Stakeholder Advisory Committee
May 29, 2014

Lisa Jeffrey, PE

Kristin Knight, PE

Brown and Caldwell

MID-OHIO REGIONAL PLANNING COMMISSION

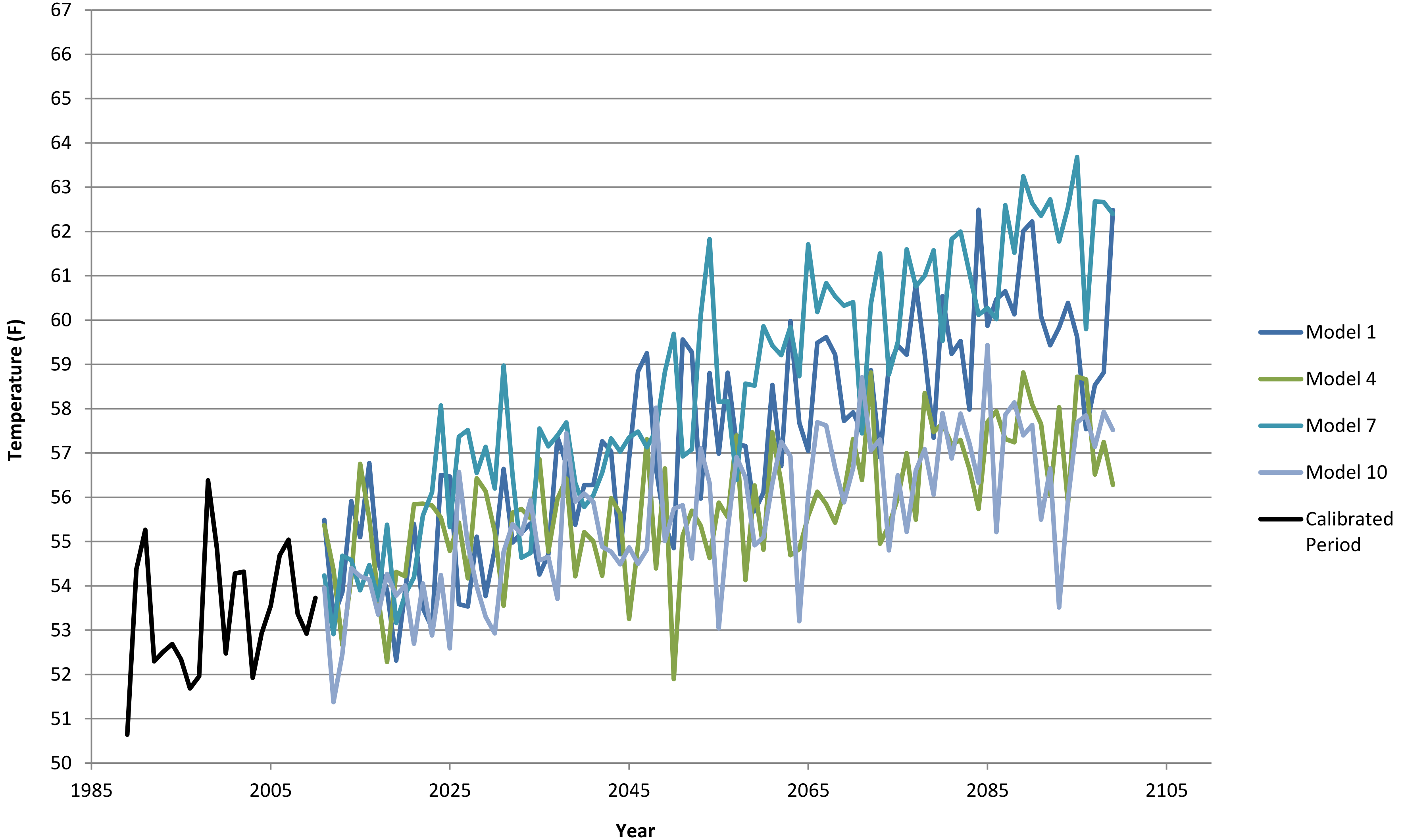
SUSTAINING SCIOTO

INVESTING TODAY. PRESERVING TOMORROW.

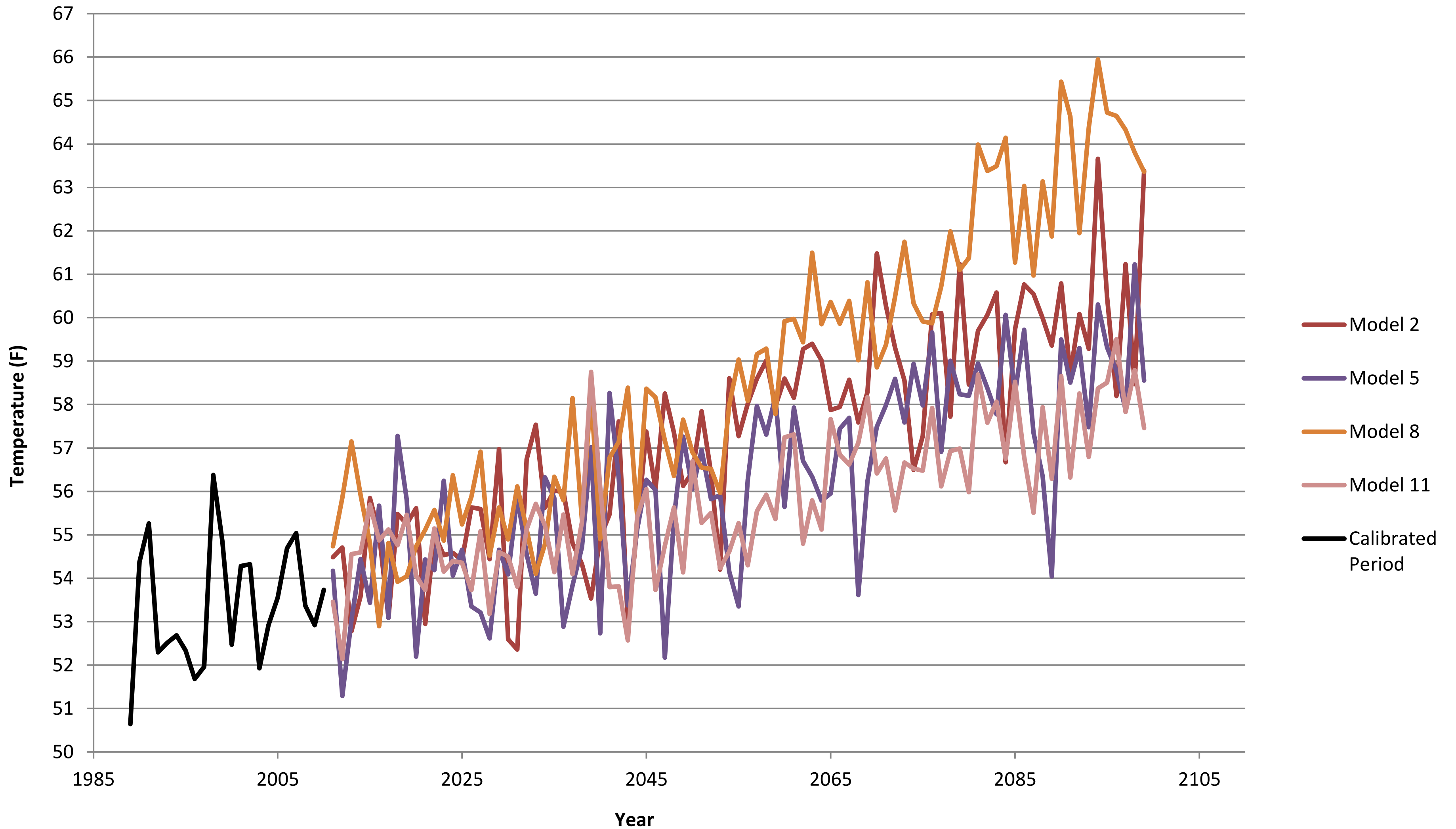
Agenda

- Welcome and Introduction
- Brief overview of previous meeting
- Current project status
- Presentation of Model Results and Water Inventory
  – Temperature and Precipitation Model Predictions
  – Water Inventory Results
  – Questions and discussion
- Impact Assessment
  – Small group discussion

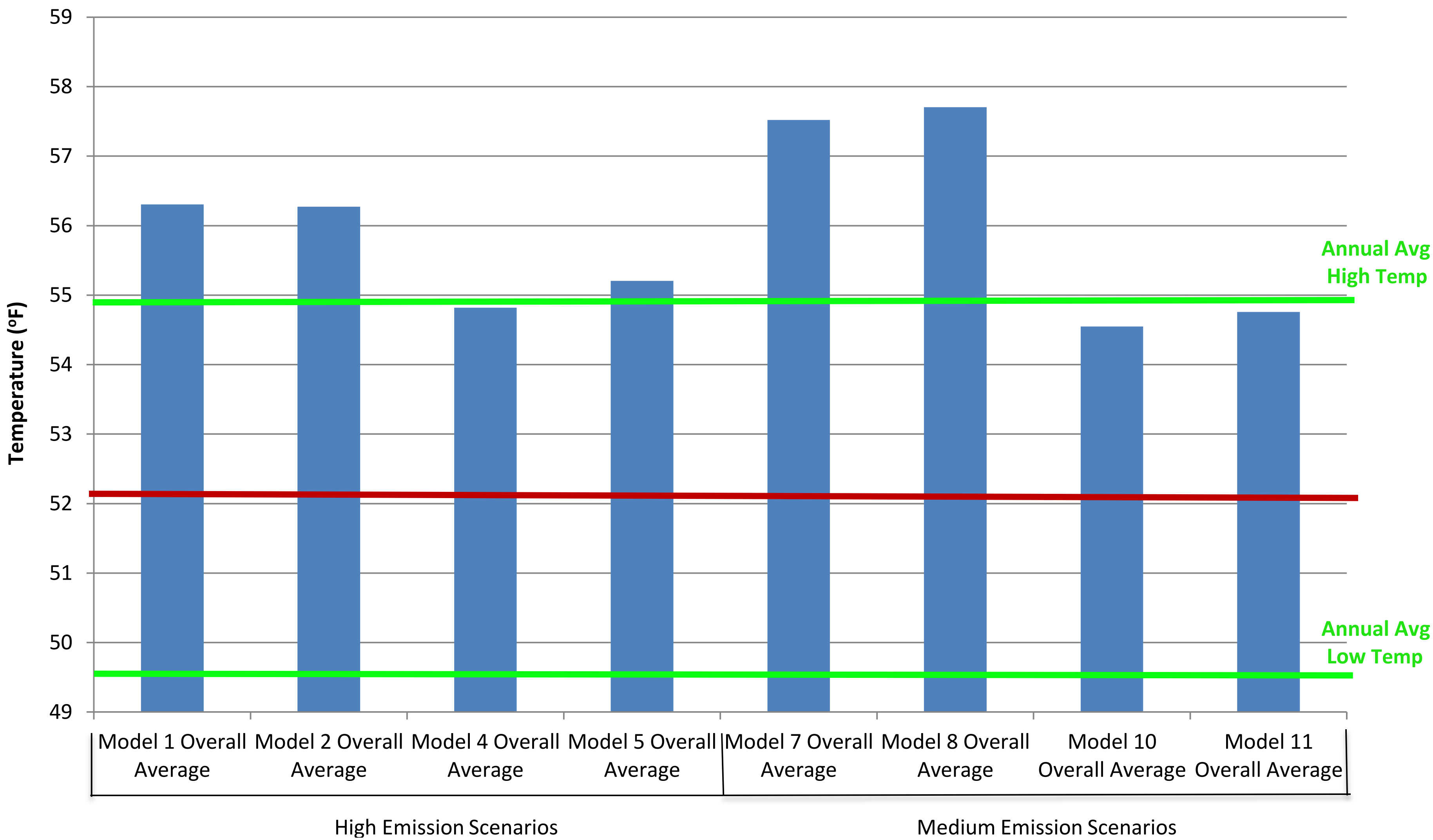
Actual vs. Projected Annual Mean Temperature (F)
High Emission Scenarios



