6: Supplemental Meteorological Notes

The Tropical Cyclone Tornadoes Course utilizes a single event containing a series of storms moving onshore that was localized for the National Weather Service (NWS) Weather Forecast Office (WFO) in Tampa Bay, FL (TBW). However, the WES data supplied will allow you flexibility with providing additional training regarding environmental assessment, radar interrogation, and storm based warning strategies for potentially tornadic convection.

Most data sets, including radar data, are provided to cover the 1200-1859 UTC time frame on 6 June 2013. Along with this, a second localization for the NWS WFO in Melbourne, FL (MLB) has also been provided with the case. For radar-based objectives, this will allow you to select from other mesocyclones that are not utilized in this WES application that occurred in the MLB and TBW county warning areas (CWAs) between 1330-1859 UTC.

The following pages provide a list of the additional mesocyclone events that can be used for supplemental training regarding radar interrogation, the warning decision making process, and storm-based warning strategies. The mesocyclone events are listed in chronological order by each CWA. Figure 6-1 presents a histogram of the number of mesocyclone events in ten minute intervals through the available time period. A list of additional procedures developed for the MLB CWA as well as environmental analysis are listed in Table 2-3 and Table 2-4 starting on Page 2-4 in Chapter 2: AWIPS Background Information.
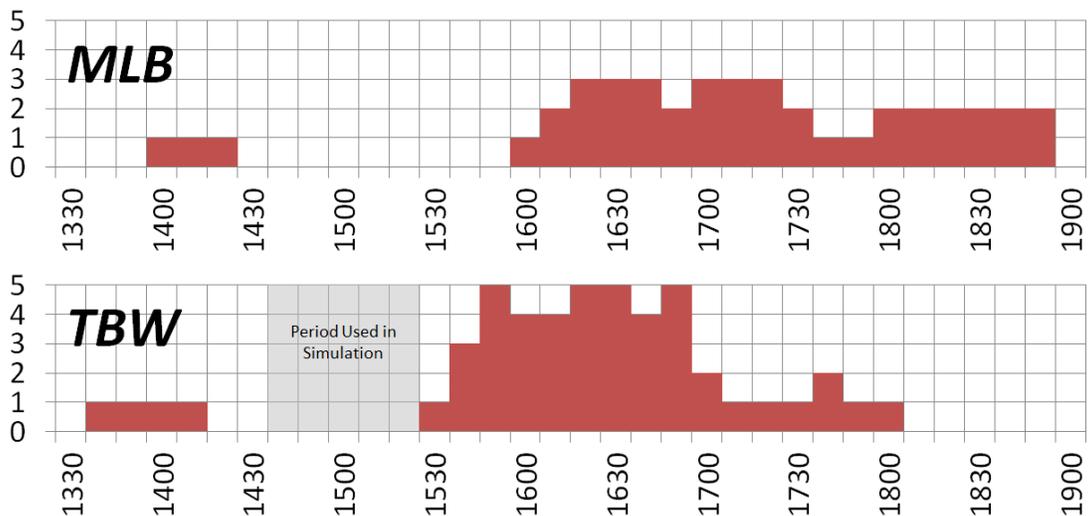

Figure 6-1. Histogram for number of mesocyclone events for MLB and TBW from 1300-1859 UTC.

The storms assessed in each section (based on CWA) were tornado-warned during Tropical Storm Andrea. Each table provides an assessment of each storm based on the radar-interrogation guidance. Based on the radar interrogation guidance, here is a summary of the warning performance for each CWA for the time period from 1330 UTC to 1859 UTC.

MLB CWA:

- Number of Tornado Events: 0
- Number of False Alarm Events: 7 (reduced from 9)

TBW CWA (excluding the period used in the WES application):

- Number of Tornado Events: 2
- TOR POD: 1.00 (unchanged)
- Number of False Alarm Events: 5 (reduced from 12)
- TOR FAR: 0.71 (reduced from 0.86)

Additional Mesocyclone Events in MLB CWA:

