Long-Range Water Supply Plan Update

Orange County Commission for the Environment

Mary Tiger, Strategic Initiatives Manager

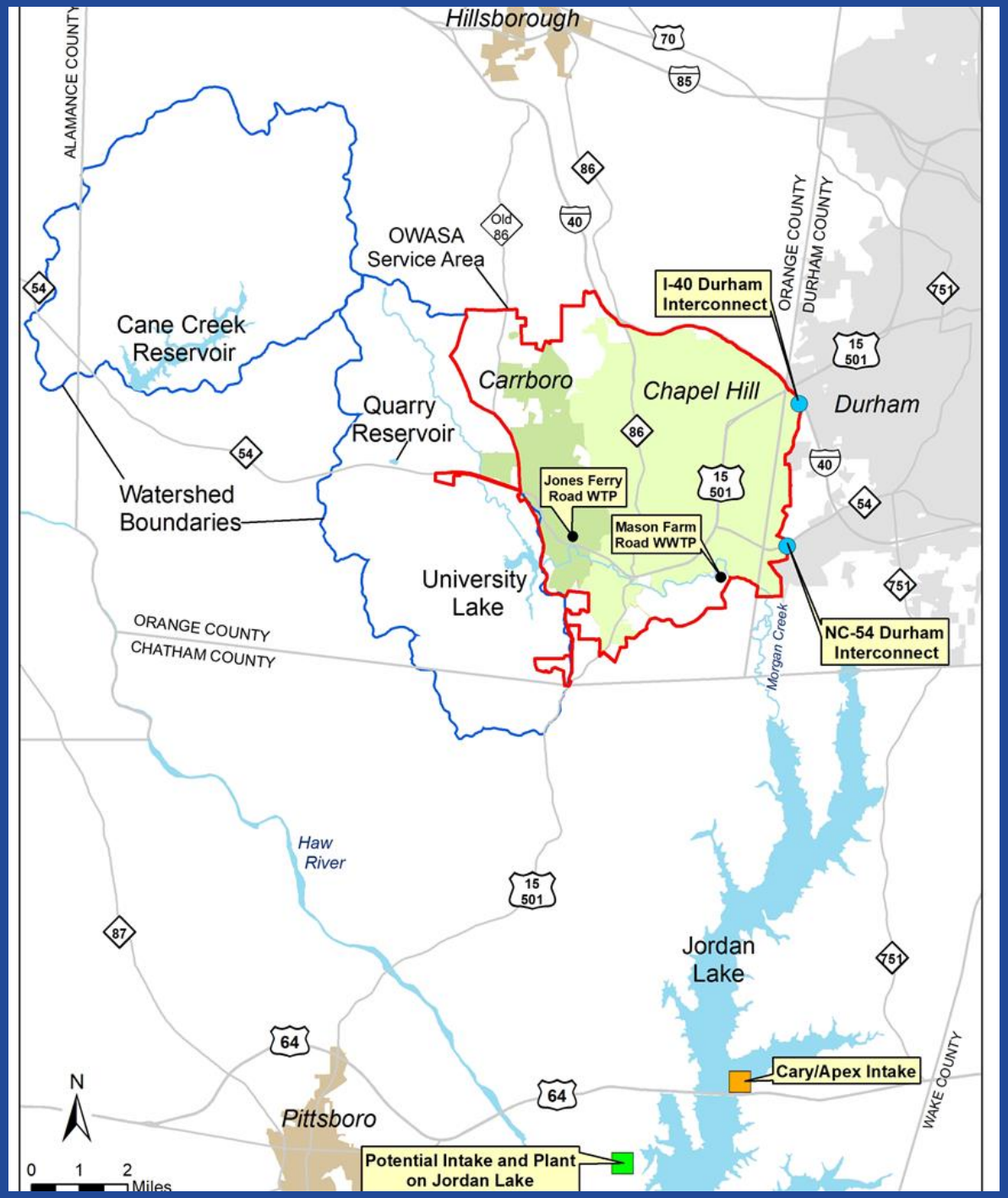
May 10, 2022

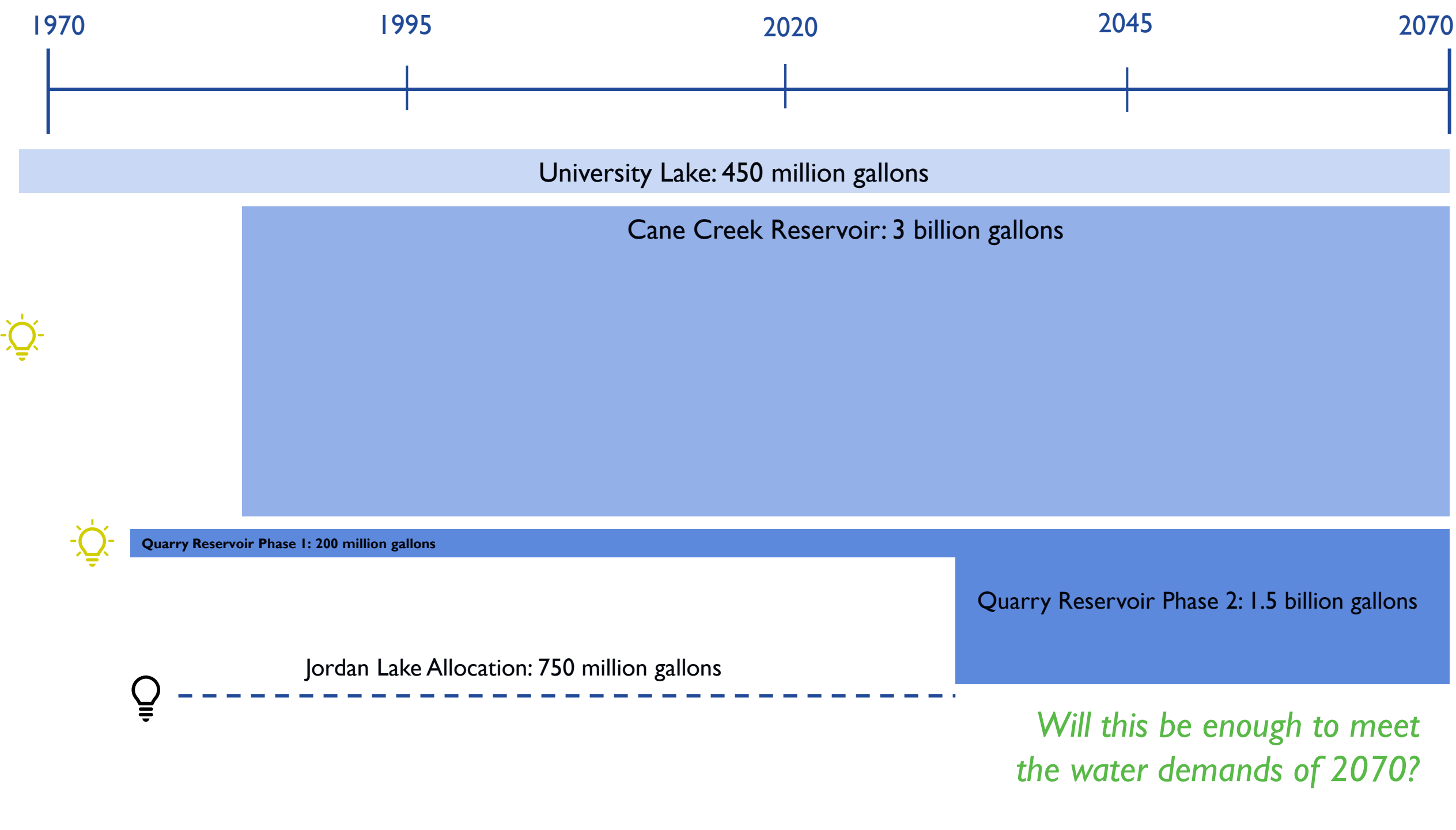
OWASA

Carrboro-Chapel Hill's not-for-profit public service agency delivering high quality water, wastewater, and reclaimed water services.

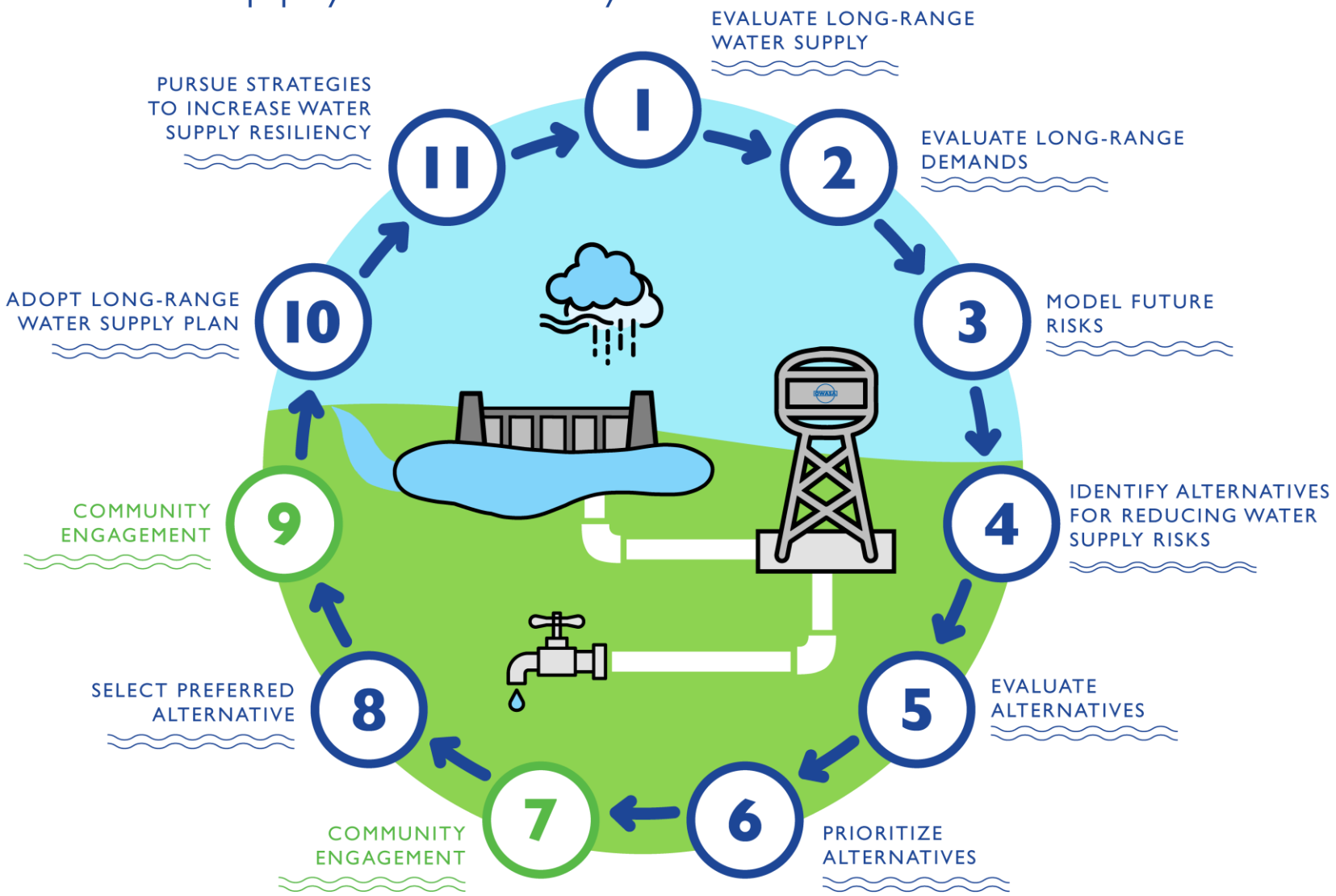
OWASA's Water Supplies

- Local Water Supplies
  - Cane Creek Reservoir
  - University Lake
  - Quarry Reservoir
- Jordan Lake
  - Allocation since 1988
  - No guaranteed access




1970
1995
2020
2045
2070
University Lake: 450 million gallons
Cane Creek Reservoir: 3 billion gallons
Quarry Reservoir Phase 1: 200 million gallons
Quarry Reservoir Phase 2: 1.5 billion gallons
Jordan Lake Allocation: 750 million gallons
Will this be enough to meet the water demands of 2070?

