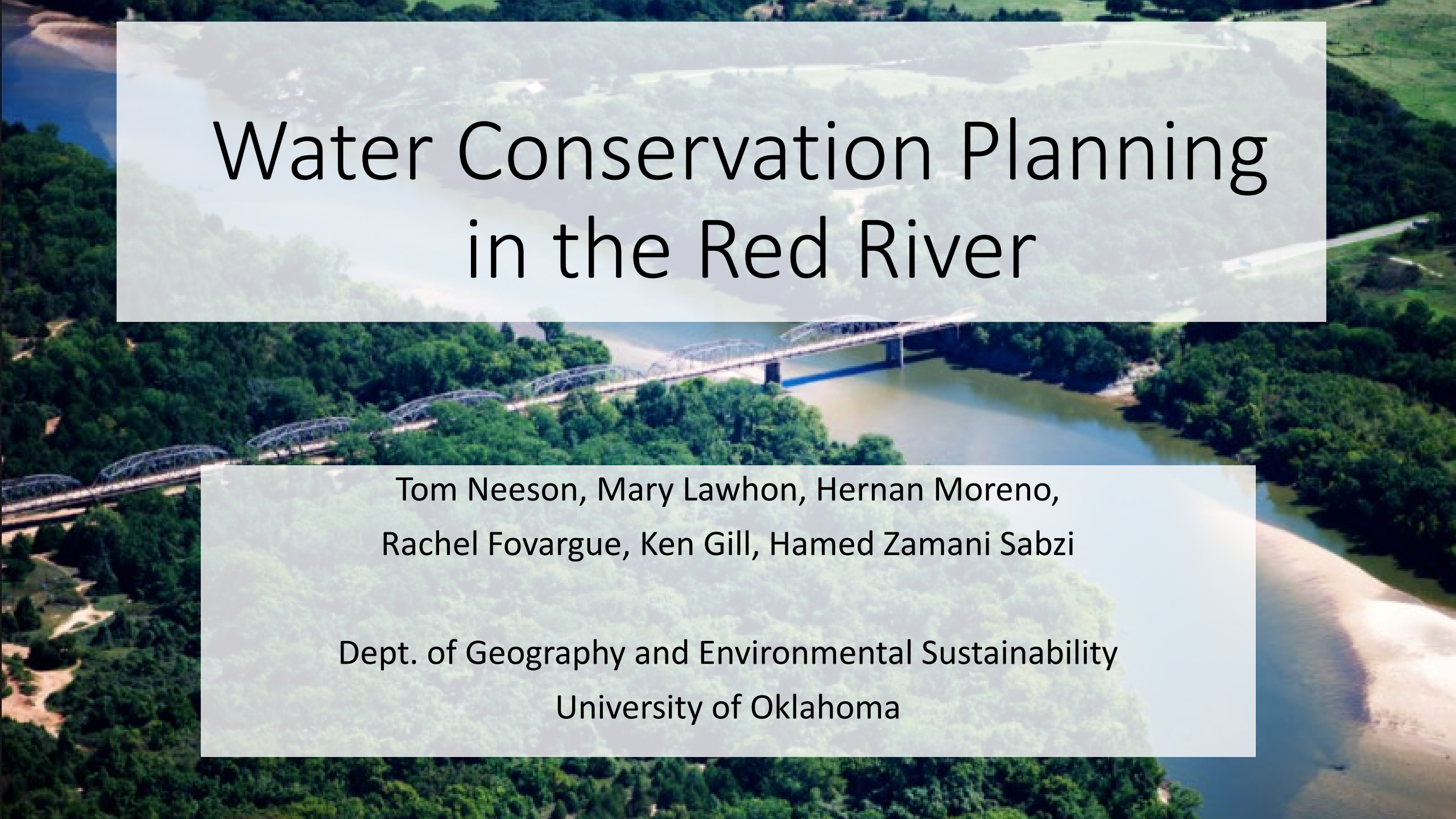

# Water Conservation Planning in the Red River

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# Project Goals

1. Driving Question: How should we allocate water conservation incentives in space and time?

