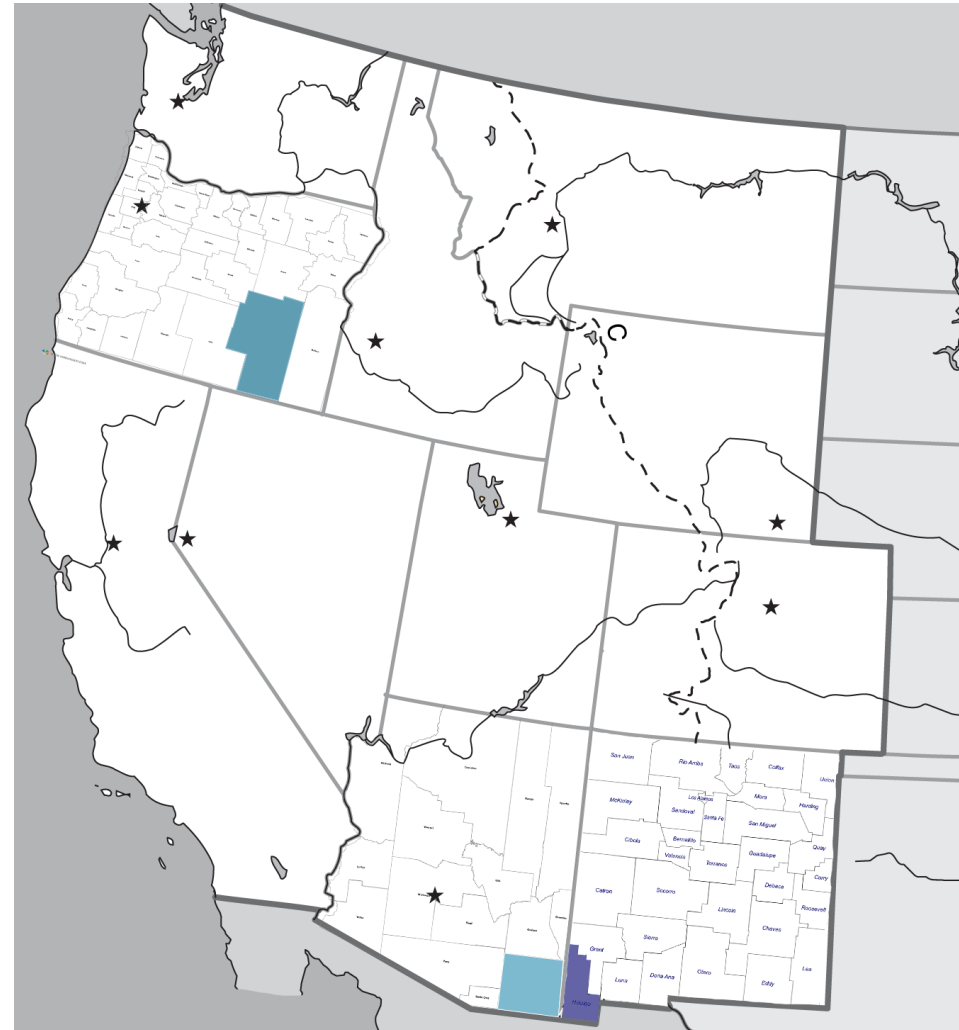




Land Use and Demographic Changes in the Malpai Borderlands Region Since 1990

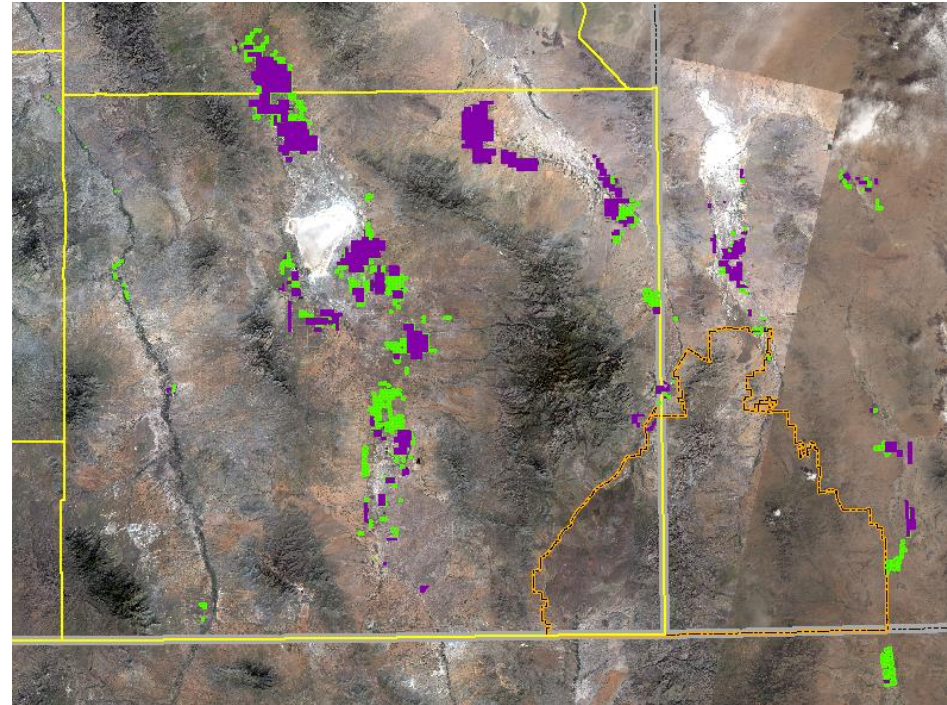
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- Present census changes (2000 and 2010) since 1990 for 11 western states: Arizona, New Mexico, Cochise and Hidalgo counties, and the Malpai Region (and Harney County, OR for a comparison)
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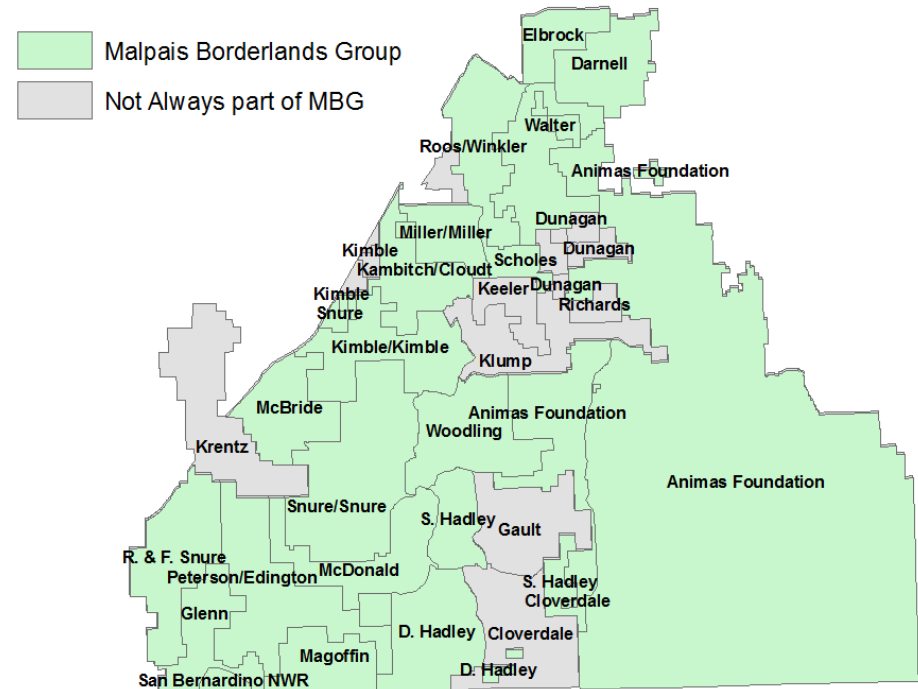
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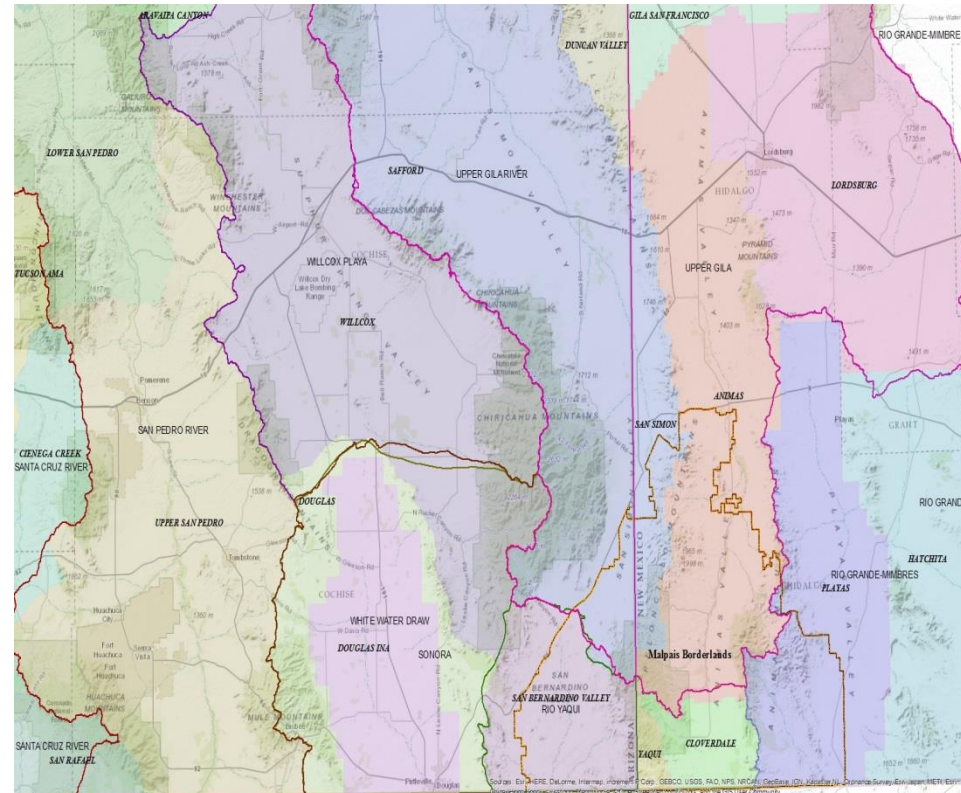
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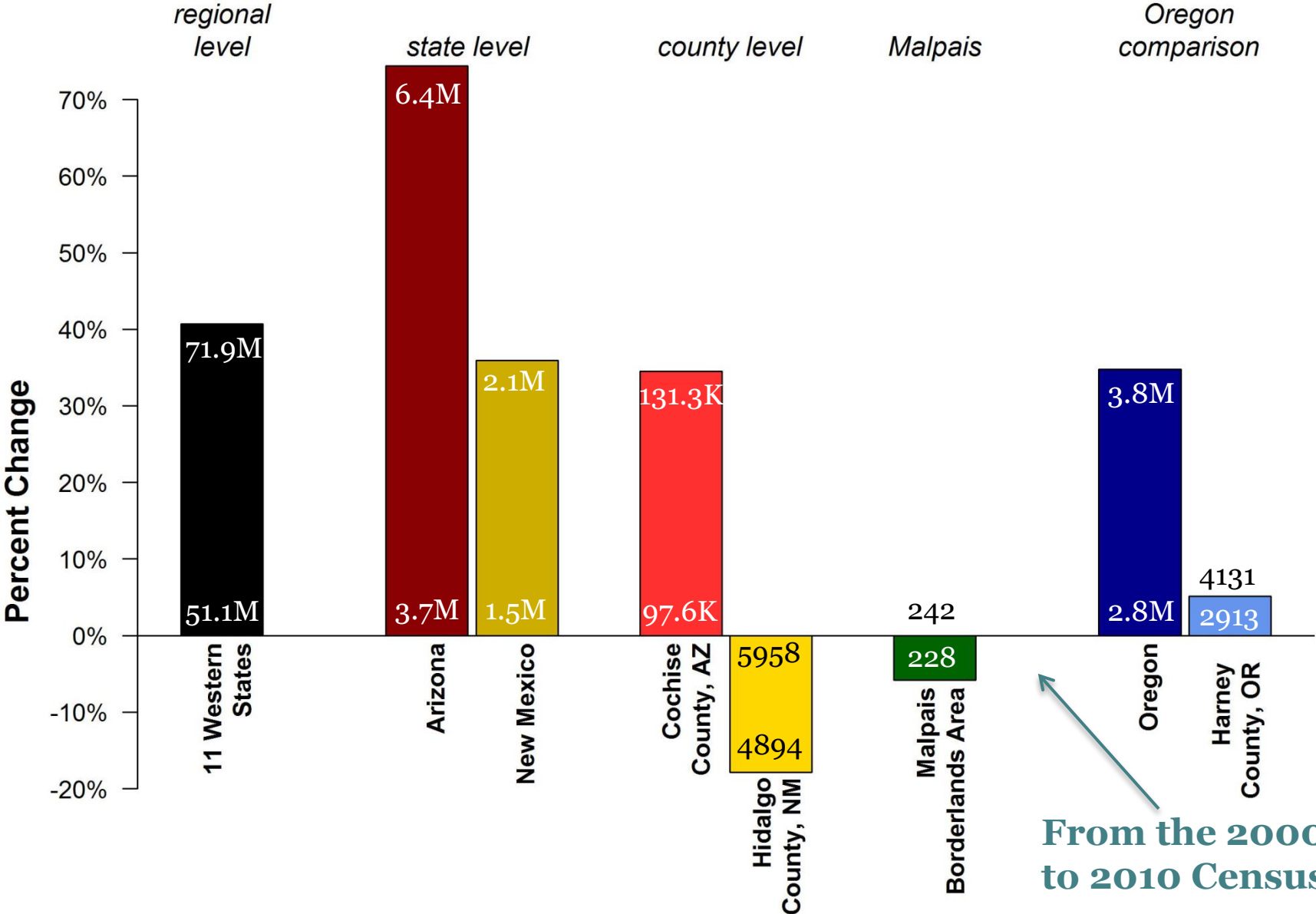


