Introduction

Hurricane Michael roared onto the Florida Panhandle on October 10, 2018. A Category 4 storm with sustained winds of 155 miles per hour—just shy of the 157 miles per hour necessary to be classified a Category 5 storm—it was the third strongest hurricane to strike the United States mainland. As Michael moved northeast across Alabama and Georgia, the hurricane’s fierce winds, towering storm surge and punishing rain caused billions of dollars in damage to homes, businesses and infrastructure in the Southern region.

For farmers in Florida, Alabama and Georgia, the timing of the storm could not have been worse. Just as harvest season for many vegetable and row crops* was beginning, like a plague of locusts, Michael devoured nearly every farm in its path. This SLC Regional Resource, current as of April 15, 2019, reviews the agricultural impact of Hurricane Michael on Florida, Alabama and Georgia. Across the three states, cotton and timber were hardest hit, but damage to other agricultural products and infrastructure was equally devastating.

The 2018 cotton crop in the South was expected to be a record-setter, with farmers anticipating a combination of good market prices and high yields that could provide strong financial footing for future years. When Hurricane Michael made landfall, cotton harvest in Florida, Alabama and Georgia was in the early stages. In the crop’s life-cycle, this is cotton’s most vulnerable phase because the leaves have dropped, exposing the delicate fiber. Although a majority of farmers have crop insurance, most policies only cover a certain percentage of the 10-year average yield. While this provides some relief, it still is far below the record profit cotton farmers were anticipating in 2018.

As the storm moved across the region, Hurricane Michael’s tempestuous winds snapped trees like matchsticks, devastating the timber industry. Following a hurricane, salvaging fallen timber can be particularly challenging and extends far beyond clearing debris. In rural areas, felled trees can block road access, making transportation of timber and equipment difficult. When farmers are unable to access the equipment necessary to salvage felled trees or are unable to promptly transport trees to processing facilities, additional losses are incurred. As downed forest debris dries, the potential for wildfire conditions increases. Even those trees that are damaged, but not felled, may die or show decreased production in future seasons due to limb and/or leaf loss. Damaged trees also are more vulnerable to disease. Timber mills in the impacted areas also incurred damage or were rendered inoperable by power loss, leaving few options for the processing of salvageable timber.

* A row crop is a crop that can be planted in rows wide enough to allow it to be tilled or otherwise cultivated by agricultural machinery. Examples of row crops include sunflowers, potatoes, cotton and soybeans.
Unlike vegetable and row crops, trees take years to mature and produce, resulting in losses that will be felt for generations. Compounding this, some farmers use their timber stands as collateral for loans used to operate their farms. For these farmers, the loss of timber also means the loss of a significant safety net.

**Florida**

Hurricane Michael was the strongest storm on record to make landfall on the Florida Panhandle. Estimates of total agricultural losses in the state vary. According to economists with the University of Florida Institute of Food and Agricultural Sciences, the storm caused production losses totaling $158 million for the state’s agricultural industries and an additional $1.3 billion in timber losses. Meanwhile, the Florida Department of Agriculture and Consumer Services (FDACS) estimates losses to production agriculture (including timber) totaled more than $1.4 billion. Timber ($1.3 billion), cotton ($56 million) and peanuts ($29.5 million) sustained the greatest crop losses, while the cattle ($43 million) and green industries ($16 million) also suffered.

Nearly 47 percent of the state is forested, with a large portion clustered in northwest Florida. This portion of the state was hardest hit by the hurricane’s wind. The Forest Service Division of FDACS estimates that Hurricane Michael damaged a total of 2.8 million acres of forest land at an estimated value of $1.3 billion at current average timber stumpage prices. Adjusting for average annual harvest levels, and assuming a 10 percent timber salvage rate, the loss for the 2018–2019 season is estimated at $147 million. According to the Florida Forestry Association, the timber industry employs approximately 120,000 people in the state, contributing a total of $25 billion to the state’s economy.

Damage to Florida’s cotton crop was catastrophic. Typically harvested in October, approximately 90 percent of the state’s crop remained in the field when Hurricane Michael struck. The FDACS estimates approximately 51,400 acres were a total loss, with no salvageable cotton, while 25,500 acres experienced severe damage with losses in the range of 85 percent, and 39,500 acres experienced significant damage with an estimated 50 percent loss. In total, an estimated $50 million in cotton crops was lost. As a comparison, in 2017, the state’s total cotton production was valued at $52.4 million. Beyond direct crop loss, infrastructure associated with the cotton industry—such as barns, sheds and farming equipment—also was impacted. These ancillary losses are expected to exceed $6 million, with total losses estimated at $56 million.

