



Changing Tundra in Canada's North

by Isla Myers-Smith

Background

Canada's North is changing and Canadian researchers are at the forefront of the research effort to understand the dynamics of the tundra biome. One of the most prominent changes being observed is an increase in shrubs. Shrub species are the trees of tree-less tundra ecosystems. They often grow taller than the other plants, have woody stems and can alter the microclimate by shading soils and trapping snow. Shrub species are able to take advantage of the short growing season in tundra ecosystems and grow relatively rapidly if conditions are right.

The Research

Sarah Elmendorf and Greg Henry at the University of British Columbia have led a recent international synthesis of 61 experimental warming studies, of up to 20 years in duration, in tundra sites worldwide. The major finding of this study was a positive response of shrub species and other functional groups to experimental warming [3]. In a second synthesis of plot-based monitoring during the last three decades at 46 tundra study sites, biome-wide trends of increased canopy height for most plant groups, increased abundance of shrub species and a decrease in the cover of bare ground were observed [4]. Shrubs were found to be increasing most rapidly at sites that were warming, and were changing less at sites where the temperature has remained more stable. These large-scale studies indicate increases in plant growth and cover with warming in tundra ecosystems; however, there is a lot of variation in the observed patterns between sites.

Why It Concerns Canada

These studies provide the most comprehensive analysis of plot-based and experimental warming data to date indicating a greening of the tundra biome. This research was an international collaboration of nearly 50 researchers from 12 different countries and were lead by researchers in Canada. The research would not have been possible without funding from the Canadian Government. The findings highlight the importance of ecological monitoring and global coordinated efforts to understand climate change, which will have profound impacts in the Canadian North.

To learn more

The International Tundra Experiment: <http://www.geog.ubc.ca/itex/about.php>

Climate Change Impacts on Canadian Tundra Ecosystems: <http://ipyttundra.ca/>

The Shrub Hub Research Network: <http://shrubhub.biology.ualberta.ca/>



1987



2009

Shrub increases in the Western Canadian Arctic (Myers-Smith et al. 2011)

The NSERC Discovery Program: Promoting discovery and fostering innovation in ecology and evolution.

www.nserc.ca, www.ecoevo.ca

