

NORTHWEST POWER POOL

Reliability through Cooperation

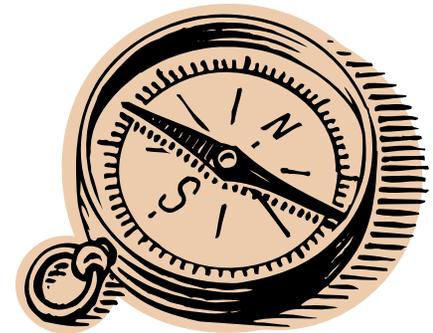
Mekong River Delegation

April 30, 2008

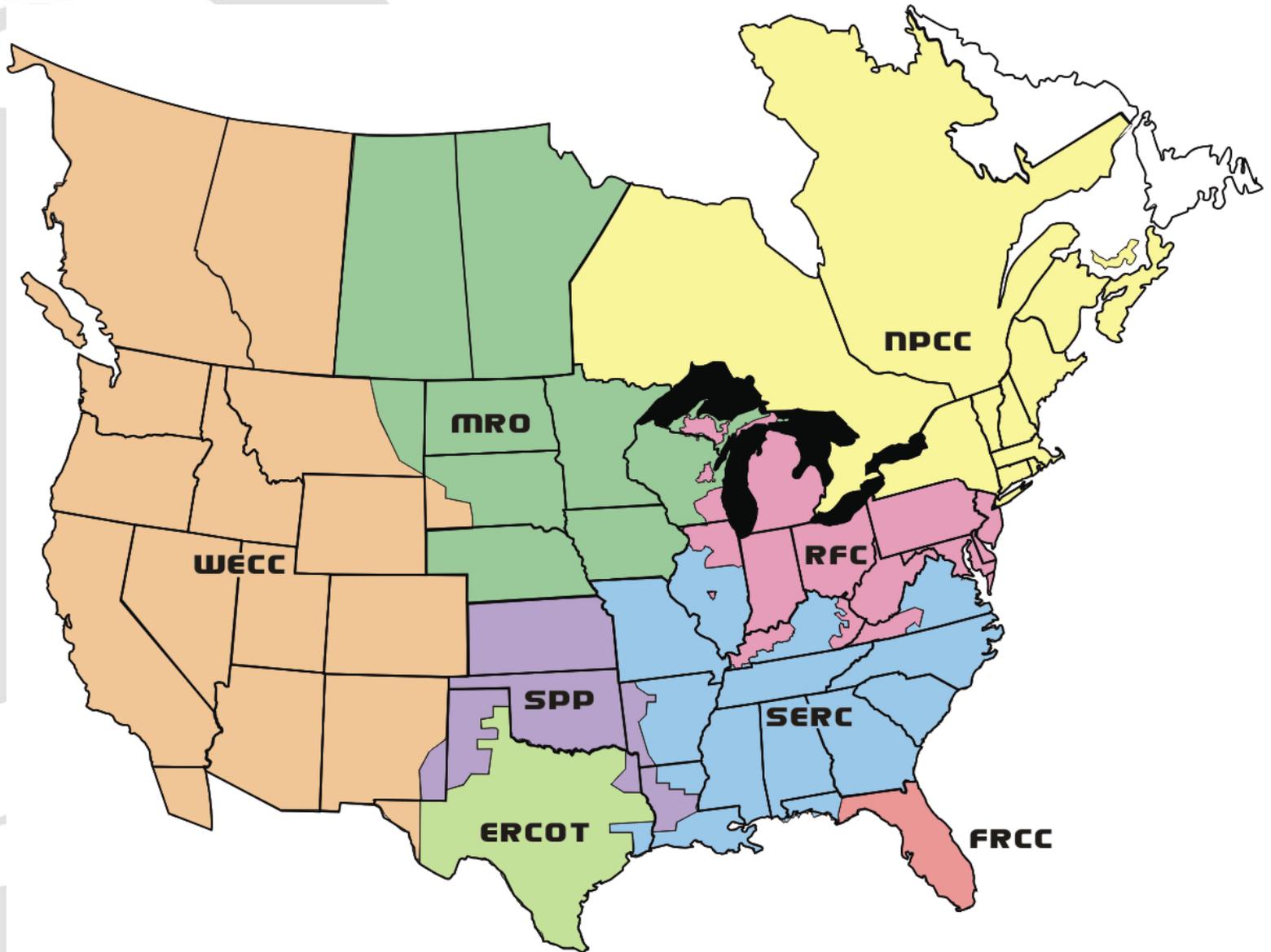


