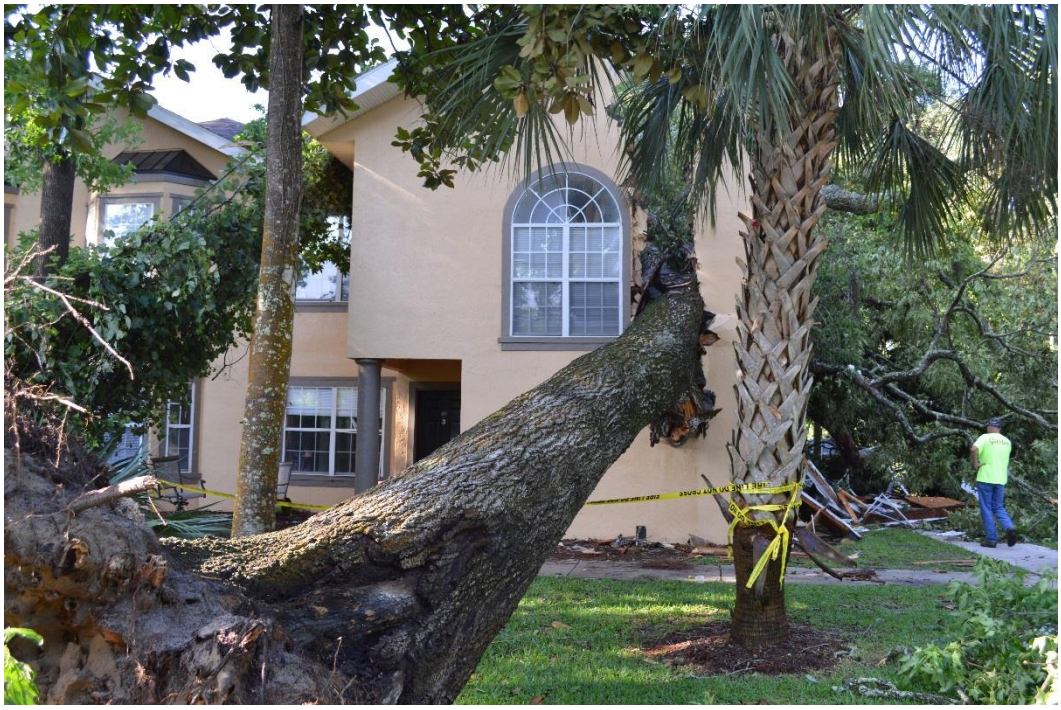
Summary Report

Damage from Severe Weather on 8 June 2014 in Alachua County, Florida



University of Florida Wind Hazard Damage Assessment Team

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11 June 2014

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BACKGROUND

On Sunday, June 8, 2014 the Storm Prediction Center issued a severe thunderstorm watch for portions of Northwest Florida, Southern Alabama, and Southwest Georgia, lasting from 1:50pm to 9pm CDT. The chances for a combined severe hail and wind event was 60%.

The convective outlook included scattered damaging winds with a maximum wind gust of 70 MPH and isolated large hail events, 1.5 inches in diameter. The SPC outlook for the day as of 3pm EST is provided in Figure 1. The outlook was mostly accurate across the outlook region, with estimated maximum wind gusts of 60 MPH in North Florida and Alachua County. Since there were local reports of severe weather and wind damage, including the possibility of a tornado, the Wind Hazard Damage Assessment Team deployed to document the extent of the damage.

