Central Indiana's Water Supply

Demand and Availability

Findings, Recommendations, and Panel Discussion

2021 Water Summit

Jack Wittman
VP, INTERA

August 2021

10:02

AA google.com

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LETTERS

Our coming climate apocalypse (or is it already here?)

Updated July 31, 2021, 2:30 a.m.

Hazy skies this week in Warwick, R.I., just south of Conimicut Lighthouse. AMANDA MILKOVITS

We are in desperation mode — act accordingly

Thank you to Sabrina Shankman for calling global warming exactly what it is: a climate

8:41

Done

Capital Weather Gang

Heat waves to drastically worsen in Northern Hemisphere, studies warn

Climate models project heat waves will regularly break records and induce more heat stress before the end of the century

Trees on a farm, stripped bare from drought and grasshoppers, in Grant County, N.D., in July 1936. (Arthur Rothstein)

By Kasha Patel

August 3 at 11:05 AM ET

In July 1936, the central United States roasted during one of the most notable summers of the Dust Bowl-era. Parched

9:55

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Synthesis of Irrigation Water Use in the United States: Spatiotemporal Patterns

Rajarshi Das Bhowmik; Seung Beom Seo; Priyam Das; and A. Sankarasubramanian, M.ASCE

Abstract

The role of large-scale drivers—climate, population, and adaption of efficient irrigation practices—in controlling irrigation water use efficiency has rarely been addressed. The primary objectives of our study are to (1) investigate the long-term changes in irrigation water use over the contiguous United States using a nationwide, multidecadal database created by USGS; and (2) understand the role of

10:08

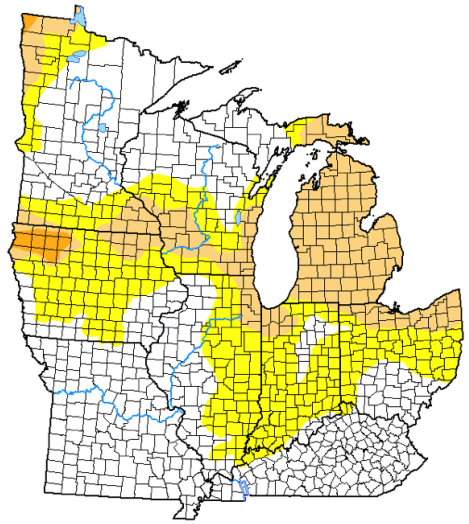
brownfieldagnews.com

NEWS

EASTERN CORN BELT DROUGHT EXPANDS

May 3, 2021 By Nicole Heslip Filed Under: Ag Weather, Crops, News, Water/Water quality/Water management, weather

April 27, 2021



An irrigation specialist says a dry winter has created a significant water deficit across the Eastern Corn Belt

10:10

AA google.com

nytimes.com

The New York Times

Climate and Environment › | Fewer Experts Unprepared Powe

CLIMATE FWD:

What a Water Shortage Is Doing to Some of America's Best Farmland

For some California farmers, selling off water rights is now more lucrative than growing food.

Published June 30, 2021 Updated July 9, 2021

Join us for the next installment of **Netting Zero**, our virtual event series on climate change: On Thursday at 1:30 p.m. Eastern The Times's London bureau chief, Mark Landler, will host a conversation about **sustainable urban spaces**. You can register here.

Subscribe to the New York Times.

10:10

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nytimes.com

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How weird is that heat wave? Very.

By Henry Fountain

Published June 30, 2021 Updated July 9, 2021

Portland, Ore., is usually delightful in June, with relatively little rain and high temperatures that average in the mid-70s. On Monday afternoon, however, the temperature was 117 degrees, a record high.

That was just one temperature record that fell throughout Oregon, Washington and British Columbia as the region was hammered by a heat wave that began over the weekend. Lytton, a town in British Columbia, set an all-Canada record three days in a row, reaching 121 degrees on Tuesday.

Meteorologists said the extreme conditions were the result of a "heat dome," an immense zone of high pressure air that stalled over the region and served as a lid, trapping heat and

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Rural Texas landowners say Sa

texastribune.org/2021/08/02/san-antonio-water-supply-rural-wells/

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THE TEXAS TRIBUNE

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San Antonio built a pipeline to rural Central Texas to increase its water supply. Now local landowners say their wells are running dry.

A pipeline helped secure water for San Antonio for decades to come — at a potentially high cost to some rural residents who are losing groundwater to the big city. Is it a preview for the rest of the state as climate change brings more water scarcity and cities keep sprawling?

BY ERIN DOUGLAS AUG. 2, 2021 5 AM CENTRAL

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Coastal Desk

Industry Overuse Puts Capital City Drinking Water At Risk

WWNO - New Orleans Public Radio | By Tegan Wendland
Published March 10, 2021 at 6:00 AM CST

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Report calls for ban on water-b

vancouversun.com/news/report-calls-for-ban-on-water-bottling-plants-in-b-c-s-increasingly-arid-interior

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Politics / Opinion / News / Local News / Local Business / Columnists

Report calls for ban on water-bottling plants in increasingly arid B.C. Interior

First Nations and environmental groups are protesting the province's continued processing of applications to extract, bottle and export water in B.C.

Stephen Hume, Stephen Hume
Jul 24, 2021 • July 24, 2021 • 9 minute read • 21 Comments

DNR offers tips to homeowners

grandforksherald.com/news/7123910-DNR-offers-tips-to-homeowners-dealing-with-domestic-well-issues-in-Polk-and-Red-La...

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85°

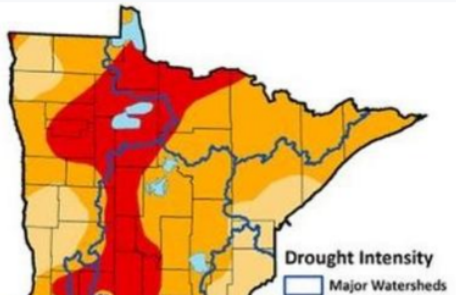
Menu Grand Forks Herald E-Paper Log in SUBSCRIBE NO Get a year for $8

NEWS

DNR offers tips to homeowners dealing with domestic well issues in Polk and Red Lake counties

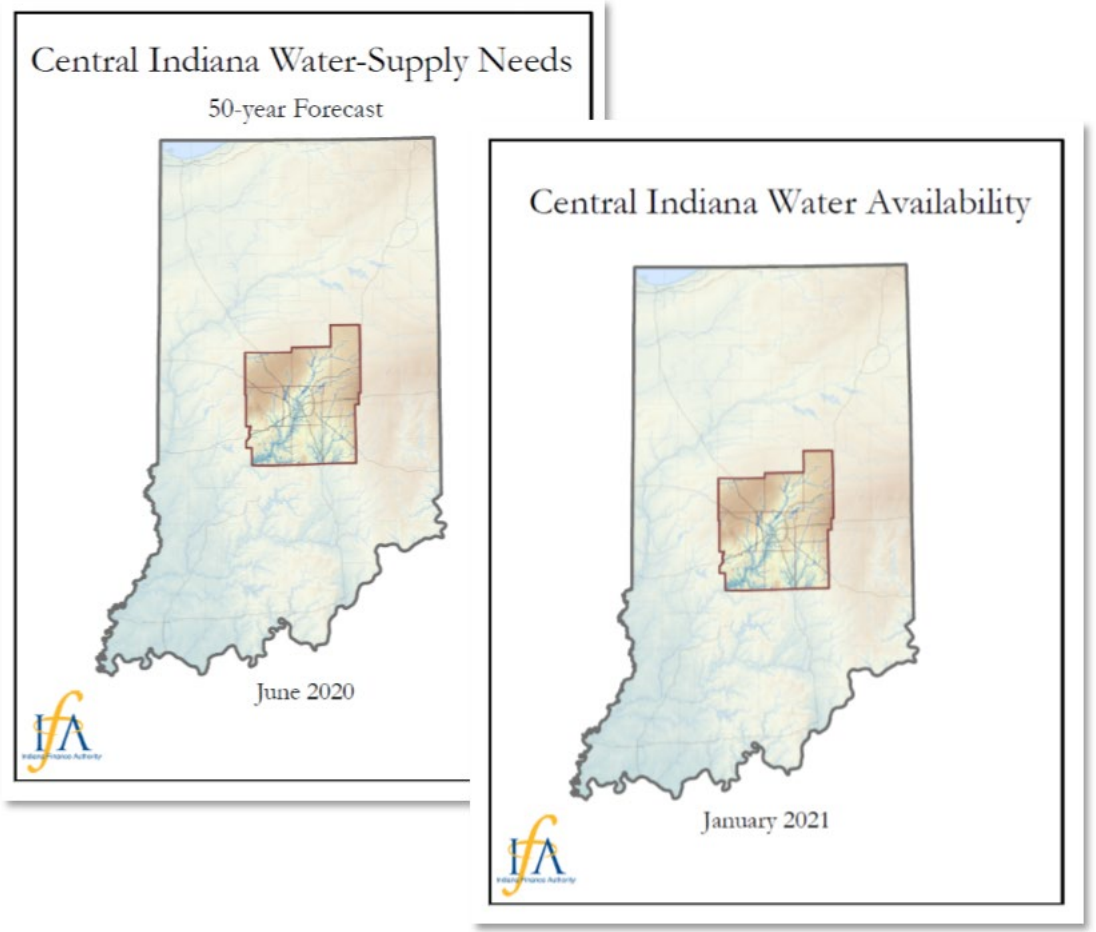
As of Thursday, July 22, about half of Polk County is experiencing severe drought and the rest of the county is experiencing extreme drought. Most of Red Lake County is experiencing extreme drought.

