

# Who, What, Where, and Why?

(as well as other reflections on forecasting)

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March 12, 2009 Workshop



# Water Supply Forecasts

Location	Water Supply Forecast Source	Forecast Period(s)
Mica	BC Hydro	Feb-Jul, Apr-Aug, May-Jul
Arrow	BC Hydro	Feb-Jul
Duncan	BC Hydro	Feb-Jul, Apr-Aug, May-Jul
Libby	U.S. Army Corps of Engineers	Jan-Jul, Apr-Aug, May-Jul
Dworshak	U.S. Army Corps of Engineers	Jan-Jul, Apr-Jul, May-Jul
Brownlee	NWRFC/NRCS	Jan-Jul, Apr-Jul
Hungry Horse	Bureau of Reclamation	Jan-Jul, Apr-Aug, May-Jul, May-Sep
Grand Coulee	NWRFC/NRCS	Jan-Jul
Lower Granite	NWRFC/NRCS	Jan-Jul, Apr-Jul
The Dalles	NWRFC/NRCS	Jan-Jul, Apr-Aug

# Water Supply Forecasts Used to Implement BiOp Actions

**Table 3. Water Supply Forecasts Used to Implement BiOp Actions**

<b>Forecast Point</b>	<b>Forecast period</b>	<b>Forecast</b>	<b>BiOp actions determined</b>
Hungry Horse	April – August	January, February, and March Final provided by Reclamation	Columbia Falls and Hungry Horse minimum flows
The Dalles	April – August	April Final July Final Provided by NWRFC	Spring flow objective at McNary Dam Summer draft elevation for Grand Coulee (August 31 elevation of 1280 feet or 1278 feet) Juvenile Fish Transport operations at McNary Libby Summer Draft Limit Hungry Horse Summer Draft Limit
Lower Granite	April – July	April Final Provided by NWRFC	Spring flow objective at Lower Granite Juvenile Fish Transport operations at Lower Snake Projects
Lower Granite	April – July	June Final Provided by NWRFC	Summer flow objective at Lower Granite
The Dalles	April – August	July Final Provided by NWRFC	Grand Coulee summer draft limit
Libby	April – August	May Final Provided by CORPS	Volume of water to provide for sturgeon and minimum bull trout flows to begin generally May 15
Libby	April – August	April, May, June Final Libby Forecast provided by Corps,	VARQ Refill Flows
Hungry Horse	May – September	April, May, June Final Forecast provided by Reclamation	VARQ Refill Flows