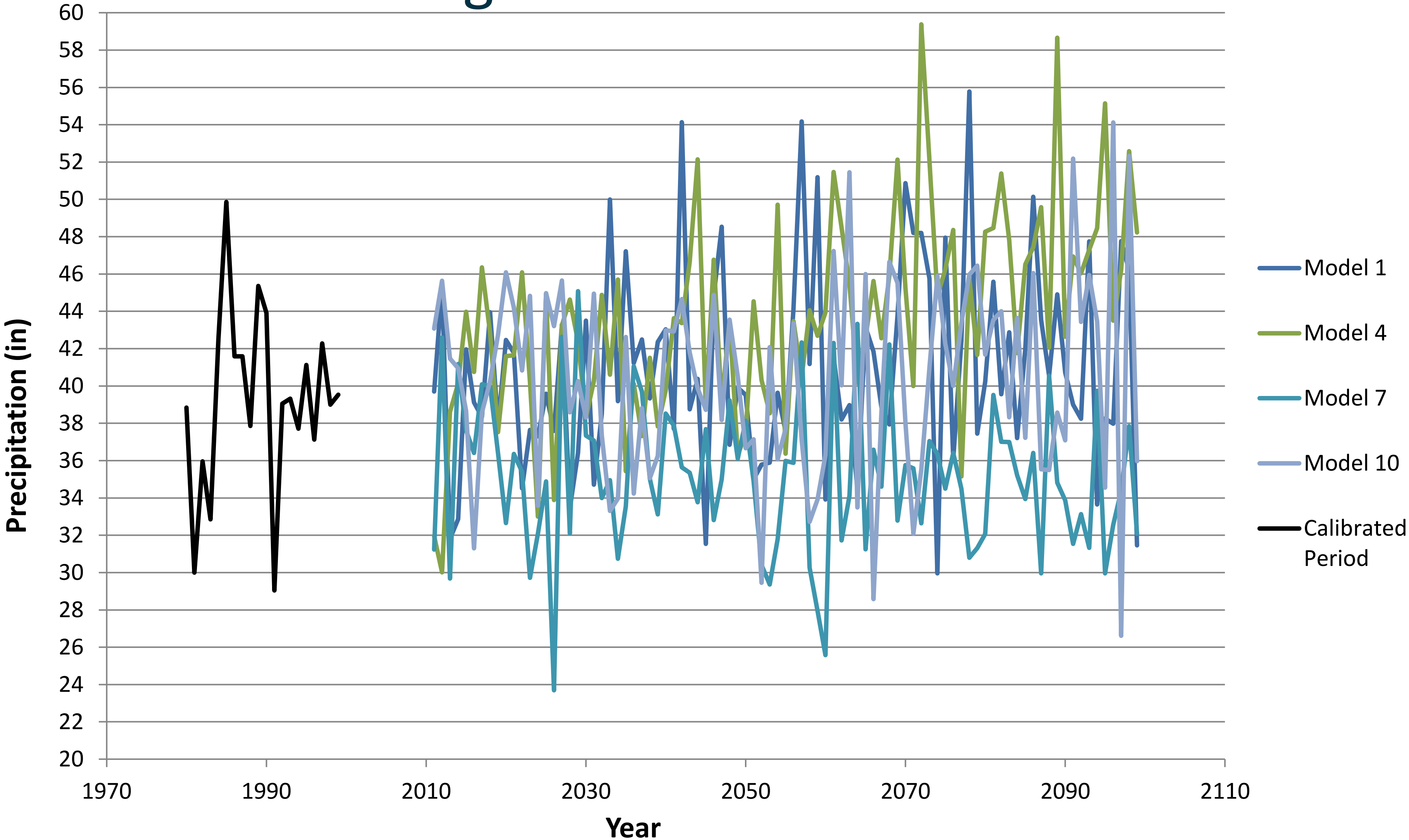
Actual vs. Projected Annual Mean Temperature (F)
Medium Emission Scenarios



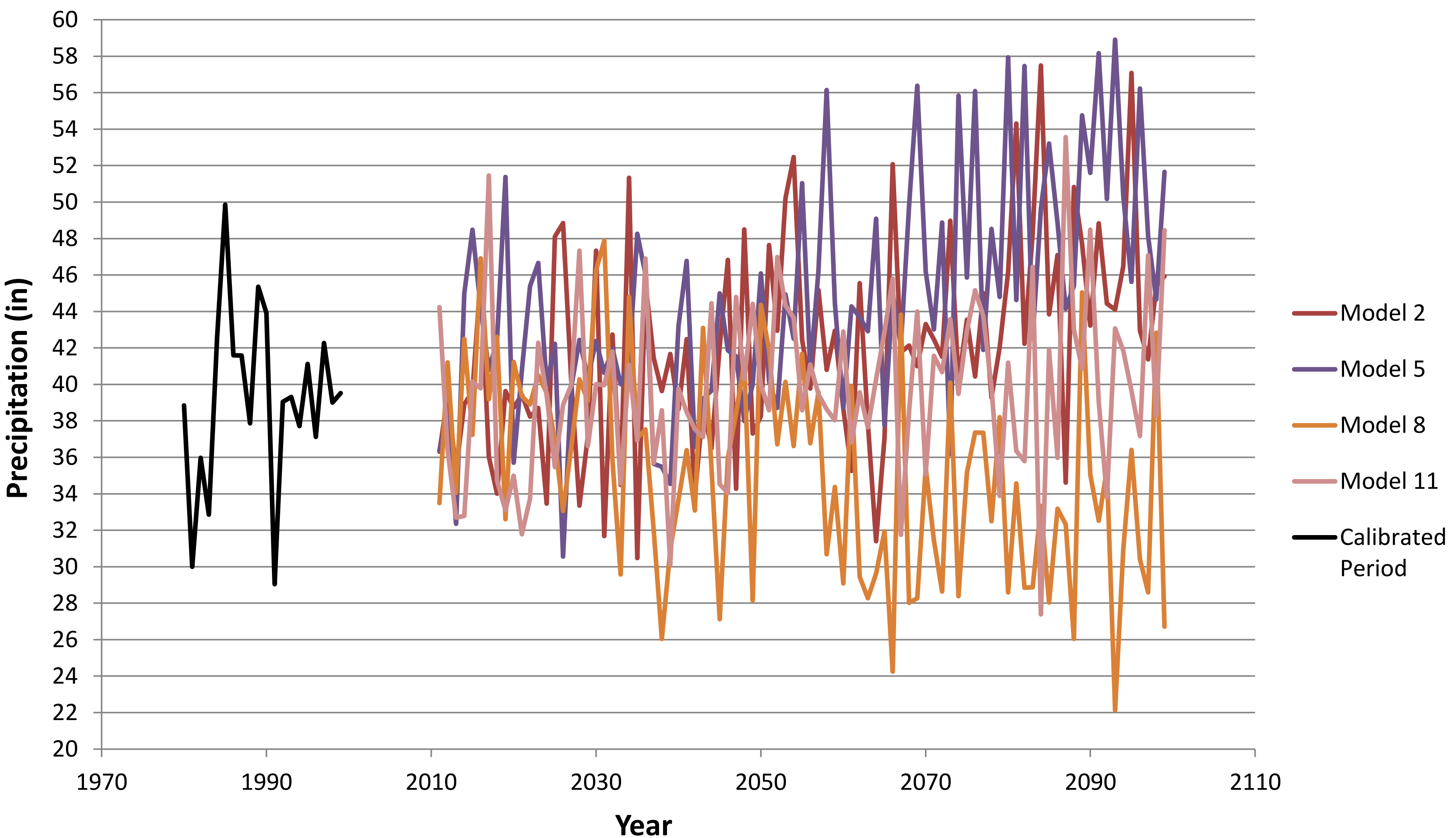
Actual vs. Projected Annual Average Temperature (ºF)



