

The Dramatic History of the Hoover Dam Construction

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What is the Hoover Dam?

Constructed from 1931 – 1936

Height: 221 meters high

Thickness, base: 201 meters

Thickness, top: 13.7 meters

Cost in 1936: € 44 million
or 427 NOK million

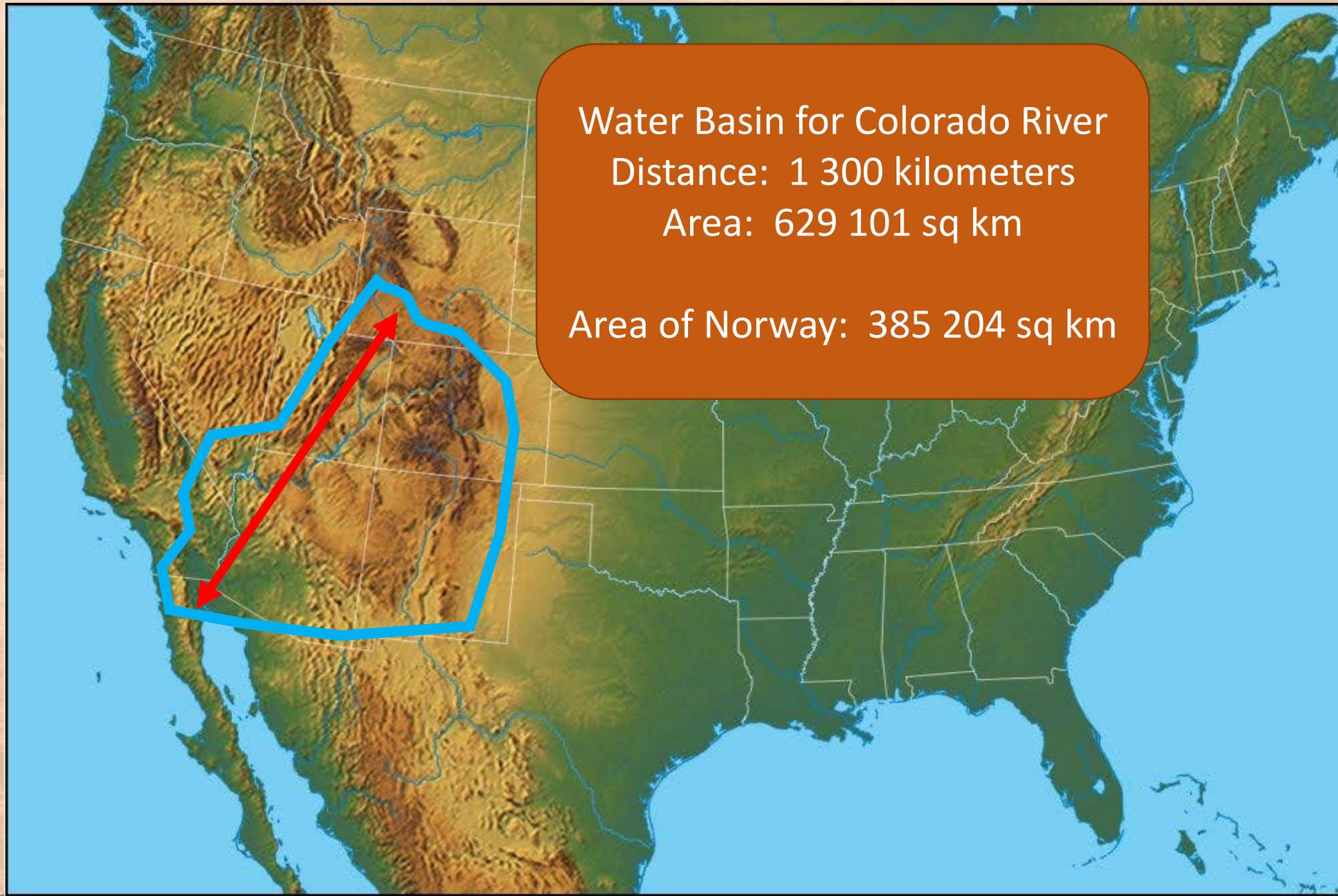
Cost today: € 793 million
or 7 713 NOK million



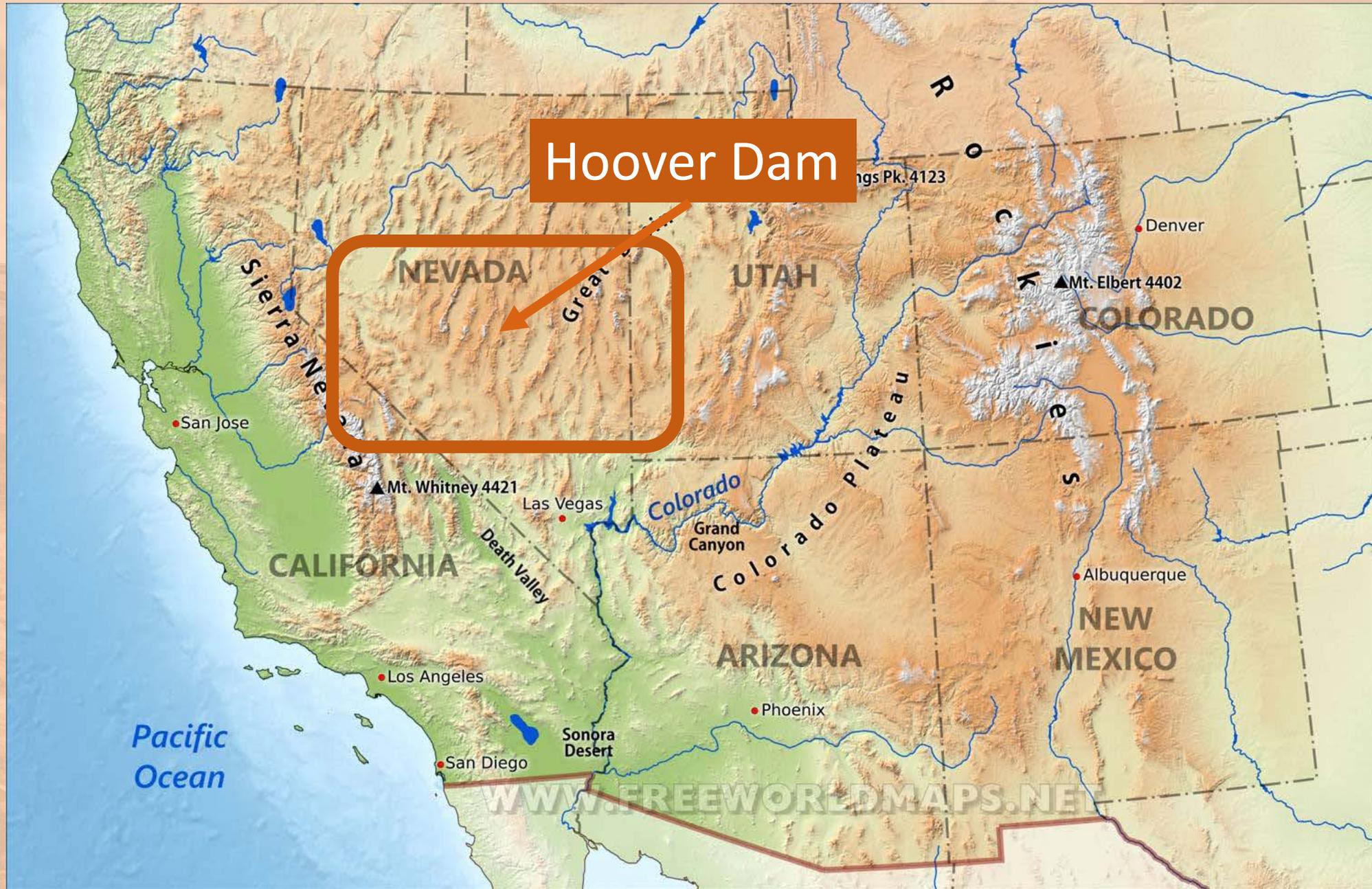
Where is the Hoover Dam?



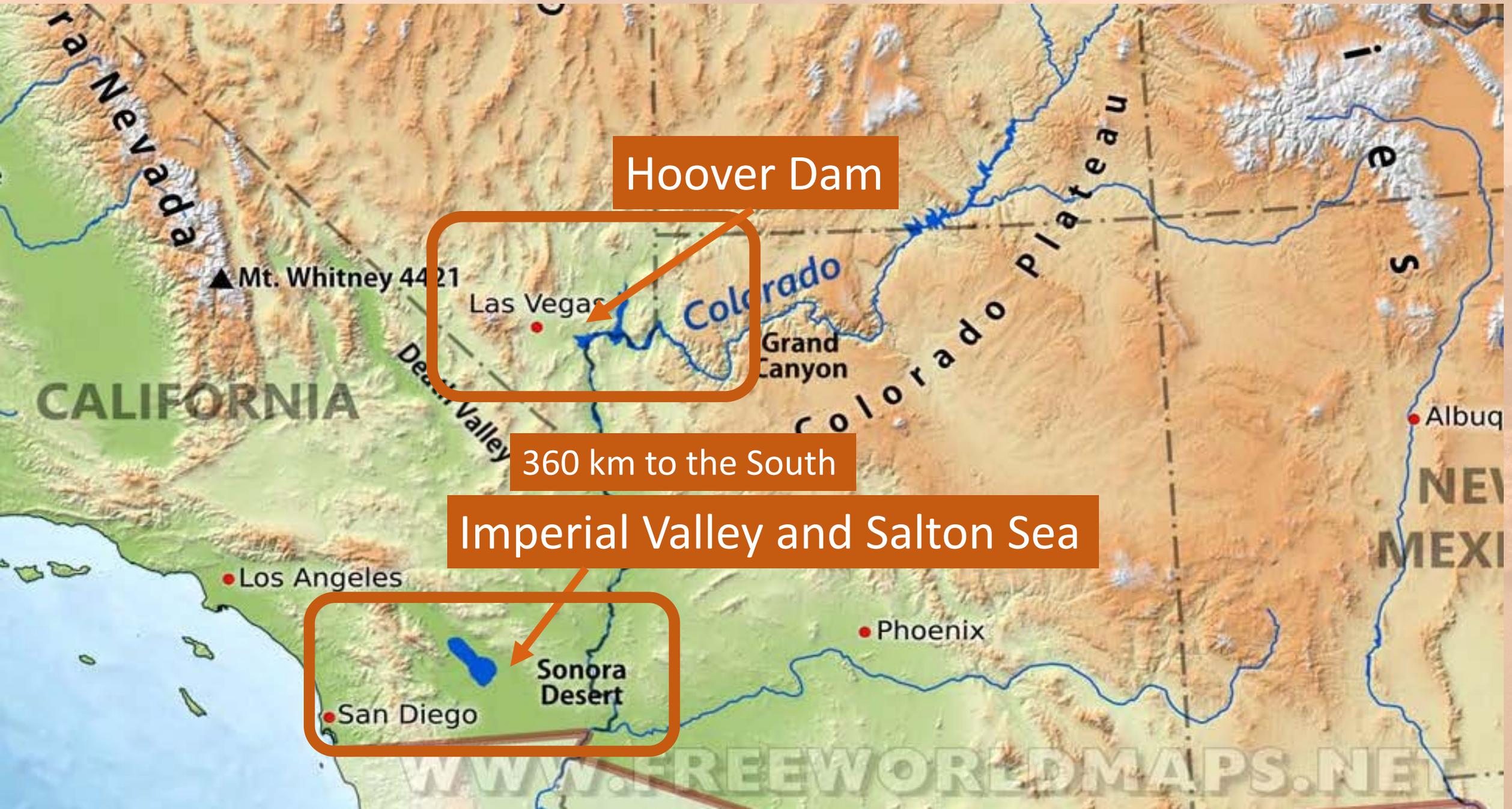
Colorado River Water Basin



Where is the Hoover Dam?