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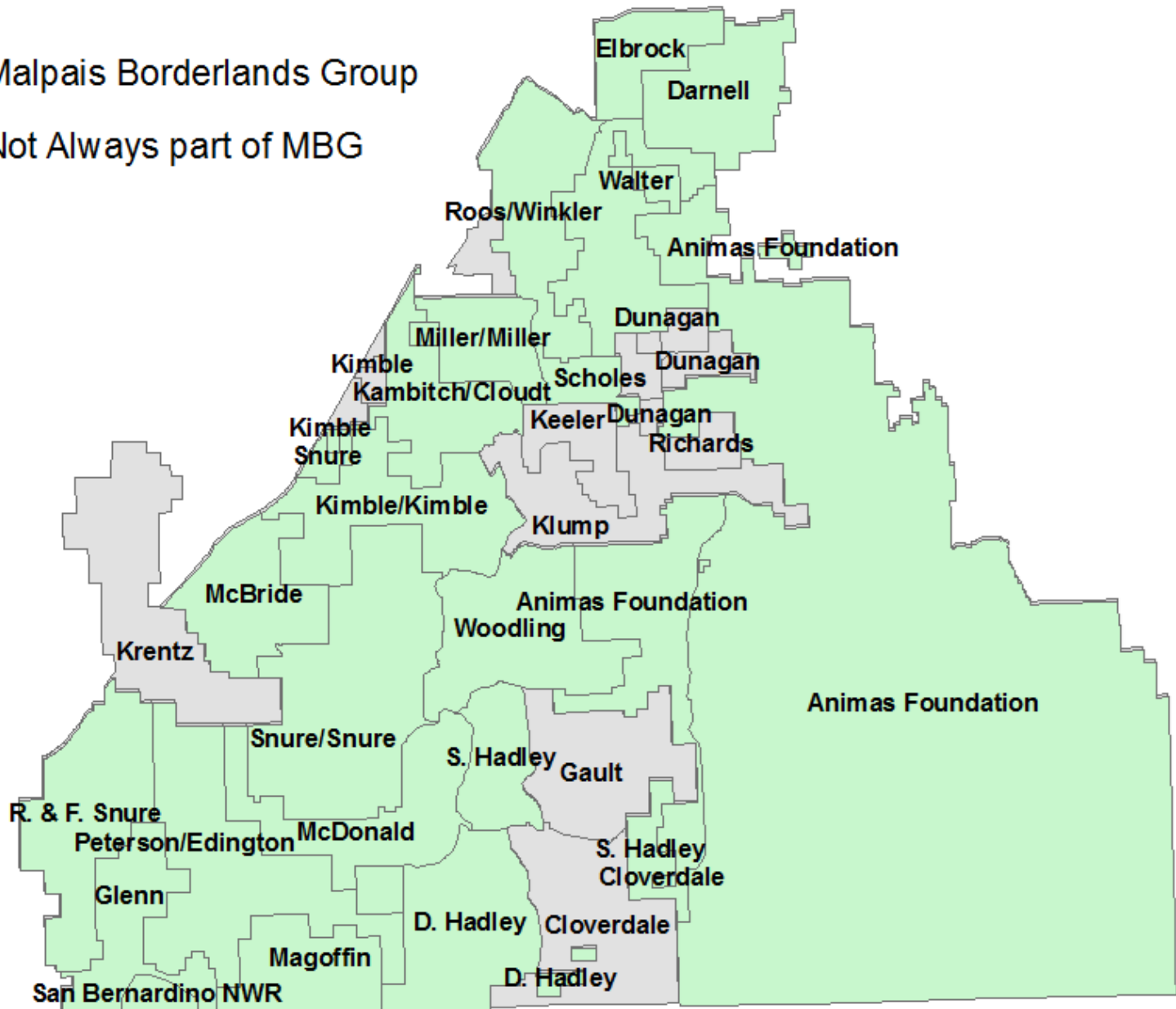
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Change in Total Population, 1990-2010

