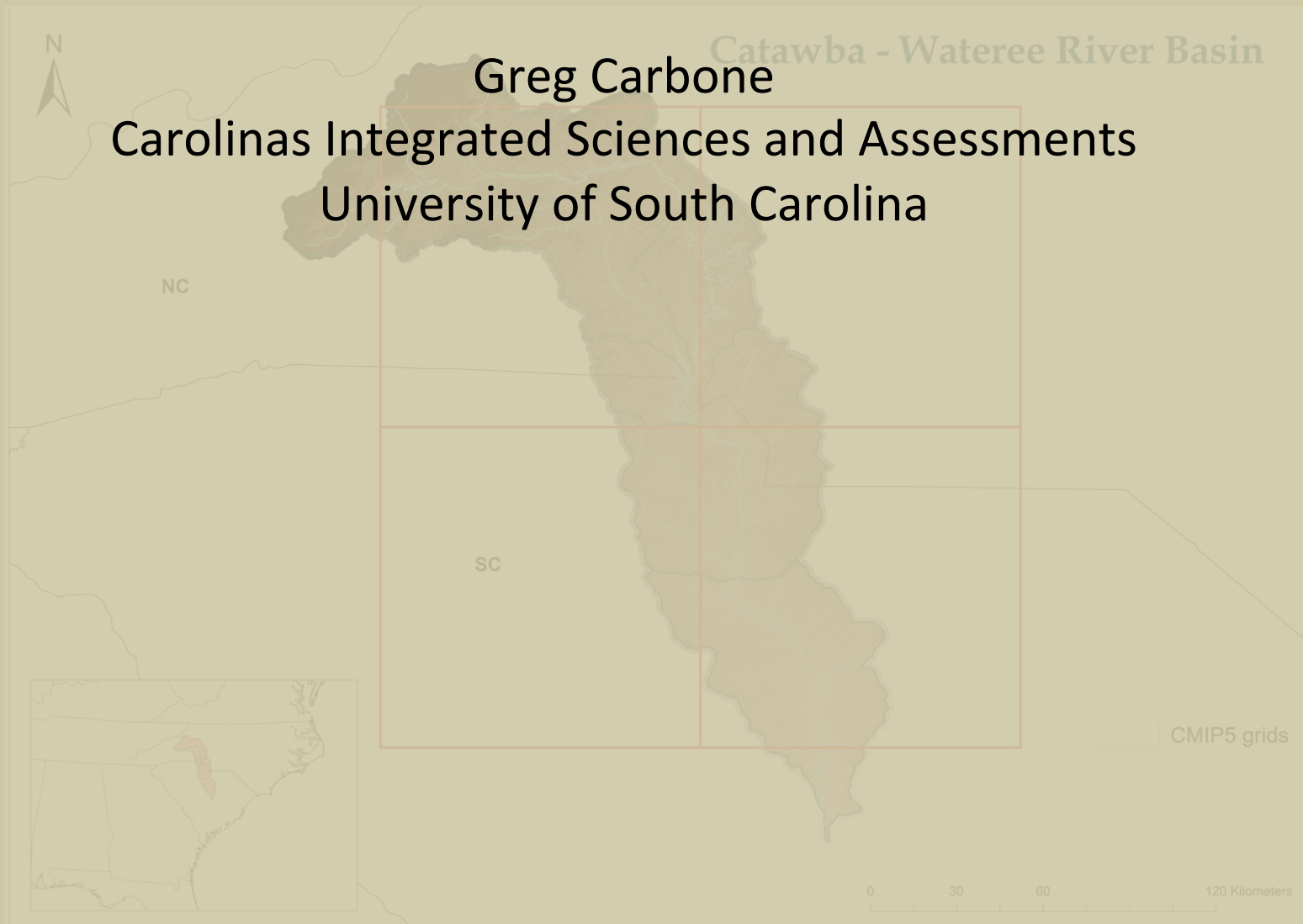
