

April 27, 2011: A Day that Changed Alabama

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A total of 62 confirmed tornadoes carved paths of destruction totaling about 1,202 miles as they traversed the northern and central sections of Alabama on April 27, 2011. The tornadoes varied in intensity and length, with three rated as EF-5, eight as EF-4, and seven EF-3 tornadoes; these inflicted damage ranging from incredible to severe to homes and businesses in the affected areas. A total of 250 people died as a result of the storms, with the highest county death toll (50) resulting from the EF-4 tornado that struck more densely populated areas of Tuscaloosa. The EF-5 tornadoes that hit the state caused 35 deaths in DeKalb County, 26 in Franklin, and 25 in Marion County as they devastated entire small communities. More than 2,200 were injured statewide. The tornadoes were indiscriminate, striking young and old, students and families, poor and middle class, and urban, small town, and rural areas.

Quantifying the April 27 Tornadoes

62 tornadoes confirmed
1,202 tornado miles
250 deaths
2,200+ injured
43 counties federal
disaster areas

As a result of these storms, 43 Alabama counties were declared federal disaster areas, with eligibility for individual assistance, 33 counties were also entitled to apply for FEMA public assistance, and all 67 counties were ruled eligible for assistance with debris removal. Over 13,000 homes and businesses were destroyed or declared unsafe, and about 10,000 more sustained lesser damage or were affected. Two schools in Tuscaloosa County and two in Hackleburg were destroyed and 10 other schools across the state were damaged, while five critical facilities statewide were destroyed or unusable. Surveys found 177,857 acres of forest land with a value of \$228.4 million damaged across the state. Insured losses from the Alabama tornadoes are estimated as at least \$2.6 to \$4.2 billion, making it the costliest natural disaster in the state's history. Recent estimates from the Insurance Information Institute indicate that insurers expect to pay out about \$2 billion on claims from the Tuscaloosa and Birmingham areas alone. Looking across the United States, insured losses from the spring 2011 tornadoes totaled \$14 billion, ranking this the nation's fifth most costly disaster.

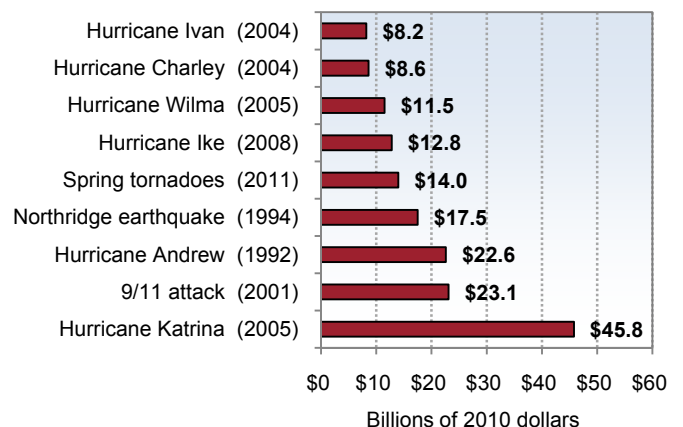
Great strides have been made in debris removal and cleanup; by mid-July the United States Army Corps of Engineers had cleared about 4.3 of the 4.7 million Cubic Yards it was contracted for. While some repairs of damaged structures were complete or in progress and a small amount of rebuilding had begun, it was also apparent that bringing planning, redevelopment, and rebuilding efforts to fruition is going to take time. And, while money has been and will continue flowing in from federal sources, insurance companies, and from individual and corporate donations, it is also clear that there are real costs to individuals, the state, and to the impacted local communities that will be incurred as these efforts

Property Damage Estimates

| | |
|----------------------------------------|---------------|
| Structures destroyed | 7,300 |
| Structures damaged | 15,700 |
| Major | 5,800 |
| Minor | 5,200 |
| Affected | 4,700 |
| Schools destroyed | 4 |
| Schools damaged | 10 |
| Critical facilities destroyed/unusable | 5 |
| Forest land damaged | |
| Acres | 177,857 |
| Value | \$228,360,576 |

Source: Alabama EMA, FEMA, American Red Cross, Alabama Forestry Commission.

