

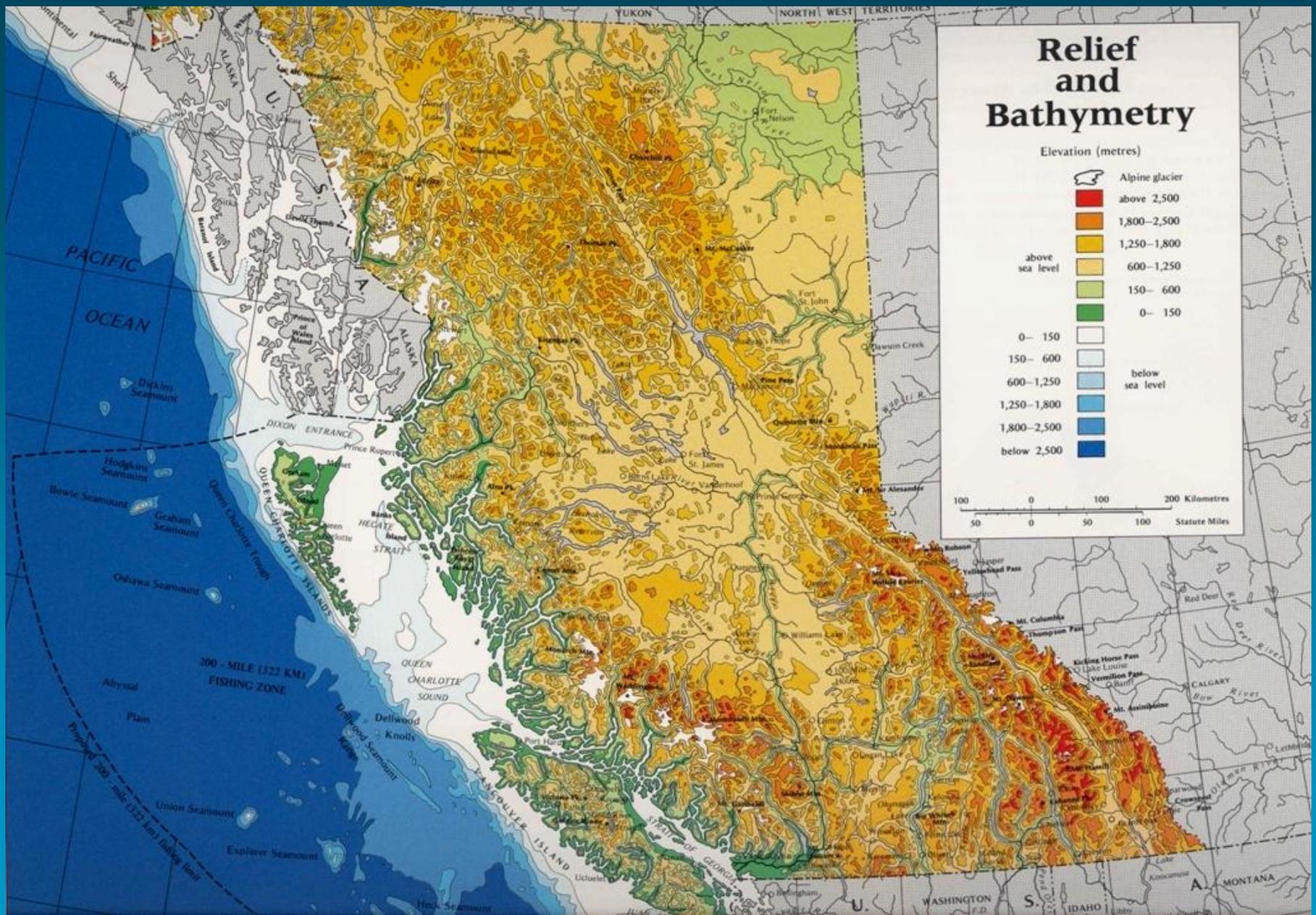


# Forestry in BC

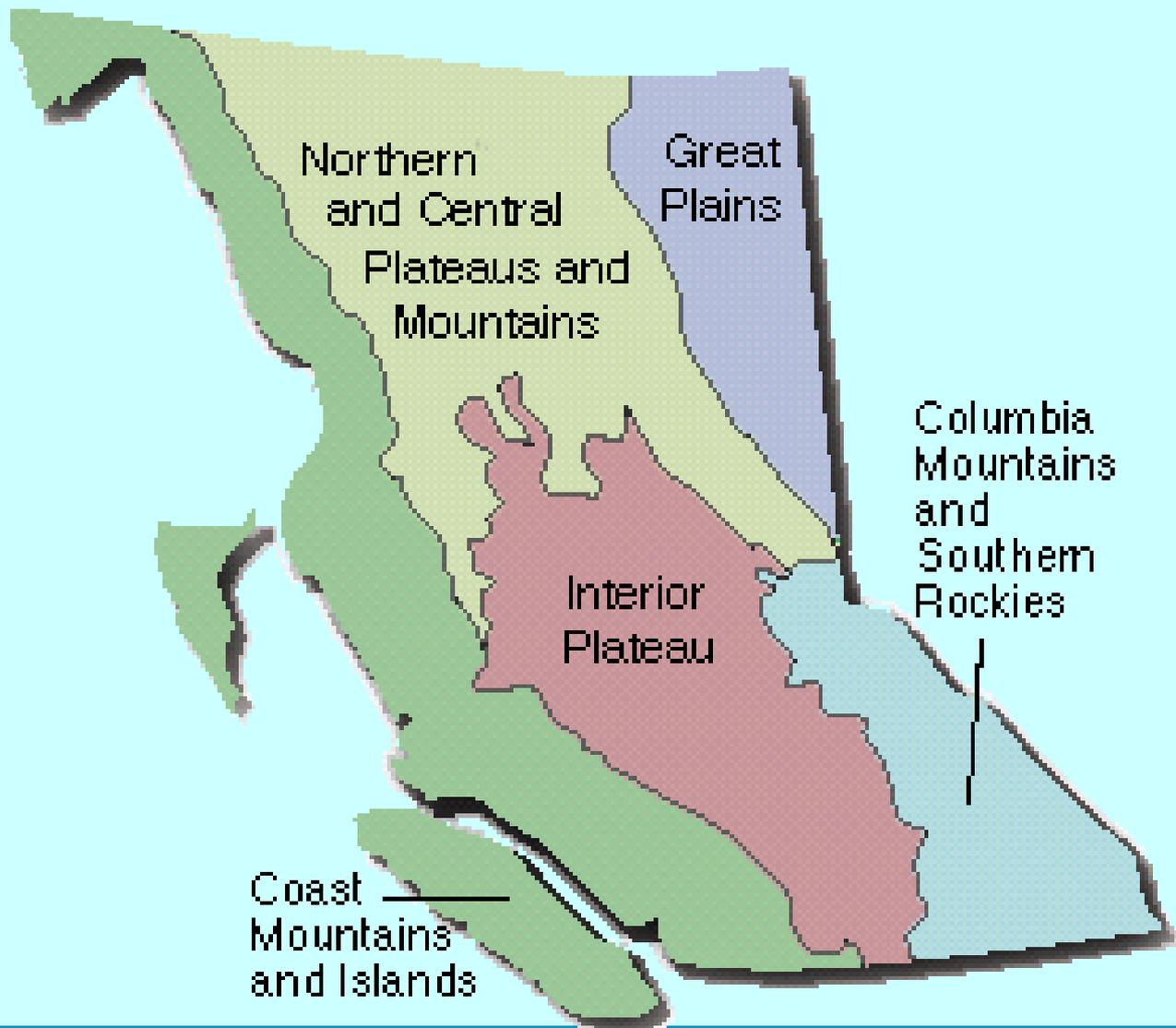
*What features of forests make them susceptible to overuse and degradation?*

“Forestry is an art born of necessity, as opposed to arts of convenience and of pleasure. Only when a reduction in the natural supplies of forest products under the demands of civilization necessitates a husbanding of supplies, or the application of art or skill or knowledge in securing a reproduction, or when unfavourable conditions of soil or climate induced by forest destruction make themselves felt does the art of forestry make its appearance.”

B.E. Fernow, Dean, Faculty of Forestry,  
University of Toronto, 1911.



BC is geographically diverse



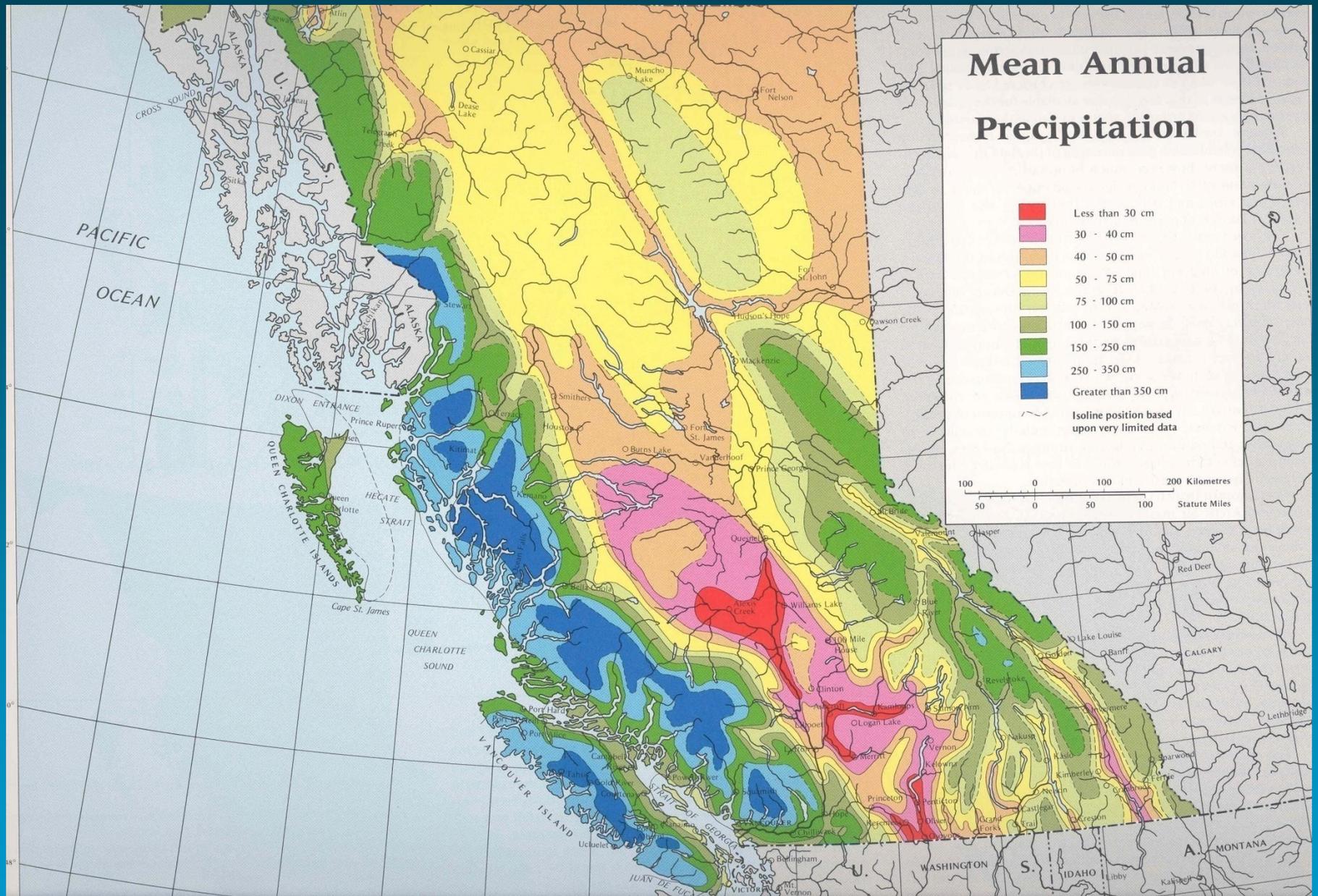
Northern  
and Central  
Plateaus and  
Mountains

