

# **OWLeS-Related Research @ Hobart & William Smith Colleges**

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Hobart & William Smith Colleges***

***9 undergraduate student participants  
in OWLeS field phase***

***6 undergraduate students as research interns  
in 2014 HWS Summer Research Program***

# ***Great Lakes Lake-effect Cloud Climatology: Placing OWLeS winter in context***

## **Goal: Determine frequencies of lake-effect clouds over the Great Lakes**

- The type of lake-effect clouds are an indicator of boundary layer circulations and forcing

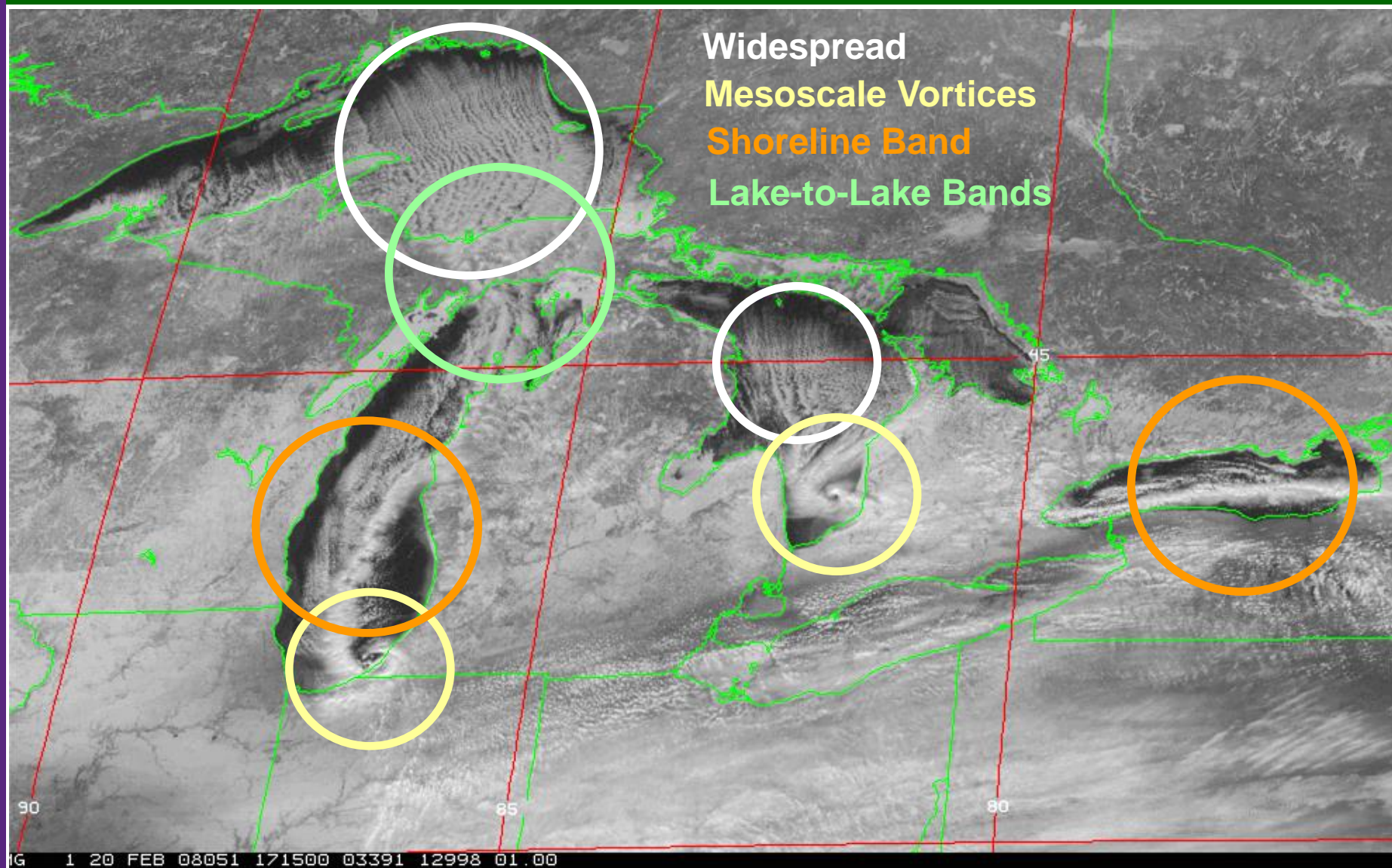
## **GOES: Geostationary Operational Environmental Satellites**

- Obtained from NOAA's Comprehensive Large Array-data Stewardship System (CLASS)
- 1-km resolution
- Examining animation of images for each day

## **17 winters (1997/98 – 2013/14)**

- Cold Season: October – March
- Daytime Hours: 14:00 – 20:00 UTC (approximately 9AM – 3PM EST)
- an average of one image per 35 minutes

# Great Lakes Lake-effect Cloud Climatology: Placing OWLeS winter in context



# **Lake Ontario – Finger Lakes Connection: IOP 16 & 17**

## **Jan. 21 – 23, 2014**

**Goal: Investigate the influence of Lake Ontario on Finger Lakes snow bands**

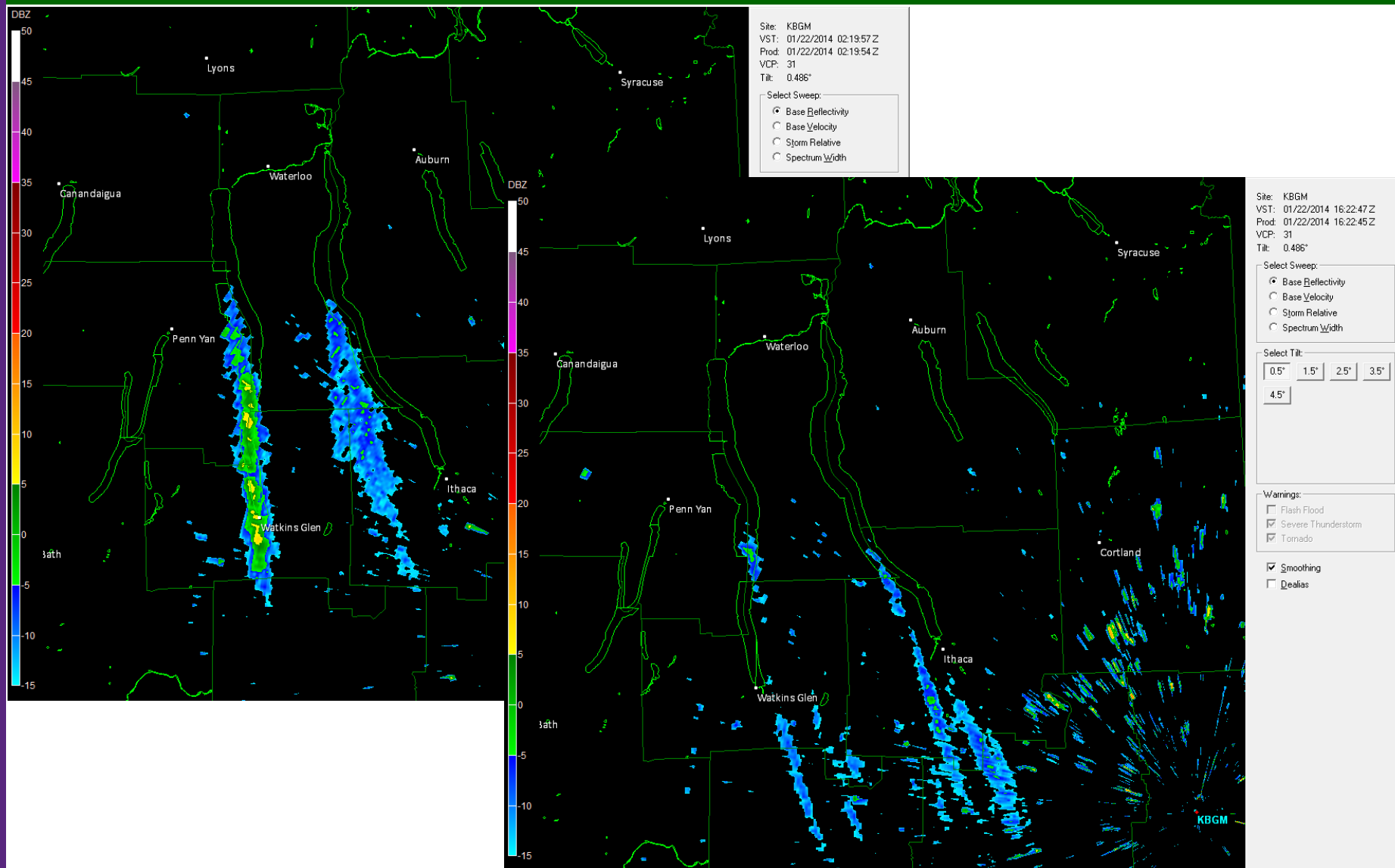
### **IOP 16 & 17 Observations**

- UW King Air radar and flight data sets
- Project Soundings near and within FL bands
- DOW radar data from upstream of FL bands
- WSR-88D KBGM radar data

