

## How do Forests Affect Climate Change?

Many people think that reducing the use of fossil fuels and conserving energy are the only ways to reduce climate change. While these are important, forests and other vegetative cover also play a significant role.

Vegetation such as trees, plants and agricultural crops all absorb carbon dioxide, a main greenhouse gas, through photosynthesis. The technical name for this is “carbon sequestration”. Oxygen, which is not a greenhouse gas, is released through respiration. By this process, most of the “carbon” is stored in the vegetation until it dies and decays. This also makes vegetation an important ingredient in reducing climate change. Trees are among the most important as they contribute upwards of 70% of all carbon absorbed by vegetative cover.

Over the last 150 years, there have been significant changes to the world's vegetative cover. Scientists think that 20% of the increase in greenhouse gases in the atmosphere is from reduced vegetative cover. By clear-cutting an area, for example, you reduce or eliminate its ability to absorb and store carbon out of the atmosphere.

### Now there's one more reason to hug a tree!

Tree planting is an important contribution Scouts of all ages can make to reducing climate change. With almost 10% (over 400 million ha) of the earth's forests in Canada, Canadians bear a large responsibility for forest stewardship.

Canada plans to promote the management of forests and agriculture as one means of reducing its greenhouse gas emissions. This will include creating new forests, reducing the permanent loss of forests through land-use change and improving forest management practices.

#### Give yourself a pat on the back.

Over the 30 year life of the program, it is estimated that Scoutrees has removed approximately two million tonnes of carbon dioxide from the atmosphere. That is equivalent to absorbing all the carbon dioxide emitted through energy use by 7.7 million single detached homes or 275,000 cars in Canada every year!

This won't be easy. Forests will become more vulnerable in the future because of climate change. Forests adapt very slowly. They will be subject to increased temperature, a drier (or wetter) climate and more frequent insect infestation and disease as a result of climate change. This will place them under great stress.

### The link between forests and climate change gets complicated.

The role that trees play in removing carbon dioxide from the atmosphere is complex. The crux of the problem is that trees can both absorb and give off carbon dioxide. Scientists from around the world, including Canada, are attempting to develop models to understand this process more accurately. What is known is that the age of trees in a forest stand affects its overall contribution to removing carbon. In general, a vigorously growing young forest absorbs more carbon through photosynthesis than it gives off. An old mature forest gives off more carbon, through decaying fallen leaves and branches, than it absorbs.

Forests also can be contributors to climate change in other ways. For instance, natural disturbances such as fires, insect infestations and disease damage forests and reduce their ability to store carbon. Although these disturbances are healthy for forests, they vary the ability of forest stands to reduce climate change from year to year.

## How many greenhouse gases will your Scoutrees project help to absorb?

Tree Canada Foundation has developed a simple equation to help Canadians figure out how much carbon a tree planting project might absorb. These numbers are estimates only, as calculating actual absorption of carbon is a complicated affair. Tree species, location, growing conditions, management, etc. are some of the factors that would be taken into account by a professional.

### Select the equation which suits your project:

If your Scoutrees project is located in an urban setting:

# trees planted  $\div$  400 = estimated tonnes of carbon dioxide removed each year

If your Scoutrees project is located in a rural setting:

# trees planted  $\div$  360 = estimated tonnes of carbon dioxide removed each year

If your Scoutrees project is planting trees where a forest has not grown for 50+ years:

# trees planted  $\div$  360 X 0.7 = estimated tonnes of carbon dioxide removed each year

NB: The above equation assumes that seedlings planted will live an average lifespan of 80 years.

Source: Tree Canada Foundation: "What Trees Can do to Reduce Atmospheric CO<sub>2</sub>".

### For more information on forests and climate change, visit:

Canadian Forestry Service: [http://www.nrcan.gc.ca/cfs-scf/index\\_e.html](http://www.nrcan.gc.ca/cfs-scf/index_e.html)

Government of Canada's Climate Change Site: [www.climatechange.gc.ca](http://www.climatechange.gc.ca)

Natural Resources Canada <http://www.nofc.forestry.ca/climate/>

World Resources Institute <http://www.wri.org/climate/sinks.html>

Canadian Forestry Association <http://www.canadianforestry.com/eng/teach/>

Tree Canada Foundation: <http://www.tcf-fca.ca/>