WASHINGTON STATE
Department of Ecology

COLUMBIA RIVER PROGRAM

2011 WATER SUPPLY & DEMAND FORECAST

PAG Meeting

July 9, 2009

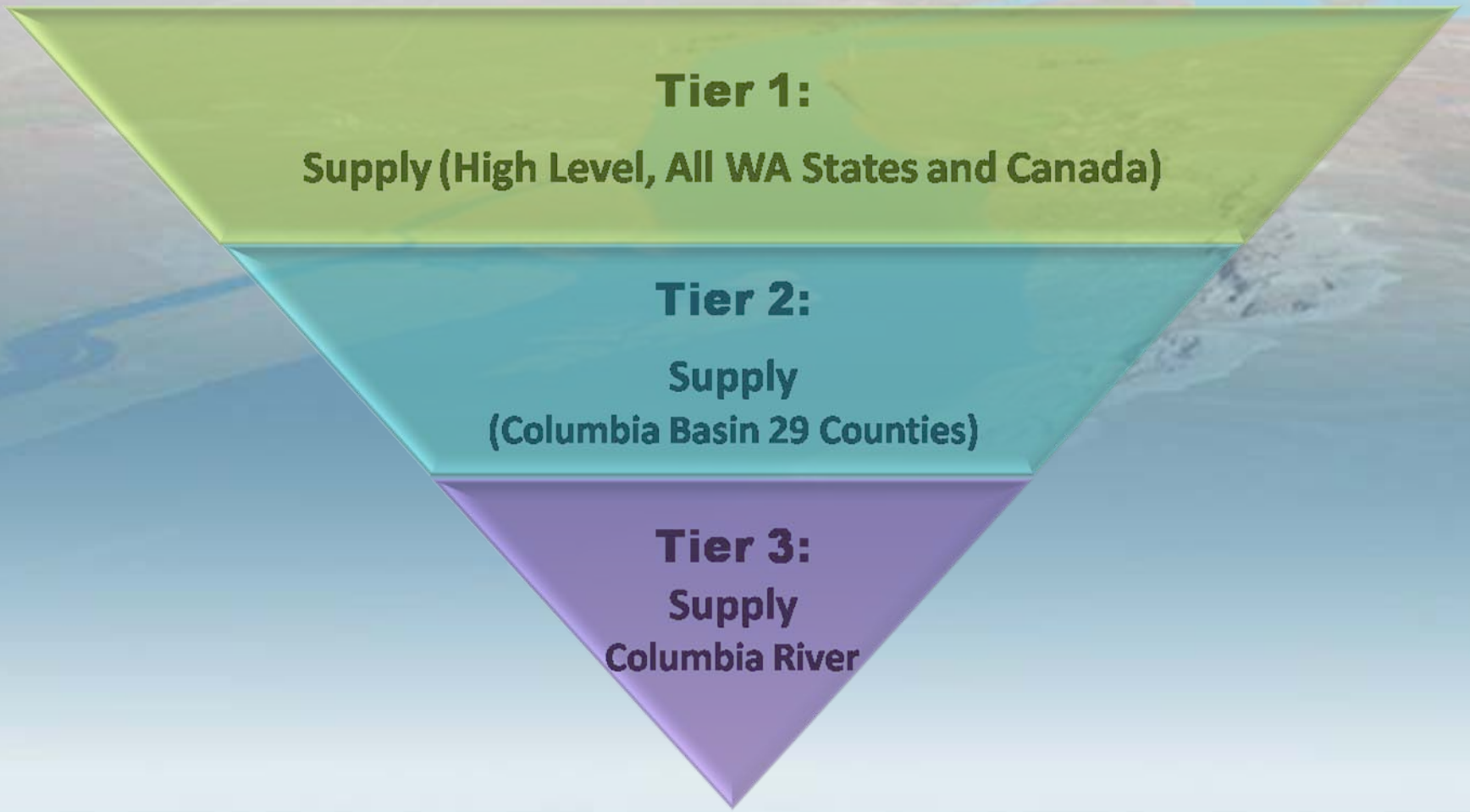
Presentation Summary

- Background
- 2011 Supply
  - Legal / Regulatory / Treaty Issues
  - Availability, Drought Susceptibility
  - Tributary vs. Columbia River
  - Climate Change
- 2011 Demand
  - Ag Demand
  - Municipal / Industrial Demand
  - Power Demand
  - Instream Flow Demand
  - Demand Exerted By Climate Change

