

# Event Summary

## Overview

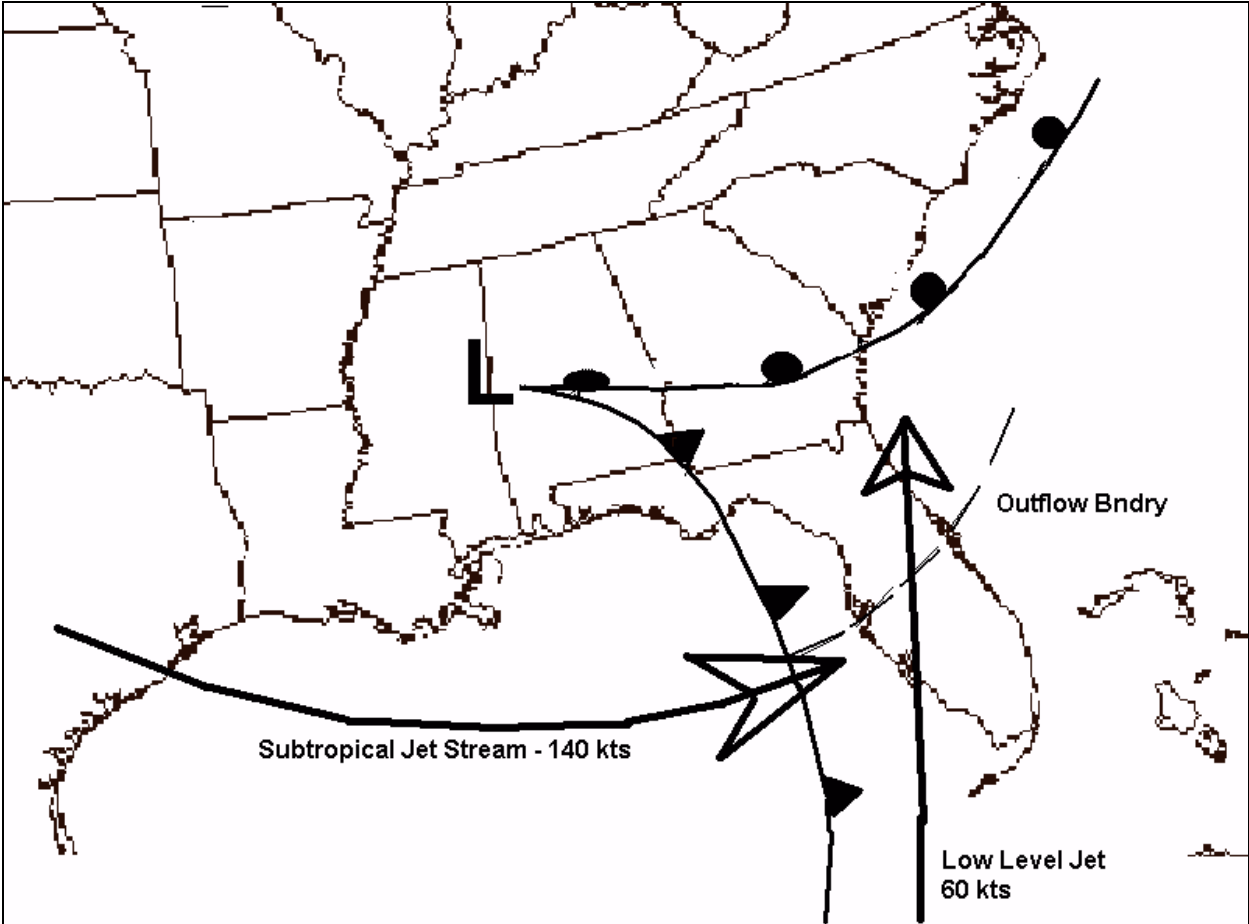
An outbreak of unusually strong tornadoes in east-central Florida during the late night and early morning hours of February 22-23, 1998, was the most deadly in the state's history. Between approximately 11 p.m. and 2:30 a.m. Eastern Standard Time (EST) (EST will be used throughout this report), seven tornadoes swept through the NWSO Melbourne county warning area (CWA), killing 42 people and injuring more than 260 others. The previous high tornado death toll in Florida was 17, which occurred on March 31, 1962, in the Florida Panhandle (Santa Rosa County). In terms of single-event, weather-related fatalities in Florida, this event ranks as the ninth greatest in loss of life. The largest number of single-event, weather-related deaths in Florida occurred during the 1928 hurricane that killed more than 1,842 people near Lake Okeechobee.

The tornadoes were unusually strong for the area and produced damage estimated in excess of \$100 million. Three of the storms were rated in the F3 category (158-206 mph) on the Fujita Tornado Intensity Scale (see Appendix A). More than 3,000 structures were damaged and more than 700 destroyed. This Service Assessment focused on the NWSO Melbourne CWA, although there were two brief tornado touchdowns in the NWSO Tampa Bay CWA earlier in the evening.