Nationally, Florida ranks fourth in the value of production of peanuts. In 2017, the state’s peanut crop production was valued at $153.9 million. Often grown in rotation with cotton, peanuts are a major crop in northern Florida. Like other ground crops, peanuts are better able to withstand the impacts of hurricane-force winds. At the time Michael struck, approximately half of the state’s peanut crop already had been harvested. The FDACS estimates $23 million in peanut crop losses. Associated infrastructure also sustained significant damage. Processing facilities were heavily impacted by the hurricane’s winds and many facilities lost power for several days. Without the ability to heat-dry peanuts in processing facilities, peanuts must be dried in the field, risking further crop loss. Damages to infrastructure, including drying facilities, warehouses and sampling stations, are estimated at $6.5 million. Total losses for the state’s peanut industry are estimated to exceed $29 million.

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1. Florida’s green industries include greenhouses, nurseries and floriculture producers.
2. Stumpage price is the price a buyer pays for the right to harvest timber from a given land base.

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**About the Data**

Data on agricultural losses were collected from publicly available reports published by the University of Florida Institute of Food and Agricultural Sciences, Florida Department of Agriculture and Consumer Services, Alabama Cooperative Extension System, Alabama Forestry Commission and the University of Georgia Cooperative Extension. Given inherent differences in data collection and measurement among these sources, figures have been rounded for the purposes of editorial standardization.
Cattle are one of Florida’s top agricultural commodities in terms of farm receipts. According to the U.S. Department of Agriculture’s (USDA) Economic Research Service (ERS), the cattle and calves commodity group ranked fourth among the state’s top commodities in 2017, with farm receipts exceeding $580 million. Damage to this sector caused by Hurricane Michael centers largely on infrastructure, including fencing, barns and equipment. Keeping cattle out of harm’s way is a significant expense, often requiring additional purchases of feed and forage to mitigate the loss of hay. Providing water for relocated herds may be complicated further by loss of electricity, rendering water pumps inoperable. As a result of the widespread damage, the FDACS cautions that some cows may not carry calves to weaning—or even breed—in the following year. Field reports indicate that a significant number of livestock animals, including beef cattle, were unaccounted for during the hurricane. Most of the animals disappeared from farms and ranches with damaged fencing or enclosures. Dead cattle also were reported, though the exact number is not known. Total ancillary losses to the cattle sector are estimated at $37.6 million, while direct losses are estimated at an additional $5.8 million.

With a unique climate and long growing season, Florida’s nurseries provide plants for landscapers and agricultural producers across the country. Statewide, the sector’s annual sales are estimated at $2.75 billion, with approximately $80 million in sales from the region impacted by Hurricane Michael. Total losses, including crop losses, for Florida’s green industry are estimated at $16.1 million.

During the 2019 legislative session, dozens of bills have been filed to provide funding and relief for cleanup efforts, as well as for rebuilding communities, schools and infrastructure in areas impacted by Hurricane Michael. To offset impacts to the state’s agriculture sector, Commissioner of Agriculture and Consumer Services Nikki Fried has requested an additional $39 million in storm-related funding from the Legislature. Likewise, Governor Ron DeSantis has announced plans to direct almost $2 billion in state and federal spending to help the state recover from the devastation caused by Hurricane Michael and other recent hurricanes.

**Alabama**

Rolling through the southeast corner of the state, Hurricane Michael caused approximately $300 million in damage to Alabama’s agricultural operations, including $204 million in direct agricultural losses. Known as the Wiregrass Region, this portion of the state has particularly fertile soil and a robust agricultural economy. As a result of the damage caused by Hurricane Michael, the Alabama Cooperative Extension System estimates that local, state and federal tax revenues could decline by as much as $22.8 million. In terms of agricultural impact, cotton ($107.7 million), livestock ($24.5 million) and timber ($20.9 million) sustained the greatest losses, while farm infrastructure ($11.9 million) and peanuts ($11.3 million) also suffered.

Cotton farmers in the state were anticipating a record-setting harvest in 2018, due to a combination of high yield and good market prices. Favorable weather conditions throughout the growing season, including a reprieve from the August drought that plagued cotton farmers previously, were expected to produce high yields. According to the USDA, an estimated output of 1,065 pounds per acre was expected, nearly 100 pounds more per acre than the previous record yield. Yet, with most of the crop still in the field when the hurricane struck, cotton accounted for more than half of the state’s direct agricultural losses. The Alabama Cooperative Extension System estimates total crop losses for cotton at approximately $107.7 million. Extension records show that farmers in the state planted more than 435,000 acres of cotton in 2017, producing crops worth an estimated $292 million. That same year, cotton ranked fifth among the state’s top agricultural commodities, according to the USDA ERS.