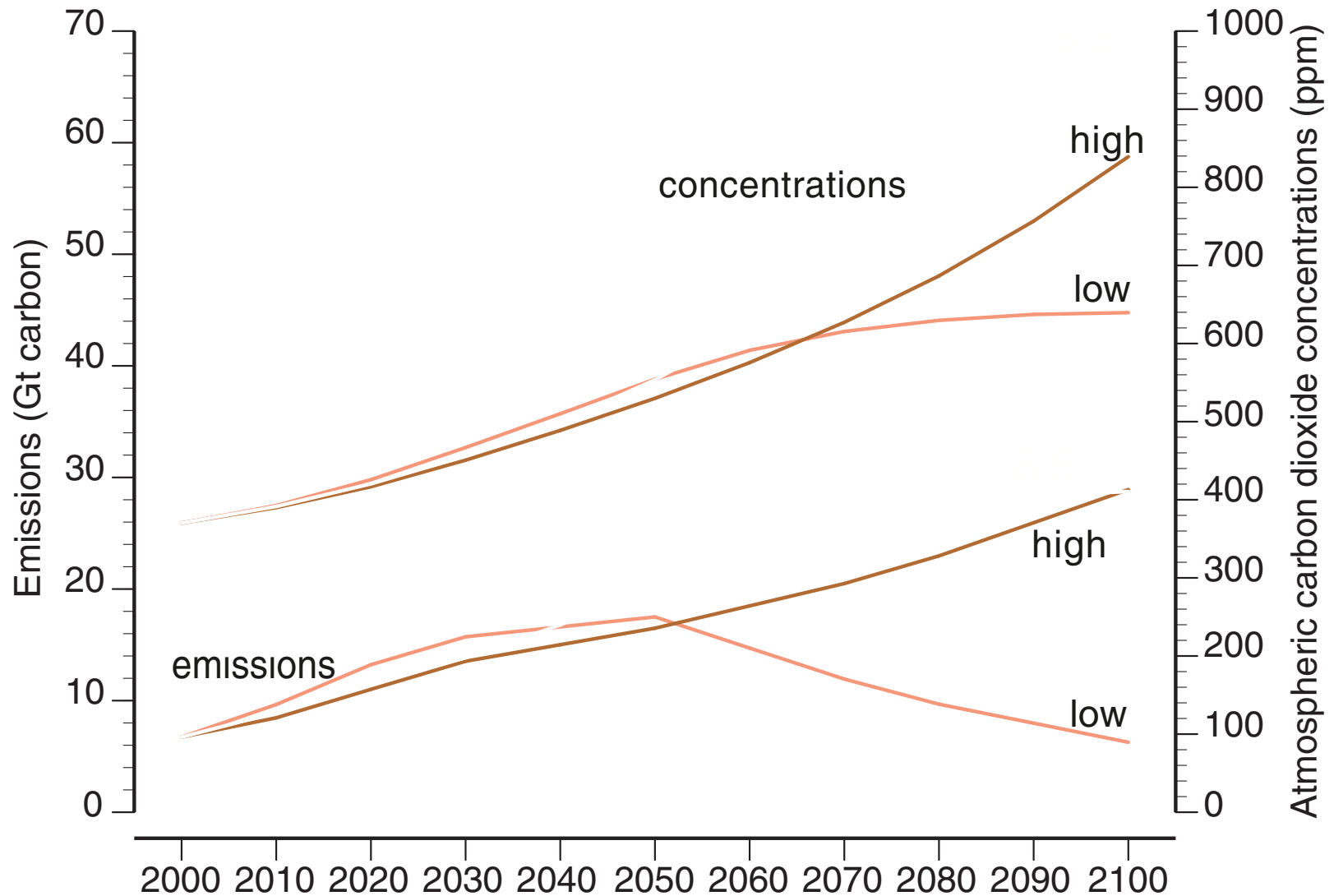