**WRF model simulations to examine influences of Lake Ontario and specific Finger Lakes region topography**

# Lake Ontario – Finger Lakes Connection: IOP 16 & 17

## Jan. 21 – 23, 2014



# *Synoptic-scale Shortwave & Lake-effect Snow Bands*

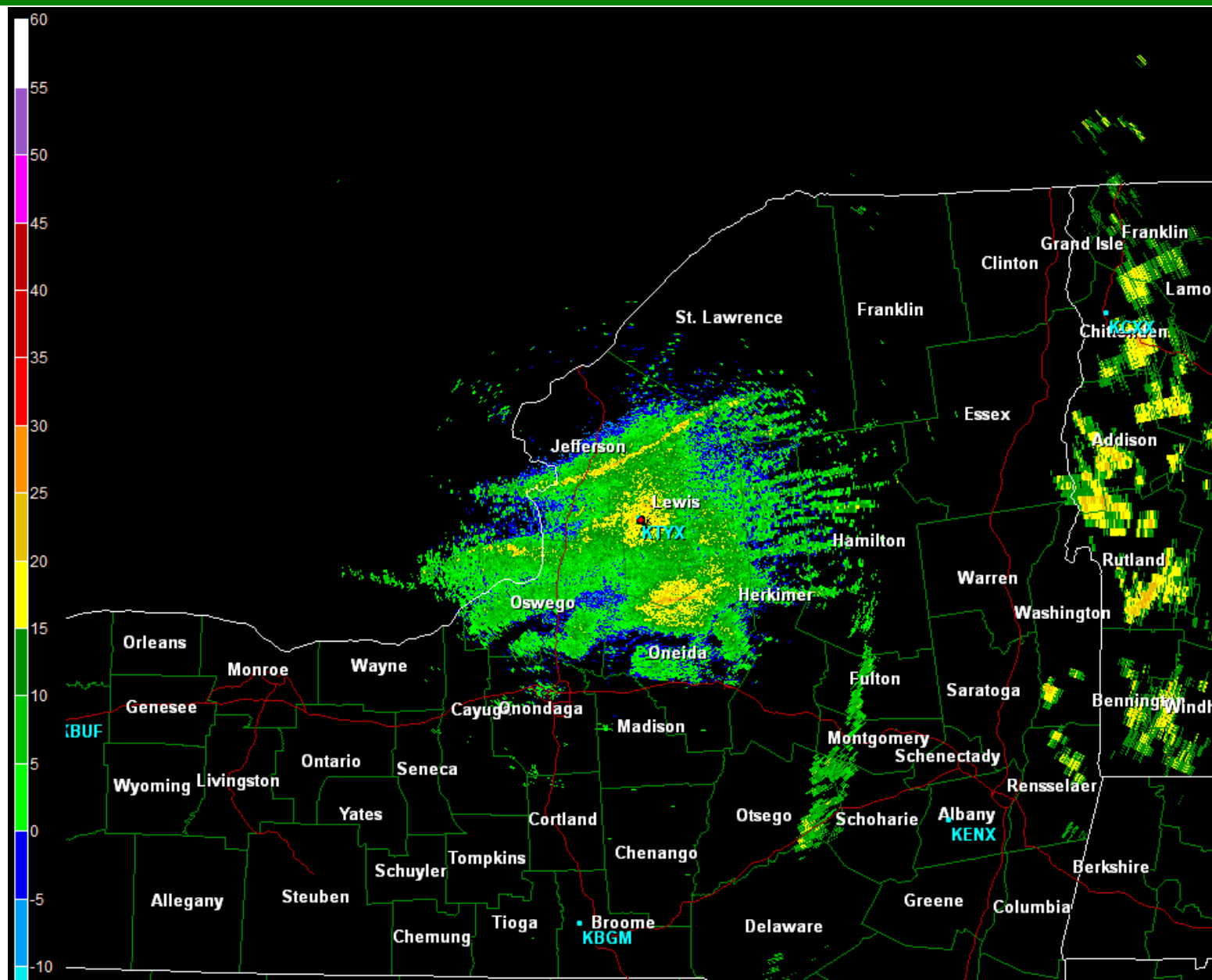
**Goal: Determine the influence that synoptic-scale shortwaves have on lake-effect snow bands**

- The large-scale dynamics complement lake boundary layer environment leading to change in position and snowfall of snow band



