



# Being Prepared for and Reacting to Hazardous Weather in Central New York

By Scott Steiger (meteorology professor), Nicholas Rodick, and Bruno Rojas  
(Meteorology seniors/LESPaRC forecast leaders)

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## Current Conditions: websites

New York Mesonet (webcams):

<http://nysmesonet.org/mesonow#network=nysm&stid=oswe>

SUNY Oswego Chermack tower (visibility):

[http://www.oswego.edu/met\\_class/tower/index.html](http://www.oswego.edu/met_class/tower/index.html)

Radar, satellite, and more: <http://weather.rap.ucar.edu/>

Weather apps: RadarScope, LiveDoppler9

# Accurate Weather Forecasts

National Weather Service (Buffalo/Binghamton):

<https://www.weather.gov/buf/>, <https://www.weather.gov/bgm/>

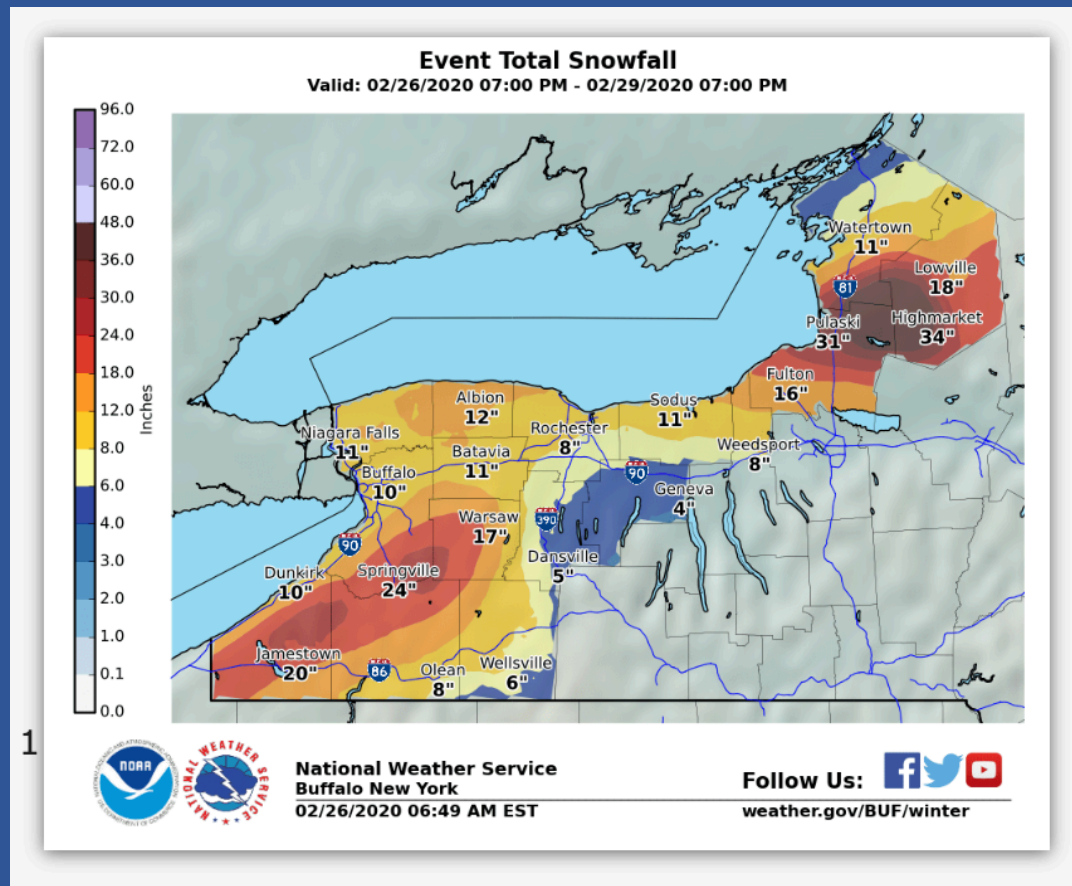
-Advisories, snowfall maps, Winter weather link

Social media: @NWSBuffalo, @SteigerScott

# Interpreting Weather Observations and Forecasts

How to interpret 30%?: it will snow on 30% of days like what is predicted tomorrow