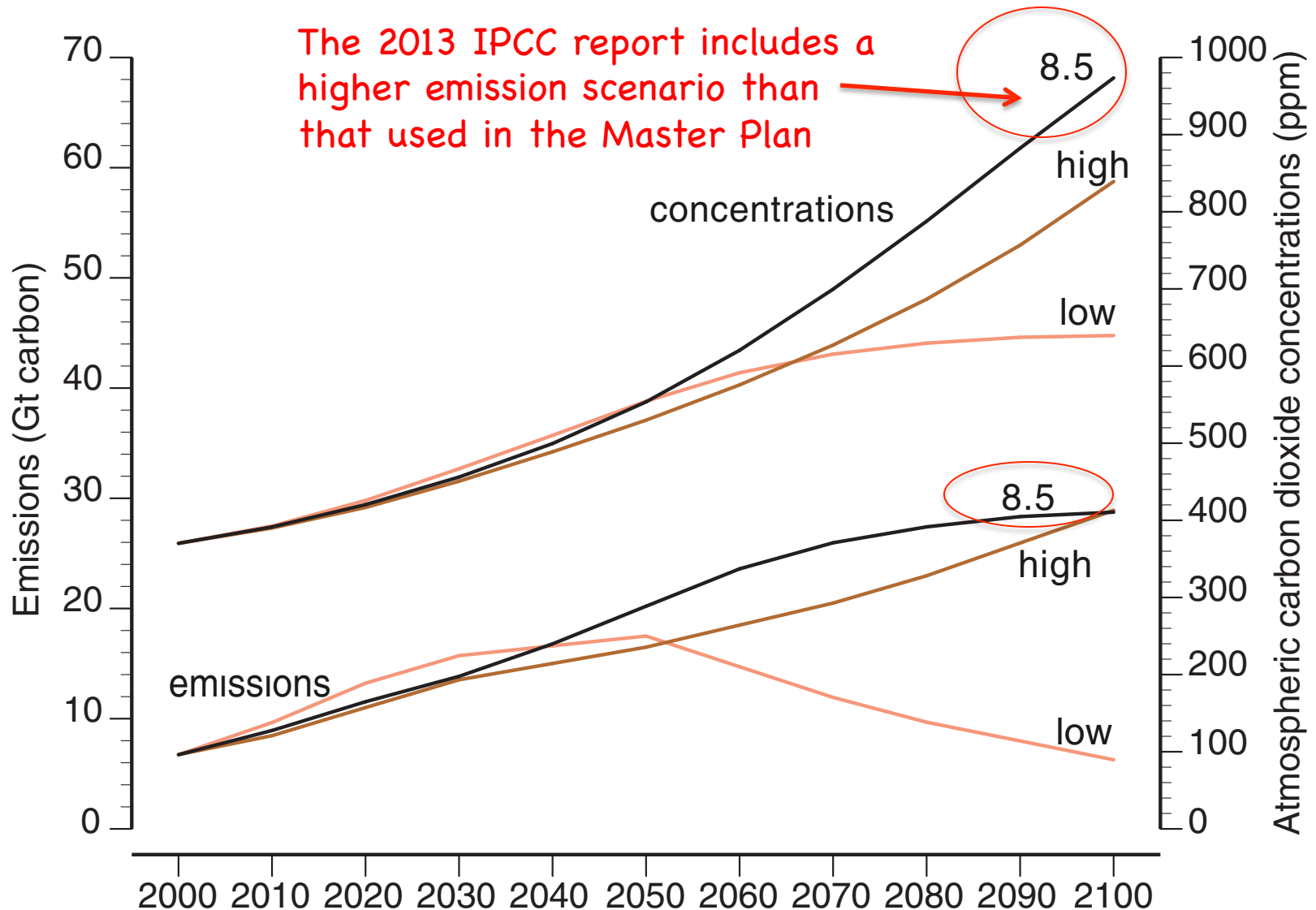
Climate Change and the Catawba-Wataree Basin



