

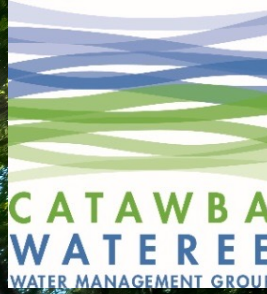
Southeast Drought Early Warning System

Jimmy Bagley, P.E.
Atlanta, Georgia
August 10, 2022



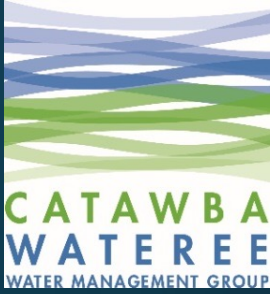
Catawba-Wateree Water Management Group

INTEGRATED WATER RESOURCES PLAN



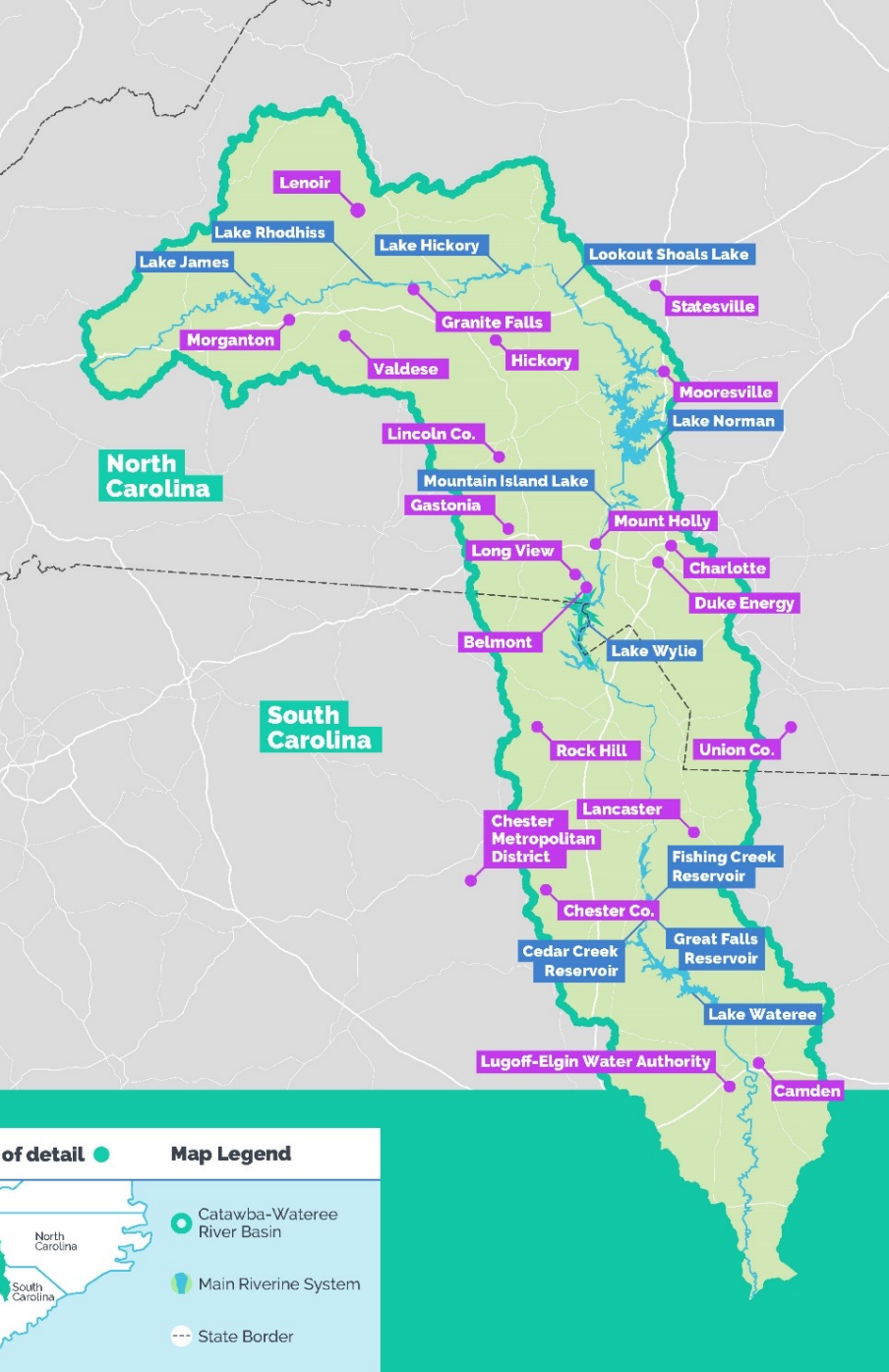
Jimmy Bagley, Deputy City Manager, City of Rock Hill

