

Carbon in the Boreal Forest

- A. Our vast northern forest is always in a state of change. Two reasons for these changes are:
- a) *Disturbance* from fire, insect infestation, logging and other natural and man-made activities create openings in the often closed forest.
 - b) With the creation of openings in the closed forest floor and sunlight reaching it, plant *succession* begins. First pioneer grasses and small shrubs invade the site. Hardwood trees begin to grow next followed by conifer trees. All this may take hundreds of years because it is often interrupted by on-going disturbances.
- B. A lot of carbon is stored in the boreal forest. The cold climate here allows carbon from dead plant material to accumulate. Because of the cold climate and water logged peatlands (which have no oxygen) the decomposing microorganisms are inactive. This is called “*soil organic carbon*”. Carbon is thus stored in soil which comes from dead plant material and dead roots in the soil. We are told that during the maximum growing season in spring and summer the world level of carbon dioxide and oxygen level rises.
- C. Forests can be carbon sinks or carbon sources.
- i) *Carbon sinks* is when the forest absorbs more carbon than it releases which in the case of a boreal forest would be its peak growing season.
 - ii) A *carbon source* is when the forest releases more carbon into the atmosphere than it absorbs.
- An example of this is a dead forest due to a fire or insects, or a missing forest due to logging or land clearing for oil or gas. These activities cause the boreal forest to stop absorbing carbon and they release the stored carbon. As the climate warms, the carbon which is locked in the cold wetlands will begin to decompose and become a carbon source.
- Global warming* happens because of a climate change caused by an exaggerated greenhouse effect, due to high levels of greenhouse gases. Or, is it climate change from global warming is caused by an exaggerated greenhouse effect due to high levels of greenhouse gas?
- These extra gases in the atmosphere are usually carbon dioxide from:
- burning of fossil fuels
 - methane from decomposing peatlands and garbage dumps
 - nitrous oxide from chemical fertilizers in agriculture

Some activities are underway to respond to many uncertain circumstances around

global warming, climate change, and the influences on the greenhouse gas accumulations. The Boreal Forest Conservation Framework calls for the protection of ecosystems and the carbon stored within. The Post 2012-Kyoto framework will hopefully promote management decisions supporting ecosystem conservation as a critical means to reducing emissions and helping ecosystems adapt to climate change.

Verbatim and summaries were gathered from the following websites:

<http://www.borealforest.org/index.php?category=world> boreal forest&page=overview

<http://www.inteboreal.org/globalwarming/ibcc-borealandclimate.pdf>

<http://www.environmentalsociety.ca/issues/forests/climate-change-boreal.html>

<http://www.environmentalsociety.ca/issues/climate/index.html>

<http://www.cwf-fcf.org/assets/pdf/en/cfa-boreal-kit-en-vol-8.pdf>

(This has activities on forest conservation influences)