Written By: Herald Staff Report | 3:40 pm, Jul. 22, 2021

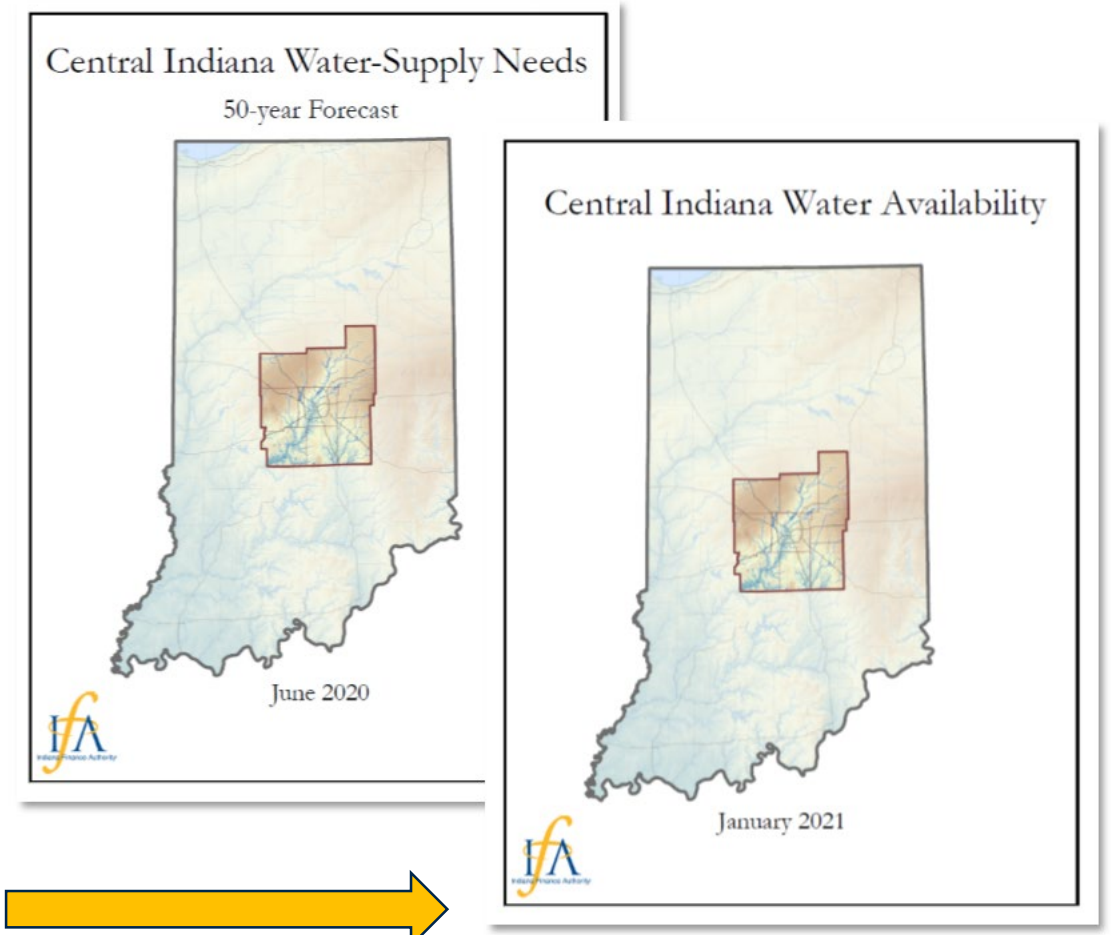


Current and Future Demand

How much water will we need in the next 50 years?

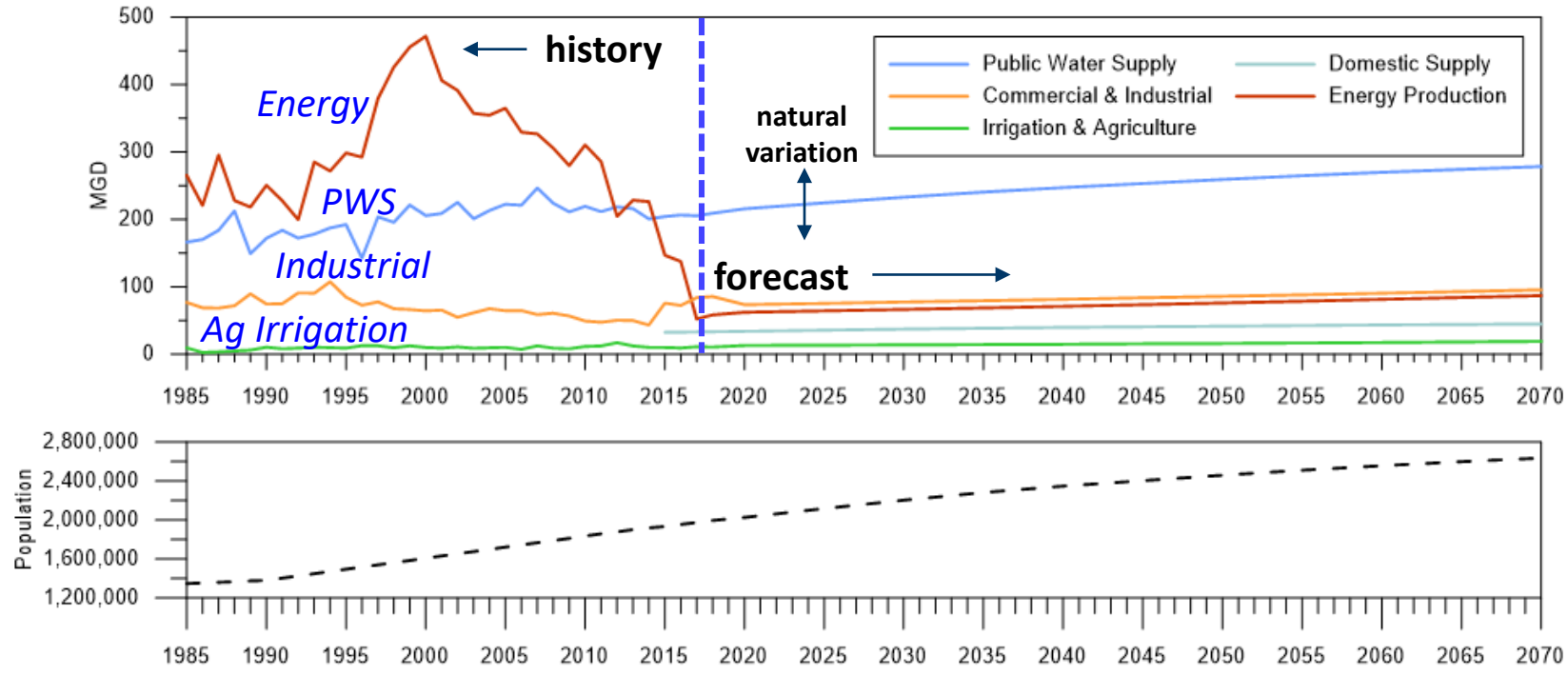


Current and Future Demand



Will there be enough?

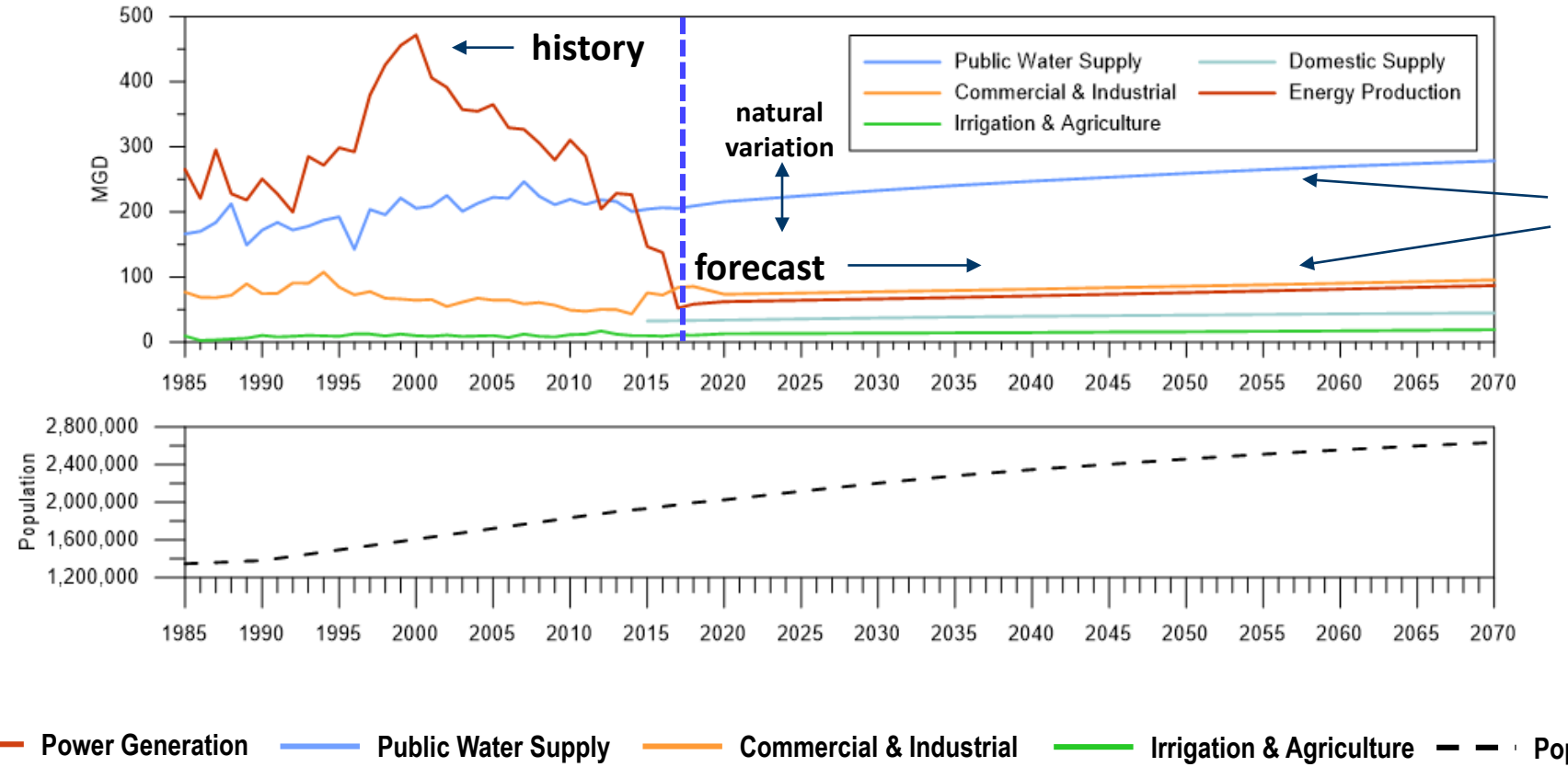
Forecast of Withdrawals *by Sector*



Power Generation | Public Water Supply | Commercial & Industrial | Irrigation & Agriculture | Population

INTERA

Forecast of Withdrawals *by Sector*



Each line is a separate forecast model designed for that water sector.