Who Can Be CWWMG Members?



- Licensee of the Catawba Project (Duke Energy)
- Any water utility operating within the Catawba-Wateree River Basin
- Any water utility using water from the Catawba-Wateree River Basin to serve customers in other river basins
- Any member of the Catawba-Wateree Drought Management Advisory Group including commercial entities that own a water intake or water treatment facility or a water distribution system partially or totally within the Catawba-Wateree River Basin

Our Basin, Our Team



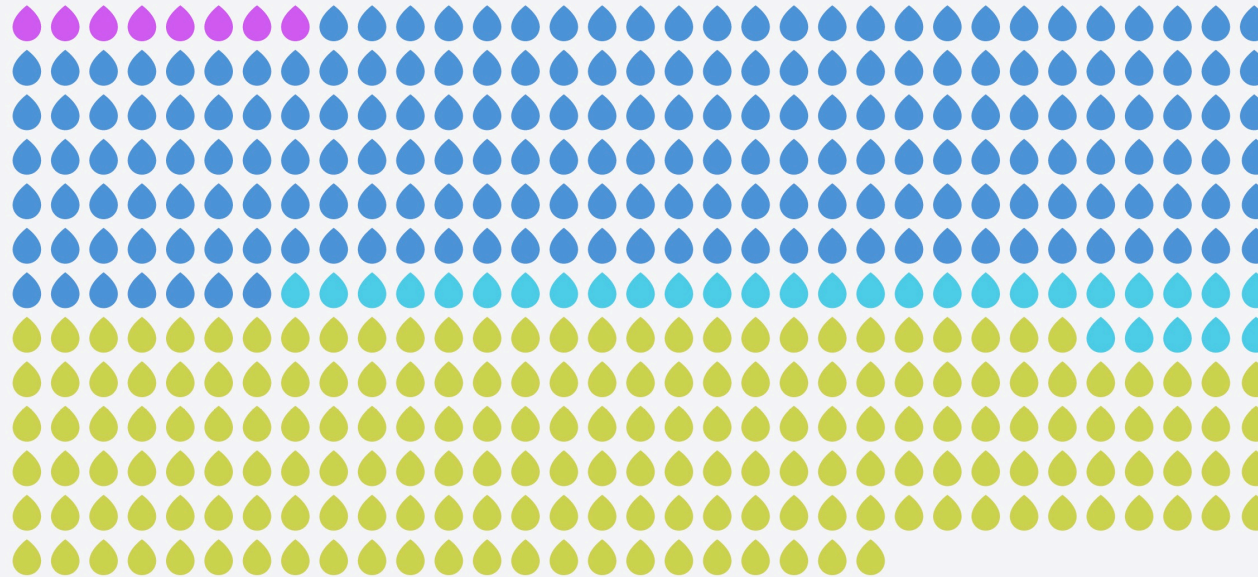
- Approximately 2 million people
- 5,680 Square miles
- 300 River miles
- 11 Interconnected reservoirs
- 13 Hydropower stations
- Nuclear & coal power stations
- 18 Public water suppliers

2065: Planning for Future Use

2065:

Future projected net water withdrawn
from Basin: 419 million gallons per day

👉 = 1M GALLONS



8
Industrial

199
Public Water Suppliers

35
Agricultural/Irrigation

178
Power

Source: Water Supply Master Plan

A History of Basin-wide Coordination



2006 Water
Supply
Study



2007 CWWMG
Incorporated



2010 WSMP
Commissioned



2014 WSMP
Completed



On-going
Implementation of
WSMP
Recommendations

- Water Loss Management Program
- Land Conservation Prioritization
- Intake Contingency Planning