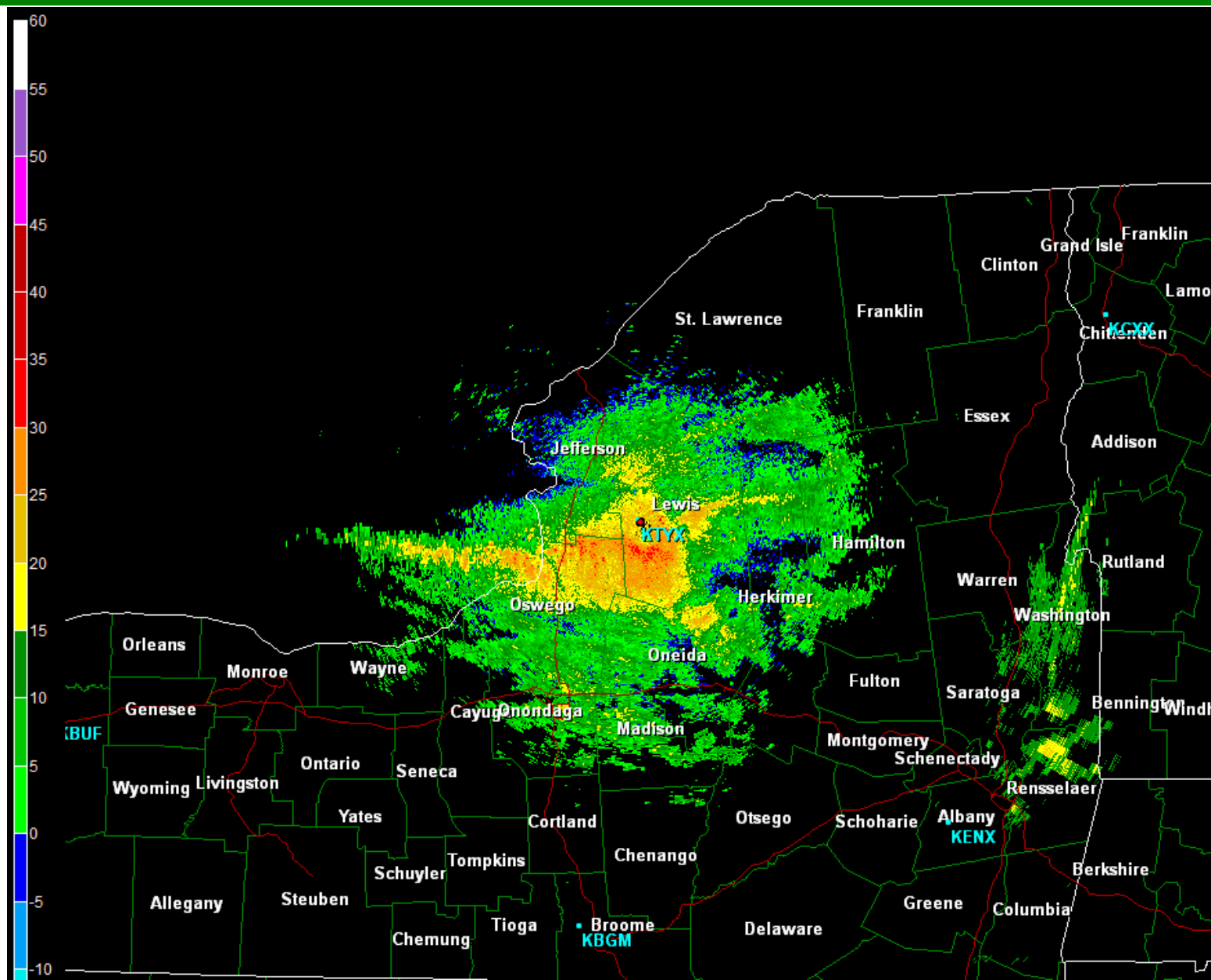
# Short-wave Troughs and LES

1630 UTC 6 January 2014



# Short-wave Troughs and LES

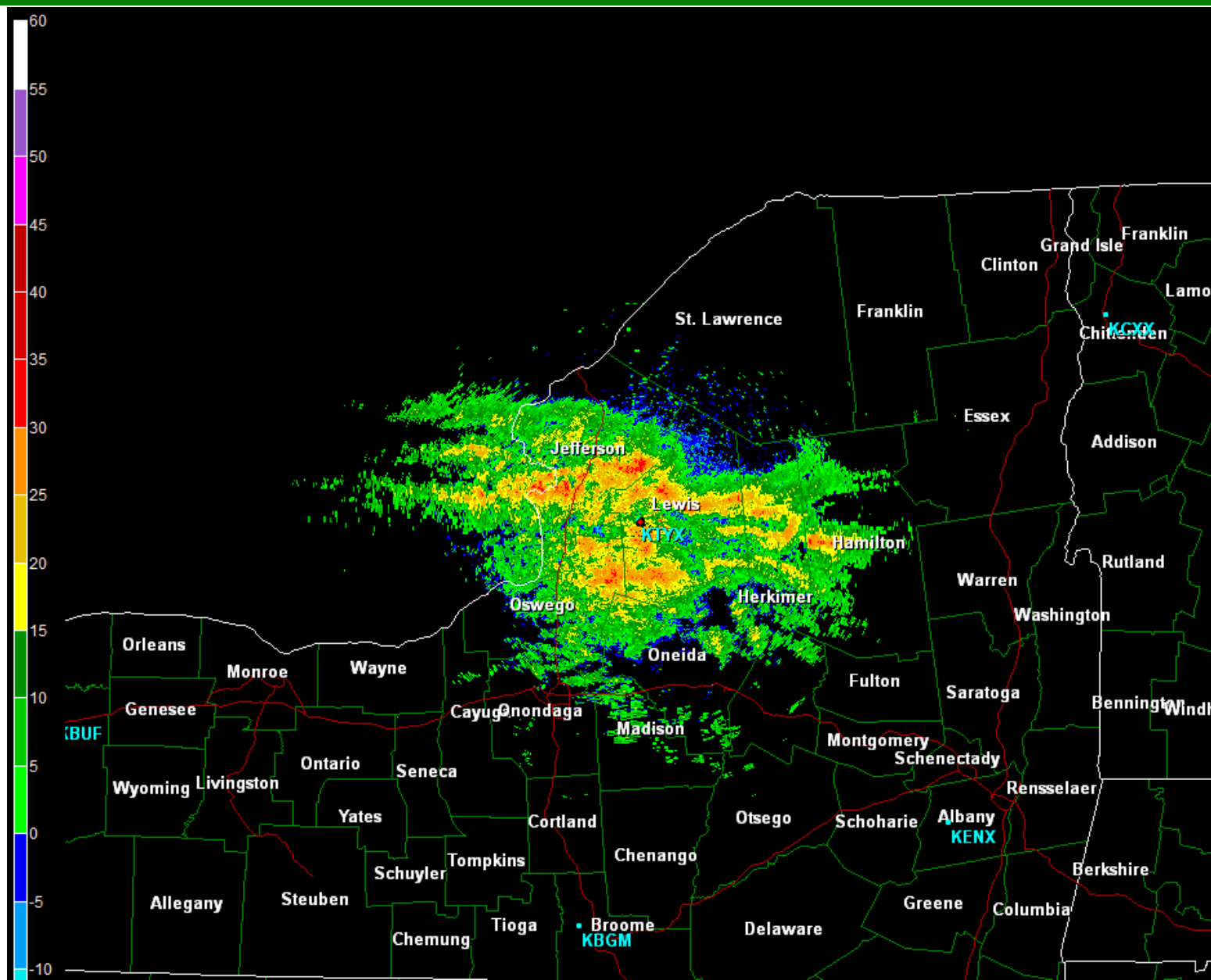
1800 UTC 6 January 2014





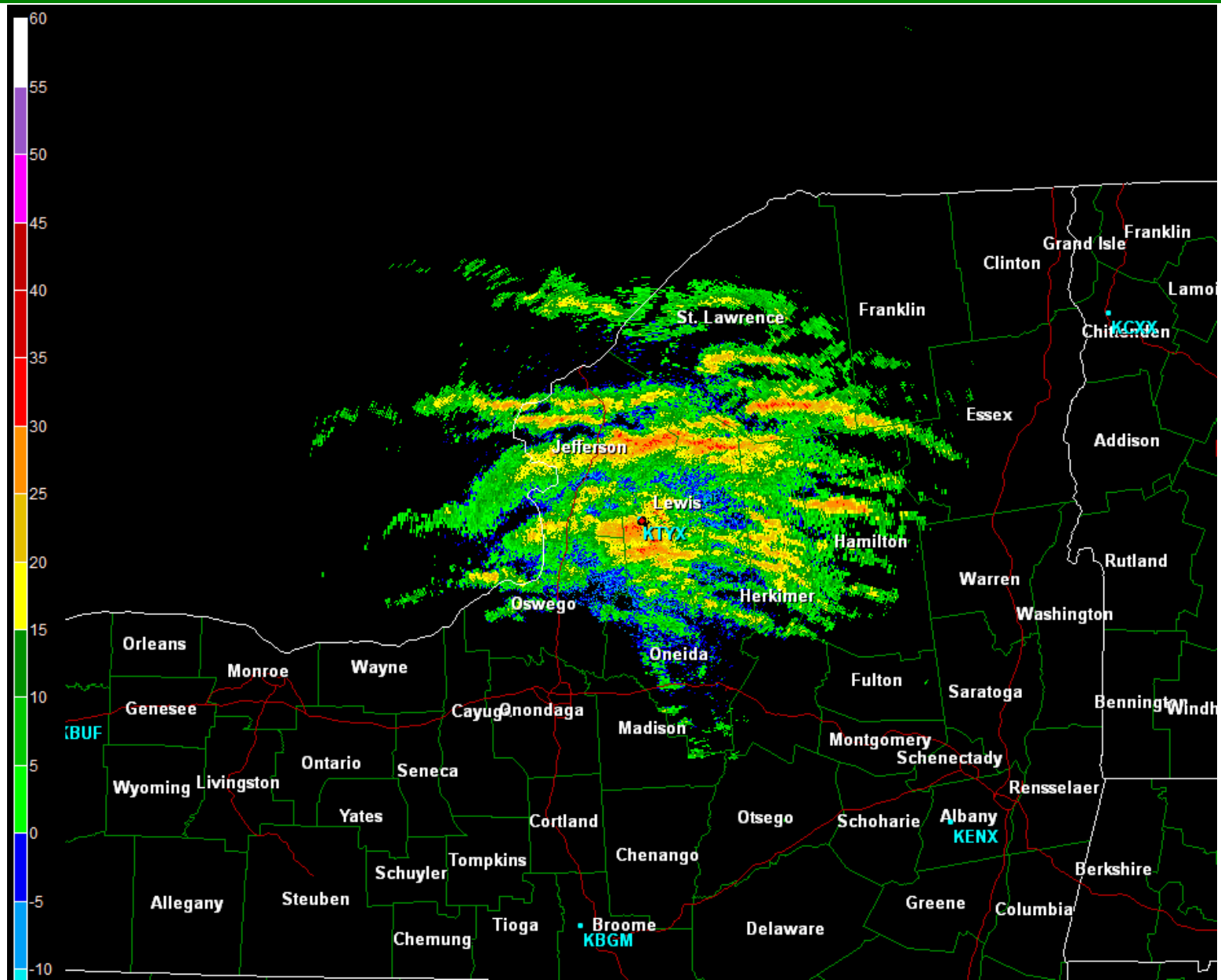
# Short-wave Troughs and LES

2100 UTC 6 January 2014



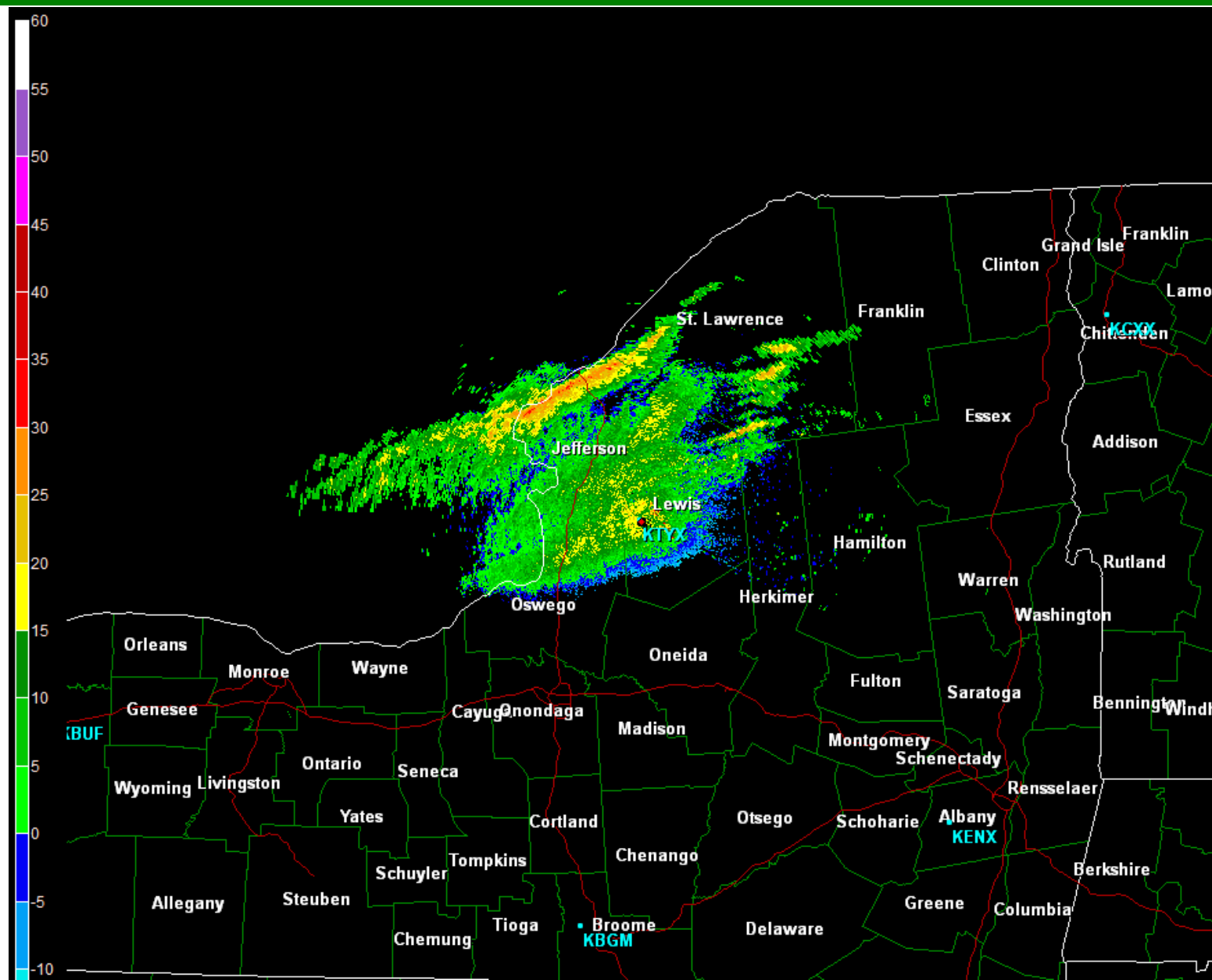
# Short-wave Troughs and LES

0000 UTC 7 January 2014



