

Martin Relicensing Study Plan 12(a)

Long Term Impact Modeling
Spill Analysis

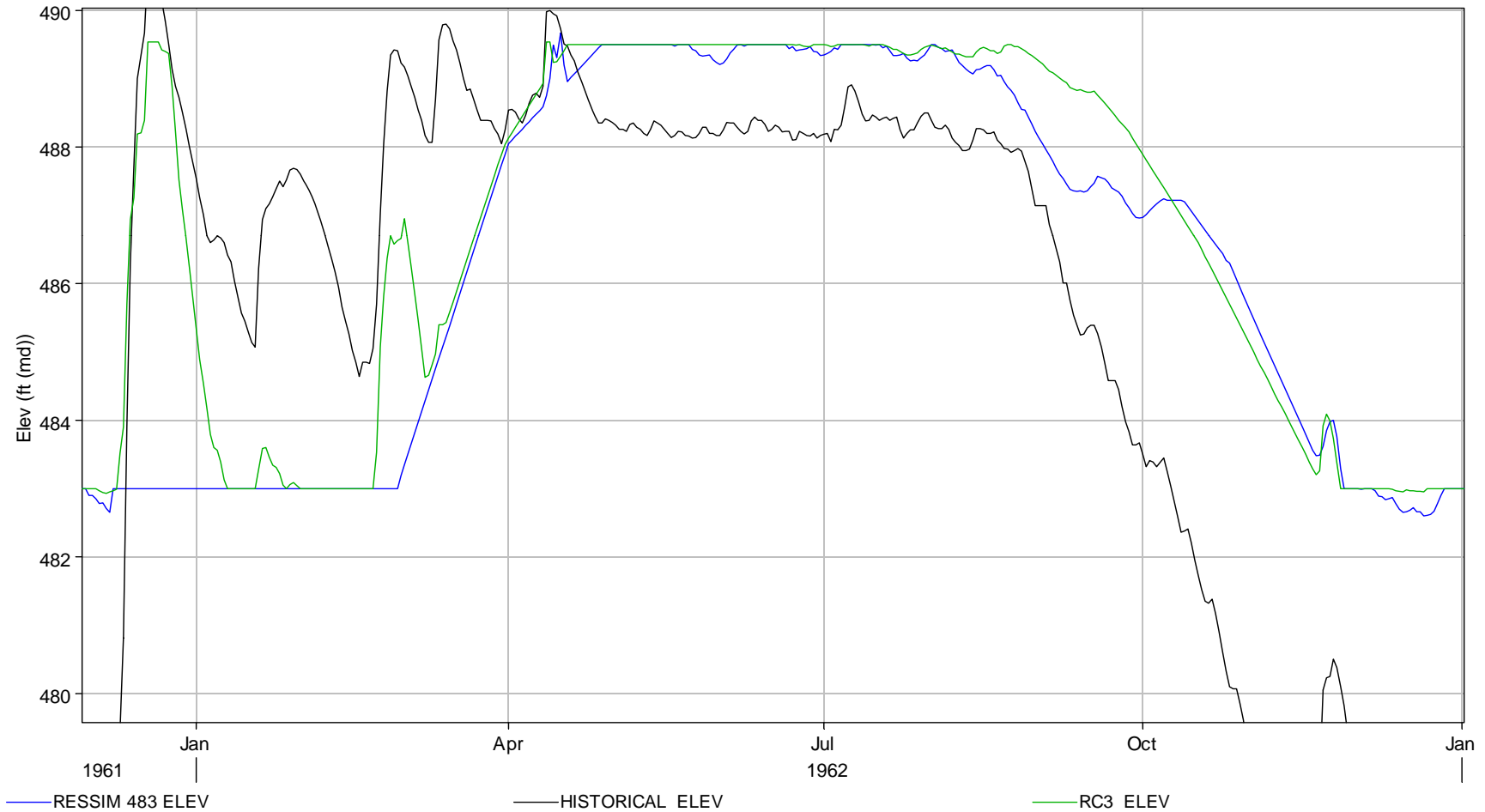


Martin Relicensing

- Models to evaluate long term impacts
 - Daily models that look at the impacts on average for the period of record (1940-2007)
 - Includes management of storage, downstream flows, power generation and **frequency of spill events**