Cattle are one of Alabama’s top agricultural commodities in terms of farm receipts. According to the USDA ERS, the cattle and calves commodity group ranked second among the state’s top commodities in
2017, with farm receipts exceeding $499 million.\textsuperscript{33} While farmers in the state did not report high numbers of livestock deaths, their operations sustained significant harm to associated infrastructure, particularly fencing. Fence replacement costs in the state’s cattle sector total almost $18 million, with another $5.6 million in debris removal expenses.\textsuperscript{34} The Alabama Cooperative Extension System estimates that Hurricane Michael cost livestock operators a total of $24.5 million.\textsuperscript{35}

Alabama is home to 23 million acres of forestland, the third largest commercial forestland in the nation.\textsuperscript{36} The state’s forest industry is an important driver of rural development in the area, supporting approximately 41,700 jobs and $2.1 billion in direct employment earnings.\textsuperscript{37} With an estimated $20.9 million in direct losses and an additional $11.8 million associated with the loss of pine straw, the state’s timber industry was severely impacted.\textsuperscript{38} Surveys conducted by the Alabama Forestry Commission indicate approximately 42,400 acres were destroyed by the storm, including 13,400 acres of pine, 2,900 acres of hardwood and 26,000 acres of mixed pine and hardwood.\textsuperscript{39} The state’s forest industry is an important driver of rural development in the area, supporting approximately 41,700 jobs and $2.1 billion in direct employment earnings.\textsuperscript{40}

In addition to crop damage, Hurricane Michael caused an estimated $11.9 million in damages to farm infrastructure, including structural damages on farms and to agribusinesses.\textsuperscript{41} The lasting effect of destroyed and damaged farm infrastructure likely will ripple across the state’s economy for years to come as farmers struggle to replace equipment and rebuild structures and fencing. Likewise, damage to the state’s agribusiness infrastructure, including cotton gins and peanut processing facilities, could cause further complications for farmers. Damaged and/or inoperable agribusiness infrastructure could lead to delays in both the harvest and sale of remaining crops, leaving already cash-strapped farmers with few options.

Although peanuts, which grow underground, are more resistant to storm damage, the commodity was among the most impacted in the state, with losses estimated at $11.3 million.\textsuperscript{42} In 2017, the state produced an estimated $156 million in peanuts, with most of the crop originating in the Wiregrass Region — the area most impacted by Hurricane Michael. Although peanuts do not rank among the state’s top commodities, the Alabama Peanut Producers Association estimates half of the peanuts produced in the United States come from a 100-mile radius of Dothan, a city in the Wiregrass Region.\textsuperscript{43}

**Georgia**

Hurricane Michael (Category 4) was one of only five major hurricanes — defined as a Category 3 or higher — to make landfall in Georgia since recordkeeping began in 1851.\textsuperscript{44} As it swept across the state, the storm flattened trees, demolished crops and destroyed chicken coops, causing an estimated $2.5 billion in damages to the state’s agriculture sector.\textsuperscript{45} Annually, agriculture contributes approximately $73.3 billion to the state’s economy, and one in seven Georgians works in agriculture, forestry or related fields.\textsuperscript{46} Timber ($763 million), cotton ($550 million–$600 million) and pecans ($560 million) sustained the greatest losses, while vegetables ($480 million) and the poultry industry ($28 million) also suffered.\textsuperscript{47}

In 2017, Georgia led the nation in the volume of annual timber harvested.\textsuperscript{48} However, with more than 2.3 million acres destroyed or damaged by the hurricane — contributing to an estimated loss of $763 million — the state’s timber industry likely will feel the impacts of the storm for generations.\textsuperscript{49} Approximately 300,000 acres (16 percent) of the state’s timber were classified as catastrophically damaged and an estimated 1.4 million acres (61 percent) were deemed moderately damaged.\textsuperscript{50} Recorded damage included breakage of trunks, tops and branches, as well as bent and toppled trees. Beyond the direct damages, the University of Georgia Cooperative Extension estimates an additional $170 million in associated agriculture sector losses resulting from reduced output.\textsuperscript{51}
Hurricane Michael cut a punishing path across the state’s cotton-growing region where, like their neighbors in Florida and Alabama, farmers were anticipating record yields. When the hurricane struck, only about 15 percent of the state’s crop had been harvested.\(^5\) As a result, some fields in the southwest portion of the state were declared a complete loss. According to the University of Georgia Cooperative Extension, loss estimates range from $550 million to $600 million, with an additional $74 million in associated agriculture sector losses.\(^5\) In 2017, upland cotton lint ranked second among the state’s top commodities in terms of farm receipts.\(^5\) According to the USDA ERS, that same year, cotton was the state’s most exported agricultural commodity and the state ranked second overall in cotton exports.\(^5\)