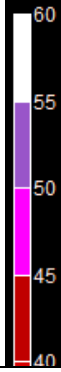
# Short-wave Troughs and LES

0300 UTC 7 January 2014

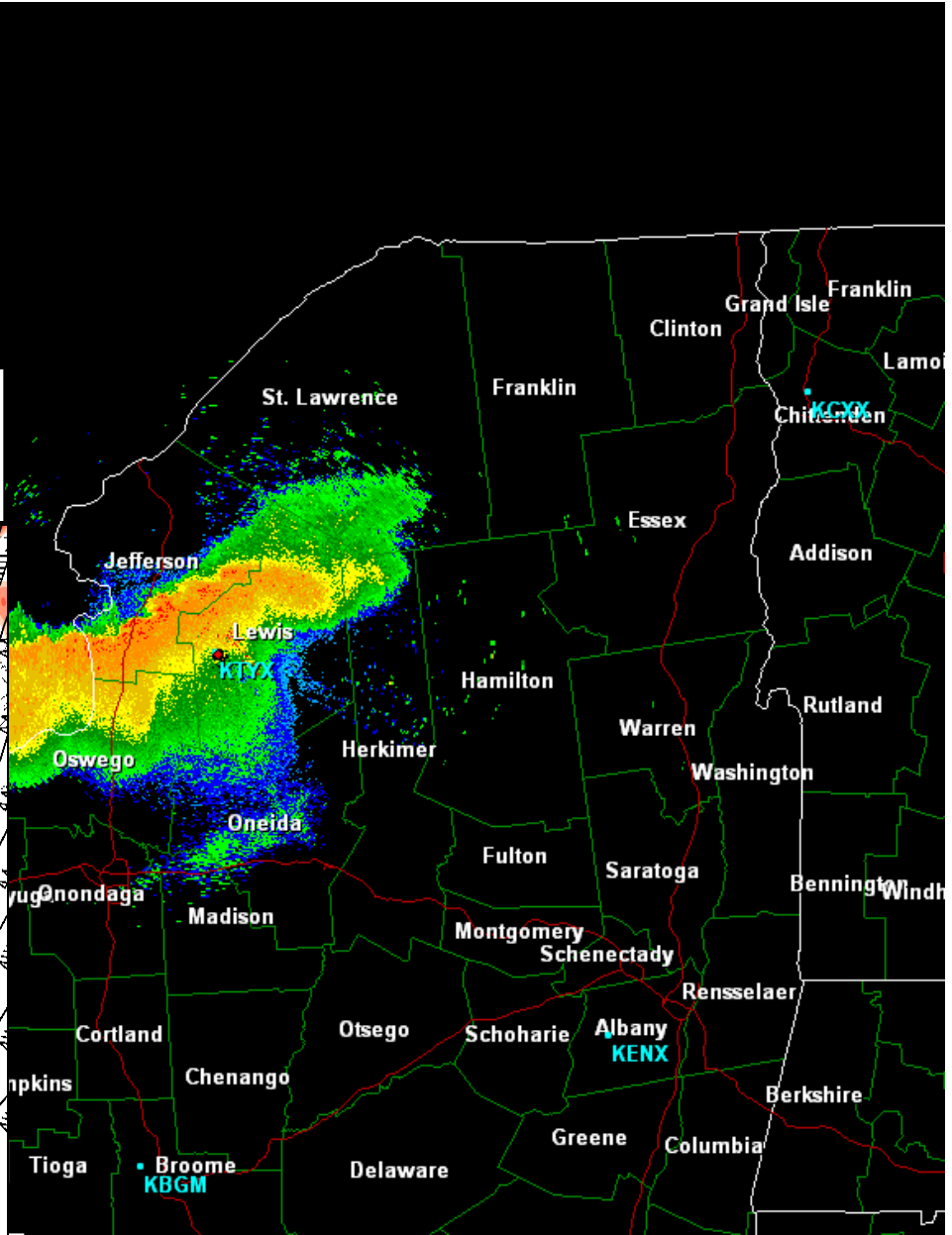
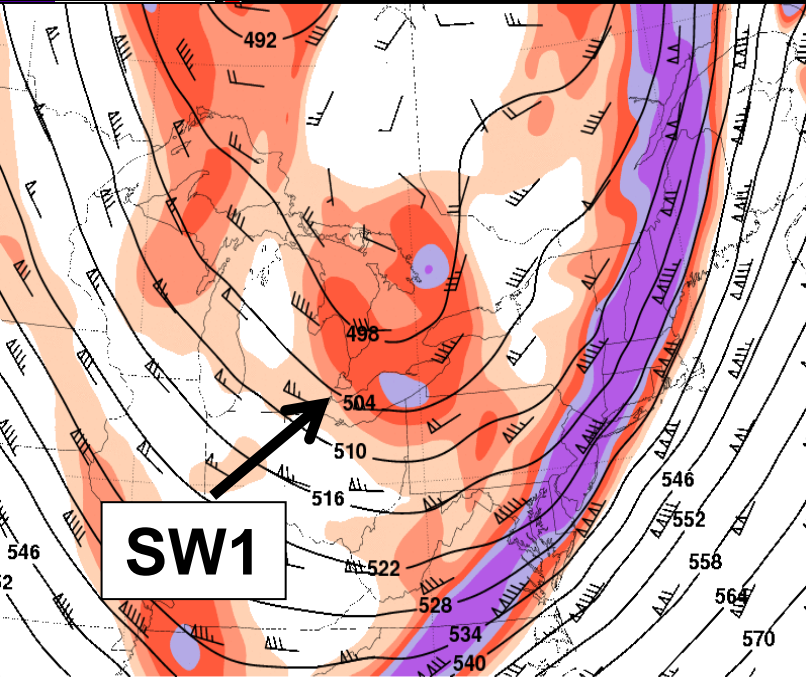


# Short-wave Troughs and LES

0600 UTC 7 January 2014



500-hPa absolute vorticity ( $\times 10^{-5} \text{ s}^{-1}$ )  
500-hPa heights (dam)  
500-hPa winds (kt)



