A Method to Reliably Predict Convective Modes (Organized Bands vs. Open-Cellular Development) in Late Season Lake-Effect Snow Events

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Local experience indicates that late season lake-effect snow undergoes changes in structure that are tied to the diurnal heating cycle. However, there are instances when the structural evolutions do not follow this pattern. The goal is of this presentation is to identify other factors that affect the organization of lake-effect snow bands.

Lake effect snow bands typically assume the structure of horizontal convective rolls. Prior research on these rolls indicates that their structure is modulated mainly by wind shear and boundary layer heat fluxes. Prior studies indicated that strong speed shear environments were associated with well defined lake-effect snow bands. Conversely, when the vertical speed shear decreased, open-cellular convection tended to prevail. It has also been shown that increased lower-tropospheric instability, especially given weak vertical shear, has a similarly detrimental effect on roll organization and longevity.

It was found that shear and instability parameters quantified within the BUFKIT sounding program, can be used to accurately forecast convective modes in lake-effect snow situations. Based on these results, forecasters will be able to use BUFKIT soundings to be more specific with the timing of any expected changes in convective mode.