

Boreal Forests



Boreal Forests

- **Coniferous forests** are mainly found in broad circumpolar belt across the northern hemisphere and on mountain ranges where low temperatures limit the growing season to a few months each year - thus too unfavorable for most hardwoods



Boreal, Canadian Rockies, Alberta



Taiga, Siberia

Boreal Forests

- Average daily temperature of 10°C is found in fewer than 120 days and cold seasons last 6 months. **Tundra** will form at the northern edge when there are 30 days only of average daily temperature of 10°C and cold season lasts up to 8 months



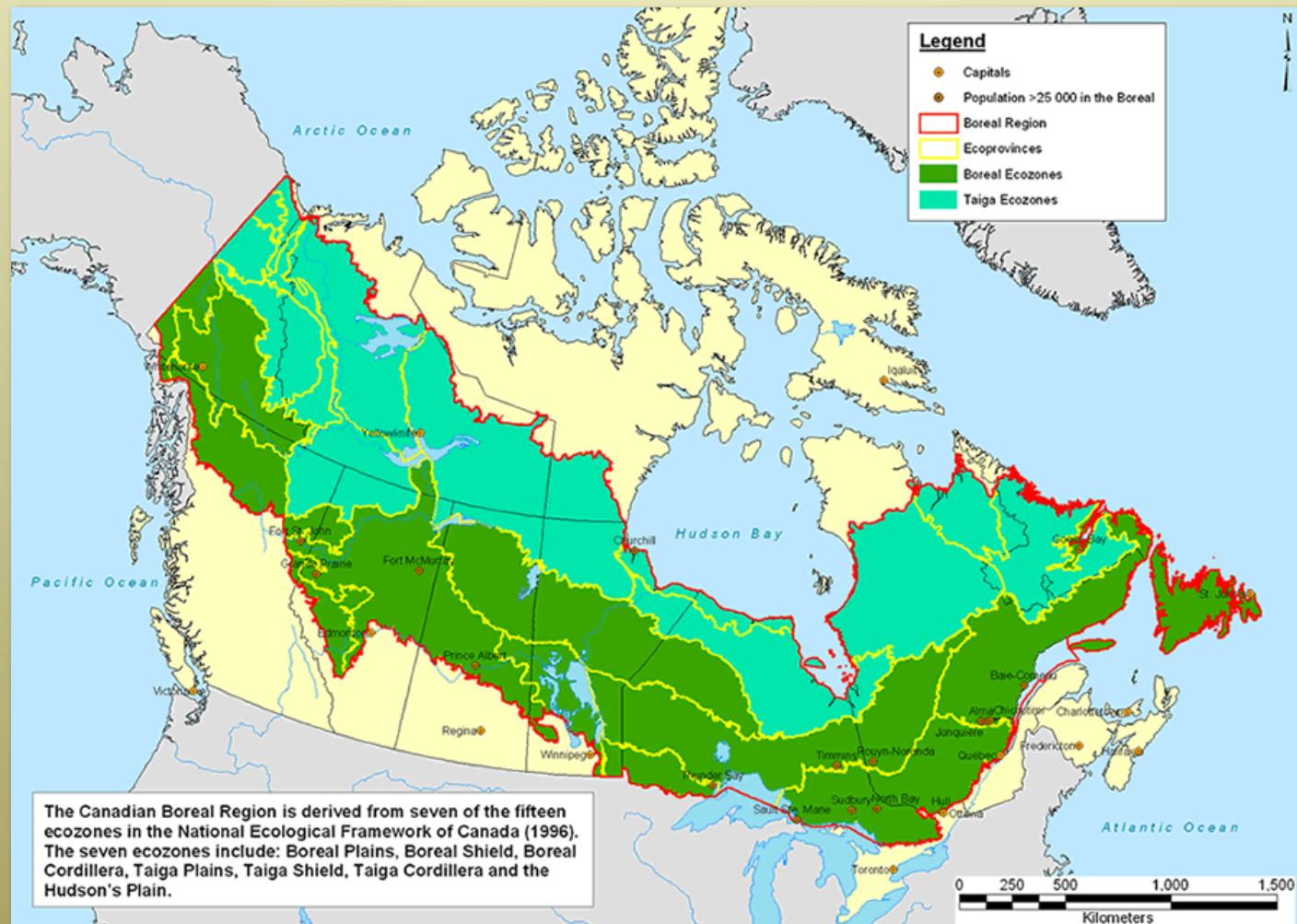
Boreal, Canadian Rockies, Alberta



Taiga, Siberia

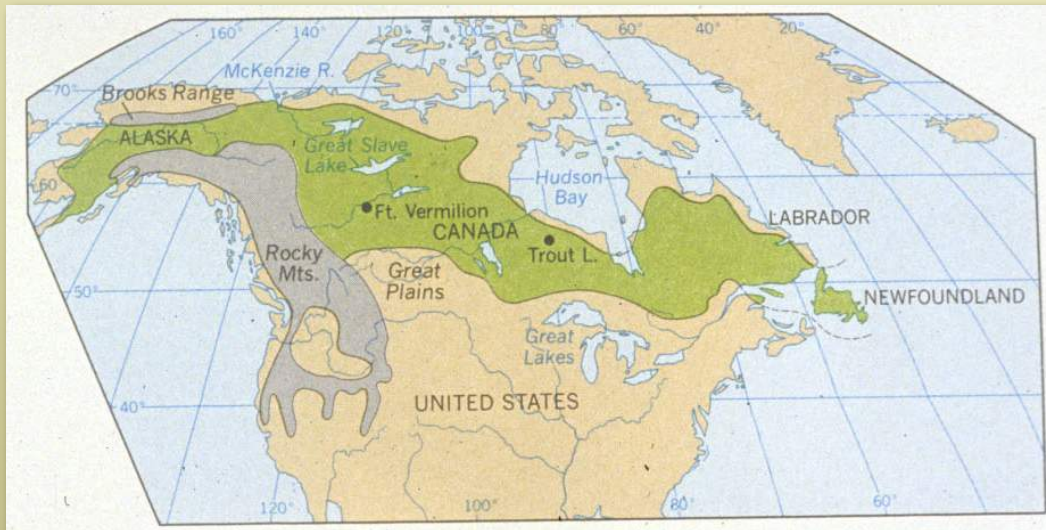
Boreal Forests

- The terms **boreal** and **taiga** are also used in more specialized sense - species diversity gradient from boreal to taiga to tundra