The state’s pecan industry, which accounts for one-third of the nation’s overall supply, sustained unprecedented losses.\(^5\) Estimates from the University of Georgia Cooperative Extension suggest the industry incurred $100 million in direct crop losses, $260 million in lost trees and $200 million in future income, for a total loss of $560 million.\(^5\) Due to the significant number of high-producing trees that were lost, the industry will feel the impact of the storm for years to come. Beyond direct losses, the state sustained an additional $24.7 million in agriculture sector losses related to the pecan industry.\(^5\)

Mid-October is an important harvest time for Georgia’s vegetable farmers. When Hurricane Michael struck, many of the state’s late summer and fall vegetable crops were near, or in the midst, of harvest. The University of Georgia’s Cooperative Extension estimates that 35 percent to 40 percent of the state’s vegetable income is connected to the fall growing season.\(^5\) The vegetable industry incurred $480 million in direct losses due to Hurricane Michael, with another $69 million in agriculture sector losses related to the industry.\(^5\) The most affected vegetable crops were sweet corn, peppers (bell and specialty), eggplants, cucumber, squash, tomatoes, snap beans and early-planted cabbage and greens.\(^5\) Crop losses for sweet corn alone exceeded 90 percent.\(^5\)

Poultry is the state’s leading agricultural industry.\(^6\) According to the Georgia Poultry Federation, the industry contributes more than $18.4 billion to the state’s economy each year.\(^6\) The USDA ERS found that, in 2017, broilers were the state’s top agricultural commodity, while chicken eggs ranked fourth.\(^6\) That same year, broiler meat was the state’s third most exported agricultural commodity.\(^6\) During Hurricane Michael, more than 90 poultry houses were destroyed or significantly damaged, resulting in approximately $20 million in direct losses.\(^6\) Additionally, farmers lost more than 2 million chickens in the storm, resulting in another $8 million in direct losses.\(^6\) Beyond the direct impacts to birds and poultry houses, the industry incurred $20 million in associated agriculture sector losses.\(^6\)

In response to the unprecedented damage to the state’s agriculture sector, then-Governor Nathan Deal called a special session of the General Assembly in November 2018. During the special session, lawmakers approved two bills aimed at providing relief for the state’s agriculture industry. House Bill 1EX provided $270 million toward hurricane relief, including $55 million for disaster relief assistance to impacted farmers and $20 million in assistance for cleanup efforts for timberland and pecan growers.\(^6\) Meanwhile, House Bill 4EX extended $200 million in income tax credits to timber and pecan farmers.\(^6\) Additionally, in February 2019, lawmakers approved a mid-year budget that included an additional $20 million in low-interest, disaster-relief loans for farmers affected by Hurricane Michael.\(^6\)

**Conclusion**

With punishing winds and torrential rain, Hurricane Michael struck Florida, Alabama and Georgia just as many of the states’ most valuable crops were nearing harvest, devastating the states’ agriculture sectors. Combined, the agriculture sector in these three states sustained losses exceeding $3.2 billion. With $2.5 billion in agricultural losses, Georgia’s producers and agribusiness incurred more damage.

\(^*\) A broiler is any chicken that is bred and raised specifically for meat production.
than Florida and Alabama combined. The most impacted commodity, timber, sustained combined direct losses of more than $2.1 billion. Meanwhile, the cotton industry sustained a combined direct loss of between $713.7 million and $763.7 million. Providing sufficient relief funds likely will place significant pressure on state budgets. Although federal disaster relief funds sometimes are authorized, they cannot be relied upon to alleviate all damages. Once authorized, such funds often can take years to arrive, as those in affected areas continue to languish.

When farmers lost their crops in October 2018, they also lost substantial resources to run their farms in 2019. These losses mean that many small farmers will be unable to pay off their bank loans after harvest, requiring them to carry the debt forward. This, in turn, impacts the ability of small farmers to borrow sufficient funds to finance another growing season. As they prepare their land for the upcoming planting season, farmers also face the added expense of replacing barns, livestock and irrigation systems. Meanwhile, ongoing trade wars and price uncertainty continue to drive prices down and drive input costs up across all agricultural industries.

