



Forestry in BC



Outline

- What is Forestry?
- Ecological Context
- Management Context
- Current Issues

Forest management is the scientific management of forests for continuous production of goods and services.

- This includes:
- forest protection
 - co-ordination of multiple uses
 - harvest regulation
 - forest renewal and tending



The case for forest management:

What kinds of disturbance events lead to forest denudation?

What normally happens following denudation?

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

1. Charcoal production, Catalonia Spain

2. Forest litter harvesting near Kunming, China

What happens when local forests run out?

4. Route to Annapurna base camp, Nepal



5. BC at time of European colonization, 1778



“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.

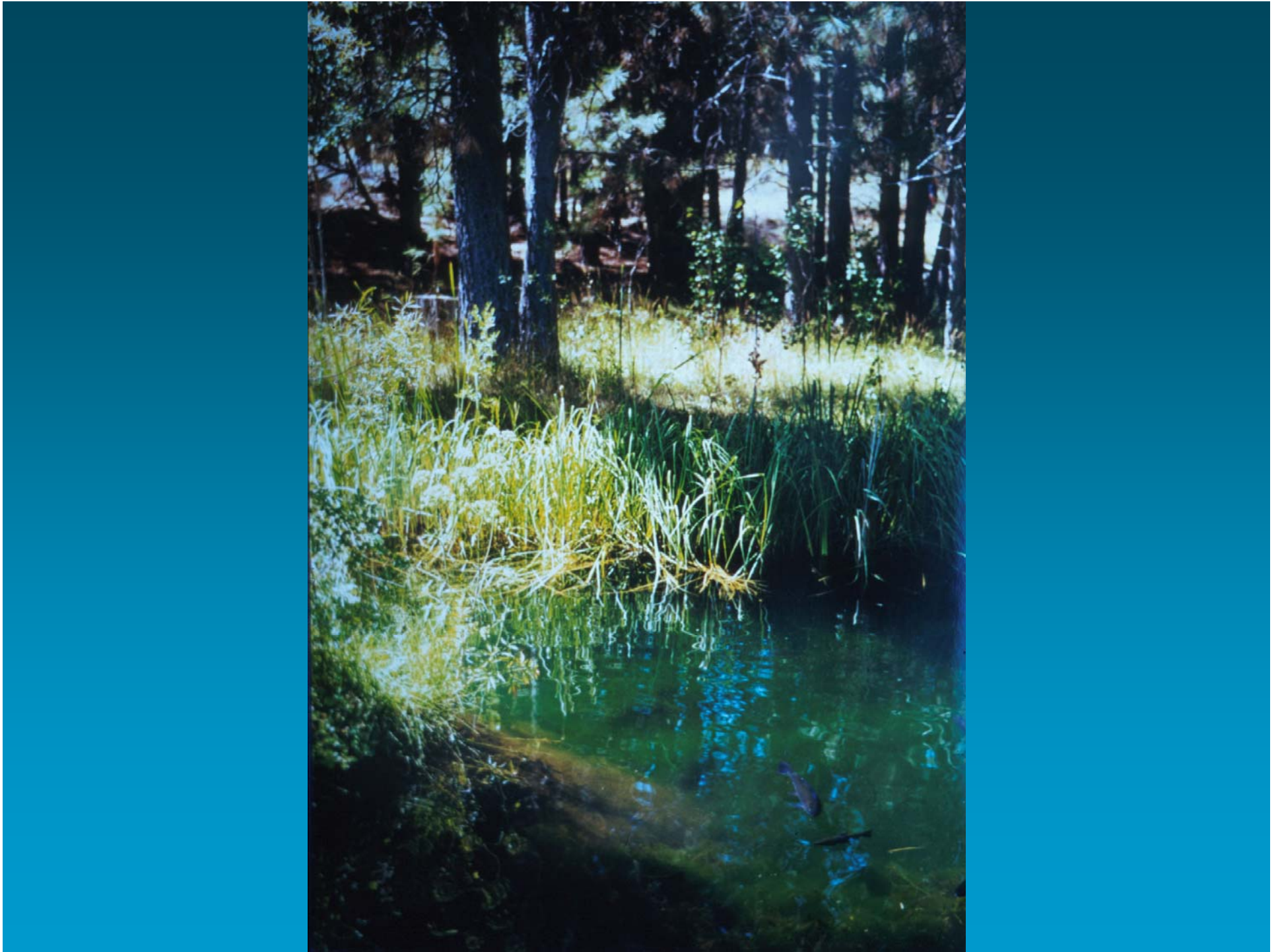
Who do foresters manage for?
What do foresters manage for?