Presentation Outline

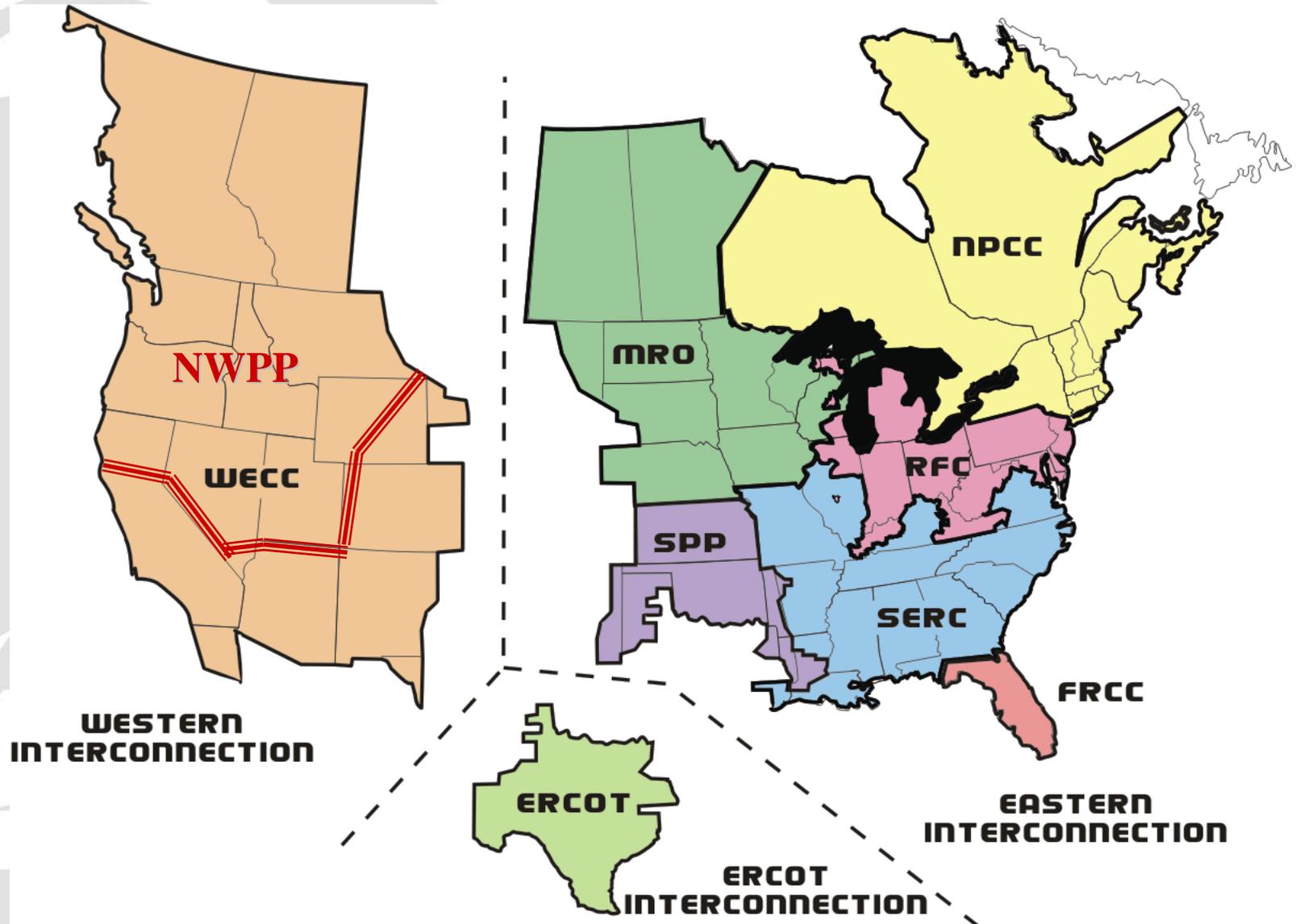
- Northwest Power Pool Background
- Pacific Northwest Coordination Agreement
- Headwater Benefits