Background

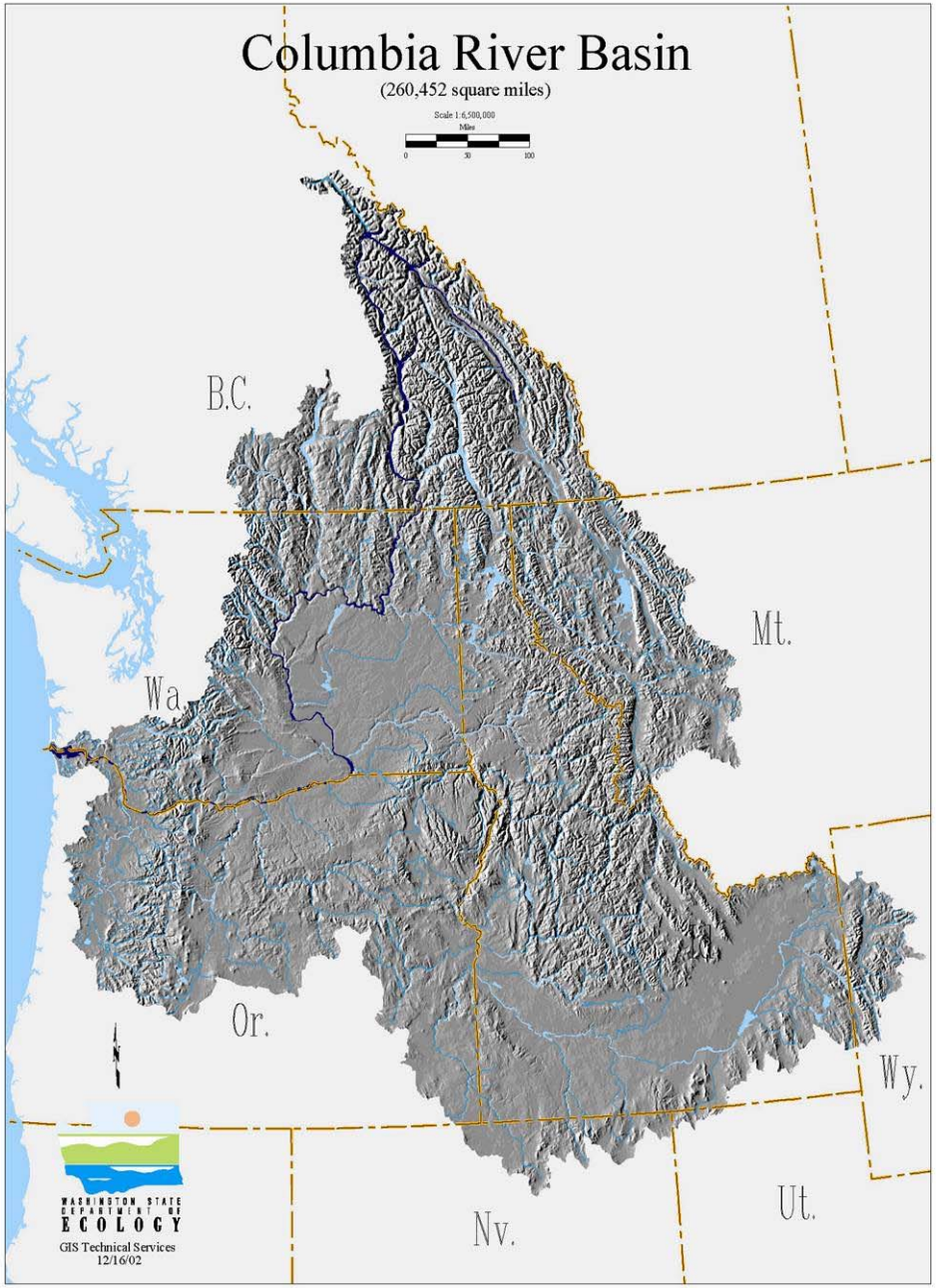
- **RCW 90.90.040(1):** "To support the development of new water supplies in the Columbia river and to protect instream flow, the department of ecology shall work with all interested parties, including interested county legislative authorities and watershed planning groups, adjacent to the Columbia river, and affected tribal governments, to develop a Columbia river water supply inventory and a long-term water supply and demand forecast."
- **RCW 90.90.040(3):** "The department of ecology shall complete the first Columbia river long-term water supply and demand forecast by November 15, 2006, and shall update the report every five years thereafter".
- **Planning Horizon = Rolling 20 year period (2025, 2030, 2035 . . .)**
- **Repeatable, transparent planning process**
- **From range of demand scenarios, select water supply development goal.**
- **Fund projects to meet that goal.**
- **Review goal every 5 years.**

