

**The work of Dr. Tetsuya Fujita,
“Mr. Tornado”**

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Dr. Tetsuya Fujita was born in a village near Kitakyushu, Japan. He studied engineering and meteorology at Meiji College and Tokyo University and taught at the Kyushu Institute of Technology. In 1953 he independently discovered and documented the existence of cold air downdrafts, a meteorological phenomena created as a reaction to warm air updrafts. He shared his findings with renowned meteorology professor Horace R. Byers at the University of Chicago and was therefore invited to study, and later teach at the University until his retirement in 1990.

His study of meteorology, particularly tornadoes and hurricanes, led to the development of the Fujita scale, the international standard scale to determine tornado severity.

Dr. Fujita also theorized and later proved the existence of the Multiple Vortex Tornado, a system of smaller vortices circling around a common centre. The smaller vortices within a tornado are often the source of the highest windspeed in any storm, and are often the sources of previously undiscovered meteorological events like the downburst and the microburst, both theorized by Dr. Fujita as the sources of much of the major damage in large storms.

His work after the unprecedented outbreak of 148 tornadoes on April 3 and 4th of 1974 in Oklahoma, helped to prove his theories concerning the existence and behavior of downbursts and microbursts. These sudden, severe gusts can result in 250km (150 mile) per-hour winds on or near the ground that can uproot trees in discernible starburst patterns.

His continued work examining the destruction after major storms such as Hurricane Fred in 1979, Hurricane Hugo in 1989, Hurricane Iniki in 1992 and Hurricane Andrew in 1992, led to further refinement of the Fujita scale, and greater understanding of the machinations of storms and wind patterns and the damage they cause to structures and even crops and trees.

In 1992, prior to the arrival of Hurricane Andrew, Miami-Dade County Public Schools had embarked on a major construction program. The arrival of a category five storm threw much of the county's projects and plans into upheaval due to the unprecedented damage it caused to buildings and property across the southern end of the county.

After Hurricane Andrew, Dr. Fujita requested access to school facilities to study the effects of the hurricane and the extensive damage left behind. In exchange for access, it was agreed that he would give the leadership of the construction and maintenance departments a seminar on how wind storms damage buildings. Mr. Fujita's notes, charts and pictures from his time in Miami in mid-September of 1992, are archived at Texas Tech University in Lubbock, Texas.

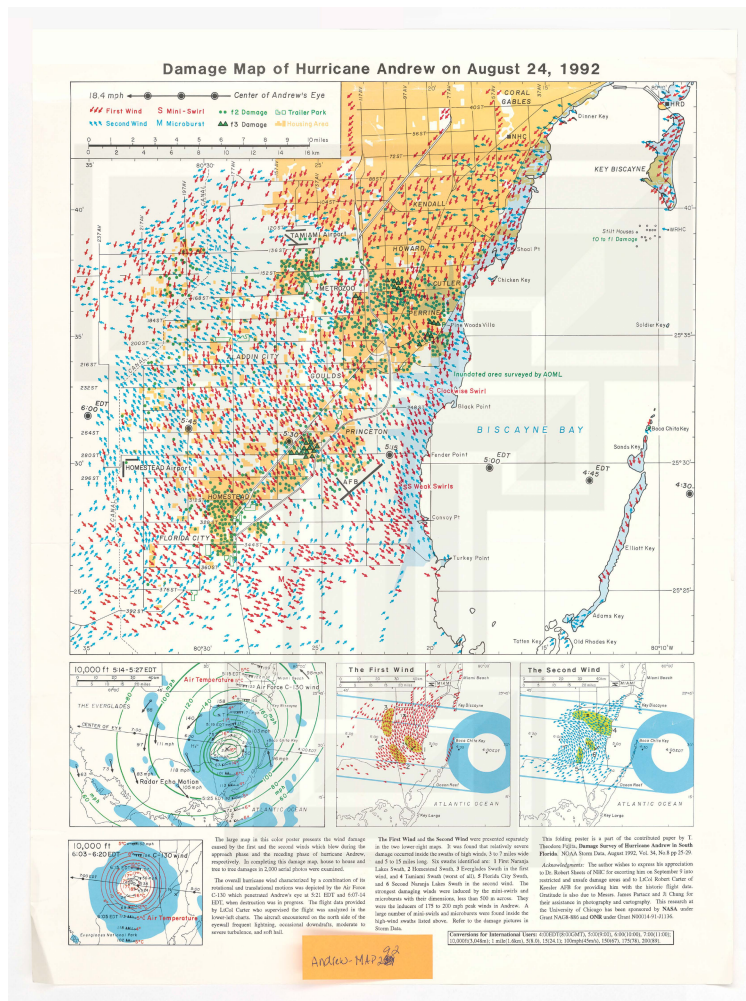
In his seminar with Miami-Dade County Schools leadership, Dr. Fujita described the fundamentals of storm meteorology including cyclones, sustained winds, gusts,

microbursts, and anti-cyclonic swirls. The sheer size of Hurricane Andrew and the catastrophic destruction it wrought made for many real-world examples of the phenomena described in Dr. Fujita's seminar. For example, on a visit to Robert Morgan Vocational and Technology School, trees in a neighboring pine forest were twisted in a counter-clockwise pattern, while the buildings were crushed.

Dr. Fujita was able to use the destroyed landscape as an example of the existence of multiple cyclones and anti-cyclones within the walls of a storm that travel as it moves across land. The smaller, individual anti-cyclones, microbursts and gusts caused more damage at higher velocity than the overall velocity of the winds attributed to the larger storm.

Dr. Fujita's information and tutelage significantly affected the methods and materials used in construction for Miami-Dade Schools, permanently altering their construction standards and preventing further damage during later Hurricanes.

This is a map tracking Microbursts and "Mini-Swirls" (or anti-cyclones) tracked by Dr. Fujita and shared with Miami Dade County Public Schools in 1992:



References:

1- Archives, Texas Tech University:

<https://legacy.lib.utexas.edu/taro/ttusw/00271/tsw-00271.html#series6>

2- Stormtrack.ORG - Timeline of Dr. Fujita's work:

<https://legacy.lib.utexas.edu/taro/ttusw/00271/tsw-00271.html#series6>

3- PBS.ORG - The Remarkable Mind of Mr. Tornado:

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4- Britannica.COM - Biography - Tetsuya Fujita:

<https://www.britannica.com/biography/Tetsuya-Fujita#ref733256>

5- University of Chicago News - How scientist Ted Fujita reshaped what we know about Tornadoes:

<https://news.uchicago.edu/story/how-one-scientist-reshaped-what-we-know-about-tornadoes>