Ensuring Long-Range Water Supply Resiliency

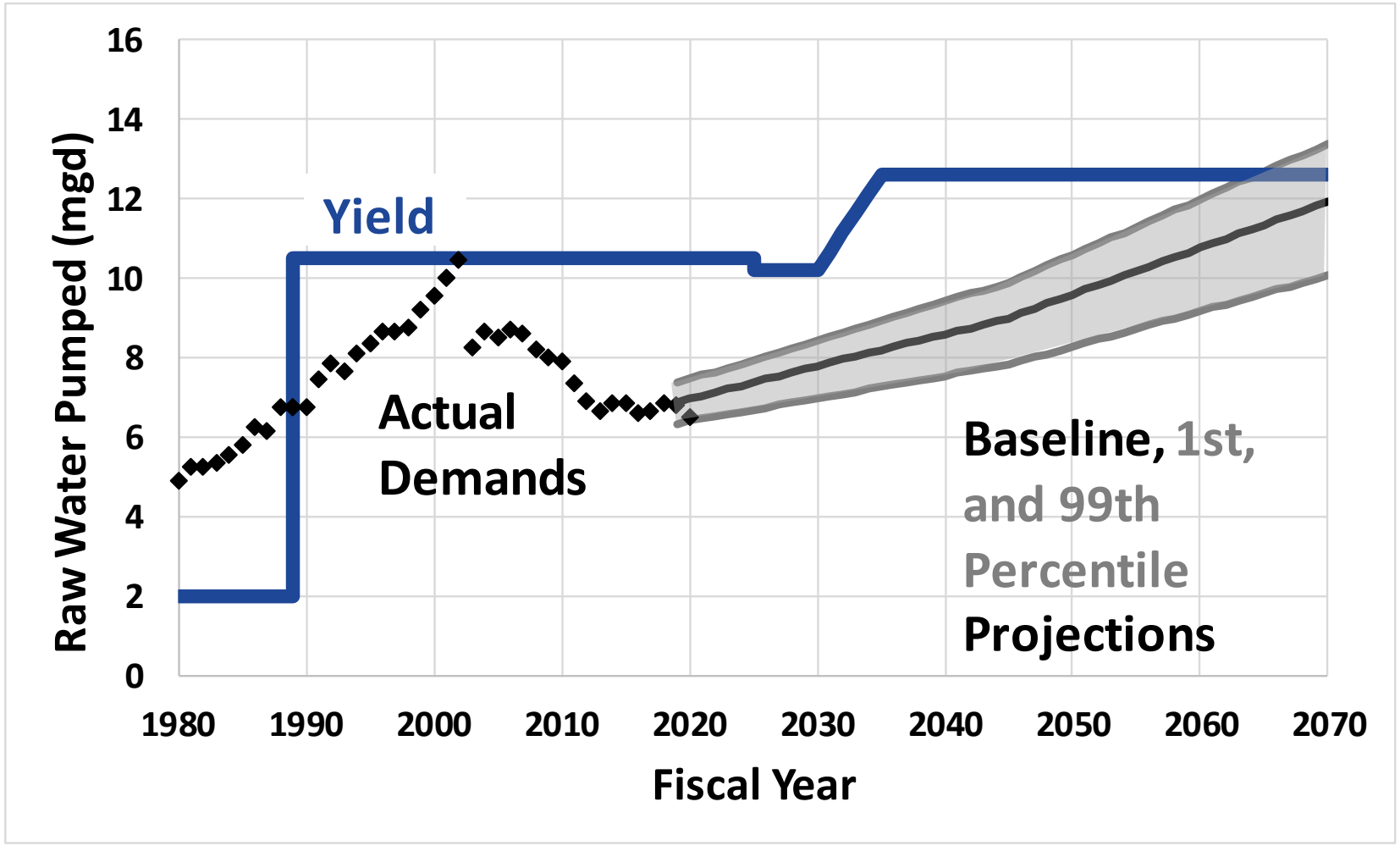


We considered community feedback in our evaluation.>>>>

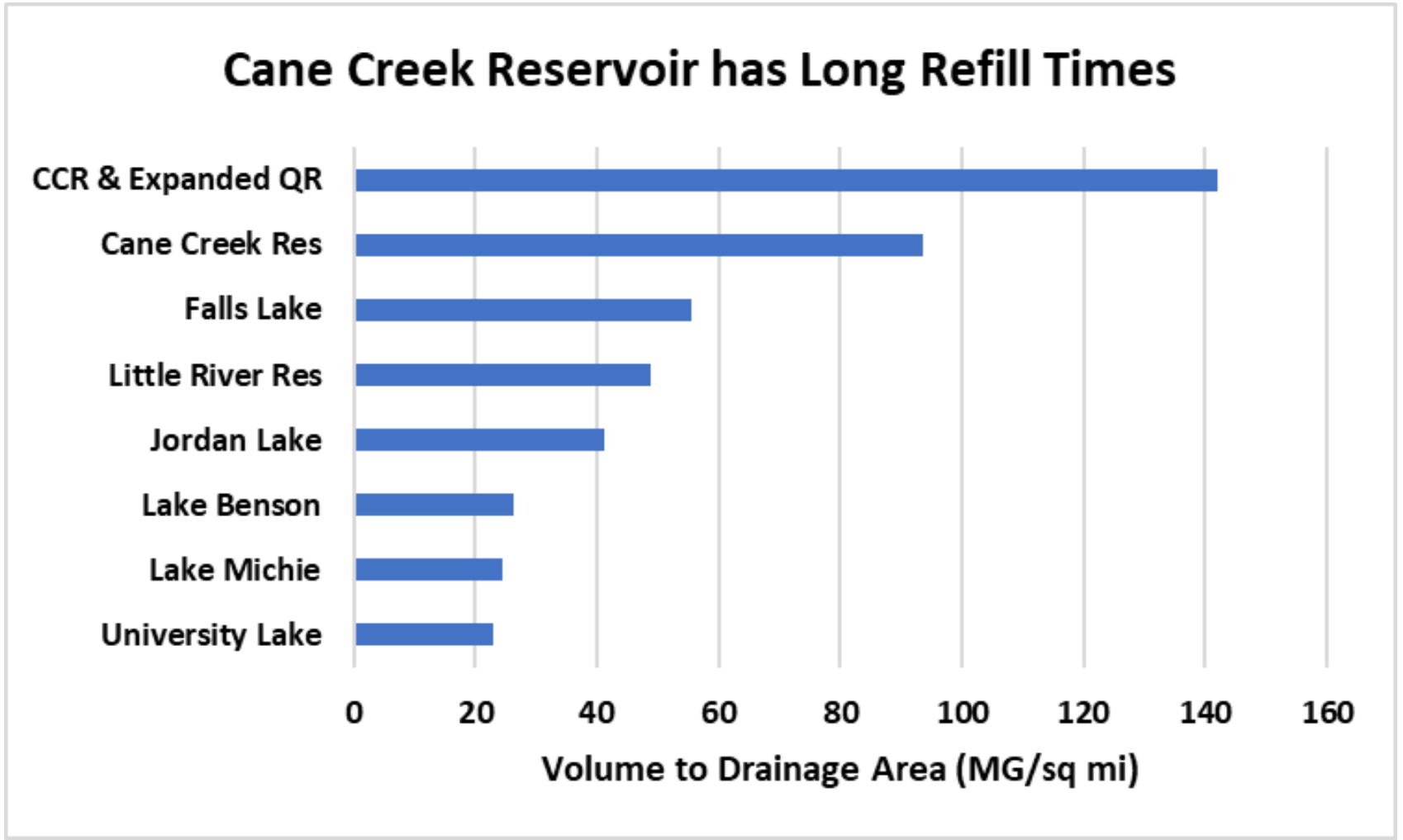
Key Messages

- We have a low risk of running out of water.
- Our largest vulnerability is in extended drought.
- After methodical and inclusive process, Jordan Lake is best option to augment our current supplies.
- Partnership of local utilities is moving forward to design and build new treatment facilities on Jordan Lake.

Our Planned Water Supply Meets Demands Under Most Conditions



Our Current Water Supply Risk is the Long Refill Time of Cane Creek Reservoir



Process for Narrowing Alternatives

Community Engagement

*Direct outreach

Options Eliminated

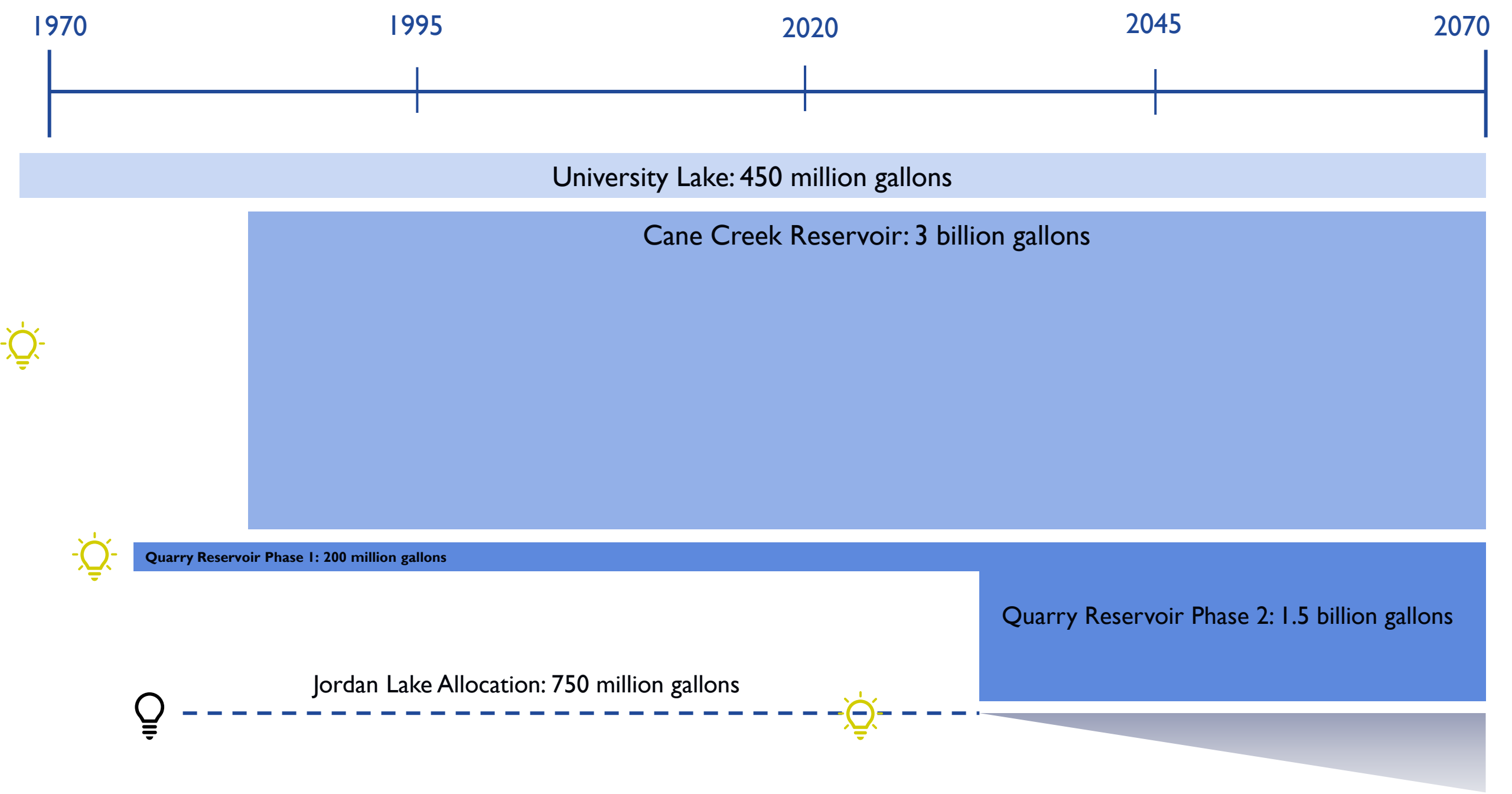
- None

- Groundwater
- Stormwater
- Some demand side management

- Demand side management
- Indirect potable reuse

- Direct potable reuse
- Deep Quarry

- TBD


1970
1995
2020
2045
2070
University Lake: 450 million gallons
Cane Creek Reservoir: 3 billion gallons
Quarry Reservoir Phase 1: 200 million gallons
Quarry Reservoir Phase 2: 1.5 billion gallons
Jordan Lake Allocation: 750 million gallons

Western Intake Partnership (WIP)

- City of Durham, Chatham County, and Town of Pittsboro
- Working since 2014 on regional approach
- Plans to build new drinking water treatment plant
  - Phase 1: 2031
  - Phase 2: 2050
- OWASA beginning discussions with WIP

Interests in Western Intake Partnership Discussions

- OWASA has access to its Jordan Lake allocation.
- We maintain our allocation of Jordan Lake water.
- Intake and transmission infrastructure are built to meet OWASA's demands.
- Impact on near-term water rates is minimized.
- Our working relationships with our utility partners are important to OWASA, and we are committed to maintaining them.
- We share with those partners a commitment to providing our customers high quality drinking water.

Jordan Lake Water Quality

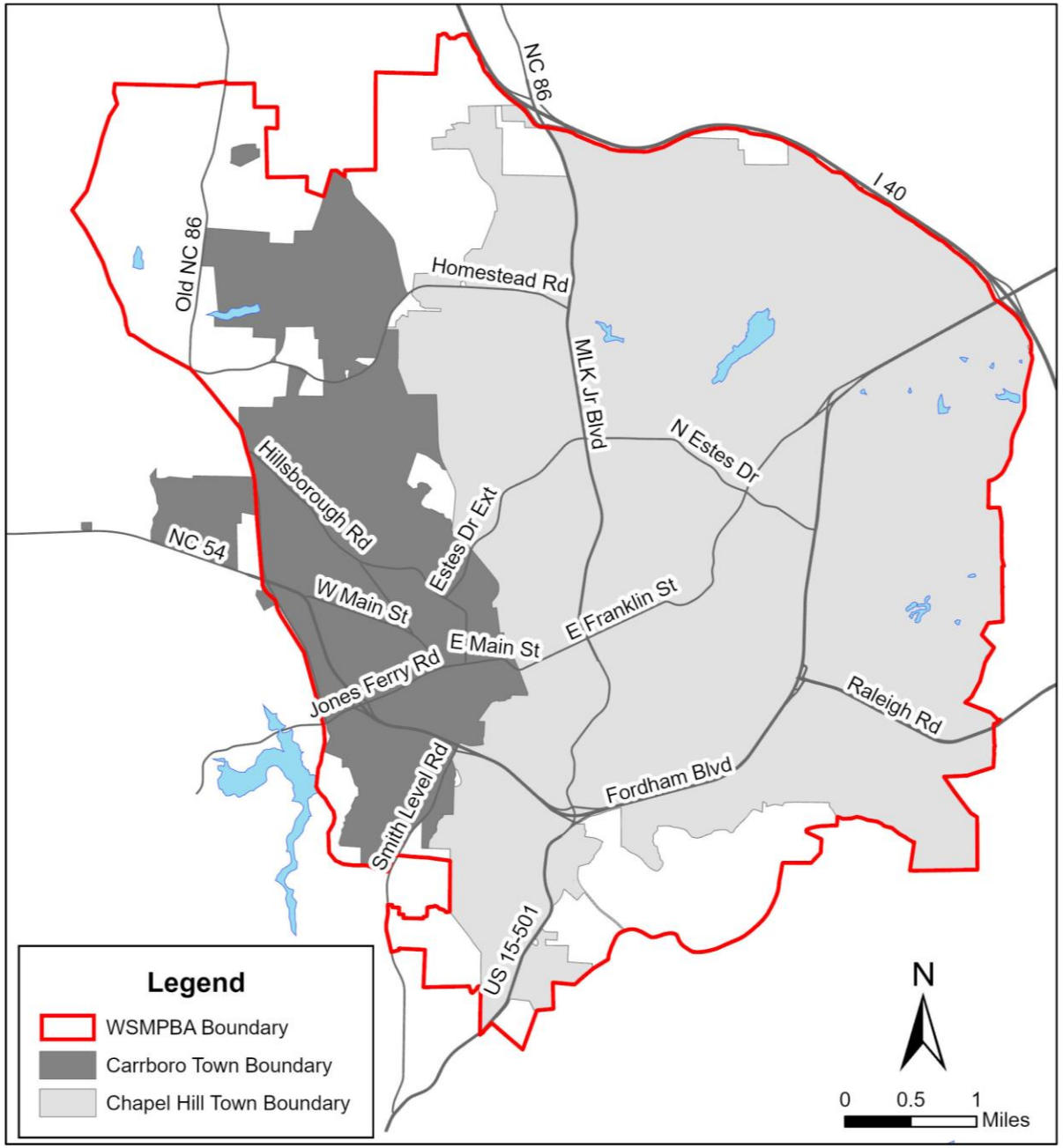
- Hundreds of thousands of people drink treated water from Jordan Lake daily
- Reviewed drinking water quality from Cary and Chatham County
- Drinking water from Jordan Lake meets all state and federal criteria
- Proposed WTP being designed to remove compounds of emerging concern