Three Tier Approach - SUPPLY



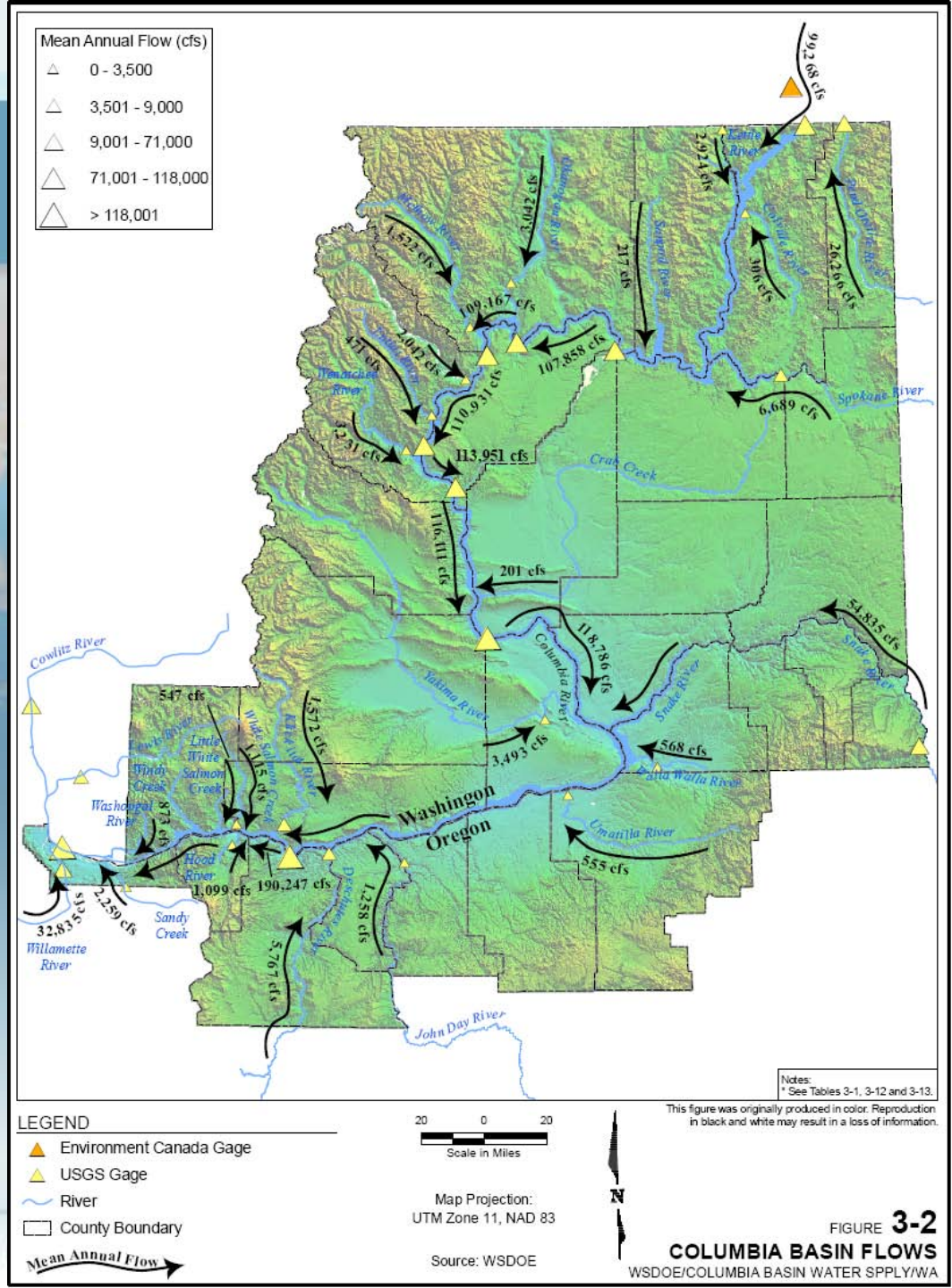
Tier 1 Example

- Develop Survey
- Pre-Contact by WA
- Summarize results



Tier 2 Example

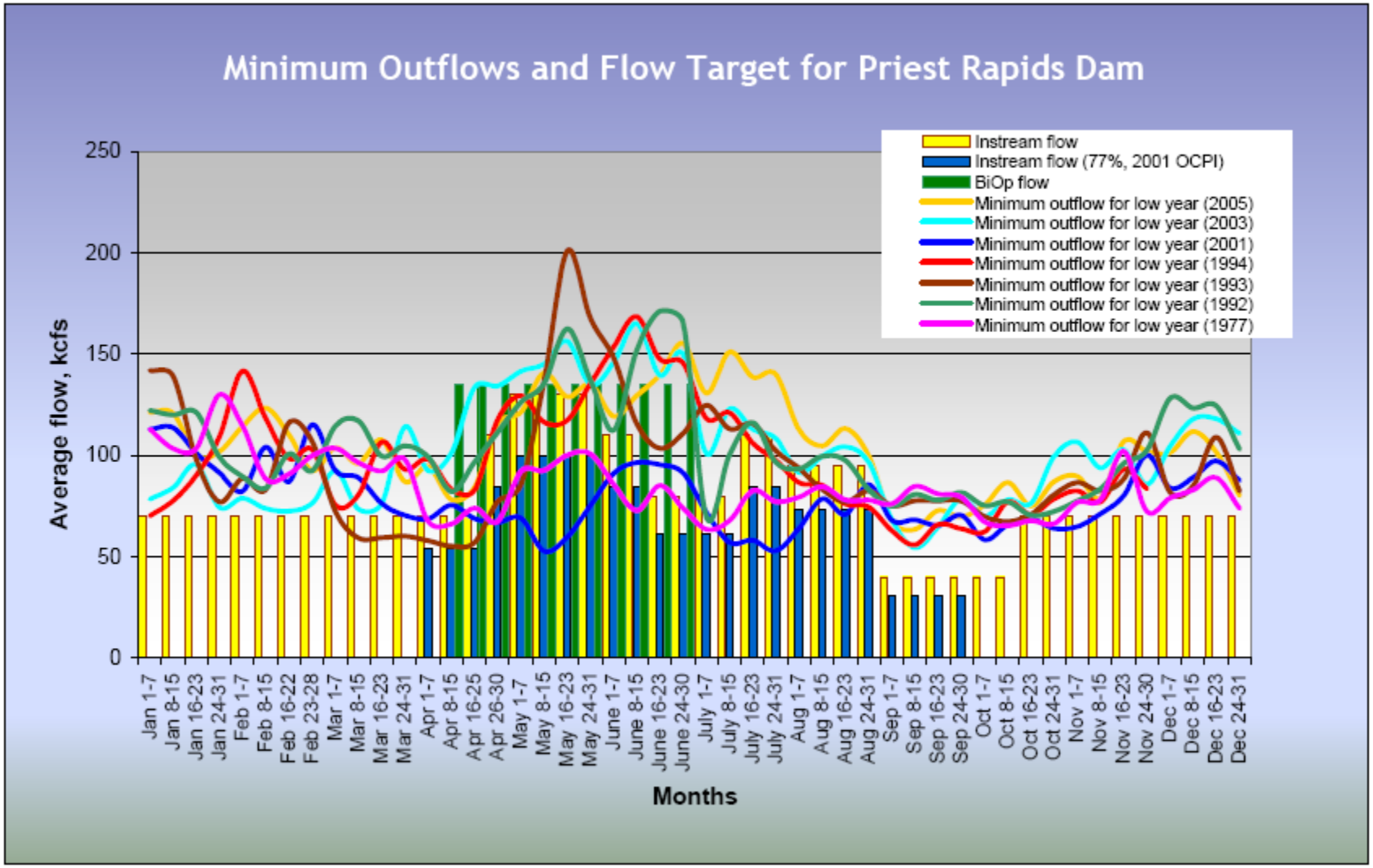
- **Water Budget (2006)**
- **Variability**
  - Historic
  - Future
  - Drought Risk
- **Climate Change**
  - Yakima Basin
  - Walla Walla Basin
  - Wenatchee Basin
  - Okanogan Basin