The important steps taken by the Georgia General Assembly during the 2018 special session will offset some of the losses suffered, particularly in the timber and pecan industries. However, many small farmers across all three states continue to struggle to regain their financial footing in the wake of the hurricane. As other states consider strategies to support their agriculture sectors following natural disasters, some options include grant programs, sales tax exemptions on farm equipment (such as tractors, irrigation infrastructure and materials used in rebuilding structures and fences), if not already implemented, and zero- or low-interest loans to provide a financial bridge to the next harvest. Narrowly tailoring these benefits will ensure they flow only to affected farmers in disaster areas.

Natural disasters resulting in significant damage to timber often can increase an area’s risk of wildfire, leading to additional losses for the industry and posing threats to human health and safety. To mitigate this, especially during periods of drought, increased resources for wildfire prevention is critical. States may also consider programs to encourage reforestation. By providing funding to assist forestry commissions in producing and distributing additional seedlings in severely impacted areas, states can assist timber producers in getting back on their feet while reducing the risk of wild fires.

As the agriculture sector in Florida, Alabama and Georgia continues to recover from Hurricane Michael, the 2019 hurricane season (June 1 – November 30) is just around the corner. Meanwhile, legislative sessions in the Southern region are drawing to a close, leaving little time to consider disaster recovery measures for future events.

Damage from Hurricane Michael is expected to have a far-reaching impact not just on farms, but also on agribusinesses such as cotton gins, peanut processors, packers and restaurants that source their produce directly from farmers. For many, the ripple effects of Hurricane Michael will be felt for years — if not generations — to come.

Endnotes

3. “Hurricane Michael’s Damage to Florida Agriculture.”
4. Ibid.
6. Ibid.
9. “Hurricane Michael’s Damage to Florida Agriculture.”

11. “Hurricane Michael’s Damage to Florida Agriculture.”

12. “Florida Agriculture Overview and Statistics.”


14. Hodges, Court and Stair, Economic Losses for Florida Agriculture.

15. “Hurricane Michael’s Damage to Florida Agriculture.”

16. Ibid.


18. “Hurricane Michael’s Damage to Florida Agriculture.”

19. Hodges, Court and Stair, Economic Losses for Florida Agriculture.

20. “Hurricane Michael’s Damage to Florida Agriculture.”

21. Ibid.

22. Ibid.


26. Ibid.


31. Pillion, “Cotton Crop Takes Hit Alabama Farmers Fear Harvest Lost.”


33. Ibid.


37. Ibid.


41. Pillion, “Hurricane Michael May Cost Alabama Farmers $204 Million.”


43. Pillion, “Cotton Crop Takes Hit Alabama Farmers Fear Harvest Lost.”


47. Hurricane Michael’s Impact on Georgia’s Ag Economy, UGA Extension.


51. Hurricane Michael’s Impact on Georgia’s Ag Economy, UGA Extension.


53. Hurricane Michael’s Impact on Georgia’s Ag Economy, UGA Extension.


55. Ibid.


58. Hurricane Michael’s Impact on Georgia’s Ag Economy, UGA Extension.

59. Hurricane Michael’s Impact on Vegetable Production in Georgia, University of Georgia Extension, https://secure.caes.uga.edu/extension/publications/files/pdf/TP%20105_1.PDF.

60. Hurricane Michael’s Impact on Georgia’s Ag Economy, UGA Extension.

61. Hurricane Michael’s Impact on Vegetable Production, UGA Extension.

62. Ibid.


64. “Hurricane Michael’s Impact on Agriculture.”


66. Ibid.


68. Hurricane Michael’s Impact on Georgia’s Ag Economy, UGA Extension.

69. Ibid.

70. Ibid.


This report was prepared by Anne Roberts Brody, policy analyst and committee liaison of the Agriculture & Rural Development Committee of the Southern Legislative Conference, chaired by Senator Daniel B. Verdin III of South Carolina. This report reflects the policy research made available to appointed and elected state officials by the Southern Office of The Council of State Governments (CSG).

Opened in 1959 as the final regional office of CSG, the mission of the Southern Office is to promote and strengthen intergovernmental cooperation among its 15-member states, predominantly through the programs and services provided by its Southern Legislative Conference (SLC). Legislative leadership, members and staff depend on the SLC to identify and analyze solutions for the most prevalent and unique state government policy issues facing Southern states. Member outreach in state capitols, leadership development and staff exchange programs, meetings, domestic and international delegation study tours, and policy fly-ins by the Southern Office support state policymakers and legislative staff in their work to build a stronger region.

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