A Brief Event Summary: Duluth Waterspout - 9 August 2012

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Main Points

Waterspout developed approximately 1100-1105 AM CDT: ~2 miles offshore from Sky Harbor Airport

Waterspout/EF-0 tornado crossed Minnesota Point across Sky Harbor Airport between 1110-1115 AM CDT

Waterspout crossed Superior Bay and briefly came onshore as an EF-0 tornado at Barker's Island and then dissipated around 1120 AM CDT

Eyewitnesses at Sky Harbor Airport reported a couple of float plane pontoons briefly lifted and set back down (not moved) – otherwise no damage has been reported on Minnesota Point or at Barker's Island

Meteorological Main Points

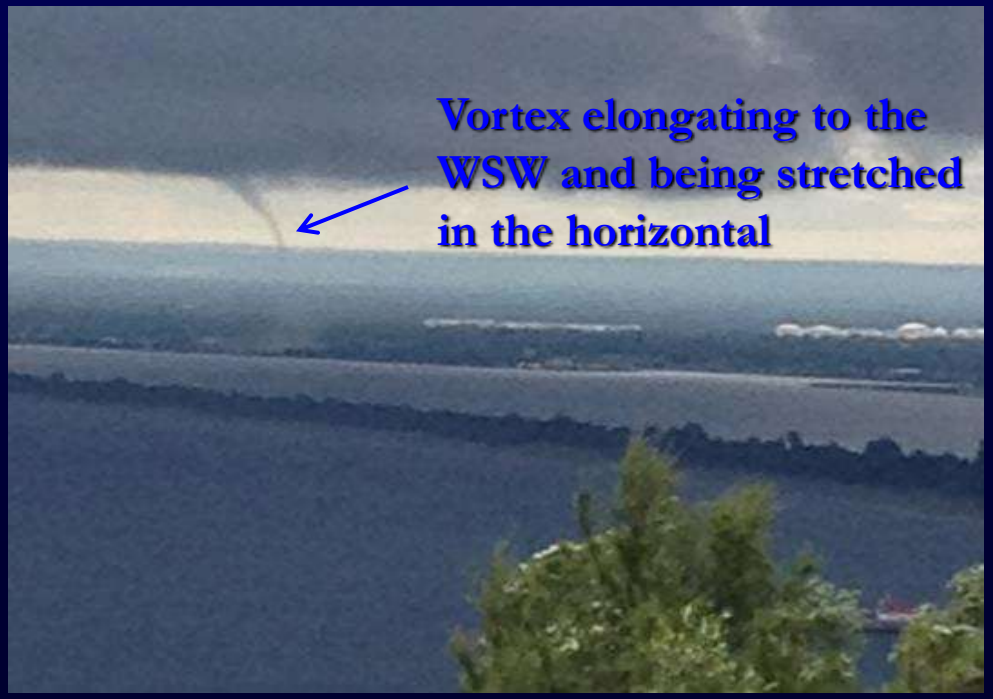
Waterspout appears to have developed near an inflection point along leading edge of strong surge of northeast winds (marine cold front)

From pictures, appears to be a bottom-up generation process resulting from pre-existing vertical vorticity along the boundary, which was concentrated and stretched when updraft developed above it (classic land-spout type process, but over water)

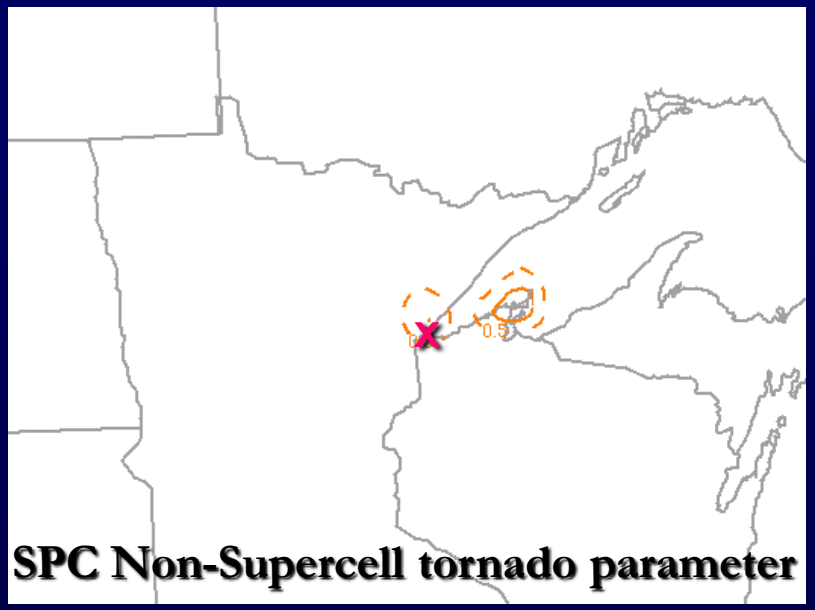
Non-supercell generation/maintenance processes were likely enhanced by very warm Lake Superior water temps near 70F (eyewitnesses stated it appeared to weaken while crossing MN point)

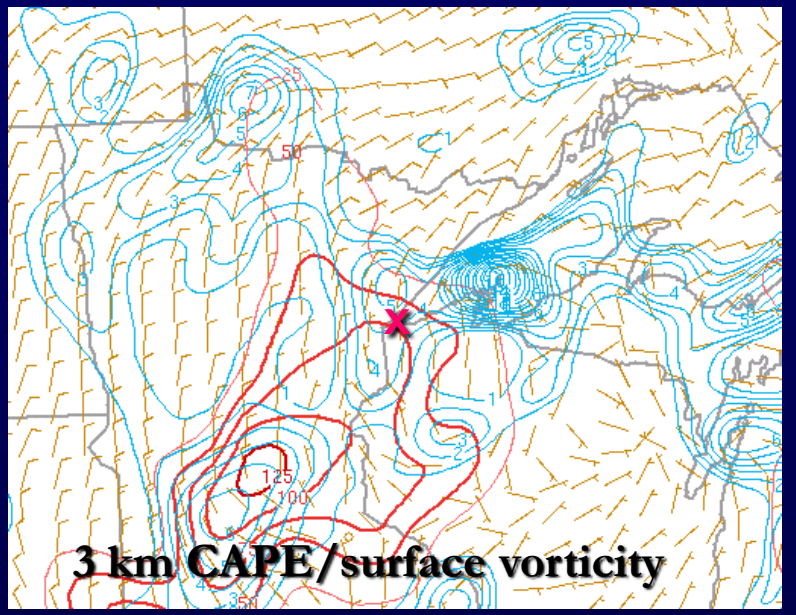
Meteorological Main Points

- Dissipation likely was due to a combination of the cold air near the surface rapidly surging to the west-southwest underneath the updraft and undercutting the maintenance processes (strongly supported by picture from when it was near Barker's Island) – and also due to increased surface friction as it moved over land