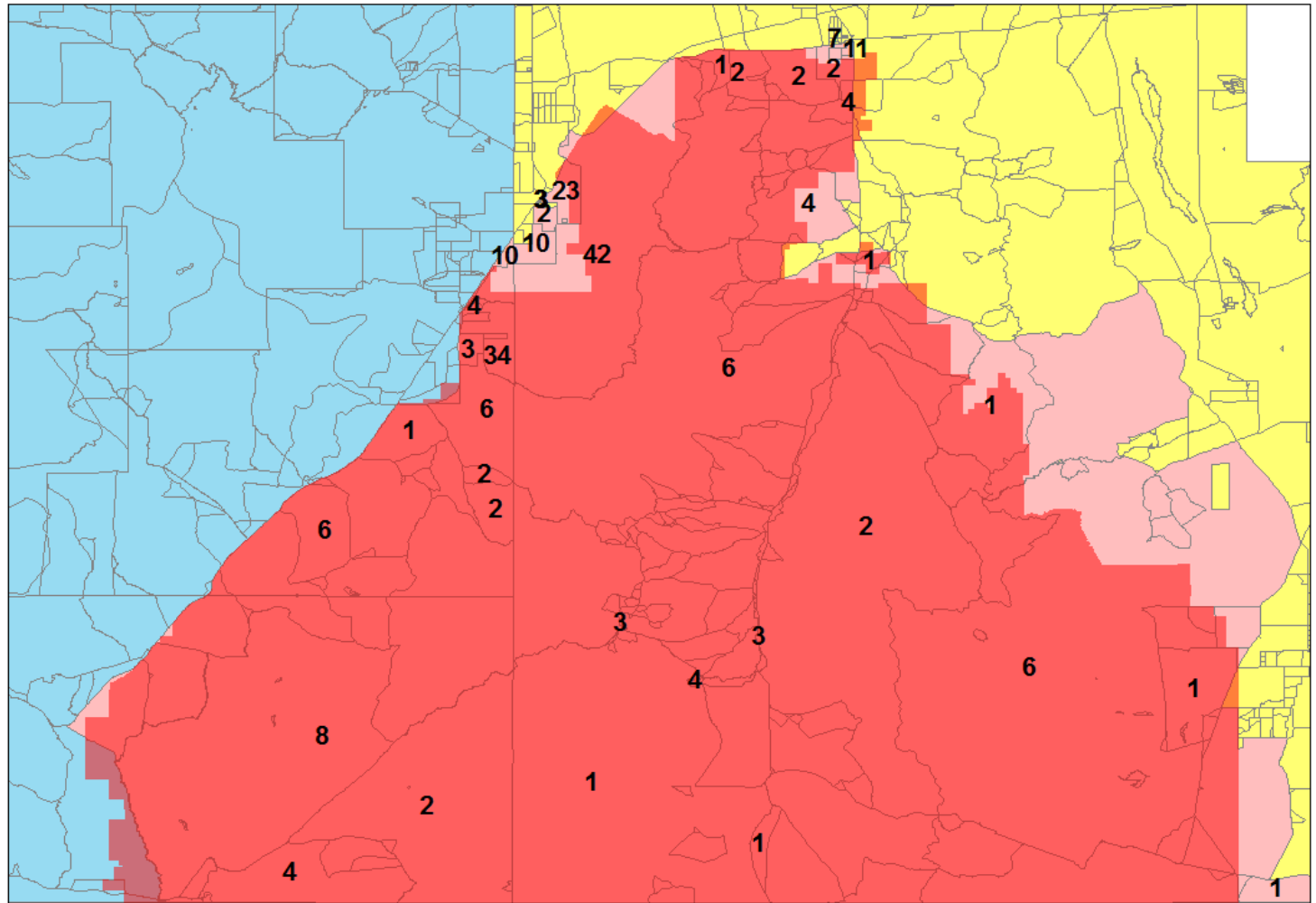


- Malpais Borderlands Group
- Not Always part of MBG

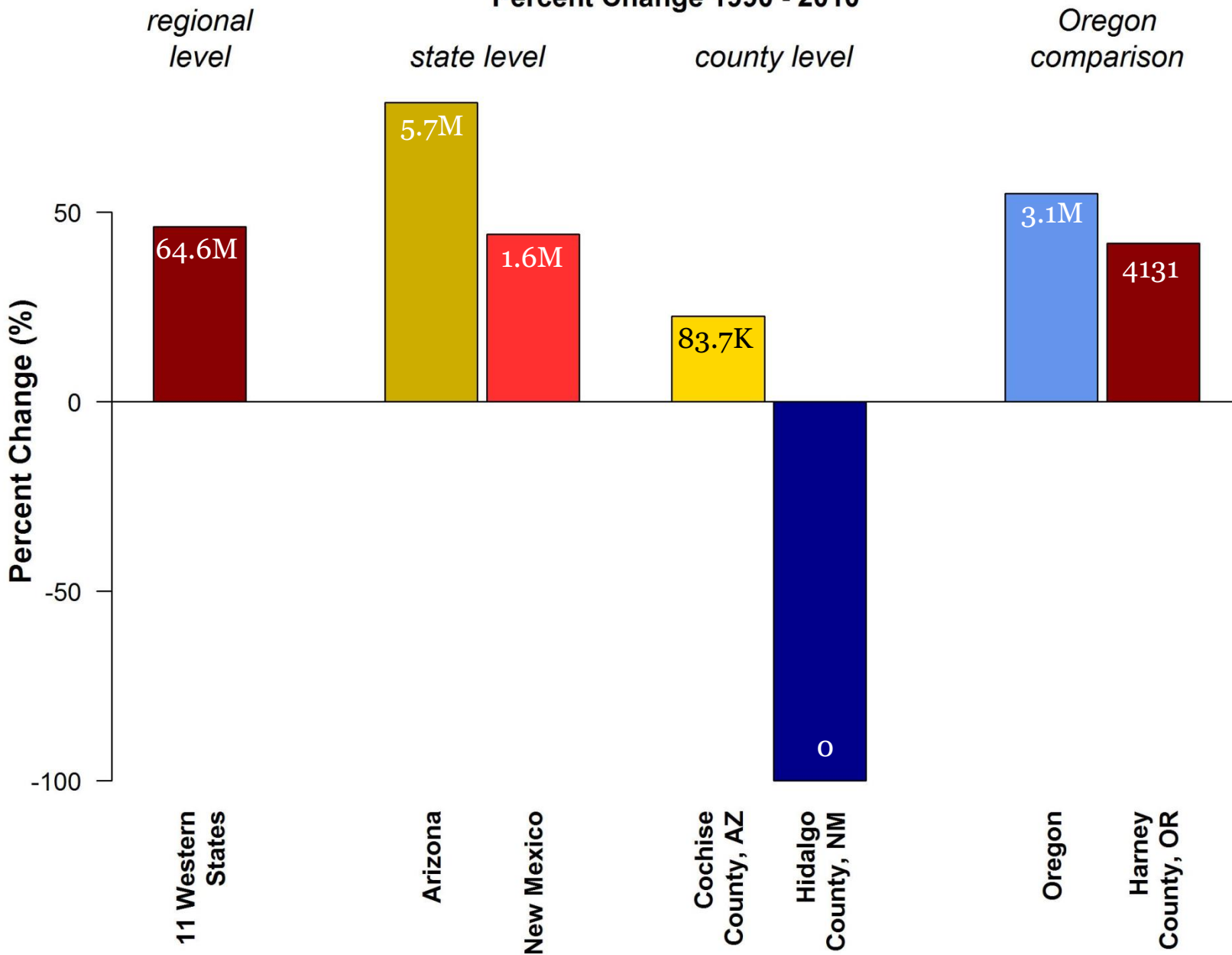


2010 U.S. Census: Population counts per block in MBG area

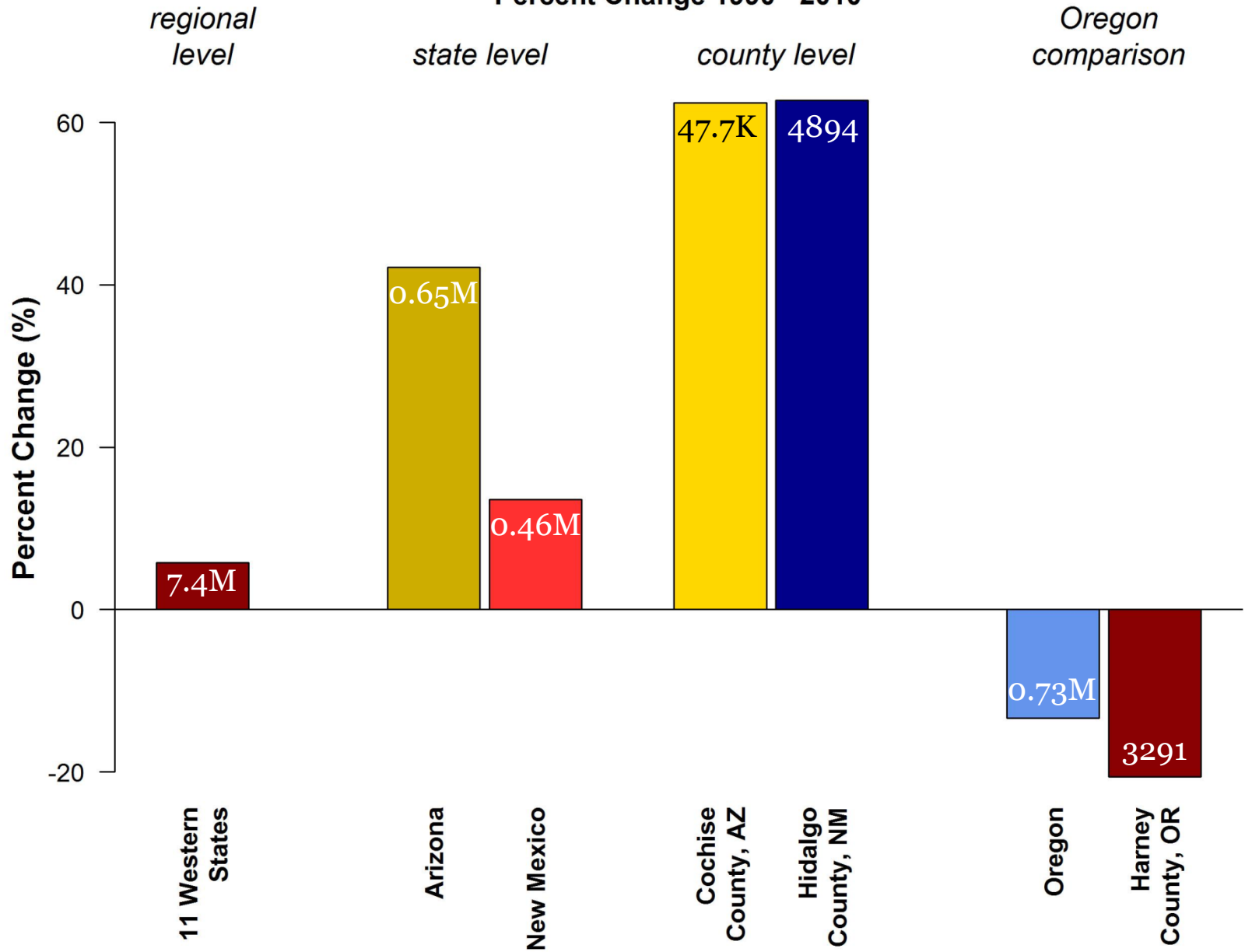
(only nonzero counts shown; some labels overlap)



