



# Radar and Mobile Mesonet Analysis of a Nontornadic Mesovortex on 3 March 2023

Morgan Schneider, Matthew Flourney, Michael Coniglio, David  
Bodine, Erik Rasmussen, Anthony Lyza, and Sean Waugh

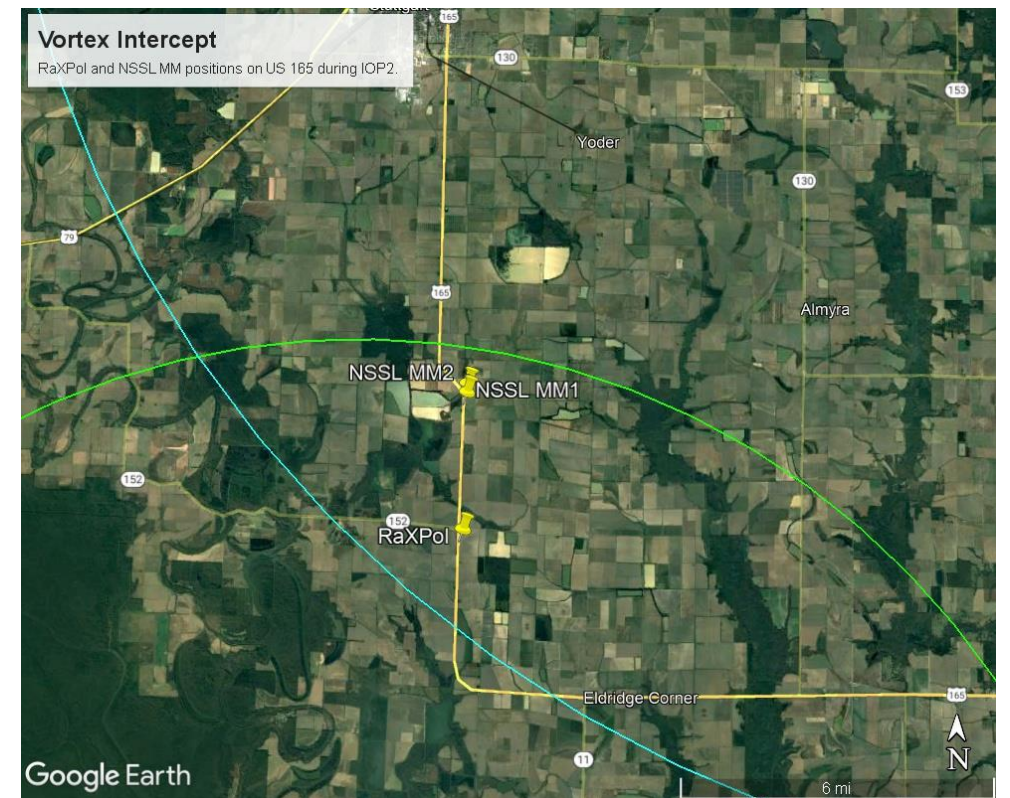
PERiLS Science Meeting

16 November 2023



# IOP2 – 3 March 2023

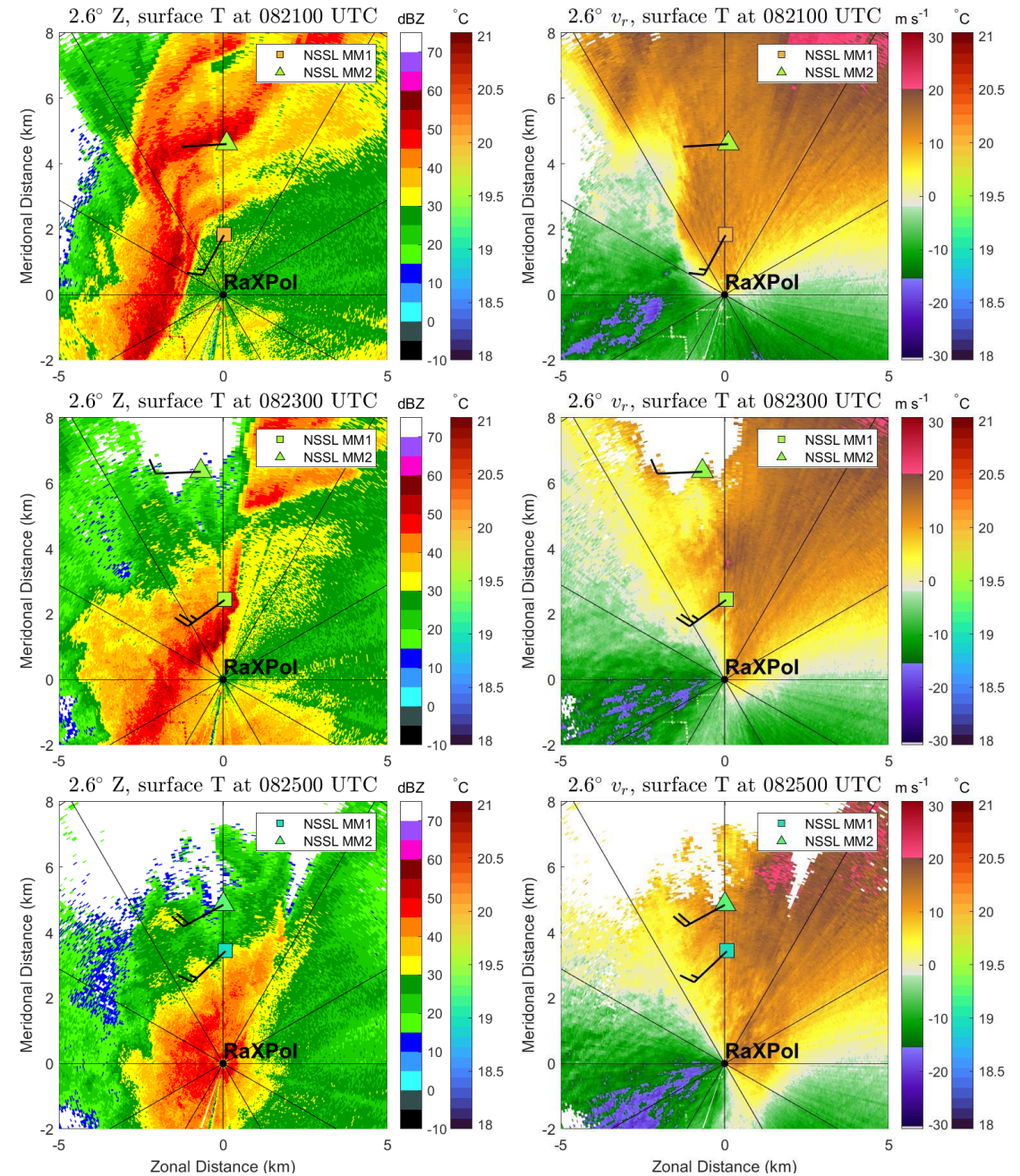
