Regional Landscapes of the United States and Canada

North Pacific Coast

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OVERVIEW

- A mild, wet climate in spite of latitudinal location.
- Coast is hemmed in by volcanic mountains.
- Snowiest mountains of North America.
- Landforms were shaped by Ice Age glaciers.
- A heavily forested area.
- Low population density with few large cities.
- Diversifying economy.
- Chief form of transportation is boat, ferry and small airplane (Seattle to Anchorage).

North Pacific Coast

Extends from Klamath Mts. of N. Calif. through the Alaska Panhandle to the Alaska Peninsula.

Isolated from much of North America by site and situation.

Irregular coastline and mountains rising from the sea make coastal travel difficult.

Marine West Coast Climate

- Unique characteristic of the area.
- Exhibits conditions that are usually mild and moist for the latitudes (40°N-60°N). Only area of North America with subtropical Cfb and Cfc groups.
- Caused by a warm ocean current offshore and prevailing westerly winds.
- High mountains near the coast contain the maritime influences (block eastward/interior movement).
- In turn, these mountains experience the highest rain and snow totals of the continent.

Climate Controls

- Modulating effect of warm offshore ocean current.
  - Mild winters and cool summers
- Temperatures decrease with elevation.
- Snow: Not common in the coastal areas south of Vancouver BUT accumulates to 100s of inches in the mountains. (Some mountain roads are open only from mid-June to mid-September.)

Temperatures

- Moderate effect of warm offshore ocean current.
- Winds blow from W to E.
- Warm ocean current prevents harbors from freezing during winter even at 60°N.
Precipitation Patterns

• North Pacific Ocean is the source for moisture-laden air masses that move eastward

• Seasonal Pattern:
  – Most precipitation is in winter because of the high pressure cell moves further south.
  – Ocean moisture is directed around the high pressure cell (now located off the coast of Mexico) and into the Pacific Northwest region.
  – In summer the pressure cell moves north, blocks some moisture from reaching the southern portion of the region.

• Orographic precipitation is dominant.
  – Air forced up western (windward) slopes = heavy rain and snow
  – Air descends eastern slopes = warming and drying conditions (rain shadow)

• Lowlands east of the mountains are semi-arid.

• Less rainfall/snowfall along Alaska’s southern coast (NW of Alaska’s Panhandle) because weather systems do not get pushed northward.

Topography and Precipitation

Average November precipitation in inches

Precipitation Totals

Regional Average is 75+ inches of precipitation per year.

– Baranof Is. (Alaska Panhandle) averages 237″/yr of precipitation on 233 days.
– W Washington and NW Oregon get over 130″/yr of rain, with the wettest areas getting over 200″/yr of precipitation.
– The Cascades are the snowiest mountains of North America.

– Mt. Baker and Mt. Rainier get over 600″/yr of snow; Crater Lake NP gets over 500″/yr of snow.
– W British Columbia is the rainiest and snowiest area of Canada with areas averaging 150″ of rain and 580″ of snow/yr.
– Northern Vancouver Island gets 230″/yr of precipitation mainly as rain.

Temperate Rain Forest

Olympic Peninsula of Washington is a temperate rain forest: warm and humid.

– Lush greenery: mosses, ferns.
– Dense forest of western hemlock, red cedar, Sitka spruce, Douglas fir (to 200 feet tall).

Coast Ranges: N. Calif., Oregon, Washington
– Over 4,000 feet high; intercept Pacific Ocean moisture.
– Responsible for the inland rain shadow effect.

Coast Mountains: Br. Columbia and SE Alaska
– Impede coastal and overland travel.
– Creates Alaska Panhandle’s Inside Passage.
– Mt. McKinley (20,300 ft high in the Alaska Range) is the highest point in North America.
– St. Elias Mts. (Alaska-Yukon-British Columbia border); are world’s tallest coastal mountains and site of Mt. Logan (19,700 feet, highest point in Canada).
Topography (cont’d)

- **Klamath Mountains** (N. California, S. Oregon): rugged, empty area 4,000 ft high
- **Cascade Mts.** Uplifted area topped with volcanic peaks created by the subduction of the Juan de Fuca plate.
- **Lowlands:** A structural trough in Br. Columbia, Washington, Oregon
  - created along fault lines
  - deepened by glaciers
  - warmer, drier than the highlands

DATES TO REMEMBER

- **May 7:** Last day to hand in **OPTIONAL EXTRA CREDIT PROJECTS** listed on syllabus.
  - Short research paper on a preapproved topic
  - “Geography of the US & Canada in the News”
- **May 14:** Last day to hand in **REQUIRED LANDSCAPE EXERCISE**
  - Last class lecture.
- **May 21:** Exam III: The Final Exam
  - From 11:30 AM to 1:30 PM.
  - Same format and length as exams I and II
  - Last day to hand in extra credit exercise for Ex. III.