Questions and Discussion

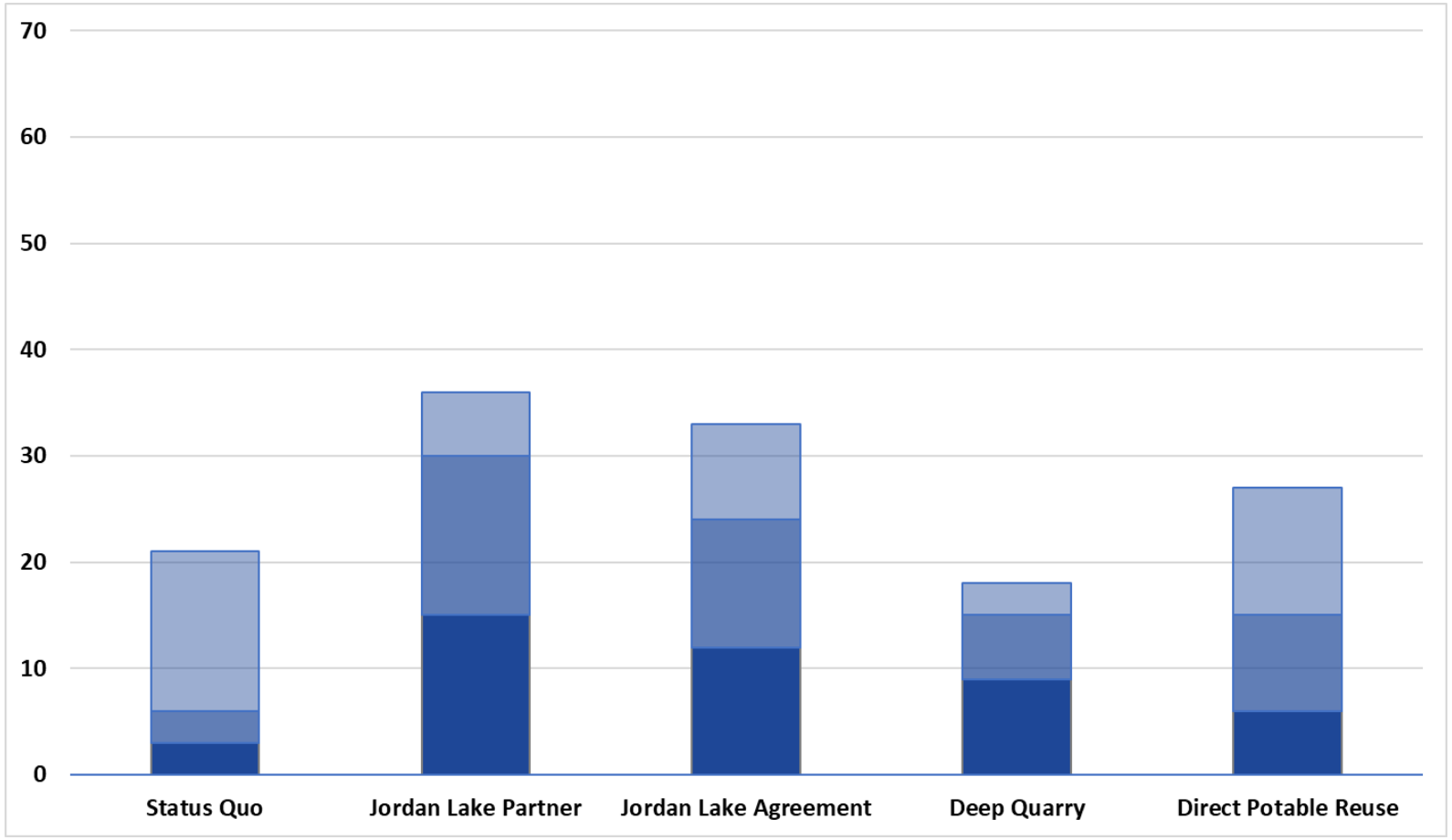
Mary Tiger
mtiger@owasa.org

Ruth Rouse
rrouse@owasa.org

OWASA's Service Area

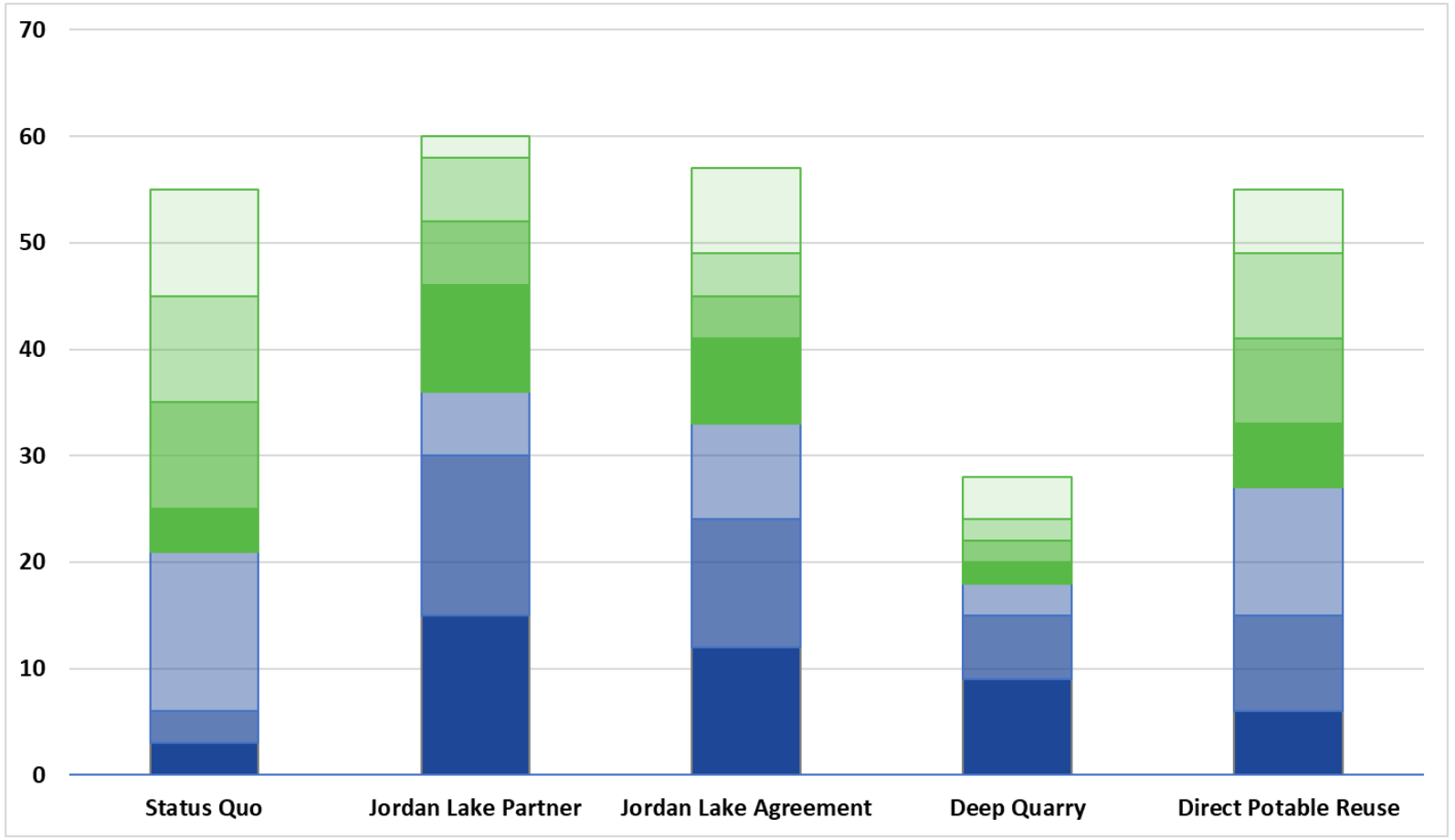


Jordan Lake Alternatives Rank Best Against Highest Priority Guiding Principles



Highest Priority GPs

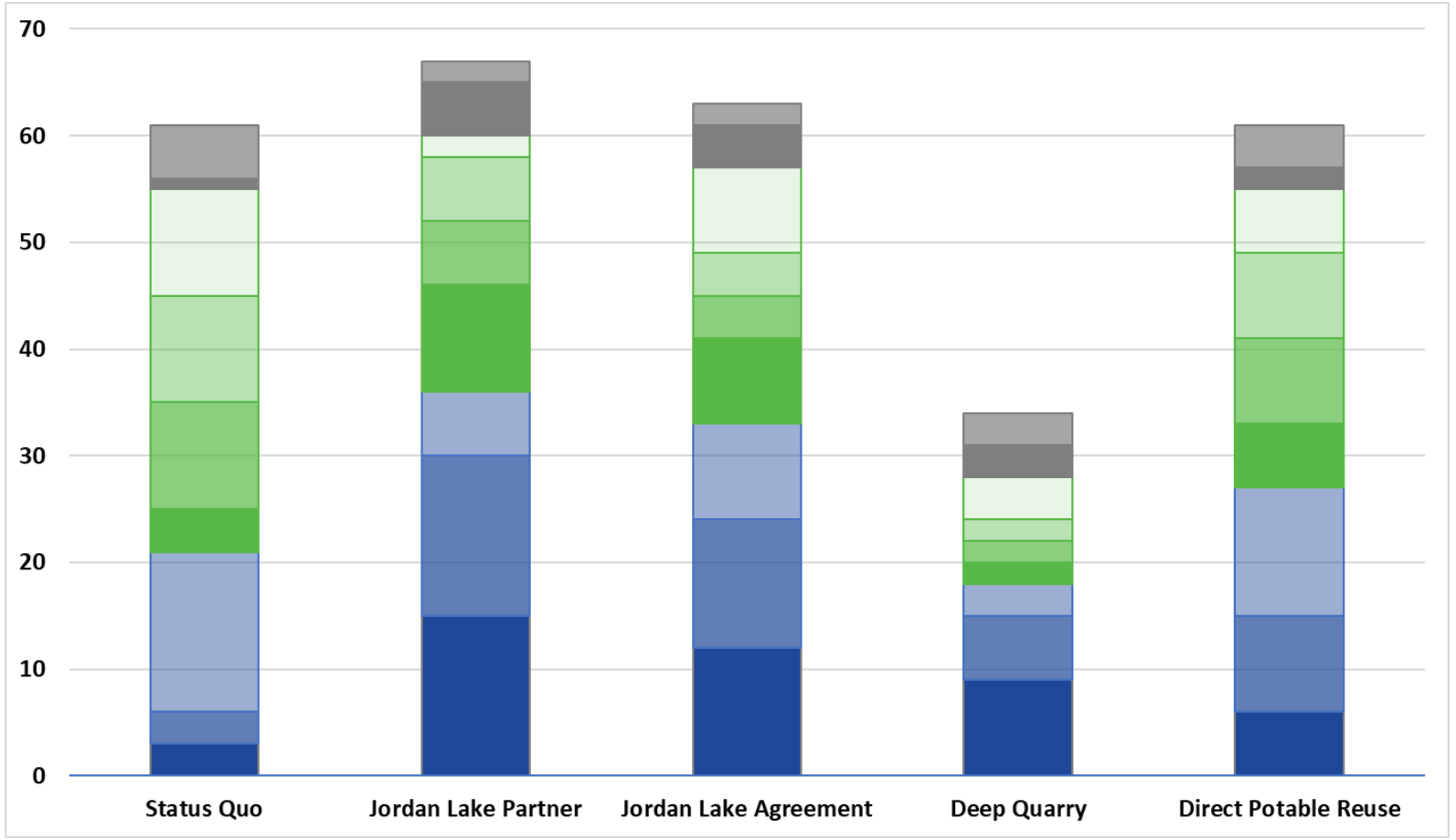
Jordan Lake Alternatives Rank Best Against Highest and High Priority Guiding Principles