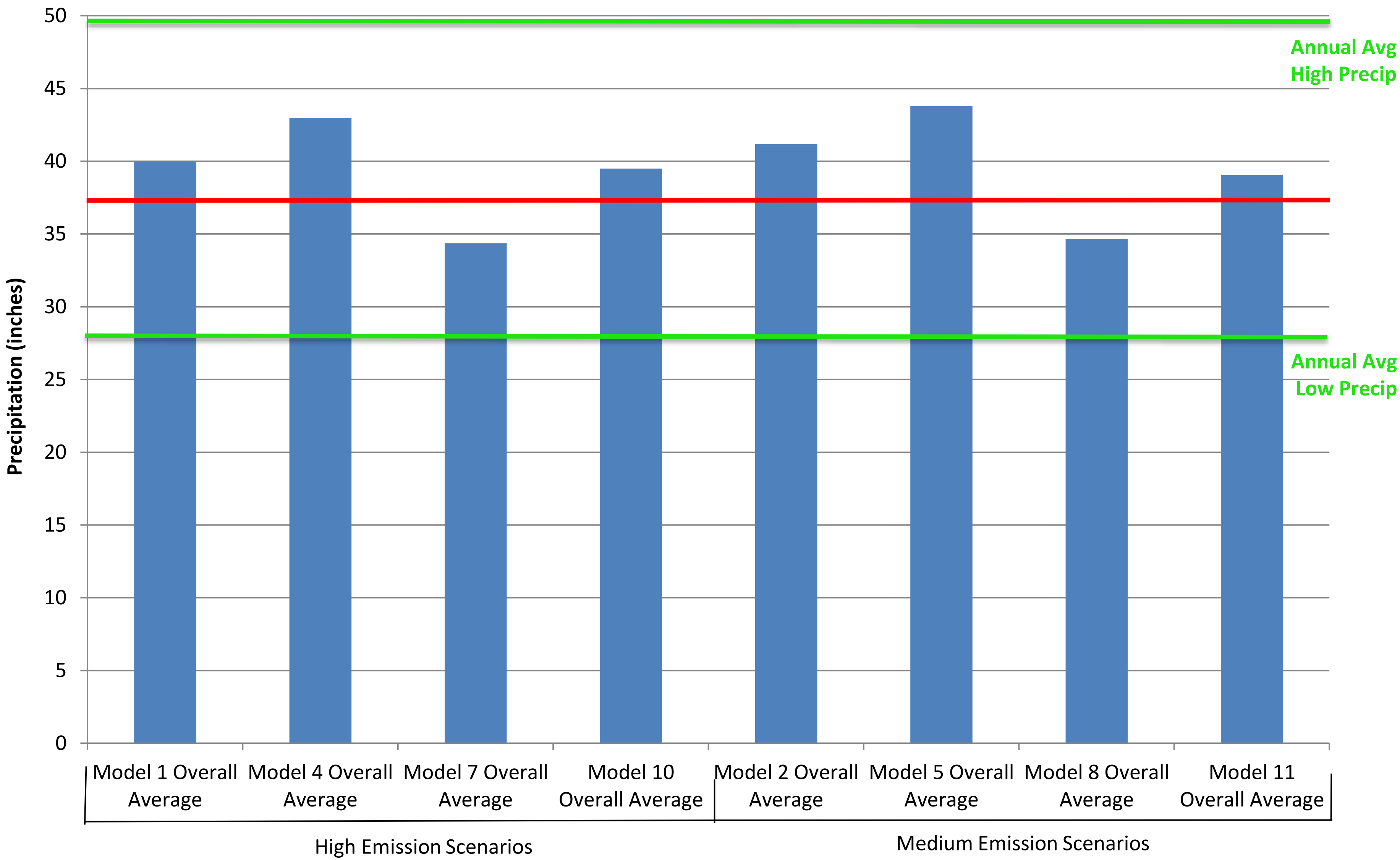
Actual vs. Projected Annual Mean Precipitation (in) High Emission Scenarios



Actual vs. Projected Annual Mean Precipitation (in)
Medium Emission Scenarios

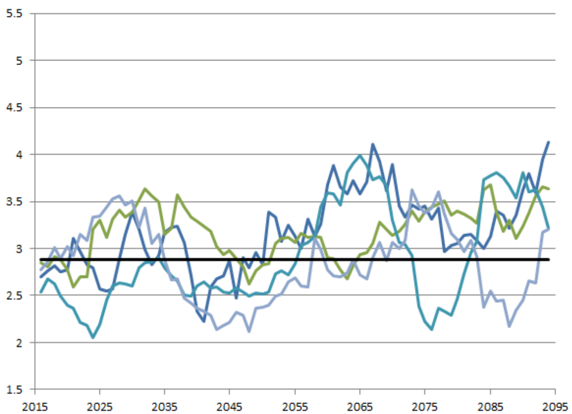


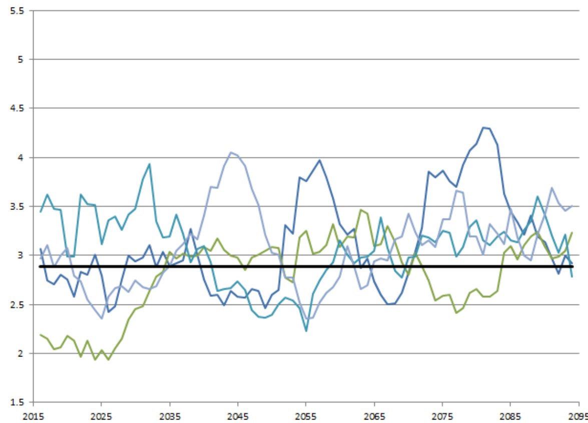
Actual vs. Projected Annual Average Precipitation (in)