Total Urban Population Percent Change 1990 - 2010



Total Rural Population Percent Change 1990 - 2010



Total Number of People Employed

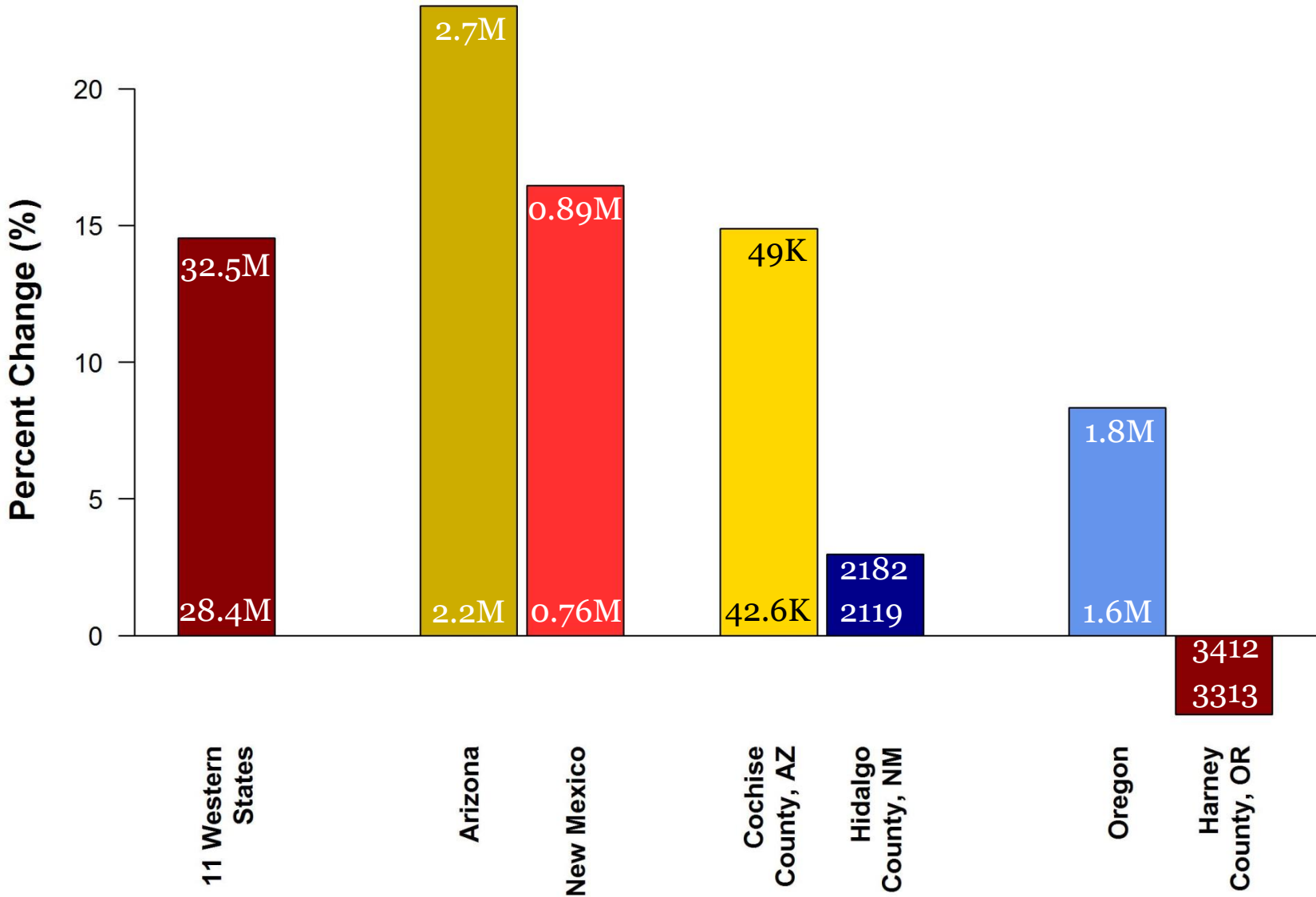
Percent Change 2000-2010

regional level

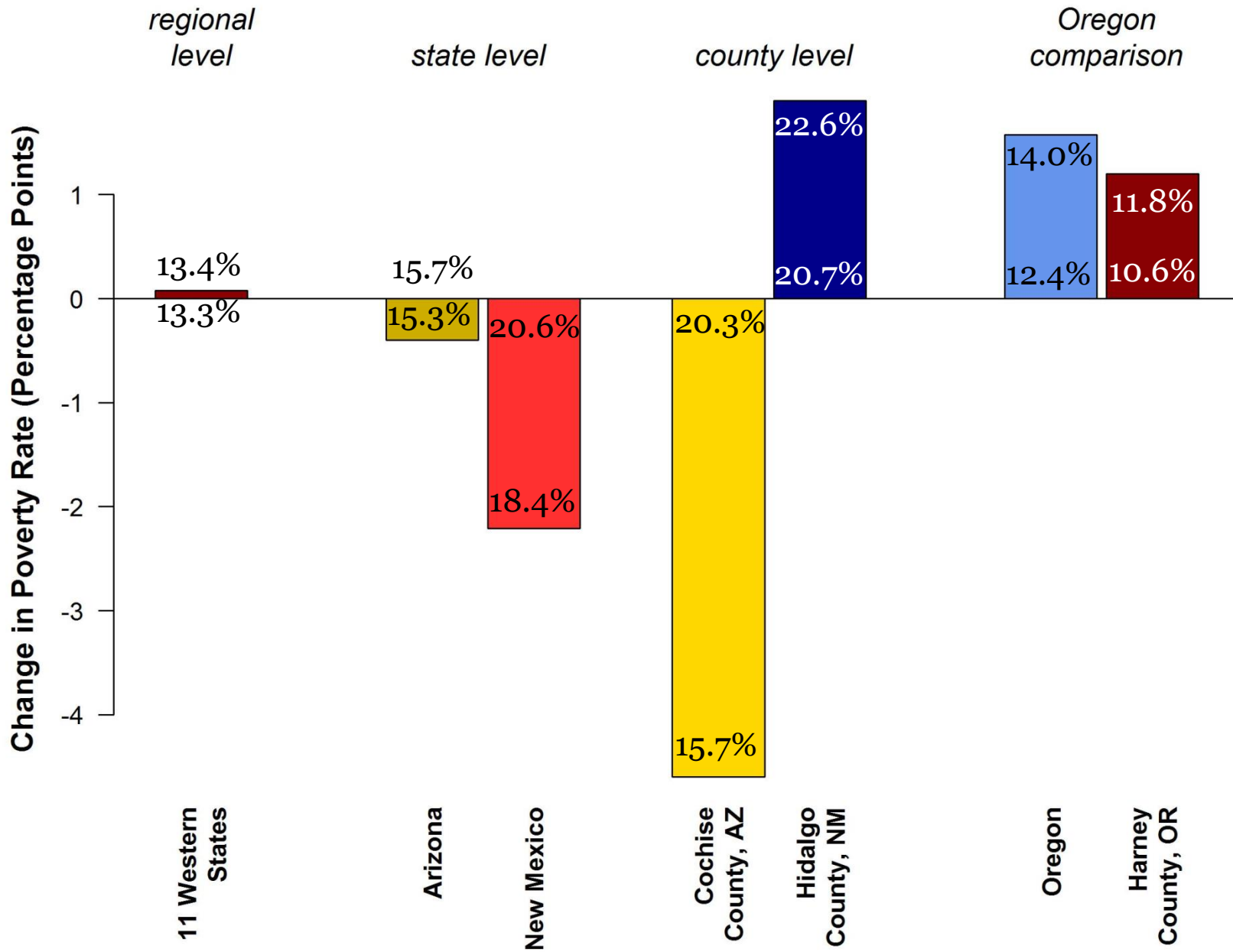
state level

county level

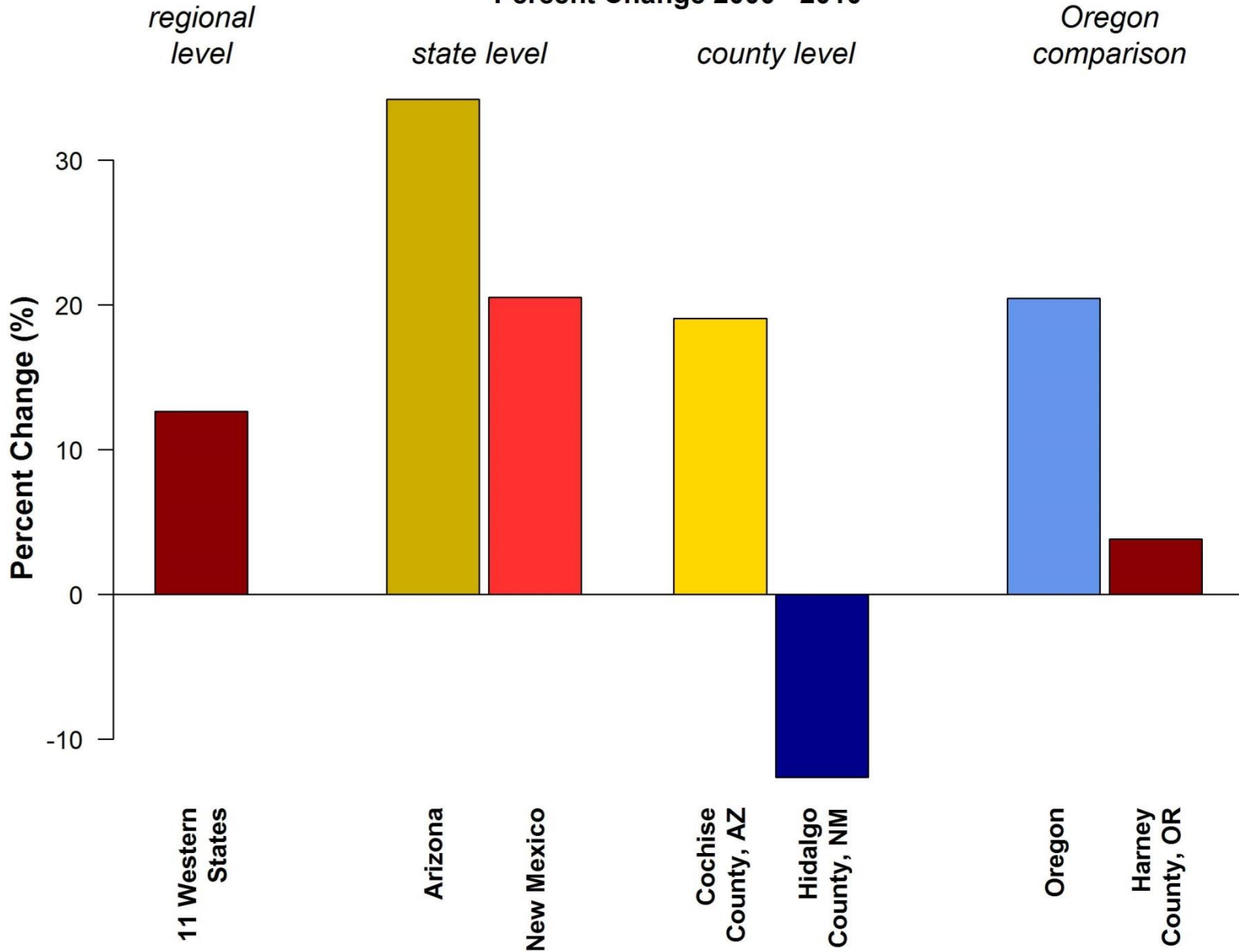
Oregon comparison



Poverty Rate, 1990 - 2010



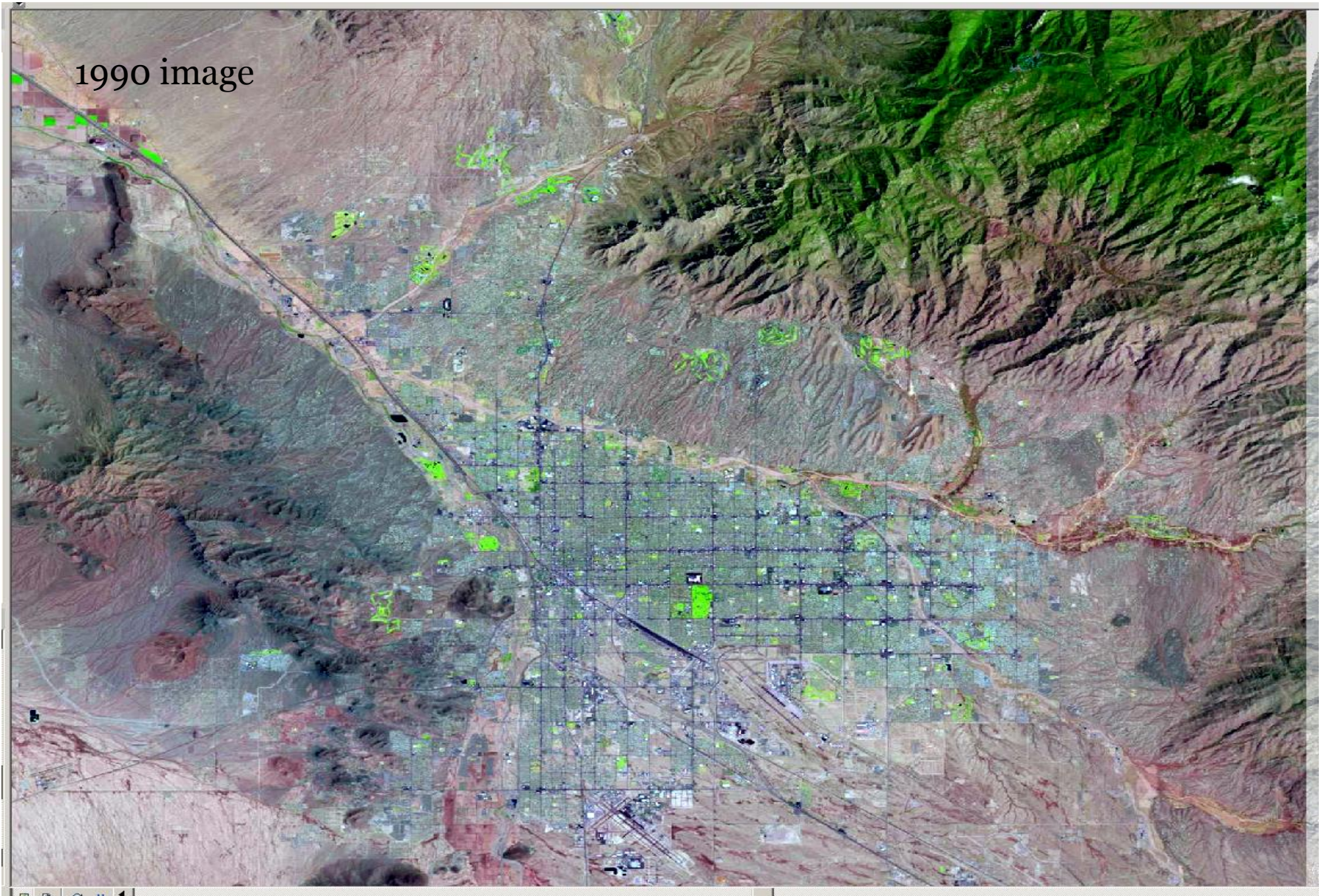
Total Population 64 and under Percent Change 2000 - 2010