Highest Priority GPs

High Priority GPs

Jordan Lake Alternatives Rank Highest Against Guiding Principles



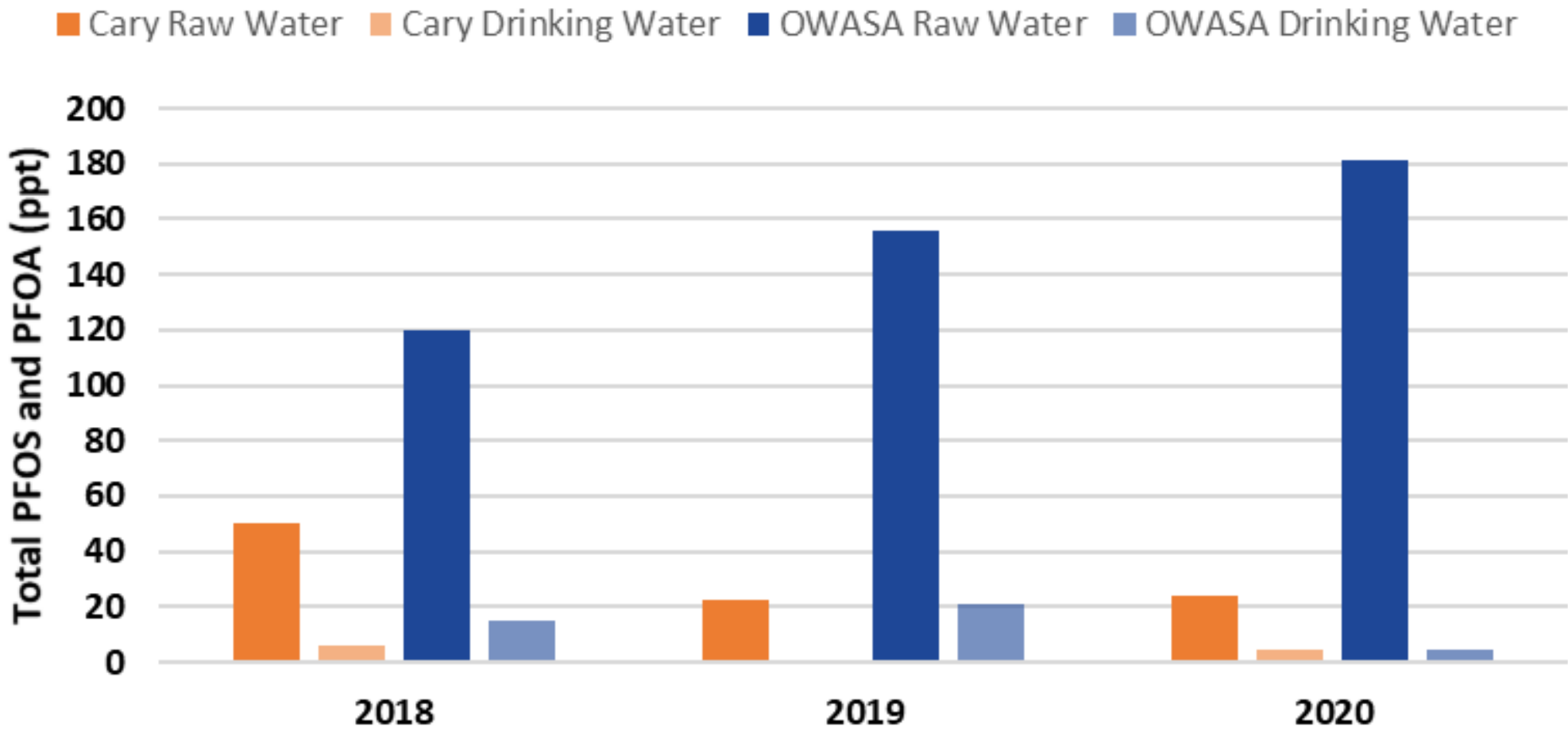
Highest Priority GPs

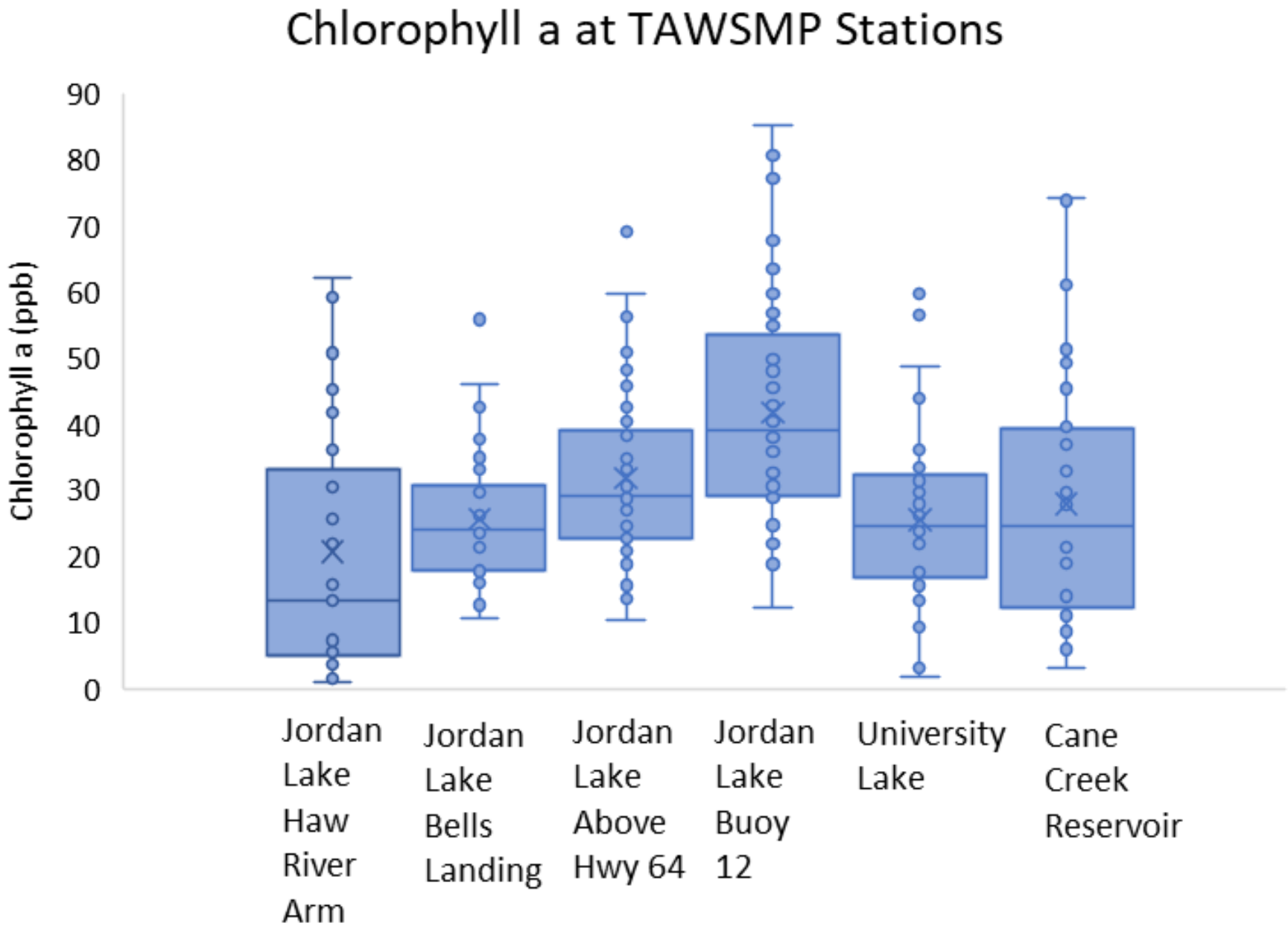
High Priority GPs

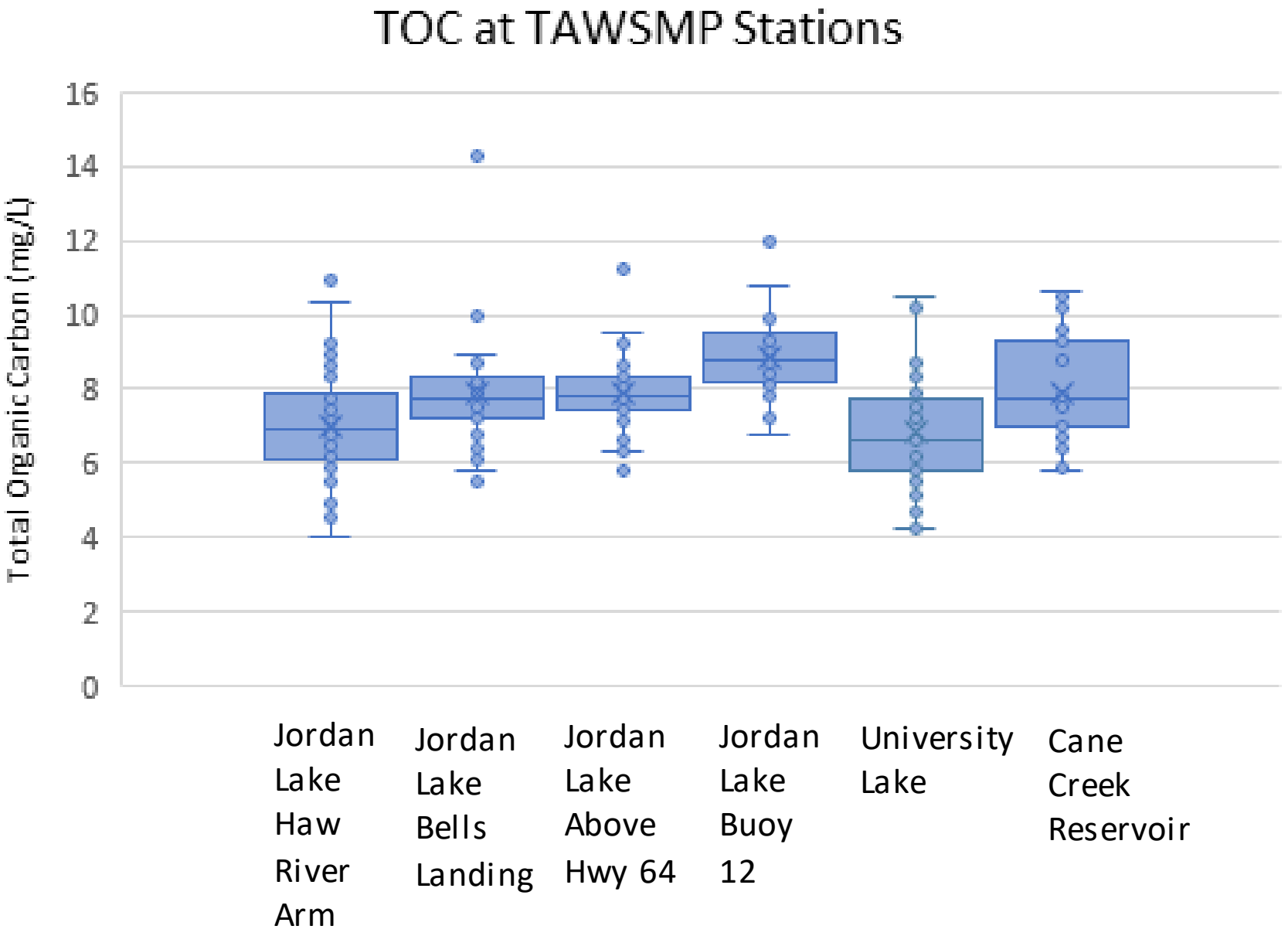
Other Considerations

Maximum PFOS+PFOA in Raw Water and Associated Drinking Water Concentration

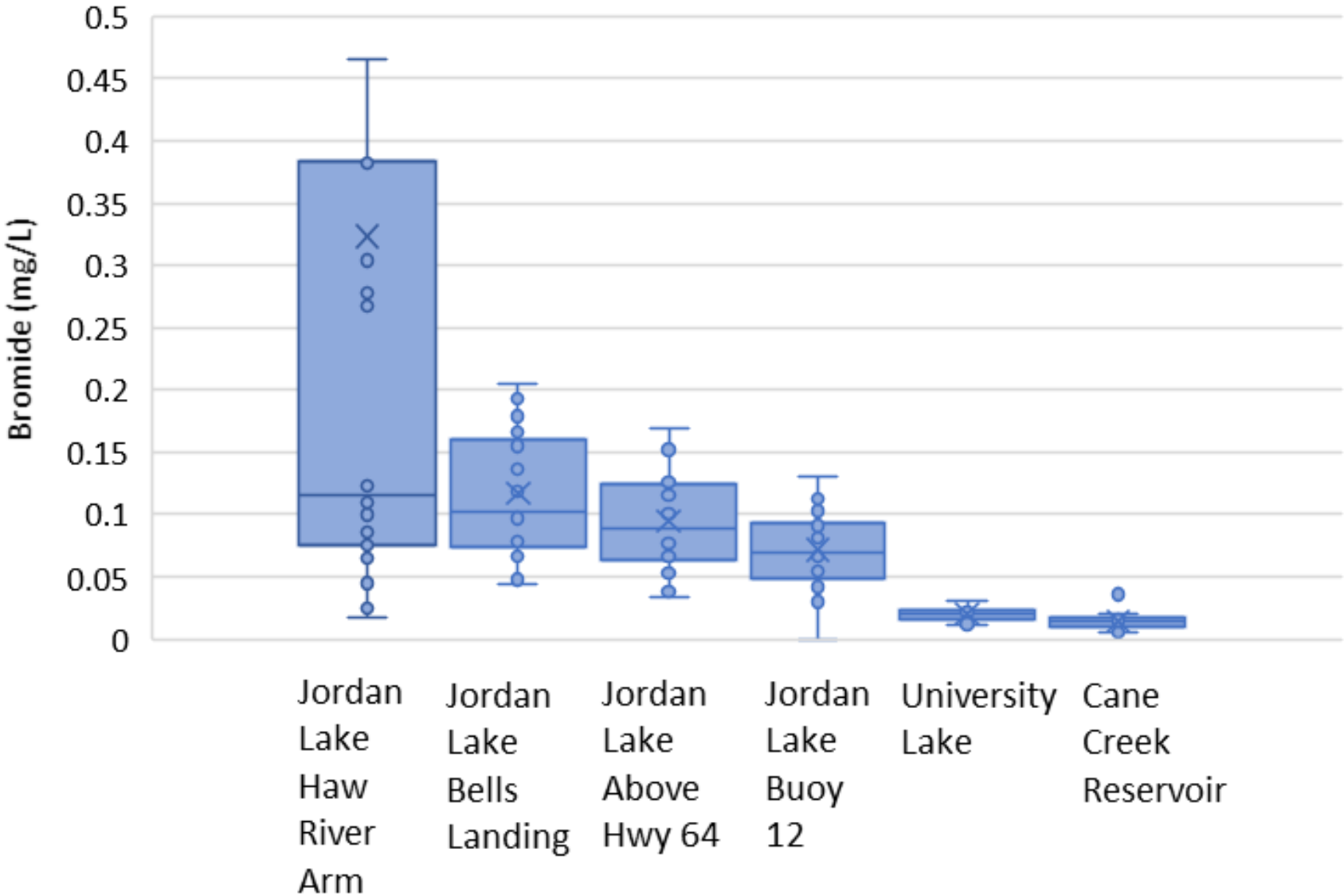
HAL of 70 ppt applies only to Drinking Water - all values meet HAL

