

An investigation of Supercell-topography interaction and the potential for tornadogenesis

John Wetenkamp
NOAA/NWS Rapid City, SD

ABSTRACT

Several tornadoes have been observed over the Black Hills of South Dakota and northeast Wyoming over the past 60 years. Many of these storms produced tornadoes while ascending higher terrain or when crossing the highest topography. The low level mesocyclone and parent supercell often weaken when encountering descending terrain. This behavior has also been observed across the plains of western South Dakota where topographic variations are not as extreme. Moreover, tornadoes in complex terrain have been observed in other parts of the U.S. The occurrence of tornadoes in complex terrain is particularly intriguing due to the common belief that complex terrain inhibits tornadogenesis. Past research has often focused on channeling of low level flow by topography. This research will focus on upslope or downslope progression of thunderstorm outflow, RFD interaction with topography, and the potential for precipitation-driven downdrafts to be inhibited from outrunning the thunderstorm while rapidly ascending topography.