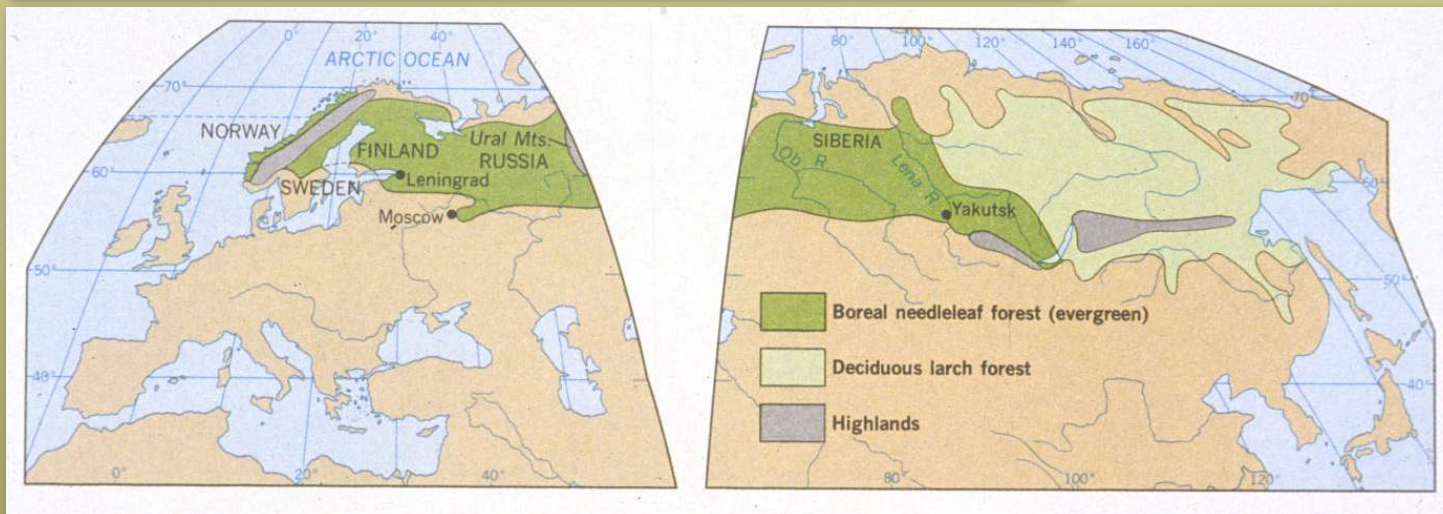


Boreal Forests

- Extends from Alaska to New Foundland. Furthest north extension at 69° in NW Canada.

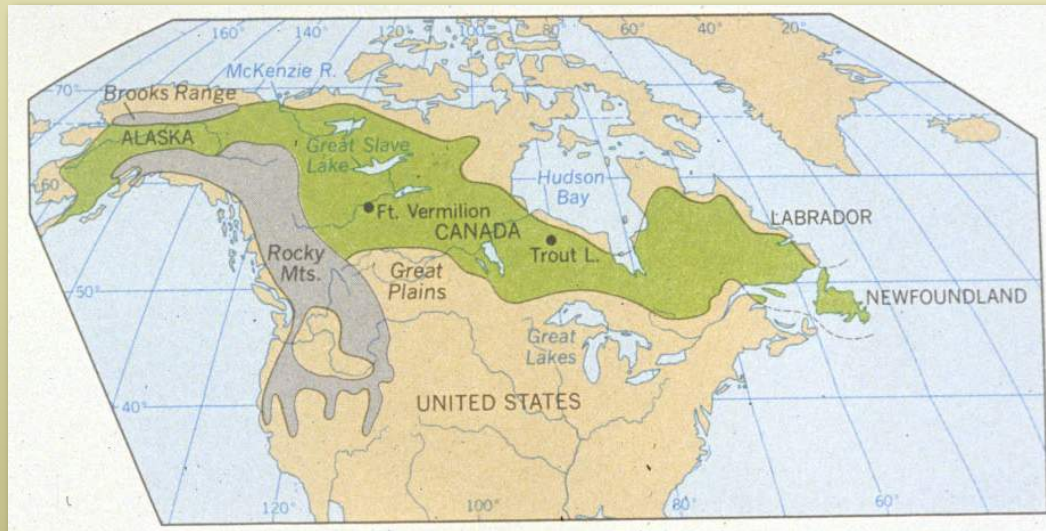


- Extends from eastern Scandinavia across northern Asia to the Pacific Ocean. Furthest north extension at 72° in Siberia.

