Mountain-top WSR-88D coverage of low-altitude storms

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A major problem in mountainous terrain is that WSR-88D radars located on high- elevation peaks can overshoot low-altitude weather. The Salt Lake City WFO's KMTX Doppler is one of several sites in the West with this problem. KMTX is ~2300 ft above the Geat Salt Lake (4210 ft MSL) and most of Utah's population is close to the lake level. Compounding the problem is the increase of beam height with range.

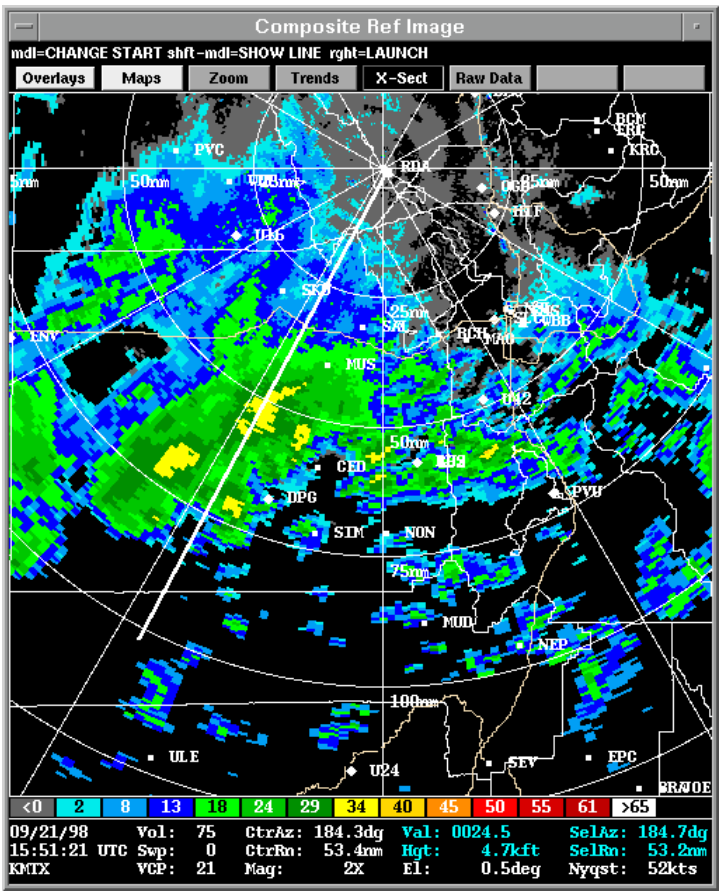

Figure 1a. Composite reflectivity image at 1551 UTC. The solid white line indicates where the vertical cross section shown in Fig. 2a was taken.