Start Time:	1409 UTC	Lat/Lon:	27.38N, -81.08W	Range from Radar:	49 nm
End Time:	1425 UTC	Lat/Lon:	27.51N, -81.06W	Range from Radar:	42 nm
County Location:		Okeechobee County			
Recommended Radar Interrogation Guidance Range:		40-70 nm			
Meet Mesocyclone Guidance?		YES			
Meet Supercell Reflectivity Feature Guidance?		N/A (YES)			
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?		YES			
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Start Time:	1604 UTC	Lat/Lon:	27.00N, -81.13W	Range from Radar:	71 nm
End Time:	1644 UTC	Lat/Lon:	27.32N, -81.00W	Range from Radar:	51 nm
County Location:		Glades (MFL), Highlands (TBW), and Okeechobee Counties			
Recommended Radar Interrogation Guidance Range:		40-70 nm			
Meet Mesocyclone Guidance?		YES			
Meet Supercell Reflectivity Feature Guidance?		N/A (NO)			
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?		YES			
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Start Time:	1613 UTC	Lat/Lon:	28.31N, -81.16W	Range from Radar:	29 nm
End Time:	1652 UTC	Lat/Lon:	28.60N, -81.05W	Range from Radar:	36 nm
County Location:		Osceola and Orange Counties			
Recommended Radar Interrogation Guidance Range:		Less than 40 nm			
Meet Mesocyclone Guidance?		YES			
Meet Supercell Reflectivity Feature Guidance?		YES			
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?		NO			
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1627 UTC	Lat/Lon:	26.97N, -81.03W	Range from Radar:	72 nm
End Time:	1708 UTC	Lat/Lon:	27.33N, -80.89W	Range from Radar:	49 nm
County Location:		Lake Okeechobee; Glades (MFL) and Okeechobee Counties			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			NO		
Meet Supercell Reflectivity Feature Guidance?			N/A (NO)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			NO		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1700 UTC	Lat/Lon:	27.14N, -80.98W	Range from Radar:	61 nm
End Time:	1722 UTC	Lat/Lon:	27.33N, -80.91W	Range from Radar:	49 nm
County Location:		Glades (MFL) and Okeechobee Counties			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			N/A (YES)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Start Time:	1708 UTC	Lat/Lon:	27.67N, -80.96W	Range from Radar:	31 nm
End Time:	1731 UTC	Lat/Lon:	27.87N, -80.91W	Range from Radar:	20 nm
County Location:		Osceola County			
Recommended Radar Interrogation Guidance Range:			Less than 40 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			YES		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Start Time:	1713 UTC	Lat/Lon:	26.91N, -80.70W	Range from Radar:	72 nm
End Time:	1740 UTC	Lat/Lon:	27.14N, -80.56W	Range from Radar:	59 nm
County Location:		Lake Okeechobee; Martin County			
Recommended Radar Interrogation Guidance Range:		40-70 nm			
Meet Mesocyclone Guidance?		YES			
Meet Supercell Reflectivity Feature Guidance?		N/A (YES)			
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?		YES			
Recommend Tornado Warning:		**YES**	Produce Tornado?		**NO**

Start Time:	1759 UTC	Lat/Lon:	27.28N, -80.48W	Range from Radar:	51 nm
End Time:	1854 UTC	Lat/Lon:	27.67N, -80.28W	Range from Radar:	33 nm
County Location:		St. Lucie County			
Recommended Radar Interrogation Guidance Range:		40-70 nm to Less than 40 nm			
Meet Mesocyclone Guidance?		YES			
Meet Supercell Reflectivity Feature Guidance?		YES			
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?		YES			
Recommend Tornado Warning:		**YES**	Produce Tornado?		**NO**

Start Time:	1808 UTC	Lat/Lon:	27.51N, -80.55W	Range from Radar:	36 nm
End Time:	1854 UTC	Lat/Lon:	27.88N, -80.34W	Range from Radar:	22 nm
County Location:		St. Lucie and Indian River Counties			
Recommended Radar Interrogation Guidance Range:		Less than 40 nm			
Meet Mesocyclone Guidance?		YES			
Meet Supercell Reflectivity Feature Guidance?		YES			
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?		YES			
Recommend Tornado Warning:		**YES**	Produce Tornado?		**NO**

Although most mesocyclones during this period met the radar interrogation guidance criteria, not a single tornado occurred with these events. There are also a number of events that cross into the MLB CWA.

Additional Mesocyclone Events in TBW CWA:

Start Time:	1346 UTC	Lat/Lon:	27.64N, -82.74W	Range from Radar:	18 nm
End Time:	1414 UTC	Lat/Lon:	27.88N, -82.68W	Range from Radar:	18 nm
County Location:		Pinellas County			
Recommended Radar Interrogation Guidance Range:			Less than 40 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			YES		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		YES	Produce Tornado?		YES

Note: The tornado touched down at 1403 UTC near Gulfport, FL and lifted at 1405 UTC. The tornado was rated EF-0.