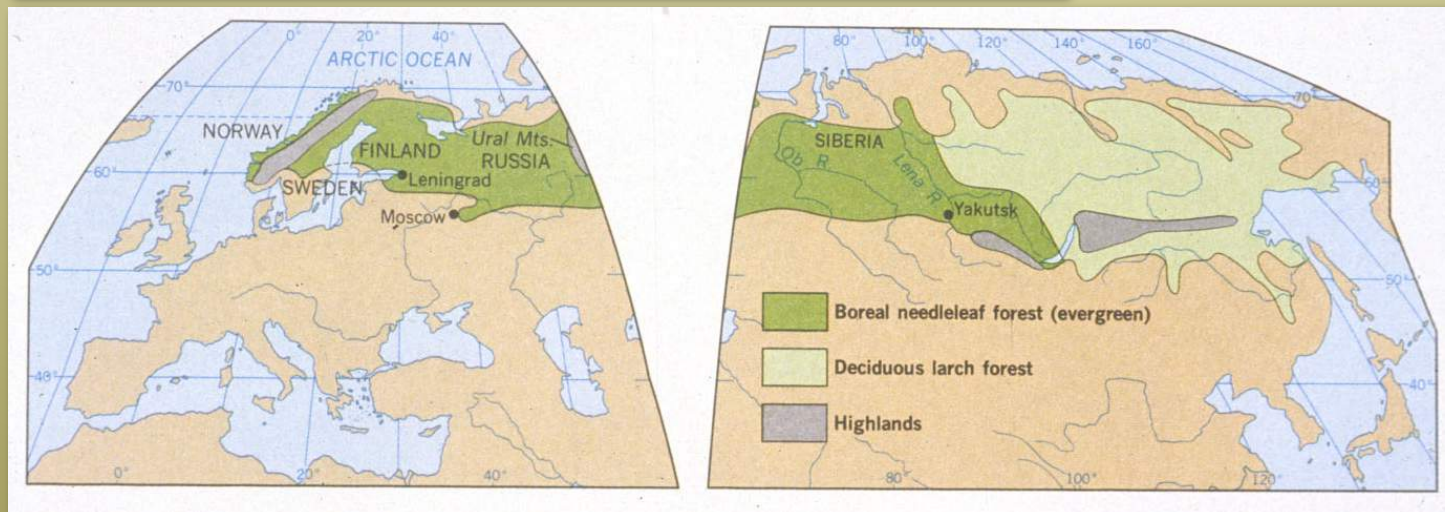


Boreal Forests

- The distribution of the biome (and thus individual species) is often called **circumboreal**

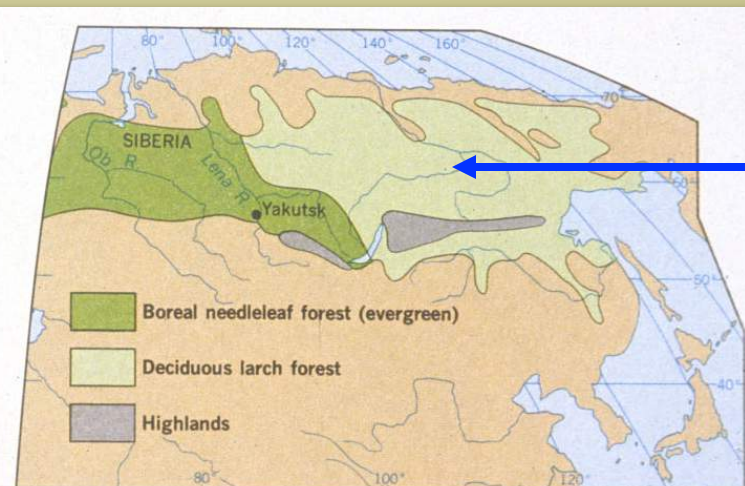


- The placement of southern continents precludes boreal formations in the southern hemisphere



Boreal Forests

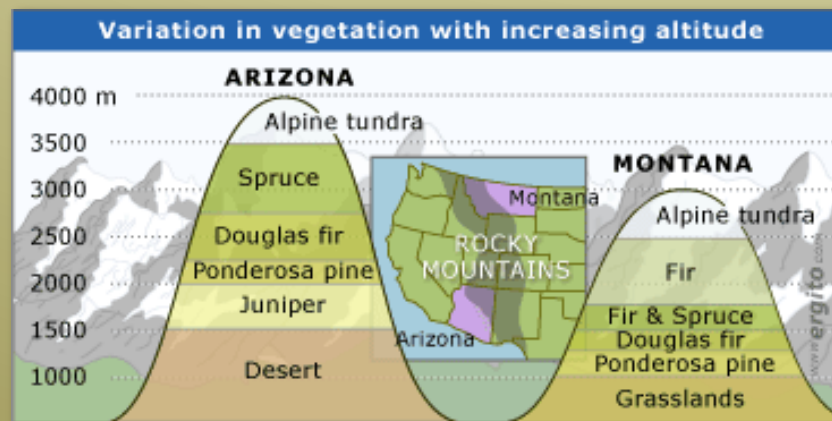
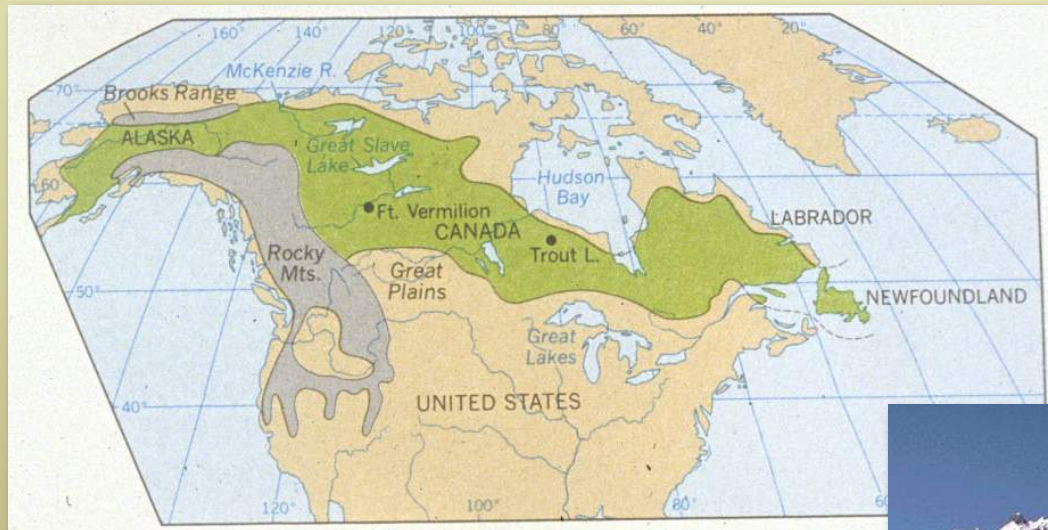
- Almost all the gymnosperms are evergreen, except *Larix* (larch)



Deciduous forest!