Insured Losses from Costliest U.S. Disasters



progress. Although it is still too early to fully comprehend the total economic effects of the damage caused by the tornadoes, enough information is available to permit some preliminary estimates of damage effects on the Alabama economy with specific focuses on employment, earnings, state finances, and gross domestic product (GDP).

Tornado Impact Analysis

The Center for Business and Economic Research at The University of Alabama derived preliminary estimates of the economic and fiscal impacts of the tornadoes as well as the consequent recovery efforts on Alabama based on data available in June. Multipliers obtained from the Bureau of Economic Analysis (BEA)'s Regional Input-Output Modeling System (RIMS II) were used in a model developed specifically for this analysis. To allow for uncertainty regarding the damage impacts at this early stage, low- and high-end estimates are presented. For impacts of recovery activities (cleanup, assistance, and rebuilding), multipliers used are for the waste management and remediation services, accommodation, and construction industries.

Fiscal impacts are derived from the earnings impacts allowing for the fact that not all of the earnings impacts are sales or income taxable. Spending on sales taxable items constitutes around 42 percent of total earnings and state taxable income (net income) is about 66 percent of earnings. Because job losses occurred across many industries, combined income and sales tax revenues share of total state tax receipts was used to determine the total lost state tax revenue for the damage impact analysis. No such determination is made on the recovery impacts because of the focus on just three industries; only sales and income taxes are reported and as such the recovery fiscal impacts are conservative.

The following assumptions are used in this analysis:

1. Economic damages only occur in 2011.
2. Cleanup and assistance spending will total \$1.6 billion (\$1.0 billion for cleanup and \$600 million for assistance) and be completed in 2011. Assistance will be mainly for accommodation.
3. Rebuilding spending will range from \$2.6 to \$4.2 billion with \$1.0 billion spent in 2011 and the remainder in 2012.
4. All recovery (cleanup, assistance, and rebuilding) activities will be completed by the end of 2012.

Negative Economic Impacts from Tornado Damage

Toward the end of May 2011, the Alabama Department of Industrial Relations (ADIR) had received 6,000 claims for tornado-related unemployment and had data showing that some claimants were returning to work. Adjusting this number of claims received for the eight months remaining in the year and assuming that a quarter of the claimants will return to work reduces the number to 3,000 net direct unemployed wage and salary workers. To this number we add an estimated 761 proprietors or self employed based on BEA data and determine that the total direct number of unemployed due to the tornadoes is 3,761 for 2011. It is expected that these people will be working again in 2012.

The 3,761 direct unemployed must be added to the indirect unemployment resulting from the tornadoes to determine a total employment impact. Since businesses in numerous industries suffered damages, specific industry multipliers cannot be applied as a breakdown by industry is not available. Most Alabama industries' direct effect employment multipliers are between 1.5 and 3.5; using these multipliers puts the total direct and indirect number of tornado-related unemployed at between 5,641 and 13,162. This is about 0.2 to 0.5 percent of total Alabama employment including proprietors.

Federal Assistance for Tornado Recovery

| | |
|----------------------------------|--------------|
| FEMA Individual assistance | |
| Applications approved | 26,143 |
| Individuals & households program | |
| Total dollars approved | \$70,731,131 |
| Housing assistance | \$51,371,472 |
| Other needs assistance | \$19,359,659 |
| SBA Low-interest loans | |
| Applications approved | 1,683 |
| Total dollars approved | \$93,593,200 |

Source: Federal Emergency Management Agency and Small Business Administration, August 31, 2011.

Currently, workers average earnings are at about the 2009 earnings per worker level of \$38,621, which means that \$217.9 to \$508.3 million in total earnings will be lost in 2011 because of the tornadoes. This translates into \$19.1 to \$44.5 million in lost state taxes, about 0.2 to 0.5 percent of the total. The lost state taxes comprise \$8.3 to \$19.3 million in income tax, \$3.5 to \$8.2 million in sales tax, and \$7.3 to \$17.0 million in other taxes. In addition, the state is expected to spend \$80 to \$100 million on cleanup. Thus, including lost tax revenues, the tornadoes will cost the state \$99.1 to \$144.5 million in 2011. Local sales tax collections are expected to fall by \$4.4 to \$10.2 million; local governments will also be negatively impacted by costs they incur for cleanup.