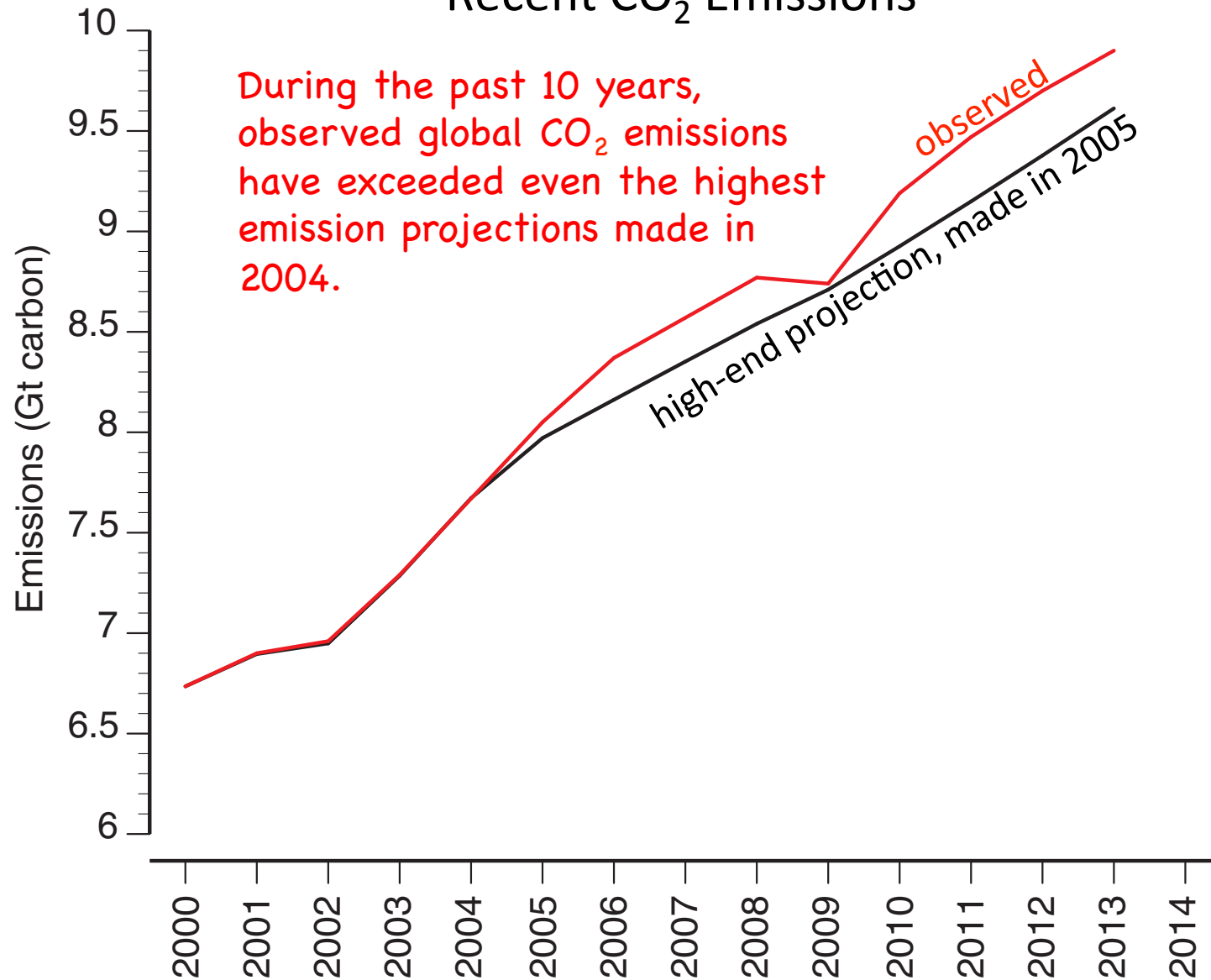
CO₂ Emissions Scenarios used in the C-W Water Supply Master Plan