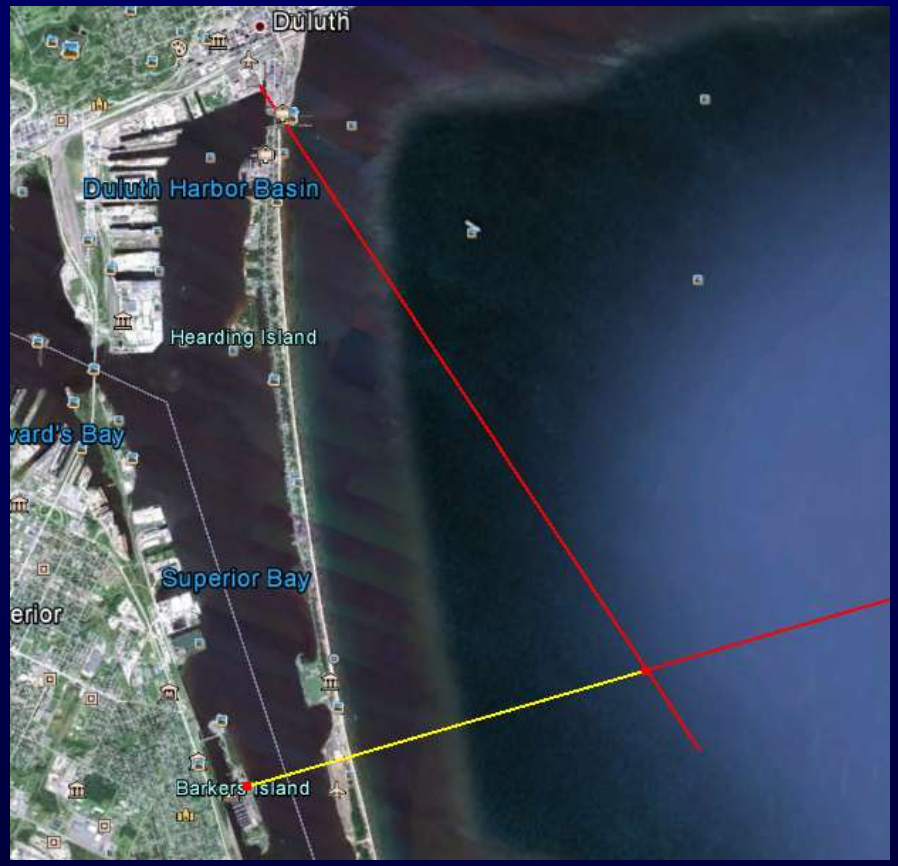
Meso-Scale Environment





Mesoscale environment was marginally favorable – some super-position of low level CAPE max with surface vorticity along wind shift/front

Estimated Begin Point/Time



We used land marks in photos and Google Earth to triangulate beginning/end points as best as possible – ***all locations/times are approximate***

