PARTNERS IN PLANNING FOR

Sustainable and Secure Water Supplies in the Triangle Region

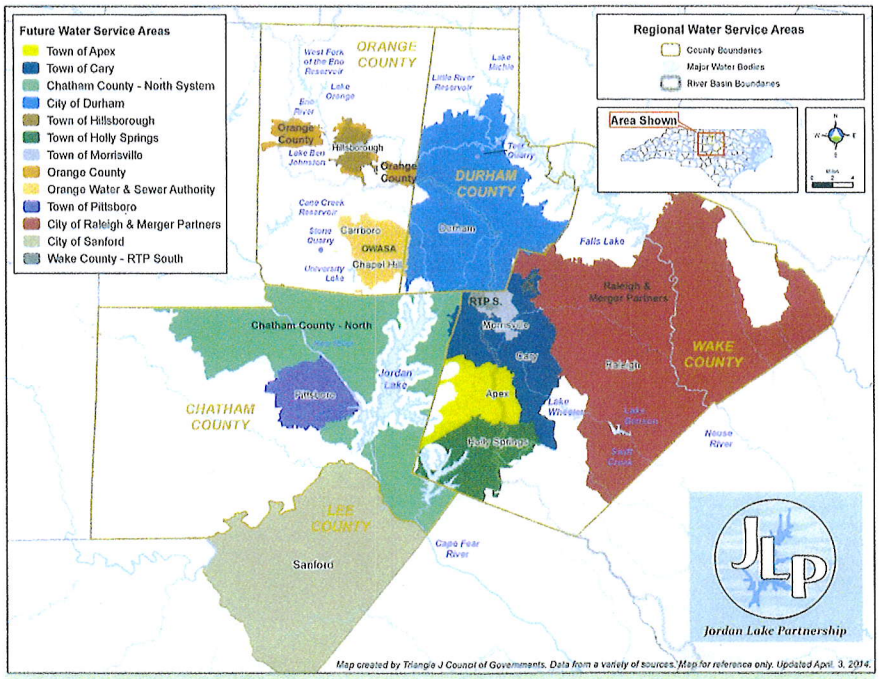
BY MIKE SCHLEGEL, PROGRAM MANAGER - WATER RESOURCES, TRIANGLE J COUNCIL OF GOVERNMENTS; WARREN MILLER, FOUNDER AND PRESIDENT, FOUNTAINWORKS; AND DON GREELEY, JLP CHAIR AND DIRECTOR – DEPARTMENT OF WATER MANAGEMENT, CITY OF DURHAM

The Jordan Lake Partnership (JLP) was created in 2009 by local jurisdictions and water systems to jointly plan for sustainable and secure water supplies for the Triangle Region of North Carolina. Acknowledging that the Triangle was one of the fastest developing areas of the state, the leaders of local jurisdictions and water systems collaborated to develop a plan for expanded use of Jordan Lake and other regional water supply sources.

The JLP committed to work together to meet the water supply needs of individual partners while addressing the short- and long-term interests of the Region without compromising the abilities of downstream communities to meet their water supply needs. Guided by this mission, the JLP developed the Triangle Regional Water Supply Plan (TRWSP) to meet the 50-year water needs of the 13 regional partners. The document is the first of its kind in the Triangle Region and represents an historic consensus among multiple regional jurisdictions about the present status and long-term needs of the Region's water supply resources.