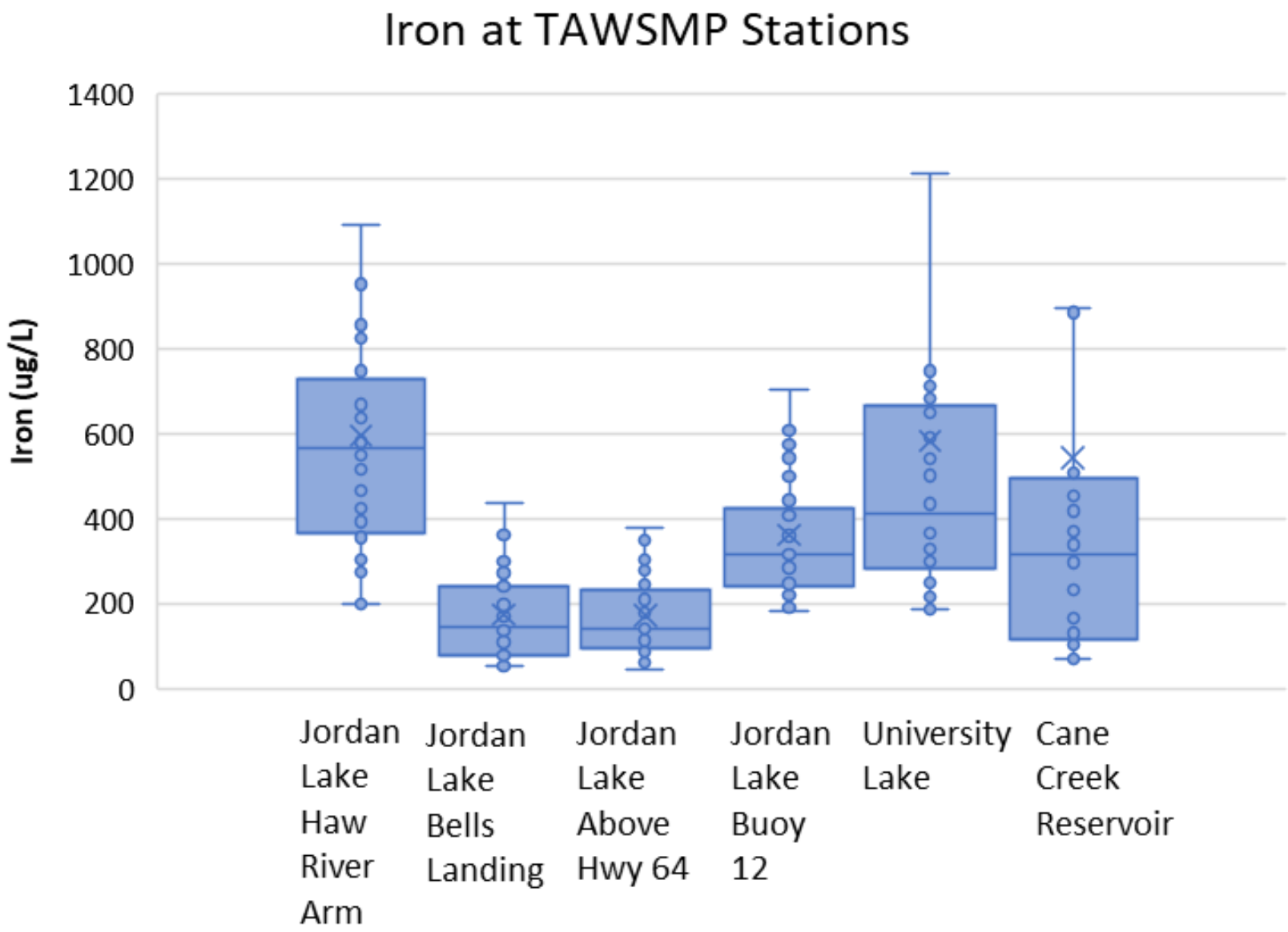


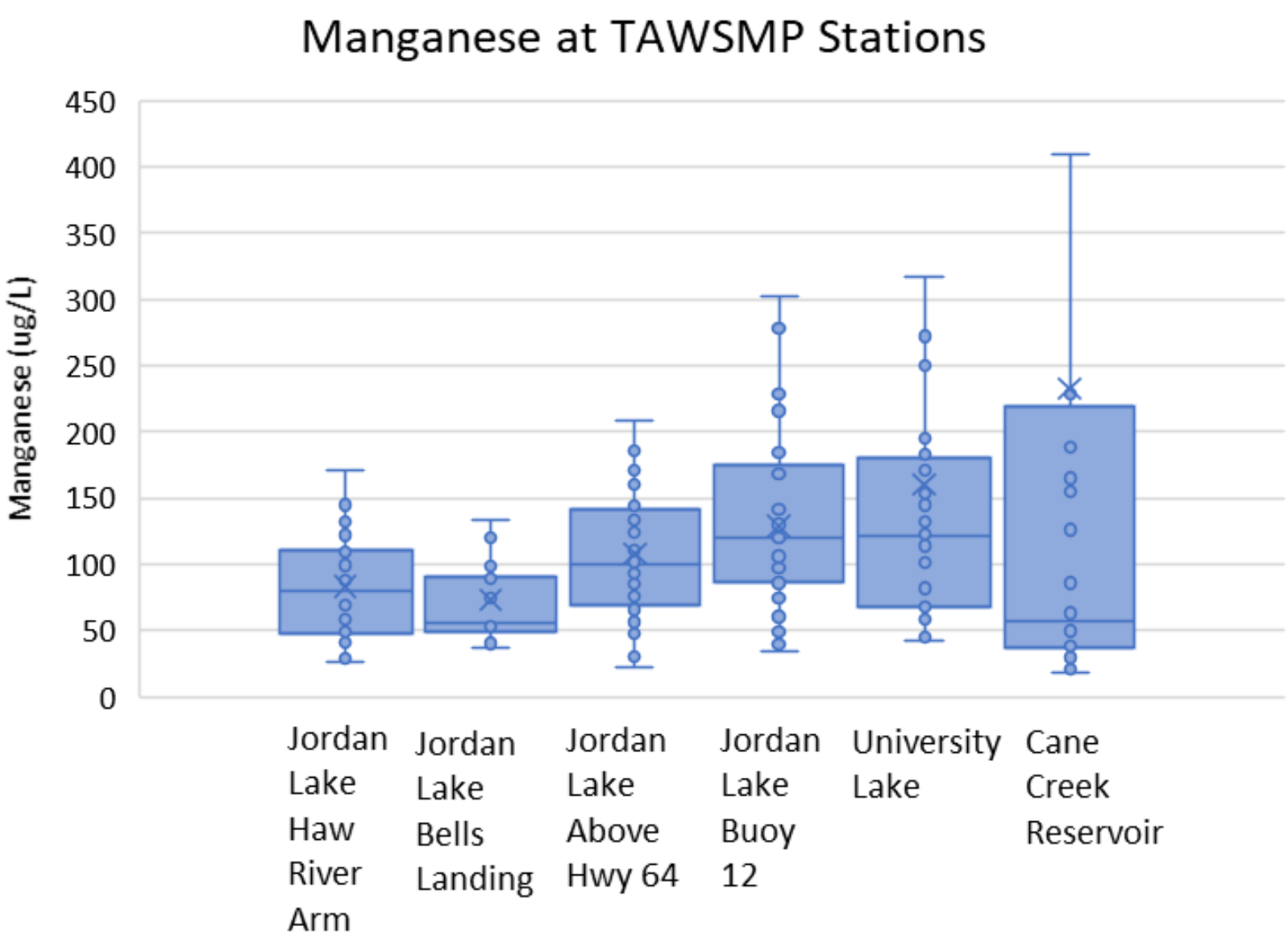

Chlorophyll a at TAWSMP Stations
Chlorophyll a (ppb)
90
80
70
60
50
40
30
20
10
0
Jordan Lake Haw River Arm
Jordan Lake Bells Landing
Jordan Lake Above Hwy 64
Jordan Lake Buoy 12
University Lake
Cane Creek Reservoir


TOC at TAWSMP Stations
Total Organic Carbon (mg/L)
16
14
12
10
8
6
4
2
0
Jordan Lake Haw River Arm
Jordan Lake Bells Landing
Jordan Lake Above Hwy 64
Jordan Lake Buoy 12
University Lake
Cane Creek Reservoir

Bromide at TAWSMP Stations

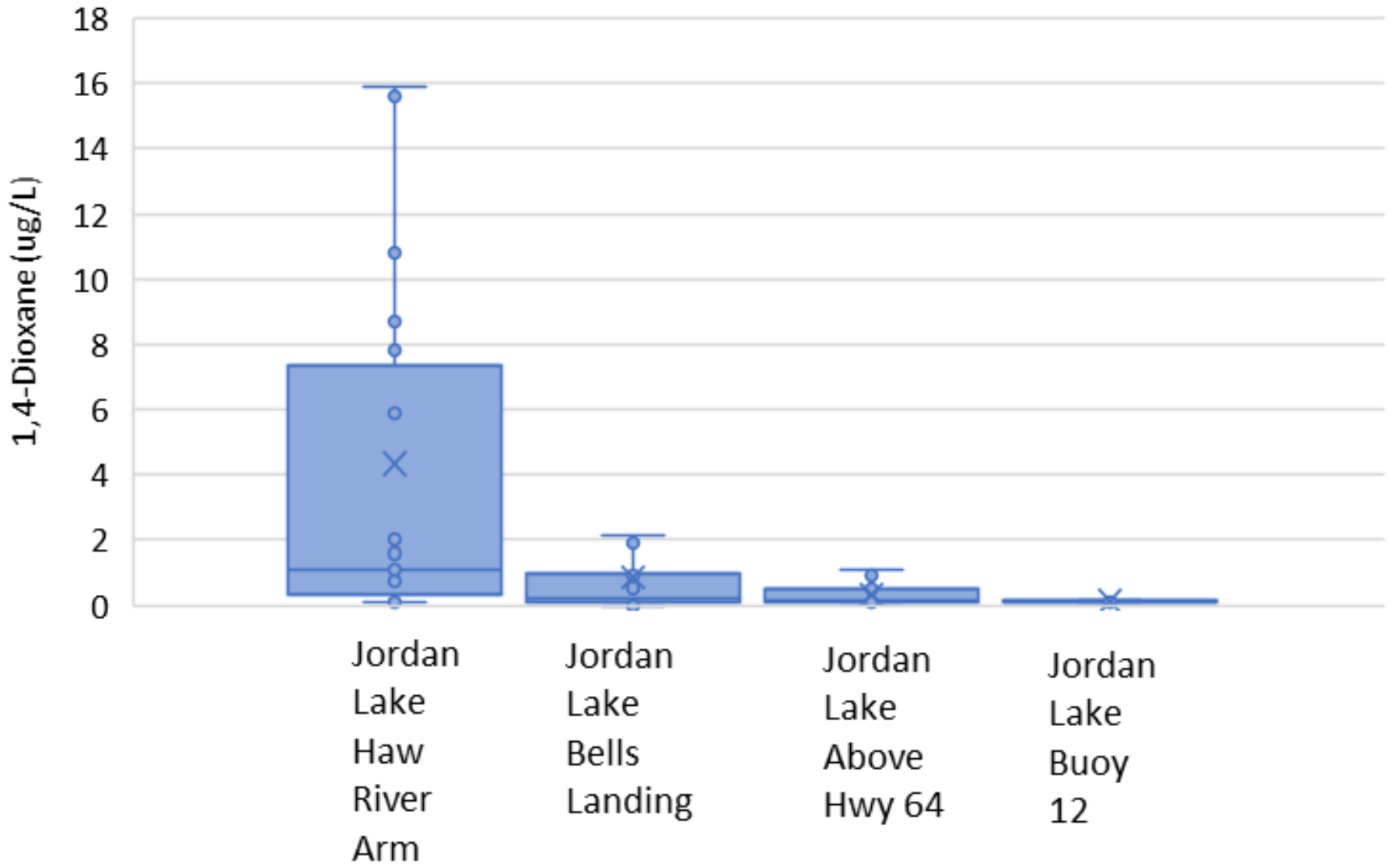



Iron at TAWSMP Stations
Iron (ug/L)
1400
1200
1000
800
600
400
200
0
Jordan Lake Haw River Arm
Jordan Lake Bells Landing
Jordan Lake Above Hwy 64
Jordan Lake Buoy 12
University Lake
Cane Creek Reservoir


Manganese at TAWSMP Stations
Manganese (ug/L)
450
400
350
300
250
200
150
100
50
0
Jordan Lake Haw River Arm
Jordan Lake Bells Landing
Jordan Lake Above Hwy 64
Jordan Lake Buoy 12
University Lake
Cane Creek Reservoir

1,4-Dioxane in Jordan Lake

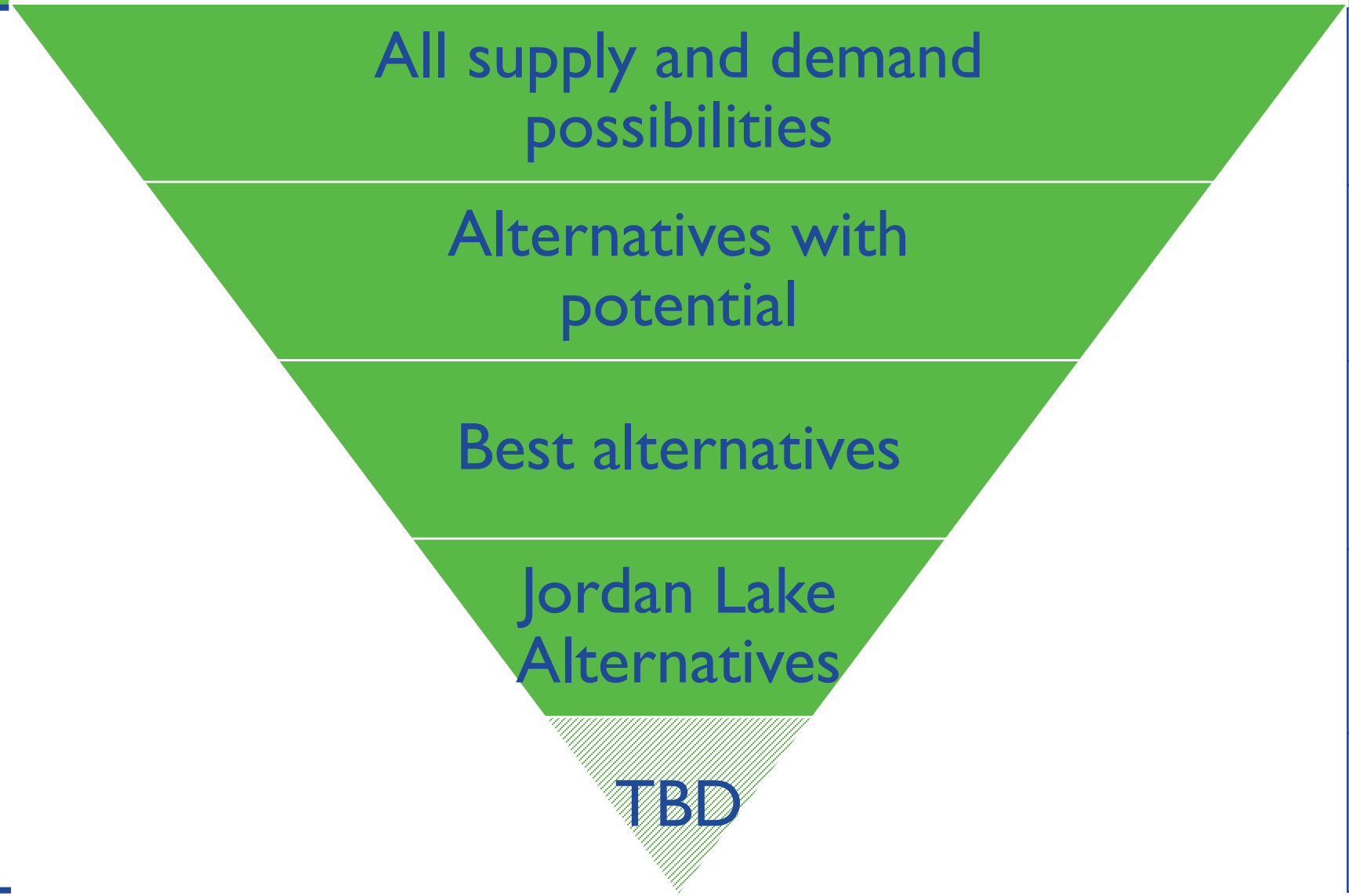
All Values non-detect in University Lake and Cane Creek Reservoir



Process for Narrowing Water Supply Alternatives

Community Engagement

* Direct outreach



Options eliminated
• None
• Groundwater • Stormwater • Some Demand Side Mgmt
• Demand Side Management • Indirect Potable Reuse
• Direct Potable Reuse • Deep Quarry
• TBD

Guiding Principles

Must Have

A. drinking water meets or surpasses public health requirements.

Highest Priority

B. reduce vulnerability to extended drought;

C. improve the reliability and resiliency of our water supply;

D. impact on current rates.

High Priority

E. impact on future rates;

F. incremental long-term impacts on the environment;

G. incremental impacts on the community;

H. flexibility to change course.

Other Considerations

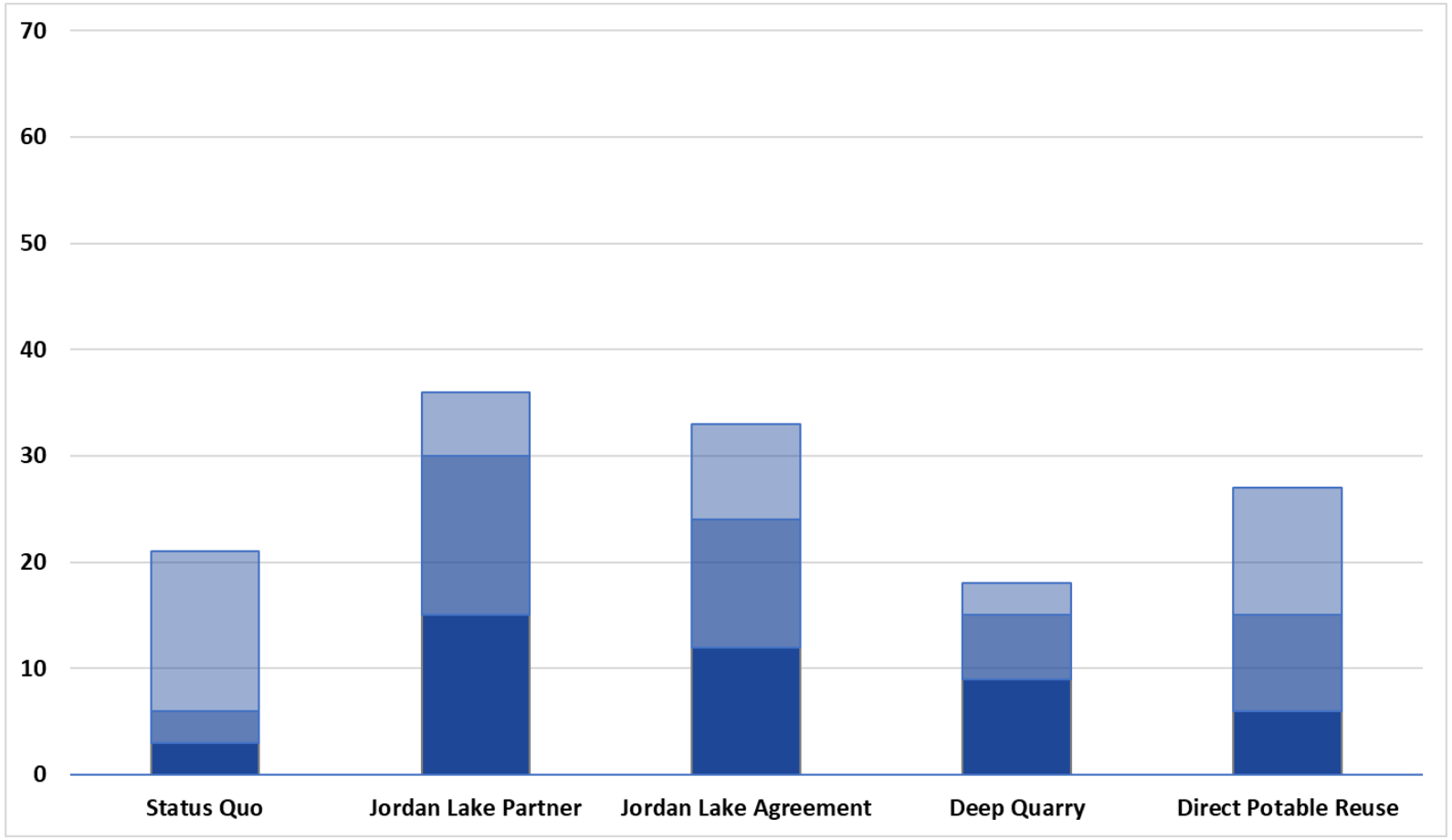
I. support for regional water supply planning efforts;