2. Overall: Support decision-making by agency, NGO and tribal partners across the Red River basin.

# Hotspots for future water stress in Red River Basin for the future (2040-2060)

*Projected Changes In Runoff*

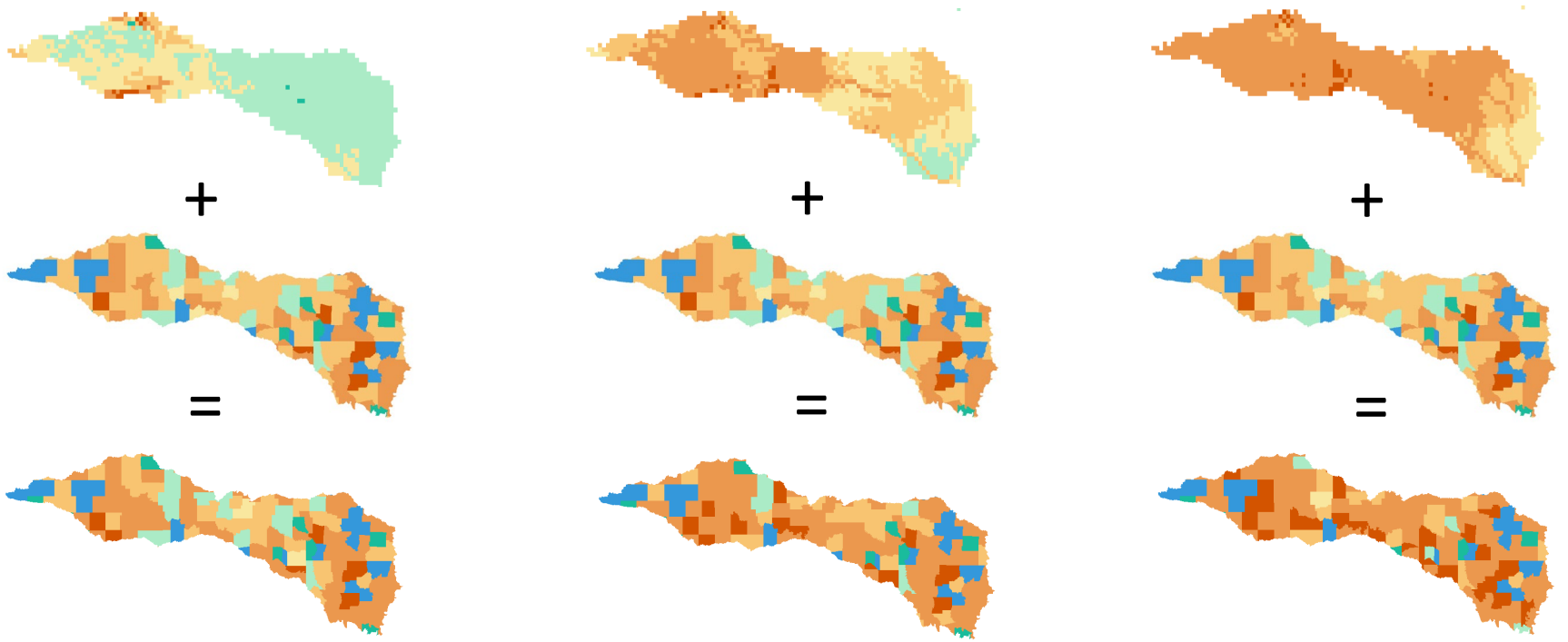
+

*Projected Changes In Water Demand*