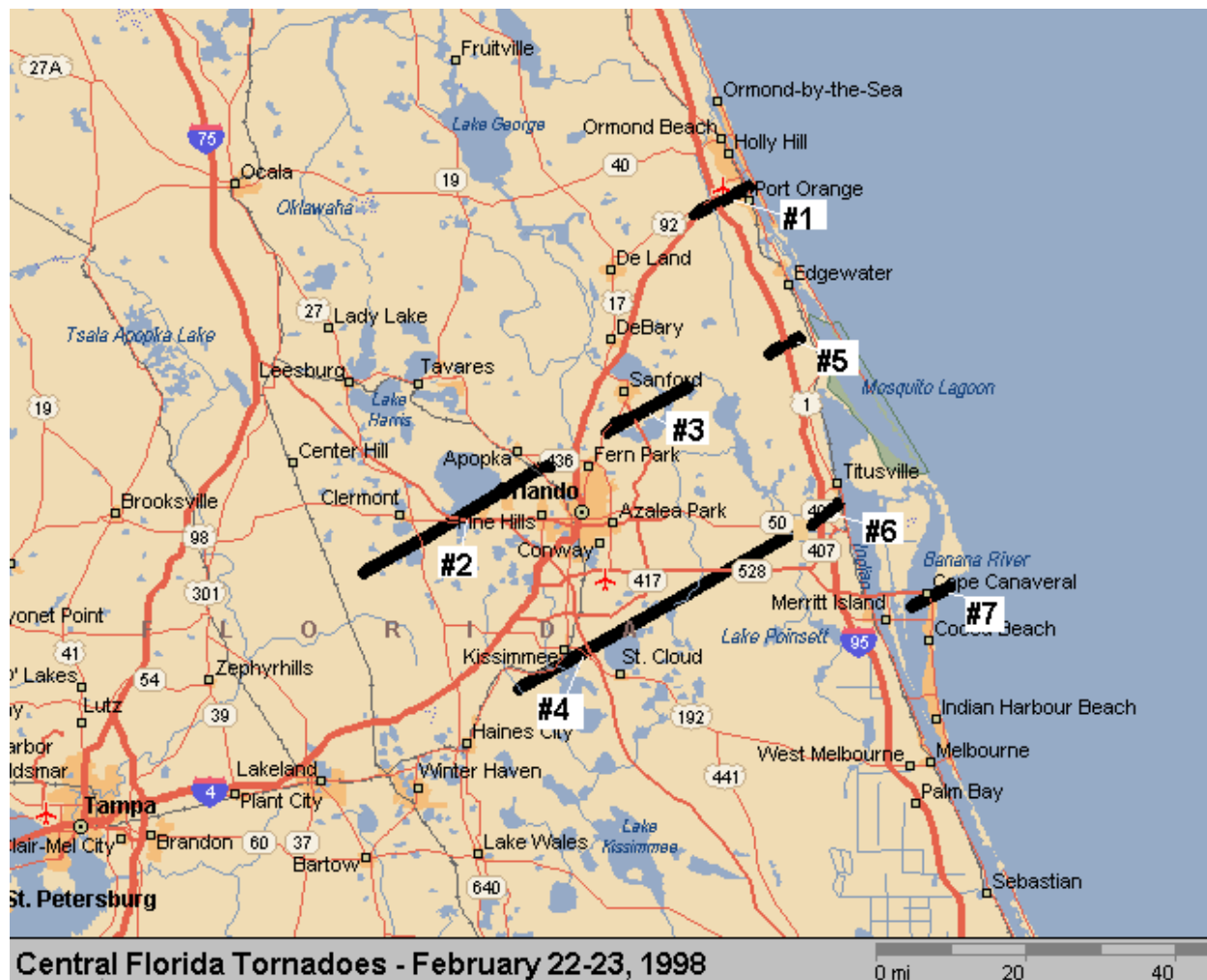
## Storm Summary

During the evening of February 22, the atmosphere over east-central Florida was primed for a devastating severe weather outbreak (Figure 1). A strong upper trough associated with a stronger-than-normal subtropical jet stream (wind speeds of 140 knots) was approaching the Florida Peninsula from the west. From a surface low near Mobile, Alabama, a surface cold front arced southeastward over the Gulf of Mexico, nearing the western Florida coast. A line of thunderstorms was moving eastward just ahead of the frontal boundary. Afternoon pre-frontal thunderstorms over southern Georgia and northern Florida had left behind a surface outflow boundary, stretching from near Daytona Beach on the east coast to northeast of Tampa on the west coast. The air mass south of the outflow boundary and east of the front was warm, moist, and very unstable. The formation of a strong, nocturnal, low-level jet (winds greater than 50 knots just 1,000 feet above ground level) was coupled with the subtropical jet further aloft to produce very strong vertical wind shear over the peninsula.

Three supercell thunderstorms formed as the storm line moved ashore from the Gulf of Mexico and interacted with the stationary outflow boundary, the instability, and the strong wind shear. Supercell storms are hazardous because they last for long periods of time, rotate, and are the parents of many strong and violent tornadoes. As the three supercells quickly moved across east-central Florida, they produced seven tornadoes in the NWSO Melbourne CWA (Figure 2).



