**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 <b>.8</b> %	+/- 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

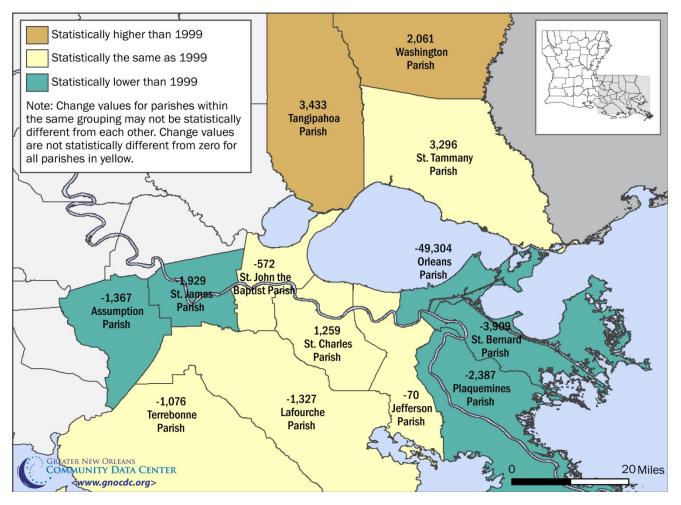
# Another way to look at the margin of error is to explore the confidence interval.

#### 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%)

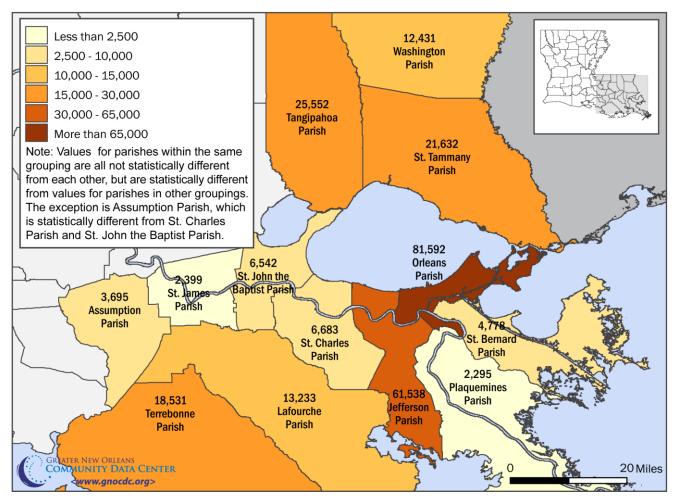
Source: The Data Center analysis of data from 2006-2010 American Community Survey

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



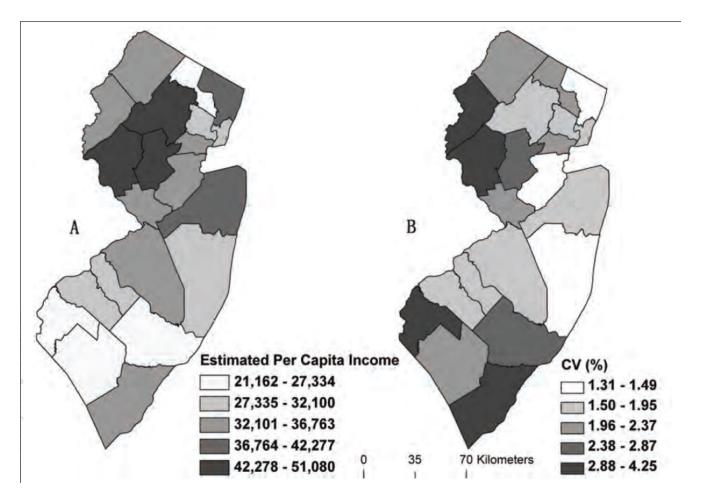
Source: Plyer, A. & Ortiz, E. (2012). Poverty in Southeast Louisiana post-Katrina. The Data Center.