Models Comparison

Example Flood Event

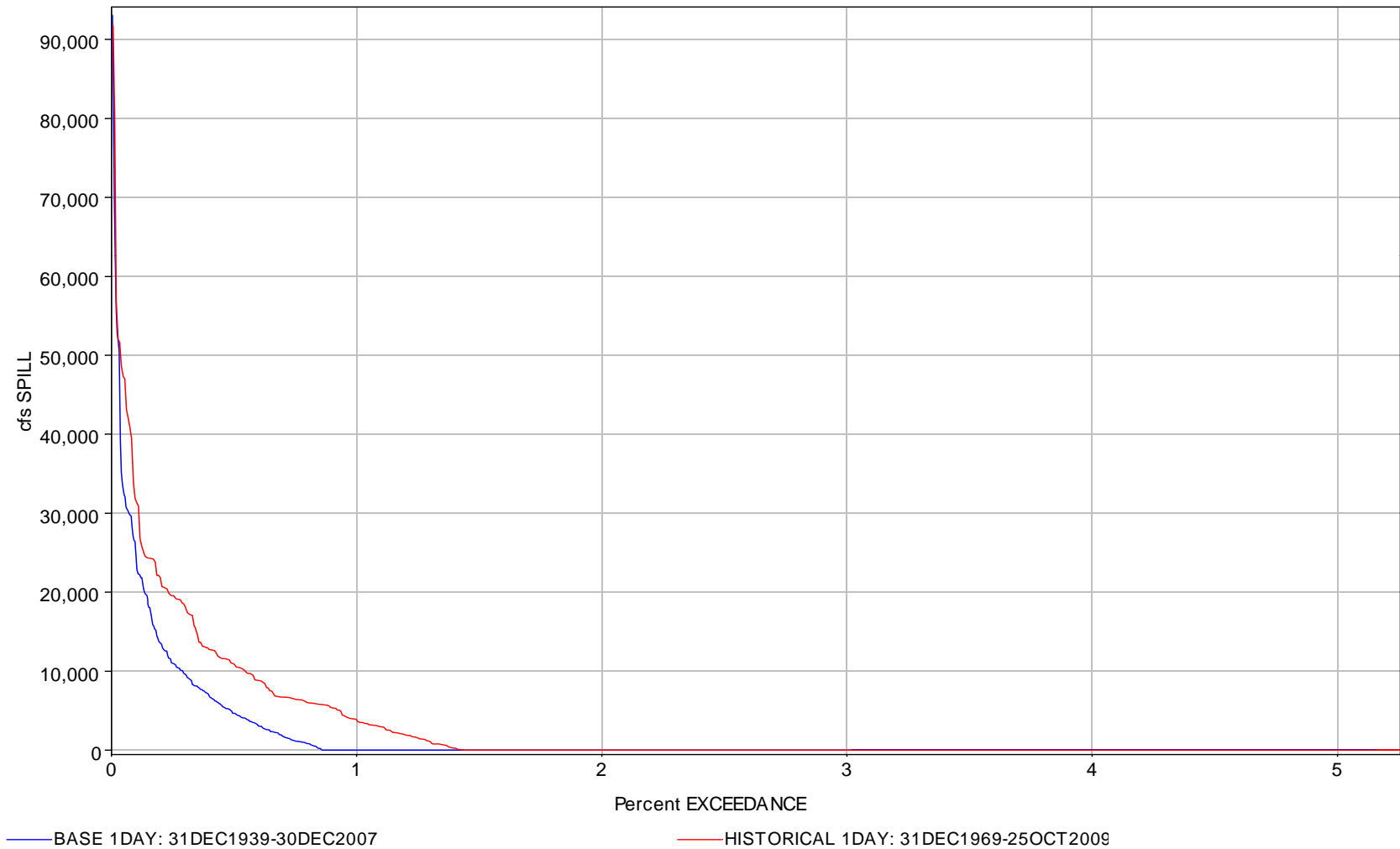


APC HydroBudget Model

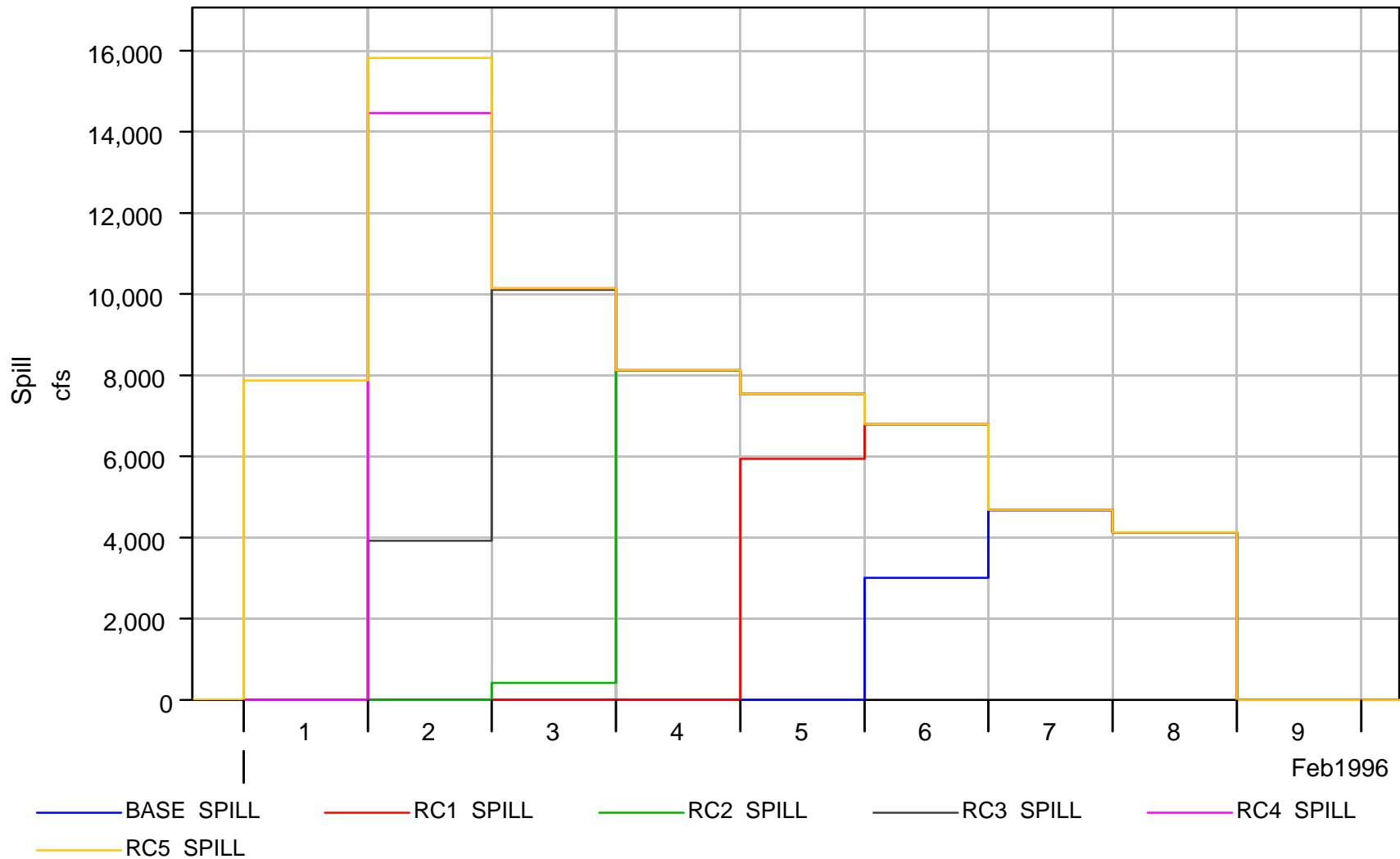
- Flood rules in model
 - Above FCGL and below 485' MD go to Yates capacity
 - Above FCGL and below 488' MD go to Thurlow capacity
 - Above FCGL and 488' MD go to Plant capacity at Martin
 - ***Spill above 489.55' MD***
 - Plant capacity down to 488' MD
 - Thurlow capacity down to 485' MD
 - Yates capacity down to FCGL
 - Normal operations when back to FCGL