Where is the Imperial Valley?



Hoover Dam



360 km to the South

Imperial Valley and Salton Sea



1849 - Gold Rush Fever

- In 1849, gold was found in San Francisco
 - About 700 km NW of the Hoover Dam
 - Miners were called the 49'ers
 - American Football team in San Francisco
- Gold Rush triggered a massive migration to the west coast
- 1/3 of people took a southern route

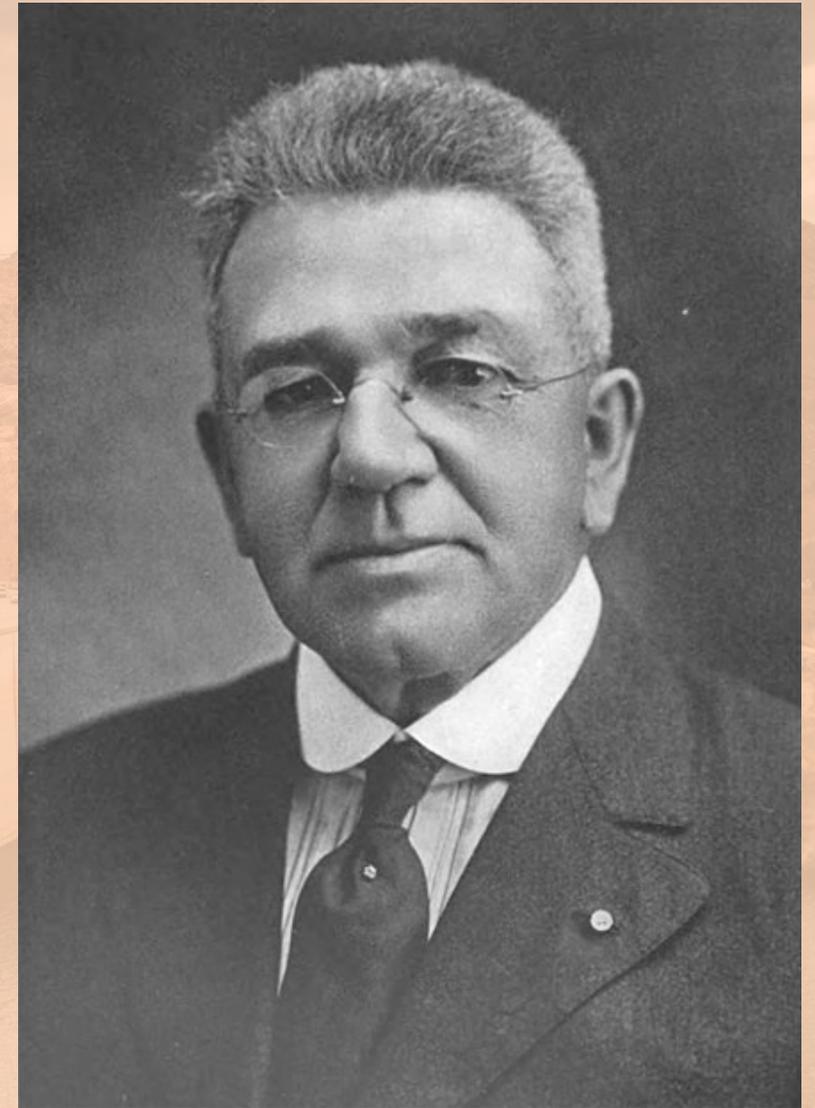


- Oliver Wozencraft created ideas to develop the land
- Imperial Valley land owned by the US Government
- Wozencraft requested land from the government
 - Land considered inhospitable
 - 1859, California said yes, but needs Federal Approval
 - Took over 30 years for federal approval
- Wozencraft was never granted the land
- Died in 1887 destitute and bankrupt from his pursuits of the land



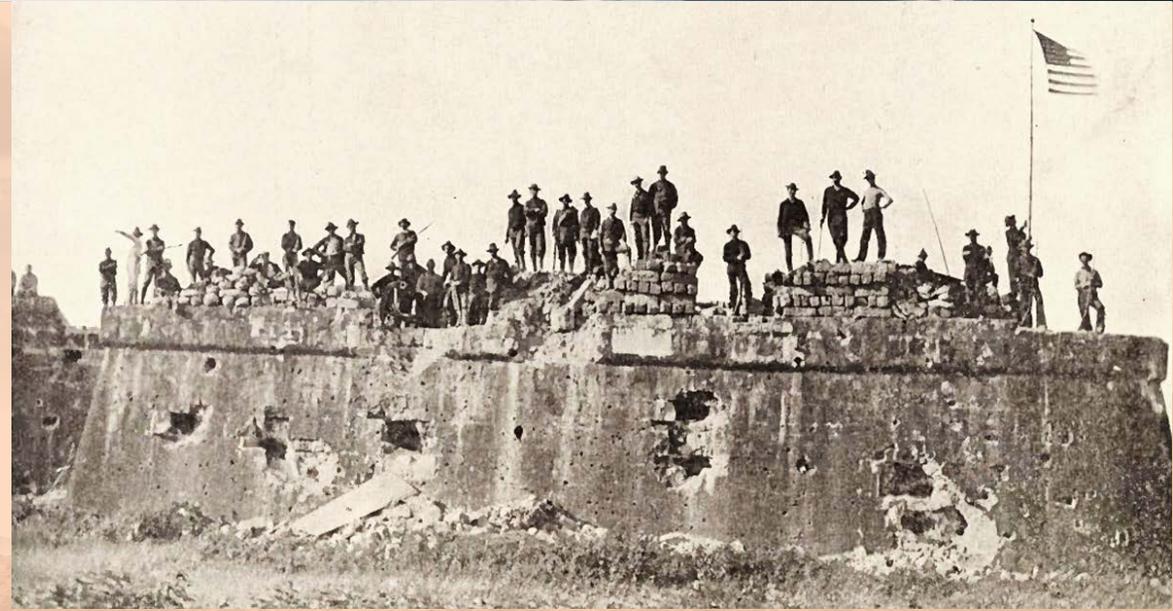
1892-1898 California Development Company

- 5 years later, Charles Rockwood formed the California Development Company (CDC)
- Began advertising the Imperial Valley in 1897
- Requested loan from the banks
- The bank was about to sign for a loan in 1898
- But...



Spanish American War of 1898

- The Spanish American War
- Lasted less than 4 months
- Theodore (Teddy) Roosevelt
- Later became 26th president of the United States



- Rockwood partnered with George Chaffey from Canada
- Came up with name “Imperial Valley”
- Built 6.5 km canal from 1900 - 1902



Problem with Silt



- “Too thick to pump...
- ...Too thin to shovel”
- Water must sit for one day to settle out



- Where does all this silt, clay and dirt come from?

Source - Grand Canyon

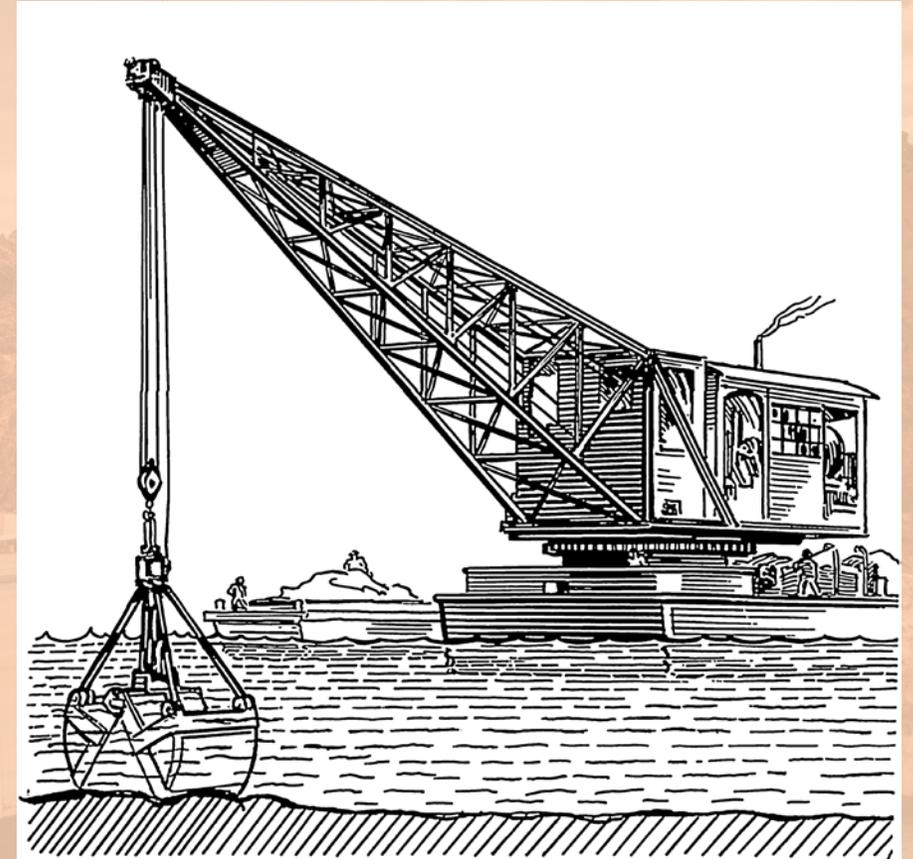


Grand Canyon



1900 – 1905 Canal Filling Up

- Farmers running out of water
- Dredge the canal
- The CDC running out of money again