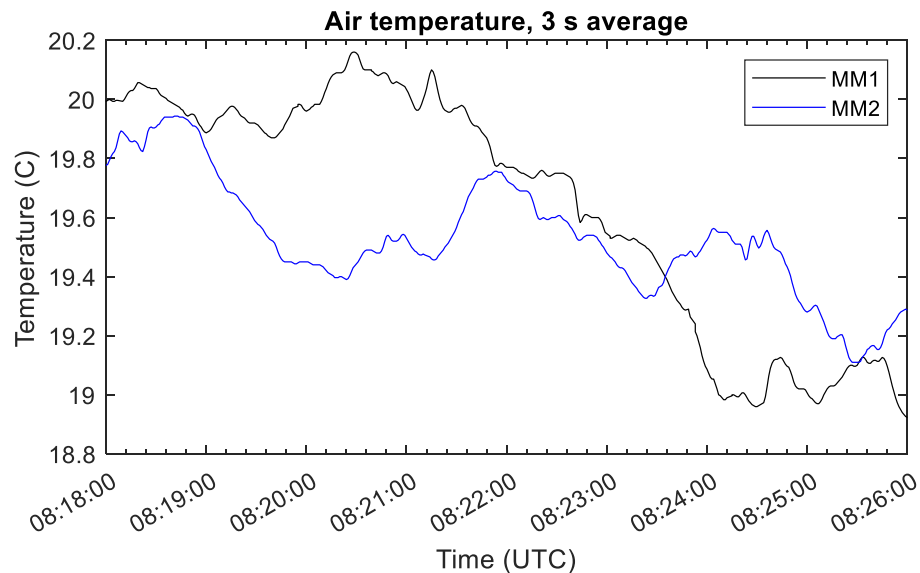
- RaXPol collected close-range observations within 5 km of a nontornadic mesovortex near Stuttgart, AR
- Shallow, rapid 30-s volumes with PPIs every  $1.5^\circ$  from  $1^\circ$ - $19^\circ$
- Simultaneous NSSL mobile mesonet transects surrounding the target mesovortex