Great  
Plains

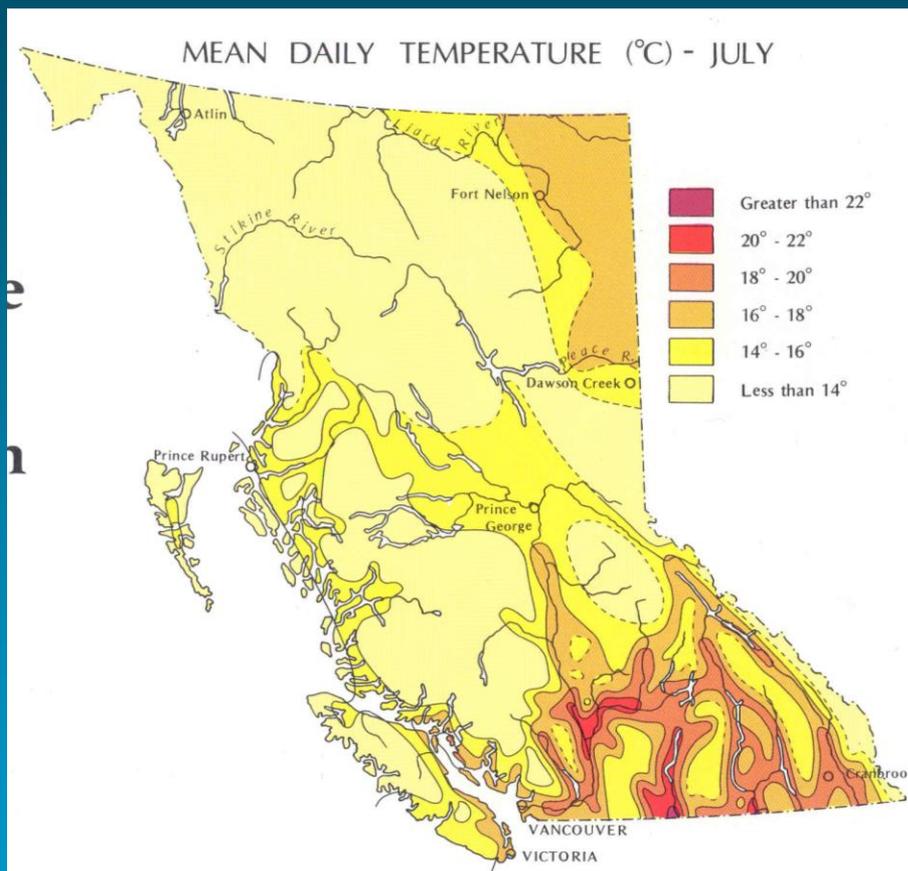
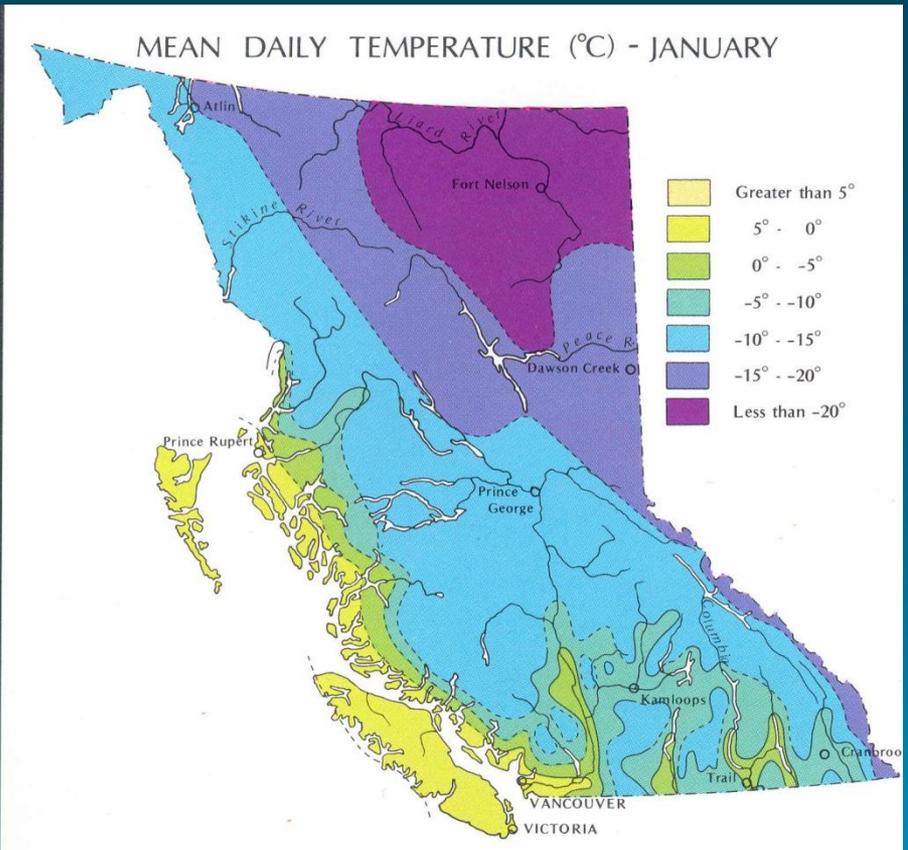
Interior  
Plateau