1905 - Second River Opening

- Built a 2nd canal and opening
- “A blunder so serious as to be practically criminal”

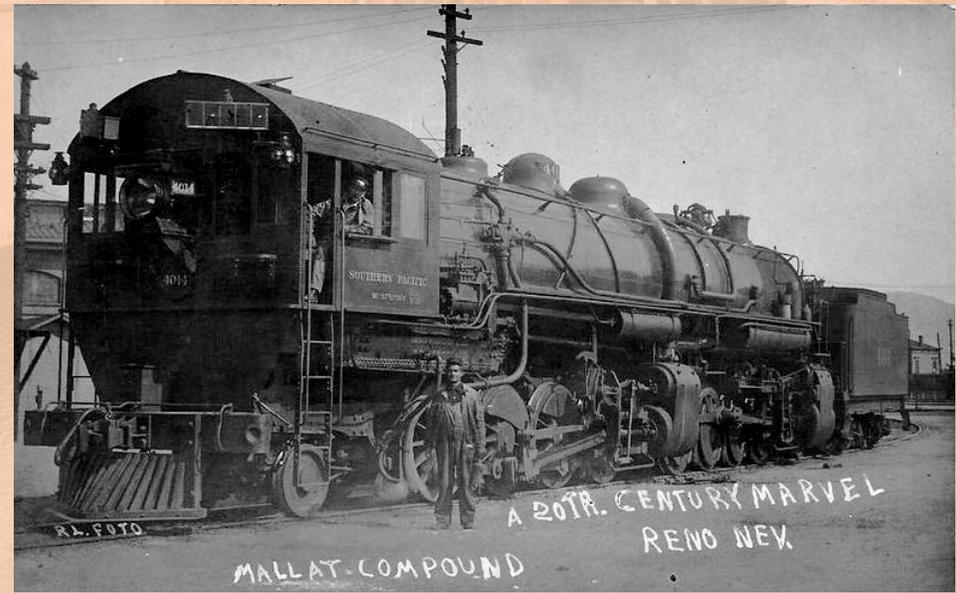
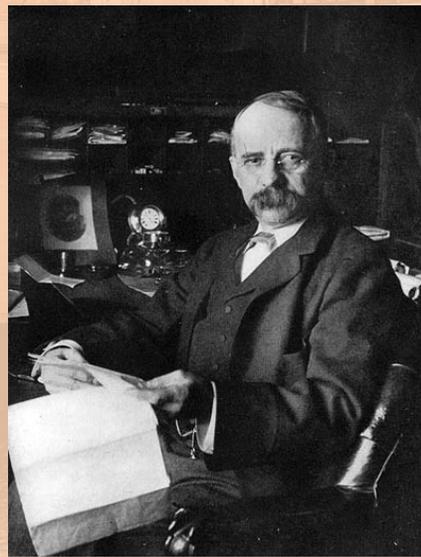
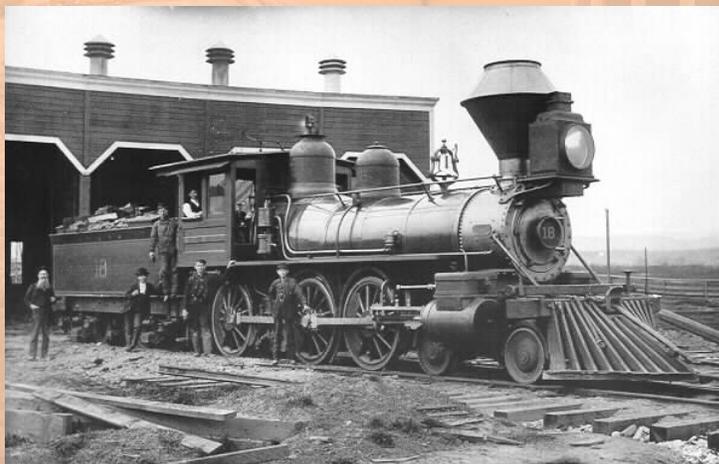
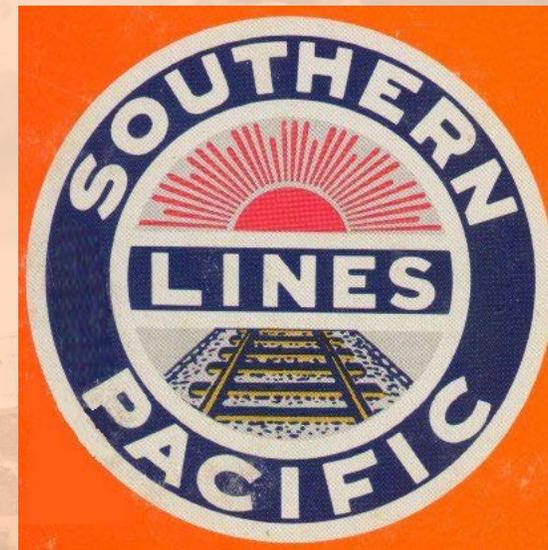


- Massive flood
- River opening grew to 45 meters wide



1905 - New Investors

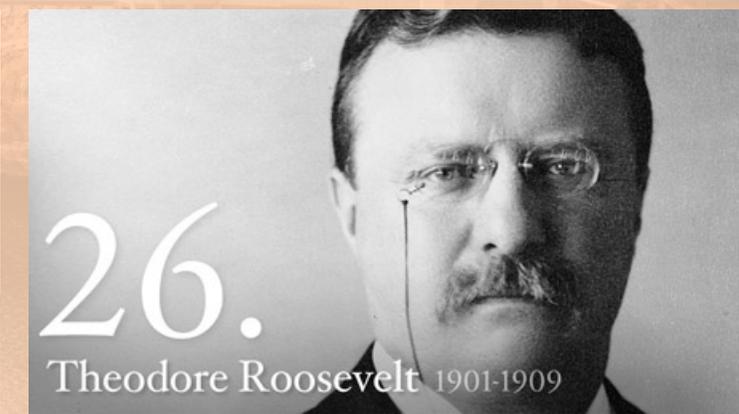
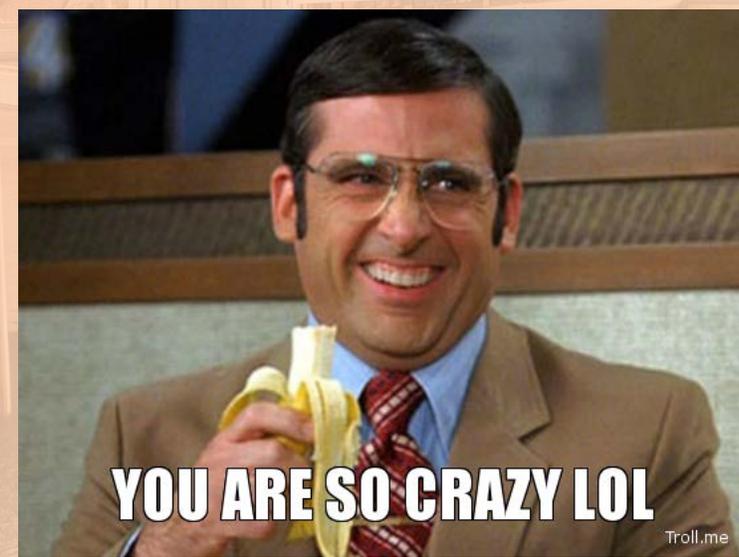
- Search for new investors
- Edward H Harriman
- Southern Pacific Railroad



1906 - Closing the breach

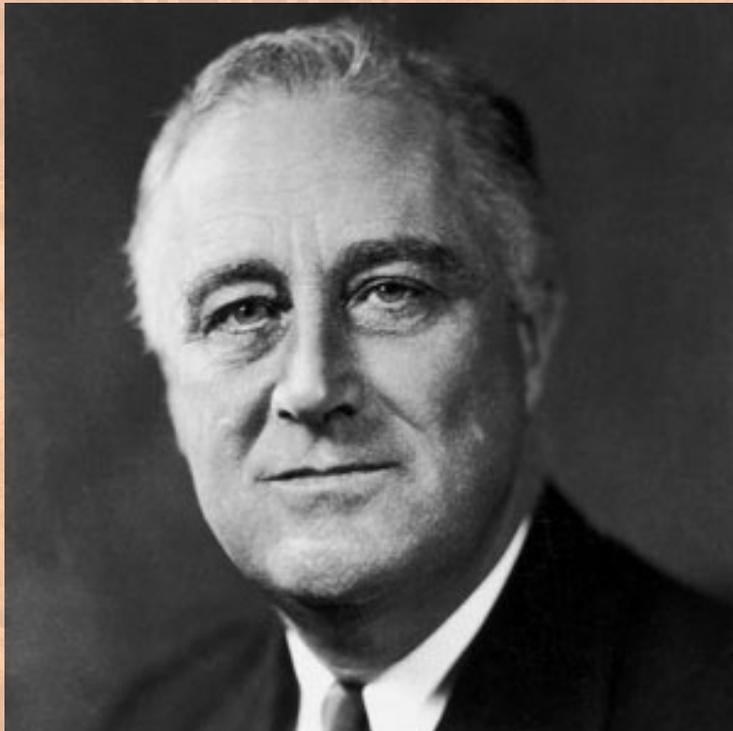
- Dumping boulders
- Total time: 18 months
- Total amount: € 3 million
- € 75 million today
- 722 NOK million

- Asked US government to reimburse the costs
 - No thank you
 - Who said no?
 - Teddy Roosevelt



1902 - 1920's - Ongoing Floods and Drought

- 1902 Teddy Roosevelt signs Reclamation Act
- Suggests using Dams
- Formed Bureau of Reclamation (BoR) in 1906



- Herbert Hoover appointed Secretary of Commerce
- Becomes 29th president form 1929 - 1933
- Later, 30th president Franklin Roosevelt claims the political credit

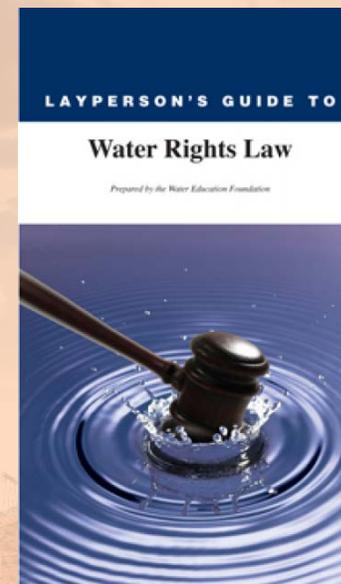
Side Note: FDR Statue near Oslo Harbor

- President Roosevelt helped Queen Marthe and her three children escape Norway
- The family lived at the White House and became friends
- The Princess and Eleanor Roosevelt dedicated the statue in 1950 as a thank you
- Nose repaired in April 2017 thanks to
 - Oslo Municipality Art Collection
 - Oslo Municipality Cultural Office
 - Stonemason Johansen Monumenthuggeri
 - Artist Fredrik K.B.