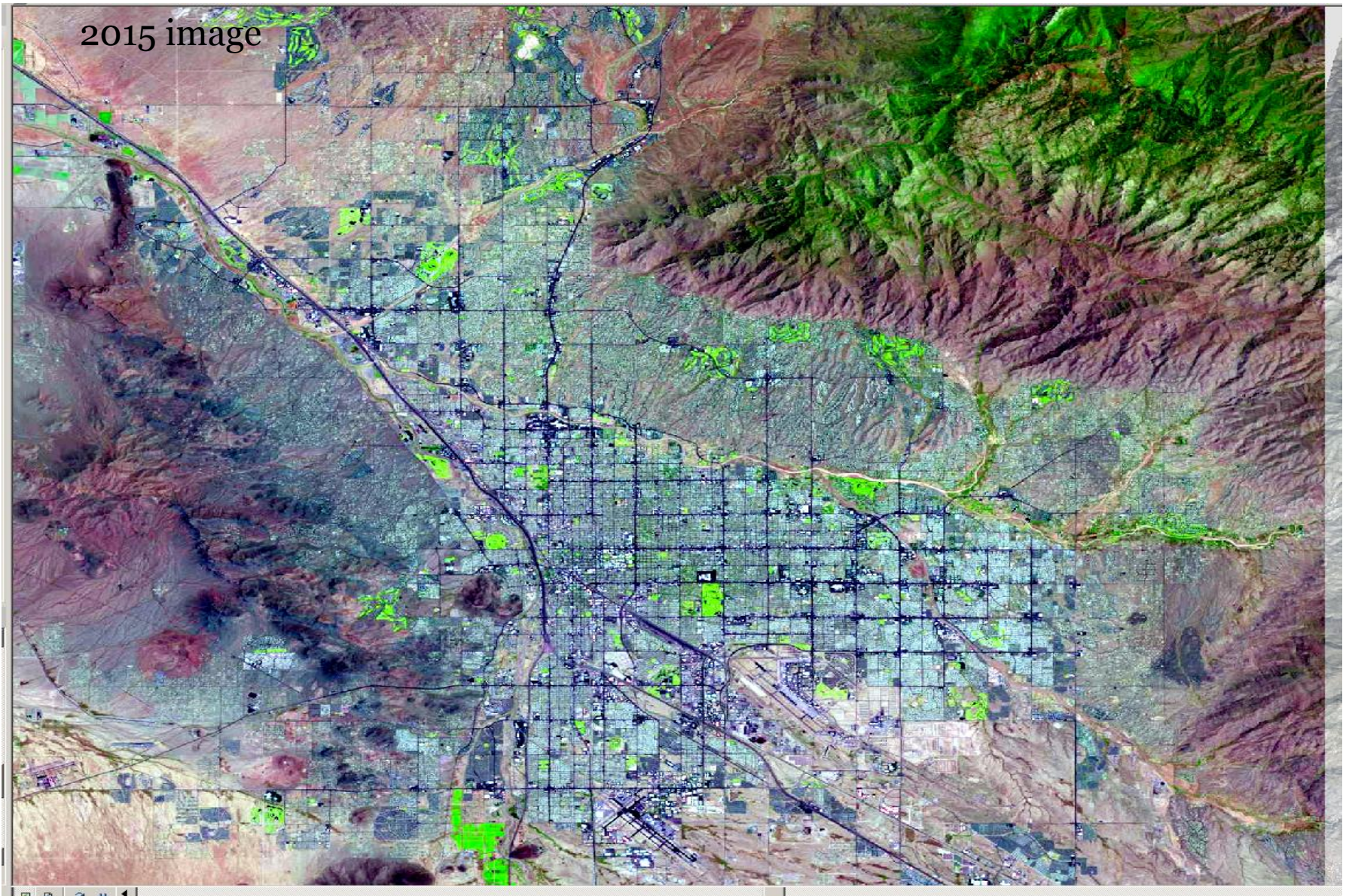
Census dynamics

- The Western US is the most urbanized area of the Country – 90% of the population lives in urban areas
- Poverty rates span from 10-22% of the population, irrespective of urban or rural
- Employment rates are increasing substantially, but mixed growth rates in rural areas
- Malpai region is a “tale of two counties”