Tier 2 Example -- Regulation

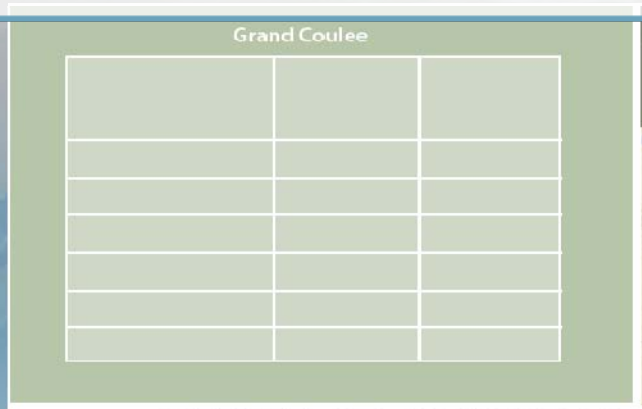
Code	WRIA	River Basin	Established	Amended	Closure	Control stations	Characterist.of closure	Closure period	High flow diversion period
173-532 WAC	32	Walla Walla	12/14/1977	8/2/2007	Yes	Mill Creek at Kooskooskie	Seasonal	June 1—November 30	Dec 1—May 31
					Yes	Walla Walla River at Detour Rd	Seasonal	June 1—November 30	Dec 1—May 31
					Yes	N. Fork Touchet above Dayton	Seasonal	May 1—November 30	Dec 1—Apr 30
					Yes	Touchet River at Bolles	Seasonal	May 1—November 30	Dec 1—Apr 30
173-545 WAC	45	Wenatchee	6/3/1983	12/11/2007	No	Wenatchee River at Plain			Jan 1—Aug 31; Nov 1—Dec 31
					No	Icicle Creek near Leavenworth			Jan 1—Aug 14; Nov 1—Dec 31
					No	Wenatchee River at Peshastin			Jan 1—Aug 31; Nov 1—Dec 31
					No	Wenatchee River at Monitor			Jan 1—Sep 14; Nov 1—Dec 31
					No	Mission Creek near Cashmere			Jan 1—Jun 30; Aug 15—30; Nov 1—Dec 31
					No	Chiwawa River near Plain			Jan 1—Feb 14; March 15—Aug 14; Nov 1—Dec 31
					No	Nason Creek near Mouth			Jan 1—Aug 31; Nov 1—Dec 31
					No	Peshastin Creek at Green Bridge Rd			Jan 1—July 31; Nov 1—Dec 31
					Yes	Chumstick Creek at North Rd	Permanent	Until the Department adopts a rule establishing instream flows or determines that instream flows or a closure are not required.	
173-546 WAC	46	Entiat	8/3/2005		No	Lower Entiat River near Entiat			May 1—July 15
					No	Upper Entiat River near Ardenvoir			No surface water available above the instream flows
					No	Mad River at Ardenvoir			Apr 16—June 30
173-548 WAC	48	Methow	12/28/1976		No	Methow River near Pateros			Year-round
					No	Methow River near Twisp			Year-round
					No	Methow River near Winthrop			Year-round
					No	Methow River at Little Boulder Creek			Year-round
					No	Early Winters Creek near Mazama			Year-round
					No	Chewack River near Boulder Creek			Year-round
					No	Twisp River near Twisp			Year-round
					Yes	Certain streams and lakes	Permanent	Year-round	
173-549 WAC	49	Okanogan	7/14/1976		No	Okanogan River at Malott			
					No	Okanogan River near Tonasket			
					No	Similkameen River at Nighthawk			
					Yes	All perennial streams except above	Seasonal	May 1—Oct 1	
							Seasonal (with exception		