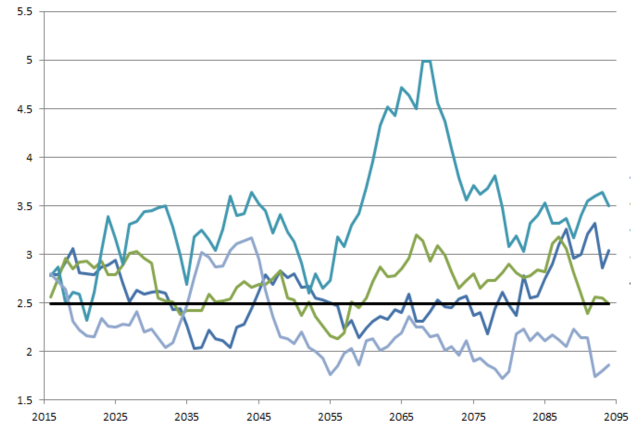


Winter Projected Precipitation Changes 2015 to 2095

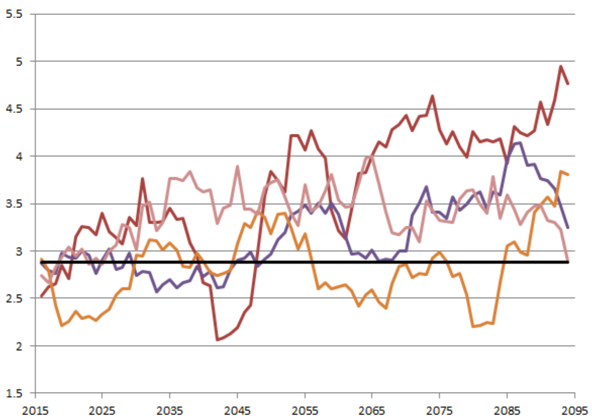
High Emissions Models

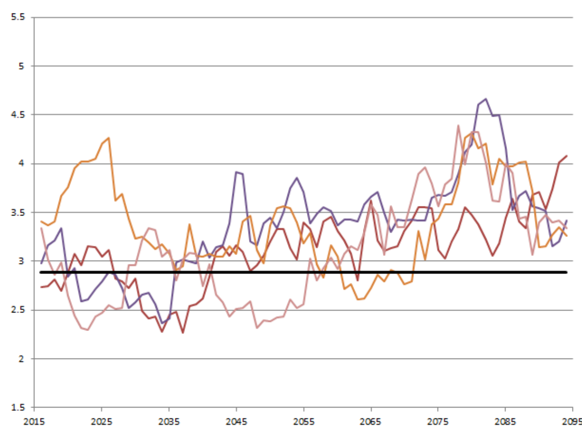


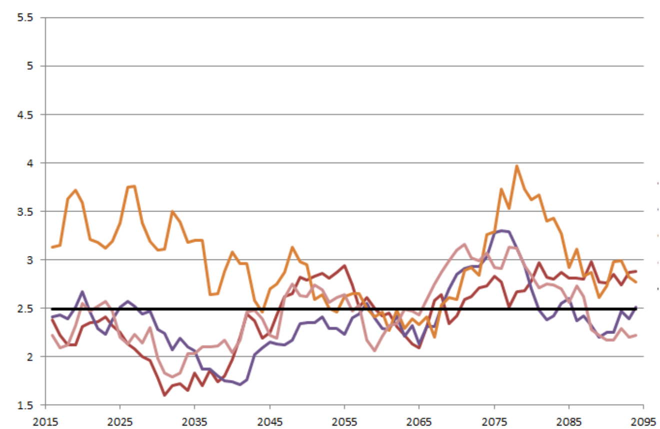




Medium Emissions Models







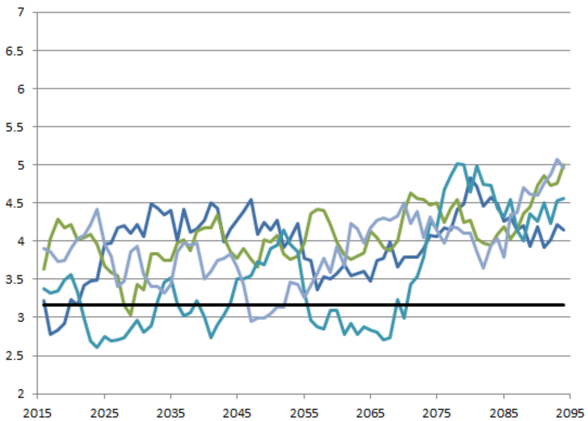
December

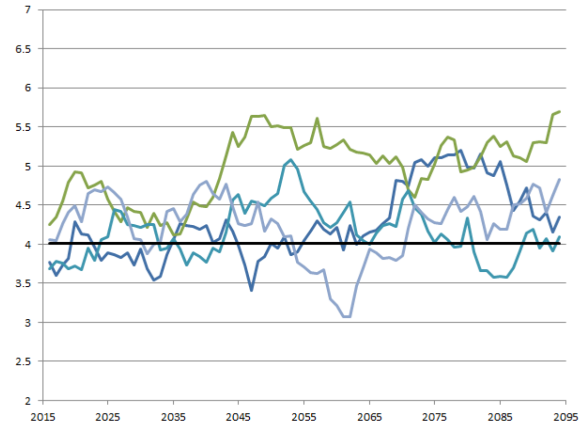
January

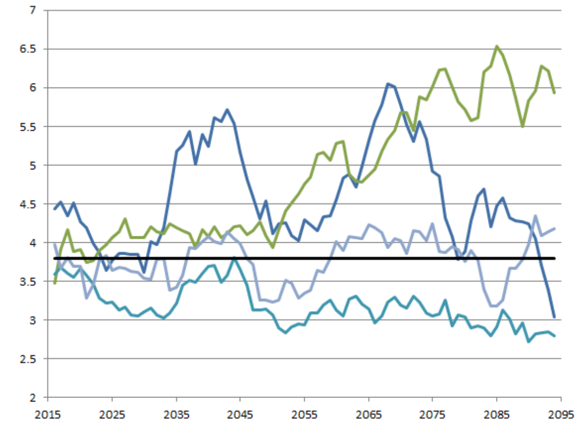
February

Spring Projected Precipitation Changes 2015 to 2095

High Emissions Models







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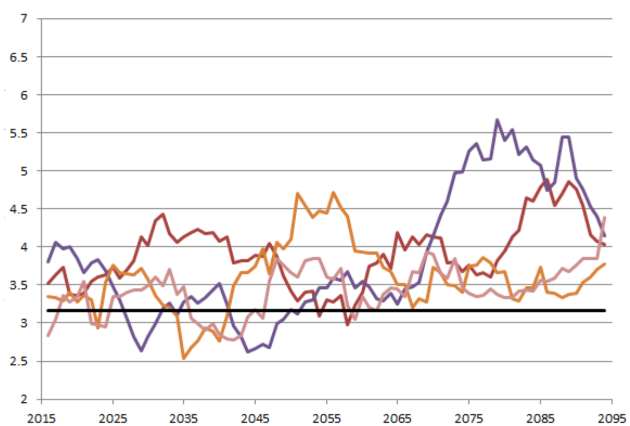
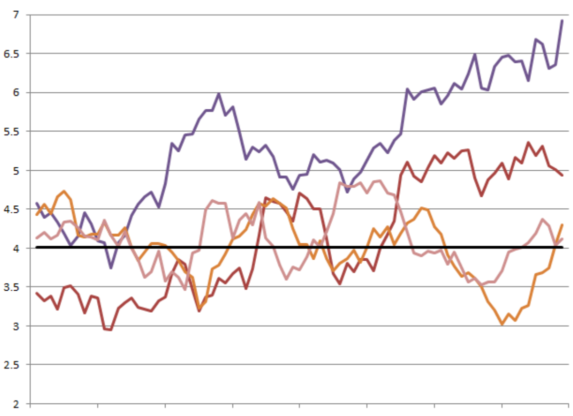
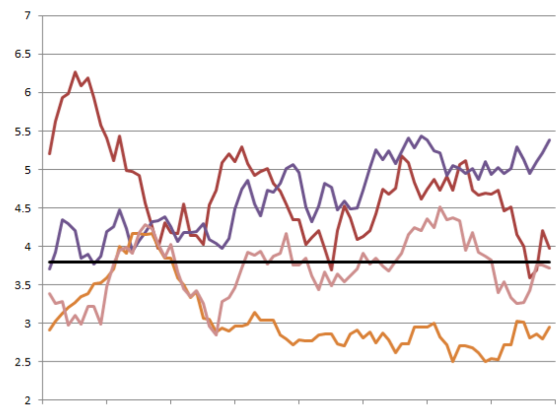






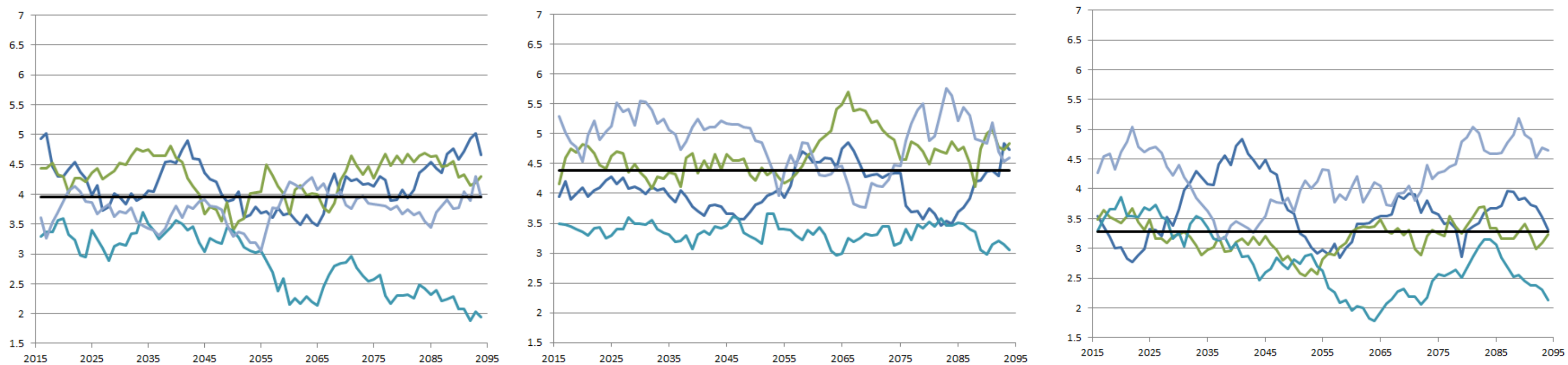
March

April

May

Summer Projected Precipitation Changes 2015 to 2095

High Emissions Models



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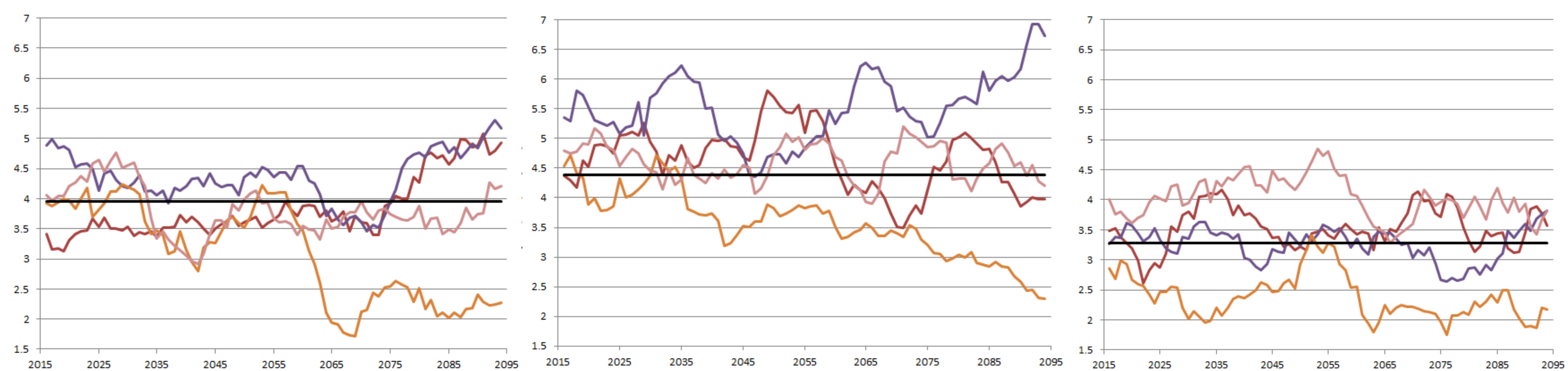
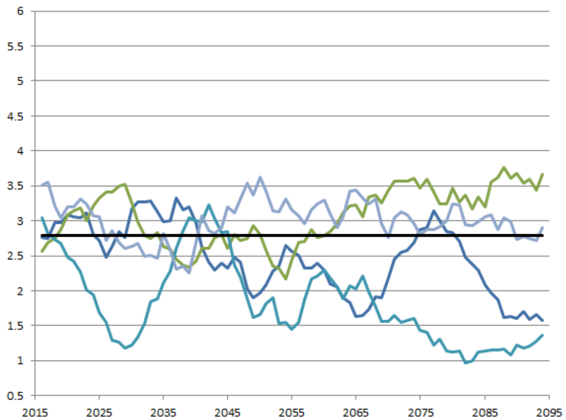
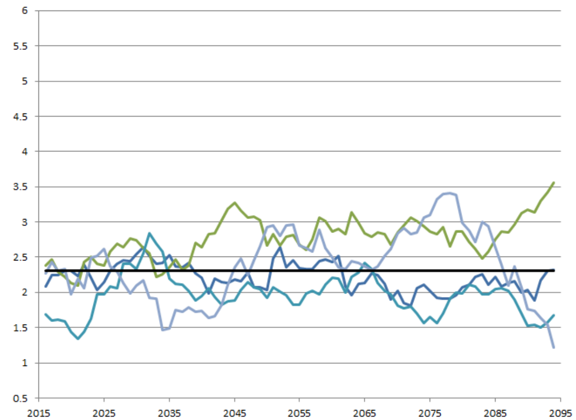


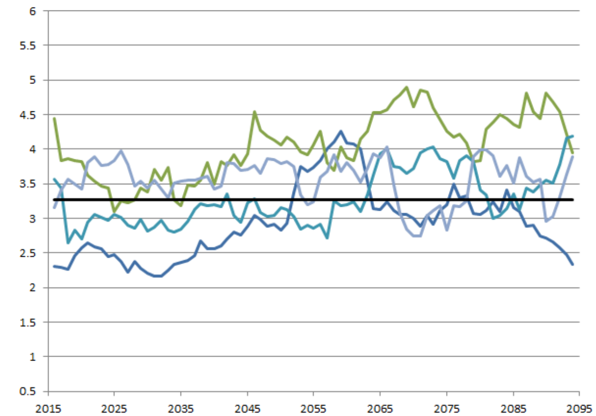
June | July | August

Autumn Projected Precipitation Changes 2015 to 2095

High Emissions Models







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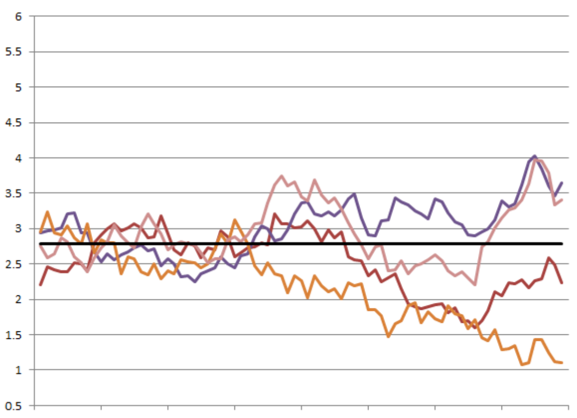
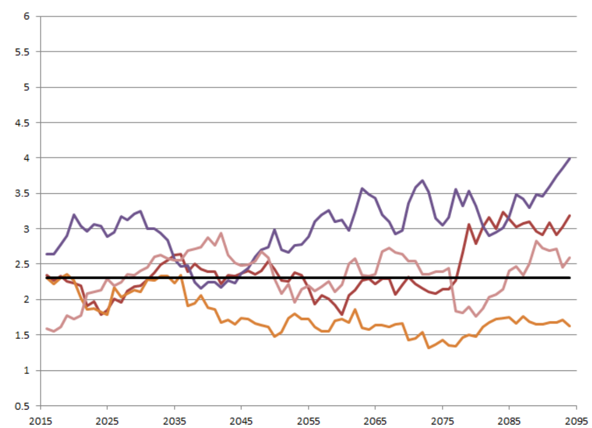
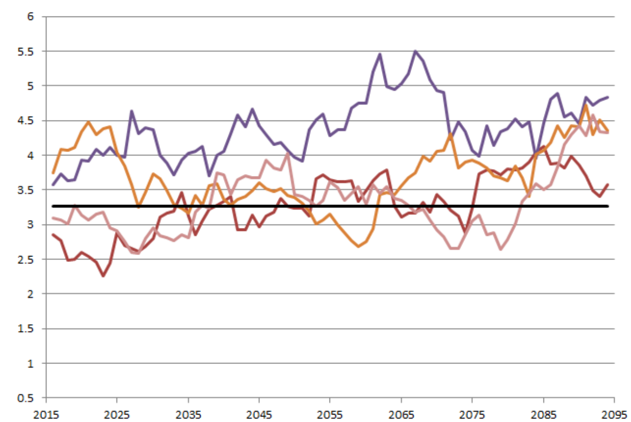