J. incremental short-term impacts on the environment.

Evaluation Using Guiding Principles

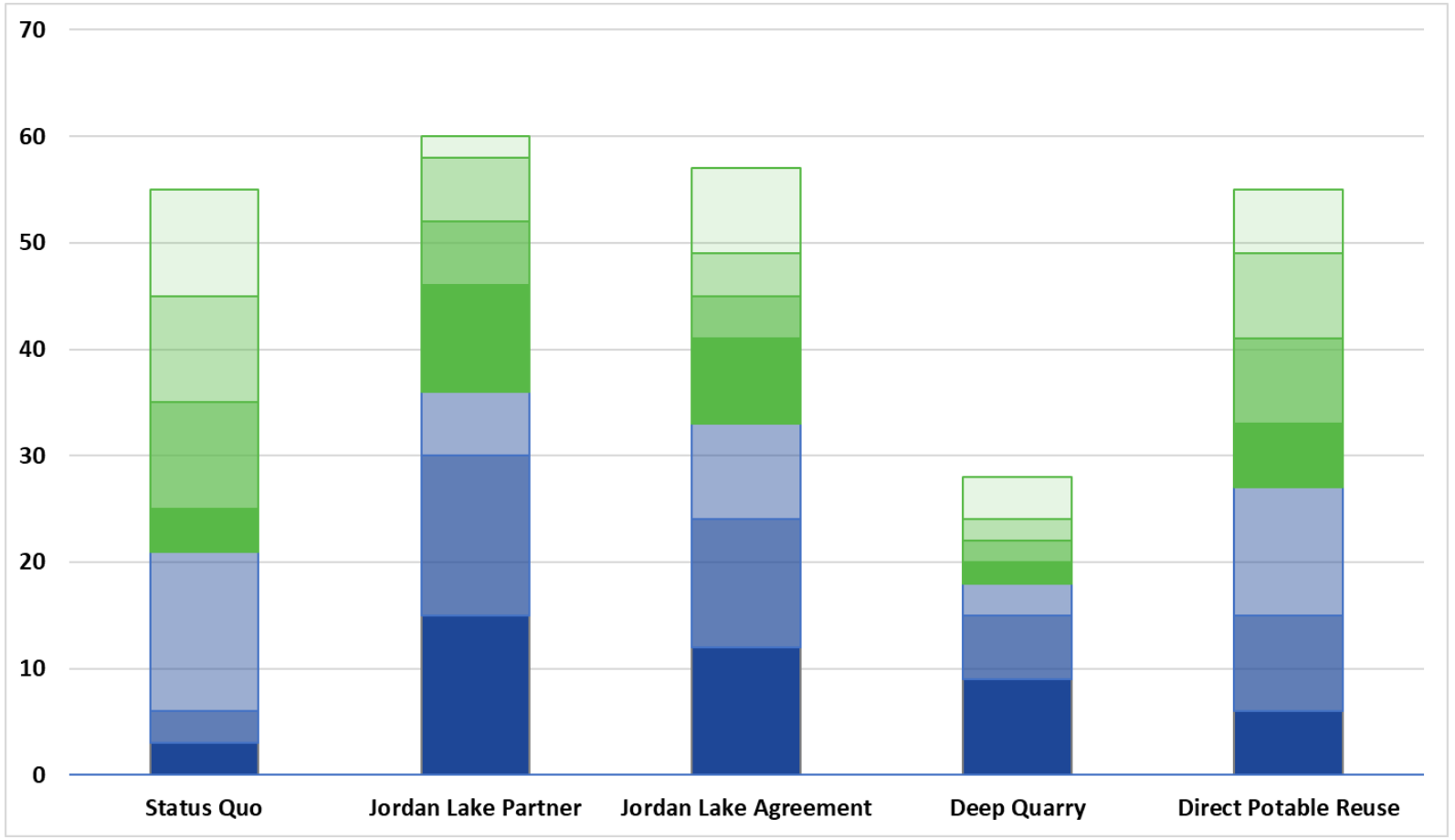
- Staff ranked each of the alternatives against each guiding principle
  - Best alternative – 5
  - Worst alternative – 1
- Staff assigned weights to each guiding principle
  - Highest – 3
  - High – 2
  - Other considerations – 1
- Alternative's score for each GP was product of rank and weight

Jordan Lake Alternatives Rank Best Against Highest Priority Guiding Principles



Highest Priority GPs

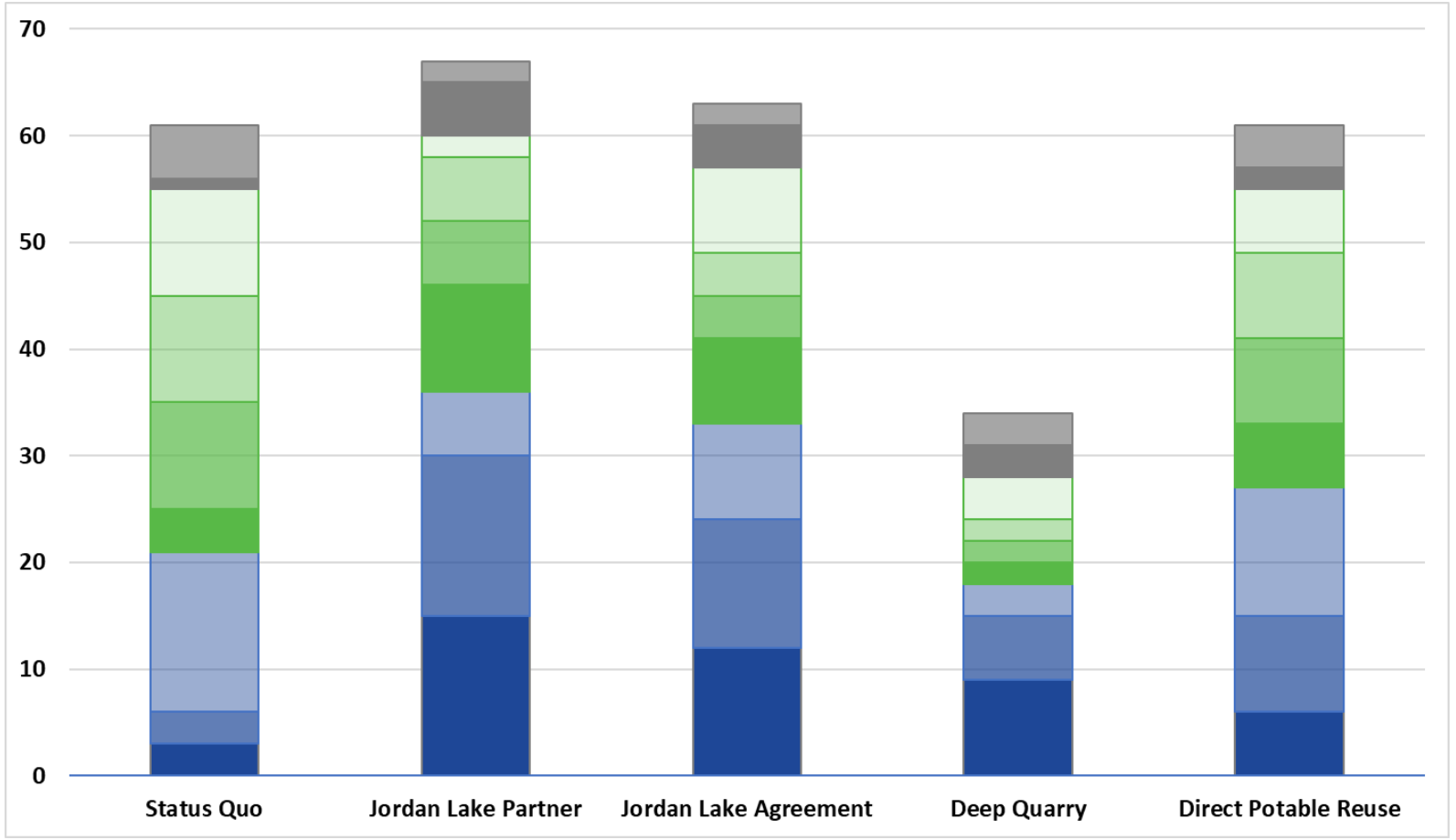
Jordan Lake Alternatives Rank Best Against Highest and High Priority Guiding Principles



Highest Priority GPs

High Priority GPs

Jordan Lake Alternatives Rank Highest Against Guiding Principles



Highest Priority GPs

High Priority GPs

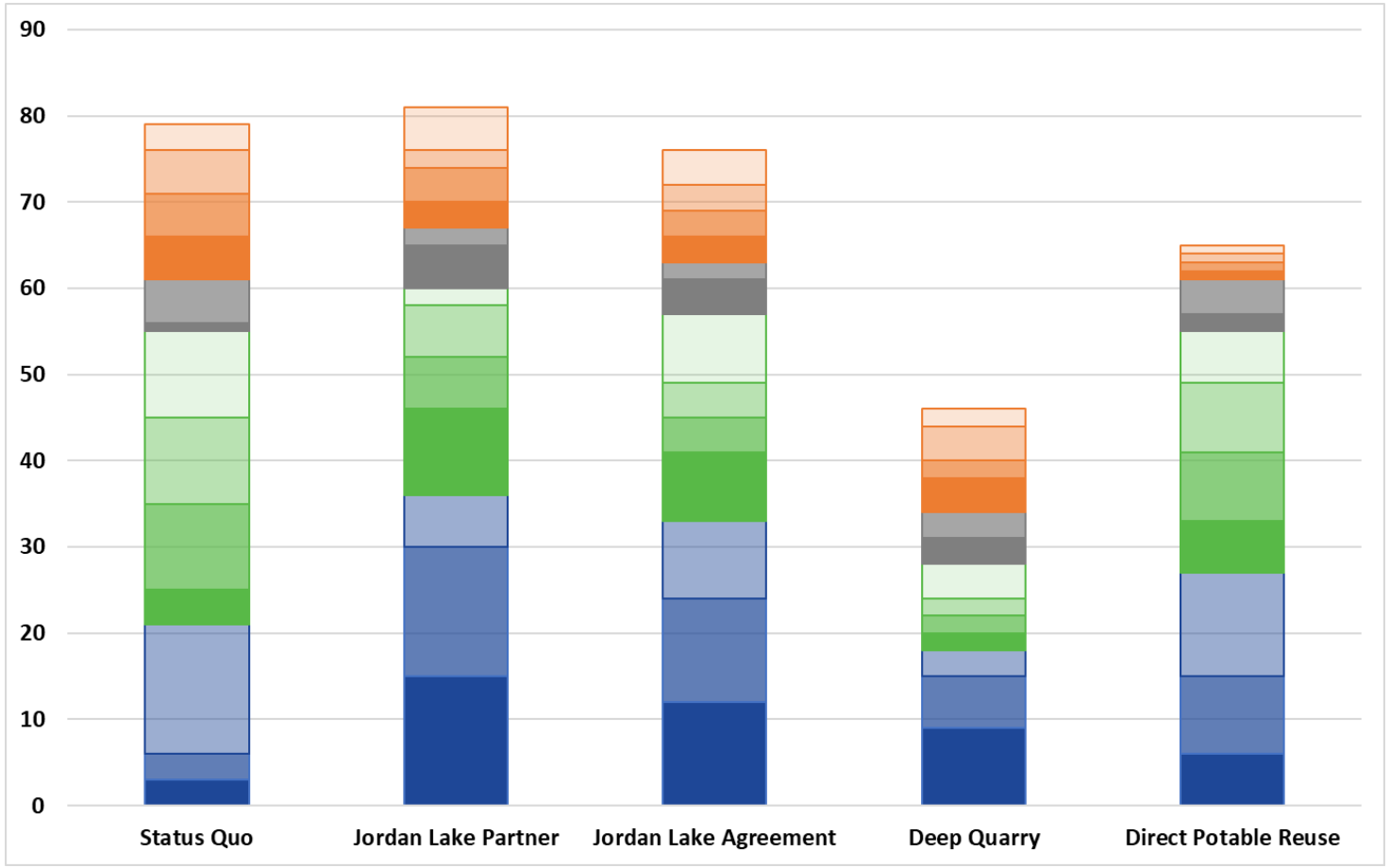
Other Considerations

Staff also developed some other criteria

K. Water quality of raw water supply
L. Legality, permitting, and partnership issues
M. Community engagement effort
N. Ability to maintain our Jordan Lake allocation

- Alternatives ranked against these criteria
- These criteria assigned a weight of 1