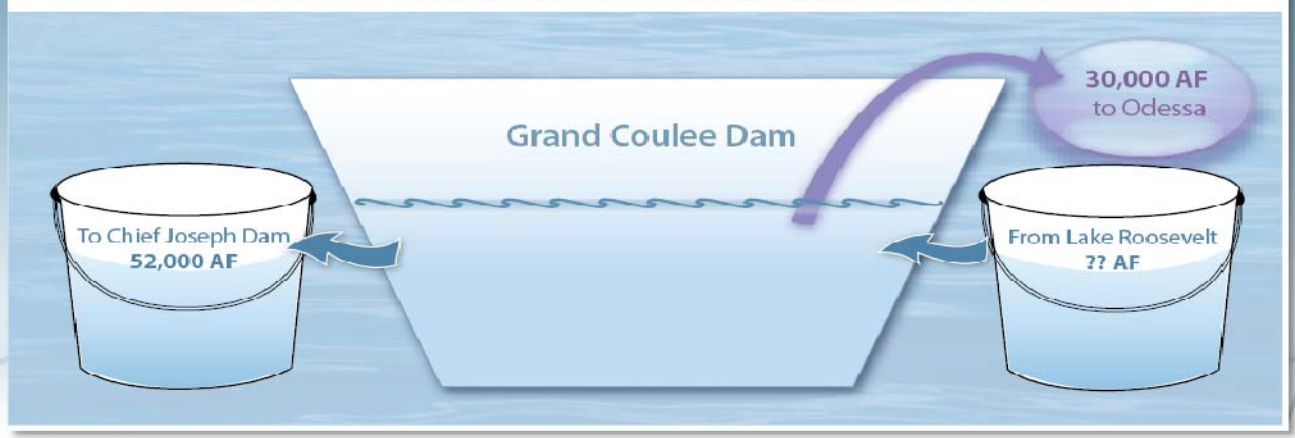
Tier 3 Example – Flow Variability



Supply Side - Columbia Mainstem (Tier 3)

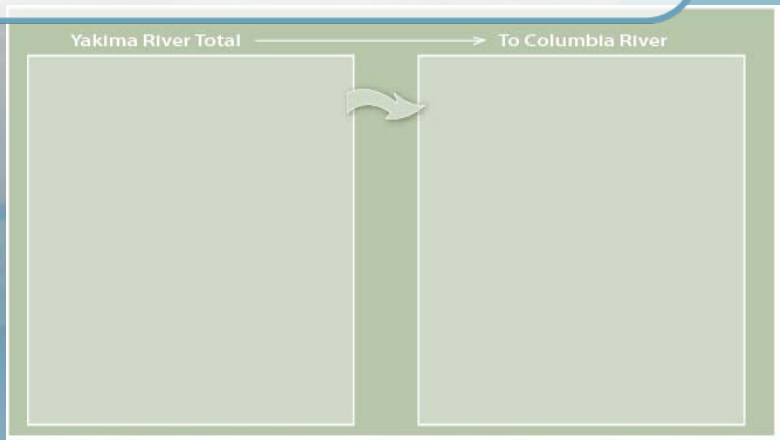
- **Water Budget**
- **OCR vs. non-OCR Supplies**
- **Columbia River Webmap**

