

Water Supply Forecast Correction Curves



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Columbia River Inter-Tribal Fish Commission

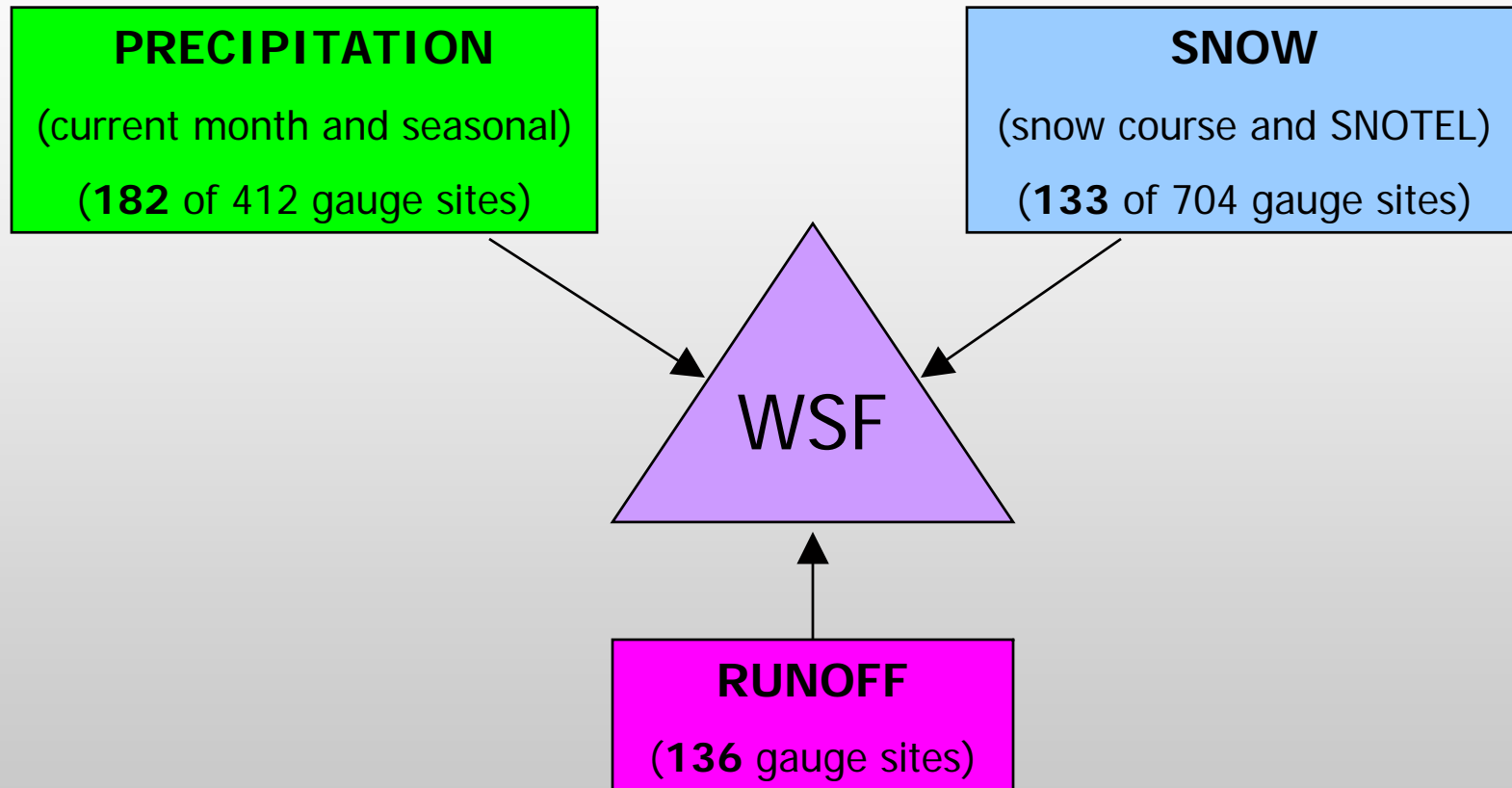
Portland, Oregon

Introduction



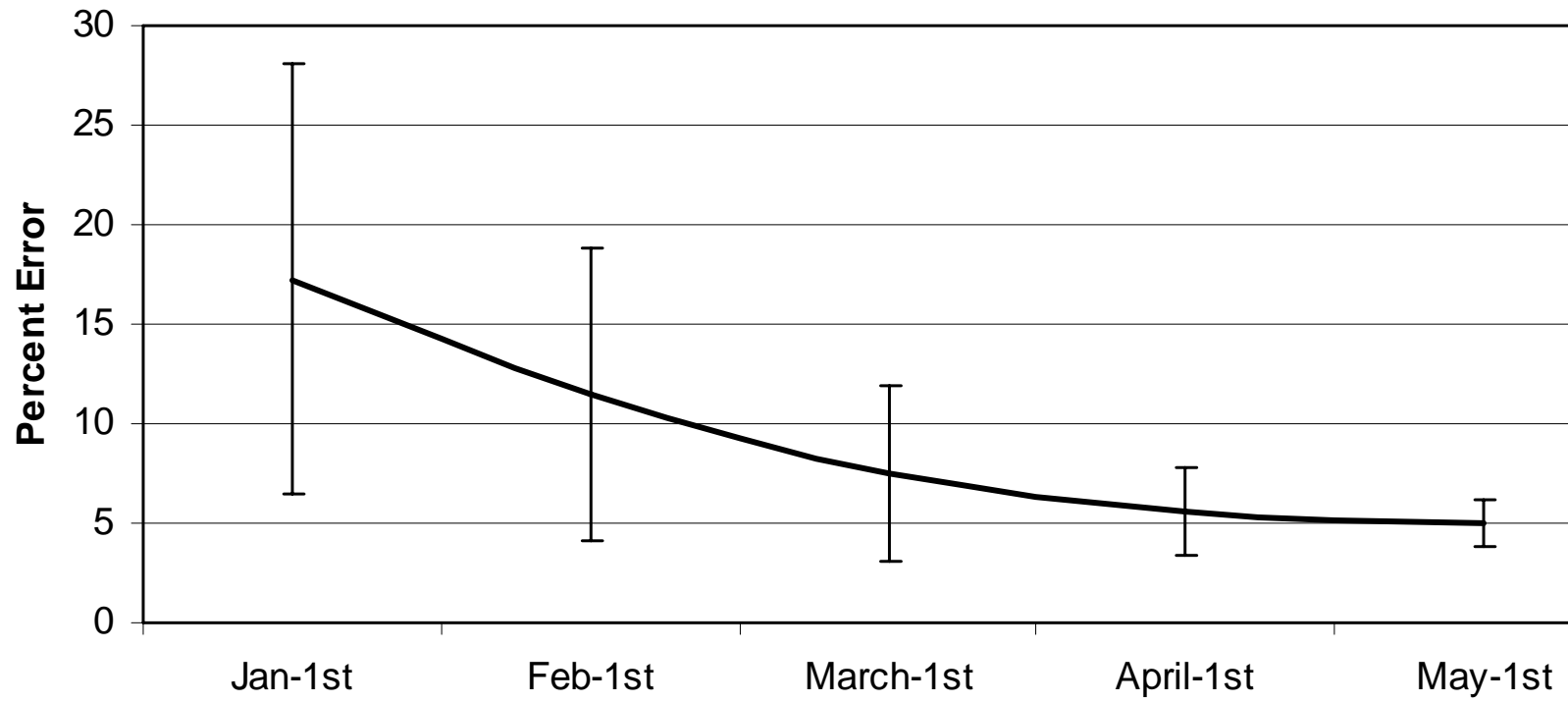
- Curves seek to add value to monthly Water Supply Forecasts (WSF) by projecting future seasonal trends.
- Historical WSFs and observed runoff data are used to compute the series of curves.
- Four volume-based water year classes are devised for each forecast location.