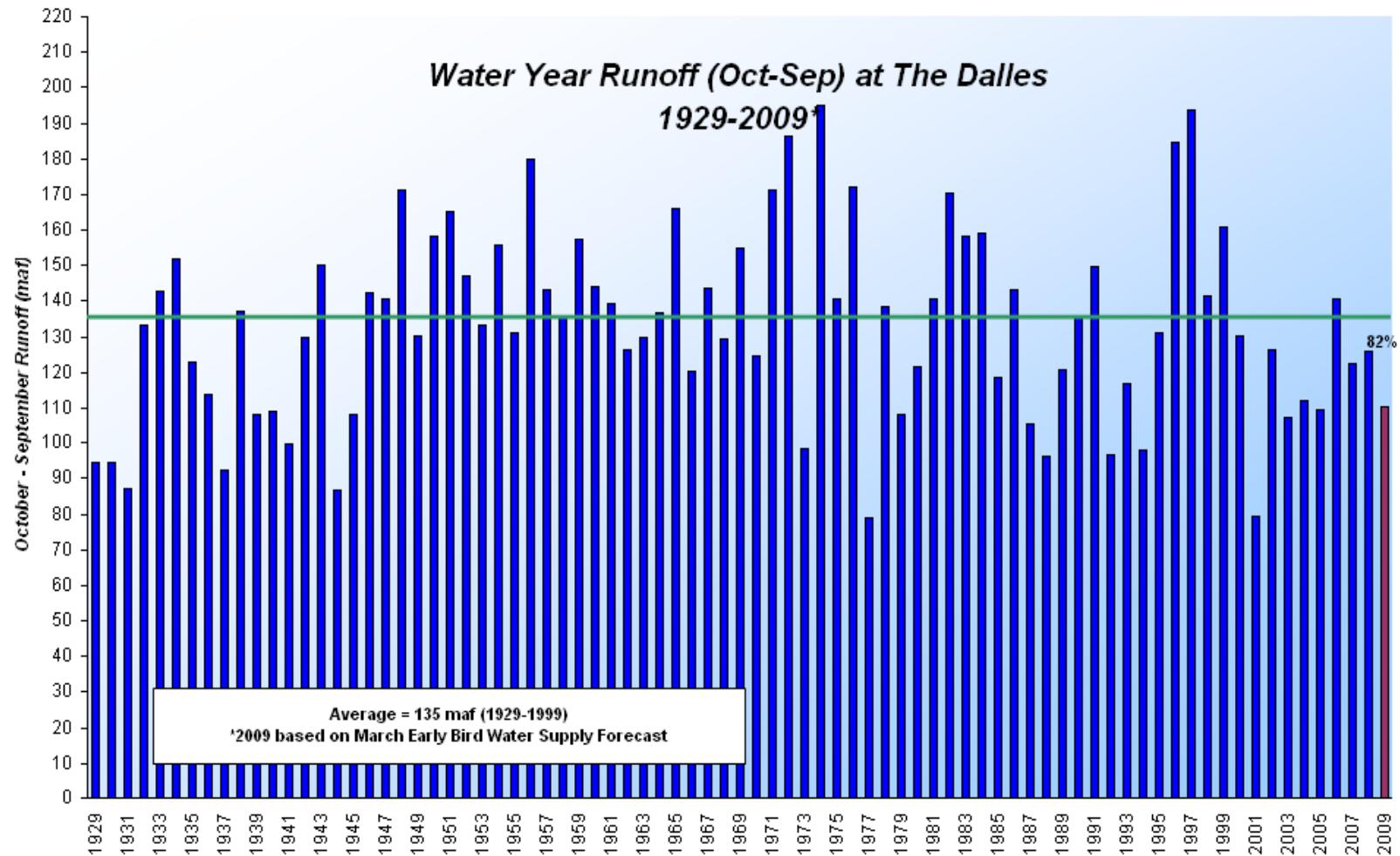
# What are the forecasts used for?

- Date – July: Calculate Treaty projects power draft rights (Variable Energy Content Curves or VECCs)
- April – Aug (Jul): Flood Control (Upper Rule Curves)  
Determine Refill Curves  
Bi-Op, Fish operations
- May – Jul (Sep): Refill Curve (HGH)
- March Final Forecast Operate storage reservoirs (Dworshak, Hungry Horse, Libby, and Grand Coulee) to achieve the April 10<sup>th</sup> objective with a high probability.