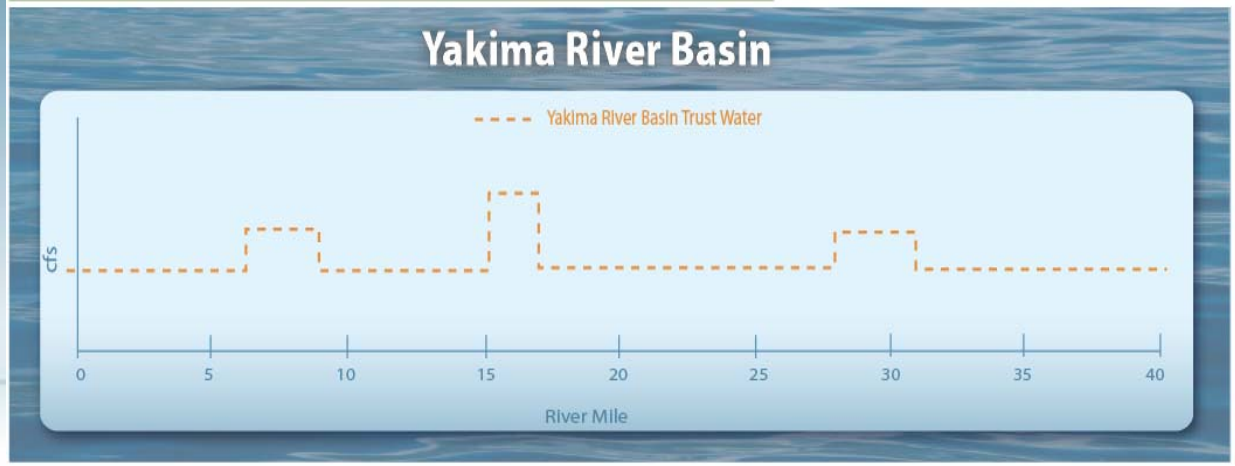




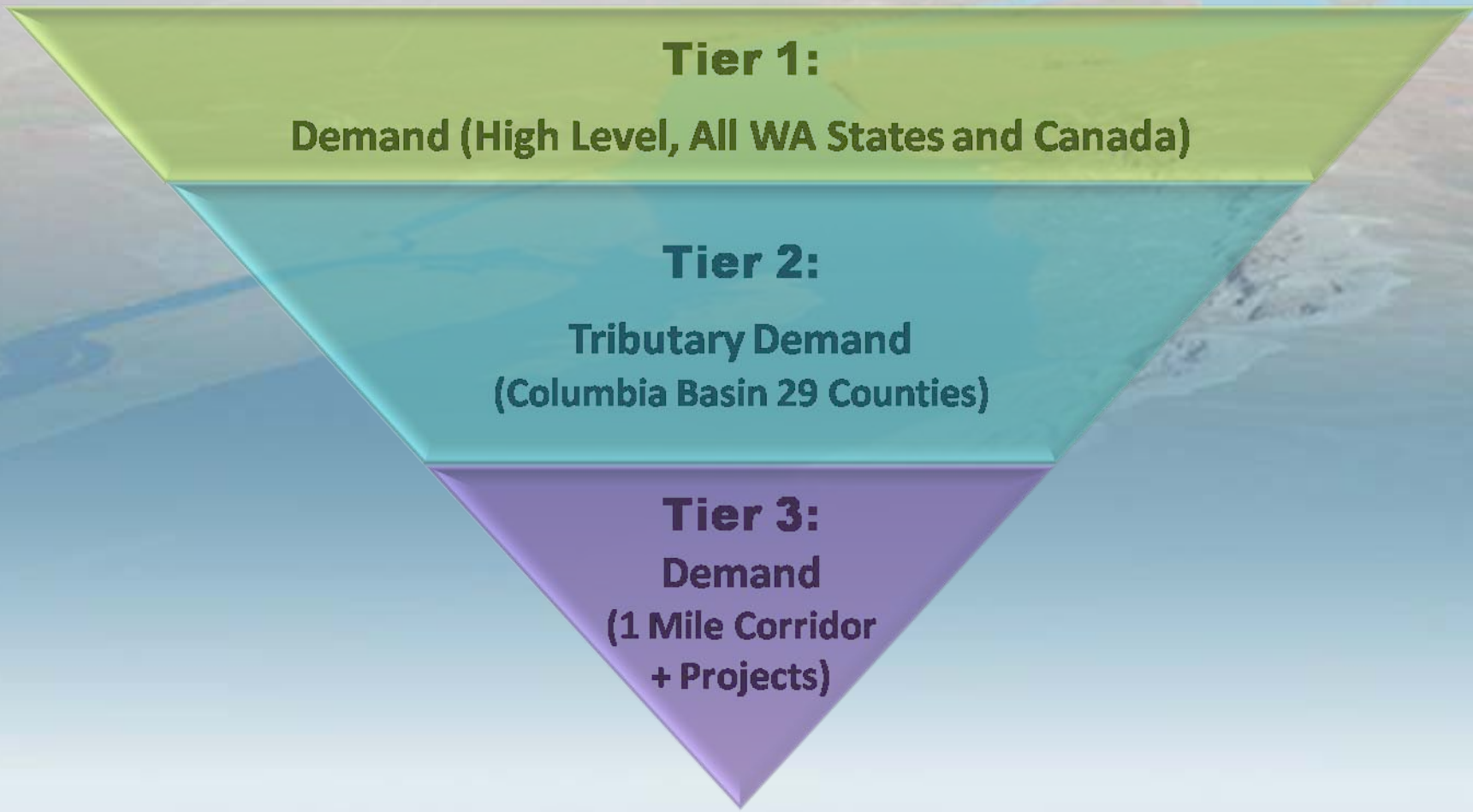
Supply Side –Tributaries (Tier 2)

- Water Budget
- OCR vs. non-OCR Supplies
- Columbia River Webmap





Three Tier Approach - DEMAND



Demand Side - AGRICULTURE

- Couple CropSyst to VIC to model crop demand
- Input Categories
  - Crops (≈15 crops)
  - Climate Change (≈2 scenarios; A1B and B1)
  - Quantity of Water (≈3 supply options; 100,000 to 1,000,000)
  - Value of Water (≈3 cost recovery options; "free", $25/ac-ft/year and $200 / ac-ft / year)
  - Trade Scenarios (≈3 competitiveness options)
  - Economic Growth (≈2 growth scenarios)
- Lower resolution initial spatial scale runs, followed by sensitivity analysis and additional higher resolution runs

Demand Side - AGRICULTURE

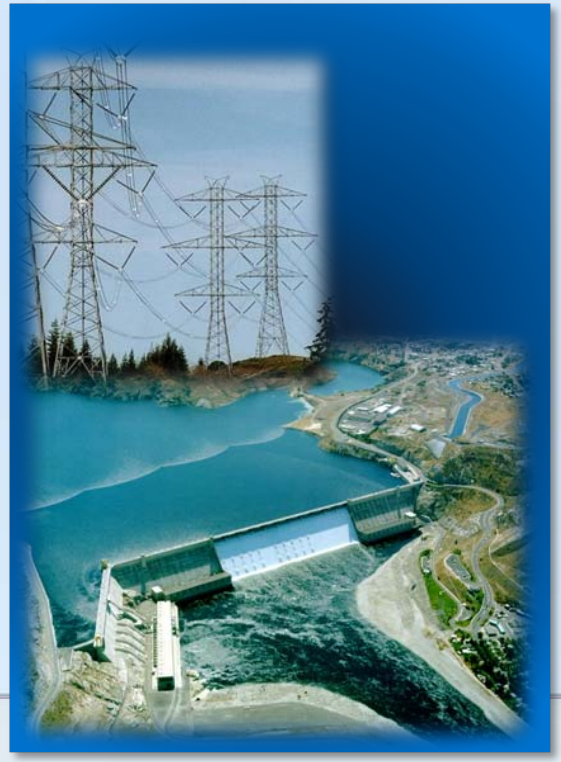
- WSU Lead
- Academic Peer Schools Review
- Quarterly external advisory group updates to coincide with PAG meetings

Demand Side - MUNICIPAL

- **Sources of Information on Muni Demand Through 2030**
  - OFM Projections
  - USGS Projections
  - Watershed Planning Projections
  - Water System Plan Projections
- **Effect of DOH Conservation Rule**
- **Incentives for Drought Conservation**
- **External Advisory Group**
  - Quarterly updates after PAG meetings

Demand Side - POWER

- **Sources of Information on Power Demand for Water Through 2030**
  - BPA, Corps
  - Northwest Power Planning Council
  - PUD's
- **I-937 (15% by 2020)**
- **Project Coordination**
- **External Advisory Group**