Columbia  
Mountains  
and  
Southern  
Rockies

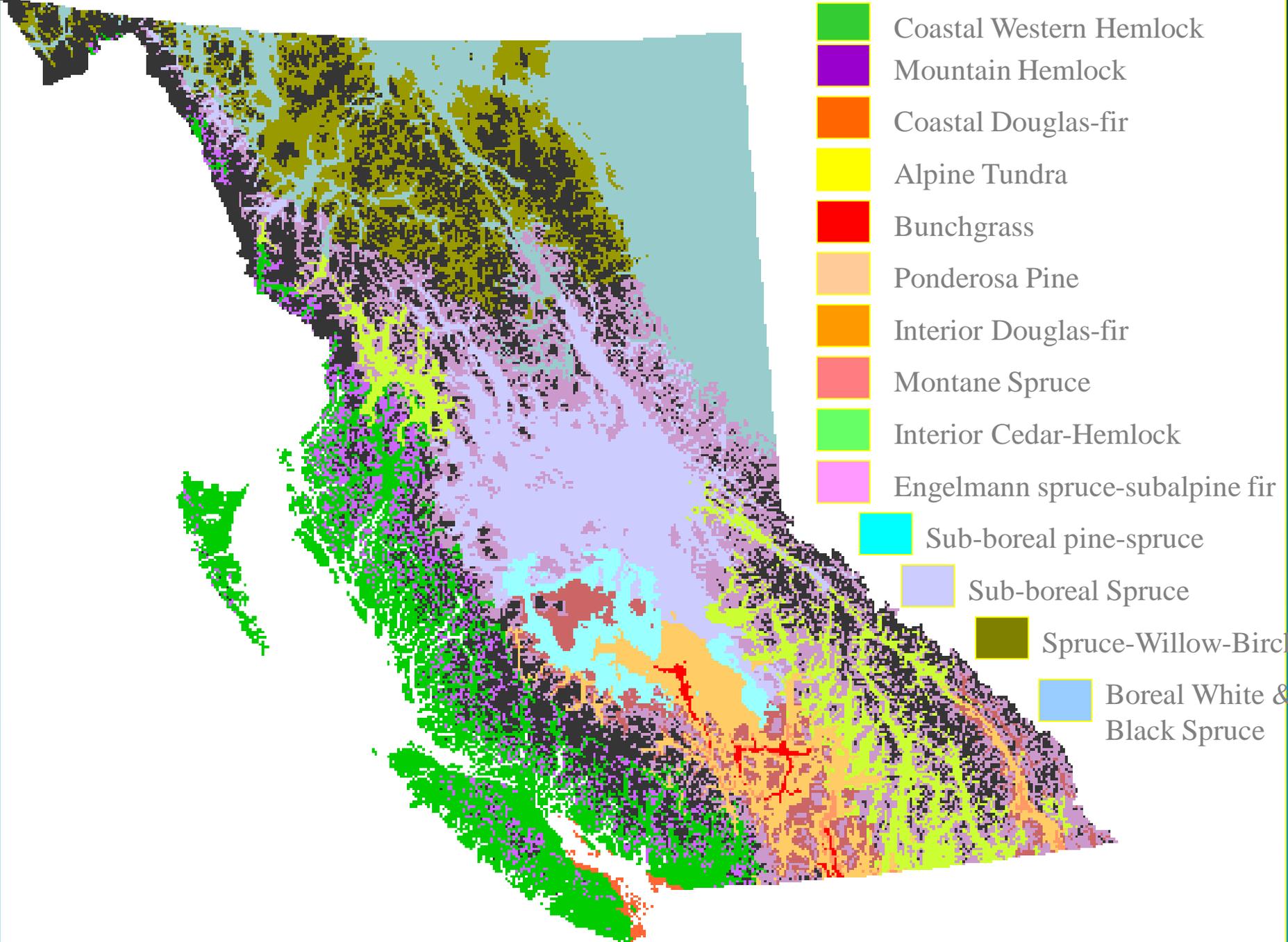
Coast  
Mountains  
and Islands



Complex topography creates a varied climate



Interplay between Arctic and Pacific air masses

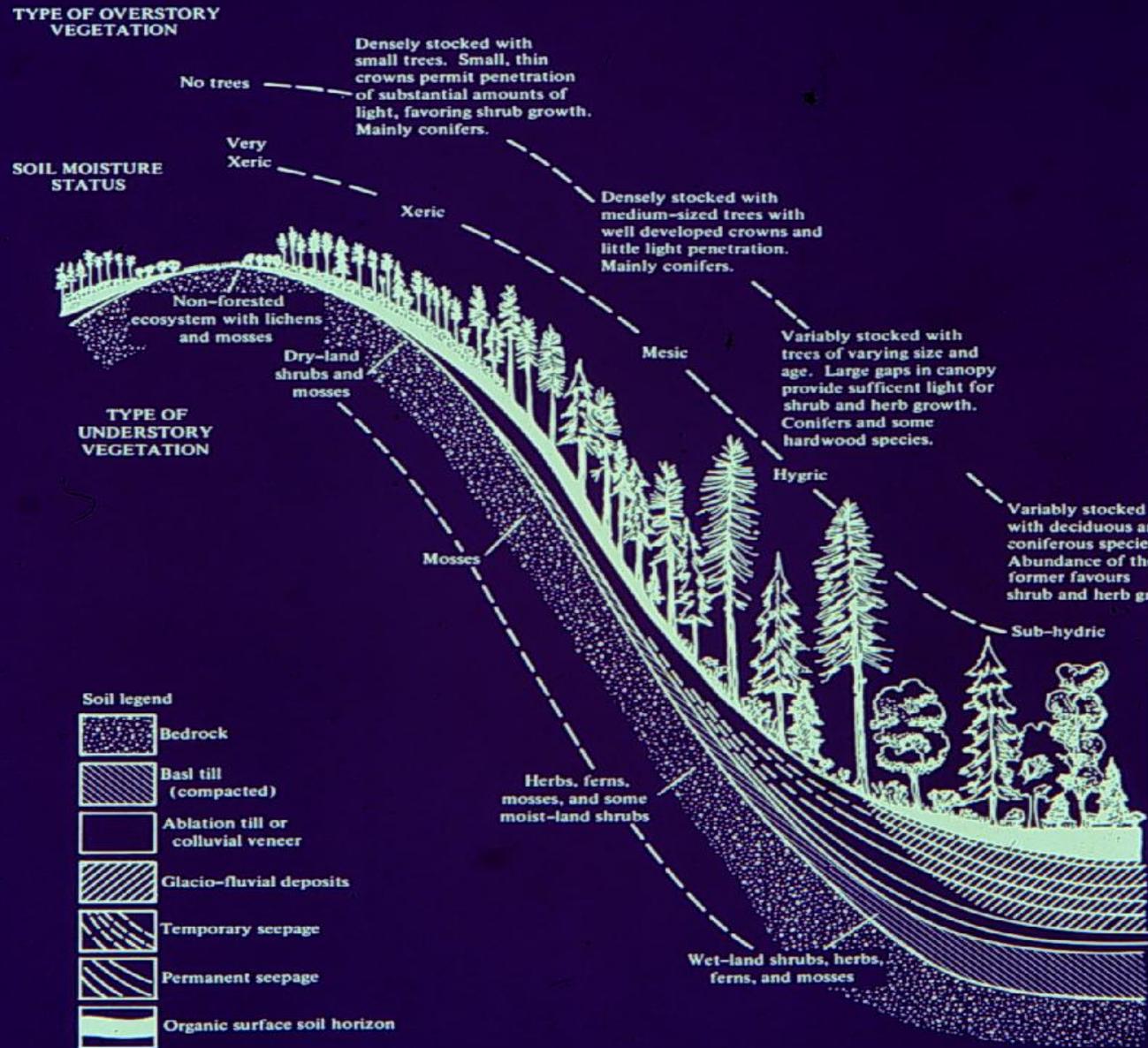


# BEC

- Biogeoclimatic Ecosystem Classification (BEC) system.
- Zones reflect differences in regional climate and are classified based on leading overstory tree species on zonal sites at 'climax'.
- <http://www.for.gov.bc.ca/hre/becweb/>

- Site series are distinct vegetation communities along a topographic sequence.

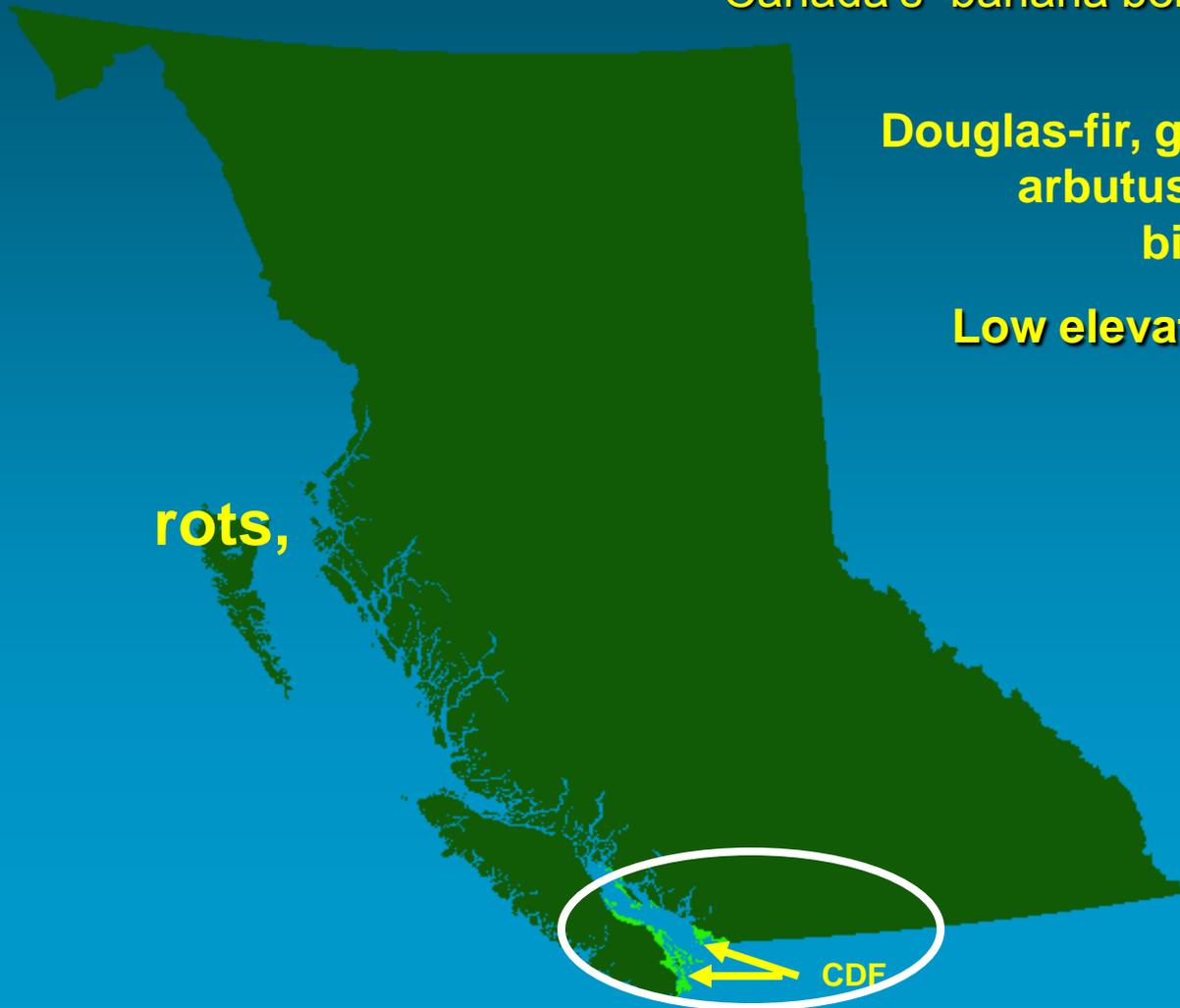
- On zonal site series moisture regime reflects climate.



# Coastal Douglas-fir Zone –

dry, warm summers; wet, mild winters. Maritime (oceanic), semi-Mediterranean (temperate) climate

Canada's "banana belt"



Douglas-fir, grand fir,  
arbutus, Garry oak,  
bigleaf maple

Low elevation

rots,

Fire, root  
drought

CDF

# Coastal Western Hemlock Zone –

wet cool winters, generally mild to warm summers.