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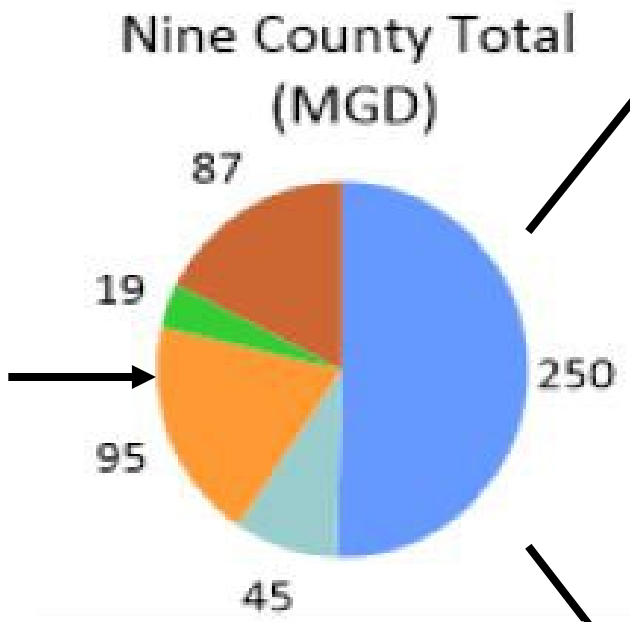
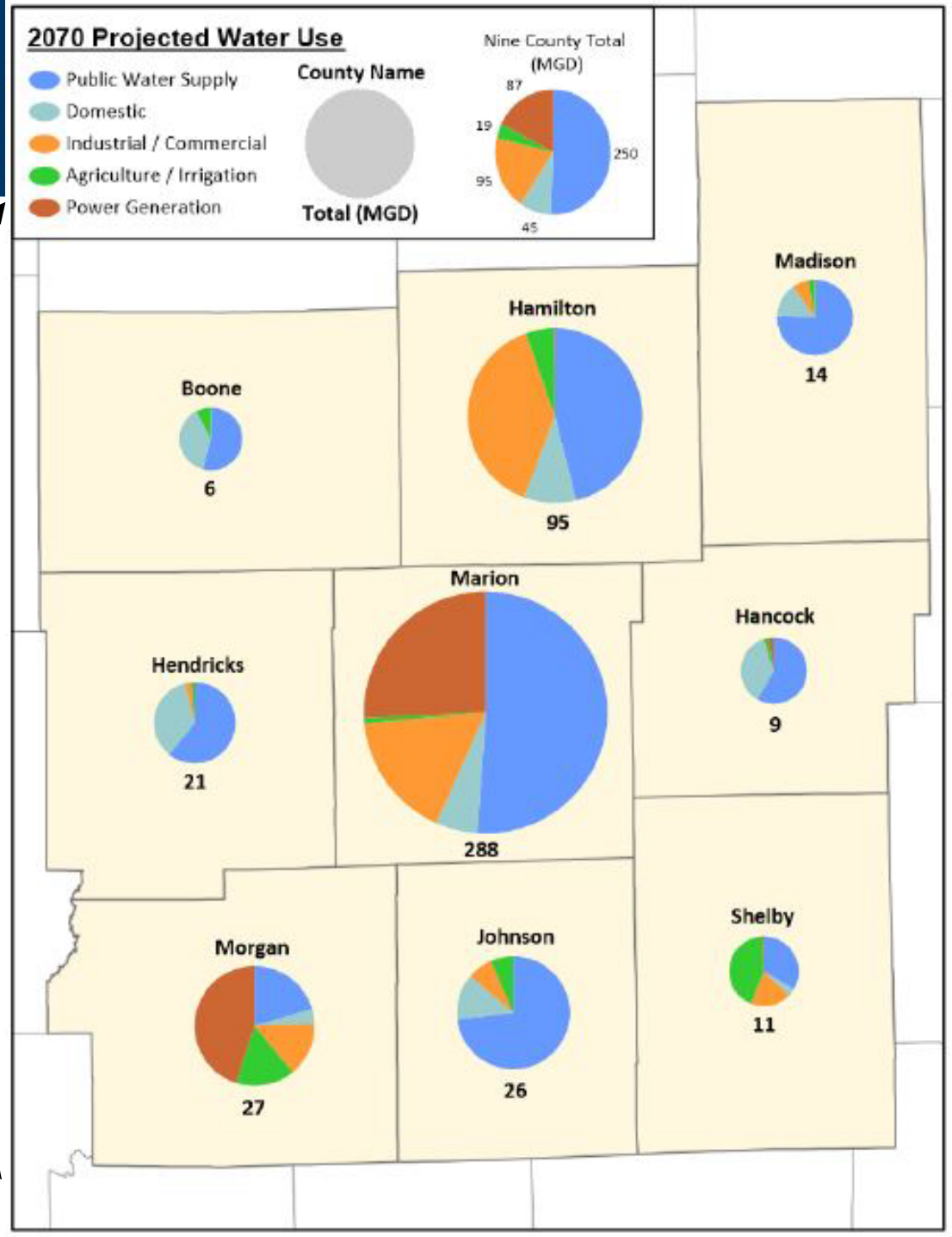
2070 Water Withdrawals

495 MGD





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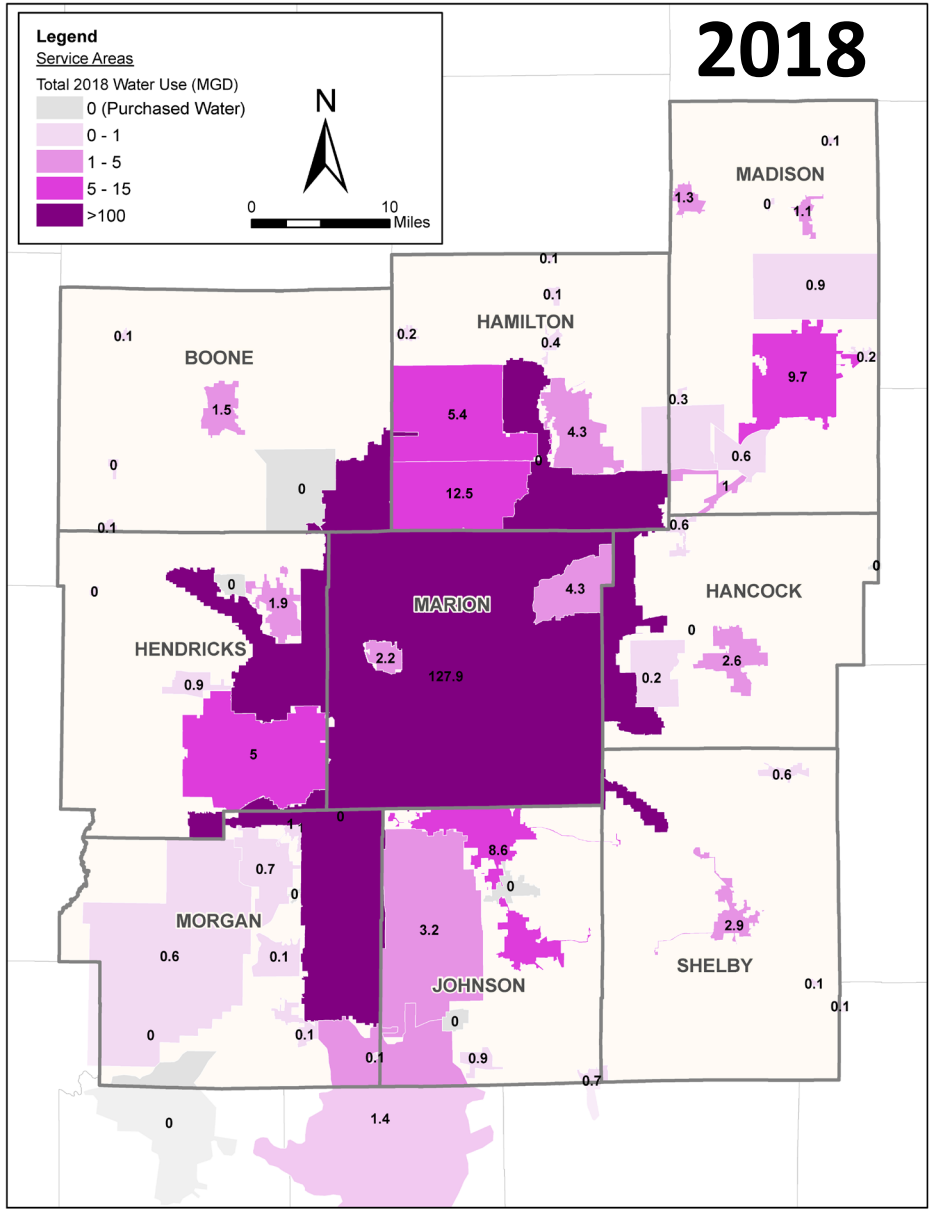
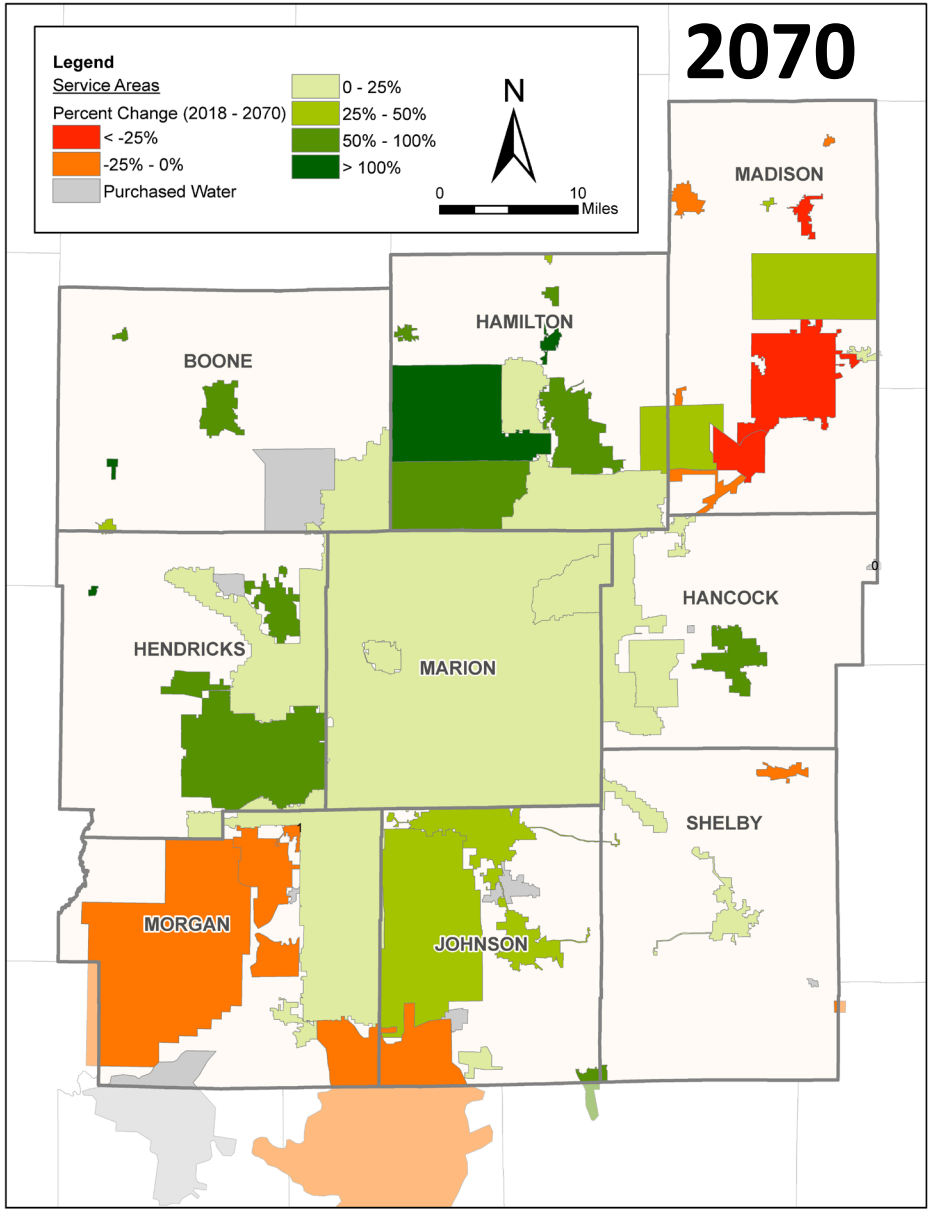
Demand Projections—Phase 1 Results