*FCGL = Flood Control Guideline

HydroBudget vs. Historical Spill Exceedance

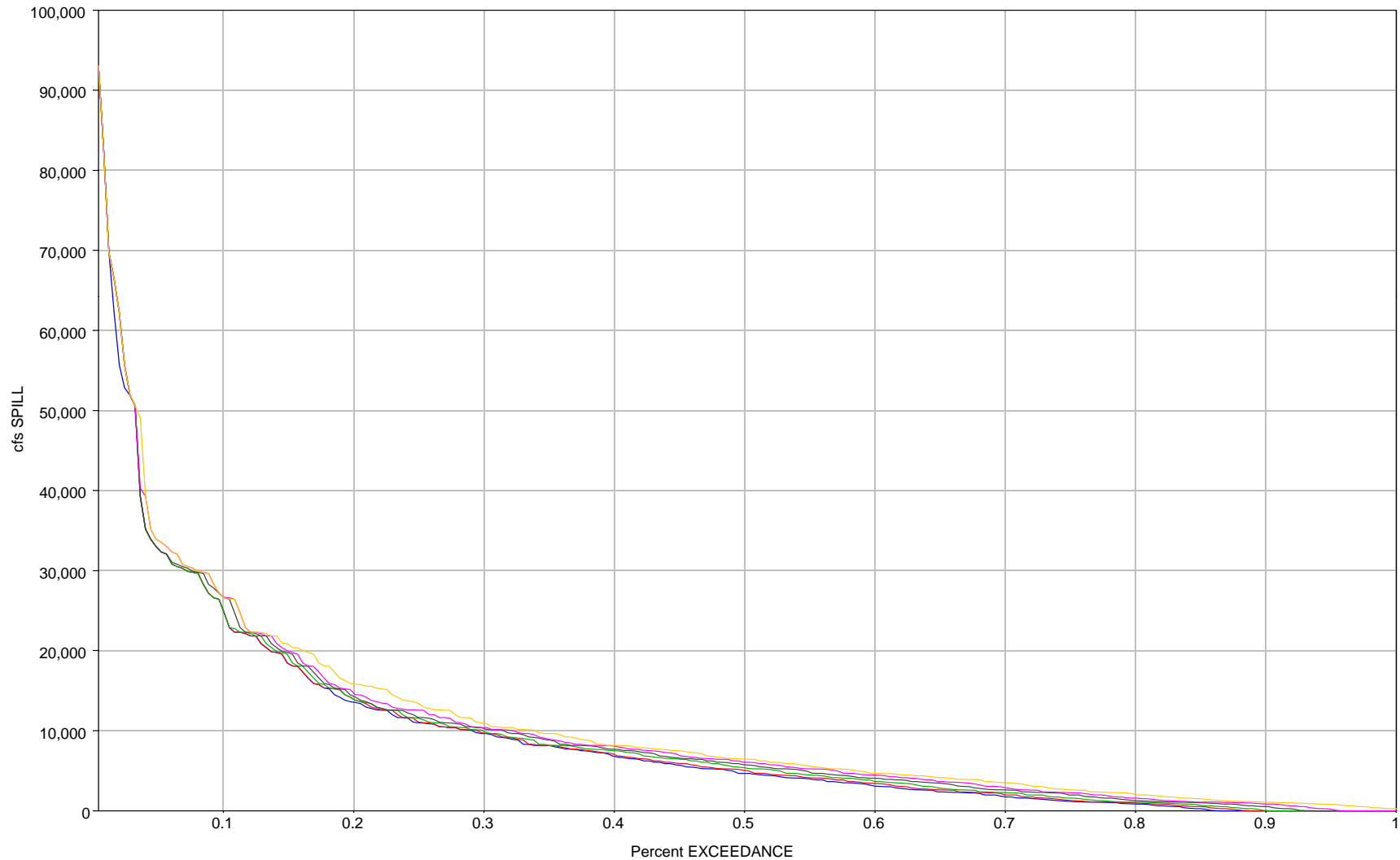


1996 Example Spill



Annual Spill Exceedance

Higher Winter Pool



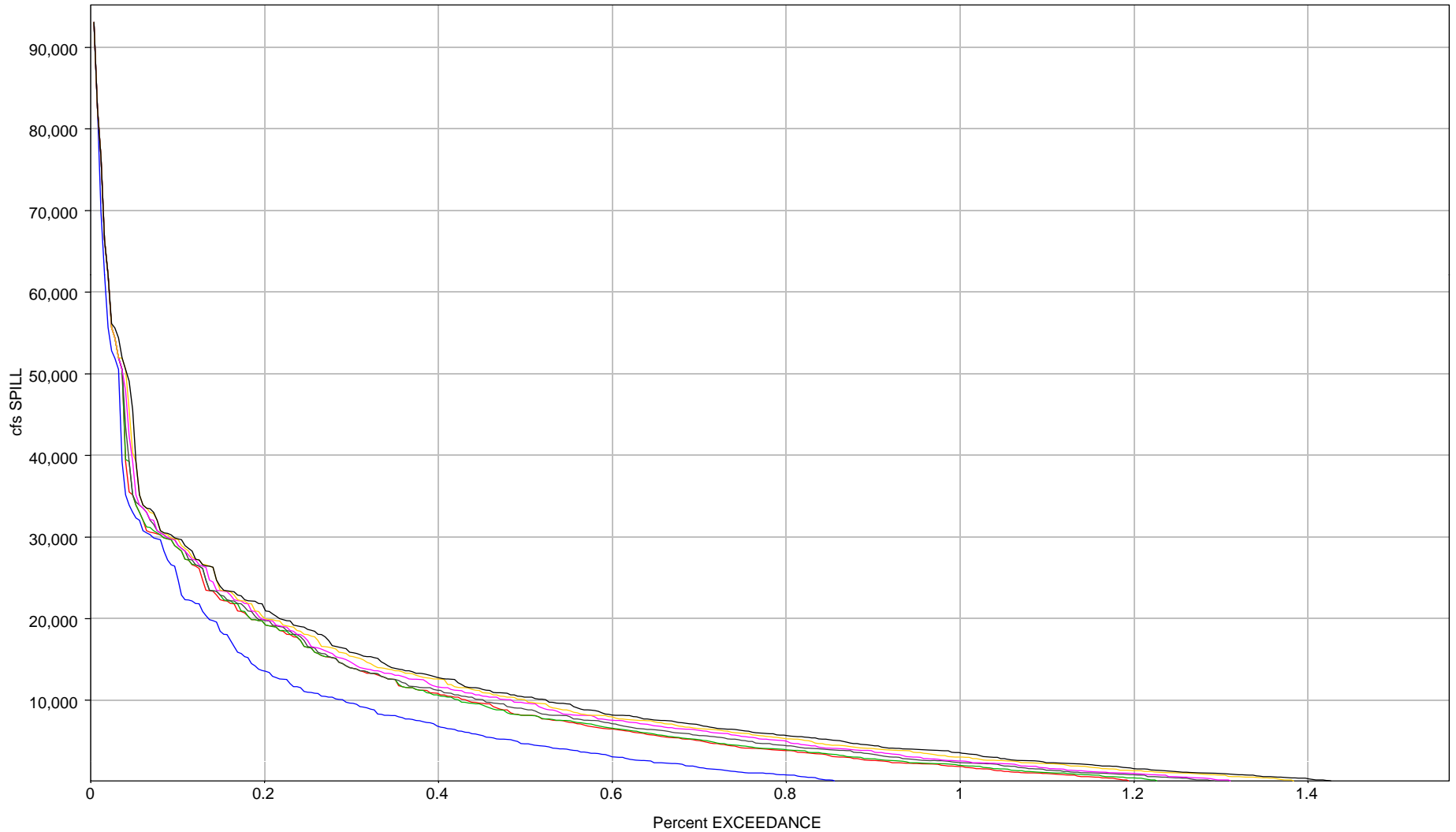
— BASE 1DAY: 31DEC1939-30DEC2007
— RC3 1DAY: 31DEC1939-30DEC2007 J

