Recap of Water Withdrawals and Projections

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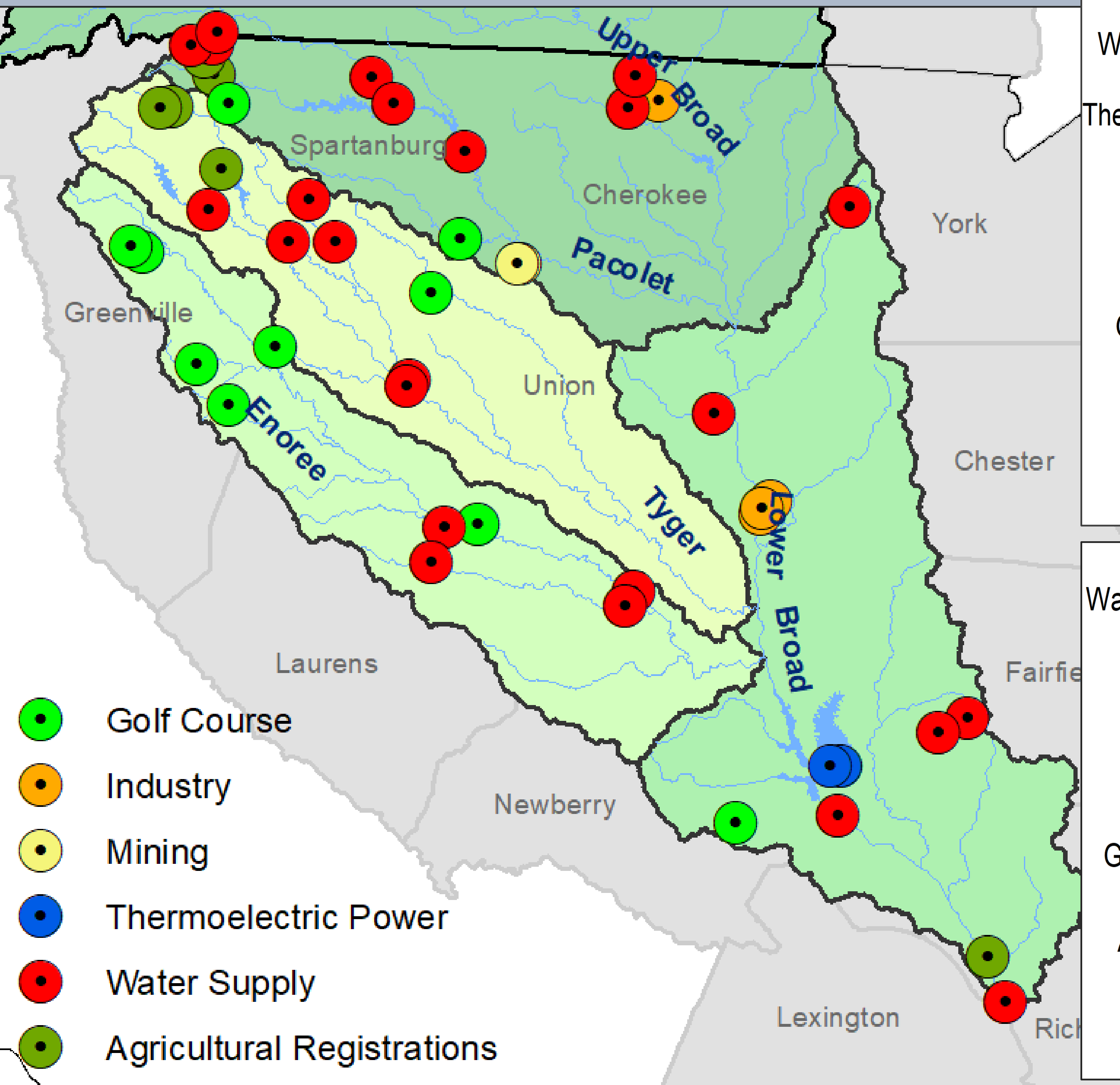
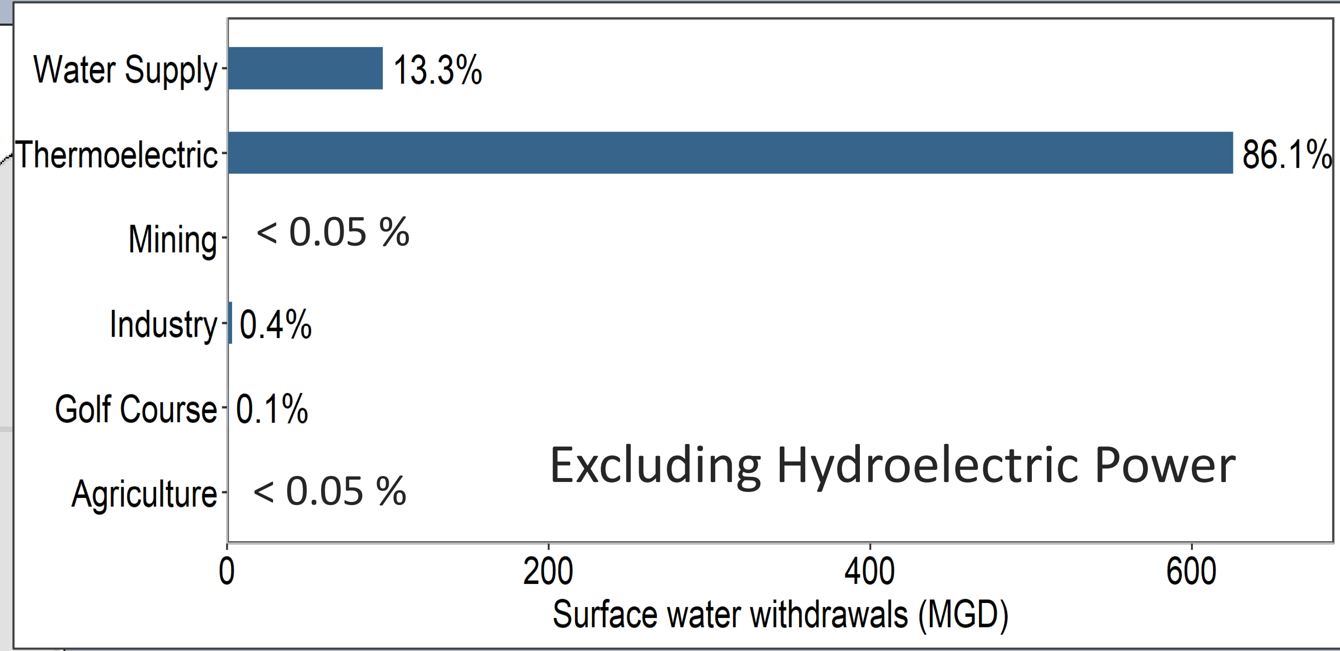
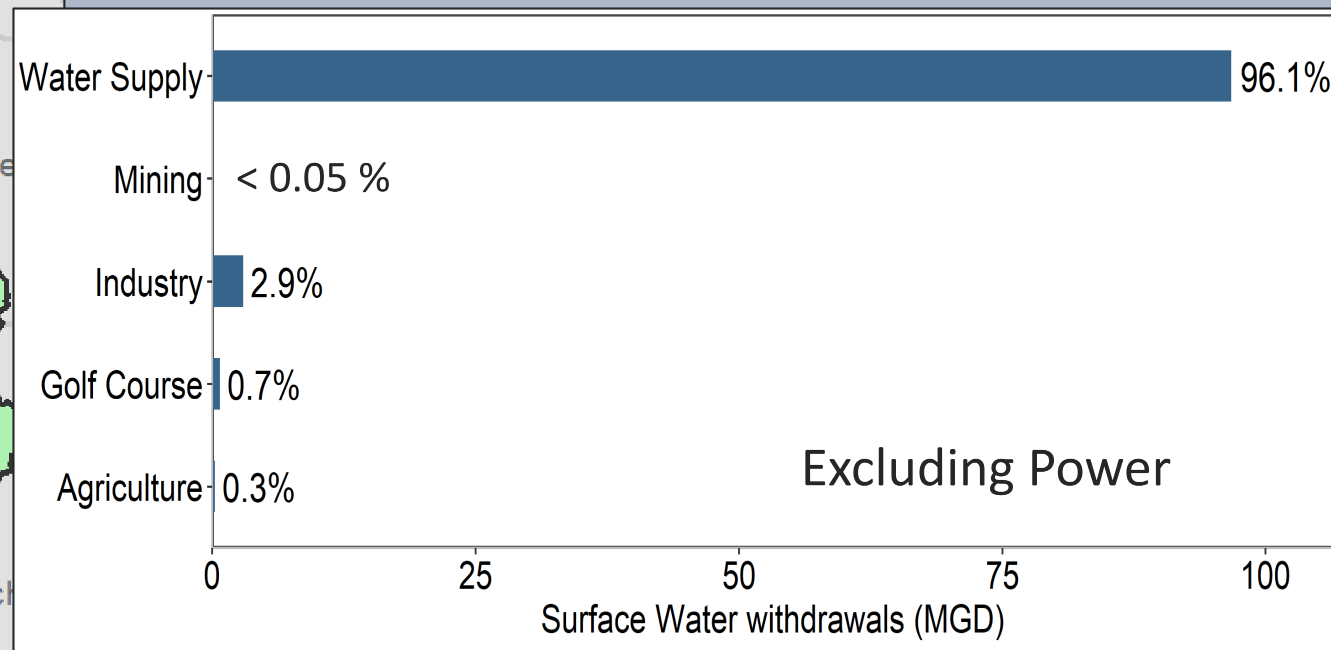
Broad River Basin Council – Meeting #5
August 10th, 2022