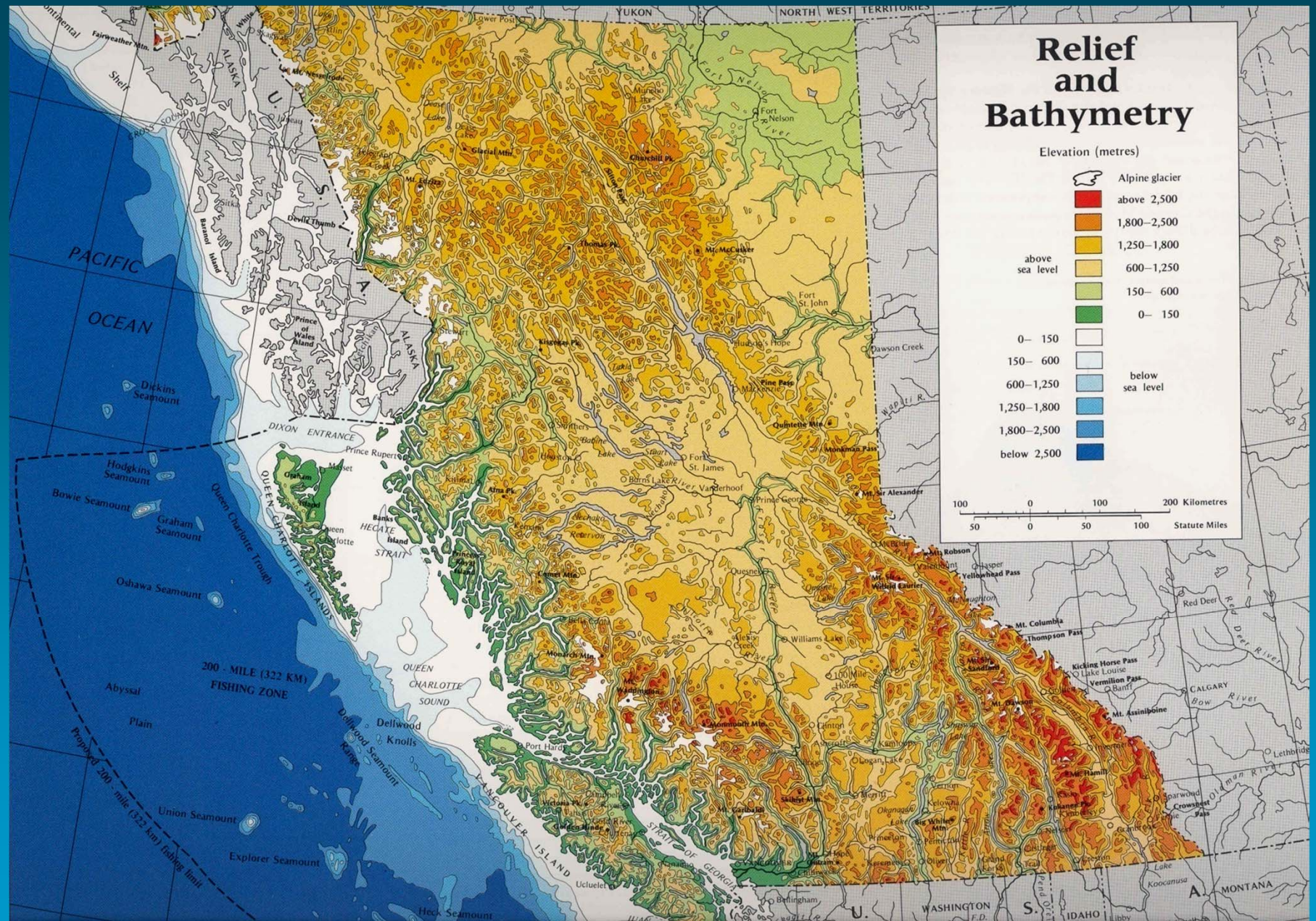




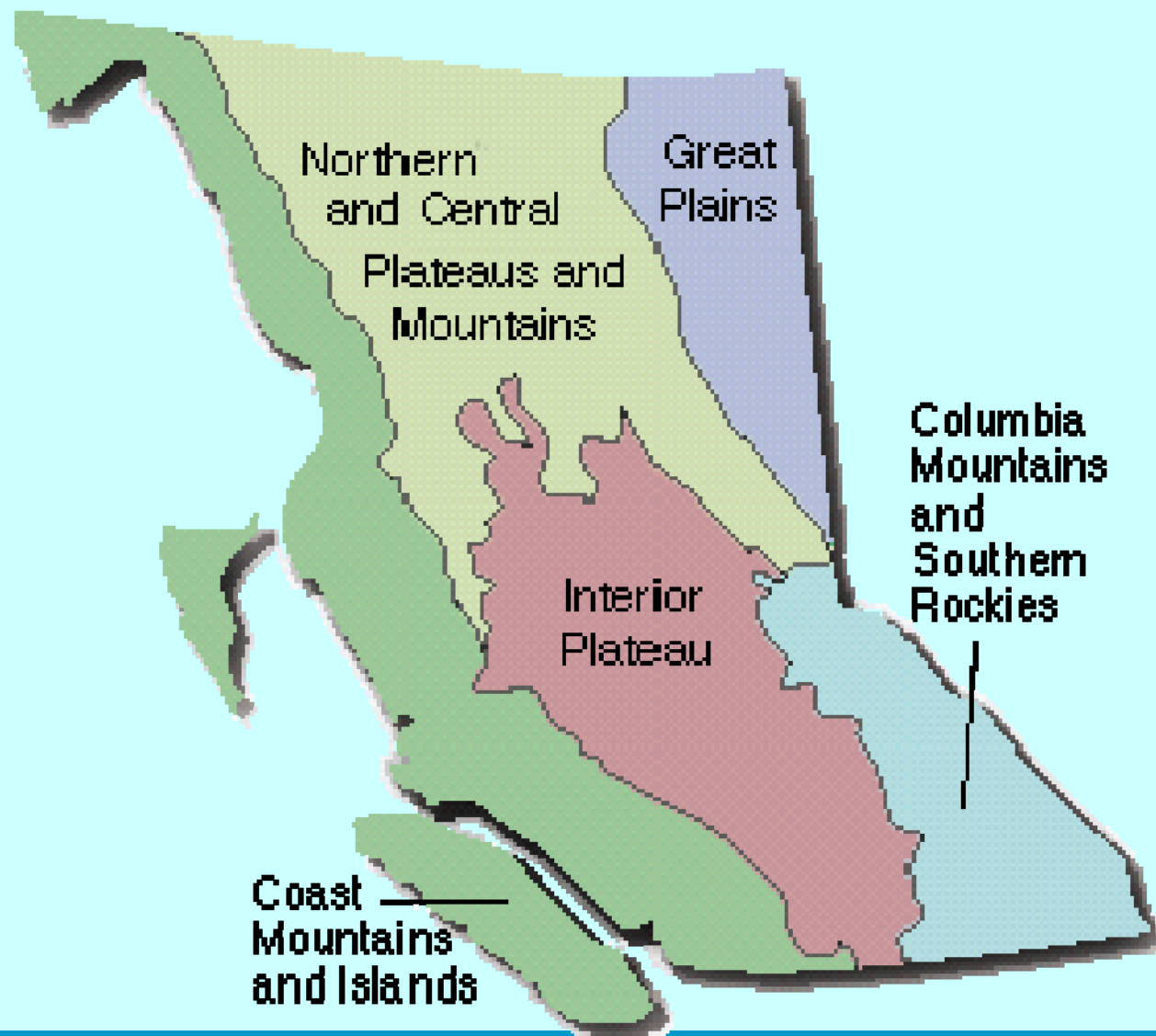


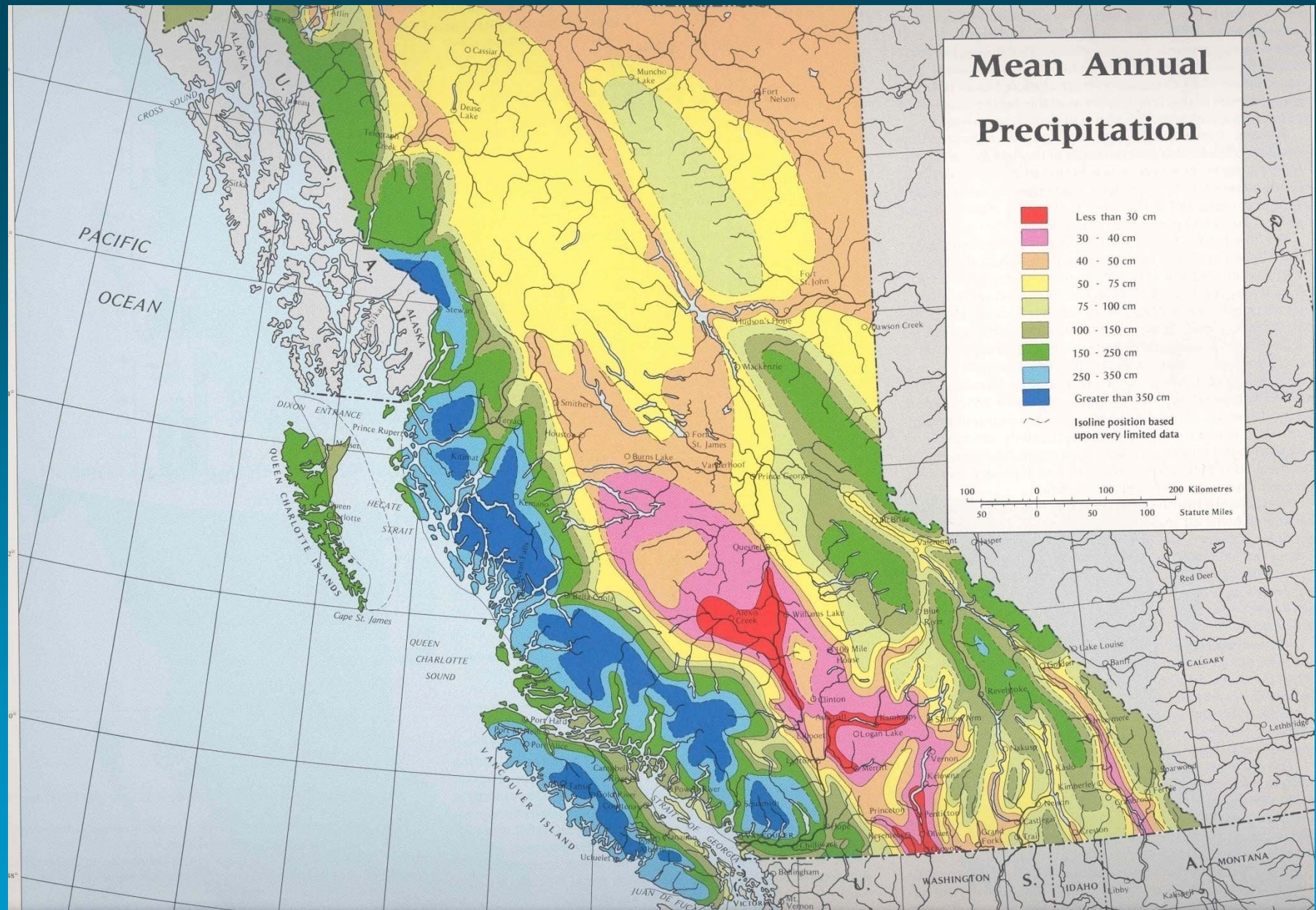
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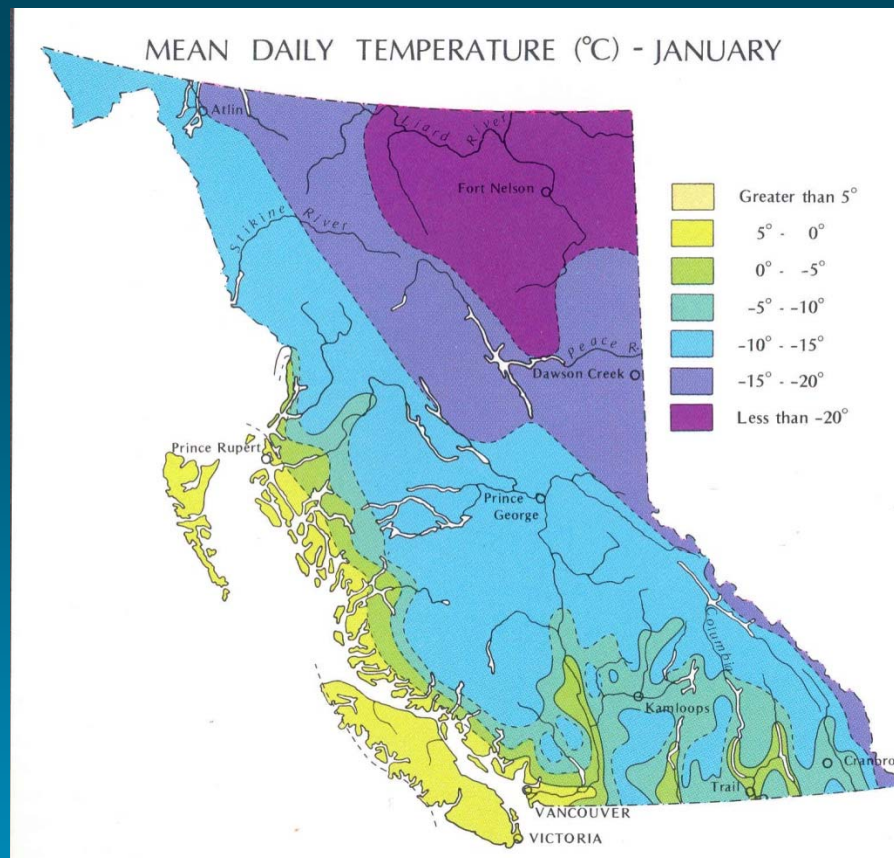


BC is geographically diverse

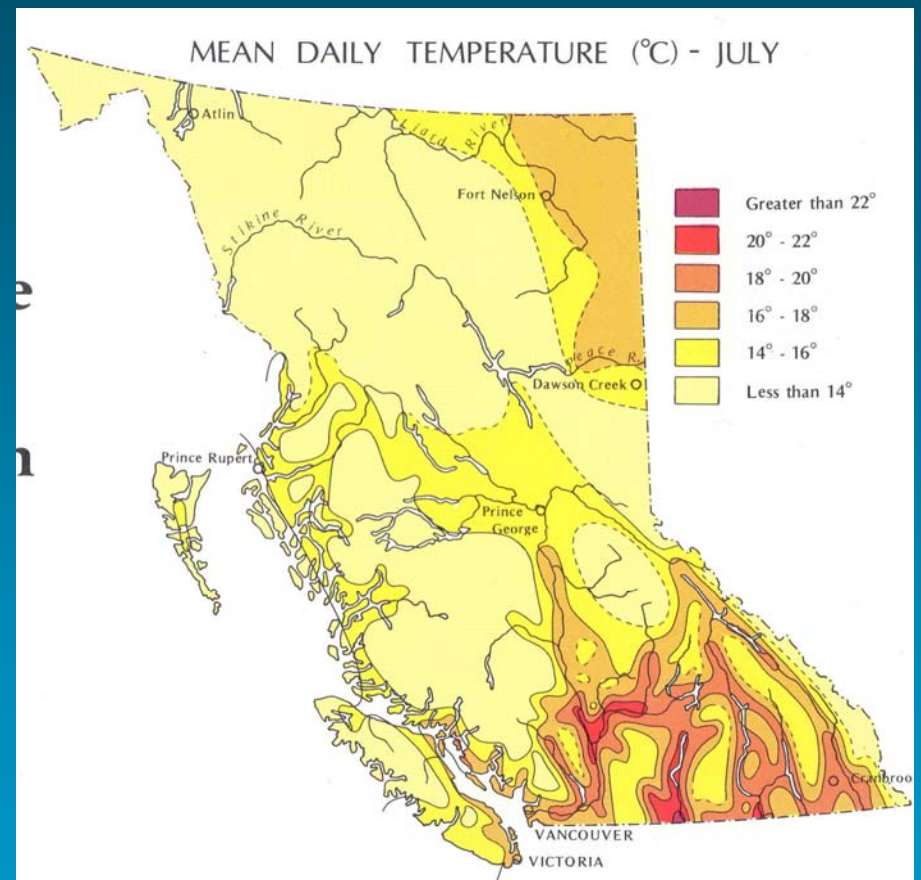




Complex topography creates a varied climate

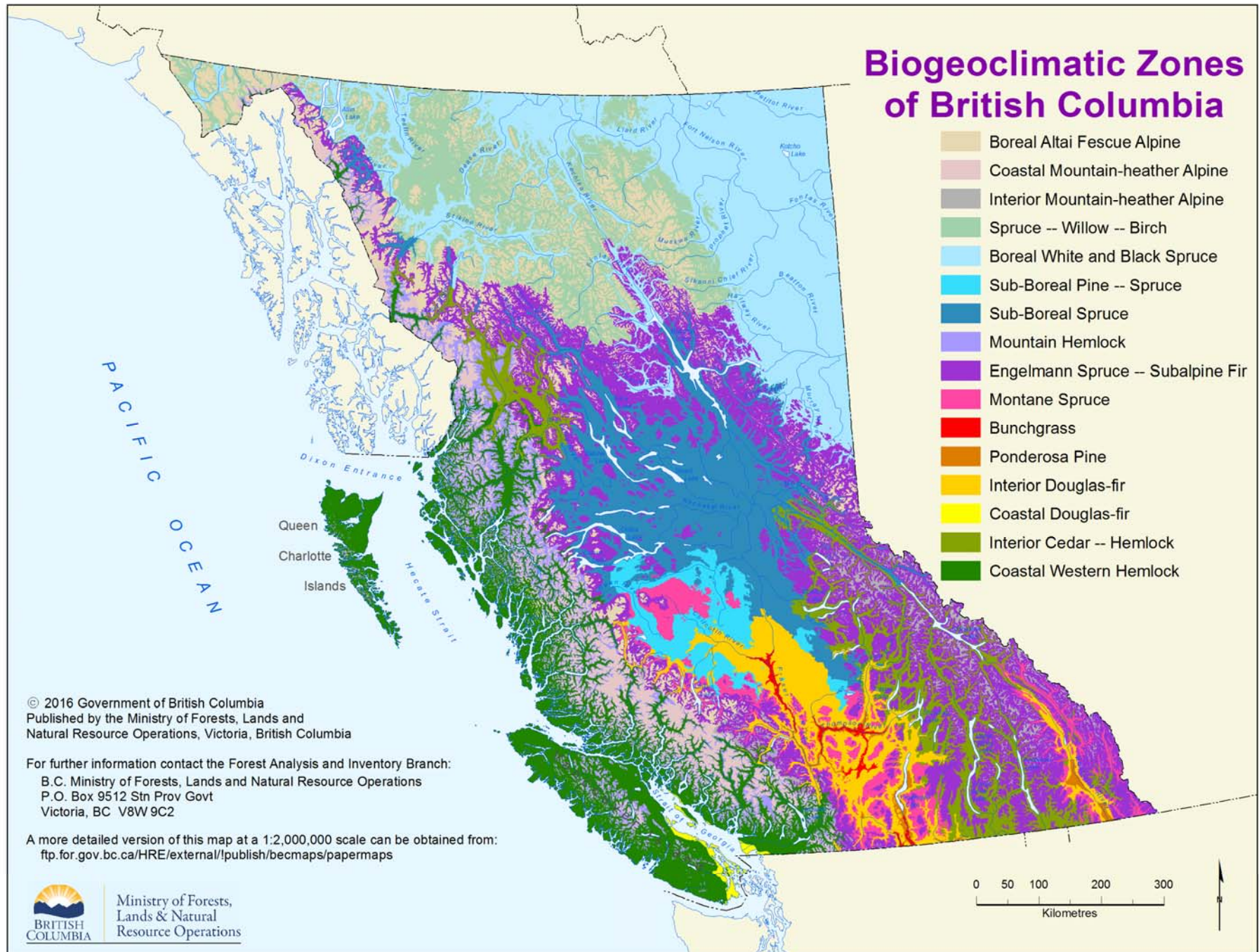


Interplay between Arctic
and Pacific air masses



Biogeoclimatic Zones of British Columbia

- Boreal Altai Fescue Alpine
- Coastal Mountain-heather Alpine
- Interior Mountain-heather Alpine
- Spruce -- Willow -- Birch
- Boreal White and Black Spruce
- Sub-Boreal Pine -- Spruce
- Sub-Boreal Spruce
- Mountain Hemlock
- Engelmann Spruce -- Subalpine Fir
- Montane Spruce
- Bunchgrass
- Ponderosa Pine
- Interior Douglas-fir
- Coastal Douglas-fir
- Interior Cedar -- Hemlock
- Coastal Western Hemlock



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Natural Resource Operations, Victoria, British Columbia

For further information contact the Forest Analysis and Inventory Branch:
B.C. Ministry of Forests, Lands and Natural Resource Operations
P.O. Box 9512 Stn Prov Govt
Victoria, BC V8W 9C2

A more detailed version of this map at a 1:2,000,000 scale can be obtained from:
<ftp.for.gov.bc.ca/HRE/external/publish/becmaps/papermaps>



Ministry of Forests,
Lands & Natural
Resource Operations

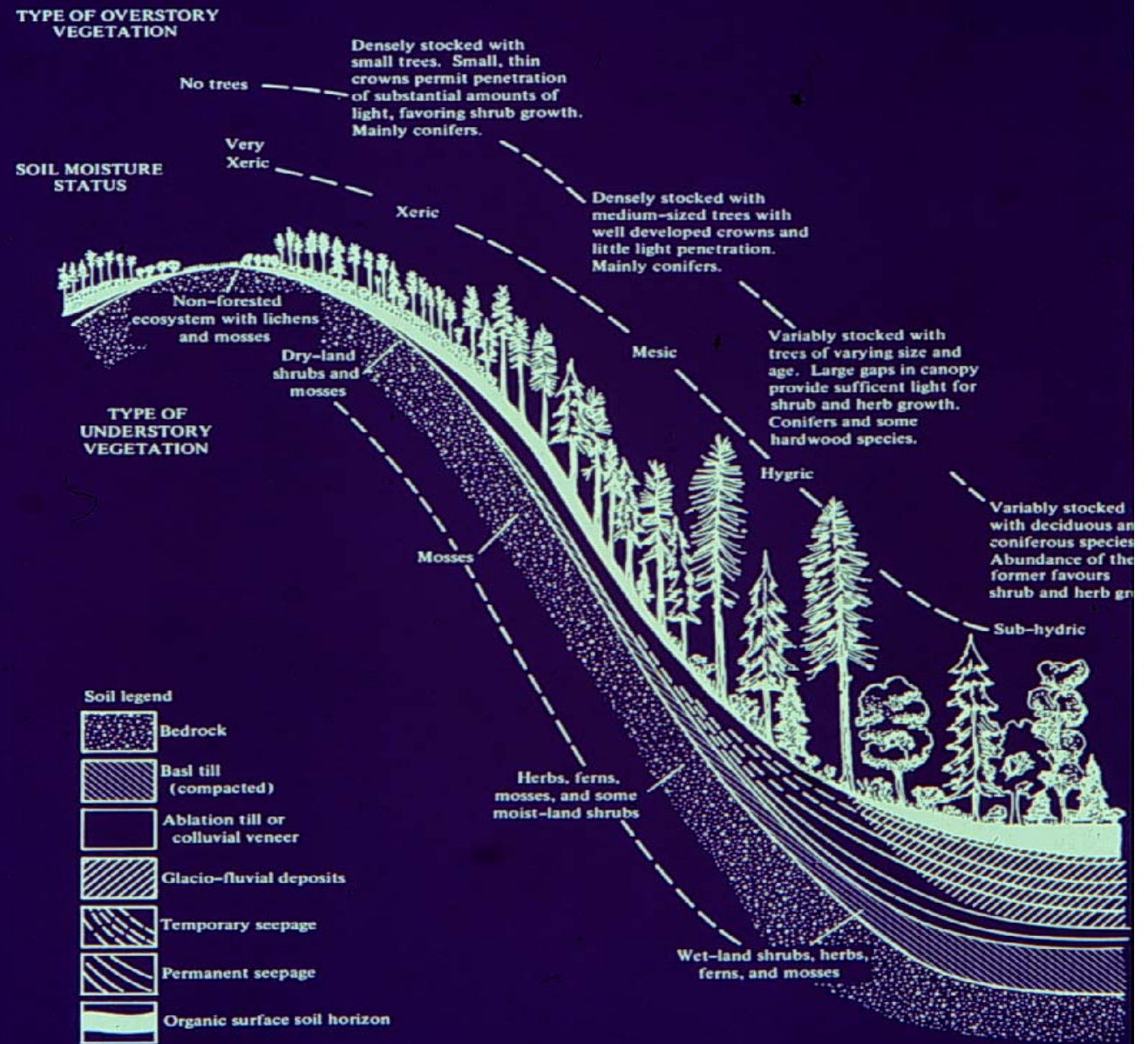
0 50 100 200 300
Kilometres

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

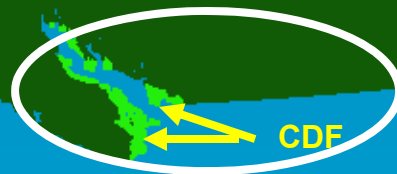
Canada's "banana belt"

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

Low elevation

rots,

Fire, root
drought



Coastal Western Hemlock Zone –

wet cool winters, generally mild to warm summers.