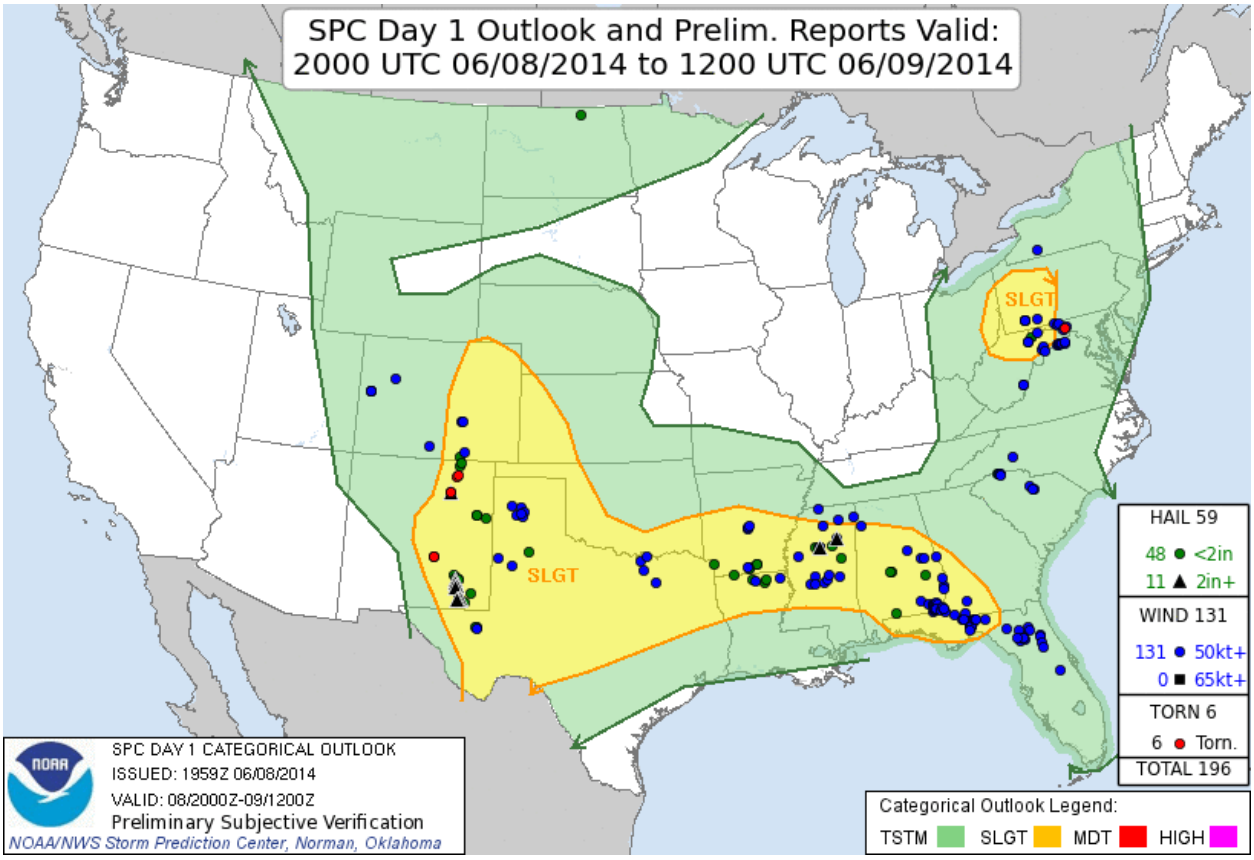


Figure 1: NWS severe weather outlook with preliminary verification map overlaid (Source: http://www.spc.noaa.gov/products/outlook/archive/2014/day1otlk_v_20140608_2000.gif)

TIMING OF STORM REPORTS

The timeline of the severe thunderstorm as it impacted Alachua County is given below and further supported by the tweets further down

5:55 PM – WRUF Weather reported pea sized hail near University of Florida campus in Gainesville

6:00 PM – minor flooding along northwest 10th avenue in Gainesville

6:05 PM – trees downed near Miconopy from strong wind gusts along US 441 near Paynes Prairie

6:15 PM – public report of a tree falling into a house near I-75 at the Archer Road exit with trees down in the area

