



Introduction

- Many states across the Sunbelt area of the United States are experiencing stressed water supplies as a result of urbanization and climate change, which makes the implementation of targeted adaptation strategies crucial.
- This study uses water use and supply trend analysis to investigate the adaptation and water management strategies being employed within the Sunbelt by conducting a comparative analysis of trends across Arizona and North Carolina between 1985 and 2005 by county.
- The aim of this analysis is to increase understanding of the influence of state policies, urbanization, climate (specifically in the form of drought), and water management on the use and distribution of water in waterstressed regions.

Methods

- The geospatial analysis of water demands was performed using a Geographic Information System (GIS) and the Statistical Package for Social Scientists (SPSS).
- With percent change data from the U.S. Geological Survey (USGS), municipal use, irrigation, groundwater and surface water supply variables are analyzed
- Neuse and Cape Fear basins in North Carolina and Verde basin in Arizona are incorporated into this analysis based on their hydrological and socio-political importance in the states under comparison.



Water use and supply trends within the Sunbelt: A comparative analysis of Arizona and North Carolina Deborah Ayodele and Kelli Larson

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Conclusion

The results show a high degree of spatial variation within and across Arizona and North Carolina, largely as a result of growth, drought periods, and water policies.

Compared to North Carolina, the southwestern state of Arizona tends to rely on non-renewable groundwater and water transfers (from agriculture to urban uses) to cope with drought and water scarcity.

These patterns—which are institutionalized by the state-wide Groundwater Management Act—may be detrimental over the long-run since the 'fossil' aquifers in Arizona will eventually be depleted, and the phasing out of agriculture over time will diminish the short-term flexibility of using water transfers to adapt to shortages.

Future Directions

Future directions in this research will include examining:

Other factors that may be responsible for the observed spatial and temporal trends in both Arizona and North Carolina.

Additional adaptation and management strategies used to cope with climate change, urbanization, and water variability.

Social-hydrologic dynamics—especially drivers of decision-making, water resource outcomes, and societal responses—using agent-based modeling.

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