Grand Coulee Dam
Columbia River – Central Washington

Becky Brosz
Objectives

► Irrigation
  ▪ Original goal
  ▪ More than half a million acres of farmland

► Hydropower
  ▪ 24 generators - up to 6.8 GW

► Flood control
  ▪ Regulates highly variable flows in Columbia River
Owners & Financing

- Managed by U.S. Bureau of Reclamation
  - Department of the Interior
  - Columbia Irrigation Project

- State of Washington
  - $377,000 (1933)

- Franklin D. Roosevelt
  - $63 million (1933)
  - Public Works Administration
Technical Description

- Gravity Dam
- 5223 feet long
- 440 feet thick at the base
- 550 feet high
- 11,975,521 cubic yards of concrete
- Nine million acre-feet of water
Technical Challenges

► Getting enough materials
  ▪ The railroad hauled
    ▶ over twelve million barrels of cement (46,500 carloads)
    ▶ 77 million pounds of reinforcing steel
    ▶ and ten million pounds of steel for the penstocks

► Excavating earth
  ▪ 2 mi long conveyor belt

► Cold weather
  ▪ Steam through pipes in wet concrete to keep from freezing

► Hot weather
  ▪ 2000 mi of cooling pipes
Technical Successes

► Pumping Plant
  - 6 – 65,000 hp pumps
  - 6 – 67,500 hp pumps
  - 12 - 12 ft diameter pipes
  - 1,600 – 2,000 cu ft per second
  - When reversed – 50 MW each

► Largest concrete structure in the United States

► Fourth largest hydropower producer in the world

► Largest hydropower producer in the U.S. (6.8 GW)
Benefits & Disbenefits

► Benefits
  - Hydropower
  - Flood Protection
  - Tourism
  - Irrigation
  - Jobs

► Disbenefits
  - Salmon
  - Steelhead
  - Colville Native Americans
Project Now

- Electricity generated has returned over $4 billion
- Tourist attraction - laser shows, fireworks
- Efforts for fish – hatcheries, transport by truck
Remarkable Traits

- Woody Guthrie - folk singer hired by government to write pro-dam propaganda (26 songs)
- Wiped out more salmon than any single structure in American history.
- Colville Native Americans - fighting for money (15-25%, $62 - $103 million annually)
- Been called the 8th Wonder of the World
Questions