CO₂ Emissions Scenarios



Recent CO₂ Emissions



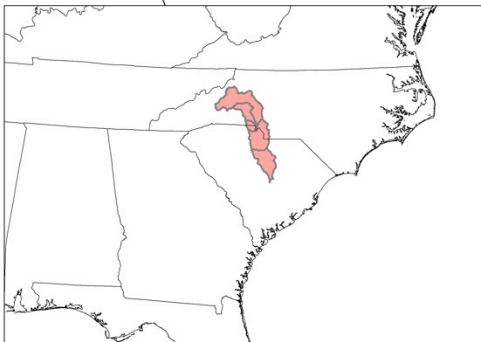
Catawba - Wateree River Basin



NC

SC

CMIP5 grids



0 30 60 120 Kilometers

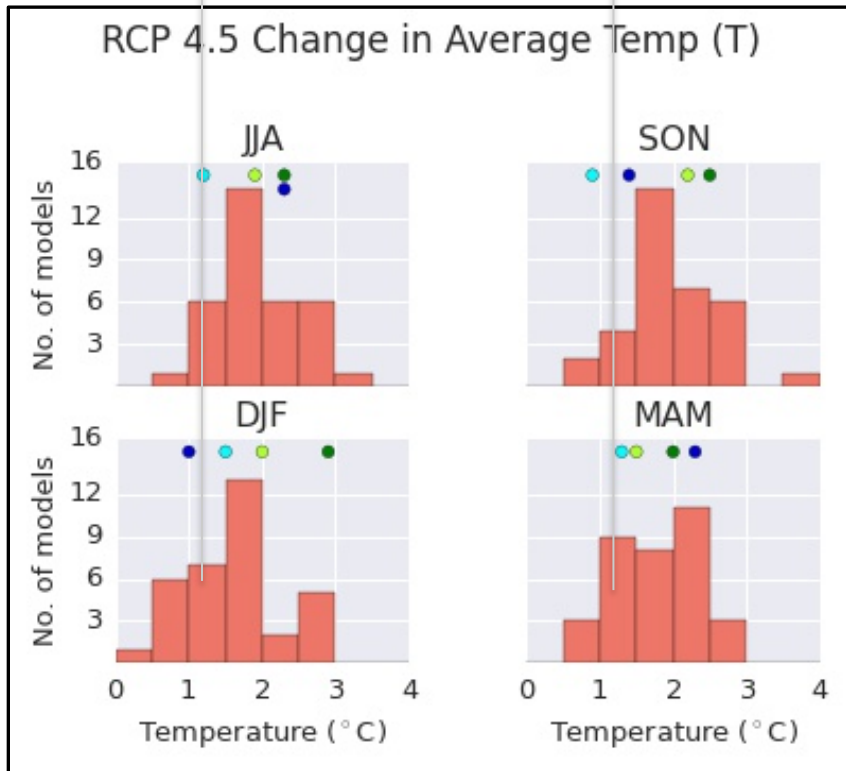
Climate change scenarios used in Water Supply Master Plan

Variable	CC-02 (by year 2065)	CC-03 (by year 2065)
Temperature	6.5°F (3.6°C)	2.7°F (1.5°C)
Precipitation	no change	-10%
Reservoir Evaporation	+22%	+9%
Inflow	-5.4%	-22%

