Regional Landscapes of the United States and Canada

CALIFORNIA

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DATES TO REMEMBER

- **COURSE EVALATION PERIOD NOW OPEN**
  Go to www.hunter.cuny.edu/te
- **MAY 7-14:** Period to hand in OPTIONAL EXTRA CREDIT PROJECT listed on syllabus.
  Short research paper on a pre-approved topic.
- **May 16:** Last day to hand in REQUIRED LANDSCAPE EXERCISE without penalty
  – Last class lecture.
  – Last day of Spring 2013 course evaluation period
- **May 21:** Exam III: The **Final Exam**
  – From 5:20 PM to 7:20 PM. Same format and length as exams I and II.
  – **Last day** to hand in extra credit exercise for Ex. III and "Geography in the News" extra credit option.

CALIFORNIA

Diverse region both physically and **culturally.**

Yet has a **national** and **world image** as a **single-place** region.

Overlaps Southwest Border and North Pacific Coast regions.

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OVERVIEW: Physical Geography

- **Elongated state.**
- **North-south alignment** of physical features.
- **Subtropical "C" climates** dominant.
- **Ample natural resources**.
- **Unbalanced water resources**: **water deficiency** in area of greatest need.
- Prone to **earthquakes**.
- Southern area is subject to **fires, mudslides** and **temperature inversions**.

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OVERVIEW: Human Geography

- Home to c.**38 million people = 12%** of US pop.
- **Ethnically** and **culturally diverse.**
- **Economic powerhouse** (2011: world's 8th largest economy, ranking between Great Britain and Brazil)
- **Strategic location** on Pacific Rim (for trade with Asia).
- **Competing land uses.**
- Most **agriculturally-productive** area of the U.S. in both variety and value.
- Has the **highest urbanization** rate in U.S.
- An area **shaped by the automobile**.

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Political Geography Question

❖**Should California be separated into 3 states**?
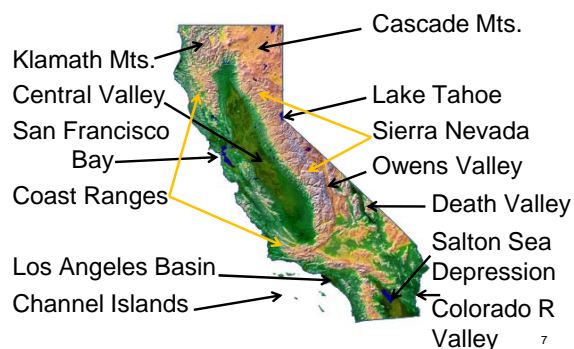
Northern California

Central California

Southern California

- **Each area is unique both physically + culturally.**
- **Each has its own priorities and outlooks.**
- **Each complains of having to "support" the others.**

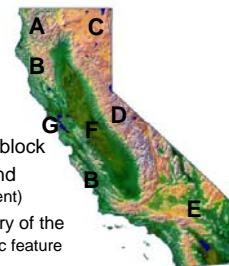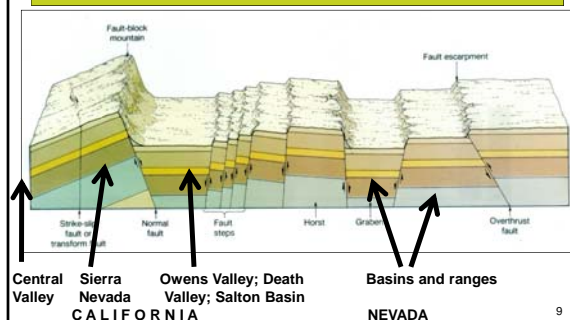➢ Similar arguments to the Quebec Secession **or** Upstate NY vs. Downstate NY **or** NYC vs. NYS

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PHYSIOGRAPHY

Klamath Mts.
Central Valley
San Francisco Bay
Coast Ranges
Los Angeles Basin
Channel Islands

Cascade Mts.
Lake Tahoe
Sierra Nevada
Owens Valley
Death Valley
Salton Sea Depression
Colorado R Valley

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Geologic Formations

A. **Klamath Mts.:** fault block
B. **Coast Ranges:** folded ridge and valley structures
C. **Cascade Mts.:** volcanic
D. **Sierra Nevada:** fault block
E. **Basin and Range Area:** fault block
F. **Central Valley:** alluvial lowland (former inland sea filled with sediment)
G. **San Francisco Bay:** an estuary of the Pacific Ocean (a separate geologic feature from the Central Valley)

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Diagram of Block Mountains
applied to California and Nevada

Fault-block mountain
Fault escarpment
Strike-slip fault or transform fault
Normal fault
Fault steps
Horst
Graben
Overthrust fault

Central Valley | **Sierra Nevada** | **Owens Valley; Death Valley; Salton Basin** | **Basins and ranges**

C A L I F O R N I A | NEVADA

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Physical Geography: Topography

A. Klamath Mountains

- Area of rugged fault block metamorphic mountains in NW California.
- Rises to 4,000 ft.

