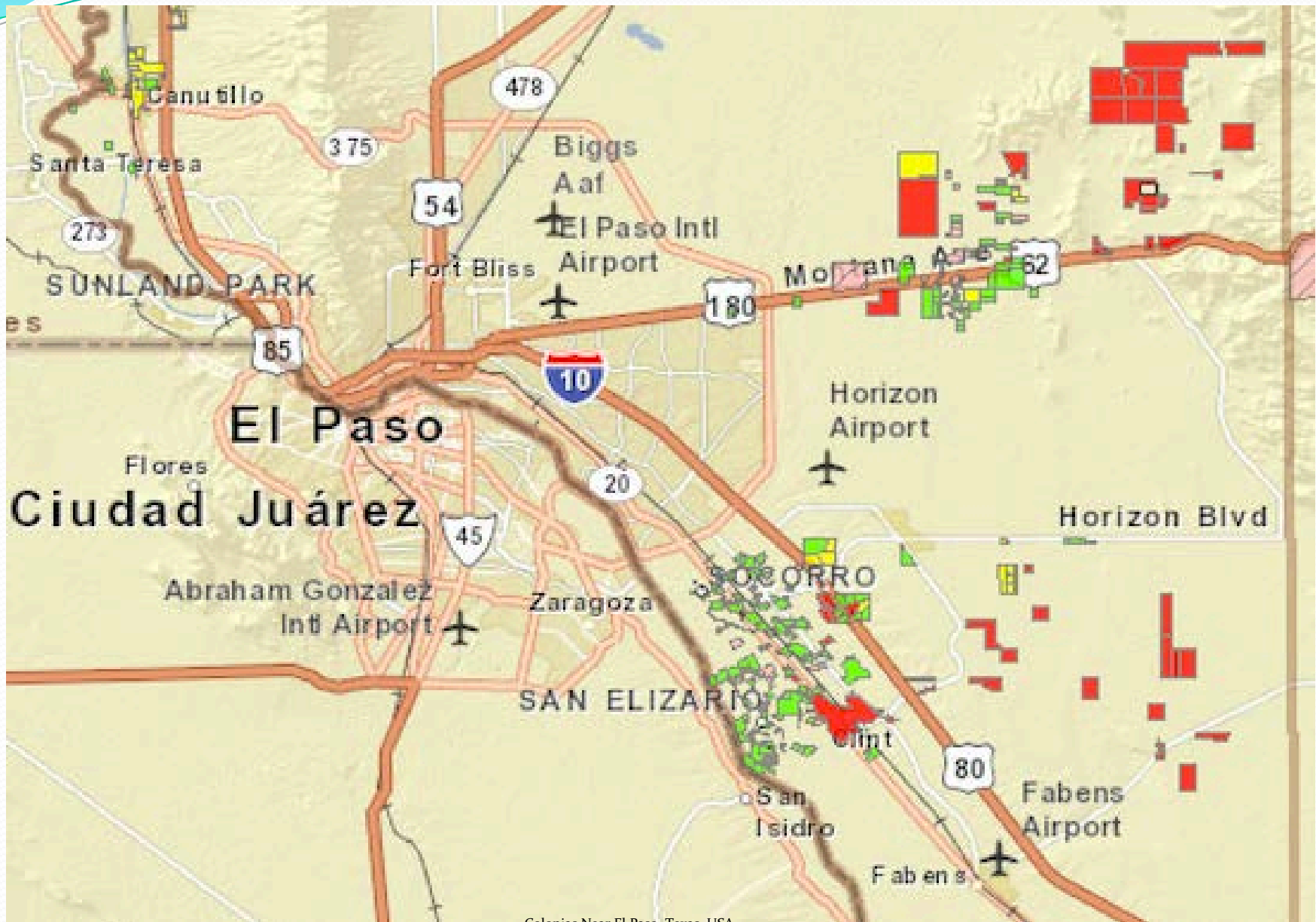


# “Photovoice Project: Climate Change effects on future water supply and Colonias without water”

University of Texas at El Paso

By Rebeka Isaac



Colonias Near El Paso, Texas, USA  
via Attorney General of Texas [Interactive Map of Colonia Communities](#)



# What is Photovoice?

- “Photovoice is a participatory health promotion strategy in which people use cameras to document their health and work realities. As participants engage in a group process of critical reflection, they may advocate for change in their communities by using the power of their images and stories to communicate with policy makers.”

