Geographies of Poverty: Improving the reliability and usability of spatial displays of small area data from the American Community Survey

Presented by: Ben Horwitz

May 30, 2014

THE DATA CENTER

Independent Analysis for Informed Decisions in Southeast Louisiana

We already display the margin of error in our neighborhood profiles.

Central City Statistical Area, Neighborhood Statistical Area Data Profile

	Central City			Orleans Parish			United States		
Population in poverty	2000	<u>2006-2010</u>	MOE*	2000	2006-2010	MOE*	2000	<u>2006-2010</u>	MOE*
People living in poverty	49.8%	37.9%	+/- 7%	27.9%	24.4%	+/- 1%	12.4%	13 .8 %	+/- 0.1%
People living at or above poverty	50.2%	62.1%	+/- 6%	72.1%	75.6%	+/- 1%	87.6%	86.2%	+/- 0.1%

Source Citation: GNOCDC analysis of data from U.S. Census 2000 Summary File 3 (SF3) and 2006-2010 American Community Survey

Test Statistical Significance

1. Enter the percents (%) or dollar amounts (\$) that you want to compare and the margin of error (MOE) for each.

Important: Only include numbers. Include a zero before the decimal point for numbers less than one. Do not include a comma, or \$, % or +/-.

Percents (%) or dollar amounts (\$):

Margins of error (MOEs):

2. Click here to calculate

3. Is the difference "statistically significant at the 90% confidence interval"?

4. Be sure to write down your results on a piece of paper.

Reset

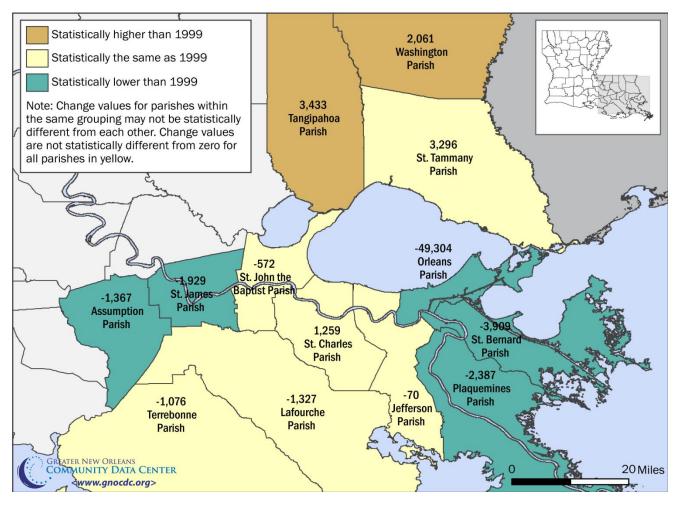
Another way to look at the margin of error is to explore the confidence interval.

Poverty rates and their 90% confidence interval by New Orleans neighborhood, 2006-2010