Water Supply Forecasting

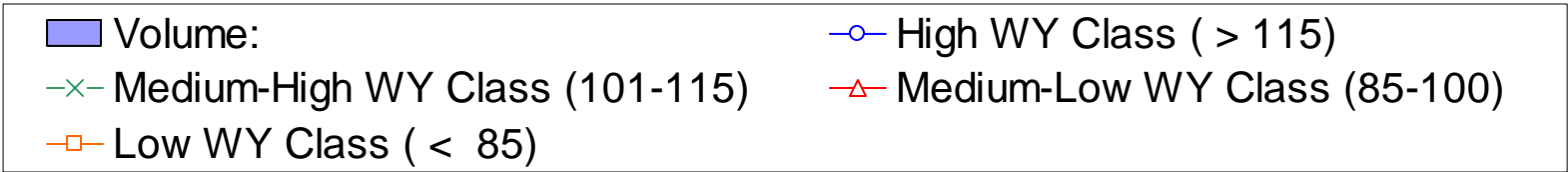
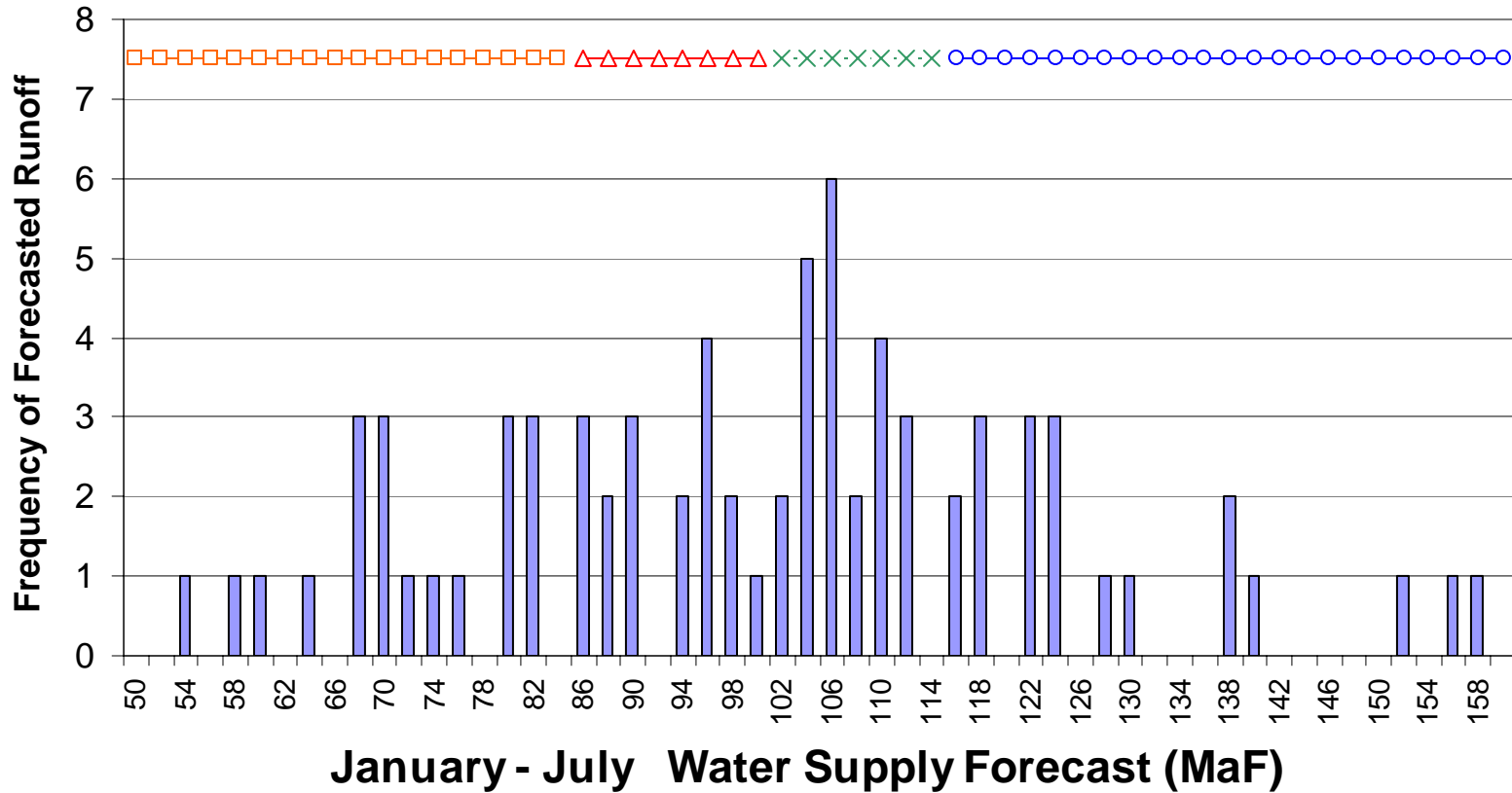