What is freezing rain? Sleet? Heavy snow?






weather.gov/buf/

Local forecast by "City, St" or ZIP code  
 Enter location ... Go

[Location Help](#)


**MY FORECAST**  
 Greater Buffalo  
 International Airport NY



Light Snow and Windy

**25°F**  
 -4°C [Get Detailed Info](#)


This Afternoon



60%

Snow Likely and Areas  
 Blowing Snow  
**High: 25°F**

Tonight



**News Headlines**

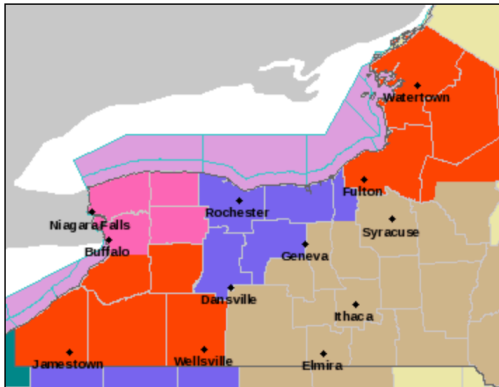
- Now Accepting Summer Student Volunteer Applications until March 1!

**NWS Forecast Office Buffalo, NY**  
[Weather.gov](#) > Buffalo, NY

Buffalo, NY  
 Weather Forecast Office

[Current Hazards](#) [Current Conditions](#) [Radar](#) [Forecasts](#) [Rivers and Lakes](#) [Climate and Past Weather](#) [Local Programs](#)

Click a location below for detailed forecast.



Last Map Update: Wed, Feb. 26, 2020 at 9:40:10 pm EST

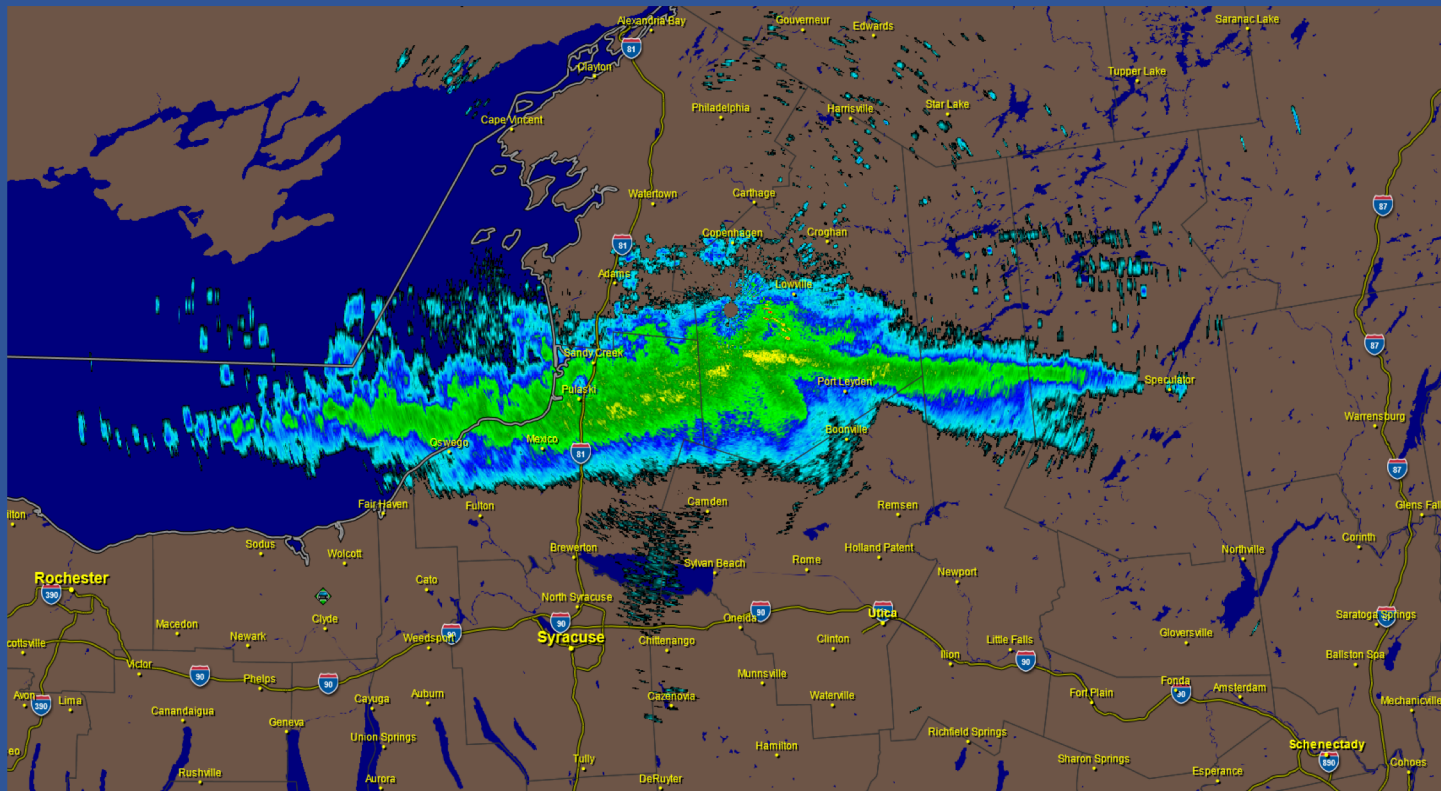
[Watches, Warnings & Advisories](#)