	Percent Below	Maurin of			Percent	Total Maurin	
Neighborhood	Poverty	Margin of Error	90% Confidence Interval	Neighborhood	Below Poverty	Total Margin of Error	90% Confidence Interval
Algiers Point	6%	+/- 4%	90% confidence interval	Leonidas	31%	+/- 7%	90% confidence interval
Audubon	18%	+/-4%		Little Woods	25%	+/- 6%	
B.W. Cooper	49%	+/-4%		Lower Garden District	25%	+/- 4%	
	49% 17%	,		Lower Garden District	21%	,	
Bayou St. John		+/-7%				+/- 14%	
Behrman	23%	+/-6%		Marigny	9%	+/- 4%	
Black Pearl	18%	+/-7%		Marlyville/Fontainebleau	18%	+/- 6%	
Broadmoor	14%	+/-7%		McDonogh	19%	+/- 9%	
Bywater	24%	+/-10%		Mid-City	37%	+/- 9%	
Central Business District	21%	+/-8%		Milan	24%	+/- 9%	
Central City	38%	+/-7%		Milneburg	16%	+/- 10%	
City Park	11%	+/-8%		Navarre	16%	+/- 10%	
Desire Dev & Neighborhood	38%	+/-23%		New Aurora/English Turn	24%	+/- 9%	
Dillard	20%	+/-8%		Old Aurora	14%	+/- 5%	
Dixon	42%	+/-28%		Pines Village	33%	+/- 18%	
East Carrollton	28%	+/-9%		Plum Orchard	21%	+/- 13%	
East Riverside	27%	+/-10%		Pontchartrain Park	26%	+/- 18%	
Fairgrounds	21%	+/-7%		Read Blvd East	17%	+/- 9%	
Filmore	29%	+/-21%		Read Blvd West	18%	+/- 10%	
Fischer Development	84%	+/-34%		Seventh Ward	44%	+/-7%	
Florida Area	43%	+/- 18%		St. Anthony	25%	+/- 10%	
Florida Development	na	na		St. Bernard Area	35%	+/-26%	
French Quarter	7%	+/-3%		St. Claude	47%	+/- 11%	
Freret	20%	+/-14%		St. Roch	34%	+/- 11%	
Garden District	6%	+/-3%		St. Thomas Development	31%	+/- 18%	
Gentilly Terrace	16%	+/-6%		Tall Timbers/Brechtel	26%	+/- 7%	
Gentilly Woods	24%	+/- 13%		Touro	14%	+/- 5%	
Gert Town	37%	+/- 12%		Treme'/Lafitte	38%	+/- 10%	
Hollygrove	21%	+/-8%		Tulane/Gravier	37%	+/- 15%	
Holy Cross	30%	+/-14%		U.S. Naval Support Area	23%	+/- 9%	
Iberville Development	71%	+/-16%		Uptown	14%	+/- 5%	
Irish Channel	22%	+/-8%		Viavant/Venetian Isles	11%	+/- 62%	
Lake Catherine	4%	+/-6%		Village de l'est	36%	+/- 10%	
Lake Terrace & Oaks	11%	+/-11%		West End	18%	+/- 9%	
Lakeshore/Lake Vista	6%	+/- 4%		West Lake Forest	43%	+/- 22%	
Lakeview	5%	+/-3%		West Riverside	10%	+/- 4%	
Lakewood	1%	+/-2%		Whitney	16%	+/- 8%	
Lunc WOOd	T 10	·/- ∠/u		multy	10 %	.7-070	
			U.S. Poverty Rate (13.8%)	(04.4%)			U.S. Poverty Rate (13.8%)
			New Orleans Poverty Rate				New Orleans Poverty Rate (24.4%)
			Concentrated Poverty	(40%)			Concentrated Poverty (40%)

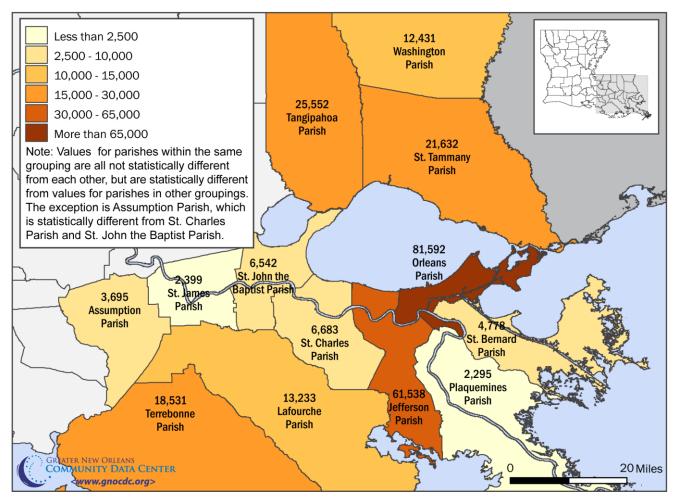
Source: The Data Center analysis of data from 2006-2010 American Community Survey