$$WSF = \{[(PRECIP+SNOW+RO)-a] * (b-c)\} + MA$$

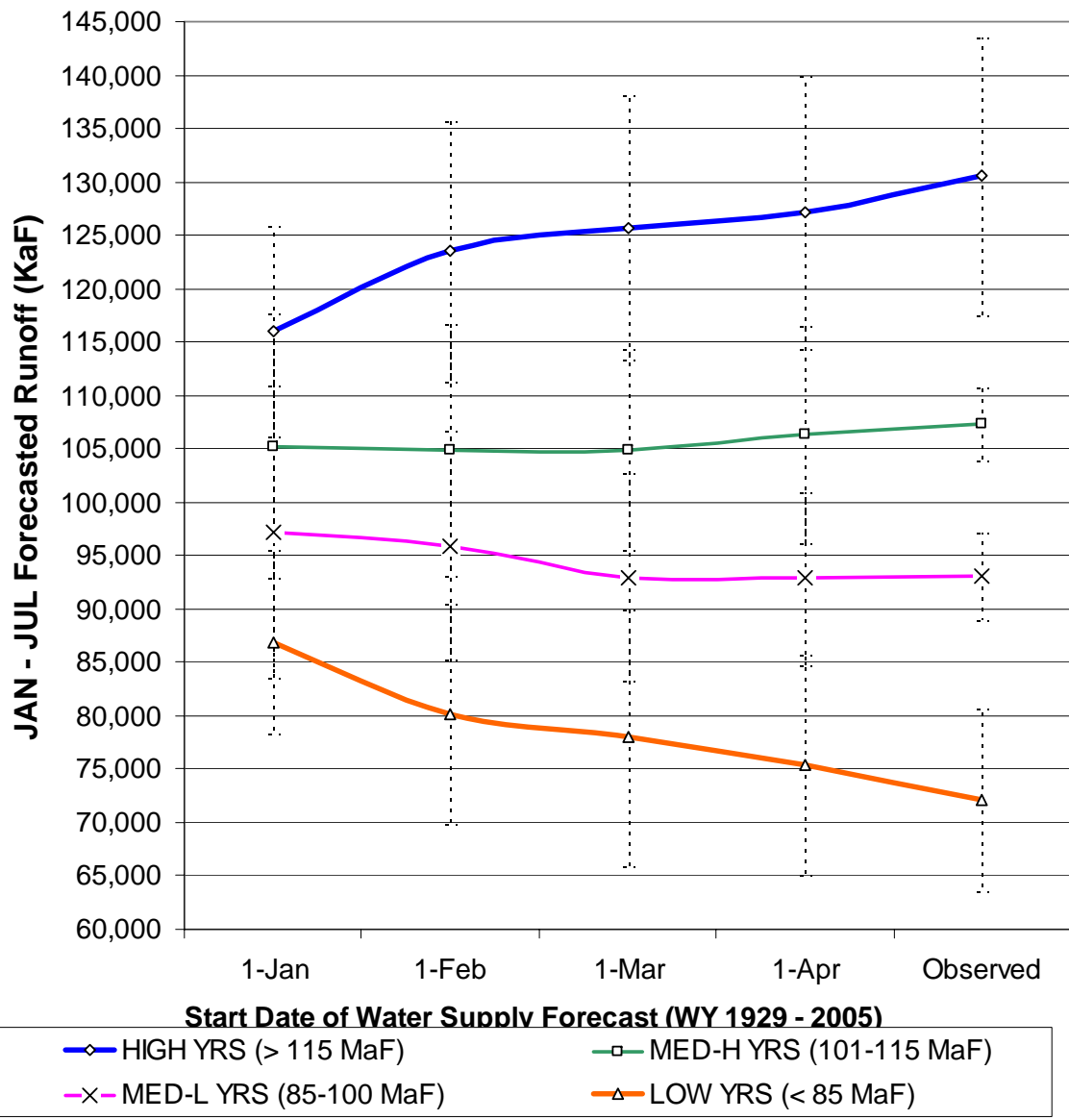
