Talking points for Introduction to mesoscale / convection section

1. Title
2. The objective of this lesson is to understand the structure of the mesoscale/convection and synoptic sections of this course. We'll also briefly introduce GOES-R specific capabilities that will be important for all of the topics discussed in this section such as 1-minute imagery and an example showing one of the new bands.
3. The mesoscale / convection section of this course is structured in the following way. First, a series of short mini-modules will introduce each topic. The mini-modules will make use of Himawari or GOES SRSOR 1-minute imagery as proxy data for GOES-R. Each mini-module will discuss how GOES-R aids in the identification, analysis and tracking for each topic. The mini-module will include a brief interactive exercise to identify the features for the specific topic. After completing all of the mini-modules, a WES-2 simulation will be taken. The simulation encompasses all of the above mini-module topics and it allows interaction with data in AWIPS.
4. The list of mini-modules will add up to 120 minutes of training time. Two of the mini-modules indicated in this list will be 20 minutes in length while the rest are 10 minutes. The modules include
5. The synoptic section will be structured similar to the mesoscale/convective section. It will start out with 3 modules that pertain to cyclogenesis that will combine for 40 minutes in length. At the end of each module, there will be interactive exercises. This will be followed by additional modules including other jet features, general circulation patterns, atmospheric rivers, and tropical to extratropical transition. Finally, a wes-2 simulation will cover all of the above modules to reinforce understanding.
6. Utilizing 1-minute imagery on GOES-R will be particularly important for the mesoscale/convection section. To help understand the importance of 1-minute imagery we compare current GOES capabilities with GOES-R in terms of temporal resolution and availability for display on AWIPS. In this animation we see a thunderstorm develop over south central Minnesota along a boundary. The animation depicts imagery at 15 minute interval, RSO interval which is approximately 5-minutes and 1-minute interval. The top row of the table lists the image time, this is the time you would be able to first identify convection initiation for the storm of interest. As you may suspect, we get earlier lead time on identification of convective initiation, however this is only part of the story. The other factor is when the imagery is displayed on your AWIPS, the latency in 15-minute mode is approximately 20 minutes, which improves substantially when in RSO mode to approximately 8 minutes. With GOES-R, the expected latency of 1-minute imagery to display on your AWIPS will be around 1 to 1.5 minutes depending on your office. Notice the drastic improvement in when you can discern convective initiation from the display on AWIPS row. This fact will be the real game changer for how you utilize satellite imagery for particular events. You will be able to make use of satellite imagery in ways that you haven't been able to do in the past, for example, in the warning decision making process. The time that you see the data on AWIPS will be comparable to (or even faster) than radar and lightning data. As you can gain experience with utilizing 1-minute imagery on GOES-R you will learn optimal ways of working with this data and integrating it with other datasets such

as radar and lightning. Keep in mind, this is a benefit in addition to the improved mesoscale analysis that will be made possible by having higher spatial and temporal imagery to view.

7. One of the new bands on GOES-R will be at 7.3 microns. This band will not only show features you are accustomed to seeing with the current GOES water vapor band, but also lower level features as well since the weighting function profile is lower in altitude. In this Himawari example over Bangladesh, warmer brightness temperatures over northeast India advecting eastward represent a combination of an elevated mixed layer, as well as diurnal heating of a relatively hot air mass west of a dryline. A thunderstorm develops along a dryline and intensifies rapidly. The features that develop on the western flank of the storm are a combination of gravity waves, outflow boundaries and compensating subsidence near a strong updraft region. GOES-R brings a variety of new capabilities that will allow you to either see features with much more clarity compared to current GOES or even see things for the first time.
8. In summary, the mesoscale and synoptic sections of this course will consist of a series of mini-modules. All but 4 of the mini-modules from the synoptic section will include interactive exercises. There will be a WES-2 simulation after each section to reinforce learning objectives. Finally, there will be a quiz at the end of the mesoscale and synoptic sections.