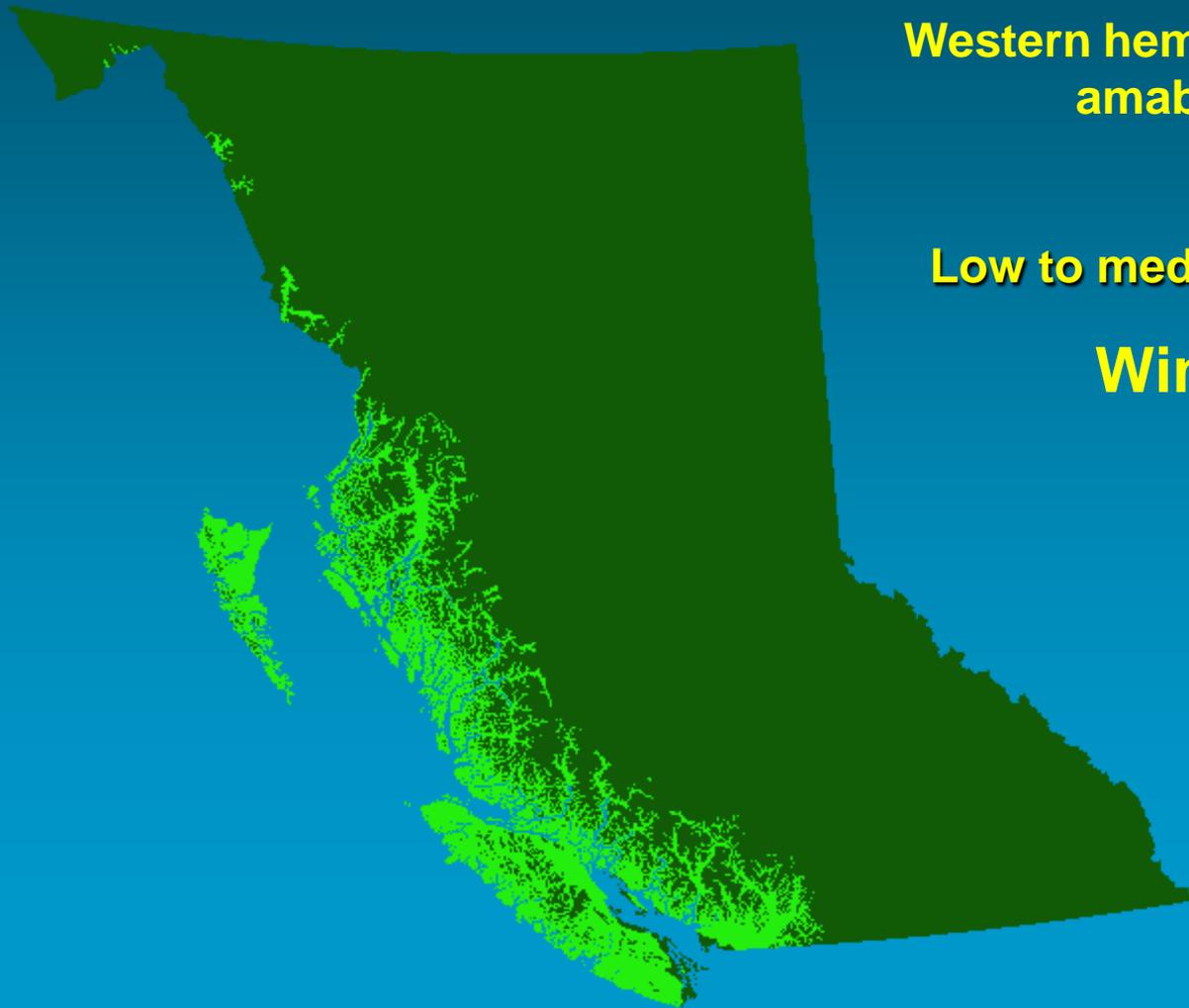
Coastal, montane climate

## Canada's temperate rainforest

Western hemlock , Douglas-fir,  
amabilis fir, western redcedar

Low to medium elevation

Wind, landslide, decay



## Mountain Hemlock Zone –

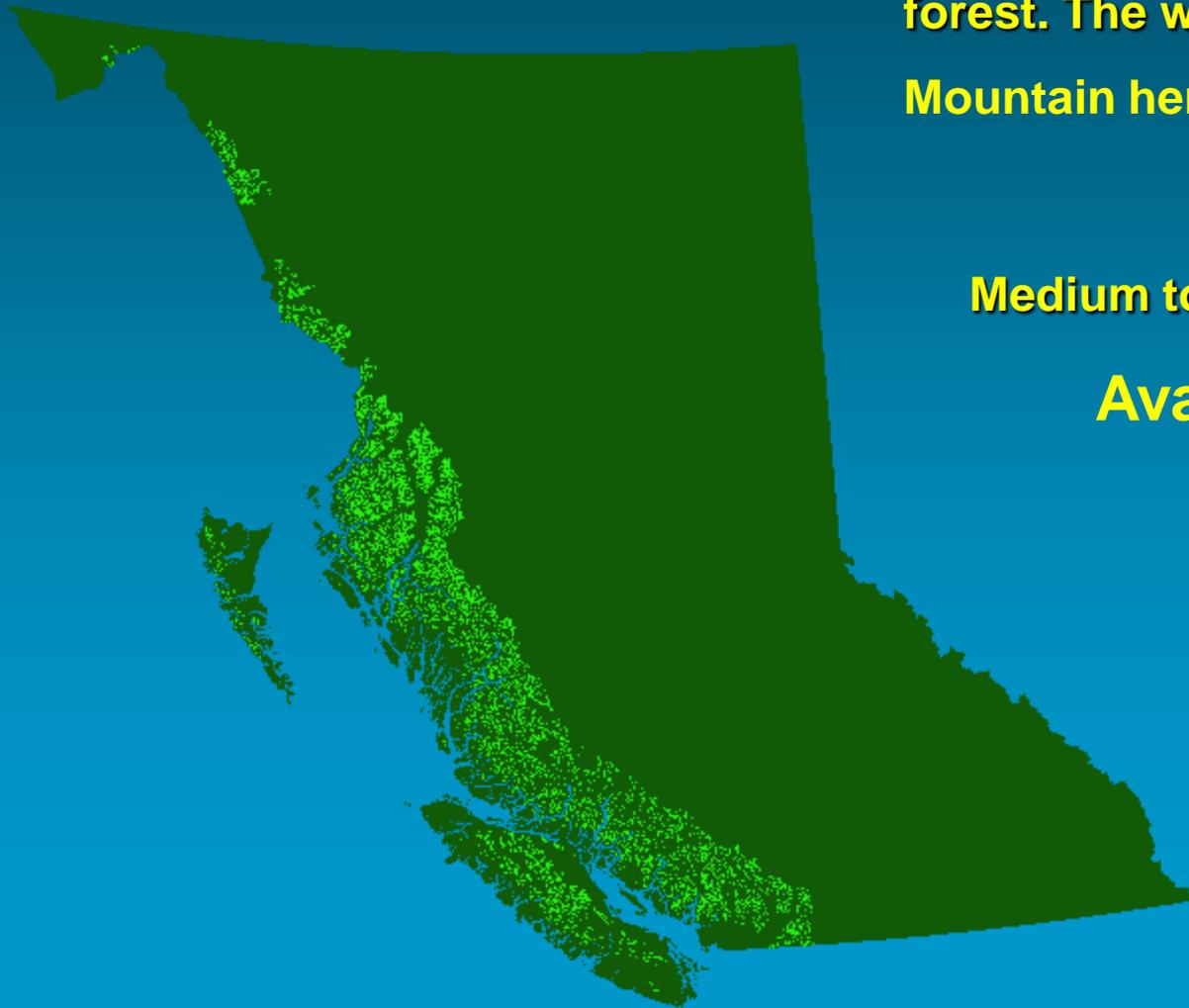
long, cool–cold winters, deep snowpack (2-10m), short warm summers. Coastal subalpine climate

**Canada’s west coast , “warm snowpack” subalpine forest. The west coast ski zone**

**Mountain hemlock, amabilis fir, yellow cedar**

**Medium to high elevation**

**Avalanche, snowpress**



## Interior Douglas-fir Zone –

Relatively short cool to cold winters; long, hot, dry summers. Montane. Sub-continental climate

### Canada's western savannah forest



Douglas-fir, lodgepole pine, ponderosa pine, western larch, grand fir, western birch, aspen

Low to medium elevation

Fire, insects (bark beetles, defoliators), root rots

# Ponderosa Pine and Grassland Zones –

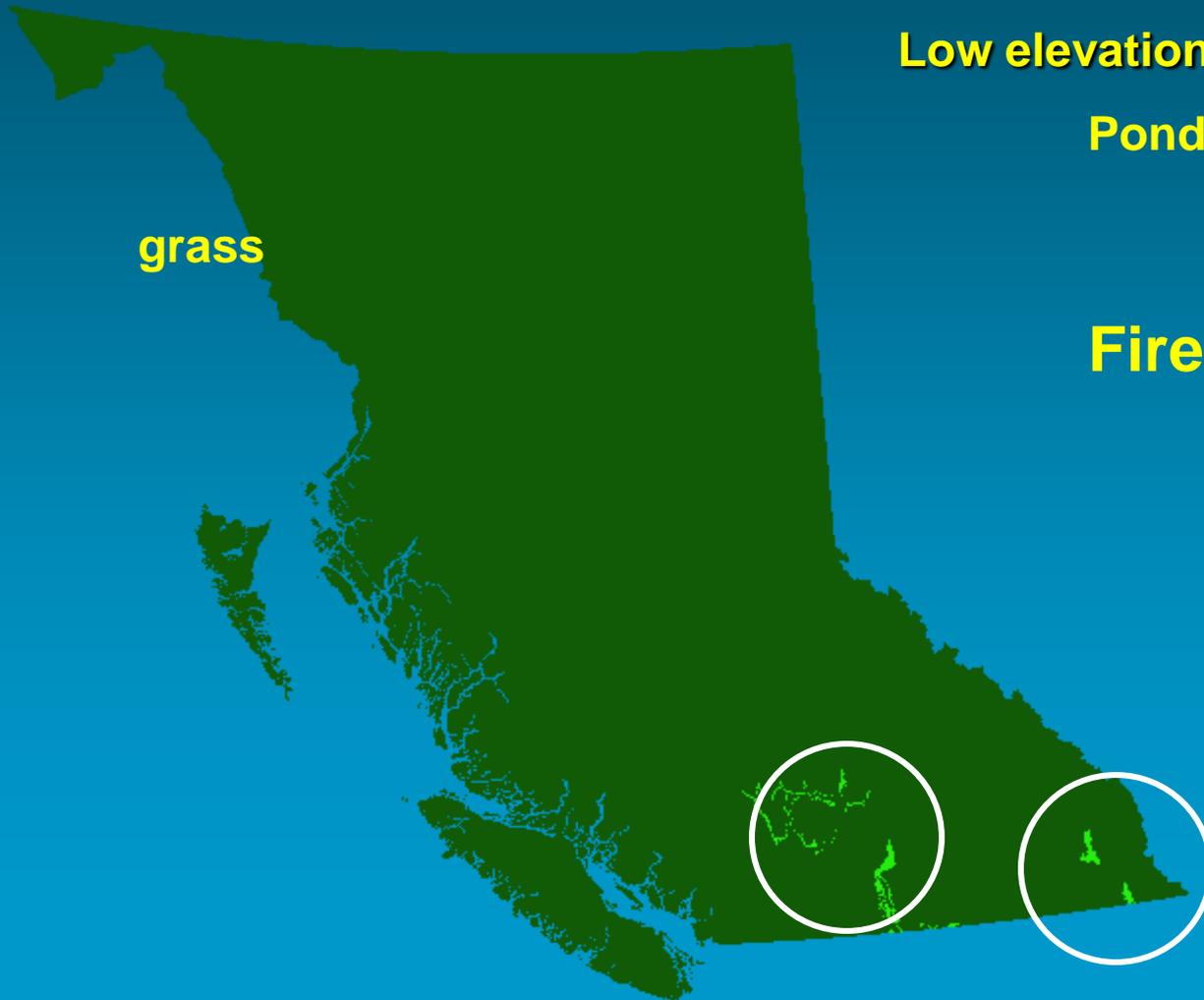
Very dry, long hot summer, relatively mild to cool winters.  
Semi-arid, subcontinental climate

