Appendix A

Completed Example Activity 1 Table Summarizing Top Five Severe Weather Events for the Local Area for 2019

CASE	#1	#2	#3	#4	#5
Severe weather date	05/19/19	05/28/19	05/29/19	07/22/19	10/31/19
Severe weather time (UTC)	00-02 UTC (05/20)	21-23 UTC	19-22 UTC	20-22 UTC	02-05 UTC (11/1)
# local tornado (intensity) reports	2 (EF1; EF0)	1 (EF2)	3 (2 EF1; EF0)	0	1 (EF2)
# local hail reports	4	7	5	0	0
# local wind reports	20	12	32	20	38

Note. Shaded cells indicate the severe weather occurred during the warmest part of the year or day.

Appendix B

Completed Example Activity 2 Table After Upper-Level Analysis of the Top Five Events

Case	#1	#2	#3	#4	#5
Date	05/19/19	05/28/19	05/29/19	07/22/19	10/31/19
300-mb map time (00 or 12 UTC)	00 UTC (05/20)	00 UTC (05/29)	00 UTC (05/30)	00 UTC (07/23)	00 UTC (11/1)
Trough present? Shade if yes, and specify location of trough axis relative to region.	600 km NW Lake Superior southeast to OH	no	no	1000 km W Lake Superior southwest to MO	800 km W Lake Superior south to KY
Trough amplitude Shade if at least moderate.	shallow	n/a	n/a	moderate	deep
Trough orientation (tilt) Shade if tilt is negative.	negative	n/a	n/a	positive	negative
Jet stream speed Shade if strong (≥ 50 kts).	70 kt (35 m/s)	70 kt (35 m/s)	75 kt (40 m/s)	80 kt (40 m/s)	150 kt (75 m/s)
Upper-level divergent signature? Shade if yes.	yes	no	yes	yes	yes
Jet streak present? If yes, specify quadrant, and shade if left exit or right entrance.	no	no	right exit	right entrance	right entrance
Optional: positive vorticity advection (PVA)? Shade if yes.	yes	no	no	yes	yes

Note. Shaded cells indicate those upper-level variables favorable for severe weather generation.

Appendix C

Completed Activity 3 Table After Surface-Level Analysis

CASE	#1	#2	#3	#4	#5
Date	05/19/19	05/28/19	05/29/19	07/22/19	10/31/19
Surface map time (00, 03, 06, 09, 12, 15, 18, or 21 UTC)	00 UTC (05/20)	21 UTC	21 UTC	21 UTC	03 UTC (11/1)
Mid-latitude cyclone present? Shade if yes, and specify position of L relative to region.	800 km NW Western Michigan	300 km N Central NY	100 km N East-Central PA	100 km N East-Central PA	500 km N NY/Quebec Border
Pressure of mid-latitude cyclone? Shade if strong (≤ 1000 mb).	999 mb	1004 mb	1002 mb	1005 mb	990 mb
Warm front? Specify position relative to region. Shade if front ≤ 500 km from region.	100 km E From "L" east to New England, then South off NJ coast	100 km E From "L" southeast through NJ	100 km E From "L" southeast to SE NJ coast	NOT A FACTOR From "L" east through Long Island	NOT A FACTOR From "L" northeast to St. Lawrence River Valley
Cold front? Specify position relative to region. Shade if front ≤ 500 km from region.	NOT A FACTOR From "L" southwest To Arkansas	NOT A FACTOR From "L" southwest To Indiana	100 km NW From "L" west to Indiana	100 km NW From "L" southwest to KY/WV Border	Over Area From "L" south to PHL
Located in Larko's Triangle? (tornado cases only) Shade if yes.	no	no	yes	no tornado reports	no
Dew point Shade if high (≥ 65°F).	73°F (23°C)	66°F (19°C)	72°F (22°C)	73°F (23°C)	70°F (21°C)
Warm air advection Shade if strong.	weak	strong	weak	strong	none

Note. Shaded cells indicate those surface variables favorable for severe weather generation.

Appendix D

Completed Activity 4 Table After Sounding Data Analysis

Case	#1	#2	#3	#4	#5
Date	05/19/19	05/28/19	05/29/19	07/22/19	10/31/19
Sounding time (00 or 12 UTC)	00 UTC (05/20)	00 UTC (05/29)	00 UTC (05/30)	00 UTC (07/23)	19 UTC (special)
Sounding site(s)	IAD	IAD & PIT	IAD	IAD	IAD
Surface cape Shade if > 0 J/kg.	1500 J/kg	900 J/kg	1400 J/kg	1700 J/kg	700 J/kg
Surface LI Shade if < 0°C.	-4°C	-2°C	-4°C	-5°C	-2°C
K-Index Shade if ≥ 20°C.	27°C	30°C	35°C	36°C	30°C
SFC-3 km helicity (tornado cases only) Shade if ≥ 150 m²/s².	236 m²/s²	47 m²/s²	78 m²/s²	No tornado reports	425 m²/s²
WBZ height(hail cases only) Shade if 7000-10500 ft.	10600 ft (3200 m)	11600 ft (3500 m)	12100 ft (3700 m)	No hail reports	No hail reports
Optional: 850 mb temp for use in computing the Total Totals Index	17°C	17°C	17°C	18°C	14°C
Optional: 850 mb dew point for use in computing the Total Totals Index.	10°C	9°C	10°C	15°C	12°C
Optional: 500 mb temp for use in computing the Total Totals Index	-9°C	-8°C	-9°C	-7°C	-8°C
Optional: Total Totals Shade if ≥ 50°C.	45°C	42°C	45°C	47°C	42°C

Note. Shaded cells indicate those sounding variables favorable for severe weather generation.

Appendix E

First Completed Activity 5 Table After Synthesizing the Qualitative Variables

Severe weather variable	% cases shaded
Activity #1	
Warmest part of year? (April through September)	80%
Warmest part of day? (18–03 UTC)	100%
Activity #2	
Trough present?	60%
"Moderate" trough amplitude?	40%
"Negatively tilted" trough?	40%
Upper-level divergent signature?	80%
Favorable quadrant of jet streak?	40%
Optional: positive vorticity advection (PVA)?	60%
Activity #3	
Mid-latitude cyclone present?	100%
Warm or cold front nearby?	100%
Located in Larko's Triangle? (tornado cases only)	25% (1 out of 4)
"Strong" warm air advection?	40%

Appendix F

Second Completed Activity 5 Table After Synthesizing the Quantitative Variables

Severe weather variable	Original threshold value	% of cases exceeding threshold value (shaded)	Revised threshold value
Activity #2			
Jet stream speed	≥ 50 kts	100%	≥70 kts
ACTIVITY #3			
Pressure of mid-latitude cyclone	≤ 1000 mb	40%	≤ 1005 mb
Dew point	≥ 65°F	100%	≥ 66°F
ACTIVITY #4			
Surface cape	> 0 J/kg	100%	≥ 700 J/kg
Surface LI	< 0°C	100%	≤ –2°C
K-index	≥ 20°C	100%	≥ 27°C
SFC-3 km helicity (tornado cases only)	≥ 150 m²/s²	50% (2 out of 4)	≥ 47 m²/s²
WBZ height (hail cases only)	7,000-10,500 ft	0% (0 out of 3)	7,000 – 12,500 ft
Optional: Total Totals Index	≥ 50°C	0%	≥ 42°C