Establish Communications Network



- Basin Wide Advisory Committee Established
- Diverse interests and input on CWWMG projects and priorities
- Communication linkage to other constituencies

- Strategic Communication Plan
- Framework and tactics for members and CWWMG to use for consistent messaging
- Social Media presence

- Annual Summit
- Regional, themed conference focused on current water resources issues
- Target audience includes policy/decision makers & influencers

- Citizens Water Academy
- Provide more in-depth background for policy/decision makers and influencers about water resources operations and issues

- Branding materials, website, videos
- Provide tools for members, recognition for CWWMG

Partner with Other Water Organizations



- Leverages member dues and experience
- Expands boundaries of CWWMG influence and results
- Supported creation of Yadkin-Pee Dee Water Management Group
- Coordinate with other Basin Planning Organizations
- Understand and collaborate on common issues and goals

Water Resources Planning



- It's a process – not an event!
- Undertaken voluntarily – no regulatory mandate
- Voluntary implementation
- Multiple phases/components
 - Safe Yield Research Project – Establish credibility of modeling & assumptions
 - Water Quantity – Extend safe yield capacity beyond year 2100
 - Water Quality – Understand future of source as drinking water supply
 - Source Water Protection – Identify and participate in protection of priority watersheds
 - Economics – Document value of the water supply, role in the economy
 - Communication and implementation
- Update at regular intervals
- Water Supply Master Plan Update currently underway

Proactive Planning for Water Supply Shortages



- Raw Water Intake Contingency Planning
- Vulnerabilities, partnerships, alternatives, options
- Lakefront Smart Irrigation Study
- Potential water savings through technology
- Benchmark Conservation Practices
- Build toolbox of options for effective conservation
- Low-inflow Protocol Response Evaluation
- Document effectiveness of drought response

Reducing Water Loss



- Regional Water Audit Workshop (Complete)
- Introduce principles and practices of water audit
- Discuss regional implementation

- Regional Water Audit/Revenue Loss Project (On-going)
- Assist water systems with planning & implementing water audit
- Develop consistency and confidence in understanding regional water loss
- Identify and implement cost-effective water loss reduction measures

Understand Issues That Impact Water Supply



- Sediment Monitoring Project (Long –term)
- Determine impact of sedimentation on usable storage
- Future water supply quality impacts on drinking water
- Identify trends and concerns of changes to raw water quality relevant to producing safe drinking water
- Extending safe yield (Water Supply Master Plan)
- Plan how to extend capacity of supply beyond 2100
- Lake Rhodhiss Tailrace Nutrient Study
- Examine nutrient levels from Lake Rhodhiss