# Preliminary Findings

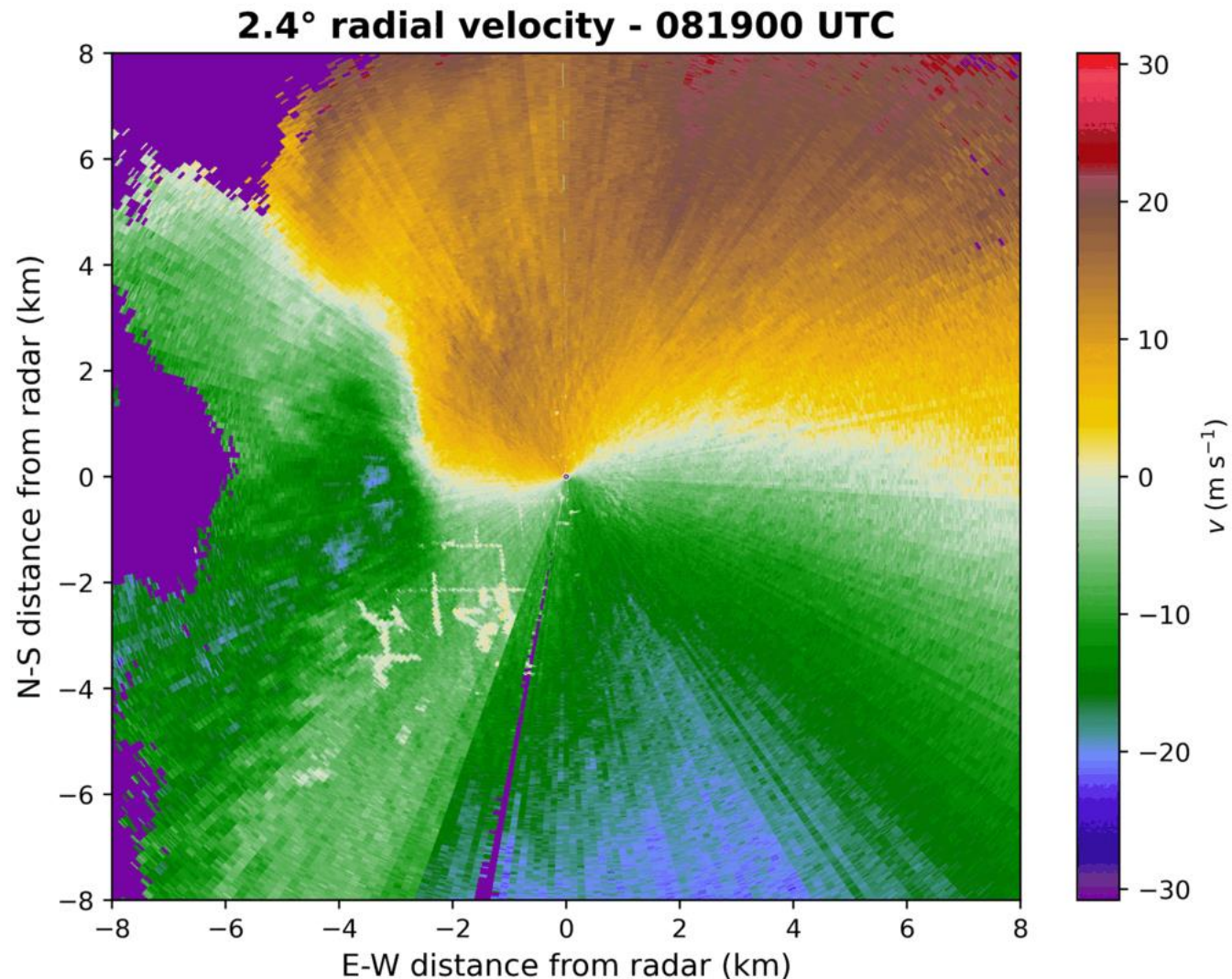
- Weak cold pool  $\rightarrow$  Observed temperature deficits  $< 2^\circ\text{C}$
- Small-scale features along the leading edge of convective precipitation





