



MAKING ACTION POSSIBLE
for Southern Arizona



MAP Talk Webinar

Manufactured Housing Gap in Tucson and Pima County

August 21, 2019





MAKING ACTION POSSIBLE
for Southern Arizona



George Hammond

EBRC Director





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Webinar Details

- ▶ **The MAP Talk will be recorded**
 - ▶ See the MAP Dashboard website for recordings
- ▶ **Conference mode**
 - ▶ Everyone muted except presenter
- ▶ **How to ask a question**
 - ▶ Email anytime to ghammond@email.arizona.edu



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New International Recognition!

MAP DASHBOARD WINS
INTERNATIONAL AWARD



Community
Indicators
Consortium

Learn More





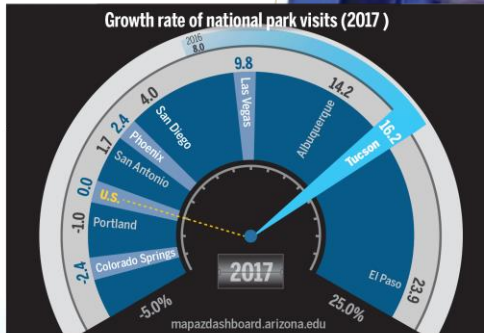
Arizona Daily Star

Tucson economy: MAP Dashboard

Monthly Stats	Change Year/Year
Non-farm jobs 389,100 (October 2018)	+1.9%
Unemployment rate 4.1% (October 2018)	-0.2% pts.
Median home price \$215,000 (October 2018)	+7.6%
Pesos per U.S. dollar 19.20 (October 2018)	+2.0%

Tucson ranks high for national park visits as growth rate doubled in 2017

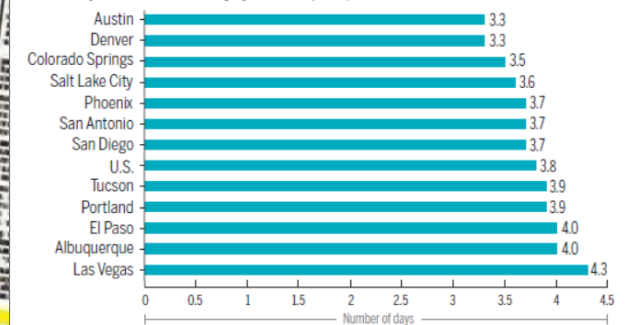
In 2017, the growth rate in national park visits within the Tucson metropolitan statistical area was 16.2 percent, double the previous year's growth. Tucson ranked second among peer western MSAs behind El Paso. Colorado Springs and Portland posted a decline in the number of visitors to national parks located in their respective regions, while the growth in visitors to national parks across the U.S. remained flat. Recreational land and outdoor leisure opportunities attract visitors to a region, which can serve as an important input for local retail and service sectors. Additionally, recreation land provides communities with direct social and economic benefits and has been linked to amenity-driven economic development, increased real estate values, and positive public health outcomes.



Tucson's health: MAP Dashboard

In 2016, those living in the Tucson MSA reported 3.9 poor mental health days each month. This tied Tucson for eighth place with Portland among 12 peer western metros. Residents of Austin and Denver reported the least number of poor mental health days at 3.3, and Las Vegas residents reported the most at 4.3. Behavioral health is a key component of a person's well-being and can affect an individual's health, longevity and productivity. To learn more about mental health and other behavioral health conditions in Southern Arizona visit the MAP Dashboard.

Number of poor mental health days per month (2016)





How Do Renters Fare?

[Learn More](#)

How Does Your Southern Arizona Community Compare?

[Learn More](#)

Tucson's Home Prices Near Pre-Recession Levels

[Learn More](#)

Understanding Chronic Disease Incidence and Prevalence

[Learn More](#)

Explore How Local Organizations Use the MAP

[LEARN MORE](#)

Potential for Water Independence in Tucson's Communities

[Learn More](#)

Hot Spots in Four Arizona Cities

[Learn More](#)

How Much Has Your Community Improved?

[Learn More](#)

Unleashing Growth: The Power of Innovation

[Learn More](#)



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MAP Talk

The “Manufactured Housing Gap” in Tucson and Pima County: Introduction and Preliminary Analysis

August 21, 2019

Mark Kear
Assistant Professor
School of Geography and Development
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MAP Talk

The “Manufactured Housing Gap” in Tucson and Pima County

Mark Kear, Asst. Prof. School of Geography and Development

Taylor Handschuh, MSGIST, The Map Lady

Sarah Launius, PhD, City of Tucson

Julian Hartman, MBA, PhD Student

Dugan Meyer, MA, PhD Student

Gary Christopherson, PhD, Director, Center for Applied Spatial Analysis





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MAP Talk

The “Manufactured Housing Gap” in Tucson and Pima County



Agnese Nelms Haury
Program in Environment and Social Justice





Manufactured Housing Gap

PROMISE

MH is not an inherently marginal form of housing



REALITY

MH is often the nexus of social, financial, health and environmental insecurities

Live Big in a Tiny House



The Big + Small Details Tiny House Dwellers Love 19 Photos

Radical downsizing? Maybe not so radical.



13 Cool, Modern Tiny Houses on Wheels 45 Photos

These chic mobile homes will roll where you do.

Source:
<https://www.hgtv.com/shows/tiny-house-big-living>



Manufactured Housing Gap

PROMISE

MH is not an inherently marginal form of housing



REALITY

MH is often the nexus of social, financial, health and environmental insecurities

- ▶ What is the *geography* of the MH gap in Tucson?
- ▶ Where is it “widest”?
- ▶ How can we better understand it?
- ▶ What holds it open and how can we close it and improve *quality of life* for MH residents?



Manufactured Housing Gap

PROMISE

MH is not an inherently marginal form of housing



REALITY

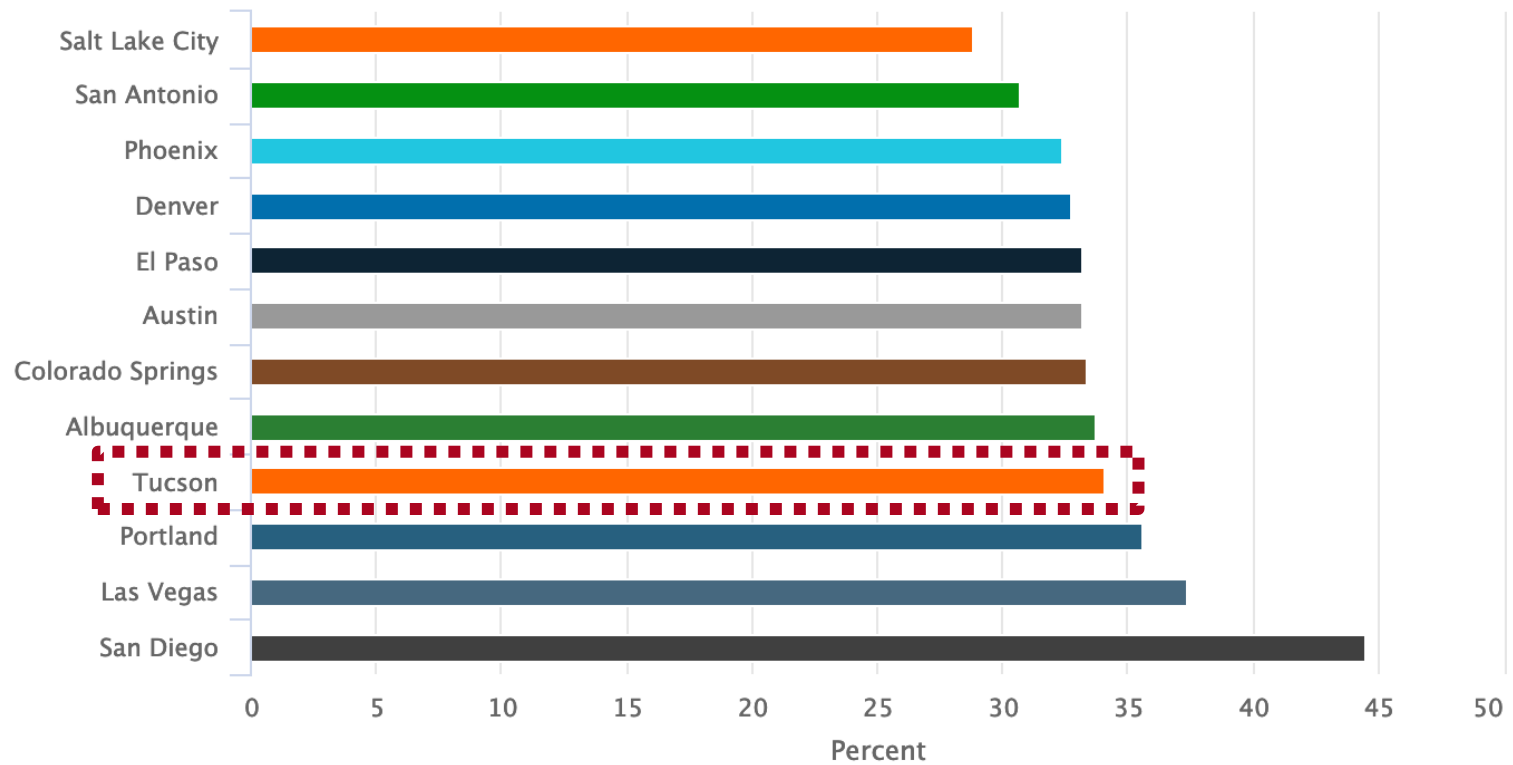
MH is often the nexus of social, financial, health and environmental insecurities

- ▶ Why do we care about closing the MH gap in Tucson?
 - ▶ Many reasons...
 - ▶ Housing affordability



Tucson is more housing cost burdened than many other Western peer cities

Percent of Housing Cost Burdened Households (2017)





