

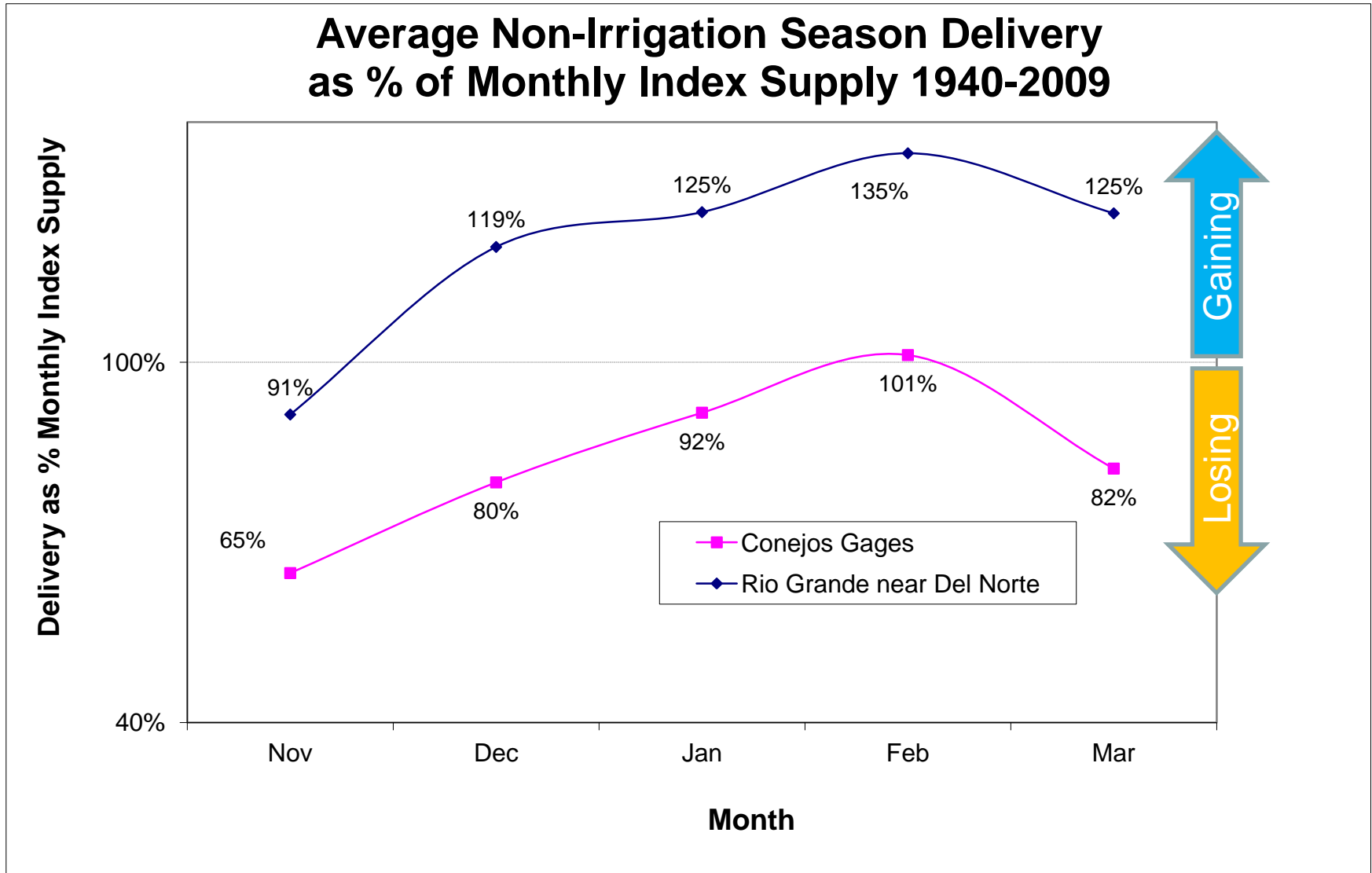
Colorado Deliveries at Lobatos

Strategy:

- On a monthly basis, deliver based on expected end of year compact obligations.
- Winter (Nov – March) index flows increased (gaining) or decreased (losing) based on historical average behavior.
- Summer: For both Conejos and RG:
 1. Predict total & remaining annual flow = Q_t & Q_r
 2. Predict total & remaining annual delivery obligation = O_t & O_r
 3. Predict deliveries in November & December = W
 4. Set monthly compact delivery % as remaining obligation less expected November and December deliveries all divided by remaining obligation: $C\% = (O_r - W)/Q_r$
 5. Limit month to month change in C% to 5% per month
- Overall goal is to have curtailed % of flow be constant through irrigation season and meet delivery obligations perfectly to end the year

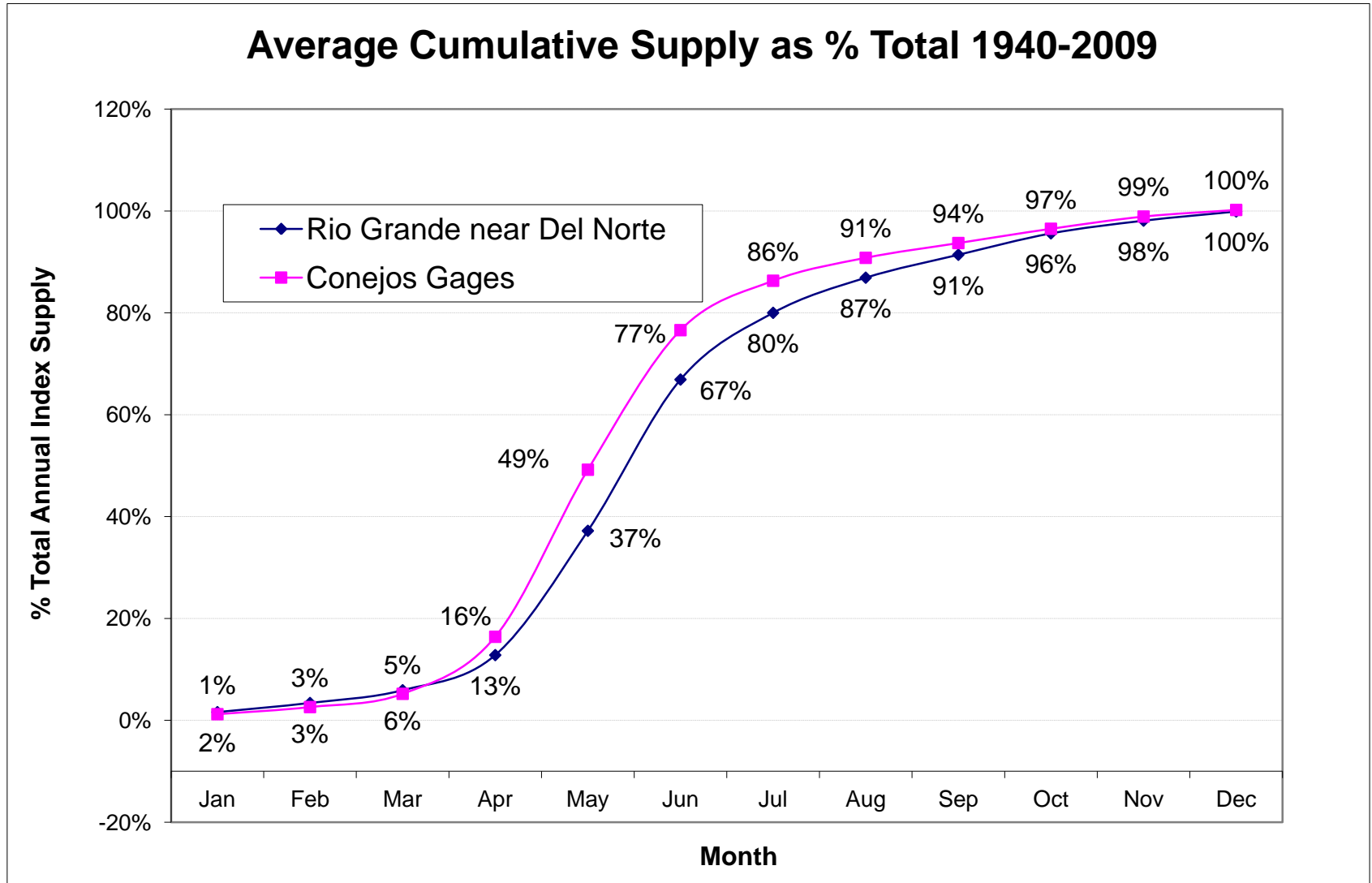
Setting up the problem

- Calculate average winter delivery as % of supply

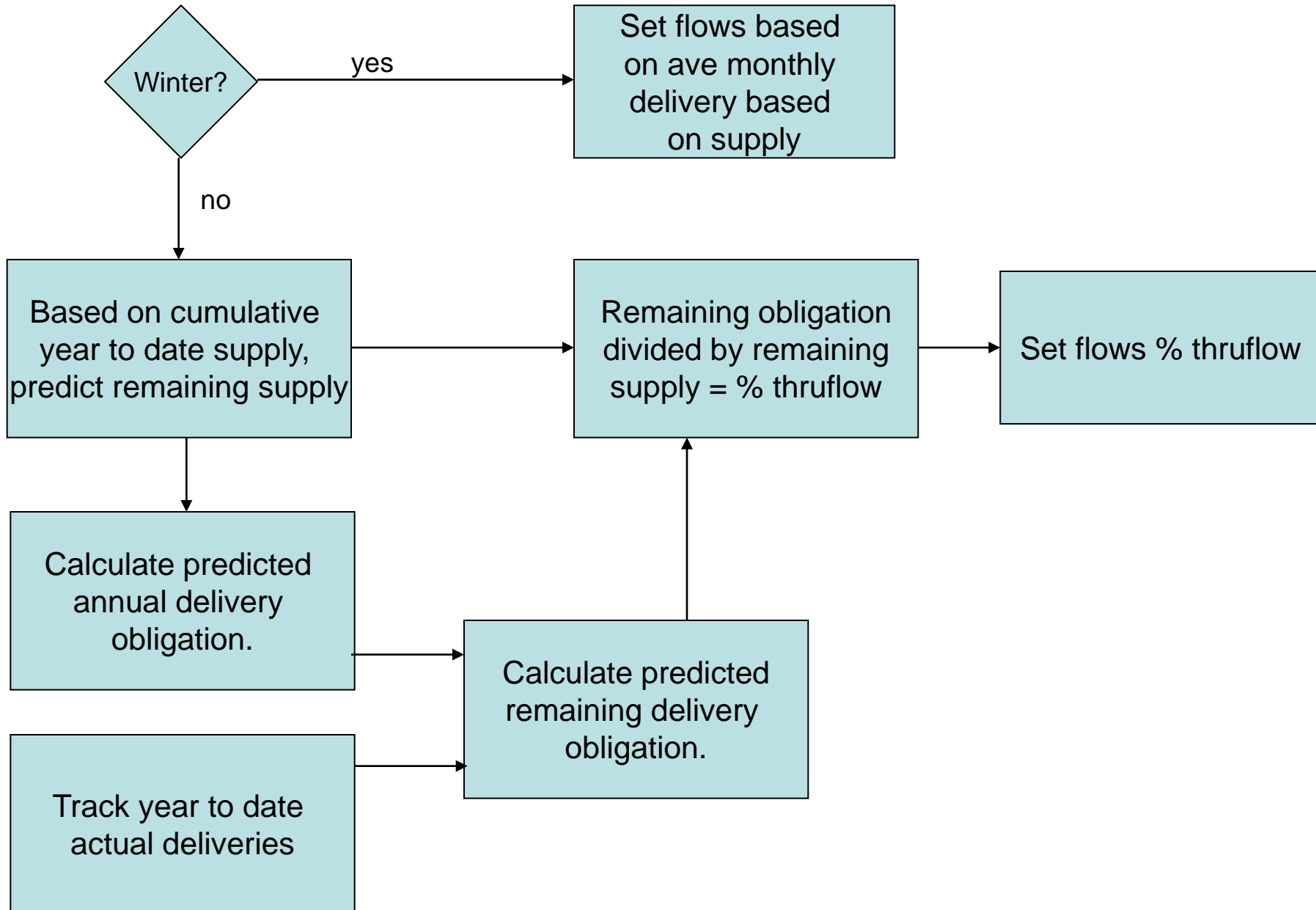