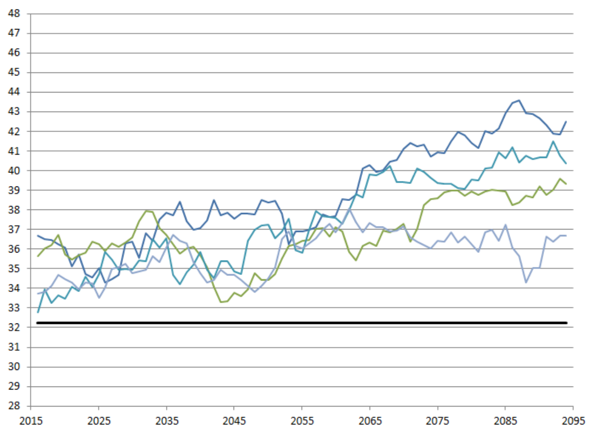
September

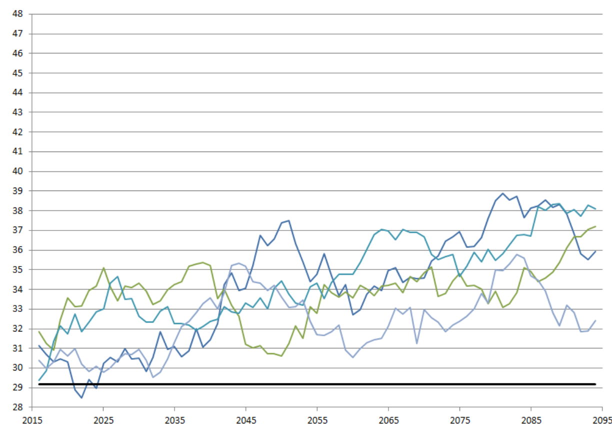
October

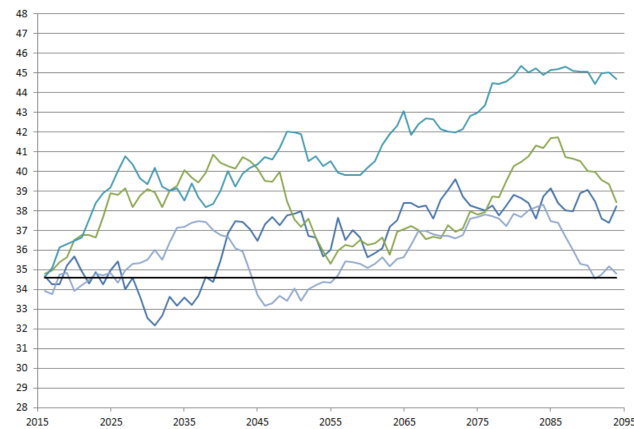
November

Winter Projected Temperature Changes 2015 to 2095

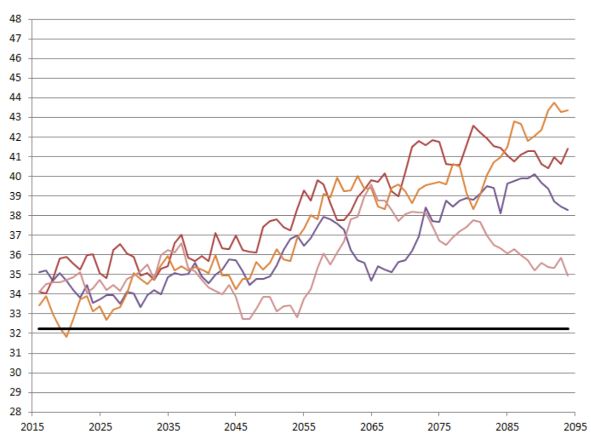
High Emissions Models



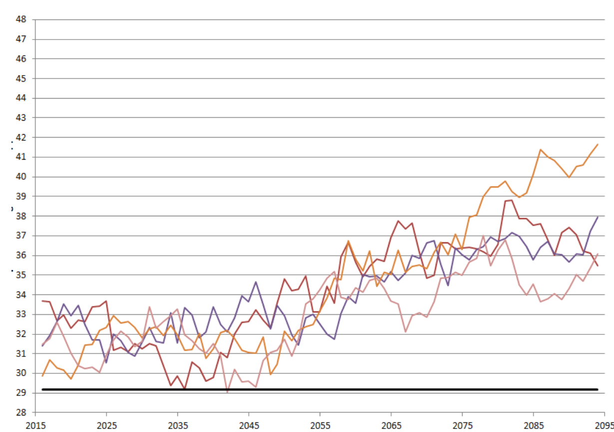




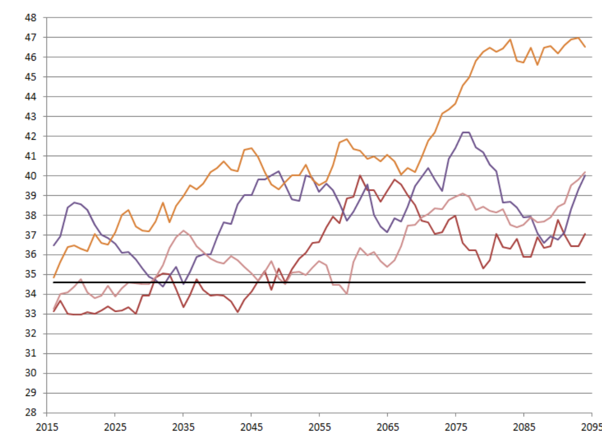
Medium Emissions Models



December



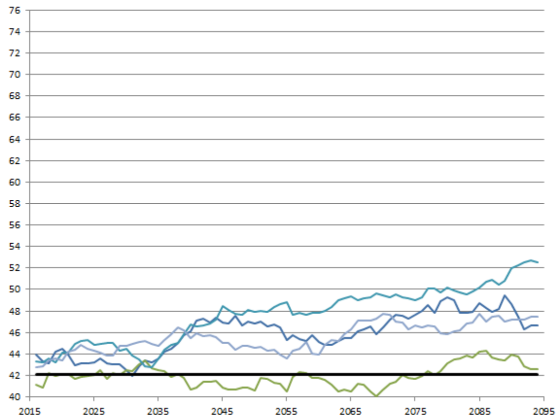
January

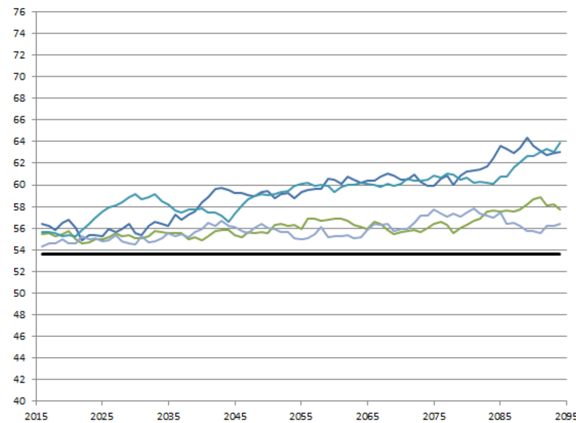


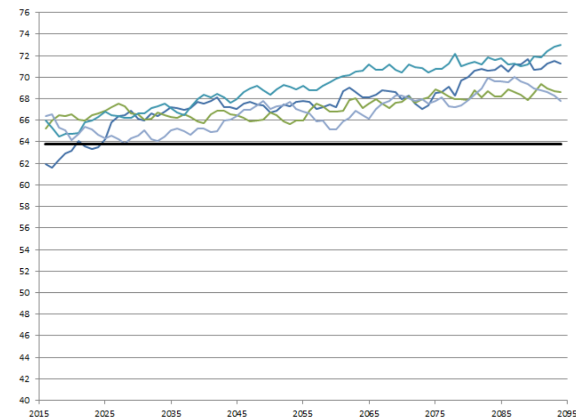
February

Spring Projected Temperature Changes 2015 to 2095

High Emissions Models







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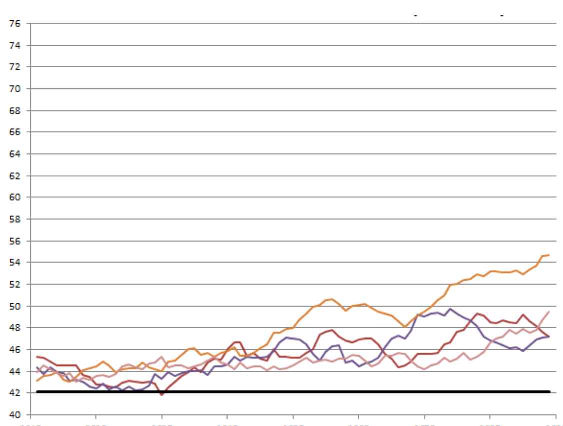
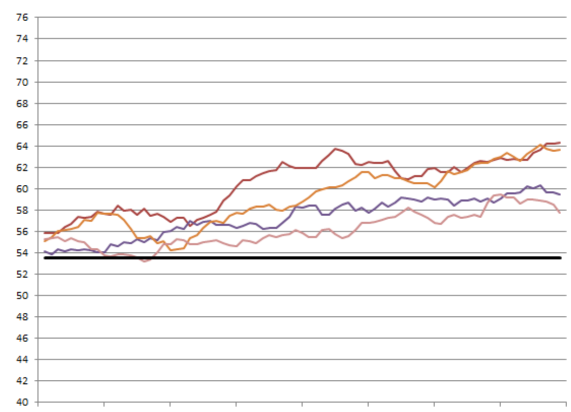
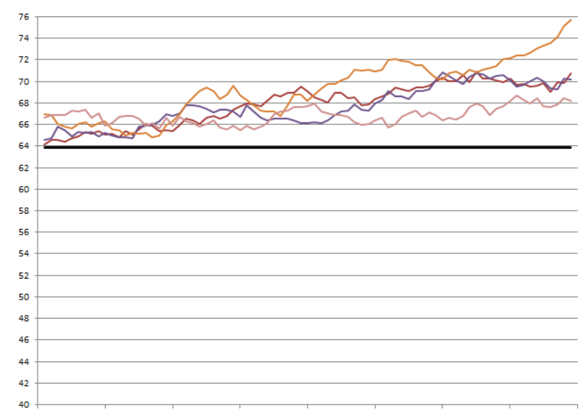