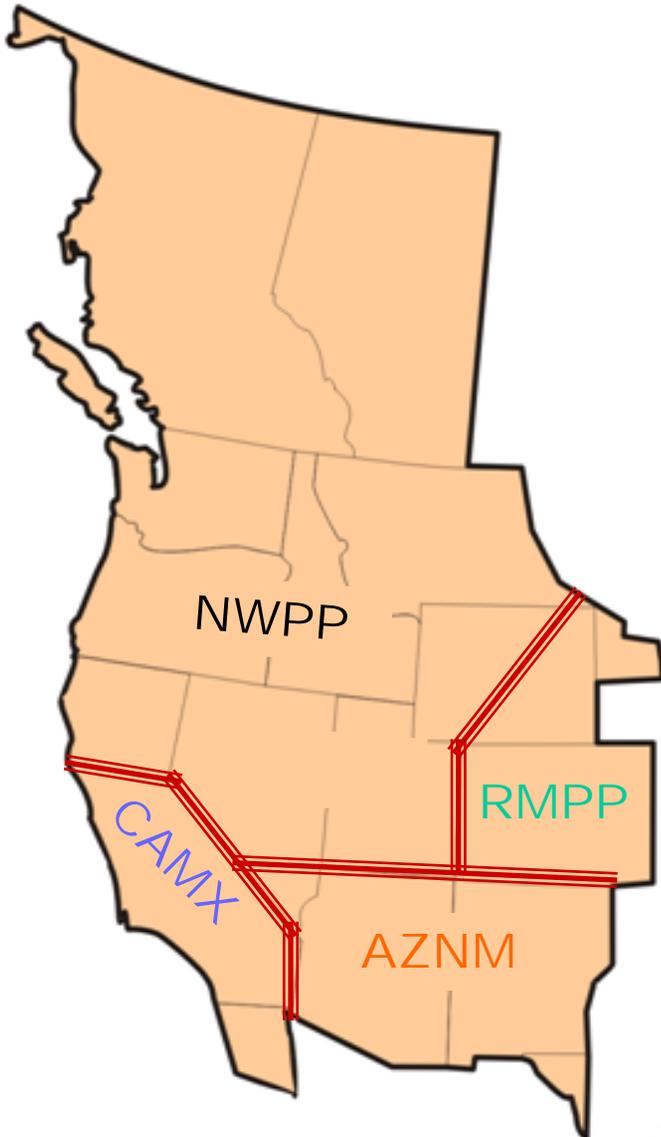
Regional Reliability Councils



North American Interconnections



NERC/WECC Subregions



Northwest Power Pool

Alberta Electric System Operator
Avista Corporation
Bonneville Power Administration
British Columbia Transmission Corporation
Chelan County PUD
Douglas County PUD
Grant County PUD
Idaho Power Company
Northwestern Energy
PacifiCorp-East
PacifiCorp-West
Portland General Electric Company
Puget Sound Energy
Sacramento Municipal Utility Board
Seattle City Light
Sierra Pacific Power Company
Tacoma Power
Turlock Irrigation District
Western Area Power Administration – UGP

Rocky Mountain Power Pool

Public Service Company of Colorado
Western Area Power Administration – CM

Arizona-New Mexico

Arizona Public Service Company
Duke – Arlington Valley
Duke – Harquahala
Duke – Gila River
El Paso Electric Company
Imperial Irrigation District
Nevada Power Company
Public Service Company of New Mexico
Salt River Project
Tucson Electric Power Company
Western Area Power Administration – DSW

California-Mexico

California Independent System Operator
Comision Federal de Electricidad
Los Angeles Dept. of Water and Power