Jordan Lake Partnership

- Town of Apex
- Town of Cary
- Chatham County (Chatham County North water service area)
- City of Durham
- Town of Hillsborough
- Town of Holly Springs
- Town of Morrisville
- Orange County
- Orange Water and Sewer Authority (OWASA)
- Town of Pittsboro
- City of Raleigh
- City of Sanford
- Wake County (RTP South service area)



JLP SERVICE AREAS

PROCESS

A key driver for creation of the JLP and, ultimately the TRWSP was the historic drought of 2007 – 2008, which demonstrated the fragility of Neuse basin water supplies and the relative drought tolerance of Jordan Lake. This led to the JLP focusing on the potential reallocation of Jordan Lake to provide a more sustainable water supply for the region. Allocation decisions for Jordan Lake are made by the NC Environmental Management Commissic (EMC) based on recommendations of the NC Department of Environment and Natural Resources (NCDENR) Division of Water Resources (DWR). In the three previous rounds of Jordan Lake water supply allocations, local water systems competed for the available supply, with the EMC ultimately deciding on the final allocations. The JLP members believed the could achieve better outcomes by working together to craft a plan to share the water. By taking a previously competitive process, and working collaboratively to develop a regional solution, local water systems improved their self-determination while als improving the reliability and resiliency of

their water supplies through cooperation and enhanced system interconnections.

As part of the regional water supply planning process, JLP members developed a mutually supported plan for meeting the future water supply needs of the Triangle Region. They supported each other through a careful peer review of each other's demand projections, shared information about conservation and water efficiency efforts, coordinated inter-utility infrastructure planning efforts, and developed an expanded pool of potential water source options. The goals of this regional water supply planning effort were to agree on the future service areas, sources, and needs of the Region's water systems; analyze strategies for meeting needs; and recommend a water supply alternative for the Region.

The peer review process was a key element of the regional water supply planning effort. Each partner presented its projection methodology and assumptions to the whole group. Partners offered questions and critiques, and also submitted anonymous peer review evaluations of each system's projections. Each system then revised its projections, often multiple times, based on feedback from peer review evaluations.

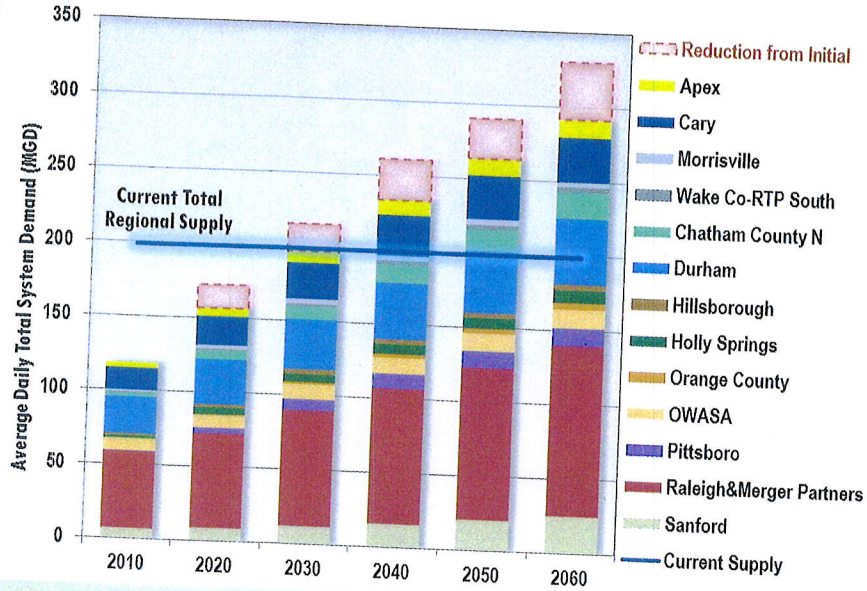
Transparency and peer review helped to standardize the definitions of certain water use sectors and set reasonable expectations for the magnitude of certain uses like flushing and water treatment process use. Transparency of demand projections allowed partners to compare their projections with others, and, more importantly, peer sharing and review of methodology helped partners strengthen underlying assumptions and improve the projections. The resulting projections represent the most complete long-term picture of the Region's demands compiled to date. Through multiple rounds of review and refinement, the partners achieved a 10-15% reduction in projected regional water demands, and established more reliable, defensible projections for use in water supply alternative analysis.