6:15 PM – strong winds near Gainesville caused downed power lines

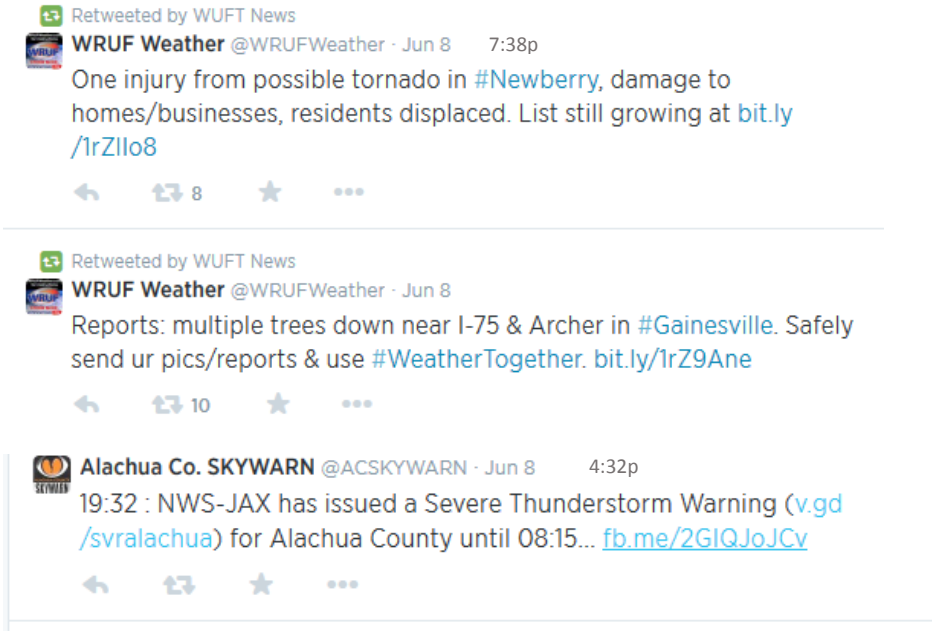
8:15 PM – multiple reports from emergency management of structural damage at 10 NW 25th street in the town of Newberry (Alachua County) where a building suffered moderate damage and a gas station canopy toppled over

8:15 PM – one person injured at an apartment complex in Newberry where trees and power lines were reportedly downed by a possible tornado

(Source: http://www.wruf.com/weather/2014/06/08/damage-reported-across-north-florida-sunday-evening/#.U5d8GigWLcu)

TWITTER

Social media has become an important tool in documenting real-time weather reports.



The University of Florida Wind Hazard Damage Assessment Team performed a survey of areas with significant structural damage (Figure 2). There were other reports of isolated downed trees but these were not surveyed as information on the exact locations were not available.