=

*Areas likely to exhibit future water stress*

Low → High

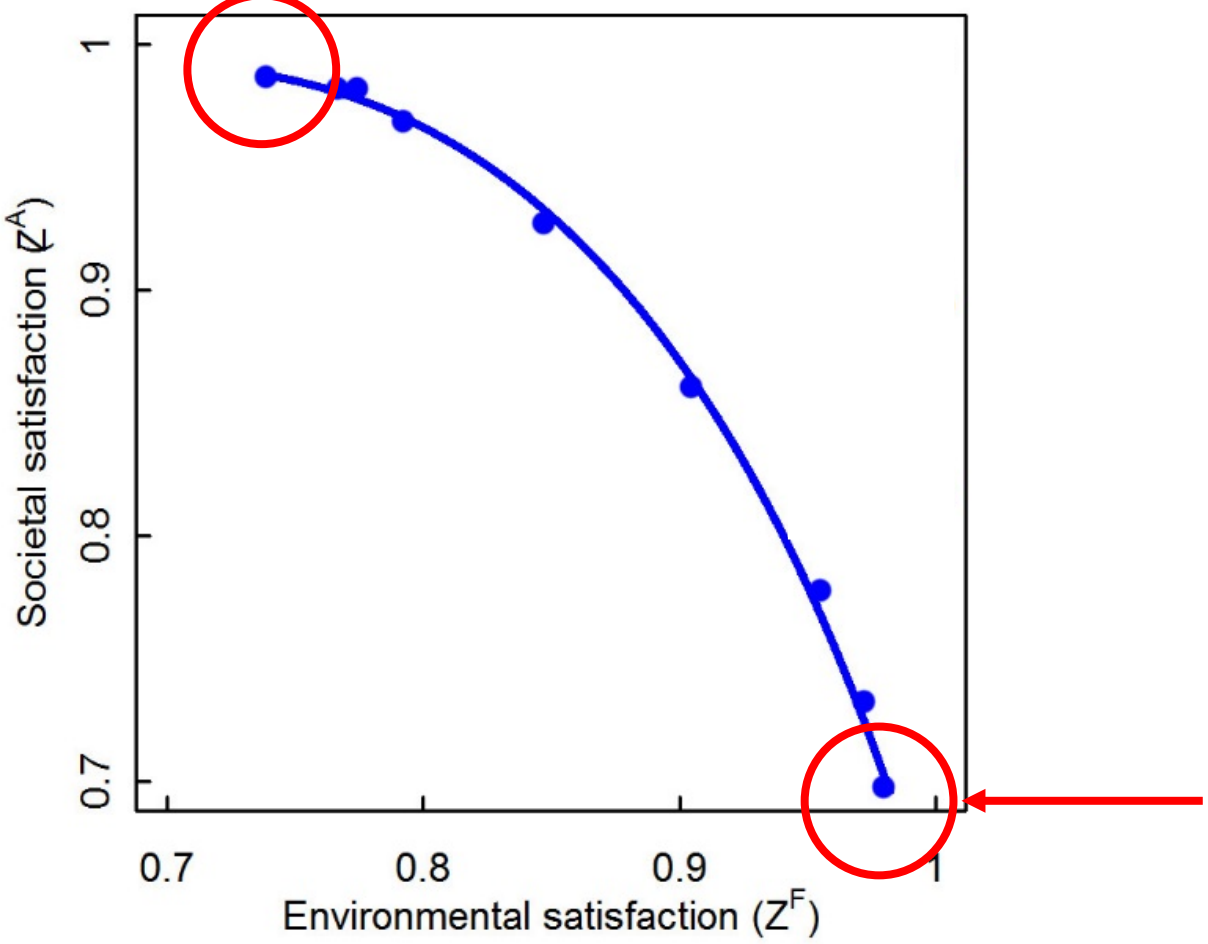


Increasing representative concentration pathways (2.6, 4.5, 8.5) using GCM CCSM4

Zamani Sabzi et al., *in review*