Some Pictures

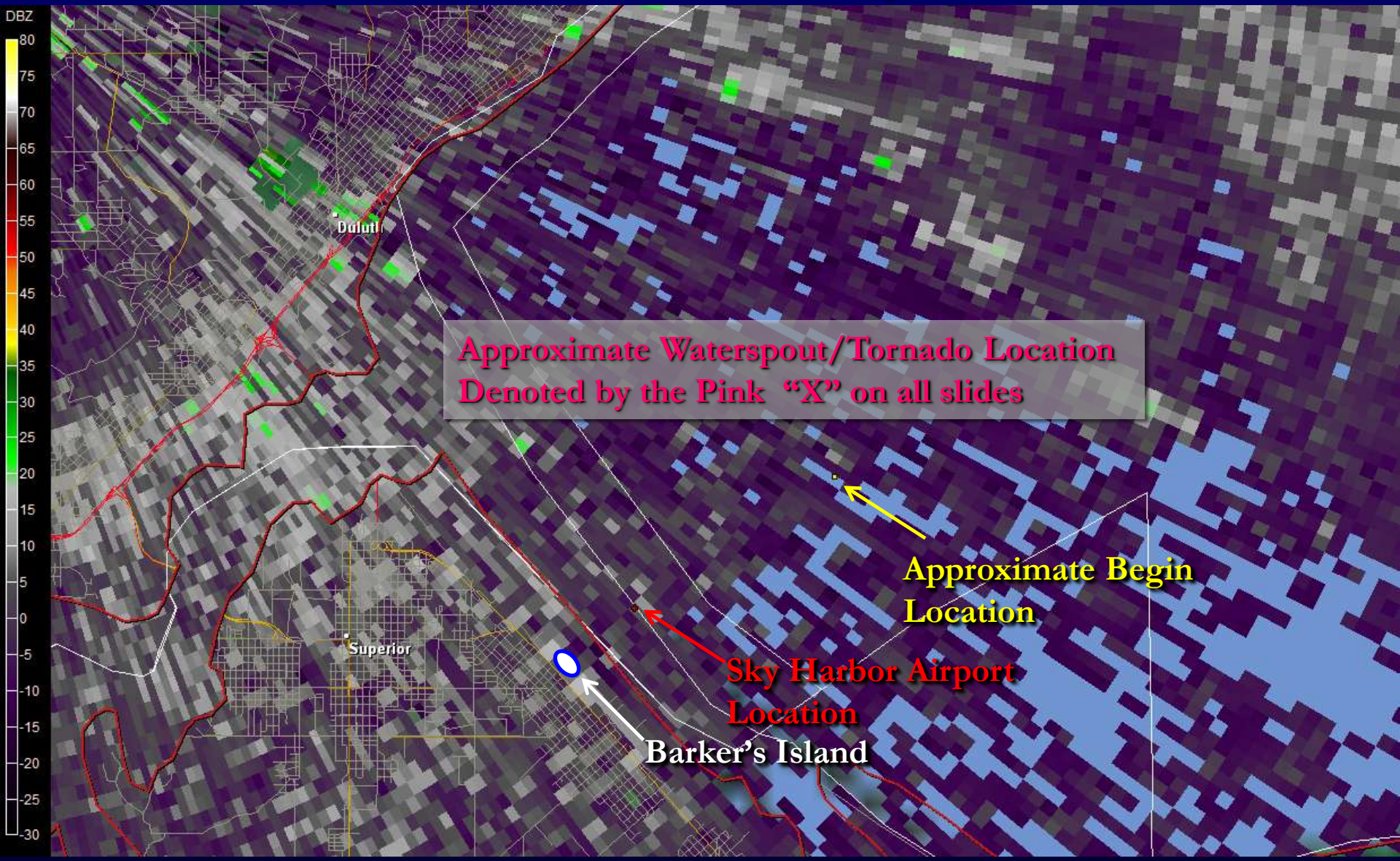
From DECC Parking Ramp - ~1100 AM

From Sky Harbor Airport
~1117 AM credit: Tom Betts

Location Unknown - ~1120 AM

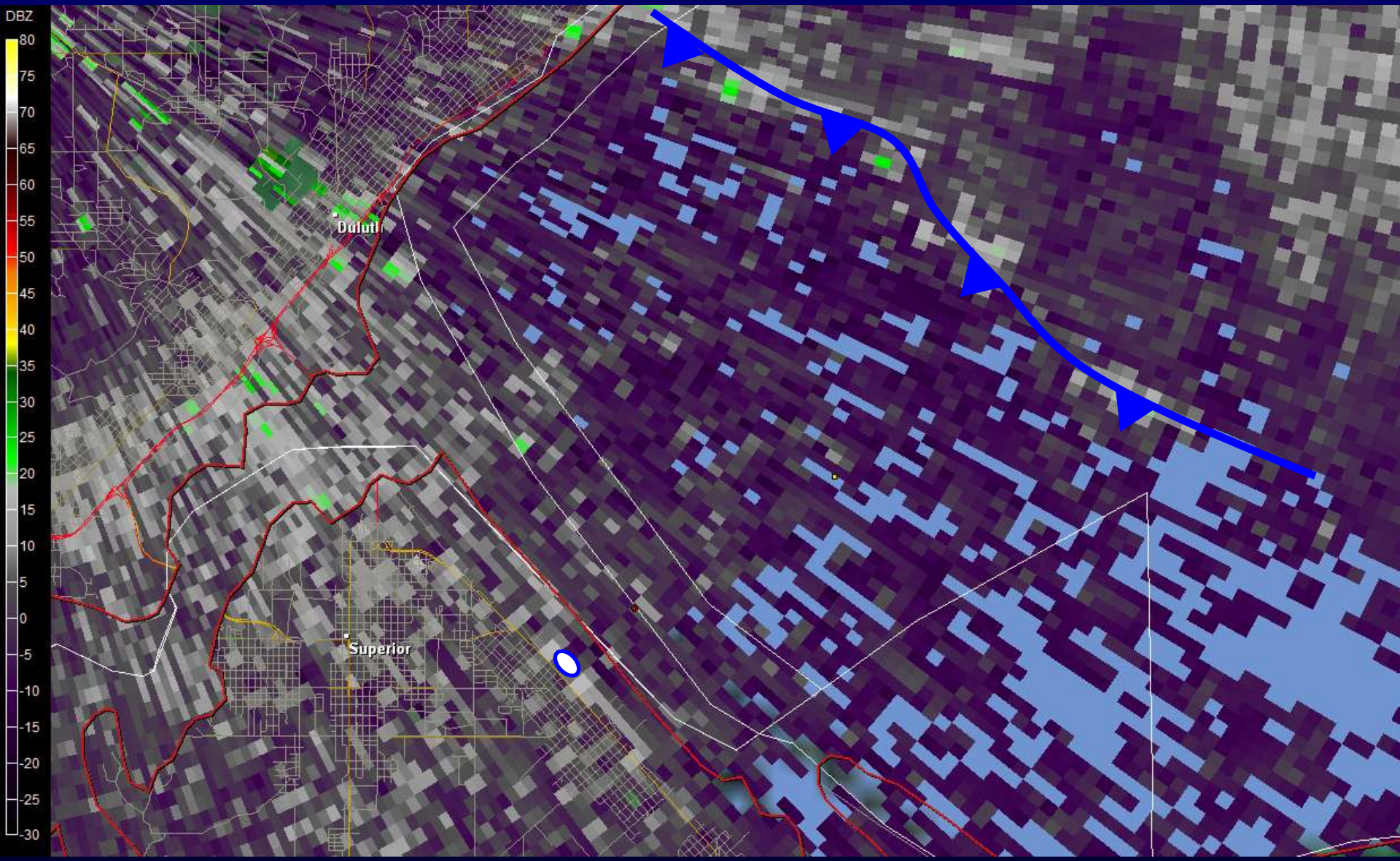
From Duluth Central HS - ~1120 AM

KDLH Radar Orientation/Annotation



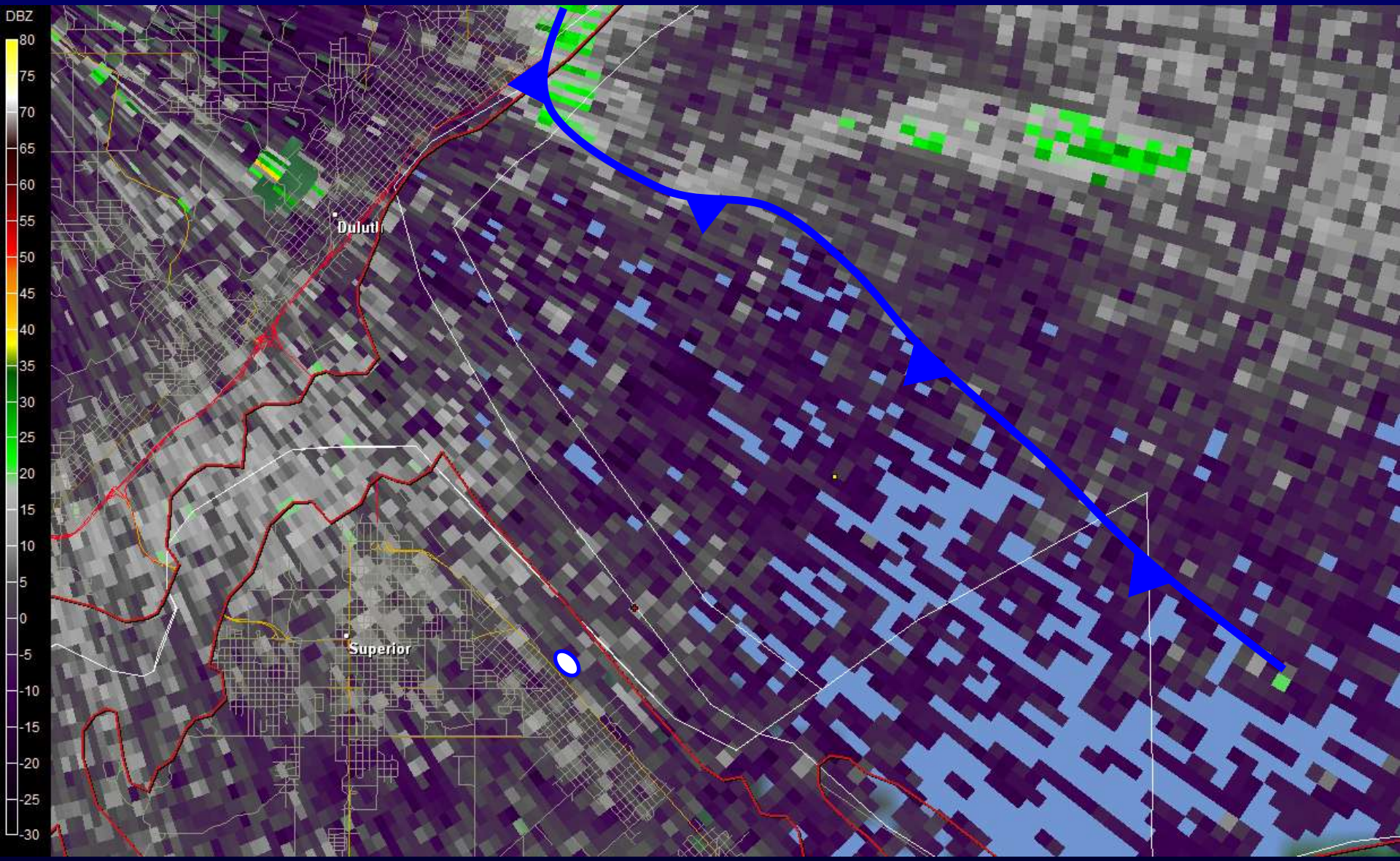
Annotation is the same on all radar slides