Alabama Tornado Economic Damage Impacts (2011 only)

| | |
|---------------------------------------|-----------------|
| Direct unemployed | 3,761 |
| Direct + indirect unemployed | 5,641-13,162 |
| Percent of total employment | 0.2-0.5 |
| Lost earnings (millions) | \$217.9-\$508.3 |
| Lost state tax revenue (millions) | \$19.1-\$44.5 |
| Lost local sales taxes (millions) | \$4.4-10.2 |
| Estimated insured losses (millions) | \$2,600-\$4,200 |
| Estimated uninsured losses (millions) | \$260-\$420 |
| Lost Alabama GDP (millions) | \$835-\$1,348 |
| Percent of total GDP | 0.5-0.7 |

Source: U.S. BEA, Alabama Department of Finance, Alabama Department of Revenue, ADIR, and Center for Business and Economic Research, The University of Alabama.

A fixed-asset basis is used to estimate the effect on Alabama GDP. At the time of this analysis, a range of \$2.6 to \$4.2 billion in expected insurance claims were reported, based on early estimates by Risk Management Solutions and AIR Worldwide. Assuming that the claims cover fixed assets only and allowing 10 percent extra for uninsured losses results in total estimated lost assets of \$2.9 to \$4.6 billion. Under the assumption that Alabama has the same GDP to fixed assets ratio of 29.2 percent as the nation, the tornadoes will reduce Alabama GDP by \$835 million to \$1.3 billion in 2011, or 0.5 to 0.7 percent.

The economic effects are certainly only a part of the full damage impacts. There are other adverse impacts on quality of life that are not considered in this analysis because they are non-market or non-economic effects. Lives were lost and disrupted, people and businesses displaced, and the physical and emotional health of many was affected. Because such quality of life aspects cannot be expressed with the variables used for impact analysis, the damage impacts reported here are conservative.

Positive Economic Impacts of Recovery Activities

Recovery activities will create economic impacts that exceed those of the tornado damage, injecting an estimated \$2.6 billion into the Alabama economy in 2011 and an additional \$1.6 to \$3.2 billion in 2012, based on the assumptions used in this study. The 2011 spending will create a \$5.3 billion output or gross sales impact which will add \$2.9 billion to the state's GDP, or 1.6 percent. Of the \$2.9 billion value-added or GDP impact, \$1.5 billion is earnings to 51,709 workers, or \$29,763 per worker. State income tax revenues of \$58.3 million and sales taxes totaling \$24.8 million will be generated, along with local sales tax receipts of \$31.0 million.

Positive Recovery Impacts

| | 2011 | 2012 |
|---------------------------------------|---------|-----------------|
| Cleanup (millions) | \$1,000 | |
| FEMA assistance (millions) | \$600 | |
| Rebuilding (millions) | \$1,000 | \$1,600-\$3,200 |
| Output (millions) | \$5,251 | \$3,664-\$7,329 |
| Value-added or GDP (millions) | \$2,938 | \$1,939-\$3,878 |
| Employment (jobs) | 51,709 | 36,893-73,787 |
| Earnings (millions) | \$1,539 | \$1,171-\$2,342 |
| State income and sales tax (millions) | \$83.1 | \$63.2-\$114.7 |
| Local sales tax (millions) | \$31.0 | \$23.6-\$47.2 |