# Results – No Incentives

Prioritize societal water goals

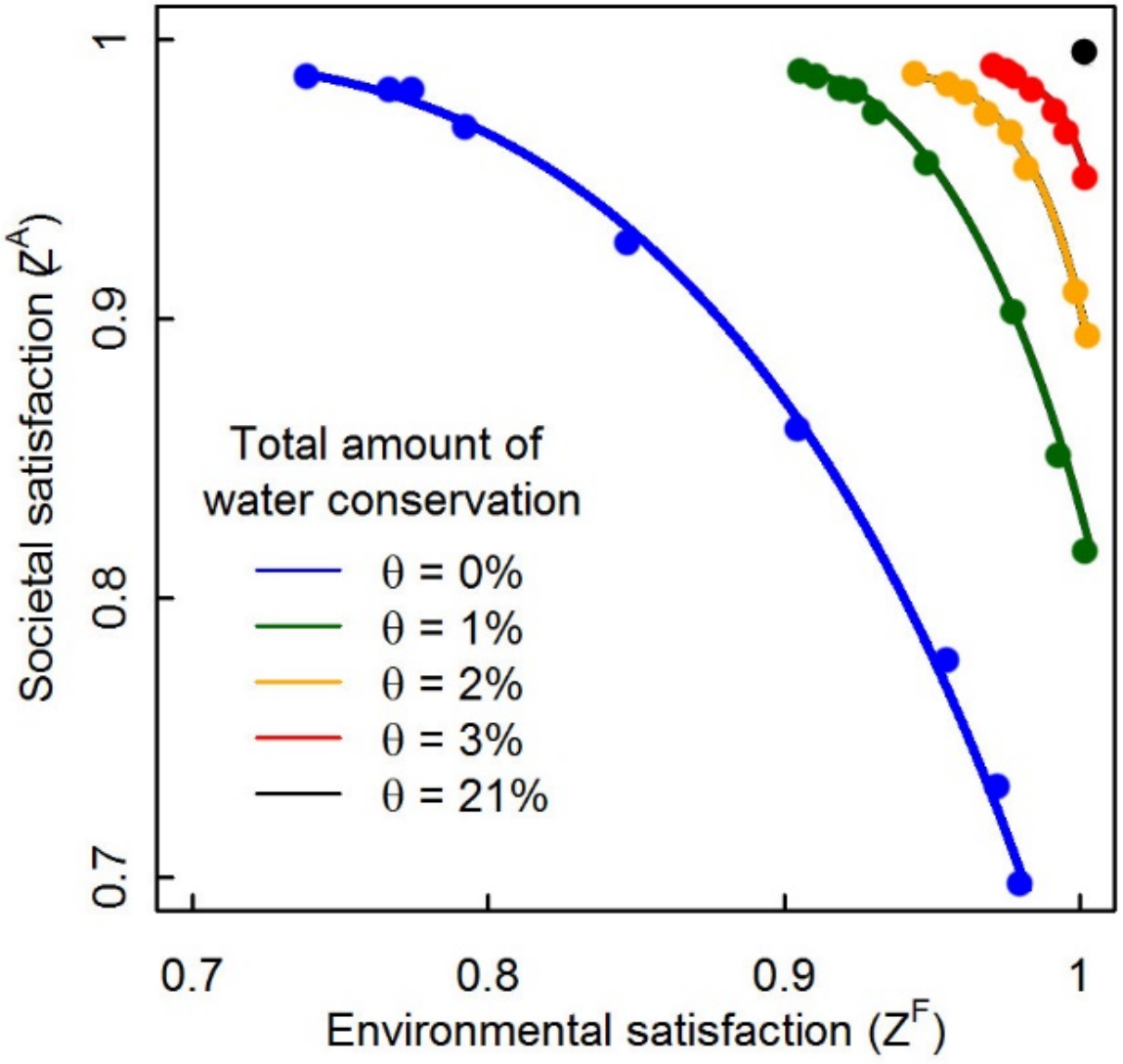



1) Model allows different weightings of societal and environmental dimensions

2) Even optimal allocation of water across network cannot simultaneously meet societal and ecosystem flow goals