In Tucson, housing cost burden of greatest concern among lower-income groups

Housing Cost Burden by Income (2017)
mapazdashboard.arizona.edu

INCOME	TUCSON	ARIZONA	U.S.
Less than \$20,000	14.6%	11.8%	11.9%
\$20,000 - \$34,999	10.1%	9.4%	8.6%
\$35,000 - \$49,999	4.6%	5.2%	4.9%
\$50,000 - \$74,999	2.6%	3.2%	3.9%
\$75,000 or more	1.1%	1.4%	2.7%



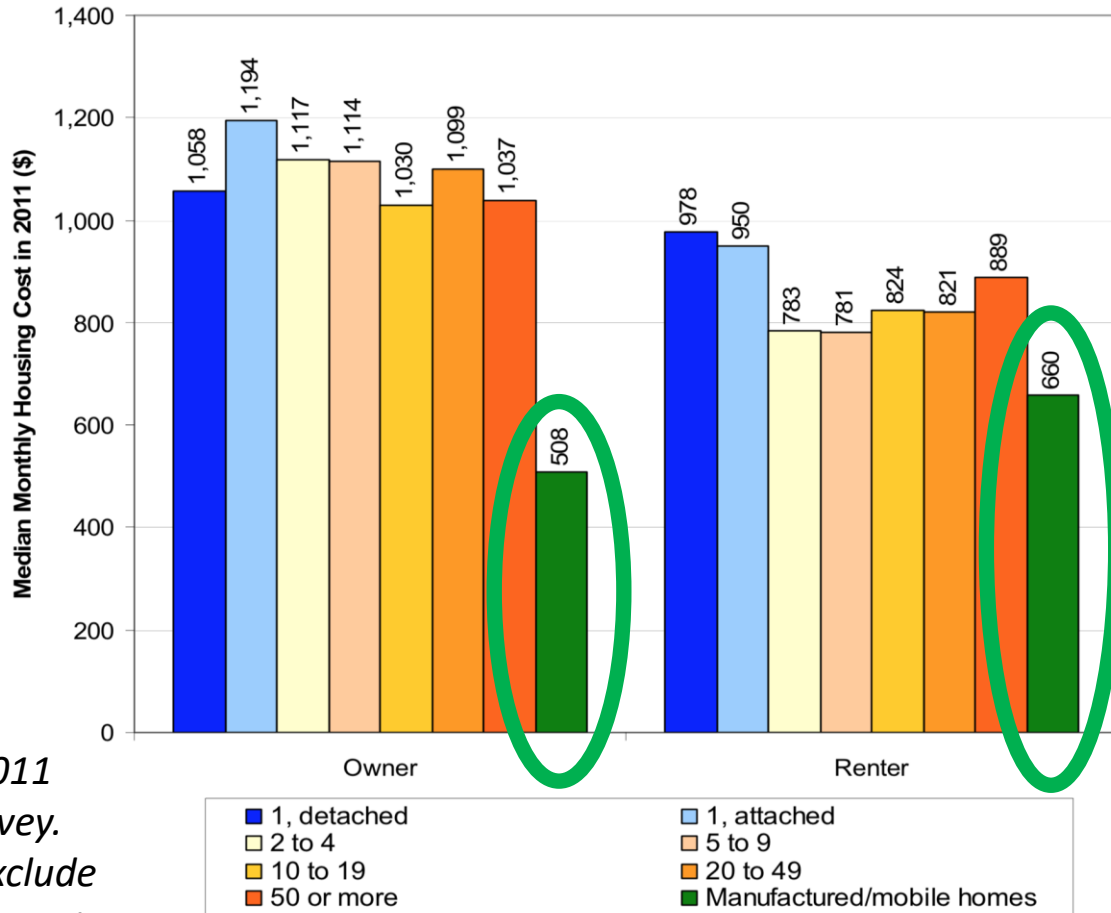
Tucson MSA experienced a substantial decline in its lowest-rent units from 2011 to 2017

Max Rent Cutoff in 2011	Number of Low-Rent Units in 2011	Number of Low-Rent Units in 2017	Percent Change in Low-Rent Units
\$523	44,920	30,236	-33

Source: [Harvard Joint Center for Housing Studies](#) tabulations of US Census Bureau, American Community Survey 1-Year Estimates using the Missouri Data Center data. Based on the “constant quartile approach” (Myers and Park 2016)



Manufactured Homes Typically Cost Less than Other Housing Types



U.S. Census Bureau, 2011
American Housing Survey.
Median renter costs exclude
renters paying no cash rent.
Fannie Mae, 2013.





MH Totals by Arrangement, Pima County in 2017

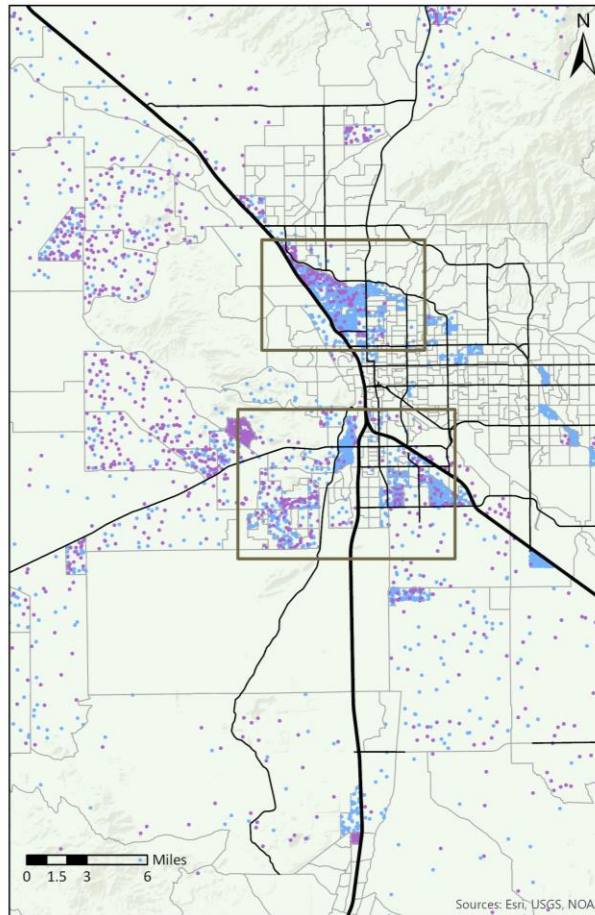
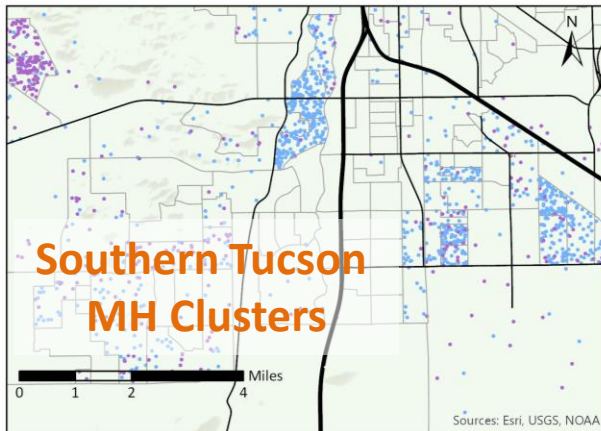
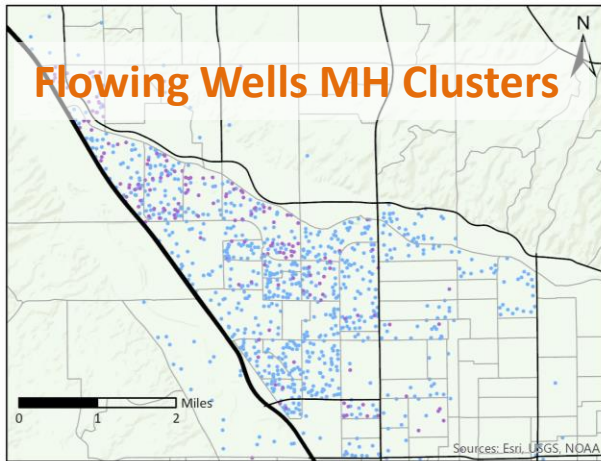
MH Arrangement	MH Instances	Average Income by Block Group
“Park”	19,474	\$16,110
Co-op	685	\$18 009
Subdivision	7,752	\$20,796
Subdivided Lot	22,353	\$24,107
	50,264	\$23,722

- ▶ A large portion of the remaining 30,236 low-rent units in Tucson are manufactured homes.
- ▶ MH residents tend to be in the most housing-cost burdened income groups in Tucson





What is the geography of MH in Pima County?



