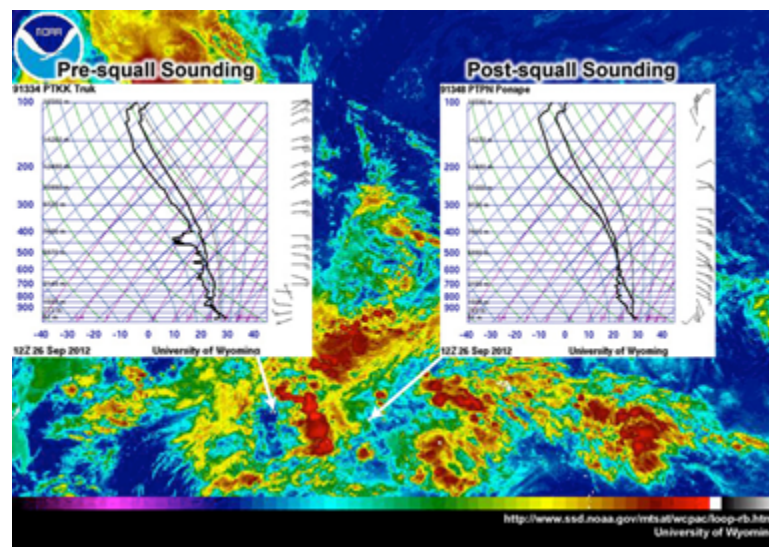


# TROPICAL SYNOPTIC METEOROLOGY

## Unit 3: General Mesoscale Phenomena



## Unit 3: General mesoscale phenomena

- Approximately 4 weeks will be spent on this section
- Focus is on mesoscale convective weather, mesoscale and local scale circulations, and local severe storms, and weather impacts
- Demonstrates use of the forecast funnel and knowledge of how different scales interact to affect local weather

# Learning Objectives

- Describe the formation, structure, and lifecycle of ordinary and multi-cellular thunderstorms
- Recall structure and lifecycle of tropical mesoscale convective systems (MCS) including tropical squall line, bow echo, mesoscale convective complex, mesoscale convective vortex, and non-squall tropical cluster
- Identify MCSs in satellite and radar imagery
- List potential weather hazards most likely associated with MCS
- Identify key dynamic and thermodynamic environments favorable for each type of MCS, including favorable large-scale environments.
- Understand similarities and differences between tropical and midlatitude squall lines
- Describe the geographic climatology of tropical MCSs
- Describe why and how sea-land breezes form
- Describe why and how mountain-valley breezes form
- Describe the structure and formation of tornadoes, waterspouts, and dust devils

# Topics

- Thunderstorms
- Mesoscale convective systems
- Orographic phenomena
- Mesoscale and local-scale circulations
- Local-scale weather influences
- Multi-scale analysis and forecasting

# Learning Activities & Assignments

- Explore triggers of convection in the tropics
- Wind rose construction for local area and exploration of impact on local scale winds
- Create 3-day forecast for your region and verify the forecast
- Track mesoscale convective systems using satellite
- Track mesoscale convective systems using radar
- Write a review of journal article on a type of mesoscale phenomena common to your region
- Photograph contest

# Case Studies

- Squall lines and bow echoes associated with severe weather and floods in Jamaica
- Mesoscale convective systems that produced record flooding in West Africa