• Western Boundary: Rocky Mountain Trench

• Eastern Boundary: Rocky Mountain foothills, Liard Plateau & Rabbit Plateau

• 2 Sub Ranges: Muskwa Range & Hart Range

• 93% in British Columbia & 7% in Alberta
• Prince George: Largest city in Northern BC
  Population ~75,000
• Fort Nelson: Population 4,514
Formation

Sketch of an oceanic plate subducting beneath a continental plate at a collisional plate boundary. The oceanic plate typically sinks at a fairly high angle (somewhat exaggerated here). A volcanic arc grows above the subducting plate.

This sketch shows the plate tectonic setting during the growth of the Rocky Mountains (Laramide orogeny). The angle of the subducting plate is significantly flatter, moving the focus of melting and mountain building much farther inland than is normally expected.
TOPOGRAPHY: Hart Sub Ranges
Rocky Mountain Tree Types

White Spruce

Englemann Spruce

Subalpine Fir

Rocky Mountain Juniper
Tree Species in the Northern Rocky Mountains

- White Bark Pine
- Mountain Hemlock
- Western Hemlock
- Western Red Cedar
- Pacific Yew
Vegetation Zones

**Valleys:** Dry valley slopes with grasslands, forests similar to Dry Montane & moist valleys similar to Moist Montane

**Dry Montane:** grassy parks, Ponderosa Pine, Douglas Fir, Grand Fir, Lodge pole Pine & Western Larch

**Moist Montane:** Western Red Cedar, Western Hemlock, Grand Fir, Western White Pine, Western Larch, Lodge pole Pine, Spruce, Ponderosa Pine, Douglas Fir, fens, meadows & Bogs
Vegetation Zones Continued

**Lower Subalpine:** Subalpine Fir, Mountain Hemlock, Spruce, Lodgepole Pine, Western Larch, Western White Pine, Douglas fir and Grand Fir, meadows, fens & Bogs

**Upper Subalpine:** Grassy parklands with open vegetation, Krummholz, Subalpine Fir, Spruce, White Bark, Pine, Alpine Larch, Mountain Hemlock & Lodgepole Pine

**Alpine:** Treeless vegetation, open areas, low shrubs, cushion plants, turfs & lichens
Wildlife

- Common species include: elk, stones sheep rams, grizzly bears, cows, calf caribou, moose, mountain goats, wolves, black bears, wolverines, and weasels.
- Under water species in the area include: marten, fisher, trout, bull trout, arctic grayling and lake white fish
Climate

- Cool temperatures with maritime influence
- Strong influence from Orographic Precipitation
- Precipitation common in spring, fall & winter

- Moderate temperatures due to the warm westerly flow of air from the pacific ocean
- Colder arctic air mass may push down from the north and over power the maritime air resulting in a colder temperature
Orographic Precipitation & the Rain shadow effect

- Prevailing wind:
  - Moist, warm air rises
  - Temperature ~20°C
  - Moisture condenses as air cools; relative humidity increases

- Rainy windward slope:
  - Temperature at 2000 m ~7°C

- Dry leeward slope:
  - Cool air depleted of moisture sinks and warms; relative humidity decreases

- Rain shadow
Climate

Summer: Dry & Hot
Winter: High levels of rain & snow, low levels of fog, wind & high humidity

• 2 main types of air masses affect the region

• Continental Polar Arctic (cP): confines cold air in the east & upslope precipitation results as the air mass moves south

• Maritime Polar (mP): Cool & moist air, characteristic of the west coast
Mountain Pine Beetle & Climate

- Old growth forests and Lodgepole Pine are ideal nesting grounds for pine beetle.
- Temperature of -25°C in the spring and summer required to kill pine beetle.
- Temperature of -35°C or -40°C for several days to kill large areas in the winter.
- In late 1930’s minimum temperatures in Fort Nelson were achieved.
- In 2011 ~3°C increase in minimum temperatures.
- No longer able to kill population of Mountain pine beetle.
Mountains

Mount Churchill
Mount Lloyd George
Mount Stalin (Peck)
Mount Sylvia
Mount Ulysses

Mount Drysdale
Sentinel Peak
Glaciers

- **Icefield in Hart Ranges**
  - Vreeland Glacier
  - Parsnip Glacier
  - Monkman Glacier

- **Mount Lloyd George Icefield**
  - Lloyd George Glacier
  - Llanberis Glacier
  - Quentin Glacier
  - Kwadacha Glacier*
  - Stagnant Glacier*
Glaciers

**Others?**
- Fusilier Glacier
- Achean Glacier
- Ithaca Glacier
- McConnell Glacier
- Wokkpash Glacier
Rivers

- **MacKenzie River System**
- **Peace River**
  - Halfway River
- **Liard River**
  - Toad River Valley
- **Finlay River**
  - Kwadacha *
  - Paul River
  - Pesika Creek
  - Parsnip River *
“British Columbia’s Best Kept Secret”
Lloyd George Ice Field

- Located in the Muskwa Ranges
- Contains Kwadacha, Llanberis, Quentin and Lloyd George outlet glaciers
- 1916: Paul Leland Haworth named the region after the Prime Minister of Great Britain
  - Survey has continued this nomenclature (Churchill, Roosevelt and Stalin)
- Extremely remote
Kwadacha Glacier

- 9.45km$^2$
- Retreating
- Outlet of Lloyd George Icefield
Kwadacha River

- Athabascan term for "White water"
- Describes suspended glacial silts
Human Influence

- W.A.C Bennett Dam
- Early interest associated with oil exploration
- Parks and Protected Areas
- Infrastructure: John Hart Highway, Alaska Highway, Monkman Pass
- Recreation: fishing, hiking etc.
References

Images
http://www.canmaps.com/topomaps/nts50/toporama/images/094f15.gif
http://bivouac.com/MtnPg.asp?MtnId=3818
http://bivouac.com/MtnPg.asp?MtnId=1639
http://www.perryridge.org/about-perry-ridge/ecology/fisheries/
http://gothunts.com/mountain-goat-hunting/
http://www.revelstokebearaware.org/identify/
http://www.gov.mb.ca/watchablewildlife/moose.html
http://roxannededogblog.blogspot.ca/2010/07/stone-sheep.html
References

- **Information**

References

- Information con’t