The Integrated Water Resources Plan Update

Key Focus Areas for Update

Communication
& Education

Implementation
& Evaluation
Mechanisms

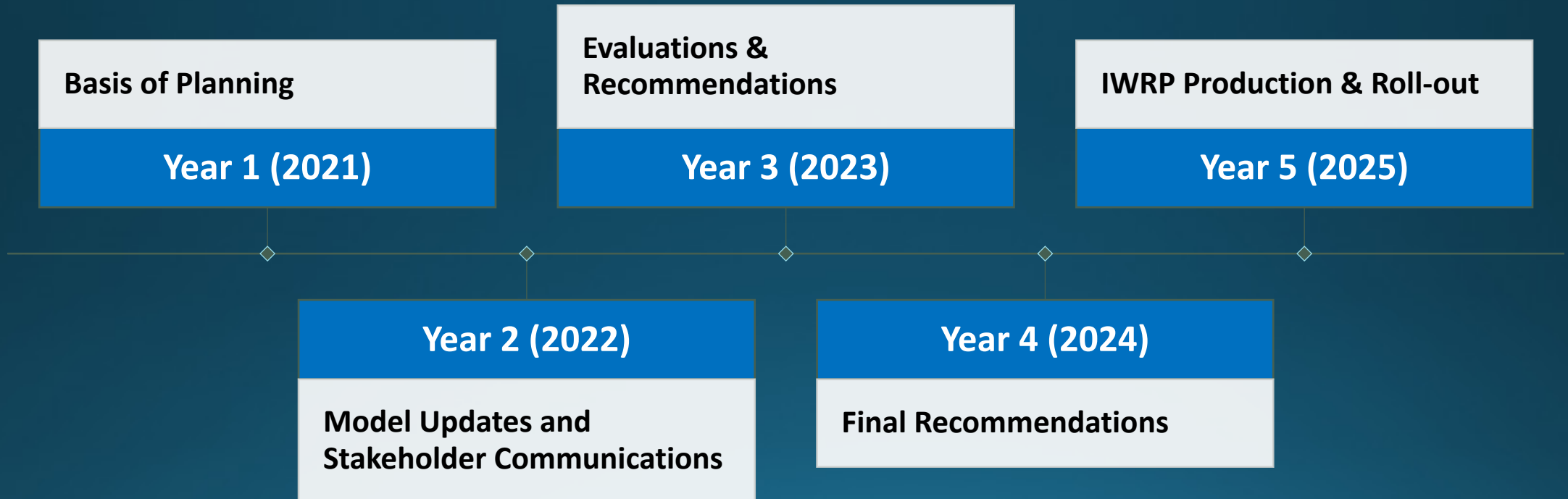
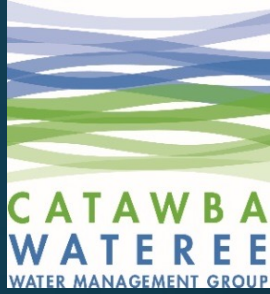
Water Quality