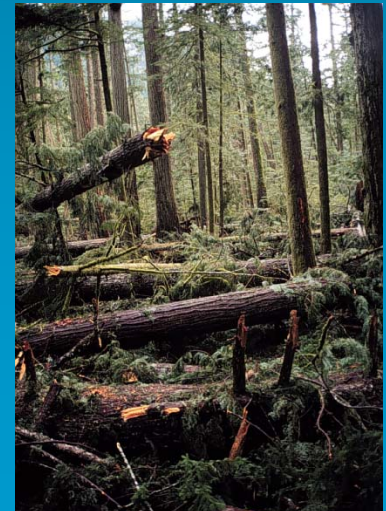
Coastal, montane climate

Canada's temperate rainforest

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

Low to medium elevation

Wind, Fire, 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, wind, snowpress



Interior Douglas-fir Zone –

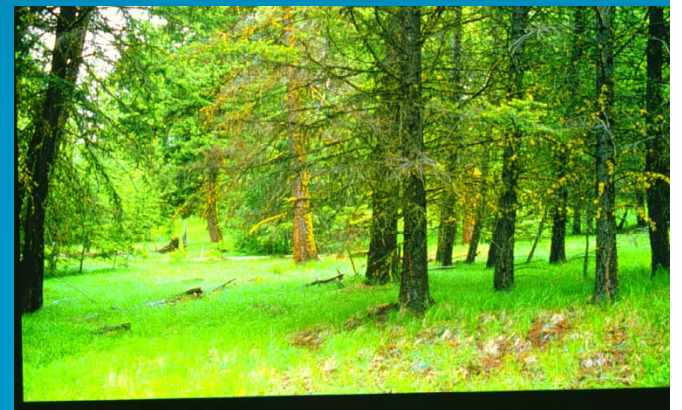
Relatively short cool to cold winters; long, hot, dry summers. Montane. Sub-continental climate

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

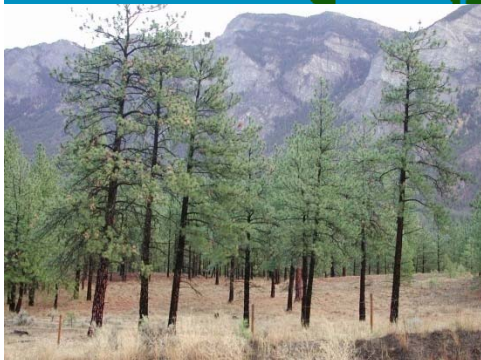
Canada's semi-desert forest/western grasslands

Low elevation – valley bottoms

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

Fire, drought, browsing

grass



Montane Spruce Zone –

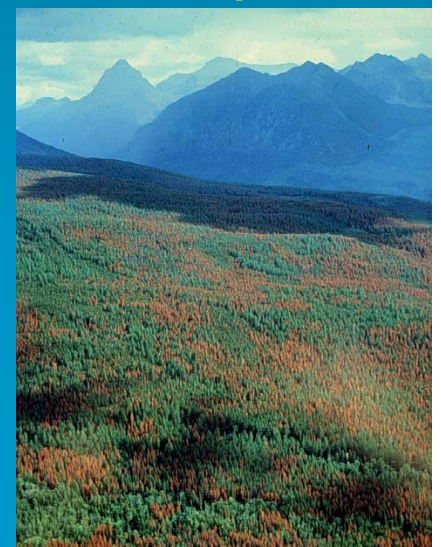
Long, cold, snowy winters, warm summers; relatively dry.
Subcontinental, montane climate

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 –

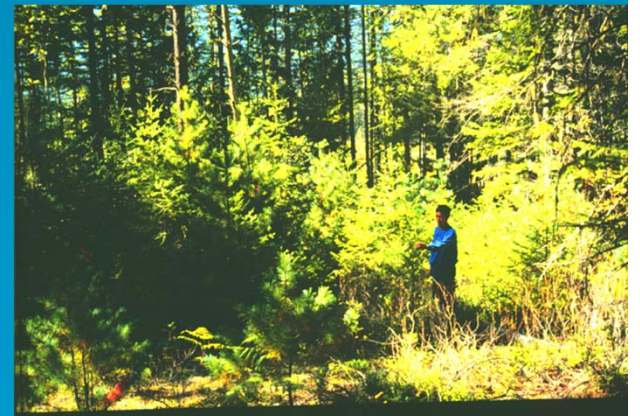
wet, mild to cool winters; warm, relatively moist summers.
Subcontinental, humid climate

The interior wet belt forest

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

Low to medium elevation

Fire, defoliators



Engelmann Spruce Subalpine fir Zone –

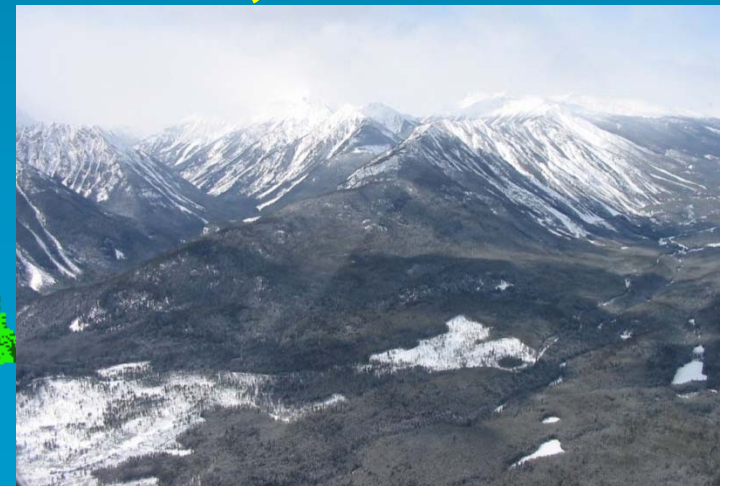
Long, cold to very cold, snowy winters; short warm summers with frequent frost, dry to humid. Continental – subcontinental subalpine climate

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

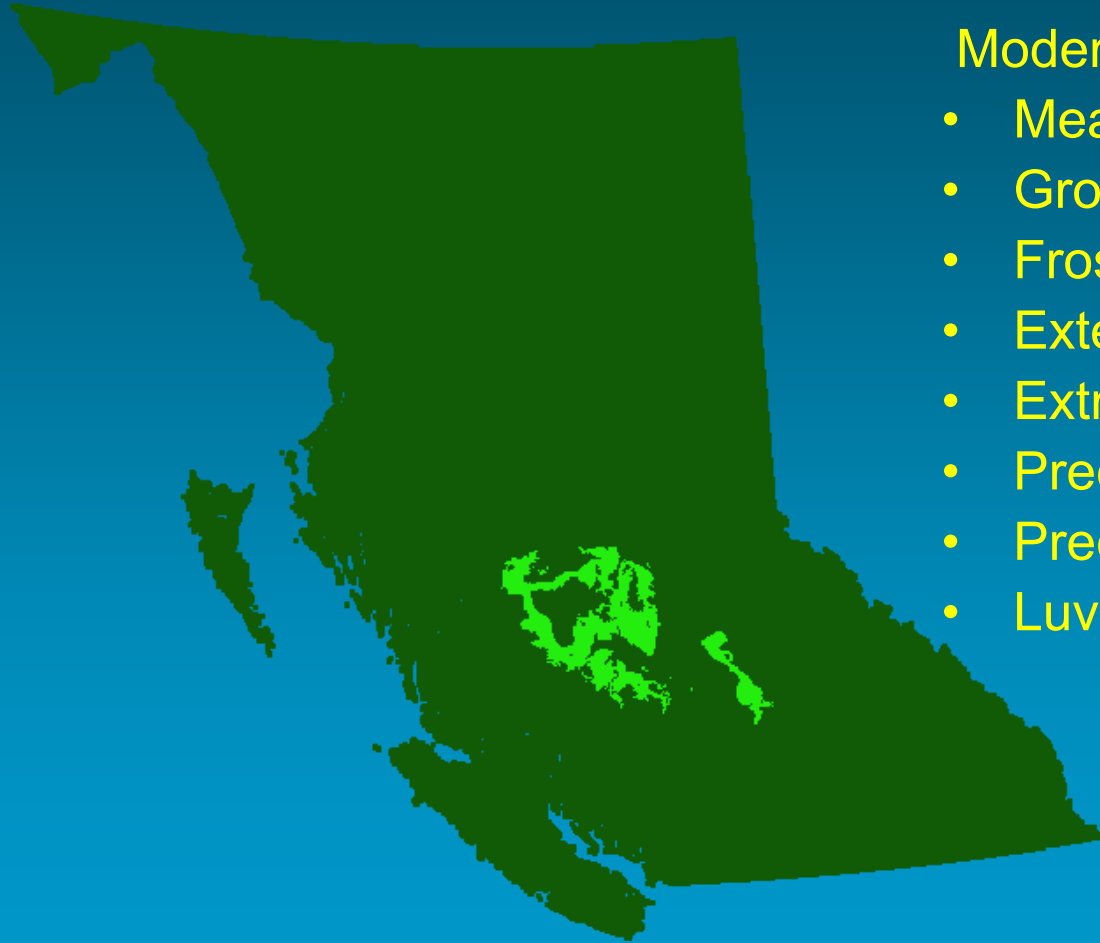
**Engelmann spruce, subalpine fir,
lodgepole pine, whitebark pine,
subalpine larch**

