# Recent Trends in Poverty in the Appalachian Region:

## The Implications of the U.S. Census Bureau Small Area Income and Poverty Estimates on the ARC Distressed Counties Designation

**A Report Presented to:**

**The Appalachian Regional Commission**

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## *EXECUTIVE SUMMARY*

The following report, funded by the Appalachian Regional Commission (ARC), explores recent poverty trends for the 399 counties that comprise Appalachia, and examines the Census Bureau's *Small Area Income and Poverty Estimates'*[1] effects on the ARC *distressed county* designation. We begin with an examination of the changes in total poverty in Appalachia between 1979 and the mid-1990s, with particular emphasis paid to the post-1990 period. The gap in poverty between Appalachia and the rest of the country declined as poverty outside Appalachia increased during the 1980s while remaining virtually unchanged in Appalachia. The U.S. average poverty rate declined from 15.1 percent to 13.8 percent between 1993 and 1995, while poverty among Appalachian counties declined from an average of 16.1 percent in 1993 to 14.6 percent in 1995. The ARC counties with relatively higher rates of poverty are generally concentrated in Kentucky, as well as West Virginia, southern Ohio, and Mississippi. Although Appalachia has long been struggling economically, Appalachia's total poverty rate in 1995 was only slightly higher than in the rest of the country.

Child poverty in Appalachia increased slightly between 1989 and 1995, following the national pattern. In particular, young children in Appalachia have experienced the greatest increases in poverty, compared with older children and the general population. The geographical patterns of total poverty and child poverty are overwhelmingly similar, with higher rates of child poverty concentrated in eastern Kentucky, and significant portions of northern Tennessee, West Virginia, southern Ohio, and Mississippi. Between 1993 and 1995 relative increases in child poverty were most expansive in Alabama, the Carolinas, and New York, followed by Kentucky, West Virginia, Virginia, Pennsylvania, Mississippi, and Georgia. Only Ohio and Tennessee experienced fairly consistent relative declines in child poverty during the period. Similar to the overall poverty rates for the sub-regions, the Central sub-region continued to experience the highest child poverty rates within Appalachia. More than one-third of the children who lived in the Central sub-region lived in households with incomes under the poverty line, with the poverty rates in the other regions just over 20 percent. Poverty rates for children ages 0-4 years were,

[1] The Census Bureau's *Small Area Income and Poverty Estimates* are abbreviated as SAIPE. These will also be referred to as "SAIP estimates" to focus on the numerical estimates themselves rather than the overall statistical estimates program

and continue to be, considerably higher than for children ages 5-17 years both nationally and in Appalachia. This gap was even wider for Appalachian counties than for the remainder of the U.S., with 27.3 percent of children ages 0-4 in poverty, compared to 19.5 percent for children ages 5-17 in 1995.

The ARC has used the distressed county designation for almost twenty years to identify counties with the most structurally disadvantaged economies. Each year the ARC updates the distressed status of counties based on more current information on unemployment and per capita market income. However, reliable county-level poverty rates have, until recently, only been available from the decennial census at the beginning of each decade. The Census Bureau SAIPE program has produced county-level poverty estimates for 1989, 1993 and 1995, giving the ARC the option of using more recent poverty data to classify counties. We evaluate the influence of post-censal estimates of poverty on the traditional distressed county classification, which uses only the estimates of poverty from the most recent census, during both the 1980s and the early 1990s. Of the 399 Appalachian counties, the number designated as distressed increased between 1980 and 1990 by 50 percent.[2] This increase reversed a two-decade decline in the number of distressed counties. Changing relative poverty levels were a factor in 10 of the 12 transitions out of distressed status during the 1980s. Poverty did not contribute quite as greatly to the much larger number of counties that became distressed in the 1980s.

Principally, we use two analyses to evaluate the viability of the SAIPE for the ARC designation of distressed counties. We first evaluate the accuracy of the distressed status designation at the end of a decade, comparing the 1980 census with the 1989 SAIPE (using the 1990 census as the standard of accuracy). With certain caveats, the results from the 1980s demonstrate that as a decade progresses, the SAIP point estimates more accurately predict the status of both distressed and non-distressed counties than the poverty estimates from the previous census. Then we examine the causes of status transitions that would occur in the early 1990s incorporating the SAIPE into the distressed county designation. The number of counties that have been affected

[2] The number of distressed counties in 1990 does not correspond to the number of counties officially designated distressed by ARC because distress levels were frozen during the 1988-1992 period awaiting the release of 1990 census poverty data (Wood and Bischak 2000). The distressed designation uses three year averages of unemployment and per capita market income. Numbers in Table 4.1a are based on a formula for defining distressed counties that incorporates poverty estimates from the last census, not the Census Bureau's post-censal SAIPE estimates.

by economic change in the 1990s can be better evaluated and joint changes in unemployment, income, and/or poverty can be distinguished from changes in poverty alone. Between 1990 and 1994 the number of distressed counties in Appalachia declined sharply (38 percent), due more to overall economic improvement in Appalachia relative to the U.S. as a whole than by substitution of the SAIPE for the 1990 census poverty estimates. Moreover, relative shifts in unemployment played a more important role as an independent cause of these transitions out of distressed status than did shifts in poverty.

The distressed status accuracy results from the end of the 1980s suggest that the SAIPE would provide a better determinant of distressed status than the poverty estimates derived from a decade old census. The magnitude and causes of distressed status transitions in the first half of the 1990s indicate that using the SAIP estimates would alter the counties that would be designated distressed by the ARC but not to a radical degree. However, both of these analyses demonstrate that a simple substitution of the SAIP point estimates for census poverty estimates may unjustifiably deny some counties distressed status recognition. As an antidote to this situation it might be more defensible to combine the SAIP point estimate and the SAIP upper bound estimate in the future determination of distressed status. This would accomplish the objective of utilizing more current estimates of poverty while reducing the negative consequences of utilizing an estimate of poverty with greater statistical variation than decennial census derived estimates.

Overall, the analysis of the 1990s indicates that the number of distressed counties has declined in Appalachia during the decade. The *Small Area Income and Poverty Estimates* indicate a decline in poverty in Appalachia relative to the U.S. as a whole, which reflects a concomitant relative decline in unemployment and a relative increase in per capita market income. Determination of distressed status using the 2000 Census of Population and Housing poverty rates should confirm this decline. During the next decade, the accuracy of the SAIPE program should improve significantly as new sources of income and poverty data, especially the American Community Survey (ACS), become available, making them an even more viable option for the determination of distressed status by the Appalachian Regional Commission.

# *SECTION I*

## *Introduction*

Since its formation in 1965, the Appalachian Regional Commission has pursued a comprehensive program of regional development to improve socioeconomic conditions and alleviate poverty. Initially, 85 percent of ARC funds were allocated to highway construction in order to overcome the region's remoteness and physical isolation from the rest of the country, not withstanding Appalachia's close proximity to the population concentrations of the Eastern United States (Isserman and Rephann, 1995). Although highway construction has remained an important activity for ARC, from its inception, funds have also been appropriated for hospitals and treatment centers, land conservation and stabilization, mine land restoration, flood control and water resource management, vocational education facilities, and sewage treatment works (Isserman and Rephann, 1995). The ARC and state and local governments have spent more than $15 billion on economic and social development in the region (Wood and Bischak 2000).

Although Appalachia continues to be a region of the U.S. with relatively high levels of poverty, it has made significant gains during the past 25 years. Numerous articles, books and documentaries have highlighted the plight of the Appalachian people over the years (Harrington, 1962; Caudill, 1963; Weller, 1965; Lyson and Falk, 1993; Couto, 1994). In this mountainous, geographically remote, and disproportionately rural region, residents have traditionally contended with a cyclical economy, lower than U.S. average earnings, and higher than average poverty levels (PARC, 1964; ARC, 1972; ARC, 1979). Besides the rural and geographically isolated nature of the region, the socioeconomic differences between Appalachia and other parts of the country have been shaped by a number of factors including the relative lack of high-skill/high-wage manufacturing, limited industrial diversity, sensitivity of the region's industries to recession, dependence on extractive industries, export of capital, and lack of investment in the human capital of the region (Dix, 1978; Raitz and Ulack, 1984; Duncan, 1992; Haynes, 1997).

The following report explores recent poverty trends for the 399 counties that comprise Appalachia. The Appalachian Regional Commission (ARC) has provided funding for this

research. The analysis examine the Census Bureau's *Small Area Income and Poverty Estimates* (abbreviated as SAIPE, which will also be referred to as "SAIP estimates" to focus on the numerical estimates themselves rather than the overall statistical estimates program) and their effects on the ARC *distressed county* designation. We begin with a discussion of the SAIP estimates. This is followed by an examination of the changes in total poverty in Appalachia between 1979 and the mid-1990s, with particular emphasis paid to the post-1990 period, including a discussion of the geographical distribution of poverty. While our analysis covers the total population (all ages), we focus in greater detail on child poverty. We conclude with an evaluation of the impact of using the SAIPE estimates for the years 1989, 1993 and 1995 to assign the economically distressed status designation used by the ARC.[3]

### *Small Area Income and Poverty Estimates Program*

Detailed poverty and income levels for states and sub-state geographic areas, especially counties, are among the most important products of the decennial census of population and housing. However, the ten-year interval between the census enumerations leaves a relatively long time span without more current data on the changes in poverty levels and rates in sub-state areas. Measuring poverty at ten-year intervals does not capture fluctuations within the period and is seldom coincident with the timing of major economic shifts. Moreover, national poverty trends do not uniformly affect all states and sub-state areas, nor do these national trends consistently affect all age groups within the population. This ten-year gap between censuses undermines the ability of many federal, state, and local programs designed to alleviate poverty to effectively identify and reach their target populations.

The Census Bureau's *Small Area Income and Poverty Estimates Program* was initiated to remedy this deficiency by providing post-censal county estimates of income and poverty. We provide a brief summary of this program in this report; more detailed information on the *Small Area Income and Poverty Estimates Program* can be found at the Census Bureau's website (http://www.census.gov /hhes/www/saipe/saipe93 /origins.html), and in reports from the

[3] We have used the 1990 Census estimates for poverty when referring to poverty change since 1990. See appendix A for a further discussion of the Census Small Area Income and Poverty Estimates.

National Research Council (1998 and 2000). The primary reason for developing post-censal estimates of income and poverty for small areas is that the national levels and spatial distributions of these characteristics are not stable over time. If decennial census data are used to benchmark poverty relief programs for an entire decade, the programs remain fixed on the decennial targets even when income and poverty levels rise or fall nationally, or the relative levels of poverty for population groups, states, or local areas change. The Census Bureau (under authorization from Congress) prepares poverty estimates for children ages 5-17. These statistics are for use by the U.S. Department of Education in allocating federal funds under Title I of the Elementary and Secondary Education Act for education programs to aid disadvantaged school-age children. In this report we examine levels and changes in poverty among the entire population, among children ages 0-4, and among children ages 0-17, while recognizing that the poverty estimates for children 5-17 and the models that generate them have been subjected to greater scrutiny and more thorough evaluation (National Research Council, 1998).

The principal aim of the Census Bureau's SAIPE program has been to produce post-censal estimates of median income and poverty for states, counties, and school districts in the absence of actual measures collected in a large-scale survey or a census. To accomplish this goal, the Census Bureau uses multiple regression statistical modeling to generate updated county-level estimates of income and poverty. Multiple regression is a statistical technique that attempts to explain or predict the level of a single dependent variable based on the levels of a set of independent variables (Vogt 1993). In the absence of a single source of reliable estimates for income and poverty, regression modeling leverages several data sources and time periods in order to optimize precision (National Research Council 1997).

The SAIPE multiple regression models have produced biennial estimates of income and poverty beginning in 1993. The SAIPE model uses several county-level independent (predictor) variables, the number of personal exemptions claimed on federal income tax returns by families with incomes at or below the poverty level, the number of people receiving food stamps, the 1990 census of population, and the Census Bureau population estimates. The statistical model incorporates county-level data on income and poverty from the Demographic Supplement of the Current Population Survey (CPS) conducted in March each year, as the dependent variable. The

SAIPE model combines three years of CPS data to improve the precision of the estimates. This technique is similar to ARC's use of three-year averages for unemployment and per capita market income in the designation of distressed counties. Because the CPS sample does not include all counties, the relationship between the predictor variables and the dependent variable is estimated for the subset of counties included in the CPS sample, and then applied to all counties.

In 1994, Congress authorized a study by the National Research Council (NRC) to assess the production, appropriateness, and the reliability of the updated poverty estimates for children ages 5-17. Upon evaluation of the original model and poverty estimates for 1993, the NRC Panel concluded that the 1993 estimates represented a substantial step toward the production of post-censal poverty estimates. The panel further recommended the use of these estimates (together with poverty estimates from the 1990 Census) for allocations for school year 1997-98 under the terms of Title I of the Elementary and Secondary Education Act allocations (National Research Council, 1997). Subsequent revisions of the 1993 estimates were evaluated by the NRC Panel and recommended for use in Title I allocations for school year 1998-99 (National Research Council, 1998). The Panel concluded that the estimates, although containing strengths and weaknesses, were superior to continued use of child poverty rate data from the outdated 1990 Census for allocations under Title I. Poverty estimates for counties and school districts for 1995 were also evaluated by the NRC Panel. The 1995 estimates for children ages 5-17, released in 1999, were recommended for Title I allocations for school year 1999-2000 (National Research Council, 1999).

The decision to use the Census Bureau's post-censal poverty estimates for funding allocations is a tradeoff between precision obtained in the decennial census and more current (if less precise) post-censal estimates. The 1990 census estimates of poverty are more precise in a statistical sense because they are based on a very large sample (approximately one-sixth of all households). However, they describe the income and poverty situation only as of 1989. The 1993 and 1995 estimates are considerably less precise, but because of their relative currency, they provide a better description of poverty and economic conditions in the post-1990 period. The Census Bureau plans to continue research and development efforts to improve the estimation models and potentially reduce the time lag between the reference year of the estimates and their release date.

National income and poverty patterns changed between 1989 and the 1993 and 1995 SAIP

estimates. Between 1989 and 1993, Census Bureau estimates suggests that, median household income declined by 7 percent, the number of people below the poverty level increased by 25 percent, and the number of poor children ages 5 to 17 increased by 24 percent. These belie the heterogeneity of economic shifts in counties across the country. In the National Research Council Panel's preliminary analysis of poor school-age children for U.S. counties, several categories of counties experienced trends that, in the Panel's judgement, warranted further investigation. For example, large metropolitan central city counties experienced a high-implied percentage change in child poverty between the 1989 census estimates and the 1993 model-based estimates (42%). This change declined systematically with decreasing population size for metropolitan counties and continued the decline to the most remote, rural non-metropolitan counties. Counties with higher percentages of Native Americans had lower implied increases in child poverty; however, there was no particular pattern of change for counties containing reservations. Farm counties had an implied decline in child poverty, while non-farm non-metropolitan counties had an implied increase in child poverty. Some of this change may be related to systematic biases in the estimation models (see National Research Council, 1998) but in all likelihood also represents actual changes in levels of poverty and its geographic distribution during this period.

## *SECTION II*

### *Overview of Total Poverty (all ages) in Appalachia during the 1990s*

Although Appalachia has long been struggling economically, Appalachia's total poverty rate in 1995 was only slightly higher than in the rest of the country. Table 2.1 compares the poverty rates for the 399 Appalachian counties with the rest of the country and the entire U.S.[4] In 1979 (based on the 1980 Census), poverty rates were two percentage points higher in Appalachia than in the remainder of the U.S. For 1989, we have two measures of poverty, the SAIPE and the census (1990 Census). According to the SAIPE figures, the gap in poverty between Appalachia and the rest of the country declined as poverty outside Appalachia increased during the 1980s while remaining virtually unchanged in Appalachia. Nationally, the 1989 SAIPE indicate that the proportion of people in poverty was slightly lower than indicated by the 1989 census.[5] In Appalachia, the SAIPE poverty rate was about 6.4 percent lower than the census rate.

In 1993, the poverty gap between Appalachian counties and counties in the remainder of the U.S. was one percentage point, and by 1995 it had declined to just under one percentage point. The SAIP estimates suggest that this apparent compression occurred because the poverty in Appalachian counties had not increased as much as it had outside of Appalachia. While the net change in poverty for Appalachia was an increase of one half of one percentage point between 1989 and 1995, poverty rates in counties outside of Appalachia increased by 1.5 percentage points. Relative to the rest of the United States, Appalachian poverty continues to decrease, a trend apparent in decennial census data since the 1960s.

[4] Throughout this report, poverty figures are labeled with the year that they measure income. For example, the 1990 census measures income from 1989 and are labeled as 1989 census poverty rates.

[5] The 1989 SAIP estimates of the number of people in poverty are 4.4% lower than the 1989 census figures. This includes adjustments made for the differences in the populations included in the poverty universe (U.S. Census Bureau, 1999).

**Table 2.1:**
**Total Poverty rates for Appalachian Counties and U.S counties outside of Appalachia**

| | 1979 Census | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|---|
| Appalachian counties | 14.1% | 14.1% | 15.3% | 16.1% | 14.6% |
| U.S. counties outside of Appalachia | 12.2% | 12.7% | 12.9% | 15.1% | 13.7% |
| **Total** | **12.4%** | **12.8%** | **13.1%** | **15.1%** | **13.8%** |

### *Total Poverty in the Sub-Regions of Appalachia*

As the total poverty rates in Table 2.2 indicate, the economic fortunes of the three sub-regions of Appalachia have shifted over the last few decades. Until recently, the northern sub-region enjoyed higher incomes and lower poverty than the other sub-regions of Appalachia (PARC, 1964; ARC, 1972; ARC 1979, ARC 1981). Since the late 1960s however, the decline in the manufacturing base and the gradual erosion of the higher paying jobs associated with this industry has caused a relative decrease in income and higher poverty levels in northern Appalachia. The poverty rate for the northern sub-region of Appalachia was higher in 1989 than in either 1979 or 1969 (Couto, 1994). Between 1989 and 1993, the poverty rate increased slightly by one to 2.5 percent, depending upon the estimate, SAIPE or census. But by 1995, the poverty rate in northern Appalachian counties had declined slightly to 13.6 percent, remaining above 1969 and 1979 levels.

In direct contrast to the northern sub-region, the southern sub-region has seen improvement in incomes and poverty levels over the last three decades. Between 1979 and the 1995, the gap in poverty levels between northern and southern Appalachia disappeared. Part of this convergence may have been due to the geographical changes in manufacturing that occurred during the last 25 years. Studies have noted that northern Appalachia has been losing manufacturing plants and

employment at the same time that southern Appalachia has been experiencing manufacturing growth (Jensen, 1998; Raitz and Ulack, 1984). Additionally, the metropolitan areas of Atlanta, Birmingham and Winston-Salem, with their strong economies, have helped lower the overall rate of poverty southern Appalachia. The SAIP estimates suggest that Southern Appalachia experienced a 2.5 percentage point increase in poverty between 1989 and 1993 and then the same percentage point decrease between 1993 and 1995. In other words, according to the SAIP estimates, there has been no net change in poverty in this part of Appalachia during the first half of the 1990s.

**Table 2.2:**
**Total Appalachian Poverty by Sub-Region**

| | **1979 Census** | **1989 SAIPE** | **1989 Census** | **1993 SAIPE** | **1995 SAIPE** |
|---|---|---|---|---|---|
| North | 11.3% | 12.5% | 14.0% | 15.0% | 13.6% |
| Central | 22.7% | 24.2% | 25.9% | 26.0% | 24.1% |
| South | 15.3% | 13.6% | 14.3% | 15.1% | 13.6% |
| **ARC counties** | **14.1%** | **14.1%** | **15.3%** | **16.1%** | **14.6%** |

The central Appalachian sub-region has undergone its own distinct pattern of recent change in poverty. The poverty rate of the Central sub-region has been consistently higher than for the two other sub-regions. There are two differences between the central sub-region and the other two regions of Appalachia that partially account for the difference in poverty. First, the lack of diversification of industry has forced this area to rely on one primary industry, coal mining, for most of the century. Many authors have discussed the problems of extractive industries in general and the crisis of mining and exporting the coal of central Appalachia in particular (Duncan, 1985; Goodstein, 1989; Haynes, 1997). The profits from mining activities have largely flowed out of the region as a result of ownership in the industry being predominated by distant individuals and corporations, thereby exacerbating the economic uncertainty inherent in coal extraction for the workers of Eastern Kentucky, Southern West Virginia, Western Virginia and Northern Tennessee (Duncan, 1992). The original President's Appalachian Regional

Commission in 1964 noted that, "Much of the wealth produced by coal and timber was seldom seen locally. It went downstream with the great hardwood logs; it rode out on rails with the coal cars; it was mailed between distant cities as royalty checks from non-resident operators to holding companies who had bought rights to the land for 50 cent or a dollar an acre. Even the wages of the miners returned to faraway stockholders via company houses and company stores" (Isserman and Rephann 1995). The second factor distinguishing central Appalachia is that is it is much more rural than the other parts of the region. There are only two metropolitan areas in central Appalachia (Huntington, West Virginia–Ashland, Kentucky and Lexington, Kentucky). Central Appalachia, like other nonmetropolitan areas nationally, suffers from higher than average poverty rates. However poverty rates for central Appalachia are high even when compared with other predominantly nonmetropolitan areas.

During the 1970s, the level of poverty in central Appalachia declined greatly. Increases in the demand for coal, such as occurred with the 1970s energy crisis, generally meant increased employment and lower poverty levels. During the 1980s as the energy crisis subsided, poverty rates rose. The Central sub-region had a poverty rate in 1979 of 22.7 percent. This rate increased to around 24 percent in 1989 according to the SAIP estimates or to around 26 percent according to the 1990 census. The sub-region's poverty rate was at 26 percent in 1993 and by 1995 it was close to the 1989 rate of 24 percent. Throughout this period it remained much higher than the adjoining areas of Appalachia. Even though there is evidence that employment in central Appalachia is diversifying, potentially easing poverty and unemployment to levels similar to the rest of the region or the nation, it has been a slow transformation. Positive changes have been concentrated mainly in manufacturing (reducing reliance on extractive industries) but they are less evident in the service sectors.

### *Total Poverty by State in Appalachia*

Rates of total poverty in Appalachia are not homogeneous across states, but instead show wide disparities (Appendix C, Table 1). Eastern Kentucky, the part of the state that is in Appalachia, and the entire state of West Virginia exhibited high rates of poverty throughout the period examined in this report. This can be partially attributed to the high unemployment rates of these

states and to the extractive and cyclical nature of the industries there. The portion of Mississippi located in Appalachia has also had a higher than average rate of poverty. Although only a small part of Mississippi is in Appalachia, the state as a whole has a higher than average rate of poverty. The Appalachian portions of Georgia, New York, North Carolina, Pennsylvania and South Carolina have experienced rates of poverty below the Appalachian average include. For some of these states, lower rates of poverty among the ARC counties may be a result of greater diversification in the economic base of those counties. For Georgia in particular, many of the Appalachian counties are suburban areas in the Atlanta metropolitan area. The difference between the 1989 SAIPE and 1989 census poverty rates is greater for individual states than it is for Appalachia as a whole or for the three sub-regions of Appalachia. Census Bureau tabulations show that the greatest differences between 1989 SAIPE and 1989 Census poverty estimates are for states in the Northeast and Midwest regions. The 1989 SAIPE estimates tend to be lower than the 1989 Census estimates for Appalachian states in the Northeast and Midwest regions (U.S. Census Bureau, 1999).

Consistent with the sub-regional change in poverty rates over the period, a north-south divergence arises. SAIPE estimates for Appalachian counties in New York suggest a 3.5 percentage point increase (a 30 percent increase) in poverty between 1989 and 1995. Poverty rates in Pennsylvania, Maryland, and West Virginia also increased between 1989 and 1995. Poverty rates in Ohio decreased between 1989 and 1995 but the poverty rate was higher for all three SAIPE years than it was in 1979. The three southeastern, Atlantic coastal Appalachian states, North Carolina, South Carolina and Georgia, all showed small increases in poverty from 1989 to 1995. More interestingly, the Appalachian counties in these states have poverty rates that have been declining for decades and are now among the lowest in Appalachia. Tennessee, Virginia, Mississippi and Alabama enjoyed declining poverty rates during the 1990s.

Since Appalachia encompasses 13 states and 399 counties, it is a heterogeneous region and each state does not contain an equal share of the Appalachian population. Pennsylvania, for example, contains more than one-quarter of the Appalachian population and therefore has a large influence on the overall poverty rate of the region. Since the poverty rates of Pennsylvania's Appalachian counties are lower than the rest of Appalachia *and* lower than the U.S. as a whole, Pennsylvania

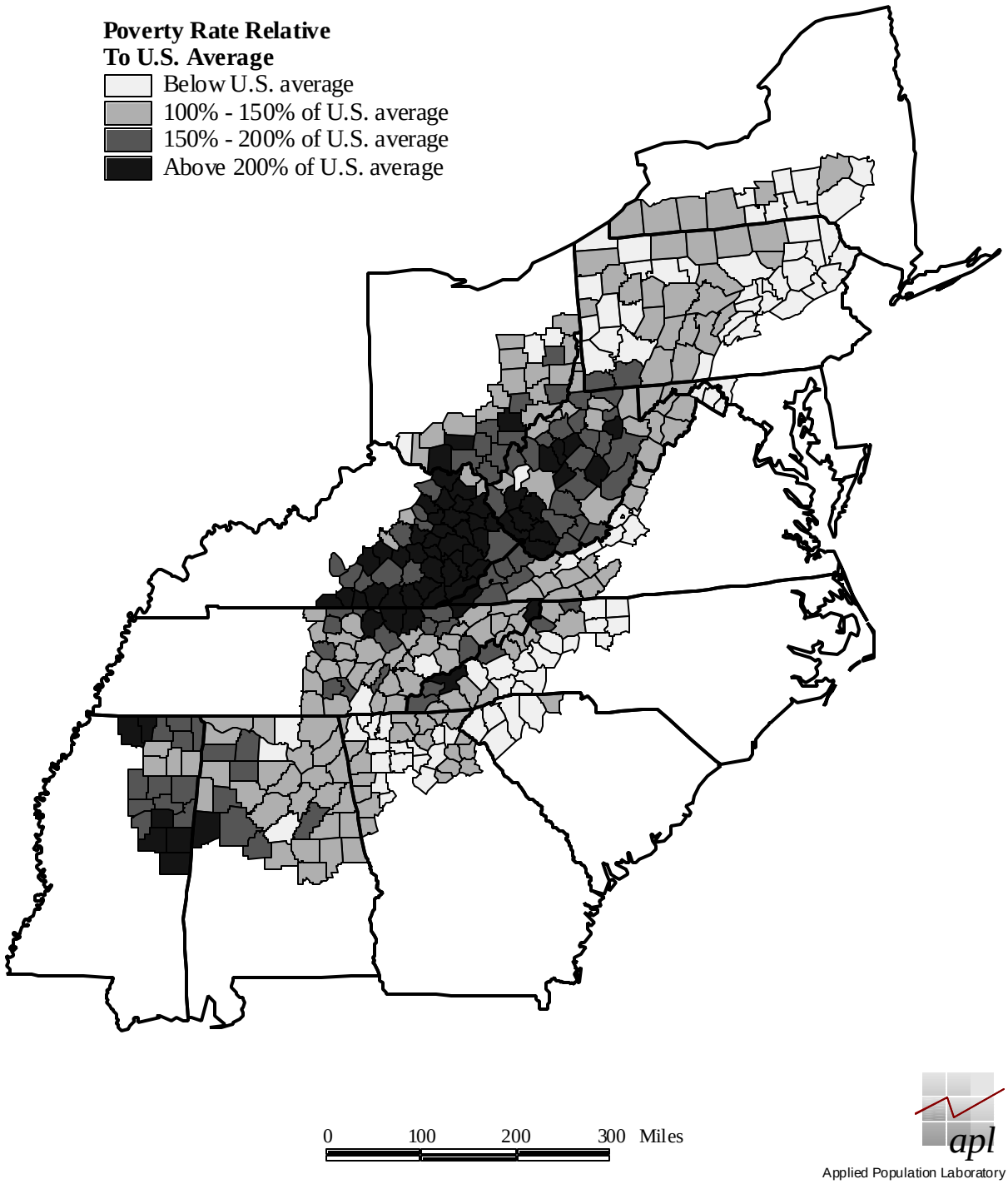
lowers the overall rate of poverty for Appalachia. And, since the poverty rate in Pennsylvania has increased since 1979, the overall decrease in Appalachia has been attenuated.

### *Geographical Distribution of Total Poverty, 1989, 1993, and 1995*

The 1990 census's total poverty rates for Appalachian counties are shown in Figure 2.1 as a proportion of the total U.S. poverty rates. The four color categories correspond to poverty rates *relative to the U.S. average rate.* We compare the Appalachian counties to U.S. average rates to control for changes that merely reflect national trends and because in the calculation of *distressed* status the comparisons are also made to U.S. averages. The counties with relatively higher rates of poverty in 1989 were noticeably concentrated in Kentucky, as well as West Virginia, southern Ohio, and Mississippi.

A cursory examination of SAIPE poverty rates in 1993 (Figure 2.2) indicates that relative poverty rates have a similar geographical distribution across Appalachia as they did in 1989, particularly the concentration in eastern Kentucky and West Virginia, although the northern Kentucky/southern Ohio region had somewhat lower relative poverty rates in 1993. Figure 2.3 allows a closer examination of the change between 1989 (1990 Census) and the 1993 SAIP estimate. For example, although both Figure 2.1 and 2.2 indicate that eastern Kentucky had relatively high concentrations of poverty in both time periods, the black and white areas in Figure 2.3 indicate which counties experienced either *decreases* in their total poverty rates or below average increases compared to the U.S as a whole. Nearly all the eastern Kentucky counties experienced a relative decline in poverty of at least three percent better than the national average over the period and the remainder experienced a more moderate relative decline. The significant increases in poverty (more than three percent above the national average) in Appalachia between 1989 and 1993 according to the SAIP estimates were few and were isolated counties in West Virginia, Pennsylvania, northern Virginia, Tennessee, and Georgia. Poverty in eight of the ARC counties in eastern Tennessee increased at a greater rate than the national average, as did a few counties in northern Georgia and in the western Carolinas. Counties that experienced relative improvement from 1989 to 1993 were especially clustered in Mississippi, Alabama, eastern Kentucky, southern Ohio, and West Virginia.