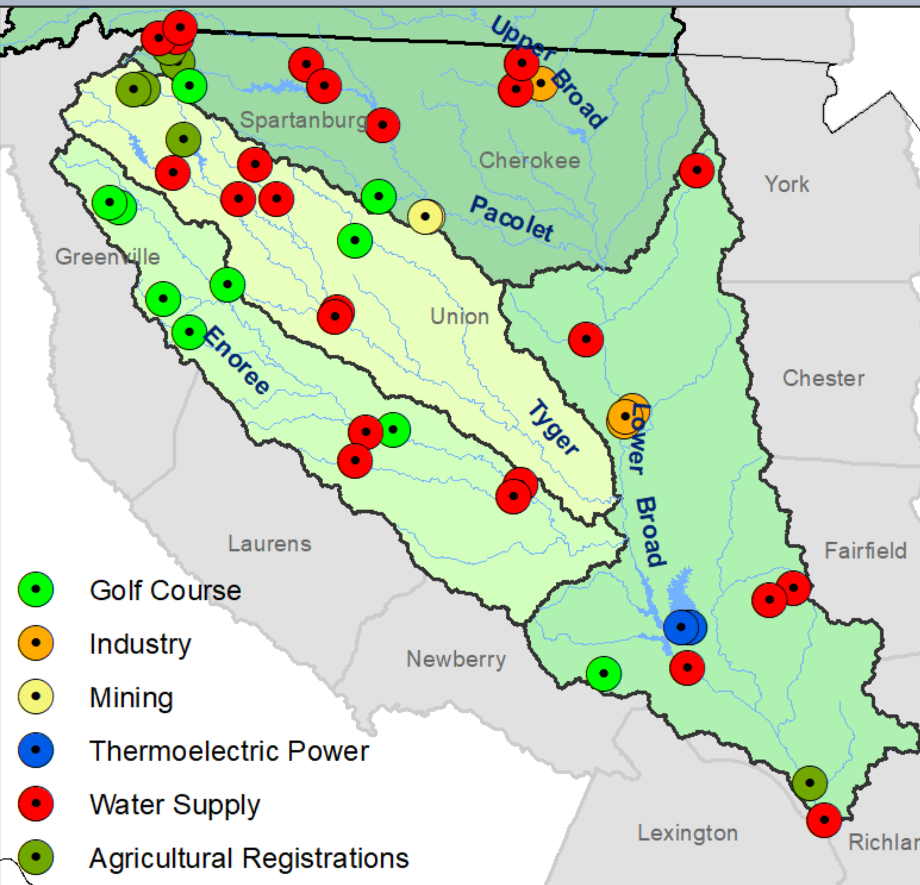
Reported Surface Water Withdrawals by Category in 2021



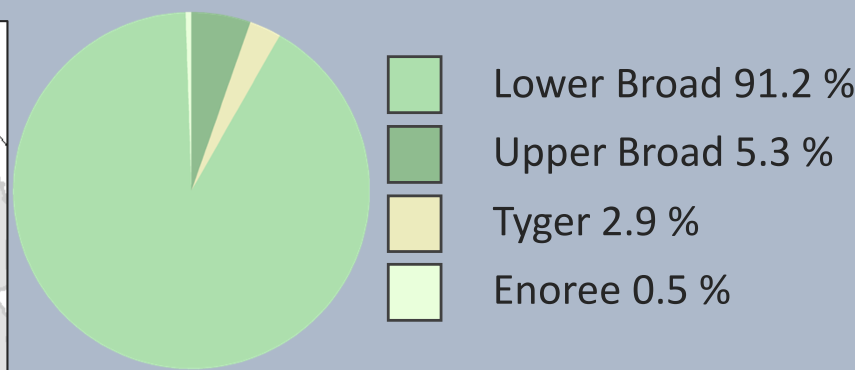




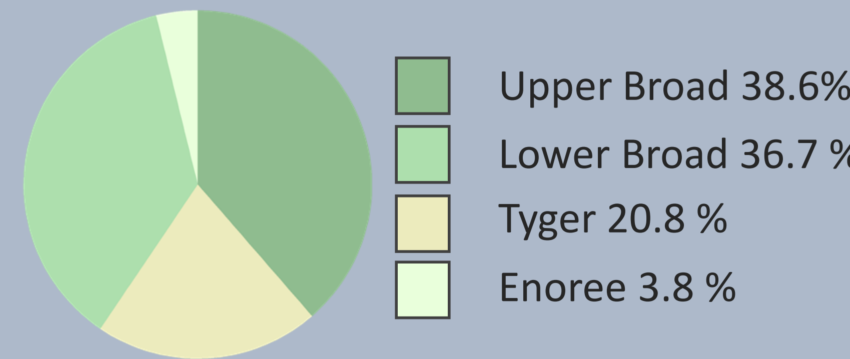
Reported Surface Water Withdrawals by Sub-Basin in 2021