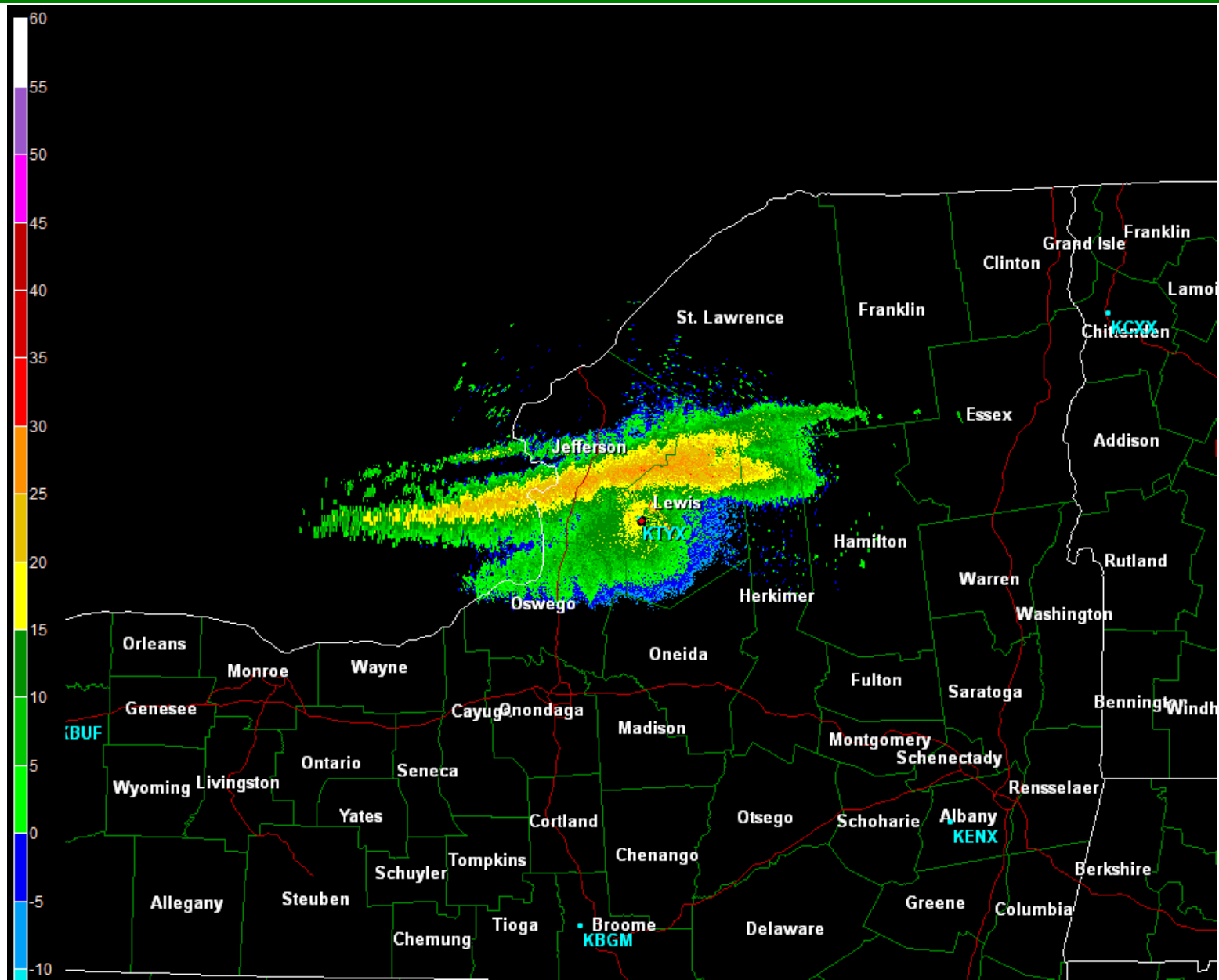






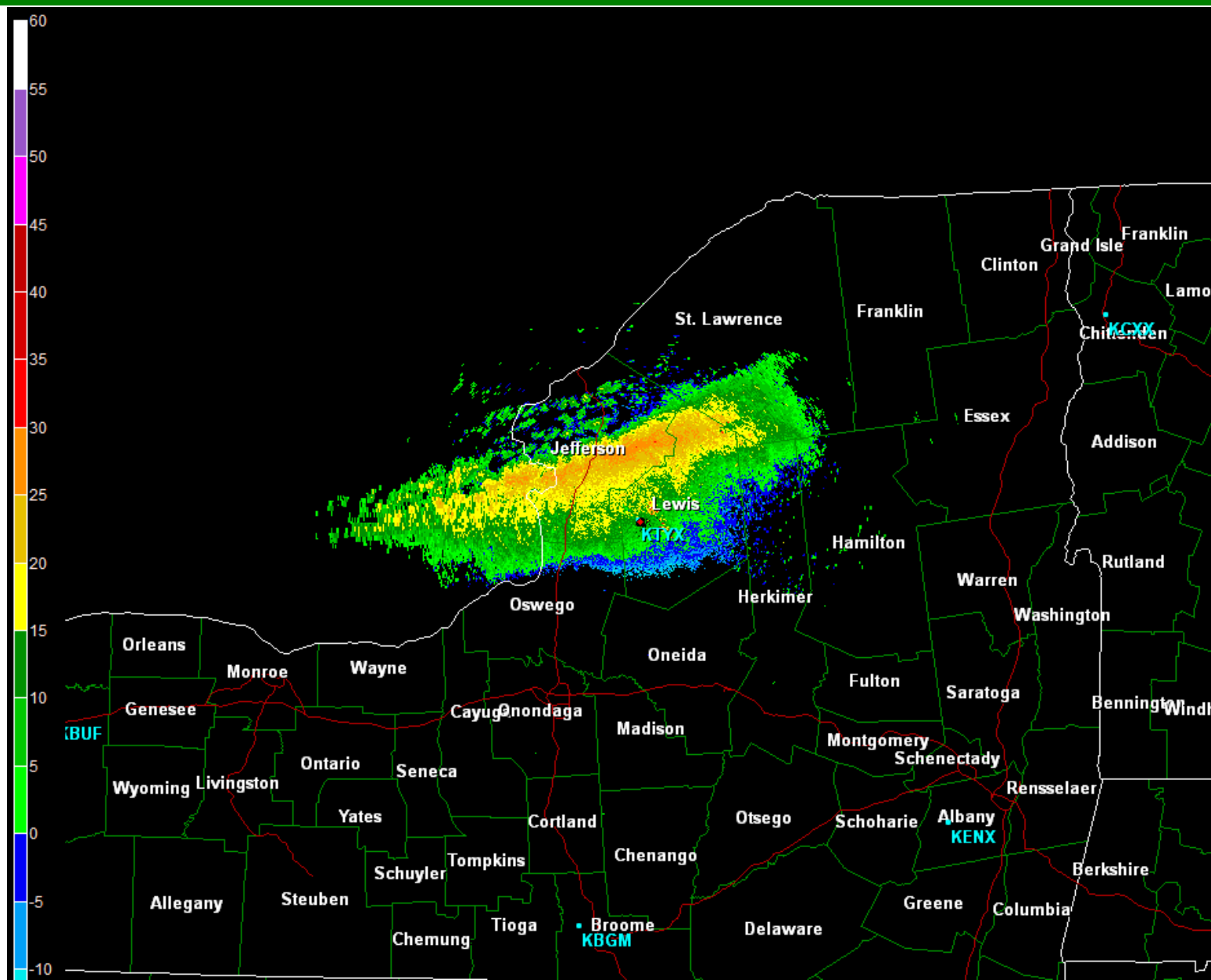
# Short-wave Troughs and LES

1500 UTC 7 January 2014



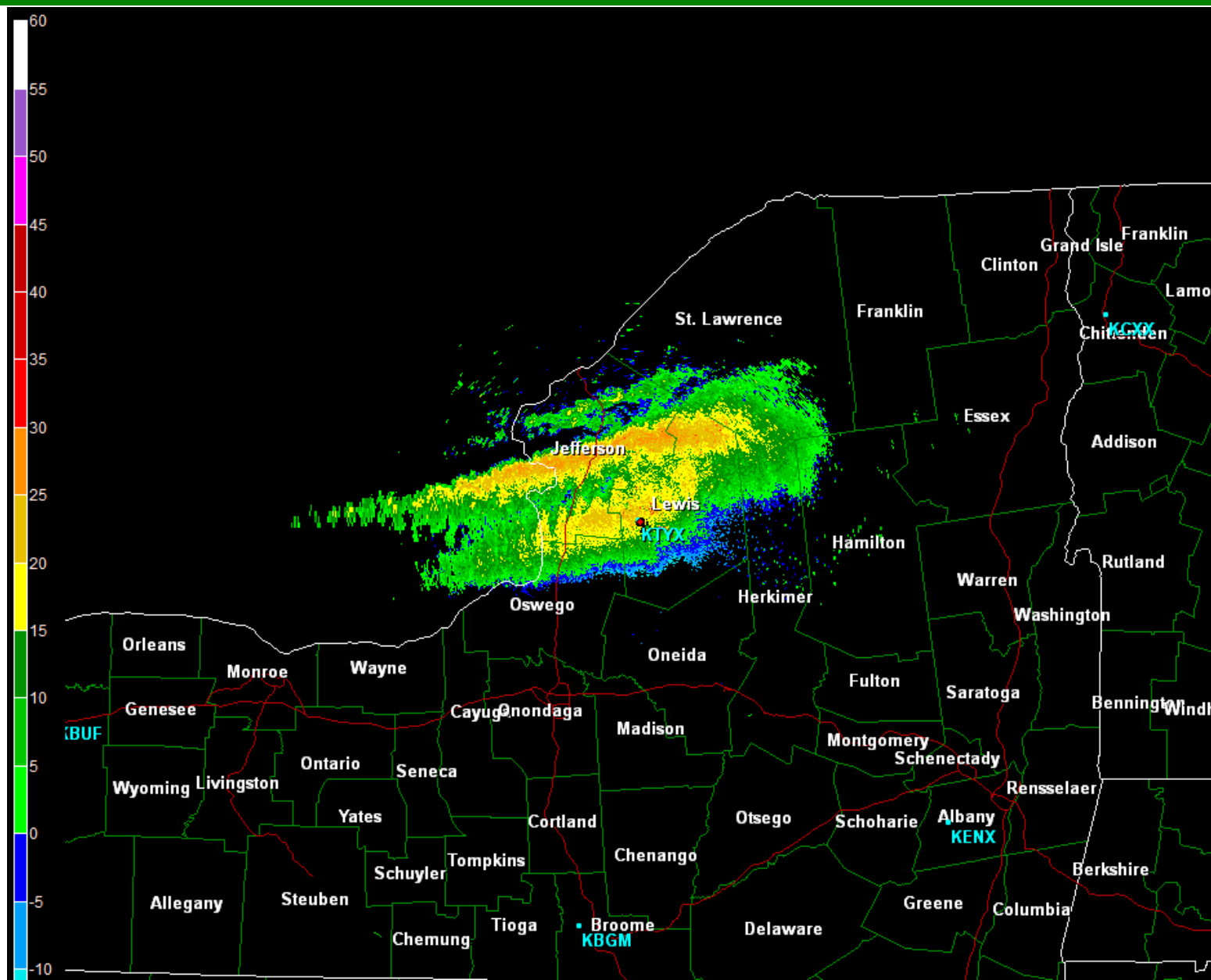
# Short-wave Troughs and LES

1800 UTC 7 January 2014



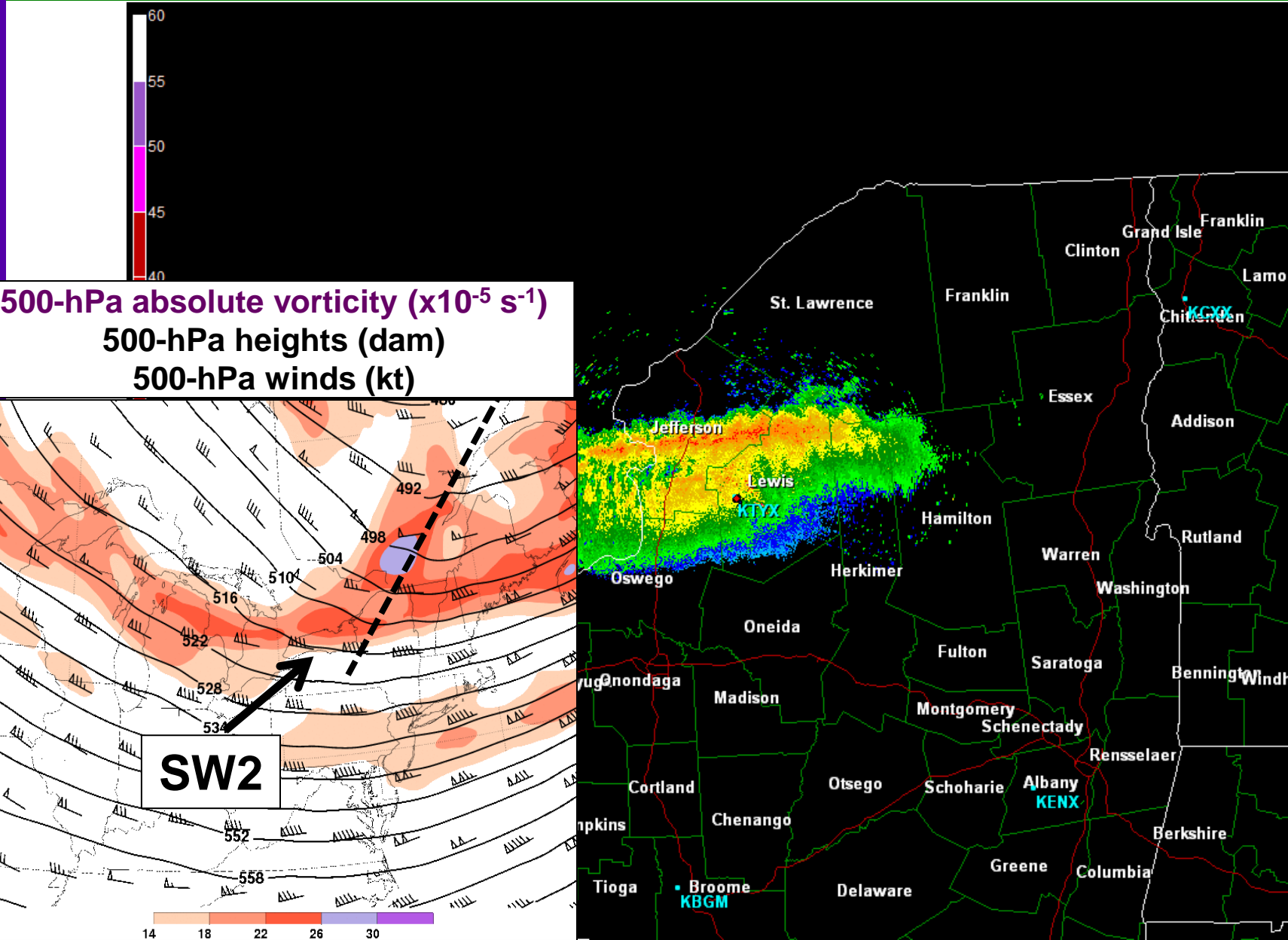