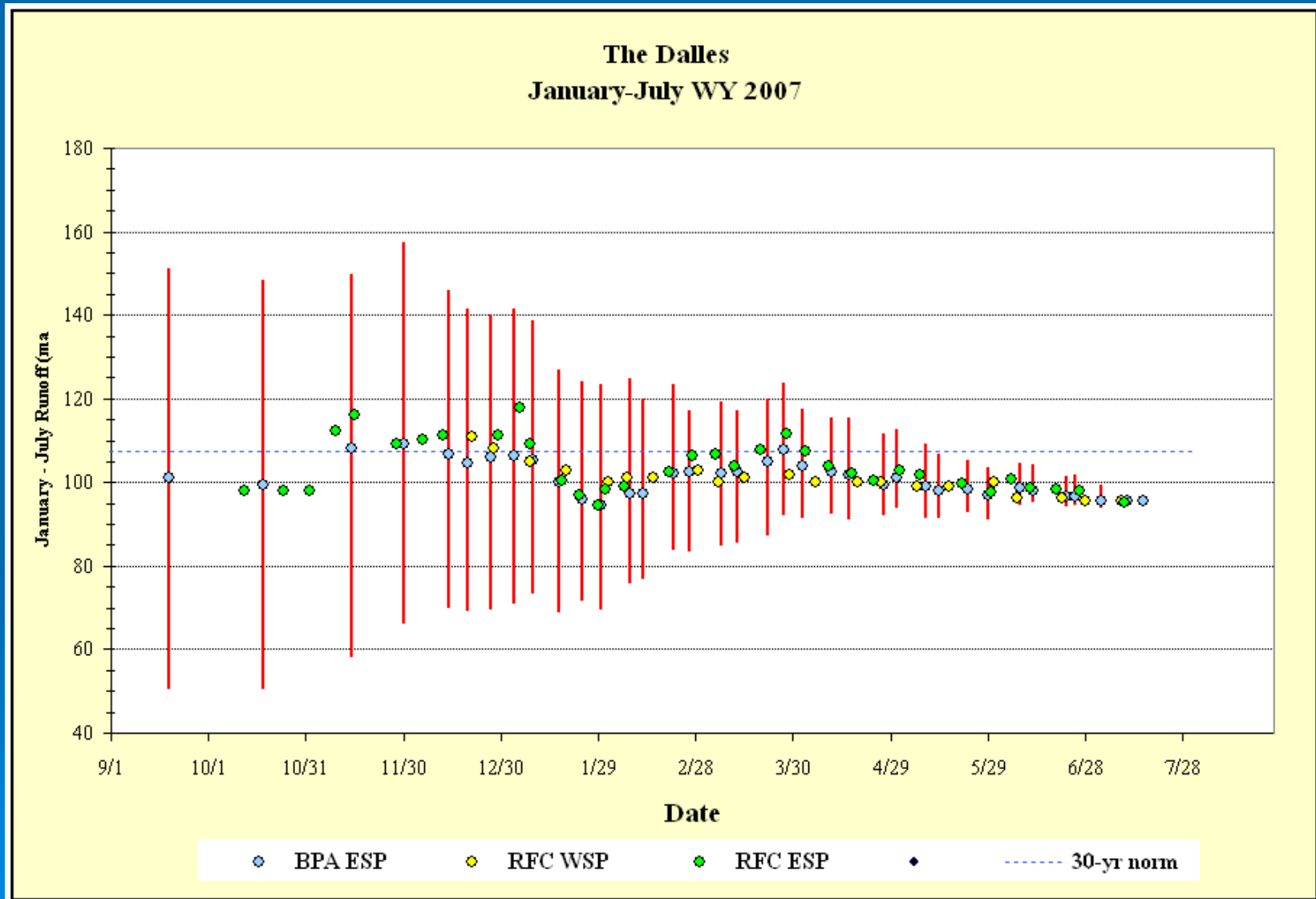
So why are we here today and why the  
Columbia River Forecast Group?