# Preliminary Findings

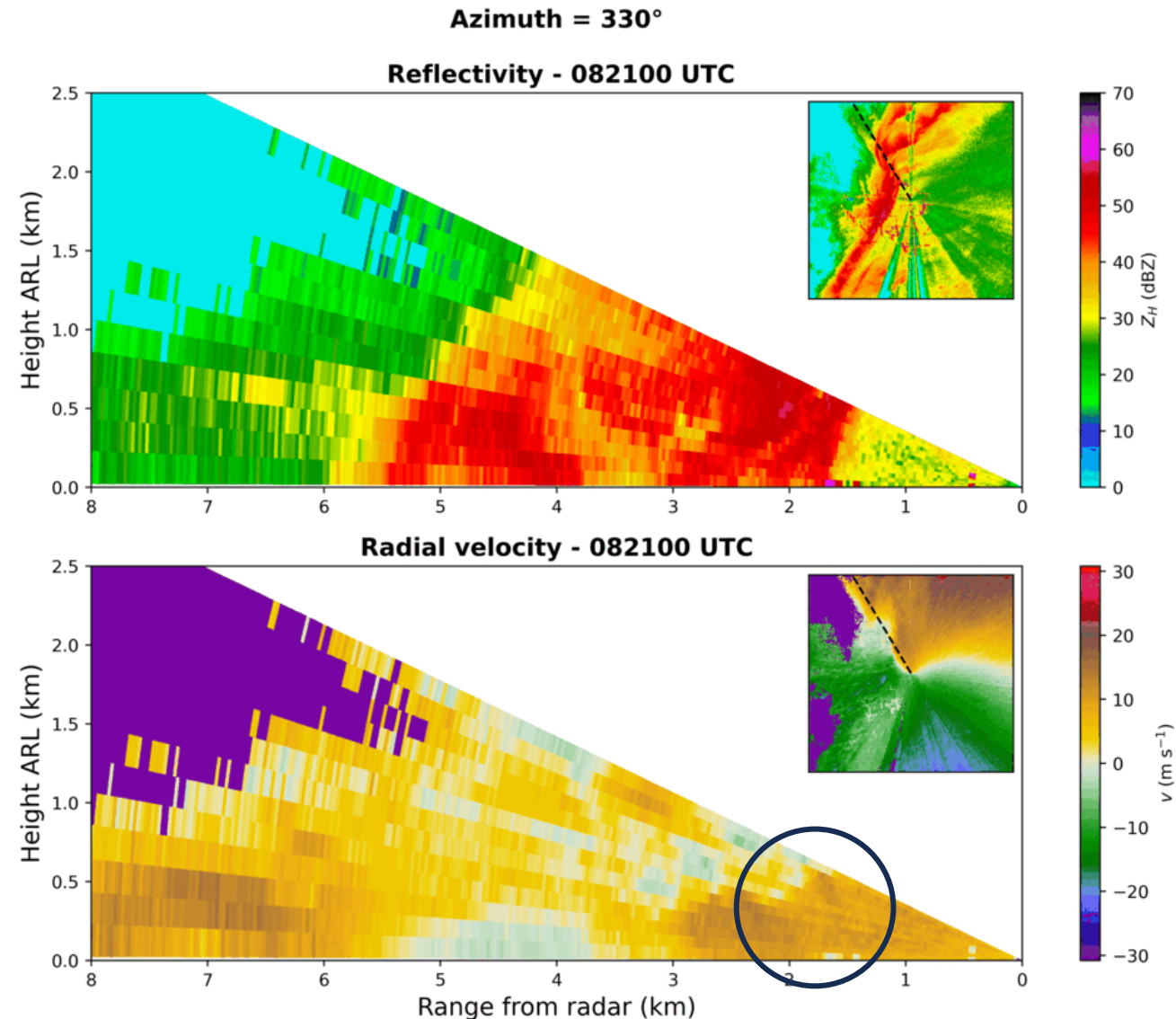
- Embedded misovortex forms 2 km NW of RaXPoI around 082100 UTC
- Strongest rotation between 082330–082430 UTC
- Attenuated after ~082500 due to heavy rain





