

WATER MANAGEMENT DIVISION

JIM BARTON, CHIEF

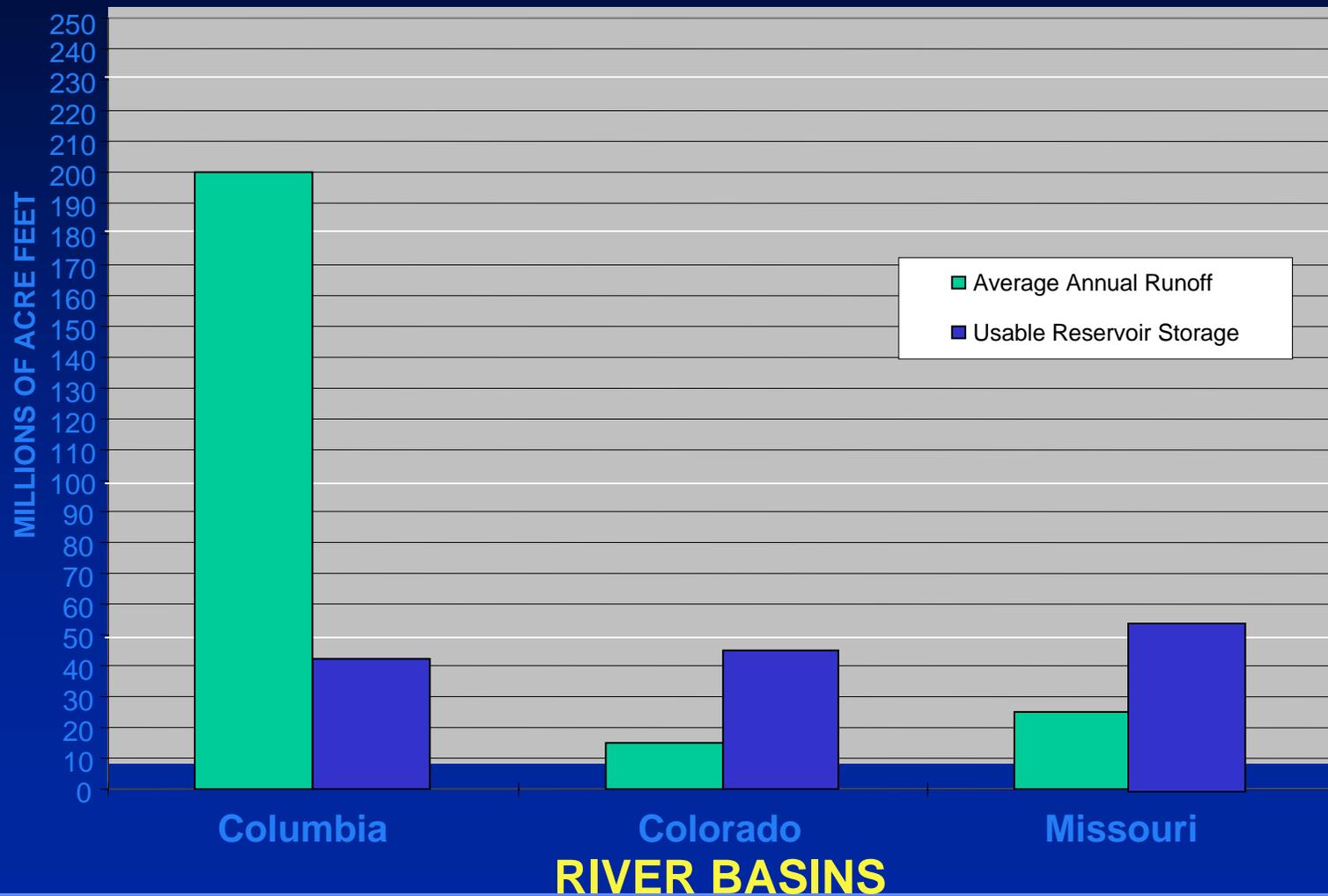
**POWER BRANCH
HYDROLOGIC ENGINEERING BRANCH
RESERVOIR CONTROL CENTER**



Columbia River Basin



AVERAGE ANNUAL RUNOFF AND USABLE RESERVOIR STORAGE MAJOR WESTERN RIVER BASINS



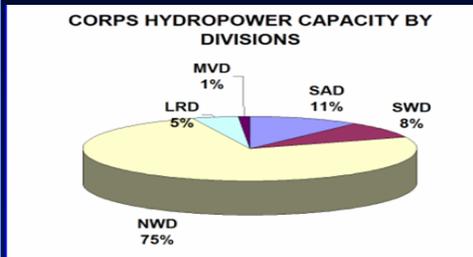
The Willamette Basin

LEGEND

- Projects operating in 1964
- Projects added since 1964
- Re-regulating Dams



GENERAL INFO

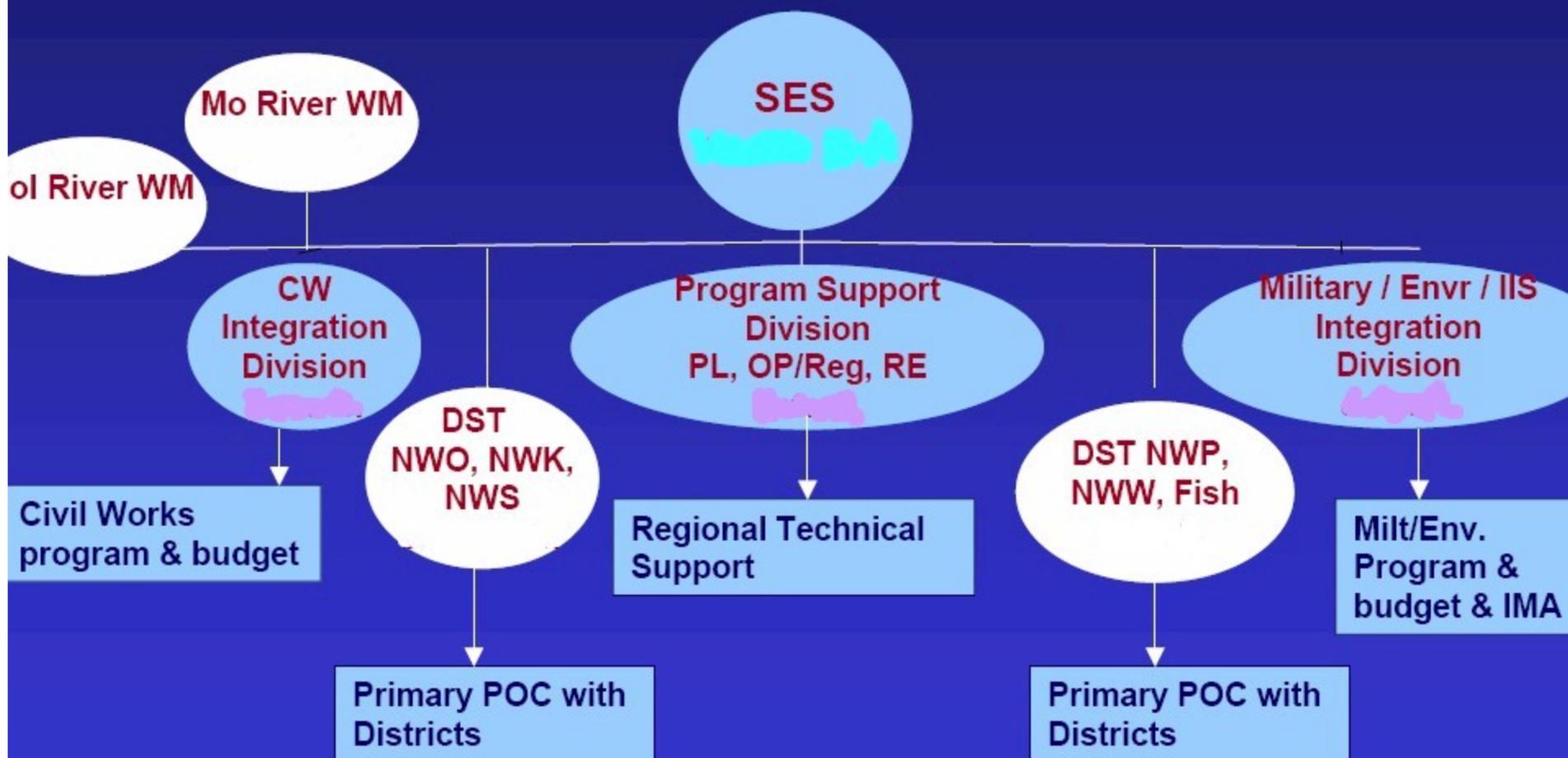


- Columbia River drainage area is approximately 259,000 square miles and projects control only about 25% of the basin area
- 42 primary & secondary projects, \$14 Billion in cumulative flood damages prevented, \$2-3 Billion in annual power revenues, major economic benefits from navigation, irrigation, etc.
- Northwestern Division: 75% of total COE installed MW (~21,000 MW) and 65% of total regional hydro output, power system operated as a regionally coordinated system.
- System operated to meet multiple purposes, including power, flood damage reduction, navigation, recreation, environment, etc.