- [Blizzard Warning](#)
- [Winter Storm Warning](#)
- [Lakeshore Flood Warning](#)
- [Lake Effect Snow Warning](#)
- [Gale Warning](#)
- [Winter Weather Advisory](#)
- [Small Craft Advisory](#)
- [Wind Advisory](#)
- [Winter Storm Watch](#)
- [Hazardous Weather Outlook](#)
- [Hydrologic Outlook](#)

Zoom Out

How would you interpret these advisories??? Compare with the snow forecast on the previous slide.

# Lake-effect Snow (LES, our main weather hazard): Single-banded storms (on Radar)

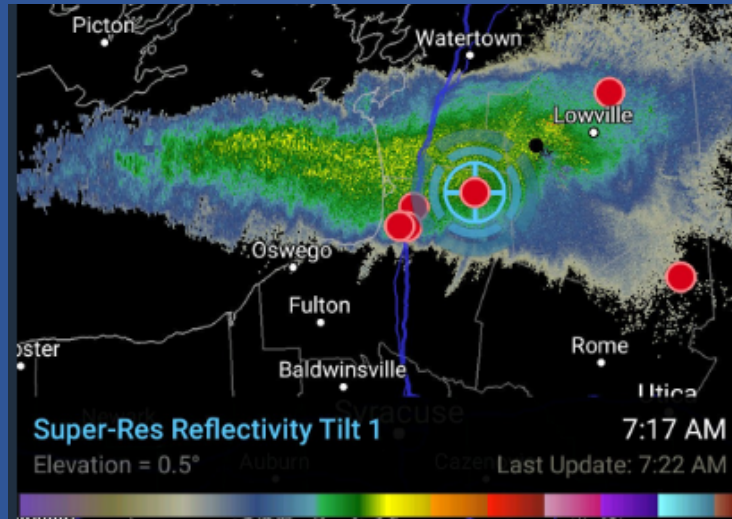


LLAP (long lake-axis-parallel)  
band east of  
Lake Ontario in  
Feb. 2013. Image  
from  
[syracuse.com](http://syracuse.com)

# Lake-Effect Using Radar and Surface Observations

- When tracking lake-effect, radar is critical to understanding the current situation. The radar will show dBZ (decibel relative to Z) values.
- “Reflectivity” is the amount of transmitted power returned to the radar receiver after hitting precipitation.
- The challenging thing with lake-effect is the band(s) don’t extend high above the ground and sometimes the radar beam doesn't hit the main part of the lake-effect band. As a result, even what appears as low reflectivity values can produce heavy snow. This is why using web cams and surface observations are also critical in combination with radar to see what is truly happening.

