

Arctic getting greener

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“We’ve managed to show that the vegetation changes in our fixed plots are a result of local warming at numerous sites across the world’s tundra,” Robert Björk says. Photo: Ulf Molau och Robert G. Björk

Recent years' warming in the Arctic has caused local changes in vegetation, reveals new research by biologists from the University of Gothenburg, Sweden, and elsewhere published in the prestigious journals *Nature Climate Change* and *Ecology Letters*.

The results show that most [plants](#) in the [Arctic](#) have grown taller, and the proportion of bare ground has decreased. Above all, there has been an increase in evergreen shrubs.

"We've managed to link the vegetation changes observed at the different sites to the degree of local warming," explains researcher and biologist Robert Björk from the University of Gothenburg.

Shrubs and plants more widespread

Comparisons show that the prevalence of vascular species, such as shrubs and plants, is increasing as temperatures rise. The degree of change depends on climate zone, [soil moisture](#) and the presence of permafrost.



This shows the Arctic getting greener. Photo: Ulf Molau och Robert G. Björk

Researchers working on the International Tundra Experiment (ITEX) have been gathering data for almost 30 years. By analysing changes in vegetation in 158 plant communities at 46 locations across the Arctic between 1980 and 2010, they have been able to identify a number of general trends.

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Summer temperatures and soil moisture implicated

ITEX was started up in the USA in 1990 when agreement was reached on a joint manual with standardised protocols which have since been used throughout the Arctic.

"The response of different plant groups to rising temperatures often varied with summer ambient temperature, soil moisture content and experimental duration, with shrubs expanding with warming only where the ambient temperature was already high, and grasses expanding mostly in the coldest areas studied," explains Ulf Molau, professor of plant ecology at the University of Gothenburg and for many years a member of the Intergovernmental Panel on [Climate Change](#) (IPCC).

Major changes

The results indicate strong regional variation in the response of tundra vegetation to rising temperatures.

"This means that particularly sensitive regions following the combined effects of long-term warming in the Arctic may see much greater changes than we have observed to date," Ulf Molau says.

This is a timely insight now that Sweden, as chair of the Arctic Council in 2011-13, has prime responsibility for producing the Arctic Resilience Report. Experience from ITEX will also be used in the next IPCC assessment report in 2014.

More information: *Nature Climate Change:*
www.nature.com/nclimate/journal/vol11/no12/nclimate1465.html
Ecology Letters: onlinelibrary.wiley.com/doi/10.1111/ele.12116

Provided by University of Gothenburg

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