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



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



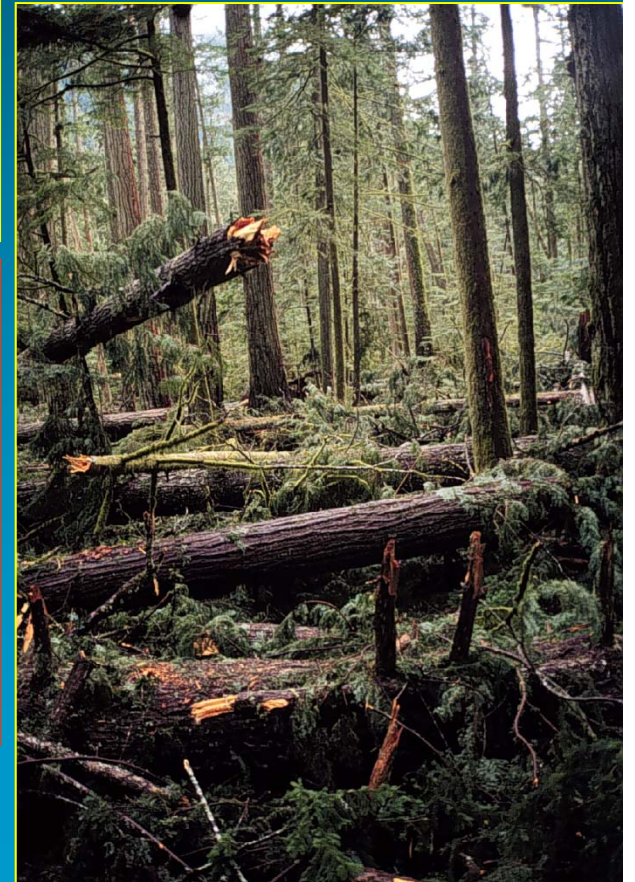
Fire and insects

Most of our forest ecosystems are disturbance driven, and disturbance dependent

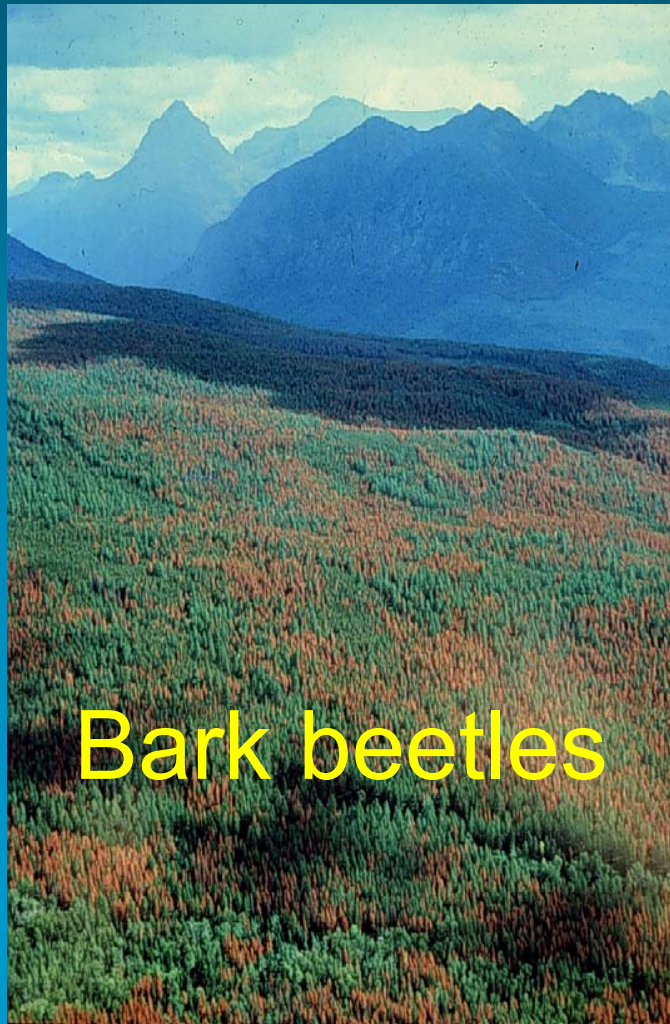
Landslide



Wind



Fire

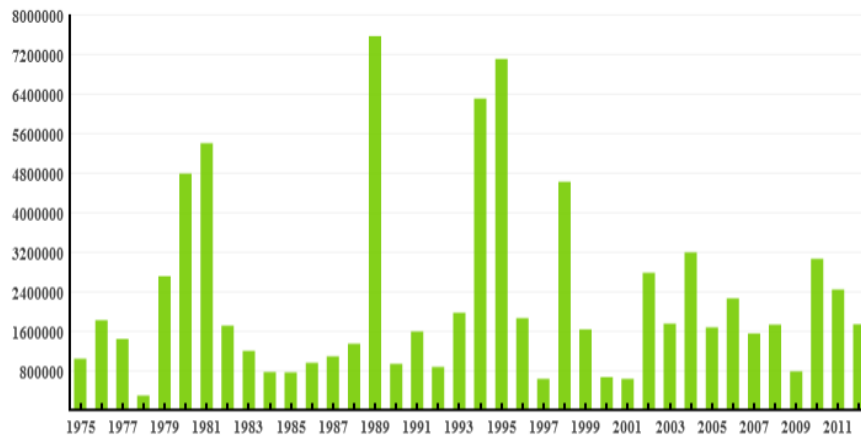


Bark beetles

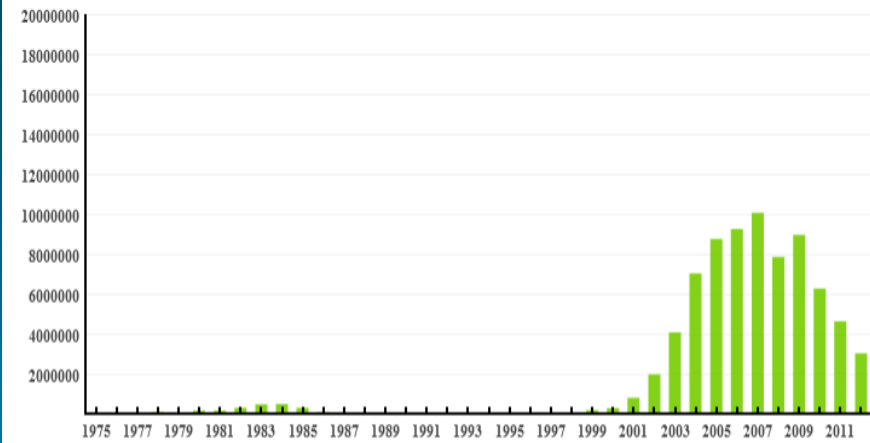


Forest Damage Trends for Canada

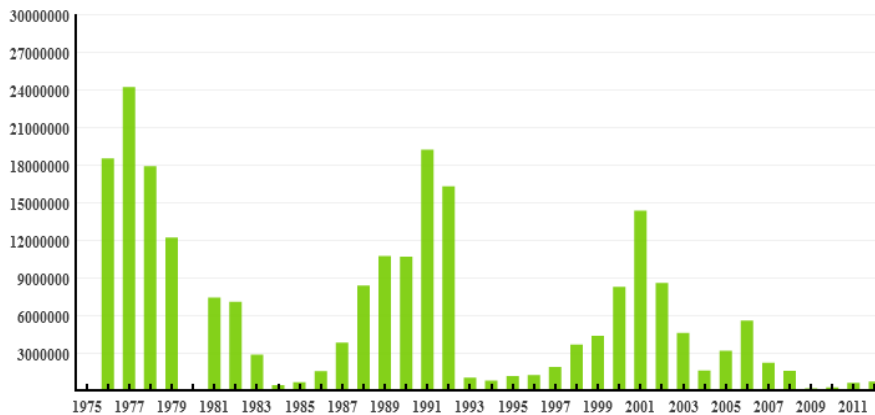
■ Total Area Burned (ha)



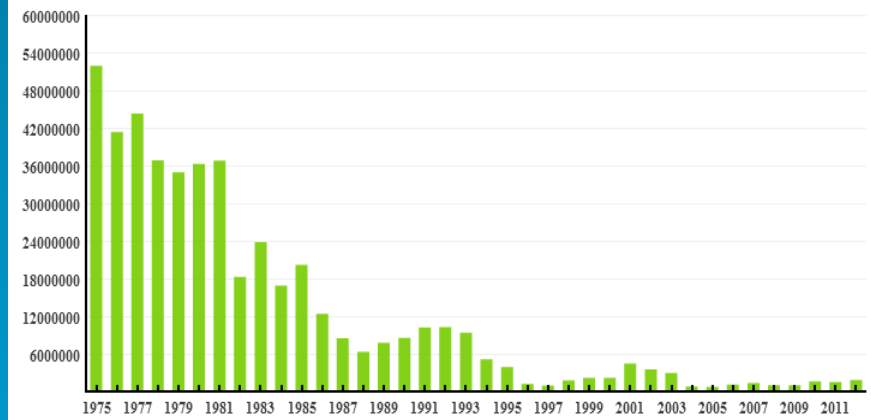
■ Area Defoliated by Mountain Pine Beetle (ha)



■ Area Defoliated by Tent Caterpillar (ha)



■ Area Defoliated by Spruce Budworm (ha)



Area of losses is 10-20 times the annual harvest area (1MM Ha)

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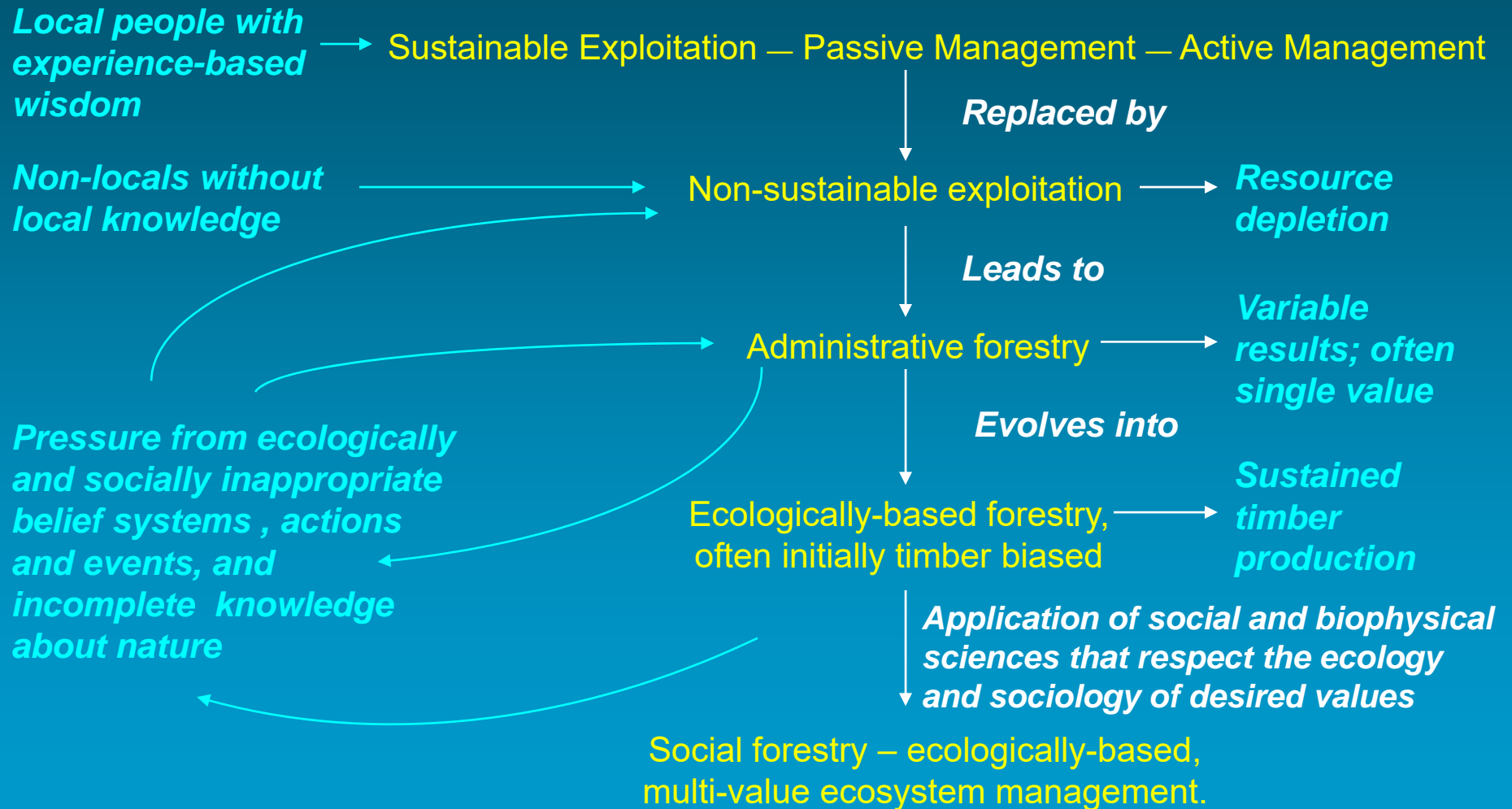


Title: Vancouver. Hastings Mill

1890's

Forest products account for 30-45% of BC exports

The Evolution of Forestry



Eras 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

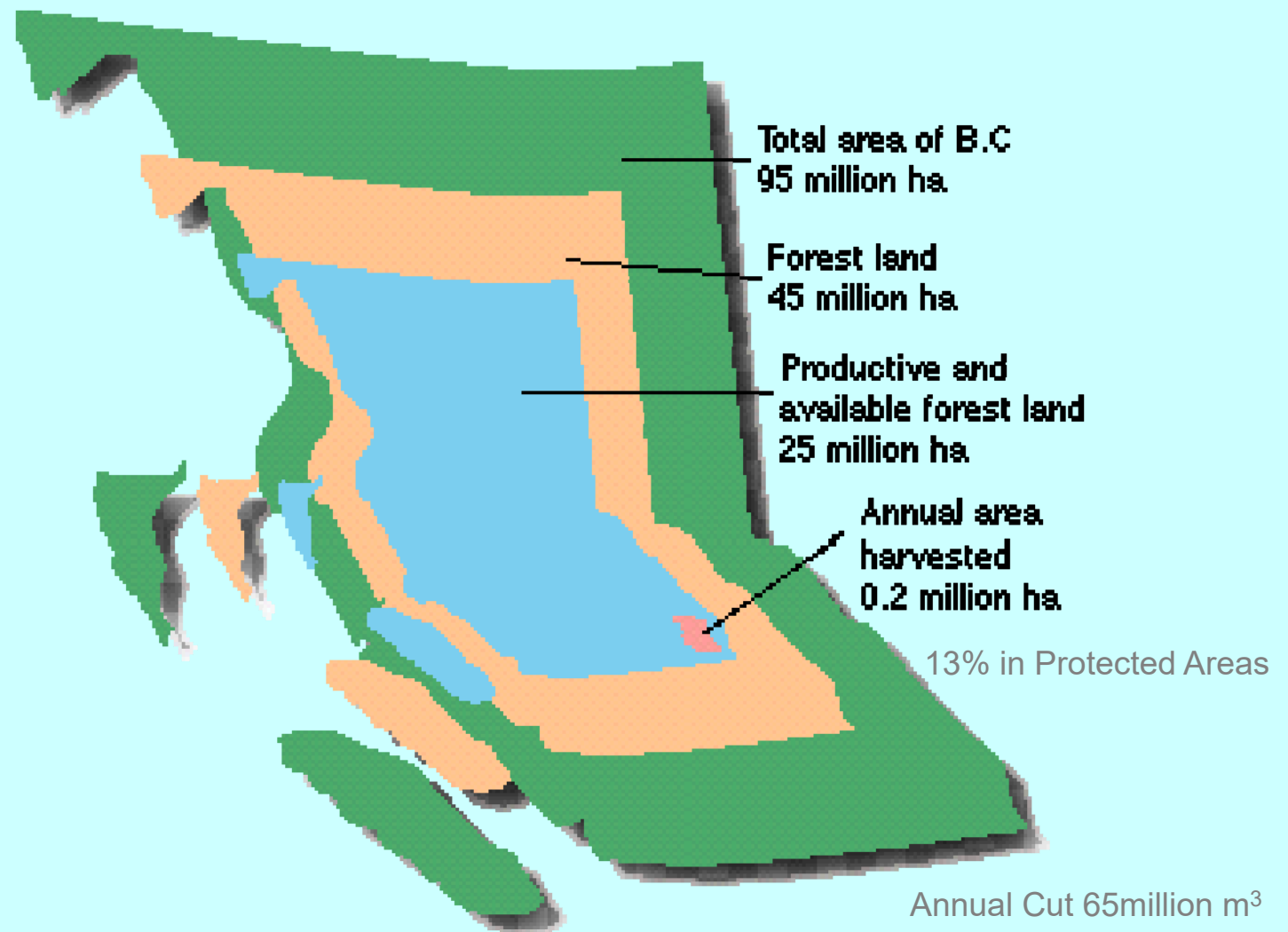
Forest use is regulated by society. In BC legislation includes:

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)