Earthquakes and Volcanoes

Region exists on the NE margin of the Pacific “Ring of Fire”, a geologic zone of earthquakes and volcanic activity.

Volcanism caused by Subduction

The Juan de Fuca Plate is being overridden by the North American Plate. As it melts, molten rock moves to the surface through fracture zones in the crumbled North American Plate.

Eruption of Mt. St. Helens (1980)

Mt. St. Helens Blast Zone
**Crater Lake**

FORMATION OF CRATER LAKE.
About 7500 years ago, Mt. Mazama erupted with such force that its top was blown off, creating a caldera that has since filled with water.

**Seattle/Portland/Bellingham**

Urban areas, on the coastal lowlands, have grown in the shadow of the Cascades and can be affected by an eruption.

**Lahar Flow**

LAHAR is a term describing massive fast-moving mudflows (ash, debris and water from melted snow) that may occur after the eruption of a volcano.

The greatest worry about any volcanic eruption in the Cascades is the creation of lahars. Evidence of historic lahars are found throughout the region including the suburbs of Seattle. Lahar evacuation route maps are posted around the area.

**Glacier-carved Landscape**

When the U-shaped valley is flooded by the sea, a fjord is created.

**Fjorded Coastline**

- A FJORD is a narrow, steep sloped inlet created by the widening and deepening of a sea level valley by glaciers and the subsequent flooding of the valley by the ocean.
- Overland travel along the length of the coast is difficult, tedious or impossible.
- Fjords:
  - Alaska’s southern coastline including the Alaskan Panhandle, Alaska Peninsula and Kodiak Island.
  - The coast of British Columbia mainland.
  - The western coast of Vancouver Island.

**Alaska Panhandle**

The Alaska Panhandle is the southernmost area of Alaska.

**Inside Passage** is a maze of deep and scenic navigable waterways between the islands. The islands are the tops of mountains after the area was flooded by the sea. Topography limits interaction with the mainland. Transportation is by boat, ferry and small airplane.
## Coastal Alaska

- Mountain ranges separate coastal areas from the interior
  - Chugach and Kenai Mountains along coast.
  - Alaska Range inland but parallel to the coast.
- Irregular, indented coastline with many islands and fjords.
- Anchorage (Alaska’s largest city) is on Cook Inlet and south of a gap in Alaska Range.
- Juneau (Alaska's capital) is located on a narrow coastal lowland in the Panhandle with NO ROAD connection to the mainland.

## Settlement – Native Americans

- Native American population of the area was relatively large because of the moderate climate and abundant year-round food supply.
- Culture
  - Over 100 distinct ethnic groups clustered in small valleys (isolated from each other) along the coast.
  - Sustained by hunting and gathering: deer, salmon, berries, roots, shellfish.
  - Large, impressive houses and dugout canoes built of red cedar planks.
  - Totem Poles: record of person’s life carved into a log.

## Settlement – European Arrival

- Last area of North America to be explored by Europeans because of the distance from Europe
  - Juan de Fuca (1592) for Spain
  - Vitus Bering (1740) for Russia
  - James Cook (1778) for Britain
- Russian Settlement
  - First settlements late 1700s.
  - Fur-trading posts from SE Alaska to N California.
  - Never self-sufficient in food; expensive to maintain.
  - Conflict with the British and Americans over Oregon.
  - Russia sold Alaska to the U.S. in 1867.

## British Settlement

- Hudson’s Bay Company
  - Fur-trading operation in Columbia R Basin (early 1800s)
  - Was the dominant force from N Oregon to British Columbia until 1830s.
- Victoria (1843) at southern tip of Vancouver Island; strategic overlook on the Strait of Juan de Fuca.
- City of Vancouver
  - Established as a sawmill in 1867.
  - Protected harbor made it a seaport.
  - Terminus of Canadian transcontinental railroad (1886).

## American Settlement

- Boundary disputes with British and Russians.
- Explored by Lewis and Clarke in 1804-07.
- John Jacob Astor established fur trade (1810)
- Treaty of 1818 extended the US-Canada border along 49°N latitude to the Rocky Mts.
- US and Great Britain jointly administer Oregon Country (Rockies to Pacific) from 1818-46.
- American settlers arrive via the Oregon Trail to Oregon’s Willamette Valley (1840s).
- By late 1840s Oregon Territory was pushing for state-hood.