"AS PART OF THE REGIONAL WATER SUPPLY PLANNING PROCESS, JLP MEMBERS DEVELOPED A MUTUALLY-SUPPORTED PLAN FOR MEETING THE FUTURE WATER SUPPLY NEEDS OF THE TRIANGLE REGION."

With realistic demand projections established, the JLP's next step was to develop a suite of potential options for meeting those demands. This process included:

- identifying the full breadth of potential sources,
- developing frameworks of specific high-level objectives that had to be met,
- creating multiple combinations or collections of sources within each framework,
- determining water supply alternatives by establishing the timing of future sources,
- analyzing and screening alternatives and establishing preferences,
- choosing a preferred alternative, and
- modeling the scenarios and evaluating impacts.

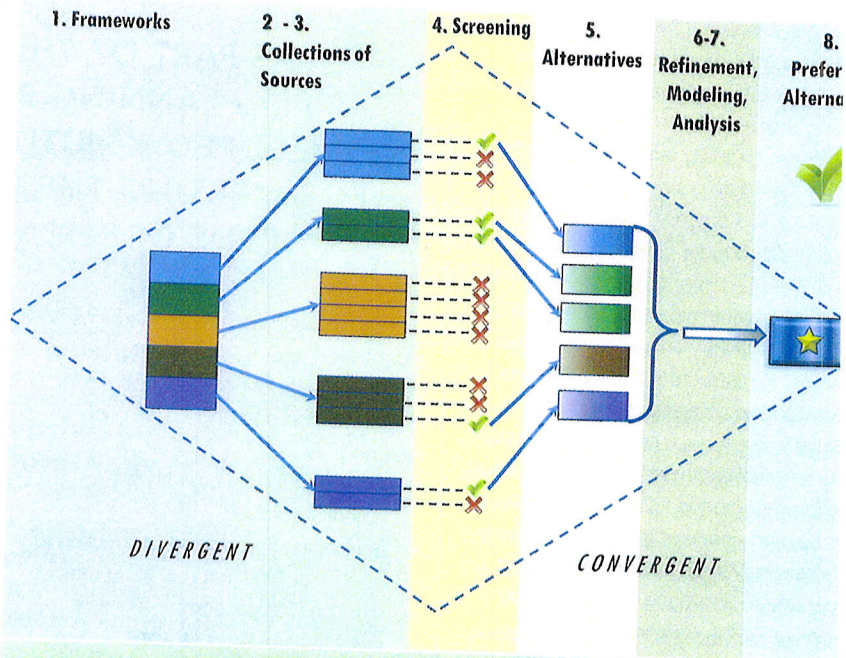
This innovative and replicable stepwise process began with identifying all potential individual water source options from each partner and compiling them into one source option spreadsheet tool. The next step was to develop a set of overall frameworks to set the general characteristics and high-level objectives of an alternatives analysis. The frameworks included utilizing each individual system's base preference, minimizing new supply sources, maximizing new sources, minimizing the number and size of new sources, using only new sources developed by JLP members, using a large new source, maximizing cooperation, and the no-action alternative. Utilizing this process of setting an overall objective helped partners approach the



REGIONAL DEMAND PROJECTIONS, CURRENT SUPPLY, AND REDUCTIONS DUE TO PEER REVIEW

task from different angles and generate creative solutions. For each framework, an innovative source selection spreadsheet tool was used to select the collections of sources that could be used to meet the future 2060 water needs while satisfying the objective of the framework. A major benefit of this collaborative planning was that it expanded the range of potential solutions to the regional water supply needs by including water supply alternatives too large or too impractical for a single system to plan, much less build.

Next, the JLP members developed, refined, and discussed the relative merits of each option. Each partner rated every collection of sources from the perspective of its individual water system. Based on the overall ratings, options with low scores were eliminated. More complete alternatives were then developed by ensuring water needs were met for each partner in all intervening years. In 2014, the JLP came to a consensus on a single, preferred regional alternative, referred to as the JLP Recommended Alternative, to meet the future water supply needs of the region. This JLP Recommended Alternative forms the foundation of the TRWSP.