- 1 Dot = 10 MHU
- MHU Real Property
 - MHU Personal Property



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MH Quality of Life: Risk, Vulnerability and Insecurity

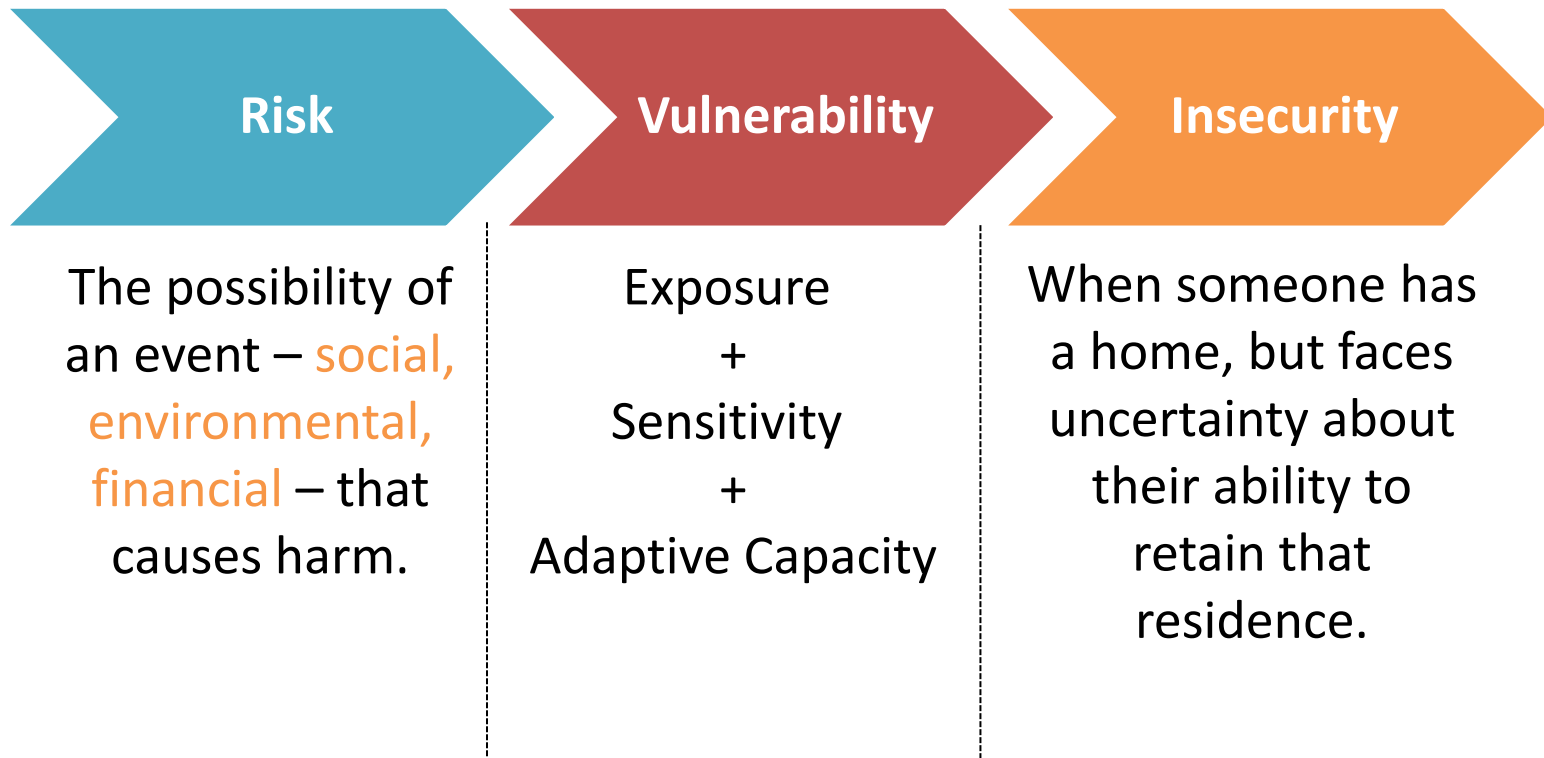
How and where can we make the biggest improvements to QOL
in Tucson's MH communities?

What can we learn in the process?





Definitions: Risk, Vulnerability and Insecurity





Environmental Vulnerability

Exposure + Sensitivity + Adaptive Capacity



Flooding
(e.g. Hurricane Harvey)



Exposure:

- MH more often located in flood zones and coastal areas

Wind Damage
(e.g. recent tornado in Alabama)



Sensitivity:

- When exposed to high winds MH is more likely to be damaged.





Environmental Vulnerability

Exposure + Sensitivity + Adaptive Capacity

MH
+
Environmental
Vulnerability

Flooding
(e.g. Hurricane Harvey)



Exposure

Wind Damage
(e.g. recent tornado in Alabama)



Sensitivity

► Doesn't this mean that Arizona is a place where MH is less vulnerable? No coast, it's a desert, and few hurricanes or tornados!





Climate Vulnerability

Exposure + Sensitivity + Adaptive Capacity

“A Catastrophe in Slow Motion”

(Pierrehumbert 2006)

MH
+
Climate
Change

Climate change projections: Western Border region

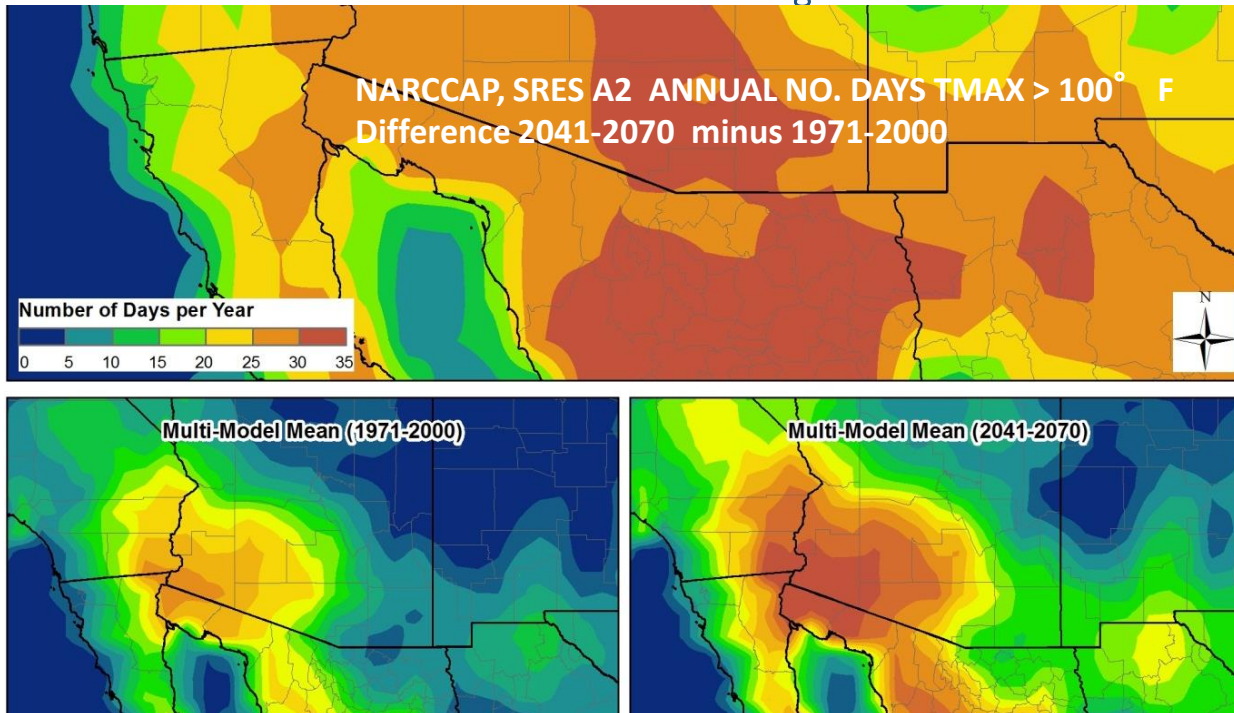
PROJECTED CHANGE	DIRECTION	BORDER SUBREGION AFFECTED	CONFIDENCE
Annual No. of days with max. temperatures >100 F	Increasing	Throughout; greatest in central Sonoran Desert & NW Chihuahua	Medium-High
Heat wave duration	Increasing	Throughout	High

Wilder, M. et al. 2013. Border Communities and Vulnerability. SW Climate Assessment. Island Press



“Ground Zero” for Climate Change

Spatial distribution multi-model mean change in no. of days > 100° F
U.S.-Mexico Border Region



Source: adapted from Wilder et al., 2013. Border Communities, in Southwest Region Report (Garfin et al. 2013).

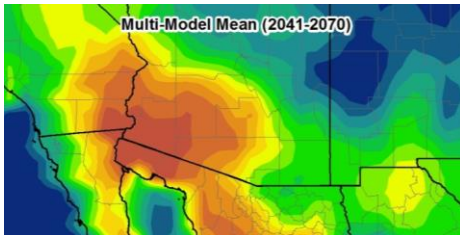
Projections show that days with maximum temperatures greater than 100° F will increase in all parts of the Southwest border region, with the largest increases, 30-35 days per year, in the Arizona-Sonora border region.



Climate Vulnerability

Exposure + Sensitivity + Adaptive Capacity

Geography of **Exposure** to
heat waves and >100°F



+

Heat **sensitive** structures
inhabited by heat
sensitive populations...



Health and mortality risks

+

...Whose **adaptive
capacities** are limited and
may increase exposures to



AZ Daily Star

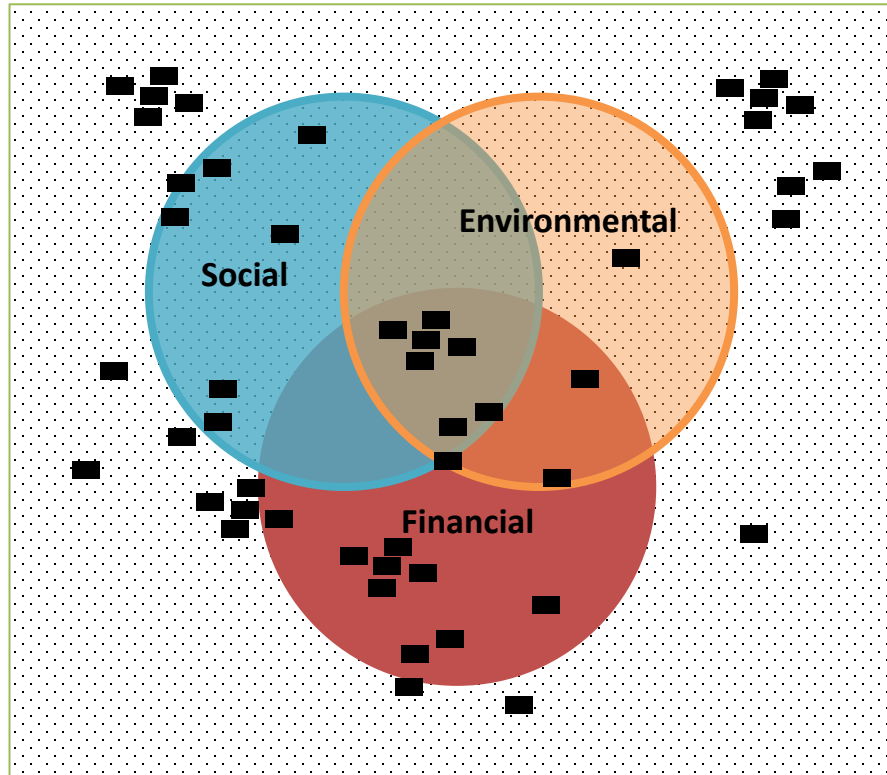
Increased AC use → Increased
energy-cost burden → **Eviction
Risk**