— RC1 1DAY: 31DEC1939-30DEC2007
— RC4 1DAY: 31DEC1939-30DEC2007

— RC2 1DAY: 31DEC1939-30DEC2007
— RC5 1DAY: 31DEC1939-30DEC2007

Annual Spill Exceedance

Early Spring Fill

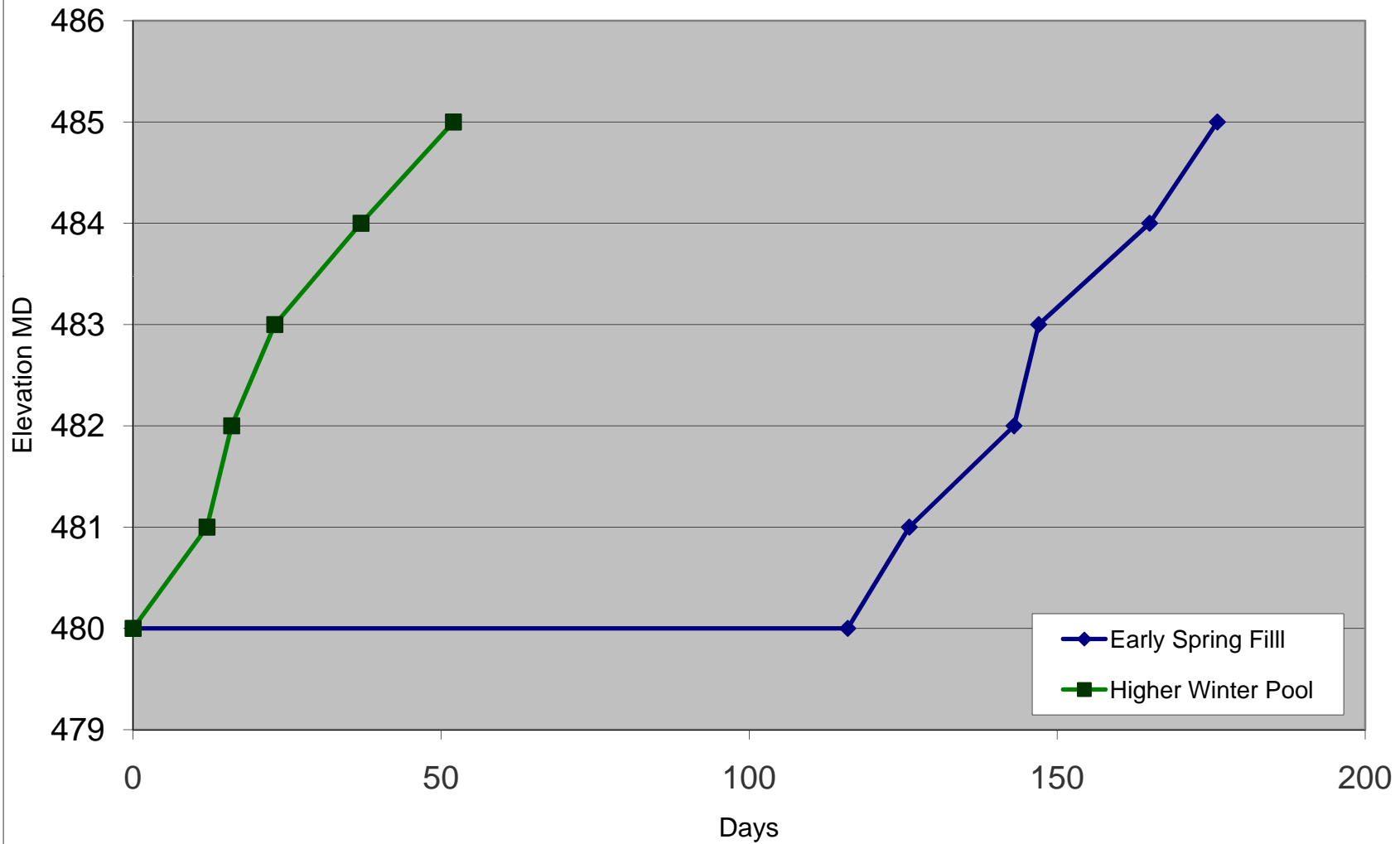