Change in the population in poverty by parish, 1999 to 2008-10 (three-year average)



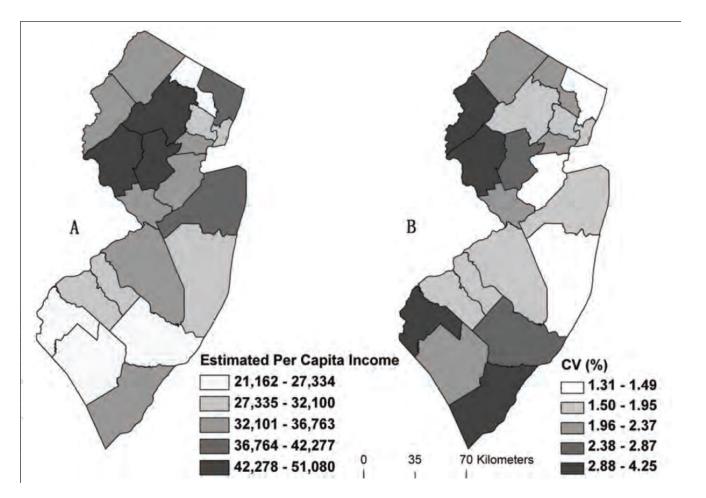
Source: Plyer, A. & Ortiz, E. (2012). Poverty in Southeast Louisiana post-Katrina. The Data Center.

Population in poverty by parish, 2008-10 (three-year average)



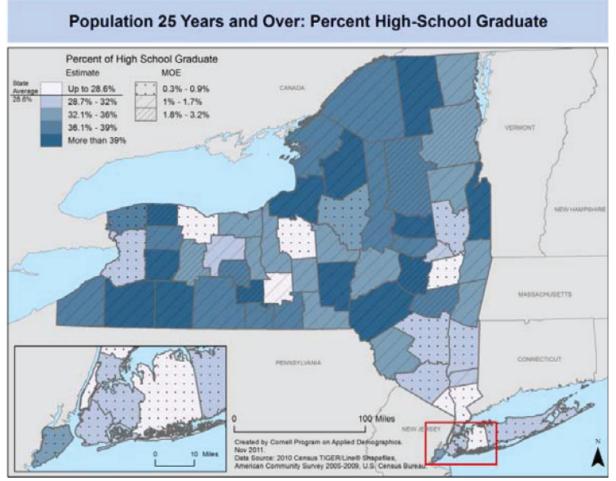
Source: Plyer, A. & Ortiz, E. (2012). Poverty in Southeast Louisiana post-Katrina. The Data Center.

Example side-by-side maps.



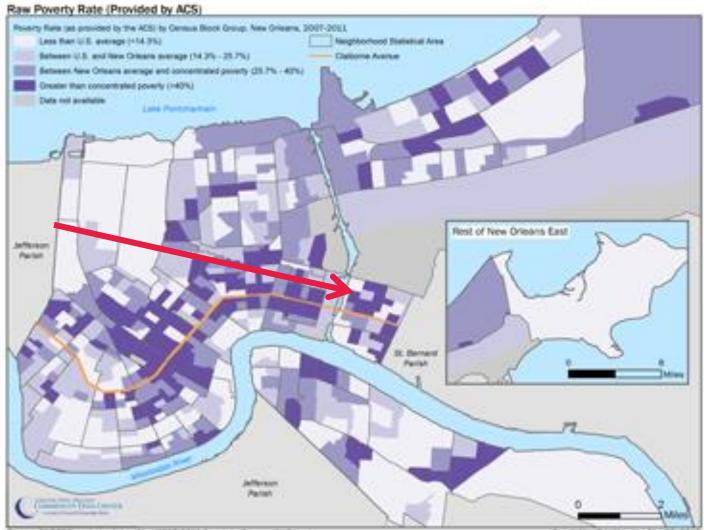
Source: Sun, M. and D. W. S. Wong. (2010). Incorporating data quality information in mapping the American Community Survey data. Cartography and Geographic Information Science 37 (4): 285-300.