# Short-wave Troughs and LES

2100 UTC 7 January 2014



# Short-wave Troughs and LES

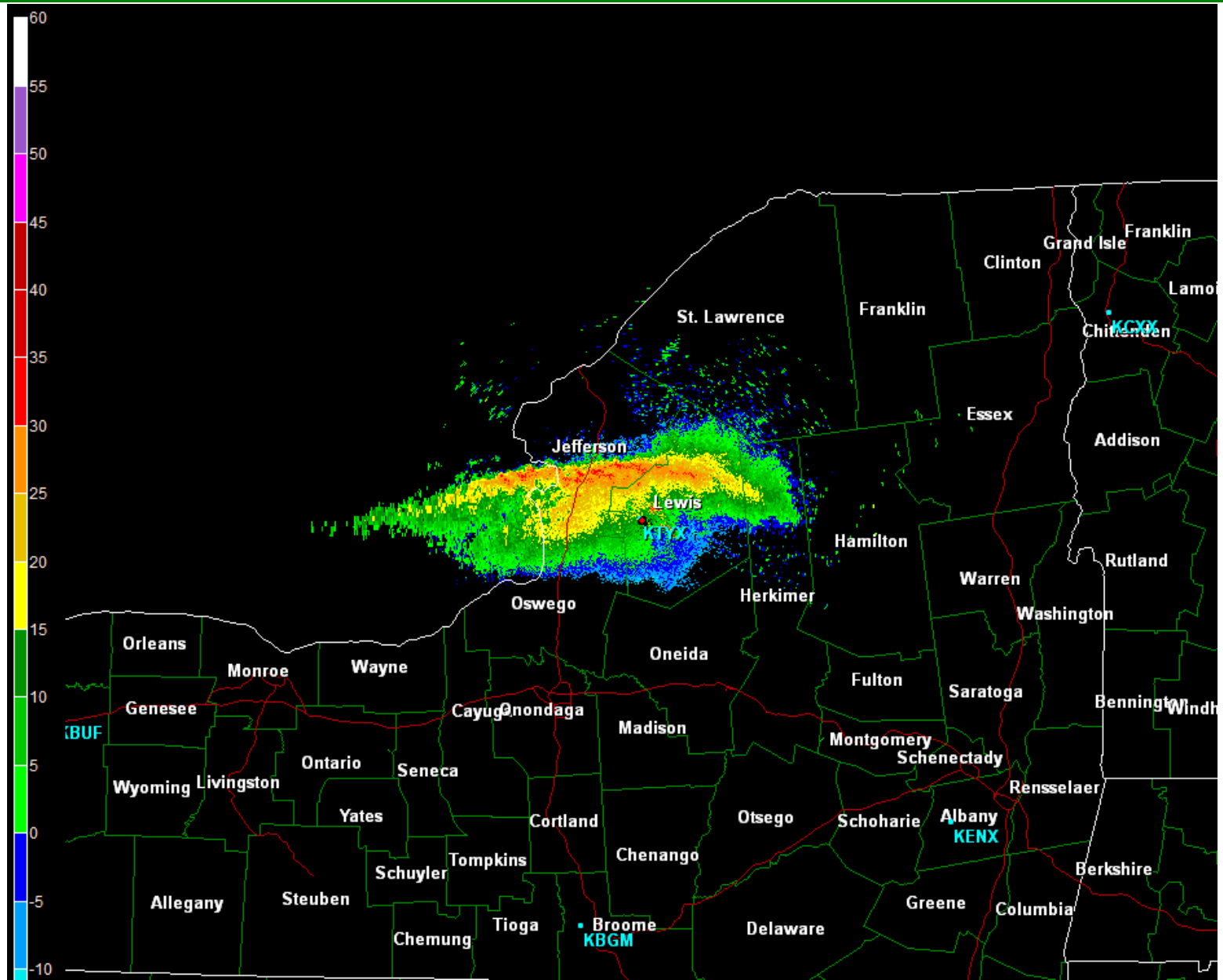
0000 UTC 8 January 2014





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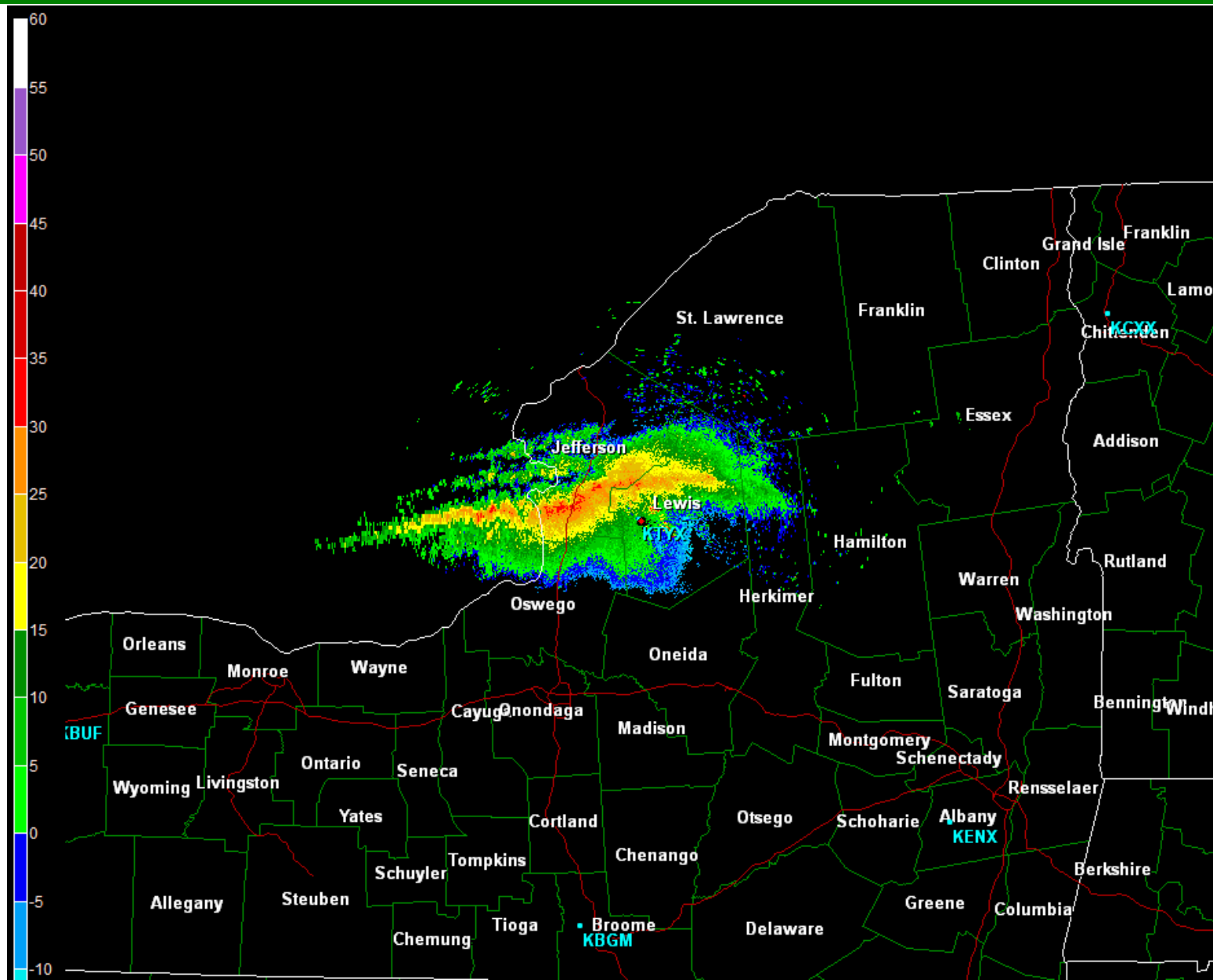
0600 UTC 8 January 2014