Jordan Lake Alternative Still Ranks Highest



Highest Priority GPs

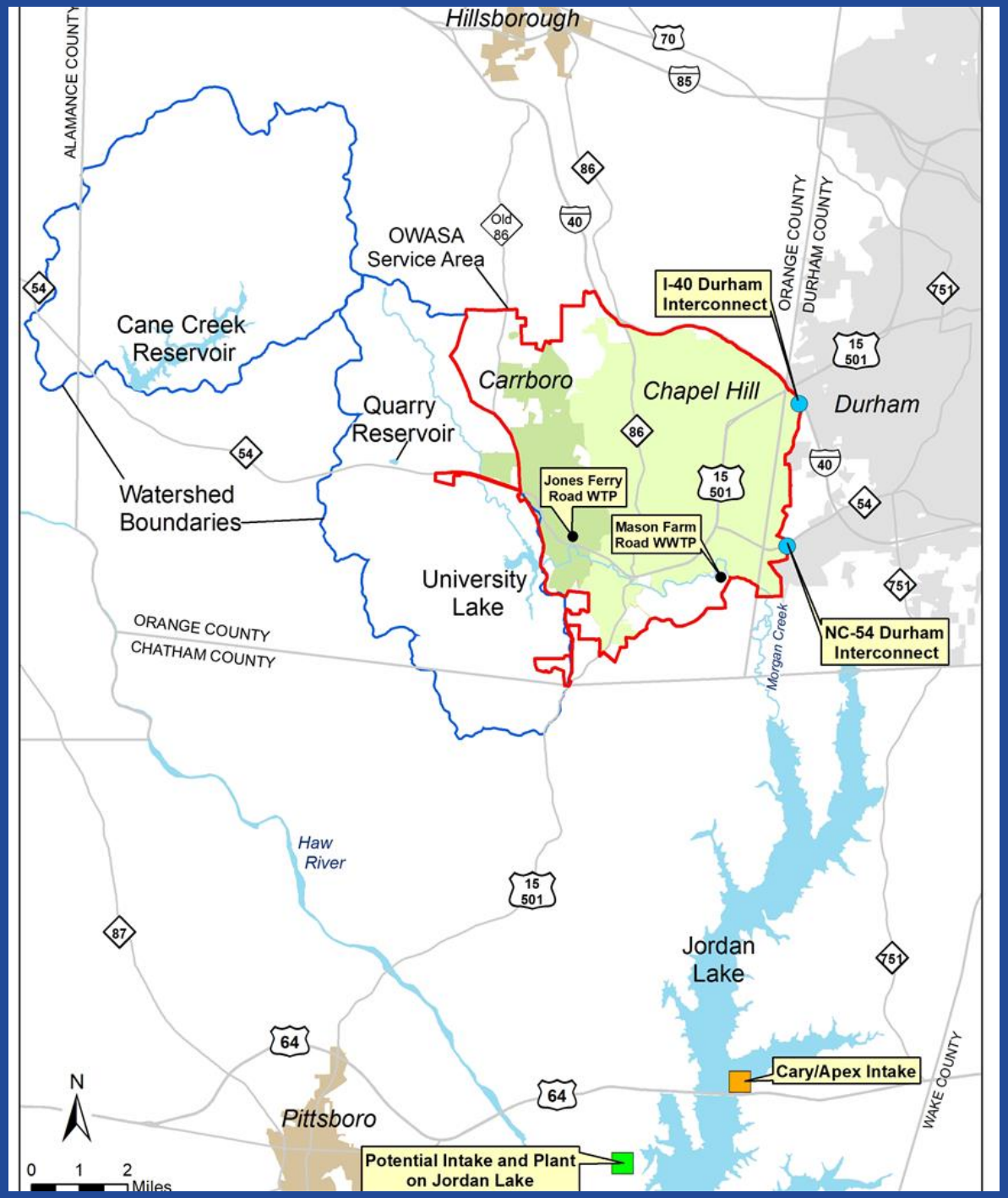
High Priority GPs

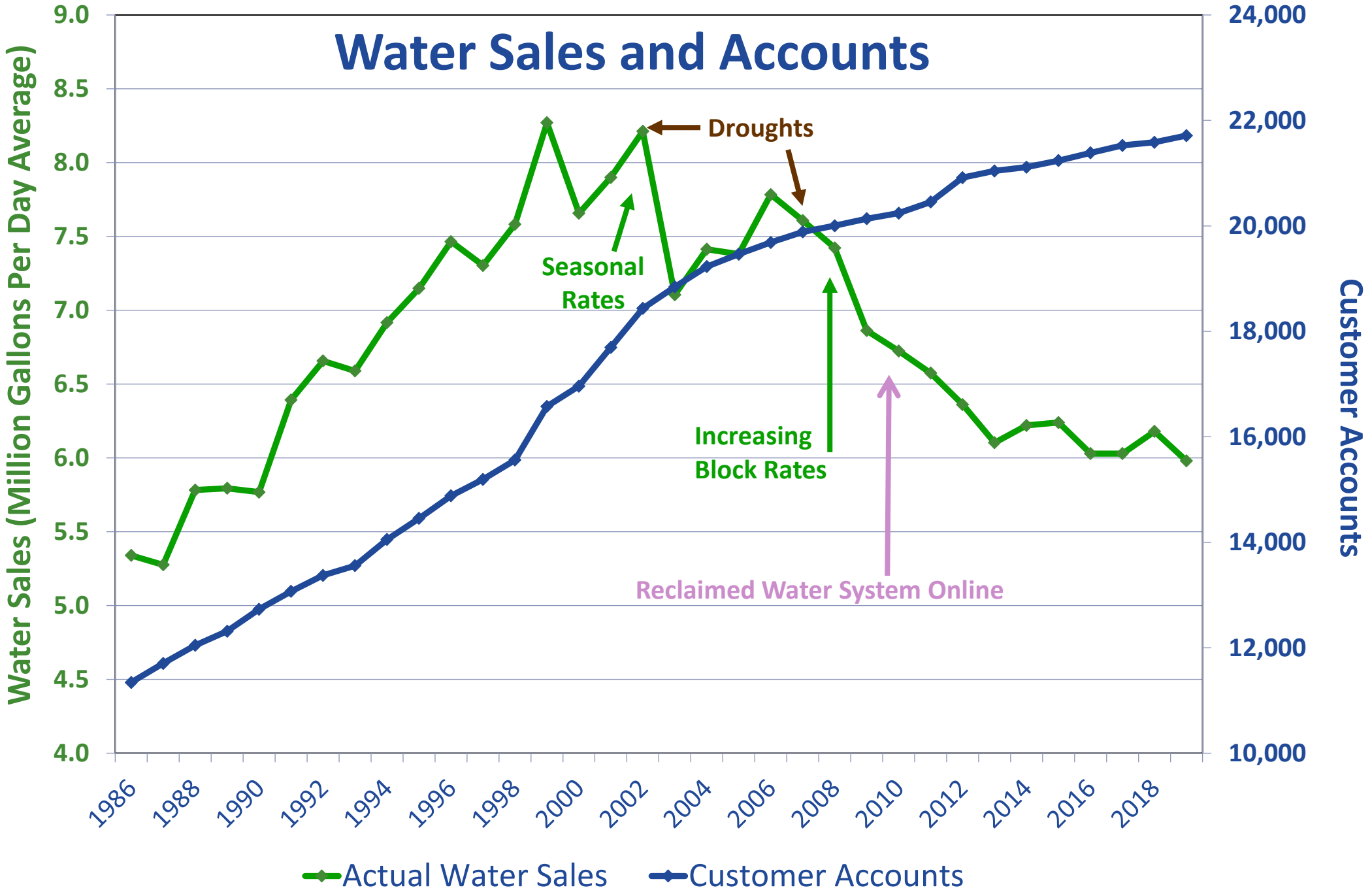
Other Considerations

Staff Criteria

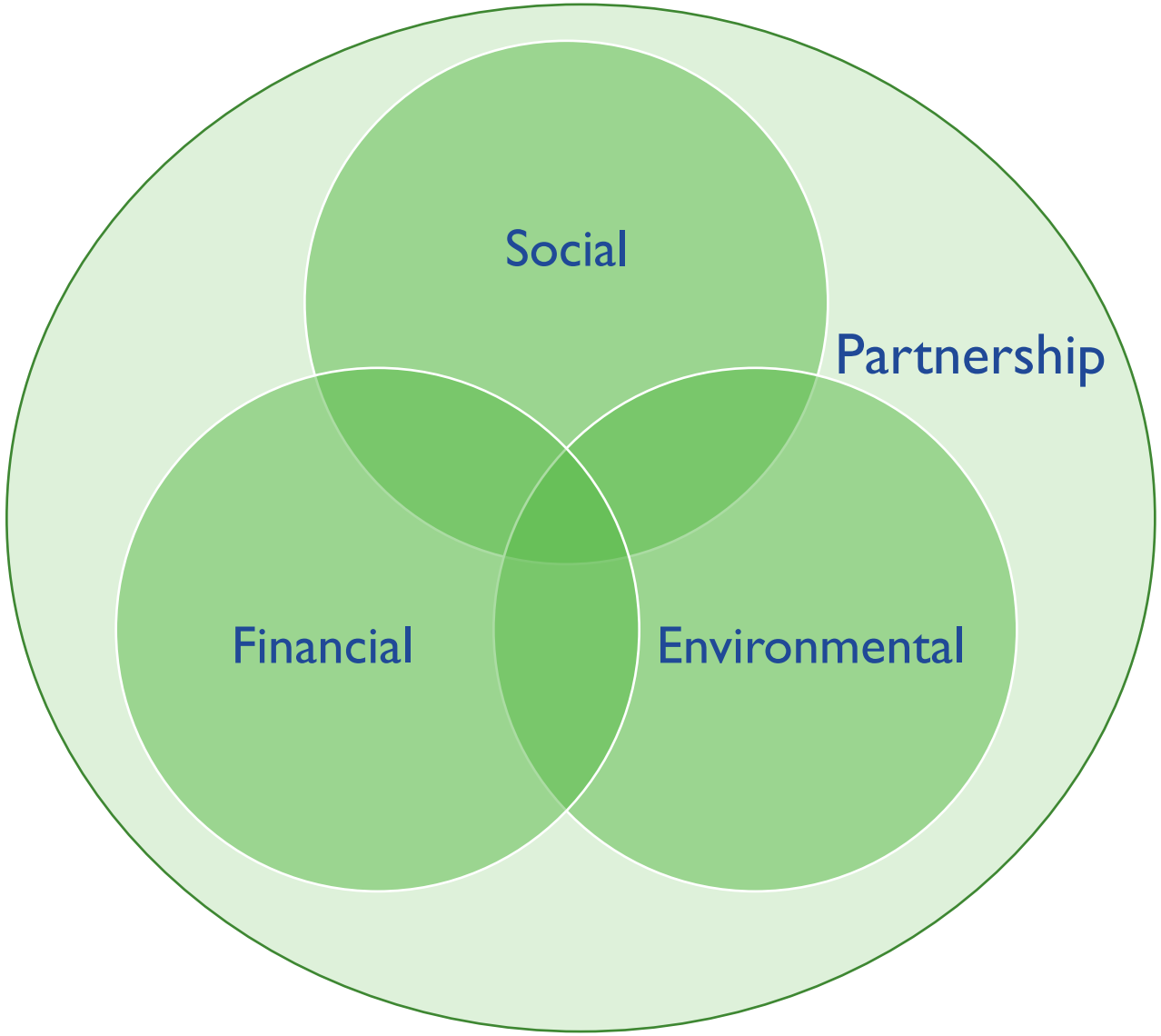
OWASA's Water Supplies

- Local Water Supplies
  - Cane Creek Reservoir
  - University Lake
  - Quarry Reservoir
- Jordan Lake
  - Allocation since 1988
  - No guaranteed access




Water Sales and Accounts
Water Sales (Million Gallons Per Day Average)
Customer Accounts
9.0
8.5
8.0
7.5
7.0
6.5
6.0
5.5
5.0
4.5
4.0
24,000
22,000
20,000
18,000
16,000
14,000
12,000
10,000
1986
1988
1990
1992
1994
1996
1998
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018
Droughts
Seasonal Rates
Increasing Block Rates
Reclaimed Water System Online
Actual Water Sales
Customer Accounts

Sustainability Principles



Demand Management Strategies

- Do not meet long-term demands 

- Cost-effective strategies will be considered in water conservation plan as appendix to LRWSP

Demand Management Alternatives

Reclaimed Water to UNC Cogeneration Facilities

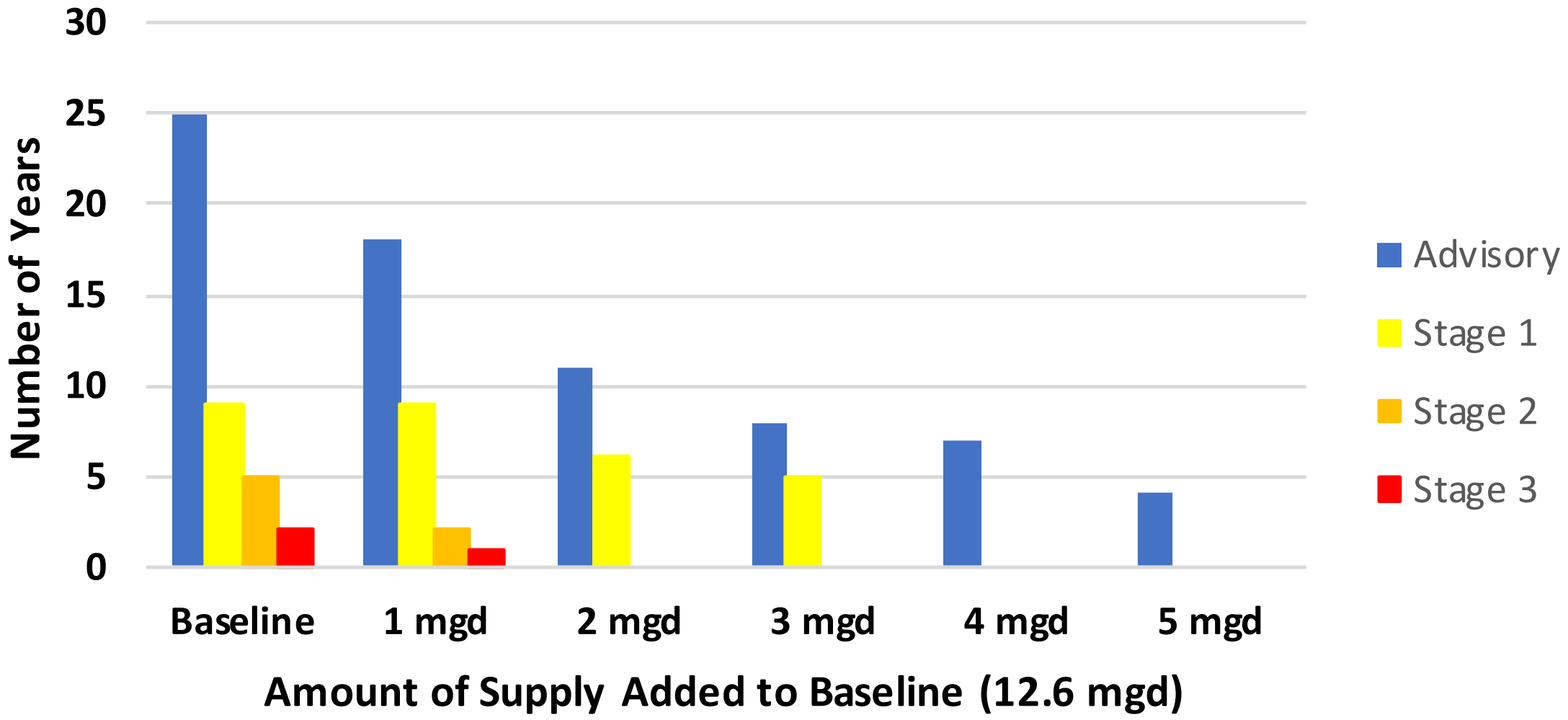
Increase Use of Reclaimed Water on UNC's Main Campus