NWPP HISTORIC DATES

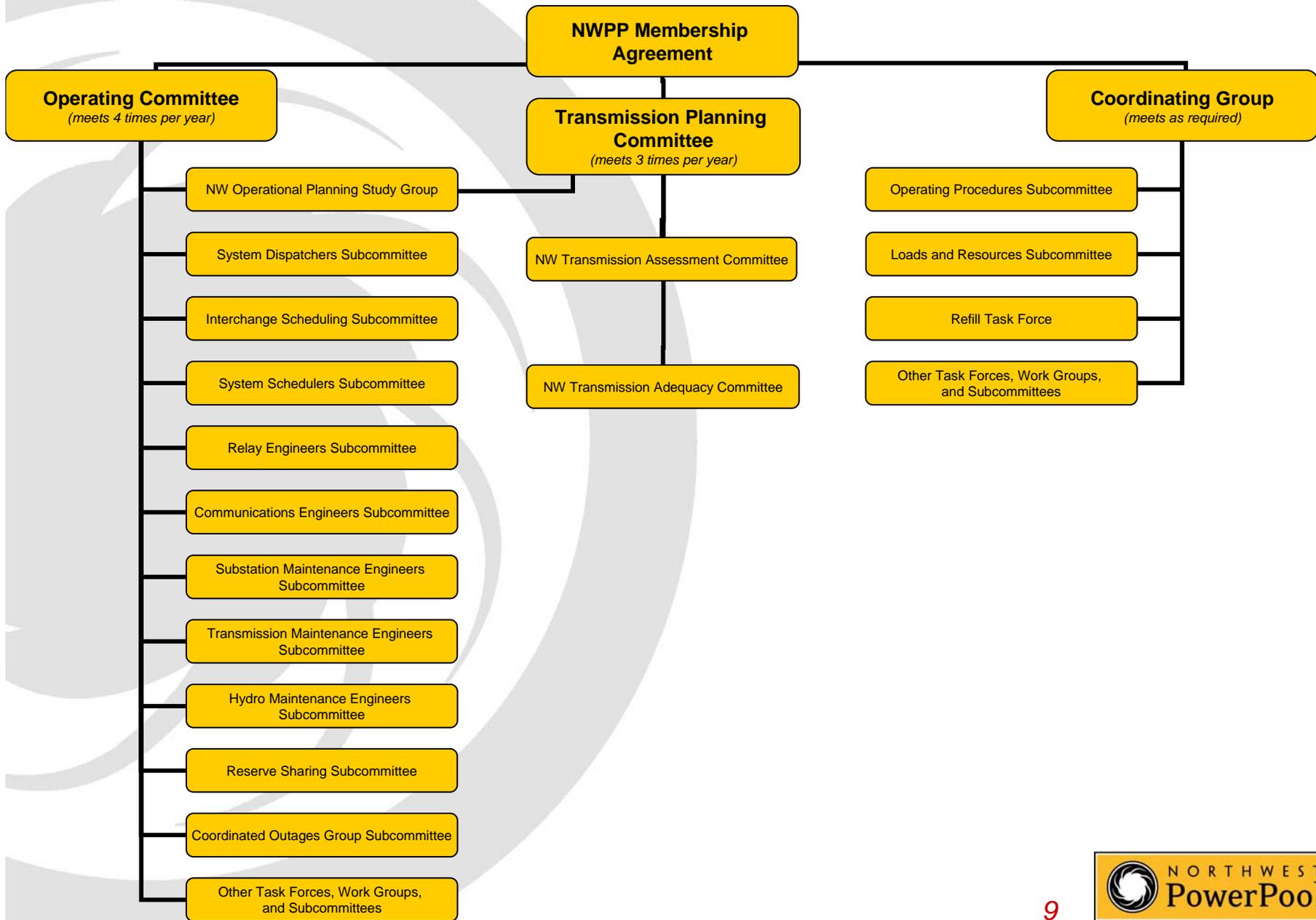
- 1942 - Operating Committee
- 1964 - Pacific Northwest Coordination Agreement signed
- 1990 - Transmission Planning Committee

VISION

The Northwest Power Pool serves as a forum for reliability and operational adequacy issues in the area for both transmission and generation