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



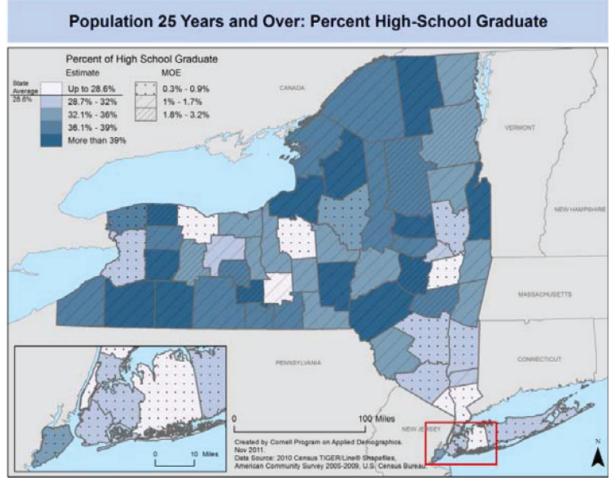
Source: Plyer, A. & Ortiz, E. (2012). Poverty in Southeast Louisiana post-Katrina. The Data Center.

Example side-by-side maps.



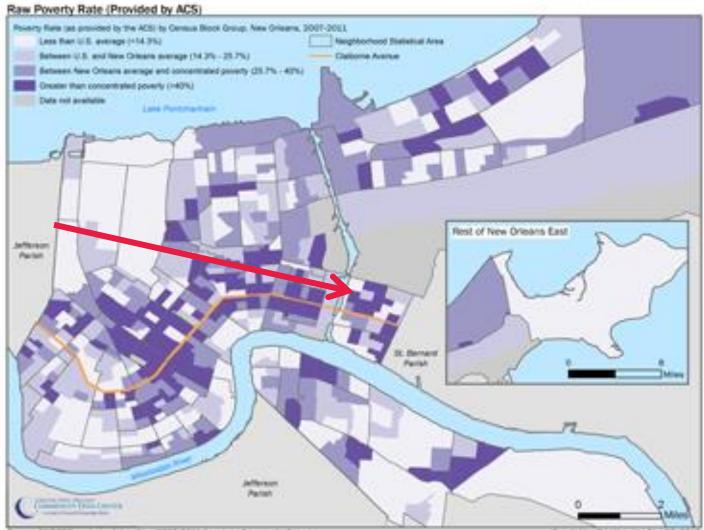
Source: Sun, M. and D. W. S. Wong. (2010). Incorporating data quality information in mapping the American Community Survey data. Cartography and Geographic Information Science 37 (4): 285-300.

#### 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

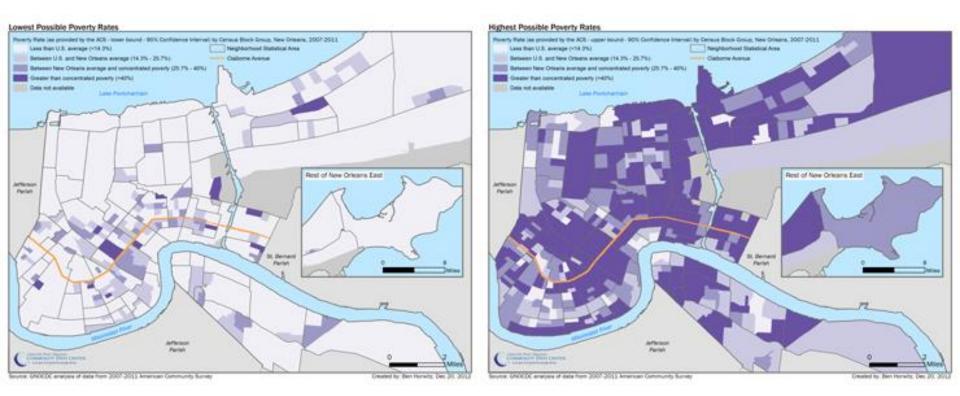
#### What does poverty look like in New Orleans as mapped by the ACS?