1929 – Decision to Build a Dam

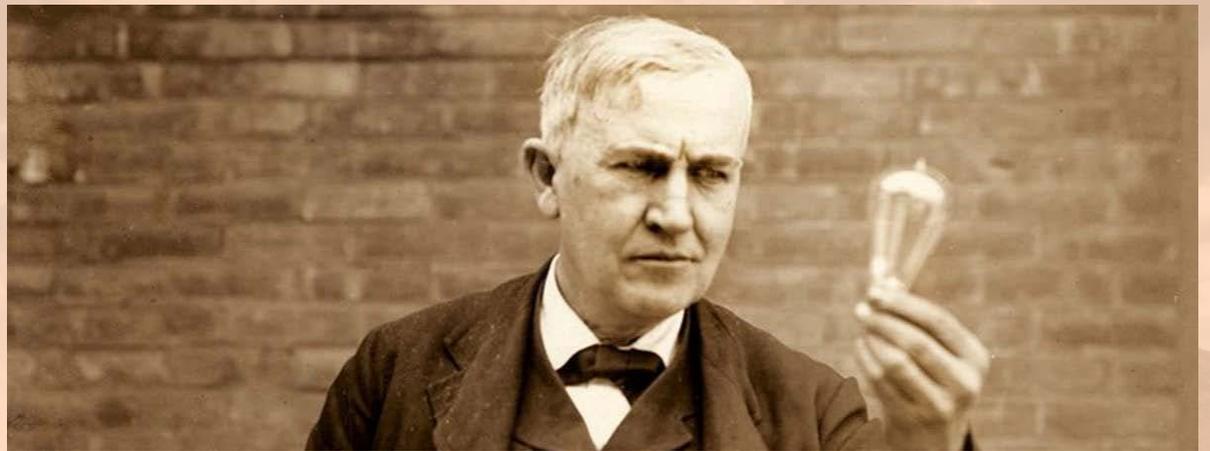
- Received approval
- But new questions arose
- Why spend lots of money for a small group of people?
- Water rights? Seven states working together
- Federal water rights with Mexico?



1929 – Funding the Dam Construction

Funding the Dam

- Hydro-electric power
- Thomas Edison
- Privately owned utilities
- Electricity only traveled 130 km
- Nearest town is Las Vegas



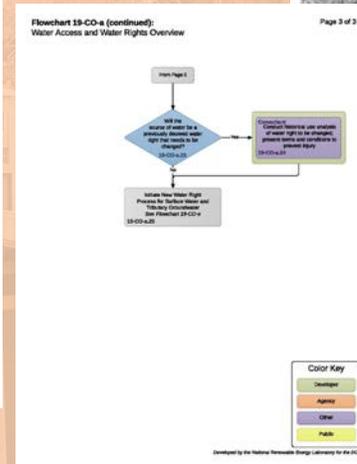
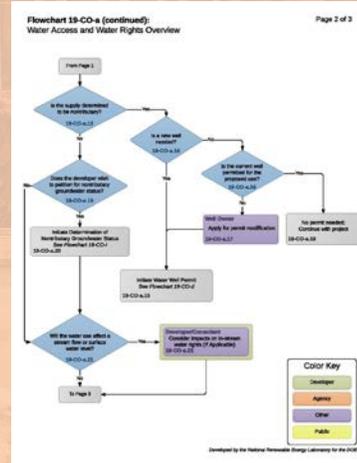
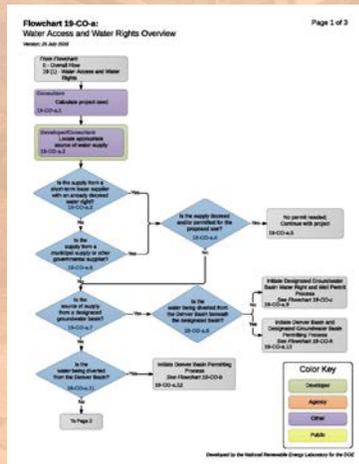
LAS VEGAS, N.M.
U.S. GEOLOGICAL SURVEY
1909

Water Rights

- Two different legal Precedents
 - Closest to water
 - First to use water



Discussing Water Rights, A Western Pastime



- Steps to use water from the Colorado River

- Water treaty was signed in 1922
- Critical Flaw: Agreement based on abnormally high water volume
- The deal is not sustainable
- Mexico left out of the deal

1930 - New Company Formation

- Too large for one company to build
- Needed € 2 million bond and € 5 million performance bond
 - € 24 million and € 60 million in today's numbers
 - 231 NOK million and 578 NOK million
- Eight companies come together
 - Kaiser and Bechtel
 - MacDonald and Kahn
 - Utah Construction
 - Morrison-Knudsen
 - Pacific Bridge
 - J.F. Shea Co
- New name, "Six Companies"



2019 – Impressions from a Recent Visit

- Impressions in 2019

- The smell and taste of **Dirt**
- The feeling of **Heat**
- The splendor of **Colors**
- The overwhelming sense of **Size**



- 97F = 36 C
- 106 F = 41 C



A screenshot of a weather application on a smartphone. The background is a blue sky with light clouds. At the top, the time is 9:52 and the location is Las Vegas, with the condition 'Mostly Sunny'. The current temperature is 106°. Below this, there is a forecast for Wednesday (today) with a high of 106 and a low of 81. A hourly forecast follows, showing temperatures from 106° at 'Now' to 97° at 10 PM, with icons for sun, sunset, and moon. A 7-day forecast is also visible, showing temperatures ranging from 77° to 106°.