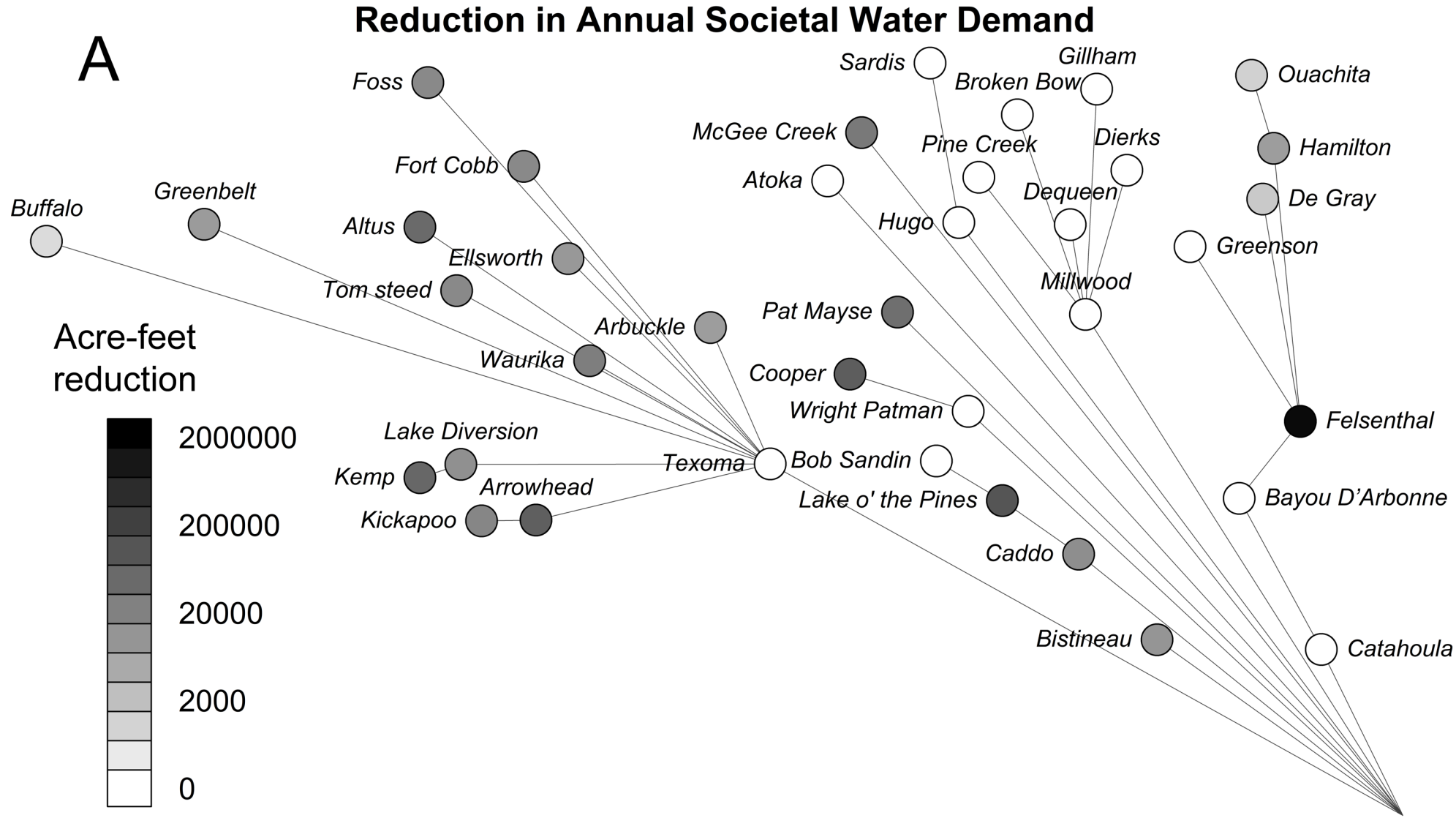
Prioritize environmental water goals

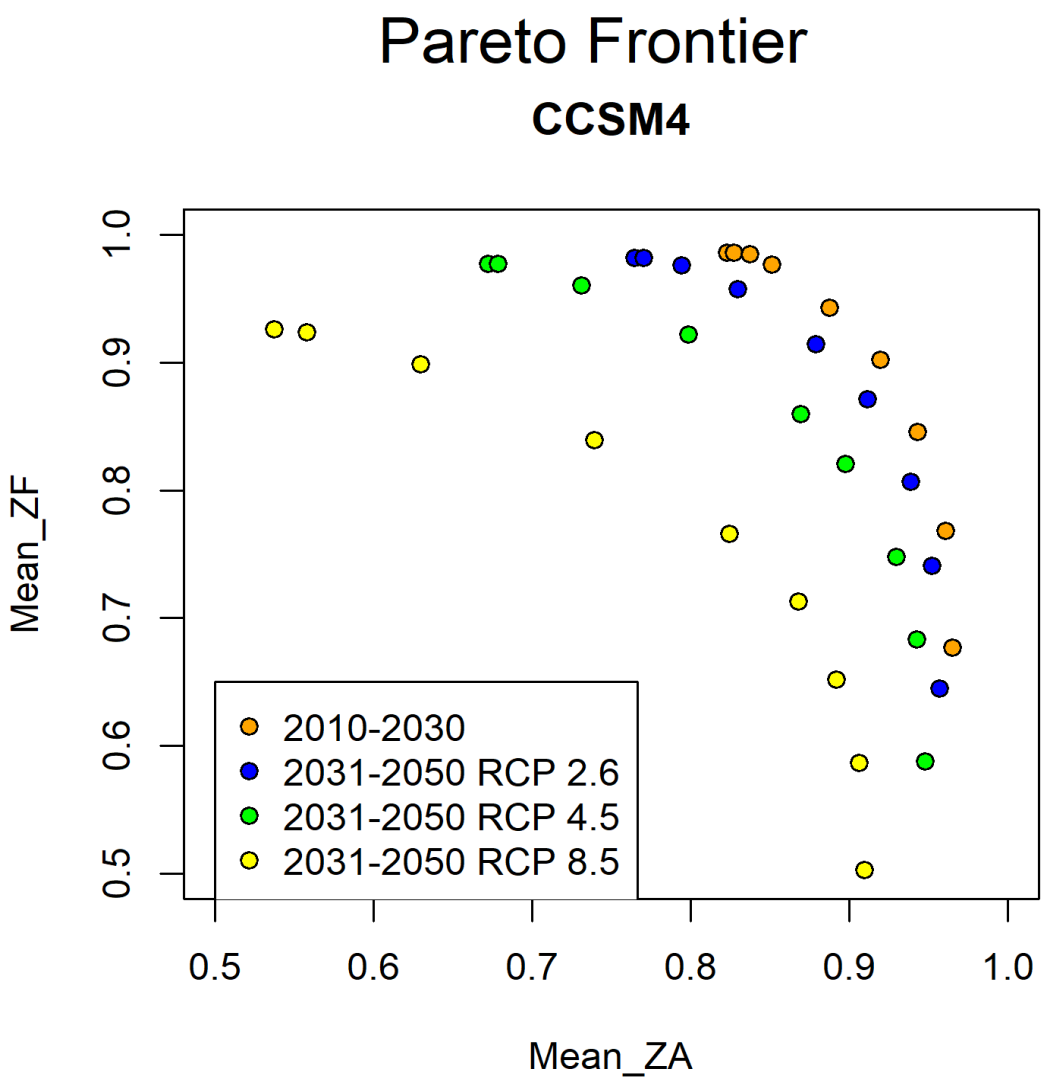
Zamani Sabzi et al., Ecological Engineering *(in press)*




Strategic allocation of water conservation incentives to reduce societal consumption by 1-3% can make a large decrease in water conflicts