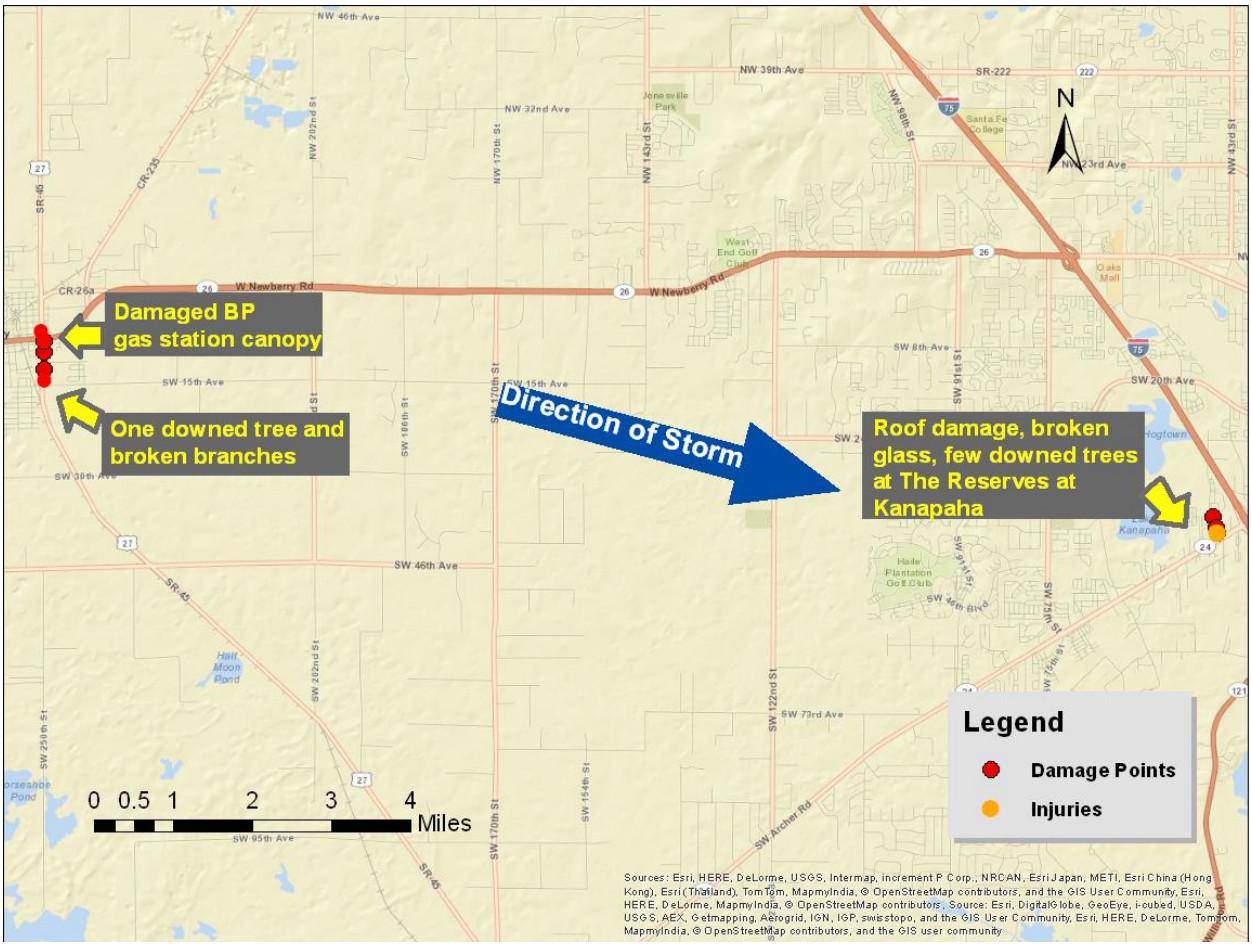


Figure 2: Map showing surveyed damage locations in Alachua County from severe weather on June 8th.

OBSERVED DAMAGE

The wind event amounted to a very intense downburst, with damage generally sporadic in nature rather than a well-defined path. Observed damage consisted of fallen and snapped trees, roof and structural damage from fallen trees and branches, a few downed power lines, and flooding. One person was trapped by a fallen tree and sustained a minor injury at the Kanapaha apartment buildings. A report was issued by University of Florida's Chief Meteorologist Jeff Huffman and the WRUF Weather team confirmed that Sunday's event involved straight-line wind damage to North Florida homes and businesses. Their report is available online http://wuft.it/1oLuJvr. The Alachua County Emergency Management, and the National Weather Service concurred with this assessment.

Figure 3: Damage map of the Reserves at Kanapaha apartment area

Pictures of the observed damage at the Reserves at Kanapaha apartments are provided in Figures 4 and 5.

Figure 4: Damage to building 700 at the Kanapaha apartments by fallen oak tree

(a) Close up of tree damage from Figure 3

(b) Close up of tree damage from Figure 3 looking North

(c) Three shattered windows

(d) Snapped oak tree about 10 inches in diameter

Figure 5: Further details of the damage at the Kanapaha apartment buildings

Damage to Building at the Reserve at Kanapaha Apartments, Gainesville, FL

A massive water oak, approximately three and a half feet in diameter, collapsed during Sunday's storm. The tree tore through a two-story unit of the Reserve at Kanapaha apartments on the 4400 block of SW Archer Road near Interstate 75, located just northwest of the University of Florida main campus. According to the Property Manager of the complex, the damaged building was built in 1999. The fallen tree cut through a wood-framed gable roof, exposing the oriented strand board wood sheathing and ½ inch thick stucco in the exterior walls. The roof structural system consisted of metal plate connected wood (2x4) trusses, supported on light-framed wood stud walls. It is believed the roof trusses were fastened to the wall top plate using toe nails, as no metal hurricane ties were visible at the site of the damage, See Figure 4 and 5(a). There were no fatalities, although a mother and daughter, trapped inside, were later rescued by Gainesville Fire Rescue firefighters. The girl had minor injuries (Source: http://www.gainesville.com/article/20140609/ARTICLES/140609655/1002/news?Title=Weather-

service-warns-of-more-strong-thunderstorms&tc=ar). Figure 5 (b) shows the damage of the same building from an adjacent corner.