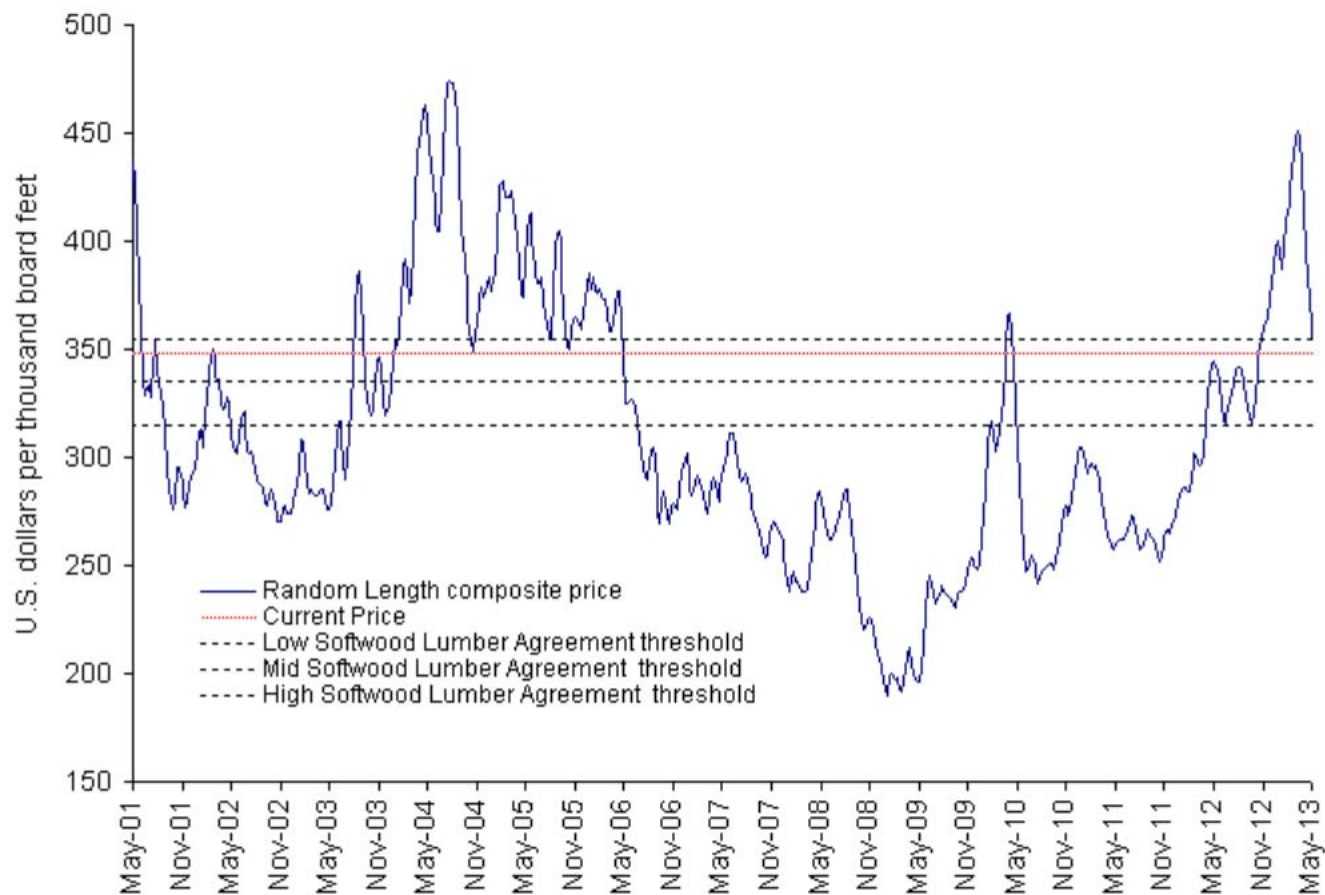
25 million hectares of old-growth forest

4.5 million hectares protected old-growth, plus 11.5 million hectares in conservation or inoperable areas

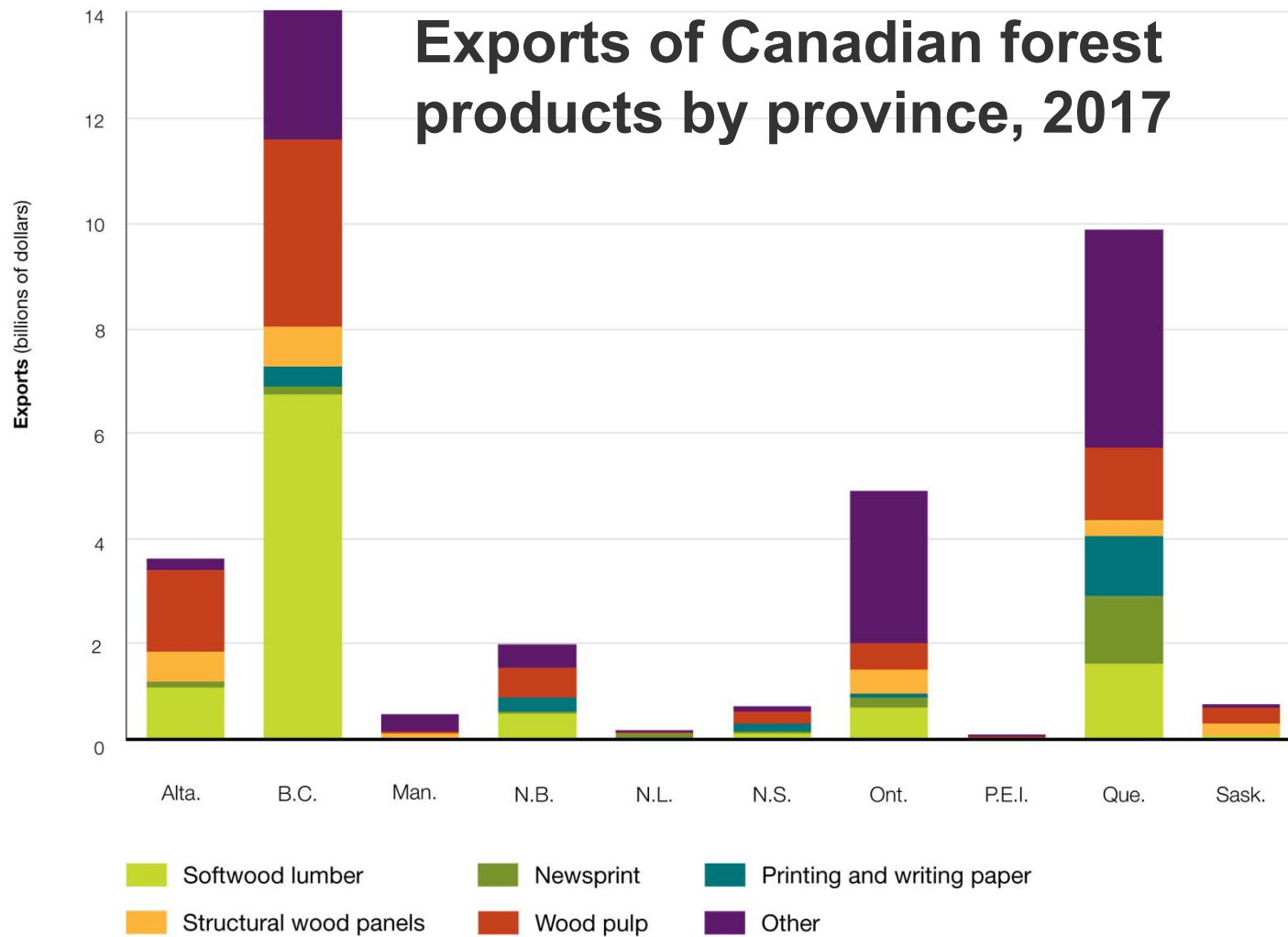
Great Bear Rainforest Agreement

<https://greatbearrainforest.gov.bc.ca/>

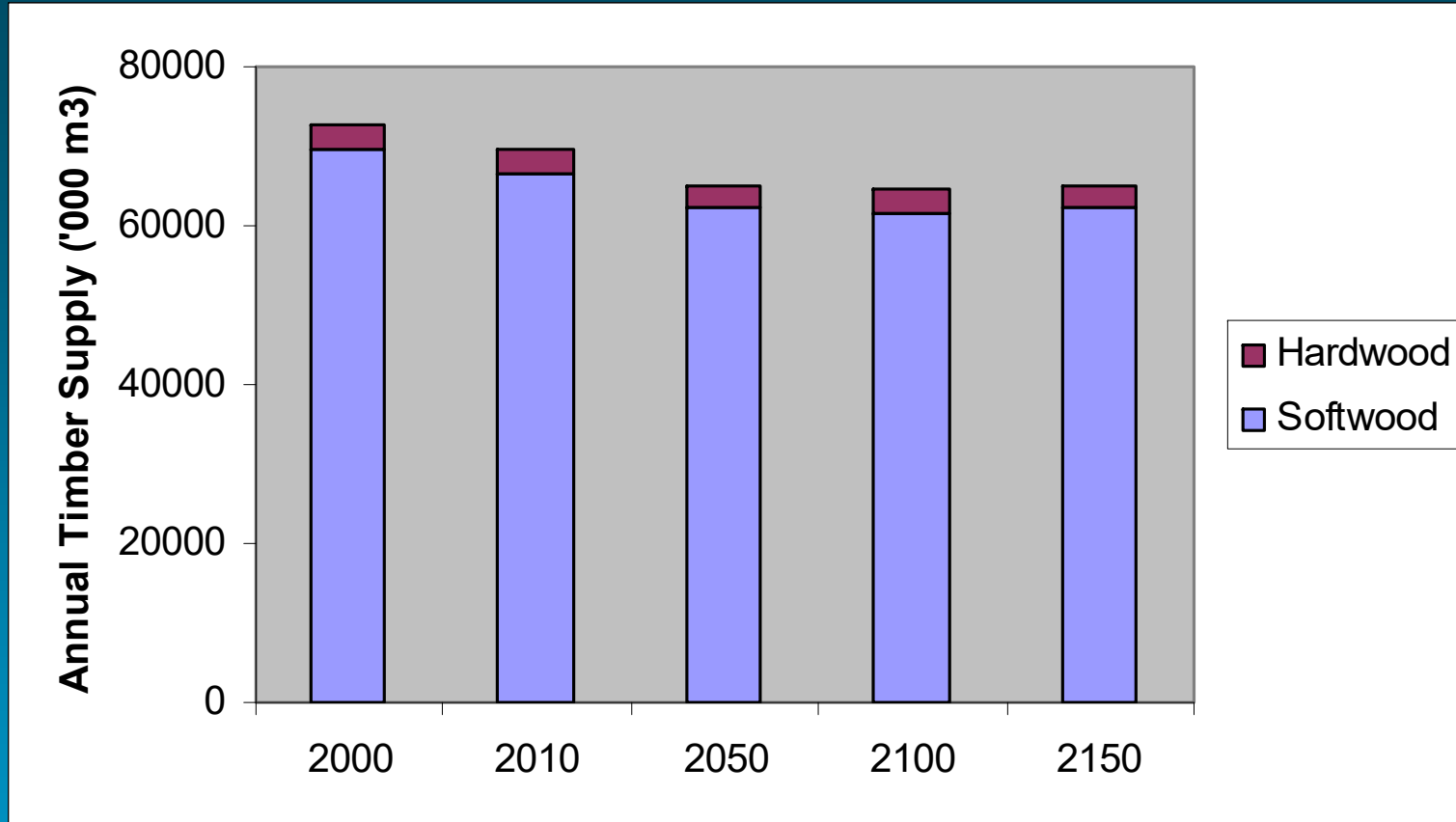
Is this a “sunset industry”?



<http://cfs.nrcan.gc.ca/selective-cuttings/43>

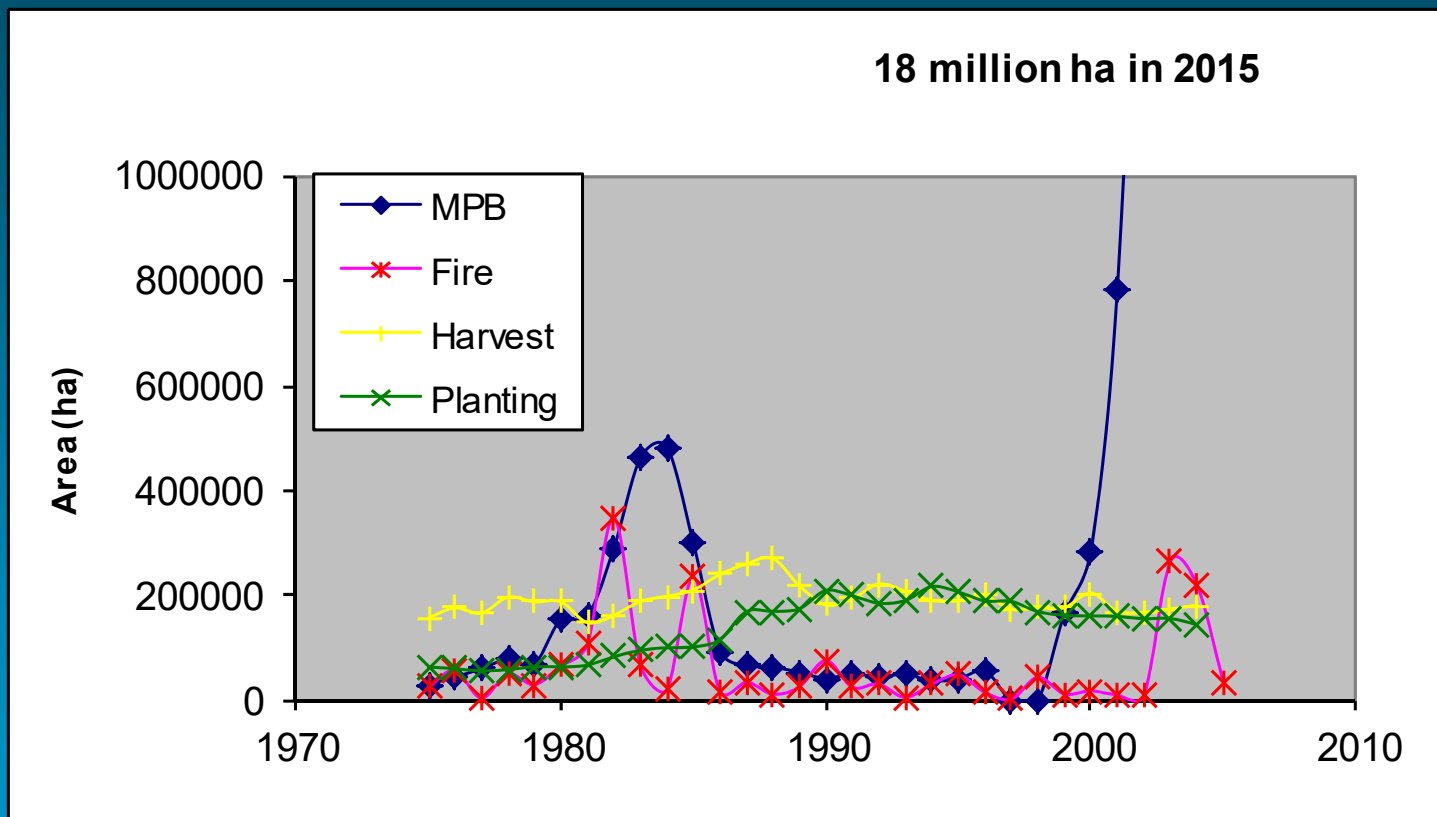


<https://www.nrcan.gc.ca/our-natural-resources/forests-and-forestry/forest-fact-book/forest-industry-regional-picture/21684>



Current annual harvest 74 million m³

(Natural Resources Canada)



(Statistics Canada)



But what about the wildlife?