Boreal Forests

- The circumboreal biome is closely linked (vegetation and flora) to temperate montane forests



Boreal Forests

- The circumboreal biome is closely linked (vegetation and flora) to temperate montane forests



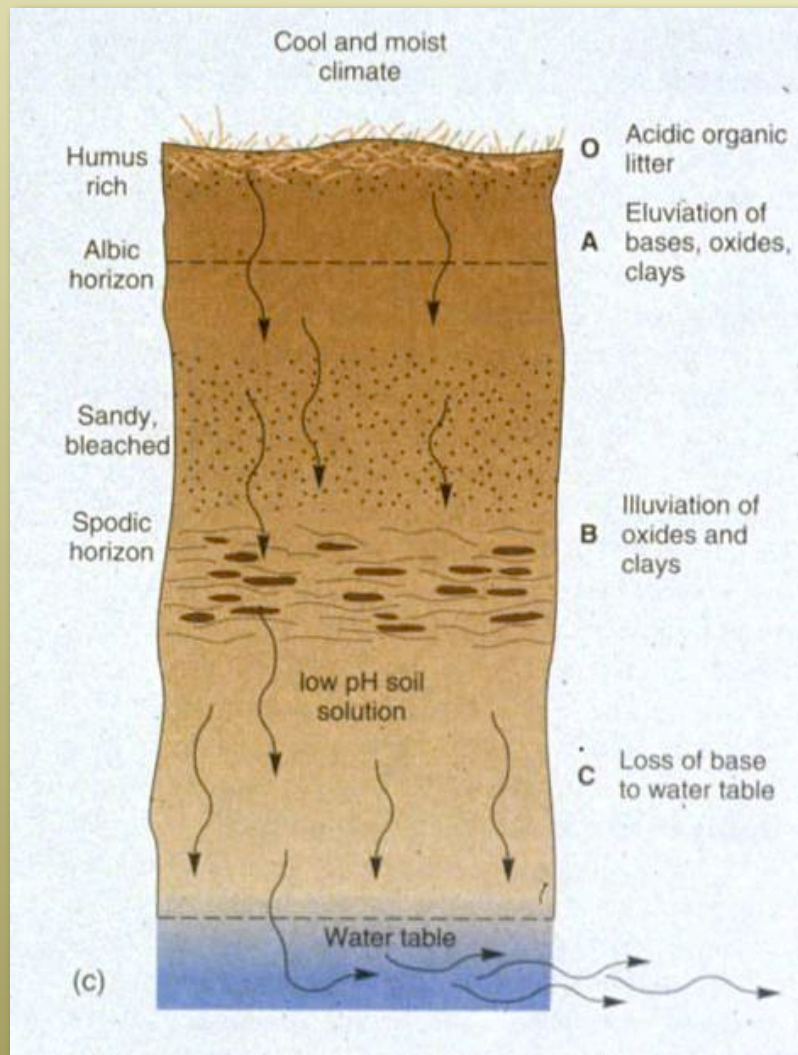
Ponderosa pine,
Mammoth, CA

Bristlecone pine, Great
Basin Natl Park, Nevada



Boreal Forests

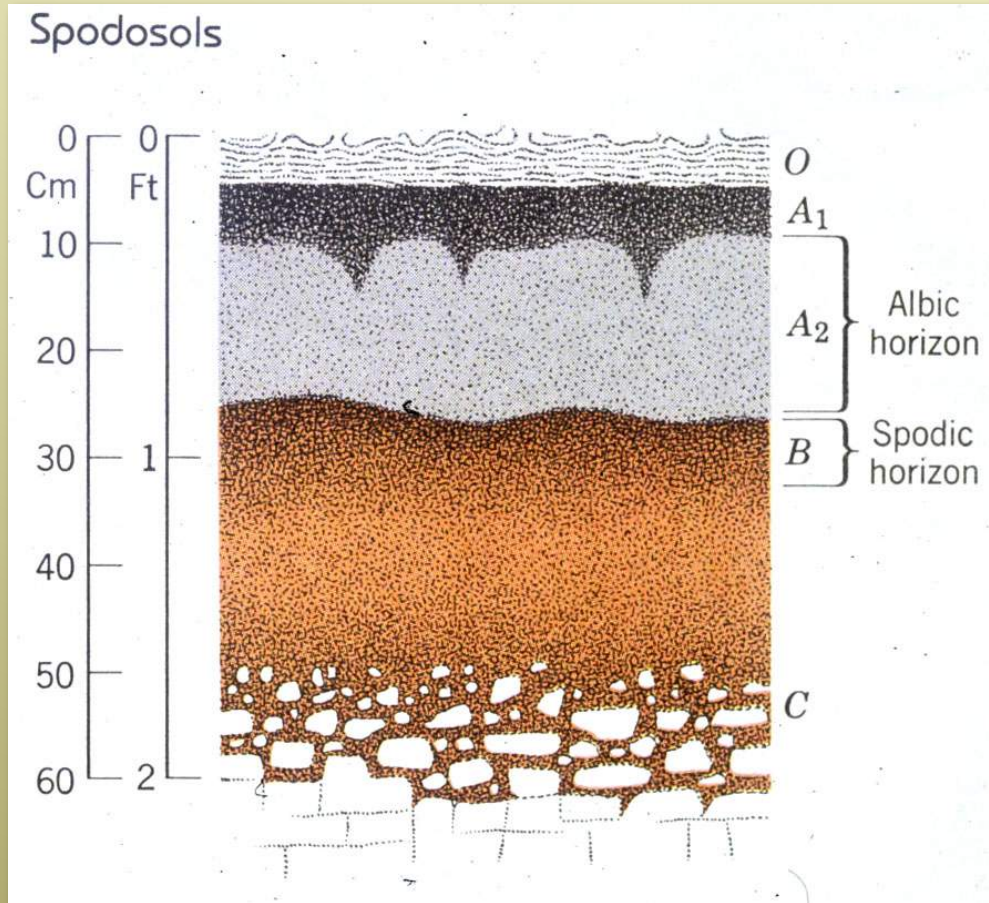
- Soil is 'spodosol' [podzol], heavily leached and acidic - infertile!