Excluding Hydroelectric Power



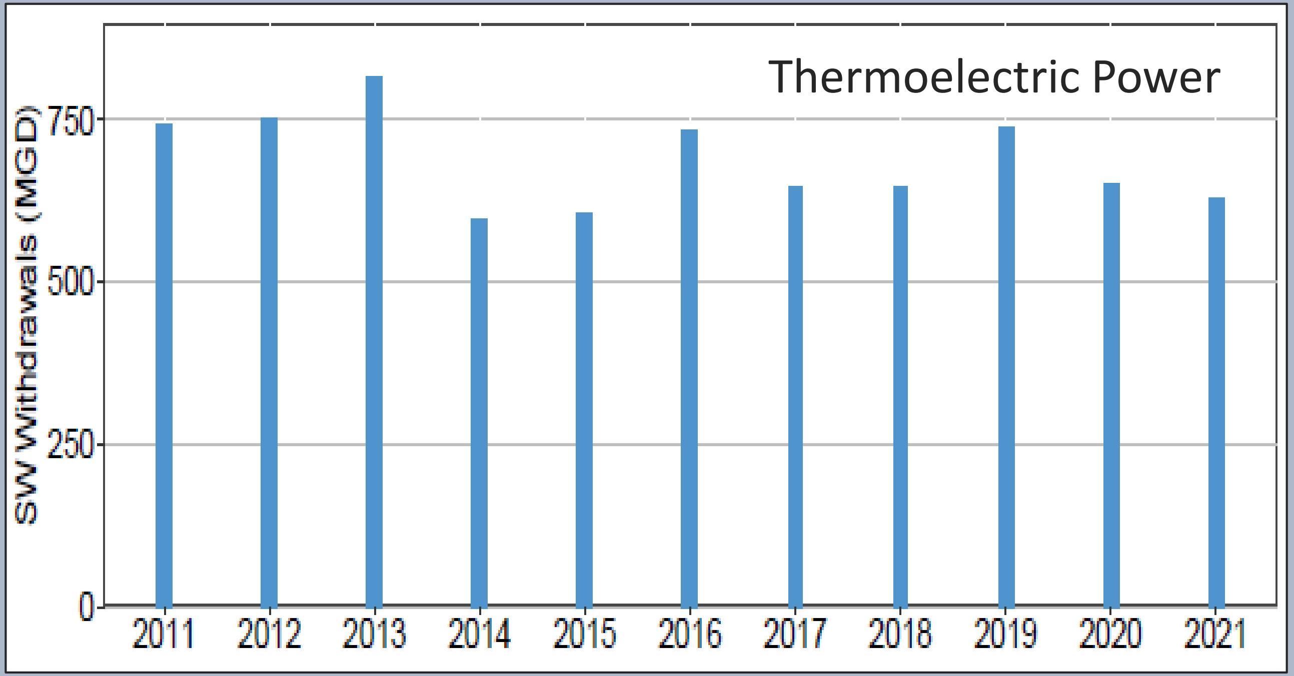
Excluding Power

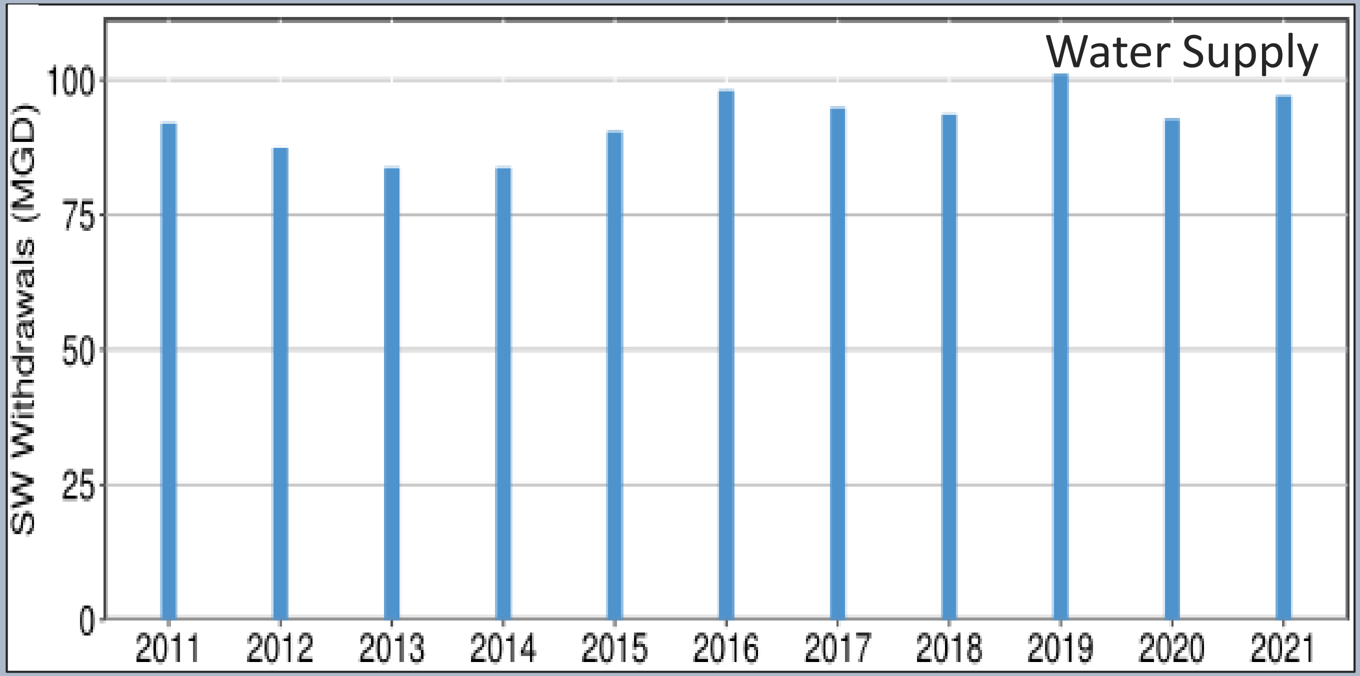


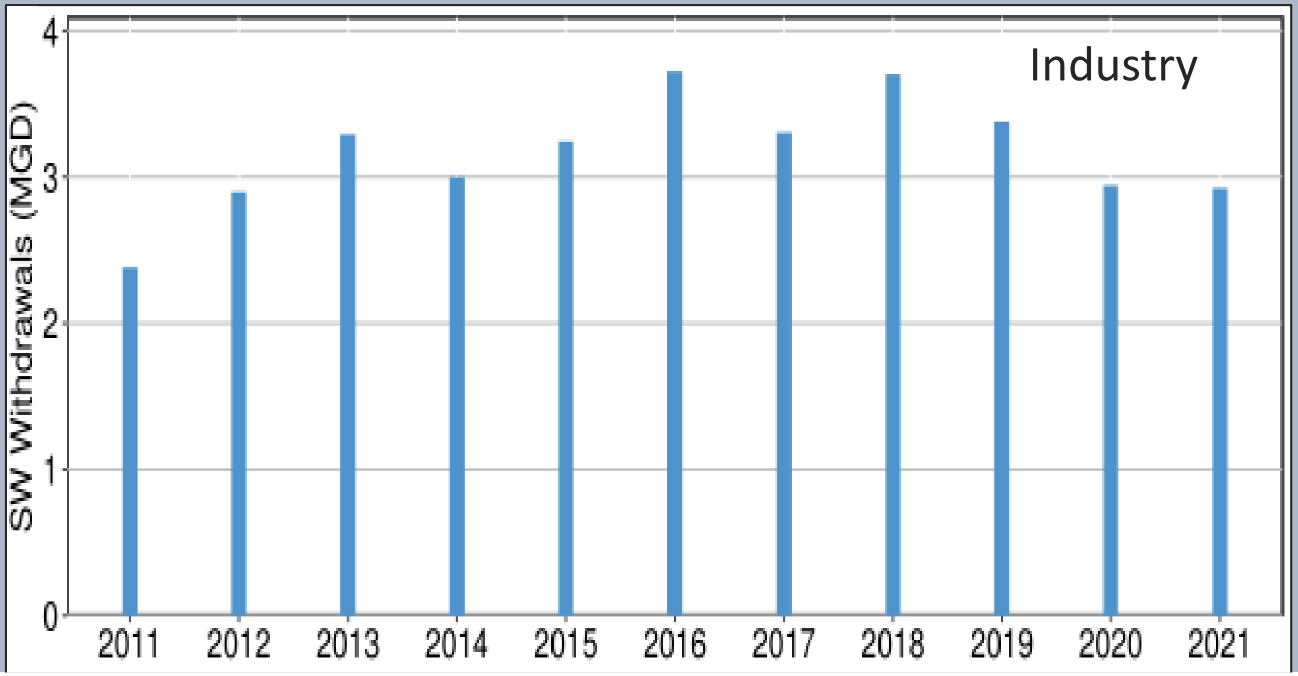
Excluding Power

Sub-basin	Percent of total SW withdrawal (%)					Total SW withdrawal (MGD)
	WS	IN	GC	Ag	MI	
Upper Broad	92.7	7.2	< 0.05	< 0.05	0.1	38.9
Lower Broad	98.8	0.3	0.1	0.7	--	37.1
Tyger	99.7	--	0.2	0.0	--	21.0
Enoree	84.8	--	15.2	--	--	3.9

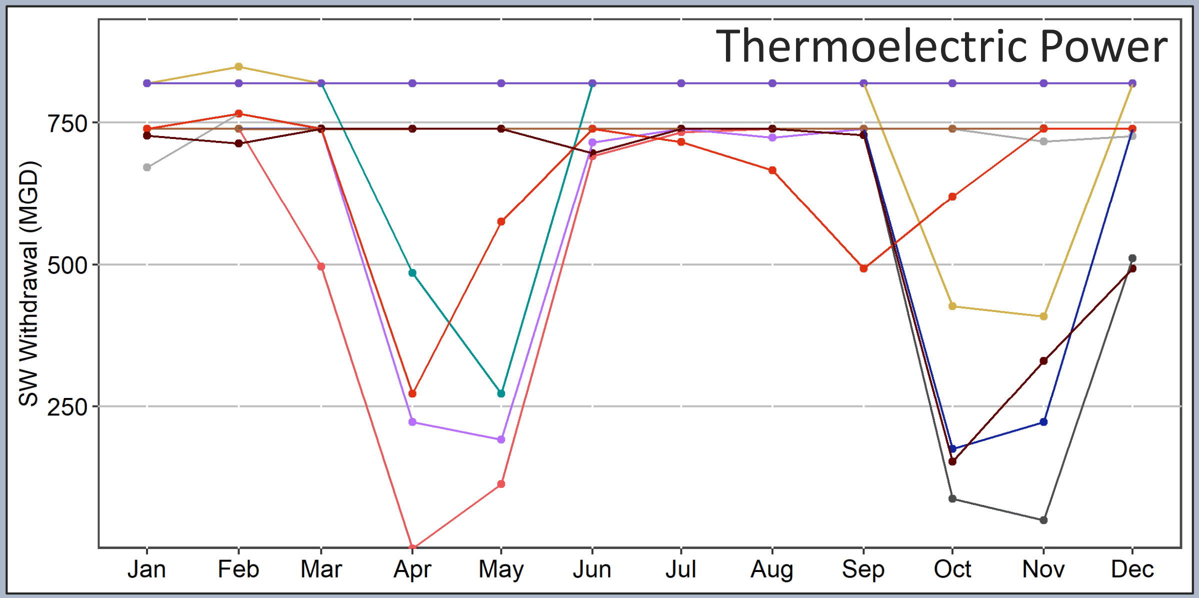
Reported Surface Water Withdrawal by Categories