“Intersectional” Vulnerability

Conceptual Map

Coupled and intersecting geographies vulnerability



Legend

-  Urban Space
-  Vulnerability
-  MH

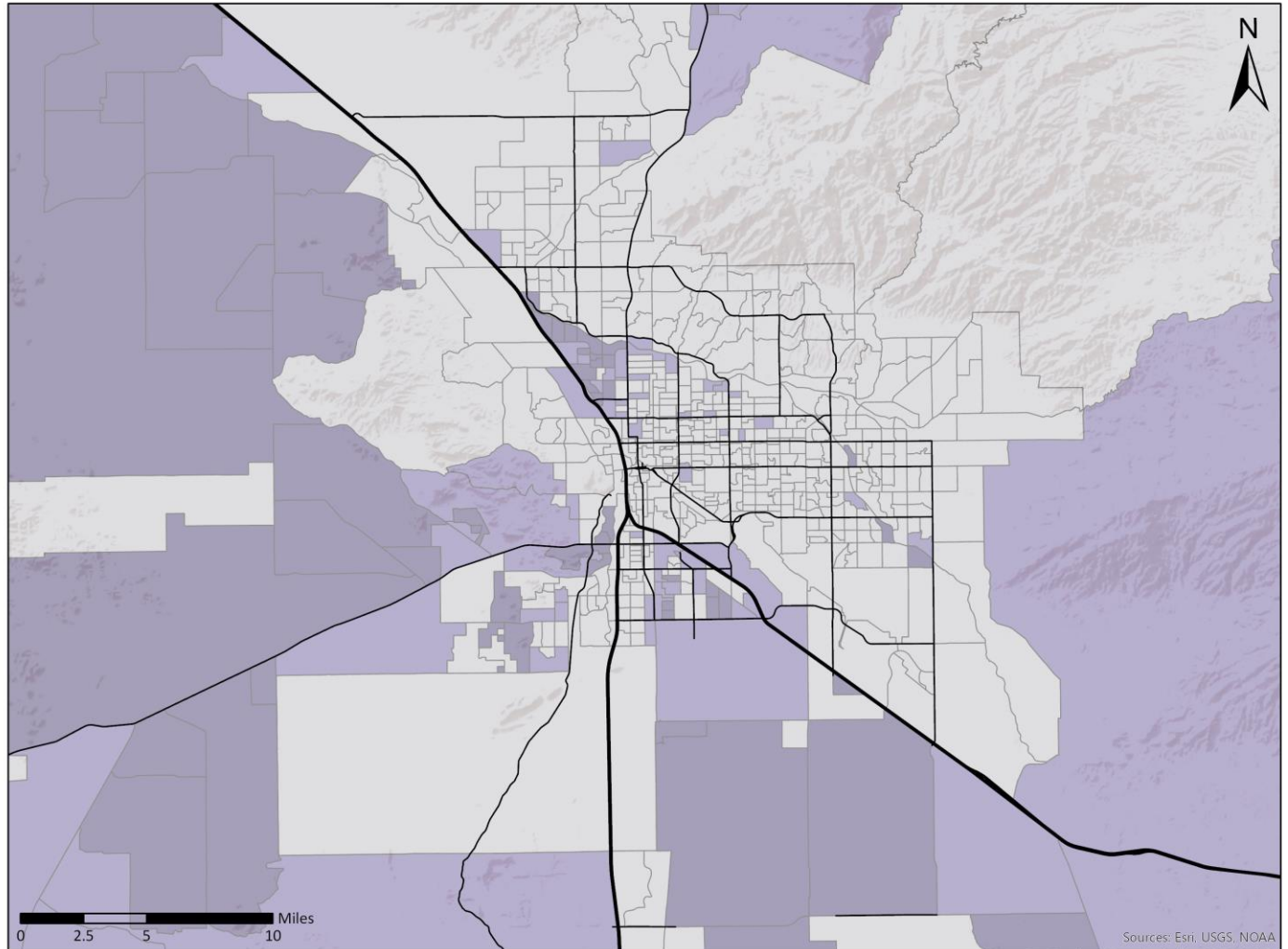




Bivariate Map Series: Location Quotient for MH in Pima County

Pima Block Group Location Quotient

- 0-1
- 1.01 - 4.69
- 4.7-12.01

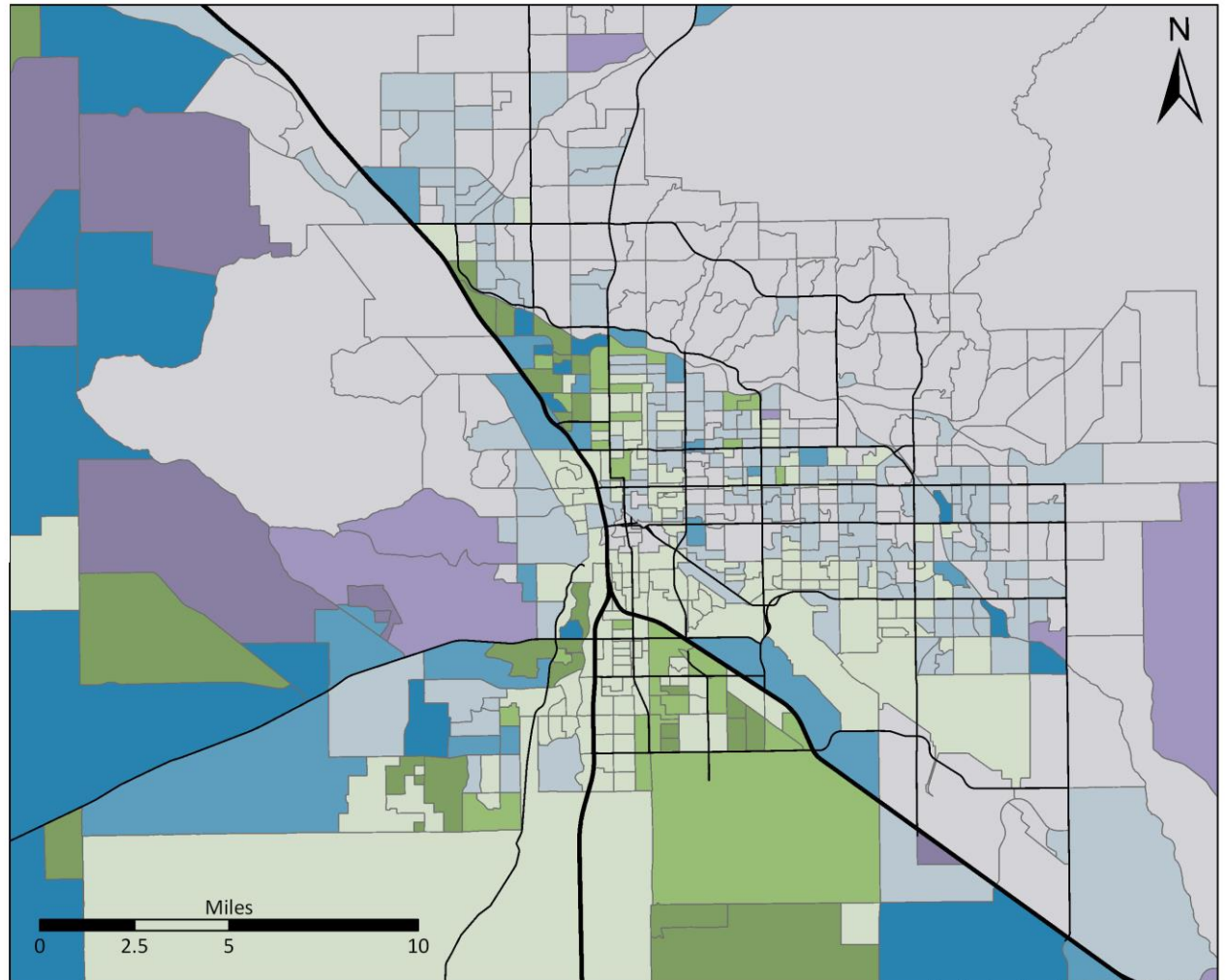
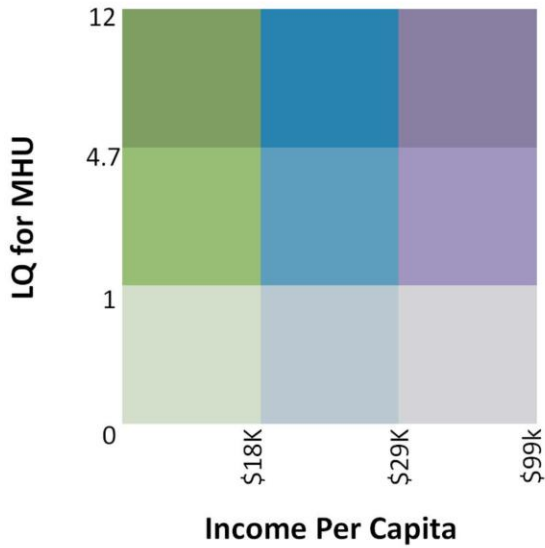