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<sub>i</sub> = neighboring block groups

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

## 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).
- 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<sub>x</sub> = Block Group of interest
  - II. W<sub>x</sub> = weight of block group of interest
  - III. BG<sub>i</sub> = neighboring block groups
  - IV. Y<sub>i</sub> weight of neighboring block group

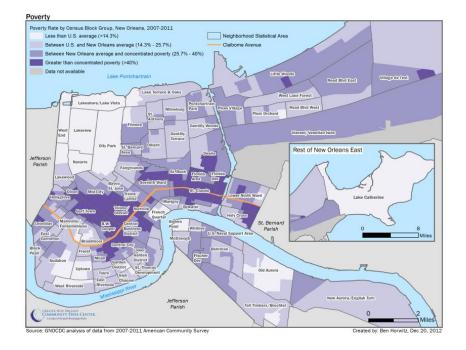
$$[BG_x * W_x] + [\sum_{i=0}^{l_n} BG_x * ((\frac{Y_i}{\sum_{i=0}^{l_n} Y_i}) * (1 - W_x))]$$

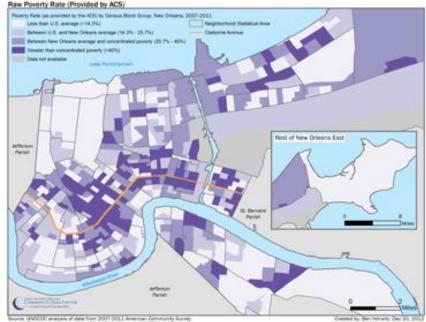
# We found that averaging the "true" neighbors was the best approach.

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

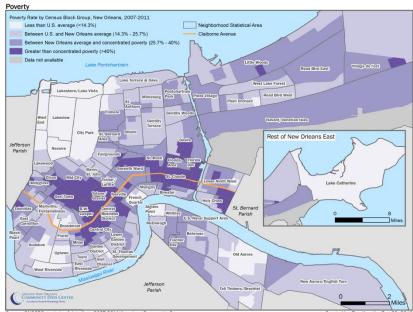
					ACS	
			ACS Average -	ACS	Weighted all	
		ACS Average	true neighbors	Weighted	block groups	
ACS		(method 1)	(method 2)	(method 3)	(method 4)	
	27.7%	15.5%	15.4%	15.4%	15.9%	

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





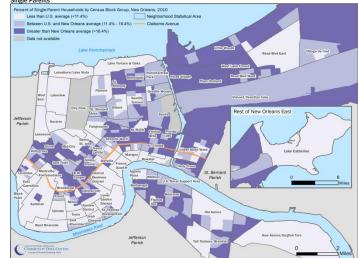
# Comparing our ACS maps to LED or Census data helps "ground-truth" the results.



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

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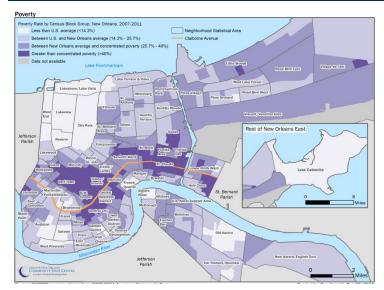
#### Single Parents



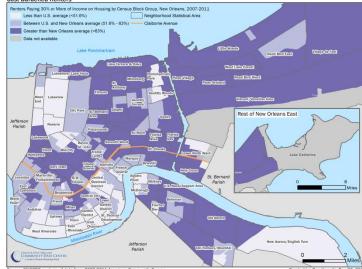
ource: GNOCDC analysis of data from 2010 Census

Created by: Ben Horwitz, Dec 20, 201

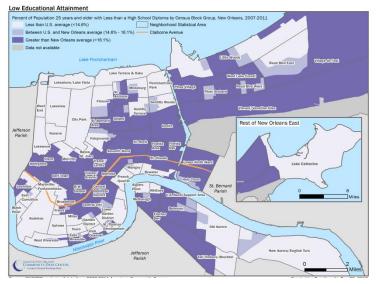
# The geographies of poverty in New Orleans follow a consistent spatial pattern.



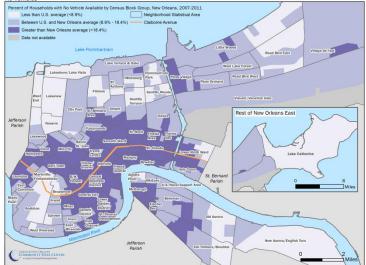
#### **Cost-Burdened Renters**

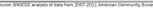






#### No Vehicles





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