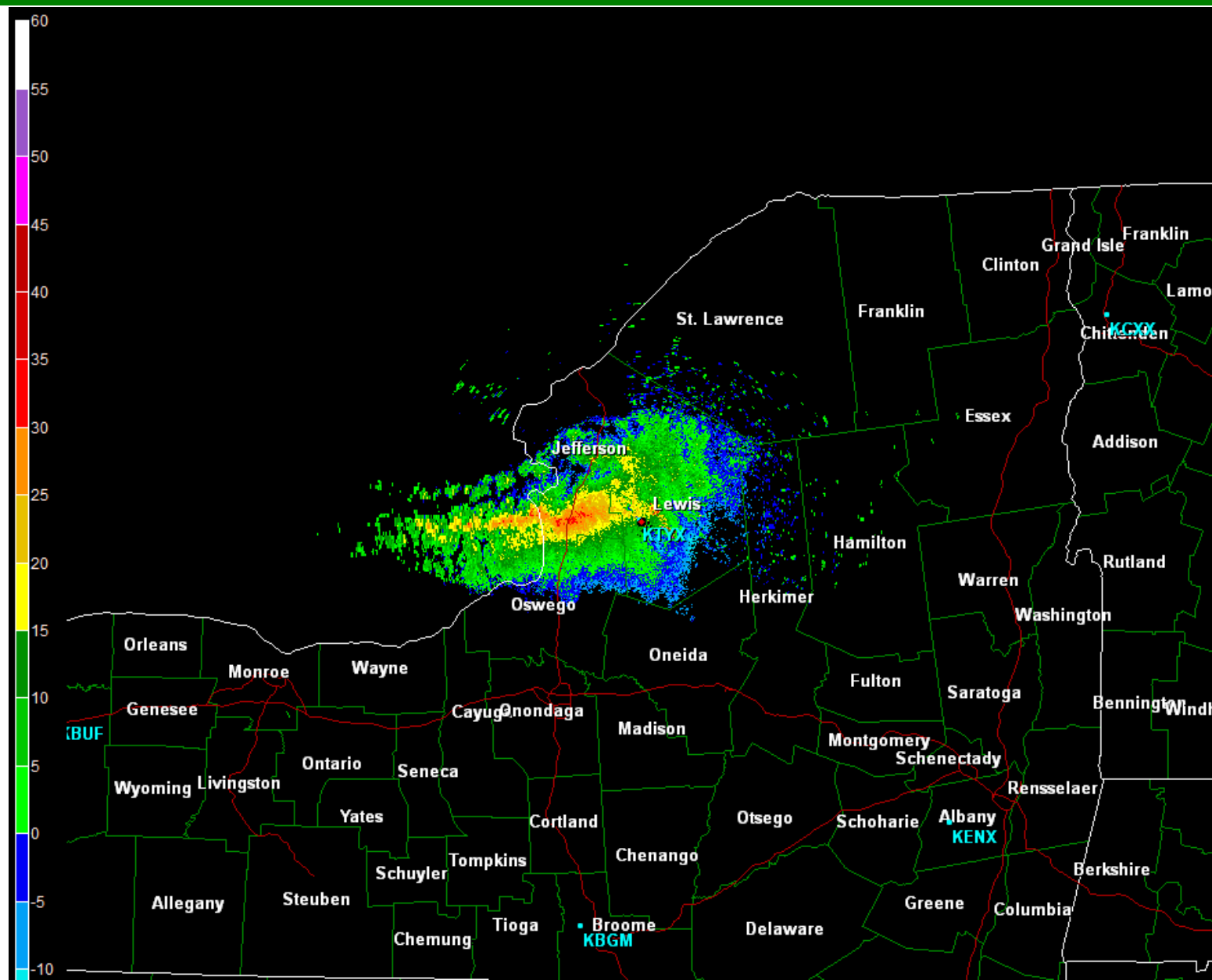
# Short-wave Troughs and LES

0900 UTC 8 January 2014



# Short-wave Troughs and LES

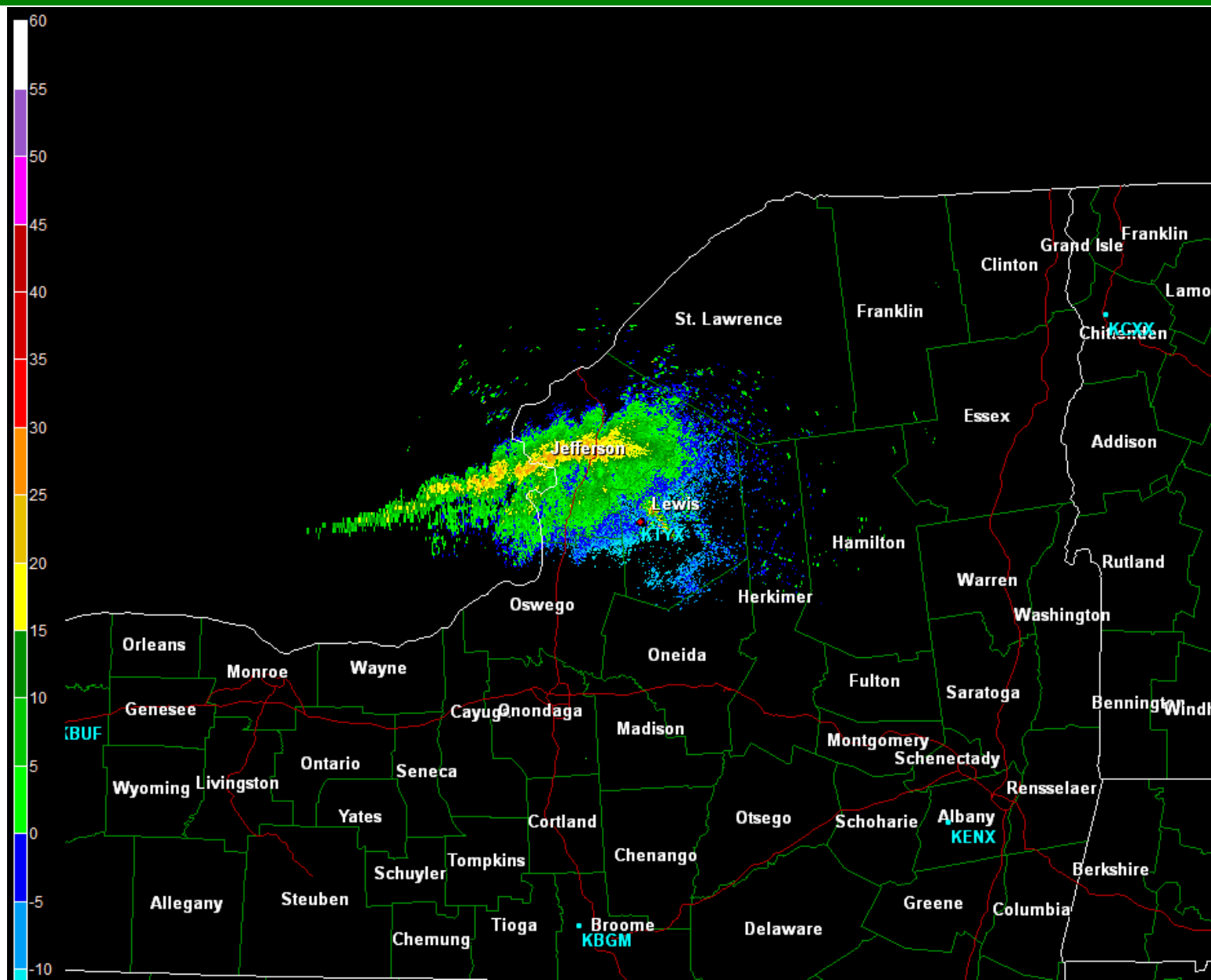
1200 UTC 8 January 2014





# Short-wave Troughs and LES

1800 UTC 8 January 2014



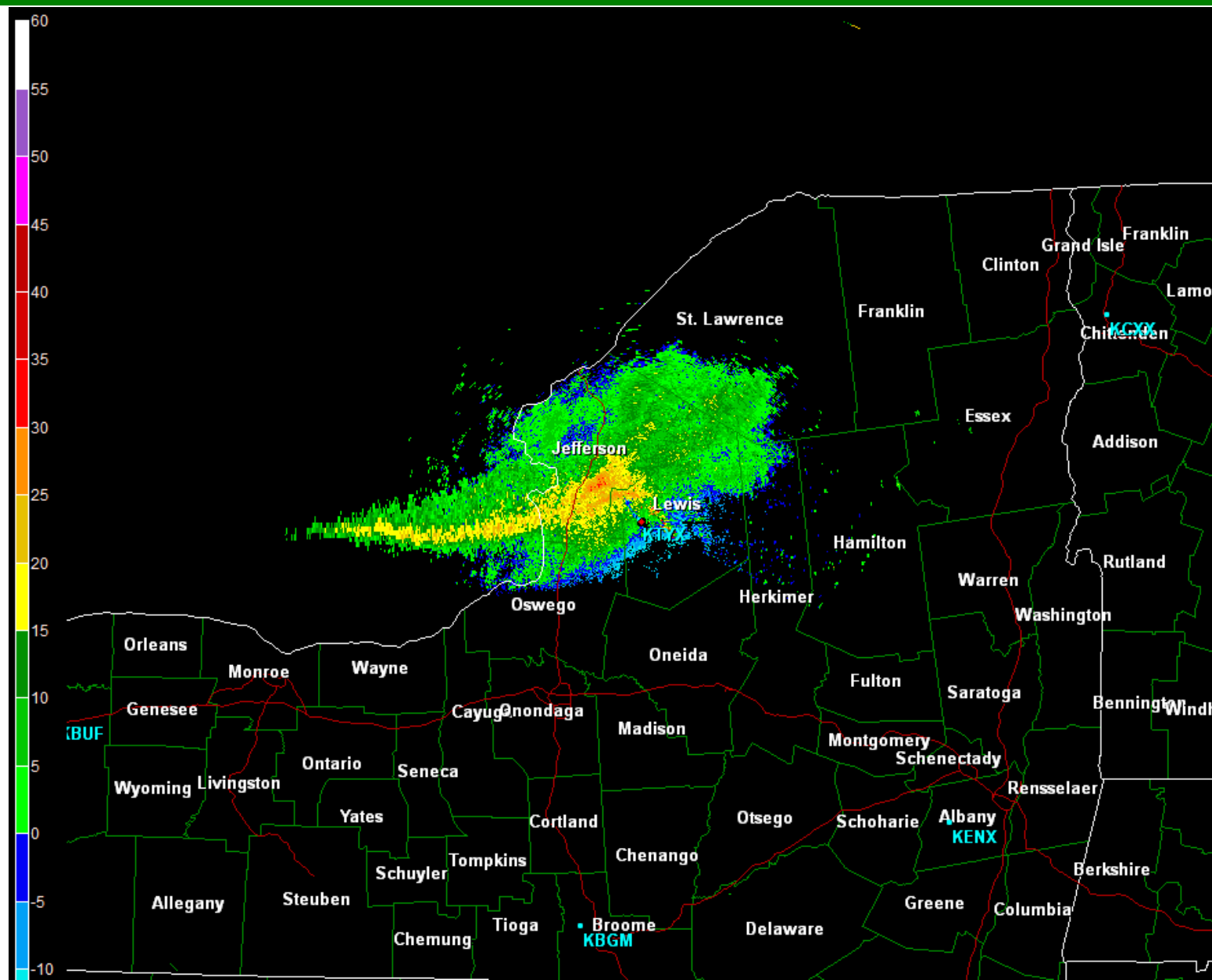






