Talking points for Boundary forced convection

1. Title
2. Learning objectives
3. Identification of boundaries will be much easier with GOES-R compared to the current GOES due to greater temporal resolution, particularly with 1-minute imagery, also greater spatial resolution and to a lesser extent additional bands as well.
4. During the Hazardous weather testbed GOES-R/JPSS spring experiment in 2016, forecasters were provided with 1-minute imagery from GOES-14 SRSOR. A survey on usage of the 1-minute imagery regarding its impact on improving convective nowcasting and warning decision making showed overwhelmingly very high positive impact. In the 1-minute example loop on the left, the forecasters found the 1-minute visible imagery valuable in assessing a storm to be elevated with a storm moving away from the boundary towards a stable air mass, and thus a very limited tornado threat.
5. Additional testimony from forecasters on use of the 1-minute imagery during the spring experiment include
6. 27 May 2015 case
7. Sea-breeze case
8. Himawari visible imagery over Bangaldesh
9. We now focus on convection over Bangladesh using the Himawari satellite as a proxy to GOES-R. Initial convection moves southward, producing an outflow boundary that initiates new convection and repeating the cycle until we see new convection going up along an outflow boundary almost like a zipper effect. The increased spatial resolution of GOES-R as approximated here with Himawari will help in detecting boundary forced convection.
10. Another familiar band for following boundary forced convection is the IR imagery, in this case band 13 or 10.4 microns from the HImawari satellite. Not only can the boundary be readily identified, but cloud top temperature trends can be monitored as well by noting brightness temperatures at cloud top.
11. As for the 3 water vapor bands that will be on GOES-R, we use the Himawari imagery as proxy data. Don't expect to see outflow boundaries on channels 8 or 9 (that is, 6.2 or 7.0 microns respectively) since the weighting function profile is generally higher in altitude relative to the height of the outflow boundary. If one of the water vapor bands may show outflow boundaries, it would be band 10, shown at the bottom, which is the 7.3 micron channel. The weighting function may see low enough in altitude to detect outflow boundaries at times. In this example, it is not evident in band 10 likely due to where the instrument see's is above the level of the outflow boundary.
12. Interactive exercise
13. In summary, identification of boundaries will be much improved in GOES-R, primarily due to greater temporal and spatial resolution but also there will be some applications such as the sea-breeze that can benefit from some of the additional channels.