

Smith, C., L. Zautner, K. Larson, and B. Bolin. Water Vulnerability on the Urban Periphery: The Case of Metropolitan Phoenix, Arizona. School of Human Evolution and Social Change, Arizona State University, Tempe AZ 85287-2402; and School of Geographical Sciences, Arizona State University, Tempe, AZ 85287-0104.

With an ongoing drought approaching a decade in Arizona, scholars, water managers and decision-makers have heightened attention to the availability of water resources, especially in rapidly growing regions where demand may outgrow supplies or where conflicts might erupt over competing demands for water. The physical and social characteristics of a place reflect individuals' and communities' vulnerability to hazards such as drought, in addition to their ability to cope with potential water shortages and other water- and climate-related risks such as flooding. Our ongoing case study research in Buckeye and Carefree/Cave Creek, Arizona investigates water management issues in the context of unprecedented growth in the greater Phoenix region. Once a small agricultural town in the West Valley, Buckeye is now planning for massive development to accommodate 325,000 new residents by 2025. Amid desert hills and near Tonto National Forest in the North Valley, Carefree and Cave Creek are upscale residential communities where water use exceeds 300 gallons per capita per day (GPDC). This poster will illustrate comprehensive assessments of water related vulnerability, with focus on the unique physical and social factors that increase the potential for losses in each area. In this context, public perception is explored to better understand awareness and beliefs about risks, and implications for adaptation and responses to mitigate losses.



Water Vulnerability on the Urban Periphery: The Case of Metropolitan Phoenix, Arizona

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Overview

Vulnerability analysis examines the differential ability of individuals and groups to anticipate, avoid, cope with, and recover from the effects of acute or chronic hazards. For this study, vulnerability to drought and water scarcity is evaluated in relation to consumption patterns, urban growth, and resource access. At a variety of scales, vulnerability is mediated by institutional arrangements that affect resource access as well as linked to persistent social inequalities and uneven geographic development produced by capitalist accumulation strategies.

Within the regional context of metropolitan Phoenix, Arizona, our research focuses on the urban fringe communities of Buckeye and Cave Creek/Carefree. While Buckeye faces rapid urbanization including privately planned development of former agricultural lands, the Carefree and Cave Creek area has recently confronted water shortages and conflicts over water provider services. Drawing from vulnerability and political ecology perspectives, our place based research includes analysis of policy documents, media coverage and interviews.

Buckeye

- Once a small agricultural town, Buckeye is rapidly transitioning into a large residential suburb of Phoenix, with its population of about 8,500 in 2000 expanding to over 380,000 by 2030.
- For an area covering 600 square miles, the town is undergoing a comprehensive planning process that aims to create an integrated municipal water distribution and wastewater reclamation system.
- The town is currently enrolled in state mandated groundwater recharge programs and is pursuing a certificate of 100 year assured water from the Arizona Department of Water Resources (ADWR).



Town looking toward future growth by annexing 108 square miles - Associated Press 7/20/06

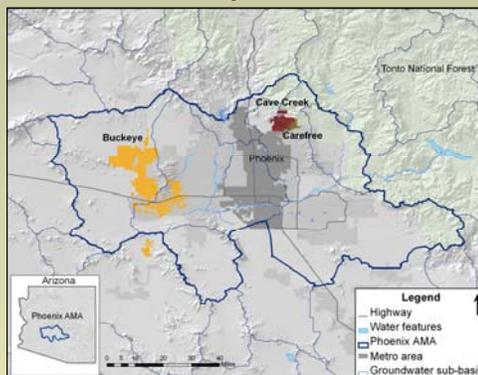


Water is top concern at Buckeye town hall - Arizona Republic 1/21/06



Residents question fairness of different water charges - Arizona Republic 10/14/05