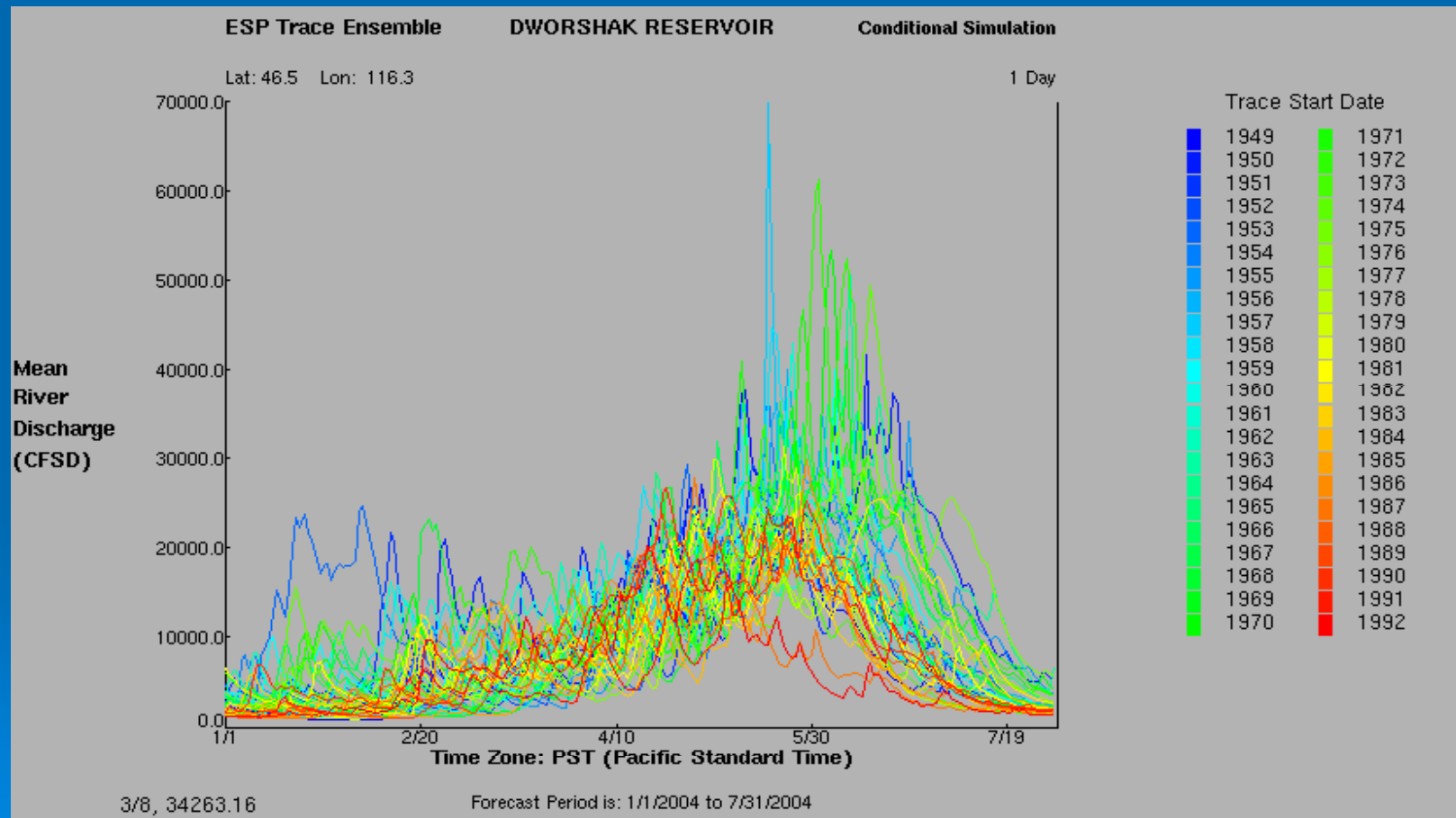
# Volumes: Large range of variability...