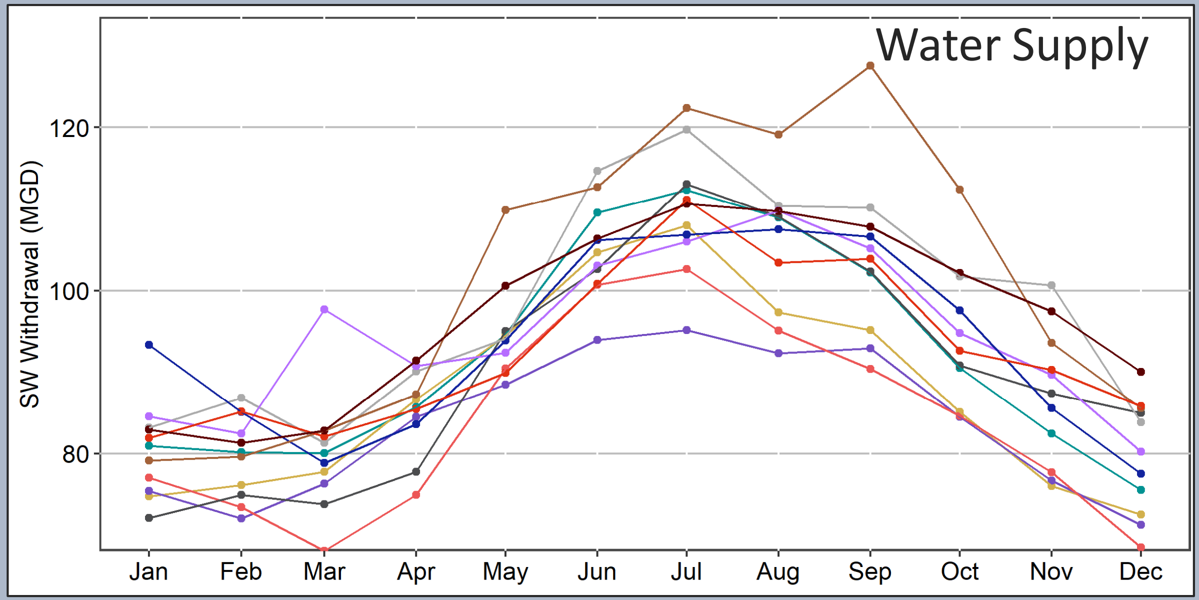


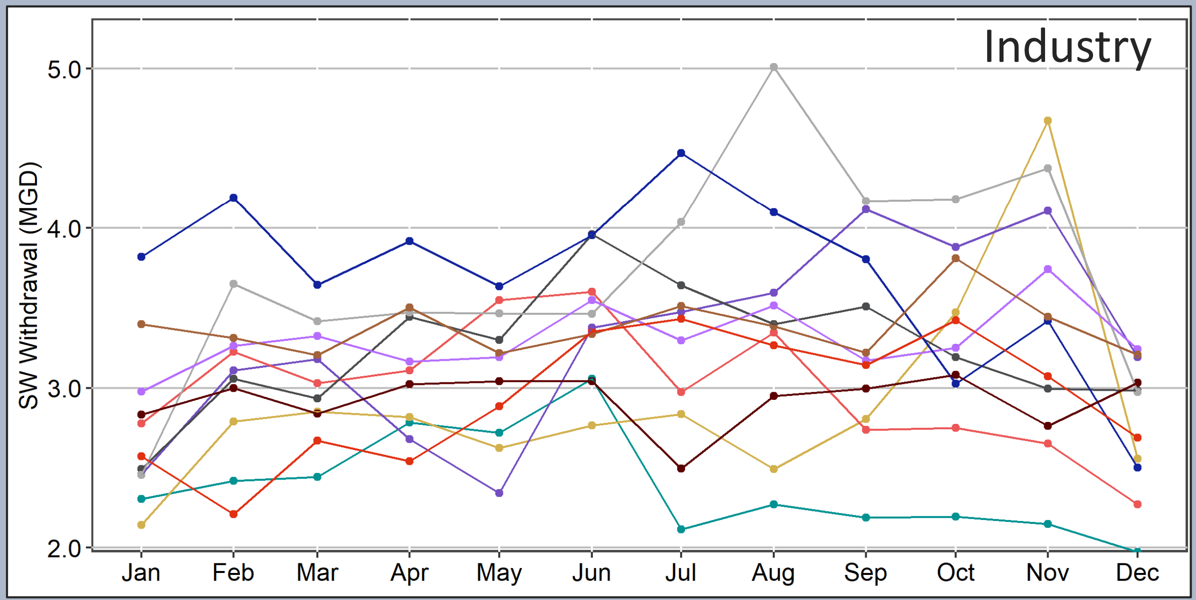




Reported Monthly Surface Water Withdrawal by Categories







Projections are not forecasts

Forecast

- Educated guess.
- Based on expected conditions and actions.
- Timeframe limited by predictability of future conditions.
- Aim to be accurate.

Projection

- Extrapolation of trend.
- Based on hypothetical scenarios.
- Timeframe can extend beyond the limits of effective forecasting.
- Aim to be informative.

Equations to Define the Terms

Equation 1: Water Demand Mass Balance

$$Demand = Withdrawal + Purchase + Reuse - Sales - Loss - \Delta Storage + Shortage$$

Where:

Demand	:	Off-stream water demand
Withdrawal	:	Total water withdrawal from source water bodies
Purchase	:	Total purchases of water from distributors
Reuse	:	Total reuse of water previously used for another purpose
Sales	:	Total wholesale transfers of water to another user or distributor
Loss	:	Total losses of water preventing it from being put to use
ΔStorage	:	Net change in off-stream storage
Shortage	:	Water not available to meet the objectives of water users

Equation 2: Return Flow Mass Balance

$$Return\ Flow = Discharge - Inflow\ \&\ Infiltration$$

Where:

Return Flow	:	Water returned to the environment after non-consumptive uses
Discharge	:	Concentrated discharges to surface water bodies (NPDES data)
Inflow & Infiltration	:	Waste-water resulting from inflow and infiltration (I/I)

Drivers of Water Demand

Table 1.1: Drivers of Water Demand

Category	Primary driver
Thermo-electric power	Electricity production
Public and domestic supply	Population
Manufacturing	Economic production
Agriculture and Golf Courses	Irrigated acres

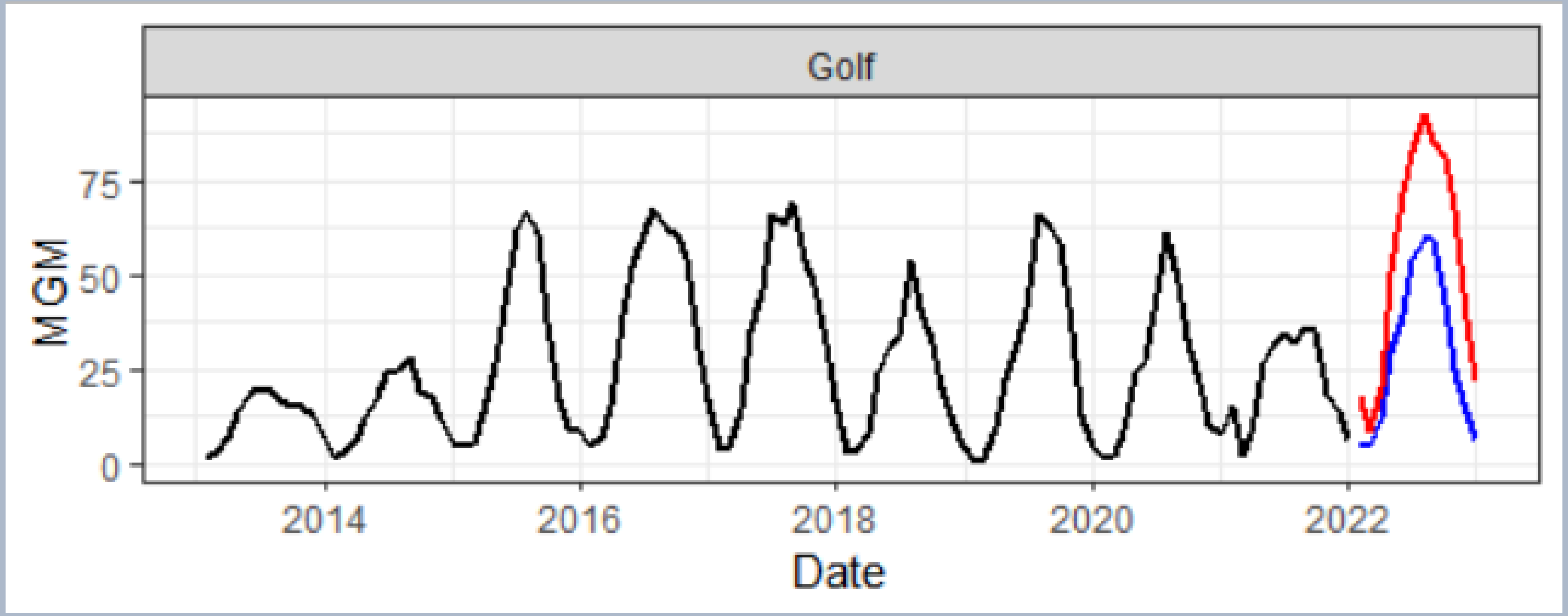
Draft Water Demand Projections

- Preliminary draft results, not yet vetted.
- For demonstration purposes only.
- Only includes users of surface water in the Broad basin.
- There will be modifications to these draft projections based on continued stakeholder feedback.
- All values are plotted as Million Gallons per Month