Example map featuring reliability overlay



Source: Francis, J., Vink, J., Tontisirn, N., Anantsuksomsri, S., & Zhong, V. (2012). Alternative strategies for mapping ACS estimates and error of estimation. Cornell University, Program on Applied Demographics

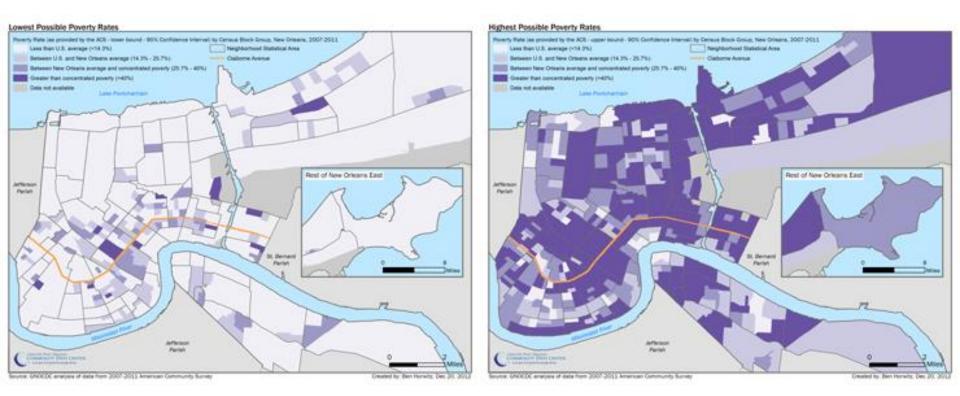
What does poverty look like in New Orleans as mapped by the ACS?



surce, GNOCOC analysis of data from 2007 2011 American Community Burvey

Created by: Ben Honwitz, Dec 20, 2002

What does poverty look like in New Orleans as mapped by the ACS?



We produced a series of methodology that *might* produce a more accurate map.

- 1. An average of all neighboring block groups.
- 2. An average of all "true" neighboring block groups (considering geographic boundaries like the Mississippi River).

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- 1. An average of all neighboring block groups.
- 2. An average of all "true" neighboring block groups (considering geographic boundaries like the Mississippi River).
- 3. A weighted average of the "true" neighbors with the weight applied evenly to all neighbors.

I. BGx = Block Group of interest

- II. W_x = number of unweighted household respondents to the ACS /100
- III. BG_i = neighboring block groups

$$[BG_{x} * W_{x}] + [\sum_{i=0}^{i_{s}} \frac{(1 - W_{x})}{i_{n}} * BG_{i}]$$

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- 1. An average of all neighboring block groups.
- 2. An average of all "true" neighboring block groups (considering geographic boundaries like the Mississippi River).
- 3. A weighted average of the "true" neighbors with the weight applied evenly to all neighbors.
- 4. A weighted average of the "true" neighbors with the weight applied proportionally to all neighbors.
 - I. BG_x = Block Group of interest
 - II. W_x = weight of block group of interest
 - III. BG_i = neighboring block groups
 - IV. Y_i weight of neighboring block group

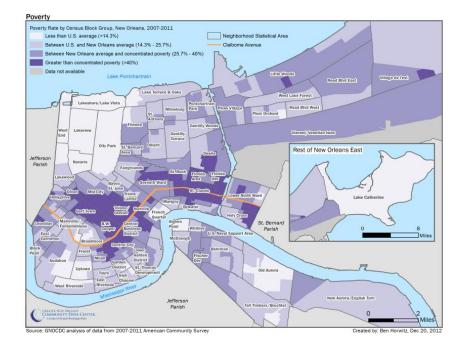
$$[BG_x * W_x] + [\sum_{i=0}^{l_n} BG_x * ((\frac{Y_i}{\sum_{i=0}^{l_n} Y_i}) * (1 - W_x))]$$