Directorate of Programs

US Army Corps
of Engineers
Northwestern Division



WATER MANAGEMENT DIVISION

POWER BRANCH

Annual Power Operating Plans :

- Columbia River Treaty
- Pacific Northwest Coordinating Agreement

System Operation & Power Impact Studies

Regional Power Planning

HYDROLOGIC ENGINEERING BRANCH

Flood Control Plan and Oversight

Hydrologic Forecasting

Reservoir System Modeling

Regional Water Control Data System

QA/QC of District Studies and Approval of Water Control Plans

RESERVOIR CONTROL CENTER

Implement Annual Operating Plans (Flood Control, Fishery, Hydroelectric, and Columbia Treaty)

Real Time Operating

RESERVOIR CONTROL CENTER

Bob Buchholz, Acting Chief

RESERVOIR
REGULATION
UNIT

WATER
QUALITY TEAM

HYDROPOWER
COORDINATION

FISH
TEAM

RESERVOIR CONTROL RESPONSIBILITIES

Reservoir Regulation Unit:

- Real-time operation and coordination of Columbia and Snake Rivers.
- Operation for Flood control, Fish and Wildlife, Power, Irrigation, Navigation, Recreation, Treaty, etc.

Water Quality Team:

- Command and control of Total Dissolved Gas Program
- BiOp consultation, Technical Management Team (TMT), Programmatic/regulatory review and coordination, modeling

Fishery Team:

- Real-time fishery operations, TMT support, ESA consultation
- Fish Passage Plan and anadromous fish evaluation program

Hydropower Coordination:

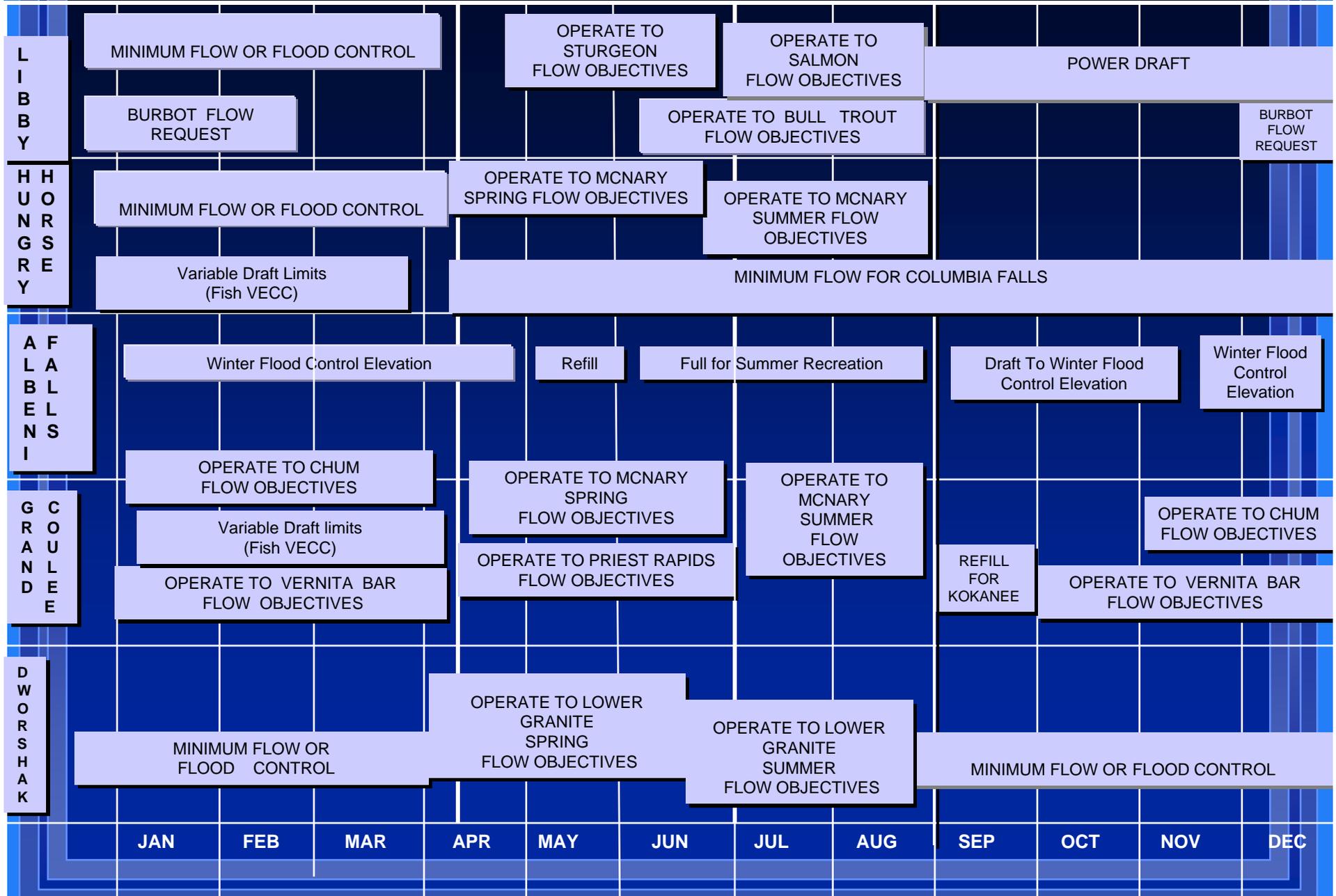
- Real-time outage scheduling, maintenance scheduling for planning, integration of transmission and other outages
- Hourly coordination for Mid-Columbia projects
- Corps/BPA/Reclamation Joint Operating Committee support