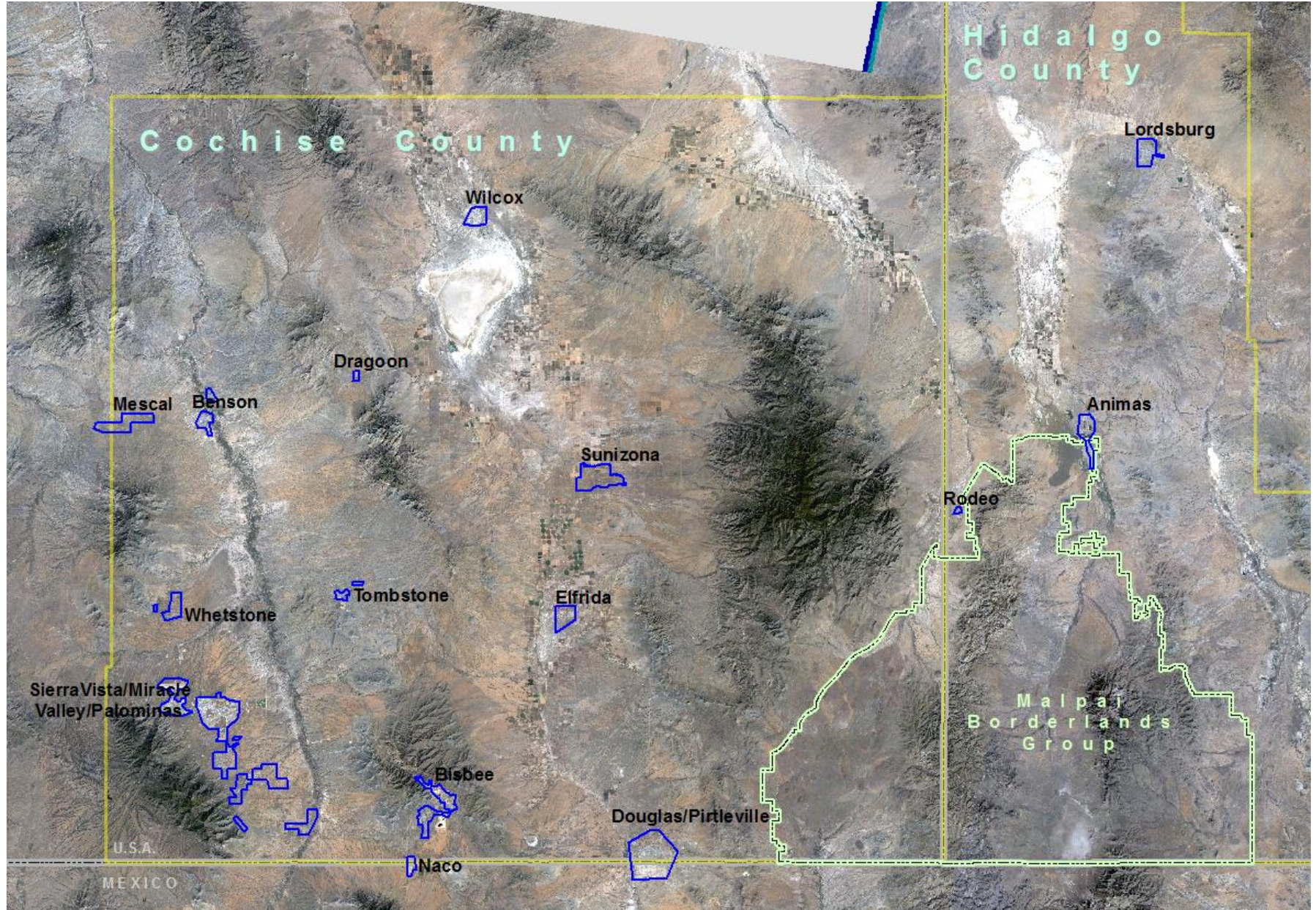
Land use - Tucson area example



Land use - Tucson area example



1990

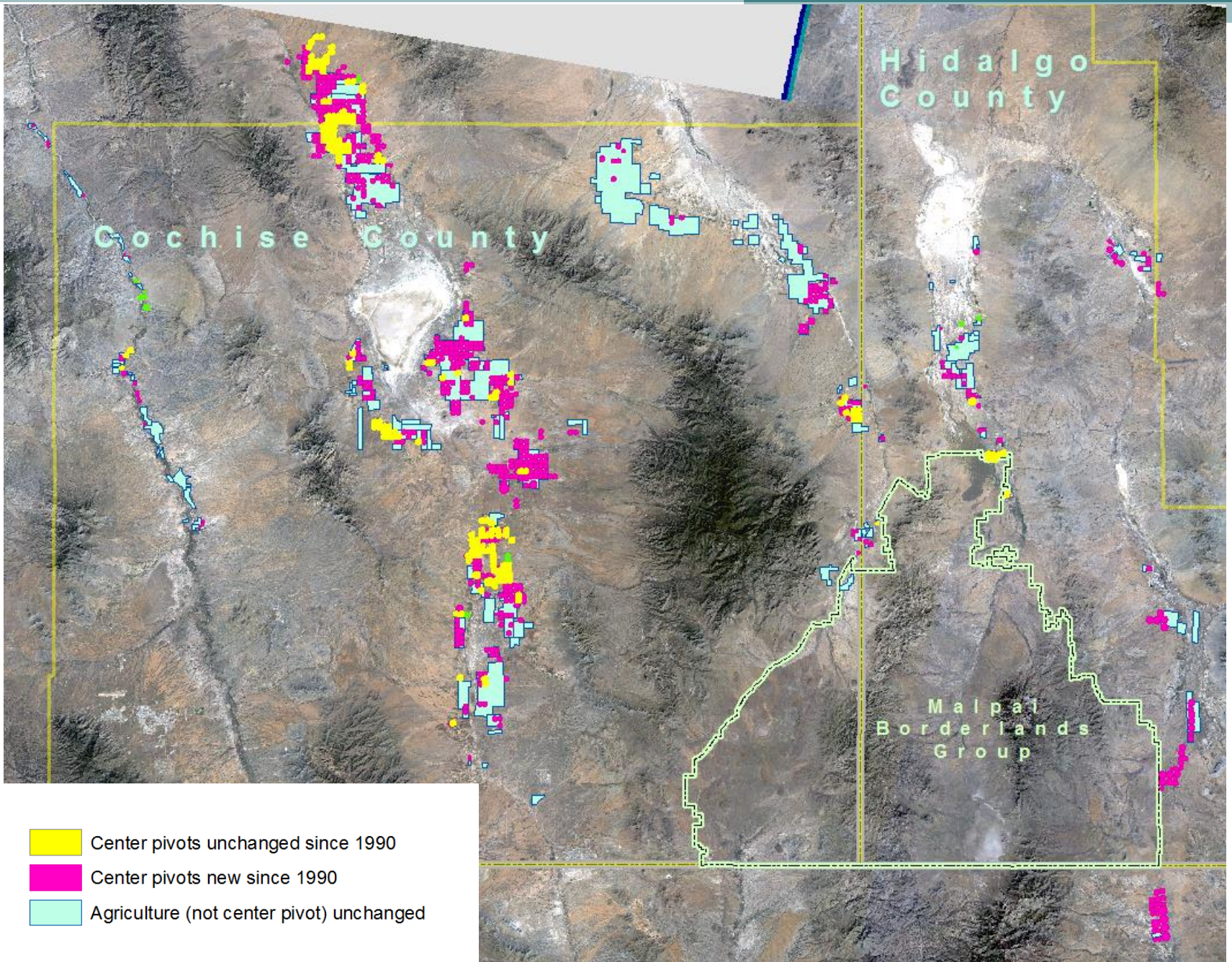


2007 Cochise County Land Use Survey Results

- 40% of respondents lived in county for 20 years or more; 48% were retired; 84% owned their home; 28% employed full time; 9% employed part-time; 5% unemployed
- 25% of respondents live here because of the climate; 12% because it put them closer to family; 10% because of small town atmosphere; 5% because of rural setting
- 80% rated quality of life as excellent or good
- 42% expect quality of life of remain to the same in near future; 35% thought it will improve; 17% expected a decline
- 50% of respondents thought the biggest challenge facing Cochise County was water availability; 30% thought managing new development; 27% thought attracting living wage employment; 22% thought maintaining rural character; 20% thought protecting the environment

Urban land dynamics

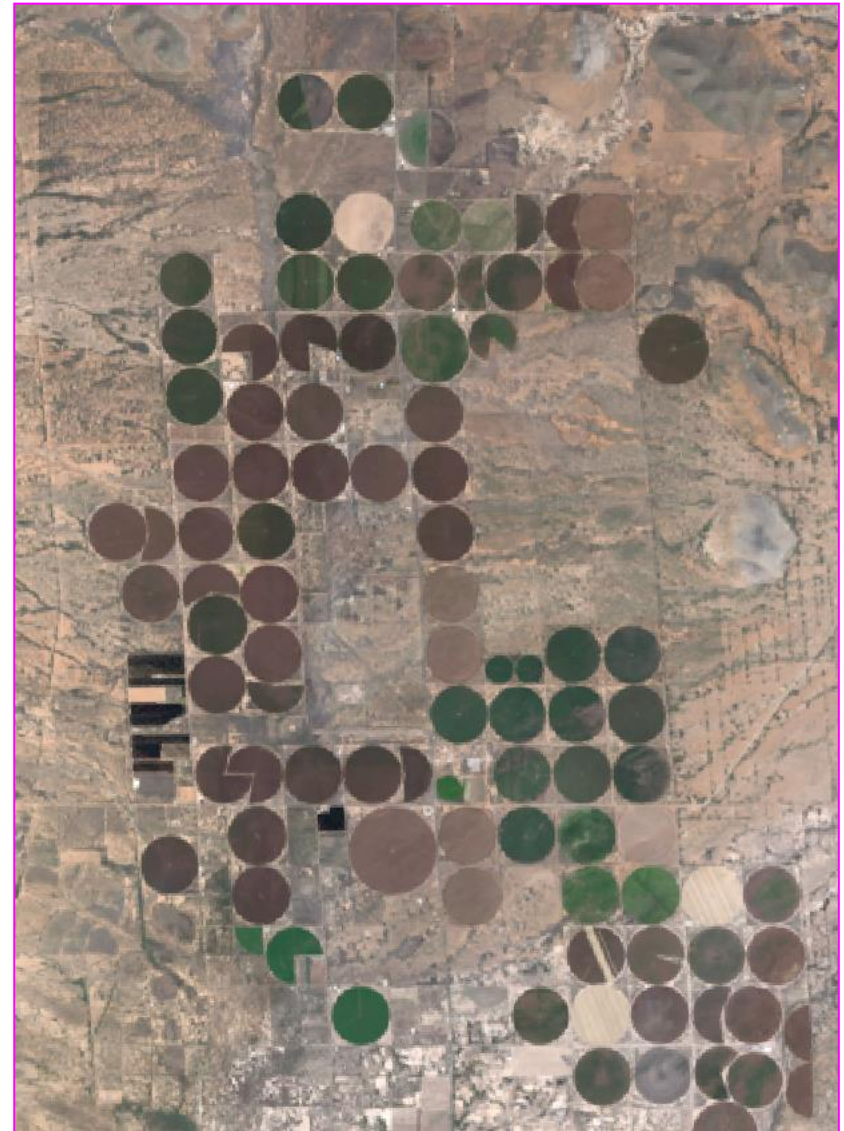
- In 1990, 59,111 ac in developed/urban areas; 40% in Sierra Vista/Miracle Valley; 19% in Douglas area
- In 2015, 109,544 ac in developed/urban areas; average of 2000+ ac/yr in expanded developments around existing urban areas