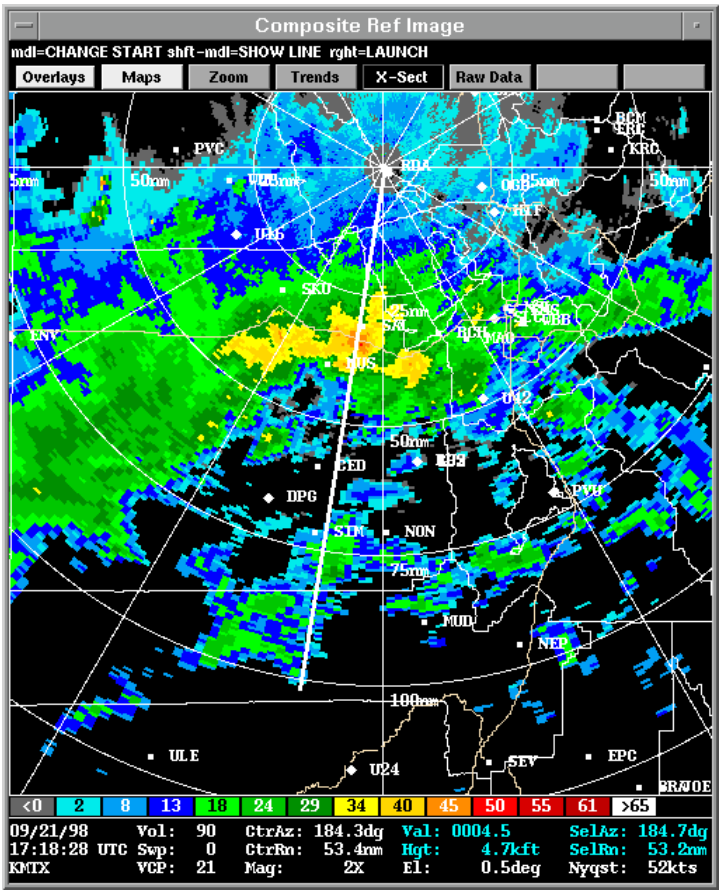

Figure 1b. Composite reflectivity image at 1718 UTC. The solid white line indicates where the vertical cross section shown in Fig. 2b was taken.

This TA Lite shows how a low-altitude storm on 21 September 1998 was undersampled at far ranges. With time, the storm moved closer to the radar and radar echoes close to the ground were seen. The above composite reflectivity images (Figs 1a and 1b)were taken about 1.5 hr apart. The two associated vertical cross sections (Fig. 2 below) clearly show the storm moving into lower-altitude coverage. Looking at only the composites, it appears that the storm strengthened as it approached the radar. However, the cross sections clearly reveal that the issue is a sampling problem.

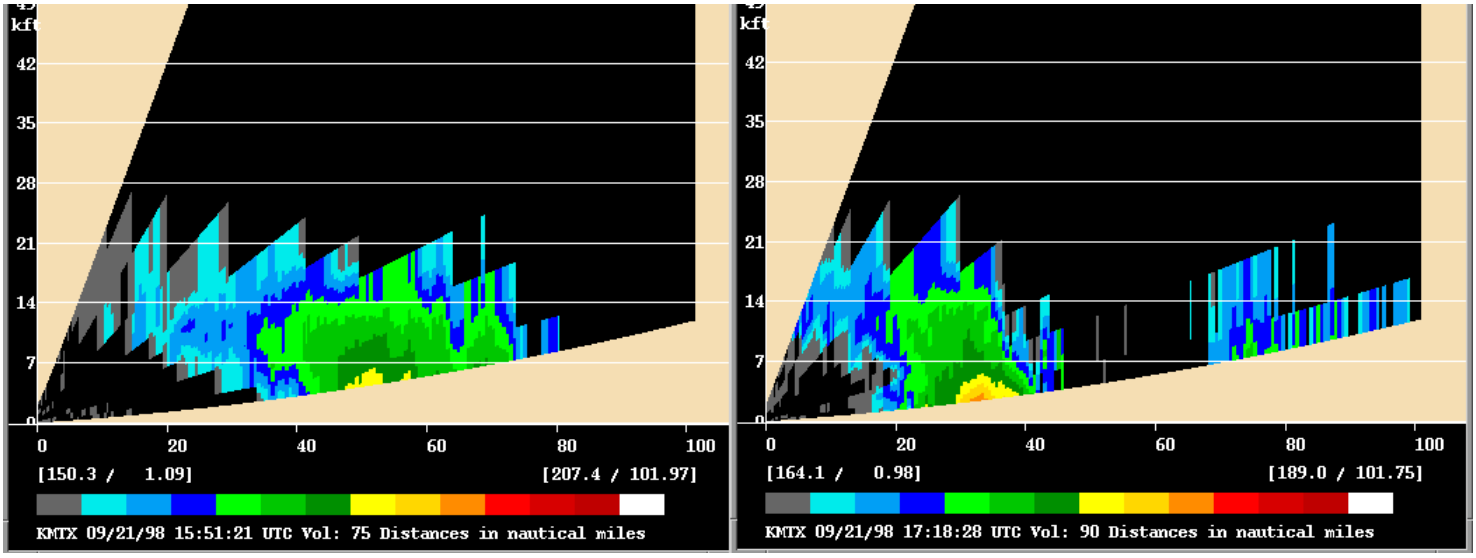

Figure 2. Vertical cross sections of reflectivity at a/left) 1551 UTC and b/right) 1718 UTC.