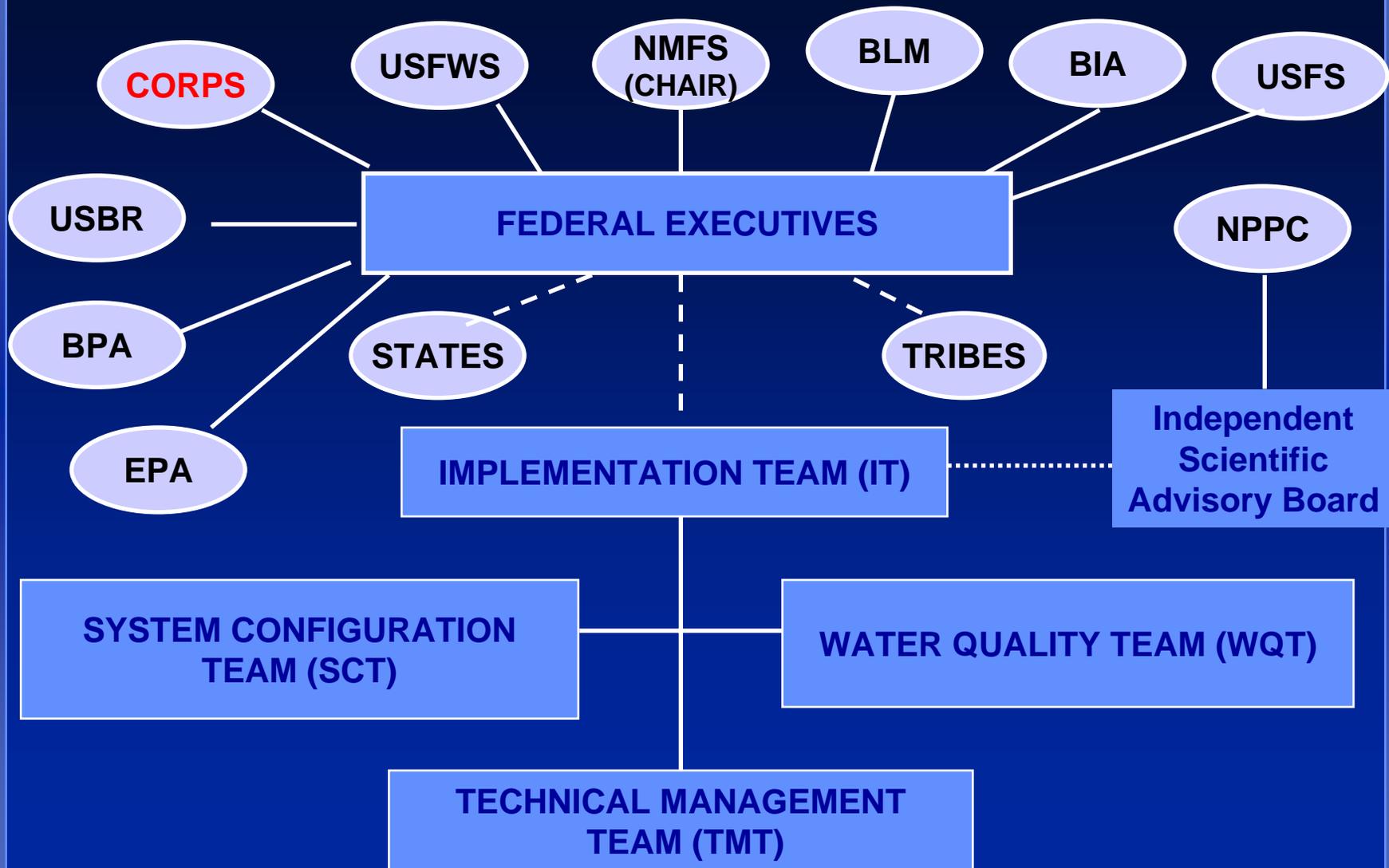
Endangered Species Act Operation



OPERATIONS TIMELINE