- 65% of increased urban/developed acres due to expansion of Sierra Vista/Miracle Valley area of the Upper San Pedro Basin



1990 image



2015 image



Crop agricultural land dynamics

- In 1990, 173 center pivots and 485 other agricultural fields not as center pivots; total of 658 agricultural fields or center pivots in both Cochise and Hidalgo counties [in 1992 NASS reported 114 farms in Cochise Co. with 10,257 ac irrigated (97.5% of farmed area)]
- In 2015, 758 center pivots, an increase of 565 new center pivots mostly in areas that had previously been ag fields; overall, an increase of 100 new areas in cropped agriculture under pivots [in 2012 NASS reported 102 farms in Cochise Co. with 20,401 ac irrigated (again, 97.5% of farm acreage; an increase of 99% in irrigated acres over 20 years)]
- Center pivots range from ~50 ac (5%) to 250 ac (5%) with 125 ac (90%) the most common size; this is ~96,650 potentially irrigated acres

Inferences

You've been successful: you've avoided substantial land use change within the Malpai region

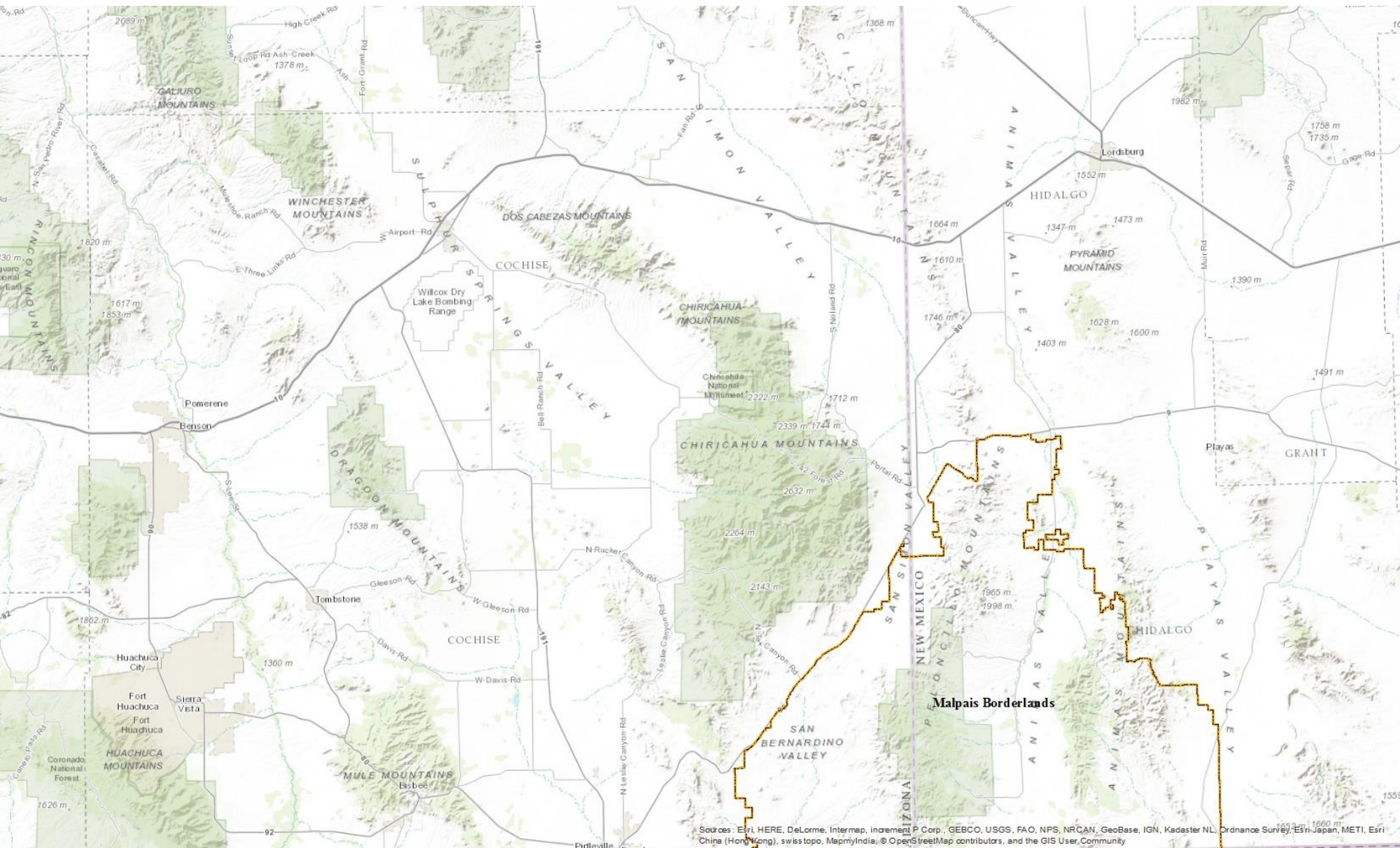
Many truly rural areas have also avoided urban/development land use change, but likely because they did not supply the infrastructure required to support those changes