Another unit approximately 200 yards away suffered minor damages, with three shattered windows from falling branches. A resident of this unit explained that she was on the porch as the storm approached, and did not see any funnel cloud or hear the roar typically associated with tornadoes.

Damage to BP gas station on North Main Street

Approximately 14 miles west of the Reserve at Kanapaha apartments, the metal canopy of a BP gas station was damaged. The roof canopy measured approximately 30 ft by 30 ft in plan with a total height of 17 ft, which included a 36 in. tall vertical metal fascia installed around its perimeter. The structural system consisted of five W-section beam hung off steel cantilever beams. Located at the intersection of State Road 45 and Newberry Road, the light-weight metal panel cladding system was ripped off of the structural steel frame (Figure 6.) The damage pattern suggests it may have been impacted by a downward wind force, (possibly from downdraft associated with the leading edge of the thunderstorm). The metal panels were fastened to the bottom flanges of the roof beams at approximately 8 inches on center, and the panels fractured around the fasteners and pulled off of them. There was visual evidence of corrosion around most of the fasteners that had pulled through. The fasteners remained attached to the steel members. This was an isolated damage – we did not observe any other signs of damage to buildings or trees around the canopy, and several banners, one visible in Figure 6 below, just a few yards away remained intact. We noted a few downed branches and a couple small trees that were blown down, but there was nothing resembling a specific damage path attributable to a tornado.

Figure 6: Extensive damage to BP gas station canopy. Note the vertical banner outlined in red located on the same side of the road just a few yards away still standing undamaged.

SUMMARY
Based upon the evidence collected in the damage survey, and other meteorological reports it does not appear that a tornado was the cause of the damage in either of these locations. There was no defined path visible, and the damage that was observed was sporadic, with no observations of damage between points. In the Kanapaha Reserve apartments, there was no evidence of shingle or soffit damage, away from the area of the tree. The damage observed is very common in thunderstorm winds, which, according to the National Weather Service, approached 60 mph in this storm. Unless additional evidence surfaces, we are in agreement with the NWS Jacksonville office that the damage in Alachua County from the severe weather on June 8th was not caused by a tornado.

ACKNOWLEDGEMENTS

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ABOUT THE PI

David O. Prevatt is an Associate Professor of Civil & Coastal Engineering, in the School of Sustainable Infrastructure & Environment, University of Florida, Gainesville, FL. He is a registered professional engineer registered in Massachusetts and in Trinidad and Tobago.

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About the Wind Hazard Damage Assessment Team

This report was prepared follow a damage survey conducted by the University of Florida Wind Hazard Damage Assessment. The study is done in parallel to our experimental research seeking to understand

and quantify the strength of tornadoes and their impact on vulnerable wood-framed residential structures. Compilation of this information is part of student learning objectives in forensic engineering and post-disaster damage investigation.

The students gathered additional information from reliable online sources, such as the National Weather Service and local news media.

Please visit our website, http://windhazard.davidoprevatt.com, for additional information, and to download previous damage reports, and filed survey results conducted by our group. Dr. Prevatt and his colleagues have published several papers on recent violent tornadoes that stuck Tuscaloosa, AL, Joplin, MO, and Moore, OK. His group has also inspected damaged structures and compiled reports on tornadoes that occur in Florida. Information is also available on the research at www.davidoprevatt.com. Your questions and comments on any aspects of our work are most welcome. Please direct your enquiries to NSF Graduate Research Fellow and PhD Graduate Student, Mr. David B. Roueche, who can be reached at david.roueche@ufl.edu. Mr. Jeandona (JD) Doreste, is a civil engineering undergraduate student at UF and Webmaster of the Wind Hazard Damage Assessment Team site. JD is actively recruiting other UF students to join the team, and he can be reached at jdoreste1@ufl.edu.

The Wind Hazard Damage Assessment Team was created through support from the NSF Award #1150975. Its mission is to train university students interested in building construction, engineering and architecture in the forensic engineering and techniques for post-hazard damage surveys and data collection. The team has surveyed damage after several Florida tornadoes and continuously monitors the prevalence of tornadoes worldwide. Ultimately the Damage Assessment Team hopes to inspire upcoming engineers and building professionals in hopes to change the paradigm of widespread catastrophic damage to houses in tornadoes and other extreme wind events.