KDLH Radar Data



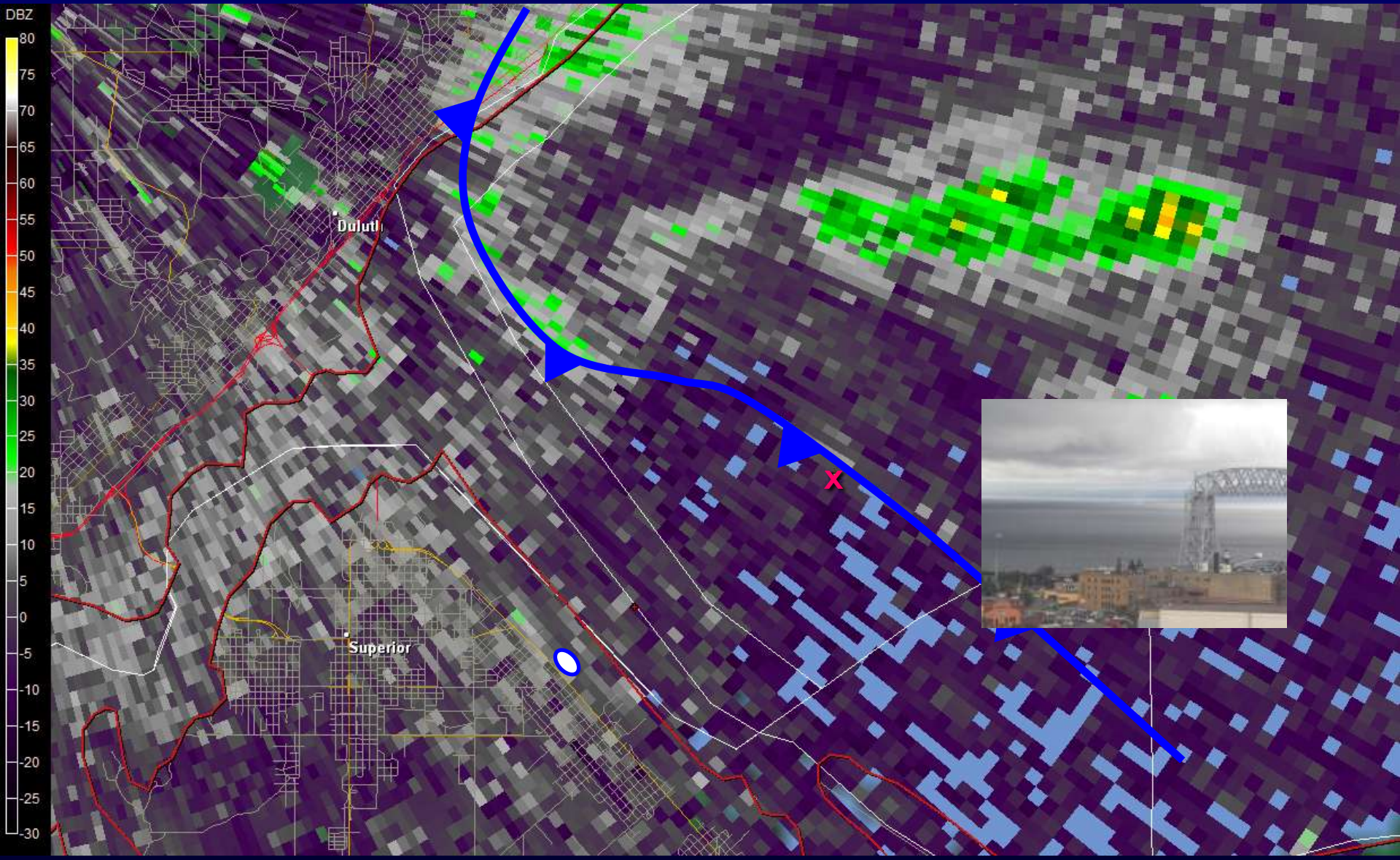
KDLH 0.5 degree reflectivity: 1052 AM CDT 8/9/2012

KDLH Radar Data



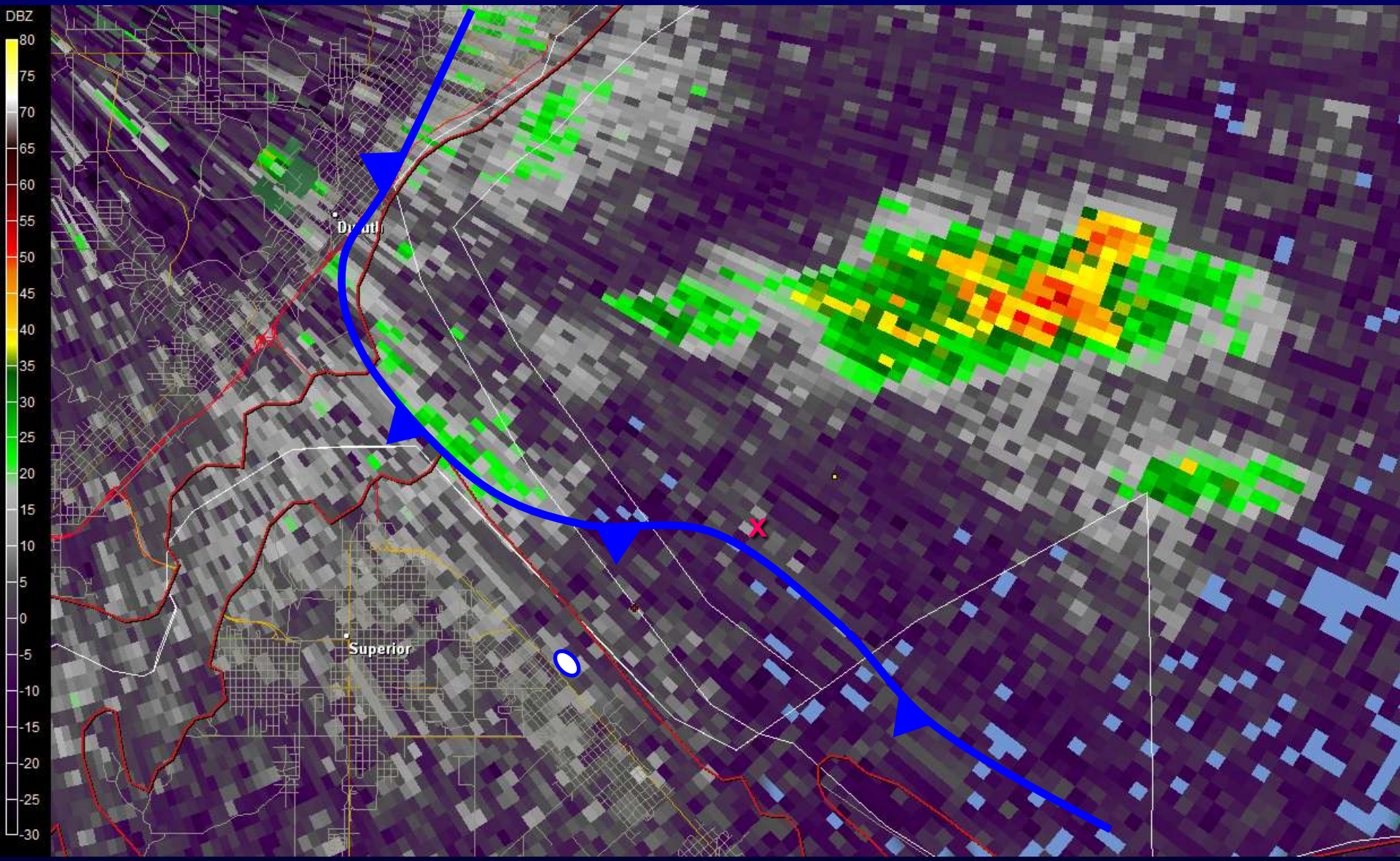
KDLH 0.5 degree reflectivity: 1057 AM CDT 8/9/2012