Regional Implementation Organization

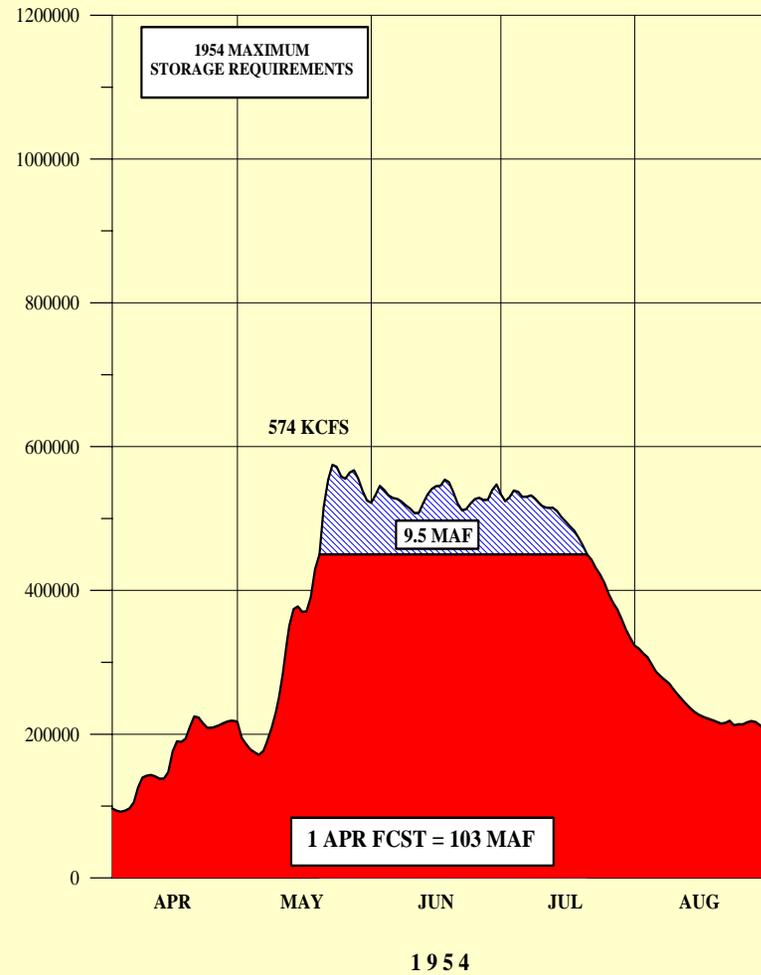
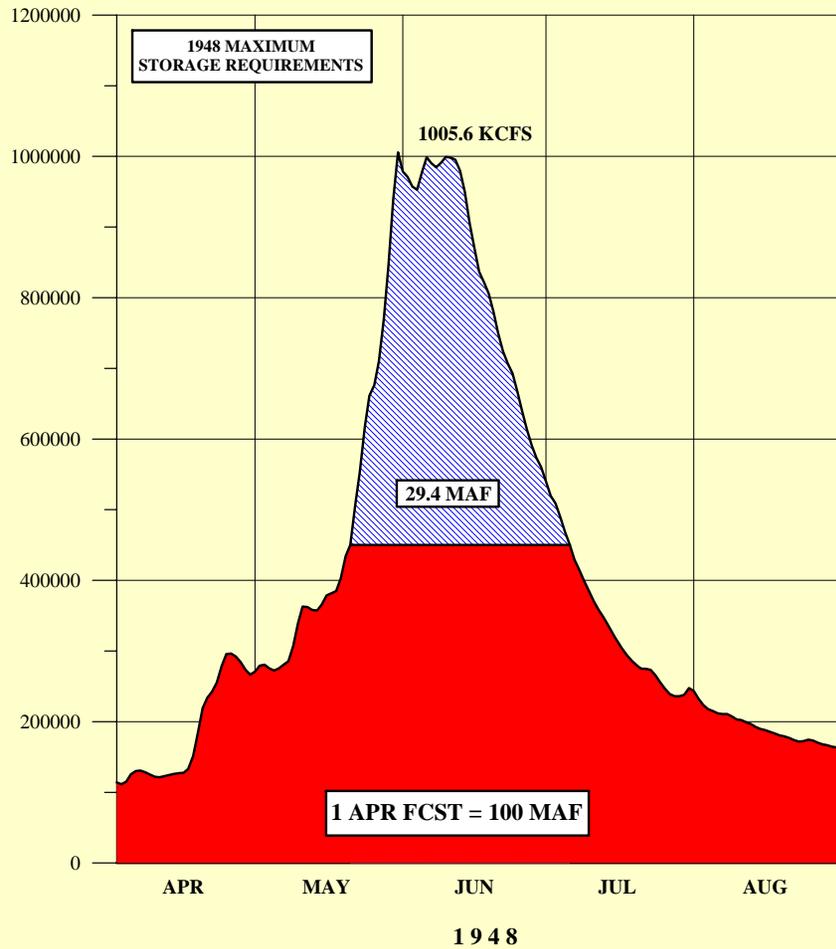