- 1700 mountain caribou (southern), in rapid decline
- < 10 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

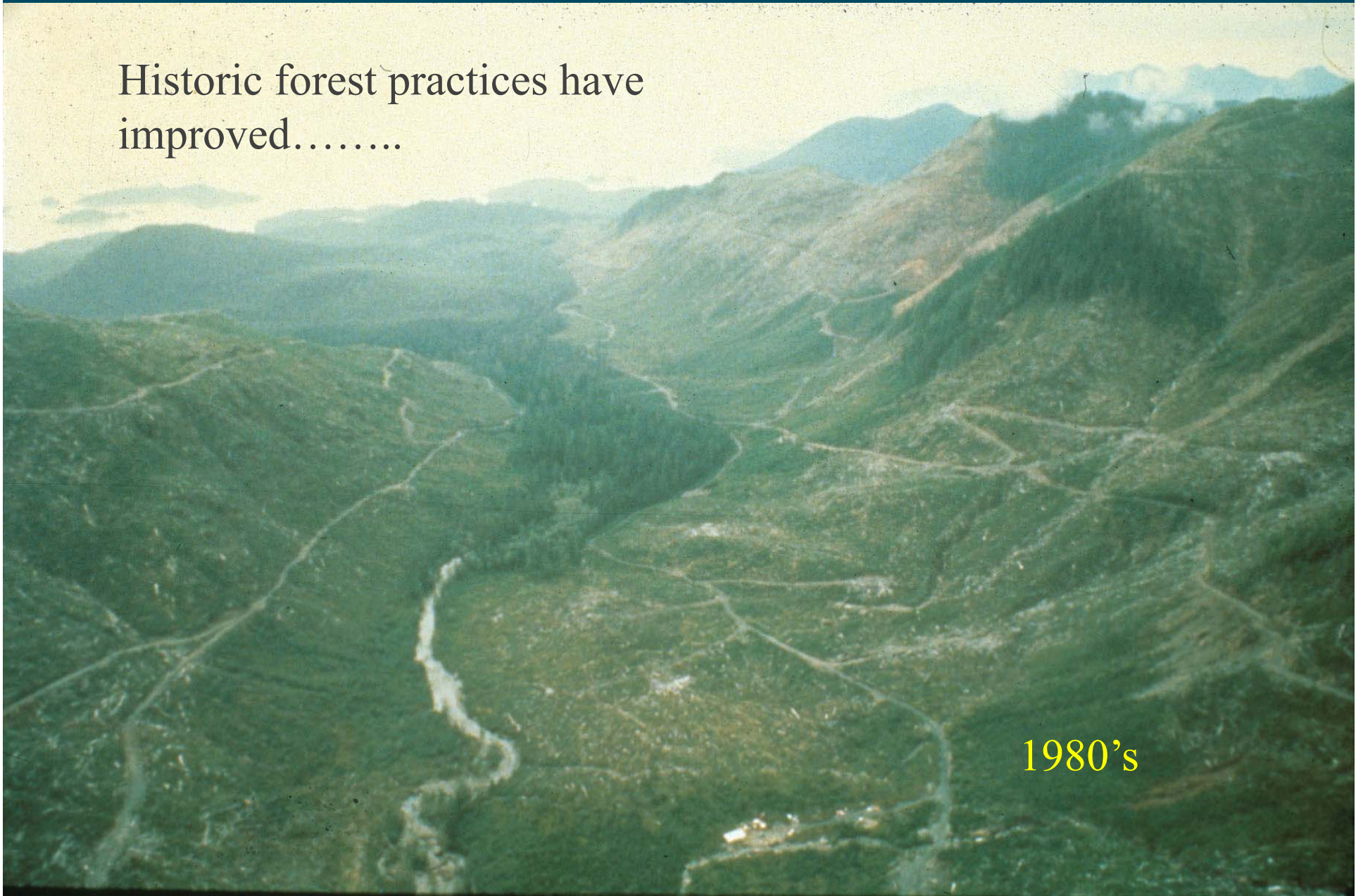
<http://www.env.gov.bc.ca/cdc/>

(BCMOE Conservation Data Centre)

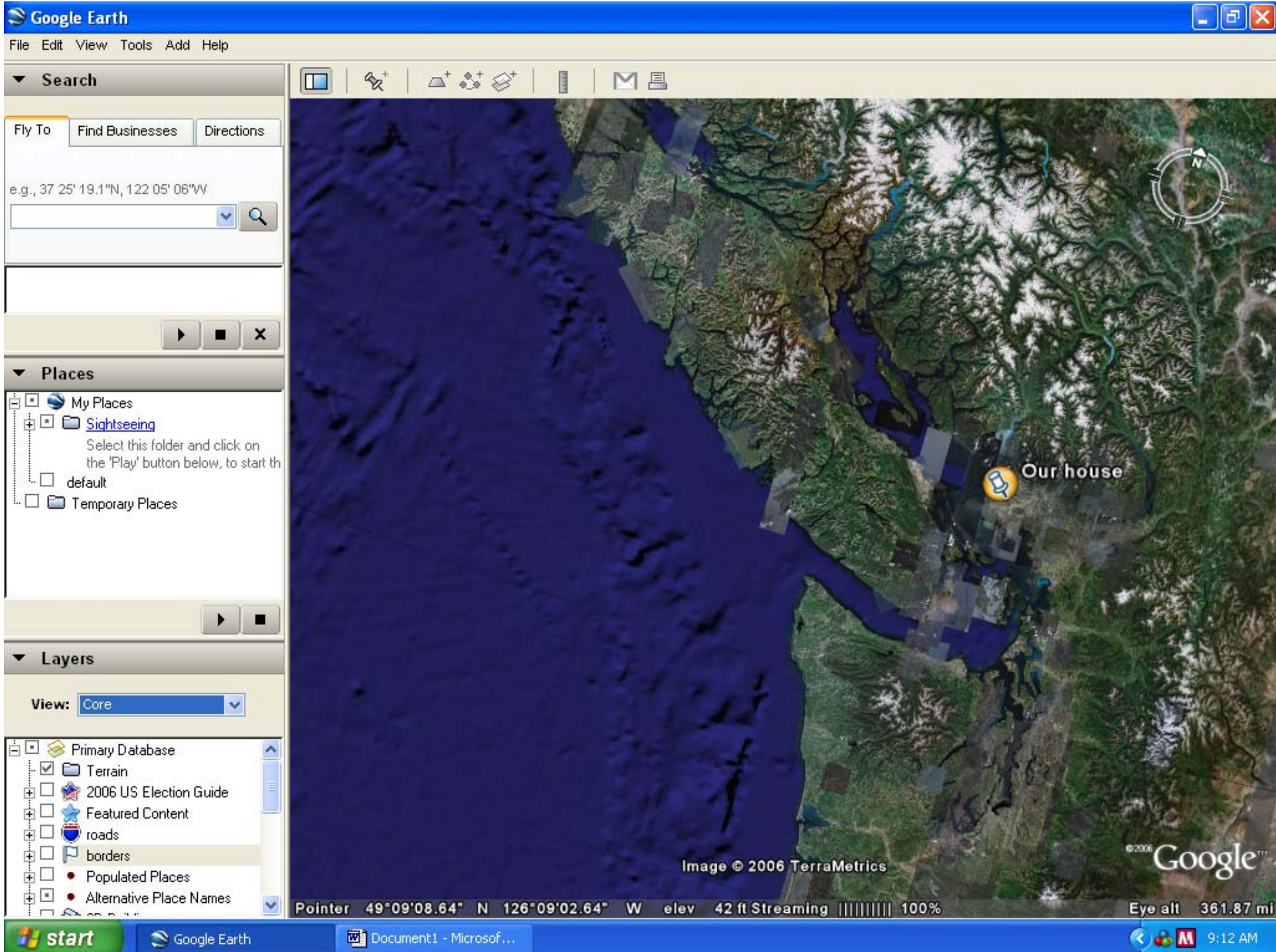


Historic forest practices have
improved.....

1980's







Search

Fly To Find Businesses Directions

e.g., 37 25' 19.1"N, 122 05' 06"W

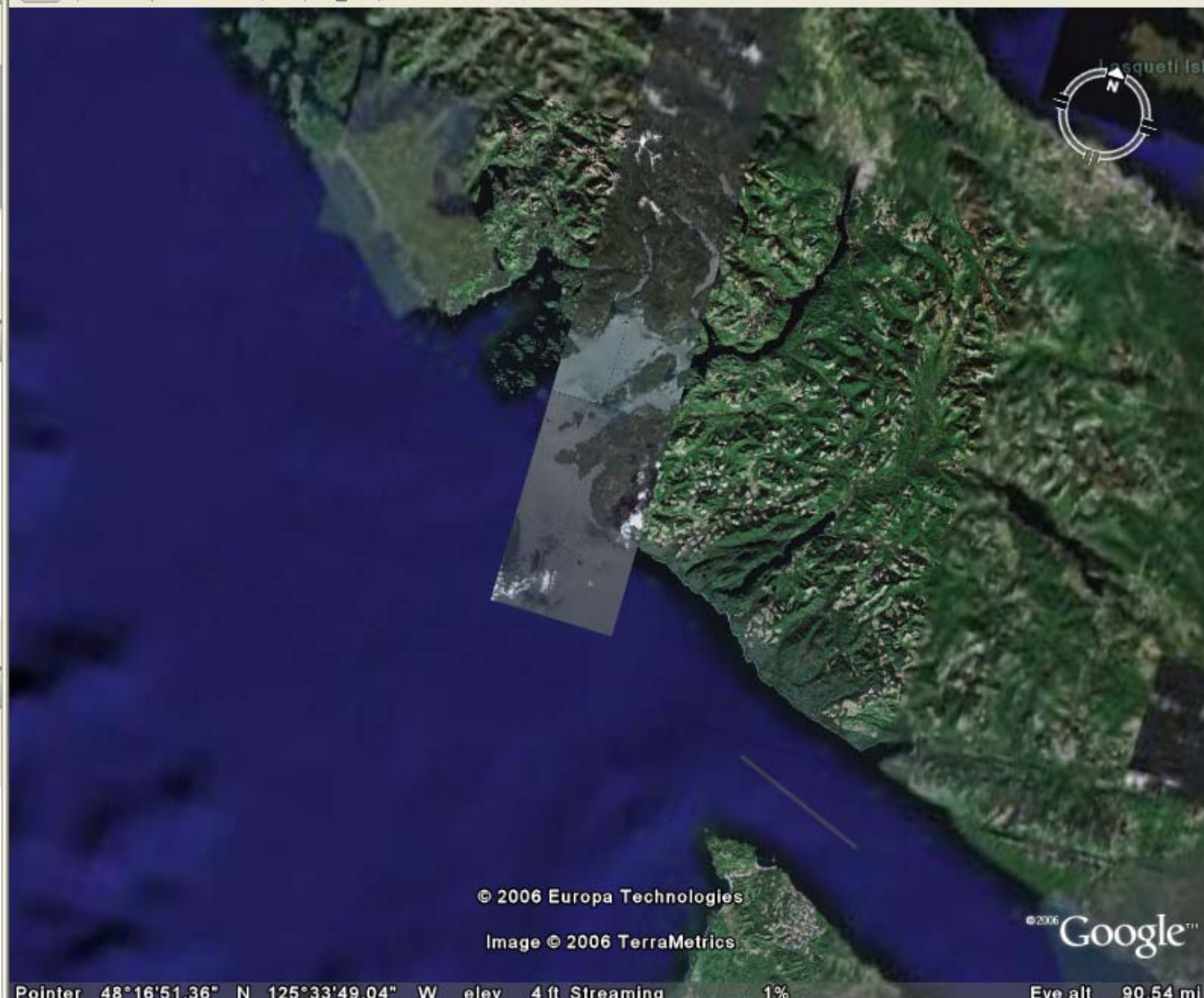
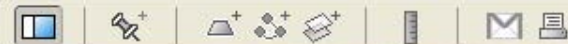
Places

- My Places
 - Sightseeing
 - Select this folder and click on the 'Play' button below, to start th
 - default
 - Temporary Places

Layers

View: Core

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 - ☒ Terrain
 - ☐ 2006 US Election Guide
 - ☐ Featured Content
 - ☐ roads
 - ☐ borders
 - ☒ Populated Places
 - ☐ Alternative Place Names

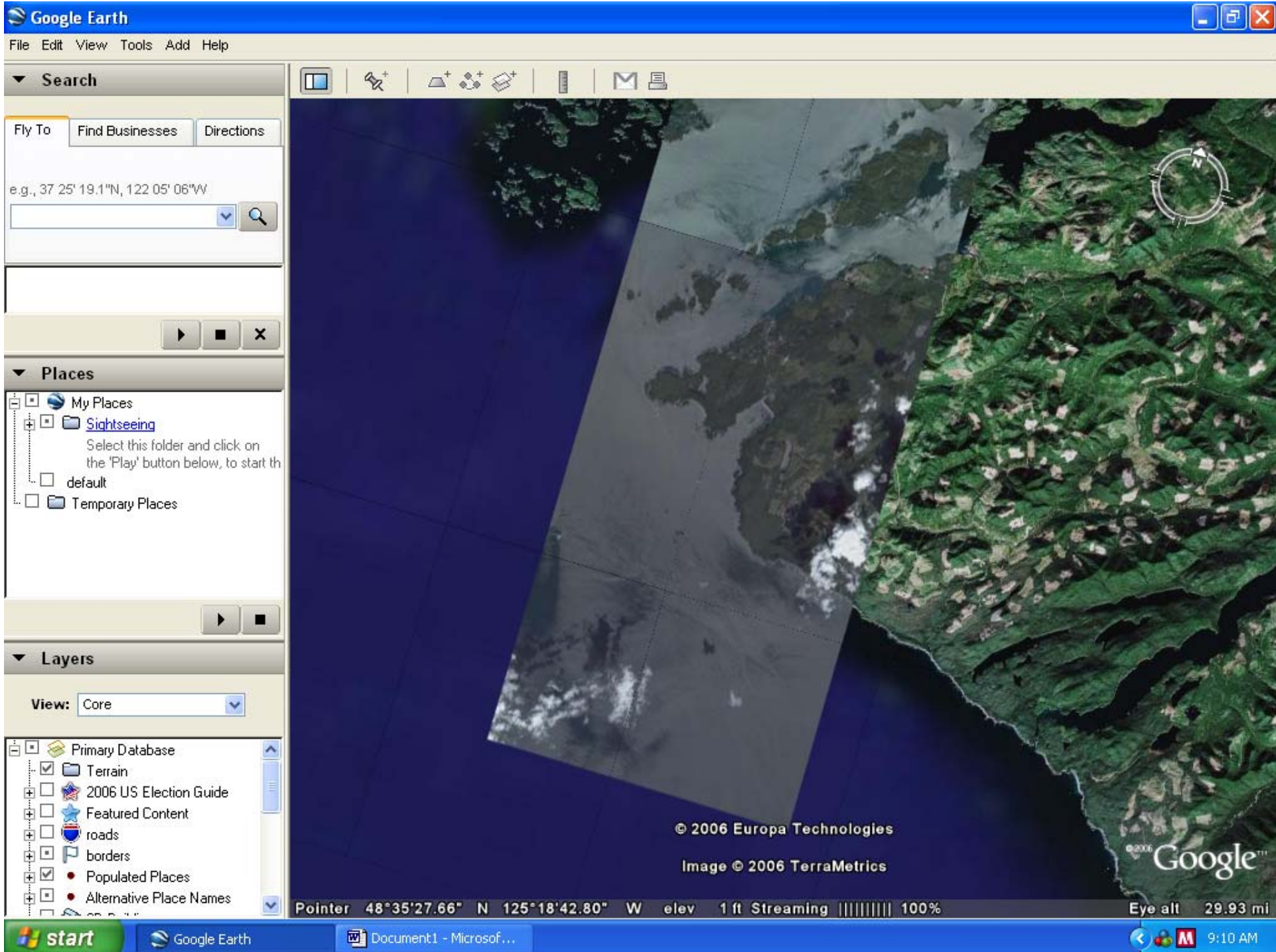


© 2006 Europa Technologies

Image © 2006 TerraMetrics

© 2006 Google™

Pointer 48°16'51.36" N 125°33'49.04" W elev 4 ft Streaming 1% Eye alt 90.54 mi



Search

Fly To Find Businesses Directions

e.g., 37 25' 19.1"N, 122 05' 06"W

Places

- My Places
 - Sightseeing

Select this folder and click on the 'Play' button below, to start th
 - default
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Layers