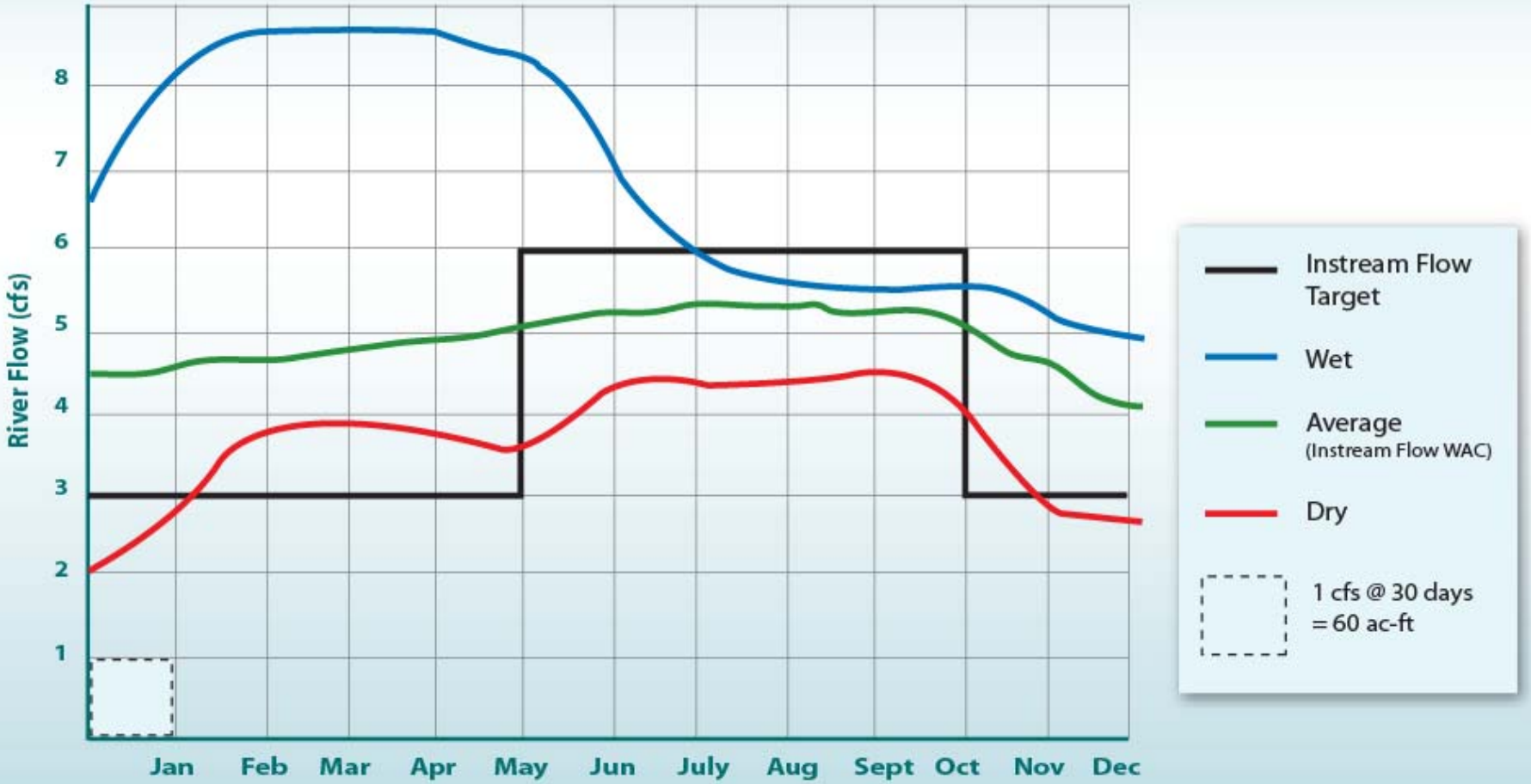


Demand Side – INSTREAM FLOW

- Tributary and Mainstem Availability and Variability
- Regulatory Environment
  - WAC (Instream Flow Rule)
  - BiOp (Columbia River Mainstem)
  - SOAC (Yakima Basin)
  - SWSL (Surface Water Source Limitation)
  - None of the Above
- Species of Concern / Interest
- Priority Stream Reaches
- Critical Life Stages
- External Advisory Group

Example Flow Variability Graphic

To be Completed for Tributaries and Columbia Mainstem



A Quantification of Instream Need

- When are flows not met?
- By How Much?
- In what type of water year?