# Preliminary Findings

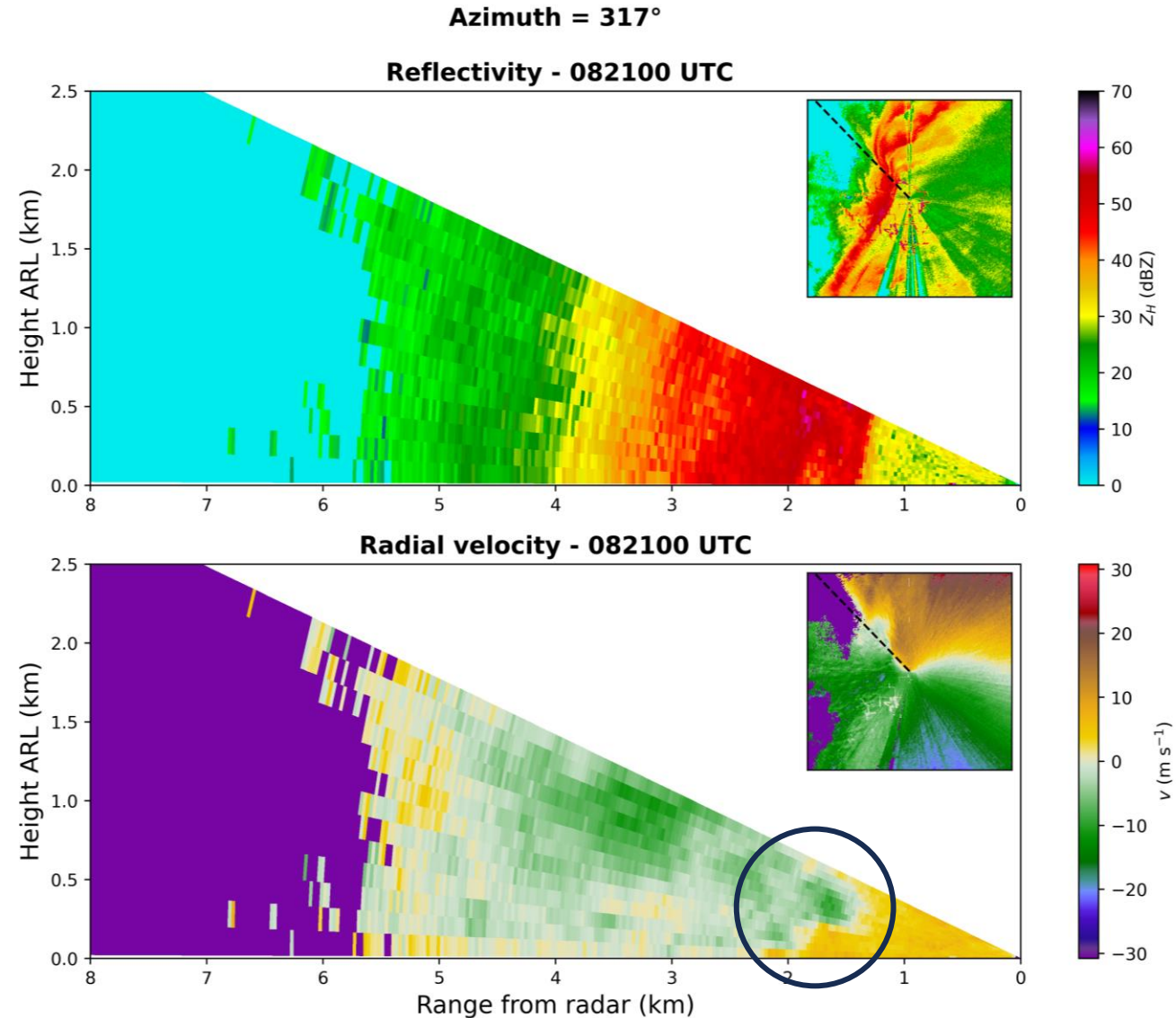
- Reconstructed RHIs at 0821 UTC show a low-level horizontal rotor along the line's leading edge
- Originates from above the surface and north of the developing misovortex
- Intensifies and descends to near-surface as it approaches the misovortex
- Associated with a slight weak echo column in Z





# Preliminary Findings

- Reconstructed RHIs at 0821 UTC show a low-level horizontal rotor along the line's leading edge
- Originates from above the surface and north of the developing misovortex
- Intensifies and descends to near-surface as it approaches the misovortex
- Associated with a slight weak echo column in Z





# Planned Future Work

- Characterize the evolution of meso- $\gamma$  and smaller scale features in RaXPol observations
- Pair NSSL mobile mesonet surface observations surrounding the mesovortex with observed radar features

**Questions? Email me at [morgan.schneider@noaa.gov](mailto:morgan.schneider@noaa.gov).**

*Acknowledgments:* This work is supported by NOAA award NA21OAR4320204 and VORTEX USA. Thanks to the University of Oklahoma Advanced Radar Research Center for facilitating the use of RaXPol in support of PERiLS.