DECISION PROCESS USED FOR IDENTIFYING, ANALYZING, AND SELECTING A PREFERRED REGIONAL ALTERNATIVE

The JLP Recommended Alternative is specific to the needs, available sources, and preferences of the members of the Jordan Lake Partnership, but the process employed to develop it is a replicable one that can serve as a model for other municipalities working together to meet future regional water supply needs. The innovative tools developed through this process are a remarkable output in and of themselves.

INNOVATIONS

The two-volume TRWSP is a long-range, 50-year cooperative water supply plan and is the first of its kind for the Region. Numerous innovations were developed through this effort, including new processes and tools such as the source selection dashboard shown on page 43. The JLP had a collaborative vision for the future of water supply in the Region, and several key principles guided the process.

Mutual support: The JLP members participated in this process to ensure a secure water supply for the Region and each individual member. The Recommended Alternative needed consensus support, so if any component of the plan was not acceptable to a partner, the plan was refined further until all partners could agree.

"THE JLP HAD A COLLABORATIVE VISION FOR THE FUTURE OF THE WATER SUPPLY IN THE REGION, AND SEVERAL KEY PRINCIPLES GUIDED THE PROCESS."

Transparency and Mutual Accountability: The JLP's process of peer review for projections and proposed water supply alternatives ensured a high level of transparency. Each partner presented information to other partners and responded to concerns and suggestions raised by the other partners.

Collection of Sources	Score Range	Any 5 scores?
A1 – Preferred Options	Top Tier (1-2)	No
D1 - Minimize New Sources	Top Tier (1-2)	No
A2 – Alternate Preferred	Mid-Range (2-3)	Yes
D3 – Min. Number of Sources	Mid-Range (2-3)	No
E1 – Self-Supply	Mid-Range (2-3)	No
F4 – Large Sources, Upper Neuse 1	Mid-Range (2-3)	Yes
F5 – Large Sources, Upper Neuse 2	Mid-Range (2-3)	No
B2 – Non-reservoir Options	Lowest Tier (3-5)	Yes
B3 - Minimize new storage	Lowest Tier (3-5)	Yes
C1 – Build New Sources	Lowest Tier (3-5)	Yes
C2 – New Sources/ Purchases	Lowest Tier (3-5)	Yes
C3 – Max. New Sources	Lowest Tier (3-5)	Yes
D2 – Min sources, Neuse	Lowest Tier (3-5)	Yes
F1 – Pipeline from Phosphate Mine	Lowest Tier (3-5)	Yes
F2 – Kerr Lake	Lowest Tier (3-5)	Yes
H - No Action	N/A – Does not meet need	N/A

COLLECTIONS OF SOURCES INITIAL SCREENING TABLE

Collaboration and Openness to new ideas: For the sake of expanding the range of potential regional water supply planning options, partners had to be open to ideas that were outside their individual planning boundaries.

Data-driven decision-making: The Partnership members were committed to using the best available data and tools to evaluate potential water supply options. This insistence on high data standards and using the best tools available at times slowed the decision-making process down, but ultimately led to better decisions.

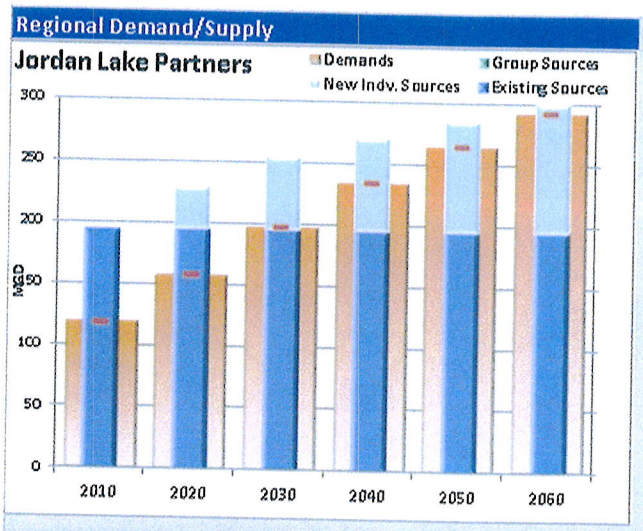
Sustained commitment: JLP members realize that actually implementing these water supply plans will require sustained commitment. Through ongoing collaboration, partners will support one another in the implementation of individual components of the water supply plan.