Recent Visit



Recent Visit



Recent Visit



Recent Visit



Recent Visit



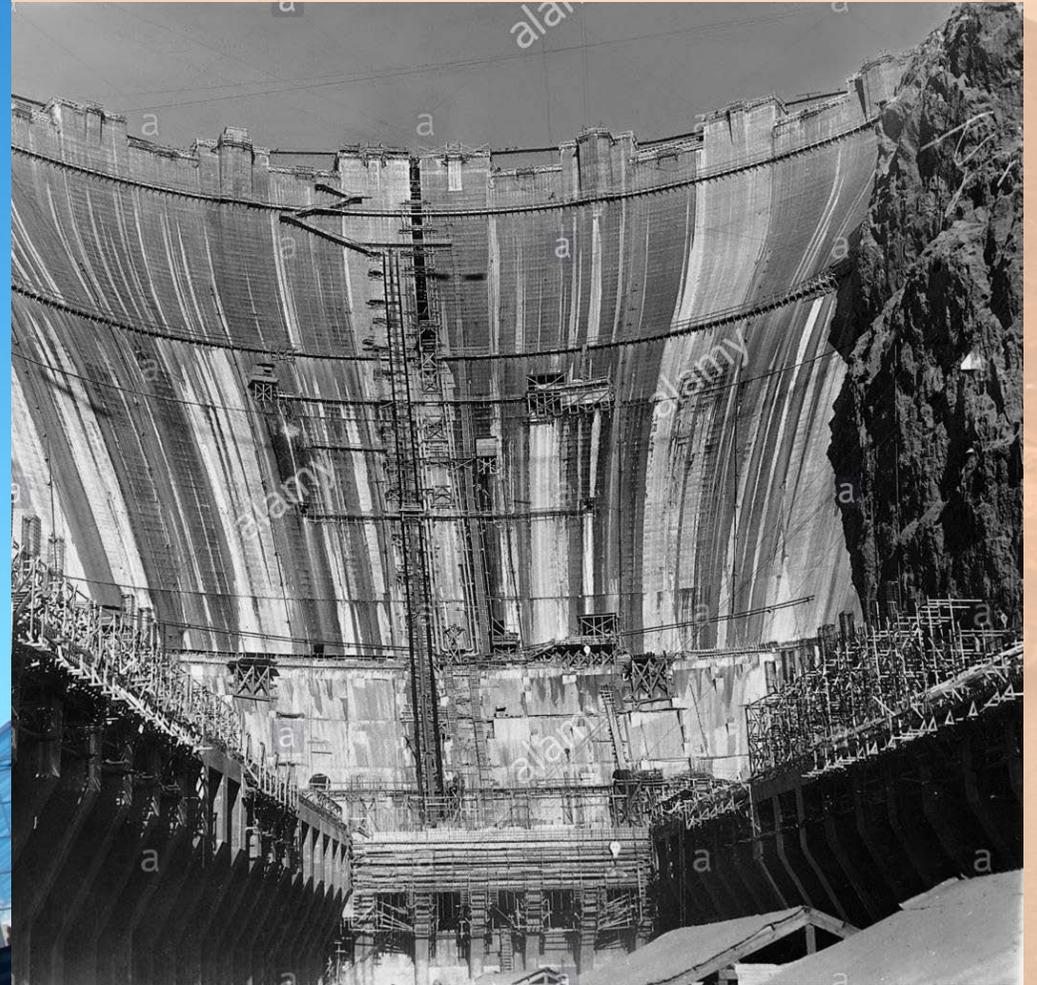
Recent Visit



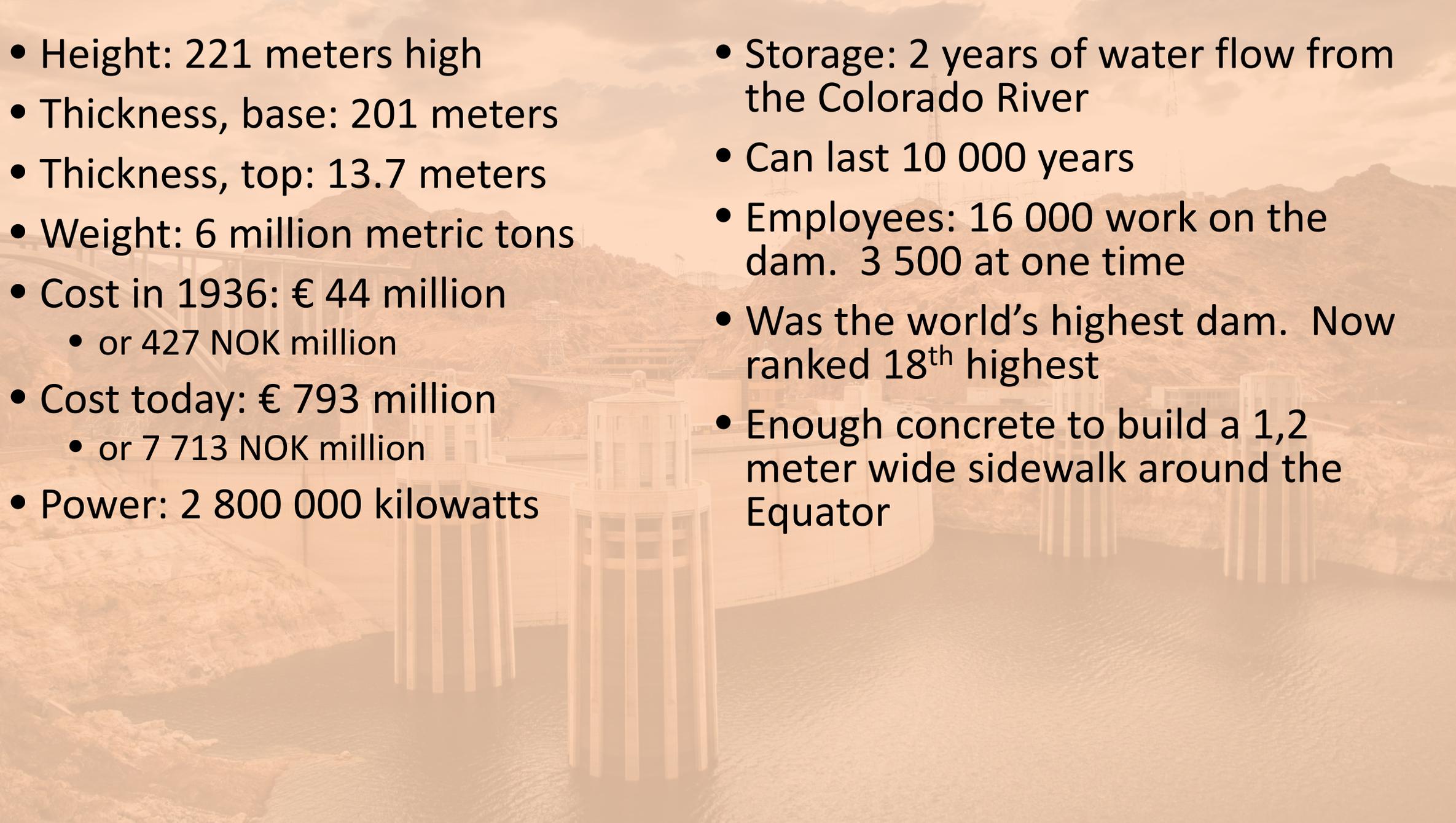
Size



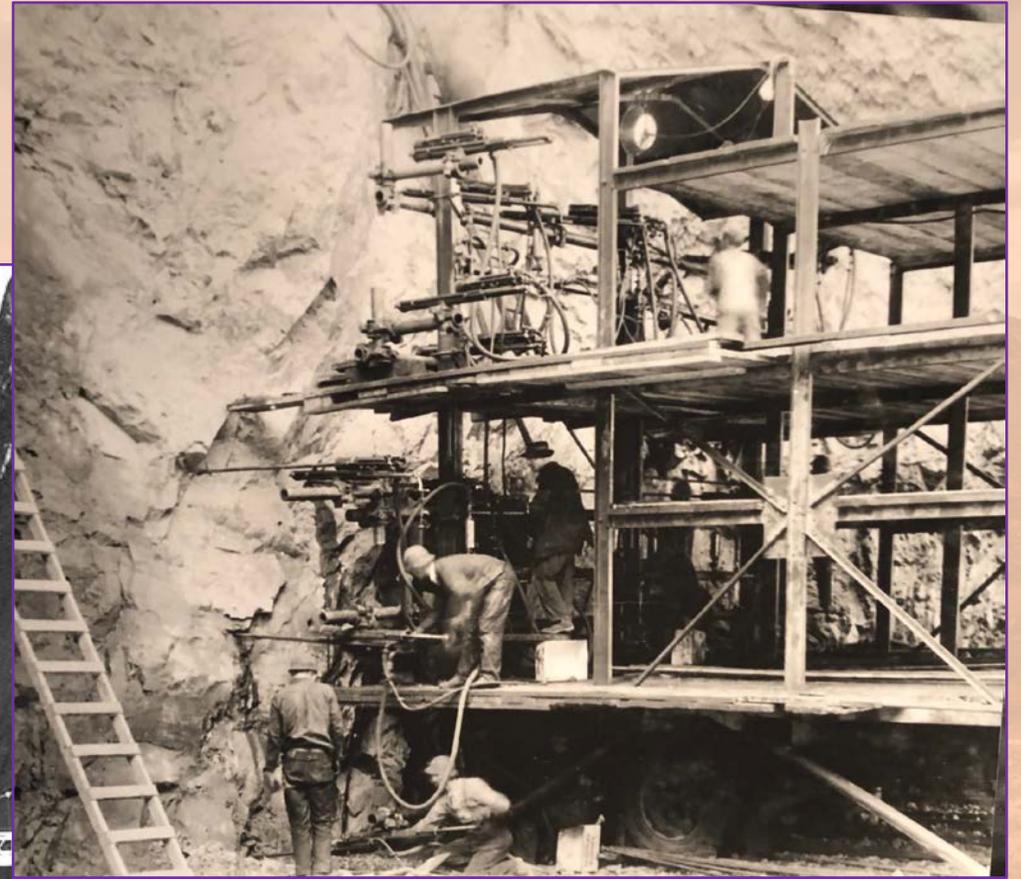
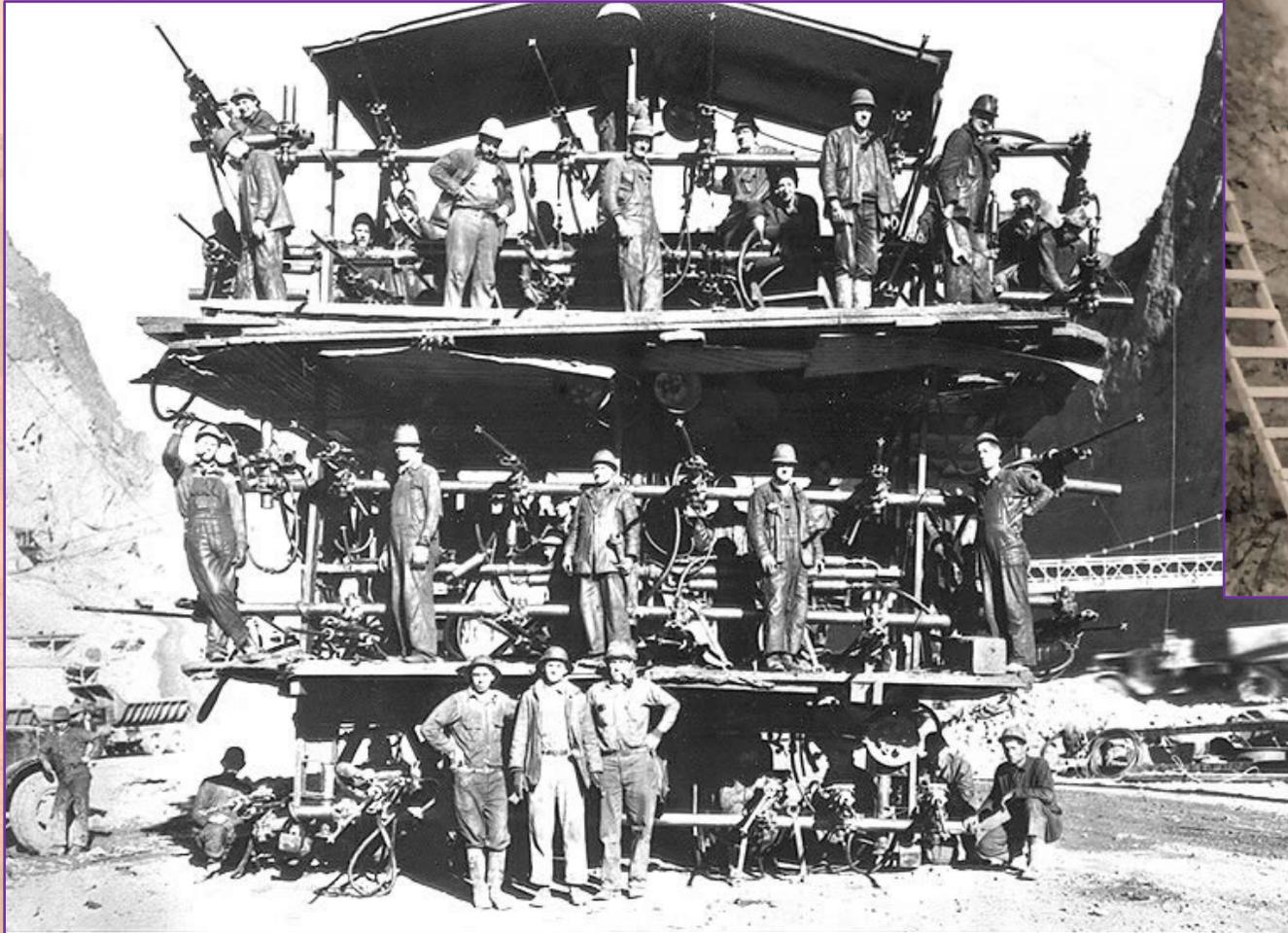
Oslo Plaza: 117 m and 37 floors
Hoover Dam: 221m and 70 floors



- Height: 221 meters high
- Thickness, base: 201 meters
- Thickness, top: 13.7 meters
- Weight: 6 million metric tons
- Cost in 1936: € 44 million
 - or 427 NOK million
- Cost today: € 793 million
 - or 7 713 NOK million
- Power: 2 800 000 kilowatts
- Storage: 2 years of water flow from the Colorado River
- Can last 10 000 years
- Employees: 16 000 work on the dam. 3 500 at one time
- Was the world's highest dam. Now ranked 18th highest
- Enough concrete to build a 1,2 meter wide sidewalk around the Equator