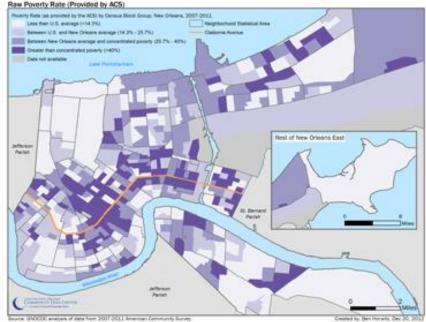
We found that averaging the "true" neighbors was the best approach.

Table 1: Index of dissimilarity evaluation results – Household type by household size

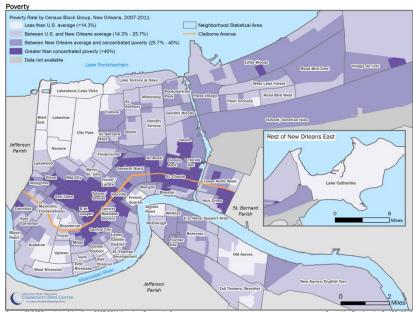
					ACS	
			ACS Average -	ACS	Weighted all	
		ACS Average	true neighbors	Weighted	block groups	
ACS		(method 1)	(method 2)	(method 3)	(method 4)	
	27.7%	15.5%	15.4%	15.4%	15.9%	

The averaging methodology produced a clearer picture of poverty in New Orleans.





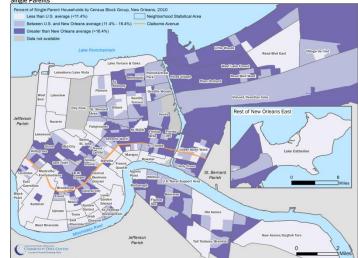
Comparing our ACS maps to LED or Census data helps "ground-truth" the results.



Source: GNOCDC analysis of data from 2007-2011 American Community Survey

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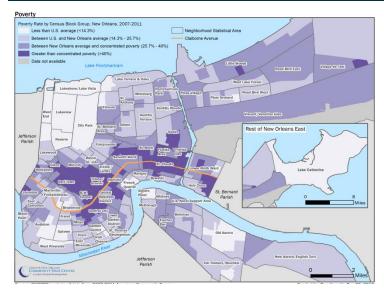
Single Parents



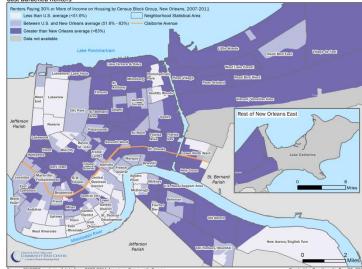
ource: GNOCDC analysis of data from 2010 Census

Created by: Ben Horwitz, Dec 20, 201

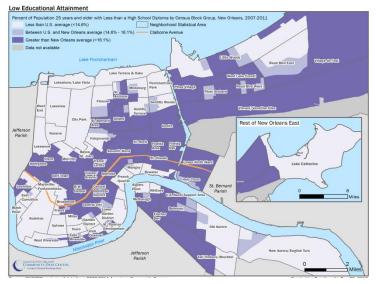
The geographies of poverty in New Orleans follow a consistent spatial pattern.



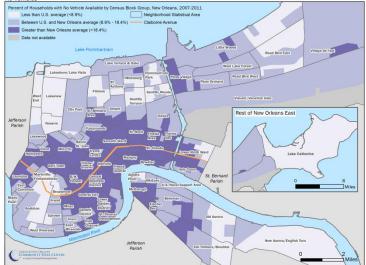
Cost-Burdened Renters

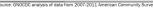






No Vehicles





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