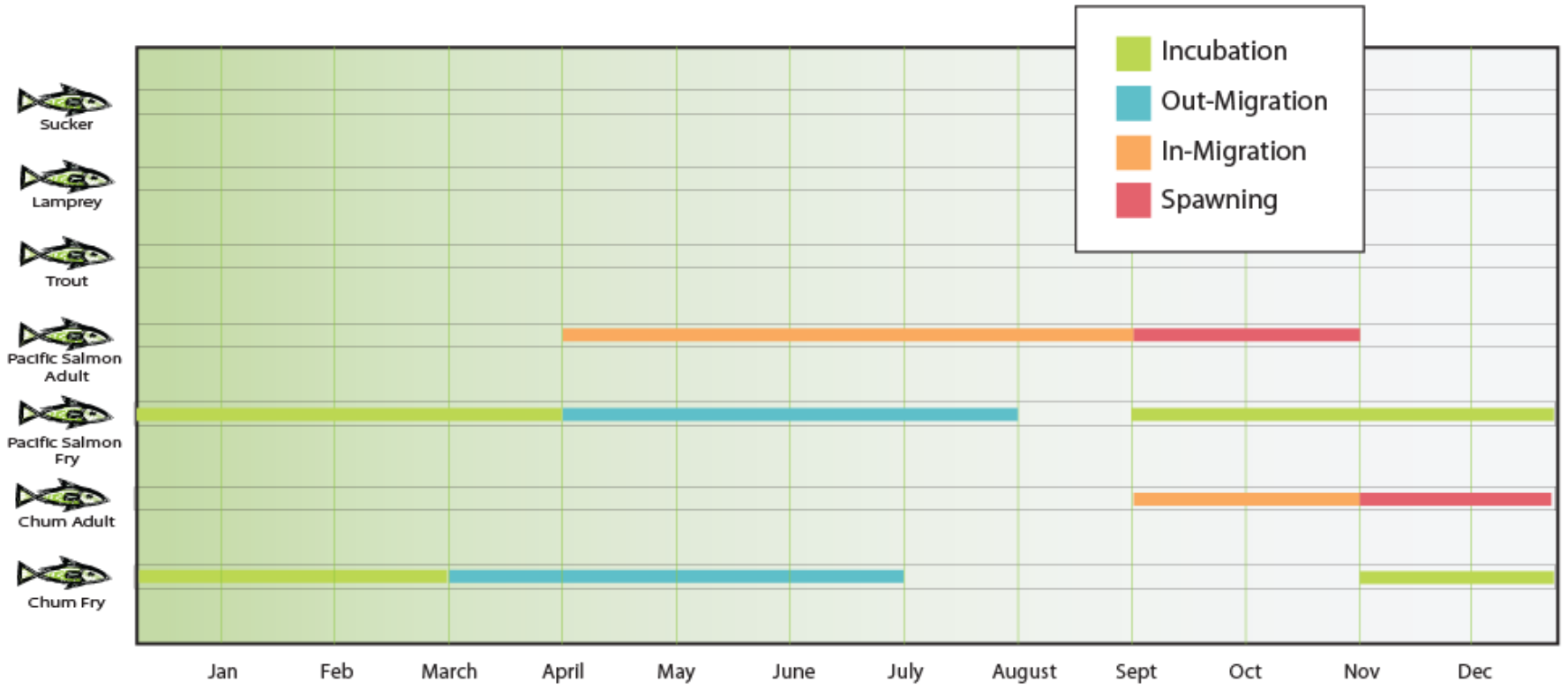
Instream Demand

Dry = 570 acre-feet

Avg = 300 acre-feet

Wet = 90 acre-feet

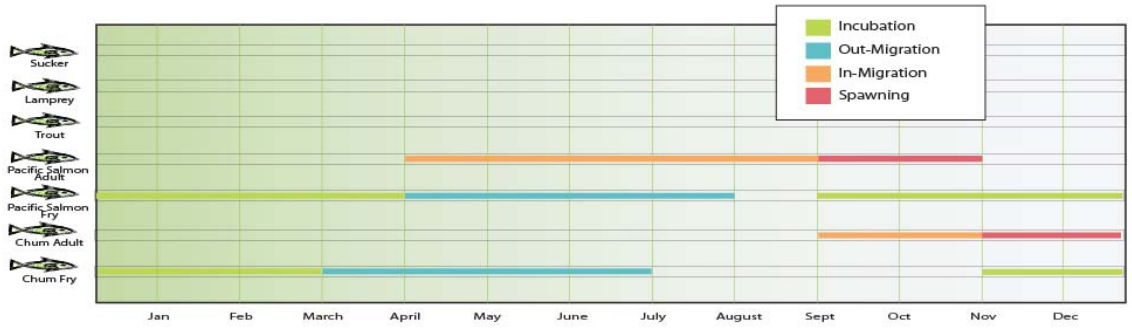
Species of Interest and Critical Life Stages

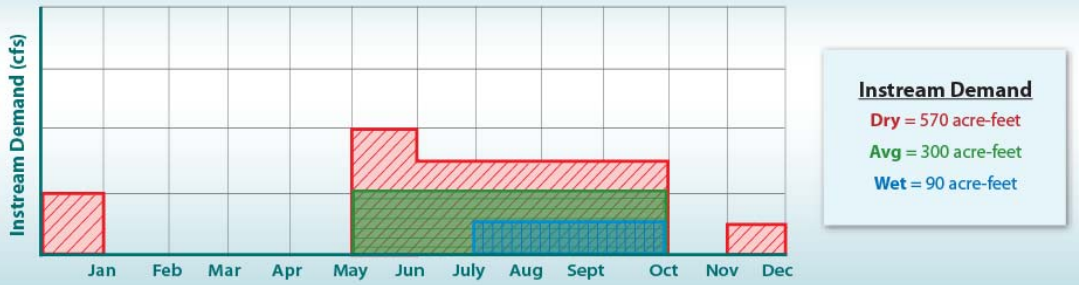


Integration

- Is a Project “Good”?
- When is Water (not) Available?
- At what “cost” to fish?
- At what “benefit” to fish?

Data | Drought Risk 1:26 | Instream Flow (WAC, SWSL, BiOp, Date)





To be Completed for Tributaries and Columbia Mainstem

2011 Goals

- Reasonable Range of Possibilities for the Future
- OCR will select target goal for water supply development
- OCR will identify areas where need for water supply projects is greatest
- Broad External Support on Process
- Broad External Support on Target
- Look again in 5 years