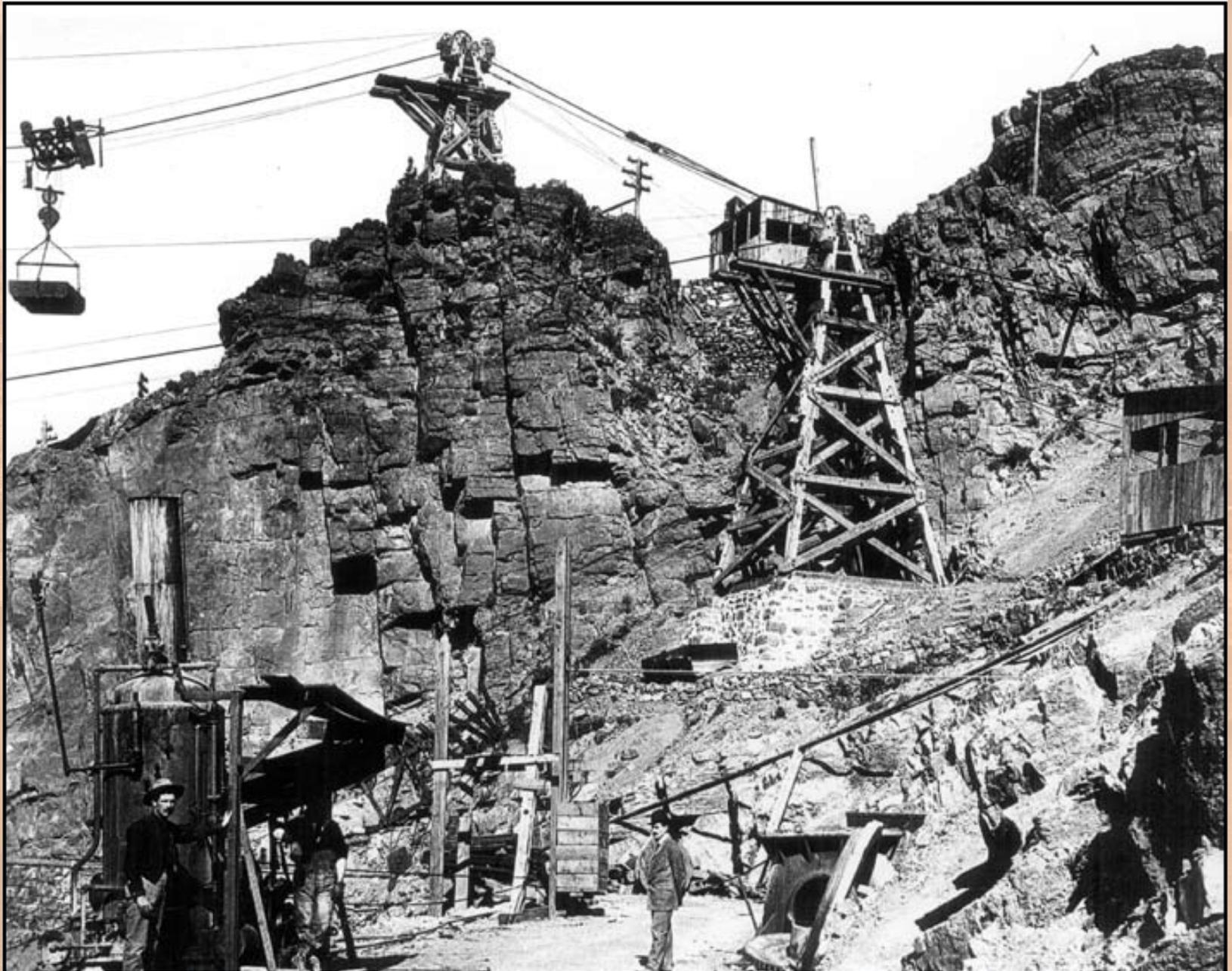
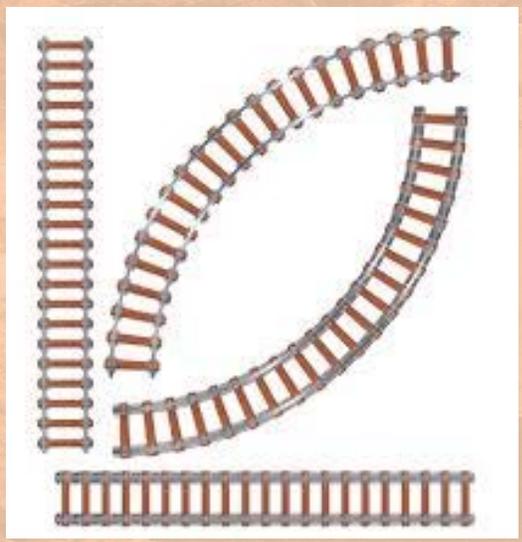


- Horizontal Drilling



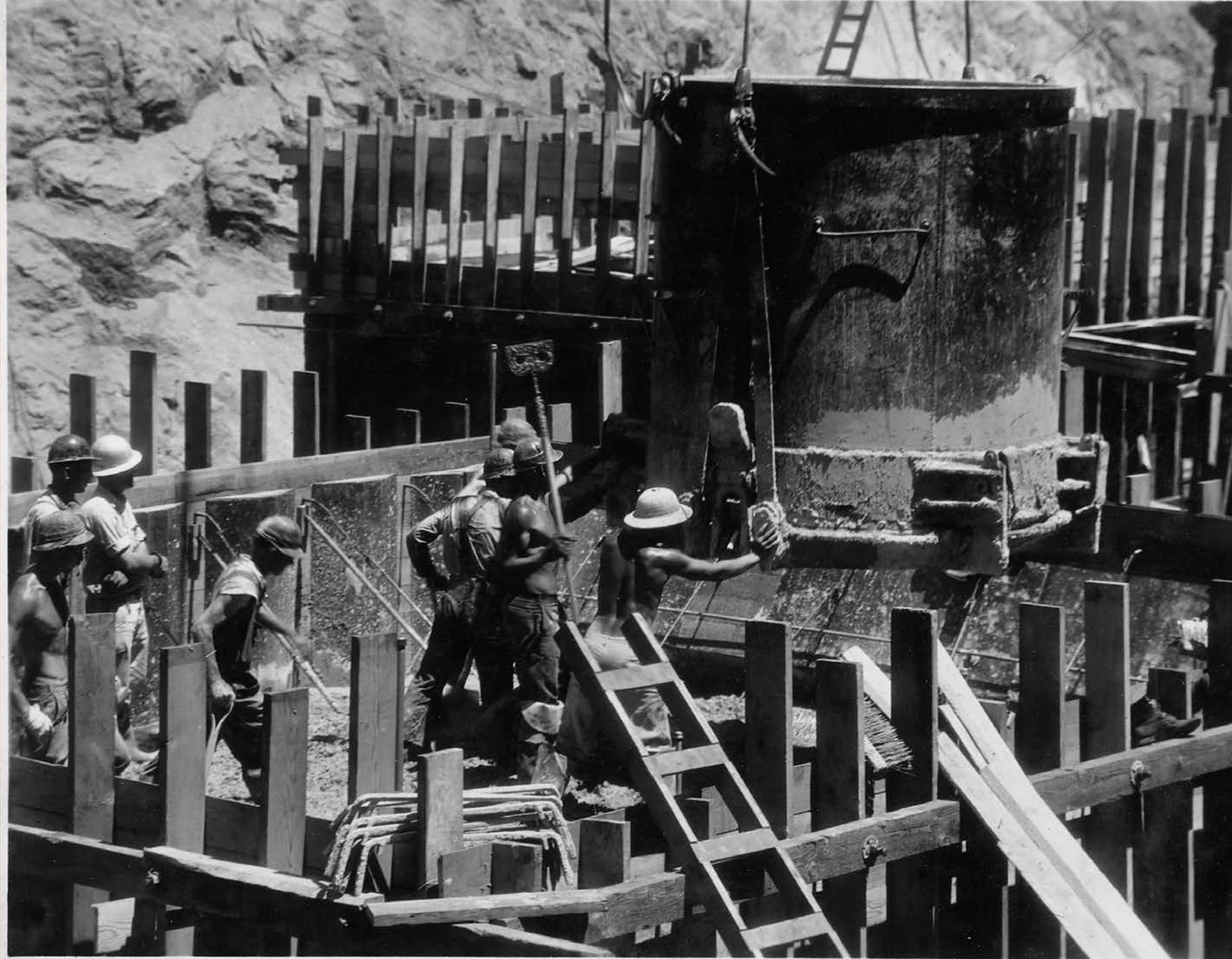
New Techniques

- Tower and Cable system
- Towers on train tracks



New Techniques

- Buckets ever 7 seconds
- 24 hours/day
- 7 days/week
- 363 days per year
- Only 2 days off per year



Construction

- If one big pour, 120 years to harden
- Instead, poured in sections
- Cooling pipes