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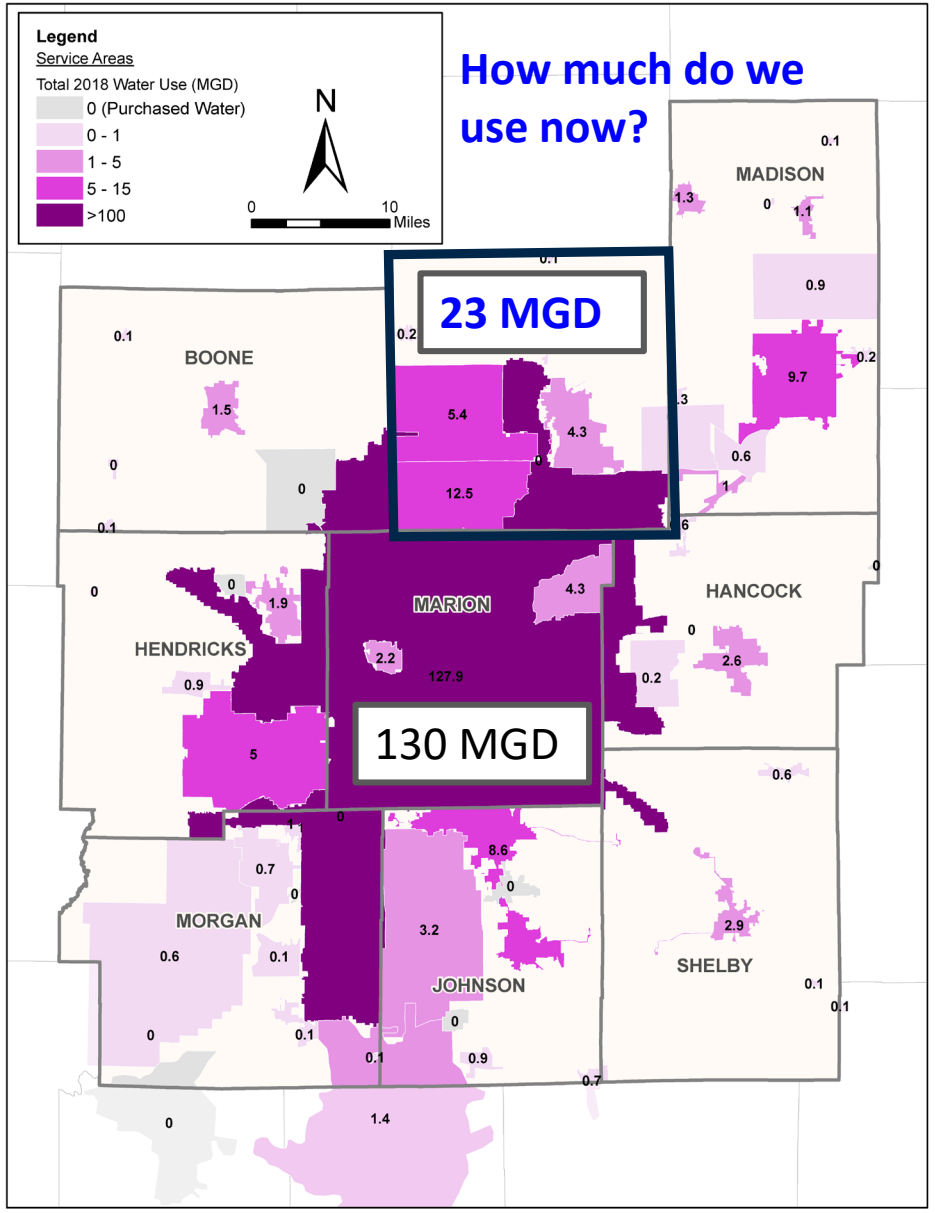
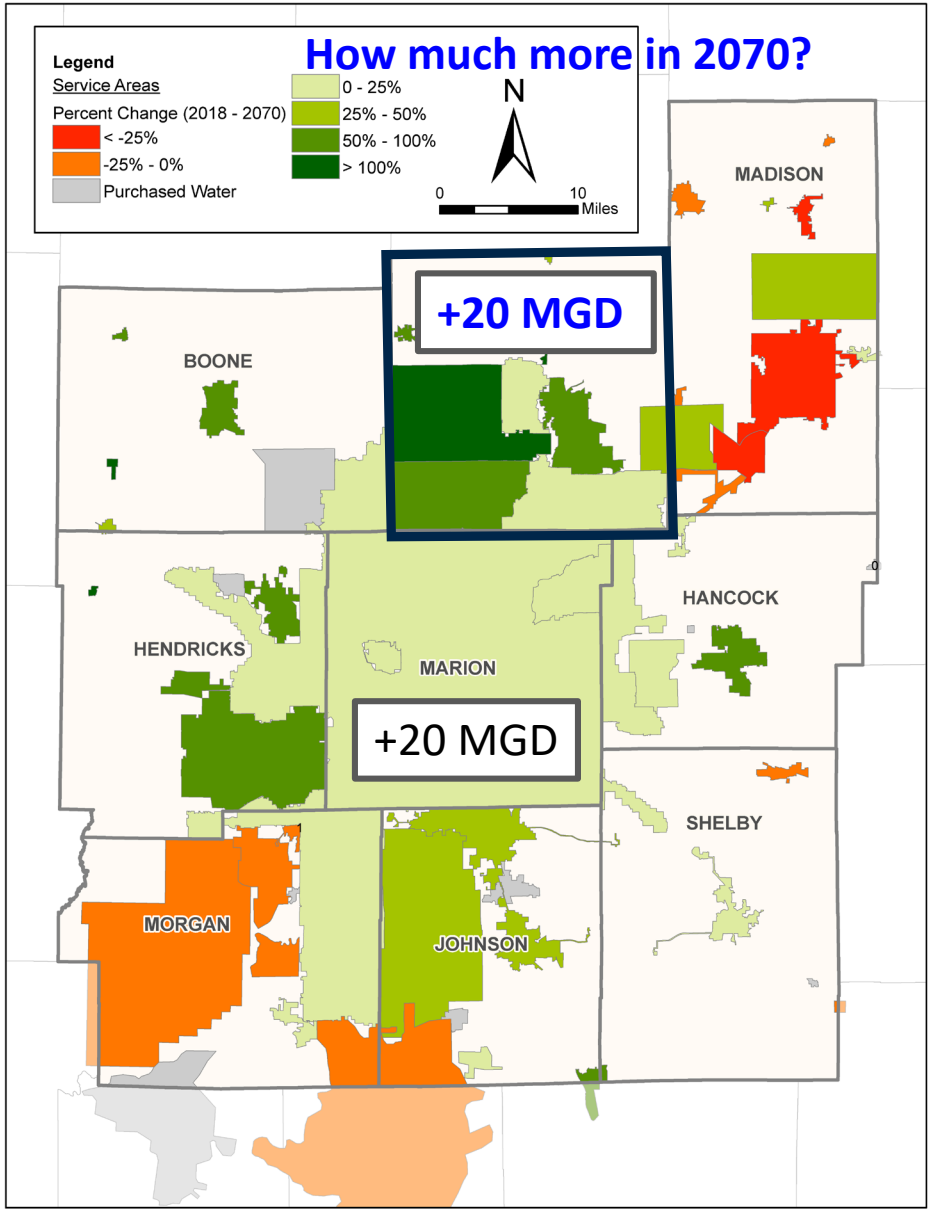
Demand Projections—Phase 1 Results





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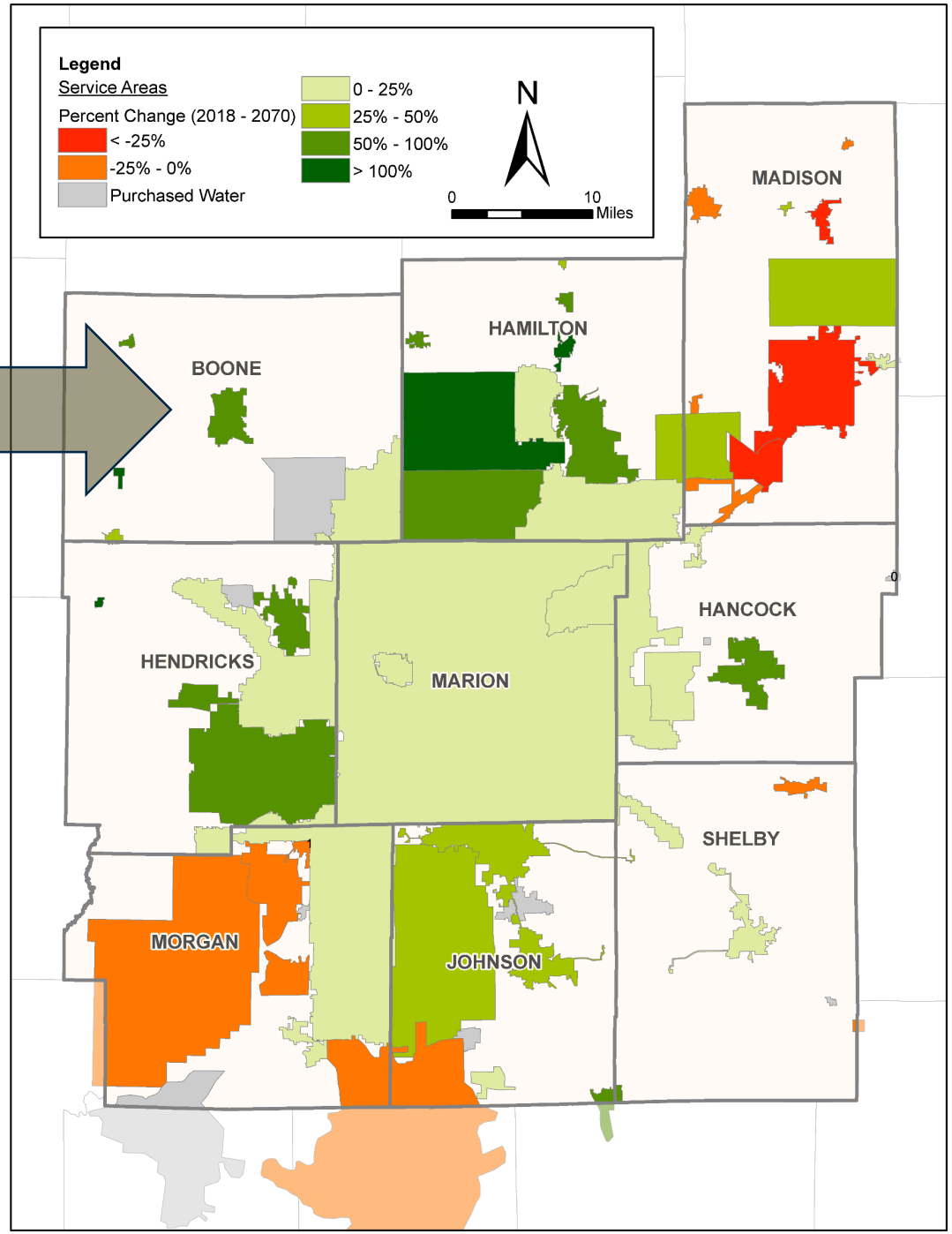
Public Water Supply Growth

Future PWS demand is expected to increase more than 100% in parts of the region.