KDLH Radar Data



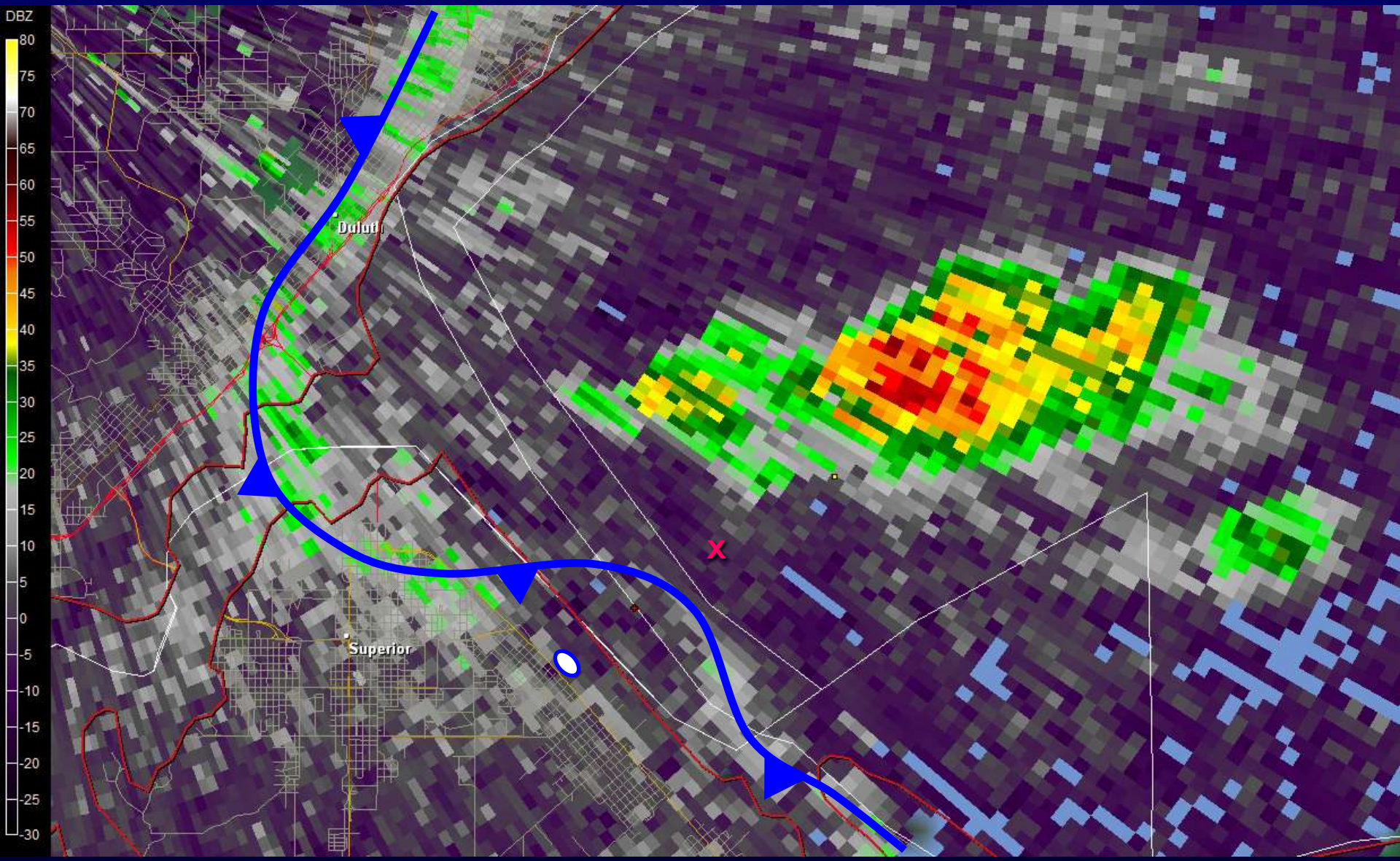
KDLH 0.5 degree reflectivity: 1101 AM CDT 8/9/2012

KDLH Radar Data



KDLH 0.5 degree reflectivity: 1106 AM CDT 8/9/2012

KDLH Radar Data



KDLH 0.5 degree reflectivity: 1110 AM CDT 8/9/2012

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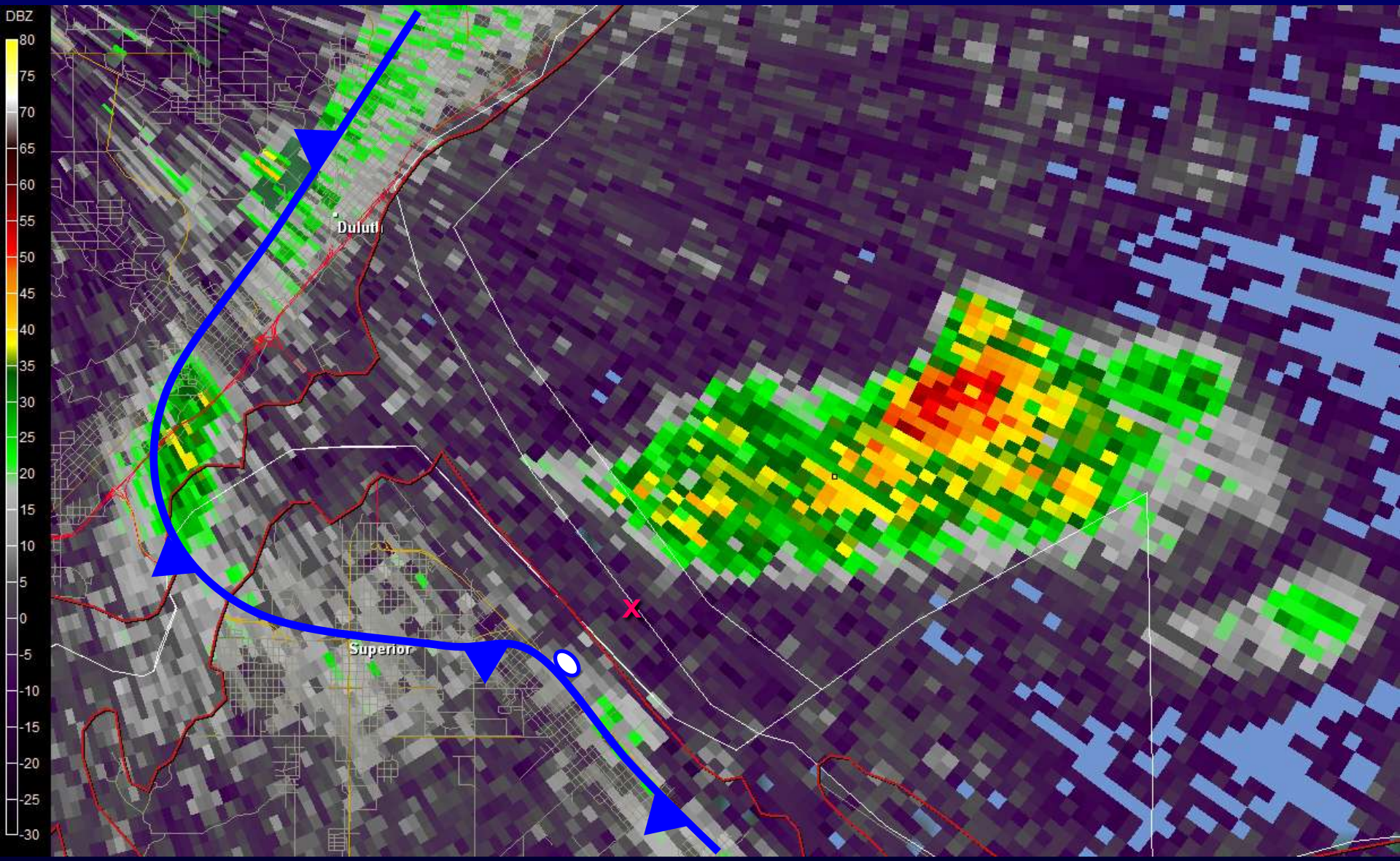