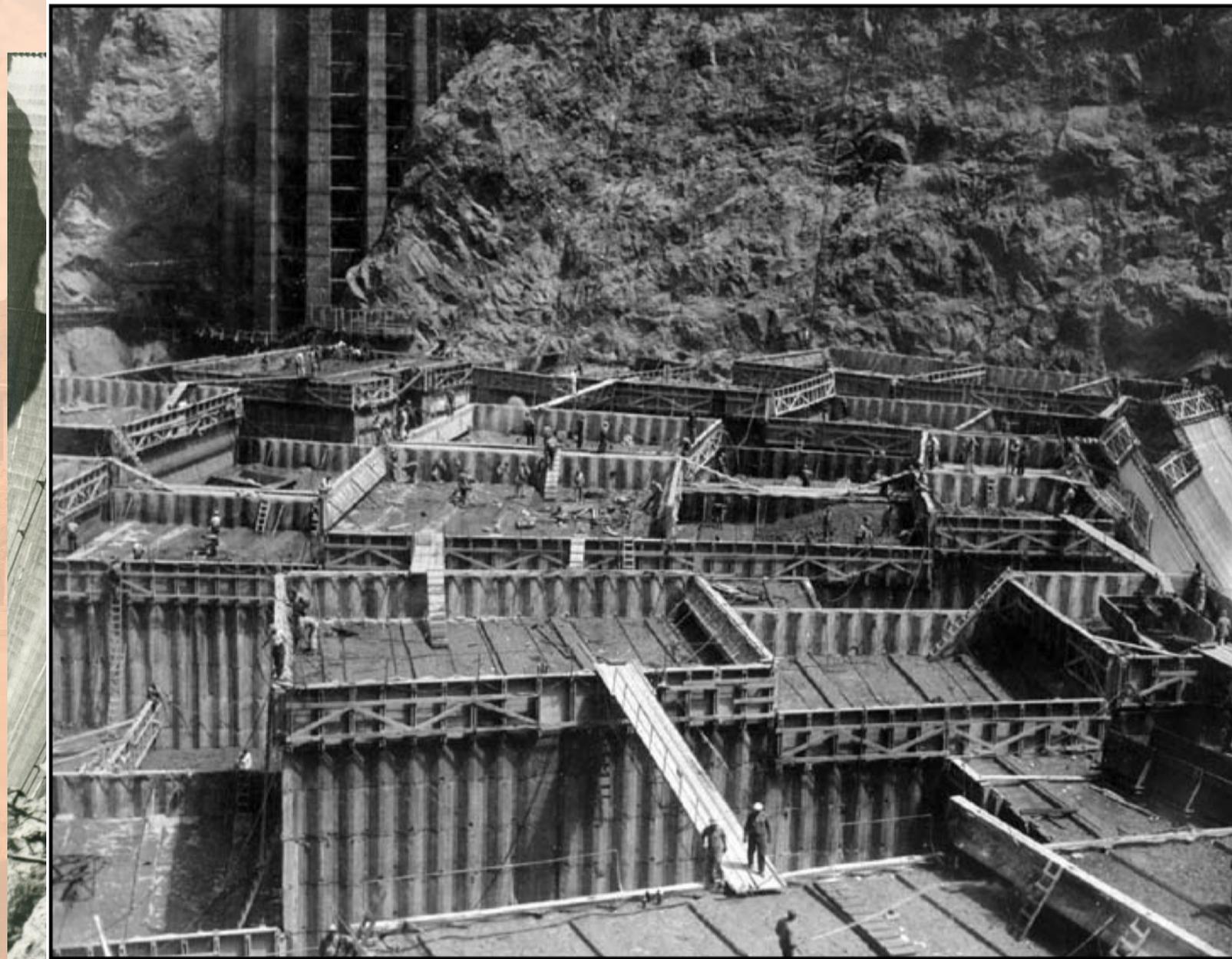
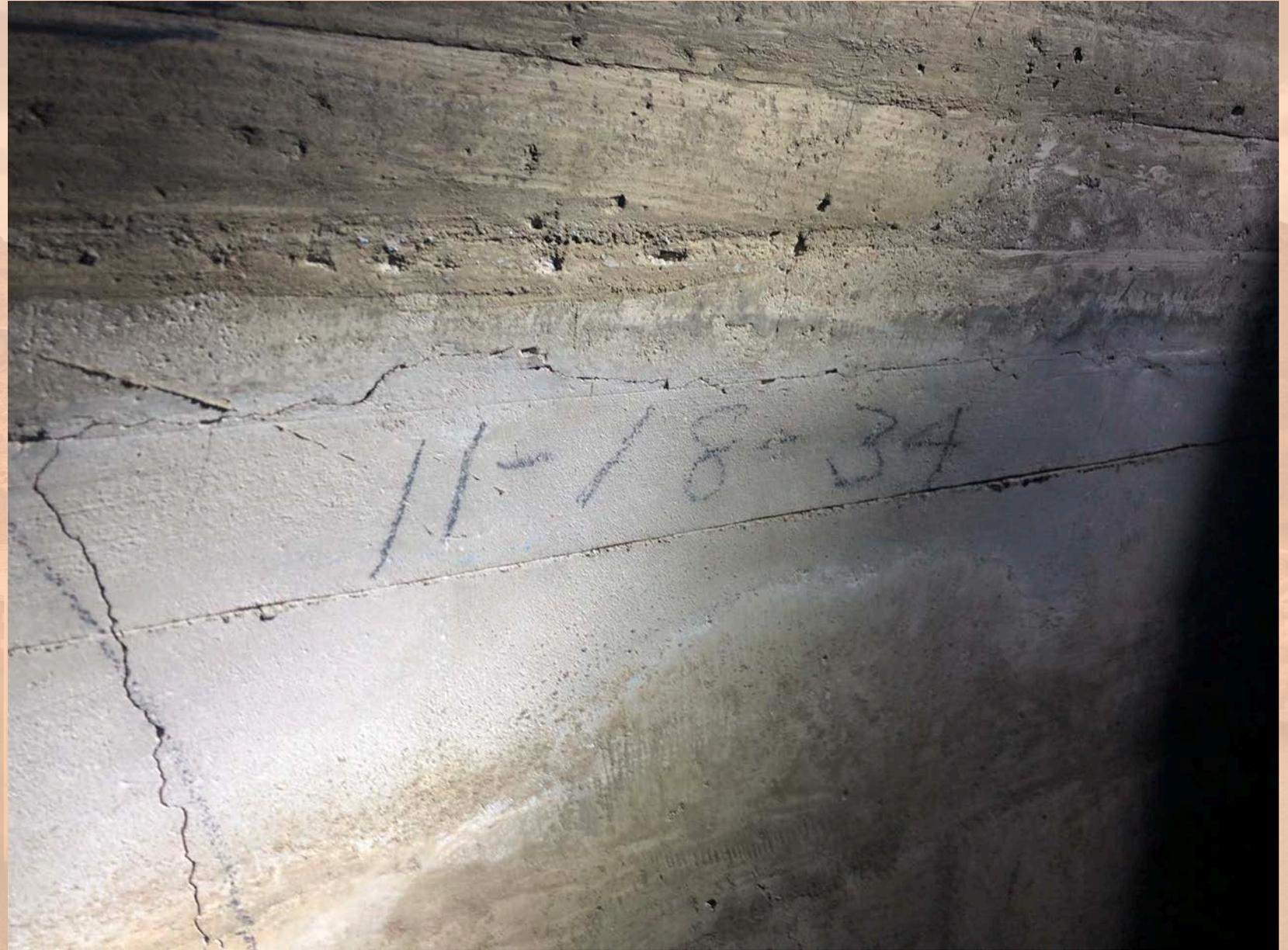


Figure 4-16: Looking across Hoover Dam during construction from the Nevada side on June 2, 1934. Source: Bureau of Reclamation.

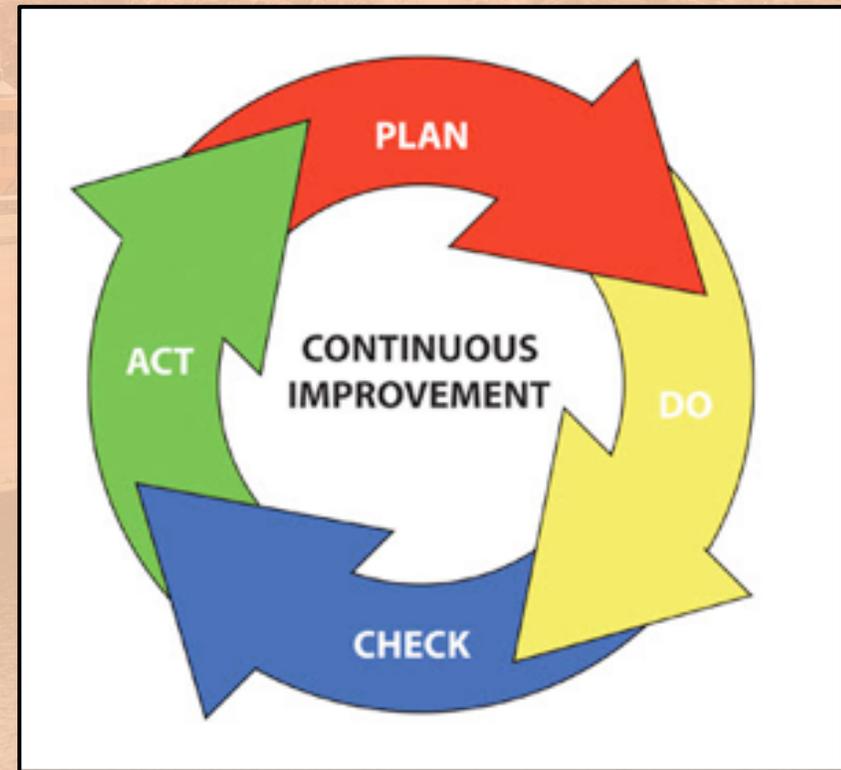
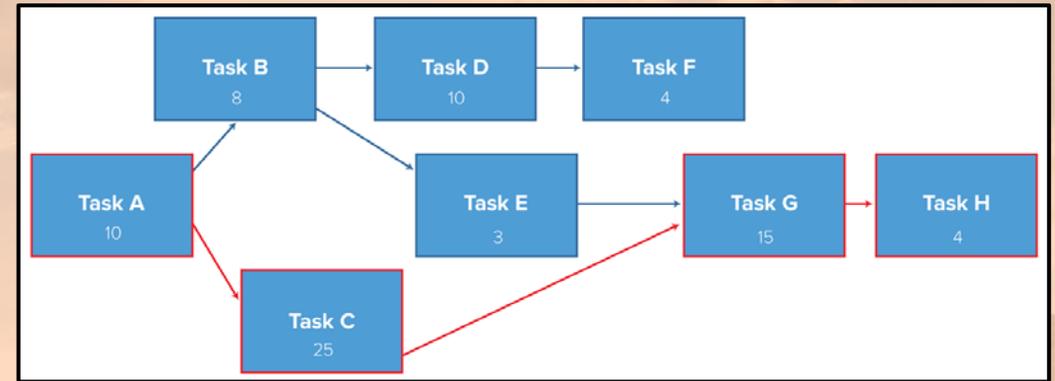
New Techniques