Mining

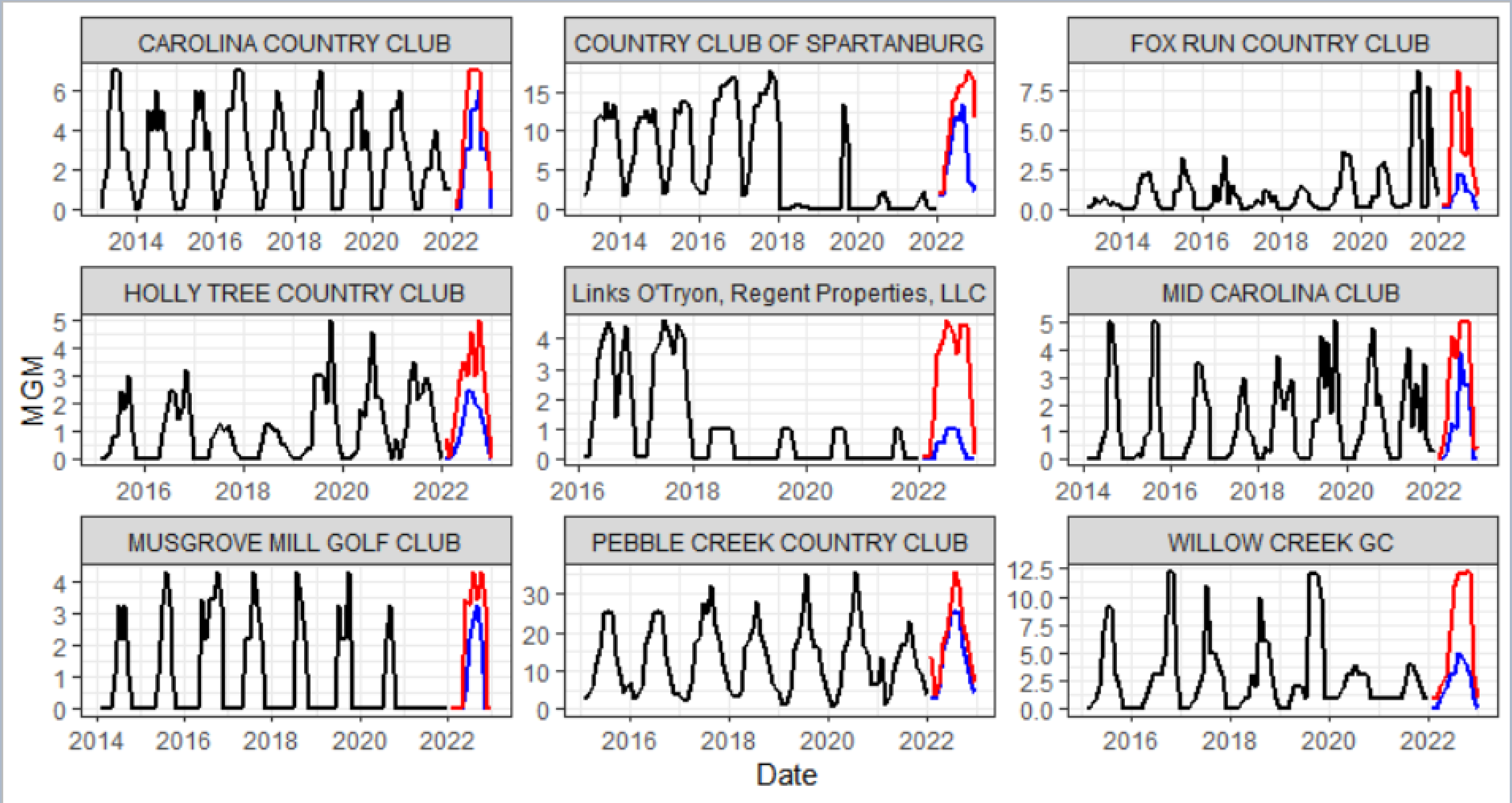
- Only one mine uses surface water in the Broad basin, a granite quarry.
- Mining water demand is not projected to change over time.

Golf Courses



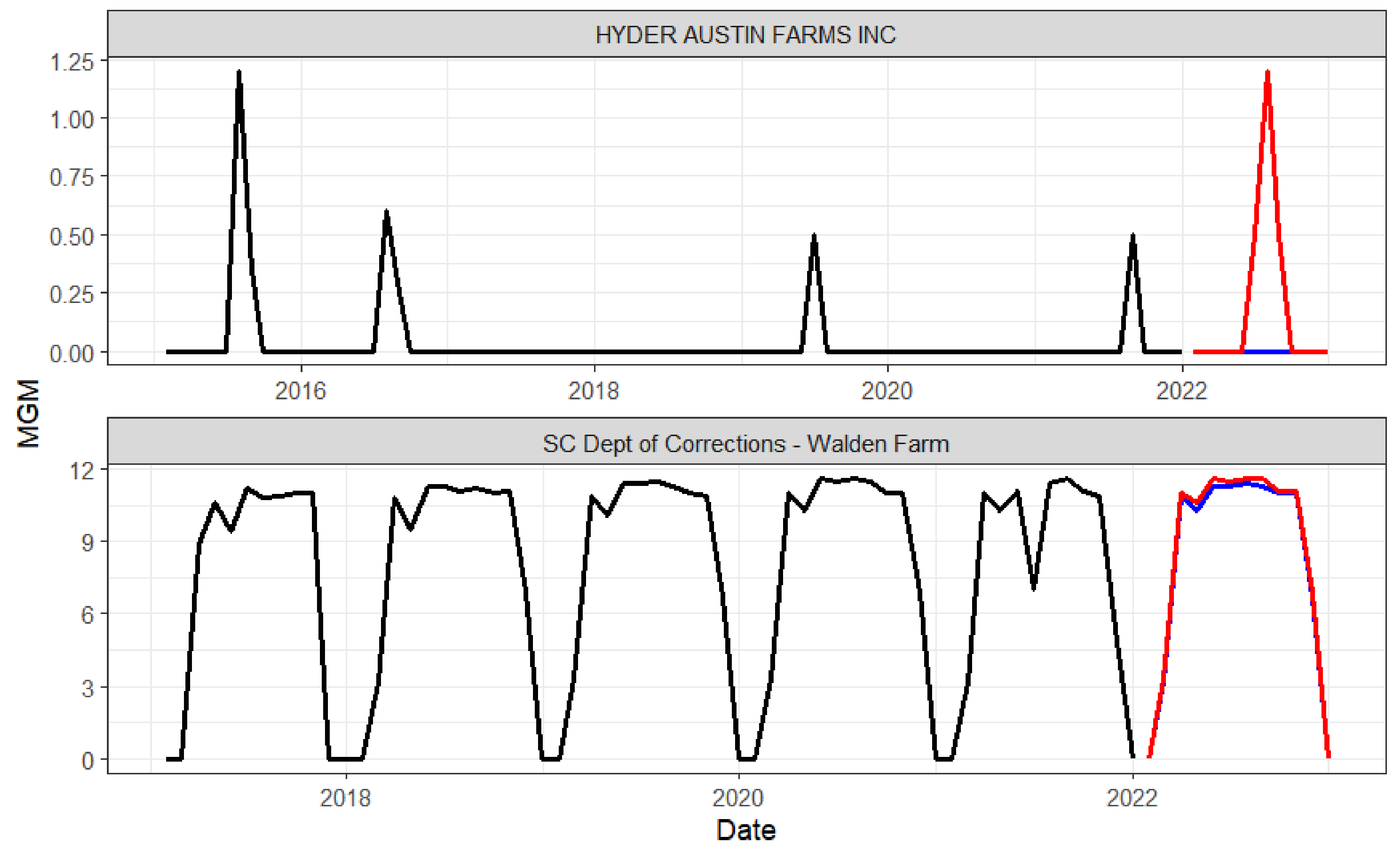
- 9 golf courses use surface water in the Broad basin.
- Golf course irrigation is not projected to change over time.