**Figure 1. Synoptic Setting, 7 p.m. EST, February 22, 1998.**



- #1 F2 tornado touched down in Volusia County at 10:55 p.m.—1 fatality, 3 injuries.
- #2 F3 tornado touched down in Lake County at 11:37 p.m., entered Orange County at 11:41 p.m., first fatalities around 11:50 p.m., lifting at midnight—3 fatalities, approximately 70 injuries.
- #3 F3 tornado touched down in Seminole County at 12:10 a.m., first fatalities around 12:15 a.m. near Sanford, lifting at Volusia County at 12:25 a.m.—13 fatalities (12 - Seminole County, 1 - Volusia County), approximately 36 injuries.
- #4 F3 tornado touched down in Osceola County at 12:40 a.m., first fatalities at 12:50 a.m. in Kissimmee, crossed into Orange County at 12:55 a.m., lifting at 1:28 a.m.—25 fatalities, 150+ injuries.
- #5 F2 tornado touched down in Volusia County at 12:45 a.m.—no fatalities or injuries.
- #6 F1 tornado touched down in Brevard County at 1:38 a.m.—no fatalities or injuries.
- #7 F1 tornado touched down in Brevard County at 2:30 a.m. near Port Canaveral—no fatalities or injuries.

**Figure 2. Central Florida Tornadoes, February 22-23, 1998.**

The northern supercell produced two brief tornado touchdowns in rural Sumter County in the NWSO Tampa Bay CWA shortly before 10 p.m. Later, that supercell produced a stronger tornado that struck just southwest of Daytona Beach (Volusia County) at 10:55 p.m. This tornado continued east-northeastward for approximately 8 miles, dissipating in southern Daytona Beach. Tornado #1 (Figure 2) resulted in one fatality along Route 92 east of Interstate 95, three injuries, and damage to or destruction of more than 600 structures (F2 category on the Fujita Tornado Intensity Scale).

The middle supercell produced the first of its tornadoes (#2 on Figure 2) at 11:37 p.m. in rural eastern Lake County. Tornado #2 was not very destructive until it moved into western Orange County at 11:41 p.m., severely striking Winter Garden and Ocoee between 11:47 and 11:55 p.m. Tornado #2 (approximately 18 miles long) ended about midnight near the Orange/Seminole County line. In all, tornado #2 was responsible for three fatalities in Winter Garden, approximately 70 injuries, and damage to or destruction of about 500 structures (F3 category).

The middle supercell's next tornado (#3) formed in Seminole County just northeast of Longwood at 12:10 a.m., February 23. It moved northeast for 14 miles, hitting several neighborhoods in the southeast portion of Sanford. Tornado #3 dissipated just after crossing the St. Johns River in Volusia County at about 12:25 a.m. Along the path of tornado #3, there were 13 deaths, 36 injuries, and damage to or destruction of more than 625 structures (F3 category). Twelve of the deaths were in Seminole County, and one was along Route 46 in Volusia County.

The last tornado (#5) from the middle supercell struck rural eastern Volusia County about 12:45 a.m., crossing Interstate 95 and damaging only a few structures (F2 category). No casualties were reported from tornado #5.

The southern supercell produced the longest tornado track of the outbreak (tornado #4). The tornado first touched down at 12:40 a.m. in northwest Osceola County just southwest of Kissimmee and moved northeastward for about 38 miles, dissipating in extreme eastern Orange County at about 1:28 a.m. The first tornado fatalities occurred at approximately 12:50 a.m. in the Ponderosa RV Park. The tornado's touchdown point was approximately 8 miles southeast of central Florida's popular area of theme parks, entertainment centers, and hotels/motels. Damage from tornado #4 was severe in southern, eastern, and northeastern Kissimmee and adjoining rural areas of Osceola County before the tornado crossed into Orange County (about 4 miles southeast of Orlando International Airport) at 12:55 a.m. In Orange County, the tornado mostly affected rural swampy areas, striking few structures except for lakeside neighborhoods on the shores of Lakes Hart and Mary Jane. Totals for tornado #4, coming mostly from Osceola County, were 25 fatalities, more than 150 injuries, and damage to or destruction of more than 1,000 structures (F3 category).

The last tornado (#6) from the southern supercell struck the southwest portion of Titusville in Brevard County just after 1:38 a.m. No casualties were reported from tornado #6, but more than 100 structures were damaged or destroyed (F1 category). The short, few-mile skip between tornado #4 and tornado #6 prevented damage at the Great Outdoors RV Park, one of the largest in the United States, housing 1,000 recreational vehicle lots.

Tornado #7 occurred at approximately 2:30 a.m. in Brevard County near Port Canaveral. The tornado formed over the Banana River and moved east-northeast for about 4 miles, crossing Port Canaveral and dissipating before reaching the Atlantic Ocean. No casualties were reported with this storm, but approximately 30 structures were damaged (F1 category).

All of the tornadoes were relatively narrow with a path width of 50-100 yards in most places. The widest damage areas in the paths of the tornadoes were approximately 200 yards at the Boggy Creek Shopping Center in Kissimmee, Osceola County, and in the Sanford area, Seminole County.