- First recorded crack in the Hoover Dam
- Recorded on Nov. 18, 1934

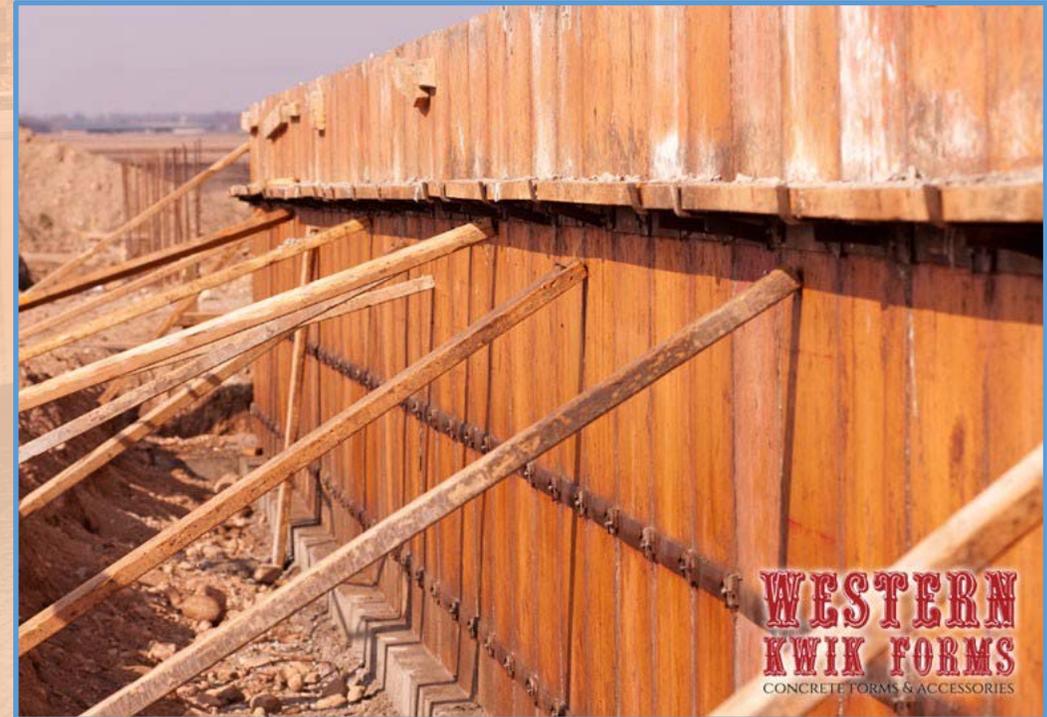


New Techniques

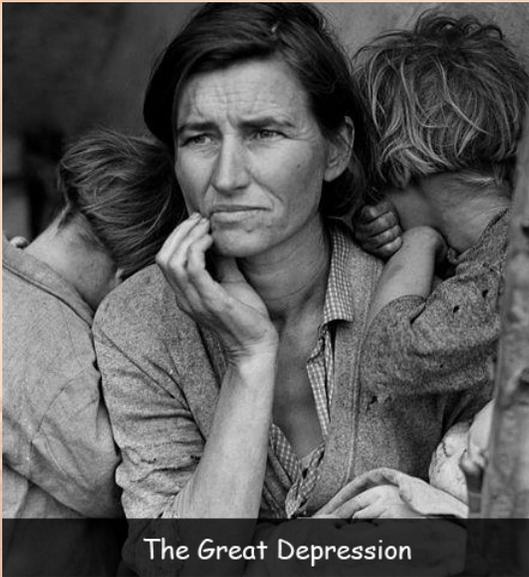
- Completed the dam two years early



Questionable Ethics



Working Conditions and Great Depression



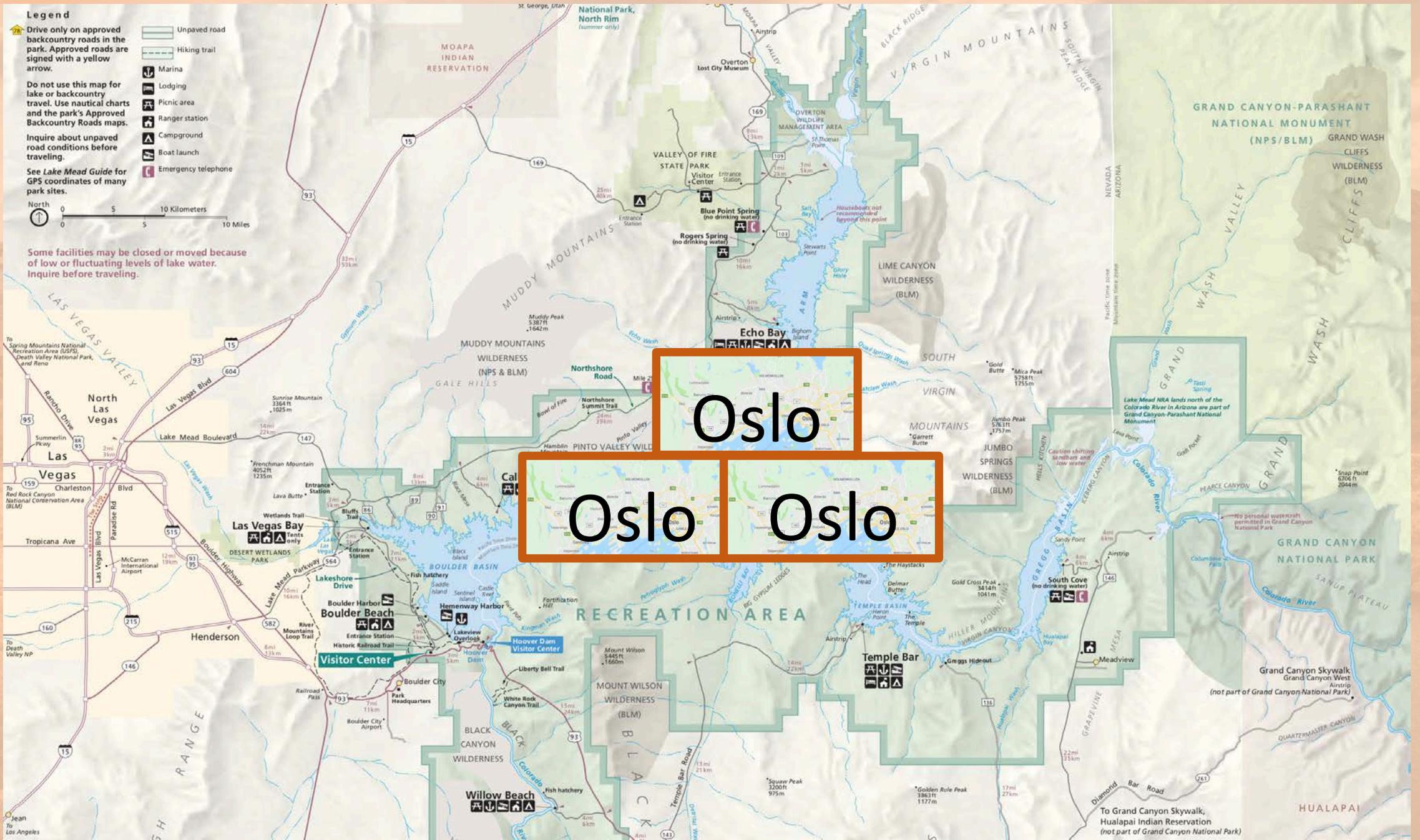
The Great Depression



Formation of Lake Mead



Formation of Lake Mead



Time Lapse





Pros

- Allowed a massive amount of people to move west
- Spurred the growth of Las Vegas
- Allowed Los Angeles to grow
- Transformed desert to farmable land
- Reduced flooding along the Colorado River
- 16 000 people able to feed their families during a major depression

Cons

- False sense of unfettered growth
- Too much water is used
- Altered natural life
 - Drop in water temperature → extinction of fish
 - Restricted water flow into Mexico
 - Groundwater table dropped 4 meters.
 - Organic material not making it to the gulf
- Mini earth quakes



A Norway Connection

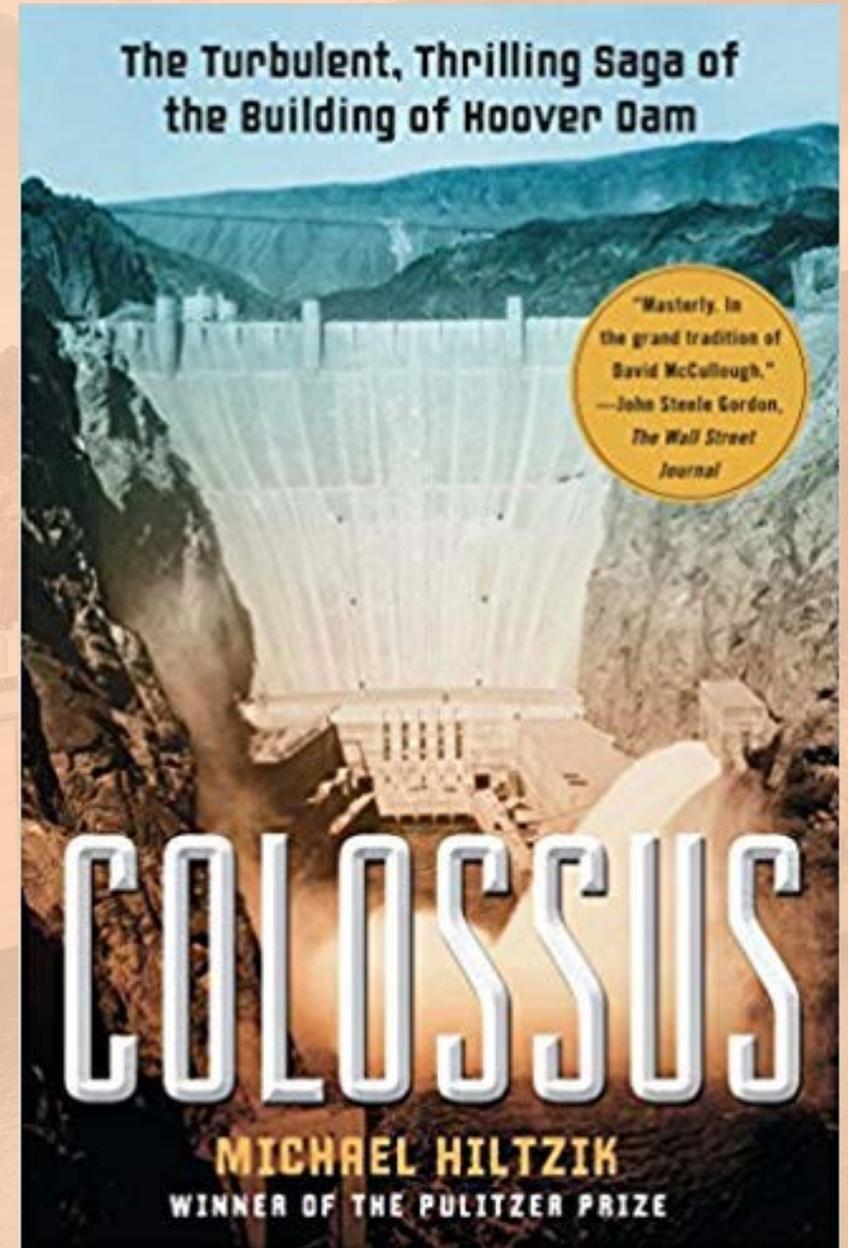
- Oskar J. W. Hansen (1892 - 1971)
 - Norwegian-born
 - Naturalized American sculptor



Additional Information

- <https://www.youtube.com/watch?v=NyklSslhXkk>
- https://www.youtube.com/watch?v=GLs3H_0yfKw
- <https://www.youtube.com/watch?v=n4o8NlSa4Hs>
- https://www.youtube.com/watch?v=Y_2OXXVuZec

- Book: Colossus by Michael Hiltzik





Questions ???
Comments ???