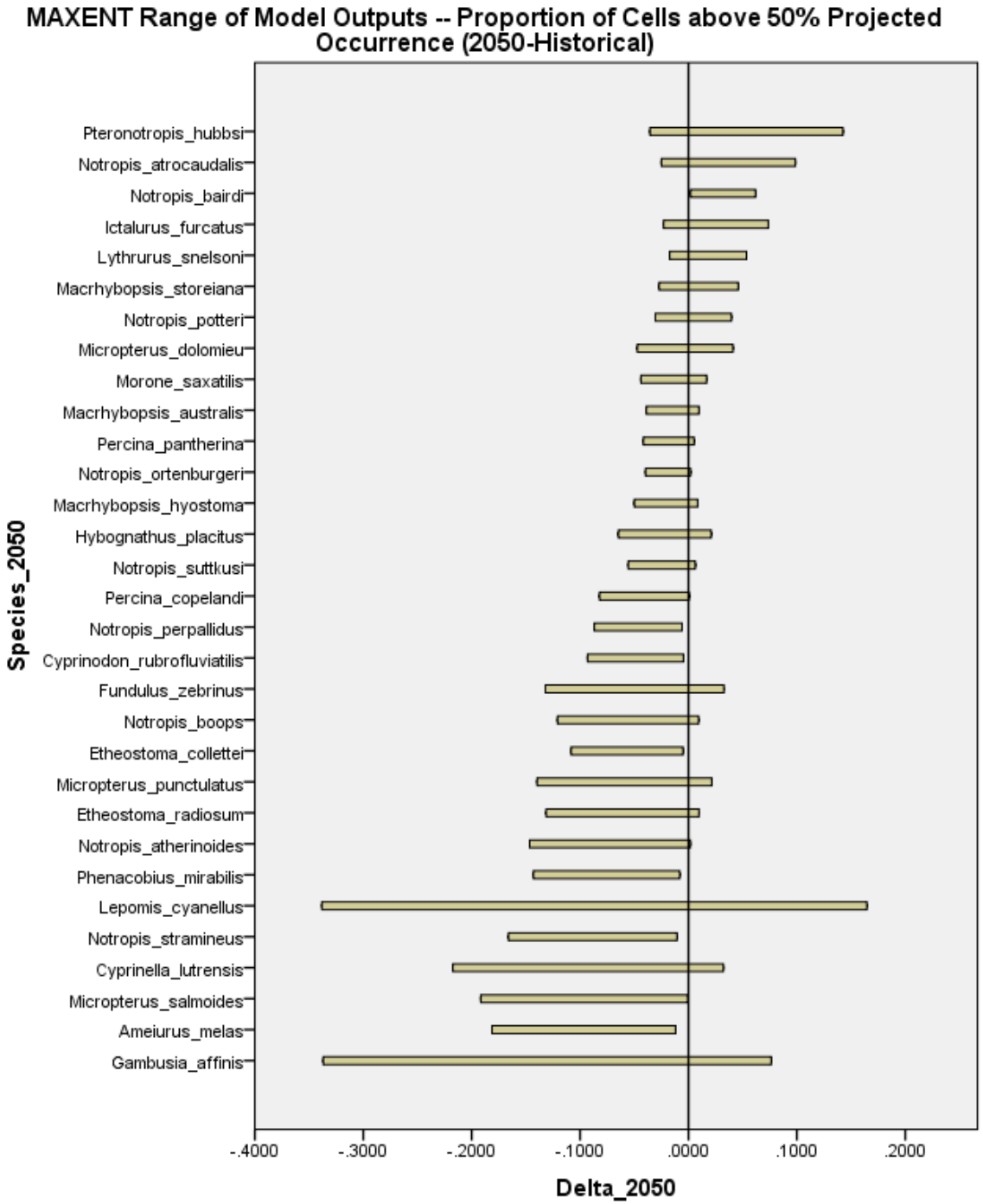
Zamani Sabzi et al., Ecological Engineering *(in press)*


Reduction in Annual Societal Water Demand
A
Acre-feet reduction
2000000
200000
20000
2000
0
Foss
Fort Cobb
Buffalo
Greenbelt
Altus
Ellsworth
Tom steed
Arbuckle
Waurika
Lake Diversion
Kemp
Arrowhead
Kickapoo
Texoma
Sardis
Gillham
Broken Bow
McGee Creek
Pine Creek
Dierks
Atoka
Dequeen
Hugo
Millwood
Pat Mayse
Cooper
Wright Patman
Bob Sandin
Lake o' the Pines
Caddo
Bistineau
Ouachita
Hamilton
De Gray
Greenson
Felsenthal
Bayou D'Arbonne
Catahoula




Climate change is expected to exacerbate these conflicts, and alter the spatial patterning of water shortages

Fovargue et al., *in prep.*




Fish species show divergent outcomes across future climate scenarios

Gill et al., *in prep.*

# Thank You!



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