DEMOGRAPHICS

- 8 U.S. States
- 2 Canadian Provinces
- Federal, Public, Private, Provincial Ownership
- International Border (Treaties associated with water)
- Non-Jurisdictional as well as Jurisdictional
- Preference Act – Public Law 88-552
- 160 Consumer-owned electric utilities
- 19 Control Areas (35 in the Western Interconnection (WI)).
- ~ 90,000 Megawatts Total Resources (44% WI)
- ~ 50% Peak load of the WI
- ~ 50% Energy load of the WI
- Automated Reserve Sharing Procedures
- Hydro Coordination
- Hydro Thermal Integration
 - *Hydro located on the West (BC, ID, OR, WA)*
 - *Thermal located on the East (AB, MT, NV, UT, WY)*



THREE MAIN COMMITTEES

- **Operating Committee**
 - *Foster coordination and communication.*
- **Coordinating Group**
 - *Administer the Pacific Northwest Coordination Agreement, optimizing Columbia Basin hydro generation.*
- **Transmission Planning Committee**
 - *Provide a forum for reliable transmission planning.*

RELIABILITY – Defined

- Two Foundational Elements
 - **Adequacy** - The ability to supply the aggregate electrical demand and energy of consumers
 - **Security** - The ability to withstand sudden disturbances

PHYSICAL FACTORS (that Drive Northwest Reliability)

- Generation/Resources
- Load
- Transmission
- Temperature

COLUMBIA RIVER TREATY

- 1948 Vanport flood
- 1950's Treaty negotiated
- 1965-73 Canada builds three dams: Duncan, Arrow and Mica
- U.S. allowed to build Libby
- Canada gets flood control payment
- Canada gets 1/2 of the “coordinated” U.S. benefit from the Mica, Arrow, and Duncan
- 30 years of benefit calculated and sold to U.S. utilities

COLUMBIA RIVER TREATY

- Revelstoke filled
- Non-Treaty Storage Agreement

PNCA COORDINATION

- **Federal Government**
 - *Bonneville Power Administrator*
 - *Corps of Engineers*
 - *Bureau of Reclamation*
 - *United States Entity (Canadian Treaty)*
- **Municipals**
 - *City of Eugene, OR*
 - *City of Seattle, WA*
 - *City of Tacoma, WA*

PNCA COORDINATION

- **Public Utility District**
 - *Grant County*
 - *Chelan County*
 - *Douglas County*
 - *Pend Oreille County*
 - *Cowlitz County*
- **Investor Owned Utility**
 - *Portland General Electric Company*
 - *PacifiCorp*
 - *Avista*
 - *Puget Sound Energy*
- **Independently Owned Entities**
 - *PP&L Montana*
 - *Alcoa Power Generation, Inc.*

PNCA COORDINATION

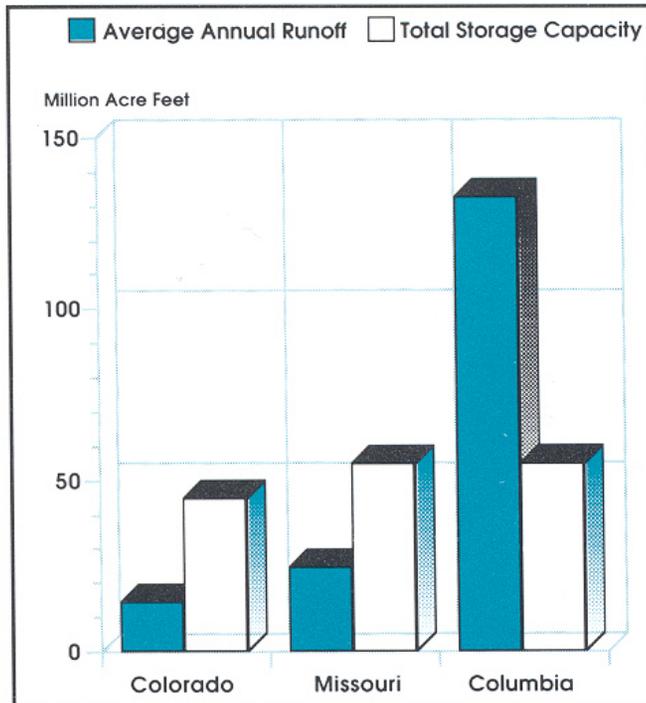
- Parties shall coordinate with all of the other Parties the planning and operation of its System.
 - *System means for any Party such Party's Firm Resources and transmission facilities that are adequately interconnected and that interconnected with the Systems of other Parties to accomplish the objected of the agreement*
- The Parties shall coordinate their System to make available to each Party its optimum Firm Load Carrying Capability (“FLCC”), to provide optimum FLCC for the Coordinated System, and, to produce the optimum amount of useable secondary energy for each Party

