



CO2, methane, water vapour flux studies: As the region was going through such rapid changes, Dr Quinton's original hydrology studies expanded to include scientists from other disciplines

Photo Credit: Courtesy W Quinton

Research shows permafrost and ecosystems in subarctic changing quickly

By [Marc Montgomery](#) | english@rcinet.ca
 Monday 9 September, 2013 , [1 Comment](#) ↓



Fresh water is an absolute necessity of life, and is increasingly becoming a concern. Canada has one of the largest freshwater reserves in the world, much of it spread across northern sections of the country.

However little is known about its vulnerability to climate change and human activity. A good percentage of the reserves are in the permafrost in the subarctic and Arctic.



William Quinton has been studying the hydrology cycle in the subarctic at the

edge of the permafrost at a place called Scotty Creek in the Northwest Territories.

William Quinton, PhD , Laurier University, Waterloo Ont. © courtesy W. Quinton

He is Associate Professor & Canada Research Chair in Cold Regions Hydrology Department of Geography and Environmental Studies Wilfrid Laurier University, in Waterloo, Ontario.



Red balloon indicates Scotty Creek along the Liard River, about 50km south of the hamlet of Fort Simpson, NT. which is about 630km west by road from Yellowknife on Great Slave Lake
© google maps

During the years Dr Quinton and his team have been studying the hydrological cycle, they noticed the region where they were studying was quickly changing.

The areas of permafrost were experiencing substantial thawing, and along with them, the forested area which only exists above permafrost in the region.

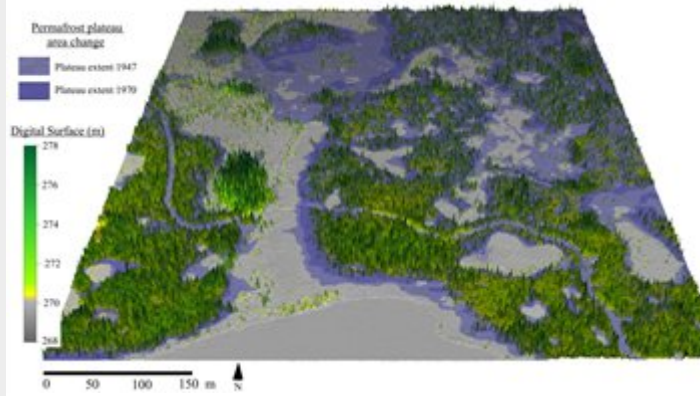
The permafrost beneath the ground is at a temperature only fractionally below freezing, and as the warming trend increases in the north, it penetrates further into the ground and permafrost thaws.

As the water melts out of the icy earth, the earth sinks and the depressions fill with water which kills the trees. The result is that forested areas recede year after year as more bogs and channel fens replace them.

Dr Quinton notes that climate change is having a much more dramatic effect in the north, than in lower latitudes, and in some places the edge of the permafrost is receding at a rate of a metre per year.

He adds that their research camps have had to be moved several times over the years as the permafrost, which supports a stable surface, thaws, sinks, and the area becomes flooded.

Along with the changes to the extent of forest cover, and the actual composition of the forests, the melting permafrost also has the potential to alter other key aspects of ecosystems.



Research area, purple shows permafrost and forest retreat since 1947, in many spots, dozens of metres. © courtesy, Quinton, Lauer U

These include things like runoff and snowcover, biodiversity, and habitat for keystone species.

Other changes include surface-atmosphere interactions including greenhouse gas fluxes, forest fire regimes and the quantity and quality of water flows to downstream ecosystems and the Arctic Ocean.



Installing deep temperature sensors in the forested area which exists only above permafrost areas, which have been retreating in some spots at a metre per year. © Courtesy W Quinton

Local communities have also told researchers that typical trapping seasons have changed dramatically as they have to wait much later into the season before the ground freezes thoroughly in winter enabling them to walk without sinking as they set and retrieve traps. It also makes

snowmobile travel more hazardous.