# Figure 2.1:
# Total Poverty,
# ARC Counties, 1989 (Census)

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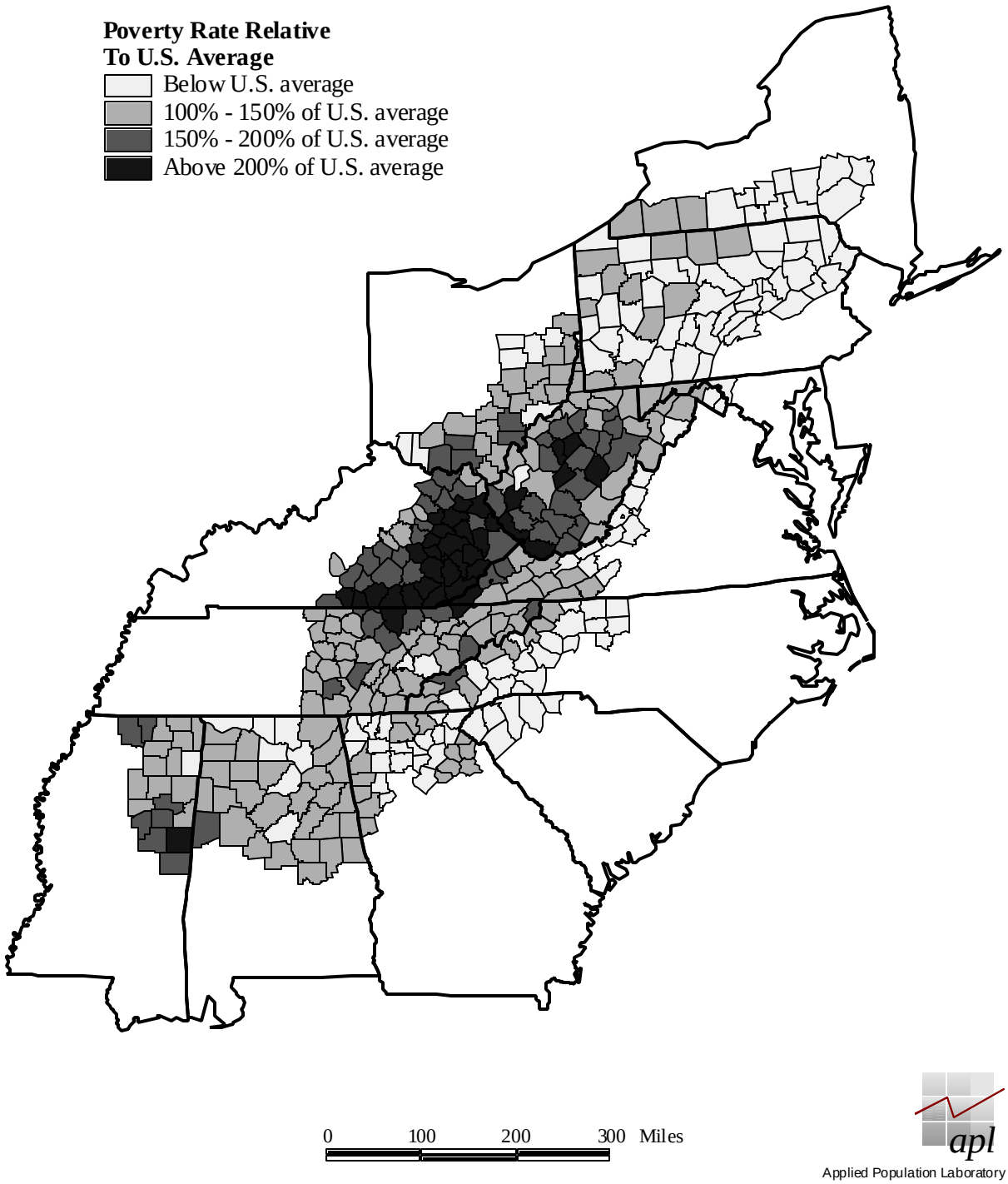
# Figure 2.2:
# Total Poverty,
# ARC Counties, 1993 (SAIPE)

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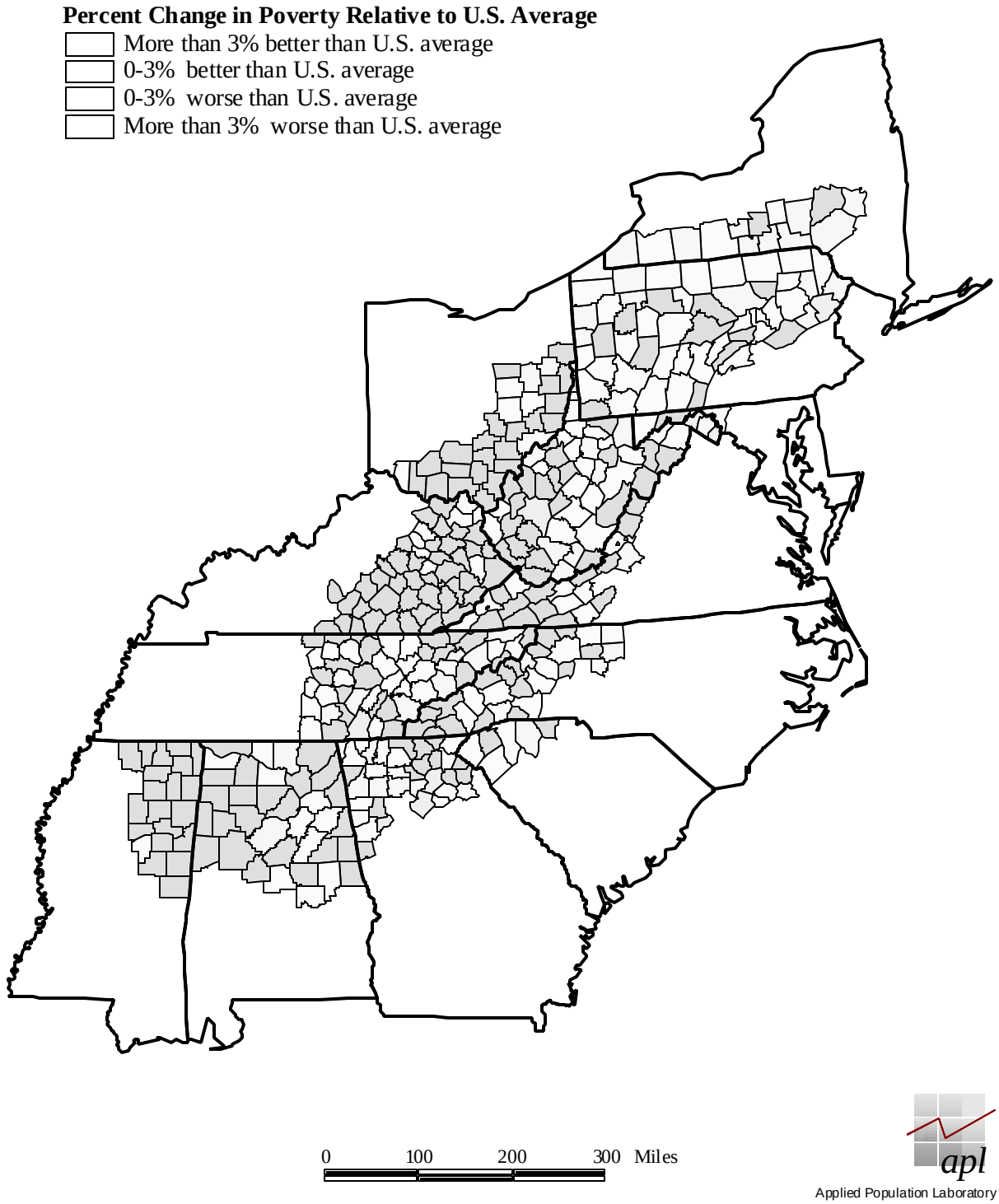
# Figure 2.3:
# Change in Poverty,
# ARC Counties, 1989-1993

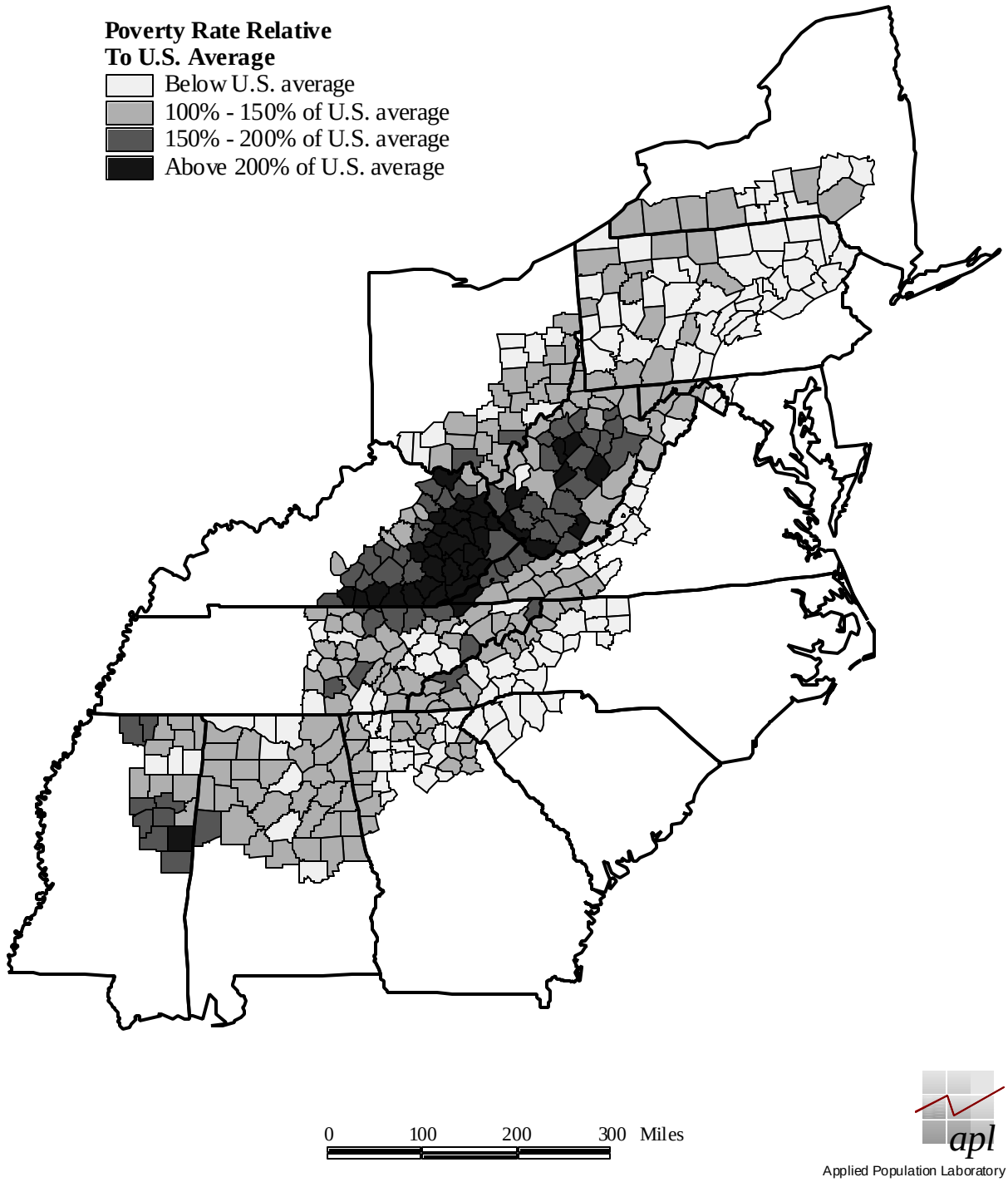


Again, the distribution of total poverty across Appalachia in 1995 looked remarkably similar to 1989 and 1993 with higher poverty counties clustered in eastern Kentucky and West Virginia (Figure 2.4). In contrast to the map of change between 1989 and 1993 (Figure 2.3), which indicated a relative decrease in poverty among most ARC counties, a large majority of ARC counties did not perform as well as the national average between 1993 and 1995 (Figure 2.5). The U.S. average poverty rate declined from 15.1 percent to 13.8 percent between 1993 and 1995, while poverty among Appalachian counties declined from an average of 16.1 percent in 1993 to 14.6 percent in 1995. The prevalence of light gray and dark gray colored counties in Figure 2.5 highlights the fact that distinct and concentrated areas of Appalachia did not perform as well as the national average. Indeed, eastern Kentucky, West Virginia, western sections of North Carolina and Virginia, and much of Alabama fall into this category. However, Mississippi, Pennsylvania, and especially Tennessee, and Ohio did experience relative declines in poverty during the decade. During the 1989 to 1995 period overall, Ohio and Mississippi experienced the most consistent relative declines in poverty across Appalachian counties followed by Pennsylvania, West Virginia, Virginia, Kentucky, Tennessee, and Georgia (Figure 2.6). Only the southern tier of New York counties consistently experienced a relative increase in poverty.

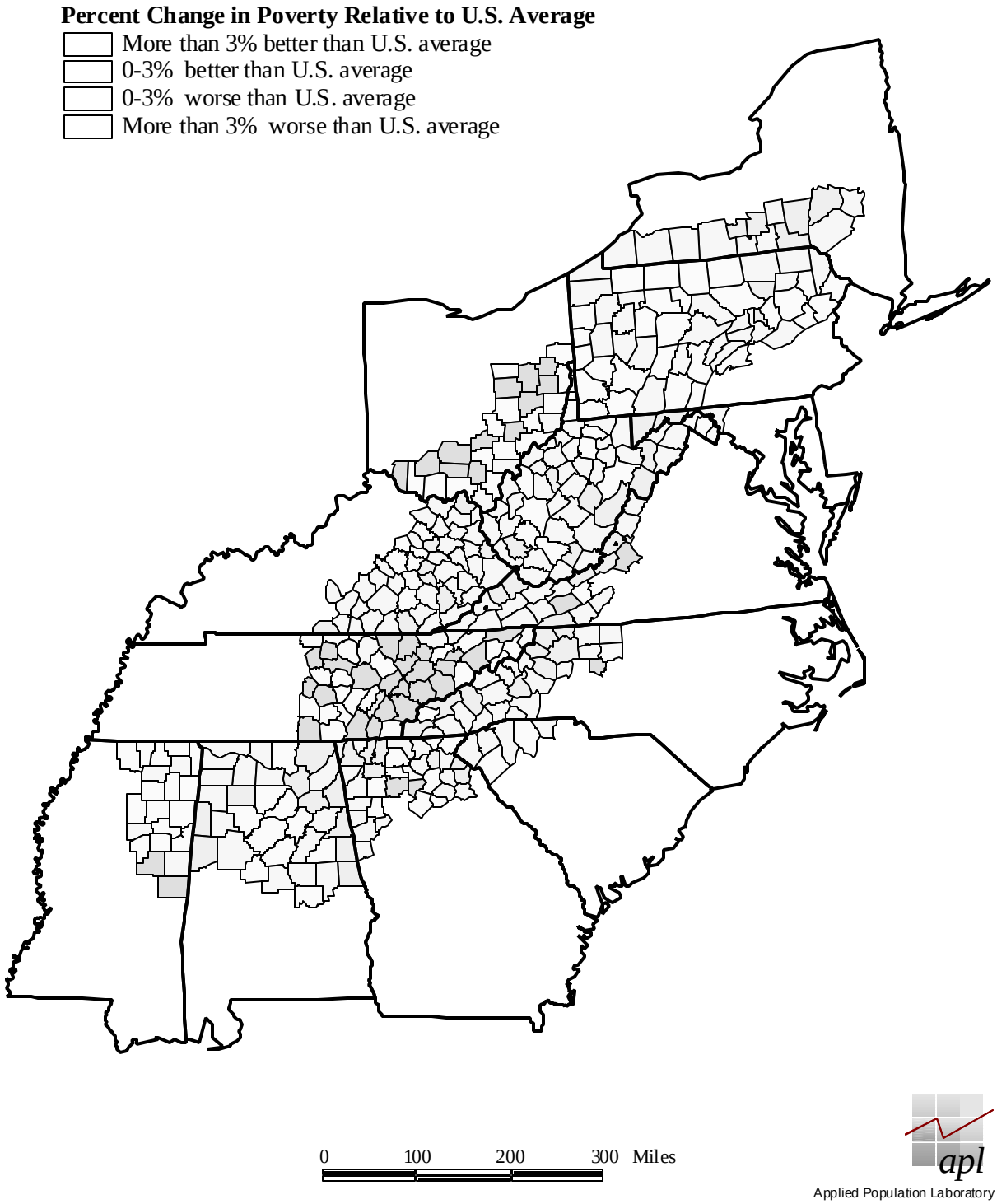
### *Development Districts*

We also compiled total poverty rates for Appalachian counties by development district (Appendix C, Table 2). There are patterns through the early and mid 1990s that are worth highlighting. Many of the development districts continue to struggle with much higher than average poverty levels. Most of these districts are in Eastern Kentucky (Buffalo Trace, Gateway Area, Big Sandy Area, Lake Cumberland, Cumberland Valley and Kentucky River) and one of these districts is in Alabama (South Central Alabama). These districts started out with 1989 poverty rates of at least 25 percent and continued to have poverty rates of at least 25 percent in 1995. One district, the East Central district of Mississippi, started out with a high rate of poverty but according to the SAIP estimates, experienced a substantial decline in poverty between 1989 and 1995. This district's poverty rate declined from 33.0 percent to 24.1 percent over the six-year period. One district, West Virginia's district 4, experienced a large increase in poverty from

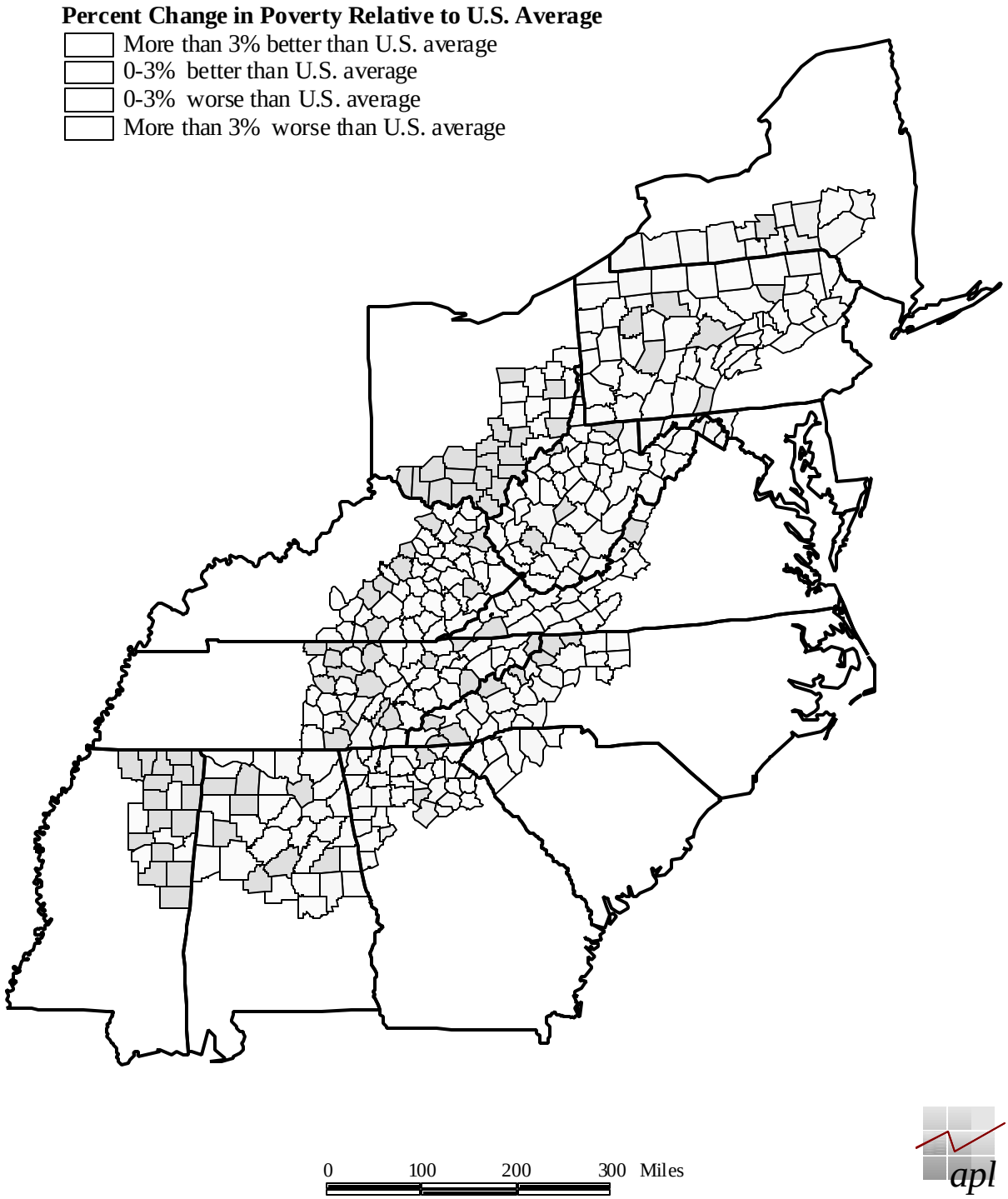
# Figure 2.4:
# Total Poverty,
# ARC Counties, 1995 (SAIPE)



# Figure 2.5:
# Change in Poverty,
# ARC Counties, 1993-1995 (SAIPE)



# Figure 2.6:
# Change in Poverty,
# ARC Counties, 1989-1995

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1989 to1995. It should be noted that every district in West Virginia experienced an increase in poverty during the period.

### *Total Poverty by Metropolitan Status*

Similar to the U.S. as a whole, there is a difference in total poverty levels between metropolitan and non-metropolitan counties in Appalachia.[6] Non-metropolitan counties historically have had higher poverty rates than metropolitan counties (Fuguitt, Brown and Beale, 1989; Lichter and McGlaughlin, 1995). This has also been the case in Appalachia. Throughout the period non-metropolitan counties have had an aggregate poverty rate about five percentage points higher than metropolitan counties (Table 2.3). This held true even in 1993 when the estimates tended to show that overall U.S. poverty increased in metropolitan areas while it stayed the same in non-metropolitan counties. The one exception to the difference is the 1989 Census poverty figures with a slightly greater, six percentage point difference, between metropolitan and non-metropolitan Appalachian counties. For 1989, the SAIPE poverty estimates did not capture the same increase in poverty between 1979 and 1989 measured by the decennial census. This could be an indication of the 1989 SAIPE model's relative inability to accurately predict poverty for counties with smaller populations.

**Table 2.3:**
**Total (All Ages) Poverty Rates by Metropolitan Status in Appalachia**

| | Number of counties | 1979 Census | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|---|---|
| **Metro** | 109 | 11.8% | 12.0% | 12.8% | 14.0% | 12.5% |
| **Nonmetro** | 297 | 17.2% | 17.1% | 18.8% | 18.9% | 17.4% |
| **ARC counties** | **406** | **14.1%** | **14.1%** | **15.3%** | **16.1%** | **14.6%** |

[6] We use the 1993 delineation of metropolitan status (U.S. Census Bureau, 1992).

For more detailed information on the effect of population size and proximity to metropolitan counties, Table 3 in Appendix C provides aggregate Appalachian total poverty rates by the 1993 rural-urban continuum codes developed by the Economic Research Service of the U.S.D.A. (Butler and Beale, 1994). Overall, there is a gradient of poverty rates based on the metropolitan hierarchy code. The poverty rates among metropolitan counties are inversely related to their size classification. Thus the largest and core metropolitan counties have the lowest poverty rates. For non-metropolitan counties, the same pattern holds true with the caveat that adjacency status also matters. Counties that are less urban (fewer people) and not adjacent to metropolitan counties are more likely to have higher poverty rates. Over time, there isn't much change in this pattern. The only movement is that the largest counties have seen their poverty rates increase faster than the other counties. Additionally, the suburban counties in the largest metropolitan areas and the counties with no urban places have seen their poverty rates decrease over the period.

### *Total Poverty by Nonmetropolitan Social and Economic Function*

Appendix C, Table 4 shows total poverty rates broken down by non-metropolitan social and economic function as developed by the Economic Research Service of the USDA (Cook and Miser 1994; See Appendix B for definitions). The table reflects the higher poverty rates that persist in Appalachian non-metropolitan counties as a whole. In each of the functional categories, the poverty rate for classified counties has decreased during the 1990s. Throughout the period, manufacturing and retirement destination counties have had the lowest poverty rates in Appalachia. By the mid-1990s, poverty in Appalachian retirement-destination counties had fallen below the national average. Not surprisingly, counties with the persistent poverty designation have had the highest rates of poverty throughout the period. These are counties that have maintained high poverty levels since the 1960 census. Persistent poverty counties in addition to government and agricultural counties do demonstrate the biggest decreases in the percent of persons living at or below poverty during the nineties. Lastly, the mining counties highlight the changes mentioned earlier with a large increase in poverty rates between 1980 and 1990 that remained high throughout the period.

### *Considering the Starting Level of Total Poverty and Subsequent Change*

Examining changes in poverty without a starting reference point can obscure the fact that while there are counties that significantly *increased* their total poverty rate, many of these counties still had relatively *low* rates even after the increase. The worsening trend, therefore, does not necessarily place these counties in a worse position relative to counties with higher rates of total poverty. For example, between 1989 (1990 Census) and 1993, counties could experience among the highest rates of increase in poverty, yet their poverty *level* among counties could remain low. This example illustrates our conviction that a comparison of changes in total poverty rates is more meaningful when the *relative* starting levels of county poverty are taken into account. To study change, therefore, we jointly consider shifts in total poverty and starting levels prior to those shifts. We cross-classify counties according to their relative *levels* of total poverty in 1989 (above or below average) with their subsequent *change* in poverty between 1989 and 1993 (above or below average). Likewise, counties are jointly grouped according to their relative levels of total poverty in 1993 and their relative change in poverty rates between 1993 and 1995.

The following tables and corresponding maps show how Appalachian counties fit into the four categories based on the comparison of individual counties with the national level of poverty at the beginning of the period and the comparison with the national change in poverty during the period. Those counties labeled "Best" (light gray) had below average levels of total poverty *and* decreased their poverty over the time period, or had below average increases. Those counties labeled "Worrisome" (dark gray) also began with below average levels of poverty, but experienced above average increases in poverty over the time period. Counties labeled "Hopeful" (white) started the period with above average levels of poverty, but decreased their poverty rates, or experienced below average increases, over the time period. Counties labeled "Worst" (black) had above average levels of total poverty *and* above average increases in poverty.

Table 2.4 shows a cross-tabulation of the 1989 poverty rates in Appalachia as determined by the 1990 Census and by the change in poverty rates between 1989 and the 1993 SAIP estimates. Here, the national benchmark for initial level of total poverty is 13.1 percent and the national

change in the total poverty rate over the four years was an increase of 3.8 percent. The percent of Appalachian counties with higher than average poverty rates was over 76 percent. A higher percentage of counties (85.2 percent) had poverty rates that were either decreasing or not increasing as rapidly as the national average. The largest proportion of counties (70.4 percent) fit into the *Hopeful* category with a higher than average starting level of poverty in 1989 but a lower than average change in poverty between 1989 and 1993. Over 14 percent were considered to be in the *Best Position* (low starting rates and smaller than average increases), while only 6.3 percent of Appalachian counties were categorized as *Worst* (high starting rates and higher than average increases).

**Table 2.4:**
**Relative Poverty Position of Appalachian Counties, 1989-1993**

| **Level** | **Change in Total (all ages) Poverty Rate Less Than U.S. (< +3.8%)** | **Change in Total (all ages) Poverty Rate Greater Than U.S. (> +3.8%)** | **Total** |
|---|---|---|---|
| **Counties Below U.S. Poverty Rate in 1989 (< 13.1%)** | ***Best***<br>59<br>14.8% | ***Worrisome***<br>34<br>8.5% | *93*<br>***23.3%*** |
| **Counties Above U.S. Poverty Rate in 1989 (> 13.1%)** | ***Hopeful***<br>281<br>70.4% | ***Worst***<br>25<br>6.3% | *306*<br>***76.7%*** |
| ***Total*** | *340*<br>***85.2%*** | *59*<br>***14.8%*** | *399*<br>***100%*** |

The comparison between Tables 2.4 and 2.5 allows us to contrast the distribution of these county types in Appalachia to the U.S. as a whole. The distribution of U.S. counties among these four categories differs somewhat, with almost a quarter of U.S. counties categorized as *Best* between 1989 and 1993, and only 5.1 percent categorized as *Worst*. A somewhat smaller percentage of U.S. counties were categorized as *Hopeful* and a higher percentage were categorized as *Worrisome*, relative to Appalachian counties.

Figure 2.7 displays the spatial distribution of these four county types for the time period 1989-1993. All of the Appalachian counties in Kentucky that had relatively high poverty in 1989 either decreased their poverty rates, or increased less than the national average and are therefore labeled *Hopeful* (white). There were no strong clustering patterns of *Best* counties, although western North Carolina and Pennsylvania had a disproportionate share. Pennsylvania, New

**Table 2.5:**
**Relative Poverty Position of all U.S. Counties, 1989-1993**

| **Level** | **Change in Poverty Rate Less Than U.S. (< +3.8%)** | **Change in Poverty Rate Greater Than U.S. (> +3.8%)** | **Total** |
|---|---|---|---|
| **Counties Below U.S. Poverty Rate in 1989 (< 13.1%)** | ***Best***<br>722<br>23.1% | ***Worrisome***<br>424<br>13.5% | 1,146<br>**36.6%** |
| **Counties Above U.S. Poverty Rate in 1989 (> 13.1%)** | ***Hopeful***<br>1,824<br>58.3% | ***Worst***<br>160<br>5.1% | 1,984<br>**63.4%** |
| **Total** | 2,546<br>**81.3%** | 584<br>**18.7%** | 3,130<br>**100%** |

York, and Georgia had a significant number of counties with lower than average poverty rates in 1989, but many of these counties increased their poverty rates at a rate greater than the national average of 5.8 percent for the period, and therefore were labeled *Worrisome* (dark gray). The Appalachian counties labeled *Worst* were largely clustered in West Virginia, and to a lesser degree along the Tennessee/North Carolina border. Two counties in Georgia and two in New York were also labeled worst due to having poverty rates just above the national average in 1989 and then experiencing a greater than average increase in poverty during the period.

Tables 2.6 and 2.7 show the *Relative Poverty Positions* for Appalachian and U.S. counties between 1993 and 1995. In contrast to the increase in poverty between 1989 and 1993, the U.S. experienced a decline in poverty (-4.3 percent) between 1993 and 1995. About 41 percent of Appalachian counties experienced an even more significant decline in poverty rates than U.S. counties on average, while 59 percent did not perform as well. Only thirteen percent of Appalachian counties were considered to be in the *Best* category, compared to 25.7 percent of all U.S. counties. Appalachia also had proportionately more counties categorized as *Worst* than did the U.S. (39.8 percent versus 35.3 percent). It is important to remember that counties whose poverty rates declined, but not as much as the national average, would be categorized as experiencing a *relative worsening trend* in total poverty. This could partially account for the significant jump in counties categorized as *Worst* in Appalachia.