# Methods

- Photovoice education for participants
- Four subjects used
- Cellphone Camera Provided for capturing pictures
- Interview after the photovoice completion

# Subject 1



# Subject 2



# Subject 3

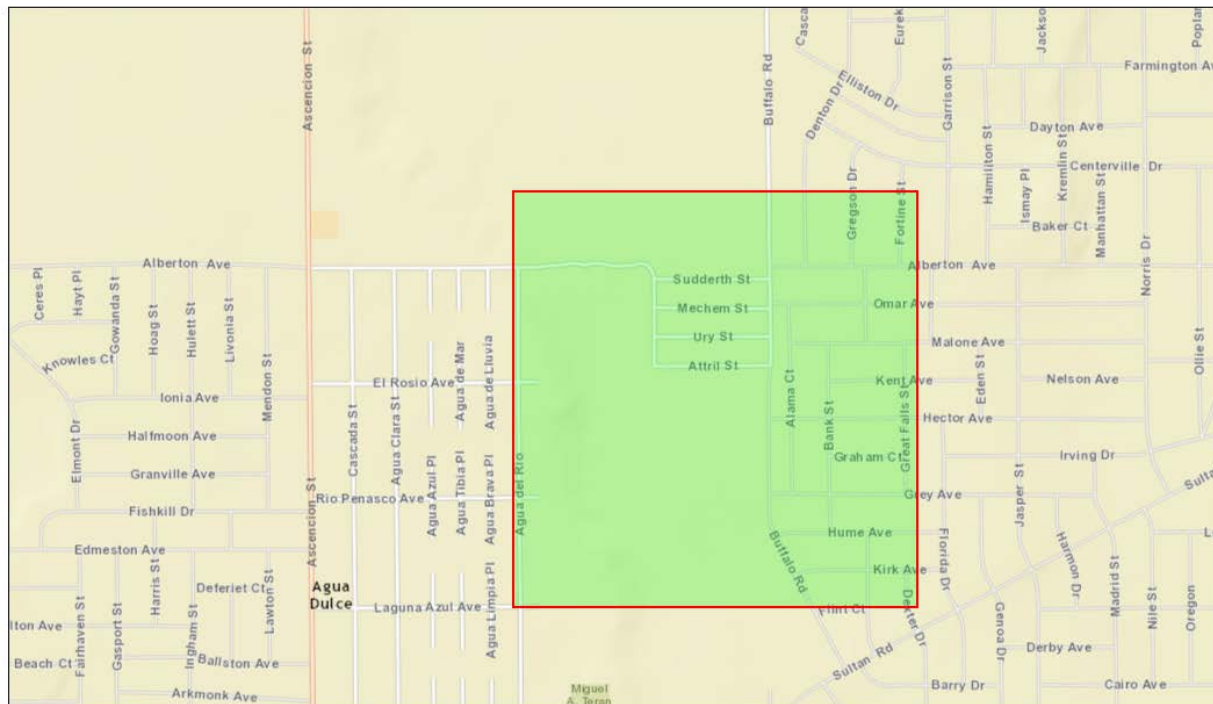


# Subject 4




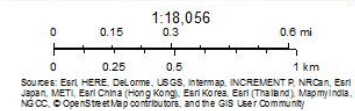


# EJ Screen



March 1, 2017

 Digitized Polygon



# EJ Screen Results

The User Specified Area, TEXAS, EPA Region 6								
Category	Selected Variables	Value	State	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
EJ Index	EJ Index for NATA Air Toxics Cancer Risk			91		93		96
EJ Index	EJ Index for NATA Respiratory Hazard Index			78		83		86
EJ Index	EJ Index for Lead Paint Indicator			82		84		84
EJ Index	EJ Index for Water Discharger Proximity			76		81		90
Environmental	NATA Air Toxics Cancer Risk (risk per MM)	36	41	20	42	<50th	40	<50th
Environmental	NATA Respiratory Hazard Index	0.83	1.8	7	1.8	<50th	1.8	<50th
Environmental	Lead Paint Indicator (% pre-1960s housing)	0.07	0.16	54	0.18	47	0.3	30
Environmental	Water Discharger Proximity (count/km)	0.12	0.48	37	0.41	37	0.31	37
Demographic	Demographic Index	90%	47%	97	45%	98	36%	99
Demographic	Minority Population	98%	56%	94	50%	95	37%	96
Demographic	Low Income Population	82%	39%	96	39%	96	35%	97
Demographic	Linguistically Isolated Population	20%	8%	85	6%	90	5%	92
Demographic	Population with Less Than High School Education	48%	18%	92	17%	94	14%	97
Demographic	Population under Age 5	10%	7%	74	7%	77	6%	83
Demographic	Population over Age 64	5%	11%	20	12%	16	14%	10