Golf Detail



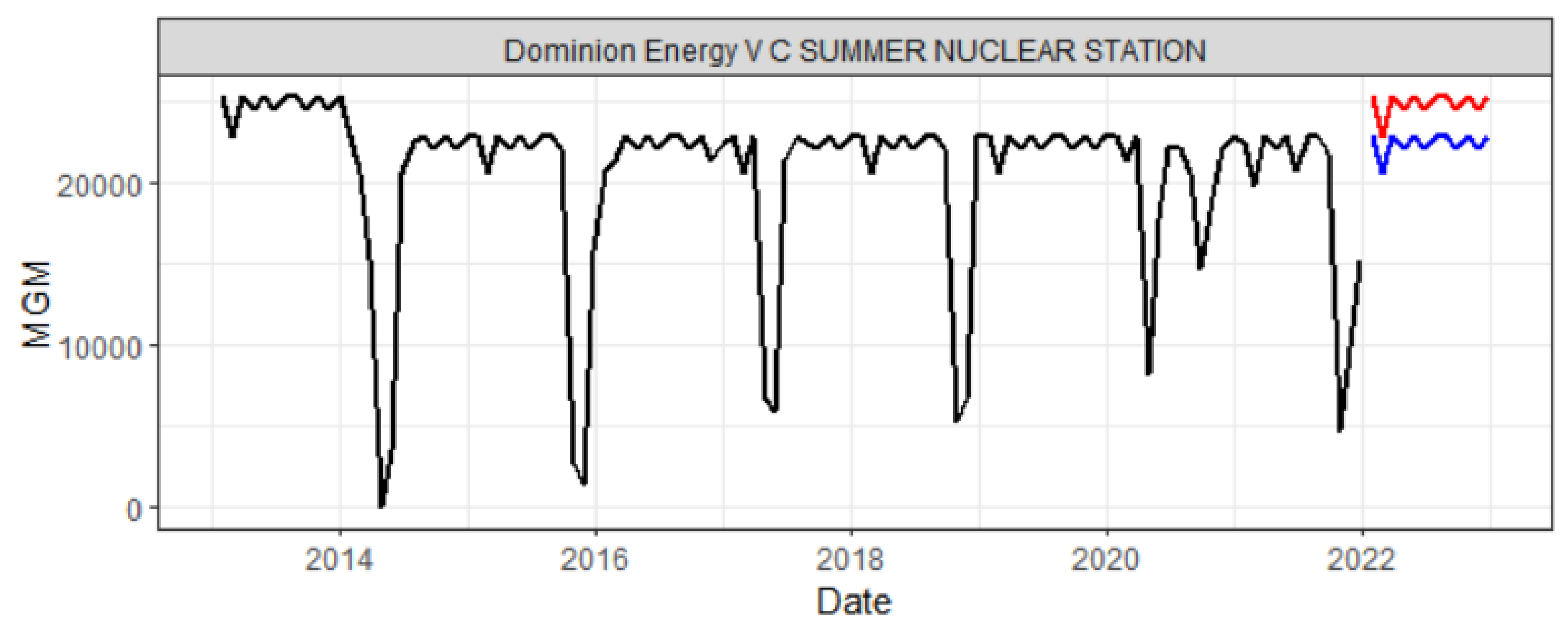
CAROLINA COUNTRY CLUB
COUNTRY CLUB OF SPARTANBURG
FOX RUN COUNTRY CLUB
HOLLY TREE COUNTRY CLUB
Links O'Tryon, Regent Properties, LLC
MID CAROLINA CLUB
MUSGROVE MILL GOLF CLUB
PEBBLE CREEK COUNTRY CLUB
WILLOW CREEK GC
MGM
Date
2014
2016
2018
2020
2022

Agricultural Irrigation



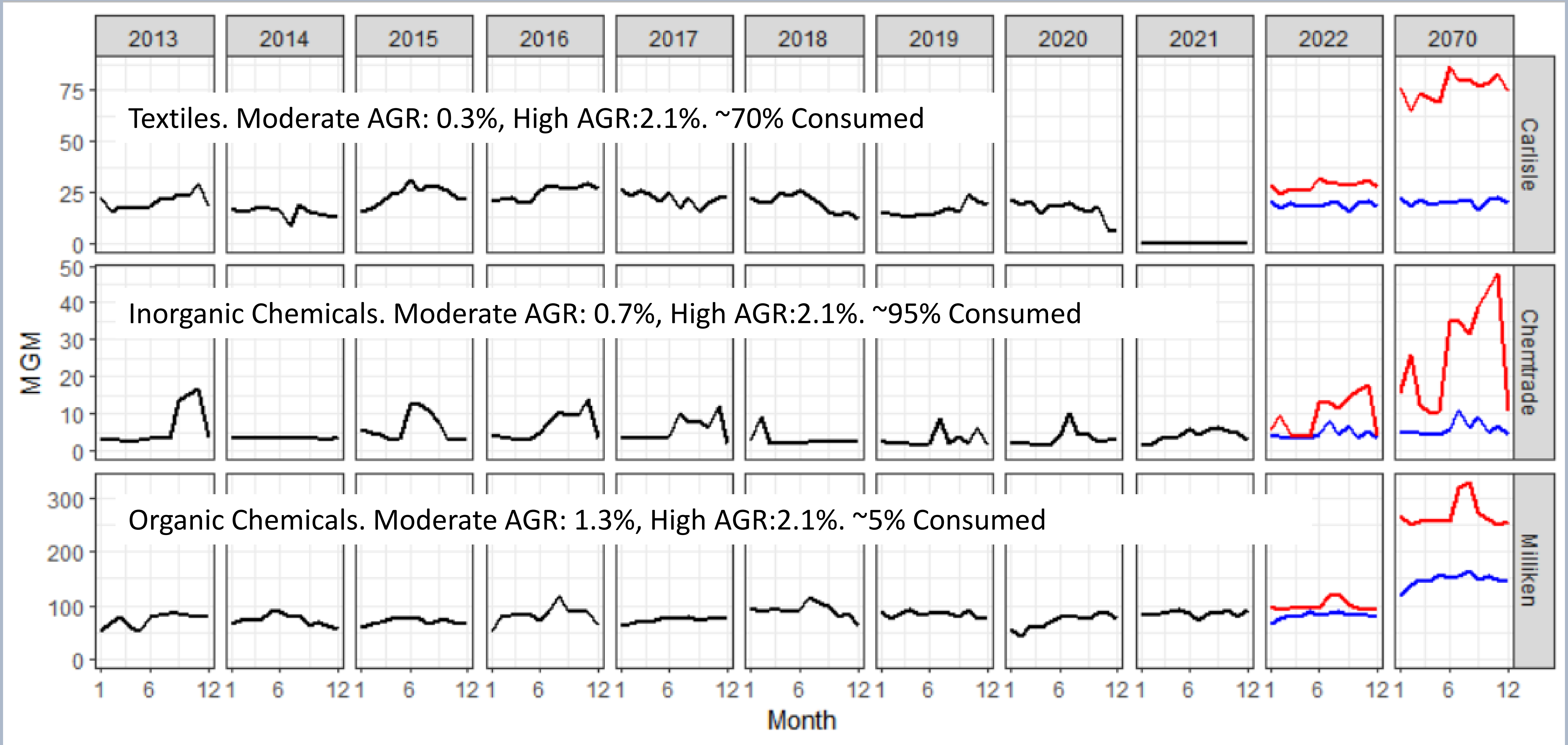
I propose projecting no growth in agricultural irrigation in the Broad basin.