Important to note that water withdrawals for mining are also expected to increase.



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Will there be enough water in the region to meet future demands?

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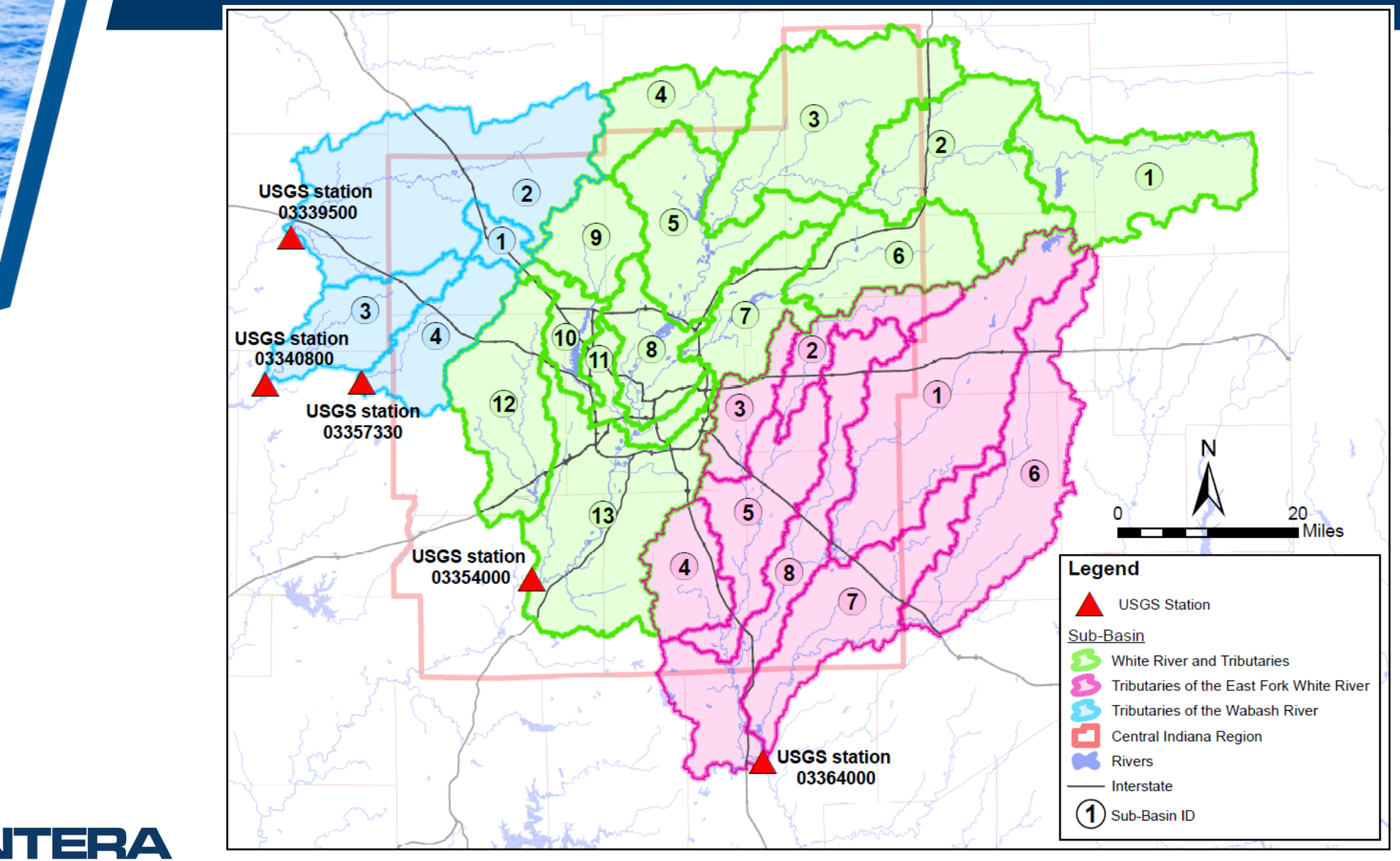
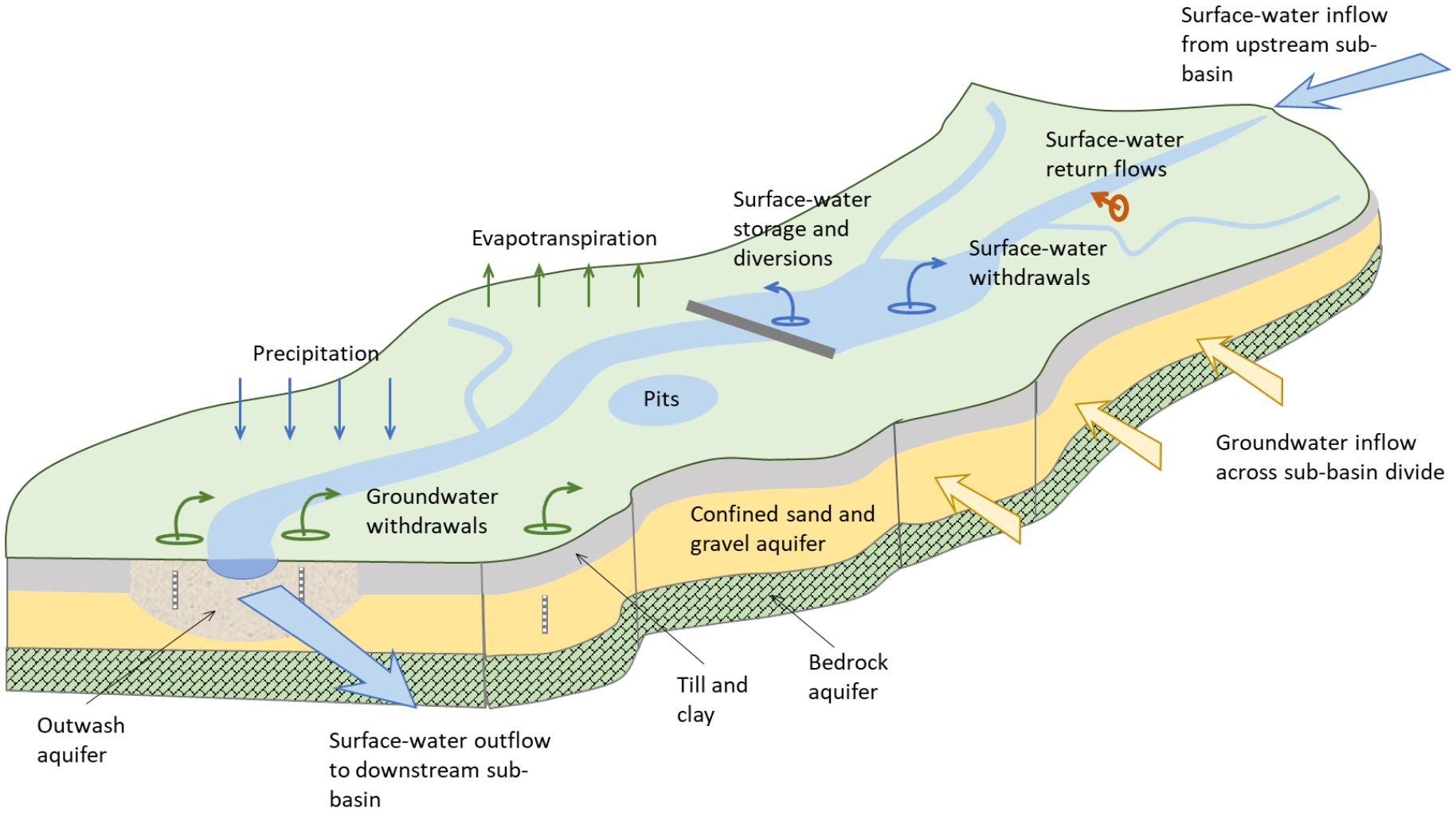
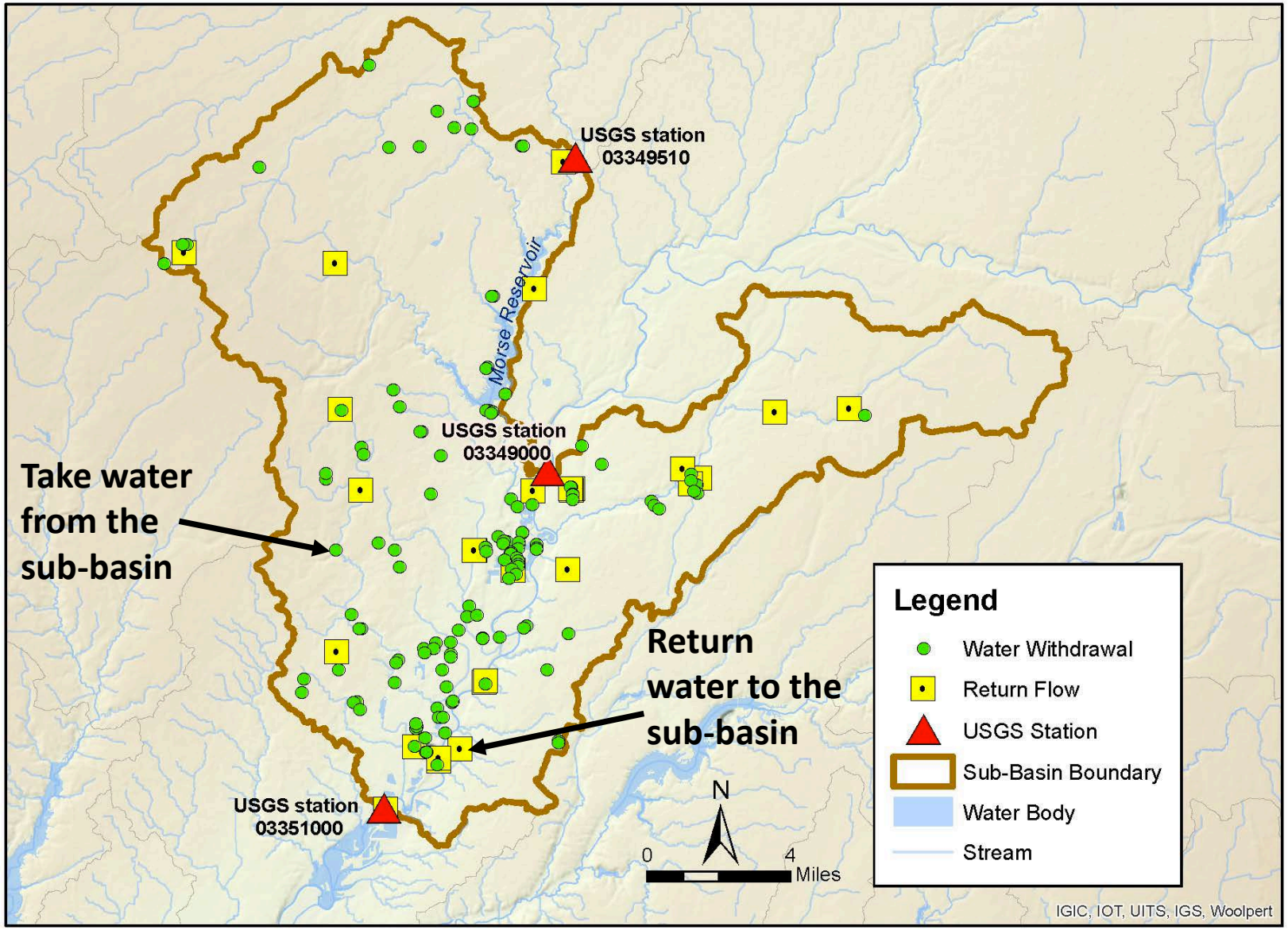
Central Region divided into Sub-Basins



