

KTYX Wind Farm Impacts

There are 4 National Weather Service (NWS) offices that use the Fort Drum KTYX radar to accomplish their mission of protection of life and property in the nearby counties. These offices are: NWS Albany, NWS Buffalo, NWS Binghamton, NWS Burlington.

NWS Albany Impacts:

- The turbines can cause beam blockage and under-sampling of the radar echoes downstream (25-30 nautical miles) into northern Herkimer County.
- Precipitation underestimate is likely (warm and cool season) in lake effect and widespread precipitation events.
- Turbines can also cause partial beam blockage impacting dual polarization data, and display large amounts of erroneous data.
- Downstream turbine clutter can impact precipitation data by over/underestimation, incorrect wind speed data, and false storm identification and tracking over Lewis County before moving into northern Herkimer County.
- In the winter, lake effect snow features could be masked or underestimated, negatively impacting warnings and advisories.
- During severe weather, erroneous data (especially wind velocities) can impact early detection and warnings of high winds, hail, and tornadoes.

NWS Buffalo Impacts:

- The height of existing turbine towers and turbines' spinning blades are causing beam blockage and under-sampling of the radar echoes downstream for Jefferson, Lewis, and Oswego counties.
- Resulting precipitation estimates in the vicinity of turbines are not useable, while precipitation estimates downstream have been degraded.
- Turbines are causing partial beam blockage impacting dual polarization products. This results in large amounts of erroneous data.
- Additional turbine installations will nearly surround the radar, further exacerbating these issues and will make radar interpretation and the detection of severe weather increasingly difficult.

- Wind turbine clutter has a negative impact on several radar capabilities:
 - Precipitation estimation algorithms produce false estimates.
 - Velocity products are often not useable near the turbines, particularly during severe weather.
 - This can cause false and/or missed detection of tornadoes by radar algorithms and forecasters.
- Thunderstorm or winter storm characteristics will be further masked or misinterpreted, reducing warning effectiveness in the vicinity of and downrange of existing and future wind turbines.
- False signatures contaminating Doppler velocity data will further reduce forecasters' situational awareness, especially during hazardous weather events.
- Potential radar relocation, particularly east or northeast from the current location will further reduce radar coverage south of Lake Ontario from Monroe, Wayne and Cayuga counties, with completely unseen lake effect events by radar. In any move, beam blockage will continue to be an issue near and over the Tug Hill Plateau.

NWS Binghamton Impacts:

- The beam blockage will hamper our abilities to detect thunderstorm circulations in Oneida/Madison Counties and hence tornado warnings could be delayed. It is important that we have good radar coverage in Oneida/Madison Counties because there is a local maximum in tornadoes in these areas since the Mohawk Valley will often skew winds to the southeast leading to increased atmospheric rotation.
- Thunderstorm or winter storm characteristics will be further masked or misinterpreted, reducing warning effectiveness in the vicinity of and downrange of existing and future wind turbines.
- False signatures contaminating Doppler velocity data will further reduce forecasters' situational awareness, especially during hazardous weather events.
- The beam blockage could also significantly hamper our ability to forecast and detect lake effect snow. Oneida County (especially northern Oneida County) sees more than 200" of snow per year on average and is one of the snowiest places east of the Rockies. The beam blockage could affect our ability to detect lake effect snow along the NY State Thruway between Syracuse and Utica of which is a major travel corridor. Our office provides almost daily briefings to the NYS Thruway Authority when a lake effect snow pattern is present. Significant beam blockage could erode our ability to time and track heavy lake effect snow bands

that severely impact travel which would lead to less accurate decision support to the Thruway Authority.

- Oneida and Madison Counties have a history of severe local flash flooding and beam blockage will hamper our ability to accurately estimate rainfall in these counties which would negatively impact the timeliness of flash flood warnings.

NWS Burlington Impacts:

- Wind turbines close to the radar cause some uncertainty/confusion about actual storm characteristics while monitoring storms that are moving north or northeast. This can delay warnings, resulting in a lower lead time prior to the storm reaching St. Lawrence or Franklin Counties.
- The wind turbines “look” like precipitation, even on a clear day. This can cause confusion to users of the data, including the media, pilots, and general public.
- If the radar is forced to be relocated because of wind turbines, concerns would be magnified. Any move to the east or south of the current location would result in reduced radar coverage over St. Lawrence and Franklin Counties. This would mean poorer detection of lake effect snow and low level severe weather features, such as tornadoes, high winds, and hail.