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— RC2SP 1DAY: 31DEC1939-30DEC200
— RC5SP 1DAY: 31DEC1939-30DEC200

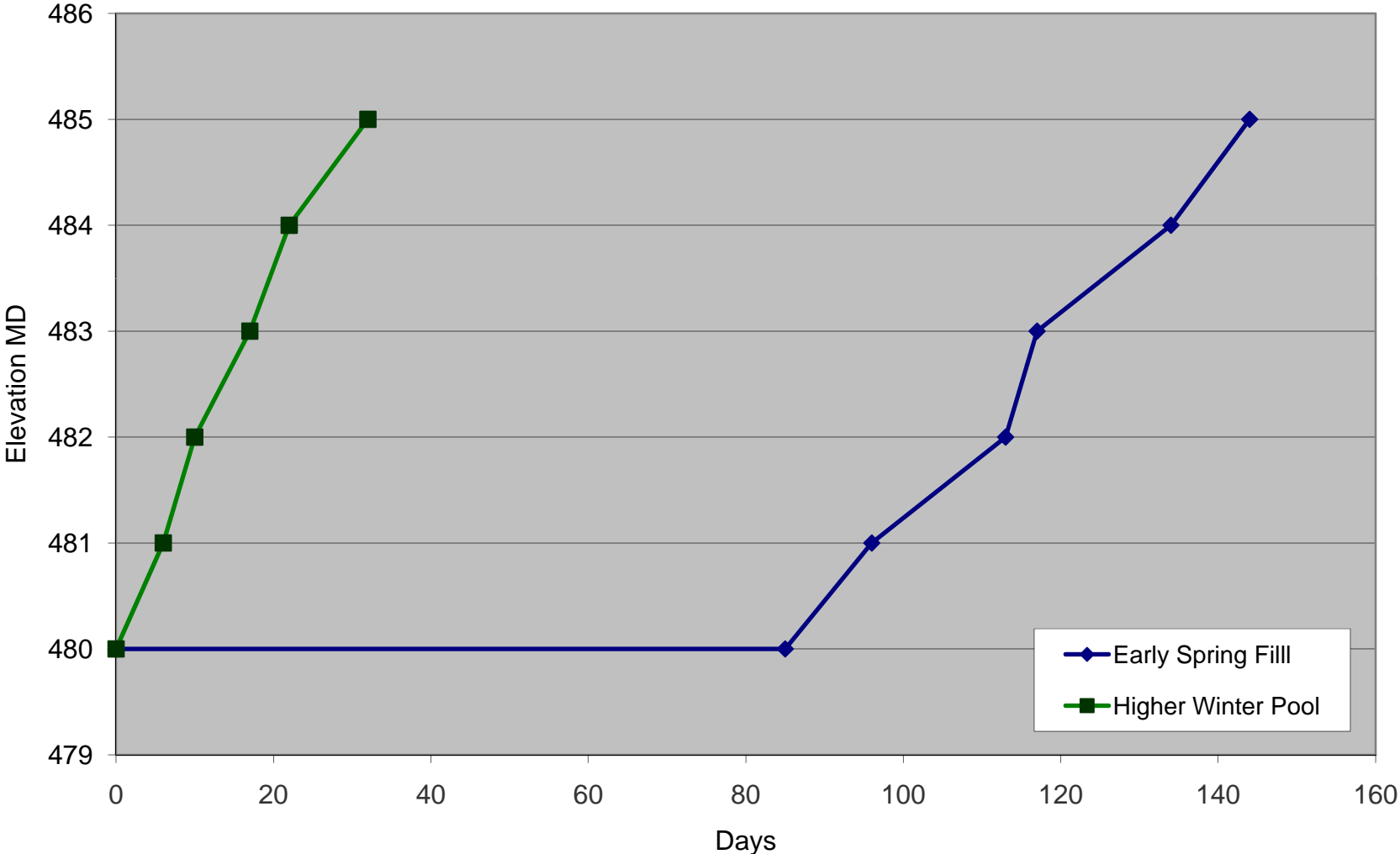
— RCBASESP 1DAY: 31DEC1939-30DEC200
— RC3SP 1DAY: 31DEC1939-30DEC200