Sources: Esri, USGS, NOAA

By Taylor Handschuh, GIST-2018



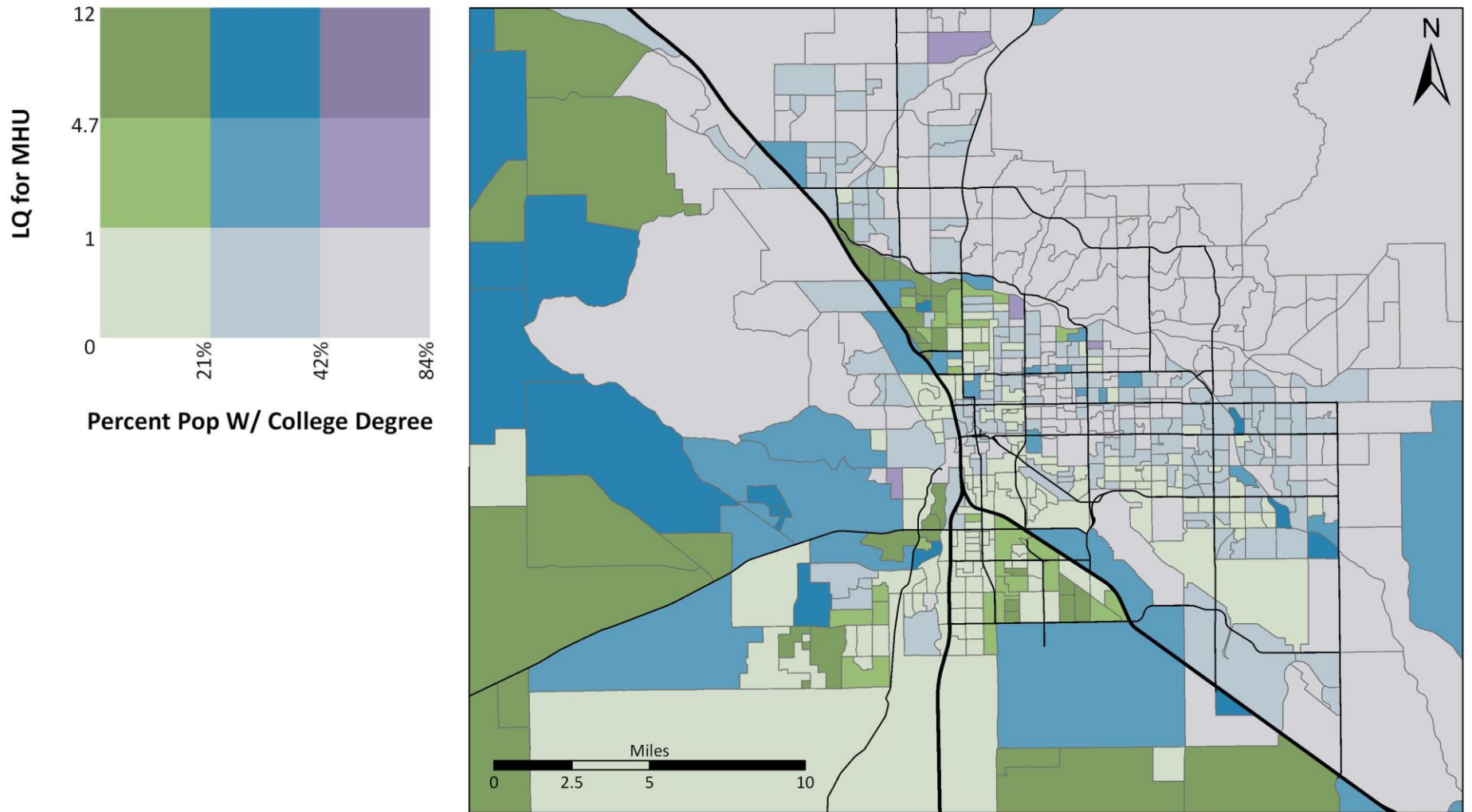
Map 1: MH location quotient by income per capita (block group)



**Bivariate Map Series:
Income**

Bivariate Map Series: Education

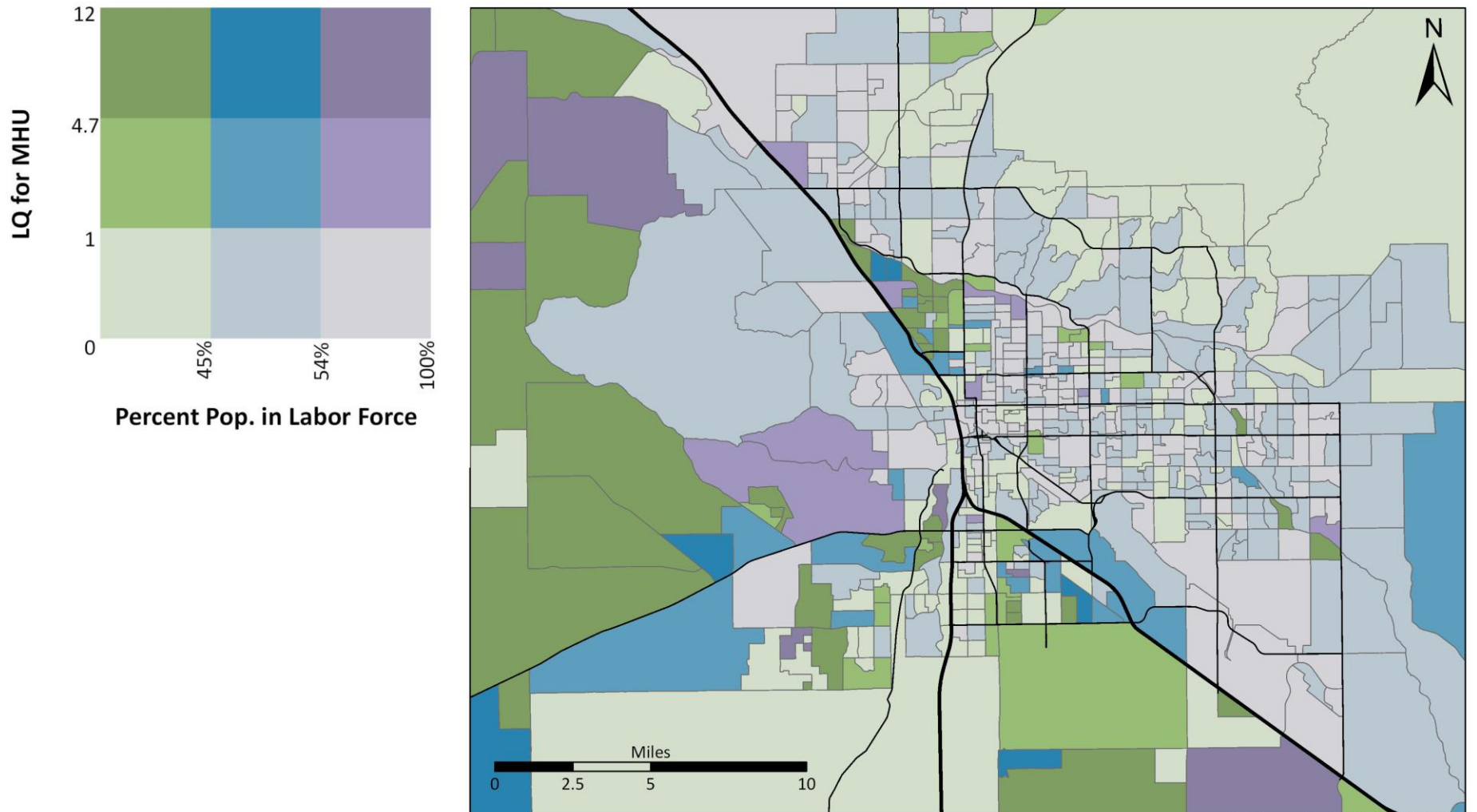
Map 2: MH location quotient by percentage of population w/ college degree (BG)