March



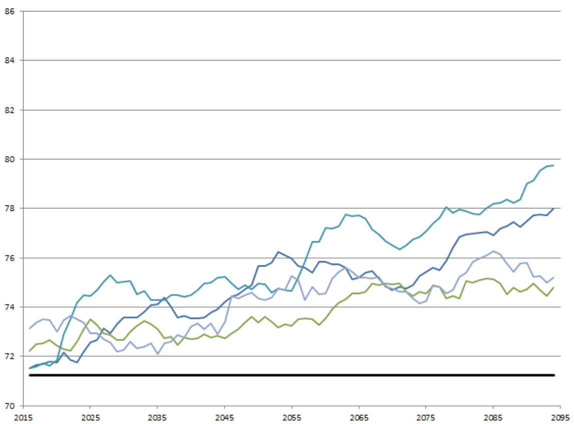
April

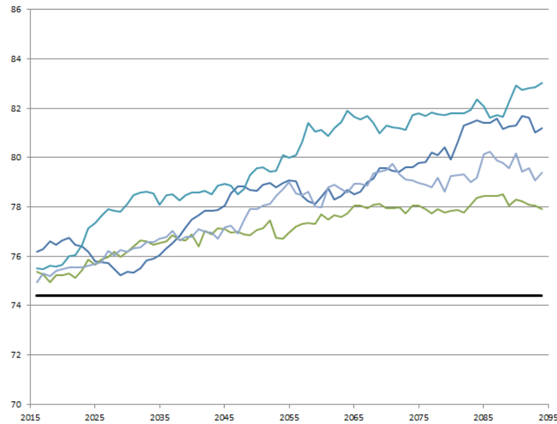


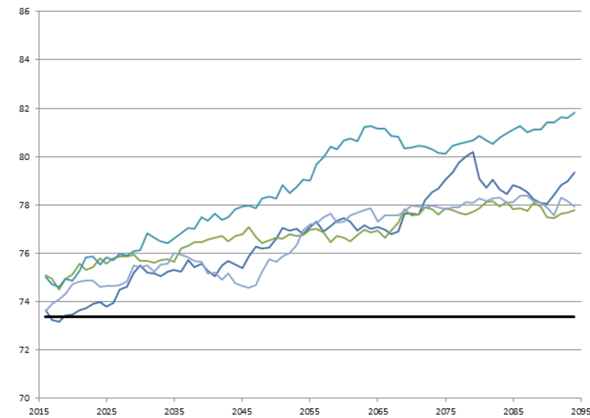
May

Summer Projected Temperature Changes 2015 to 2095

High Emissions Models







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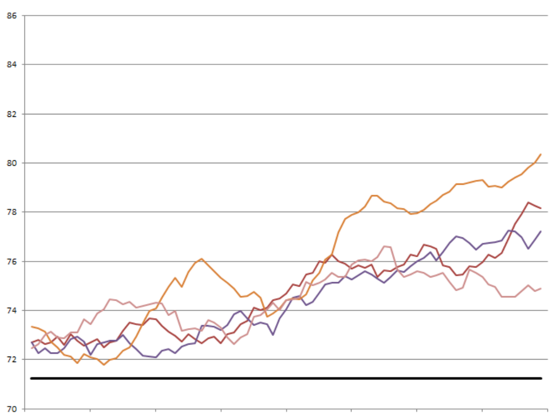
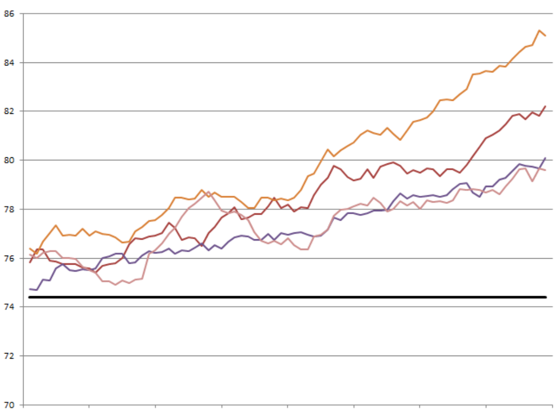
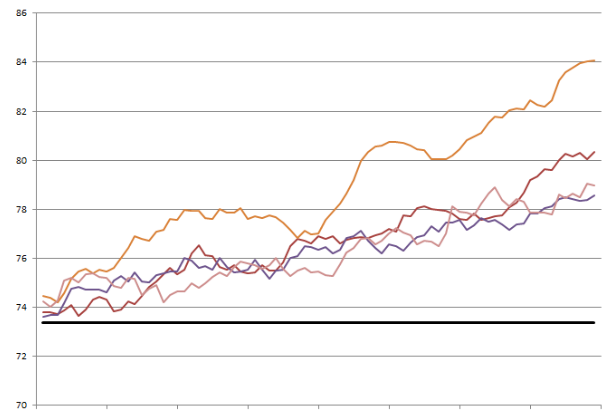


