

Regional Landscapes of the United States and Canada

The Empty Interior

Prof. Anthony Grande

©AFG 2012

Empty Interior

Stretches from:

- Alaska's North Slope to the Mexican border
- Interior Plains to the Pacific mountain system.

Includes some the most **rugged, harshest and isolated** environments of North America.



THE EMPTY INTERIOR



OVERVIEW - Physical Geography

- **Variations in topography and elevation:** mountains, plateaus, salt flats.
- **Contains both the highest** (Mt. McKinley +20,320 ft) **and lowest** (Death Valley -282 ft) **points of North America.**
- Significant **climatic variation** because of great range of both latitude and altitude.
- **Driest conditions** in North America.
- **Water problem:** a growing imbalance between supply and demand.

4

OVERVIEW – Human Geography

- **Low population densities** with some large cities and areas of high growth: **Salt Lake City, Las Vegas.**
- Some **regionally distinctive populations:** a mix of ethnicities, a concentration of Native Americans and influence of the Mormon Church.
- Economic activities **related to resource removal** and **recreation** are key but unevenly distributed.
- In the U.S., a **significant amount of federally owned lands.**
- Region includes some of the most **spectacular national parks** of the U.S. and Canada.

5

Physiography - Mountains

- **Major mountain ranges:**
 - **Rocky Mts.** (Northern or Canadian Rockies, Middle Rockies and Southern Rockies)
 - **Brooks Range; Alaska Range**
- **Features:**
 - Continental Divide - backbone of North America
 - Very steep slopes with jagged summits.
 - Dramatic elevation changes: local relief over 3000 ft from base to summit.
 - Shaped by water and ice.
 - Barrier to movement.

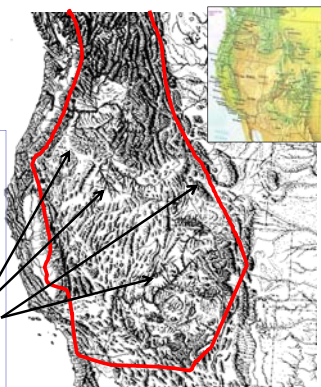
6

Physiographic Map of the Rockies

There are very few routes across the region from the High Plains to the West Coast.

Canadian Rockies are very difficult to cross.

Gaps around the Middle Rockies through Wyoming and Colorado exist.



7

Canadian Rockies



8

Physiography - Plateaus

- **Colorado Plateau:** a dissected sedimentary plateau carved by rivers; "canyon lands" area over 5000 feet thick.
- **Basin and Range:** a fault-block deformed area of sedimentary rock layers; area of interior drainage.
- **Columbia Plateau:** basalt plateau formed from the gradual buildup of lava flows; over 2000 feet thick with narrow, deep canyons.

9

Colorado Plateau (layers of sediment)

Grand Canyon
National Park



Canyonlands
National Park



10

Colorado Plateau (layers of sediment)

Bryce Canyon
National Park



Monument Valley
Navajo Tribal Park

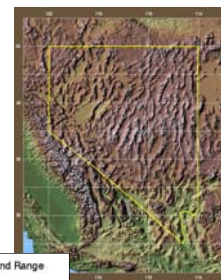


11

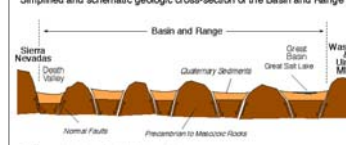
Basin and Range Topography

80 broad, flat basins containing over 200 linear ridges.

No drainage outlet to the sea. Streams from surrounding highlands flow into it but none leave it.



Simplified and schematic geologic cross-section of the Basin and Range



12

Basin and Range

- Lake Bonneville was largest Ice Age lake (N. Utah). **Great Salt Lake** and numerous **salt flats** are remnants.



Pleistocene lake locations.

13

Columbia Plateau (lava flows)

Snake River Canyon



Craters of the Moon Nat'l Mon.



14



Hells Canyon

Climate

- Arid or semiarid throughout most of the area**, especially in southern portion.
 - Vertical zonation of climate
 - Vertical zonation of vegetation; tree line dependent on moisture
 - Snow is the chief form of precipitation.
 - Thunderstorms in summer.
 - Low lying areas are dry.
 - Heaviest precipitation on mid-slopes of mountains.
- People, wildlife and natural vegetation depend on **water from exotic streams** (a stream that originates in a wet area and flows through a desert). In driest areas these streams can be salty.

15

Climate Regions



Climate varies with latitude and altitude.

Orographic precipitation is evident and rain shadow areas are pronounced.