Collaboration &
Consistency

Water Quantity/
Availability

Realistic
Planning for
Future Growth

Integrated Water Resources Plan | 5-Year Plan

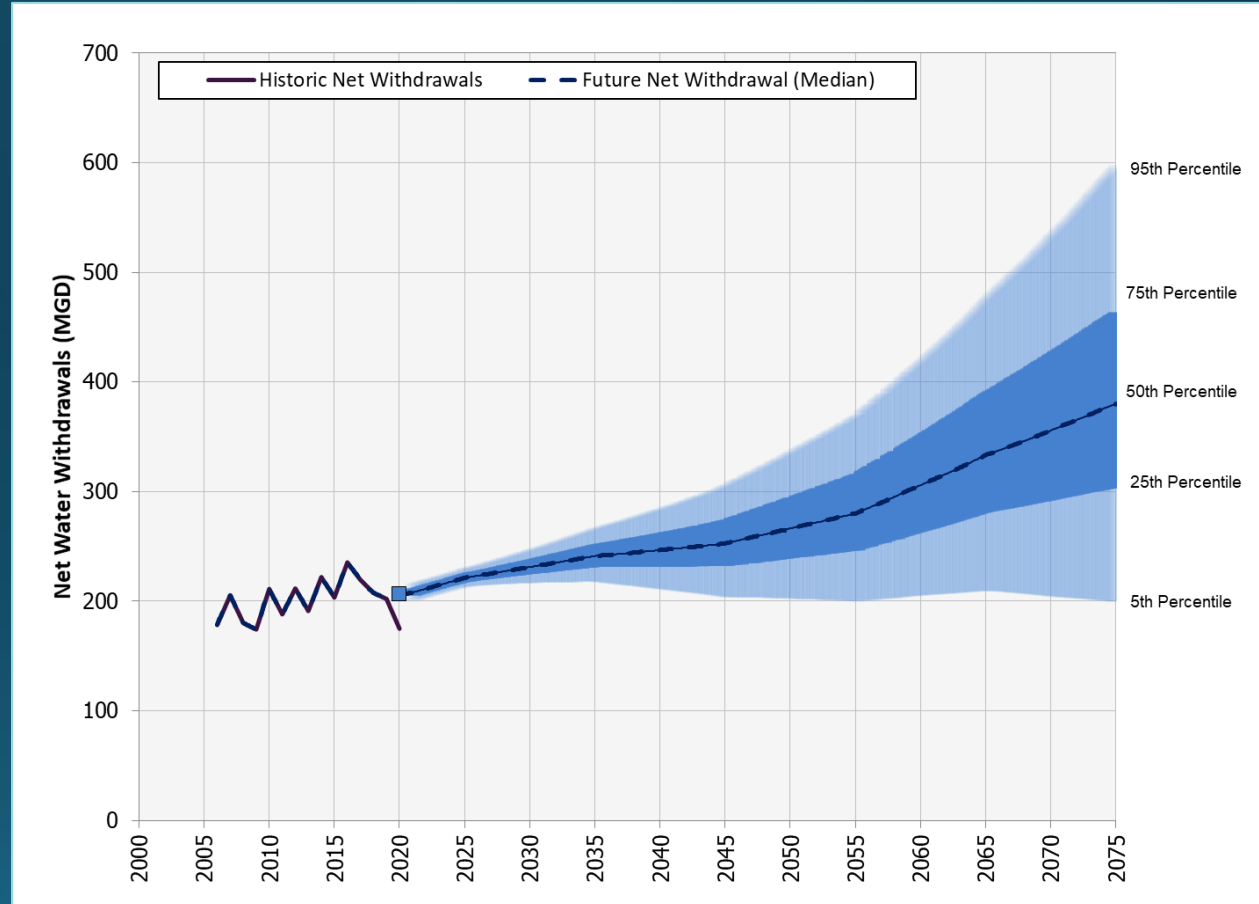


IWRP | Current Progress

Year 1 (2021): Basis of Planning

Water Demand Projections

- Deterministic
- Probabilistic



IWRP | Current Progress

Year 1 (2021): Basis of
Planning

Defining Water Quality
Priorities

Scenario Planning



Additional Scenario Topics

Climate

- High intensity storm events
- Intensified drought event
- Updated climate projections (temp, precip, inflows) for the region providing a range of impact
- Groundwater Trends

Land Use

- Projected Land Use/ Cover change impact on streamflow and water quality
- Mitigation through land conservation/preservation and buffer implementation

Infrastructure

- Changes in water quality standards impacting WWTPs

Demand

- Variation in industrial water use/demand

Low Inflow Protocol



CW-DMAG:

- The Catawba-Wateree River Basin Low Inflow Protocol (LIP) remains in Stage 0 (Low Inflow Watch Stage) based on the streamflow and storage trigger. The chart below is a visual summary of the current conditions. As a reminder, once the LIP is activated, all triggers (except groundwater) must recover to the lower stage before the LIP can recover to that stage.

Storage:

- The Storage Index (SI) is the ratio of the Remaining Usable Storage (RUS) to the Target Usable Storage (TUS) expressed as a percentage. The Reservoir Storage trigger is in Stage 0 Conditions and close to Stage 1. Duke Energy will balance the SI going forward based on weather patterns, ongoing maintenance activities and license flow requirements.

Streamflow:

- The streamflow trigger is a rolling 180 day (six-month) average of 4 selected tributary USGS streamflow gages combined and the current number still reflects below average rainfall in 2022. The trigger has improved somewhat, mainly due to the very dry fall and early winter data is no longer part of the rolling average.

Low Inflow Protocol



U.S. Drought Monitor:

- The Drought Monitor trigger is based on the average-weighted reading of the end-of-month readings for the last three months (in this case March, April and May). The Drought Monitor is published on Thursday of each week and is based on input from drought experts across the country on Tuesday of each week. The most recent map shows increased drought conditions in the basin, but the three-month average of this trigger remains in Normal Condition.

Overall:

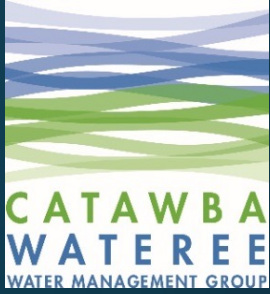
- The lack of significant rainfall is affecting the reservoir storage and not allowing the streamflow trigger to measurably improve. Duke Energy will continue to monitor these conditions heading into the more challenging summer months.
- Since we continue in Stage 0, Duke Energy will continue with the CW-DMAG meetings on the second Tuesday of the month until we reach recover to Normal Conditions. HDR will coordinate the meeting. The Catawba-Wateree Water Management Group has meetings on the second Tuesday of each month also, but we will schedule the CW-DMAG meetings to minimize conflicts with the CWWMG.