June



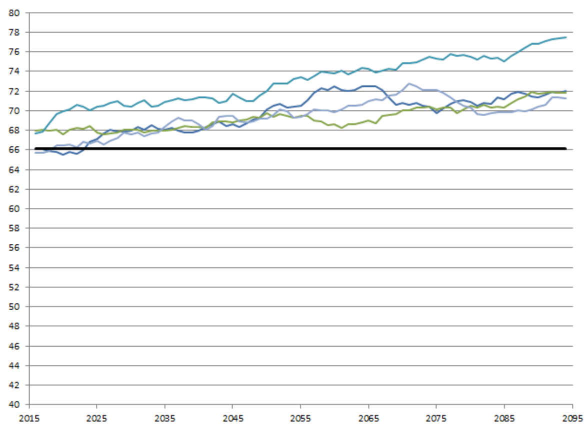
July

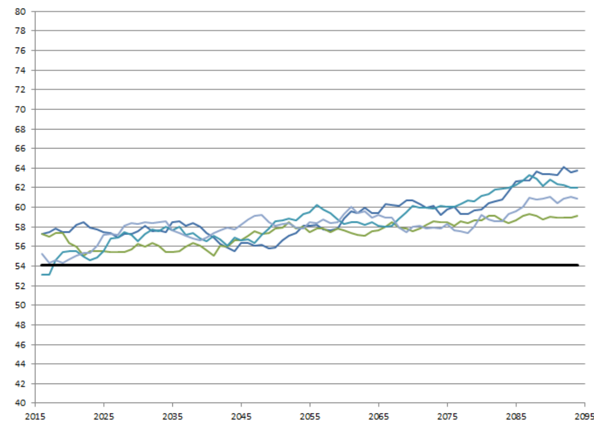


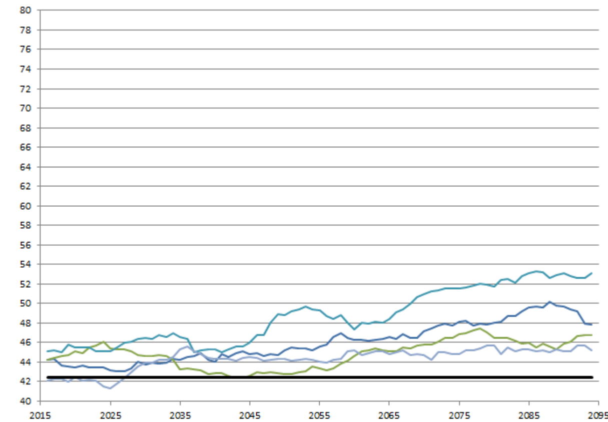
August

Autumn Projected Temperature Changes 2015 to 2095

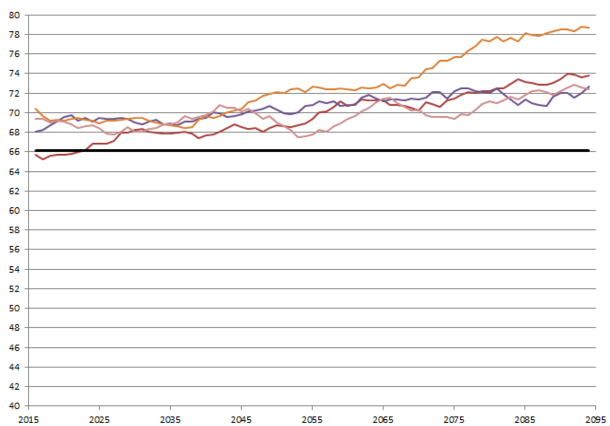
High Emissions Models



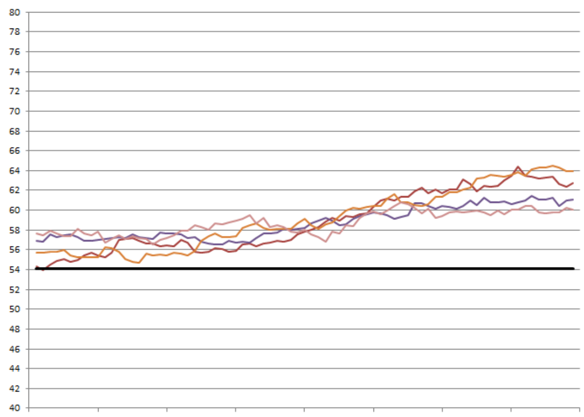




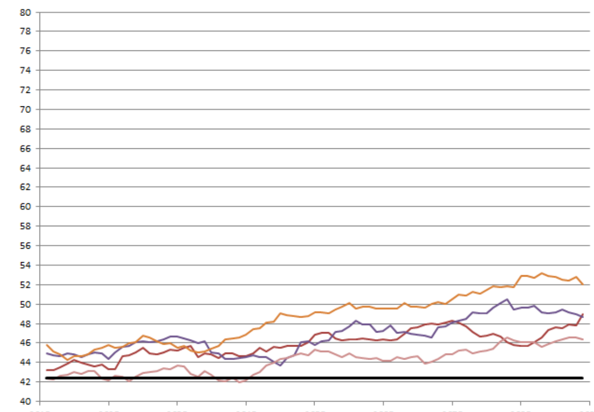
Medium Emissions Models



September

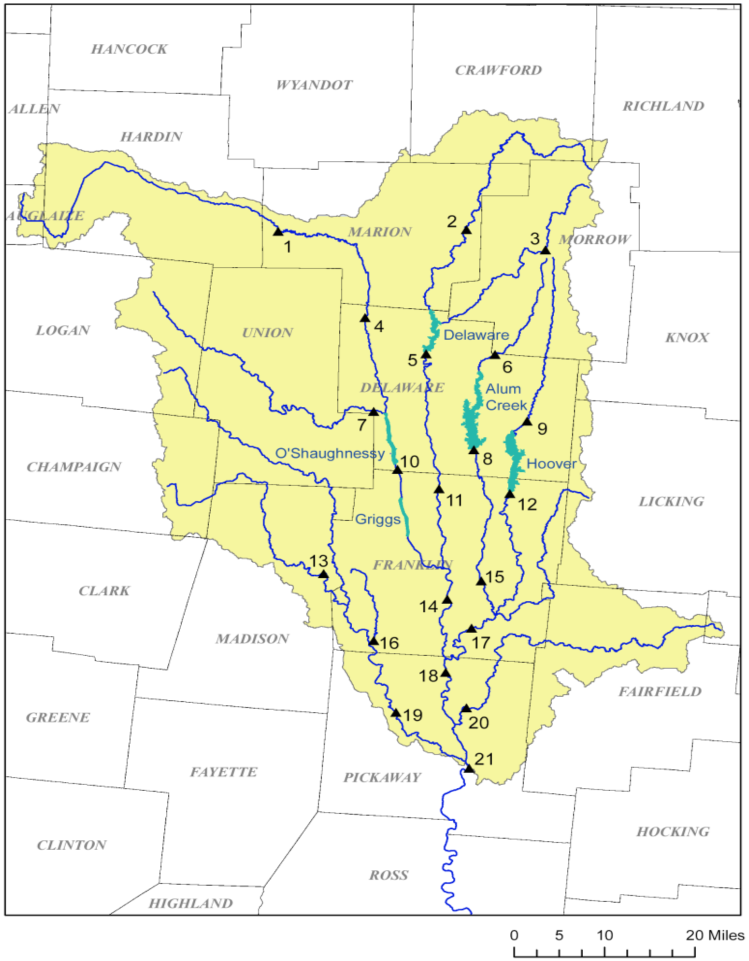


October



November

Water Inventory



Purpose of Water Inventory:

- High level calculation of water flow into and out of the watershed
- Provides a broad overview of the availability of surface water within the study area.
- Water flow into the watershed consists of precipitation and discharges into the rivers.
- Water flow out of the watershed includes evapotranspiration and withdrawals from the rivers and reservoirs

Water Inventory

- Climate has a significant impact on the water levels within the watershed
- The Upper Scioto River is at the top of the watershed, so precipitation is the primary source of water
- Temperature affects the evaporative water losses and the amount of water used

Water Inventory Development

- Inventories developed for current and projected water use & climate conditions
- Historical annual average precipitation & temperature
- Projected Inventory - Climate data from each climate models
  - Annual average precipitation & temperature for 8 potential future scenarios
  - 4 Models with high and low emission scenarios

Current Water Inventory

Average Annual Inflow	Average Annual Precipitation	Wastewater Treatment Plant Discharges	Total Inflow
Million Gallons	2,143,874	69,459	2,213,333
Average Annual Losses	**Evaporation**	**Withdrawals**	**Total Losses**
Million Gallons	1,658,413	61,981	1,720,393
Water Inventory/Balance = Total Inflow - Total Losses			
Net Balance - 2,213,333 - 1,720,393 = 492,940 Million Gallons			

2035 Water Inventories

Average Annual Inflow (Million Gallons)								
	Model 1	**Model 2**	**Model 4**	**Model 5**	**Model 7**	**Model 8**	**Model 10**	**Model 11**
Precipitation	2,571,917	1,647,871	1,927,933	2,451,828	1,853,344	2,092,732	2,347,636	2,052,175
Discharges	105,530	105,530	105,530	105,530	105,530	105,530	105,530	105,530
Total Inflow	**2,677,447**	**1,753,401**	**2,033,464**	**2,557,358**	**1,958,874**	**2,198,262**	**2,453,167**	**2,157,705**

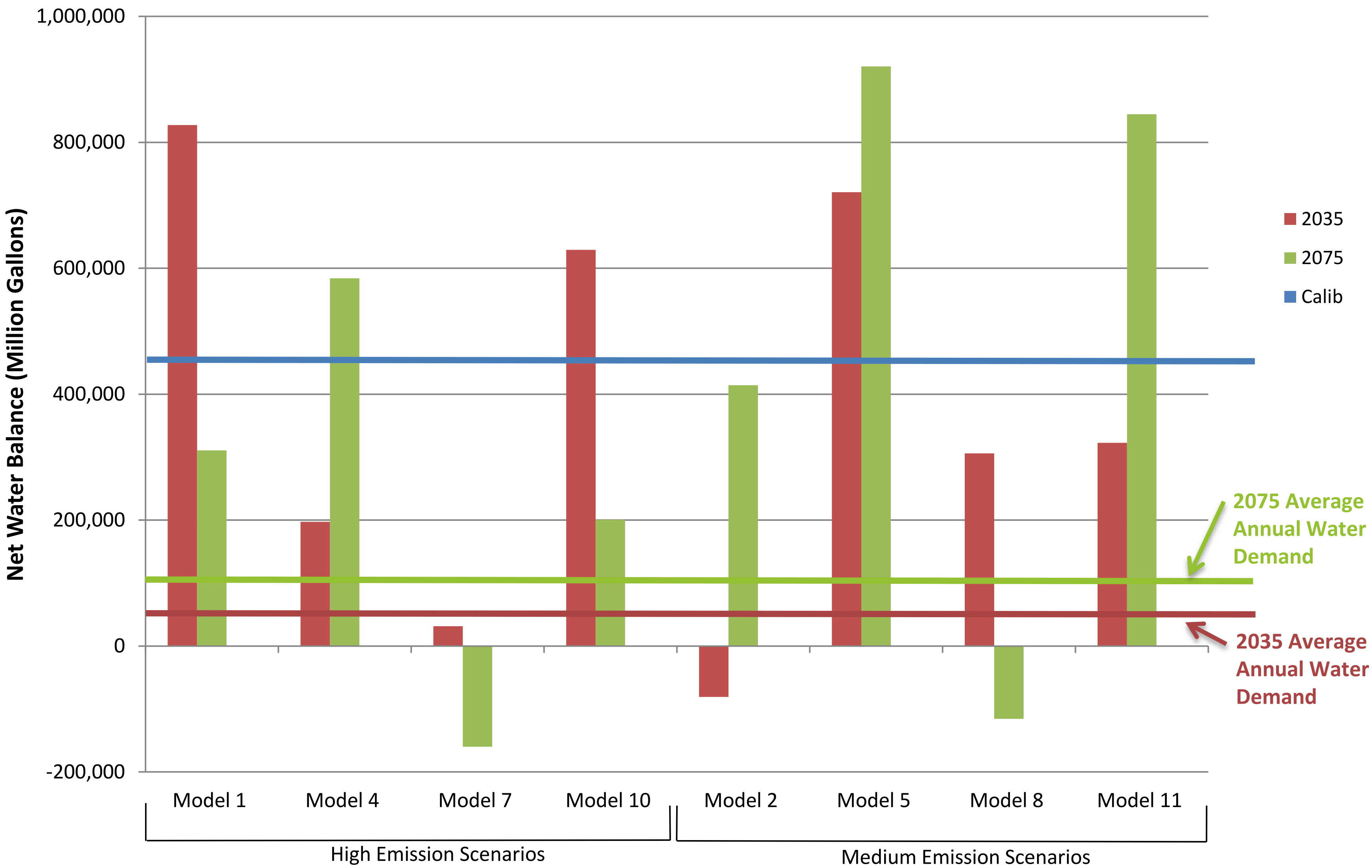
Average Annual Losses (Million Gallons)								
	Model 1	**Model 2**	**Model 4**	**Model 5**	**Model 7**	**Model 8**	**Model 10**	**Model 11**
Evaporation	1,780,136	1,764,380	1,766,066	1,766,583	1,857,259	1,822,294	1,754,026	1,765,043
Withdrawals	69,994	69,994	69,994	69,994	69,994	69,994	69,994	69,994
Total Losses	**1,850,129**	**1,834,374**	**1,836,060**	**1,836,577**	**1,927,253**	**1,892,287**	**1,824,020**	**1,835,037**
Net Balance	**827,318**	**-80,973**	**197,404**	**720,781**	**31,621**	**305,974**	**629,147**	**322,668**

2075 Water Inventories

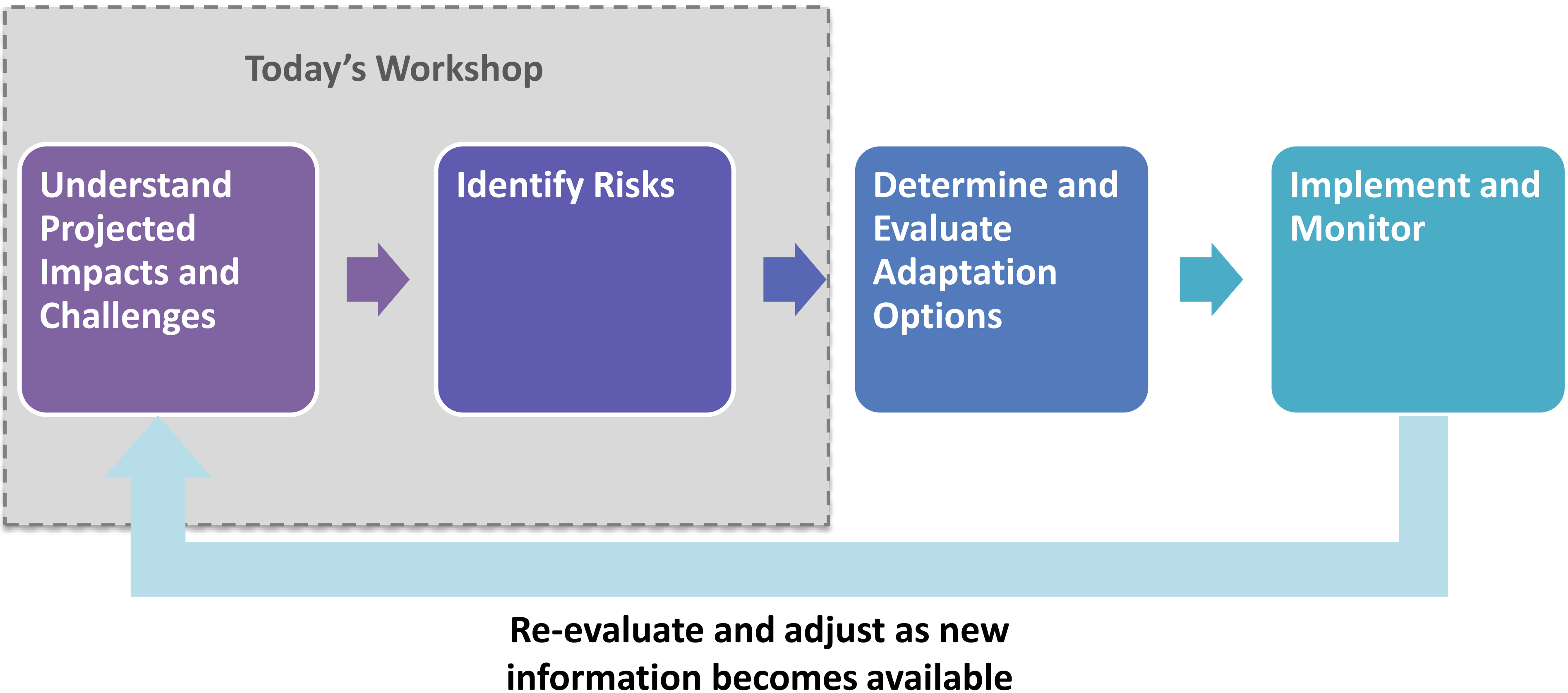
Average Annual Inflow (Million Gallons)								
	Model 1	Model 2	Model 4	Model 5	Model 7	Model 8	Model 10	Model 11
Precipitation	2,229,251	2,341,584	2,392,503	2,806,999	1,871,926	1,959,369	2,041,457	2,677,267
Discharges	177,737	177,737	177,737	177,737	177,737	177,737	177,737	177,737
Total Inflow	**2,406,988**	**2,519,322**	**2,570,241**	**2,984,737**	**2,049,663**	**2,137,107**	**2,219,194**	**2,855,004**