Thermoelectric Water Demand

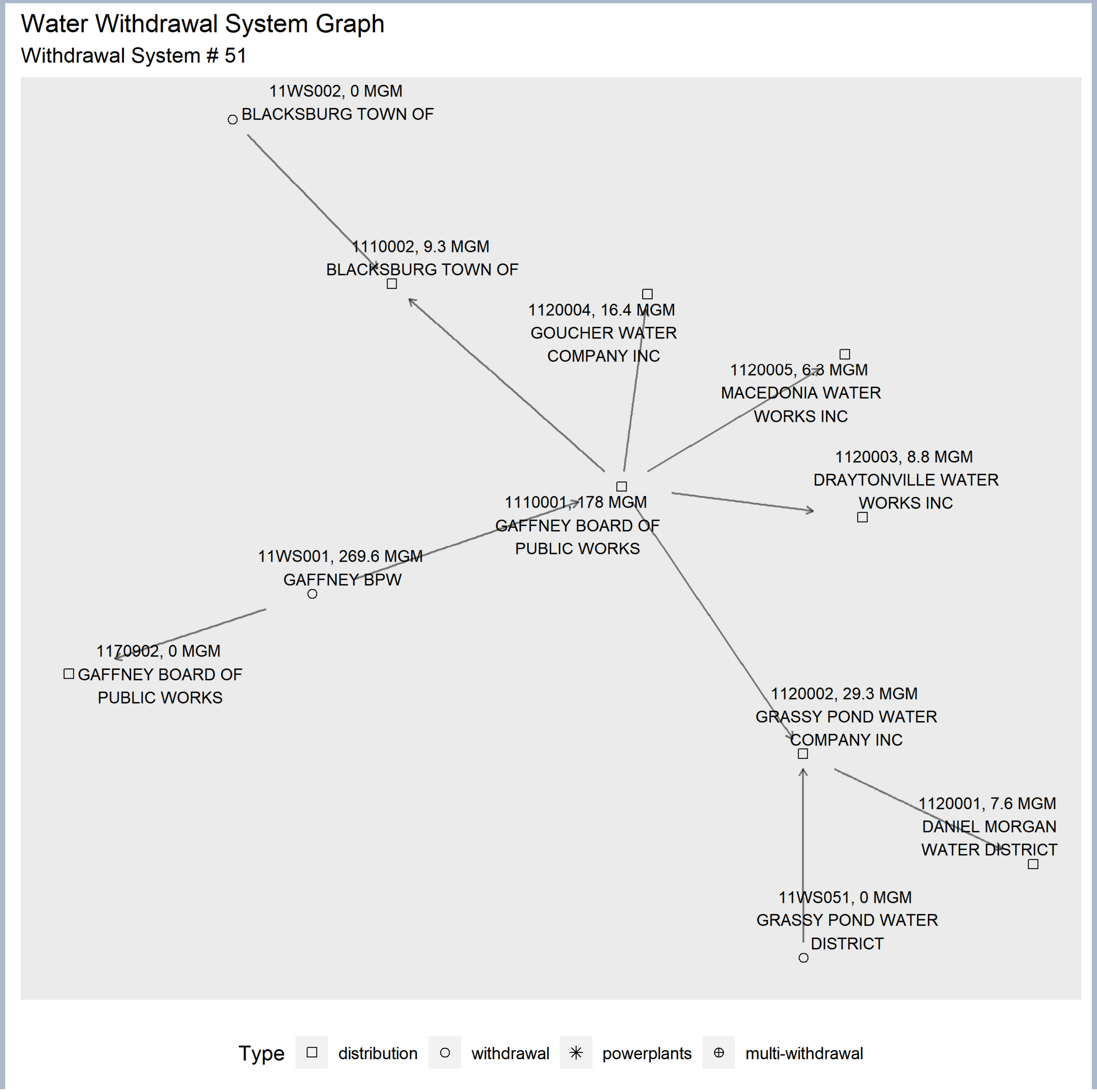


- No planned expansions have been reported for VC Summer. Filed for extension of license to 2062. No change is water demand is projected.
- Prior to 2014, water demand (and consumption) was greater than in recent years.
- Apparently, maintenance/refueling is carried out in alternative spring and fall seasons.
- Will there be a new nuclear plant in the future? Cherokee or William States Lee…

Manufacturing



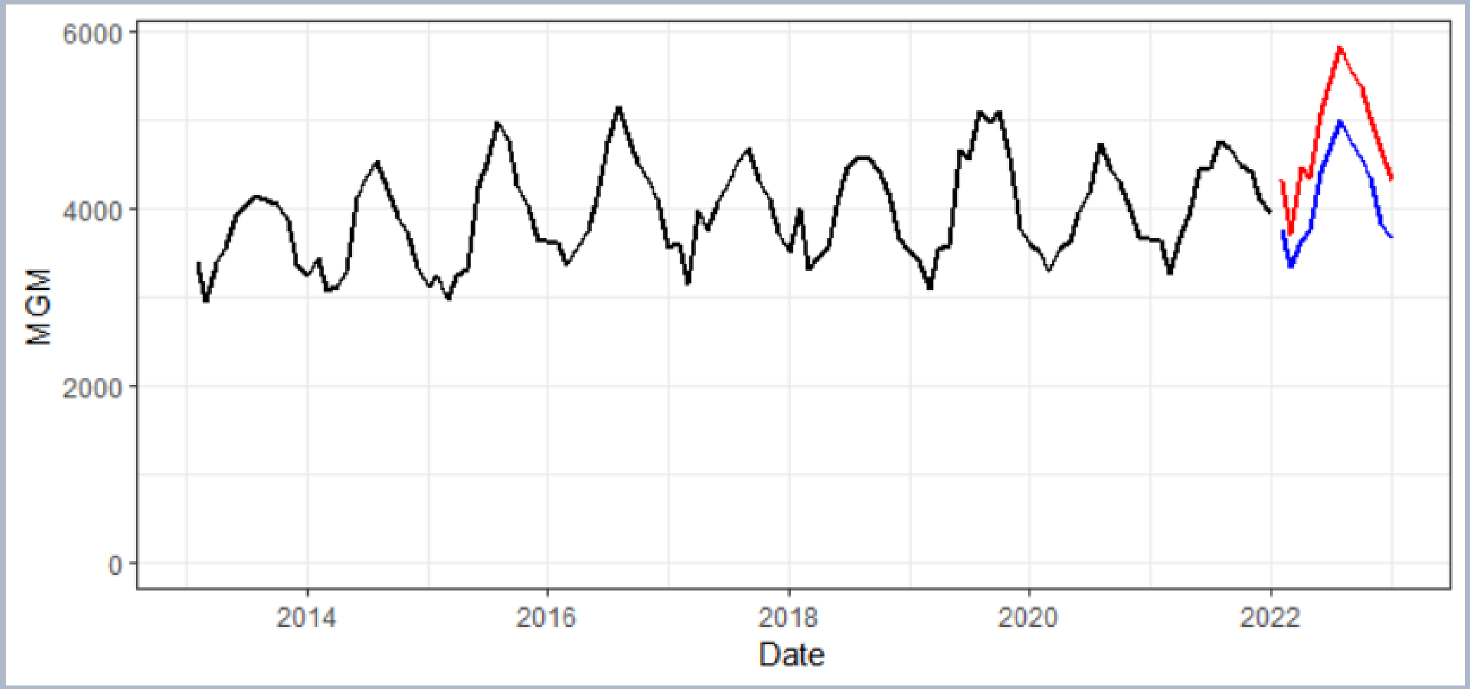
Public Supply

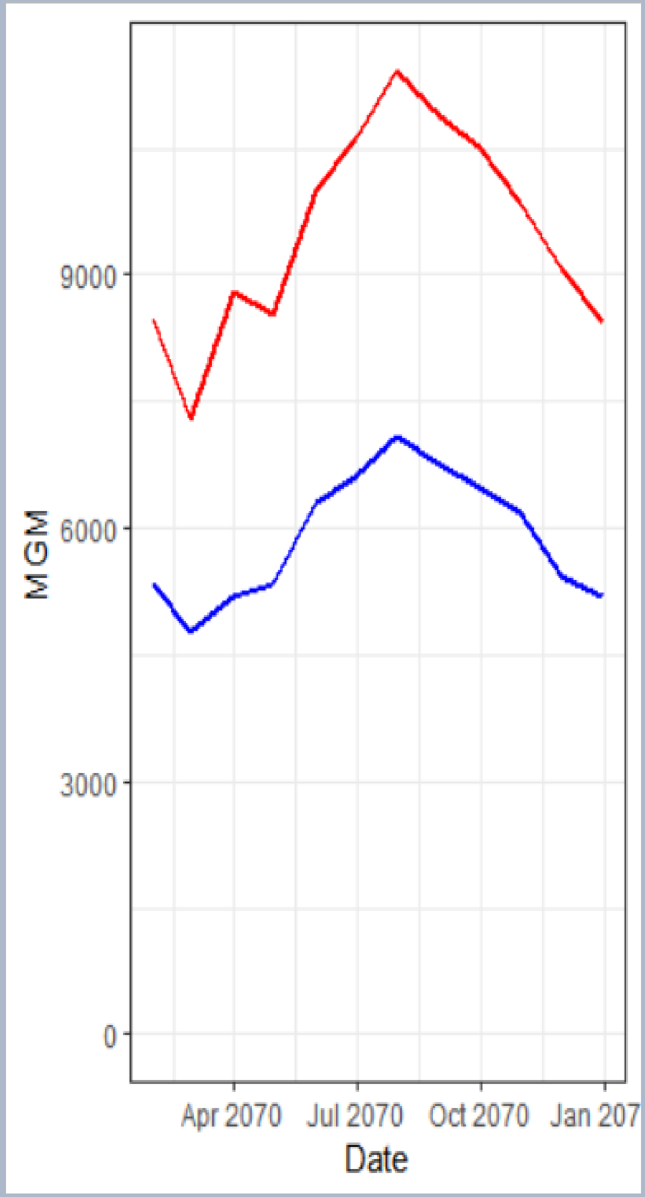


- Many Drinking Water Distributors are interconnected by wholesale purchases and sales.
- Public Supply Systems are represented as the total of all interconnected withdrawal and distribution permits.
- Population served by each distributor is projected based on the county listed on the distribution permit.