**Table 2.6:**

**Relative Poverty Position of Appalachian Counties, 1993-1995**

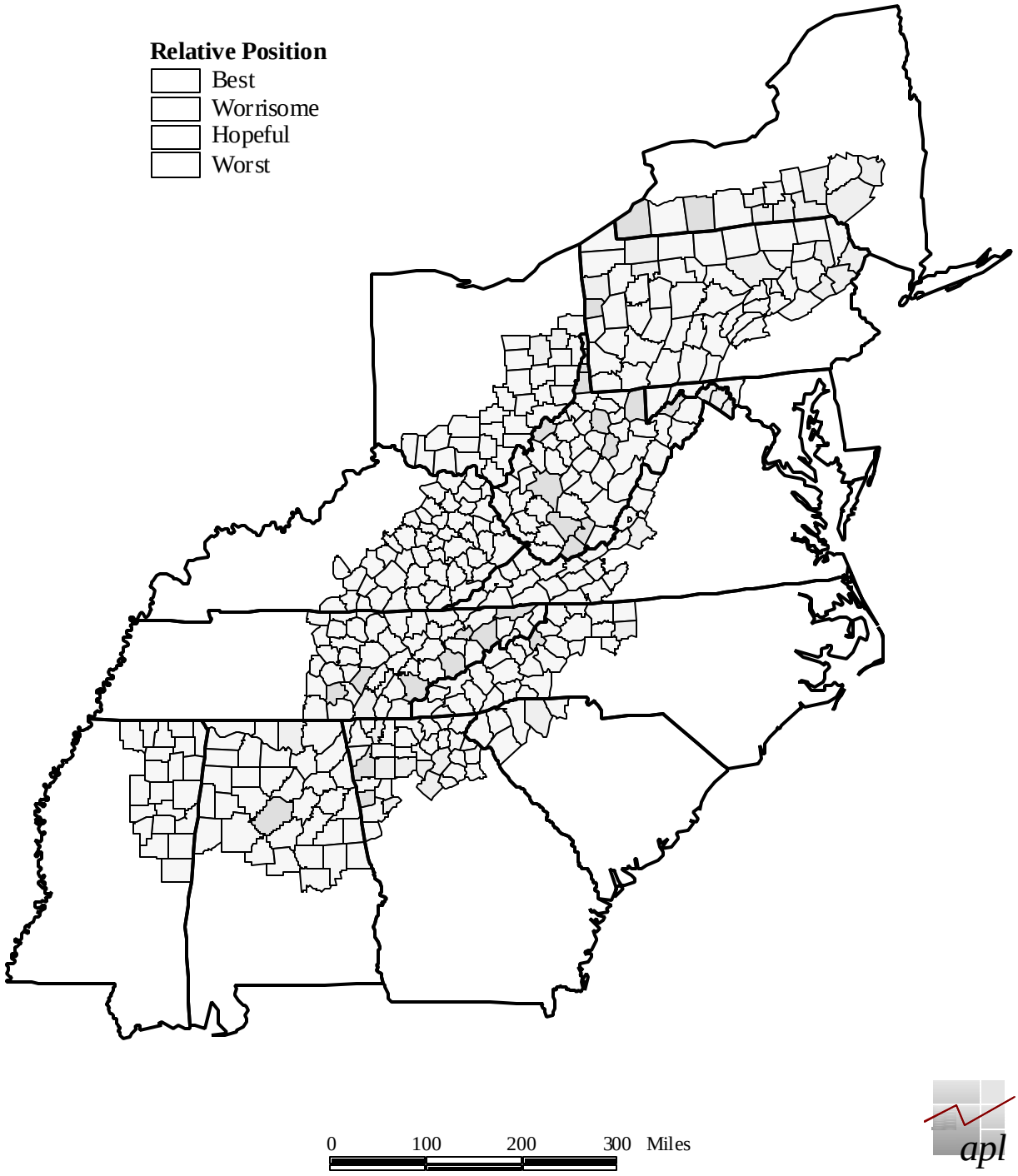
| **Level** | **Change in Poverty Rate Less Than U.S. (< -4.3%)** | **Change in Poverty Rate Greater Than U.S. (> -4.3%)** | **Total** |
|---|---|---|---|
| **Counties Below U.S. Poverty Rate in 1993 (< 15.1%)** | ***Best***<br>52<br>13.0% | ***Worrisome***<br>77<br>19.3% | 129<br>**32.3%** |
| **Counties Above U.S. Poverty Rate in 1993 (> 15.1%)** | ***Hopeful***<br>111<br>27.8% | ***Worst***<br>159<br>39.8% | 270<br>**67.7%** |
| **Total** | 163<br>**40.9%** | 236<br>**59.1%** | 399<br>**100%** |

**Table 2.7:**

**Relative Poverty Position of U.S. Counties, 1993-1995**

| | **Change in Poverty Rate Less Than U.S. (< -4.3%)** | **Change in Poverty Rate Greater Than U.S. (> -4.3%)** | **Total** |
|---|---|---|---|
| **Counties Below U.S. Poverty Rate in 1993 (< 15.1%)** | ***Best***<br>805<br>25.7% | ***Worrisome***<br>780<br>24.9% | 1,585<br>**50.6%** |
| **Counties Above U.S. Poverty Rate in 1993 (> 15.1%)** | ***Hopeful***<br>442<br>14.1% | ***Worst***<br>1,105<br>35.3% | 1,547<br>**49.4%** |
| **Total** | 1,247<br>**39.8%** | 1,885<br>**60.2%** | 3,132<br>**100%** |

# Figure 2.7:
# Relative Poverty Position,
# ARC Counties, 1989-1993



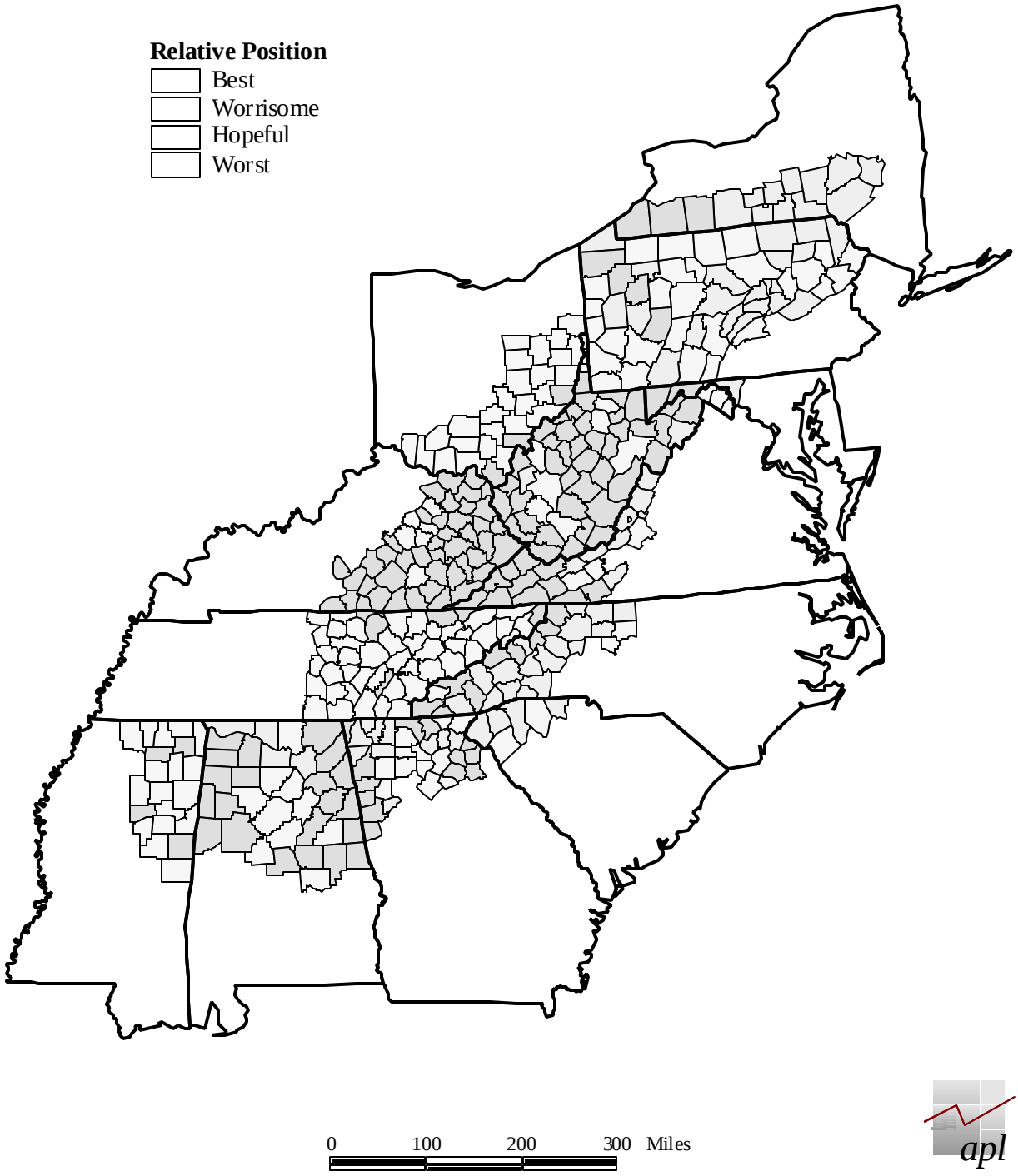
The spatial distribution of these four county types for the time period 1993-1995 appears in Figure 2.8. Although most of the Appalachian counties in Kentucky had been labeled *Hopeful* between 1989 and 1993, between 1993 and 1995 their designation predominantly changed to *Worst*. The *Worst* relative position and change counties were concentrated in Kentucky, West Virginia, western Virginia, along the North Carolina/Tennessee border, and along the eastern and western boundaries of Alabama. Again, we emphasize that certain counties labeled as "worst" may have decreased their rates of poverty, but less than the national average. Therefore, while those counties may have improved their position compared to the previous time period, their *relative* position with regard to U.S. averages remained or became "worst."

Finally, Table 2.8 provides the breakdown of counties for Appalachia and the U.S. as a whole by status above or below the national poverty level. Appalachian counties were still more likely to have poverty rates above the national average than all U.S. counties. Slightly more than two-thirds of Appalachian counties had poverty rates above the U.S. national poverty rate. During the time period covered by this analysis, a declining number of Appalachian counties exhibited these high poverty rates. Between the 1979 census and the 1995 SAIP estimates, a net of 38 counties moved from having higher than average poverty rates to lower than average poverty rates. Interestingly, most of this decline occurred between the 1979 and 1989 census, a period when the *overall* Appalachian poverty rate increased faster than the national poverty rate.

**Table 2.8:**
**Poverty levels for Appalachian and U.S. counties using SAIPE estimates for 1995.**

| | **Appalachia** | **United States** |
|---|---|---|
| **Below U.S. Poverty Rate in 1995 (< 13.1%)** | 128<br>31.5% | 1,485<br>47.3% |
| **Above U.S. Poverty Rate in 1995 (> 13.1%)** | 278<br>68.5% | 1,656<br>52.7% |

# Figure 2.8:
# Relative Poverty Position,
# ARC Counties, 1993-1995 (SAIPE)



## *SECTION III*

### *Child Poverty (ages 0-17)*

We now shift our attention from total (all ages) poverty to poverty among the Appalachian child (ages 0-17) population. Child poverty is an important indicator of overall child well being. Although many factors put children at risk, nothing predicts bad outcomes for a child more powerfully than growing up poor. Children who spend their early years in poverty often suffer negative health, social and cognitive outcomes and are much more likely to be poor as adults. Child poverty is a particularly persistent condition for minority children, whereas white children are more likely to live in poverty for a relatively shorter time. Of great concern is the increasing number of poor children in the U.S. during the last couple decades. In 1974, 10 million American children lived below the poverty line; by 1994 the number had risen to over 15 million. This represents an increase from 15 percent to 22 percent of all children, a poverty rate that is among the highest in the developed world. Child poverty in Appalachia increased slightly between 1989 and 1995, following the national pattern. In particular, young children in Appalachia have experienced the greatest increases in poverty, compared with to older children and the general population.

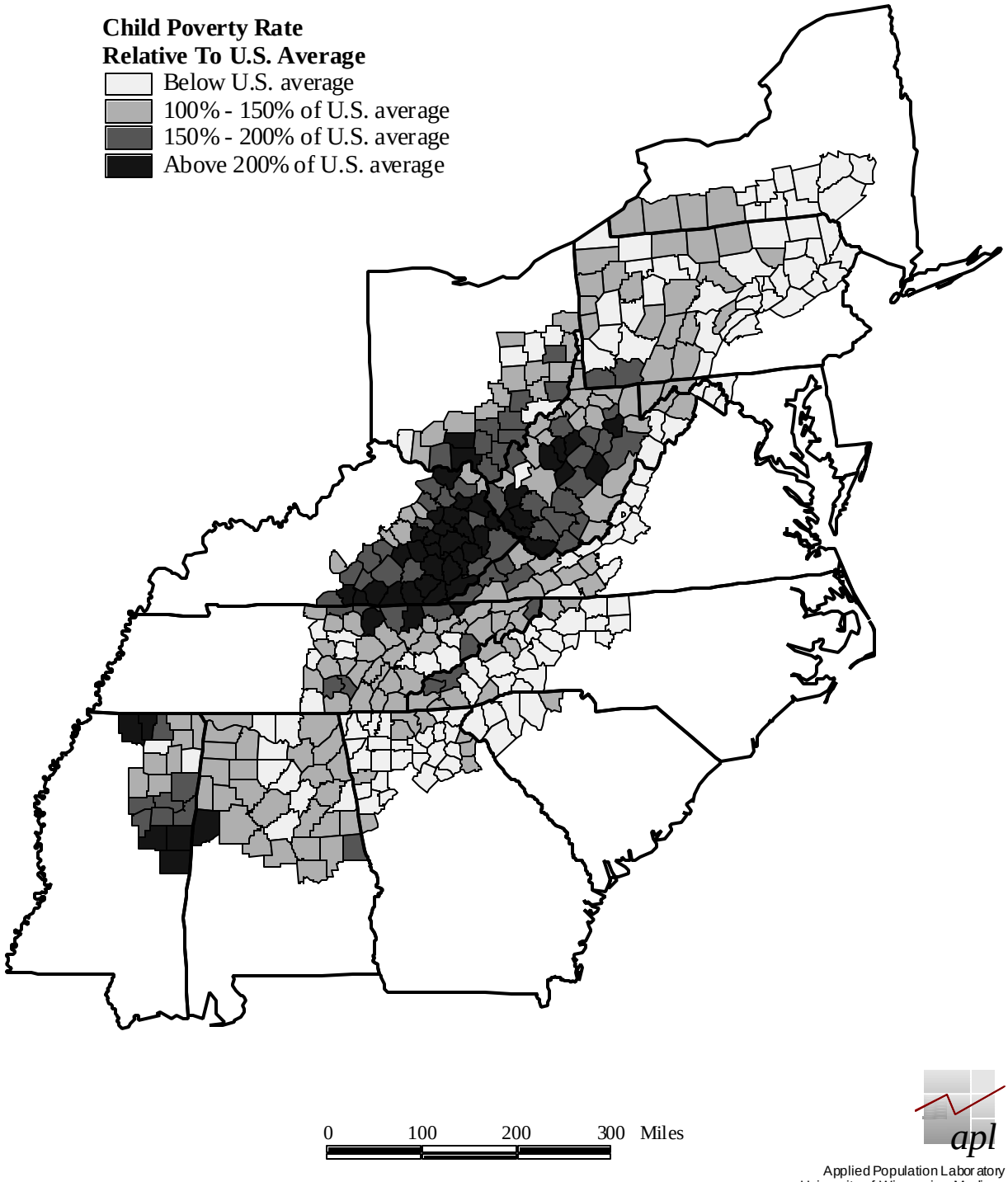
### *Changes in Child Poverty, 1989-1995*

Child poverty followed a pattern similar to that of overall poverty in Appalachia and the United States, with increases between 1989 and 1993, followed by declines between 1993 and 1995. However, child poverty in *non*-Appalachian counties in the U.S. increased significantly more between 1989 and 1993. Still, the absolute *level* of child poverty was slightly higher in Appalachian counties than in non-Appalachian counties (Table 3.1).

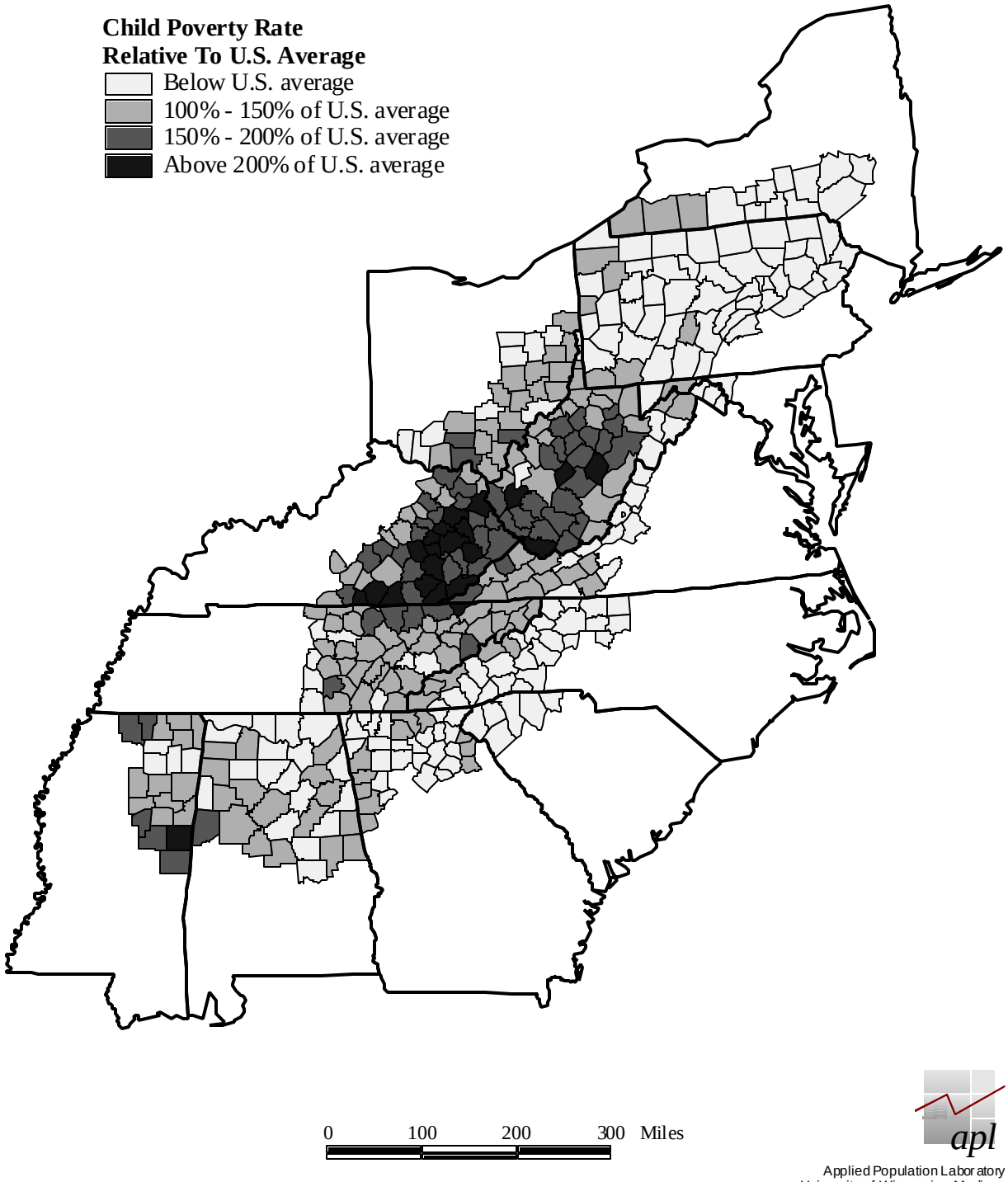
**Table 3.1:**
**Poverty rate for children age 0-17 years, Appalachian Counties and U.S. Counties outside of Appalachia**

| | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|
| Appalachian counties | 20.5% | 20.1% | 23.3% | 21.6% |
| U.S. Counties outside of Appalachia | 19.6% | 18.1% | 22.6% | 20.7% |
| **Total** | **19.6%** | **18.3%** | **22.7%** | **20.8%** |

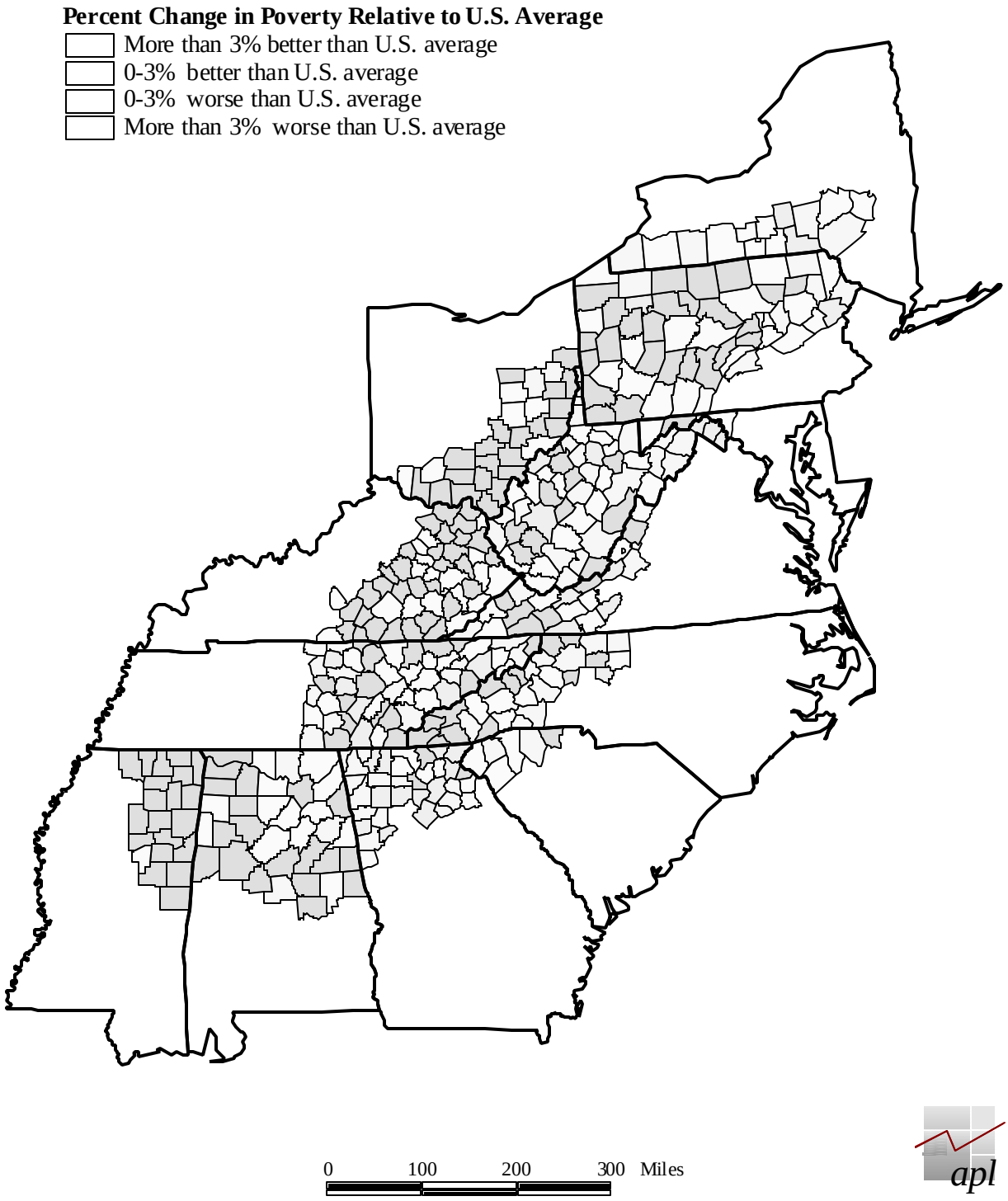
# Figure 3.1:
# Child Poverty (ages 0-17),
# ARC Counties, 1989 (Census)



# Figure 3.2:
# Child Poverty (ages 0-17), ARC Counties, 1993 (SAIPE)



# Figure 3.3:
# Change in Child Poverty (ages 0-17), ARC Counties, 1989-1993



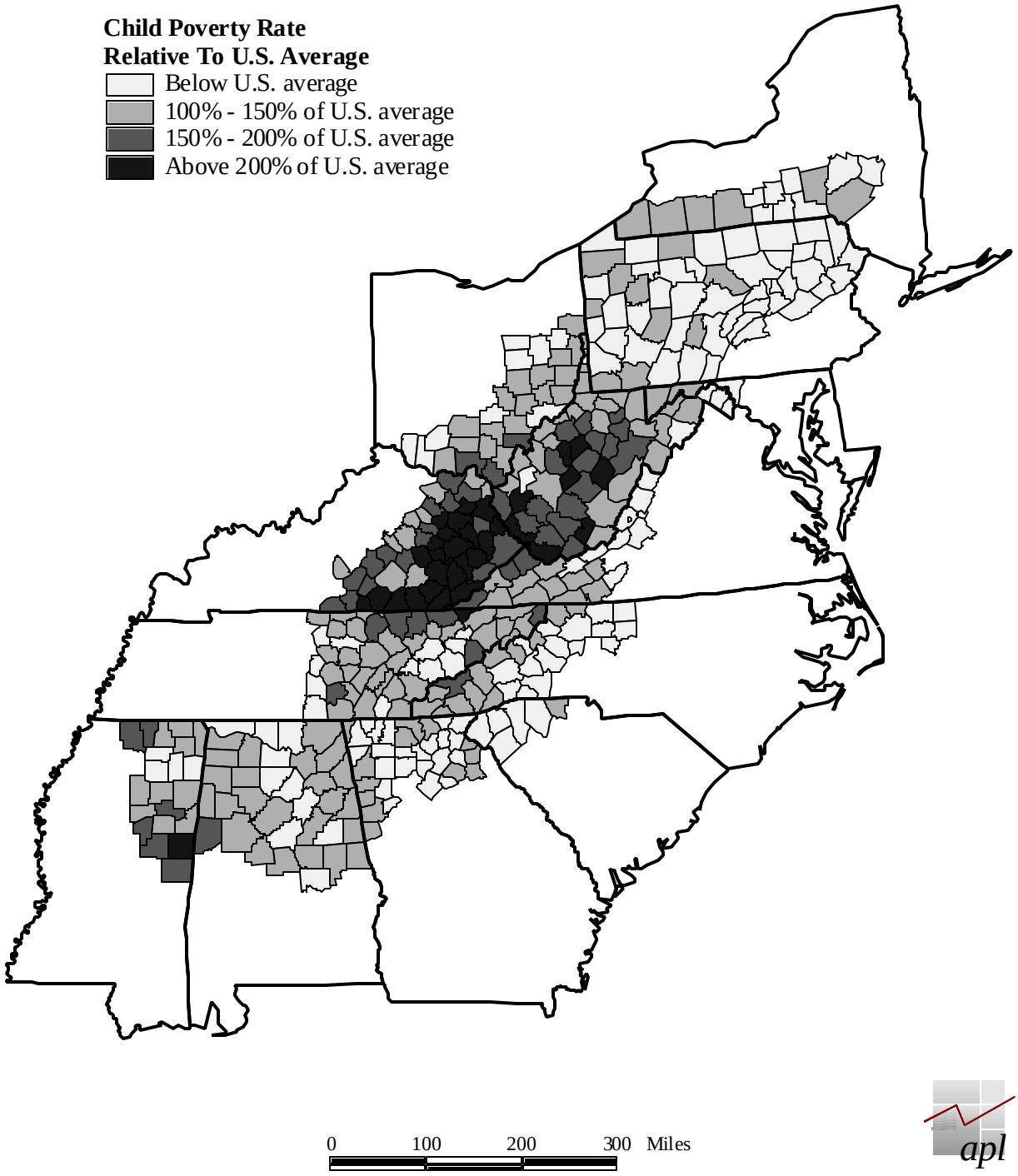
Figures 3.1, 3.2, and 3.3 display the geographical distribution of child poverty (0-17 year olds) among Appalachian counties for the years 1989 (Census) and 1993. As we might expect, counties that experienced higher *total* poverty rates, also experienced higher *child* poverty rates. While the maps of total poverty and child poverty are not identical, it is apparent that the patterns are overwhelmingly similar. The counties with higher rates of child poverty in 1989 were noticeably concentrated in eastern Kentucky, and significant portions of northern Tennessee, West Virginia, southern Ohio, and Mississippi. The geographic pattern of child poverty also shifted between 1989 and 1993, in a similar pattern to the shifts for total poverty.

The geographical distribution of SAIPE child poverty rates across Appalachia in 1993 (Figure 3.2) is quite similar to the 1989 distribution, particularly the concentration in eastern Kentucky and West Virginia.

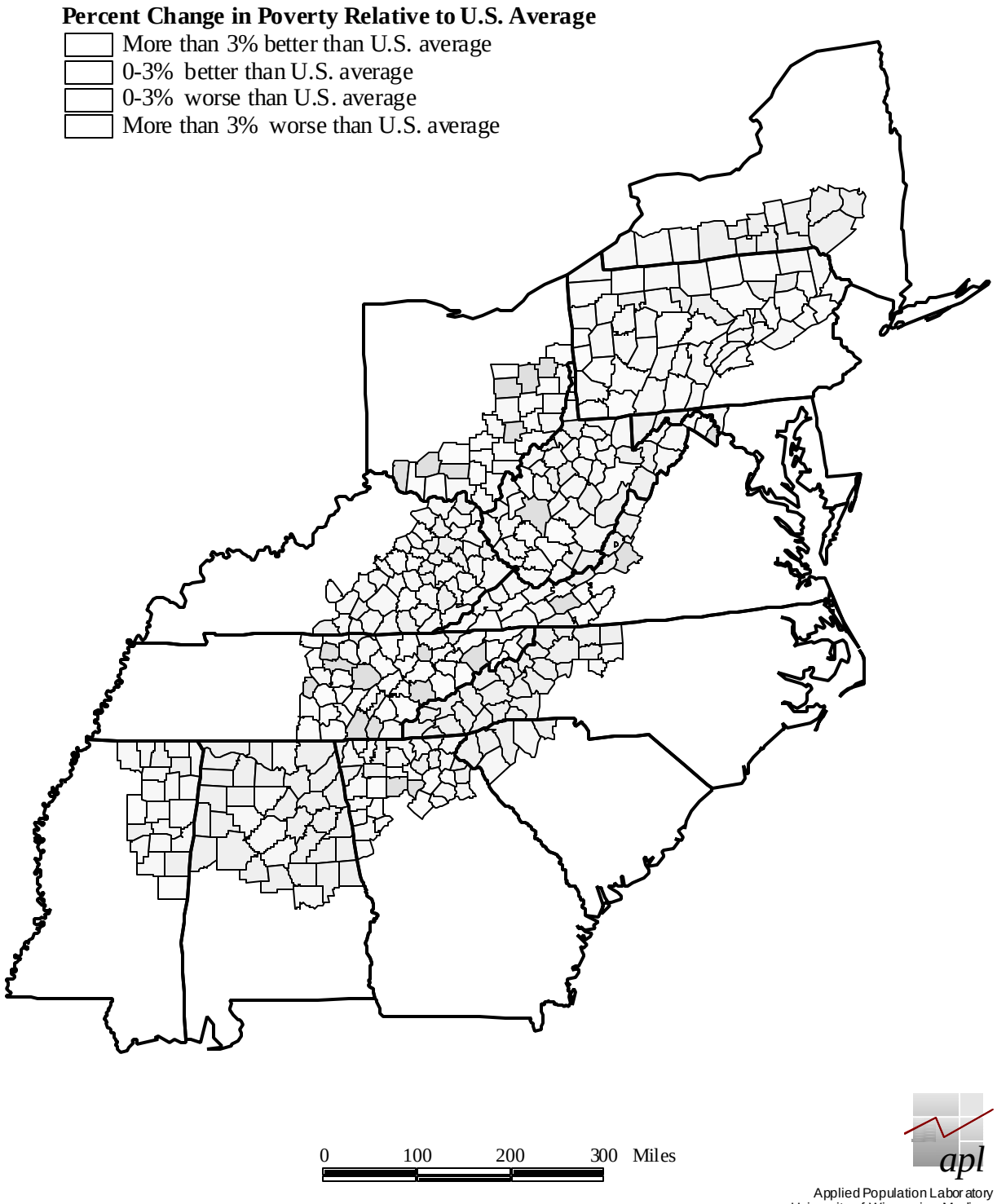
Figure 3.3 allows us to examine changes in child poverty rates between 1989 (1990 Census) and the 1993 SAIP estimate more closely. For example, although both Figure 3.1 and 3.2 indicate that eastern Kentucky had relatively high concentrations of child poverty in both time periods, change in all the ARC Kentucky counties was a fairly evenly distributed relative improvement. The dominance of black and white counties in Figure 3.3 indicates that between 1989 and 1993 Appalachia experienced a reduction in child poverty that was greater than the national average. The most significant relative increases in child poverty in Appalachia between 1989 and 1993 were in West Virginia, northern Georgia, Tennessee, and the southern tier of New York.