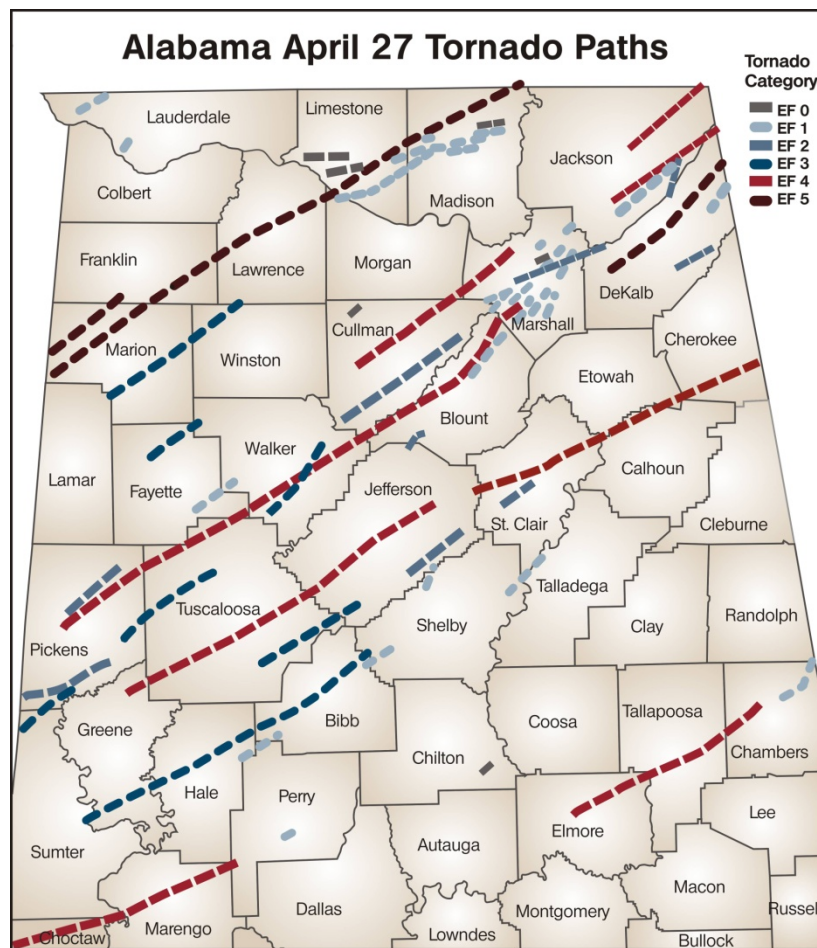
Source: Center for Business and Economic Research, The University of Alabama.

In 2012 the \$1.6 to \$3.2 billion that will be spent on rebuilding will yield \$3.7 to \$7.3 billion in gross economic activity, including a \$1.9 to \$3.9 billion contribution to Alabama GDP. A forecasted 36,893 to 73,787 jobs that will be created in 2012 as the recovery progresses will generate \$1.2 to \$2.3 billion in earnings at an average of \$31,741 per job. It is likely that some of the jobs created by recovery activities could go to people who became unemployed as a result of the tornadoes. Increased tax revenues

resulting from the recovery should yield \$63.2 to \$126.5 million for the state (\$44.4 to \$88.8 million in income tax and \$18.9 to \$37.7 million from sales tax) as well as \$23.6 to \$47.2 million of local sales tax collections.

Over the expected 2011 to 2012 period, the recovery activities will generate enough revenue to cover damage-induced losses to state finances as well as the state spending for cleanup if assumptions on losses and spending hold. While the tornadoes' damages are largely localized, the economic impacts of the ensuing recovery activities will be more widespread. Some areas were so devastated that it is nearby communities that will benefit from the recovery spending.

Certainly the positive economic impacts of recovery activities are larger than the negative impacts of the tornado damages. It is important to note that the net effect is positive because most of the recovery funds are from external sources—the federal government, insurance claims, and personal and corporate donations. Those funds would have gone to some other use if the tornado devastation had not occurred. As such, from a national perspective, the combined impact is negative. Additionally, there are the adverse effects on quality of life that if considered and valued could point to a net negative impact. Reinvesting and improving on what was there before, rather than just rebuilding, will facilitate long term positive impacts.



Source: Alabama Emergency Management Agency and Center for Business and Economic Research, The University of Alabama.

Note: A version of this article appeared in the BBVA Research publication, *United States Regional Outlook: Third Quarter 2011*.