Desert/semi-arid areas exist where moisture is blocked.



16

Rain Shadow of Sierra Nevada Mts.



17

Death Valley National Park

The hottest air temperature ever recorded in Death Valley was 134°F on July 10, 1913 at Furnace Creek .

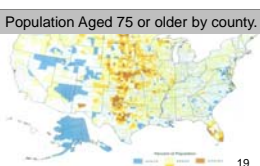
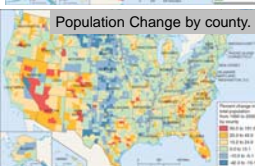
The highest ground temperature recorded was 201°F at Furnace Creek on July 15, 1972. with an air temperature of 128°F.

Hottest, driest and lowest area of the Western Hemisphere.



18

Population Distribution



19

Las Vegas Urban Sprawl



20

Mormon Influence

- **Church of Jesus Christ of Latter-Day Saints** was founded in NYS (1830). Its adherents suffered repeated attacks and persecution.
- **Migrated to West**; settled in the Wasatch Valley between Wasatch Mountains and Great Salt Lake.
- **Rapid population growth**: high birth rate; migration and missionary outreach for converts.
- **Innovative agriculturalists**, esp. irrigation techniques.
- **Strong central organization** (theocracy).
- Tried but failed to create the State of Deseret; Utah Territory (est'd 1850) was admitted to the Union in 1896.

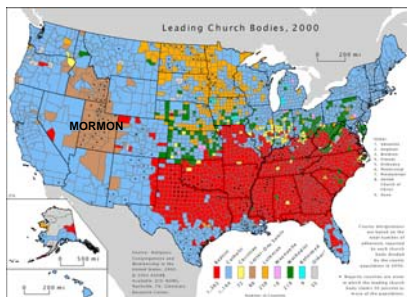
21

The Mormon Pioneer Trail



22

Mormon Concentration



23

Salt Lake City



24

Irrigation and Agriculture

Naturally arid conditions do not support agriculture without irrigation.

- Diversion of rivers
- Doctrine of Prior Appropriation: "first come, first served"
- **Reclamation Act of 1902:** support for water works.
- Water from the **Colorado** and **Columbia-Snake** river systems is essential to the region.



25

Colorado River

Region's longest river – rises in the Middle Rockies and empties into the Gulf of California (Mexico)



Hoover Dam and Lake Mead



26

Colorado River Water Use

Intense competition for its water:

By 1915 nearly its entire flow allocated mainly to Arizona and California. Now **half** goes to upstream states.

Population and economic booms in Nevada, Arizona and southern California need water.

International agreement provides Mexico with a minimum flow to flush the delta region.

The allocation formula is now facing severe strains due to several years of below-average precipitation in the basin and high rates of population growth in the Southwest.



Glen Canyon Dam and Lake Powell



Evidence of drought

28

Columbia River Basin

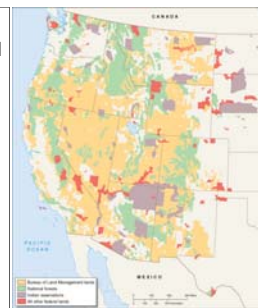
An international project to provide water for irrigation, navigation, hydroelectric power and flood control.



29

Public Land Ownership

- Most land in the region is still under government control (90% of Nevada).
- Last of U.S. to be settled.
- Largely unsuitable for agriculture; grazing potential.
- Documented mineral and forestry resources.
- Areas of scenic beauty and historic interest worth preserving.



30

Public Control of Land

- **Conservation Programs**
 - U.S. national park system
 - U.S. national forests
 - Canadian provincial lands
- **Criticism**
 - Hindrance to planning
 - Hindrance to resource development
 - Hindrance to commercial grazing
 - Plight of Indian reservations in regions



Transportation

- Area is located between more the populated, earlier-settled Midwest and West Coast.
- Originally an area to pass through, not stop: **transcontinental railroads and main highways are east-west trending.**
- **Towns grew** along E-W routes to **service** travelers: railroad, truck, automobile travelers.
- **Growth centers** with additional attributes were established:
 - Central location (regional focus)
 - Recreation/tourist centers
 - Retirement centers
 - Light manufacturing

32

Tourism

- **20th century phenomena** especially after enlargement of the national parks system.
- **Federal control** of most major scenic attractions.
- **Related private enterprises**
 - Needed tourist services
 - Distance between attractions
- **Las Vegas**
 - 1931: legislation allowing gambling, easy divorce
 - Cheap electricity from **Boulder Dam**
 - Proximity to southern California.
- **Problem of overburdening natural attractions** (too many visitors; air, water and land pollution)

33

Yellowstone National Park



Established March 1, 1872. The world's first national park.