# Lake-Effect Using Radar and Surface Observations



Launching a weather balloon in a LES band

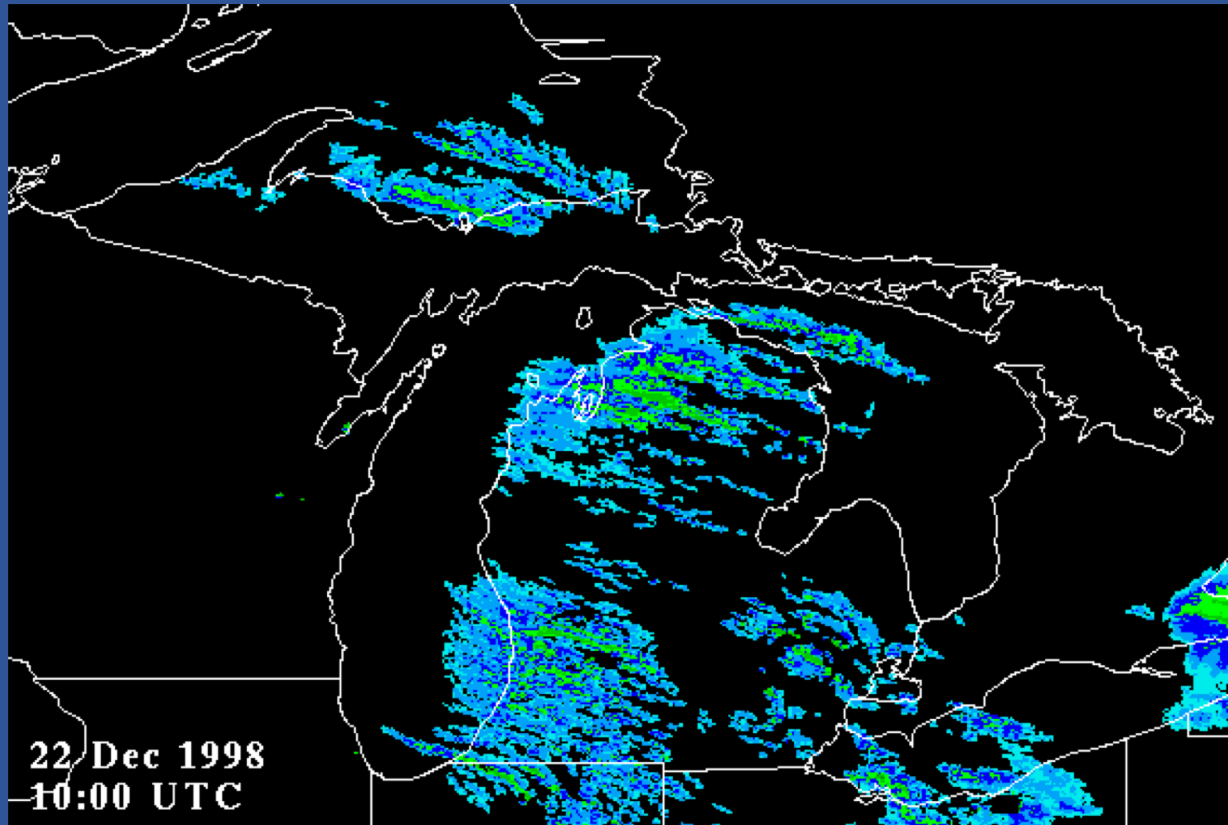
Scott Steiger's Twitter-Winter of 18/19

When the radar beam doesn't overshoot the lake-effect band, the following snowfall rates can *generally* be assumed:

dBZ Values	Snowfall Rate
0-10 dBZ (Light Blue on most radar images)	Flurries (<0.1 in/hr)
11-20 dBZ (Darker Blue)	Light-Moderate Snow (0.1-1 in/hr)
21-35 dBZ (Green)	Moderate-Heavy (1.1-2 in/hr)
36+ dBZ (Yellow)	Heavy (2 in/hr or greater)

Snowfall Rate	Expected Visibility
Flurries (<0.1 in/hr)	3.1-5 Miles
Light-Moderate Snow (0.1-1 in/hr)	0.76-3 Miles
Moderate-Heavy (1.1-2 in/hr)	0.26-0.75 Mile
Heavy (2 in/hr or greater)	<0.25 Mile

## Lake-effect Snow: multi-bands



Lighter  
snows, wider  
area covered

Lake-effect snow east  
of Lakes Michigan and  
Superior on Dec. 22,  
1998.  
Image from UWYO.

