**GOALS:** To develop and improve severe and other mesoscale weather analysis and forecast techniques.

- Improve severe weather nowcast and prototype winter weather, fog, smoke and volcanic ash products for NPP, NPOESS and GOES
- Development and improvements of maximum likelihood ensemble filter (MLEF) data assimilation methods
- Develop satellite products for mesoscale winter weather applications
- Prototype fog, smoke, ash detection products for GOES-R, NPOESS from simulated and model-generated (synthetic) satellite data
- Develop satellite-based severe weather nowcast product
- Advanced satellite mesoscale products
- Improve understanding of data information content
- New applications to winter weather
- Prototype NPOESS and GOES-R products
- First generation severe weather nowcast products