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Physical Geography: Topography

B. Coast Ranges

- **Linear mountain ranges** (3,000-5,000 ft high) paralleling the coast. The **only gap** is the Golden Gate and SF Bay.
- Heavily **folded and faulted** as a result of pressure from tectonic plate contact (North American Plate against Pacific Plate).
- Confines the marine influence to coastal areas by preventing air mass movement inland.

Big Sur

The Golden Gate

COAST RANGE

PACIFIC OCEAN

SAN FRANCISCO BAY

San Francisco Peninsula

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Redwoods National Park

Coastal Giant Redwood trees are found on the <u>windward</u> (wet) <u>side</u> the Coast Range.

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Topography

Mt. Shasta 14,162 ft high)

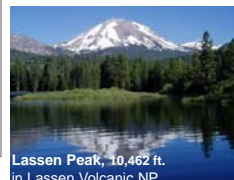### C. Cascades

- Southern portion is in northern California.
- **Volcanic mountains** created by the subduction of the Juan de Fuca Plate under the North America Plate.
- **Lassen Peak** and **Mt. Shasta** are dormant volcanoes.
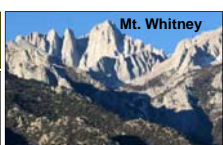 Lassen last erupted in 1915.

Lassen Peak, 10,462 ft. in Lassen Volcanic NP

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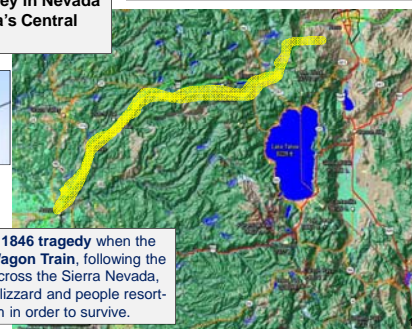## Topography

Mt. Whitney

D. Sierra Nevada

- Between the Central Valley and the Basin and Range
- **Fault-block mountains** rising to 14,505 ft at Mt. Whitney, the highest point in lower 48 states.
- **Major barrier to movement of people** and **air masses.**
- Few mountain passes cross it.

Switch back road up east face

East face of the Sierra Nevada
Owens Valley (in the rain shadow)
Basin and Range Province

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<u>Donner Pass</u> is the chief route across the Sierra Nevada connecting the Humboldt Valley in Nevada with California's Central Valley.

Donner Pass

Donner Summit ELE. 7227 FT

Infamous for the **1846 tragedy** when the **Donner Party Wagon Train**, following the California Trail across the Sierra Nevada, got caught in a blizzard and people resorted to cannibalism in order to survive.

Sierra Nevada

South Lake

Giant Sequoia Tree

Yosemite National Park

Topography

E. Basin and Range Area

- Area of Southern California **east the Coast Range** and **south of the Sierra Nevada**.
- Alternating **ridges** and **basins**.
- Site of Owens Valley, Death Valley and the Salton Depression.

Topography creates a desert environment (rain shadow). **Joshua Tree National Park** preserves a portion of the area.

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Topography

F. Central Valley
- 400 mi long and 90 mi wide
- **Former inland sea** filled with sediment from rivers eroding the Sierra Nevada.
- Divided into 2 segments: **Sacramento Valley** (north) and **San Joaquin Valley** (south).
- **Productive agricultural area**
  - Extremely flat, fertile
  - Favorable climate (hot, sunny and dry; irrigation needed)

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Central Valley:
San Joaquin Valley Area

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Topography

S F
Golden Gate Bridge

G. San Francisco Bay
- **Tidal estuary** of the Pacific Ocean reached via a gap - **Golden Gate** - in the Coast Range.
- **Divided into four bays**.
- Fed by Sacramento and San Joaquin rivers.
- **Six major fault zones** pass through it, giving it its NW-SE alignment, and subjecting it to earthquakes.