- Gymnosperm evergreen leaves are heavily protected by tannins, terpenes, and other acids

Boreal Forests

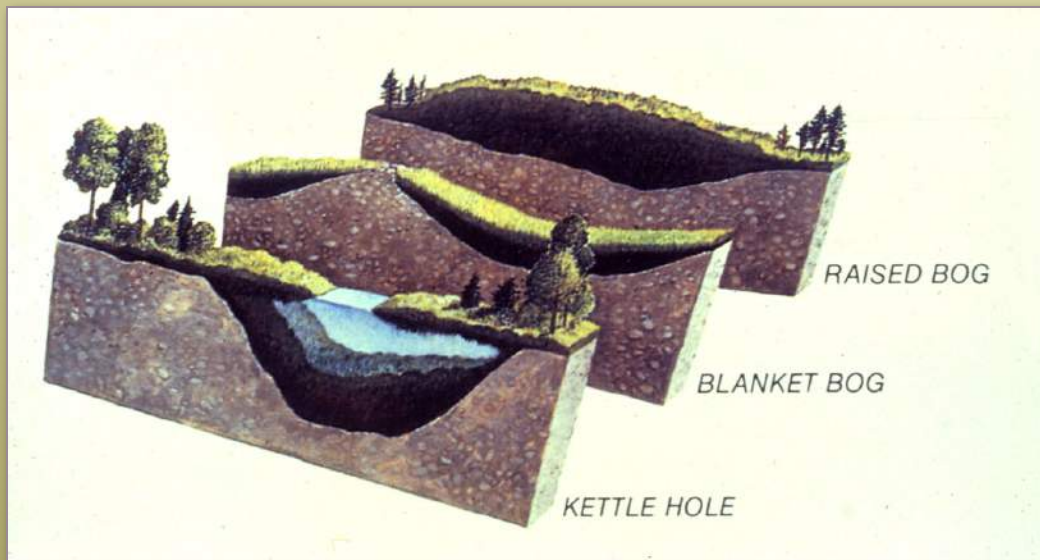
- Soil is 'spodosol' [podzol], heavily leached and acidic - infertile!



- A horizon is largely leached and ash-colored due to quartz sand (from glacial scouring)

Boreal Forests

- Landscape is young due to Pleistocene glacial activity which is reflected in poorly drained water systems - forms complex interactions of forests and various wetlands of fens and bogs



Canadian Shield fens

Boreal Forests

- Boreal forests and fire are closely linked

Hiawatha Natl Forest,
U.P. Michigan

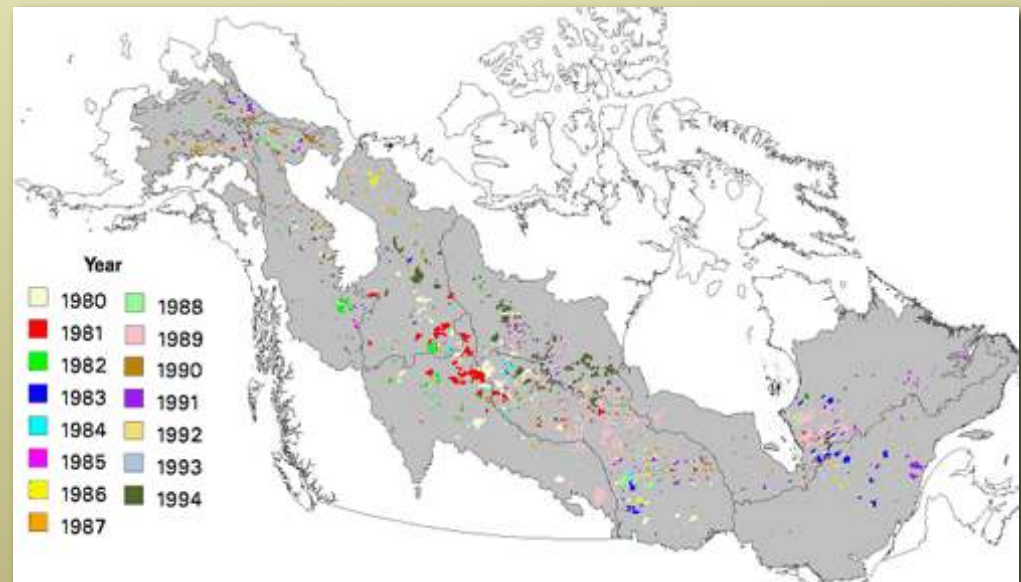


Northwest Territories, Canada



Boreal Forests

- Boreal forests and fire are closely linked - fire frequency is high!