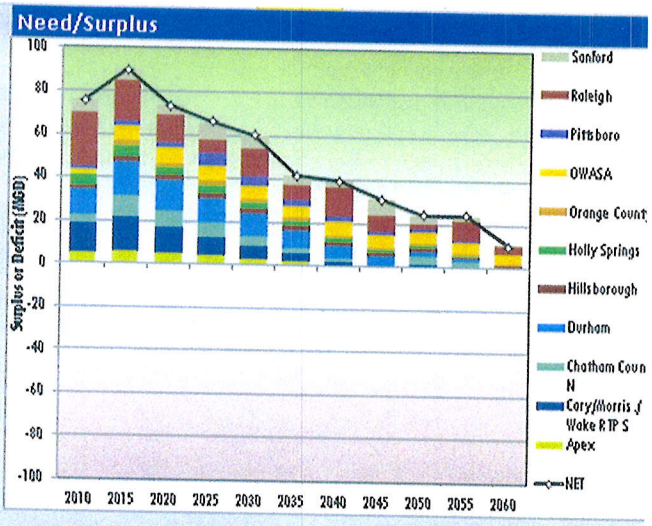
RESULTS

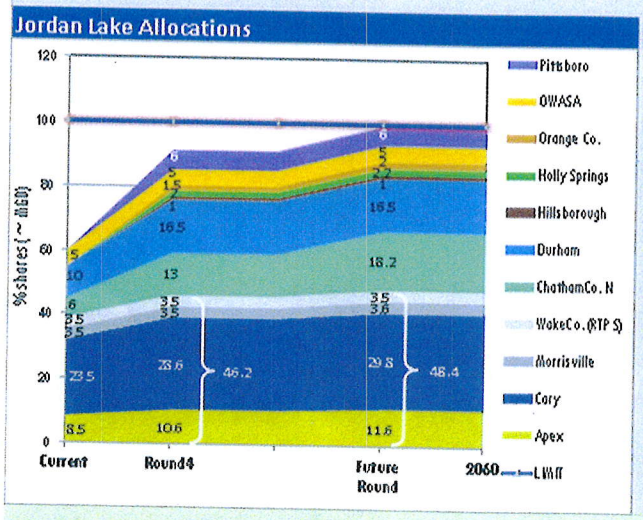
The Partnership demonstrated that local governments can work together in a cooperative fashion with their peers in the Region, with constituent organizations, with upstream and downstream jurisdictions, and with regulators to create environmentally sustainable, secure, and mutually beneficial water supply strategies for the Triangle Region.

The Jordan Lake Partnership's regional water supply planning process helped to standardize the definitions of certain water use sectors. The transparency of demand projections allowed systems to compare their projections with other systems, and peer sharing and review of methodology helped the systems strengthen underlyir assumptions and improve the projectior The more accurate demand projections gave the partners a firmer starting point for analyzing potential water supply alternatives, and the reduced overall demands made finding viable alternative much easier. The accrued benefits of mutual accountability and transparency also carried over in the working relations between partners for the regional alternatives analysis.