# More frequent updates don't always give you a better answer...

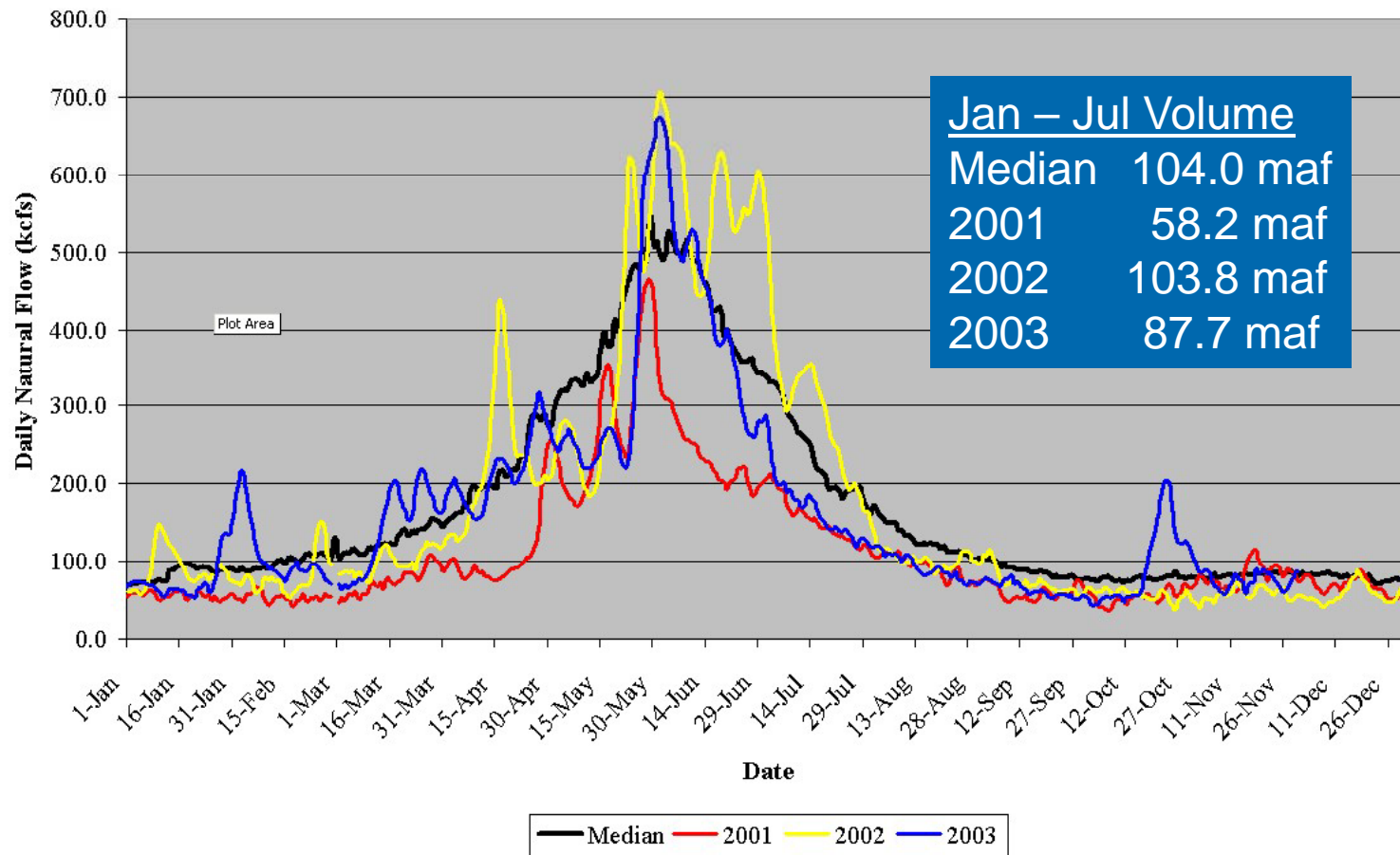


# System Operations: Streamflows

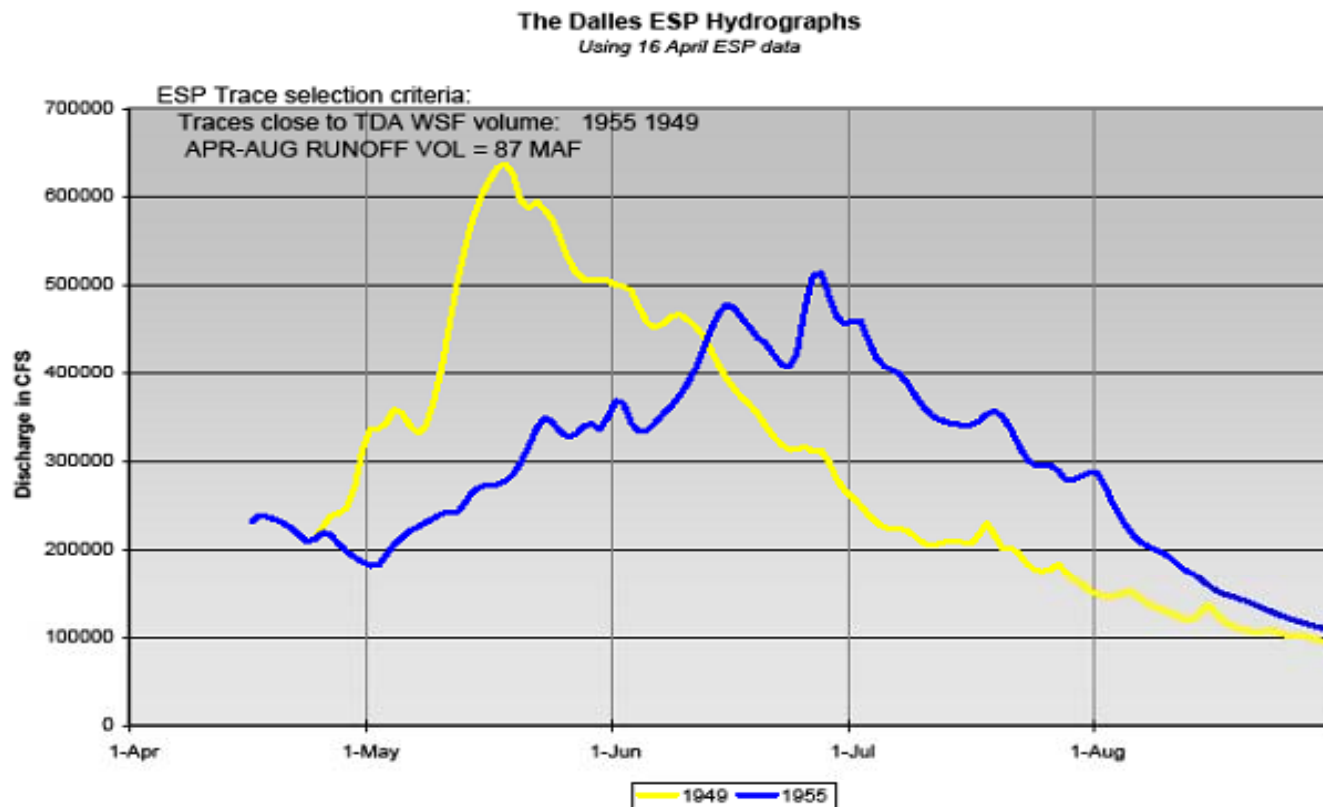