Approach – Water budget developed for each sub-basin



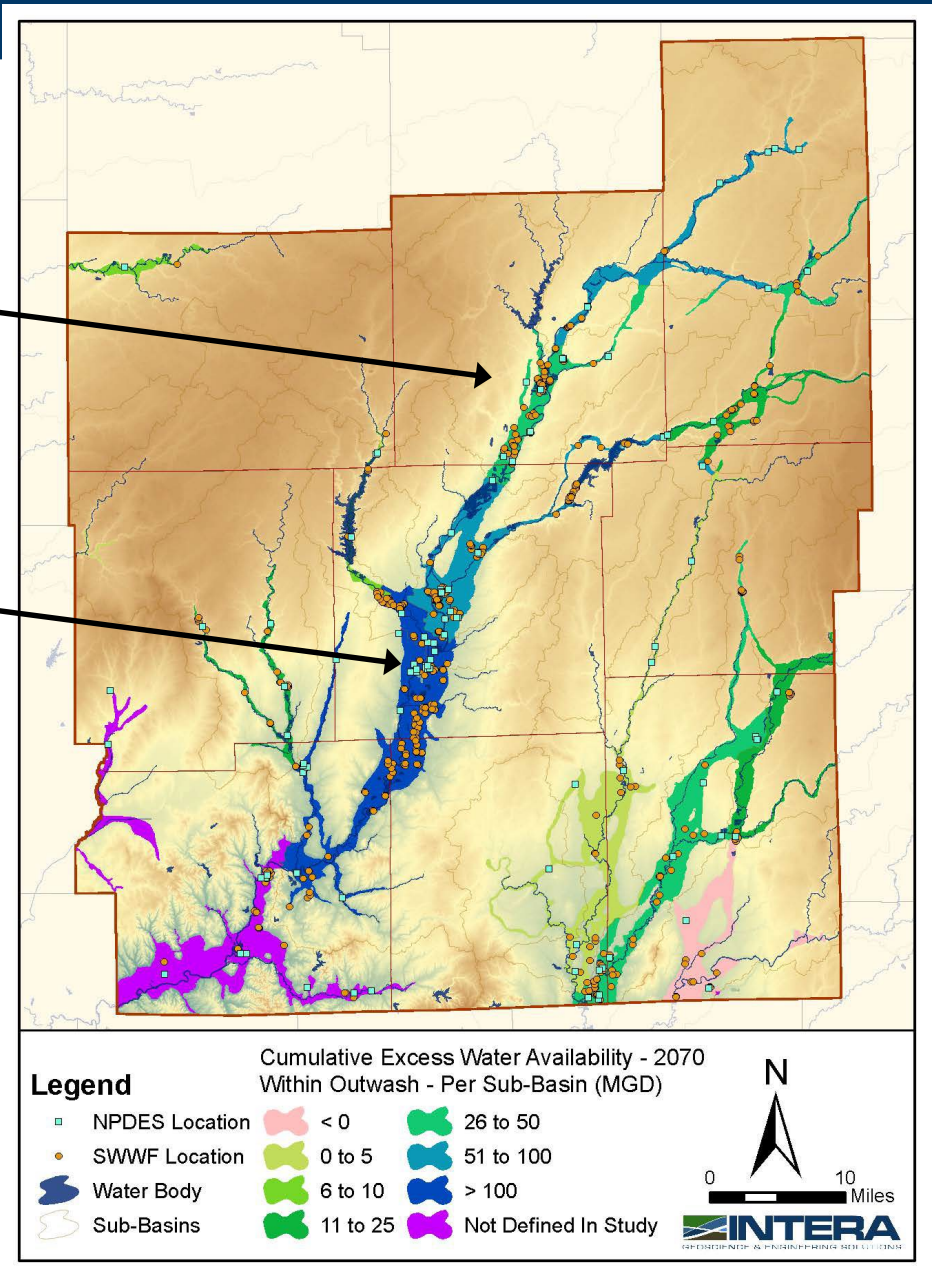
An Example Sub-Basin



Results – Future cumulative excess availability

higher withdrawals

higher return flows



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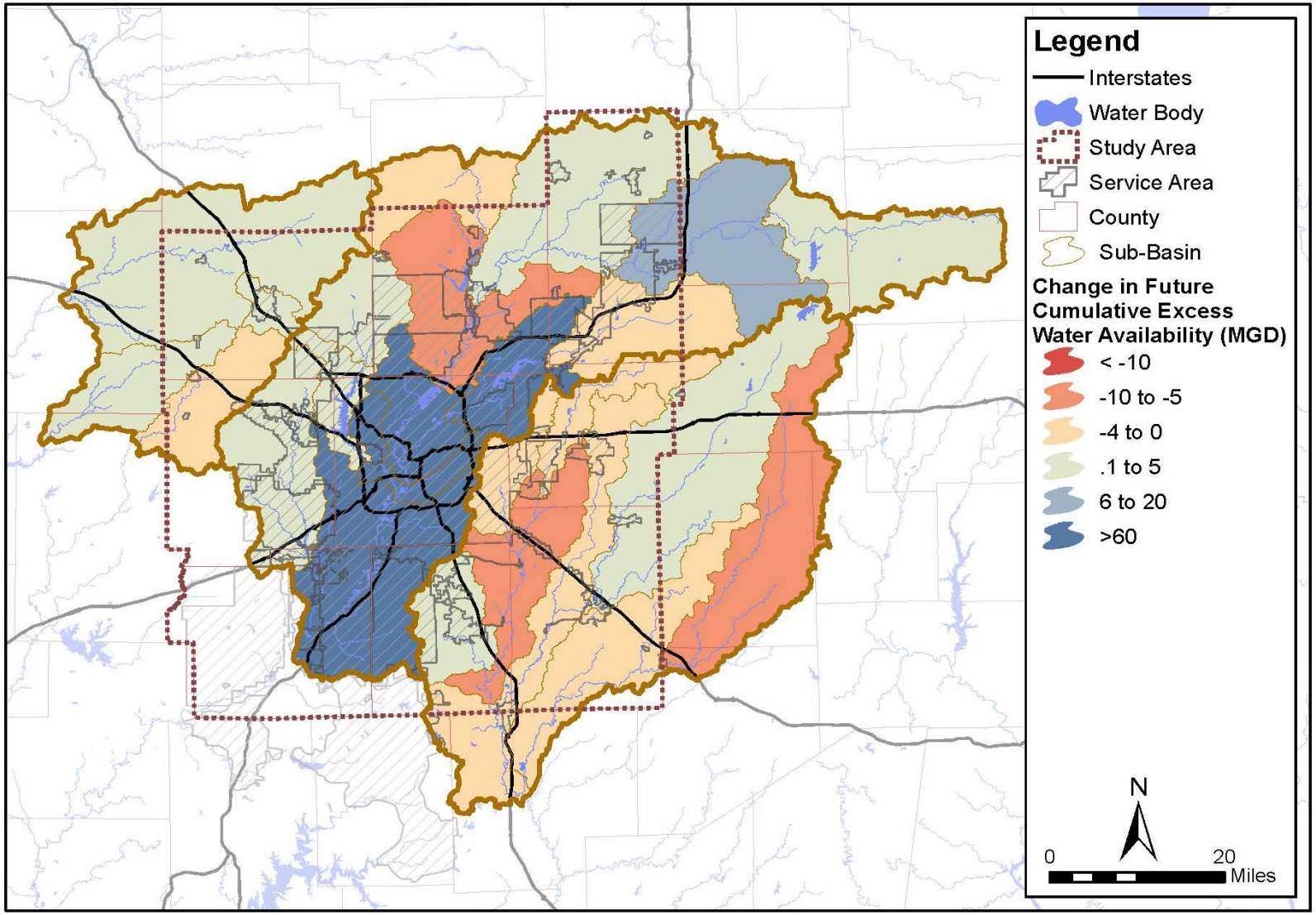
How much change in each sub-basin?

This map shows the **difference** between water availability in 3rd Quarter of 2012 and what is predicted for 2070. The new withdrawals are offset by new return flows at treatment plants.