By Taylor Handschuh, GIST-2018

Bivariate Map Series: Employment

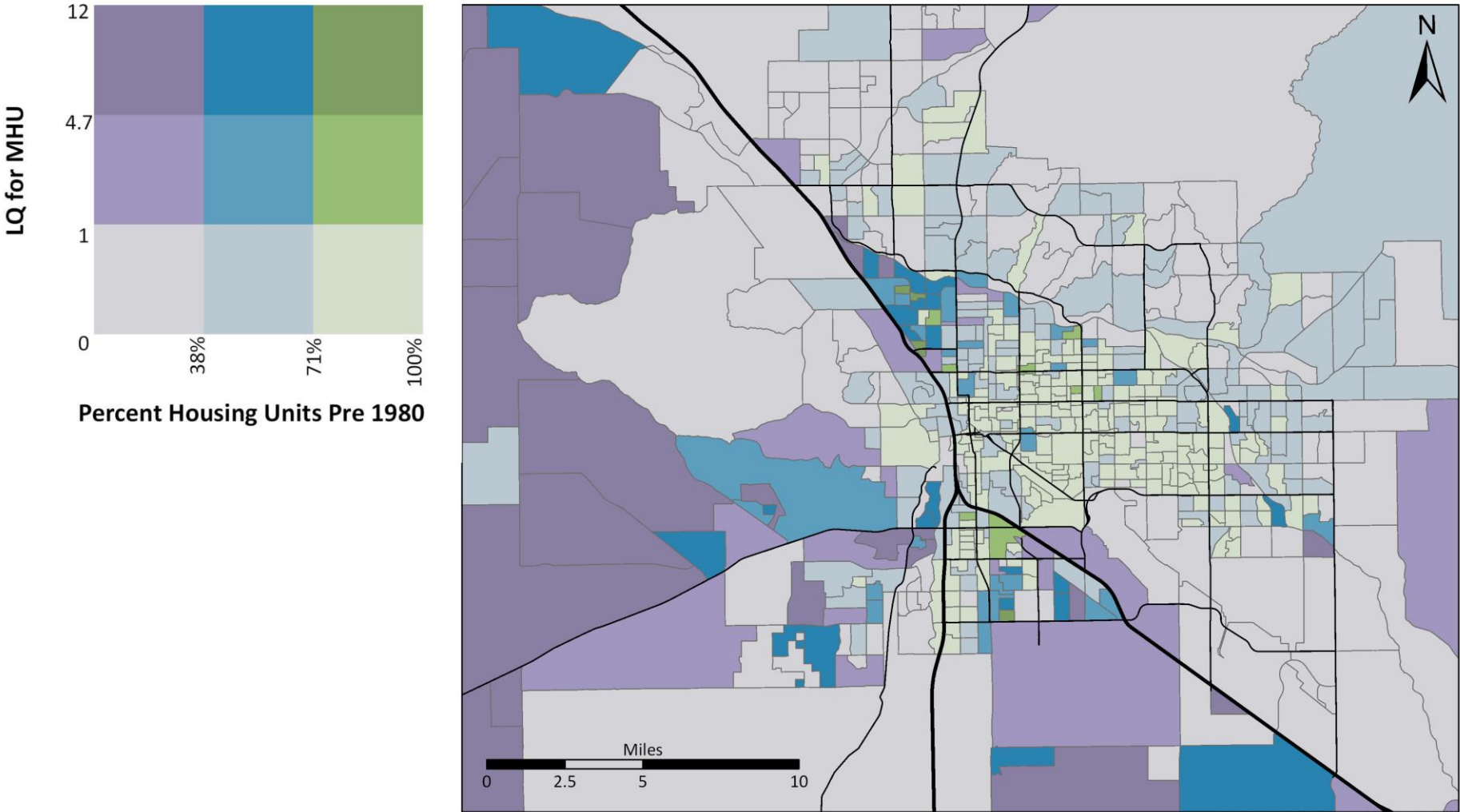
Map 4: MH location quotient by labor force participation (BG)



By Taylor Handschuh, GIST-2018

Bivariate Map Series: Structure

Map 5: MH location quotient by percentage of Pre 1980 (BG)*



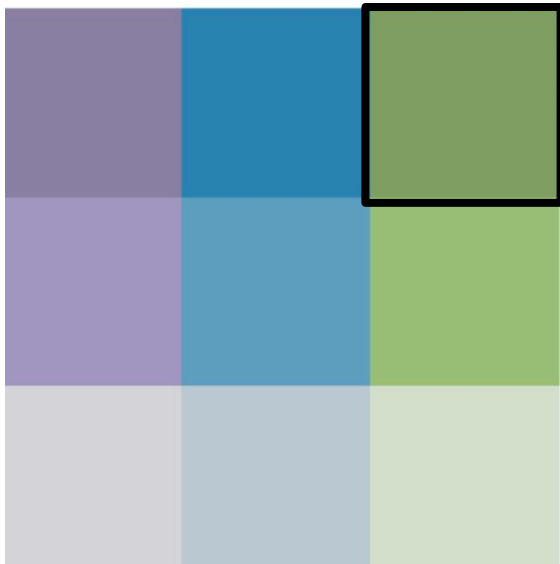
By Taylor Handschuh, GIST-2018

*What we really want is pre 1976 (i.e. pre HUD code)

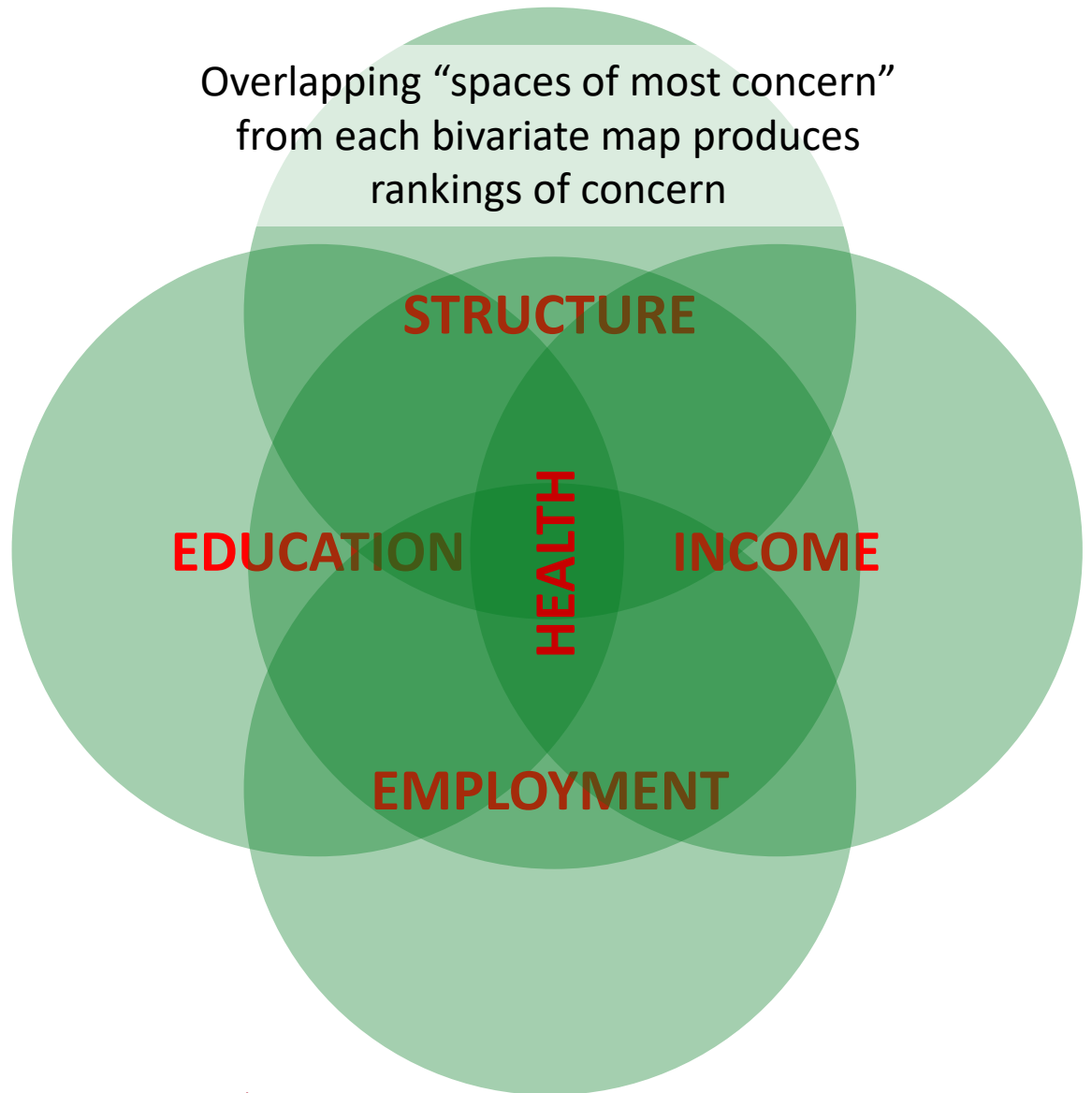
Spatializing the MH Gap:

Converting Bivariate Maps into Concern Rankings

Map “cell of most concern”
from each bivariate map



Overlapping “spaces of most concern”
from each bivariate map produces
rankings of concern



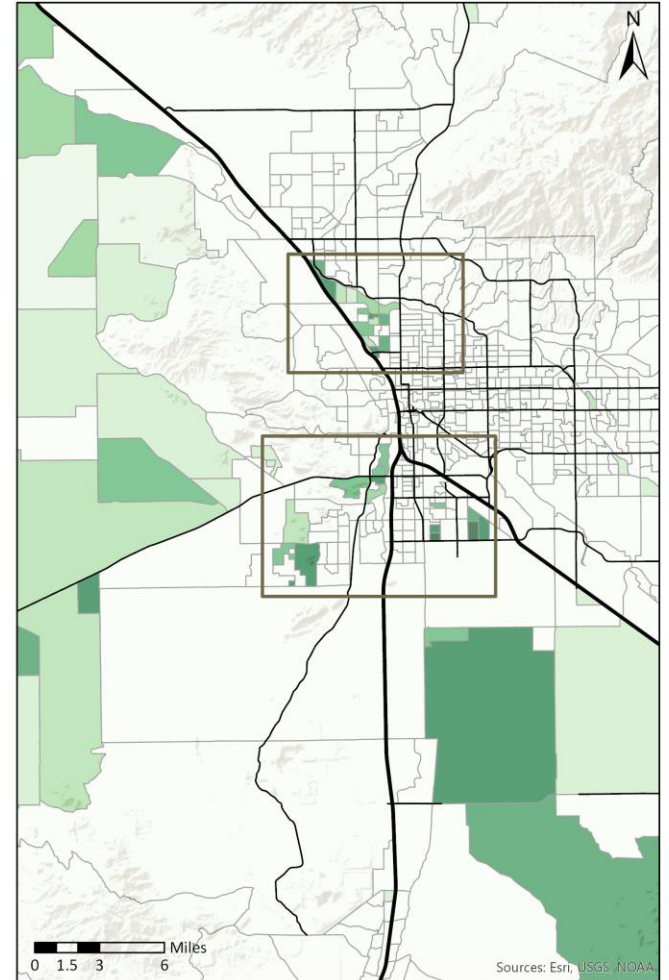
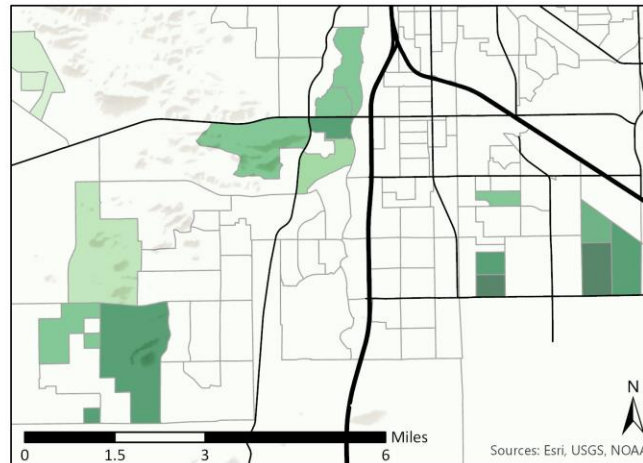
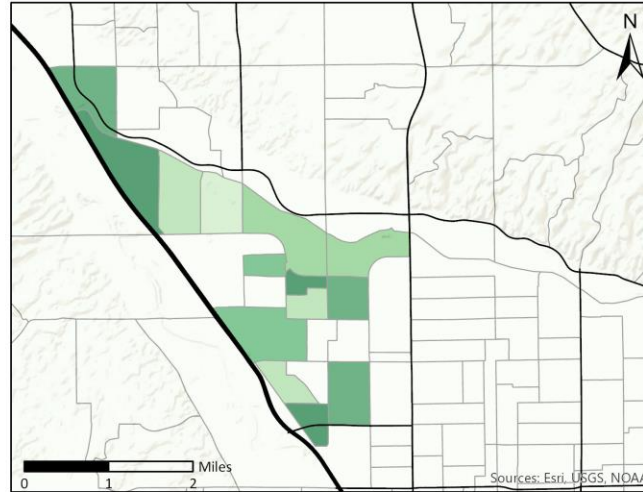