Golden Gate

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Climates of California

Arid (**BW and BS**): desert and semi-arid

Highland (**H**): mountains – vertical zonation

Mediterranean (**Csa**): hot dry summers and cool wet winters.

Marine West Coast (Csb): cool summers; wetter than Csa. Found along the coast.

Conditions change rapidly as you move away from the coast or up the side of a mountain.
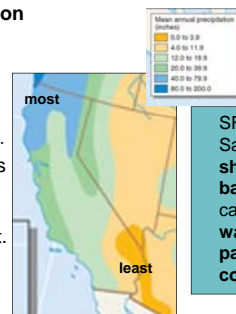

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Climate Controls

- **Chief source of weather systems and moisture is the Pacific Ocean** (westerly winds).
- A **high-pressure cell** moves north and south along the coast with the seasons, blocking westward moving weather systems.
  - Moves north in summer; south in winter.
  - Its winter position allows Pacific moisture to reach the land. (Area is summer dry, winter wet.)
- **Temperature** and **position of cold offshore ocean current affects precipitation patterns.**

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Precipitation

- ❖ **Varies with elevation and distance from the coast.**
- Coast Ranges and Sierra Nevada form **rain shadow** areas.
- Cold ocean currents create clouds, fog and rain <u>offshore</u> and along the coast.

most
least

SF's **fog** and San Diego's **off-shore fog banks** are caused by **warm air passing over cold water.**

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San Francisco Fog

Fog is a cloud at ground level.
When warm humid air passes over a cold body of water condensation occurs were they meet --- forming a cloud.
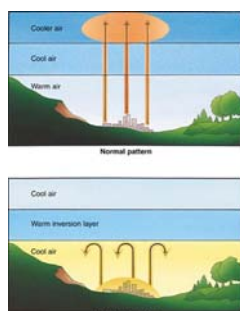
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Los Angeles Smog

Smog (smoke + fog) is a type of air pollution created when by-products of combustion mix with atmospheric moisture. (Originally caused by the mixing of soot with fog in coal burning areas.)

Los Angeles smog is caused when vehicle emissions re-act with sunlight to form photochemical pollution. This mix of gases includes particulates and ozone.

In the Los Angeles Basin the problem is heightened by a combination of local weather and topography that act to **prevent dispersion** of contaminants.

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Inversion Layer

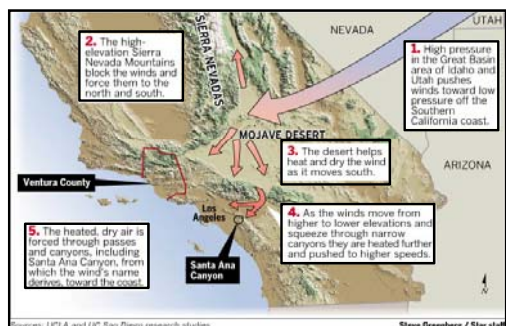Warm Mojave Desert Air

LA Basin

Coast Ranges

Cool Pacific Ocean wind

1. Weak ocean winds push polluted air against the mountain.
2. However, the winds cannot break through stronger desert air layer.
3. They are forced to double back over the LA Basin, warming as they descend, and trapping pollution.

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Santa Ana Winds

1. High pressure in the Great Basin area of Idaho and Utah pushes winds toward low pressure off the Southern California coast.
2. The high-elevation Sierra Nevada Mountains block the winds and force them to the north and south.
3. The desert helps heat and dry the wind as it moves south.
4. As the winds move from higher to lower elevations and squeeze through narrow canyons they are heated further and pushed to higher speeds.
5. The heated, dry air is forced through passes and canyons, including Santa Ana Canyon, from which the wind's name derives, toward the coast.

Sources: UCLA and UC San Diego research studies

Steve Greenberg / Star staff

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Santa Ana Winds and Fire

Low humidity, hot temperature plus wind creates a severe fire hazard.

MALIBU FIRES 21 OCTOBER 2007

11:35 local time

14:50 local time

USA

USA

Santa Barbara

Santa Clarita

Santa Barbara

Malibu
Los Angeles

Malibu
Los Angeles

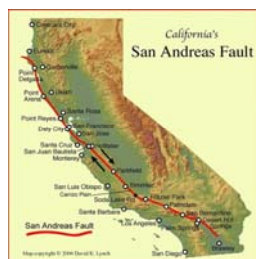Smoke plume 3 hrs later

Fire Smoke

Source: NASA

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Earthquakes

California exists on the eastern margin of the Pacific "Ring of Fire", a geologic zone of earthquakes and volcanic activity.