The collaborative planning also expanded the range of potential solutions to the regional water supply







Regional Checklist

Partner	2045	2060	Satisifed?	Proj. JL Alloca Current	Rd. 4	2060
Apex	✓	✓	GOOD	8.5	10.6	11.6
Cary	✓	✓	GOOD	23.5	28.6	29.8
Morrisville	✓	✓	GOOD	3.5	3.5	3.6
RTP South	✓	✓	GOOD	3.5	3.5	3.5
Chatham County	✓	✓	GOOD	6	13	18.2
Durham	✓	✓	GOOD	10	16.5	16.5
Hillsborough	✓	✓	GOOD		1	1
Holly Springs	✓	✓	GOOD	0 (2)	2	2.2
Orange County	✓	✓	GOOD	0 (1)	1.5	2
OWASA	✓	✓	GOOD	5	5	5
Pittsboro	✓	✓	GOOD	0	6	6
Raleigh	✓	✓	GOOD	0	0	0
Sanford	✓	✓	GOOD	0	0	0

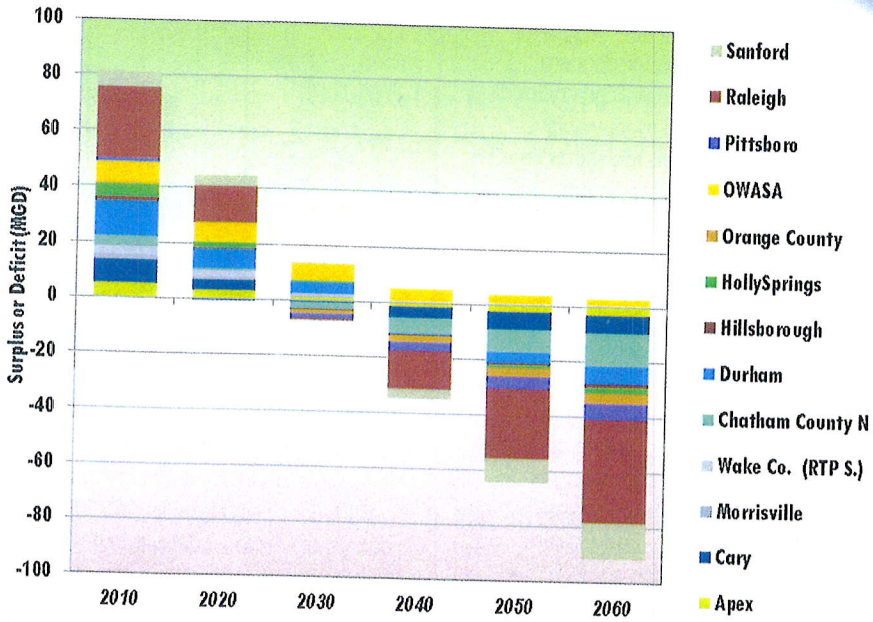
TOTAL JL	91.2	99.4	GOOD
Net Surplus/Deficit	39.3	10.0	GOOD

JLP WATER SUPPLY SOURCE SELECTION DASHBOARD

needs. Developing options that compel the utilities to examine how to meet water needs from a broader, regional perspective created a different lens with which to view the relative benefits and shortcomings of existing options.

Many systems projected a continuing decrease in water usage rates, and some systems' success with reducing their per capita demand convinced other systems in the Region that achieving similar gains was achievable.

The trust developed through the JLP enabled communication about preferences, concerns, and objections to water supply options to be discussed more openly. Partners were up-front about why they supported some alternatives over others in their local planning. More importantly, partners could articulate which alternatives being considered by other partners