Concern Rankings: A Map of the MH Gap in Tucson and Pima County

Intersection of block groups of most concern from each bivariate map

MHUxConcern

- 0 Minimal Concern
- 1
- 2
- 3
- 4 Moderte Concern
- 5
- 6
- 7
- 8 Maximum Concern



By Taylor Handschuh, GIST-2018



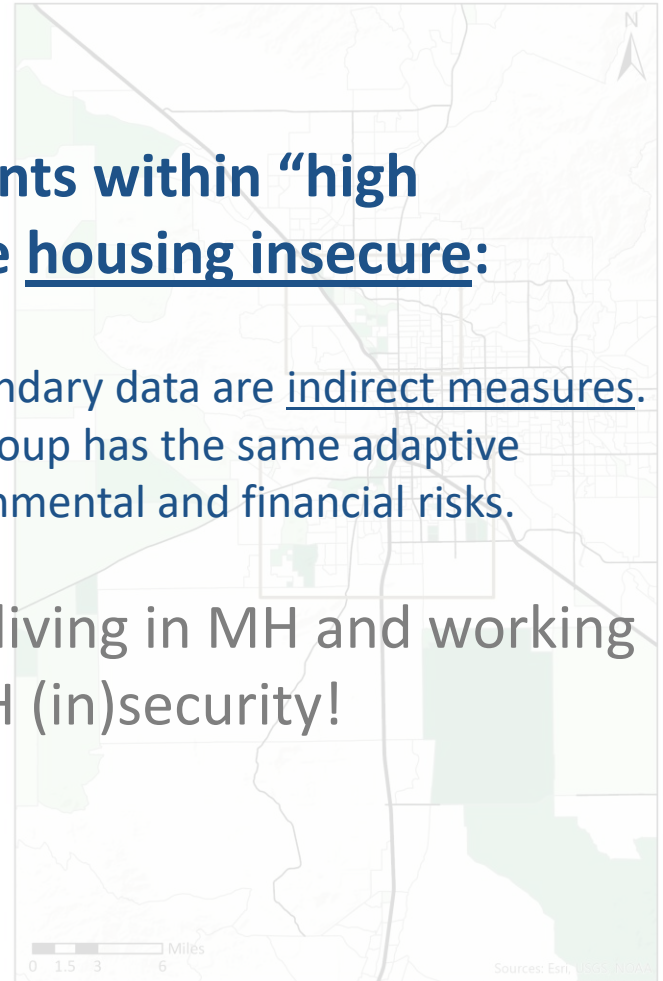
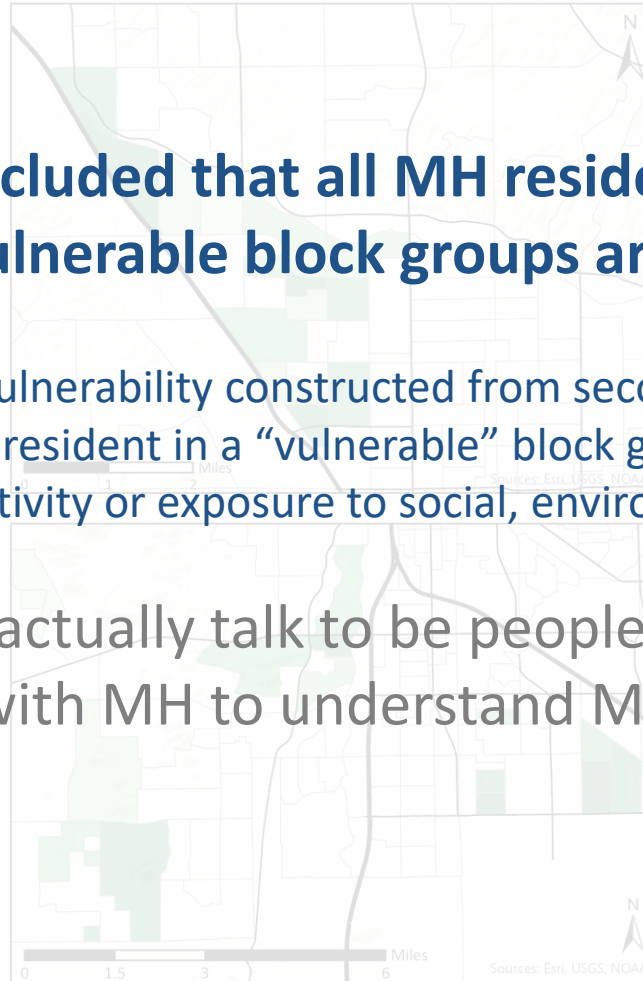
Concern Rankings: A
Map of the MH Gap
in Tucson and Pima
County

Can't concluded that all MH residents within "high concern"/vulnerable block groups are housing insecure:

Intersection of block groups of most concern from each bivariate map

1. Indicators of vulnerability constructed from secondary data are indirect measures.
2. Not every MH resident in a "vulnerable" block group has the same adaptive capacity, sensitivity or exposure to social, environmental and financial risks.

➤ We need to actually talk to be people living in MH and working with MH to understand MH (in)security!





Concern Rankings: A
Map of the MH Gap
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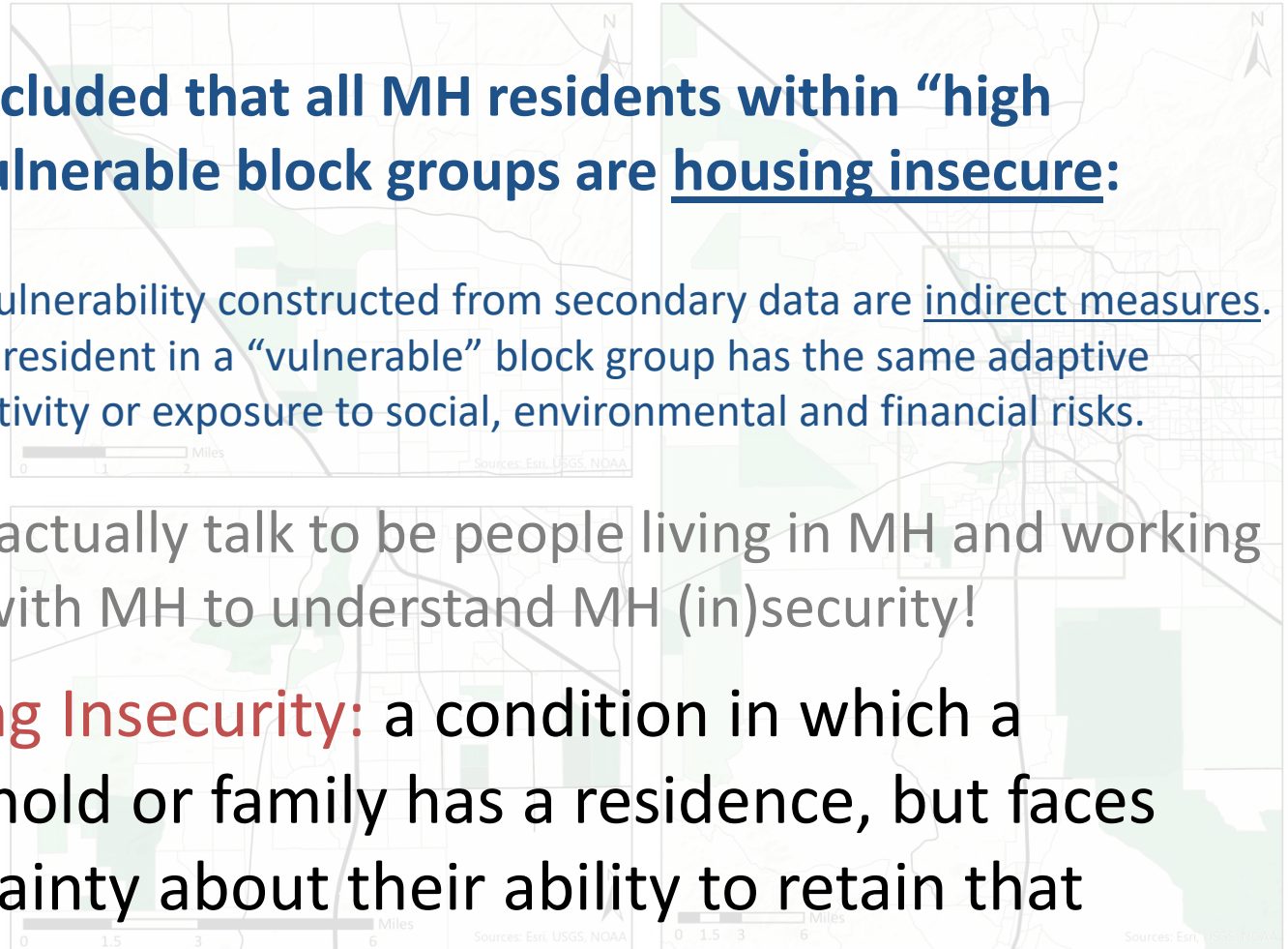
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MHUxConcern