## Oregon Country

Oregon Country was disputed by the United States and Great Britain. The Oregon Treaty of 1846 set the boundary at 49°N latitude with the exception of Vancouver Is. While politically acceptable, it disrupted N-S movement in Puget Sound and on the Columbia River. Became Oregon Territory in 1848; a state in 1859.
Present Population Distribution

- Faster growth than national averages in both the U.S. and Canada
- Home to 3% of U.S. population and 10% of Canada’s population.
- Most people live within the inside lowlands from the Fraser River to Willamette Valley.
- Few large cities: Vancouver and Victoria, BC; Seattle, WA; Portland, OR; Anchorage, AK

Vancouver

- Canada’s 3rd largest (605,000 people) and fastest growing city.
- Metro area of more than 2.3 million people.
- Western HQ for Canadian businesses.
- Serves as western outlet for Interior Canada.
- Gateway to the Canadian Rockies; hosted the 2010 Winter Olympics.
- Tourist hub for the Inside Passage.
- Canada’s busiest seaport: Wood products; wheat.

Seattle

- Largest U.S. city of the North Pacific Coast since late 1800s; currently over 600,000 in city with 3.5 mil in metro area
- Founded as a logging center, became dominant with coming of railroads (1883) and as an outfitting point to Alaska, especially after gold was discovered (1890s) in the Klondike;
- Second largest container port in U.S.
- Since WWI, the home of Boeing Aircraft.
- Diversification: Computer technology (Microsoft); research & development, medical biotechnology, forest products, banking and finance.

Portland

- Has a population of over 500,000 people with a metro area of over 1 million.
- Ranks high among livable cities
- More diversified economy than Seattle’s with better access to interior via Columbia River.
  - Shipment of grain from eastern Washington.
  - Large, deep port with easy access to the Pacific.
  - Iron and steel, clothing, food processing, computer technology

Anchorage

- Alaska’s largest city with about 300,000 people and 40% of the state’s population.
- Established (1914) as a port for the construction of the Alaska Railroad.
- Grew as a transportation hub and military base because of its harbor and connections to the interior.
- Today is a shipping center.

Anchorage Earthquake

On March 27, 1964, the 9.2 Good Friday Earthquake killed 115 people (106 by the tsunami) and caused wide spread damage.
Regional Economy

- Dominant characteristics
  - Production of **staple products**: wood, fish, agricultural products.
  - **Distance from major markets** of U.S. and Canada increases costs.
  - Cheap electricity is a asset.
  - Tourist industry is growing

Agriculture

- Competition with areas farther east
- Much production for local consumption
- Aggressive marketing for some specialties
- Agricultural areas
  1. **Willamette Valley**
     - Forage crops
     - Dairy products (local markets)
     - Strawberries, hops, grass for turf seed, cherries, spearmint, grapes for wine

Agriculture (cont’d)

2. **Puget Sound lowland**
   - Dairying
   - Vegetables
3. **British Columbia**: dairying
4. **East of Cascades**
   - Semi-arid area that needs irrigation
   - Palouse: Wheat (dry farming)
   - Yakima and Wenatchee valleys: apples
   - Grand Coulee: Sugar beets, potatoes, alfalfa, dry beans

Forestry

- Production
  - British Columbia: 54% of Canada’s timber.
  - Washington, Oregon, California: >50% of the U.S. total
- **Douglas fir** major lumber tree (houses, plywood)
- Tree species vary with region
- Large-scale logging activity
  - Trees are large; produce much square footage
  - Clear-cut harvesting method
- Markets
  - Forest products are shipped great distances
  - All parts of US&C; Asian countries, esp. Japan

Cutting and Milling

**CLEAR CUTTING**: A harvesting method where entire areas of forest are cut down without regard to size and species of tree.

Trees are sorted, trimmed of branches and the logs are cut to transportable length on site.

The area will be replanted with hybrid seedlings of one specie.

Lumber mills are located within the forest.

Trucks transport the logs to the mill. At the mill they are cut into usable lengths for easier transport to market.

Forestry Industry
Fishing

- Once the lifeline of the region especially that of Native American.
- Area of cold water species.
- Whale and salmon populations have been greatly reduced by overfishing and human interference.
- Dams on the rivers of the Pacific NW have interfered with salmon migration to upstream spawning areas.

Fish Ladders

- Fish Ladders have been built around dams to aid salmon moving up stream.

Hydroelectric Power and Dams

- Region’s hydroelectric potential unmatched in North America
  - Rugged topography and deep canyons (40% of U.S. potential in Oregon and Washington)
  - Abundant precipitation with no dry season
- Dams on the Columbia River regulate water flow, impound water for irrigation and produce inexpensive electricity.