Again not surprisingly Appalachian child poverty in 1995 (Figure 3.4) was distributed similarly to total poverty, with higher child poverty counties clustered in eastern Kentucky and West Virginia. However, between 1993 and 1995 a considerable majority of ARC counties either did not decrease their child poverty rates as much as the U.S. averages, or *increased* their child poverty rates during the two-year period (Figure 3.5). During this period relative increases in child poverty were most expansive in Alabama, the Carolinas, and New York, followed by Kentucky, West Virginia, Virginia, Pennsylvania, Mississippi, and Georgia. Only Ohio and Tennessee experienced fairly consistent relative declines in child poverty during the period. Finally, Figure 3.6 examines change in child poverty between the 1990 Census and the 1995 SAIP estimate

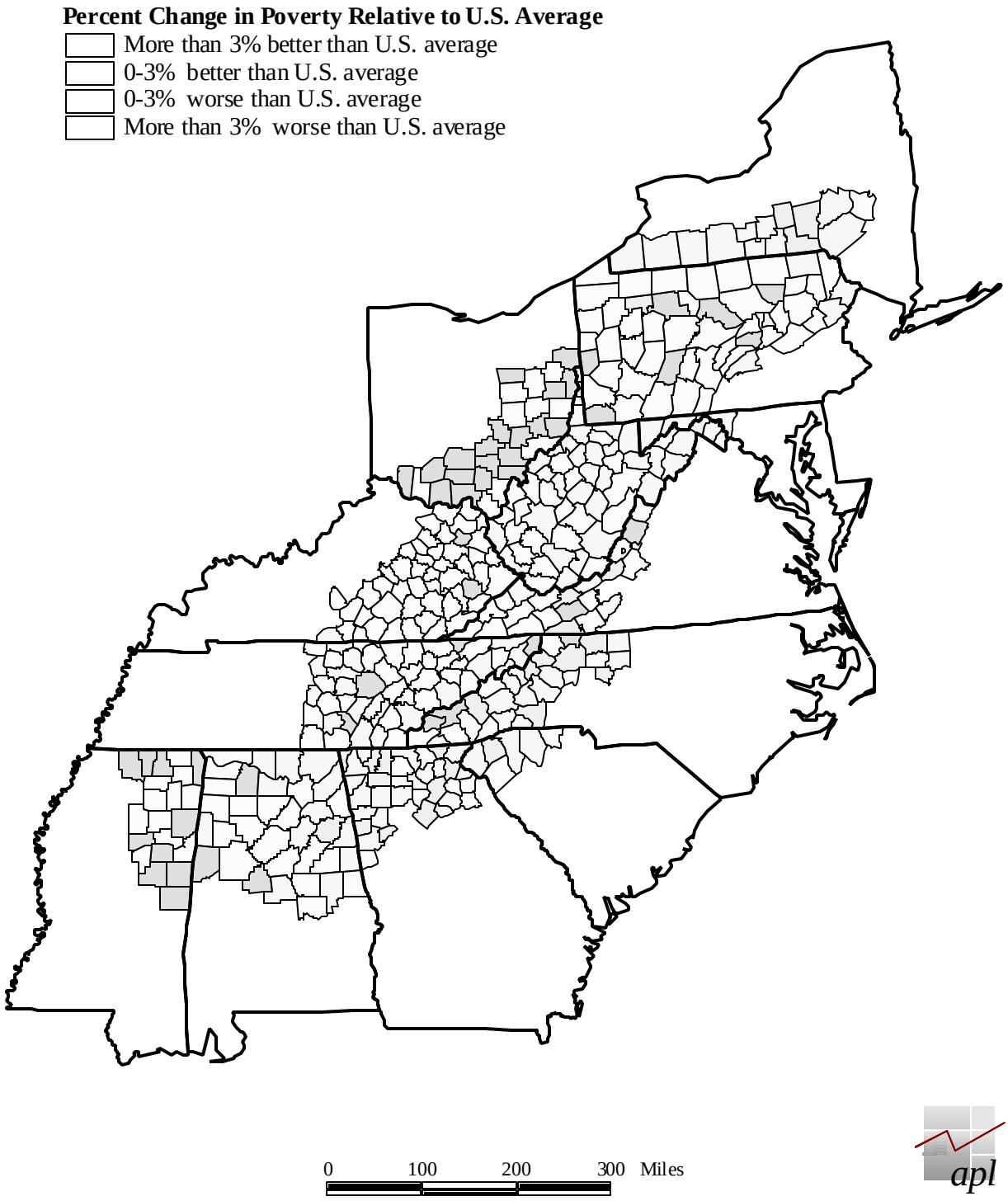
# Figure 3.4:
# Child Poverty (ages 0-17), ARC Counties, 1995 (SAIPE)



# Figure 3.5:
# Change in Child Poverty (ages 0-17), ARC Counties, 1993-1995 (SAIPE)



# Figure 3.6:
# Change in Child Poverty (ages 0-17), ARC Counties, 1989-1995



(1989-1995). The relative increases in child poverty experienced between 1989 and 1993 were tempered by the declines between 1993 and 1995. The most significant relative declines in child poverty between 1989 and 1995 were clustered in southern Ohio and Mississippi. Increases in child poverty over the six-year period were most notably clustered in the New York, West Virginia, northern Georgia and Alabama, and the western Carolinas. Many of these counties, however, still had relatively low child poverty rates in 1995.

### *Considering the Starting Level of Child Poverty and Subsequent Change*

As discussed with our comparison of total poverty rate changes, comparison of changes in child poverty rates is more meaningful when the *relative* starting levels of county child poverty are taken into account. Therefore we examine the *Relative Child Poverty Position* of ARC counties for the most recent period, 1993-1995. Table 3.2 tabulates the 1993 poverty rates in Appalachian counties and the change in poverty between 1993 and 1995. The national benchmark for level of child poverty was 22.7 percent and the national change in the child poverty rate over the two years was a decrease of 4.2 percent. The percent of counties in Appalachia with higher than average child poverty rates was about 57 percent. A higher percentage of counties (69.7 percent) had child poverty rates that were either increasing, or decreasing less than the national average. The largest proportion of Appalachian counties (40.1 percent) fit into the Worst category with a higher than average starting level of child poverty in 1993, *and* a worse than average change in child poverty between 1993 and 1995. Only 13 percent were considered to be in the *Best Position* (low starting rates and better than average declines). As would be expected, compared to the U.S. as a whole (Table 3.3), Appalachia has a significantly greater proportion of its counties in the *Worst* position, and significantly fewer in the *Best* position.

Figure 3.7 examines the geographic distribution of the relative child poverty position among Appalachian counties between 1993 and 1995. As Table 3.2 above describes, over 40 percent of Appalachian counties were categorized as "worst" between 1993 and 1995. Those counties with high rates of child poverty in 1993 and worse than average change in the following two year period were clustered in eastern Kentucky, West Virginia, and in parts of Mississippi and Alabama. There were smaller clusters of these worst category counties in New York, Virginia, North Carolina, and Georgia. Of the 13 percent of Appalachian counties that were categorized

**Table 3.2:**
**Relative Child Poverty Position of Appalachian Counties, 1993-1995**

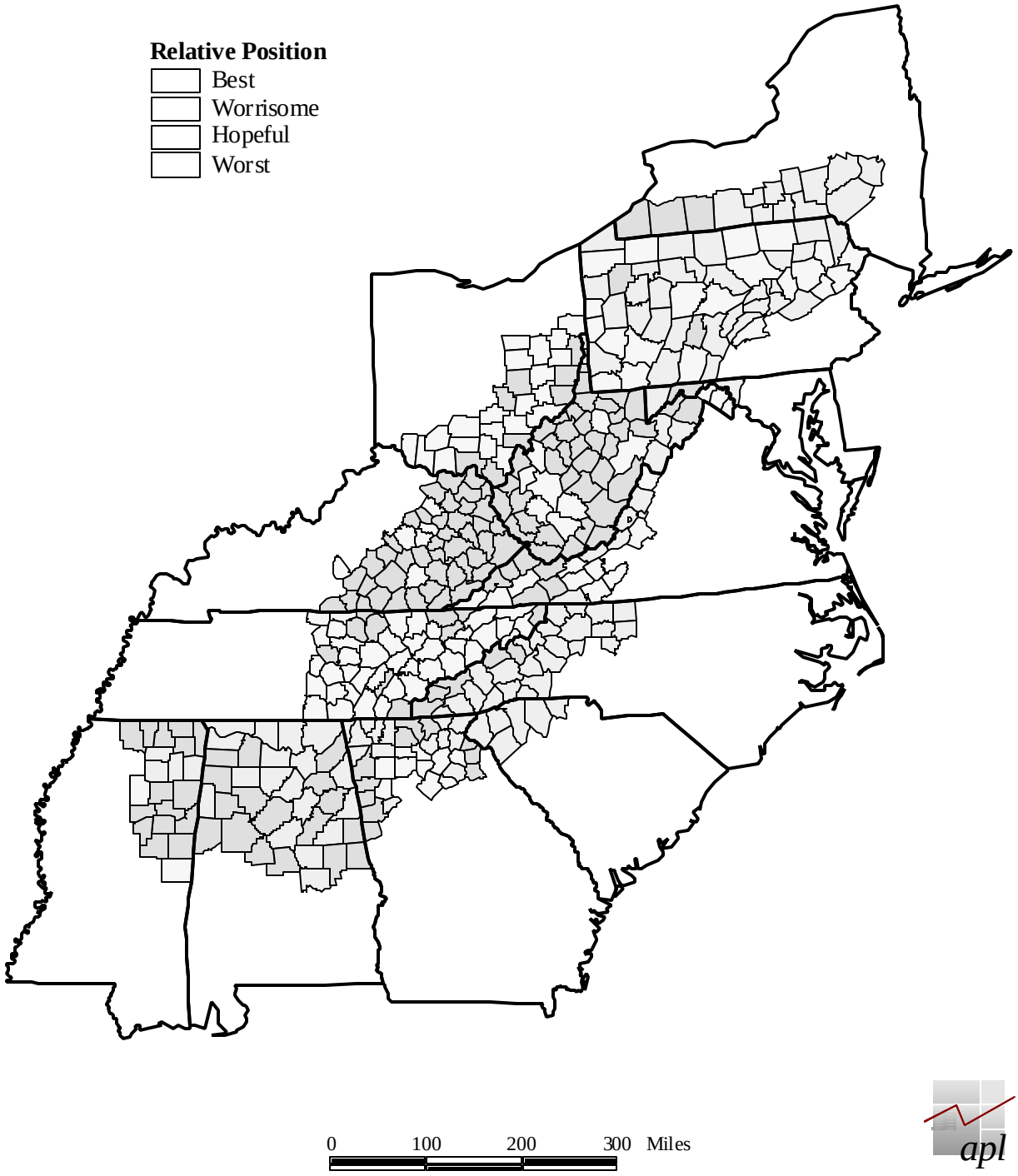
| Level | Change in Child Poverty Rate Less Than U.S. (< -4.2%) | Change in Child Poverty Rate Greater Than U.S. (> -4.2%) | Total |
|---|---|---|---|
| Counties Below U.S. Child Poverty Rate in 1993 (< 22.7%) | ***Best***<br>52<br>13.0% | ***Worrisome***<br>118<br>29.6% | *170*<br>***42.6%*** |
| Counties Above U.S. Child Poverty Rate in 1993 (> 22.7%) | ***Hopeful***<br>69<br>17.3% | ***Worst***<br>160<br>40.1% | *229*<br>***57.4%*** |
| ***Total*** | *121*<br>***30.3%*** | *278*<br>***69.7%*** | *399*<br>***100%*** |

**Table 3.3:**
**Relative Child Poverty Position of U.S. Counties, 1993-1995**

| Level | Change in Child Poverty Rate Less Than U.S. (< -4.2%) | Change in Child Poverty Rate Greater Than U.S. (> -4.2%) | Total |
|---|---|---|---|
| Counties Below U.S. Child Poverty Rate in 1993 (< 22.7%) | ***Best***<br>752<br>24.0% | ***Worrisome***<br>1,108<br>35.4% | *1,860*<br>***59.4%*** |
| Counties Above U.S. Child Poverty Rate in 1993 (> 22.7%) | ***Hopeful***<br>254<br>8.1% | ***Worst***<br>1,018<br>32.5% | *1,272*<br>***40.6%*** |
| ***Total*** | *1,006*<br>***32.1%*** | *2,126*<br>***67.9%*** | *3,132*<br>***100%*** |

as "best", there did not appear to be any significant geographic concentrations, except in the counties adjoining the Atlanta, Georgia, Cincinnati and Columbus, Ohio metropolitan areas, as well as the westernmost Appalachian counties in Tennessee along Interstate 65. Counties classified as "worrisome" seemed to follow a sickle-shaped pattern from New York and Pennsylvania south, along the western Virginia border, the western Carolina borders, into northern Georgia and Alabama. "Hopeful" counties, with above average child poverty but better than average change in child poverty, were predominantly located in Tennessee but also appeared in Ohio and West Virginia.

# Figure 3.7:
# Relative Child Poverty Position, ARC Counties, 1993-1995 (SAIPE)



### *Child Poverty by Age Group (0-4 and 5-17)*

While poverty certainly has negative consequences for the general population, considerable research has shown that poverty can be particularly detrimental to the development of very young children. Poverty rates for children ages 0-4 years were, and continue to be, considerably higher than for children ages 5-17 years both nationally and in Appalachia. This gap was even wider for Appalachian counties than for the remainder of the U.S., with 27.3 percent of children ages 0-4 in poverty, compared to 19.5 percent for children ages 5-17 in 1995.

**Table 3.4:**
**Poverty rate for children ages 0-4, Appalachian Counties and U.S. Counties outside of Appalachia**

| | **1989 SAIPE** | **1989 Census** | **1993 SAIPE** | **1995 SAIPE** |
|---|---|---|---|---|
| Appalachian counties | 24.9% | 22.8% | 28.7% | 27.3% |
| U.S. counties outside of Appalachia | 23.9% | 19.9% | 27.8% | 25.5% |
| **Total** | **23.9%** | **20.1%** | **27.8%** | **25.7%** |

**Table 3.5:**
**Poverty rate for children ages 5-17, Appalachian Counties and U.S. Counties outside of Appalachia**

| | **1989 SAIPE** | **1989 Census** | **1993 SAIPE** | **1995 SAIPE** |
|---|---|---|---|---|
| Appalachian counties | 18.7% | 19.2% | 21.1% | 19.5% |
| U.S. counties outside of Appalachia | 17.7% | 17.4% | 20.4% | 18.7% |
| **Total** | **17.7%** | **17.5%** | **20.4%** | **18.7%** |

In light of the markedly higher poverty rates in Appalachia for *young* children (aged 0-4), we focus on this age group in the following maps. In 1989, the spatial patterns for young child

poverty and total child poverty were similar among Appalachian counties (Figure 3.8). In 1993 (Figure 3.9) the geographic distribution of total child poverty and young child poverty were remarkably similar. Despite similarities in the spatial *patterns*, of child poverty, the actual *rates* of young child poverty were significantly higher in 1993 (see Tables 3.4 and 3.5, above).

Comparing change in young child poverty between 1989 and 1993 (Figure 3.10), with change in total child poverty over the same period (Figure 3.3), change in *young* child poverty was very similar relative to the U.S. average change. Only in Virginia did a recognizably greater number of counties experience on average significant increases in young child poverty compared to overall child poverty.

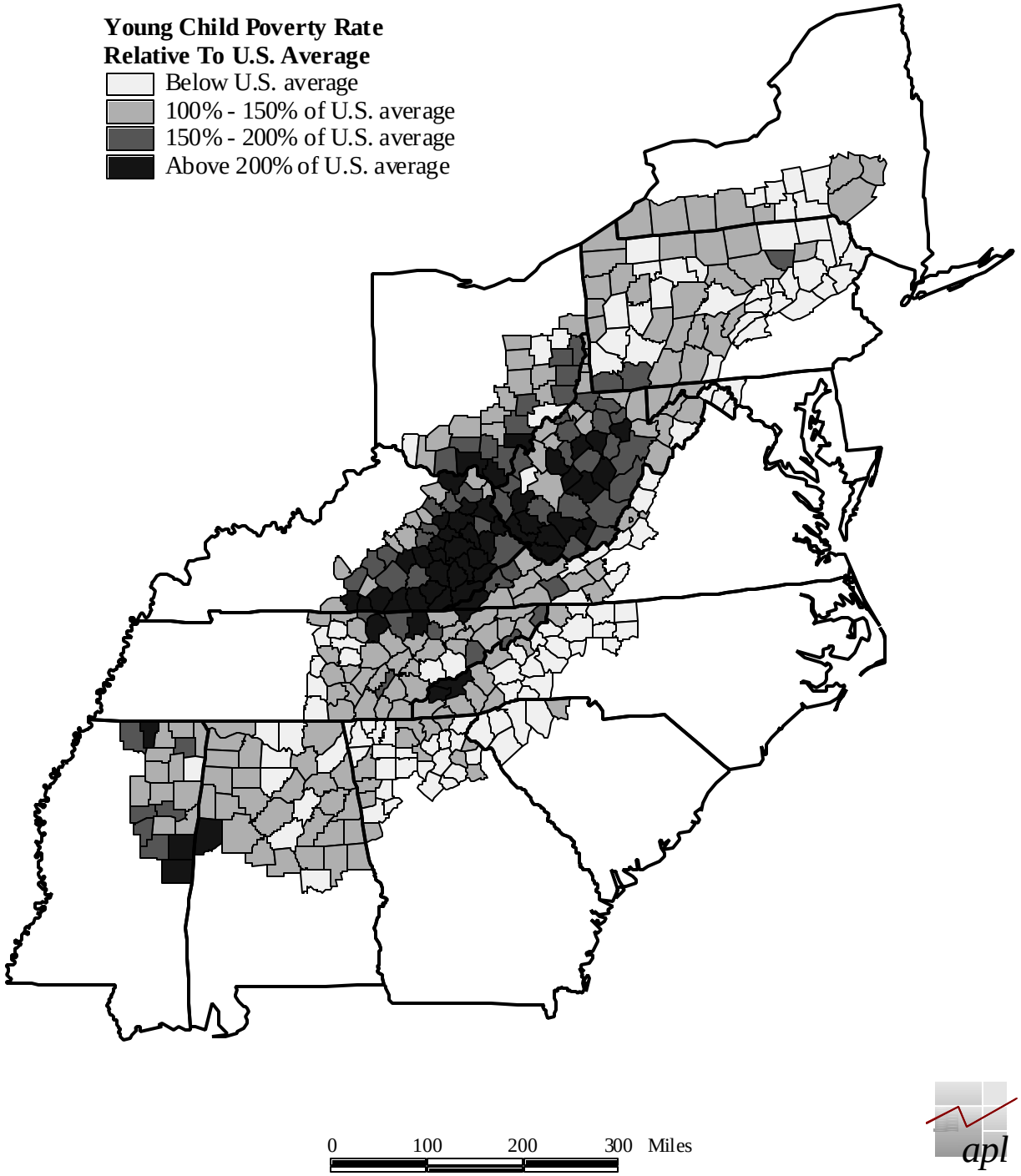
Figure 3.11 provides the geographic distribution of the 1995 SAIP estimates for young child poverty. Again, the higher than average (compared to U.S.) poverty counties were concentrated in eastern Kentucky and West Virginia. Between 1993 and 1995 different patterns emerged with regard to change in young child poverty (Figure 3.12). Compared to change in overall child poverty (Figure 3.5), a significant cluster of counties in eastern Kentucky, western Virginia, and in southern West Virginia performed much better than national average. Relatively poor performance between 1993 and 1995 was observed for Alabama, the western Carolinas, Pennsylvania, and New York.

Table 3.6 provides a breakdown of child poverty rates for the three sub-regions of Appalachia. Similar to the overall poverty rates for the sub-regions, the Central sub-region continued to experience the highest child poverty rates within Appalachia. According to the 1995 estimates, more than one-third of the children who lived in the Central sub-region lived in households with incomes under the poverty line, with the other three regions ranging from 20.1 percent to 21.6 percent.

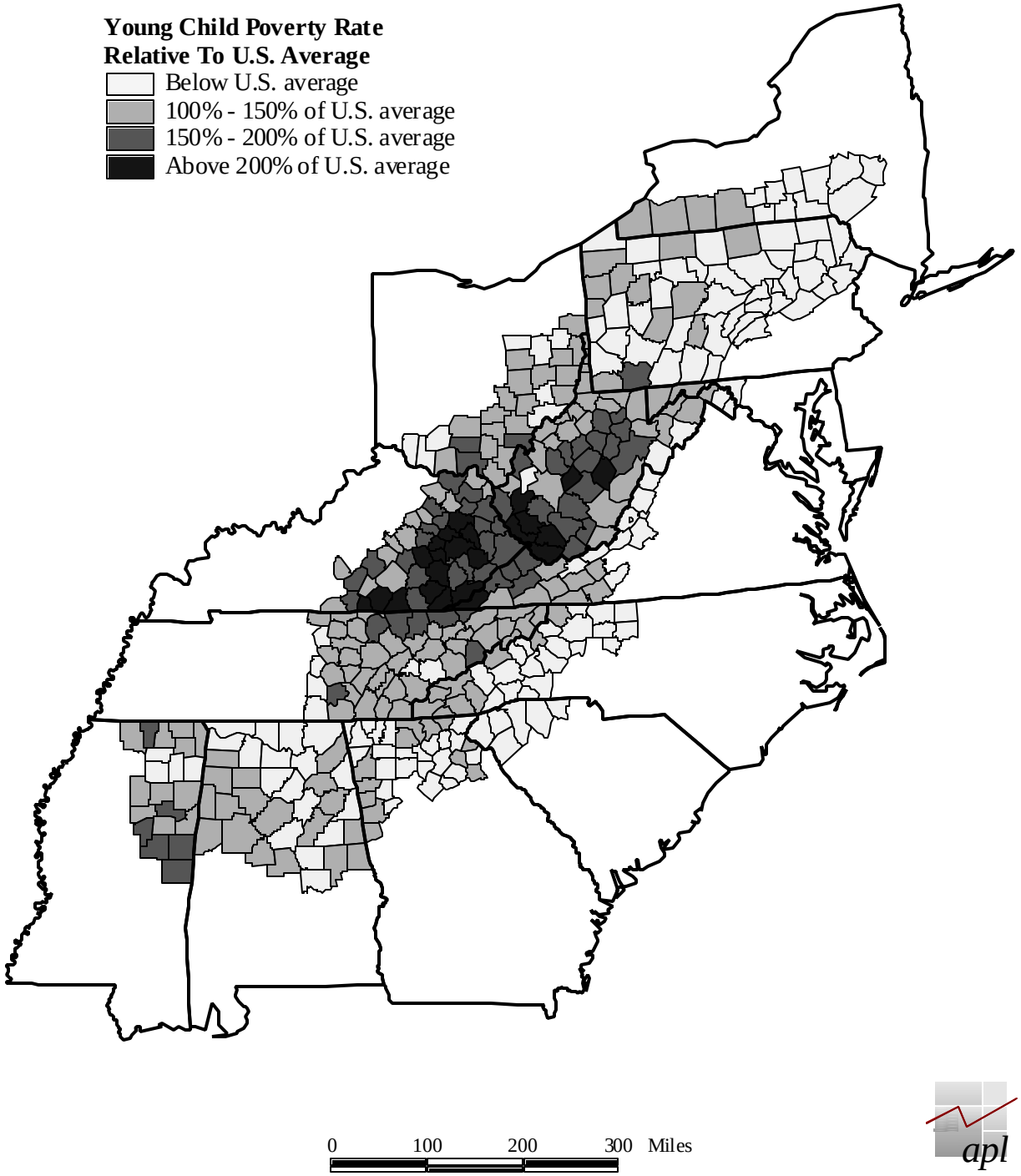
**Table 3.6:**
**Poverty rate for children age 0-17 years, by region within Appalachia**

| | Number of counties | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|---|
| **Northern** | 144 | 18.6% | 19.2% | 22.2% | 20.3% |
| **Southern** | 177 | 18.3% | 18.1% | 21.3% | 20.1% |
| **Central** | 85 | 37.6% | 32.9% | 37.2% | 34.7% |
| **Appalachia** | **406** | **20.5%** | **20.1%** | **23.3%** | **21.6%** |

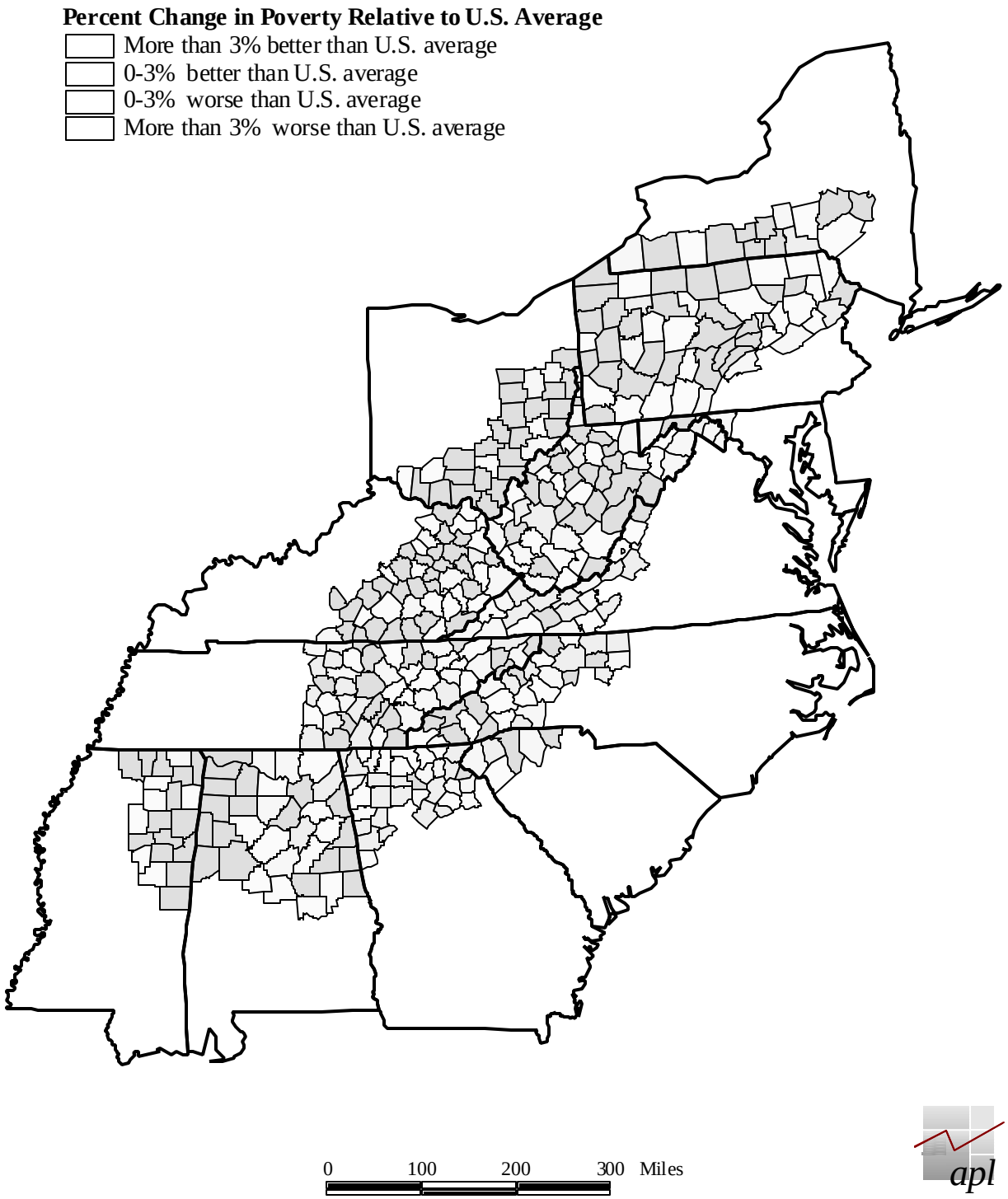
# Figure 3.8:
# Young Child Poverty (ages 0-4), ARC Counties, 1989 (Census)



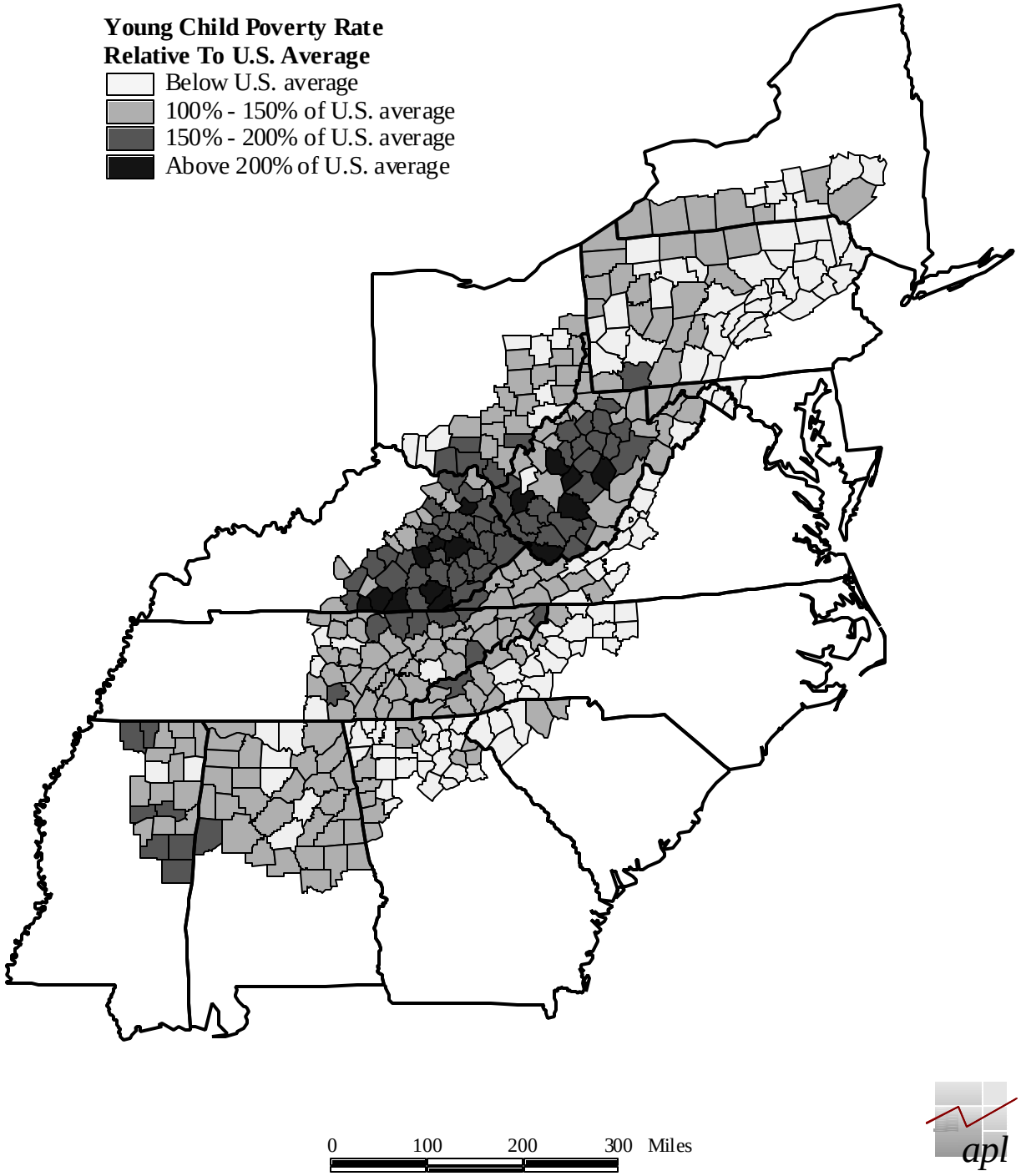
# Figure 3.9:
# Young Child Poverty (ages 0-4), ARC Counties, 1993 (SAIPE)