Water Supply Forecast Error



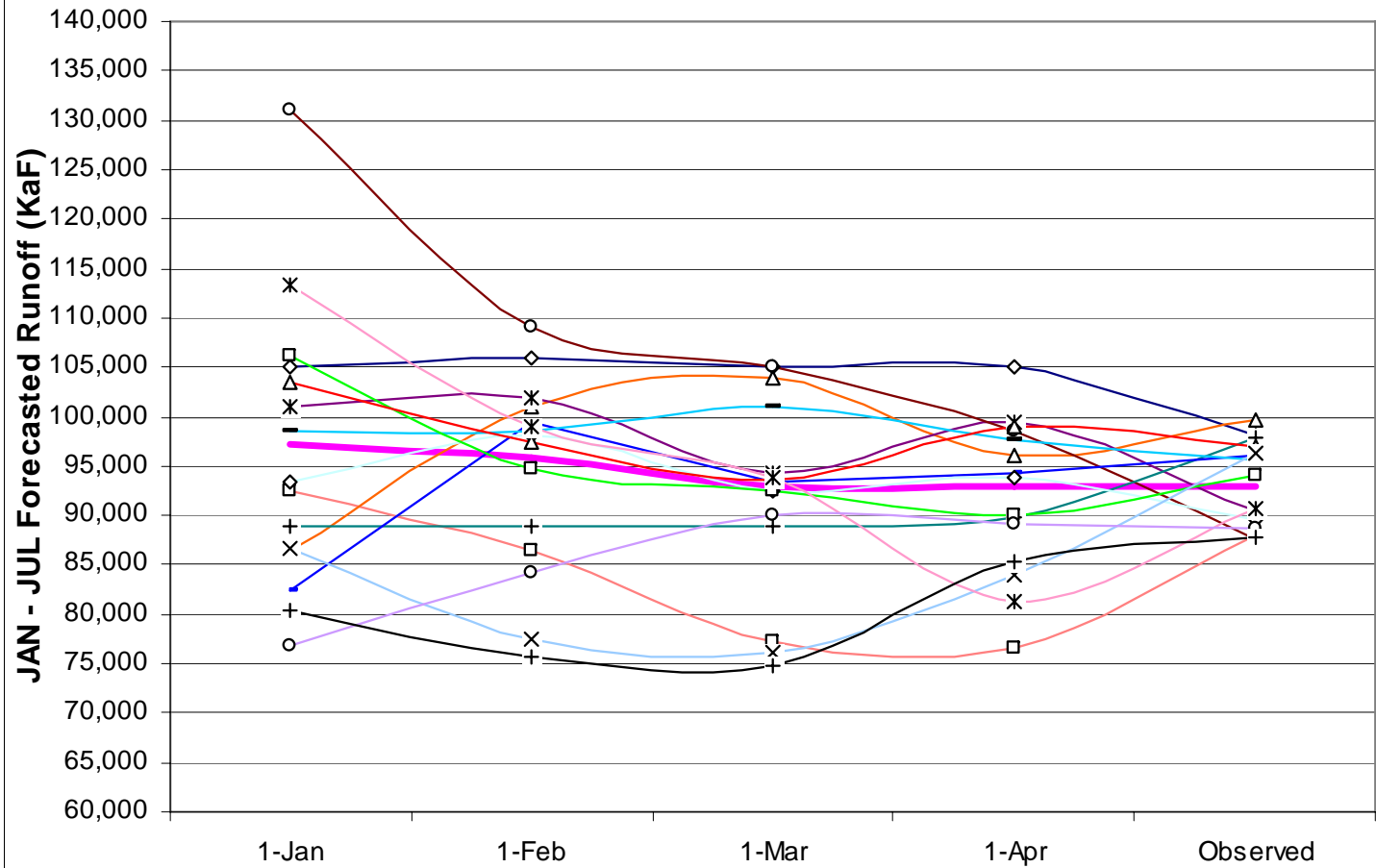
COLUMBIA R. at THE DALLES: WY 1929 - 2005



