

Peatlands



Noteworthy:

- Peatlands have often been regarded as a hindrance to agriculture. Large areas of peat have been cleared to improve the productivity of agricultural land, but the volume of peat that is cleared is not monitored, and has not been included in our account.
- About 3,000 hectares of peat are currently being harvested. The revenue from the peat mined each year in Alberta is about \$30 million.
- Estimates for the change in area of peatlands are not available, but the 1996 inventory has been used to estimate the carbon sequestered and the change in area between 1961 and 2003 (also see carbon budget). These estimates are not complete because the losses in peatland due to drainage for agricultural purposes have not been included.
- Peatlands sequester about 0.273 tonnes carbon/hectare/year.
- More carbon is embodied in Canada's peatlands than in our forests.

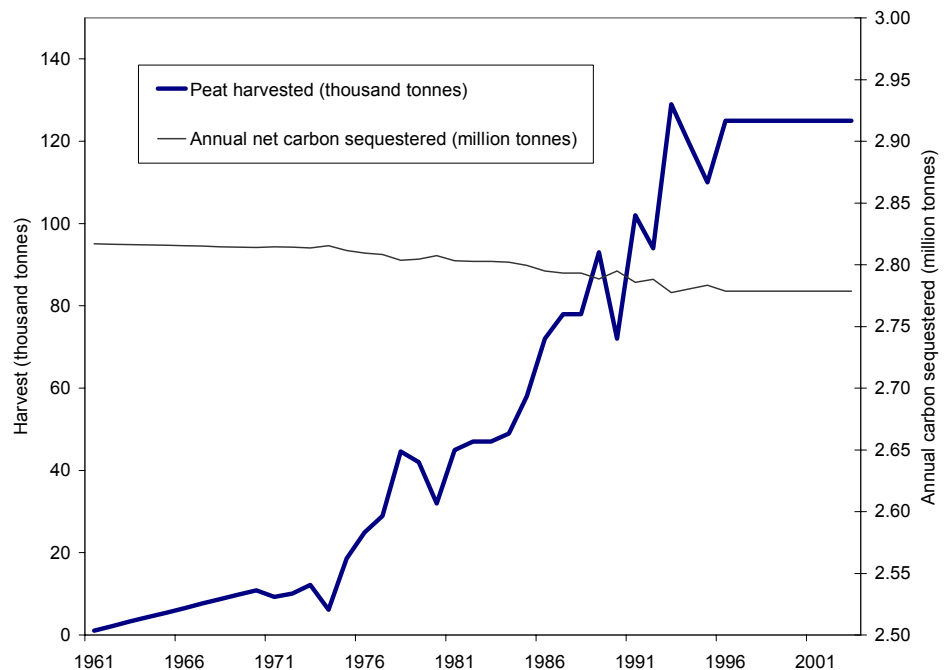
The State of Alberta's Peatlands

Peatlands are most extensive in the northern two-thirds of the province. They cover nearly 50,000 sq km of the central mixedwood sub-region of the boreal forest, which extends across much of north-eastern Alberta. According to the 1996 wetland and peatland inventory, peatlands covered 103,200 square kilometres, or 16.3% of the Alberta land base. Peatlands play a vital ecological role as a fil-

tration system for water and by controlling water runoff. Peatlands absorb water from spring snowmelt and summer storms, thus reducing flooding, erosion and sedimentation, and recharging the water table in times of drought. They are natural filters, cleansing the water that passes through them. In addition they store a massive amount of carbon. The carbon stored in peatlands in-

creased from 13.64 billion tonnes in 1961 to 13.76 billion tonnes in 2003. However, the annual net rate of carbon sequestration has declined very slightly from 2.82 million tonnes in 1961, when there was no harvest, to 2.78 million tonnes in 1996 through to 2003, when the peat harvested was 125,000 tonnes.

Net Carbon Sequestration by Peatlands, and Peat Harvested, 1961 to 2003

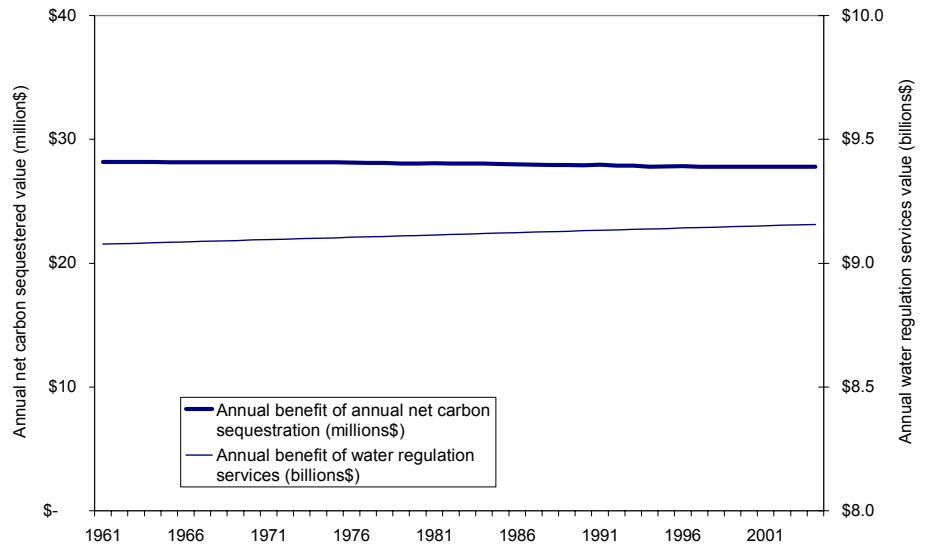


So What?