HYDROLOGIC ENGINEERING BRANCH

Peter Brooks, Chief

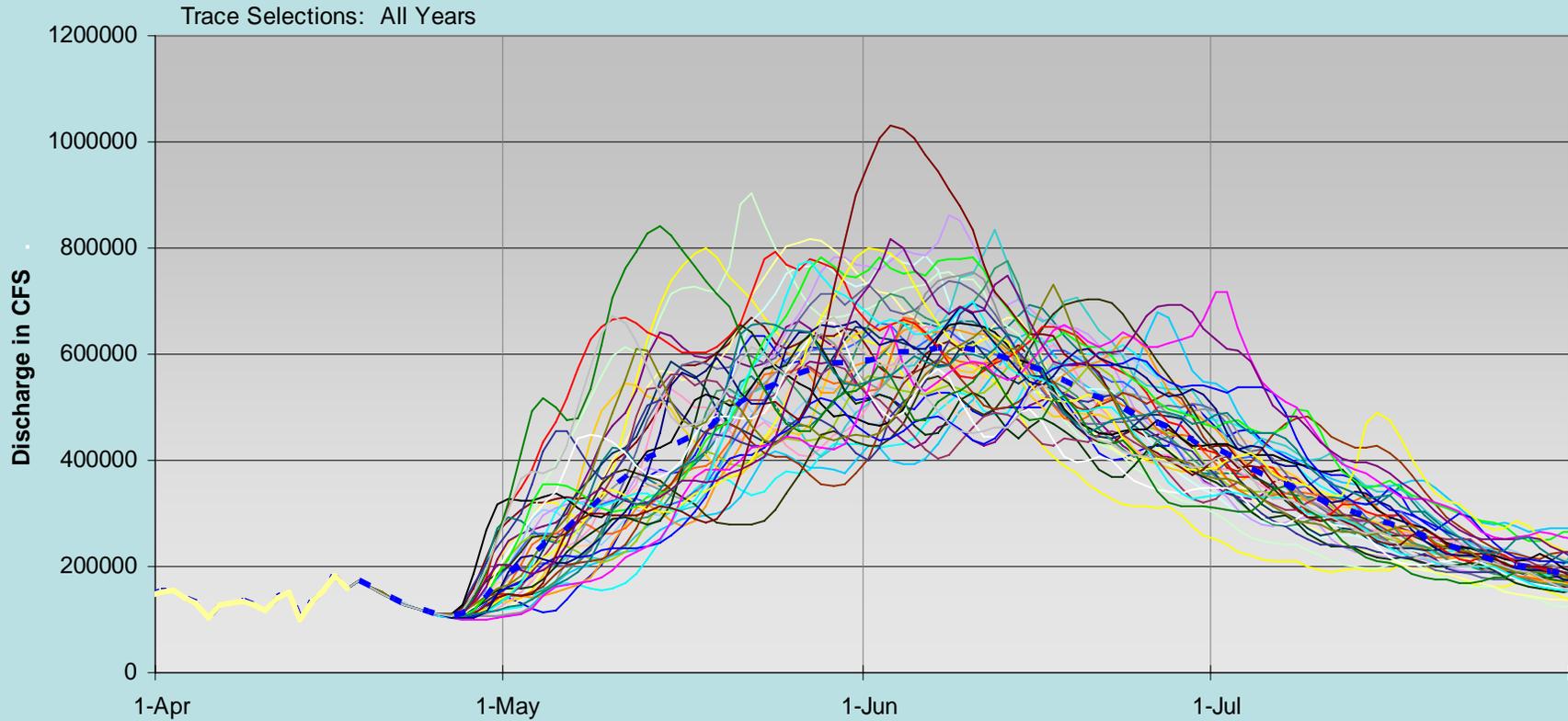
- Flood Control Planning and Oversight
- Seasonal Volume Forecasting, Ensemble Streamflow Prediction Tool Development
- Special Flood Control Studies
- Regional Water Control Data System
- QA/QC of District Studies, Approval of Water Control Plans, Processing Deviation Requests