# Lake-effect Snow (LES) Climatology

- LES often occurs during the late fall and winter months
  - Peak season for Lake Ontario typically December-January
- All of the Great Lakes produce LES
  - Upstream connections occasionally enhance Lake Ontario LES
- Similar to the lake-effect process, sea-effect snow occurs in other regions of the world
  - Atlantic Canada
  - Sea of Japan
  - Black Sea



# Lake-effect Research at SUNY Oswego

- Several studies related to lake-effect processes have been conducted using data collected during the OWLeS (Ontario Winter Lake-effect Systems) Project (NSF, \$4M).
  - Misovortices
  - Lightning
  - DOW and Wyoming King Air data correlation



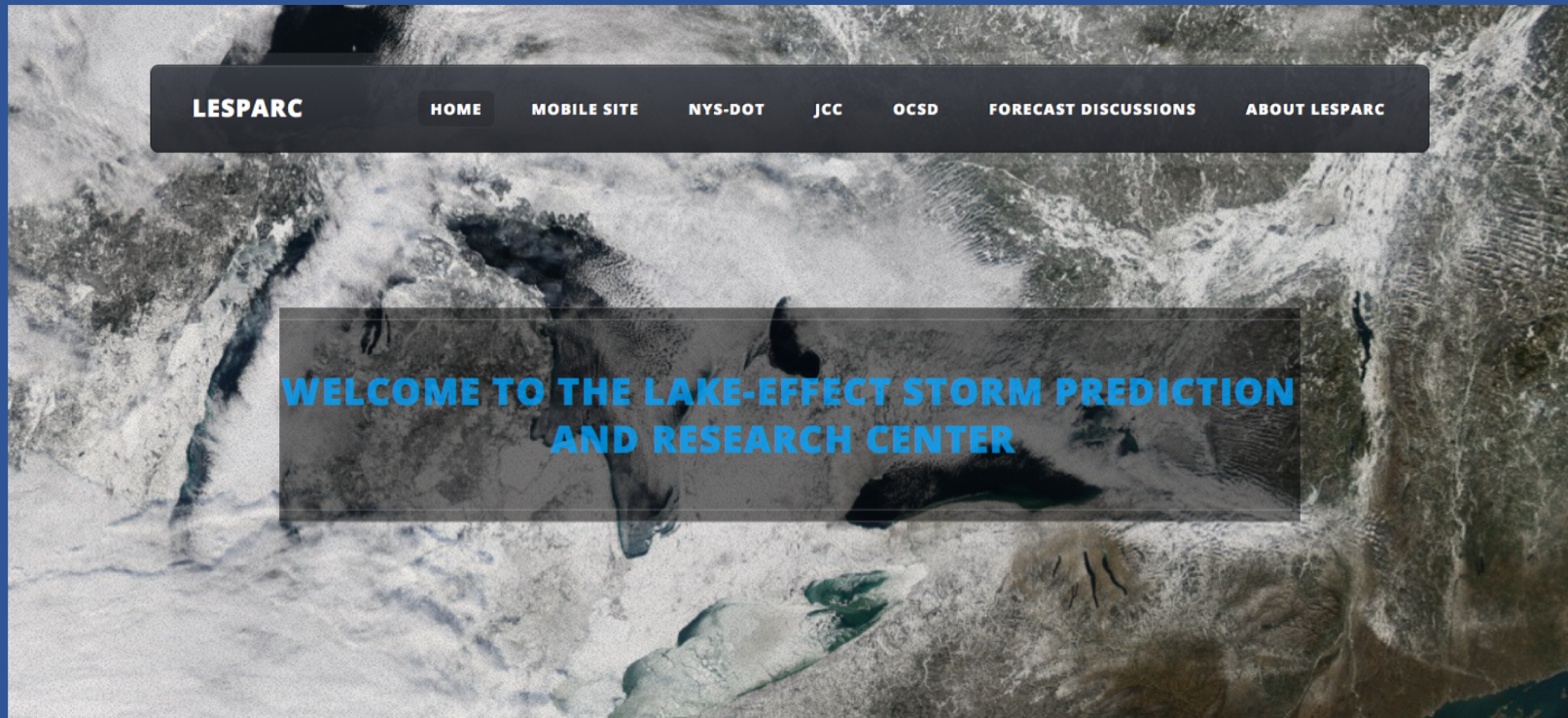
(OWLeS Field Catalog)