Even NASA has become involved in the widened scope of the research in correlating satellite and high-level imaging with research findings on the ground by both Canadian researchers and other visiting scientists.

Dr Quinton says there is a great deal of new and important research being performed by this wide variety of scientists from differing fields who visit the camp.

He adds while their research is extremely interesting, there is also a deep concern among the scientists about the rapid pace of the change and the uncertainty of what these changes will mean.

He says the research being conducted by Laurier University researchers and the many scientist working in the north is therefore extremely important as they work towards a better understanding of the highly complex interactions and feedbacks among climate, water, biogeochemistry, and the ecology of subarctic ecosystems.



Tagged with: Laurier University, Northwest Territories, permafrost research, Quinton
Posted in Environment, Internet, Science and Technology

Do you want to report an error or a typo?
[Click here!](#)

More stories

« **Royal Canadian Mint celebrates 75th anniversary of Superman**
Montreal's 'Mois de la photo' biennale focuses on photography itself
»

Leave a Reply

Your email address will not be published. Required fields are marked *

Comment

1800 characters available

Note: By submitting your comments, you acknowledge that Radio Canada International has the right to reproduce, broadcast and publicize those comments or any part thereof in any manner whatsoever. Radio Canada International does not endorse any of the views posted. Your comments will be pre-moderated and published if they meet netiquette guidelines.

Netiquette »

Name *



Email *

Website

Post Comment

One comment on “Research shows permafrost and ecosystems in subarctic changing quickly”



Peter Ashcroft says:

15 September 2013 at 12 h 20 min

Most illuminating, and somewhat alarming. Huntingdon is close to East Anglian fenlands, but permafrost does not come into the picture. Drainage is the main problem here.

[Reply](#)

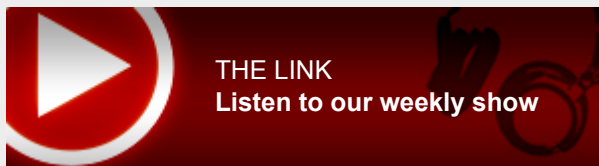
Join us live every Friday as of 13:15 Montreal time, [here](#)

Search by

CATEGORY

AUTHOR

Listen to us



All shows

Subscribe to our podcast

Subscribe to our podcast (iTunes)

ICI RADIO-CANADA  Première

 radio one

ICI  musique

 radio 2

Follow us



On Facebook



Like



Share

17K people like this. [Sign Up](#) to see what your friends like.



On Twitter



Subscribe to the Cybermagazine

YOUR CHOICES

HIGHLIGHTS

ADDITIONAL
LANGUAGES



ARTS AND ENTERTAINMENT, IMMIGRATION & REFUGEES, SOCIETY

St. Patrick's Day parade, the 195th edition in Montreal



RADIO-CANADA.CA

CBC.CA

Fired conductor James Levine sues Metropolitan Opera

Canadian Geographic is taking a closer look at its racist past

Law firm made famous by Panama Papers document leak announces it's closing

Number of Canadian soldiers on UN
peacekeeping missions hits new low

Good Samaritan stops to help driver, gets
his car stolen

Father of British-Canadian accused of
joining ISIS hopes to plead son's case in
Canada next week



All rights reserved @ Radio Canada International 2013

Subscriptions

[Cybermagazine](#)
[Podcast](#)
[Podcast \(iTunes\)](#)
[RSS Feed](#)
[Facebook](#)
[Twitter](#)

Archives

[June 2012 - April 2013](#)
[2006-2012](#)

[↑ Scroll to top ↑](#)

Other sites

[Technical Assistance](#)
[FAQ & Forum](#)
[Radio-Canada.ca](#)
[Conditions d'utilisation](#)
[Ombudsman](#)
[CBC.ca](#)
[Transparency and Accountability](#)
[Ombudsman](#)

Visit our strategic partners



[swissinfo.ch](#)



[Radio Prague](#)
Czech Radio