**Canada's semi-desert forest/western grasslands**

**Low elevation – valley bottoms**

**Ponderosa pine, Douglas fir,  
juniper, sage,**

**Fire, drought, browsing**



## Montane Spruce Zone –

Long, cold, snowy winters, warm summers; relatively dry.  
Subcontinental, montane climate

**Medium to high elevation plateaus**

Interior spruce, subalpine fir, lodgepole  
pine, Douglas-fir, aspen

Medium to high elevation

**Fire, insects (bark  
beetles, defoliators)**



# Interior Cedar-Hemlock Zone –

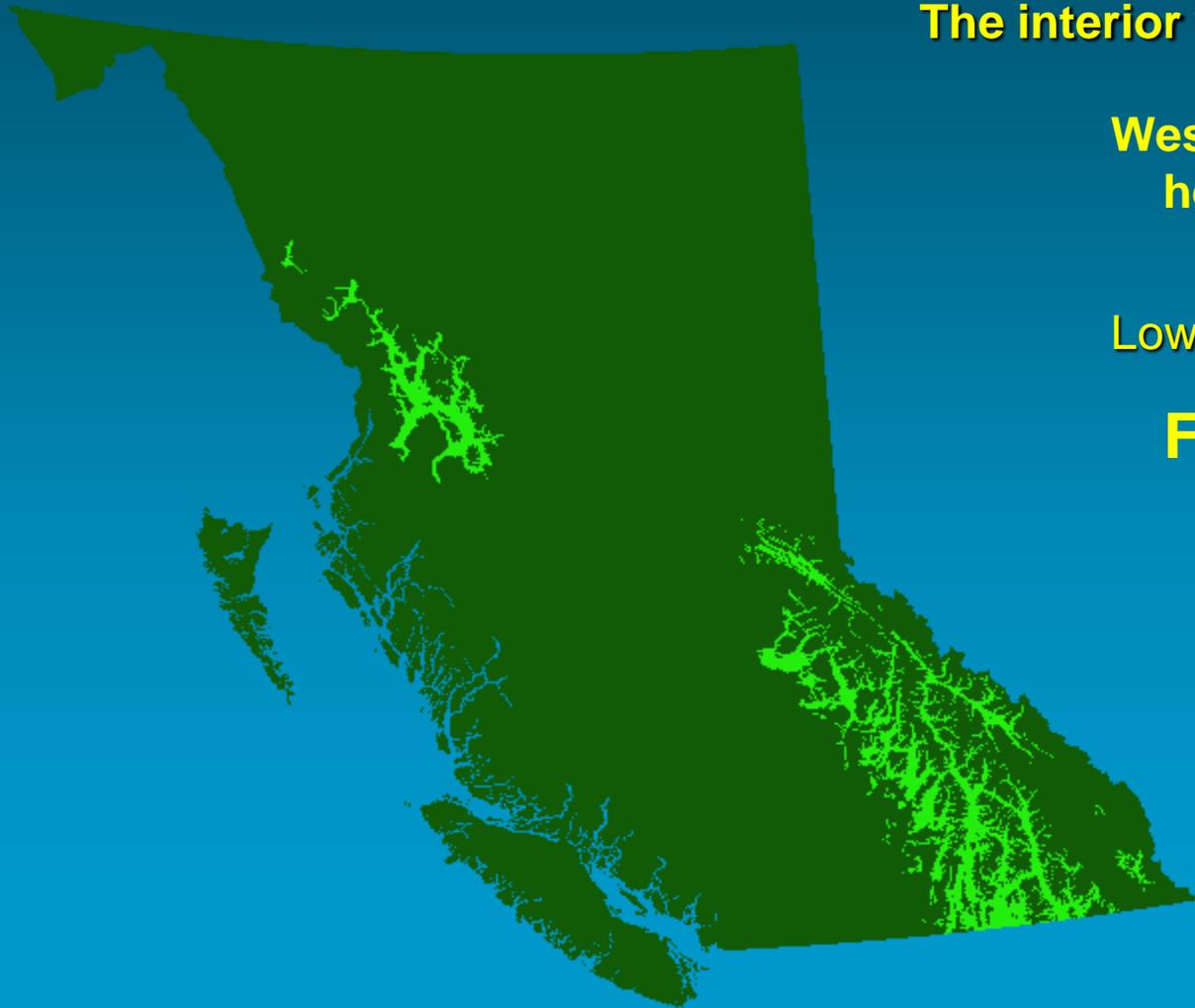
wet, mild to cool winters; warm, relatively moist summers.  
Subcontinental, humid climate

## The interior wet belt forest

Western redcedar, western  
hemlock, Douglas-fir,  
lodgepole pine

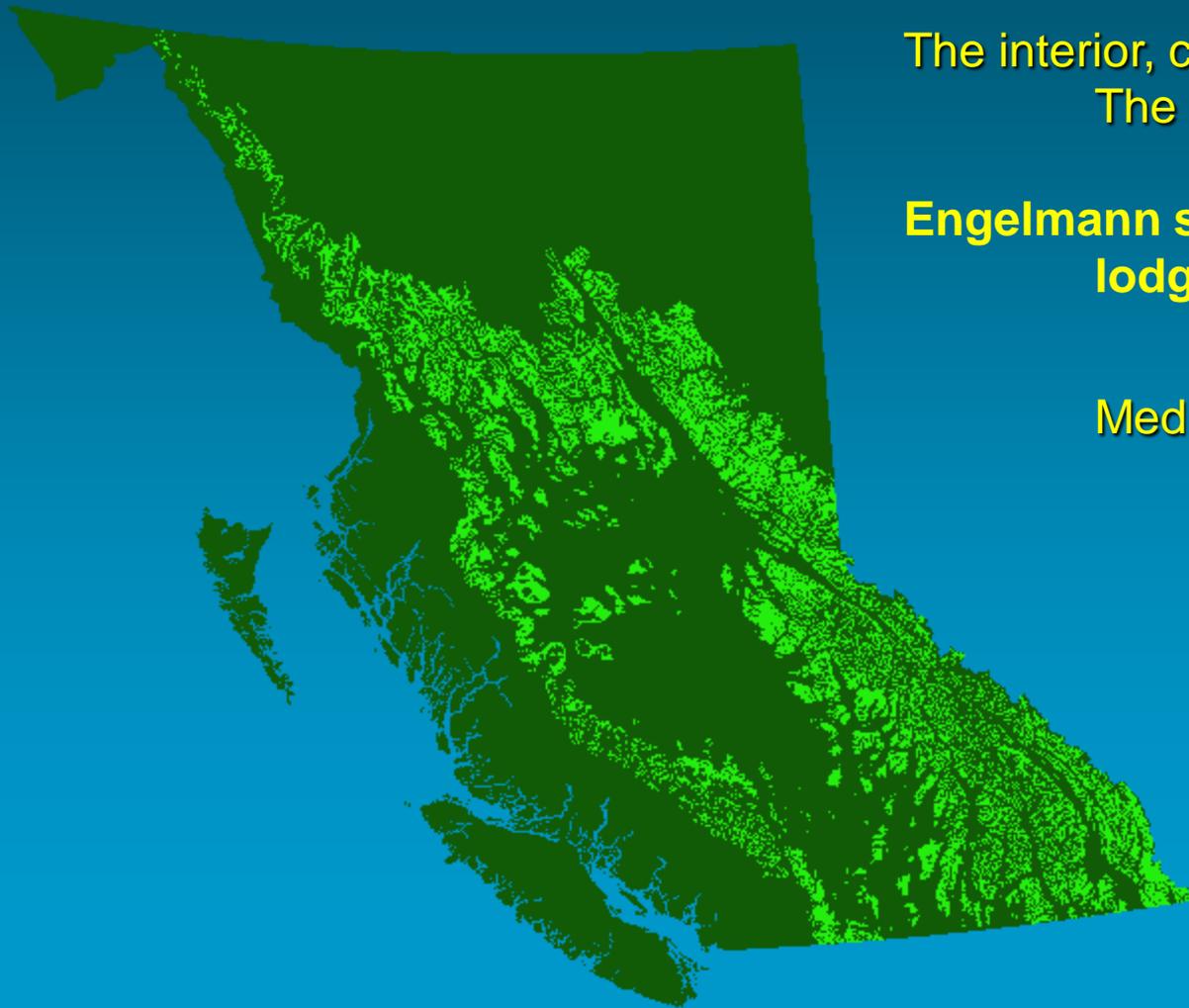
Low to medium elevation

**Fire, defoliators**



# Engelmann Spruce Subalpine fir Zone –

Long, cold to very cold, snowy winters; short warm summers with frequent frost, dry to humid. Continental – subcontinental subalpine climate



