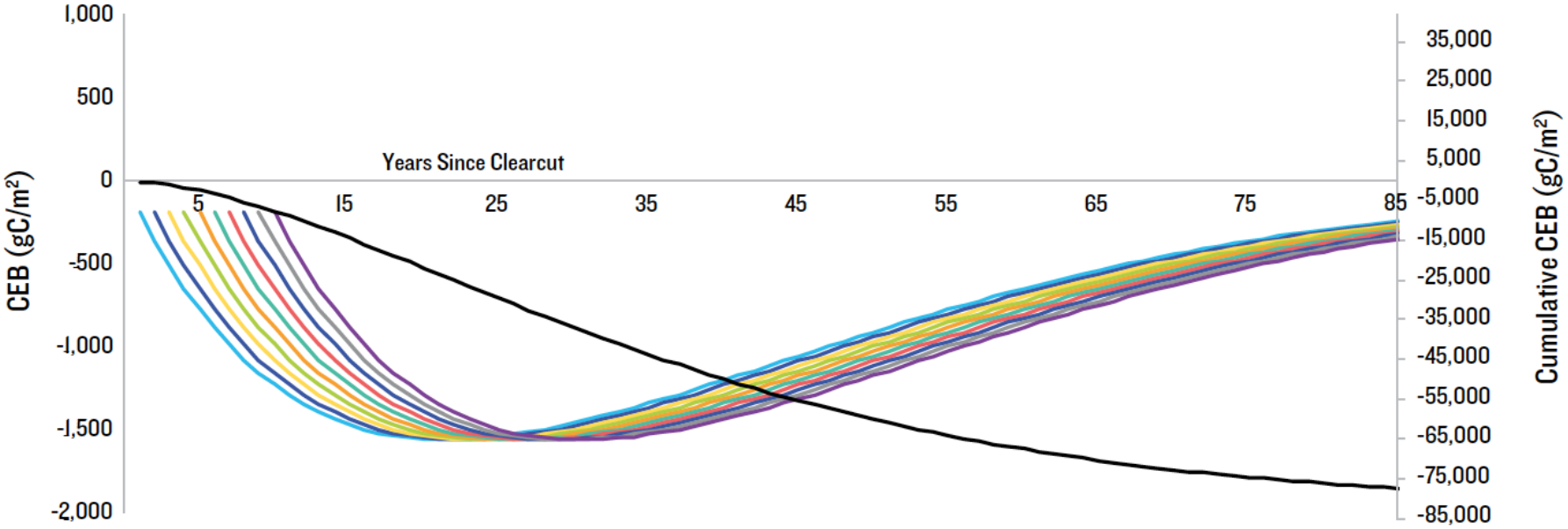
Source: NRDC, White Paper: Accounting for CO2 emissions from Clearcut Logging in the Canadian Boreal Forest, 2017