# Discussion and Evaluation

- Concerns of Colonia Residents Presented
- City efforts towards Colonia populations
- Interview with Physics department at the University of Texas at El Paso

# Water in El Paso



Picture from: <https://www.slideshare.net/KeithRakes/el-paso-water-presentation>

- Treaty of 1944
- Four Water Sources
- Water Allocation

# Climate Change and Water Shortages

- Causes
- Drought
- Lack of aquifer replenishment
- Conservation efforts
- Groundwater dependency and depletion
- Projected Water Rates

# Short-term Solutions in Colonias

- Install Water Filters in houses that qualify
- Monitor the water quality of the Colonias
- Introduce water lines and other city services into the Colonias

# Long-Term in the Region

- Increase public education
- Renegotiate water treaties
- Promote Water Conservation efforts
- Continue Aquifer storage and recovery as a method to replenish water
- Implement water recycling in the city

# Bibliography

- Anderson, J. (2003). The environmental benefits of water recycling and reuse. *Water Science and Technology: Water Supply*, 3(4), 1-10.
- Bath, C. R., Tanski, J. M., & Villarreal, R. E. (1994). The politics of water allocation in El Paso County colonias. *Journal of Borderlands Studies*, 9(1), 15-38.
- Chávez, O. E. (2000). Mining of internationally shared aquifers: the El Paso-Juarez case. *Nat. Resources J.*, 40, 237.
- Earl, R. A., & Czerniak, R. J. (1996). Sunbelt water war: the El Paso-New Mexico water conflict. *The Social Science Journal*, 33(4), 359-379.
- Groschen, G. E. (1994). *Simulation of ground-water flow and the movement of saline water in the Hueco Bolson aquifer, El Paso, Texas, and adjacent areas* (No. 92-171). US Geological Survey.
- Knowles, D. B., & Kennedy, R. A. (1958). *Ground-water resources of the Hueco Bolson, northeast of El Paso, Texas* (No. 1426). US Government Printing Office.
- Meyer, W. R. (1976). *Digital model for simulated effects of ground-water pumping in the Hueco bolson, El Paso area, Texas, New Mexico, and Mexico* (No. 75-58). US Geological Survey.
- Mier, N., Ory, M. G., Zhan, D., Conkling, M., Sharkey, J. R., & Burdine, J. N. (2008). Health-related quality of life among Mexican Americans living in colonias at the Texas-Mexico border. *Social Science & Medicine*, 66(8), 1760-1771.
- Rios-Arana, J. V., Walsh, E. J., & Gardea-Torresdey, J. L. (2004). Assessment of arsenic and heavy metal concentrations in water and sediments of the Rio Grande at El Paso-Juarez metroplex region. *Environment International*, 29(7), 957-971.
- Sandoval-Solis, S., McKinney, D. C., & Loucks, D. P. (2010). Sustainability index for water resources planning and management. *Journal of Water Resources Planning and Management*, 137(5), 381-390.
- Sayre, Albert Nelson, and Penn Poore Livingston. *Ground-water resources of the El Paso area, Texas*. No. 919. US Government Printing Office, 1945.
- Wang, C., & Burris, M. A. (1997). Photovoice: Concept, methodology, and use for participatory needs assessment. *Health education & behavior*, 24(3), 369-387.
- Wang, C. C., Yi, W. K., Tao, Z. W., & Carovano, K. (1998). Photovoice as a participatory health promotion strategy. *Health promotion international*, 13(1), 75-86.
- Wang, C. C., Morrel-Samuels, S., Hutchison, P. M., Bell, L., & Pestronk, R. M. (2004). Flint photovoice: Community building among youths, adults, and policymakers. *American journal of public health*, 94(6), 911-913.
- Wang, C. C., & Redwood-Jones, Y. A. (2001). Photovoice ethics: Perspectives from Flint photovoice. *Health Education & Behavior*, 28(5), 560-572.
- Ward, F. A., & Pulido-Velazquez, M. (2008). Water conservation in irrigation can increase water use. *Proceedings of the National Academy of Sciences*, 105(47), 18215-18220.
- Ward, F. A., & Pulido-Velázquez, M. (2008). Efficiency, equity, and sustainability in a water quantity-quality optimization model in the Rio Grande basin. *Ecological Economics*, 66(1), 23-37.
- Sheng, Z. (2005). An aquifer storage and recovery system with reclaimed wastewater to preserve native groundwater resources in El Paso, Texas. *Journal of Environmental Management*, 75(4), 367-377.