

vegetation cover from satellite imagery

[Bear biologist Grant McHutcheon describes the vegetation on the ground and compares this to satellite imagery in a process called ground-truthing. [JP]



It is difficult to get detailed information on what plants cover our land because areas like the Peel River watershed are remote and therefore expensive to do research in. One solution to this problem is to use satellites in space to give us a better picture of the land.

Map 11 is based on images taken by just such a satellite. The Advanced Very High Resolution Radiometer (AVHRR) sensor on board the United States National Oceanic and Atmospheric Administration (NOAA) satellites took pictures of Canada at a resolution of 1.1 kilometres. Then, scientists from the Laurentian Forest Research Centre, the Canadian Forest Service, and the Canada Centre for Remote Sensing took the images and tried to match colours on the images with distinct vegetation types on the ground in a process called vegetation classification. The idea behind this method is that different vegetation types will reflect light back to the sensor differently and this results in different colours on the image. Put simply, the task of the scientists is then to figure out what colour responds to what vegetation type. Although not 100% accurate, the resulting classification scheme gives us a general idea of what the vegetation looks like in a specific region.

Similar work was done in Alaska using slightly different AVHRR imagery. The two datasets from Alaska and Canada were then merged to produce the data displayed on Map 11. In total, this merged dataset identified 11 different cover types in Alaska and Canada, 7 of which occur in the area of interest shown in this atlas.

Forests have been classified into needleleaf forests (consisting of coniferous trees such as black and white spruce) and broadleaf forests (consisting of deciduous trees such as aspen and balsam poplar).

A large part of the map shows tall and low shrubs, which could include all kinds of different willows and scrub birch.

Herbaceous plants are plants that do not have woody parts, such as grasses, lupines and fireweed. According to the map large numbers of herbaceous plants can be found on the Yukon-Northwest Territories border in the north. Clearly these kinds of plants occur elsewhere in the Peel Watershed as well, however they often grow in amongst the shrubs and trees so that they are difficult to capture on the image. Also, keep in mind that the resolution of the image is 1.1 kilometres. That means that a little individual

speck of colour on the image covers an area of 1.1 km by 1.1 km. There could be all kinds of different vegetation types growing in such a large area, but in the end scientists can only give that little speck one vegetation classification. The areas on Map 11 that show herbaceous plants are just areas where herbaceous plants are the main ground cover. They undoubtedly occur in other areas as well.