Start Time:	1538 UTC	Lat/Lon:	27.27N, -82.30W	Range from Radar:	26 nm
End Time:	1557 UTC	Lat/Lon:	27.44N, -82.24W	Range from Radar:	18 nm
County Location:		Sarasota and Manatee Counties			
Recommended Radar Interrogation Guidance Range:			Less than 40 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			NO		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1548 UTC	Lat/Lon:	28.13N, -82.60W	Range from Radar:	27 nm
End Time:	1557 UTC	Lat/Lon:	28.22N, -82.58W	Range from Radar:	32 nm
County Location:		Hillsborough and Pasco Counties			
Recommended Radar Interrogation Guidance Range:			Less than 40 nm		
Meet Mesocyclone Guidance?			NO		
Meet Supercell Reflectivity Feature Guidance?			NO		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1548 UTC	Lat/Lon:	27.06N, -82.08W	Range from Radar:	43 nm
End Time:	1620 UTC	Lat/Lon:	27.33N, -81.93W	Range from Radar:	34 nm
County Location:		Sarasota and DeSoto Counties			
Recommended Radar Interrogation Guidance Range:			Less than 40 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			NO		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1552 UTC	Lat/Lon:	27.89N, -82.49W	Range from Radar:	12 nm
End Time:	1606 UTC	Lat/Lon:	28.06N, -82.43W	Range from Radar:	22 nm
County Location:		Hillsborough County			
Recommended Radar Interrogation Guidance Range:			Less than 40 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			YES		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Start Time:	1552 UTC	Lat/Lon:	26.74N, -81.89W	Range from Radar:	64 nm
End Time:	1620 UTC	Lat/Lon:	27.33N, -81.76W	Range from Radar:	54 nm
County Location:		Lee and Charlotte Counties			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			N/A (YES)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			NO		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1606 UTC	Lat/Lon:	26.89N, -82.32W	Range from Radar:	49 nm
End Time:	1653 UTC	Lat/Lon:	27.27N, -82.12W	Range from Radar:	30 nm
County Location:		Charlotte, Sarasota, and Manatee Counties			
Recommended Radar Interrogation Guidance Range:			40-70 nm to Less than 40 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			YES		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Start Time:	1616 UTC	Lat/Lon:	26.71N, -81.77W	Range from Radar:	69 nm
End Time:	1639 UTC	Lat/Lon:	26.94N, -81.64W	Range from Radar:	61 nm
County Location:		Lee and Charlotte Counties			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			N/A (NO)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Start Time:	1620 UTC	Lat/Lon:	27.05N, -81.75W	Range from Radar:	53 nm
End Time:	1653 UTC	Lat/Lon:	27.41N, -81.58W	Range from Radar:	47 nm
County Location:		DeSoto and Hardee Counties			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			N/A (YES)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			NO		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1630 UTC	Lat/Lon:	27.29N, -82.47W	Range from Radar:	25 nm
End Time:	1707 UTC	Lat/Lon:	27.61N, -82.28W	Range from Radar:	9 nm
County Location:		Sarasota and Manatee Counties			
Recommended Radar Interrogation Guidance Range:			Less than 40 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			YES		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		YES	Produce Tornado?		NO

Note: There is significant data quality issues with the 0.5 tilt.

Start Time:	1639 UTC	Lat/Lon:	27.18N, -81.75W	Range from Radar:	47 nm
End Time:	1653 UTC	Lat/Lon:	27.33N, -81.67W	Range from Radar:	45 nm
County Location:		DeSoto County			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			NO		
Meet Supercell Reflectivity Feature Guidance?			N/A (NO)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1658 UTC	Lat/Lon:	27.47N, -81.55W	Range from Radar:	47 nm
End Time:	1717 UTC	Lat/Lon:	27.68N, -81.46W	Range from Radar:	50 nm
County Location:		Highlands and Polk Counties			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			NO		
Meet Supercell Reflectivity Feature Guidance?			N/A (NO)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			NO		
Recommend Tornado Warning:		NO	Produce Tornado?		NO

Start Time:	1726 UTC	Lat/Lon:	26.56N, -81.96W	Range from Radar:	73 nm
End Time:	1740 UTC	Lat/Lon:	26.70N, -81.86W	Range from Radar:	67 nm
County Location:		Lee County			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			N/A (YES)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		**YES**	Produce Tornado?		**NO**

Start Time:	1745 UTC	Lat/Lon:	26.59N, -82.05W	Range from Radar:	70 nm
End Time:	1805 UTC	Lat/Lon:	26.72N, -81.84W	Range from Radar:	66 nm
County Location:		Lee County			
Recommended Radar Interrogation Guidance Range:			40-70 nm		
Meet Mesocyclone Guidance?			YES		
Meet Supercell Reflectivity Feature Guidance?			N/A (NO)		
Meet Supercell Feature (Mesocyclone VES and/or ZDR/KDP Separation) Guidance?			YES		
Recommend Tornado Warning:		**YES**	Produce Tornado?		**YES**

Note: The tornado touched down at 1805 UTC north of Fort Myers Shores, FL and lifted at 1807 UTC. The tornado was rated EF-0.