PNCA COORDINATION

- Coordination for the production of power must take into consideration non-power uses for water resources – recreation, irrigation, transportation, biological opinion (fish), and others.
- Coordinated System means the aggregated Systems of each of the Parties, including generating plants, reservoirs, transmission system and associated facilities owned or controlled by such Party and coordinated by such Party under this Agreement. The Coordinated System shall include Treaty Storage to the extent such inclusion is not inconsistent with the Treaty.

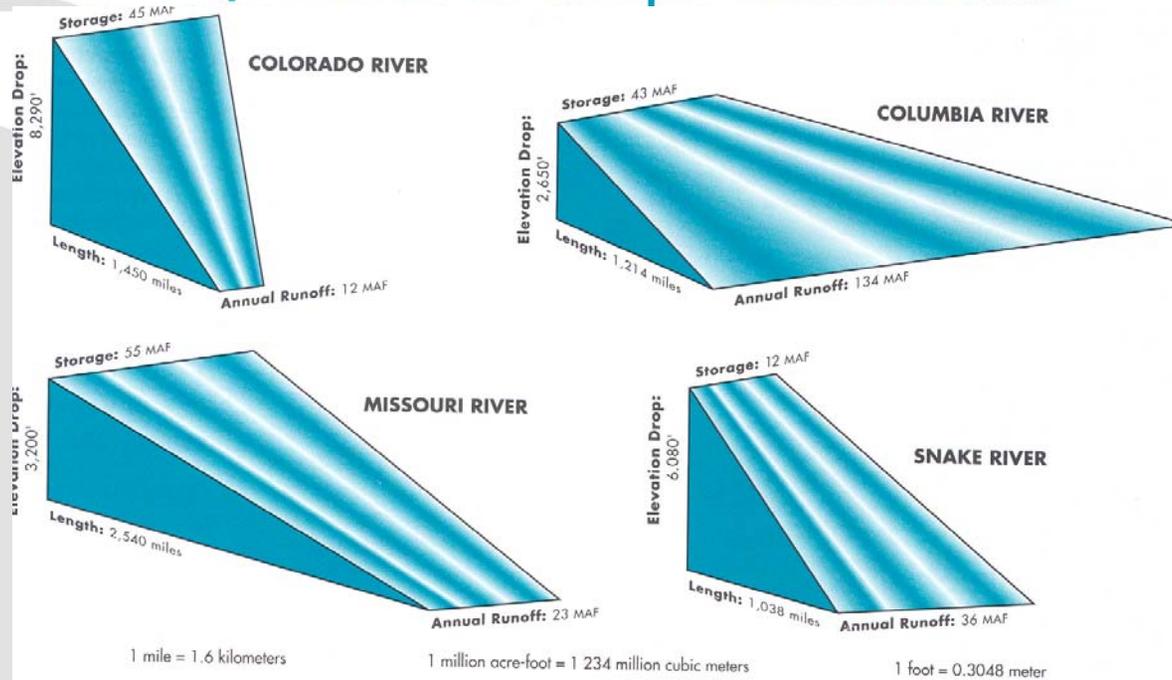


Columbia River Runoff and Storage Compared to the Colorado and Missouri Rivers



The Columbia River has greater runoff than storage, compared to two other large river systems, the Colorado and the Missouri.

Comparison of Major U.S. Rivers



It is the large volume of water passing given points along the Columbia-Snake Rivers that is so valuable to river planners and users. Although the Columbia River total storage compares favorably with other large U.S. rivers, its runoff is significantly larger than its storage capacity as compared to the Colorado or Missouri which have annual flows less than storage capacity.