# Shape is very critical...

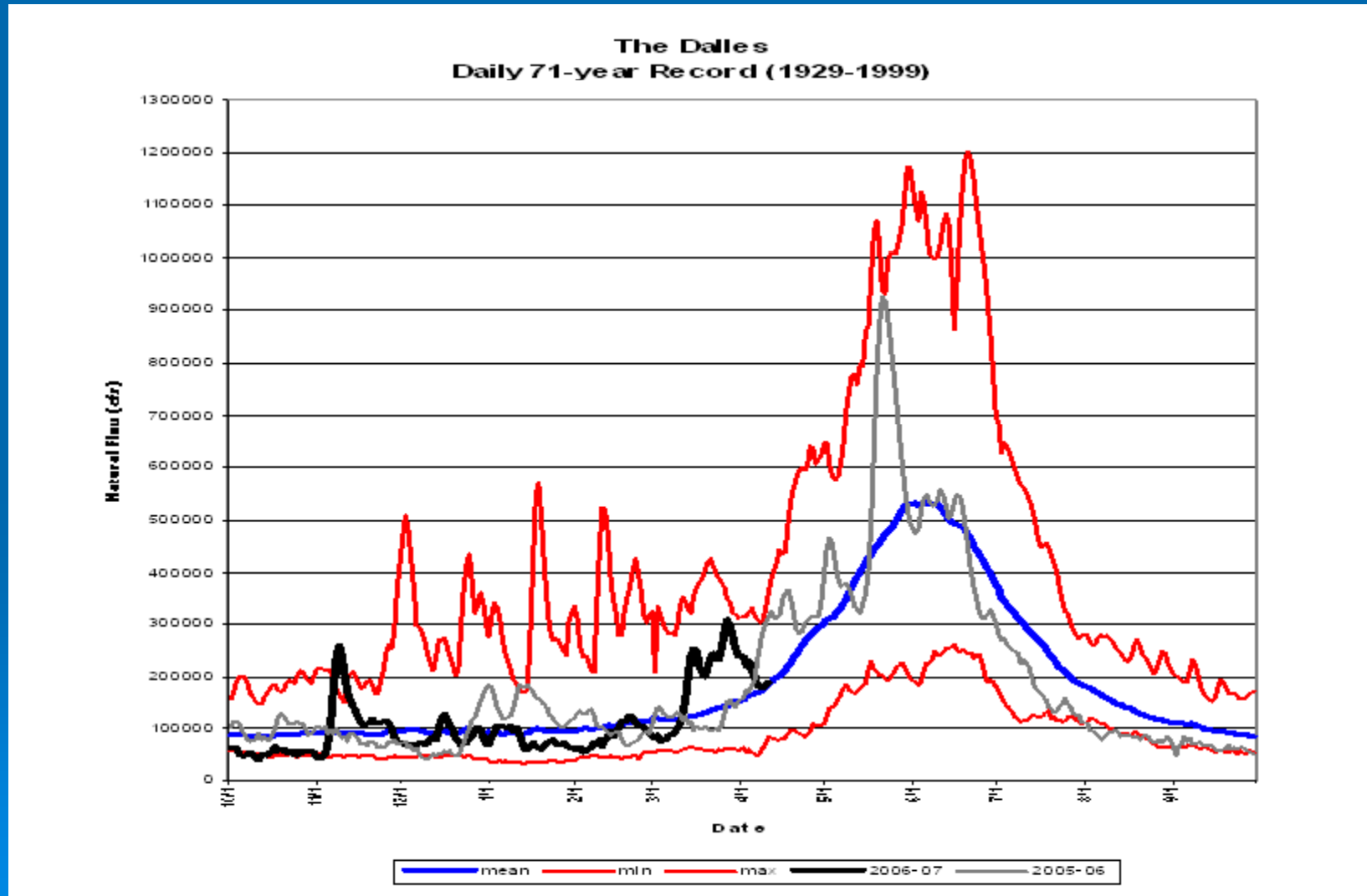
Natural Flow at The Dalles



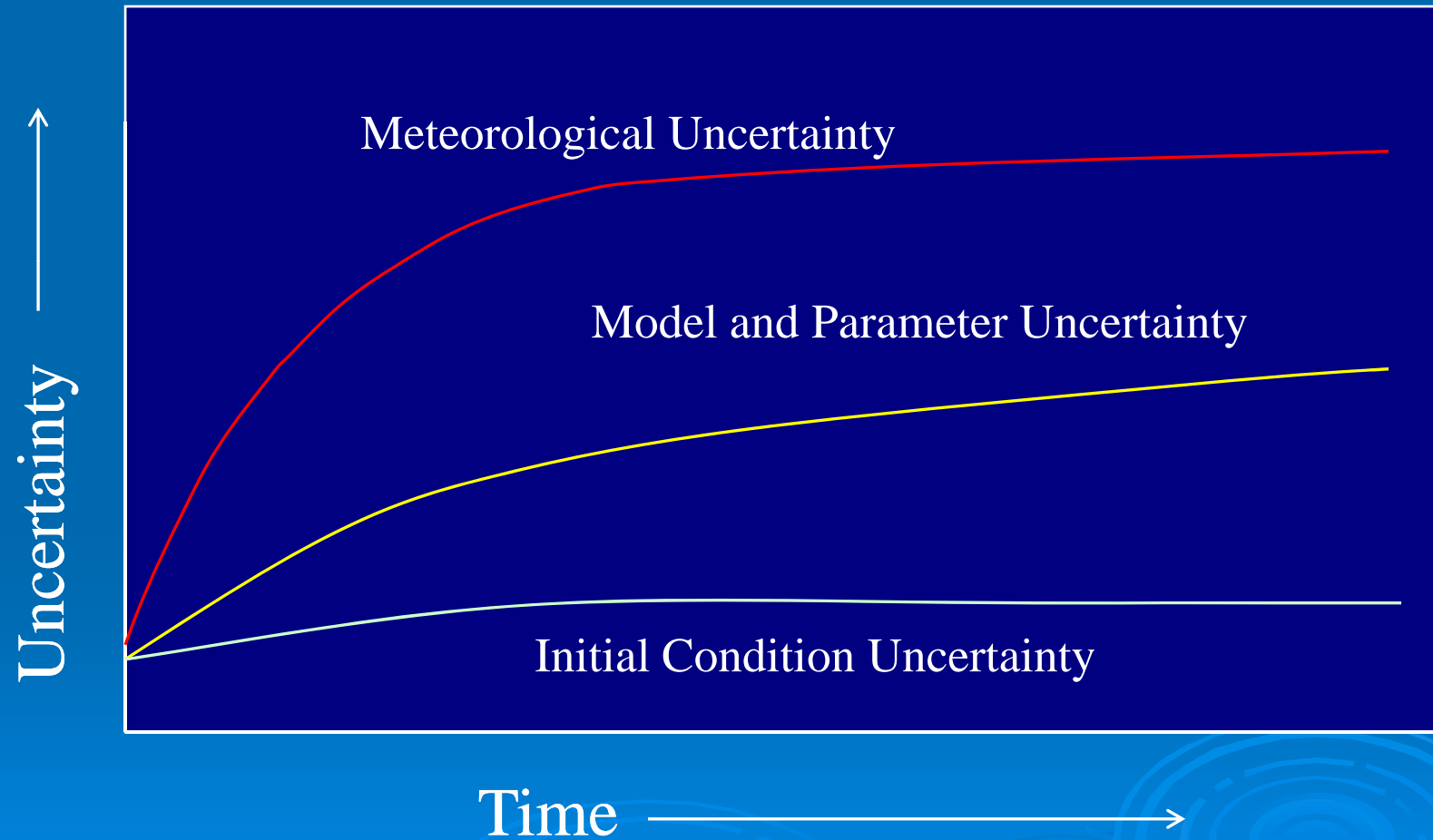
# Similar volume, different shape...



# Large range of variability...



# Uncertainty in Hydrologic Forecasts



# Timeline of System Operational Requirements