North American Plate

Juan de Fuca Plate

San Andreas Fault

Caribbean Plate

Dots show epicenters of major quakes.

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The San Andreas Fault

California's San Andreas Fault

Sections of the fault are "locked" (have not moved in hundreds of years) and **are closely monitored by geologists.**

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Earthquakes

❖ **Major zones** (common throughout Calif.)
  – **A. Southern California** (LA southeast to the Imperial Valley)
  – **B. San Francisco Bay Area**
❖ **Devastating earthquakes**
  – **64 major earthquakes since the first documented one in 1769** that killed people in a mission church.
  – Thousands of little ones.
  – Awaiting the "**Big One**."
❖ **Earthquake Laws:** world-leading
  – Where to build, type of construction, usage. Laws have changed over time with new technologies.

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San Francisco
Earthquake of 1906

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San Francisco
Earthquake of 1989

What's different from the 1906 photos?

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Mudflows and Landslides

Mudflows occur towards the end of the winter rainy season and usually in areas that experienced brush fires at the end of the previous dry summer season.

M.U.D flow
Source area
Main pathway
Depositional area

Landslides usually occur during and after an earthquake.

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Mudflows

As saturated soil (up to 30% water by volume) loses inertia on a slope, it can no longer support weight and moves (flows) downhill. The steeper the slope, the faster it moves and the stronger it is.

Highway 1 Collapsed
BIG SUR, HURRICANE POINT

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Coastal Erosion

Occurs during winter storms as waves batter the shoreline. Houses built at the edge of cliffs "for the view" are under-mined and many collapse.

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Settlement History

- **Native Americans**
  - Estimated 10% of all Native Americans before the European contact lived in California.
  - They lived by hunting, fishing and gathering.
  - Many small isolated tribes; many cultures exist. **Why?**
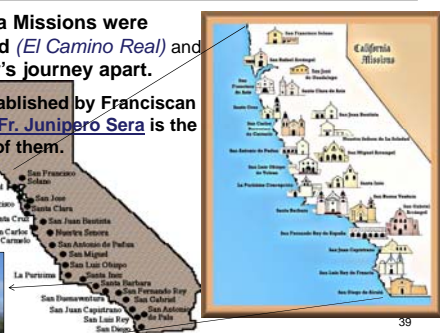- **Spanish exploration began in the mid-1500s.**
  - California was originally thought to be an island.
  - When no riches were discovered, settlements were established to insure a presence in area; **buffer zone**.
  - Missions were built from San Diego to Sonoma as a base to **convert** Indians to Christianity.

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California Missions

The California Missions were **linked by road** *(El Camino Real)* and **located a day's journey apart.**

Most were established by Franciscan missionaries. Fr. Junipero Sera is the most famous of them.

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Wine Making

Climate conditions are similar to those of the wine producing regions of Europe. This allowed Spanish vines to be transplanted in California. Vines from other areas of Europe came with settlers.

Excellent combination of climate, soil and slope.

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Napa Valley Vineyards

Sloped land is essential for both water and air drainage.

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Settlement
See atlas pp. 32-36 + 46

California's status continued as a backwater of Spanish Empire until it **became part of Mexico in 1821**.

Called **Alta California** by the Mexicans. They awarded land grants to U.S. citizens to encourage settlement.

Americans revolted in 1846 after hearing about the Texas Rebellion.

After the Mexican War, California was given to the U.S. in 1848 as part of the **Mexican Cession.**

It grew after 1849 following the discovery of **gold** near Sacramento (1848).

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Discovery of Gold

On **Jan. 24, 1848 gold flakes were discovered** in the South Fork of the American River at **Sutter's Mill.**

This set off the California Gold Rush of 1849.

Sutter's Mill: a water-powered saw mill on the banks of the South Fork of the American River used to cut trees into lumber.

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Locations of Major Gold Strikes

Sacramento became the **center of the gold mining region** of California**.**

San Francisco grew as a **supply point** for the gold mining region and was the region's **financial center**. Its harbor became an **international port**.

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California in the U.S.

1. Acquisition of California
- ✓ Rebelled from Mexico in 1846 (Bear Flag Republic).
- ✓ Part of **Mexican Cession** at end of **Mexican War (1848).**
- ✓ Statehood in 1850.

