

NATURAL HAZARD PROFILES AT THE UNIVERISTY OF MISSISSIPPI

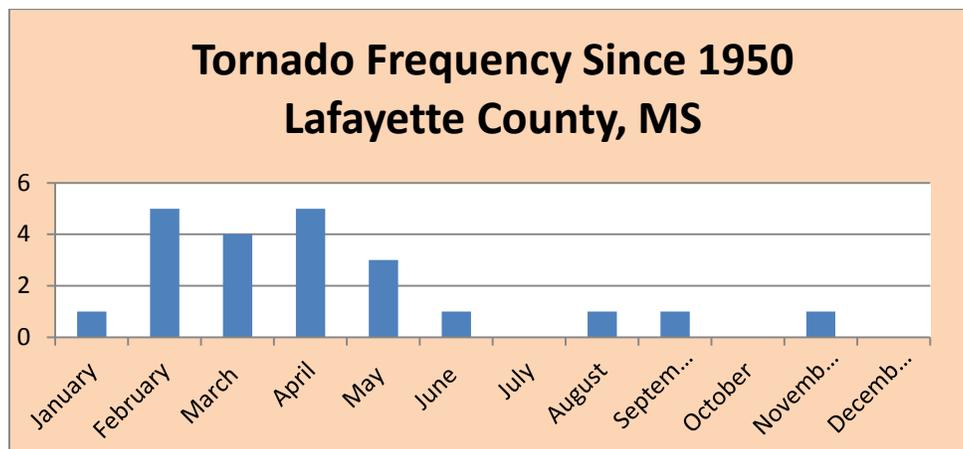
THE TORNADO HAZARD

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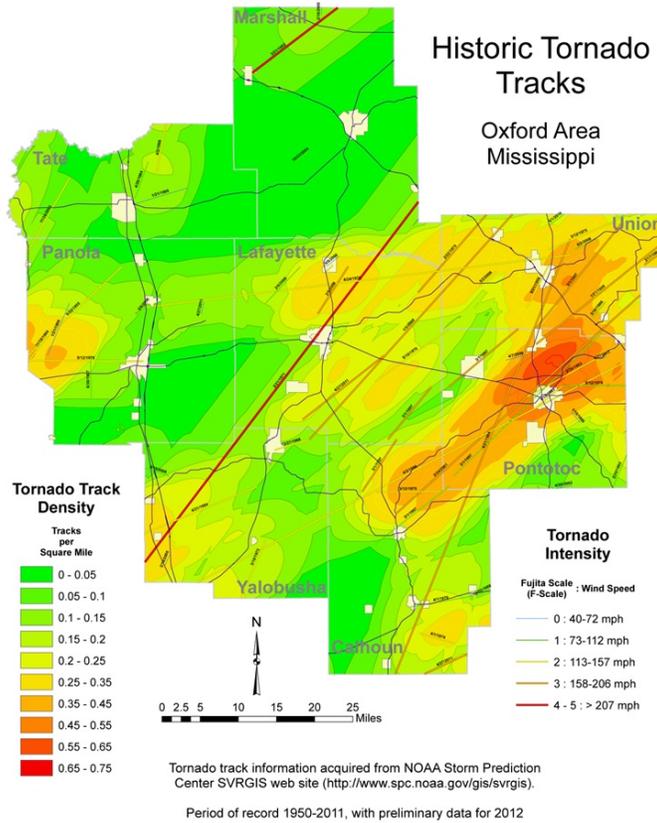
A recently completed analysis of natural hazards that could impact the University of Mississippi, led by the Mississippi Mineral Resources Institute (MMRI), has developed hazard profiles to help guide UM to cost effective ways of reducing the vulnerability and mitigating the hazards. Tornadoes are one of the top three hazards of concern.

Tornados are considered a natural hazard that consistently ranks as one of the top three concerns of the University of Mississippi. These violent winds rotating around a central vortex are capable of wind speeds in excess of 300 miles per hour and can produce incredible amounts of damage. There were significant and noteworthy tornado events in 2011 that changed the way engineers think of tornados, the type damage they cause and potential ways to mitigate tornado damage. In particular, the tornado that devastated the town of Smithville, Mississippi, and the tornado that tracked through Tuscaloosa, Alabama. The devastation caused by both events caused engineers and emergency managers to review their procedures and allowed new information to be developed on what a tornado swath looks like as far as wind speed and the variable damage it causes the built environment. The Tuscaloosa event was significant not only because of densely populated urban area it affected, but also because it very nearly tracked across the University of Alabama campus.

Since 1952, at least 22 tornados have tracked through Lafayette County. Some of these tornados have ranked as high as F-3 on the Fujita Scale (EF) or approximately an EF-4 on the Enhanced Fujita Scale (EF) with wind speeds as high as 200 miles per hour. Tornado occurrence is not uniformly distributed throughout the year. The chart below is the frequency of tornado occurrence in Lafayette County throughout the year since 1950. It is evident that most tornados occur between February and May. Neither do tornados occur uniformly across any



geographic area. This uneven geographic distribution of tornado occurrence is evident in scales varying from a nation-wide to local. While the midwestern U.S. is known as a tornado alley, Mississippi is equally vulnerable, only less well known, and the tornados are more difficult to see and analyze. Tornado distribution in Lafayette and adjoining counties also illustrate “tornado allies” on a local scale. The map on the right illustrates that Oxford and the University of Mississippi are in an area of medium tornado vulnerability. Averaging 62 years of tornado occurrence, Lafayette County has approximately a 30 percent chance of a tornado occurring any given year. Within this period, five tornados have been EF-5 tornados, suggesting these destructive tornado events occur approximately once every 12 years. All of these data suggest that Lafayette County, Oxford, and the University of Mississippi have significant vulnerability to the tornado hazard.



The University of Mississippi, like the University of Alabama, has also had tornados track near the main campus. A well-documented tornado is the February 21, 1971; Mobile City tornado that tracked just to the north of campus resulted in an estimated \$500,000 in damage (in 1971



dollars). The most recent example is the EF-3, College Hill Station tornado that occurred on February 5, 2008, and tracked through the Oxford Industrial Park. This tornado caused an estimated \$35,000,000 in damage. The Ability Works building (photo to the left) was totally

destroyed by the tornado and numerous other buildings and industrial park structures were heavily damaged.

The MMRI has estimated tornado losses on campus based on a theoretical EF-4 tornado event. The evaluations consider the tornado event, type of construction and date of construction, and the value of the structure and the building contents. The campus structures were classed as: 1) Critical, 2) High Priority, 3) Medium Priority, or 4) Low priority. In the Critical class of structures, the Lyceum was likely to sustain the highest dollar loss (due to its age) and in the High Priority Class, the J.D. Williams Library was likely to sustain the highest dollar loss due to the value of the building and its contents.

The study of the University's vulnerability to natural hazards and the potential loss due to them is a MMRI project that will result in an update of the University's Natural Hazard Mitigation Plan. The existing plan is available on the MMRI website (<http://mmri.olemiss.edu/Home.aspx>) and the updated plan will also be posted online. Check back for updates.

For additional information regarding the project, its status or its products, contact Charles Swann, Mississippi Mineral Resources Institute, 111 Brevard Hall, University, MS. 38677, (Ph. (662) 915-7611 or at cts@olemiss.edu). The vulnerability map was constructed by Dr. Louis Zachos of the Department of Geology and Geological Engineering.