Carbon Emissions Budget curves for Black Spruce and Jack Pine



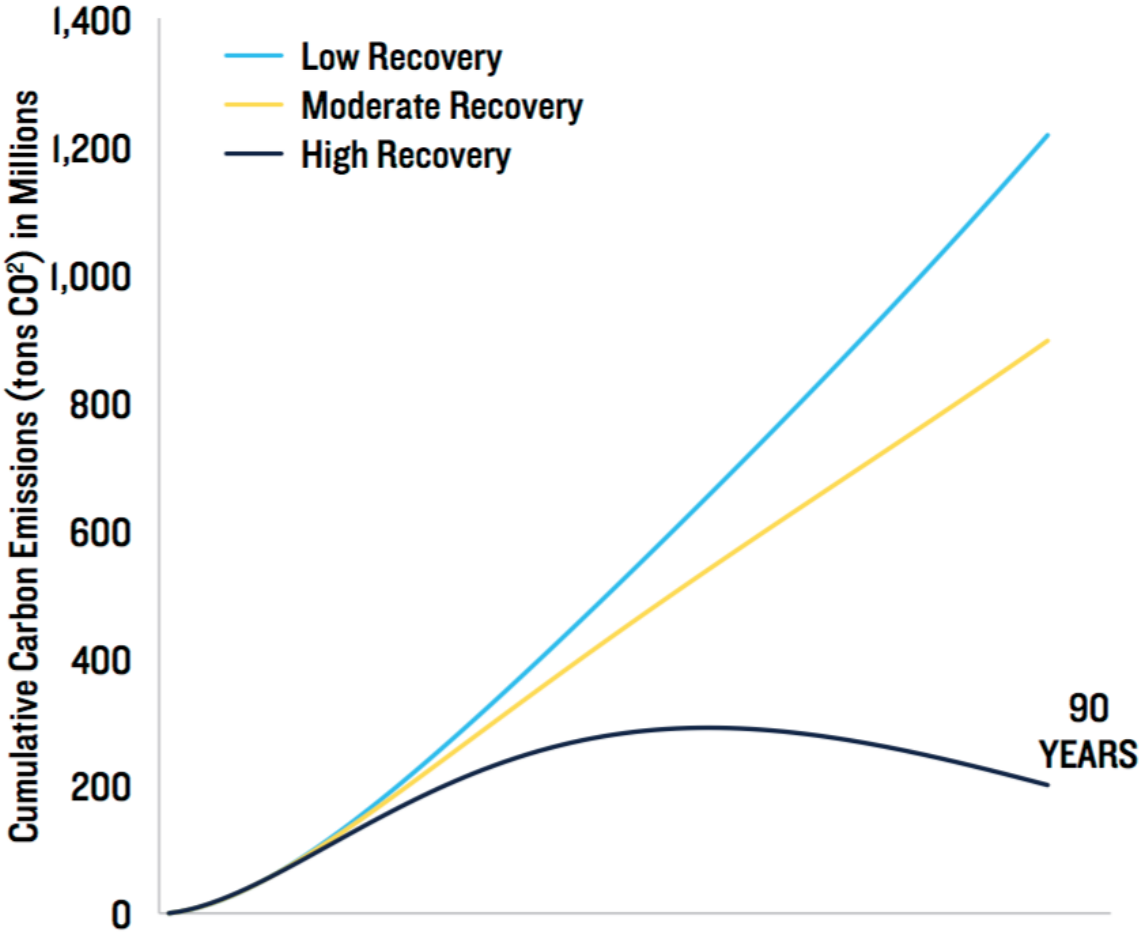
Source: NRDC, White Paper: Accounting for CO2 emissions from Clearcut Logging in the Canadian Boreal Forest, 2017

Sequential Emissions Curves from Black Spruce Forests



Source: NRDC, White Paper: Accounting for CO2 emissions from Clearcut Logging in the Canadian Boreal Forest, 2017

Uncounted emissions in Quebec's forestry sector



Logging in intact boreal forest is a significant source of emissions

TABLE I: AVERAGE ANNUAL AREA CLEARCUT WITH ESTIMATED CO_2 EMISSIONS ASSOCIATED WITH THAT CUTTING

PROVINCE	QUEBEC	ONTARIO	ALBERTA	NEWFOUNDLAND	SASKATCHEWAN	MANITOBA	TOTALS
Annual Harvested Area (acres)[49]	407,000	318,000	190,000	32,000	35,000	25,000	1,007,000
CO_2 Emissions Associated with Annual Harvest (million metric tons)[50]	11.2	8.7	3.4	0.9	0.6	0.5	25.3

Source: NRDC, Pandora's Box, 2017

Supporting the boreal forest's resiliency in a changing climate

Recommendations

1. Improve monitoring of greenhouse gas emissions in the boreal forest and incorporate in national climate inventory.
2. Establish regulations to reduce emissions associated with industrial activates and create incentives for management of boreal carbon stores.
3. Reduce demand in the global marketplace for products sourced from intact boreal forests.
4. Develop and implement tools for enhancing the resilience of the boreal forest.

Thank you

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