Setting up the problem

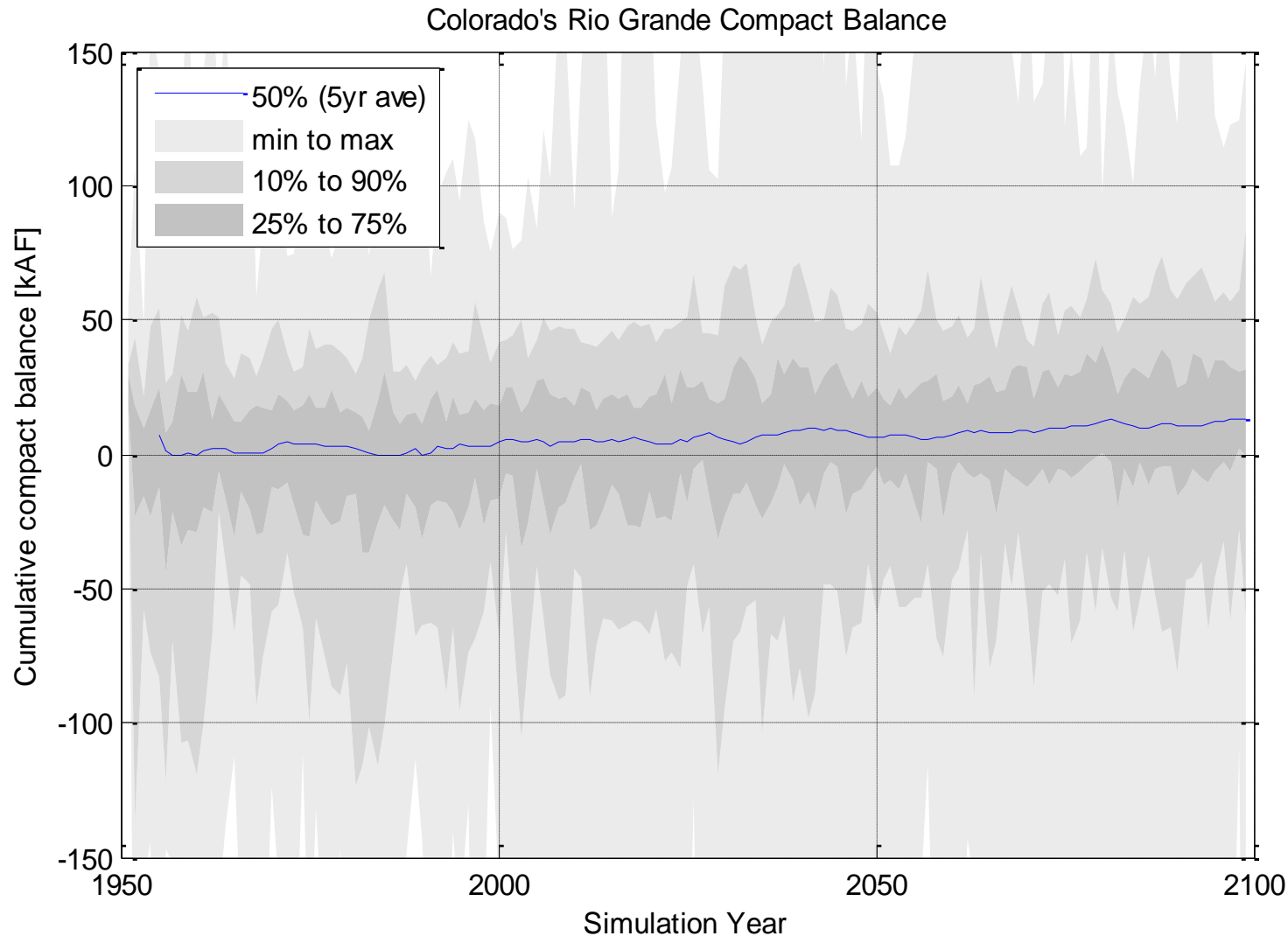
- Calculate average % supply by month



Calculating deliveries



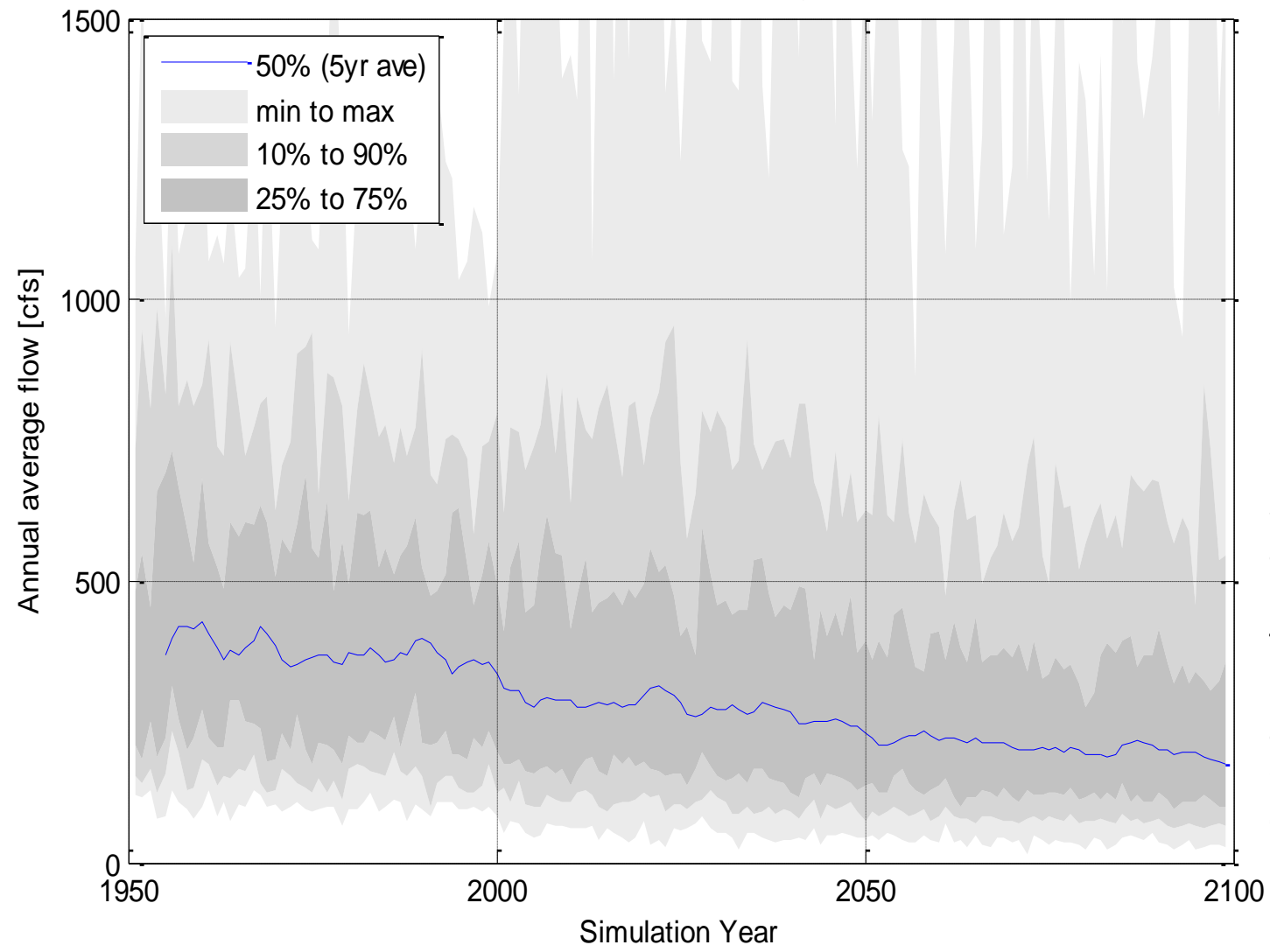
Simulated Compact Balance for Climate Change Runs



Method overshoots a little with climate change hydrographs because they are shifted to earlier runoff making model think total flow is going to be bigger than it ends up being.

Simulated Compact Balance for Climate Change Runs

Rio Grande near Lobatos, CO



~50% decline

Compact structure means a 33% decline in index flows leads to a 50% decline in deliveries and a 25% decline in Colorado consumption

Future possible improvements

- Currently using gaged flows at index gages rather than actual index flows.
- No max diversion or min thruflow (base flow) currently included.
- No prediction based on snowpack
- Every year predicted to have same hydrograph shape