On-Site Non-Potable Water Treatment and Reuse

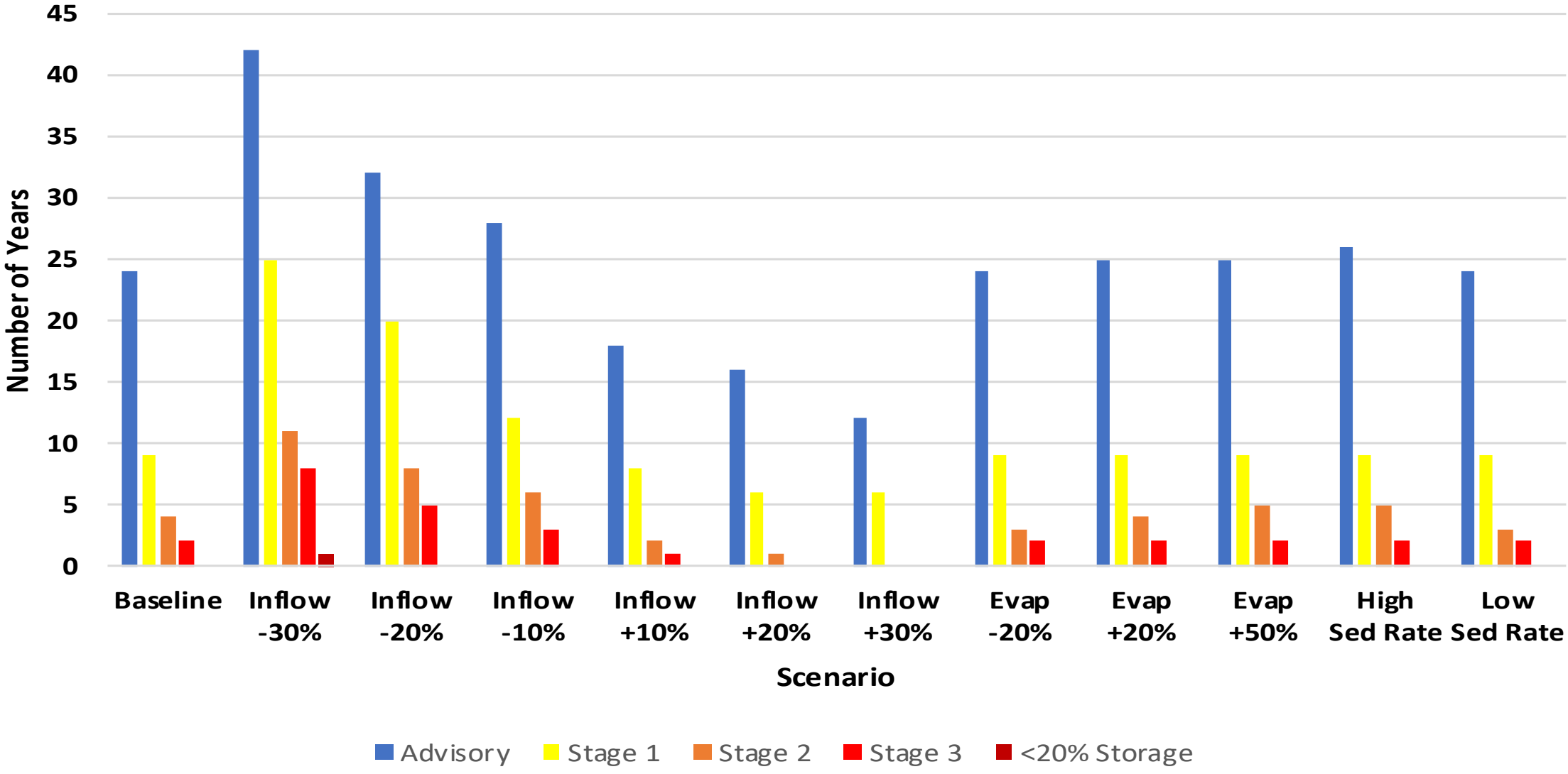
4 Bundled Demand Mgmt Options:

- Unit Sub-metering and WaterSense
- Water Efficiency Design Assistance
- On-bill Financing for Water Efficient Fixtures
- Minimize Need for System Flushing

Number of Years Water Shortages Reached at Various Supplies (out of 94 Modeled Years)

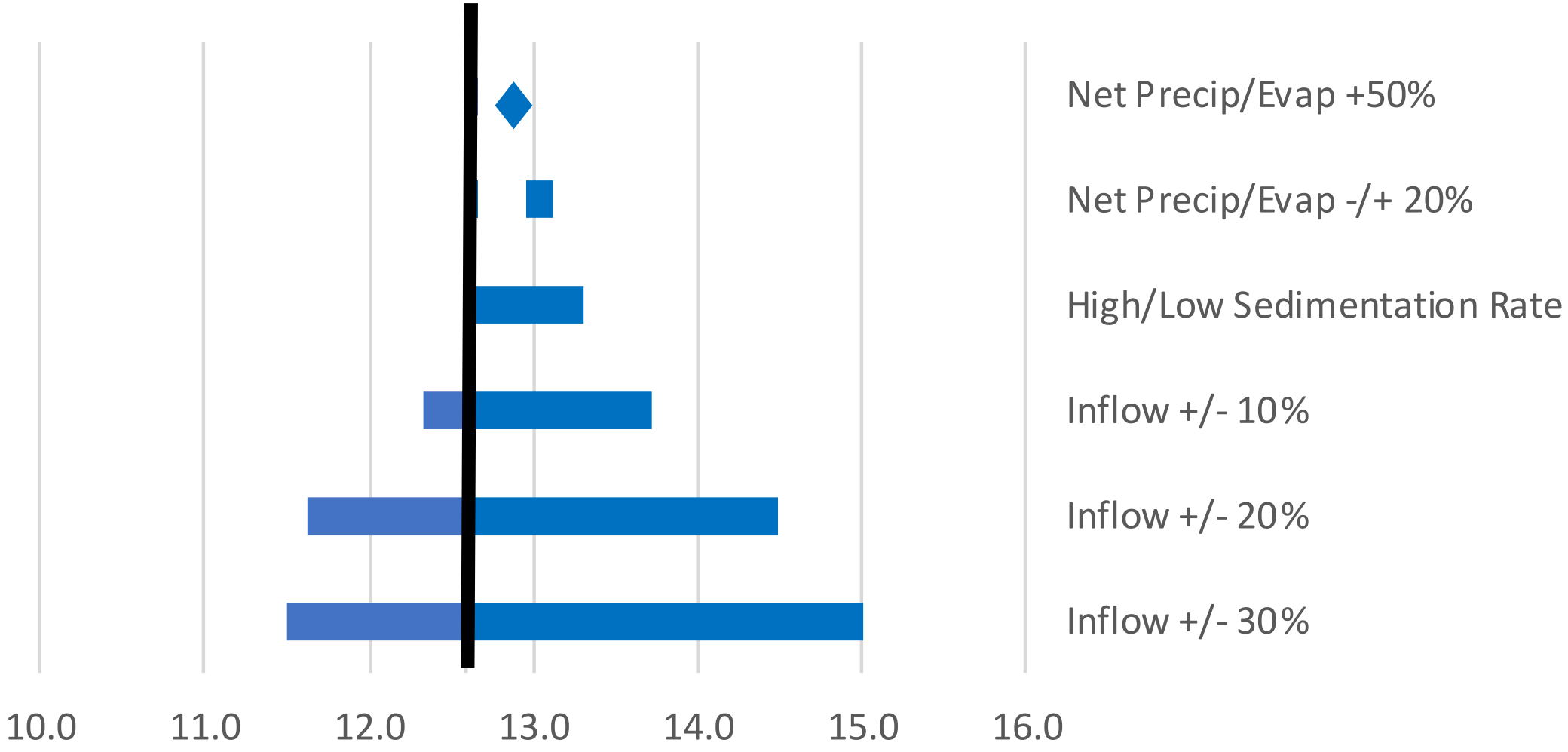


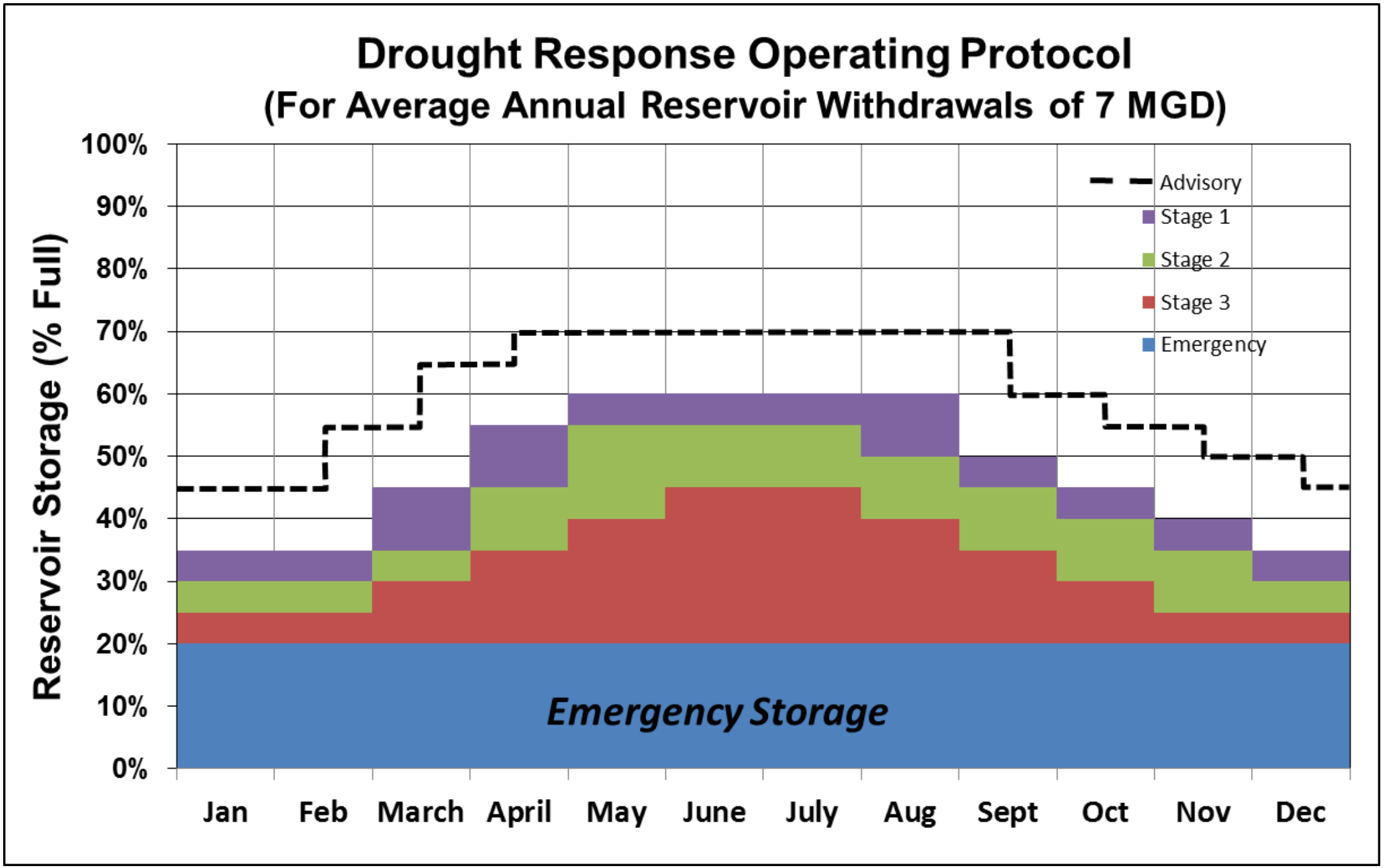
Number of Years Water Shortage Stages Reached Under Varying Scenarios (out of 94 Modeled Years)



Existing Yield Estimate is 12.6 mgd

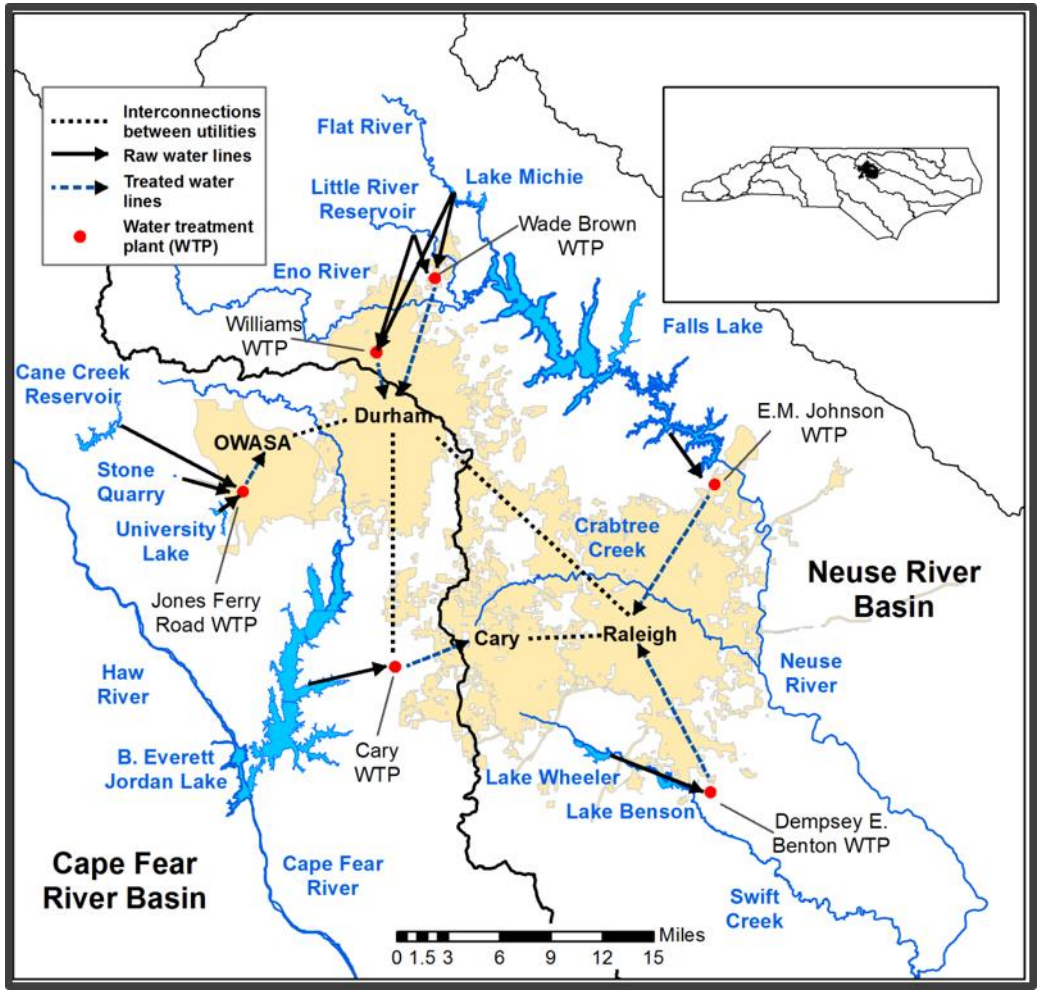
Uncertainty ranges from 11.5 to 15 mgd




Drought Response Operating Protocol
(For Average Annual Reservoir Withdrawals of 7 MGD)
Reservoir Storage (% Full)
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Jan
Feb
March
April
May
June
July
Aug
Sept
Oct
Nov
Dec
Advisory
Stage 1
Stage 2
Stage 3
Emergency
Emergency Storage

Regional Modeling Work

- Dr. Greg Characklis
- OWASA, City of Durham, Town of Cary, City of Raleigh
- Greatest reliability of regional water supply occurs when:
  - Proactive transfers of water
  - Conservation (our demand projections assume continued improvement in conservation)



Jordan Lake Pools