Fire history in North American boreal forests

Boreal Forests

- Jack pine (serotinous cones), jack pine budworm, hymenopteran parasites, and fire - complex interactions



Boreal Forests

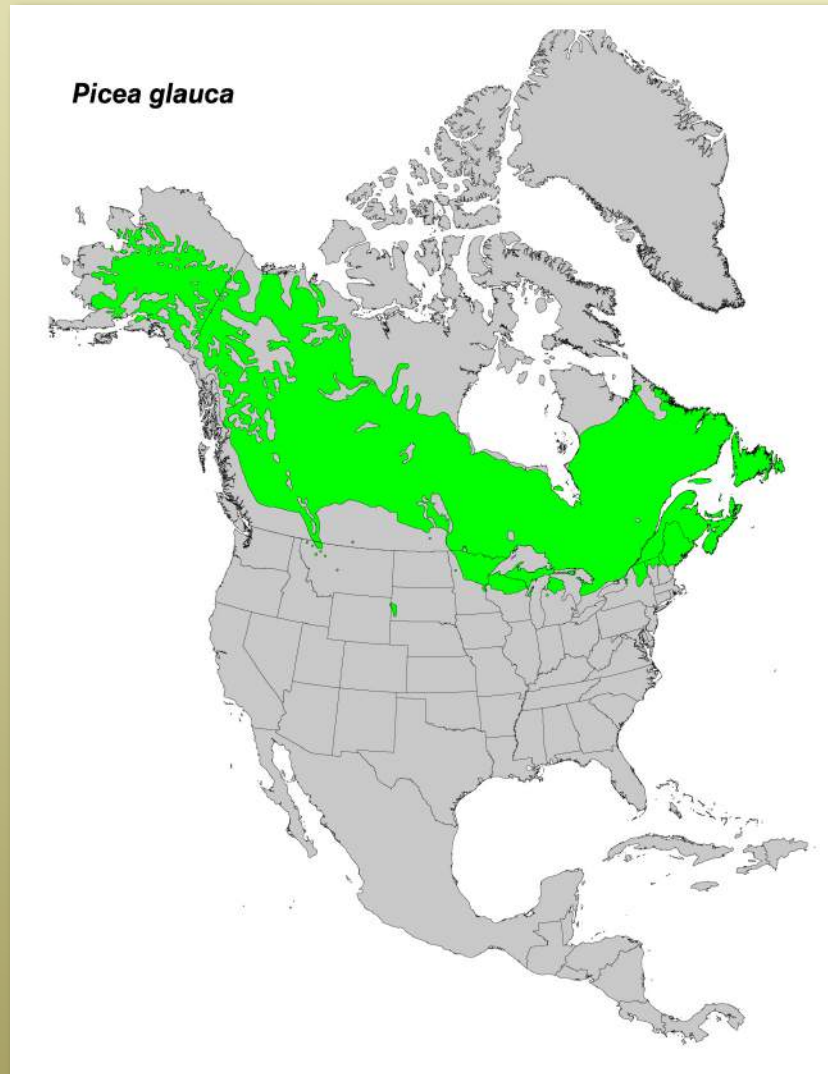
- North American floristics: gymnosperms and few angiosperm hardwoods



Fairbanks, Alaska

Boreal Forests

- North American floristics: **white spruce** most widespread N Am tree



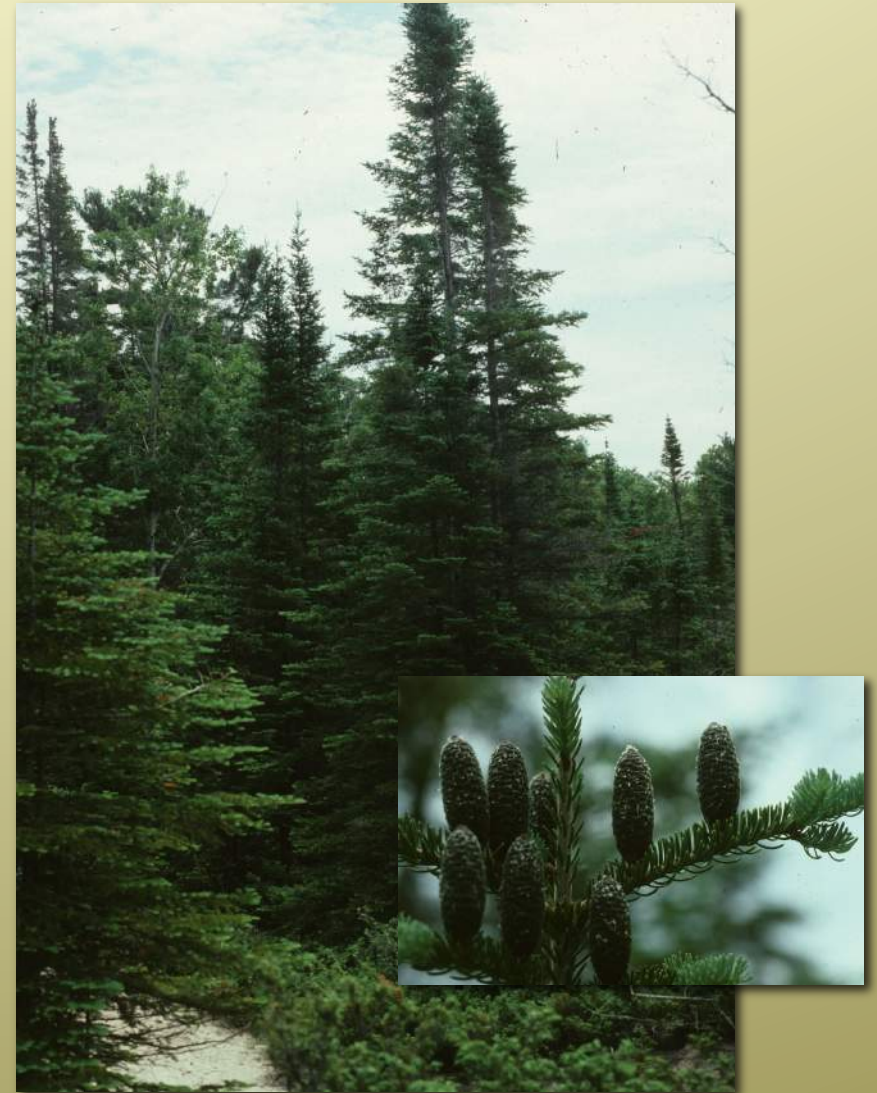
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- North American floristics: **black spruce** more specialized on poor soil