# LESPaRC

- The Lake-effect Storm Prediction and Research Center (LESPaRC) is a SUNY Oswego student-run organization (overseen by Scott Steiger) that forecasts for Central and Northern NY during the winter season of November to April.
- Forecasters are assigned one day of the week to produce forecasts, twice on that day (4x a day during Active Mode)
- Forecasts are delivered to the NY DOT and a number of school districts
- Co-Forecast Leaders write forecast discussions prior to significant events
- LESPaRC is a 24/7 operation

# LESPaRC

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(SUNY Oswego LESP aRC website)

# LESPaRC: sample products

Time of Update: 12:00 AM on December 21<sup>st</sup>

Time of Next Update: 12:00 PM on December 21<sup>st</sup>

I-81 @ Adams						
Time	Weather Conditions	Snowfall Rates	Temperature	Wind	Wind Chill	Visibility
12:00 AM	Mostly Cloudy	None	24°	SW 10-15 mph	11-14°	10 Miles
1:00 AM	Mostly Cloudy	None	23°	SW 10-15 mph	10-13°	10 Miles
2:00 AM	Cloudy	None	23°	W 10-15 mph	10-13°	10 Miles
3:00 AM	Snow Showers	Trace-0.1 in/hr	22°	W 10-15 mph	9-12°	3-5 Miles
4:00 AM	Snow Showers	Trace-0.1 in/hr	22°	W 10-15 mph	9-12°	3-5 Miles
5:00 AM	Snow	0.25-0.5 in/hr	23°	W 10-15 mph	10-13°	0.5-1 Miles
6:00 AM	Heavy Snow	1-2 in/hr	23°	W 10-15 mph	10-13°	<.25 Miles
7:00 AM	Heavy Snow	2-3 in/hr	24°	W 10-15 mph	11-14°	<.25 Miles
8:00 AM	Heavy Snow	1-2 in/hr	24°	W 10-15 mph	11-14°	<.25 Miles
9:00 AM	Snow	0.5-1 in/hr	25°	W 10-15 mph	12-15°	0.25-0.5 Miles
10:00 AM	Snow	0.25-0.5 in/hr	26°	W 10-15 mph	13-16°	0.5-1 Miles
11:00 AM	Snow Showers	0.1-0.25 in/hr	27°	W 10-15 mph	15-18°	1-3 Miles
Noon	Sctd. Snow Showers	Tr-0.1 in/hr	28°	W 10-15 mph	16-19°	3-5 Miles
1:00 PM	Sctd. Snow Showers	Tr-0.1 in/hr	29°	NW 10-15 mph	17-20°	3-5 Miles
2:00 PM	Sctd. Snow Showers	Tr-0.1 in/hr	30°	NW 10-15 mph	18-21°	3-5 Miles
3:00 PM	Sctd. Snow Showers	Tr-0.1 in/hr	30°	NW 10-15 mph	18-21°	3-5 Miles

(SUNY Oswego LESP ARC website)

# LESPaRC

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**Meteorologist on Call:** Matthew Seymour **Email:** [mseymour@oswego.edu](mailto:mseymour@oswego.edu)

**Alerts:** Winter Weather Advisory in effect until 4pm

**Forecast Discussion:** A band of lake-effect snow is projected to gradually move southward through this period. Within the core of the snow band, snowfall rates of 2-3 in/hr are possible, making for very low visibility. Gusty winds of 10-20mph may cause some areas of blowing and drifting. Temperatures will slowly rise through the 20s.