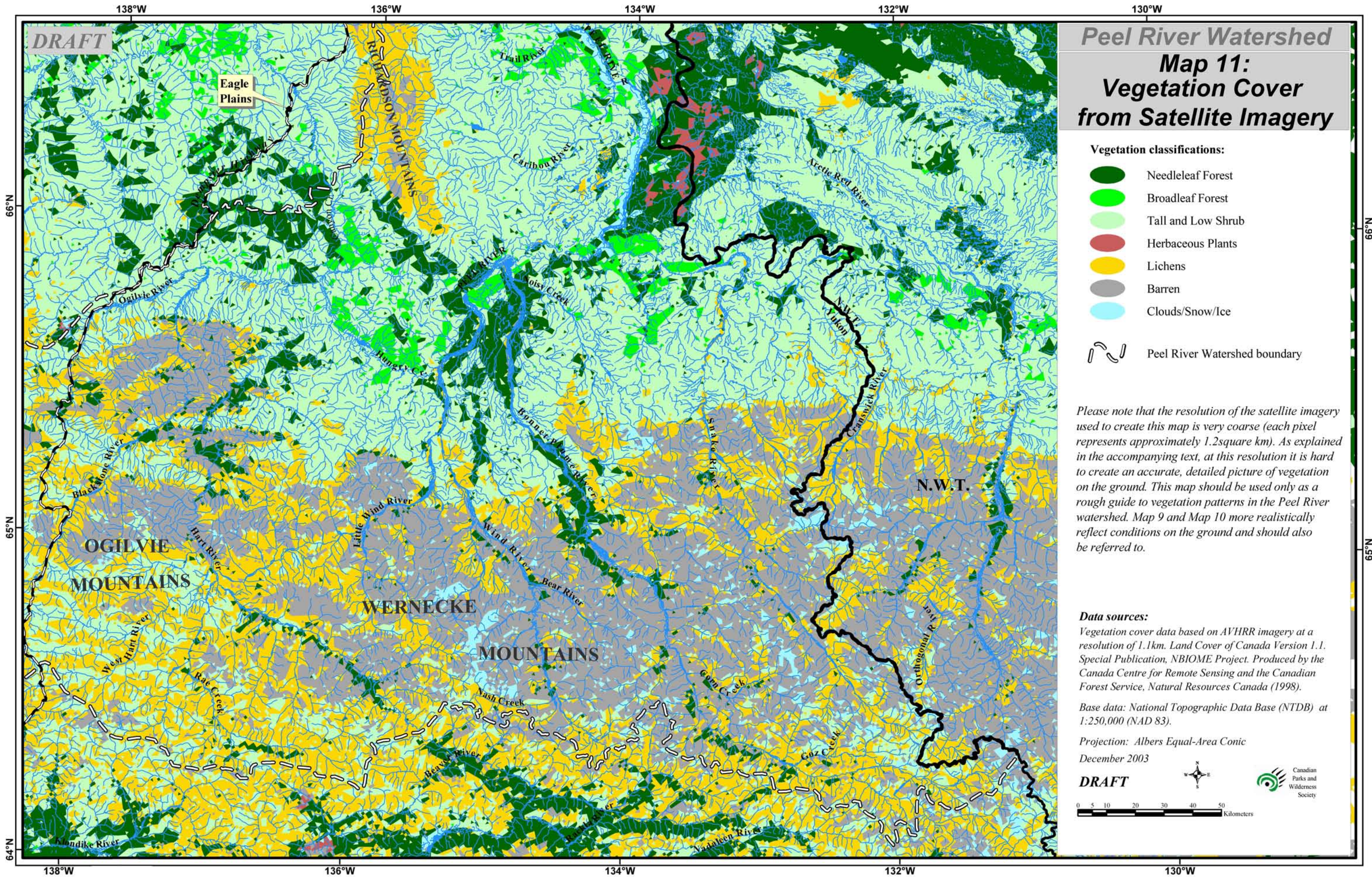
There also appear to be a lot of lichens growing in the Wernecke and Ogilvie Mountains, as indicated by the yellow colour on the map. Further “ground-truthing” by researchers is required to determine whether this is actually the case. Lichens are important food for caribou so it would be valuable to find out how much is actually available to caribou in different regions.

Finally, as expected, the barren areas occur in the Wernecke and Ogilvie Mountains as well as some spots in the Richardson Mountains. In some instances clouds, snow or ice obscured the picture and scientists were unable to tell what type of vegetation lay underneath. These areas are indicated in light blue.

When looking at this map, keep in mind that it gives only a general picture of what the

vegetation is like in the Peel River watershed. More detailed information would require further research.

In 1996 and 1997 researchers hired by CPAWS worked on a habitat classification study in the Snake and Bonnet Plume river watersheds (MacHutcheon, 1997 and MacHutcheon, 1998). Plant communities were sampled on the ground using plots 20 metres in diameter. Twenty-two different plant communities were distinguished in the Snake and Bonnet Plume river valleys. Attempts were then made to correlate the plant communities on the ground with satellite imagery of the study area. Currently, Ducks Unlimited is working on a more accurate and more detailed classification of the vegetation in this region, using more advanced technology and doing more groundtruthing in the field. Once their information becomes available, a clearer picture of vegetation in the Peel River watershed will emerge.



Peel River Watershed
Map 11:
Vegetation Cover
from Satellite Imagery

- Vegetation classifications:**
- Needleleaf Forest
 - Broadleaf Forest
 - Tall and Low Shrub
 - Herbaceous Plants
 - Lichens
 - Barren
 - Clouds/Snow/Ice
- Peel River Watershed boundary

Please note that the resolution of the satellite imagery used to create this map is very coarse (each pixel represents approximately 1.2square km). As explained in the accompanying text, at this resolution it is hard to create an accurate, detailed picture of vegetation on the ground. This map should be used only as a rough guide to vegetation patterns in the Peel River watershed. Map 9 and Map 10 more realistically reflect conditions on the ground and should also be referred to.

Data sources:
 Vegetation cover data based on AVHRR imagery at a resolution of 1.1km. Land Cover of Canada Version 1.1. Special Publication, NBIOME Project. Produced by the Canada Centre for Remote Sensing and the Canadian Forest Service, Natural Resources Canada (1998).

Base data: National Topographic Data Base (NTDB) at 1:250,000 (NAD 83).

Projection: Albers Equal-Area Conic
 December 2003

DRAFT