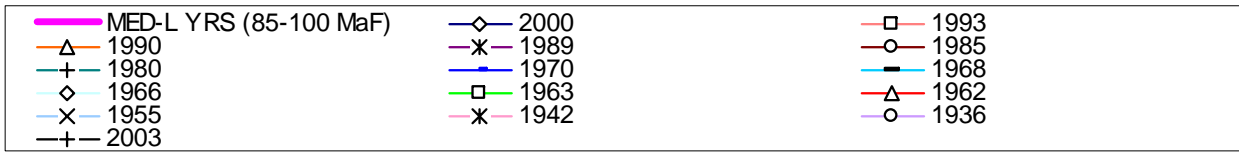
COLUMBIA RIVER at THE DALLES



COLUMBIA RIVER at THE DALLES



Start Date of Water Supply Forecast (WY 1929-2003)



How to Use a Curve



- Pick one Master curve for the Columbia at The Dalles in January. Repeat procedure using subsequent forecasts (Feb., March, and April).
- Use the CIG (UW) VIC Hydro model results to “hedge” on picking the correct Master curve.
- The Dalles curve determines a sub-basin curve. Then, add/subtract the sub-basin differential (WSF starting month vs. historical observed volume) to the current sub-basin WSF.

Example of Calculation

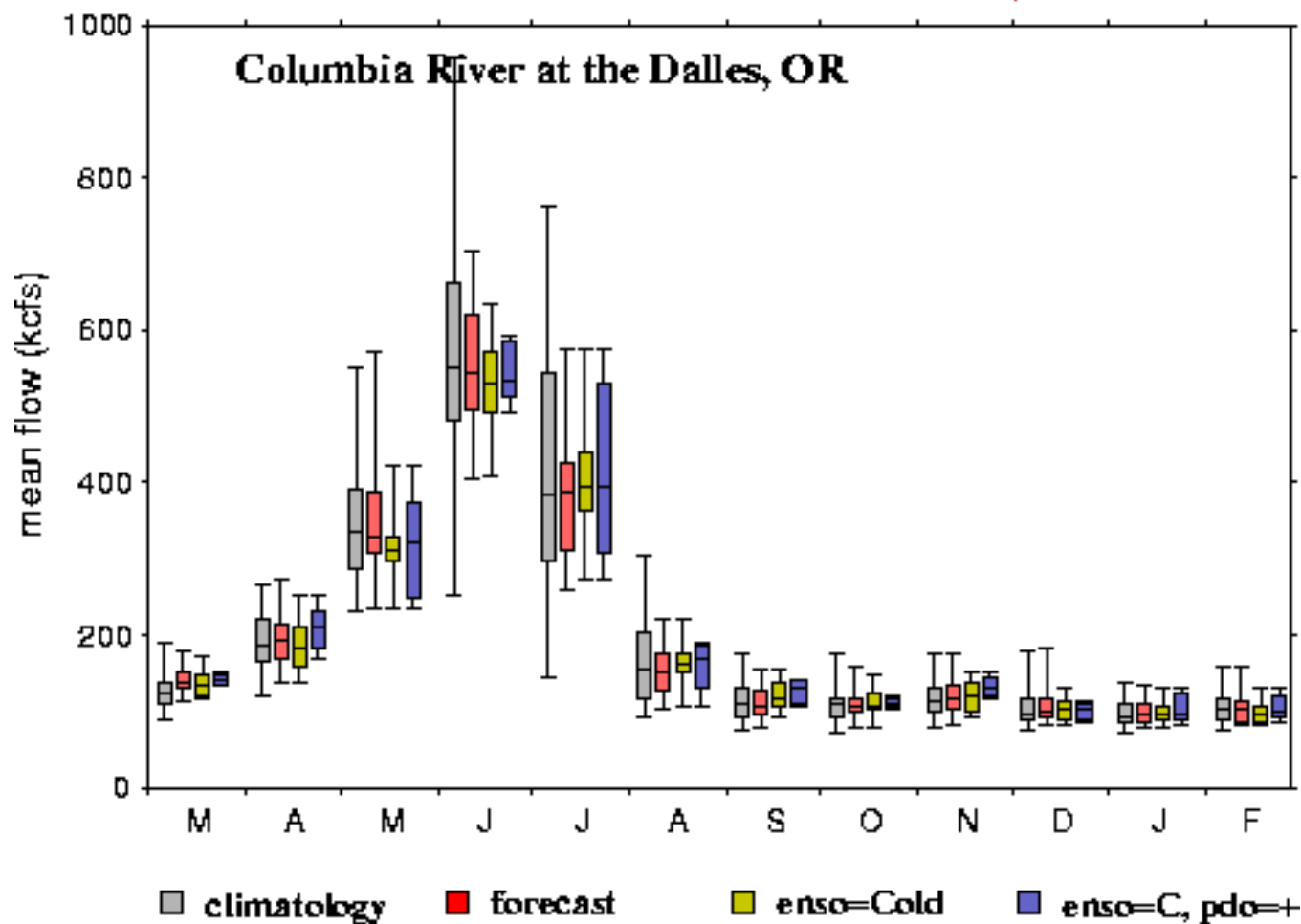


- Use January 1st 2004, Columbia at The Dalles: Official forecast was 103 MaF. Indicators suggested a “Medium-High” curve.
- The correction differential for January for a Medium-High curve is +2 MaF (107 MaF, observed, minus 105 MaF, average January).
- Hence, The Dalles corrected forecast would be 105 MaF.

UW Climate Impacts Group One-Year Lead Experimental Forecast

PNW Streamflow Forecast vs. Climatology (1960–99)

FORECAST DATE: MARCH 1, 2006



Test Results to Date:



- WY 2003, 2004, and 2005 were odd-ball years.
- Main problem: Incorrect selection of the Master Curve. Hence, more error is introduced.
- A more objective approach is being tested for WY 2006 to better ensure the proper selection of the Master Curve.
- Curves worked in 30-35% of sub-basins.
- Method reduced RMS Error by 75%.

Summary



- A correction differential applied to a WSF can give a better forecast by trending. Curves have been developed for 40 regional sites.
- Curves are divided by High (*La Nina*) and Low (*El Nino*) classes plus two Medium classes.
- Benefits: (1) More water for fish needs, (2) Minimize overdraft of reservoirs, (3) Better long-range water management.