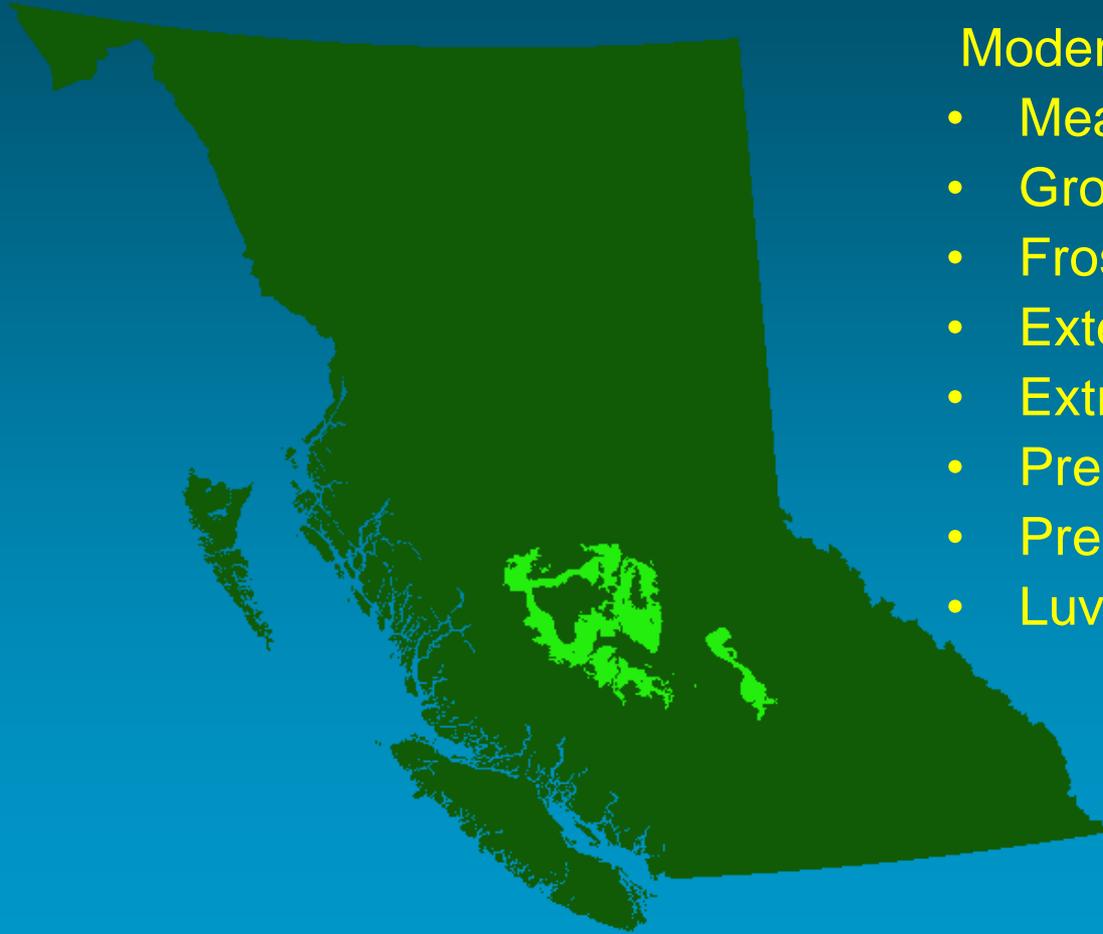
The interior, cold snowpack, subalpine forest  
The interior ski zone

**Engelmann spruce, subalpine fir,  
lodgepole pine, whitebark pine,  
subalpine larch**

Medium to high elevation

**Fire, insects**

# SBS – Sub-Boreal Spruce



## Moderated Continental Climate

- Mean Temperature 4 °C
- Growing Degree Days 1200
- Frost Free Period 85
- Extended periods < -10 °C
- Extremes to - 50 °C
- Precipitation 650 mm
- Precipitation as snow 40%
- Luvisols, Brunisols

# SBS – Sub-Boreal Spruce

- Interior Plateau (700 m)
- Rolling terrain, gentle slopes, lakes and wetlands
- Montane forests to south
- Boreal to north
- Drier Sub-Boreal Pine Spruce to southwest
- Subalpine above
- Very productive for timber
- Cattle grazing
- Trapping / hunting
- Wind, insects, fire

**Early seral species:**

- Paper birch
- Trembling aspen
- Lodgepole pine
- Douglas-fir (limited by growing season frost)

**Late seral tree species:**

- Hybrid white spruce (*Picea engelmannii* x *glauca*)
- Subalpine fir

## Sub-Boreal Pine Spruce

- Interior Plateau in rain shadow of Coast Mountains
- Colder, drier climate
- Frequent stand replacing wildfires and extensive mountain pine beetle
- Large areas of pure lodgepole pine forests
- Young, even-aged and dense

# BWBS – Boreal White and Black Spruce



## Continental climate

- Mean Temperature - 2 °C
- Growing Degree Days 550
- Frost Free Period 70
- Very cold winters
- Extremes to - 60 °C
- Soils freeze
- Short, warm summers
- Precipitation 450 mm
- Precipitation as snow 40%
- Luvisols, Gleysols, Organic

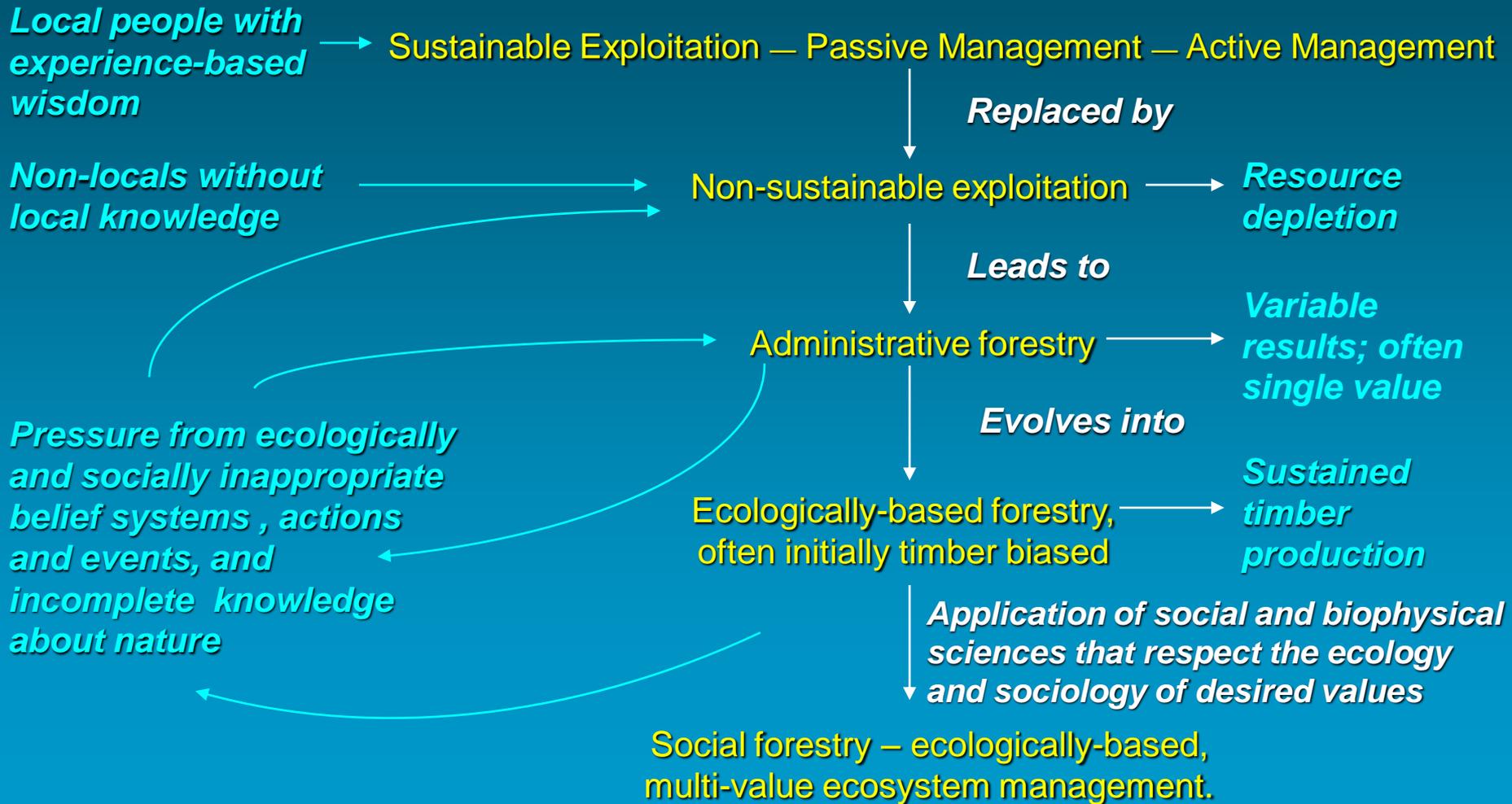
Most widespread zone in Canada, from the Yukon to Newfoundland  
Great Plains east of Rockies, northern BC valleys

# BWBS – Boreal White and Black Spruce

- Northern Great Plains and valleys in Northern Rockies
- Flat to rolling, valley bottoms
- 400 m
- Most northerly forested zone
- Productive for timber
- Trapping, abundant game east of Rockies
- Some grain and beef farming at southern edge

Fire and insects

# The Evolution of Forestry



## **Era's in BC Forestry:**

**Pioneer (1865-1912):** revenue, land clearance

**Transition (1912-1945):** conservation, reforestation

**Sustained yield (1945-1978):** sustained production  
industrial and community development, multiple use

**Ecologically based (1978-1994 ):** silviculture  
prescriptions, licensee responsibility for free-growing,  
backlog reforestation, genetic improvement, species  
management

**Sustainable forest management (1994-):** social  
license, biological diversity, ecosystem management,  
non-timber forest products and values, community  
participation