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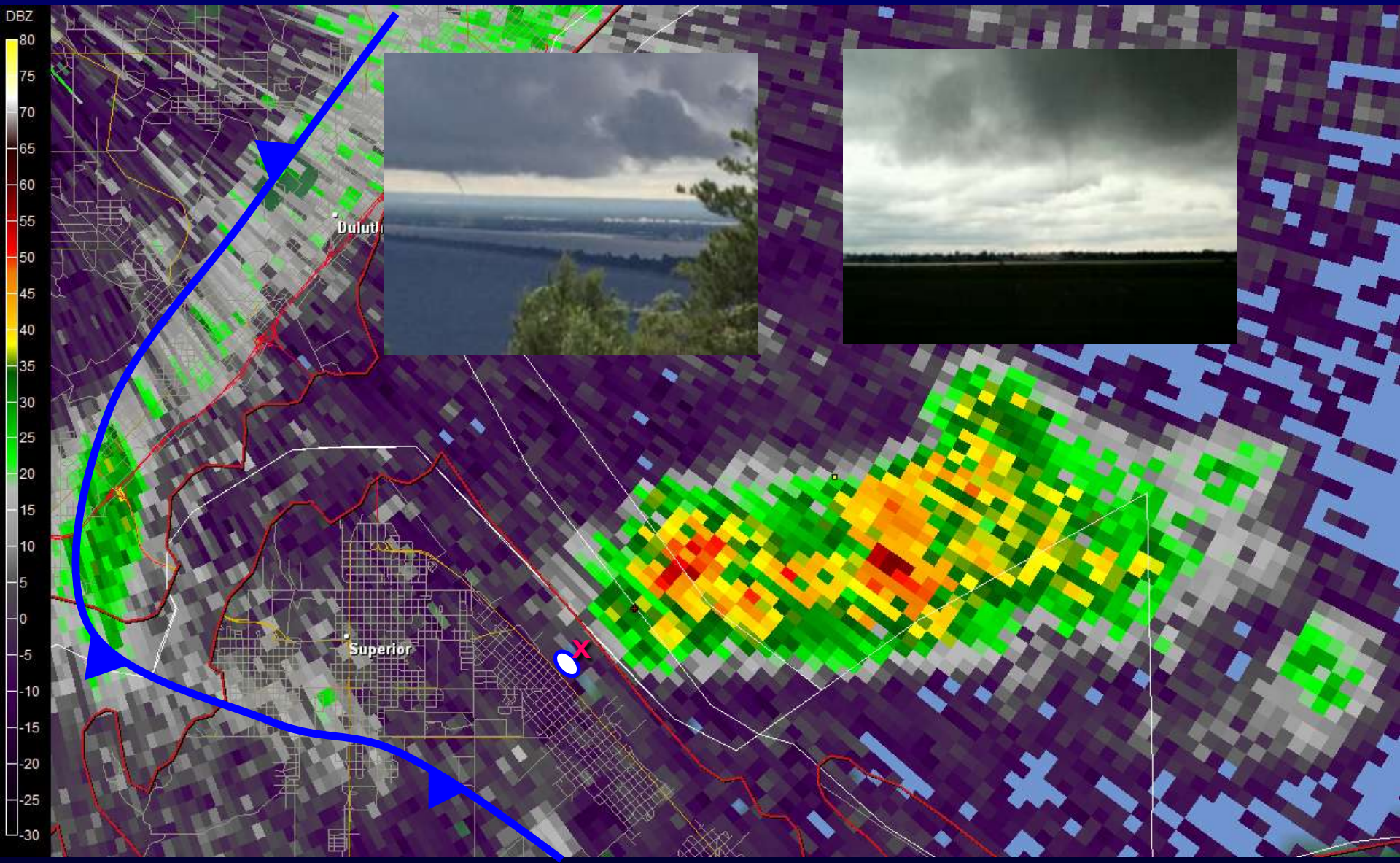
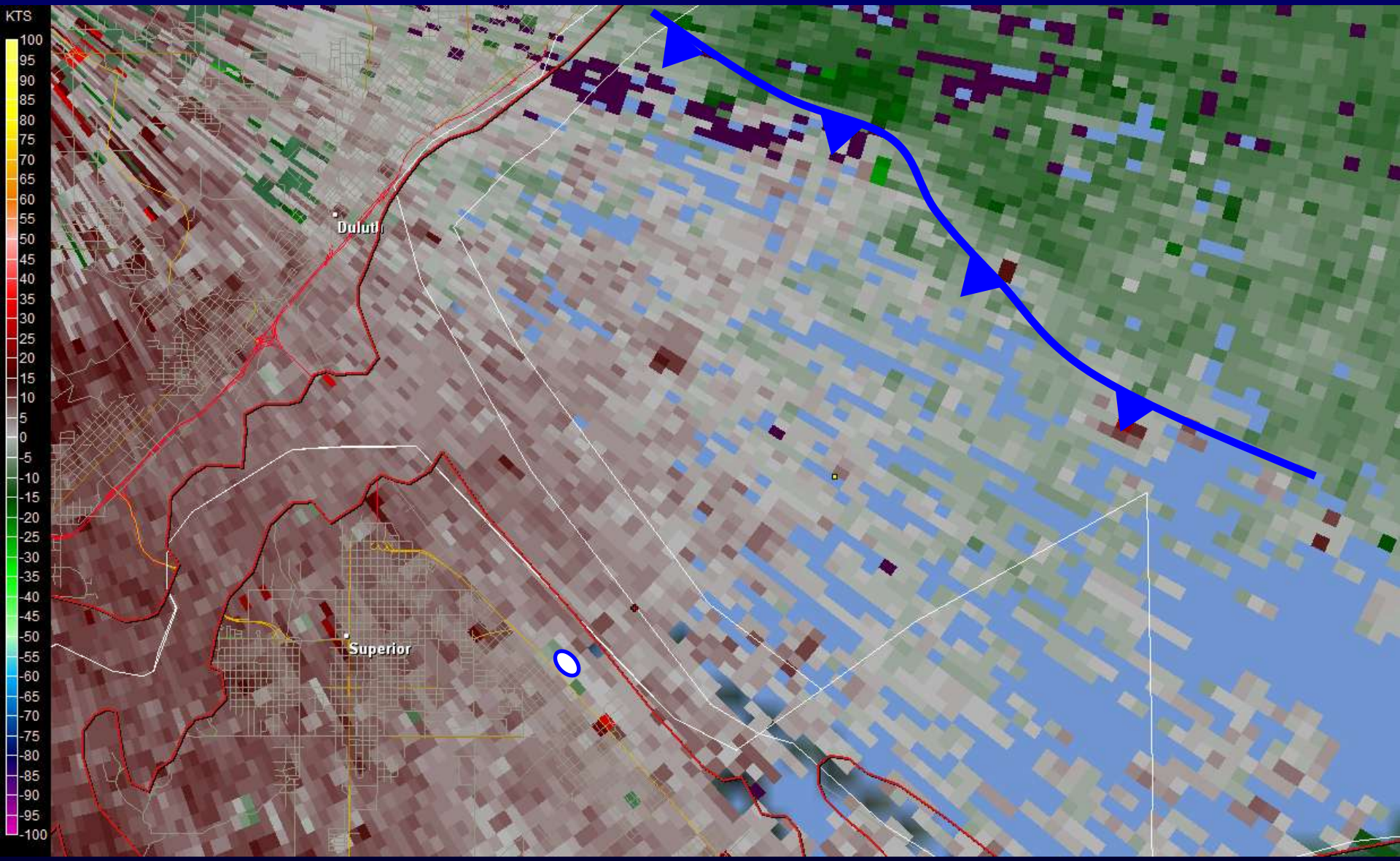