— RC1SP 1DAY: 31DEC1939-30DEC200
— RC4SP 1DAY: 31DEC1939-30DEC200

Higher than Historical Spill for Each Alternative



Additional Days of Spill for Each Alternative



Summary

- For baseline, spill occurs approximately .85% of the period of record (1940-2007)
- For higher winter pools, spill ranges up to 1% of the period of record (1940-2007)
- For higher winter pools and early spring fill, spill ranges from 1.2%-1.4% of the period of record (1940-2007)

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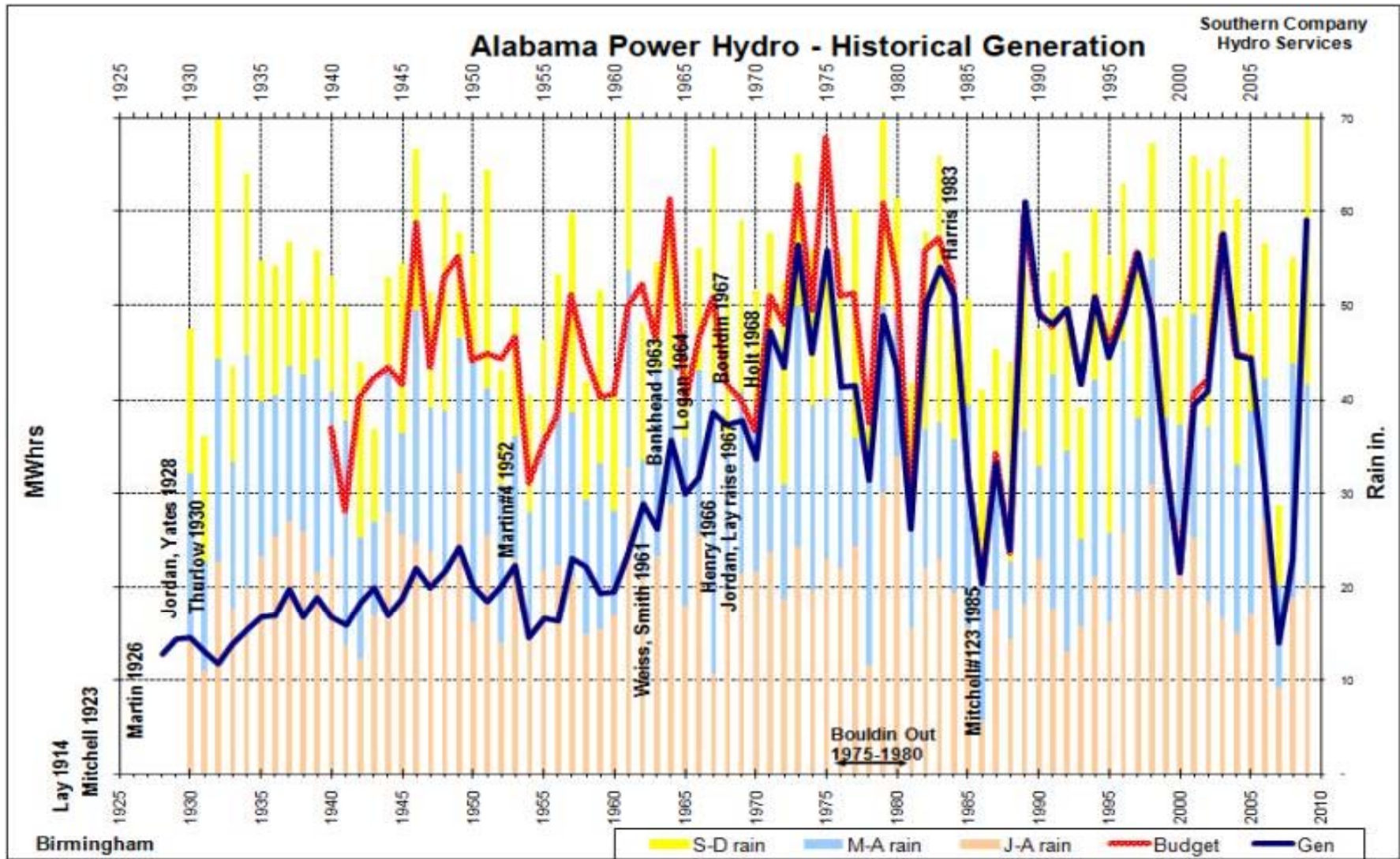
Long Term Impact Modeling
Economic Impacts