Average Annual Losses (Million Gallons)								
	Model 1	Model 2	Model 4	Model 5	Model 7	Model 8	Model 10	Model 11
Evaporation	1,965,303	1,974,149	1,855,301	1,933,255	2,078,802	2,121,913	1,888,020	1,879,627
Withdrawals	130,888	130,888	130,888	130,888	130,888	130,888	130,888	130,888
Total Losses	**2,096,191**	**2,105,037**	**1,986,189**	**2,064,143**	**2,209,690**	**2,252,801**	**2,018,908**	**2,010,515**
Net Balance	**310,797**	**414,285**	**584,052**	**920,594**	**-160,027**	**-115,694**	**200,286**	**844,489**

Net Water Inventory

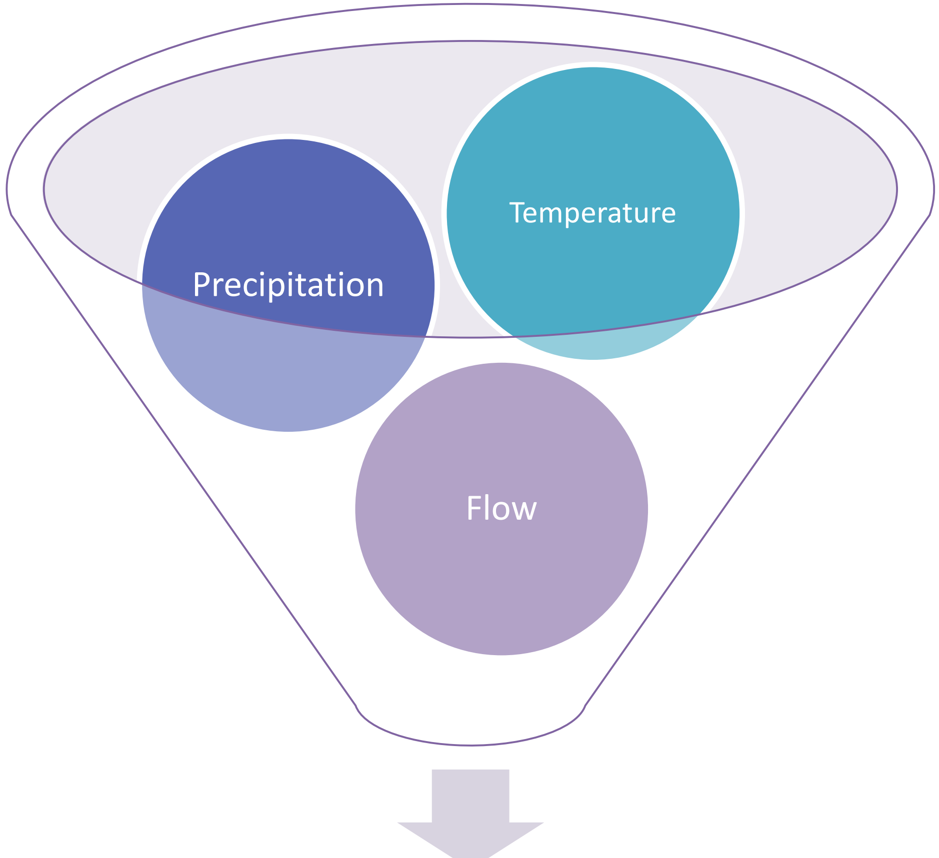


Adaptive Management Strategies



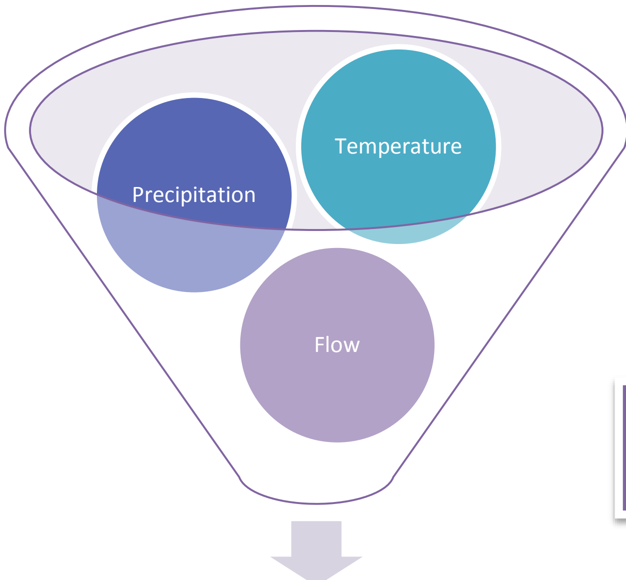
Understand Projected Impacts and Challenges

Projected or Potential Changes in these factors



Projected or Potential Future Challenges

Identify Risks Caused by Predicted Impacts

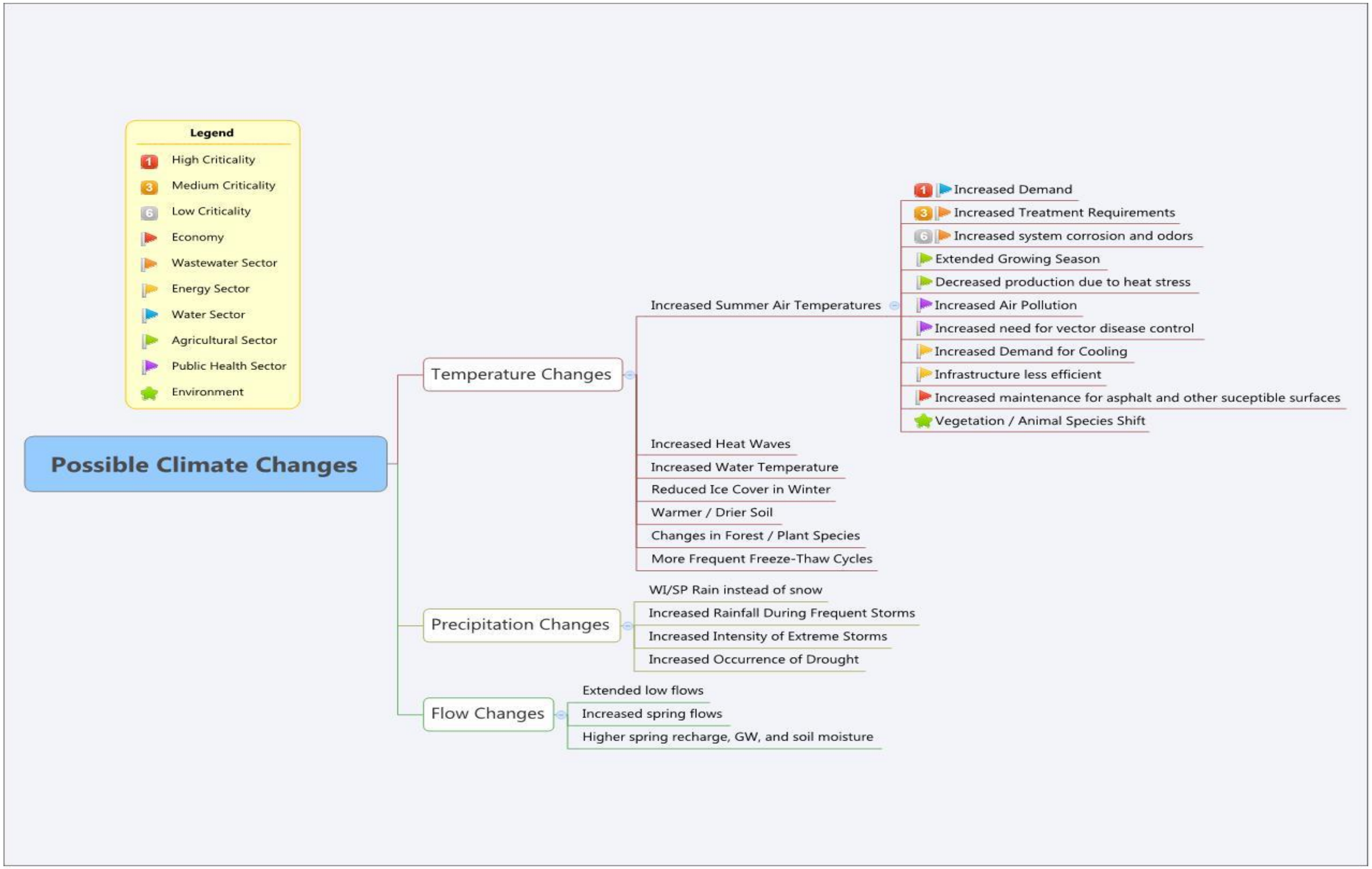


Projected or Potential Future Challenges

Water Production	Wastewater Treatment
Environment	Public Health
Economy	Energy

Risk and Impacts

Identify Risks Caused by Predicted Impacts



Questions?

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Water Inventory Development

- Withdrawals from the watershed were based on historical water demands

- Future water use demands were used to represent the water withdrawals for 2035 and 2075.