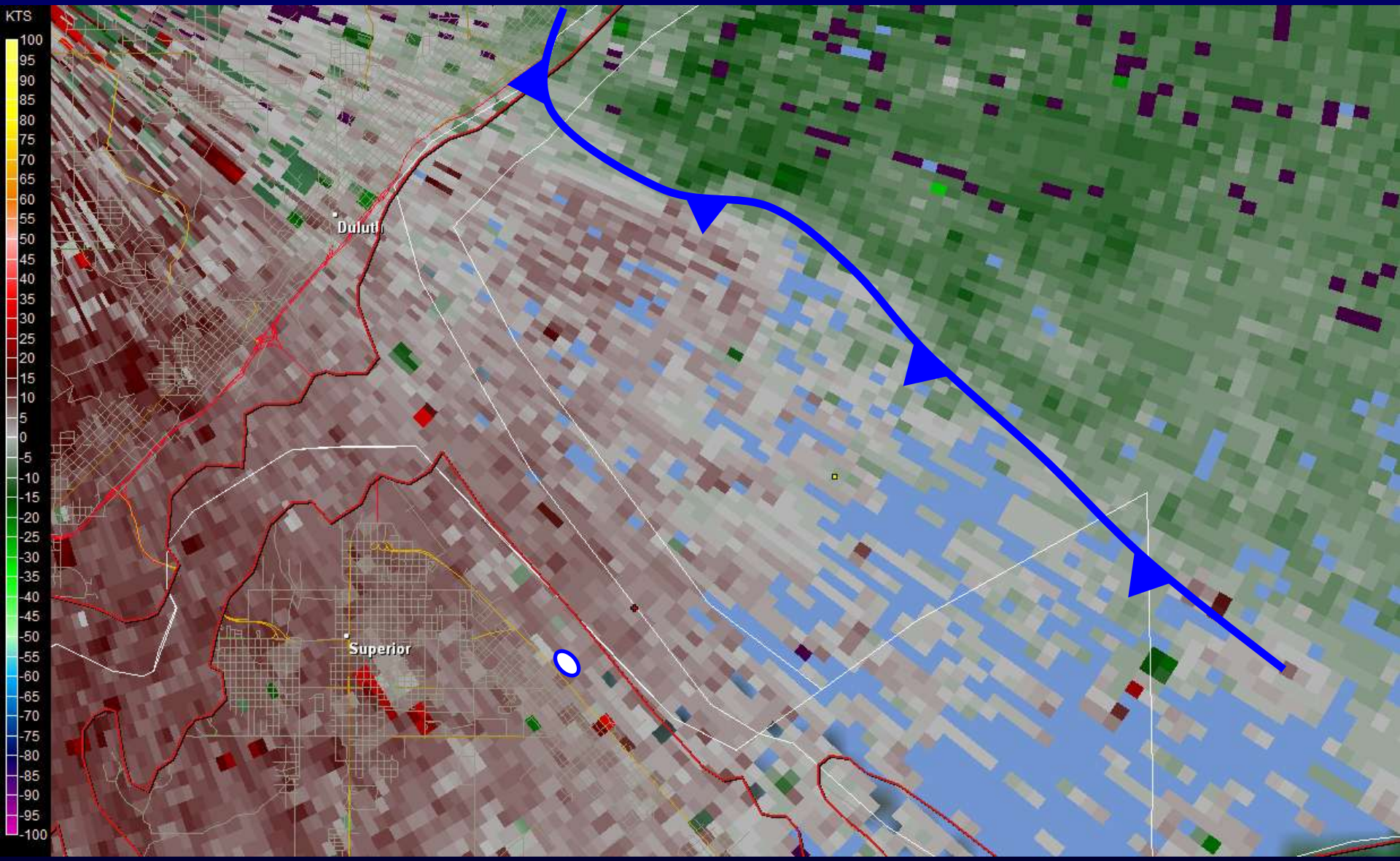
KDLH 0.5 degree reflectivity: 1120 AM CDT 8/9/2012

KDLH Radar Data



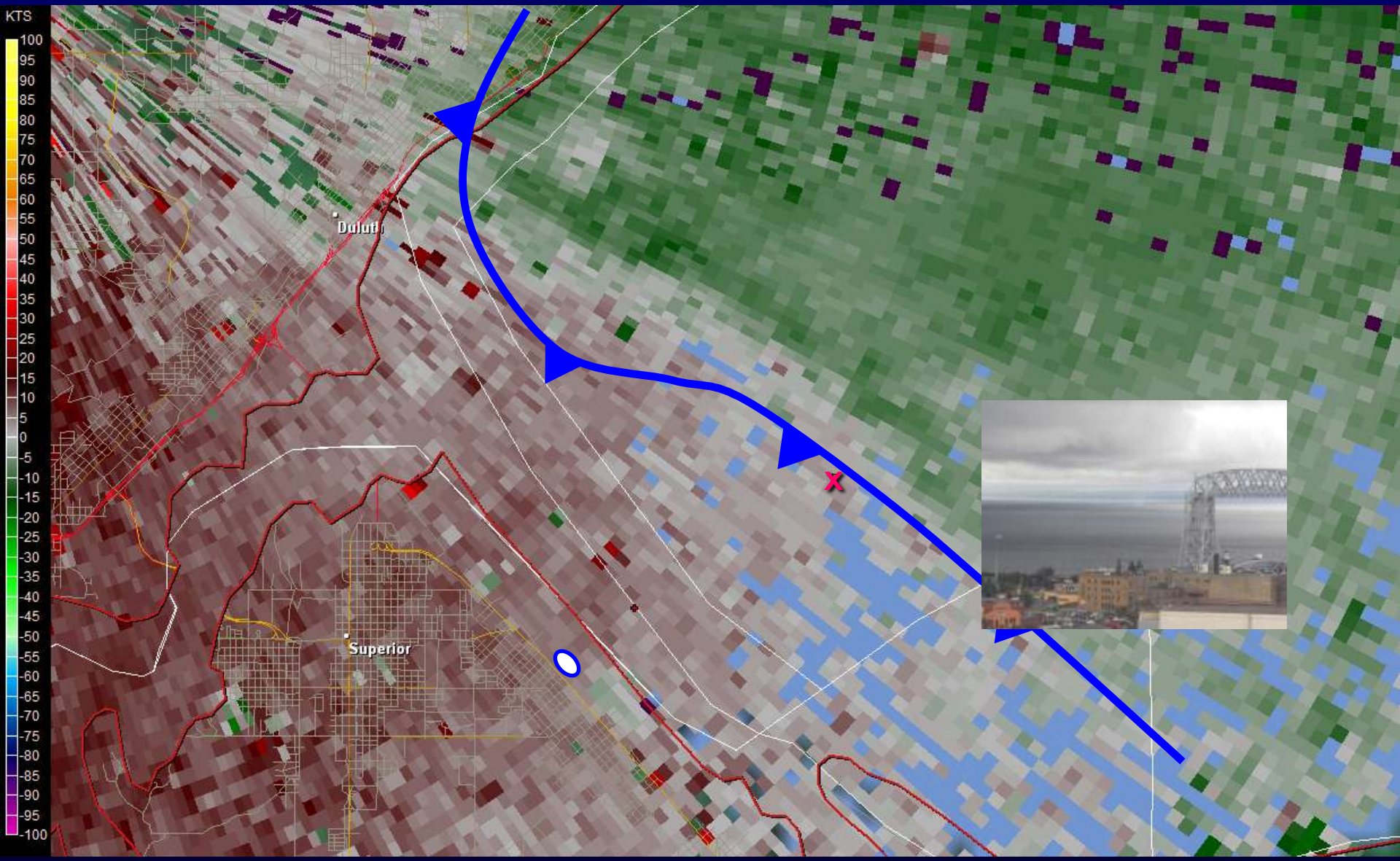
KDLH 0.5 degree base velocity: 1052 AM CDT 8/9/2012