2. Gold Rush
- ✓ Discovery of gold at Sutter's Mill (1848)
- ✓ By 1849 more than 80,000 arrivals through SF or overland.
- ✓ San Francisco became largest city on the west coast (until 1920s)

3. Southern Pacific Railroad
- ✓ **RR arrives** in the LA Basin in 1876 (The Gadsden Purchase!!!)
- ✓ **Southern California land boom** 1881-1887: population grew from 10,000 to 70,000

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Water Supply

Water Mismatch
- ➤ **70% of precipitation in N. California**
- ➤ **80% of use in S. California**

- **Since the early 1900s, California has had to deal with a water deficiency.**
- **Los Angeles used up its ground water by 1913** - had to bring in water from Owens Valley.

- **Agriculture became the major consumer of water**: today there is more irrigated land in CA than any other state.
- California accounts for **more than 25%** of all irrigated water usage in the U.S. today.
- Has the ability to move water over great distances.

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California Water Projects

Fresh water is moved from surplus areas to deficit areas.

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San Francisco Bay Area

- ▪ **Historical Development**
  - Northern core of Spanish activity
  - Supply port for Gold Rush
  - First transcontinental railroad terminus
  - Largest west coast city until 1920
  - Large numbers of Asian immigrants, esp. Chinese
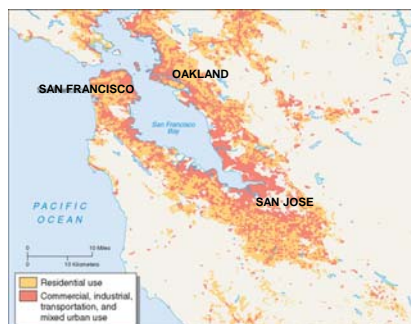- ▪ **Attractions**
  - Excellent harbor; access to interior
  - Scenery
  - Climate
- ▪ **Surrounding Areas Today**
  - East Bay region: Oakland - industrial and shipping
  - Silicon Valley (between SF and San Jose = technology)

Northern Conurbation
San Francisco Bay Area

SAN FRANCISCO
OAKLAND
San Francisco Bay
PACIFIC OCEAN
SAN JOSE

Residential use
Commercial, industrial, transportation, and mixed urban use

Silicon Valley is a region in the south-ern part of the SF Bay area, especially around San Jose, known for its concentration of major technology corporations.

The name originally referred to the large number of local firms that manufacture silicon chips.

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Southern California

Southern Metropolis
- A **megalopolis** from Santa Barbara to San Diego has been created: about 185 mi long with over 19 million people
- **Rapid 20th century growth:** World War I conversion from agriculture to urban, location of the motion picture and aircraft industries; perception of open space and freedom that was in short supply on the East Coast.
- **Continued municipal independence**, despite spreading and merging; many small cities.
- **Automobile dependent.**

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Automobiles and
Southern California

- ❖ **50% of land is devoted to automobiles** (streets, high-ways, parking lots, driveways, repair shops)
- ❖ **Driving mentality** from early days with a decentralization (anti-East Coast) point of view leading to
  - ➤ Single-family houses.
  - ➤ No central business districts.
  - ➤ Limited mass transit.
  - ➤ Low population density
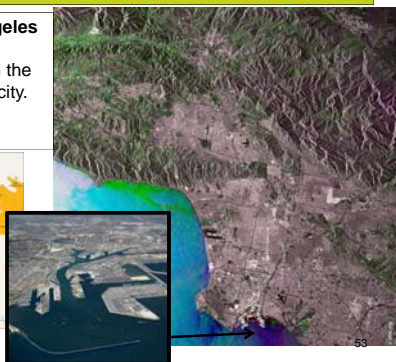 - ➤ **Leads to sprawl, congestion and pollution.**

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Los Angeles

- Settled by the Spanish as an **agricultural community** (*pueblo*) to provide food for the settlers.
- The site of Los Angeles includes the **largest expanse of flat land** on the California coast.
- Chosen as the **terminus** of the **Southern Pacific Railroad** (1870s).
- The **San Gabriel Mts.** provided a reliable water source (for irrigation) from its snowpack and rain runoff until the early 1900s.

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Los Angeles Metro Area

Metropolitan Los Angeles fills the **LA Basin.**
Many cities exist within the area. LA is the largest city.
The Port of LA is an artificial harbor.

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San Diego

San Diego Bay was discovered in 1542. First Spanish settlement in California at Mission San Diego Alcala (1769).

Chief Calif. border crossing station into Mexico.

Today military/defense, research & development, and tourism are major economic activities.

Old Town