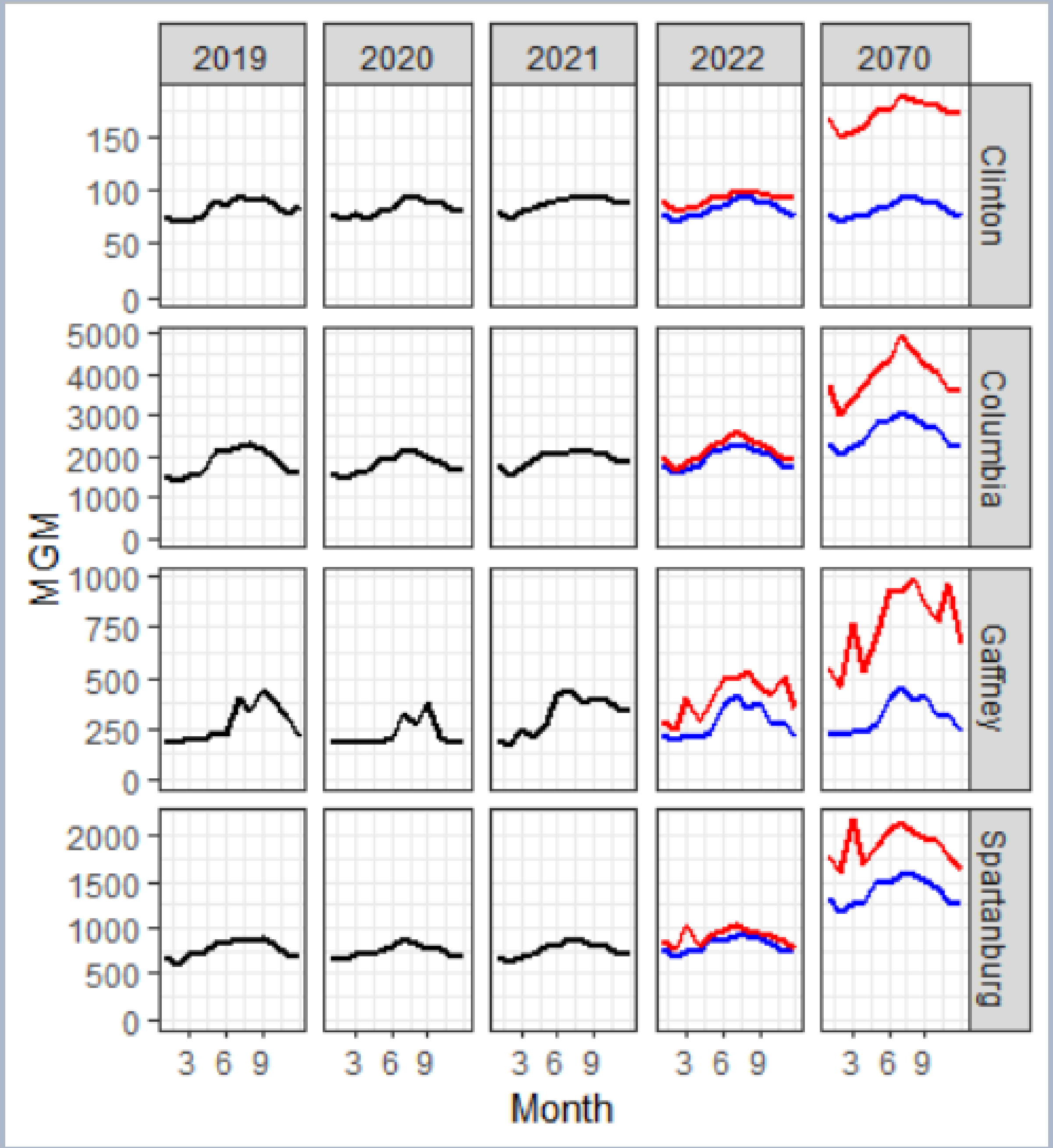
Public Supply Projection Summary

Total water demand of public suppliers that withdraw surface water in the Broad Basin.





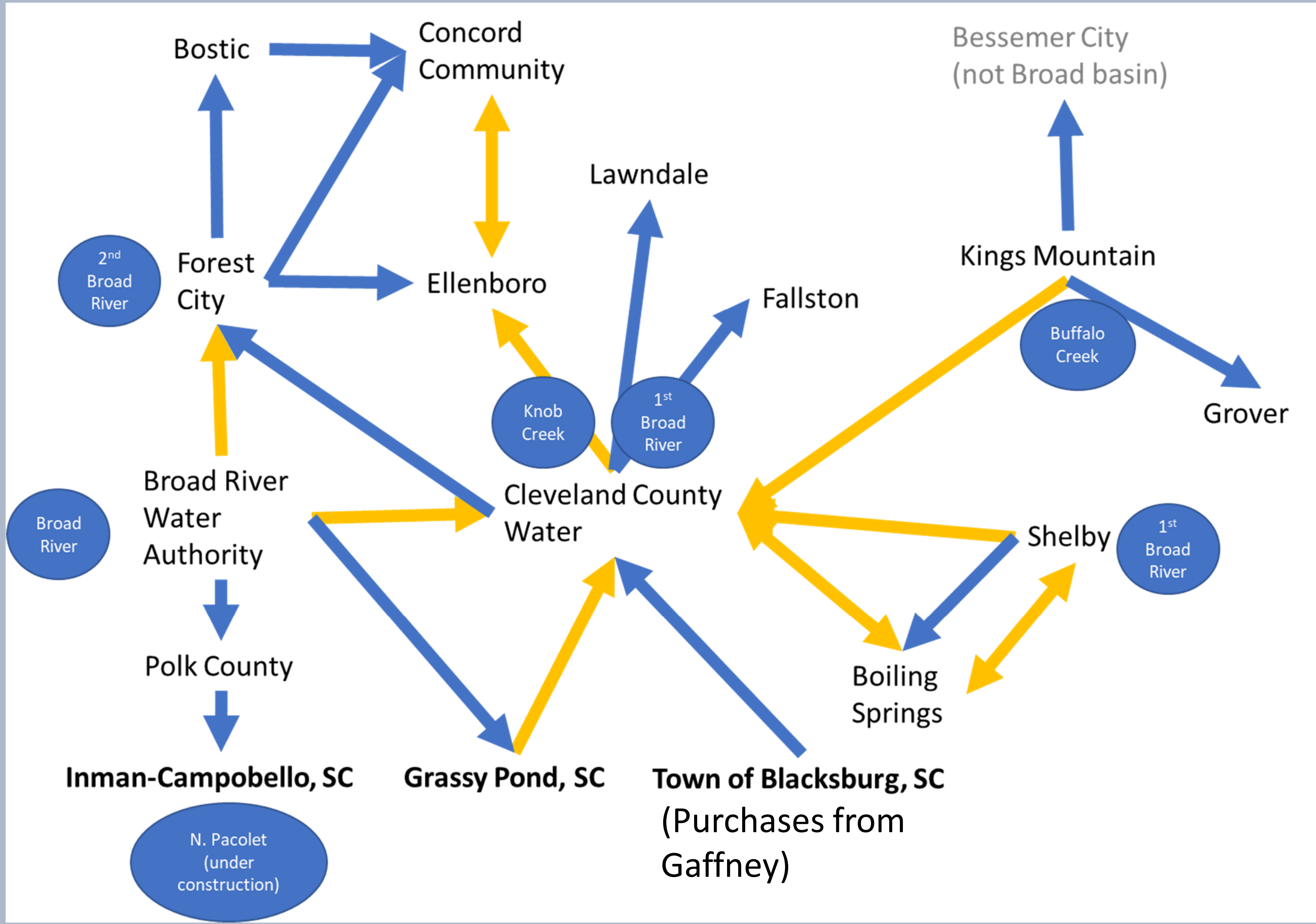
Selected Public Supply Projections



- Clinton consumes ~50% and returns to Saluda basin.
- Columbia gets about half of its water from Lake Murray. All returns go to Saluda basin.
- Gaffney consumes ~45%
- Spartanburg consumes ~75%

Questions?

Public Supply in North Carolina



Public Supply in North Carolina