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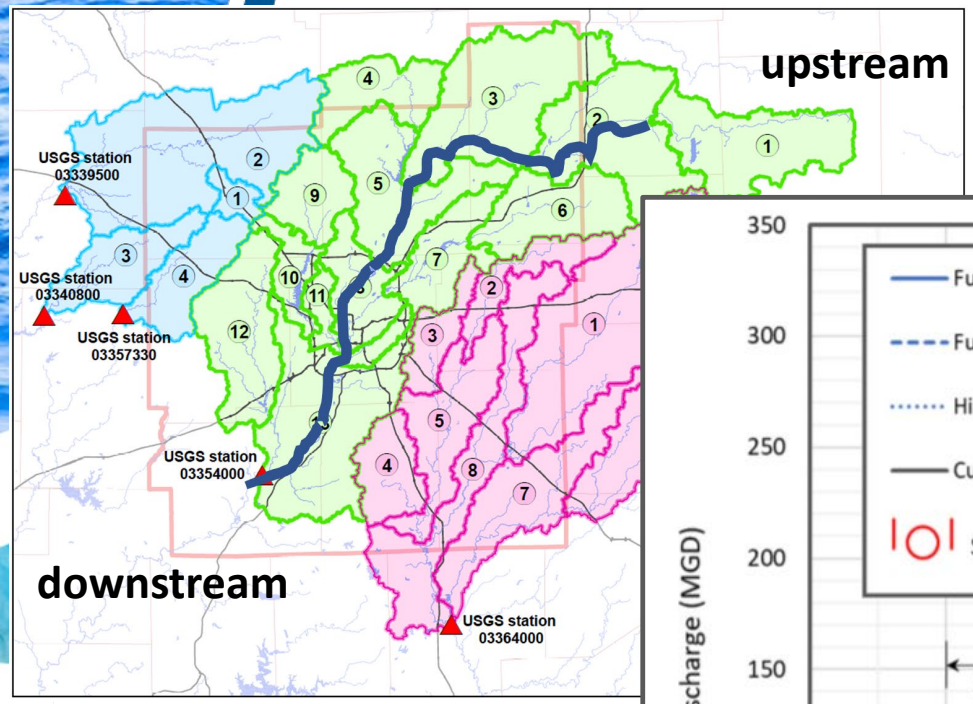
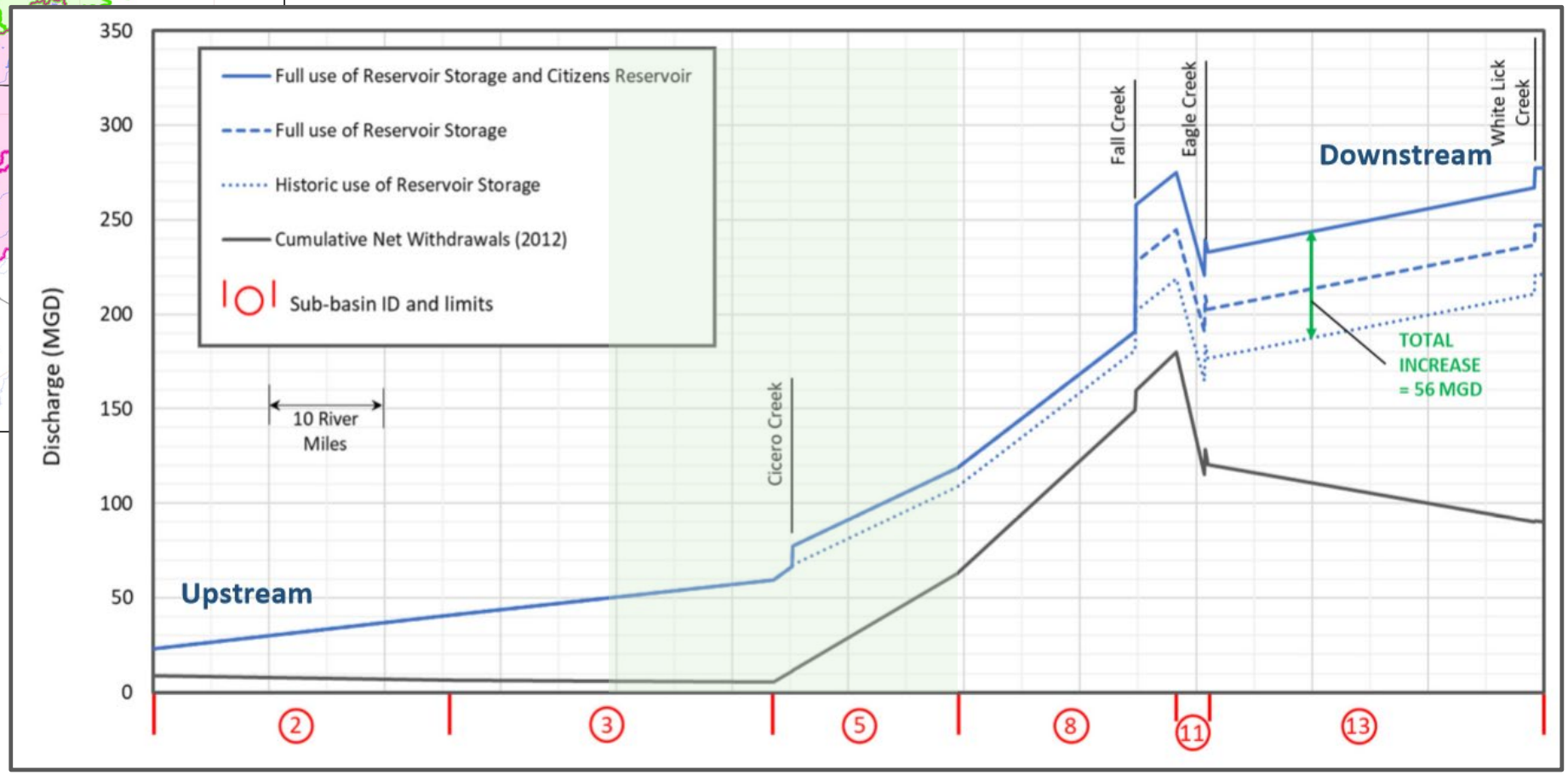
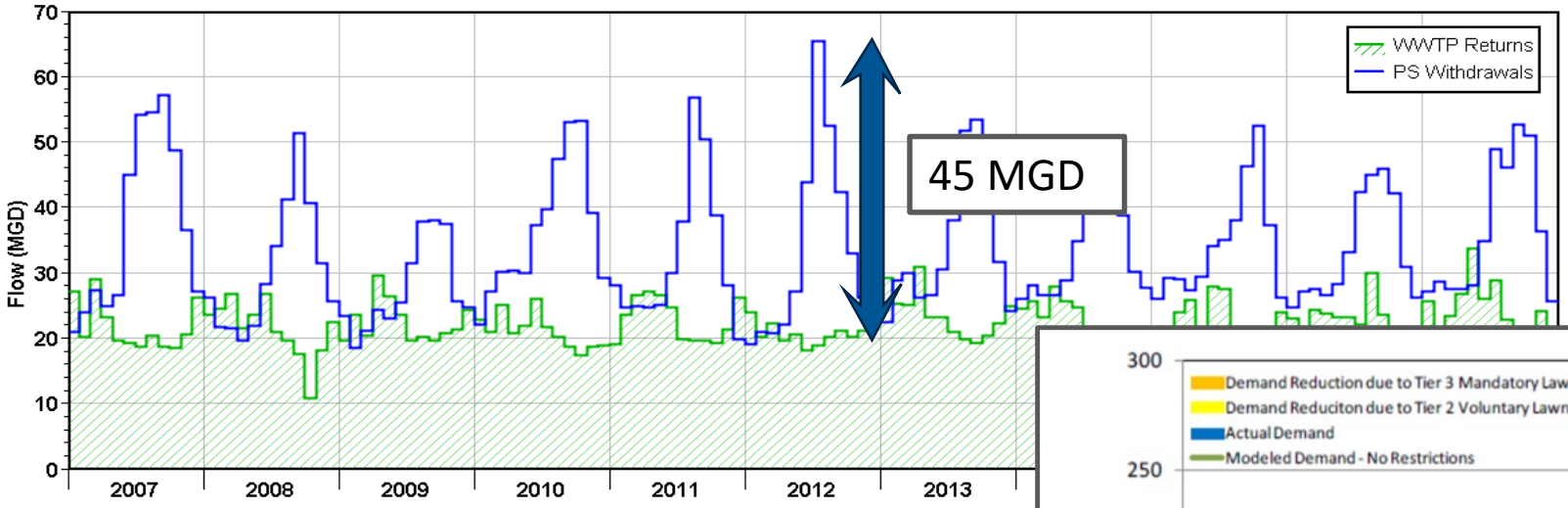
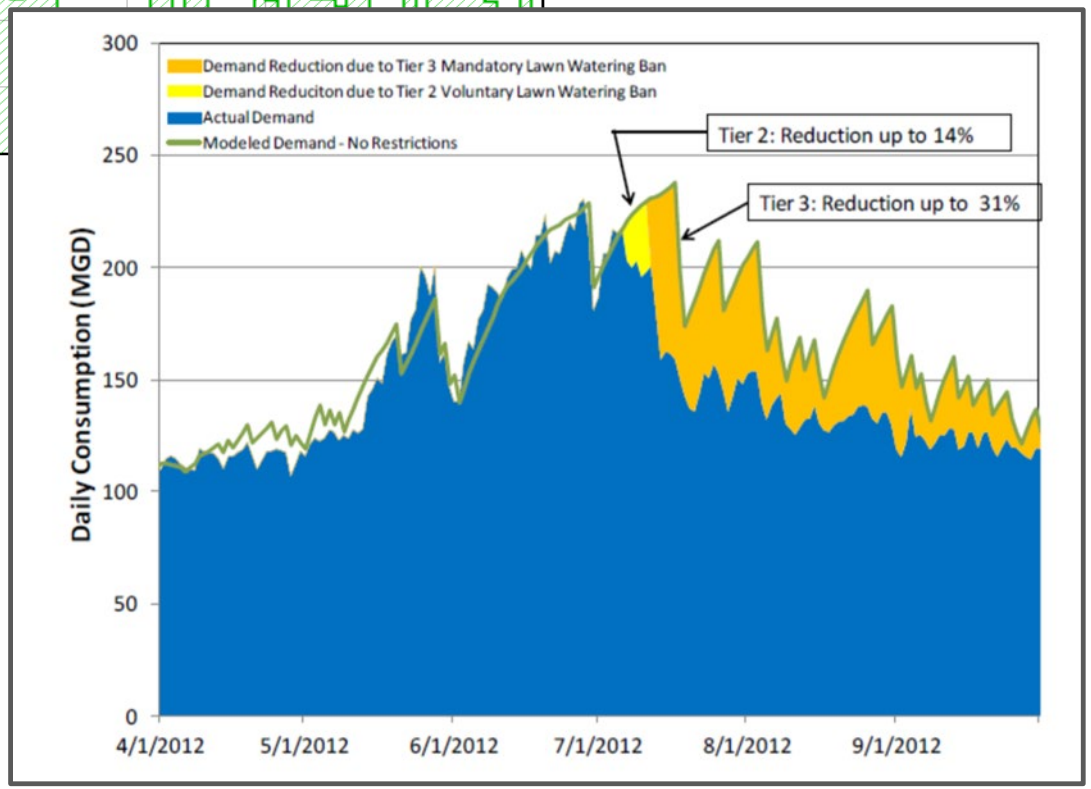
Availability increases with new infrastructure





Significance of Water Conservation





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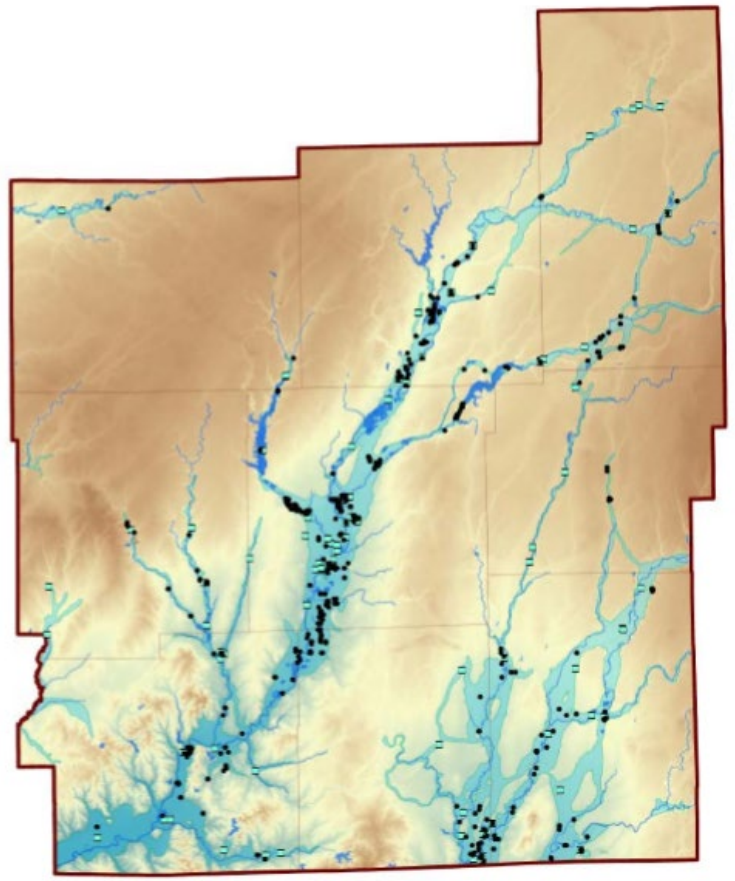
Potential Sources of Supply

Where is the water we need?