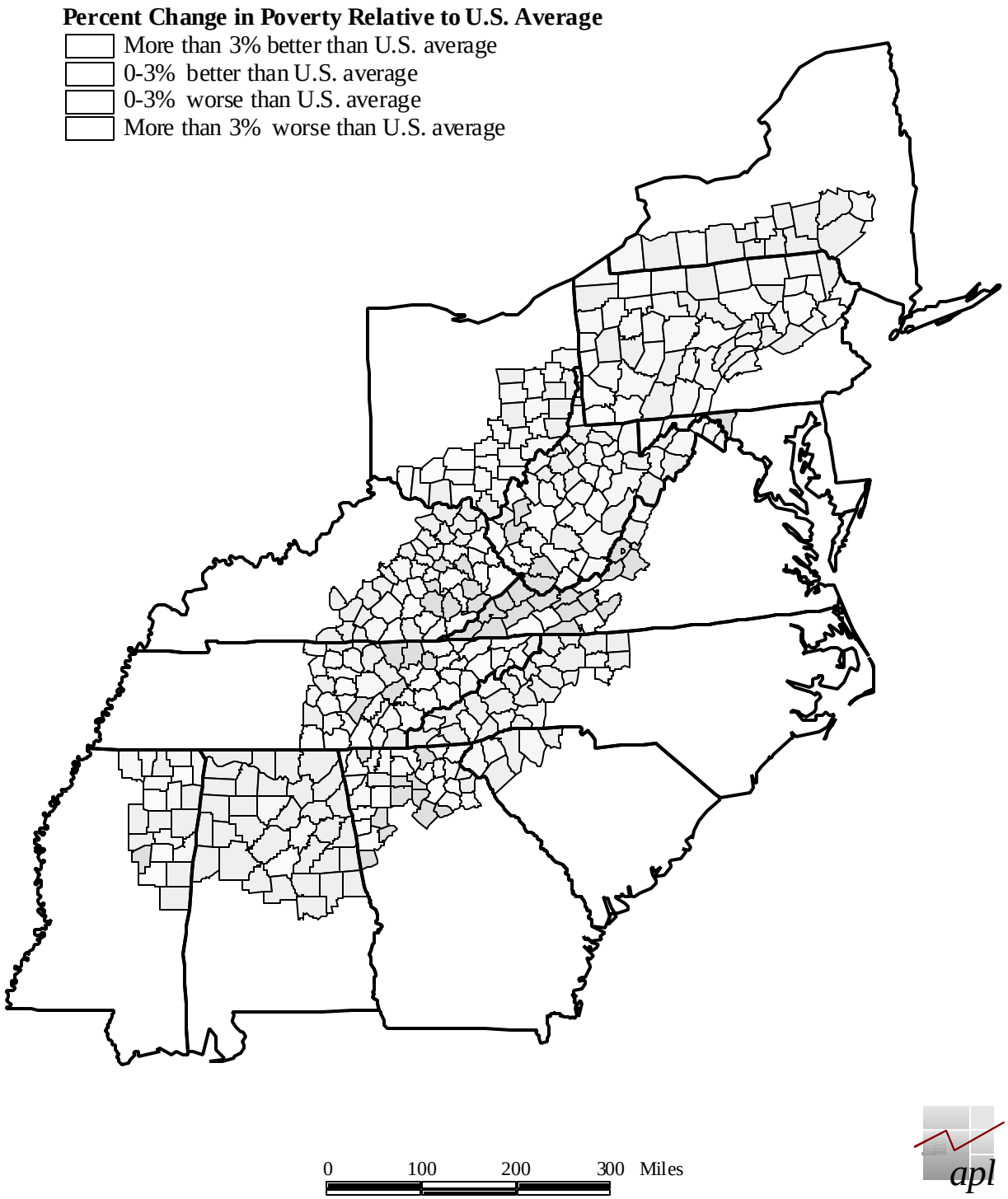
# Figure 3.10:
# Change in Young Child Poverty (ages 0-4), ARC Counties, 1989-1993



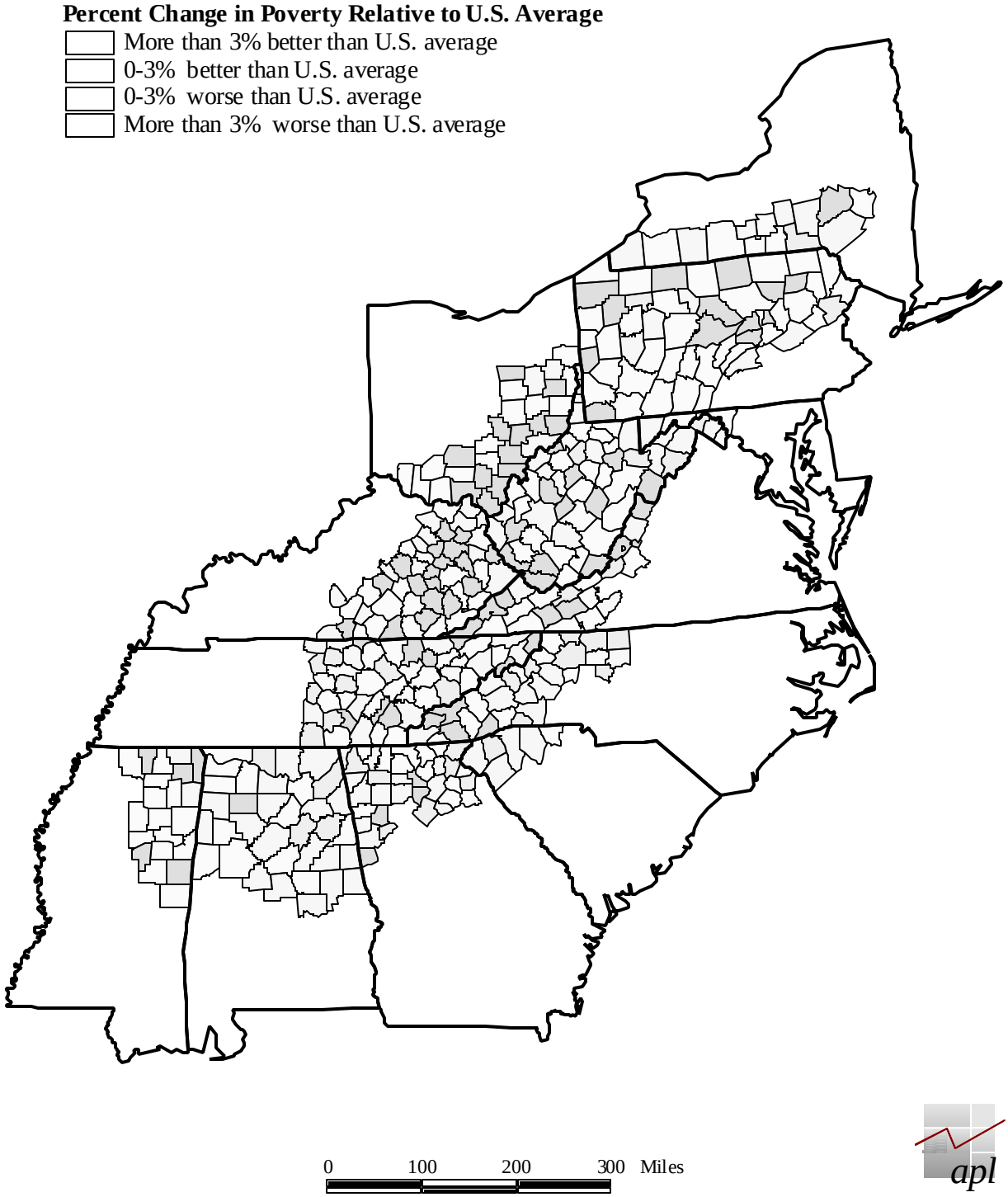
# Figure 3.11:
# Young Child Poverty (ages 0-4), ARC Counties, 1995 (SAIPE)



# Figure 3.12:
# Change in Young Child Poverty (ages 0-4), ARC Counties, 1993-1995 (SAIPE)



# Figure 3:13:
# Change in Young Child Poverty (ages 0-4), ARC Counties, 1989-1995



Among the Appalachian states, counties within Kentucky had, by far, the highest child poverty rates in 1989 (see Table 3.7). Child poverty in these Kentucky counties increased through 1993, as it did in the majority of Appalachian counties. Georgia had the lowest child poverty rates among its Appalachian counties in 1989, and maintained this relative position, although they did experience overall increases over the next several years.

**Table 3.7:**
**Poverty rates for children ages 0-17 years, by state within Appalachia**

| | Number of counties | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|---|
| **Alabama** | 37 | 20.6% | 20.6% | 23.3% | 23.0% |
| **Georgia** | 37 | 12.7% | 12.1% | 16.4% | 15.1% |
| **Kentucky** | 49 | 41.4% | 36.1% | 39.8% | 37.8% |
| **Maryland** | 3 | 18.4% | 17.2% | 19.3% | 18.7% |
| **Mississippi** | 22 | 28.0% | 28.6% | 28.6% | 27.1% |
| **New York** | 14 | 14.2% | 16.4% | 21.0% | 20.7% |
| **North Carolina** | 29 | 16.2% | 15.5% | 18.2% | 18.5% |
| **Ohio** | 29 | 24.5% | 23.6% | 24.8% | 21.8% |
| **Pennsylvania** | 52 | 16.8% | 17.4% | 19.8% | 18.0% |
| **South Carolina** | 6 | 14.1% | 14.9% | 17.9% | 18.0% |
| **Tennessee** | 50 | 21.9% | 21.0% | 25.8% | 22.5% |
| **Virginia** | 23 | 26.4% | 21.5% | 25.5% | 22.5% |
| **West Virginia** | 55 | 26.1% | 26.2% | 32.6% | 30.0% |
| **Appalachia** | **406** | **20.5%** | **20.1%** | **23.3%** | **21.6%** |

Metropolitan status is another county-level characteristic that may influence child poverty rates. Table 3.8 indicates that non-metropolitan counties in Appalachia have had, and continue to have, significantly higher rates of child poverty than metropolitan counties. While both county types follow the same general trend between 1989, 1993 and 1995, the particular economic conditions that exist in non-metropolitan Appalachia, including high unemployment, industry and job loss, and lack of adequate infrastructure may contribute to the sustained nature of their higher child poverty rates.

Table 3.9 provides more specific information regarding county types and child poverty rates. While in general non-metropolitan counties in Appalachia have higher child poverty rates than do metropolitan counties, the Urban Continuum code (used earlier in Section II) provides an even closer correlation with poverty rates. For example, in the 1989 Census, *metro-core*

**Table 3.8:**
**Poverty rates for children age 0-17 years, by 1993 metropolitan status within Appalachia.**

| | Number of counties | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|---|
| **Metropolitan** | 109 | 16.9% | 17.2% | 20.5% | 18.9% |
| **Nonmetropolitan** | 297 | 25.0% | 24.0% | 27.0% | 25.3% |
| **Appalachia** | **406** | **20.5%** | **20.1%** | **23.3%** | **21.6%** |

counties in Appalachia had a 14.4 percent child poverty rate. The child poverty rate increased along the Urban Continuum scale to 26.5 percent for *nonmetro, 20,000 urban population, non-adjacent to metro* Appalachian counties. The child poverty rate was somewhat lower (23.9 percent) for the next category of counties, but increased again to 30.6 percent, fell to 27.6 percent, and then rose to a 35.5 percent child poverty rate for *Non-metro, rural adjacent to metro* Appalachian counties. The 1993 and 1995 SAIP estimates followed this exact pattern of relative child poverty rates along the Urban Continuum.

**Table 3.9:**
**Poverty rates for children age 0-17 years, by 1993 Urban Continuum (Beale Code) within Appalachia.**

| 1993 Beale Category | Number of counties | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|---|
| **Metro-core** | 7 | 14.2% | 14.4% | 17.2% | 15.0% |
| **Metro-fringe** | 12 | 16.6% | 15.6% | 18.7% | 16.4% |
| **Metro-medium** | 59 | 17.8% | 17.8% | 21.7% | 20.0% |
| **Metro-small** | 31 | 17.8% | 18.9% | 21.9% | 21.1% |
| **Non-metro, 20,000 urban population, adjacent to metro** | 20 | 19.8% | 20.3% | 23.2% | 21.6% |
| **Non-metro, 20,000 urban population, non-adjacent to metro** | 11 | 20.7% | 22.6% | 26.5% | 24.4% |
| **Non-metro, 2,500-19,999 urban population, adjacent to metro** | 83 | 21.3% | 21.1% | 23.9% | 22.6% |
| **Non-metro, 2,500-19,999 urban population, non-adjacent to metro** | 78 | 29.2% | 27.4% | 30.6% | 28.6% |
| **Non-metro, rural, adjacent to metro** | 40 | 25.8% | 24.9% | 27.6% | 25.9% |
| **Non-metro, rural non-adjacent to metro** | 65 | 39.8% | 32.5% | 35.5% | 34.2% |
| **ARC counties** | **406** | **20.5%** | **20.1%** | **23.3%** | **21.6%** |

## *Considering the* Starting Level *of Young Child Poverty and Subsequent* Change

We examine the *Young Child Relative Poverty Position* of ARC counties for the most recent period, 1993-1995 in order to provide a more meaningful analysis of change when considering the starting levels of young child poverty. Table 3.10 shows a cross-tabulation of the 1993 young child poverty rates in Appalachian counties and the change in poverty rates between 1993 and the 1995 SAIP estimates. The national benchmark for level of young child poverty was 27.9 percent and the national change in the young child poverty rate over the two years was a decrease of 3.7 percent. The percent of counties with higher than average young child poverty

rates was almost 63 percent. A similar percentage of counties (63.4 percent) had young child poverty rates that were either increasing, or decreasing less than the national young child poverty level. The largest proportion of counties (38.6 percent) fit into the Worst category with a higher than average starting level of young child poverty in 1993, *and* a worse than average change in young child poverty between 1993 and 1995. Only 12.3 percent of Appalachian counties were considered to be in the *Best Position* (low starting rates and greater than average declines). Compared to the U.S. as a whole (Table 3.11), Appalachia had a similar proportion of its counties in the *Worst* position, but significantly fewer in the *Best* position.

**Table 3.10:**
**Young Child Poverty Relative Position of Appalachian Counties, 1993-1995**

| Level | Change in Young Child Poverty Rate Less Than U.S. (< -3.7%) | Change in Young Child Poverty Rate Greater Than U.S. (> -3.7%) | Total |
|---|---|---|---|
| Counties Below U.S. Young Child Poverty Rate in 1993 (< 27.9%) | ***Best***<br>49<br>12.3% | ***Worrisome***<br>99<br>24.8% | *148*<br>***37.1%*** |
| Counties Above U.S. Young Child Poverty Rate in 1993 (> 27.9%) | ***Hopeful***<br>97<br>24.3% | ***Worst***<br>154<br>38.6% | *251*<br>***62.9%*** |
| ***Total*** | *146*<br>***36.6%*** | *253*<br>***63.4%*** | *399*<br>***100%*** |

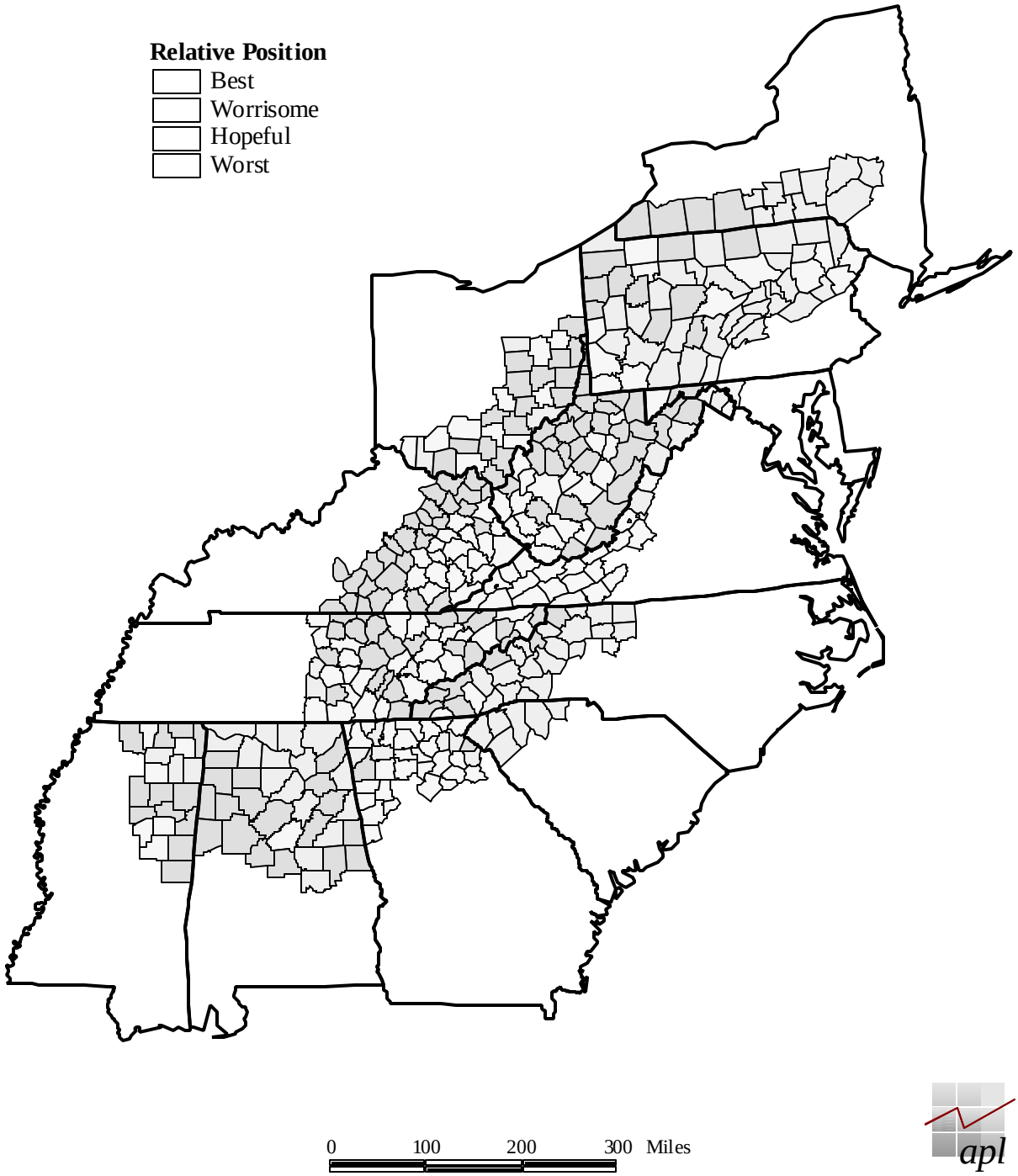
**Table 3.11:**
**Relative Young Child Poverty Position of U.S. Counties, 1993-1995**

| Level | Change in Child Poverty Rate Less Than U.S. (< -3.7%) | Change in Child Poverty Rate Greater Than U.S. (> -3.7%) | Total |
|---|---|---|---|
| Counties Below U.S. Child Poverty Rate in 1993 (< 27.9%) | ***Best***<br>721<br>23.0% | ***Worrisome***<br>1020<br>32.6% | *1741*<br>***55.6%*** |
| Counties Above U.S. Child Poverty Rate in 1993 (> 27.9%) | ***Hopeful***<br>382<br>12.2% | ***Worst***<br>1008<br>32.2% | *1390*<br>***44.4%*** |
| ***Total*** | *1103*<br>***35.2%*** | *2028*<br>***64.8%*** | *3131*<br>***100%*** |

Figure 3.14 provides the spatial distribution of the relative young child poverty position for ARC counties between 1993 and 1995. The geographic patterns are very similar to the patterns of starting position and change for overall child poverty with a few exceptions. The Appalachian counties that were categorized as "best" again were not markedly geographically clustered

except in the counties adjoining the Atlanta, Georgia, Cincinnati and Columbus, Ohio metropolitan areas. Notably the best category cluster that appeared in total child poverty among the westernmost Appalachian counties in Tennessee along Interstate 65 does not appear in young child poverty. Counties classified as "worrisome" again seemed to follow a sickle-shaped pattern from New York and Pennsylvania south, along the western Virginia border, the western Carolina borders, into northern Georgia and Alabama. Finally, those counties with high rates of child poverty in 1993 and worse than average change in the following two-year period were again clustered in eastern Kentucky, West Virginia, and in parts of Mississippi and Alabama. Like for overall child poverty, there were smaller clusters of these worst category counties in New York, Virginia, and North Carolina, but unlike overall child poverty there was not a cluster in Georgia. The pattern of worst counties in Kentucky was quite distinct with a solid line several counties wide following the entire western border of Appalachia and then extending into Tennessee. The geographic distribution of hopeful counties for young children is quite different than it was for all children. Tennessee is not as dominant in this category and there is a large and contiguous cluster of hopeful counties in eastern Kentucky, Western Virginia, and Virginia.

# Figure 3.14:
# Relative Young Child Poverty Position, ARC Counties, 1993-1995 (SAIPE)



### *The ARC Distressed County Designation*

The Appalachian Regional Commission (ARC) has used the distressed county designation for almost twenty years to identify counties with the most structurally disadvantaged economies. Up to 30 percent of ARC's Area Development Funds are targeted at distressed counties through allocation of ARC grants to distressed counties, requiring only a 20 percent match from the state and/or local government, which is lower than the state/local match required from non-distressed counties. From 1983, the inception of the distressed counties program, through 1999 the ARC has provided $266 million dollars in single-county grants to distressed counties. This sum constituted 42 percent of such single-county grants awarded across Appalachia (Wood and Bischak, 2000).

The ARC has modified the variables and the formulae used to determine distressed status several times during the past two decades, adopting its present form in FY 1995. The current criteria for distressed status compare the poverty, unemployment, and per capita market income of Appalachian counties with national averages. Three-year rolling averages are utilized for unemployment and per capita market income to moderate the effect of annual variation caused by short-term economic fluctuations. Currently, a county qualifies as distressed if its poverty rate and its unemployment rate are greater than or equal to 150 percent of the corresponding national average and its per capita market income is less than or equal to 2/3 of the national average. A county with a poverty rate of 200 percent or more of the national average need only meet the criteria on one of the other two measures in order to be designated distressed. The ARC also designates transitional, competitive, and attainment counties, although these categories will not be addressed in this report.

Each year the ARC updates the distressed status of counties based on more current information on unemployment and per capita market income. However, reliable county-level poverty rates have, until recently, only been available from the decennial census at the beginning of each decade. In the years between decennial censuses, poverty rates for individual counties change, and the distribution of poverty within the region shifts. Using the poverty rates from the most recent census ignores the subsequent changes in poverty conditions as the decade proceeds.

Post-censal updates of poverty paralleling the updated estimates for unemployment and per capita market income could improve the distressed county designation. The Census Bureau's *Small Area Income and Poverty Estimates* (abbreviated as SAIPE, which will also be referred to as "SAIP estimates" to focus on the numerical estimates themselves rather than the overall statistical estimates program) program offers a potential solution to this problem. The Census Bureau's SAIPE program initially published county-level poverty estimates for 1993 (and 1989 for comparison with 1990 census poverty estimates) with updates scheduled on a biennial basis during the remainder of the decade. In this section of the report, we incorporate the SAIPE post-censal poverty estimates for 1989, 1993, and 1995 into the ARC distressed status designation. We evaluate the influence of post-censal estimates of poverty on the traditional distressed county classification, which uses only the estimates of poverty from the most recent census, during both the 1980s and the early 1990s.

### *Distressed Counties in 1980 and 1990*

To provide a context for the introduction of the SAIPE into the distressed county designation, we first examine distressed counties in 1980 and 1990, using the poverty estimates from the respective censuses (Appendix D Distressed Status Designation Methodology). Of the 399 Appalachian counties, the number designated as distressed increased between 1980 and 1990, from 71 counties in 1980 to 105 in 1990, nearly a 50 percent increase (Table 4.1a).[7] This increase reversed a two-decade decline in the number of distressed counties. Between 1960 and 1980 the number of distressed counties declined from 214 to only 78, according to designations made using a slightly modified distress formula, with single year income and unemployment estimates rather than three-year averages (Wood and Bischak 2000). During the 1970s alone, the number of distressed counties declined by more than 50 percent from 161.

[77] The number of distressed counties in 1990 does not correspond to the number of counties officially designated distressed by ARC because distress levels were frozen during the 1988-1992 period awaiting the release of 1990 census poverty data (Wood and Bischak 2000). The distressed designation uses three year averages of unemployment and per capita market income. Numbers in Table 4.1a are based on a formula for defining distressed counties that incorporates poverty estimates from the last census, not the Census Bureau's post-censal SAIPE estimates.

In 1980, Kentucky contained the largest number of distressed counties among Appalachian states at 32, with Tennessee a distant second at 16. This represented 65 percent of the ARC counties in Kentucky and 32 percent of the Tennessee ARC counties. The already high number of distressed counties in Kentucky increased by five, making 75 percent of Kentucky's ARC counties distressed. During the 1980s West Virginia experienced an increase of 20 distressed counties or nearly triple its 1980 number moving it into second place, with 27 distressed counties, behind Kentucky. While only 13 percent of West Virginia ARC counties were distressed in 1980, 50 percent were in 1990. Over 60 percent of the distressed counties in 1990 were located in just two states, Kentucky (37) and West Virginia (27). Ohio also had more than 2.5 times as many distressed counties in 1990 than in 1980 with 13, or 24 percent of the ARC counties in Ohio. Mississippi gained seven distressed counties during the decade, more than doubling the number of distressed counties, and moving the percent of ARC counties distressed in that state from 29 percent to 62 percent. Only Tennessee lost a substantial number of distressed counties between 1980 and 1990, seven or just under one half of its distressed counties, moving it from the state with the second most distressed counties in 1980 to fourth in 1990.

**Table 4.1a:**

**ARC Distressed Counties by State, 1980 and 1990**

| | ARC | 1980 Distressed | | 1990 Distressed | | Change | |
|---|---|---|---|---|---|---|---|
| **State** | **Counties** | **#** | **%** | **#** | **%** | **#** | **%** |
| Alabama | 35 | 3 | 8.6 | 7 | 20.0 | 4 | 133 |
| Georgia | 35 | 1 | 2.9 | 0 | 0.0 | -1 | -100 |
| Kentucky | 49 | 32 | 65.3 | 37 | 75.5 | 5 | 16 |
| Maryland | 3 | 0 | 0.0 | 0 | 0.0 | 0 | 0 |
| Mississippi | 21 | 6 | 28.6 | 13 | 61.9 | 7 | 117 |
| New York | 14 | 0 | 0.0 | 0 | 0.0 | 0 | 0 |
| North Carolina | 29 | 3 | 10.3 | 2 | 6.9 | -1 | -33 |
| Ohio | 29 | 2 | 6.9 | 7 | 24.1 | 5 | 250 |
| Pennsylvania | 52 | 0 | 0.0 | 0 | 0.0 | 0 | 0 |
| South Carolina | 6 | 0 | 0.0 | 0 | 0.0 | 0 | 0 |
| Tennessee | 50 | 16 | 32.0 | 9 | 18.0 | -7 | -44 |
| Virginia | 21 | 1 | 4.8 | 3 | 14.3 | 2 | 200 |
| West Virginia | 55 | 7 | 12.7 | 27 | 49.1 | 20 | 286 |
| **TOTAL** | **399** | **71** | **17.8** | **105** | **26.3** | **34** | **48** |

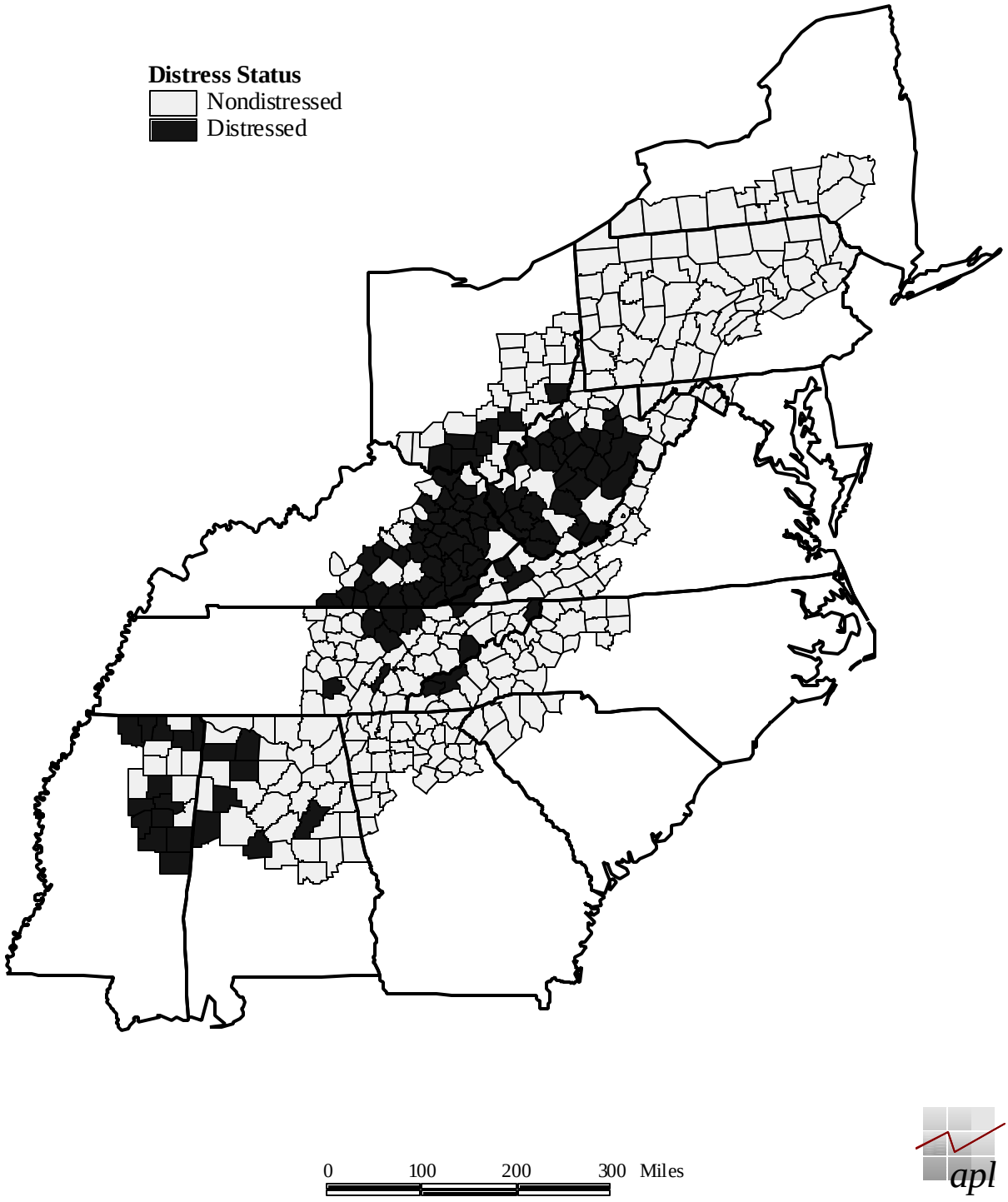
Given the distribution of distressed counties across states in 1990, it is not surprising that distressed counties were also geographically clustered (Figure 4.1). A large, contiguous group of distressed counties encompassed nearly all the Appalachian counties in Kentucky then extended several counties deep into West Virginia along the boundary of those two states. This cluster also extended into a line of counties stretching northeast in Ohio and to a lesser degree into a pocket of four distressed counties in Tennessee and two in North Carolina. A second large cluster barely separated from the first by a single row of counties located just to its northeast, was comprised of 20 counties in West Virginia. Principally Mississippi but also Alabama shared two smaller agglomerations of distressed counties. In 1990 there were only six isolated distressed counties that did not at least touch a corner of another distressed county.