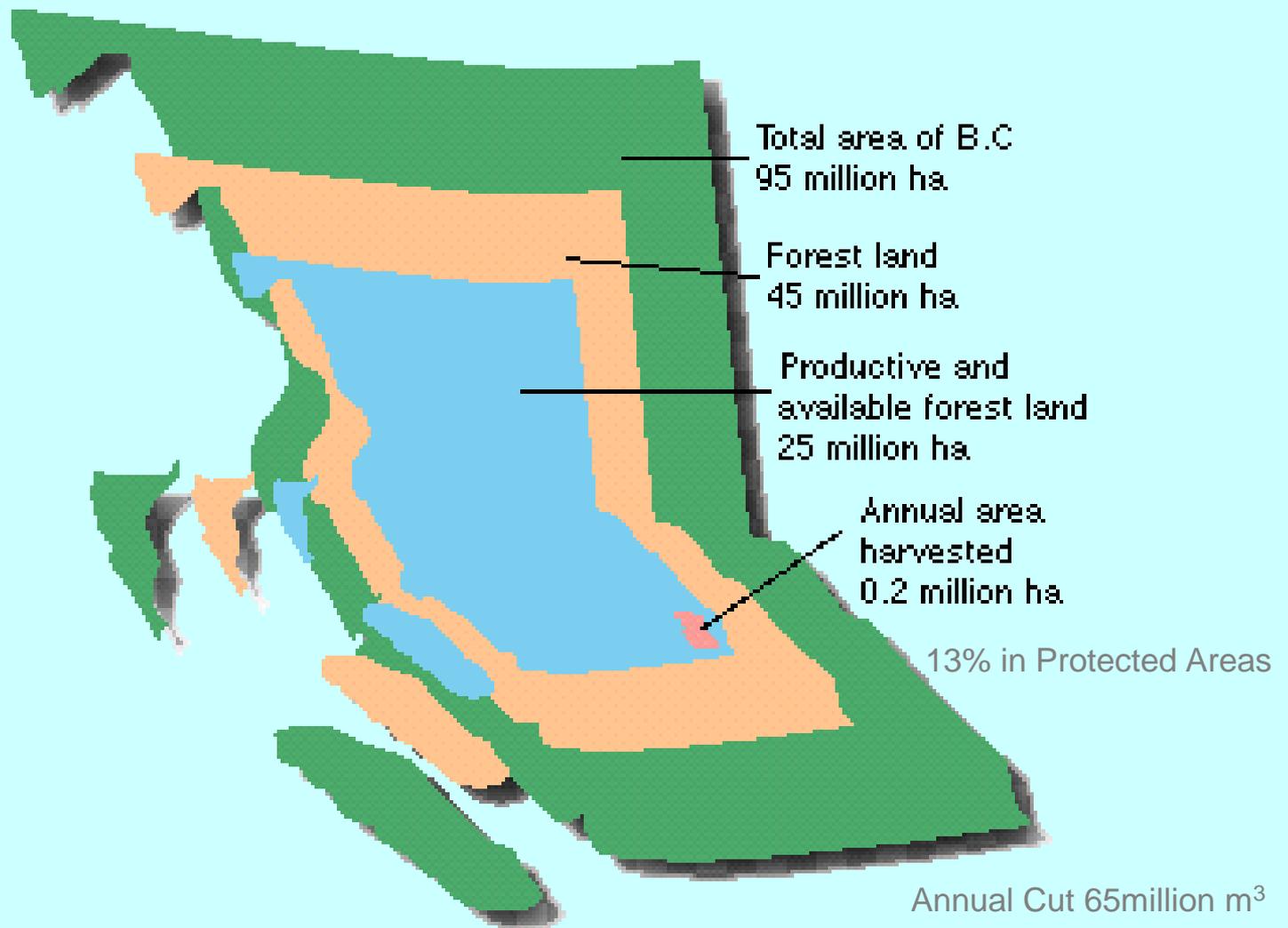
**Forest use is regulated by society. In BC legislation includes:**

**Forest Act** - defines forests and conditions of licences

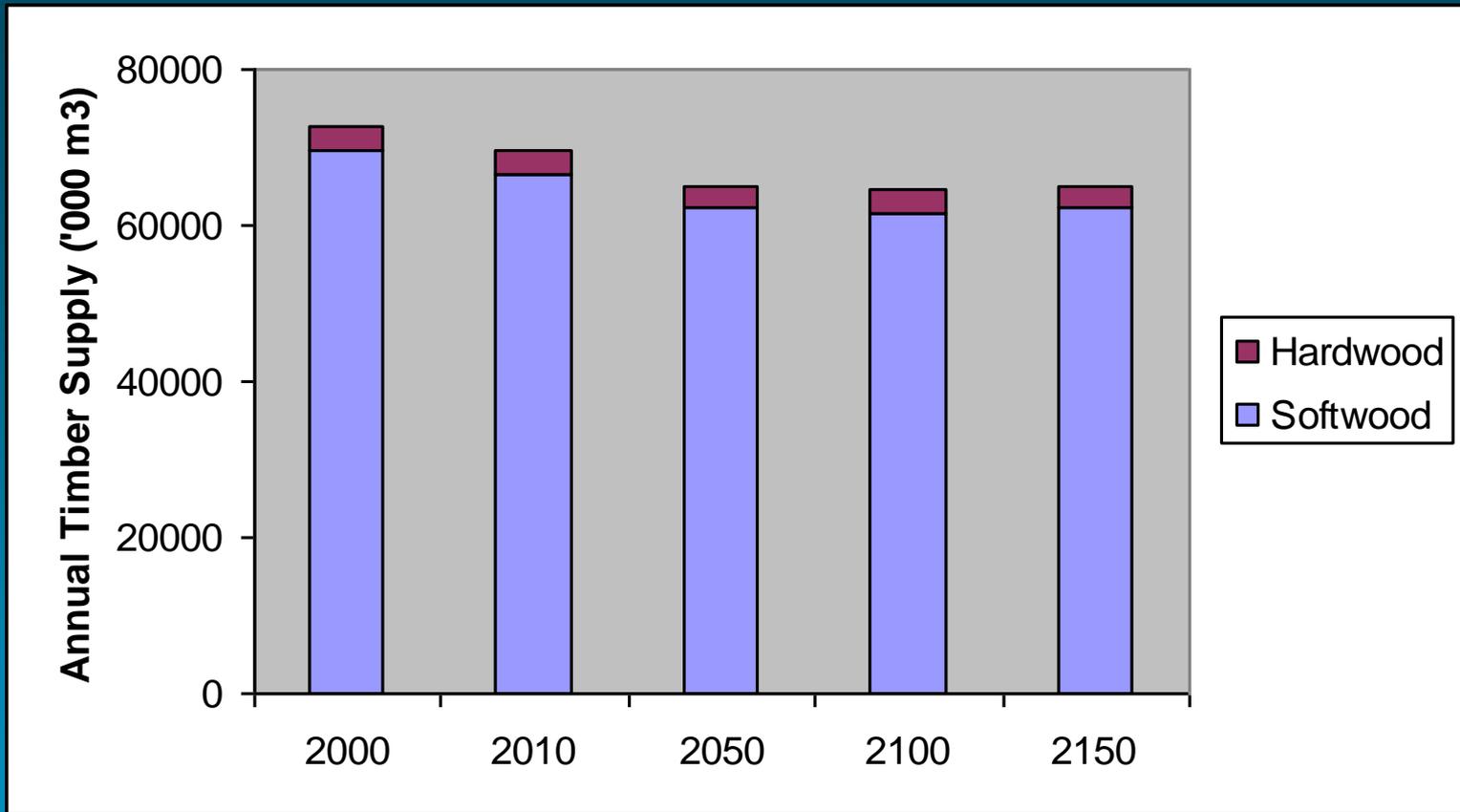
**Ministry of Forest Act** - sets out management objectives for public forests, and role and powers of MOF

**Forest and Range Practices Act** - sets standards of practice, environmental protection, and public participation

**Foresters Act** - establishes Association of BC Forestry Professionals as self-regulating profession with exclusive right to practice.



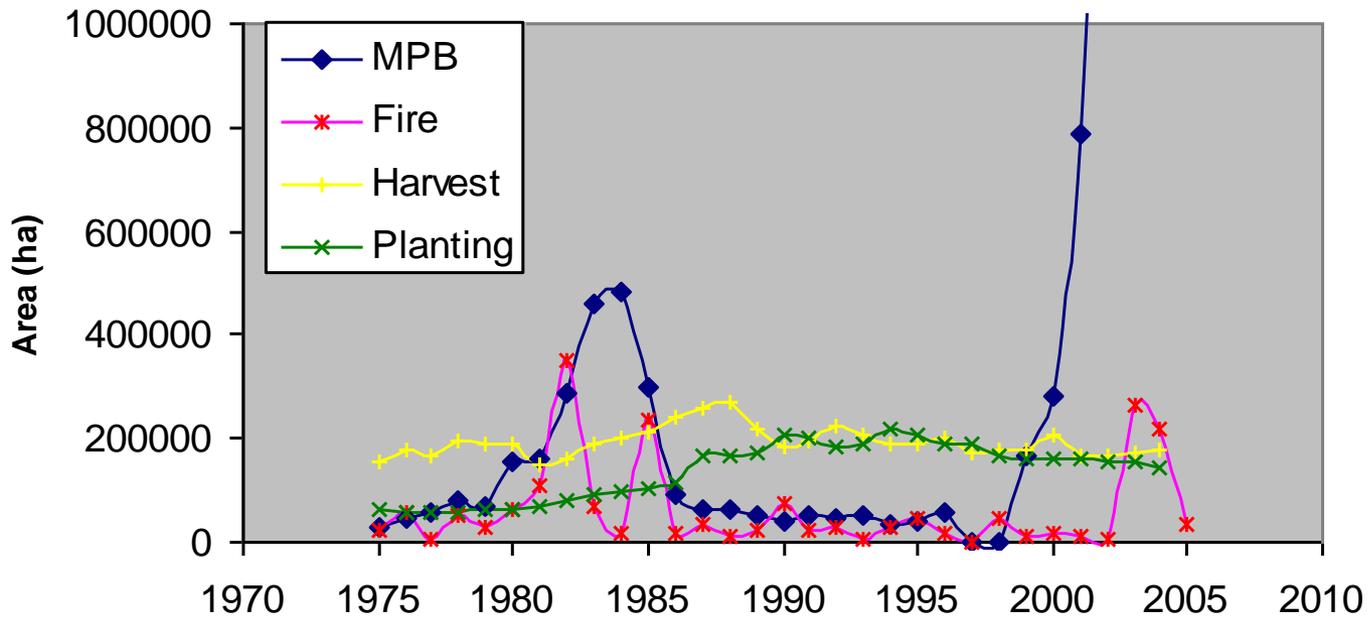
95% of BC's forest land is publicly owned  
54 million ha is certified (CSA, SFI, FSC)