View: Core

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 - ☐ borders
 - ☒ Populated Places
 - ☐ Alternative Place Names



Image © 2006 DigitalGlobe
Image © 2006 TerraMetrics

Pointer 48°42'42.11" N 125°08'53.89" W elev 0 ft Streaming 79%

Eye alt 39905 ft

Search

Fly To Find Businesses Directions

e.g., 37 25' 19.1"N, 122 05' 06"W

Places

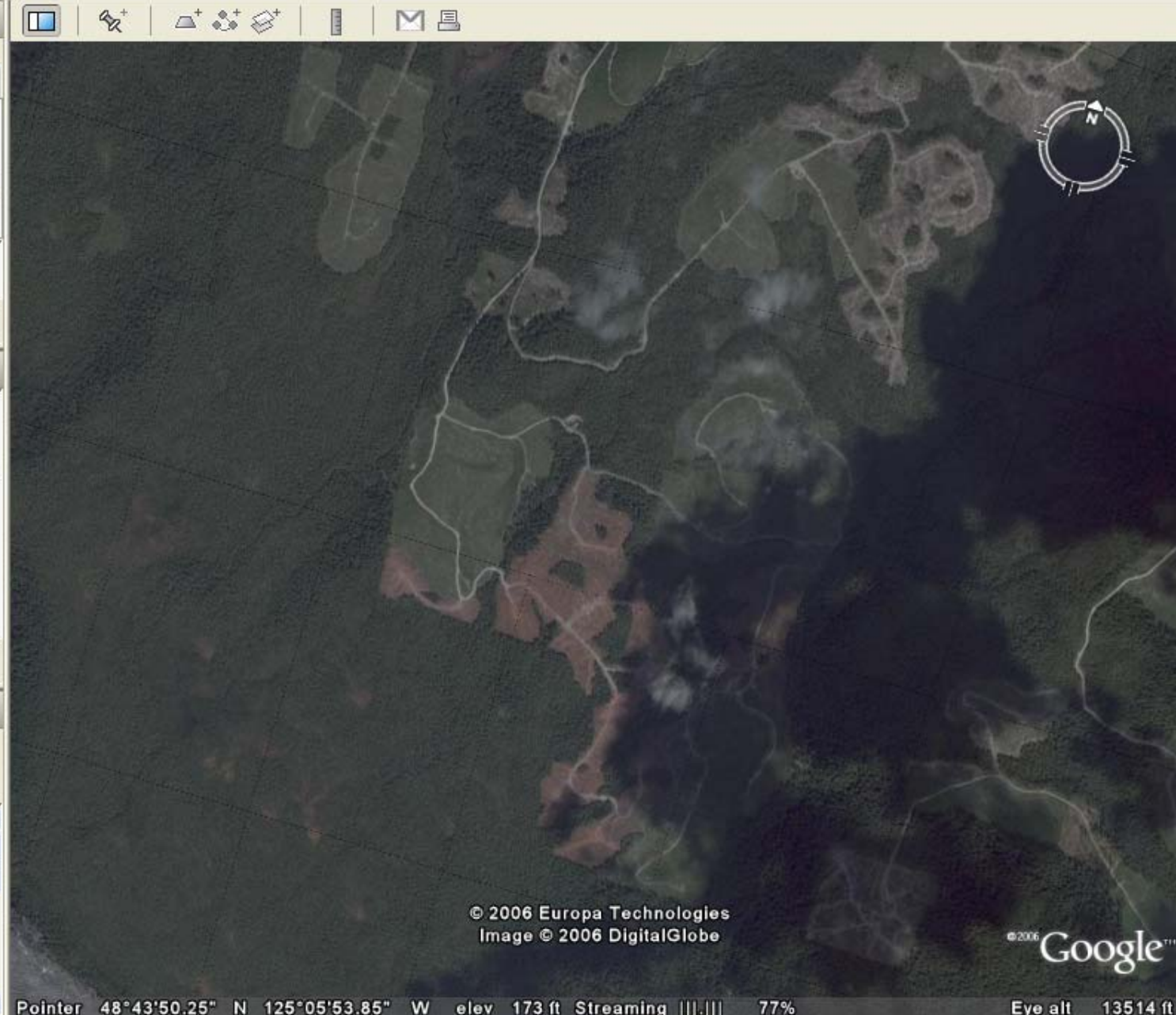
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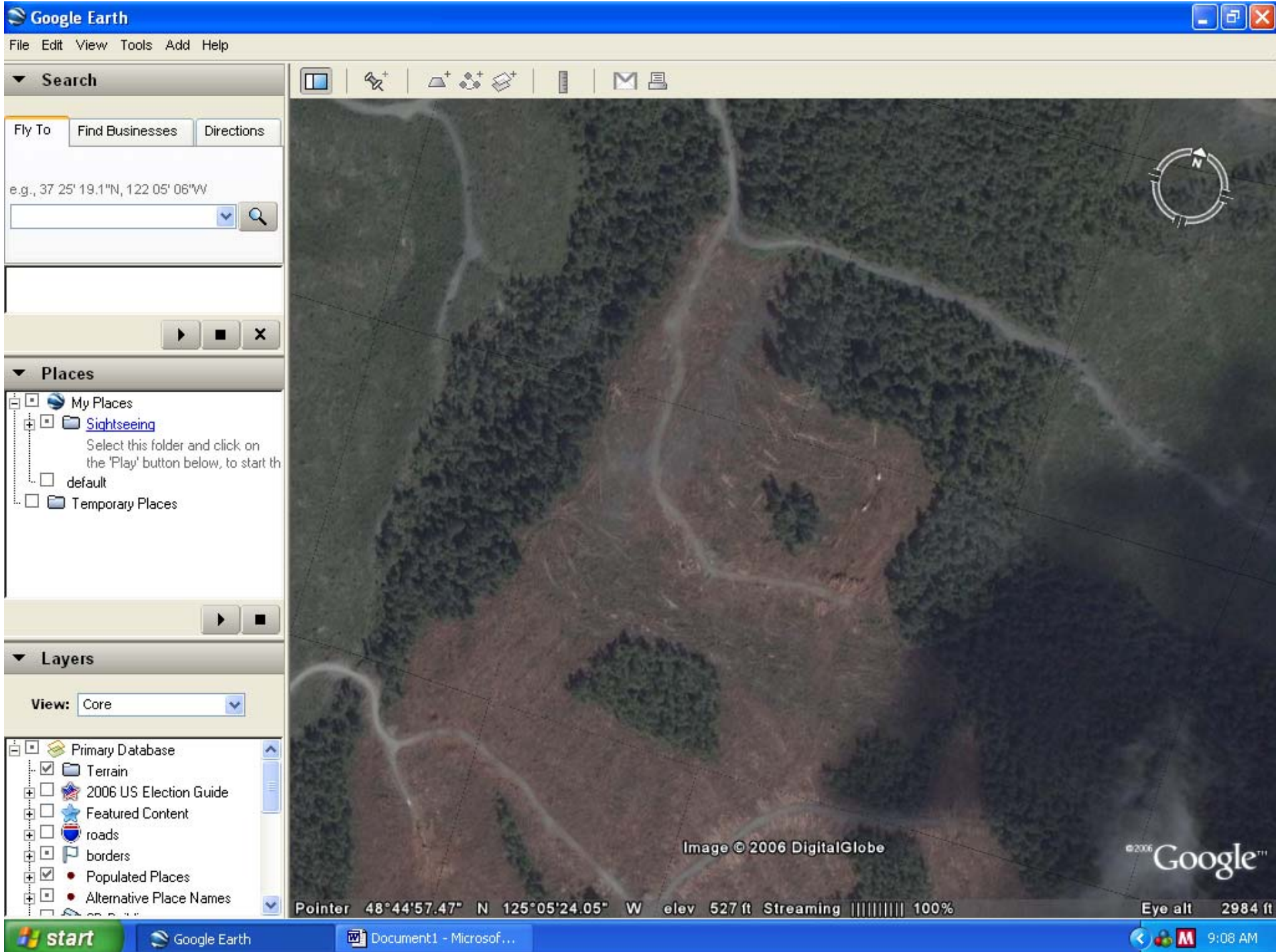
Select this folder and click on the 'Play' button below, to start th
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Search

Fly To Find Businesses Directions

e.g., 37 25' 19.1"N, 122 05' 06"W

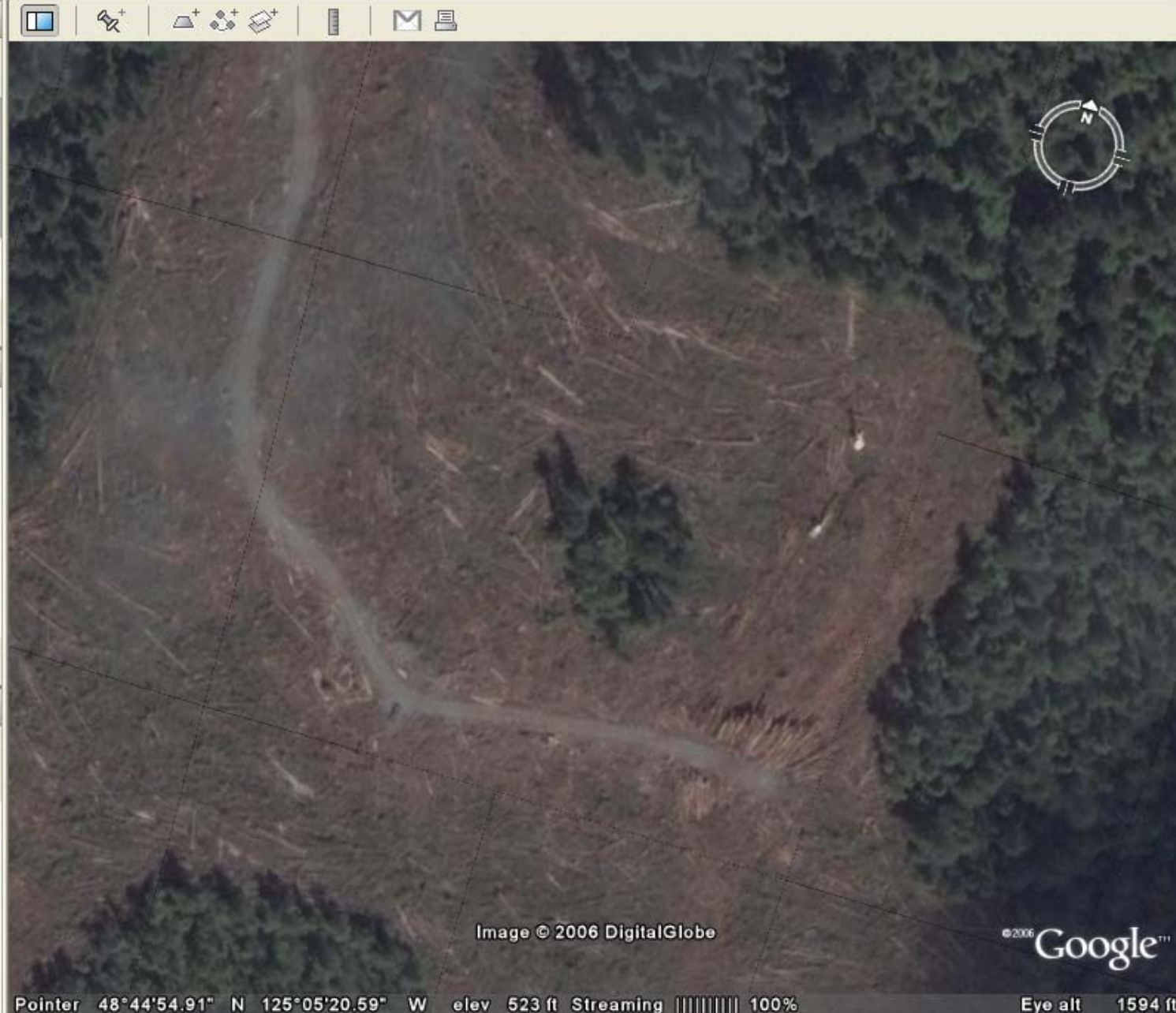
Places

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Layers

View: Core

- Primary Database
 - ☒ Terrain
 - ☐ 2006 US Election Guide
 - ☐ Featured Content
 - ☐ roads
 - ☐ borders
 - ☒ Populated Places
 - ☐ Alternative Place Names