The change in the geographic distribution of distressed counties between 1980 and 1990 not only reflected an increase in the number and extent of distressed counties but also a substantial shift northward and somewhat eastward in the bulk of distressed counties. This is especially evident in the two large 1990 clusters of distressed counties in central Appalachia with the Kentucky group growing, moving out of Tennessee and into Ohio and West Virginia and the second West Virginia group emerging. The cluster of four contiguous distressed counties in West Virginia that existed in 1980 grew to about 5 times that size in 1990 (Figure 4.2).

The large cluster centered in Kentucky in 1990 was also considerably larger than in 1980, having grown significantly into West Virginia and Ohio. In 1980 a much larger portion of this cluster was located in Tennessee, extending nearly to its southern border. In 1980, there was also a somewhat more continuous line of distressed counties stretched along the Tennessee/North Carolina border than in 1990. In contrast, the cluster of distressed counties along the southern tier of Appalachia in Mississippi and Alabama was much smaller in 1980, containing only five counties, compared to 10 in 1990. The cluster along the northern border of Mississippi, extending into Alabama did not exist at all in 1980, with only two scattered distressed counties, one distressed county in Mississippi and another in Alabama.

Throughout both periods, 1980 and 1990, 282 counties remained non-distressed, while 59 counties remained distressed (Table 4.1b). Of the 12 counties that transitioned from distressed to non-distressed status during the 1980s, the majority of them (seven) did so solely as a result of changes in poverty. An additional two resulted from joint changes in poverty and unemployment

# Figure 4.1:
# ARC Distressed Counties, 1990

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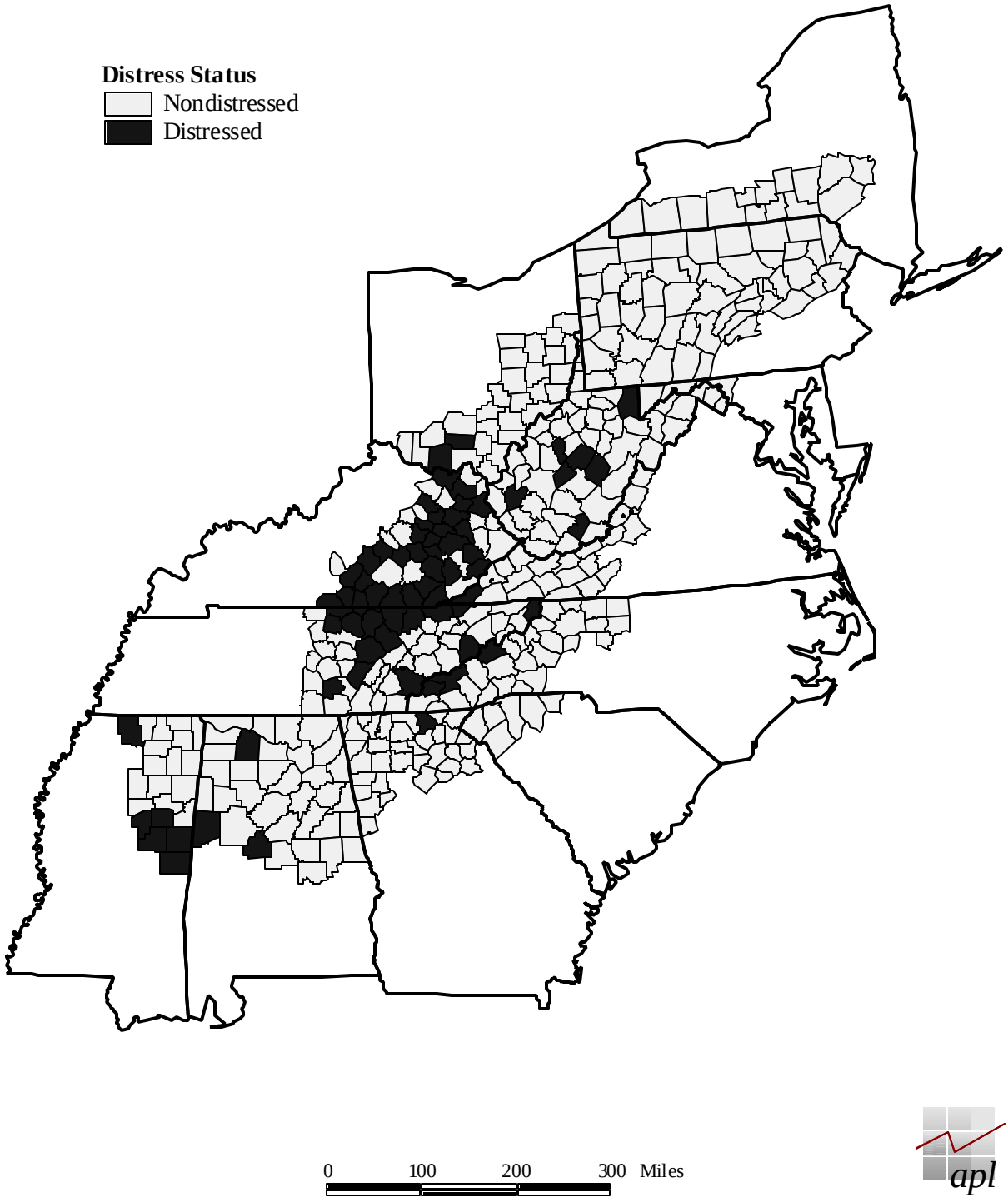
# Figure 4.2:
# ARC Distressed Counties, 1980

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and one other resulted from joint changes in poverty and income. The remaining two transitions out of distressed status resulted from changes in unemployment. Therefore, changing relative poverty levels were a factor in 10 of the 12 transitions out of distressed status during the 1980s. Poverty did not contribute quite as greatly to the much larger number of counties (46) that became distressed in the 1980s. The largest group of counties transitioning into distressed status experienced changes in both income and poverty (10), followed by eight counties with changes in unemployment and income, seven counties with changes in unemployment alone, seven counties with changes in poverty alone, and six counties with changes in all three indicators of distress.

**Table 4.1b:**
**ARC Distressed Status Changes by Cause of Change**

| | Number |
|---|---|
| **No Status Change** | **341** |
| Non-Distressed | 282 |
| Distressed | 59 |
| **Distressed to Nondistressed** | **12** |
| Unemployment | 2 |
| Poverty and Unemployment | 2 |
| Poverty and Income | 1 |
| Poverty | 7 |
| **Nondistressed to Distressed** | **46** |
| Unemployment | 7 |
| Income | 3 |
| Unemployment and Income | 8 |
| Poverty and Unemployment | 5 |
| Poverty and Income | 10 |
| Poverty, Unemployment, and Income | 6 |
| Poverty | 7 |

### *The Accuracy of Distressed Status at the End of the 1980s*

As noted, a significant problem with the determination of distressed status during the course of a decade is the diminishing relevance of the Census poverty rates as the decade progresses. Substitution of the SAIP estimates in the determination process may more accurately identify distressed counties, especially near the end of each decade. This section examines the change in 1990 distressed status when the SAIP estimates are substituted for the census-based estimate of poverty during the 1980s. We compare the accuracy of "old" census poverty estimates (1980

census) with SAIP estimates (for 1989 poverty), when each is used to predict 1990 distressed status as measured by the 1990 census. We calculated four versions of distressed status for 1990 using four different measures of poverty for calendar year 1989. The per capita market income and unemployment figures are the same in all four versions of distressed status. The first distressed status designation is identical to the 1990 distressed status used in the comparison of 1980 and 1990 above and includes poverty rates for 1989 as measured by 1990 census. The second uses poverty rates from the 1980 census, which previously would have been the only available measure of poverty at the end of a decade prior to the release of data from the new census. Further, using the SAIPE we calculate two sets of distressed status designations for each year. As in the analysis of the 1990s below, we incorporate the actual SAIP point estimate (which will be referred to as the estimate or the point estimate) in one distressed status designation and we incorporate the 95 percent confidence interval upper bound SAIP estimate (which will be referred to as the upper bound or UB in the tables) to create a fourth measure of distressed status. Table 4.2 compares the accuracy of the 1980 census and the two SAIPE measures in replicating 1990 distressed status as determined by the 1990 census.

Of the 294 non-distressed counties in Appalachia in 1990 (i.e., as determined by the 1990 Census), both the SAIP point estimate and the 1980 census correctly categorized 281 of those counties (Table 4.2). The 1980 census incorrectly classified 12 of those counties as distressed, while both the 1980 census and the SAIP point estimate incorrectly categorized one of those counties. As such, the SAIP point estimate correctly categorized 99.7 percent of the non-distressed counties while the 1980 census did so for 95.6 percent of those counties. The SAIPE upper bound incorrectly classified a greater number of counties as distressed than did the other two measures; a total of 22 counties for an accuracy of 92.5 percent. The upper bound estimate would be expected to classify a greater number of nondistressed counties as distressed since it is the upper estimate of poverty at a 95 percent confidence level. All three measures correctly categorized a very high percentage of the non-distressed counties, over 90 percent.

For the 105 counties that were distressed in 1990, the 1980 census categorized 28 of those counties as non-distressed. Although, the SAIP point estimate only incorrectly categorized 19 of these counties, this was an accuracy level of only 80 percent, while the 1980 census accuracy was lower at 73.3 percent. The SAIP upper bound distressed categorization was much more accurate than the other two in categorizing distressed counties with only three counties incorrectly classified and an accuracy of 97.1 percent.

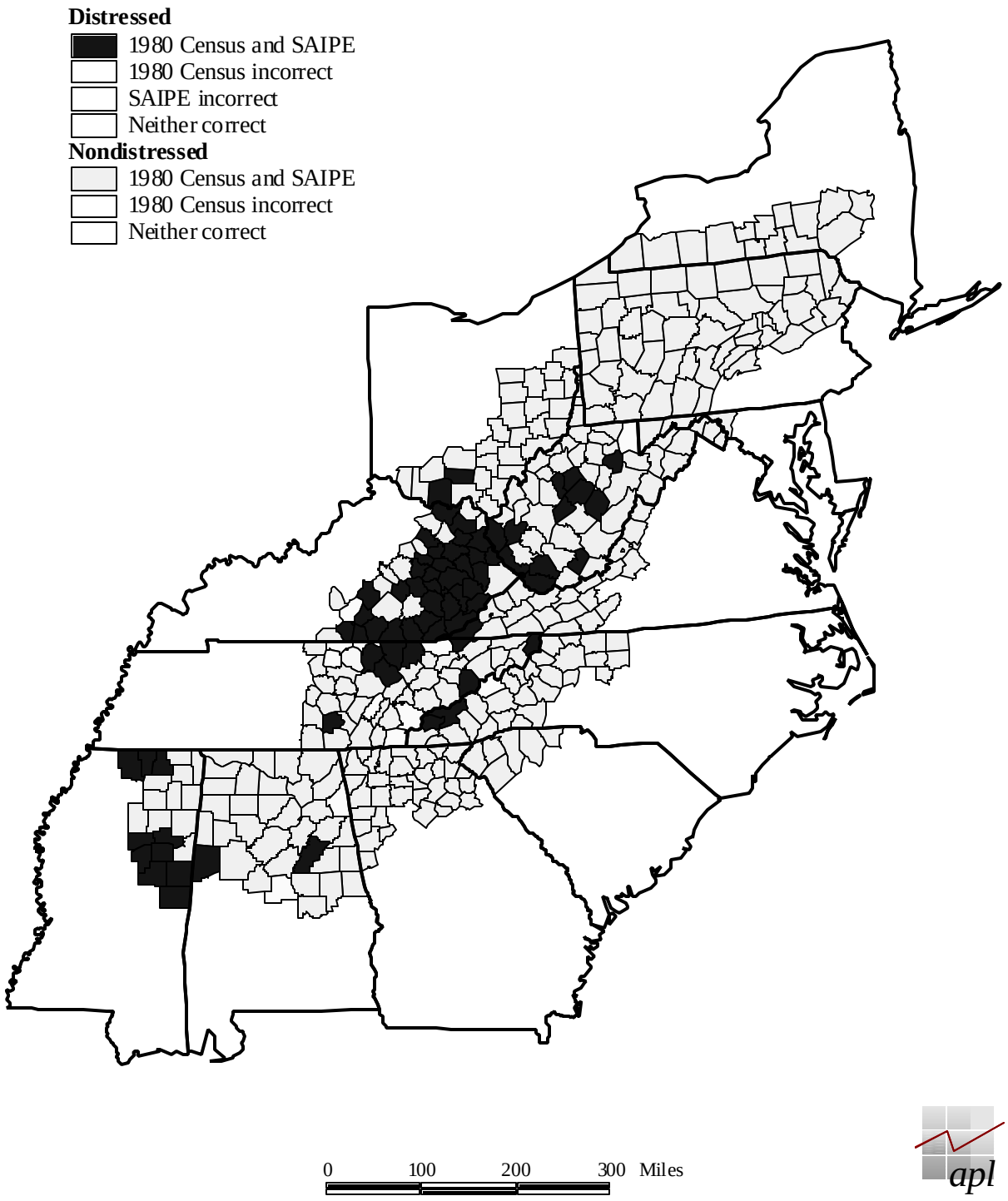
**Table 4.2:**

**Comparison of 1980 Census and SAIPE in Determining 1990 Distressed Status**

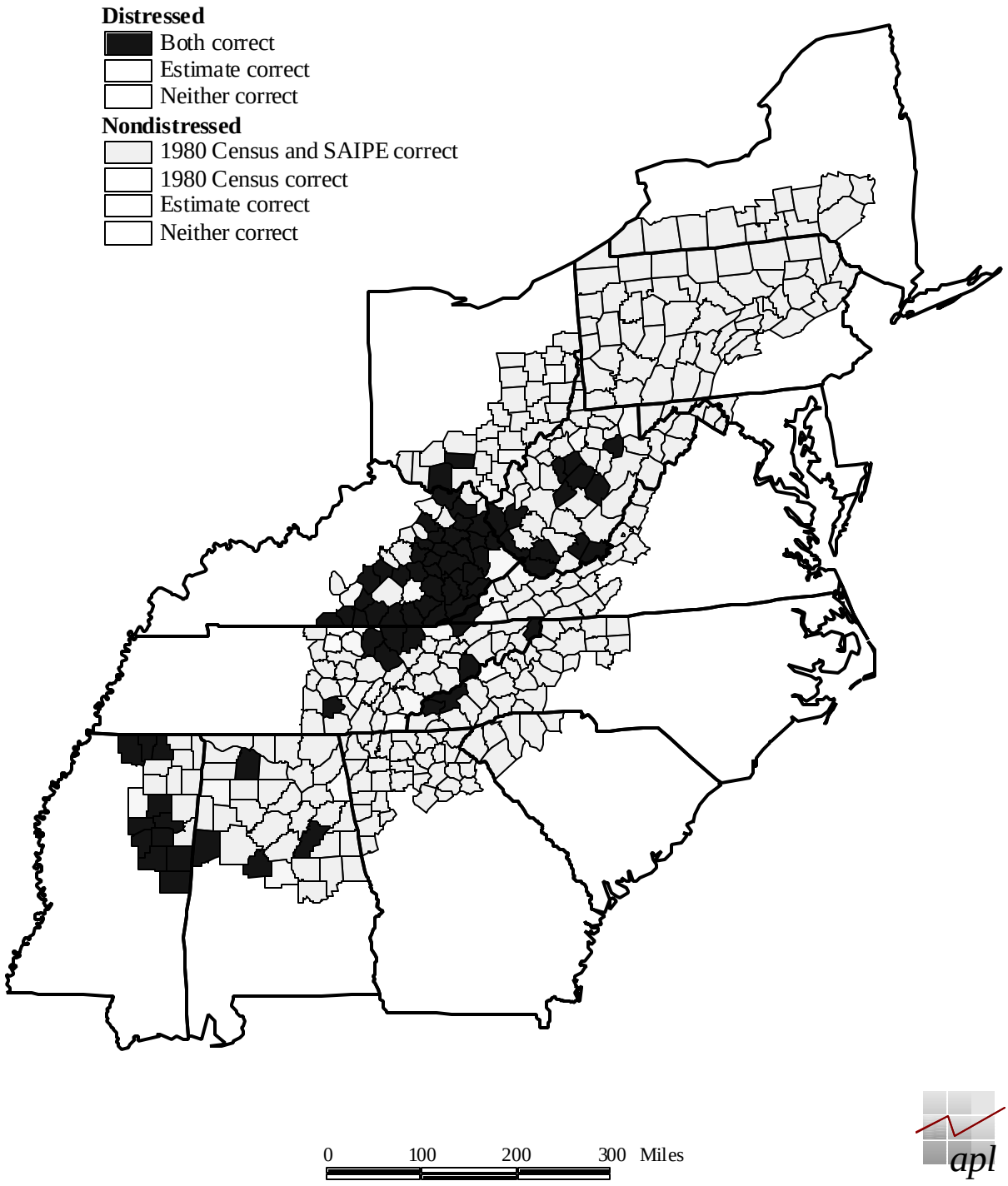
| | Point Estimate | Upper Bound Estimate |
|---|---|---|
| **Non-Distressed** | **294** | **294** |
| 1980 Census and SAIPE Correct | 281 | 267 |
| Only 1980 Census Incorrect | 12 | 5 |
| Only SAIPE Incorrect | 0 | 14 |
| Both Incorrect | 1 | 8 |
| **SAIPE (% Correct)** | **99.7%** | **92.5%** |
| **1980 Census (% Correct)** | **95.6%** | **95.6%** |
| **Distressed** | **105** | **105** |
| 1980 Census and SAIPE Correct | 71 | 77 |
| Only 1980 Census Incorrect | 13 | 25 |
| Only SAIPE Incorrect | 6 | 0 |
| Both Incorrect | 15 | 3 |
| **SAIPE (% Correct)** | **80.0%** | **97.1%** |
| **1980 Census (% Correct)** | **73.3%** | **73.3%** |

Neither the 1980 census nor the 1989 SAIP point estimate adequately anticipated the overall expansion in distressed counties in terms of their northward shift (Figure 4.3). A sizeable portion of the distressed counties in the West Virginia cluster were classified as non-distressed by both the 1980 census and the SAIP point estimate. The 1980 census misclassified an additional five of those counties. Both indicators also largely missed the increase in the number of distressed counties in Ohio but this was true of the 1980 census to a greater extent. At the other end of that geographic cluster of distressed counties, the 1980 census did not accurately predict the improving status of counties in Tennessee and counties along the Tennessee/North Carolina border. Nor did these two indicators accurately anticipate the expansion of distressed counties in the border region of Mississippi and Alabama, although in this case the SAIPE incorrectly categorized more of the counties. However, the SAIPE upper bound does correctly categorize those distressed counties (Figure 4.4). The upper bound indicator also more accurately predicted the expansion of distressed counties in Ohio and West Virginia. However, it did misclassify a number of non-distressed counties as distressed, although those generally were not clustered but were scattered throughout Appalachia.

# Figure 4.3:
# Comparison of 1980 Census and 1990 SAIPE to 1990 Census



# Figure 4.4:
# Comparison of 1980 Census and 1990 SAIPE Upper Bound to 1990 Census

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## *SECTION V*

### *The Effect of Using Post-Censal Poverty Estimates on Distressed Status during the 1990s*

The Census Bureau SAIPE program has produced county-level poverty estimates for 1989, 1993 and 1995, giving ARC the option of using more recent poverty data to classify counties. The post-censal SAIPE produced by the Census Bureau may more accurately reflect current poverty rates in Appalachian counties. However, the use of post-censal estimates of poverty with relatively large standard errors must be weighed against use of the outdated but more precise census-based estimates of poverty.

In the following section we determine the distressed status of Appalachian counties in 1990, 1994, and 1996 using the poverty levels (for calendar year 1989) measured by the 1990 census. We then substitute the 1993 and 1995 SAIPE for the 1990 census poverty estimate in the distressed county determination, thus determining distressed status according to the SAIPE for fiscal years 1994 and 1996. In this manner, the number of counties that have been affected by economic change in the 1990s can be better evaluated and joint changes in unemployment, income, and/or poverty can be distinguished from changes in poverty alone.

Further, using the SAIPE we calculate two sets of distressed status for each year, the first incorporating the actual SAIP point estimate (which will be referred to as the estimate or the point estimate) and the second incorporating the 95 percent confidence interval upper bound SAIP estimate (which will be referred to as the upper bound or UB in the tables). Using the upper bound SAIP estimate enables us to evaluate the statistical significance of distressed status changes that are due to changes the in poverty indicator. This constitutes a more conservative approach to incorporating the SAIPE into the distressed county designation, since only counties whose poverty is below the distressed threshold to a statistically significant degree are designated non-distressed. As such, we do not incorporate the SAIPE lower bound estimates into the distressed status designation, since the lowest poverty rate within a 95 percent confidence limit does not hold the same consequences of unjustifiably removing counties from the distressed designation.

### *Distressed Status by State, 1990 to 1994*

Using the 1993 SAIP estimates, between 1990 and 1994 the number of distressed counties in Appalachia declined sharply by 38 percent from 105 in 1990 to only 65 in 1994 (Table 5.1). Kentucky and Mississippi accounted for nearly one half (9 and 10 counties respectively) of the decline in the number of distressed counties. This represented a 24 percent decline in the number of distressed counties in Kentucky but a 77 percent decline for Mississippi. Seven fewer West Virginia counties (26 percent) were distressed in 1994, as were six fewer Alabama counties (86 percent).

**Table 5.1:**
**Distressed Counties by State, 1990 and 1994**

| | ARC | | 1994 SAIPE | | | 1994 SAIPE Upper Bound | | |
|---|---|---|---|---|---|---|---|---|
| **State** | **Counties** | **1990** | **Distressed** | **Change** | **% Change** | **Distressed** | **Change** | **% Change** |
| Alabama | 35 | 7 | 1 | -6 | -86 | 1 | -6 | -86 |
| Georgia | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kentucky | 49 | 37 | 28 | -9 | -24 | 36 | -1 | -3 |
| Maryland | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mississippi | 21 | 13 | 3 | -10 | -77 | 8 | -5 | -38 |
| New York | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Carolina | 29 | 2 | 1 | -1 | -50 | 2 | 0 | 0 |
| Ohio | 29 | 7 | 4 | -3 | -43 | 5 | -2 | -29 |
| Pennsylvania | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Carolina | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tennessee | 50 | 9 | 6 | -3 | -33 | 8 | -1 | -11 |
| Virginia | 21 | 3 | 2 | -1 | -33 | 3 | 0 | 0 |
| West Virginia | 55 | 27 | 20 | -7 | -26 | 23 | -4 | -15 |
| **TOTAL** | **399** | **105** | **65** | **-40** | **-38** | **86** | **-19** | **-18** |

Substituting the upper bound of the SAIPE, the decline in the number of distressed counties is reduced by one half with 86 distressed counties as opposed to 65. Kentucky is most affected by this substitution, with a decrease of only one county, as opposed to nine using the estimate. The number of distressed counties in Mississippi also declines by only five, as opposed to 10 using the estimate. The number of distressed counties in West Virginia was also affected by the use of the upper bound SAIPE with a decrease of only 4. Alabama, the state that experienced the largest percentage decline in the number of distressed counties, lost the same number of distressed counties regardless of whether the point or upper bound estimate was used.

### *Distressed Status by State, 1990 to 1996*

Using the point estimates to calculate distressed status in 1996 results in a 12 percent increase in the number of distressed counties after 1994. The number of distressed counties increased from 65 in 1994 to 73 in 1996, although the number remained 32 percent lower than in 1990 (Table 5.2). Between 1994 and 1996, the number of distressed counties in Kentucky and Mississippi increased by three and four respectively, yet remained substantially below the number of distressed counties in each of those states in 1990. Among Appalachian states, only Ohio lost distressed counties during both time periods, with a decrease of three counties between 1990 and 1994 and a decrease of two counties between 1994 and 1996, a cumulative 71 percent decline.

**Table 5.2:**
**Distressed Counties by State, 1990 and 1996**

| | ARC | | 1996 SAIPE | | | 1996 SAIPE Upper Bound | | |
|---|---|---|---|---|---|---|---|---|
| **State** | **Counties** | **1990** | **Distressed** | **Change** | **% Change** | **Distressed** | **Change** | **% Change** |
| Alabama | 35 | 7 | 1 | -6 | -86 | 1 | -6 | -86 |
| Georgia | 35 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Kentucky | 49 | 37 | 31 | -6 | -16 | 39 | 2 | 5 |
| Maryland | 3 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Mississippi | 21 | 13 | 7 | -6 | -46 | 8 | -5 | -38 |
| New York | 14 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| North Carolina | 29 | 2 | 1 | -1 | -50 | 2 | 0 | 0 |
| Ohio | 29 | 7 | 2 | -5 | -71 | 6 | -1 | -14 |
| Pennsylvania | 52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| South Carolina | 6 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Tennessee | 50 | 9 | 8 | -1 | -11 | 11 | 2 | 22 |
| Virginia | 21 | 3 | 3 | 0 | 0 | 4 | 1 | 33 |
| West Virginia | 55 | 27 | 20 | -7 | -26 | 25 | -2 | -7 |
| **TOTAL** | **399** | **105** | **73** | **-32** | **-30** | **96** | **-9** | **-9** |

Using the upper bound SAIPE in 1996 alters the pattern of change with a decrease of only nine counties to 96. The number of distressed counties in Kentucky increases by two, to 39, as does the number of distressed counties in Tennessee, while Virginia increases by one. The number of distressed counties using the upper bound in Alabama and Mississippi remains the same as in 1994 with a loss of six and five respectively compared to 1990.

### *Causes of Distressed Status Transition, 1990 to 1994*

The dramatic decline in the number of distressed counties during the early part of the decade

(1990 to 1994) was due more to overall economic improvement in Appalachia relative to the U.S. as a whole than by substitution of the SAIPE for the 1990 census poverty estimates (Table 5.3). Moreover, relative shifts in unemployment played a more important role as an independent cause of these transitions out of distressed status than did shifts in poverty. Of the 42 counties that transitioned from distressed to non-distressed status between 1990 and 1994, 12 did so as a result of change in unemployment alone while an additional eight did so as a result of changes in both unemployment and poverty. Another two counties moved from distressed to non-distressed

**Table 5.3:**

**Distressed Status Changes by Cause of Change**

| | 90-94 | | 90-96 | | 94-96 | |
|---|---|---|---|---|---|---|
| | **Estimate** | **UB** | **Estimate** | **UB** | **Estimate** | **UB** |
| **No Status Change** | **355** | **368** | **359** | **368** | **385** | **385** |
| Non-Distressed | 292 | 288 | 290 | 283 | 323 | 301 |
| Distressed | 63 | 80 | 69 | 85 | 62 | 84 |
| **Distressed to Non-distressed** | **42** | **25** | **36** | **21** | **3** | **3** |
| Unemployment | 12 | 9 | 6 | 7 | 1 | 0 |
| Income | 2 | 4 | 1 | 5 | 2 | 1 |
| Unemployment and Income | 0 | 1 | 0 | 4 | 0 | 0 |
| Poverty and Unemployment | 8 | 2 | 5 | 1 | 0 | 0 |
| Poverty and Income | 5 | 2 | 3 | 0 | 0 | 0 |
| Poverty, Unemployment, and Inc. | 5 | 4 | 6 | 2 | 0 | 0 |
| Poverty | 10 | 3 | 15 | 2 | 0 | 2 |
| **Non-distressed to Distressed** | **2** | **6** | **4** | **10** | **11** | **11** |
| Unemployment | 2 | 2 | 3 | 4 | 9 | 6 |
| Income | 0 | 0 | 1 | 1 | 2 | 2 |
| Poverty and Income | 0 | 0 | 0 | 0 | 0 | 1 |
| Poverty | 0 | 4 | 0 | 5 | 0 | 2 |

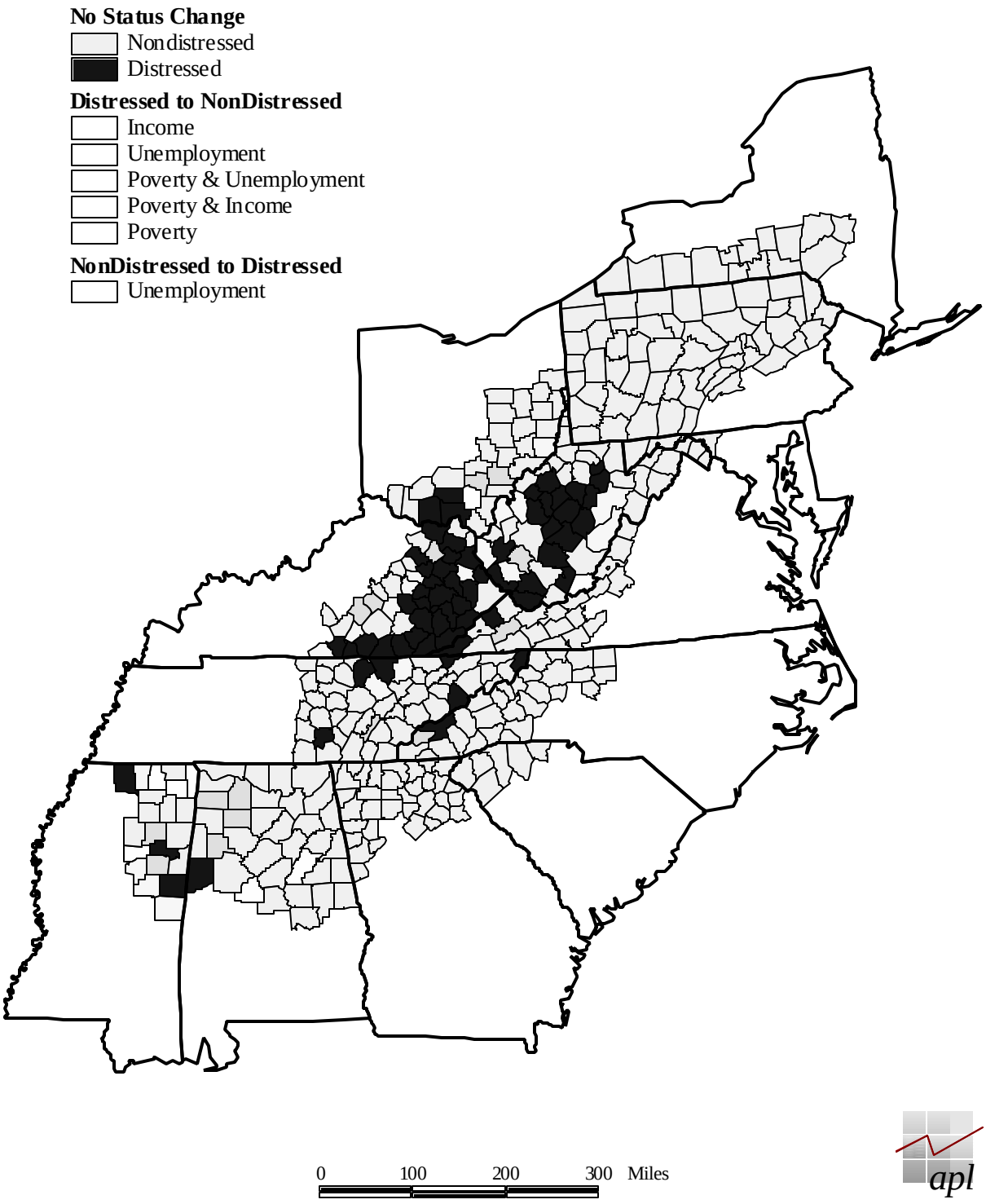
as a result of change in per capita income, while five counties did so as a result of change in both poverty and income. Combined changes in unemployment, income, and poverty resulted in five counties leaving distressed status. Changes in poverty in combination with changes in unemployment or income or both accounted for 2/3$^{rds}$ (28 counties) of the transition from distressed to non-distressed status between 1990 and 1994. Less than 1/4$^{th}$ of the total transitions (10) can be solely attributed to the substitution of the SAIP estimate. Two counties moved into the distressed category as a result of change in unemployment.