As long as you do not develop associated infrastructures you will likely continue to avoid urbanized land use change; i.e., you will remain a sparsely populated, rural area

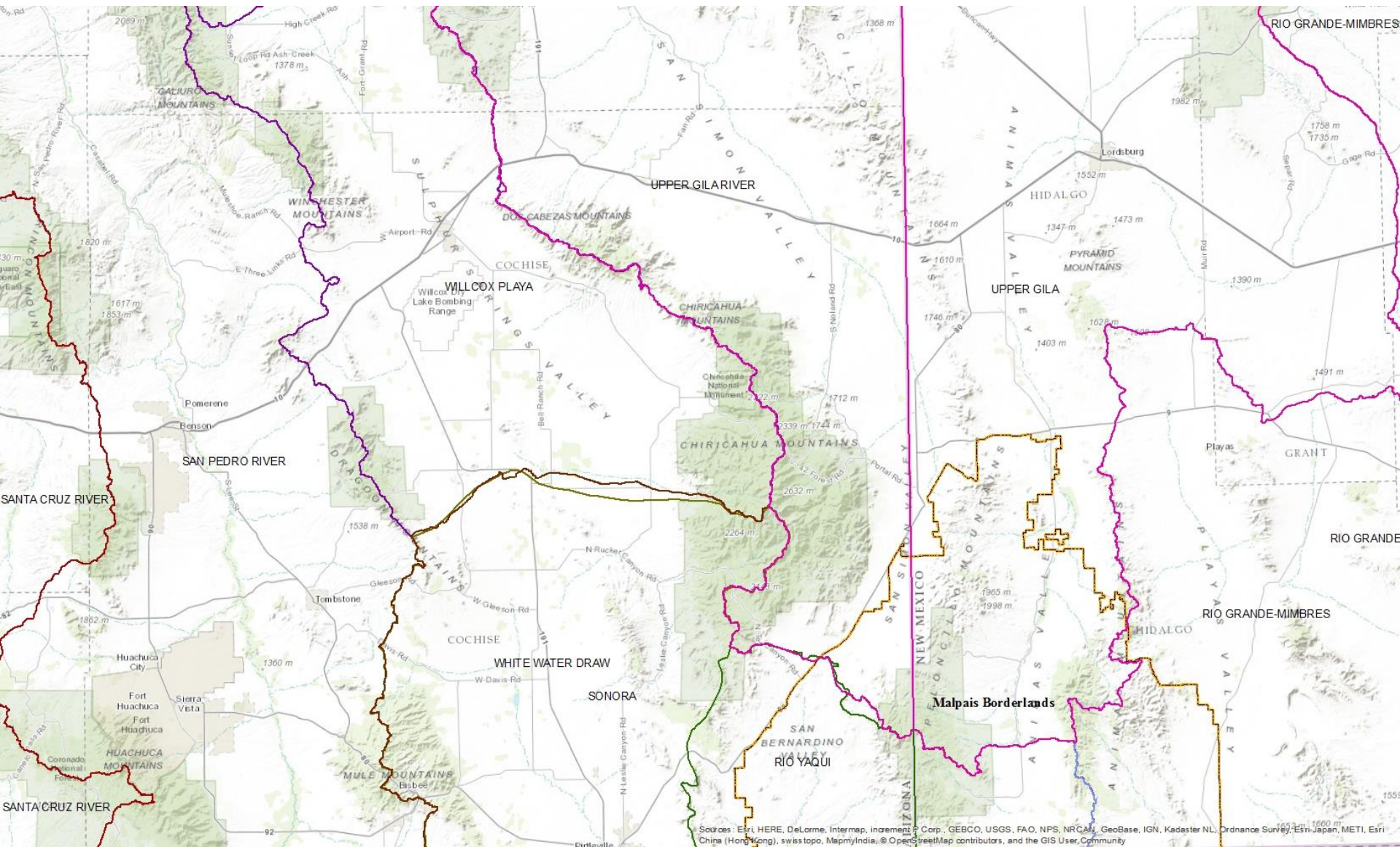
A greatly expanded irrigation infrastructure is increasing crop agriculture, especially in the Willcox, Douglas, Safford and Playas Basins

Because of these inferences:

You actually have a unique opportunity to look outward for support for a rural agricultural landscape rather than looking inward...a “working landscape” that benefits all of the SW (not just the Malpai region) by staying in private hands and managing resources that benefit a wider set of stakeholders: “management and conservation for sustainability of ranching and landscapes across the SW”



Sources: Esri, HERE, DeLorme, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, © OpenStreetMap contributors, and the GIS User Community



Basin	2006 Ground Water Demand Acre Feet/Year	2011 Estimated Natural Recharge Acre Feet/Year	2011 Adjusted Ground Water in storage Acre Feet
Douglas	53,500	15,500	16,640,000
Safford	84,900	105,000	21,600,000
San Bernardino Valley	19	9,000	1,280,000
Upper San Pedro	24,000	35,800	15,840,000
Willcox	175,700	15,000	33,600,000

Malpai Borderlands Group website (<http://www.malpaiborderlandsgroup.org>)

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Watershed Improvement Project

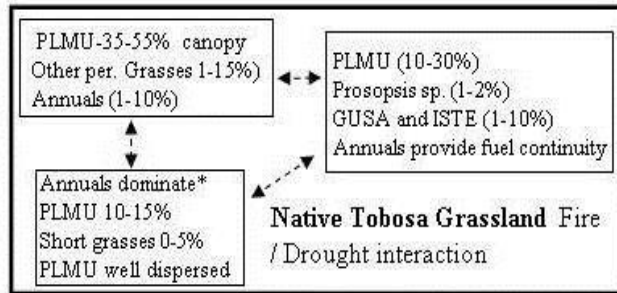
Through grant monies, the MBG has been able to install thousands of loose rock structures in order to redirect erosional processes and improve water infiltration. This work is still being carried out, primarily by the Douglas Wildland Fire Crew during the wildfire off season (winter). The material used is rock and brush trimmings on hand. The intended result is to slow the flow of water, capture eroded sediment and ultimately grow more grass. Many of the runoff problems in the Malpai area were initially started by old roads and trails. Most of this work has been carried out in the San Bernardino watershed with the intent to improve the associated riparian areas and artesian stream flows found near and within the US Fish and Wildlife Service San Bernardino Refuge.



These photos show some typical structures.

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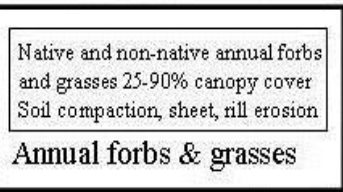
MLRA 41-3 (12-16"), Clayey Upland



1a ↓ ↑ 1b

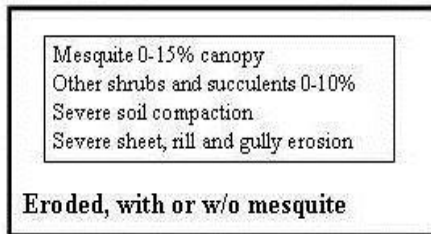
2a ↓ ↑ 2b

1a



3a ↓ ↑ 3b

4a ↓ ↑ 4b



- 1a. Proximity to seed source, introduction of seeds, lack of fire for long periods of time.
- 1b. Herbicide or mechanical means to remove mesquite. PG/NG
- 2a. CHG (managing for annuals), persistent low per. grass cover, 1. Reduction of A horizon OM and litter, compaction, persistent reduced infiltration or 2. Cultivation and abandonment
- 2b. PG/NG, seeding or planting of tobosa and vine mesquite. Soil ripping, contouring and / or mulching
- 3a. CHG coupled with drought (or fire), low grass cover. Reduction of A horizon OM and litter, compaction, sheet, rill and gully erosion. Persistent reduced infiltration and very limited recruitment of grass.
- 3b. Mechanical/herbicide treatment of shrubs, PG/NG, seeding planting of native grasses, maintenance treatments for shrubs, rill and gully erosion control
- 4a. CHG, interruption of overland flow, diversion of runoff, Severe soil compaction from traffic (livestock or equipment)
- 4b. Mechanical control of rills and gullies. PG/NG



From the Malpai Borderlands Group website:

Our goal is to restore and maintain the natural processes that create and protect a ***healthy, unfragmented landscape to support a diverse, flourishing community of human, plant and animal life in our borderlands region.***

Together, we will accomplish this by working to encourage profitable ranching and other traditional livelihoods, which will ***sustain the open space nature of our land for generations to come.***

MALPAI BORDERLANDS GROUP

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And water...