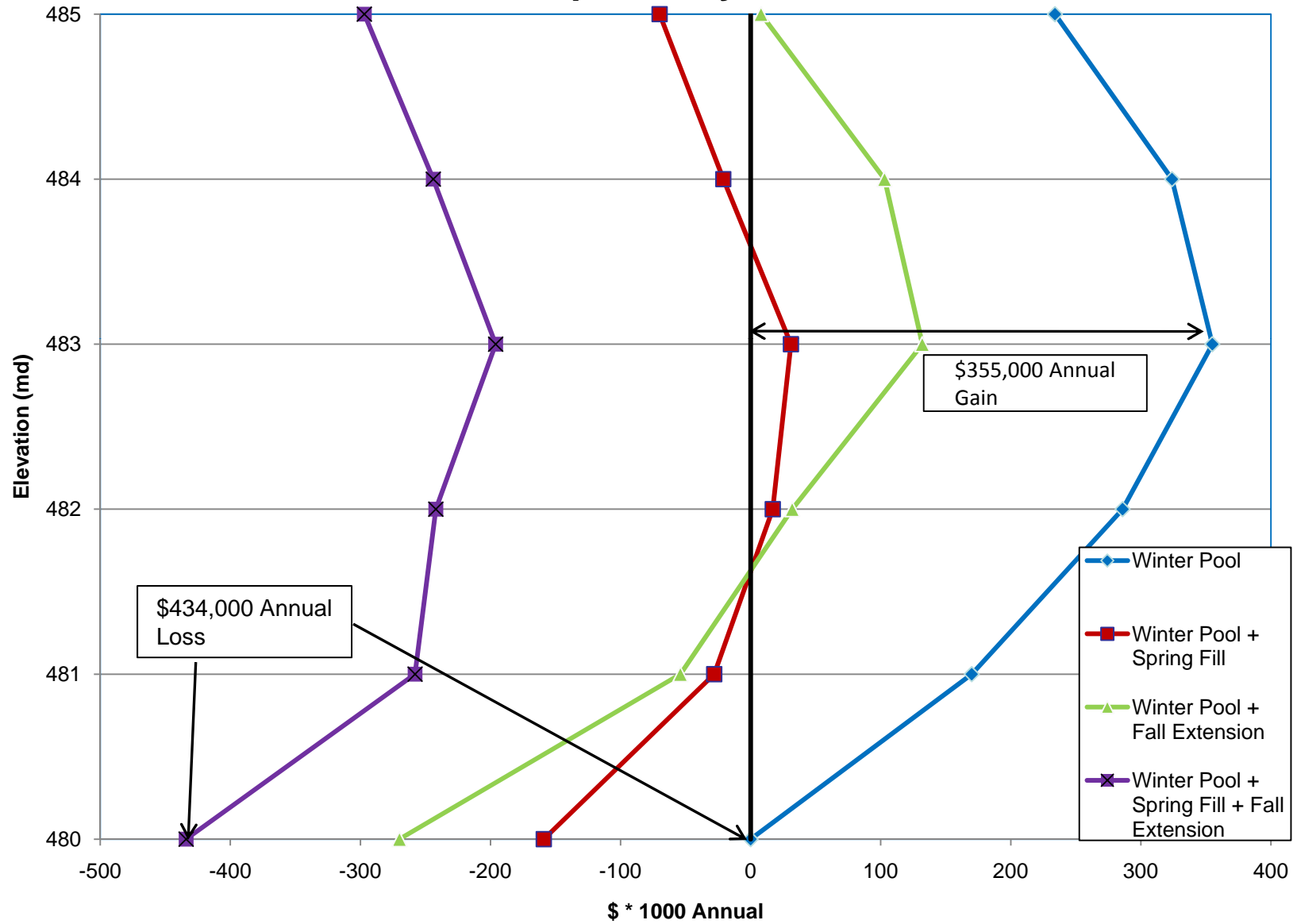
APC HydroBudget Model

- The HydroBudget Model is an analytical model for the determination of power production and its value by simulating actual reservoir operation
- Parameters include turbine discharge ratings and efficiencies, generator efficiencies, head loss, operating guidelines and lambdas

Model vs. Historical Generation Comparison



Economic Impact on Generation Tallapoosa System



Summary

- Higher winter pool alternatives result in increased economic gain on generation due to increased head on the turbines
- Higher winter pool alternatives combined with either early spring fill or fall extension result in a more neutral value on generation due to loss from either spill or off peak generation (later in the year)
- Combination of all three, higher winter alternatives with early spring fill and fall extension result in an overall economic loss on generation