Substituting the upper bound SAIPE further reduces the influence of changes in poverty on distressed status, with only three counties moving to non-distressed status solely due to poverty

and 11 doing so as a result of changes in poverty combined with changes in one or both of the other indicators. Using the upper bound, four counties become distressed between 1990 and 1994.

Counties that were designated as distressed in both 1990 and 1994 were largely clustered in eastern Kentucky and in central West Virginia. With regard to the causes of transitions from distressed status to non-distressed, no clear cut geographic patterns emerge. That said, eight of the 12 counties in which change in unemployment alone caused a status change, were located on the perimeter or just inside the eastern Kentucky distressed cluster (Figure 5.1). The remaining four counties were located in Mississippi, three contiguous and one on the northern border. Between 1990 and 1994 the five counties that transitioned from distressed to non-distressed due to changes in poverty and unemployment combined were located in three states, but were all situated along those state's borders. Importantly, the 10 counties where changes in poverty alone accounted for status shifts are located outside the major clusters of distressed counties in Kentucky and West Virginia.

# Figure 5.1:
# Change in Distressed Status, ARC Counties, 1990-1994



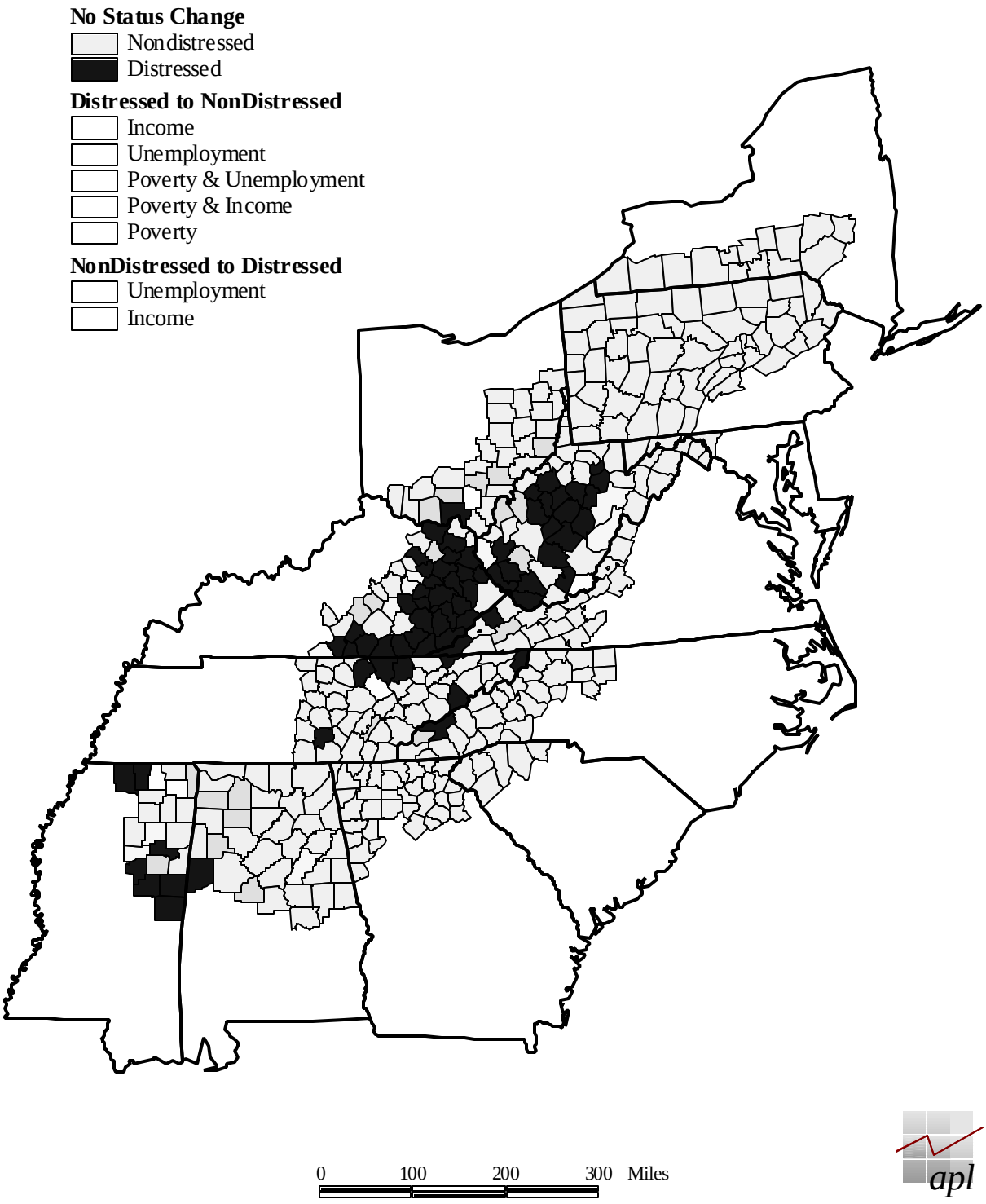
### *Causes of Distressed Status Transition, 1990 to 1996*

Changes in distressed status between 1990 and 1996 follow a pattern similar to the changes occurring between 1990 and 1994, although the independent role of change in unemployment in transitions out of distressed status was markedly diminished, accounting for six of the 36 counties leaving distressed status (Table 5.3). Joint changes in all three of the indicators accounted for six of the transitions out of distressed status, five were due to changes in poverty and unemployment, and six resulted from changes in poverty and income. As a singular factor, change in poverty was responsible for a much larger portion (15 counties or 40 percent) of transitions out of distressed status between 1990 and 1996 than between 1990 and 1994. As a result of changes in unemployment, three counties that were not distressed in 1990 became distressed in 1996. During this interval one county became distressed as a result of income changes.

Compared to using the 1996 SAIPE estimate, the substitution of the 1996 SAIPE upper bound has an even greater effect on designations than it did in 1994. The independent effect of poverty on distressed status is virtually eliminated, accounting for transition out of distressed status for only two counties as opposed to 15. Status changes due to the joint changes of poverty and one or both of the other indicators also diminish considerably. Using the upper bound, only 21 counties overall would move out of distressed status compared to 36 using the SAIP point estimates.

Referring again to point estimate designations, counties that were designated as distressed in both 1990 and 1996 remained clustered in eastern Kentucky and central West Virginia, although Mississippi had more than half of its distressed counties in 1990 remain distressed in 1996 (see Figure 5.2). This was a different pattern than was observed between 1990 and 1994. With regard to the causes of transitions from distressed to non-distressed status, changes in poverty alone accounted for this shift in several counties in southern Ohio as well as a few counties surrounding the eastern Kentucky distressed cluster. Joint changes in poverty, unemployment

# Figure 5.2:
# Change in Distressed Status, ARC Counties, 1990-1996



and income were responsible for five of the six previously distressed counties in Alabama transitioning to non-distressed status. Otherwise, there did not appear to be any other discernible geographical patterns of causes of county status change.

### *Causes of Distressed Status Transition, 1994 to 1996*

While the transition from the 1990 census based poverty estimates to the SAIP estimates is important for understanding the implications of changes in poverty for the distressed county designation, comparison of the two SAIPE years is also important (Table 5.3). Not surprisingly, a larger number of counties maintain the same status between 1994 and 1996 (385 compared to 355 between 1990 and 1994 and 359 between 1990 and 1996). Between 1994 and 1996, only three counties transitioned from distressed to non-distressed; one of these was solely a result of improving unemployment and the other two were a result of improving income and poverty. Compared to the transitions from the 1990 census poverty estimates, a large number of counties became distressed during the 1994 to 1996 period. Nearly all of those (9 of 11) were due to increasing unemployment, while one was due to change in per capita market income. None of the status changes in the 1994 to 1996 period were due solely to changes in poverty. However, substituting the upper bound SAIPE, poverty was solely accountable for two counties moving out of distressed status and for two counties moving into distressed status.

### *Counties Distressed Due to Poverty at 200 Percent of National Average and Above*

Counties with a poverty rate of 200 percent of the national average or higher that meet the criteria for distressed status on one of the other two indicators, unemployment or per capita market income, are designated distressed. These counties, which will be referred to as 200 percent poverty distressed counties, may be disproportionately affected by the substitution of the SAIP estimates for the decennial census poverty rates, due to the higher level of poverty necessary to maintain their distressed status. Although it does not have direct implications for the use of the SAIPE in the distressed designation, in this section we examine 200 percent poverty distressed counties to assess the effect using the SAIPE estimates would have on their status. In 1990, there were 13 such counties, 12 of which were distressed due to meeting the per capita market income criteria, and one due to meeting the unemployment criteria (Table 5.4). In the table, counties distressed on all 3 indicators are designated by PUI, while those distressed on two indicators are designated by P*U or P*I.

In 1994, six of these counties (Athens, Ohio; Lincoln, Casey, and Rowan, Kentucky; Oktibbeha, Mississippi, and Boone, West Virginia) transitioned out of distressed status due to changes in poverty indicated by the SAIP estimates. One of these counties would not have been designated distressed in 1994 regardless of the use of SAIP estimates (Monroe, Kentucky) since its per capita market income also exceeded the distressed threshold in 1994. Substituting the 1994 upper bound SAIP estimates preserves the distressed status of three of the counties (Casey, and Rowan, Kentucky; and Oktibbeha, Mississippi).

**Table 5.4:**
**200 Percent Poverty Distressed Counties, 1990, 1994, and 1996**

| | | | 1994 | | 1996 | |
|---|---|---|---|---|---|---|
| **County** | **State** | **1990** | **Estimate** | **Upper Bound** | **Estimate** | **Upper Bound** |
| Monroe | Kentucky | P* I | P | P | P | P* |
| Athens | Ohio | P* I | P I | P I | I | P I |
| Lincoln | Kentucky | P* I | P I | P I | P I | P*U |
| Casey | Kentucky | P* I | P I | P* I | P I | P*U |
| Rowan | Kentucky | P* I | P I | P* I | P I | P*U |
| Oktibbeha | Mississippi | P* I | P I | P* I | P I | P*U |
| Owsley | Kentucky | P* I | P* I | P* I | P*U | P*U |
| Whitley | Kentucky | P* I | P* I | P* I | P*U | P*U |
| Hancock | Tennessee | P* I | P* I | P* I | P*U | P*U |
| Clinton | Kentucky | P* I | P* I | P* I | PUI | PUI |
| Cumberland | Kentucky | P* I | P* I | P* I | PUI | PUI |
| Knox | Kentucky | P* I | P* I | P* I | PUI | PUI |
| Boone | West Virginia | P*U | PU | P*U | PU | P*U |
| Leslie | Kentucky | PUI | P* I | P* I | P*U | P*U |
| Wayne | Kentucky | PUI | P* I | P* I | P*U | P*U |
| Bell | Kentucky | PUI | P* I | P* I | PUI | PUI |
| Clay | Kentucky | PUI | P* I | P* I | PUI | PUI |
| McCreary | Kentucky | PUI | P* I | P* I | PUI | PUI |
| Noxubee | Mississippi | PUI | P* I | P* I | PUI | PUI |
| Mingo | West Virginia | PUI | P*U | P*U | PUI | PUI |
| Jackson | Kentucky | PUI | PUI | PUI | P*U | P*U |
| Lee | Kentucky | PUI | PUI | PUI | P*U | P*U |
| Wolfe | Kentucky | PUI | PUI | PUI | P*U | P*U |

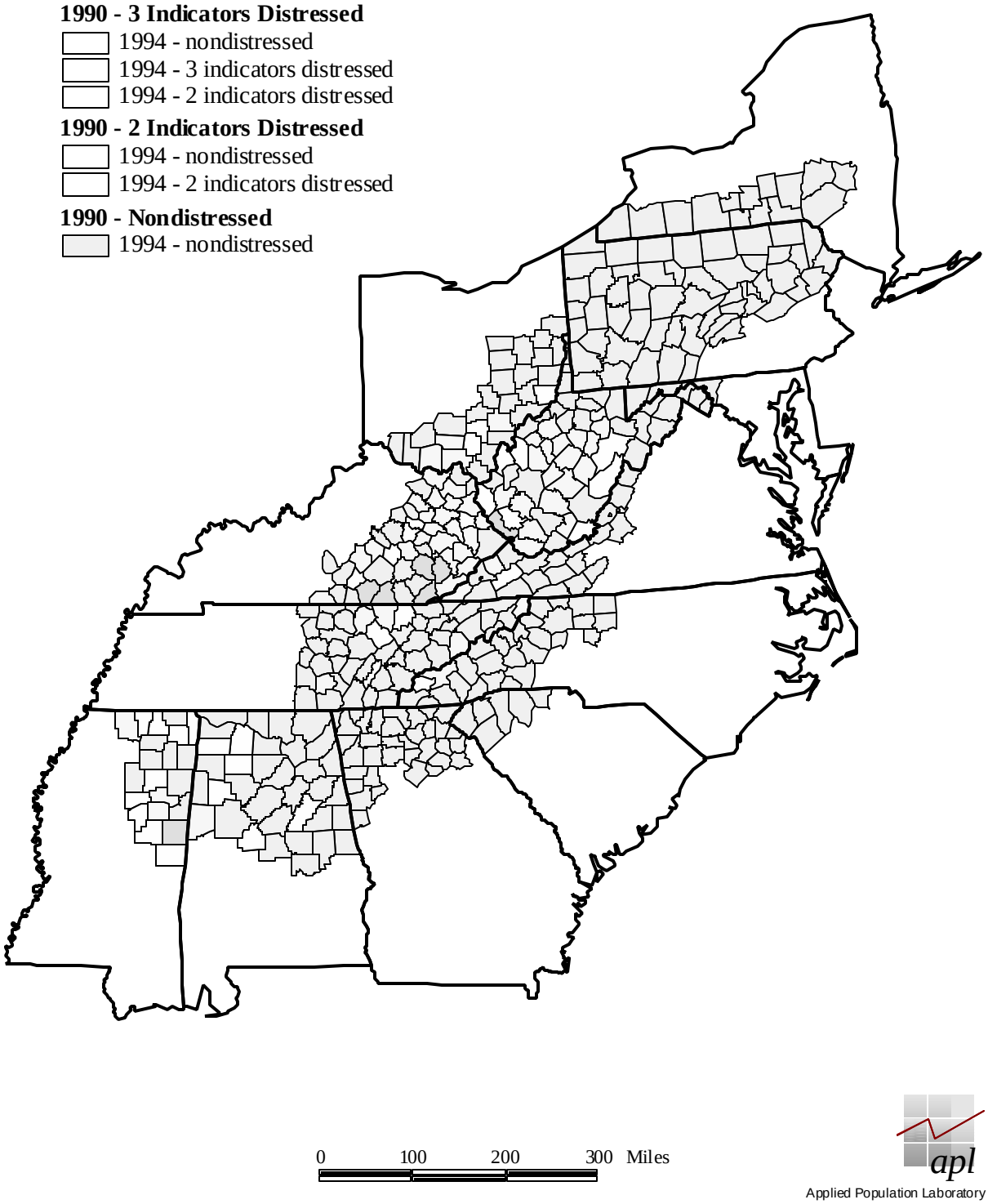
P = County poverty rate at or above 150% of national average
P* = County poverty rate at or above 200% of national average
U = County unemployment rate at or above 150% of national average
I = County per capita market income at or below 2/3 of national average

With regard to the geographic distribution of the 200 percent poverty distressed counties, during the 1990 to 1994 period, both the stability and transition of this status occurred principally in southern Kentucky, proximate to the Tennessee border (Figure 5.3). Near this border, four counties were categorized as 200 percent poverty distressed in both 1990 and 1994 (dark gray), while another five changed to 200 percent poverty distressed counties (black) during the period. The counties that changed from 200 percent poverty distressed counties to non-distressed (vertical stripes) were scattered throughout the Appalachian region.

In 1990 there were seven counties that met the criteria for distressed status on all three indicators but were distressed by virtue of meeting the distressed criteria on two of the indicators by 1996. Six of these counties, (Leslie, Wayne, Bell, Clay, and McCreary, Kentucky; and Noxubee, Mississippi), experienced changes in unemployment but remained distressed due to a poverty rate of 200 percent of the national average or higher and a per capita market income of 2/3 or less of the national average. The sixth county (Noxubee, Mississippi) experienced changes in income but remained distressed. Since the poverty rates for these counties in the SAIP point estimates were at or above 200 percent of the national average, substituting the upper bound estimates would not affect their status. All six of the counties that were 200 percent poverty distressed counties in 1990 and remained so in 1994, which were all located in Kentucky, were also designated distressed in 1996. However, the indicators responsible for their distressed categorizations changed. Three of the counties (Owsley, Whitley, and Hancock, Kentucky) remained 200 percent poverty distressed categories but in 1990 and 1994 poverty and per capita market income exceeded the distressed threshold while in 1996 unemployment exceeded the threshold and income did not. The other three counties (Clinton, Cumberland, and Knox, Kentucky) became distressed on all three indicators. The seven 1990 200 percent poverty distressed counties that were not designated distressed in 1994, remained non-distressed in 1996 and the poverty rate for Athens County, Ohio fell below 150 percent of the national average. Substituting the upper bound estimates, five of those counties would again remain distressed. However, whereas four of them (Lincoln, Casey, Rowan, and Oktibbeha, Mississippi) were distressed due to their per capita market income levels in 1990 and 1994, they are distressed due to their unemployment rates in 1996. The other county (Boone, West Virginia) would remain distressed due to its poverty and unemployment rates.

As would be expected from the 1990 to 1996 period, many of the 200 percent poverty distressed counties were concentrated in southern Kentucky (Figure 5.4). All three of the counties that moved from two indicator distressed to three indicator distressed between 1990 and 1996 were located in this area. Whereas during the 1990 to 1994 period five counties along the Kentucky/Tennessee border moved from three category distressed to two category distressed in 1996 all but two of those counties reverted to three category distressed. Unlike in 1994, a small cluster of three more northerly Kentucky counties (Jackson, Lee and Wolfe) transitioned from three indicator to two indicator distressed.

# Figure 5.3:
# ARC Distressed Counties
# By Type and Change, 1990-1994

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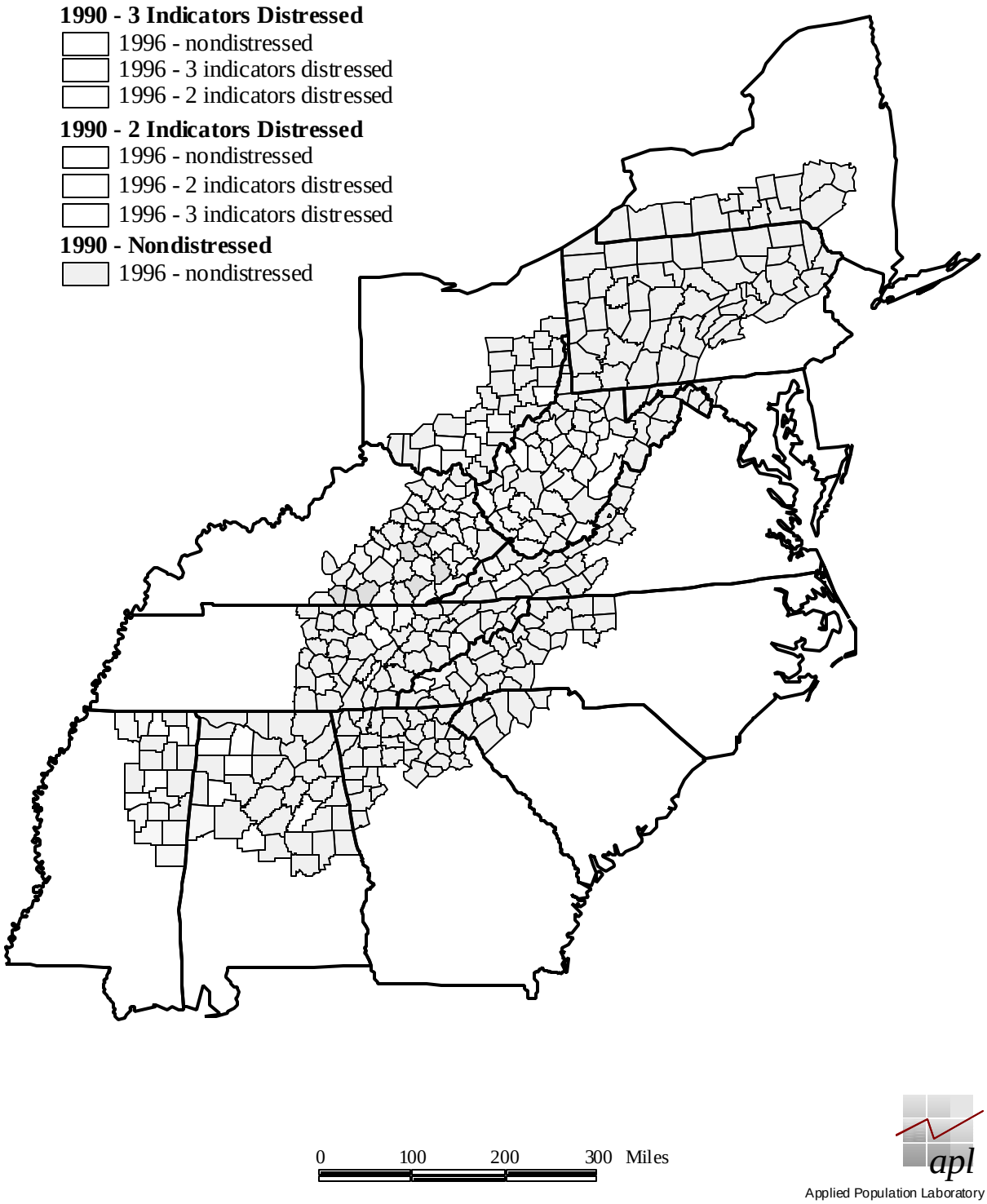
# Figure 5.4:
# ARC Distressed Counties
# By Type and Change, 1990-1996

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## *SECTION VI*

### *Conclusions and Recommendations*

Principally, we have used two analyses to evaluate the viability of the SAIP estimates for the ARC designation of distressed counties. We first evaluate the accuracy of the distressed status designation at the end of a decade, comparing the 1980 census with the 1989 SAIPE (using the 1990 census as the standard of accuracy). Then we examine the causes of status transitions that would occur in the early 1990s incorporating the SAIPE into the distressed county designation. Incorporating the SAIPE into the ARC distressed county designation formula is complicated by the threshold rather than continuous designation. The extent of error in the SAIP estimates, or any other estimates, cannot be known precisely. In a continuous funding allocation formula, error in the estimates might increase or reduce a county's funding, but in the case of a threshold formula the error might completely eliminate funding for a county (See National Research Council, 2000). Counties that meet the thresholds on the distress indicators are eligible for distress funding while those that do not are not eligible for the funding. Therefore, error in the estimates could result in a county unjustifiably being denied distressed status funding completely. These consequences must be considered carefully in assessing the impact of the SAIPE on the ARC distressed county designation.

The 1980s were an anomalous decade for distressed status in Appalachia and nationally with a significant increase in the number of distressed counties following two decades of decline. It is noteworthy that the distress trends for the U.S. as a whole were the same as those for Appalachia, with distress rising in the 1980s. So it was not that Appalachia was different, but that the decade was a break in the secular decline of distress nationally and regionally. This somewhat undermines the usefulness of comparing the accuracy of the SAIPE and the 1980 census in determining distressed status at the end of the decade. The SAIPE and decade old census results might not behave in the same manner during a more typical decade in which the number of distressed counties declines. With these caveats, the results from the 1980s demonstrate that as a decade progresses, the SAIP point estimates more accurately predict the status of both distressed and non-distressed counties than the poverty estimates from the previous census.

Both the SAIPE and the 1980 census categorized 1990 non-distressed counties very well (99.7

percent and 92.5 percent respectively), but they both largely failed to capture the increase in the number of distressed counties. The SAIPE incorrectly categorized one in five of the distressed counties and the 1980 census incorrectly categorized one in four. The SAIPE upper bound estimate with its higher estimates of poverty than the point estimate did very well in categorizing distressed counties with 97.1 percent accuracy. This would be expected in this decade of relatively increasing poverty in Appalachia. The upper bound performed worse than the other two measures in categorizing non-distressed counties but still correctly categorized 92.5 percent of them. Based on the available evidence, we would conclude that the SAIPE upper bound estimates most accurately categorize counties into the distressed status. However, this is a result of the dramatic and unprecedented shifts in poverty during the decade in Appalachia and may not hold true in future decades.

Although there will not be an independent confirmation of the accuracy of the SAIPE for determining distressed status prior to the release of the 2000 census poverty rates, the impact of the SAIPE on distressed status can be determined for 1994 and 1996, using the SAIP poverty estimates for 1993 and 1995. Using the SAIP estimates in assigning distressed status to counties during the 1990s did not independently account for the majority of status transitions. While it did independently account for between approximately 24 and 40 percent of the transitions (depending on the end year of the time period, 1994 or 1996), its greater utility was demonstrated in combination with the other indicators. To a considerable extent, changes in poverty follow the general patterns of economic change measured by unemployment and income. Of the three distress indicators, unemployment had the largest independent effect on change in distressed status between 1990 and 1994 (accountable for 12 of 42 transitions out of distressed status and both the transitions into distressed status), although poverty affected distressed status independently more frequently between 1990 and 1996 (accounting for 15 of 36 transitions out of distressed status). Income independently affected distressed status change for only a small number of counties. Therefore, during the early 1990s the ARC distressed county designation was affected more by independent changes in unemployment than by the substitution of the SAIPE for census-based poverty estimates. It should be noted that for the small number of counties moving from distressed to non-distressed status during the 1980s (12), changes in poverty alone accounted for nearly three quarters of them.

Substituting the SAIP upper bound poverty estimates into the distressed status designation formula, further reduces the independent effect of poverty on distress. During the 1990 to 1994 period, the number of transitions out of distressed status solely due to changes in poverty would be reduced from 10 to 3 with a reduction in the total number of transitions out of distressed decreasing from 42 to 25. Likewise, during the 1990 to 1994 period, the number of transitions out of distressed status solely due to changes in poverty would be reduced from 15 to just 2 with a reduction in the total number of transitions out of distressed decreasing from 36 to 21. This substitution would also result in four net additional counties moving into the distressed designation in the 1990 to 1994 period and six net additional counties in the 1990 to 1996 period. In sum, use of the upper bound estimate significantly reduces the independent effect of poverty on distressed status during the early 1990s.

Overall, the analysis of the 1990s indicates that the number of distressed counties has declined in Appalachia during the decade. The *Small Area Income and Poverty Estimates* indicate a decline in poverty in Appalachia relative to the U.S. as a whole, which reflects a concomitant relative decline in unemployment and a relative increase in per capita market income. Determination of distressed status using the 2000 Census of Population and Housing poverty rates should confirm this decline.

The distressed status accuracy results from the end of the 1980s suggest that the SAIPE would provide a better determinant of distressed status than the poverty estimates derived from a decade old census. The magnitude and causes of distressed status transitions in the first half of the 1990s indicate that using the SAIP estimates would alter the counties that would be designated distressed by the ARC but not to a radical degree. However, both of these analyses demonstrate that a simple substitution of the SAIP point estimates for census poverty estimates may unjustifiably deny some counties distressed status recognition. As an antidote to this situation it might be more defensible to combine the SAIP point estimate and the SAIP upper bound estimate in the future determination of distressed status. This would accomplish the objective of utilizing more current estimates of poverty while reducing the negative consequences of utilizing an estimate of poverty with greater statistical variation than decennial census derived estimates. In effect, use of both the point and upper bound estimates would serve as a statistical hold-harmless provision under which counties would not lose their distressed designation unless their

poverty rate fell to a level below the distressed threshold with 95 percent confidence. More specifically, the SAIP point estimate initially could be substituted into the distressed designation. Then for counties designated as distressed at the beginning of the decade according to the census but moving out of distressed status later in the decade solely due to change in poverty according to the SAIPE (that is without concomitant changes in unemployment and/or per capita market income), the SAIP upper bound estimates could be substituted into the distressed designation. In this way, only counties for which the magnitude of the change in poverty responsible for removing their distressed status designation was statistically significant in the SAIPE would be negatively affected by the use of the SAIP estimates. This solution still would not benefit non-distressed counties with actual relative changes in poverty of a sufficient magnitude to move them into distressed status, yet undetected by the SAIPE. However, that is a problem that could only be addressed in hindsight, as in the analysis of distressed status at the end of the 1980s in this report.