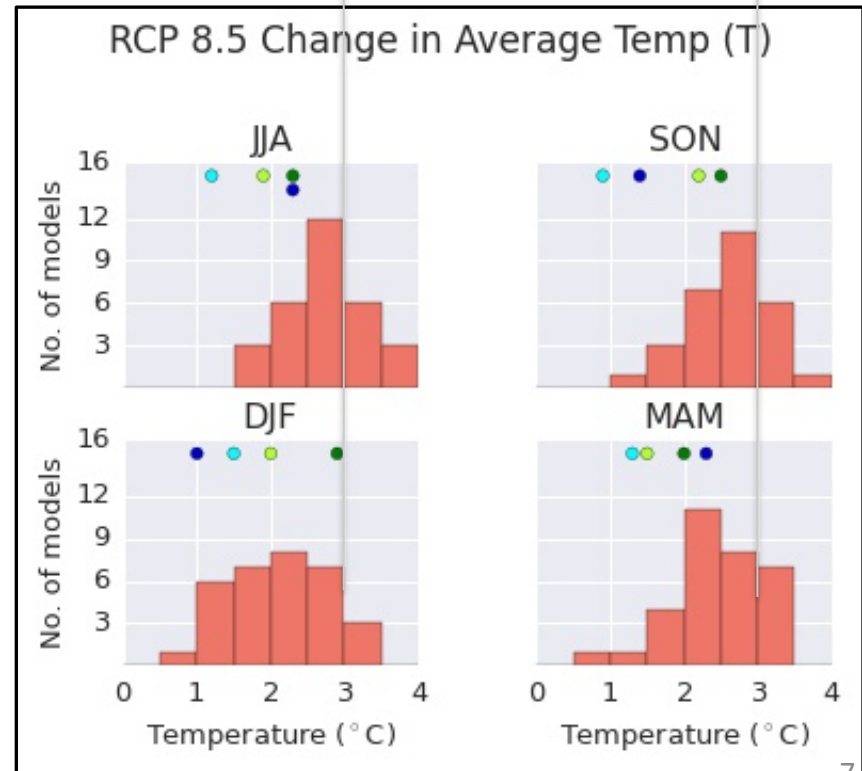
Average Temperature

Change in 2041-2070 relative to 1981-2010

Projected temperature changes from general circulation models show mid-century warming ranging from 1 to 4°C depending on season and climate model. This is commensurate with the 6.5°F (3°C) temperature change shown in the high-end scenario depicted in the Master Plan.