34

Lumbering and Ranching

- Depend on the use of **federal lands**
 - **U.S. Forest Service** and **Bureau of Land Management** lands open to grazing
 - Most lumbering in national forests
 - Productivity of federal lands less than private lands
 - Low quality of federal lands
 - Federal lands by definition multiple use
- **Transhumance**
 - Seasonal movement of animals
 - Especially important in sheep ranching
- **Canadian Rockies:** Wood products economic cornerstone.

35

Bureau of Land Management (BLM)



Branch of the US Department of the Interior that administers government-owned public lands.

About 1/8 of the country, mostly in the West and Alaska.

Controversy regarding use and leasing.
Allows grazing.

36

Mining

- **Miners were the second largest group** (after Mormons) **to settle the region.**
 - Variety of easily mined mineral deposits
 - Numerous mining towns grew near the deposits.
 - Today many serve as tourist attractions
- **Mining today.**
 - **Gold** and **silver** still mined, but less important
 - **Copper**: most important mineral of the region, esp. in Arizona and Utah
 - **Lead** and **zinc**: mined in U.S. but more important in Canada.

37

Open Pit Copper Mine Bingham Canyon, Utah



Open pit mining is a means of extracting minerals from the earth by digging a bowl-like pit that gets wider and deeper with use.

It is used where the mineral is near the surface and/or if the ground is not unsuitable for tunneling.

38

Oil Shale

Oil shale a sedimentary rock containing **kerogen** a solid mixture of organic compounds from which from which liquid hydrocarbons called "**shale oil**" can be produced after heating.

Shale oil is a substitute for conventional crude oil and not a petroleum product.



39

Abandoned Mines, Colorado



40

Ghost town



A town or settlement that has been abandoned by humans.

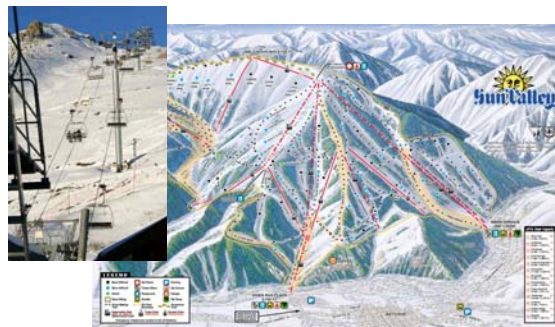
Happens because the economic activity that supported it (e.g., mining) has failed (or because of some human or natural calamity forced people to leave the area).



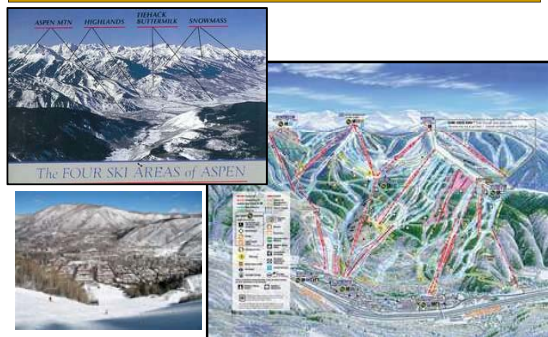
41

SKI RESORTS

Sun Valley, Idaho



Aspen and Vail (Colorado)



The Military Landscape

The emptiness of the area is ideal for

- Military bases
- National training centers
- Bombing ranges and weapons testing centers
- Military manufacturing

Contains historic fortifications from days of exploration and westward expansion.

44

Nellis AFB and Area 51



45

Nevada Test Site

Craters created by underground detonations.



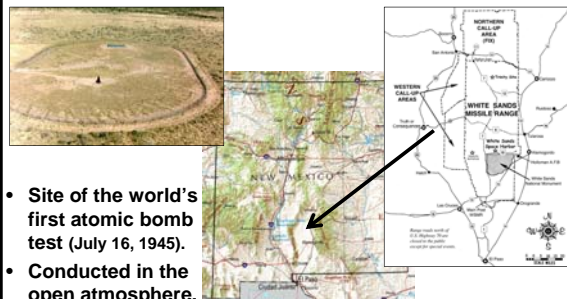
46

Yucca Mountain, Nevada Prospective Nuclear Waste Repository



47

White Sands Proving Ground



- Site of the world's first atomic bomb test (July 16, 1945).
- Conducted in the open atmosphere.

48