**Level of Confidence:** High



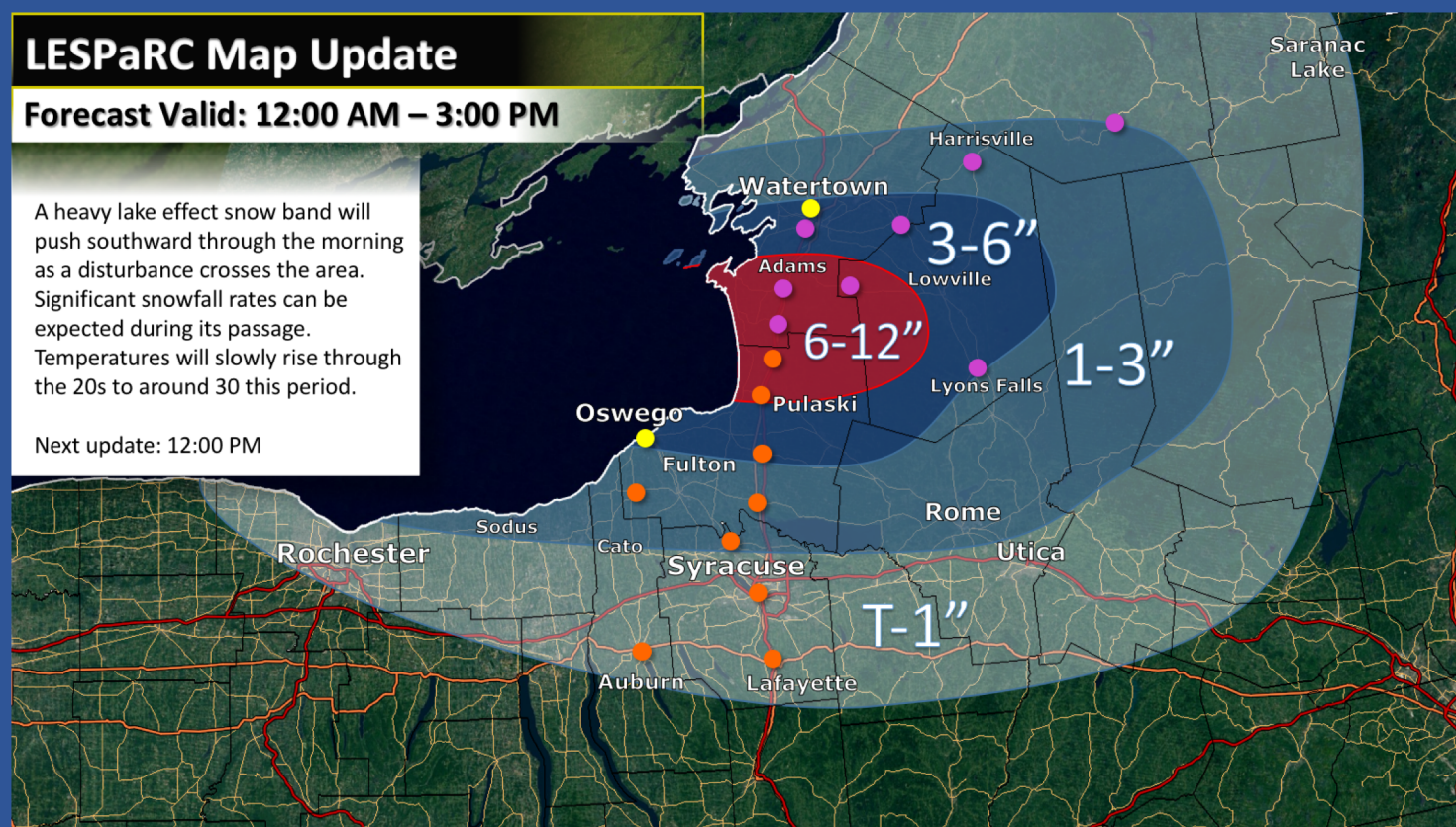
# LESPaRC

## LESPaRC Map Update

**Forecast Valid: 12:00 AM – 3:00 PM**

A heavy lake effect snow band will push southward through the morning as a disturbance crosses the area. Significant snowfall rates can be expected during its passage. Temperatures will slowly rise through the 20s to around 30 this period.

Next update: 12:00 PM



(SUNY Oswego  
LESPaRC website)



# Suggestions and Questions?

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- Please consider multiple sources when making a decision based on weather forecasts
- Campus Preparation and Response to Hazardous Weather Task force?