Current annual harvest 74 million m<sup>3</sup>

(Natural Resources Canada)

18 million ha in 2013



(Statistics Canada)

# But what about the wildlife?

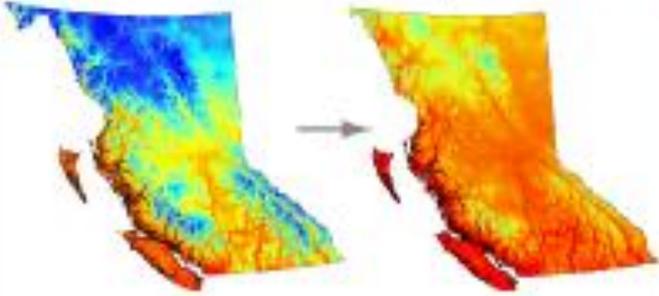
- 1700 mountain caribou (southern), in rapid decline
- < 30 pairs of spotted owl, in rapid decline
- 66,000 marbled murrelet, in decline
  
- 13,000 grizzlies, stable, but extirpated in 10% and declining in 8% of historic range

<http://www.env.gov.bc.ca/cdc/>

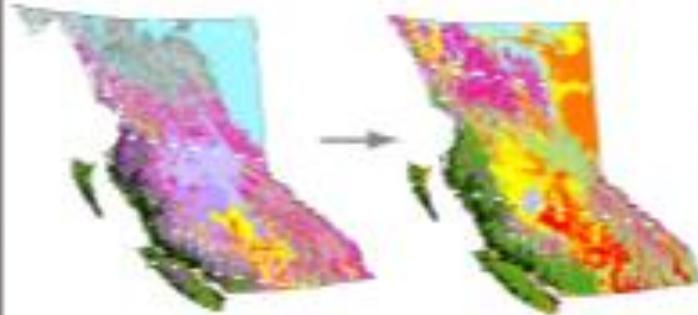
(BCMOE Conservation Data Centre)

# Climate Change

Mean Annual Temperature



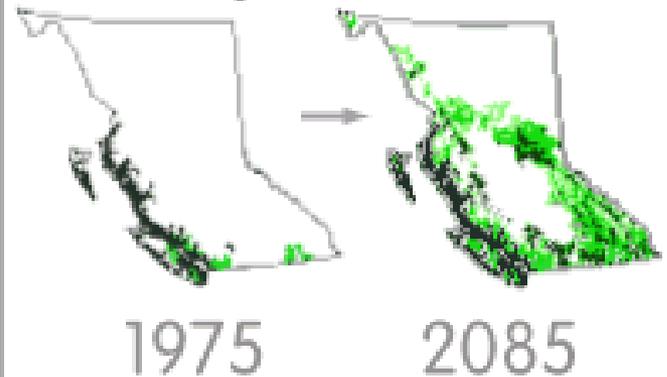
BEC Zones

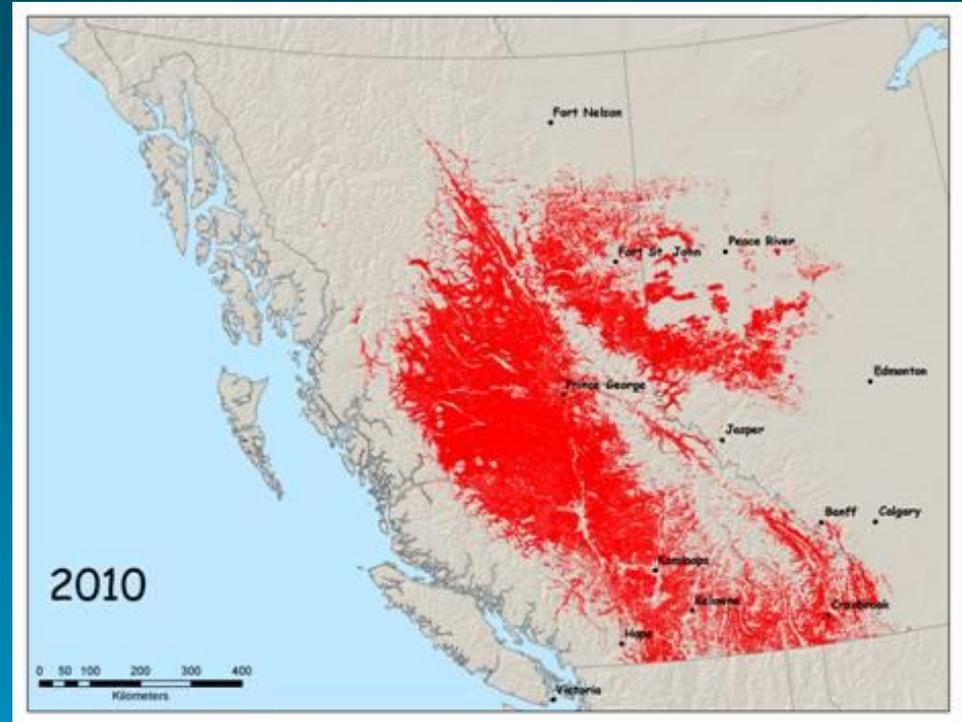
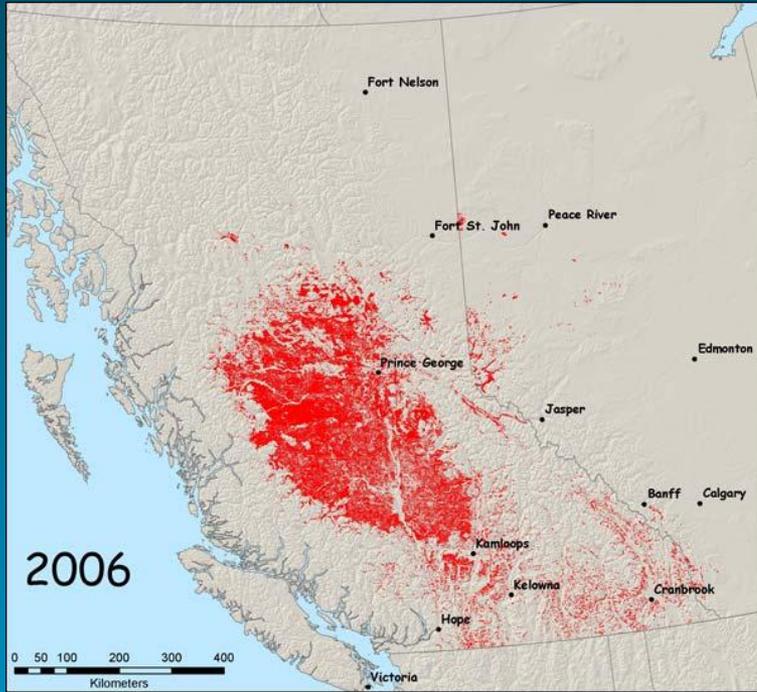


<http://www.livesmartbc.ca/government/plan.html>

<http://www.genetics.forestry.ubc.ca/cfcg/climate-models.html>

Range of Grand Fir





2013 – 18 million ha, >700 million m<sup>3</sup>

<http://www.for.gov.bc.ca/hre/bcmpb/BCMPB.v6.BeetleProjection.Update.pdf>

# Forest-Rural Interface

“The summer of 2003 was the worst ever for forest fires in British Columbia. Abnormally hot, dry weather resulted in over 2,500 wildfire starts .... The interface fires of last summer destroyed over 334 homes and many businesses, and forced the evacuation of over 45,000 people.” (2650 km<sup>2</sup>)  
Filmon 2004

<http://www.2003firestorm.gov.bc.ca/>

<http://bcwildfire.ca/faq/interface.htm>

<http://cfs.nrcan.gc.ca/subsite/disturbance/map-carte>

August 25, 2009:

“Destructive wildfires that have scorched nearly 2,000 square kilometres ... There are still nearly 150 forest fires burning across the province and at least five of them have prompted evacuation orders keeping residents from their homes.”

The logo for BC Bioenergy Strategy is a horizontal banner with a white border. The left side features a green field, and the right side features a forest. The text "BC Bioenergy Strategy" is in white, and "Growing Our Natural Energy Advantage" is in orange.

# BC Bioenergy Strategy

Growing Our Natural Energy Advantage

Utilize waste wood from phased-out beehive burners to produce clean energy.

Support wood gasification research, development and commercialization.

<http://www.energyplan.gov.bc.ca/bioenergy/>

# Carbon Management

Pacific Carbon Trust – Forest Greenhouse Gas Offsets

1) Afforestation of pre -1989 deforested land.

(2) Using select seed - Reforesting to produce forest growth rates beyond what is anticipated under the baseline scenario.

(3) Fertilizing – fertilizing to produce forest growth rates beyond the baseline scenario. (fire, bugs?!)

Bioenergy Network to encourage research and development in areas such as wood-waste cogeneration, biofuel production and wood pellet production.

<http://www.pacificcarbontrust.ca/>

<http://www.livesmartbc.ca/government/plan.html>

## Challenges in BC forestry:

Mountain pine beetle and its aftermath

Climate change, pathogens, movement of ecosystems and species

Unresolved First Nations land claims, access to resources

Shrinking contribution of timber production to provincial GDP

Increasing urbanization in southern BC, decline of rural communities

Renewable energy installations, new transmission corridors

Shortage of skilled workers and professionals in forest sector

Global markets and conventions

## Opportunities in BC forestry:

Development of a collective cultural identity and value system that connects us to BC landscapes and ecosystems

Resolve First Nations land claims and partnerships

Less general revenue but more value via Community Forests

Working up the value chain via log and timber frame buildings and wood crafts

Extensive forest management; non-timber forest products

'Space' tourism, carbon sequestration, bioenergy

Export of forest management expertise and technology

## In Summary:

- BC is ecologically diverse
- We have a large, productive forest and low population density.
- Our forest management is state-of-the-art, but profits are declining.
- Climate change, forest health, fuel build-up
- We are still converting old-growth.
  
- We need to make choices, with the luxury of having options!