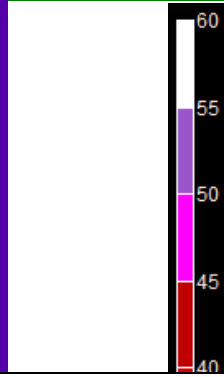
# Short-wave Troughs and LES

0300 UTC 9 January 2014

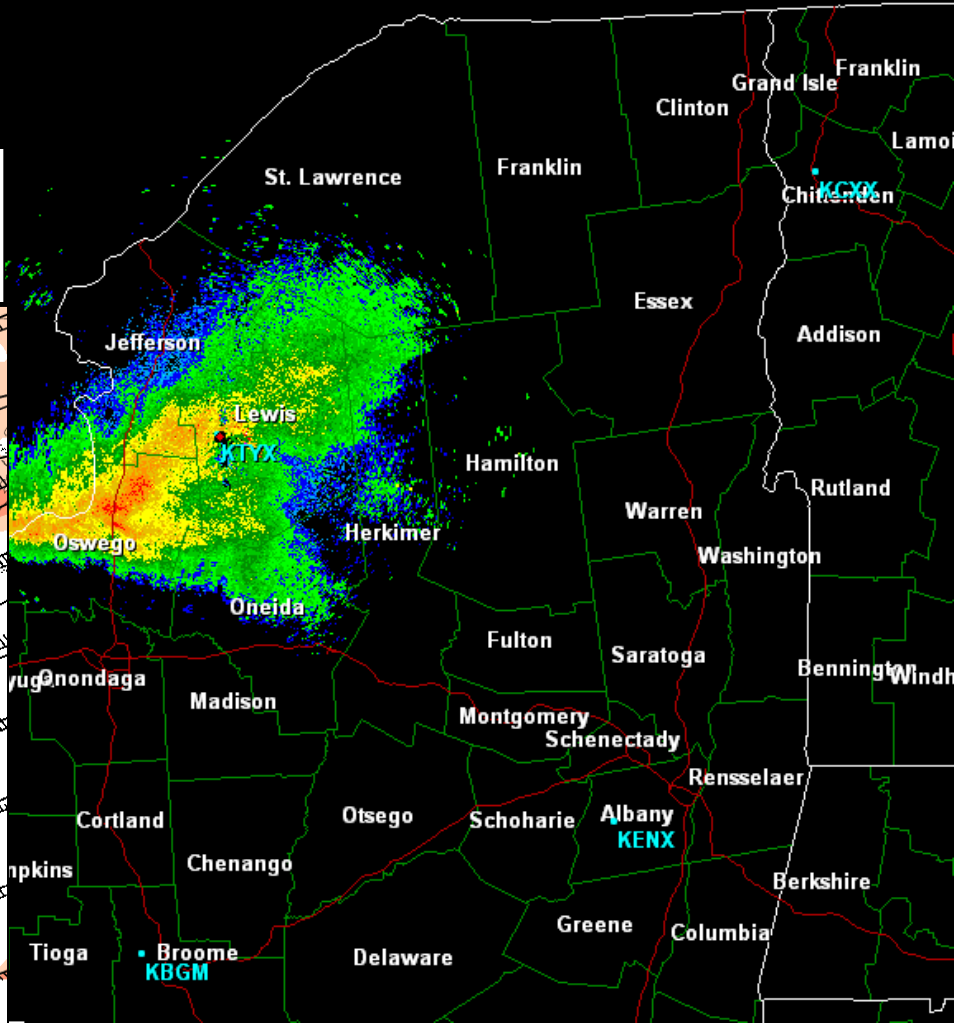
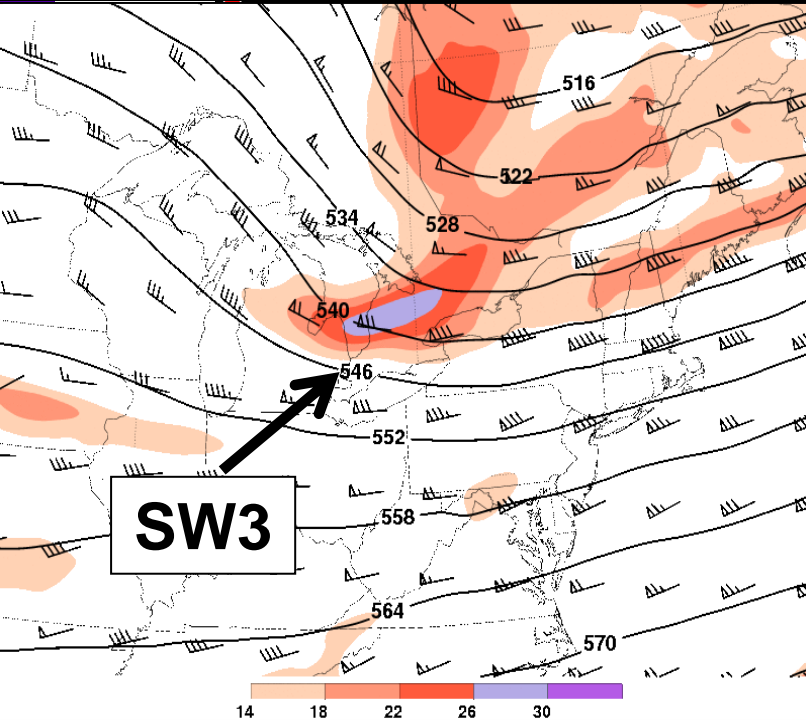


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0600 UTC 9 January 2014



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