- 0 Minimal Concern
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- 3
- 4 Moderate Concern
- 5
- 6
- 7
- 8 Max

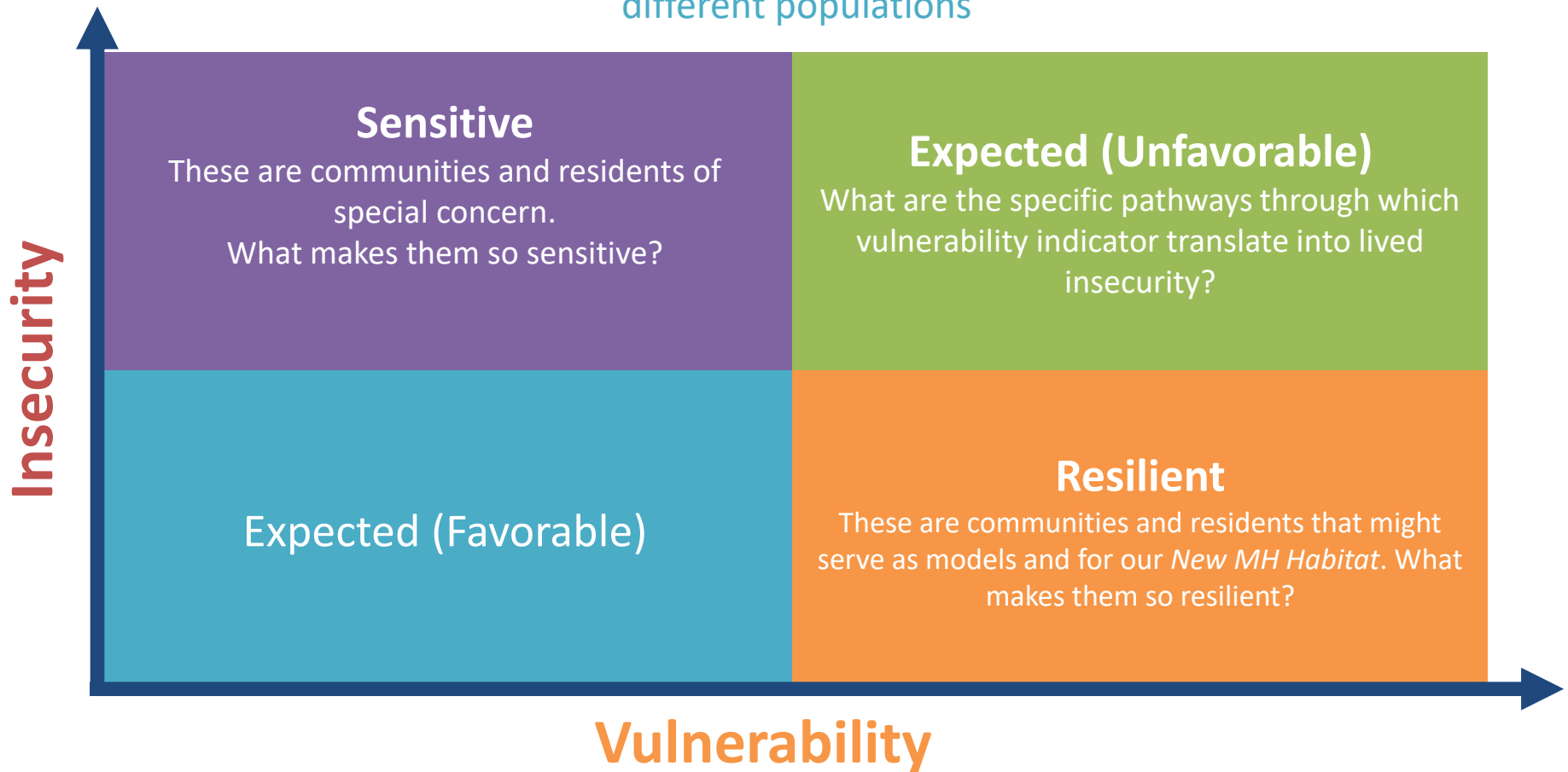
Housing Insecurity: a condition in which a household or family has a residence, but faces uncertainty about their ability to retain that residence.





Learning from different populations

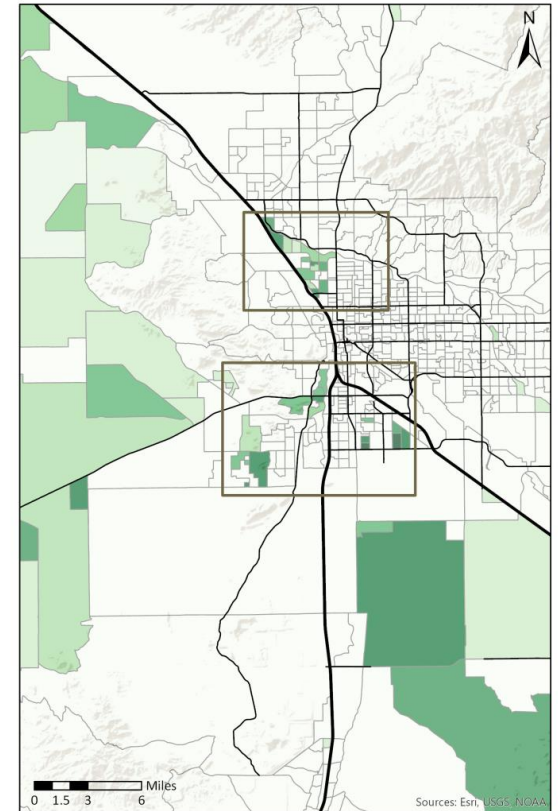
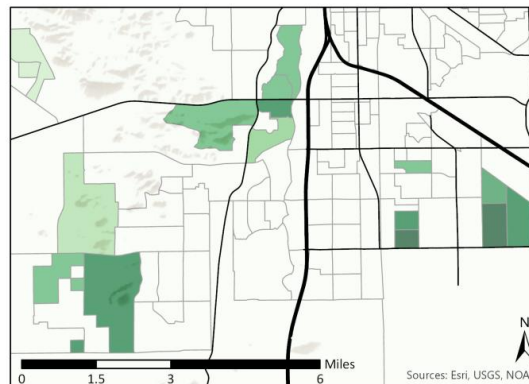
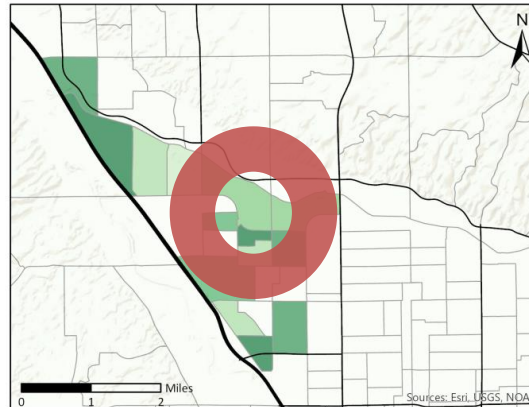
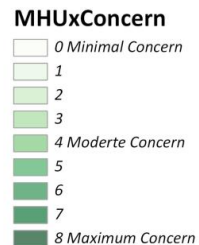
Interviews and surveys will help us to identify and learn from four different populations





Resilient Park: Sunbird Shores

- 55+ Park
 - Fixed incomes
 - Many health and mobility issues
- All Personal Property (“half-way home owners”)
- High-density park with 300 units
- Large percentage of units are pre HUD Code (pre-1976)
 - Heating and cool
 - Accessibility





Resilient Park: Sunbird Shores

- Long-term ownership
- “Affordable” lot rent (\$425, includes water)
- Modest rent increases
- Owners invested in solar panels
- 1/3rd of residents belong to state-wide MH advocacy organization
- Many clubs and social groups
- High collective amenity





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We can't learn any of this from traditional data sources.





Conclusions

- ▶ Need for qualitative research: from top-down to resident-up
- ▶ Pre-1976 MH: Energy poverty, substandard housing
- ▶ Overcoming stigma
- ▶ Rural vs Urban MH
- ▶ Financing MH
- ▶ Need to replace, preserve, and improve existing stock.



Manufactured Housing

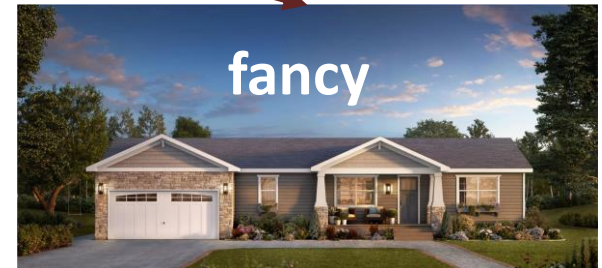
- MH is a regulatory category with murky borders in practice...



“Mobile” Homes
(Pre 1976)



Tiny Homes





Opportunity Zones and MH in Tucson