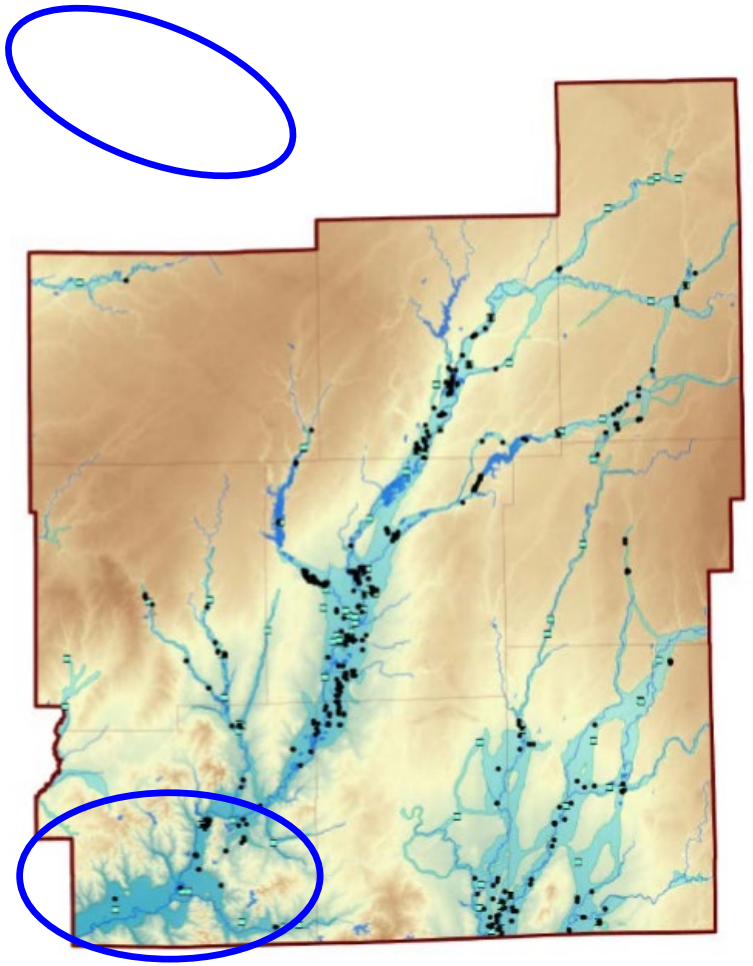
- Conservation
- New surface water supplies (more quarries).
- Engineered recharge systems to add back mine dewatering.



Options

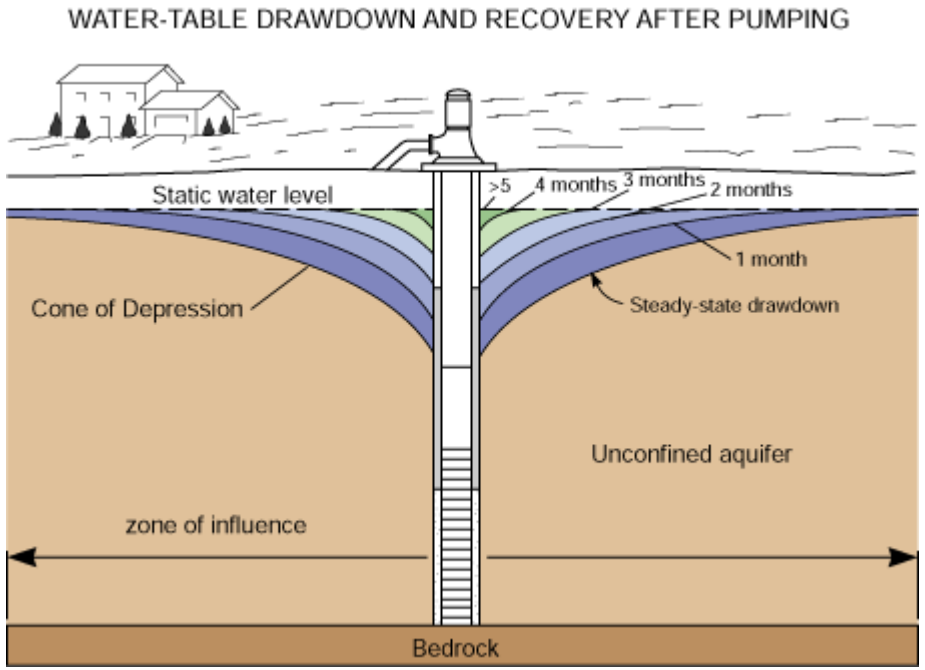
Where is the water in the region?

- Future sources in high yield aquifers
  - Anderson Valley deposits in Clinton County
  - West Fork White River downstream in Morgan County



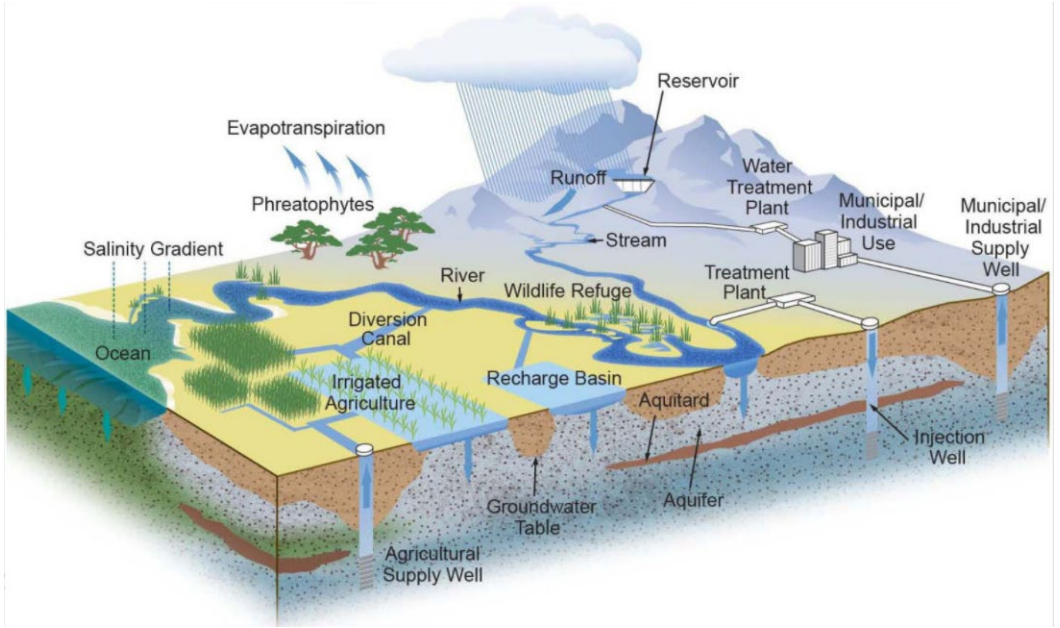
Changing Scales of Water Management

- In the past, all water was <u>local</u>
  - **Questions**: How much can I pump from this well?
  - **Studies**: We measure drawdown to see what rate can be sustained.
  - **Data**: water levels with time
  - **Solution**: Well design that delivers required flows.



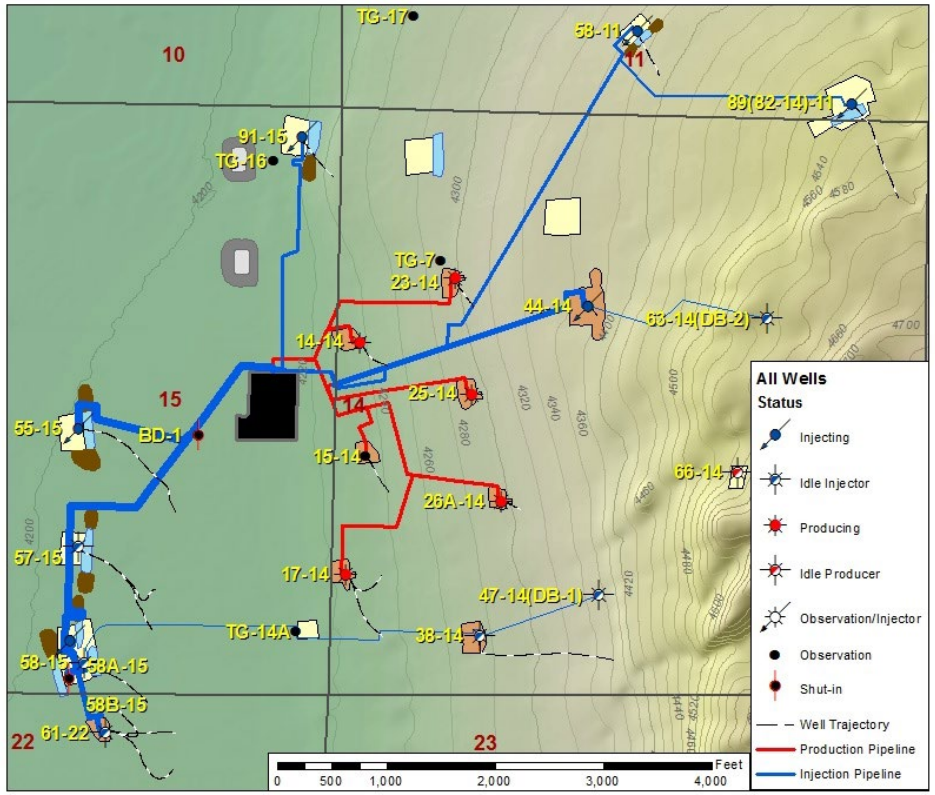
Changing Scales of Water Management

- Growth and resource development often occur <u>regionally:</u>
  - **Questions**: How much water is available for use in the basin?
  - **Studies**: Regional analysis of water budget to define system.
  - **Data**: Measure flows into and out of each sub-basin to define excess.
  - **Solution**: Identify locations for monitoring and potential development.



Changing Scales of Water Management

- Future water users will need to <u>operate with knowledge of the system:</u>
  - **Questions**: How can we use water more efficiently during drought?
  - **Studies**: Multi-party collaboration among stakeholders and dense data.
  - **Data**: Real-time water level measurements and daily pumping.
  - **Solution**: Optimizing operations and resiliency.

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