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

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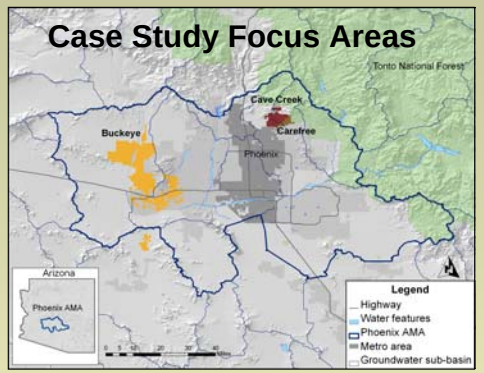
## Overview

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.

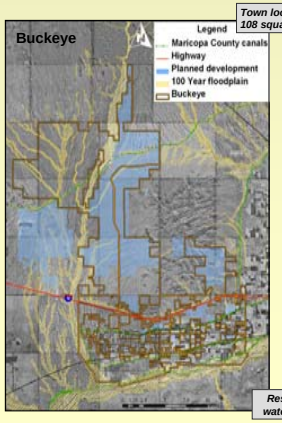
Within the regional context of metropolitan Phoenix, Arizona, our research focuses on the urban fringe communities of Buckeye and Cave Creek/Carefree. While Buckeye faces rapid urbanization including privately planned development of former agricultural lands, the Carefree and Cave Creek area has recently 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.

## Case Study Focus Areas




## 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).



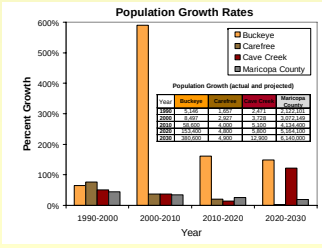

*Town looking toward future growth by annexing 108 square miles* – Associated Press 7/20/06

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

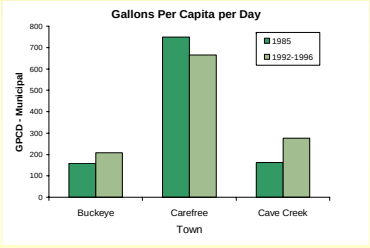
*Residents question fairness of different water charges* – Arizona Republic 10/14/05

## Vulnerability Indicators

| | Buckeye | Cave Creek | Carefree |
|---|---|---|---|
| **Source of water** | 100% groundwater | 45% CAP water (1,600 AF allocation) 55% groundwater | >90% CAP water (1,300 AF allocation) Remainder groundwater |
| **Water providers** | Municipal provider & 5 small private providers | Global Water Co. (private) | Municipal provider & Global Water Co. (private) |
| **Exempt wells (#)** | 1,187 | 545 | 81 |
| **Wildfire** | N/A | - Bordering Tonto National Forest<br>- Severe fires have caused property damage in past.<br>- Protection thru subscription to private fire service co. | |
| **Demographics:** | | | |
| **Ethnicity (% Anglo)** | 57% | 91% | 96% |
| **Average Age** | 30 years | 45 years | 55 years |
| **Median income** | $35,383 | $59,937 | $88,702 |
| **% below poverty line** | 18.8% | 7.8% | 3.2% |
| **Median house value** | $86,400 | $270,500 | $411,200 |



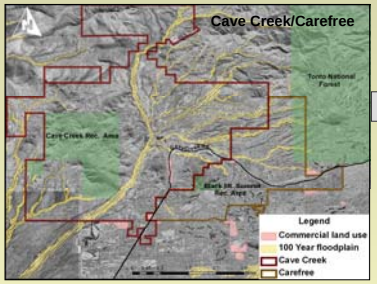

US Census data 1990, 2000; Maricopa Association of Governments 2003

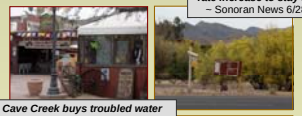



Arizona Department of Water Resources

## Cave Creek Carefree

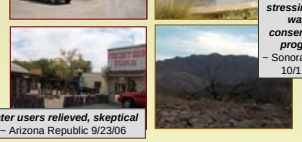
- Bordered by the Tonto National Forest, Carefree and Cave Creek value low-density desert living, preservation of open spaces, and associated recreational amenities. While Carefree is known for its resort-style living, Cave Creek is known for its 'old West' atmosphere.
- Carefree, one of the highest 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.

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