PROJECTED CHANGES IN SURPLUS AND DEFICIT (MGD) FOR THE JLP MEMBERS 2010-2060

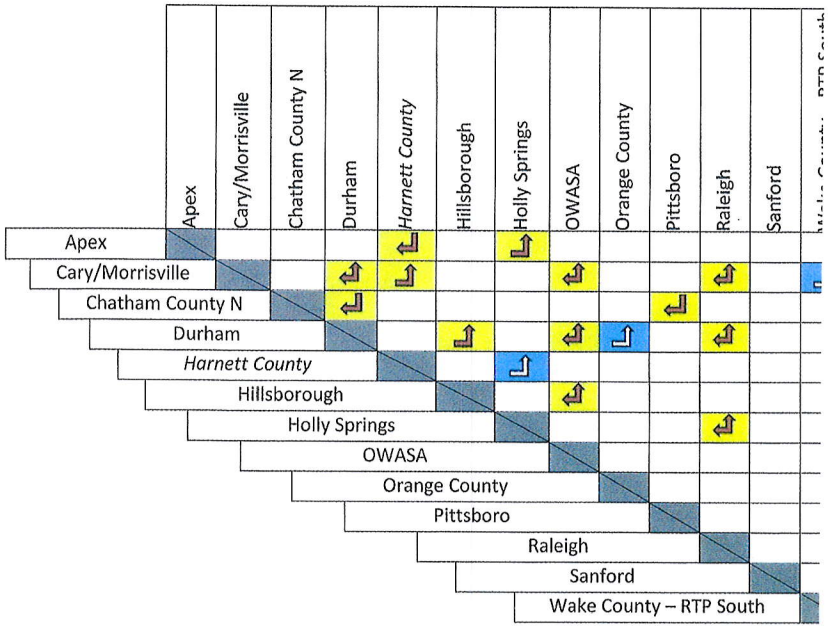
caused them the most concern. Clear explanations of causes for concern with well-reasoned justifications helped partners focus on the most viable sources and not waste too much time analyzing options that could not win support from the whole Partnership. Similarly, strong preferences for particular sources by a few partners helped make decisions between otherwise comparable source options easier.

The planning efforts also investigated where interconnections among the JLP members' water systems could be improved both from engineering and inter-local agreement standpoints, which improved the reliability and resiliency of the Region's water sources.

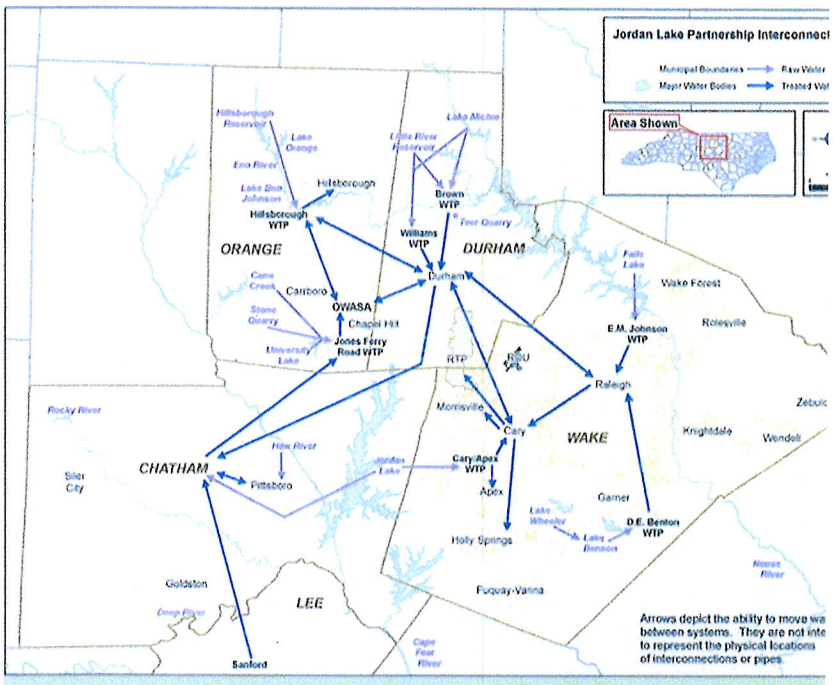
Through the collaborative planning of the JLP, 11 partners submitted coordinated individual requests for Jordan Lake water supply allocations in 2014. The requests were all consistent with the Recommended Regional Water Supply Alternative in the TRWSP, ensuring that requests did not exceed the available supply or impair downstream users from meeting their future water need or face water shortages under the 80+ year range of recorded hydrologic conditions.