Catawba-Wateree LIP Trigger Status Summary for 07/01/22 and Changes Compared to 06/01/22

	Reservoir Storage as % of Target	% of 6-Month Long-Term Avg Streamflow	3-Month Avg of US Drought Monitor	C- W Groundwater Network (% of Historic Range) <i>For Informational Use Only</i>
			↓ -0.62	
Normal	>=100%	>85%	<0	
← Jul 1, 2022	>90%	<=85%	>=0	
	↓ 90.9%	↑ 80.0%		
LIP Stage 1	>75%	<=78%	>=1	↓ 32.3%
LIP Stage 2	>57%	<=65%	>=2	
LIP Stage 3	>42%	<=55%	>=3	
LIP Stage 4	<=42%	<=40%	4	

To recover to a less restrictive LIP Stage the Trigger Indicators above, unless noted otherwise, must support that Stage or lower.

Year 1 (July-December 2021): Basis of Planning



Activity 1 - Project Oversight and Administration (6 months)	\$ 16,200
Activity 2 - Strategic Communications Plan	\$ 8,720
Activity 3 - Stakeholder Advisory Committee (6 months - setup & 2 quarterly meetings)	\$ 20,475
Activity 4 - Water Demand Projection Updates	\$ 79,800
Activity 5 - Identify Water Quality Priorities	\$ 66,580
Activity 6 - Identify Future Planning Scenarios	\$ 88,060
Year 1 Total	\$ 279,835

Year 2 (January-December 2022): Model Updates and Preliminary Evaluations



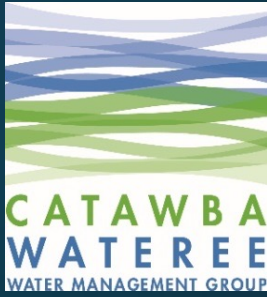
Project Oversight and Administration (12 months)	\$ 25,000
Stakeholder Advisory Committee (12 months - 4 quarterly meetings)	\$ 18,000
Regulatory Agency Coordination for Water Resources Modeling	\$ 16,000
Hydrologic Model Updates	\$ 136,000
Develop strategic communications materials	\$ 20,000
Water Quantity Evaluations	\$ 100,000
Year 2 Total	\$ 315,000

Year 3 (January-December 2023): Detailed Evaluations and Recommendations



Project Oversight and Administration (12 months)	\$ 30,000
Stakeholder Advisory Committee (12 months - 4 quarterly meetings)	\$ 18,000
Communication and Outreach	\$ 15,000
Water Quality evaluations	\$ 120,000
Remote sensing for water quality concerns	\$ 75,000
Regulatory Drivers	\$ 10,000
Emerging Contaminants	\$ 10,000
Climate Change and Variability	\$ 17,000
Groundwater-Surface Water Relationship	\$ 25,000
LIP evaluation	\$ 15,000
Interbasin transfer coordination with neighboring basins	\$ 10,000
Point Source Management strategies	\$ 20,000
Non-point Source Management Strategies	\$ 25,000
Source Water Protection Planning	\$ 50,000
Year 3 Total	\$ 440,000

Year 4 (January- December 2024): Final Recommendations



Project Oversight and Administration (12 months)	\$ 20,000
Stakeholder Advisory Committee (12 months - 4 quarterly meetings)	\$ 18,000
Communication and Outreach	\$ 15,000
Monitoring Collaboration	\$ 10,000
Implementation and Evaluation Plan	\$ 27,000
Regional Economic Impacts	\$ 175,000
Year 4 Total	\$ 265,000

Year 5 (January- December 2025): IWRP Production and Roll-Out



Project Oversight and Administration (12 months)	\$ 15,000
Communication, Outreach & Rollout (video, presentations, resolutions of support)	\$ 30,000
WSMP Report - InDesign Production	\$ 40,000
ESRI Storymap (interactive)	\$ 20,000
GIS Update & Web Mapping Application	\$ 25,000
PowerBI (data processing and visualization)	\$ 10,000
Year 5 Total	\$ 140,000

Questions?

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