

Bark beetles, climate change and our future

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Pine beetles have killed half of B.C.'s commercial forests in 15 years.

Photograph by: Handout, Vancouver Sun

Recently, a classmate from the University of B.C. asked what I thought about Canada backing out of the Kyoto agreement, and if there was any connection between the insatiable bark beetles infesting the province's forests and the rising temperatures on Earth.

First, trees are effectively the greatest CO₂ warehouses ever created. For every metric ton of wood

grown, 1.5 metric tons of CO₂ is absorbed and one metric ton of oxygen is released.

Bark beetles like the mountain pine or spruce beetles and lightning-induced fires are nature's emissaries of change. All forests must undergo a natural process of aging, facilitating regeneration — new life.

In order to fully understand what is happening in British Columbia and throughout the entire western North American continent, it is important to keep in mind that trees, insects and the climate are all inexorably linked; each plays a pivotal role in the feedback loops on nature's gameboard.

Any change in the behaviour of one or two of these players inevitably changes all of the triumvirate's interaction along with it. With little opportunity to adapt to new conditions, instability can cause remarkable devastation to entire ecosystems.

That instability has reverberated not only in B.C. and western North America but around the globe on every forested continent as elevated temperatures in the past 40 years of just over 0.5 degrees Celsius on average are killing mature trees by the billions.

In B.C., the mountain pine beetles have killed half the commercial forests in the last 15 years. Instead of absorbing CO₂ these massive graveyards of dead trees are releasing 250 million metric tons of CO₂ into the atmosphere, the equivalent of all the car and light truck emissions in Canada for five years or enough wood to build a city of eight million homes.

It doesn't even begin to end there; the spruce beetles in the far north of the province into Yukon and Alaska have taken full advantage of warming temperatures by speeding up their life cycles, which formerly took two years and now occurs within one year.

In Kluane National Park and Reserve, Yukon spruce beetles have accomplished something never recorded in modern or past times. Since the cold ecological constraint has been removed, spruce beetles have killed over 350,000 hectares of white spruce. Before this, the largest spruce attack was a modest 247 hectares in 1977.

The long-lived, thrifty high elevation forests of white bark and limber pines of B.C. have also been decimated by mountain pine beetles because, again, the cold-temperature barrier precluding attacks is no longer in situ. Mortality in parts of northern B.C. ranges from 72 per cent to 80 per cent. These forests are crucial habitat for grizzly and black bears, and of paramount importance to retain winter snowfall, slowly release spring melt back into the water cycle and replenish the Pacific Ocean, its salmon, eagles, wolves, bears and orcas.

Death rates of white bark and limber pines across the western United States are as high as 90 per cent. The sentinels of the high country have become the tsunami sirens of global warming, showing ecologist, climatologist and physiologists that a warming world is irrevocably altering the landscape

across the entire mountainous region of western North America.

It's not just the forests that are disappearing but rather immense amounts of ice that reflect incoming solar radiation. One hundred billion metric tons of ice melted from Greenland during the blistering-warm summer of 2010. This year alone 50 per cent of Canada's millennia-old Arctic ice shelves along the coast of Ellesmere Island vanished.

And far worse, the Southern Ocean which occupies 22 per cent of the total ocean on the globe, absorbing 40 per cent of Earth's CO₂, is acidifying so quickly (as a byproduct of absorbing rising CO₂) that by 2030 the sea water will be corrosive to crustaceans, dissolving shells that the animals are making. This amplification will reverberate all the way up the food chain to the whales.

Data from the Global Carbon Project showed the carbon emissions from our planet had increased 5.9 per cent from 2009 to 2010; that's the largest jump in any year since the Industrial Revolution.

The \$17-trillion Alberta oilsands industry must spend carbon energy and precious fresh water to separate the gooey, toxic oil from the sand. Moreover, by burning this petroleum, humans will knowingly raise atmospheric CO₂ levels by an astounding 150 parts per million. Earth will be uninhabitable for life as we know it.

If Australia, with its \$10-trillion coke-coal industry, can ratify a carbon tax, then surely progressive Canadians can follow their lead.

We are running out of time to combat rising CO₂ emissions: Earth's forests are dying.

It's time to embrace innovation and the cofounder of the London School of Economics, George Bernard Shaw's dictum: "Progress is impossible without change, and those who cannot change their minds cannot change anything."

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