Peatlands provide two primary ecosystem services: they regulate water flows and they sequester carbon. Studies in Minnesota and North Dakota estimate that the annual benefit of water regulation provided by each hectare of peatlands is \$886 (1998\$). Based on the peatland area estimated in the 1996 peatland inventory, the water regulation benefits provided by Alberta's peatlands were \$9.14 billion in 1996 (1998\$).

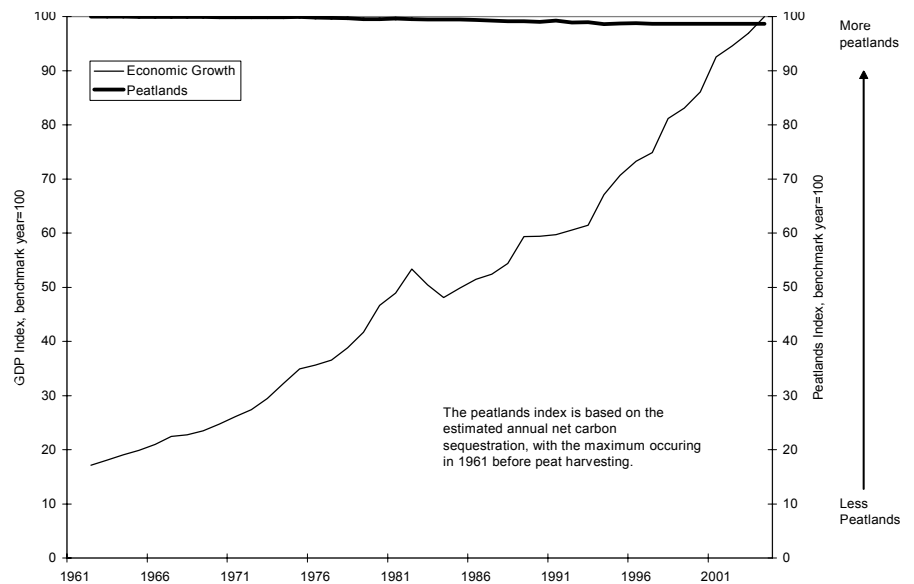
Because we do not know the original extent of peatland area, a peatland model was constructed based on the estimated annual carbon sequestered by peatlands and the volume of peat harvested per year in Alberta. Using this model, we can estimate the benefits of carbon sequestration and water regulation services provided in 1961, and compare them with the services provided today. If we assume that the benefit of avoided damage for each tonne of carbon is worth \$10 (\$38/tonne of CO₂ x 0.273, the content of carbon in one tonne of CO₂), then in 1961, the benefit of net annual carbon sequestered by peatlands was worth \$28.17 million (1998\$). In 2003, the net annual carbon sequestered declined slightly and was worth \$27.79 million (1998\$). The cost of the annual loss in net peatland carbon sequestration was an estimated \$387,750 in 2003 (1998\$), relative to the net annual carbon sequestered in 1961, when there was no peat harvested. At the same time, the benefit of the overall water regulation services provided in 2003 was an estimated \$9.16 billion (1998\$). However, the cost in terms of the net annual rate of water regulation services relative to 1961 was an estimated \$25,570 (1998\$).

The Annual Estimated Benefits of Alberta's Peatland Ecosystem Services, 1961 to 2003



Annual value of net carbon sequestration based on \$10 per tonne of carbon. The carbon value is based on the avoided damages of climate change and health costs of a tonne of CO₂ adjusted by the carbon content in a tonne of CO₂ (0.273). The annual value of water regulation services provided by a hectare of peatlands is \$866.

Alberta's Peatland Index: Where are we today?



The peatlands index is based on the estimated annual net carbon sequestration, with the maximum occurring in 1961 before peat harvesting.



The cost of the annual loss in net peatland carbon sequestration was \$387,750 (1998\$) in 2003, relative to the net annual carbon sequestered in 1961. The cost in terms of the net annual rate of water regulation services relative to 1961, was \$25,570 (1998\$). Thus the total cost of lost peatlands between 1960 and 2003 was \$413,320 (1998\$). Despite these costs, the benefit of the overall water regulation services of existing peatlands in 2003 was \$9.16 billion (1998\$) and the benefit of carbon sequestration of existing peatlands in 2003 was \$27.79 million (1998\$).