PATH FORWARD

While the Partnership's original objective has been achieved, the collaboration process has strengthened the trust between partners and has clearly demonstrated the value of information sharing. The Memorandum of Understanding (MOU) has been extended through 2019 and the City of Fayetteville – a downstream user – has been invited to become a member of the JLP. Members continue to meet regularly as the elements of the TRWSP are implemented, such as the ongoing interconnection study to determine the engineering capacity to move water among and between the individual systems. In addition to Jordan Lake allocation requests, four Partnership

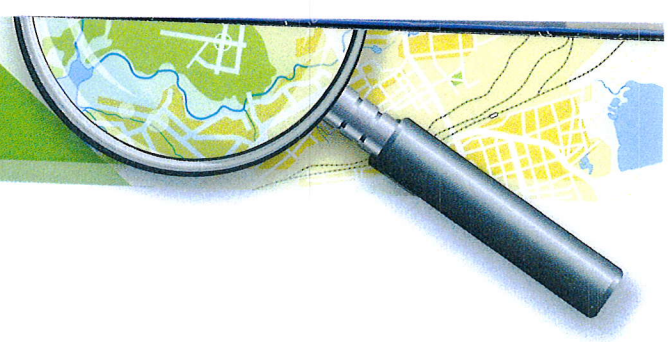


INTER-UTILITY WATER SUPPLY AGREEMENTS



JLP INTERCONNECTIONS

"ELEVEN PARTNERS SUBMITTED COORDINATE INDIVIDUAL REQUESTS FOR JORDAN LAKE WATER SUPPLY ALLOCATIONS IN 2014."



"WATER SYSTEMS IN THE TRIANGLE REGION WORKED TOGETHER TO DEVELOP A RANGE OF SOLUTIONS."

members are exploring opportunities to jointly share in the costs and development of facilities to access the Jordan Lake water supply, including a regional intake and water treatment plant on the western side of the lake

Each JLP member has been responsible for obtaining endorsement of its participation in the Partnership and for the TRWSP from city managers and councils. By engaging municipal leaders as well, the Jordan Lake Partnership has expanded the scope of stakeholders involved in jointly planning the future of the Region's water supply and helped develop and strengthen relationships between jurisdictions beyond the level of technical staff.

Not only is water supply a fundamental need, it is a critical driver for economic prosperity and community growth. Through this collaborative planning process, water systems in the Triangle Region worked together to develop a range of solutions. A consensus recommended alternatives to meet the needs of this growing region and ensure adequate and sustainable water supplies for the future. This historic document and the unparalleled level of joint planning and collaboration that went into its creation are a phenomenal asset to the Region, one which will provide mutual benefits long into the future and that can serve as a national model of collaboration and joint regional water supply planning.

ABOUT THE AUTHORS

Mike Schlegel *(mschlegel@tjcog.org)* is the program manager for Water Resources for the Triangle J Council of Governments.
Warren Miller *(warren@fountainworks.com)* is the founder and president of Fountainworks.
Don Greeley *(don.greeley@durhamnc.gov)* is the director for the City of Durham Department of Water Management and serves as the chair of the Jordan Lake Partnership.

NC Currents

SUMMER 2015

NC AWWA-WEA
www.ncsafewater.org
Dedicated to Safe Water

Municipal Coordination

• Member Profile: Steve Shoaf

NC AWWA-WEA
3725 National Drive, Suite 217
Raleigh, NC 27612
ADDRESS SERVICE REQUESTED

MIXED ADC 60902 64/1
WARREN MILLER
PO BOX 28142
RALEIGH, NC 27611-8142

NON-PROFIT
PRSRT STD
US POSTAGE
PAID
PENDINA, ND
PERMIT # 14

The official publication of The North Carolina Section of the American Water Works Association (NC AWWA)
& The North Carolina Member Association of the Water Environment Federation (NC WEA)