Which Shape This Year?



The Dalles Unregulated Inflow ESP Hydrographs

4/15/2008



1949	1950	1951	1952	1953	1954	1955	1956
1957	1958	1959	1960	1961	1962	1963	1964
1965	1966	1967	1968	1969	1970	1971	1972
1973	1974	1975	1976	1977	1978	1979	1980
1981	1982	1983	1984	1985	1986	1987	1988
1989	1990	1991	1992	Average	Observed		

POWER BRANCH

Bolyvong Tanovan, Chief

COLUMBIA RIVER TREATY

Annual Hydropower

Operational Planning:

- Assured Operating Plan
- Downstream Power Benefits
- Detailed Operating Plan
- Annual Report
- Principles & Procedures

- HYDROPOWER IMPACT STUDIES (Flood Control, Fish Operations)

- SUPPORT TO OTHERS (RCC, HEB, HDC-HAC, DISTRICTS)

- REGIONAL POWER PLANNING (NPPC, PNUCC)

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PACIFIC NW COORDINATION

Annual Power Planning

Rights & Obligations

- Data Submittal
- Actual Energy Regulation
- Refill Studies
- Headwater Payments

WATER MANAGEMENT TREND

- Changes in Traditional Operating Priorities: Flood Control, Firm Power, Fish.
- Eroding Firm Energy Generation (aMW):
1984 Water Budget & Spill (350); 1992 Strategy for Salmon (50); 1994 F&W Program (525); 1995 Biological Opinion (325); 1998 Biological Opinion (317). Total: 1,567 (13% of System' Firm of 2,000).
- New Fish Requirements
Flow Augmentation: more VOL and for Longer
Spill for-fish-passage: Higher % and Longer
- More Players (more Dynamic Tension)

CHALLENGES

- Regulating increasingly constrained system to meet multiple competing uses
- Implementing Water Management reorganization and ongoing work
- Conducting Columbia River Treaty 2014/2024 Review
- Training/maintaining highly competent staff
- Maintaining close partnership with Bonneville Power Administration, Federal and State agencies, and stakeholders
- More fish listings (new Biological Opinions)

Problems are complex:

- ❑ **Solutions Uncertain**
- ❑ **Consensus Elusive**
- ❑ **Increasing Number of Players**
- ❑ **Direct Challenge to Existing Authorities**
- ❑ **Tighter Controls on Operations**
- ❑ **Less Flexibility to meet All Purposes**



Questions?