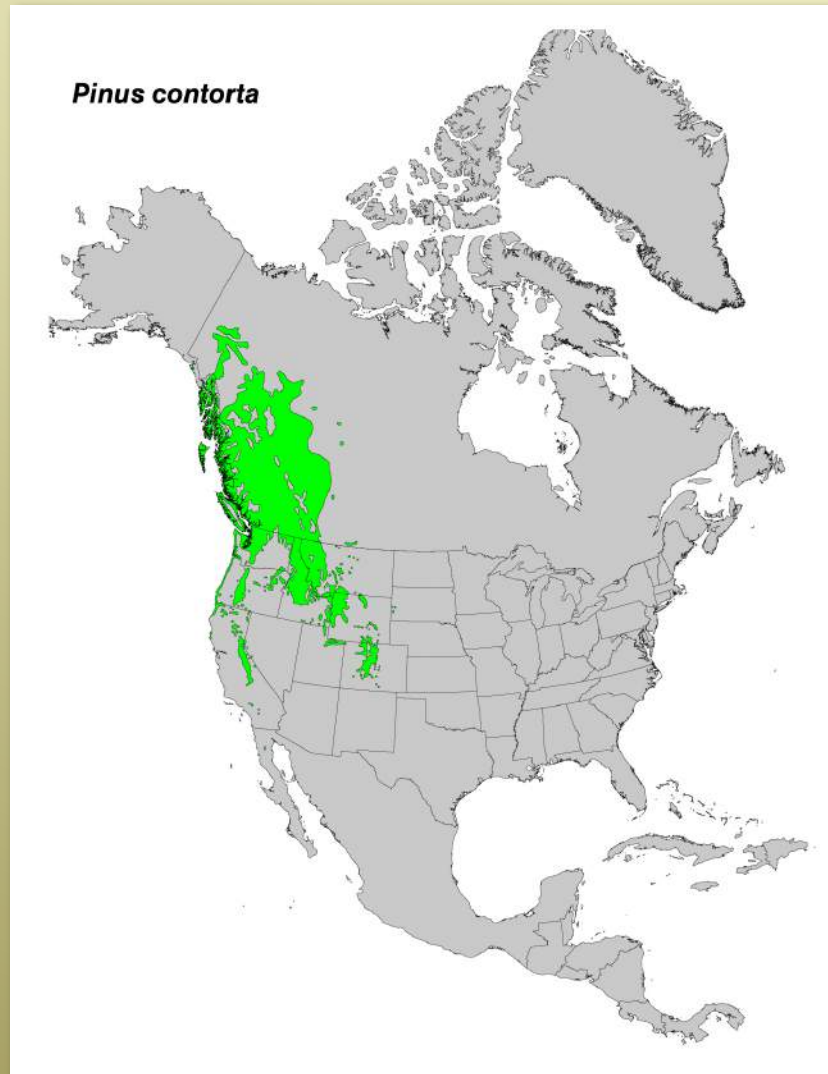
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- North American floristics: **balsam fir**



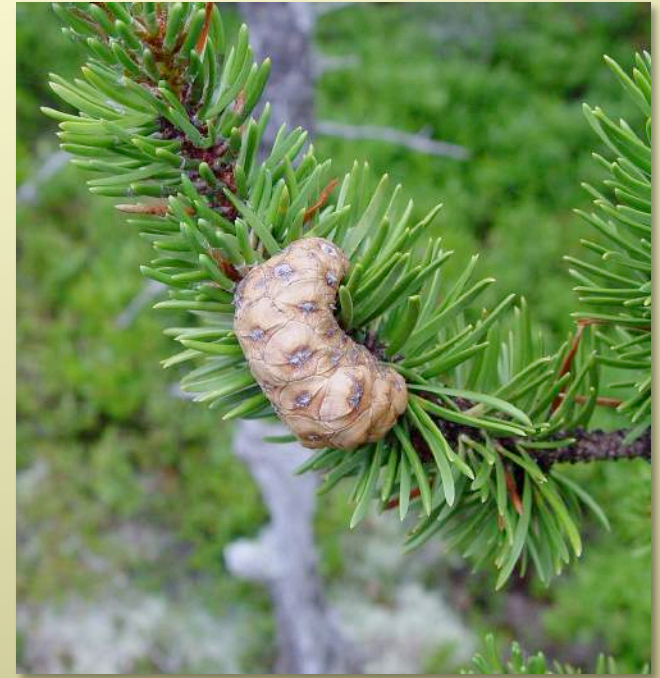
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- North American floristics: lodgepole pine