WSMP CC-02: 2.7°F in 2065

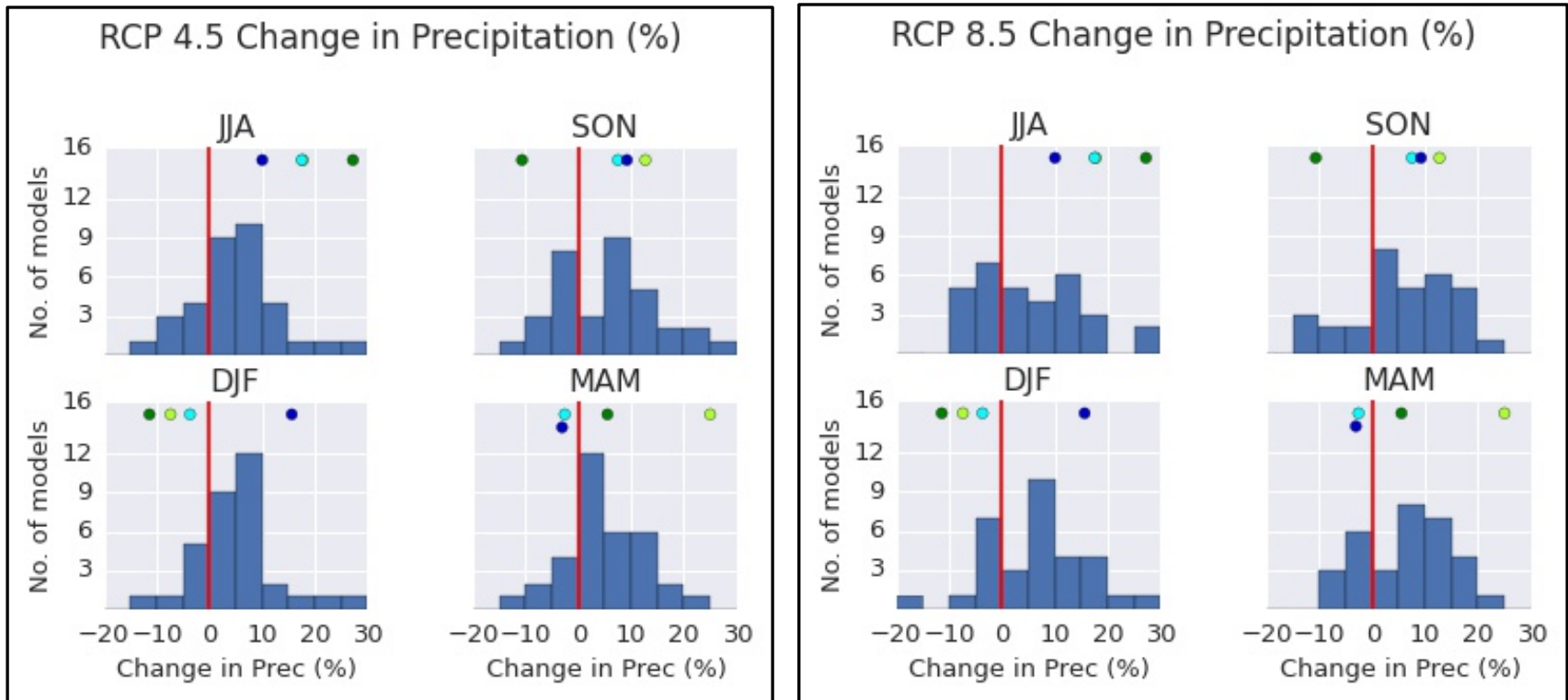


WSMP CC-03: 6.5°F in 2065

Precipitation

Change in 2041-2070 relative to 1981-2010

Projected precipitation changes from general circulation models show a wide range (from 20% drier to 30% wetter) depending on season and climate model.

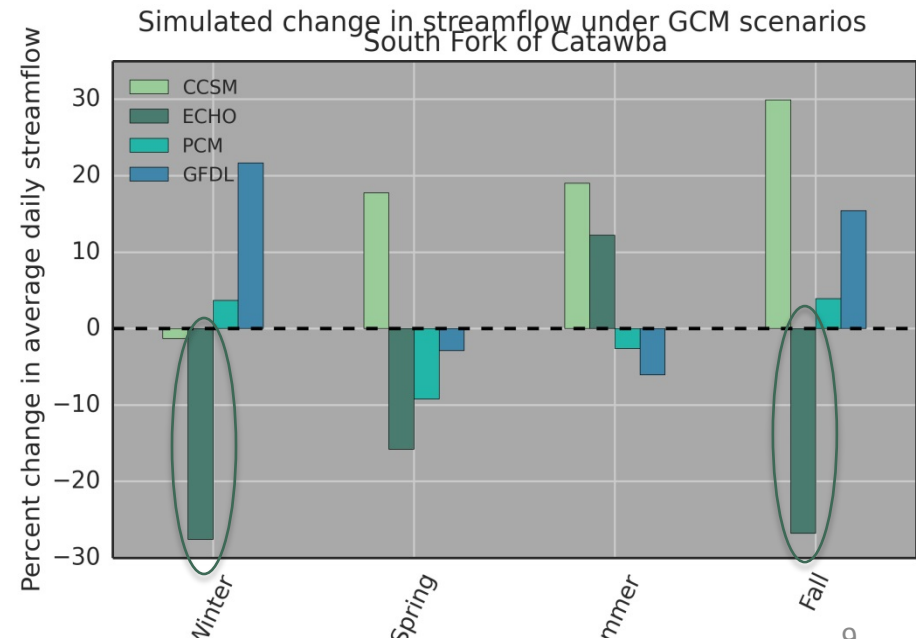


Examination of 100-year historic records and climate model projections (not shown) suggest some evidence for more intense precipitation in recent years and in the future.

Seasonal streamflow simulated with the Hydrological Simulation Program – FORTRAN model. Output from four climate models provide meteorological inputs for years 2051-2070. Streamflow changes can be specific depending on season and model.

HSPF simulations, 2051-2070

	South Fork of Catawba				
	Temp (°C)	Prec (%)		Temp (°C)	Prec (%)
CCSM3			PCM		
Winter	2.0	-7.4	Winter	1.5	-3.7
Spring	1.5	25.0	Spring	1.3	-2.6
Summer	1.9	17.7	Summer	1.2	17.5
Fall	2.2	12.7	Fall	0.9	7.5
ECHO-2			GFDL		
Winter	2.9	-11.4	Winter	1.0	15.6
Spring	2.0	5.5	Spring	2.3	-3.1
Summer	2.3	27.2	Summer	2.3	10.0
Fall	2.5	-10.7	Fall	1.4	9.2



Climate change scenarios used in Water Supply Master Plan

Variable	CC-02 (by year 2065)	CC-03 (by year 2065)
Temperature	6.5°F (3.6°C) ✓	2.7°F (1.5°C)
Precipitation	no change ok, but not worst case	-10%
Reservoir Evaporation	+22% ✓	+9%
Inflow	-5.4%?	-22%

This value seems low relative to our work, but CHEOPS does not consider basin ET?

No water use change

? (if per capita, this may be fine, but overall would undoubtedly rise in future)