Study Area



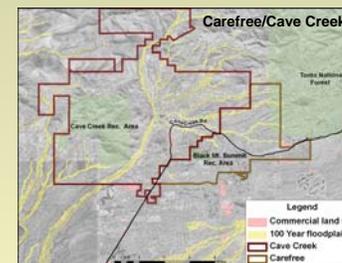
Vulnerability Indicators

	Buckeye	Carefree	Cave Creek
Source of water	100% groundwater	>90% CAP water (1,300 AF allocation) Remainder groundwater	45% CAP water (1,600 AF allocation)
Water providers	Municipal provider & 5 small private providers	Municipal provider & Global Water Co. (private)	Global Water Co. (private)
Exempt wells (#)*	1,187	81	545
Wildfire	N/A	- Bordering Tonto National Forest - Severe fires have caused property damage in past. - Protection thru subscription to private fire service co.	
Demographics:			
Ethnicity (% Anglo)	57%	96%	91%
Average Age	30 years	55 years	45 years
Median income	\$35,383	\$88,702	\$59,937
% below poverty line	19.8%	3.2%	7.8%
Median house value	\$86,400	\$411,200	\$270,500

* Unregulated wells with a pumping capacity of less than 35 gallons per minute

Carefree Cave Creek

- Bordered by the Tonto National Forest, Carefree and Cave Creek value low-density desert living, preservation of open spaces, and associated recreational amenities. While Carefree is known for its resort-style living, Cave Creek is known for its 'old West' atmosphere.
- Carefree, one of the highest per capita water users in the Valley, has goals of reducing their reliance on groundwater to zero through increased CAP purchases, waste water reclamation, and rate driven conservation strategies.
- Cave Creek recently purchased a private water company in an overnight deal, preventing a rival - Global Water Co. - from acquiring it. Desert Hills Water Co. was bought out after severe water outages in the summer affected residential customers in nearby unincorporated areas.



Carefree Water Co. needs rate increase to stay afloat - Sonoran News 6/28/06



Cave Creek buys troubled water company - Arizona Republic 9/12/06



Carefree stressing new water conservation program - Sonoran News 10/11/06



Water users relieved, skeptical - Arizona Republic 9/23/06

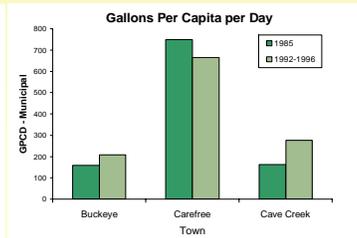
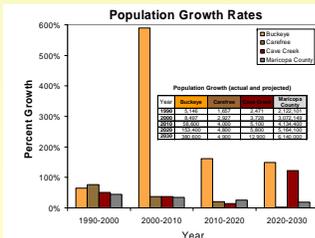
Conclusions and Next Steps

The growth machine exposes communities in the Phoenix region to rapid changes that sometimes outpace comprehensive planning and building the institutional capacity to prepare for water scarcity. These factors threaten resilience and result in different levels of risks among and within communities. A key difficulty facing municipalities on the urban fringe is coordinated planning and preparedness in the face of private, and sometimes multiple, water providers. For the case study communities, proximity to preserved desert areas versus agricultural land also create unique challenges such as wildfires exacerbated by drought and wells that are exempt from regulatory oversight, respectively. Particular geographic contexts may, in turn, influence perceptions of risks and the willingness and ability of communities to prepare and respond to acute or chronic scarcity.

Forthcoming interviews with water resource professionals and other key informants will evaluate risk perceptions and institutional capacity to cope with water scarcity. Further data collection and mapping will also reveal region-wide vulnerabilities in terms of differential access to secure water sources and infrastructural buffers as well as preparedness to respond and cope with water scarcity and other risks.

Acknowledgment

This material is based upon work supported by the National Science Foundation under Grant No. SES-0345945 Decision Center for a Desert City (DCDC). Any opinions, findings and conclusions or recommendation expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).



US Census data 1990, 2000; Maricopa Association of Governments 2003

Arizona Department of Water Resources