Boreal Forests

- North American floristics: **jack pine**



Boreal Forests

- North American floristics: tamarack, larch



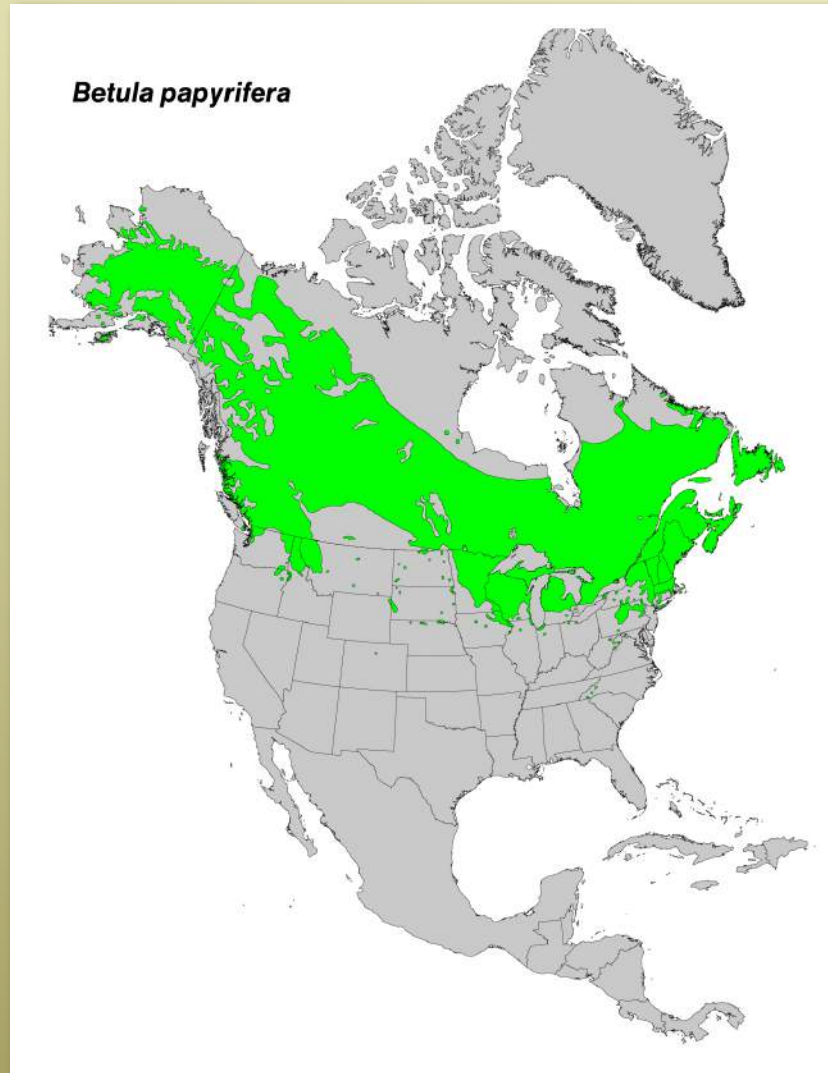
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- North American floristics: [white cedar](#), [arbor vitae](#)



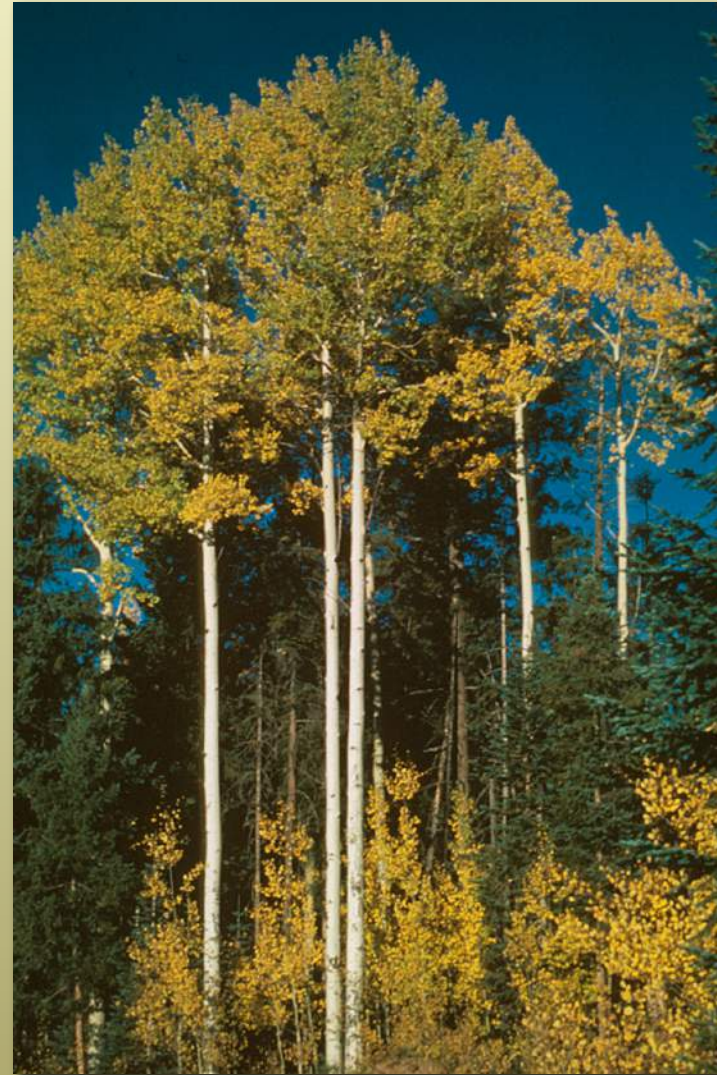
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- North American floristics: *white birch* - widespread angiosperm



Boreal Forests

- North American floristics: **trembling aspen** - widespread angiosperm



Boreal Forests

- North American floristics: ferns diverse



Pteridium aquilinum - bracken fern

Boreal Forests

- North American floristics: **subshrubs** - woody plants low to ground, often with mycorrhizal relationships (e.g., Ericaceae)



Linnaea borealis (Caprifoliaceae) -
twin flower



Vaccinium vitis-idaea (Ericaceae) -
mountain cranberry

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- North American floristics: [herbs](#)



Lycopodium obscurum - ground pine



Trientalis borealis - starflower



Maianthemum canadense - Canada mayflower

Boreal Forests

- North American floristics: [mycorrhizal parasites](#)



Pyrola (shinleaf)
Ericaceae



Monotropa (Indian-pipe)
Ericaceae



Corallorhiza (coral root)
Orchidaceae

Boreal Forests

- Eurasian floristics: significantly less diverse, three dominant trees



Larix decidua (larch)



Pinus sylvestris
(Scot's pine)



Picea abies (Norway
spruce)

