



## CANADIAN FOREST SERVICE

## Science HIGHLIGHTS

GEOGRAPHIC  
INFORMATION SYSTEMS

## How will a new map help boreal forest research?

### New map creates common baseline for North America's boreal zone

Canada's boreal forest region was last mapped almost 40 years ago, but then little was done over the following decades to update its boundaries. Without a current map, analyzing boreal characteristics was hampered by inconsistencies. Today, a common understanding of what constitutes the North American boreal zone is becoming a reality.

Dr. James Brandt of the Canadian Forest Service–Natural Resources Canada has created an updated map using the latest technology and data. This standardized map will allow researchers and others interested in the boreal region to rely on a common baseline for comparison.

#### How was the map developed?

Existing maps of North America's boreal zone<sup>1</sup> and its forests<sup>2</sup> had to be scanned, digitized and converted to geographic information systems (GIS).

"The rapid development of GIS data and recently developed spatial data sets provided new data that could be combined to develop a complete North American boreal zone map," says Brandt. His two-and-a-half year project to produce the map also involved referencing the work of more than 450 other researchers and scientists. "The map of the North American boreal zone should be considered a refinement of the 1972 maps of Rowe for Canada and of Viereck and Little for Alaska," says Brandt of these seminal map-makers.

The map can also be seen as a work in progress. As available information is improved and updated, GIS can be used to update and refine the map's boundaries. This will ensure that the map is always a leading-edge resource for researchers.

#### Who will use this new map?

"Scientists, regulators and environmental groups can use the map to create a common baseline or standard to measure the success of conservation efforts

#### Overview

The new map is set to play a big role in increasing our understanding of the boreal zone and the effects of human development in the zone.

The map will help with resource development, land-use planning and studies of boreal ecology and biodiversity.

Rapid development of geographic information systems (GIS) and spatial data sets provided new data to develop a detailed and precise North American boreal zone map.



<sup>1</sup> The boreal zone is the broad, circumpolar vegetation belt of high northern latitudes covered with forests and other wooded land consisting of cold-hardy trees primarily within the genera *Abies*, *Larix*, *Picea*, or *Pinus* but also *Populus* and *Betula*

<sup>2</sup> The boreal forest is the portion of the boreal zone that is made up of forests and other wooded lands

against future changes in the North American boreal zone," Brandt says. "Now we can be confident that everyone is comparing apples to apples when we refer to the boreal forest."

The world's focus on climate change and the role the boreal forest could play in mitigating such change is just one important example of how having a shared and accurate view of the boreal forest will become increasingly important in the years ahead. The map will help with a wide variety of applications related to resource development, land-use planning and studies of boreal ecology and biodiversity.

### **How is this new map being received internationally?**

Brandt's work is being used to inform discussions at the international level. He and 15 other scientists from across Canada and Alaska held a workshop in Sault Ste. Marie in late November 2009 as part of the Circumboreal Vegetation Map Project. The first international meeting on the project featured 10 northern countries in November 2008, in Helsinki, Finland.

The circumpolar project recognizes the boreal zone as a single biogeoclimatic area with a common set of ecological, cultural, political and economic issues. The global boreal map will be the first detailed vegetation map of the zone. It will have a common legend and language for defining and describing the boreal zone around the northern hemisphere.

### **How is this new map changing how we look at the boreal forest?**

Brandt's work is bringing coherence to existing maps and information that show differing boundaries and terminologies for the boreal forest. Existing boreal maps are often of low resolution, which means they have little value for estimating area. "Methodologies and terminologies of researchers have varied, and this has led to different opinions on limits of the boreal zone in various regions," Brandt notes.

Given the boreal zone's importance to Canadians and its key role in regulating global and regional climates and biogeochemical cycles—the chemical, physical, geological and biological processes and reactions that govern the composition of the natural environment—the new map is set to play a major role in increasing our understanding of the boreal forest and the effects of human development in the zone.



Prince Albert National Park, Saskatchewan