Pointer 48°44'54.91" N 125°05'20.59" W elev 523 ft Streaming 100%

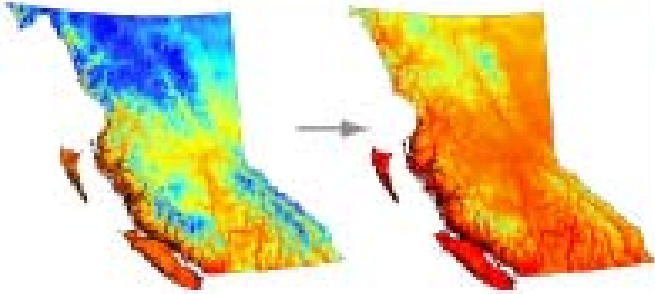
Eye alt 1594 ft

Outline

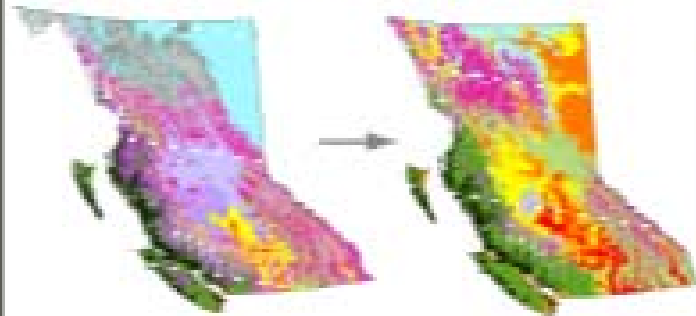
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Climate Change

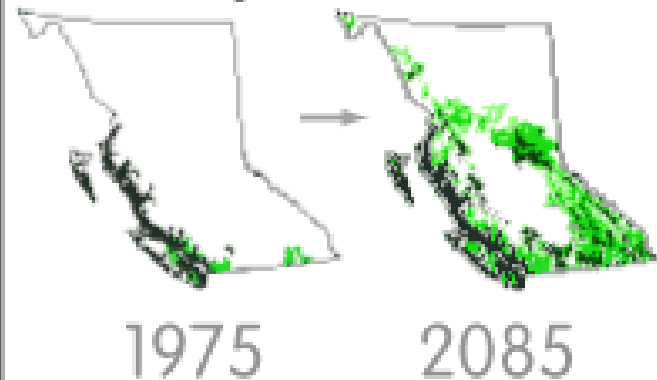
Mean Annual Temperature



BEC Zones

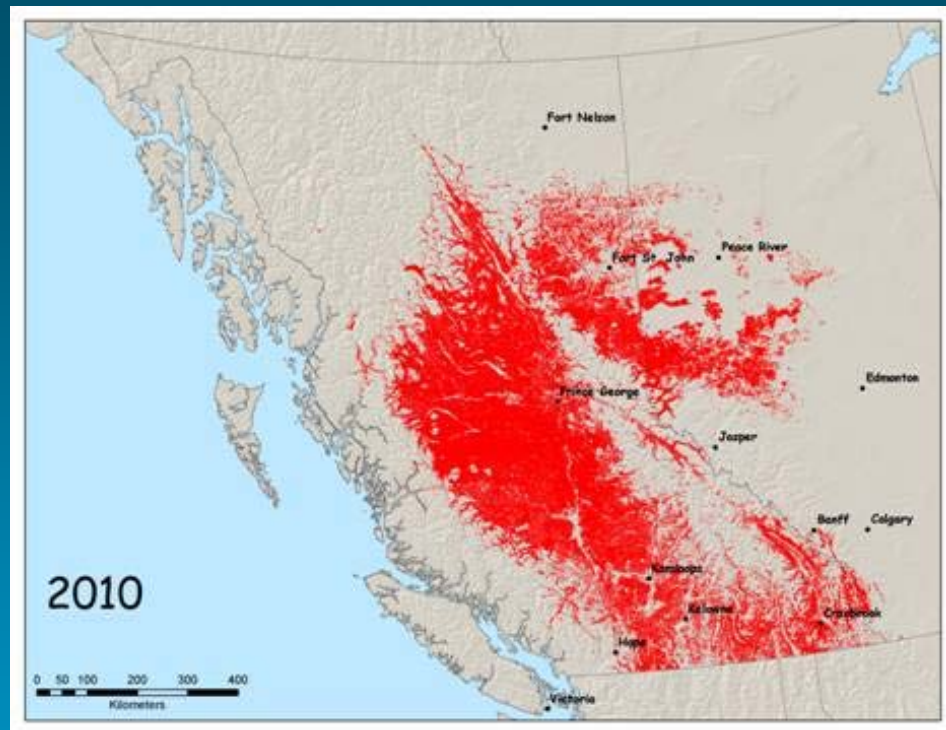
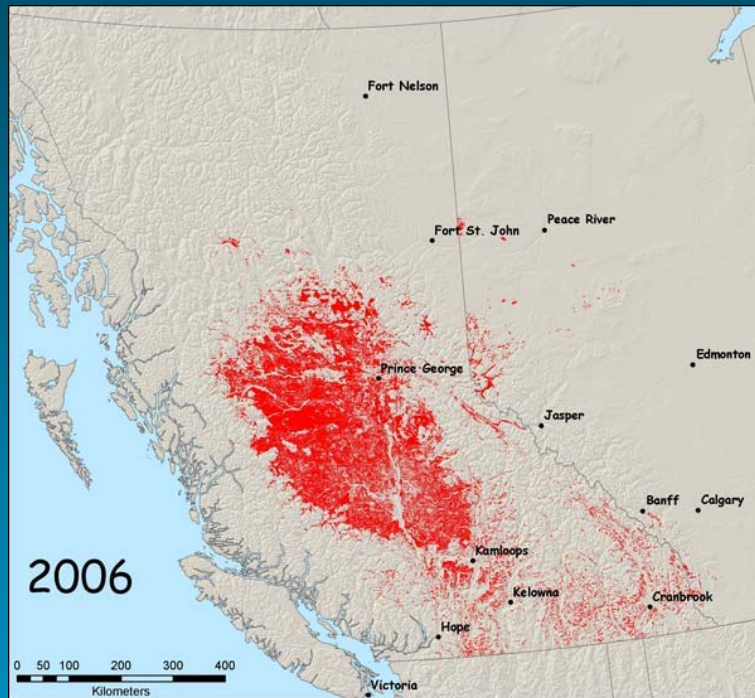


Range of Grand Fir



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

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



2015– 18 million ha

<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 km²)
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.”

Sept 2017 1200 fires, 11,650 km²

Mill Closures

B.C. pulp mills refusing to pay taxes

Tax revolt could hit rural municipalities hard

Last Updated: Thursday, July 9, 2009 | 9:19 AM PT Comments 168 Recommend 69

CBC News



Two B.C. pulp mills say their municipal taxes are too high and they plan to fight them in court. (Jeff Bassett/Canadian Press)

Two B.C. pulp and paper companies say their municipal tax bills are too high and they are refusing to pay up, leaving several rural communities wondering how they'll cover their own bills this year.

Castlegar Mayor Lawrence Chernoff said he learned of the tax revolt just hours before the tax deadline when the local local pulp mill, Celgar, notified the city that instead of paying its \$3.6 million tax bill, the company is planning to fight it in court.

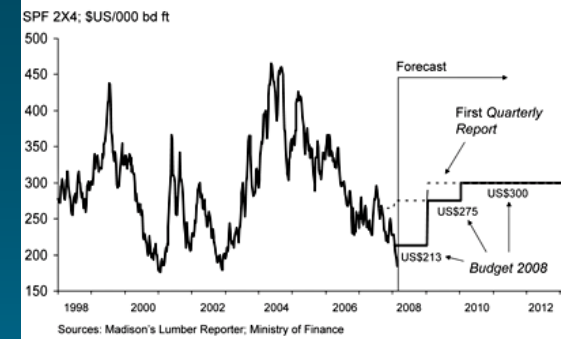
BC - 10,000 forestry jobs gone in past year

Mar 3, 2008 | In [Mill Closures & Layoffs](#) | [2 feedbacks »](#)

Almost 10,000 forestry sector jobs have been lost in the province of **British Columbia** in just this last year alone.

The Vancouver Sun surveyed all the forestry companies in British Columbia that reported a layoff since January 2007. The results show that 34 mills are down either permanently or indefinitely. Twenty-three have curtailed shifts or introduced job-sharing. The cost in jobs lost, both permanent and temporary, has climbed to 9,597.

Chart 4.12 Forestry prices expected to remain weak through 2008 before returning to trend



Tembec announces mill closures

June 5, 2009 by [Bram Rossman](#)

1 Comment

Filed under [Business](#), [Headlines](#), [Local News](#)



Tembec yard at Canal Flats (Photo: CV News - June 5, 2009)

After recent news of indefinite mill closures slated for Canfor sawmill operations in Radium, Vavenby and Rustad, Tembec Forest Products has now confirmed that it will be stopping production at two of its East Kootenay mill operations.

Generating More Value from Our Forests

**A Vision and Action Plan
for Further Manufacturing**

BC Bioenergy Strategy

Growing Our Natural Energy Advantage

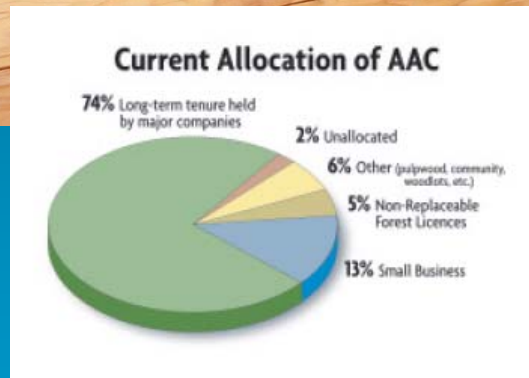
Utilize waste wood from phased-out beehive burners to produce clean energy.

Support wood gasification research, development and commercialization.

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



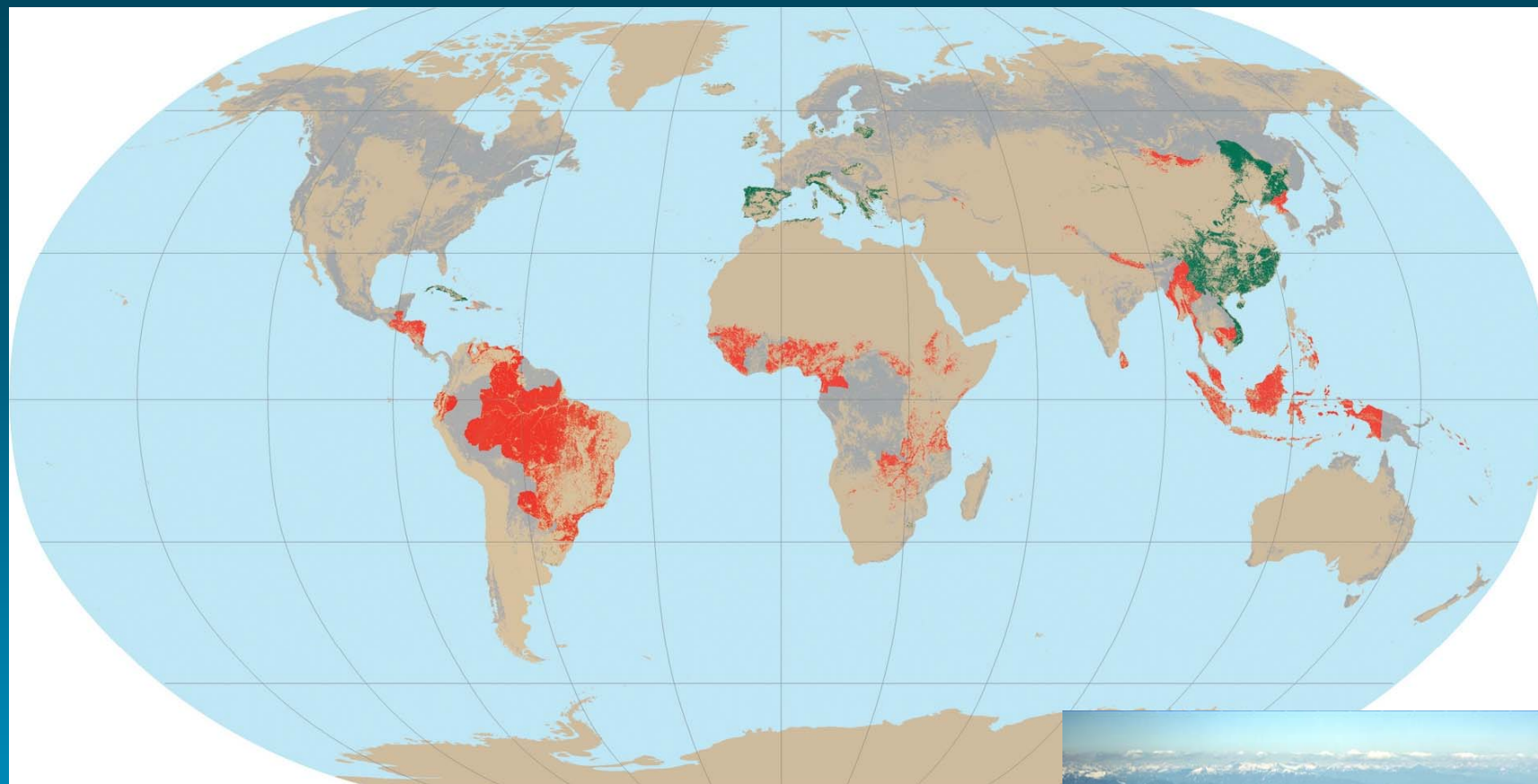
Tenure Diversification



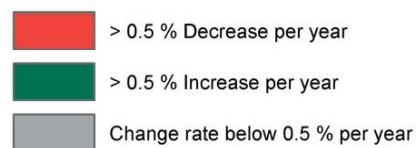
20% of Major
Licences to be
redistributed

<http://www.for.gov.bc.ca/hth/community/>

<http://www.for.gov.bc.ca/mof/plan/frp/>



FAO



Change in forest area



How much resource extraction do we want and what should we do about resource dependent communities?

**Should we substitute
intensive plantation
silviculture for managing
natural forests?**

What do our communities want
from their forests?

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- Protection from natural disaster and forest loss
- Employment and sustainable industry
- Diversification of opportunity
- Recreation, hunting and fishing
- Food and botanicals
- Wood and energy
- Value added and market opportunities
- Spin-off jobs and industries
- Complimentary jobs and industries
- First Nations reconciliation

What do our communities want from their forests?

Forestry today must work to protect community interests
and a future in more than timber

What are the dynamics of forestry?

Increasing:

Expectations
Economic risk
Biological risk
Need for flexibility
of users

Decreasing:

Economic returns
Willingness to trade off
Biodiversity
Interest in careers

Solutions: community involvement,
value added, stakeholder
participation, planning for resiliency

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

Eco-tourism, carbon sequestration, bioenergy

Export of forest management expertise and technology

What lessons have we learned?

- Diversity is critical to our future
- Our forests need to be resilient and healthy
- We need all the friends we can get:
 - business and trade
 - community
 - internationally

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!