During the next decade, the accuracy of the SAIPE program should improve significantly as new sources of income and poverty data, especially the American Community Survey (ACS), become available. When fully implemented in 2003, the ACS sample will include approximately 250,000 households each month compared to approximately 57,000 in the March CPS. The sampling design will also select households in each county across the country, unlike the CPS. The ACS will thus sample approximately three million households annually and 15 million households over a five-year period. Poverty estimates for small areas will be derived by taking multiple-year averages from the ACS, up to five years for the least populous counties. However, the ACS slightly modifies the measure of poverty with questions asking about income during the 12 months preceding the interview, rather than the preceding calendar year as in the census and the CPS. The ACS may provide an additional predictor variable in the SAIPE model or a substitute for the current CPS derived dependent variable. Continued funding is a critical issue for incorporating the ACS into the SAIPE program since insufficient funding would likely necessitate reducing the sample size and introducing other discontinuities (NRC 2000). However, the anticipated increased accuracy of the SAIPE will make them an increasingly viable option for the Appalachian Regional Commission's designation of distressed counties.

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## *APPENDIX A*

### *Small Area Income and Poverty Estimate Program Methodology*

The data analyzed in this report are based in part on estimates of people in poverty prepared by the U.S. Census Bureau as part of its Small Area Income and Poverty Estimates (SAIPE) program. Portions of these estimates have been the subject of considerable analytical scrutiny due to the fact that federal legislation calling for estimates of the numbers of related children ages 5-17 living in poverty also called on the National Research Council (NRC) of the National Academy of Sciences to establish a panel of experts to study the estimates and to make a recommendation to the Secretary of the Department of Education regarding their statistical adequacy for allocating to federal funds to school districts under Title I of the Elementary and Secondary Education Act. Findings by the NRC Panel on Estimates of Poverty for Small Geographic Areas have, to date, been reported in three published interim reports (National Research Council, 1997, 1998, 1999).

With respect to the Census Bureau's estimates *for counties* of children ages 5-17 in families with incomes below the poverty level, the NRC panel, on the basis of its own studies as well as Census Bureau evaluations of its estimation model and reasonable alternative models, issued a carefully and narrowly worded recommendation: "[T]hat the Census Bureau's revised 1993 county estimates of poor school-age children be used in the Title I allocations for the 1998-1999 school year" (National Research Council, 1998:3).

Three things must be noted with respect to this recommendation:

First, the scope of the recommendation pertains exclusively to the use of the Census Bureau's estimates of poor school-age (5-17) children for making allocations to counties under the Title I program. The recommendation is based on the panel's conclusion that use of the revised model-based estimates for 1993 is preferable to using outdated 1990 Census-based estimates for such allocations, and, in particular, the panel withholds any mention of the potential utility of these numbers for other uses. Indeed, the Census Bureau's own technical documentation for the SAIPE program (U.S. Census Bureau, 1999a) specifically cautions the user who wishes, for example, to

compare census-based estimates of poverty with inter-censal model-based estimates of poverty, or inter-censal estimates for two different years, exactly what we attempt to do in the present report.

Second, the recommendation pertains only to the Census Bureau's estimates of poor school-age (5-17) children. At the present time, the Bureau's SAIPE program is producing estimates of the number of poor and poverty rates for age groups 0-17, 5-17 and all ages. While the full extent of the Census Bureau's examination of the models for age groups 0-17 and all ages is unknown, some evaluation data are available on the Census Bureau's homepage (U.S. Census Bureau, 1999a). It is important to note, however, that the models for estimates of poverty of persons 0-17 and all ages were not examined by the NRC panel. It is the estimates of total poverty that are the focus of the present report.

Third, even the estimates of poor school-age (5-17) children suffer from errors that often are quite large. Based on the NRC panel studies (see, in particular, National Research Council, 1998), we know that the revised 1993 estimates of poor school-age children are based on a model which suffers a small bias in the estimates with respect to county size and proportion of Hispanic residents. Moreover, the model shows evidence of "variance heterogeneity with respect to both CPS sample size and poverty rate" (p. 41). Both are observations that prompted the panel to suggest further research into alternative model specifications. Indeed, while the NRC panel concluded that the Census Bureau's estimation model performed as well as, or better than, alternative models that were tested, the panel recommended considerable further model experimentation and testing. Data users who have examined the county estimates have noted, as do we, that most of the estimates have uncomfortably wide confidence intervals.

Finally, the NRC panel has drawn attention to the fact that census-based estimates of poverty and CPS-based model estimates of poverty have systematic differences that arise from differences in data collection procedures between the decennial census and the CPS (see, in particular, National Research Council, 1997:Appendix B). There is some evidence that when compared to the 1990 Census, CPS-based poverty estimates of the number and proportion of school-age children are higher. This fact, when considered alongside the additional fact that census-based estimates of poverty themselves are based on a sample of the population (and thereby suffer from sampling

error), adds further complexity to the task of gauging the trends in poverty among counties between 1990 and any subsequent year -- a task we herein undertake.

## *APPENDIX B*

### *Economic Research Service Economic and Policy Typology Definitions*

**Farming dependent counties**: Farming contributed a weighted annual average of 20 percent of more of total labor and proprietor income over the three years from 1987 to 1989.

**Mining dependent counties**: Mining contributed a weighted annual average of 15 percent or more of total labor and proprietor income over the three years from 1987 to 1989.

**Manufacturing dependent counties**: Manufacturing contributed a weighted annual average of 30 percent or more of total labor and proprietor income over the 3 years from 1987 to 1989.

**Government dependent counties**: Government contributed a weighted annual average of 25 percent of more of total labor and proprietor income over the 3 years from 1987 to 1989.

**Services dependent counties**: Service activities (private and personal services, agricultural services, wholesale and retail trade, finance and insurance, transportation and public utilities) contributed a weighted annual average of 50 percent of more of total labor and proprietor income over the 3 years form 1987 to 1989.

**Non-specialized counties**: Counties not classified as a specialized economic type over the 3 years from 1987 to 1989.

**Retirement destination counties**: The population aged 60 years and over in 1990 increased by 15 percent of more during 1980-90 through in-migration of people.

**Federal lands counties**: Federally owned lands made up 30 percent of more of a county's land area in the year 1987.

**Commuting counties**: Workers aged 16 years and over commuting to jobs outside their county of residence were 40 percent or more of all the county's workers in 1990.

**Persistent poverty counties**: Persons with poverty-level income in the preceding year were 20 percent of more of total population in each of 4 years: 1960, 1970, 1980 and 1990.

**Transfer dependent counties**: Income from transfer payments (Federal, state and local) contributed a weighted annual average of 25 percent or more of total personal income over the 3 years from 1987 to 1989.

## *APPENDIX C*

### *Appalachian Poverty Measures*

**Table C.1:**
**Appalachian Poverty by State**

| | 1979 Census | 1989 estimates | 1989 Census | 1993 estimates | 1995 estimates |
|---|---|---|---|---|---|
| **Alabama** | 16.9% | 15.6% | 16.1% | 16.8% | 15.5% |
| **Georgia** | 12.5% | 9.8% | 10.2% | 11.5% | 10.5% |
| **Kentucky** | 26.0% | 27.0% | 29.0% | 28.5% | 26.9% |
| **Maryland** | 11.9% | 12.0% | 12.5% | 13.2% | 12.9% |
| **Mississippi** | 22.3% | 20.4% | 22.6% | 21.1% | 18.7% |
| **New York** | 12.0% | 10.6% | 12.9% | 14.3% | 14.1% |
| **North Carolina** | 13.8% | 11.9% | 12.4% | 13.1% | 12.4% |
| **Ohio** | 12.6% | 16.0% | 17.4% | 16.8% | 14.4% |
| **Pennsylvania** | 10.0% | 11.2% | 12.5% | 13.3% | 11.9% |
| **South Carolina** | 12.6% | 10.9% | 11.6% | 12.6% | 11.6% |
| **Tennessee** | 16.6% | 15.6% | 16.1% | 17.8% | 14.9% |
| **Virginia** | 15.6% | 17.5% | 17.9% | 17.6% | 16.5% |
| **West Virginia** | 15.0% | 17.2% | 19.7% | 21.7% | 19.9% |
| **ARC counties** | 14.1% | 14.1% | 15.3% | 16.1% | 14.6% |

***Note:*** *Poverty rates by state within Appalachia only include counties designated as Appalachian.*

**Table C.2:**
**Poverty Rates by Developmental Districts for Appalachia.**

| | 1979 Census | 1989 Census | 1989 estimates | 1993 estimates | 1995 estimates |
|---|---|---|---|---|---|
| ***ALABAMA*** | | | | | |
| Northwest Alabama (1a) | 15.5% | 14.9% | 16.7% | 15.6% | 14.9% |
| North Central Alabama (1b) | 16.7% | 13.5% | 14.4% | 14.5% | 13.4% |
| Top of Alabama (1c) | 15.6% | 12.8% | 13.6% | 14.2% | 13.3% |
| West Alabama (1d) | 22.4% | 20.1% | 21.9% | 20.6% | 19.7% |
| Birmingham Regional (1e) | 15.5% | 15.9% | 15.3% | 17.0% | 14.7% |
| East Alabama (1f) | 18.0% | 16.2% | 17.2% | 18.5% | 18.0% |
| Central Alabama (1h) | 18.2% | 14.6% | 14.5% | 15.9% | 13.7% |
| South Central Alabama (1i) | 33.0% | 34.1% | 34.5% | 35.3% | 34.4% |
| ***GEORGIA*** | | | | | |
| Coosa Valley (2a) | 13.2% | 12.4% | 12.5% | 14.0% | 14.2% |
| Georgia Mountains (2b) | 14.4% | 11.9% | 12.2% | 13.4% | 12.1% |
| Chattahoochee-Flint (2c) | 15.8% | 13.4% | 14.9% | 13.4% | 12.1% |
| Atlanta Regional (2d) | 7.0% | 4.5% | 4.7% | 6.6% | 5.8% |
| Northwest Georgia (2e) | 16.5% | 14.0% | 15.7% | 16.7% | 15.2% |
| North Georgia (2f) | 14.9% | 12.3% | 12.5% | 13.8% | 13.4% |
| ***KENTUCKY*** | | | | | |
| Buffalo Trace (3a) | 27.8% | 25.9% | 28.1% | 26.5% | 25.1% |
| FIVCO (3b) | 18.2% | 19.1% | 21.8% | 22.5% | 21.5% |
| Bluegrass Area (3c) | 22.2% | 20.0% | 22.3% | 21.8% | 19.7% |
| Gateway Area (3d) | 26.2% | 26.0% | 28.5% | 28.0% | 26.4% |
| Big Sandy Area (3e) | 22.4% | 27.1% | 29.5% | 29.7% | 28.5% |
| Lake Cumberland (3f) | 30.1% | 28.0% | 29.1% | 27.9% | 26.2% |
| Cumberland Valley (3h) | 30.2% | 32.3% | 33.5% | 32.7% | 31.0% |
| Kentucky River (3i) | 30.5% | 33.6% | 36.3% | 35.3% | 33.6% |
| Barren River (3j) | 29.1% | 23.6% | 26.9% | 24.3% | 23.7% |
| ***MARYLAND*** | | | | | |
| Tri-County W. Maryland (4a) | 11.9% | 12.0% | 12.5% | 13.2% | 12.9% |
| ***MISSISSIPPI*** | | | | | |
| Northeast Mississippi (5a) | 21.7% | 21.5% | 23.8% | 21.4% | 18.8% |
| Three Rivers (5b) | 18.8% | 15.4% | 17.8% | 16.9% | 14.9% |
| Golden Triangle (5c) | 25.6% | 24.6% | 26.6% | 25.2% | 22.6% |
| East Central (5d) | 37.2% | 33.0% | 35.1% | 29.8% | 24.1% |
| North Central (5e) | 24.6% | 24.4% | 26.4% | 26.1% | 23.9% |
| ***NEW YORK*** | | | | | |
| Southern Tier West (6a) | 12.5% | 13.3% | 14.0% | 17.0% | 16.0% |
| Southern Tier Central (6b) | 11.5% | 10.7% | 12.4% | 14.3% | 13.8% |
| Southern Tier East (6c) | 12.0% | 9.2% | 12.5% | 13.1% | 13.4% |
| ***NORTH CAROLINA*** | | | | | |
| Southwestern North Carolina (7a) | 18.8% | 15.7% | 17.2% | 16.8% | 16.4% |
| Land of Sky (7b) | 13.6% | 12.3% | 11.9% | 13.1% | 12.3% |
| Isothermal (7c) | 13.0% | 10.7% | 11.6% | 12.5% | 12.1% |
| Region D (7d) | 18.4% | 15.1% | 16.8% | 15.3% | 14.8% |

| | 1979 Census | 1989 Census | 1989 estimates | 1993 estimates | 1995 estimates |
|---|---|---|---|---|---|
| Western Piedmont (7e) | 10.0% | 9.7% | 10.3% | 11.2% | 10.9% |
| Northwest Piedmont (7i) | 12.1% | 10.4% | 10.6% | 11.8% | 10.7% |
| ***OHIO*** | | | | | |
| Ohio Valley (8a) | 14.2% | 17.1% | 18.4% | 17.2% | 14.7% |
| Buckeye Hills-Hocking (8b) | 14.3% | 17.5% | 20.3% | 18.6% | 16.1% |
| Ohio Mid-Eastern (8c) | 10.9% | 14.1% | 14.6% | 15.2% | 13.0% |
| ***PENNSYLVANIA*** | | | | | |
| Northwest Pennsylvania (9a) | 9.9% | 12.3% | 13.6% | 14.8% | 13.6% |
| North Central Pennsylvania (9b) | 10.1% | 11.7% | 13.4% | 14.2% | 12.6% |
| Northern Tier (9c) | 13.5% | 11.9% | 13.1% | 14.0% | 12.9% |
| ECD of Northeastern Pennsylvania | 9.9% | 9.7% | 10.4% | 11.7% | 10.2% |
| Southwestern Pennsylvania (9e) | 9.3% | 11.4% | 12.5% | 13.4% | 11.8% |
| Southern Alleghenies (9f) | 11.3% | 12.7% | 13.9% | 14.7% | 13.6% |
| SEDA (9g) | 11.9% | 10.0% | 12.5% | 12.1% | 11.1% |
| ***SOUTH CAROLINA*** | | | | | |
| South Carolina Appalachian (10a) | 12.6% | 10.9% | 11.6% | 12.6% | 11.6% |
| ***TENNESSEE*** | | | | | |
| Upper Cumberland (11a) | 20.2% | 16.9% | 18.6% | 19.0% | 16.2% |
| East Tennessee (11b) | 16.8% | 15.7% | 16.0% | 17.4% | 14.6% |
| First Tennessee (11c) | 16.1% | 15.4% | 16.5% | 17.9% | 15.3% |
| South Central Tennessee (11d) | 15.3% | 13.8% | 14.8% | 16.1% | 13.6% |
| Southeast Tennessee (11e) | 15.2% | 15.1% | 15.0% | 18.0% | 14.6% |
| ***VIRGINIA*** | | | | | |
| LENOWISCO (12a) | 20.1% | 25.7% | 23.4% | 24.2% | 22.7% |
| Cumberland Plateau (12b) | 16.1% | 21.6% | 21.5% | 21.5% | 21.2% |
| Mount Rogers (12c) | 14.6% | 16.0% | 15.5% | 16.1% | 14.7% |
| New River Valley (12d) | 15.7% | 14.2% | 17.8% | 15.7% | 14.2% |
| Fifth Planning (12e) | 8.7% | 8.4% | 7.7% | 8.6% | 7.7% |
| Central Shenandoah (12f) | 14.3% | 11.2% | 13.7% | 11.6% | 11.5% |
| ***WEST VIRGINIA*** | | | | | |
| Region 1 (13a) | 17.3% | 22.0% | 24.1% | 26.7% | 24.5% |
| Region 2 (13b) | 17.1% | 20.6% | 24.0% | 25.0% | 23.4% |
| Region 3 (13c) | 11.7% | 15.1% | 16.7% | 19.7% | 17.3% |
| Region 4 (13d) | 17.1% | 20.9% | 23.3% | 25.4% | 26.3% |
| Region 5 (13e) | 13.7% | 15.1% | 18.6% | 20.2% | 19.1% |
| Region 6 (13f) | 15.5% | 16.6% | 19.3% | 20.7% | 18.9% |
| Region 7 (13g) | 18.8% | 21.5% | 23.9% | 26.0% | 24.4% |
| Region 8 (13h) | 17.3% | 14.1% | 15.9% | 17.0% | 16.3% |
| Region 9 (13i) | 14.1% | 9.6% | 11.4% | 14.6% | 13.0% |
| Region 10 (13j) | 10.6% | 14.5% | 16.8% | 18.2% | 16.6% |
| Region 11 (13k) | 9.3% | 12.3% | 14.9% | 16.0% | 14.7% |

***Note:*** *Some developmental districts include non-Appalachian counties that do not appear in this table.*

**Table C.3:**

**Poverty Rates by Urban Continuum Code for Appalachia**

| **Beale Code (93)** | **Number of counties** | **1979 Census** | **1989 estimates** | **1989 Census** | **1993 estimates** | **1995 estimates** |
|---|---|---|---|---|---|---|
| Metro-core | 7 | 8.4% | 9.6% | 10.3% | 11.3% | 9.8% |
| Metro-fringe | 12 | 12.4% | 11.3% | 12.2% | 12.9% | 11.2% |
| Metro-medium | 59 | 12.8% | 12.8% | 13.3% | 14.9% | 13.1% |
| Metro-small | 31 | 12.6% | 12.8% | 14.3% | 15.2% | 14.2% |
| Non-metro, 20,000 urban population, adjacent to metro | 20 | 13.1% | 14.1% | 15.4% | 15.9% | 14.5% |
| Non-metro, 20,000 urban population, non-adjacent to metro | 11 | 15.9% | 15.1% | 18.2% | 18.5% | 16.6% |
| Non-metro, 2,500-19,999 urban population, adjacent to metro | 83 | 15.6% | 15.0% | 16.4% | 16.9% | 15.5% |
| Non-metro, 2,500-19,999 urban population, non-adjacent to metro | 78 | 18.9% | 19.7% | 21.6% | 21.6% | 19.9% |
| Non-metro, rural, adjacent to metro | 40 | 19.6% | 17.4% | 19.7% | 19.5% | 18.1% |
| Non-metro, rural non-adjacent to metro | 65 | 25.1% | 24.9% | 26.0% | 25.1% | 23.7% |
| **ARC counties** | **409** | **14.1%** | **14.1%** | **15.3%** | **16.1%** | **14.6%** |

**Table C.4:**
**Poverty Rates by USDA Non-metropolitan Economic and Policy Functions**

| ERS Code | Number of counties | 1979 Census | 1989 SAIPE | 1989 Census | 1993 SAIPE | 1995 SAIPE |
|---|---|---|---|---|---|---|
| Commuting | 71 | 19.7% | 18.3% | 19.9% | 19.9% | 18.1% |
| Farming | 6 | 25.2% | 20.7% | 22.6% | 20.6% | 19.6% |
| Federal Lands | 24 | 19.1% | 17.3% | 18.5% | 18.3% | 17.3% |
| Government | 24 | 25.9% | 26.2% | 28.5% | 26.6% | 24.8% |
| Manufacturing | 128 | 15.4% | 14.5% | 15.8% | 16.2% | 14.9% |
| Mining | 41 | 19.3% | 22.5% | 25.3% | 26.4% | 23.8% |
| Not Specified | 65 | 18.9% | 18.4% | 19.5% | 19.9% | 18.2% |
| Poverty | 93 | 27.0% | 27.1% | 28.9% | 28.0% | 26.0% |
| Retirement | 19 | 15.7% | 11.9% | 12.9% | 13.4% | 12.4% |
| Service | 32 | 15.4% | 16.0% | 17.8% | 18.3% | 16.8% |
| Transfer | 91 | 22.2% | 25.4% | 27.4% | 27.2% | 25.3% |
| ARC Non-metro | 297 | 17.2% | 17.1% | 18.8% | 18.9% | 17.4% |

# *APPENDIX D*

## *Distressed Status Designation Methodology*

This report determines distressed status of Appalachian counties using the current ARC indicators. The poverty data to determine distressed status was derived from the 1980 and 1990 U.S. Censuses of Population and Housing (U.S. Census Bureau, 1982 and 1992) and the U.S. Census Bureau Small Area Income and Poverty Estimates (U.S. Census Bureau, 1999a). This report uses three-year average unemployment rates derived from *USA Counties 1998* (U.S. Census Bureau, 1999b) and three-year average per capita market income derived from the *Regional Economic Information System 1969-98* (U.S. Bureau of Economic Analysis, 2000). The use of the three-year averages for unemployment and per capita market income accounts for the differences in distressed counties between this report and Wood and Bischak (2000).

## *National Averages and Distressed Standards (in parentheses)*

***1980***

Poverty Rate - 12.4% (18.6%; 24.8%)

Unemployment Rate - 6.87% (10.3%)

Per Capita Market Income - $9,124 ($6,083)

***1990***

Census Poverty Rate - 13.1% (19.7%; 26.2%)

SAIPE Poverty Rate - 13.1% (19.7%; 26.2%)

Unemployment Rate – 5.9% (8.85%)

Per Capita Market Income - $18,114 ($12,076)

***1994***

SAIP Poverty Rate - 15.1% (22.7%; 30.2%)

Unemployment Rate – 6.14% (9.21%)

Per Capita Market Income - $21,271 ($14,181)

***1996***

SAIPE Poverty Rate – 13.8% (20.7%; 27.6%)

Unemployment Rate – 5.25% (7.87%)

Per Capita Market Income - $23,089 ($15,393)

# *APPENDIX E*

## *Appalachian Distressed Counties 1980 – 1996*

### Table E.1:
### Distressed Counties, 1980, 1990, 1994, and 1996 (Bold Text = Distressed)

| | | | | 1994 | | 1996 | |
|---|---|---|---|---|---|---|---|
| **County** | **State** | **1990** | **1990** | **Estimate** | **Upper Bound** | **Estimate** | **Upper Bound** |
| Bibb | Alabama | **PUI** | **PUI** | I | P I | None | P |
| Fayette | Alabama | None | **PUI** | None | None | None | P |
| Franklin | Alabama | U | **PUI** | None | None | None | None |
| Lawrence | Alabama | **PUI** | **PUI** | None | None | None | None |
| Pickens | Alabama | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Talladega | Alabama | PU | **PUI** | I | P I | P I | P I |
| Winston | Alabama | UI | **PUI** | None | None | None | P |
| Union | Georgia | **P* I** | None | None | None | None | None |
| Adair | Kentucky | **P* I** | P I | P I | P I | **PUI** | **PUI** |
| Bath | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Bell | Kentucky | **P* I** | **PUI** | **P* I** | **P* I** | **PUI** | **PUI** |
| Breathitt | Kentucky | **P* I** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Carter | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Casey | Kentucky | **P* I** | **P* I** | P I | **P* I** | P I | **P*U** |
| Clay | Kentucky | **P* I** | **PUI** | **P* I** | **P* I** | **PUI** | **PUI** |
| Clinton | Kentucky | **P* I** | **P* I** | **P* I** | **P* I** | **PUI** | **PUI** |
| Cumberland | Kentucky | **P* I** | **P* I** | **P* I** | **P* I** | **PUI** | **PUI** |
| Elliott | Kentucky | **P* I** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Estill | Kentucky | **PUI** | **PUI** | P I | **P* I** | P I | **P*U** |
| Floyd | Kentucky | P | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Green | Kentucky | P I | P I | I | P I | UI | **PUI** |
| Harlan | Kentucky | P* | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Jackson | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **P*U** | **P*U** |
| Johnson | Kentucky | P | **PUI** | P I | **P* I** | **PUI** | **PUI** |
| Knott | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Knox | Kentucky | **P* I** | **P* I** | **P* I** | **P* I** | **PUI** | **PUI** |
| Laurel | Kentucky | P | P I | P I | **P* I** | P I | P I |
| Lawrence | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Lee | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **P*U** | **P*U** |
| Leslie | Kentucky | **P* I** | **PUI** | **P* I** | **P* I** | **P*U** | **P*U** |
| Letcher | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Lewis | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Lincoln | Kentucky | **PUI** | **P* I** | P I | P I | P I | **P*U** |
| McCreary | Kentucky | **PUI** | **PUI** | **P* I** | **P* I** | **PUI** | **PUI** |
| Magoffin | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Martin | Kentucky | P* | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Menifee | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |

P = County poverty rate at or above 150% of national average
P*= County poverty rate at or above 200% of national average
U= County unemployment rate at or above 150% of national average
I = County per capita market income at or below 2/3 of national average

| County | State | 1990 | 1990 | 1994 Estimate | 1994 Upper Bound | 1996 Estimate | 1996 Upper Bound |
|---|---|---|---|---|---|---|---|
| Monroe | Kentucky | **P* I** | **P* I** | P | P | P | P* |
| Morgan | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Owsley | Kentucky | **PUI** | **P* I** | **P* I** | **P* I** | **P*U** | **P*U** |
| Perry | Kentucky | P | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Pike | Kentucky | P | PU | PU | **P*U** | PU | **P*U** |
| Powell | Kentucky | **PUI** | **PUI** | P I | **P* I** | P I | **P*U** |
| Rockcastle | Kentucky | **P* I** | **PUI** | P I | **P* I** | P I | **P*U** |
| Rowan | Kentucky | P I | **P* I** | P I | **P* I** | P I | **P*U** |
| Russell | Kentucky | **PUI** | **PUI** | P I | P I | **PUI** | **PUI** |
| Wayne | Kentucky | **P* I** | **PUI** | **P* I** | **P* I** | **P*U** | **P*U** |
| Whitley | Kentucky | **PUI** | **P* I** | **P* I** | **P* I** | **P*U** | **P*U** |
| Wolfe | Kentucky | **PUI** | **PUI** | **PUI** | **PUI** | **P*U** | **P*U** |
| Benton | Mississippi | P I | **PUI** | P I | **P* I** | **PUI** | **PUI** |
| Chickasaw | Mississippi | P I | **PUI** | None | P | U | PU |
| Choctaw | Mississippi | **P* I** | **PUI** | P I | **P* I** | **PUI** | **PUI** |
| Clay | Mississippi | P I | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Kemper | Mississippi | **P* I** | **PUI** | P I | **P* I** | **PUI** | **PUI** |
| Marshall | Mississippi | **P* I** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Noxubee | Mississippi | **PUI** | **PUI** | **P* I** | **P* I** | **PUI** | **PUI** |
| Oktibbeha | Mississippi | **P* I** | **P* I** | P I | **P* I** | P I | **P*U** |
| Prentiss | Mississippi | I | **PUI** | I | I | I | P I |
| Tippah | Mississippi | P I | **PUI** | I | P I | I | I |
| Tishomingo | Mississippi | None | **PUI** | I | I | UI | UI |
| Webster | Mississippi | P I | **PUI** | I | P I | P I | P I |
| Winston | Mississippi | **P* I** | **PUI** | P I | **P* I** | **PUI** | **PUI** |
| Graham | North Carolina | **PUI** | **PUI** | UI | **PUI** | UI | **PUI** |
| Madison | North Carolina | **P* I** | P I | None | None | None | P |
| Swain | North Carolina | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Adams | Ohio | **PUI** | **PUI** | **PUI** | **PUI** | UI | **PUI** |
| Athens | Ohio | P I | **P* I** | P I | P I | I | P I |
| Jackson | Ohio | U | **PUI** | I | P I | I | P I |
| Meigs | Ohio | None | P I | **PUI** | **PUI** | **PUI** | **PUI** |
| Monroe | Ohio | None | **PUI** | U | U | UI | **PUI** |
| Pike | Ohio | **PUI** | **PUI** | **PUI** | **PUI** | UI | **PUI** |
| Scioto | Ohio | U | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Vinton | Ohio | I | **PUI** | UI | **PUI** | UI | **PUI** |
| Bledsoe | Tennessee | **PUI** | I | P I | P I | P I | P I |
| Campbell | Tennessee | **PUI** | **PUI** | P I | **P* I** | **PUI** | **PUI** |
| Claiborne | Tennessee | **PUI** | P I | P I | P I | P I | P I |
| Clay | Tennessee | **P* I** | P I | None | P | U | PU |
| Cocke | Tennessee | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Cumberland | Tennessee | **PUI** | I | None | None | None | None |
| Fentress | Tennessee | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Grundy | Tennessee | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Hancock | Tennessee | **PUI** | **P* I** | **P* I** | **P* I** | **P*U** | **P*U** |

P = County poverty rate at or above 150% of national average
P*= County poverty rate at or above 200% of national average
U= County unemployment rate at or above 150% of national average
I = County per capita market income at or below 2/3 of national average

| County | State | 1990 | 1990 | 1994 Estimate | 1994 Upper Bound | 1996 Estimate | 1996 Upper Bound |
|---|---|---|---|---|---|---|---|
| Jackson | Tennessee | **PUI** | P I | I | P I | I | I |
| Johnson | Tennessee | **P* I** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Meigs | Tennessee | U | **PUI** | UI | UI | UI | **PUI** |
| Monroe | Tennessee | **PUI** | UI | I | P I | UI | **PUI** |
| Morgan | Tennessee | **P* I** | **PUI** | P I | P I | I | P I |
| Overton | Tennessee | **PUI** | UI | I | P I | UI | **PUI** |
| Pickett | Tennessee | **P* I** | P I | P I | P I | **PUI** | **PUI** |
| Rhea | Tennessee | P | UI | UI | **PUI** | UI | UI |
| Scott | Tennessee | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Buchanan | Virginia | P | PU | PU | PU | **PUI** | **PUI** |
| Dickenson | Virginia | U | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Lee | Virginia | **P* I** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Russell | Virginia | None | **PUI** | UI | **PUI** | UI | **PUI** |
| Barbour | West Virginia | P | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Boone | West Virginia | None | **P*U** | PU | **P*U** | PU | **P*U** |
| Braxton | West Virginia | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Calhoun | West Virginia | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Clay | West Virginia | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Doddridge | West Virginia | P I | P I | **PUI** | **PUI** | P I | **P*U** |
| Fayette | West Virginia | U | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Gilmer | West Virginia | P I | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Jackson | West Virginia | U | **PUI** | U | PU | None | P |
| Lewis | West Virginia | I | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Lincoln | West Virginia | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Logan | West Virginia | None | **PUI** | PU | **P*U** | **PUI** | **PUI** |
| McDowell | West Virginia | PU | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Mason | West Virginia | U | **PUI** | U | PU | UI | **PUI** |
| Mingo | West Virginia | P | **PUI** | **P*U** | **P*U** | **PUI** | **PUI** |
| Monroe | West Virginia | P I | **PUI** | I | P I | I | P I |
| Nicholas | West Virginia | U | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Pocahontas | West Virginia | U | **PUI** | U | PU | U | PU |
| Preston | West Virginia | **PUI** | UI | UI | **PUI** | UI | **PUI** |
| Randolph | West Virginia | None | **PUI** | PU | PU | PU | PU |
| Ritchie | West Virginia | UI | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Roane | West Virginia | UI | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Summers | West Virginia | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Taylor | West Virginia | UI | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Tucker | West Virginia | I | UI | UI | UI | UI | **PUI** |
| Upshur | West Virginia | I | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Wayne | West Virginia | P | **PUI** | P I | P I | P I | P I |
| Webster | West Virginia | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Wirt | West Virginia | UI | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |
| Wyoming | West Virginia | PU | **PUI** | **PUI** | **PUI** | **PUI** | **PUI** |

P = County poverty rate at or above 150% of national average
P*= County poverty rate at or above 200% of national average
U= County unemployment rate at or above 150% of national average
I = County per capita market income at or below 2/3 of national average