KDLH Radar Data



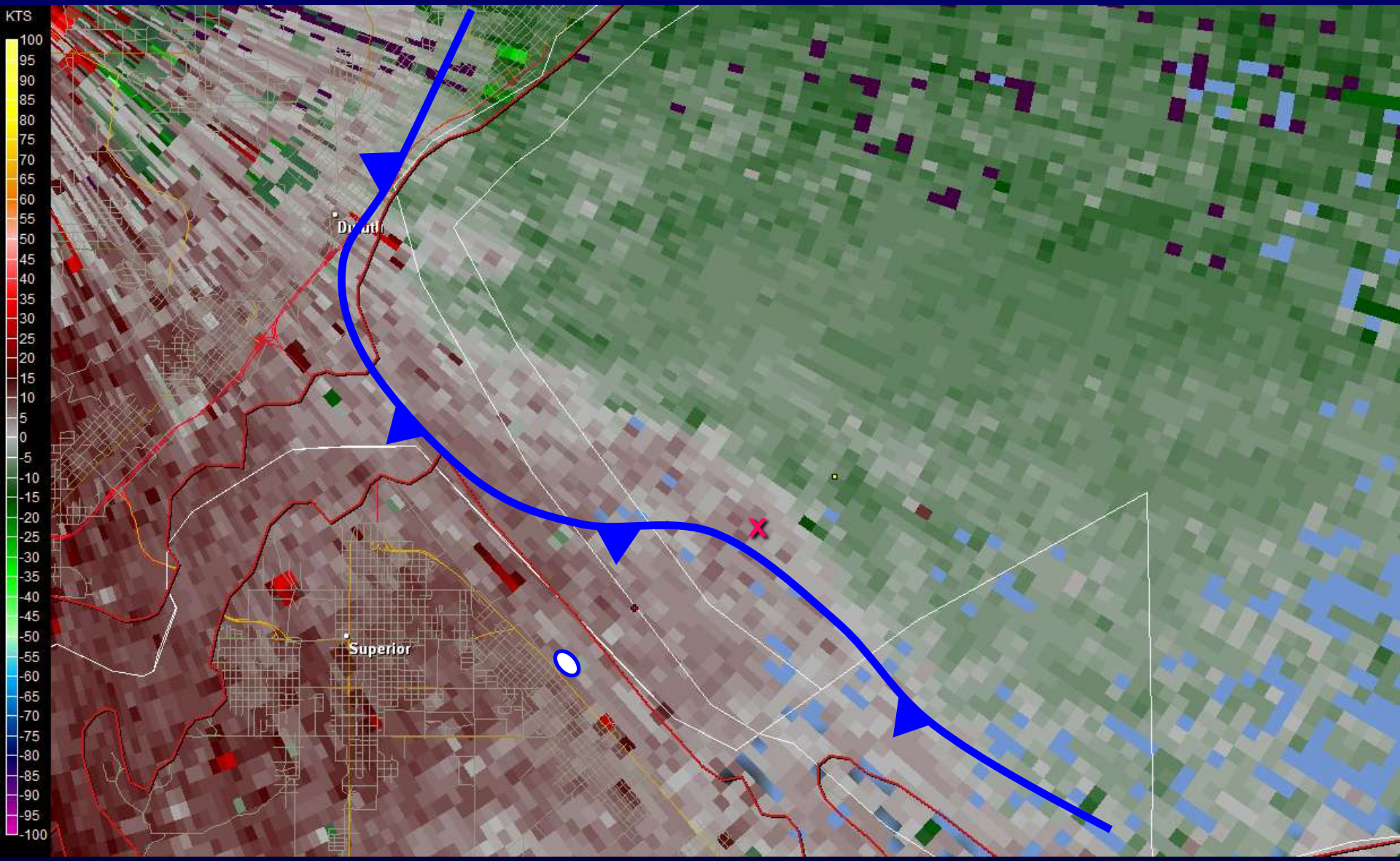
KDLH 0.5 degree base velocity: 1057 AM CDT 8/9/2012

KDLH Radar Data



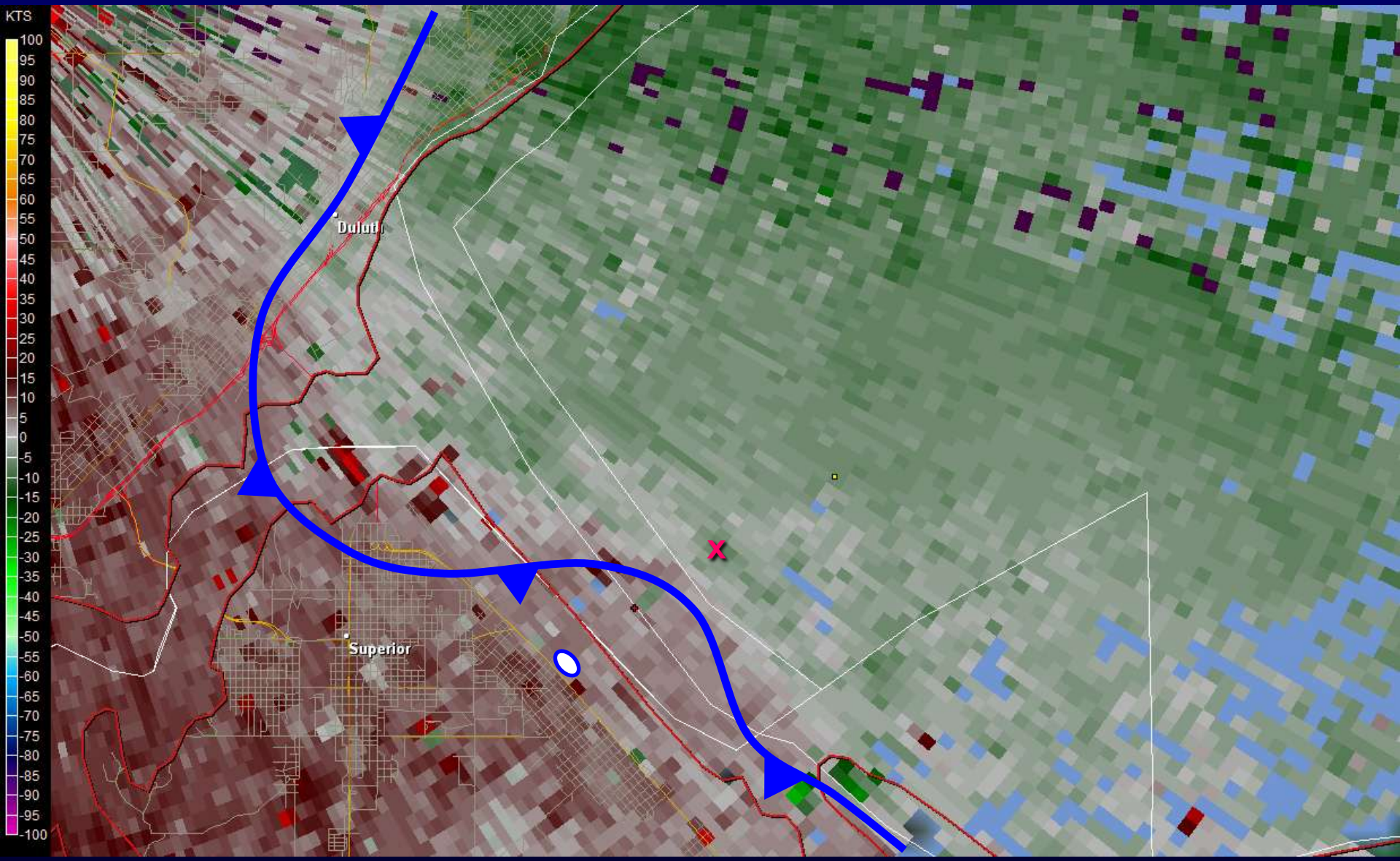
KDLH 0.5 degree base velocity: 1101 AM CDT 8/9/2012

KDLH Radar Data



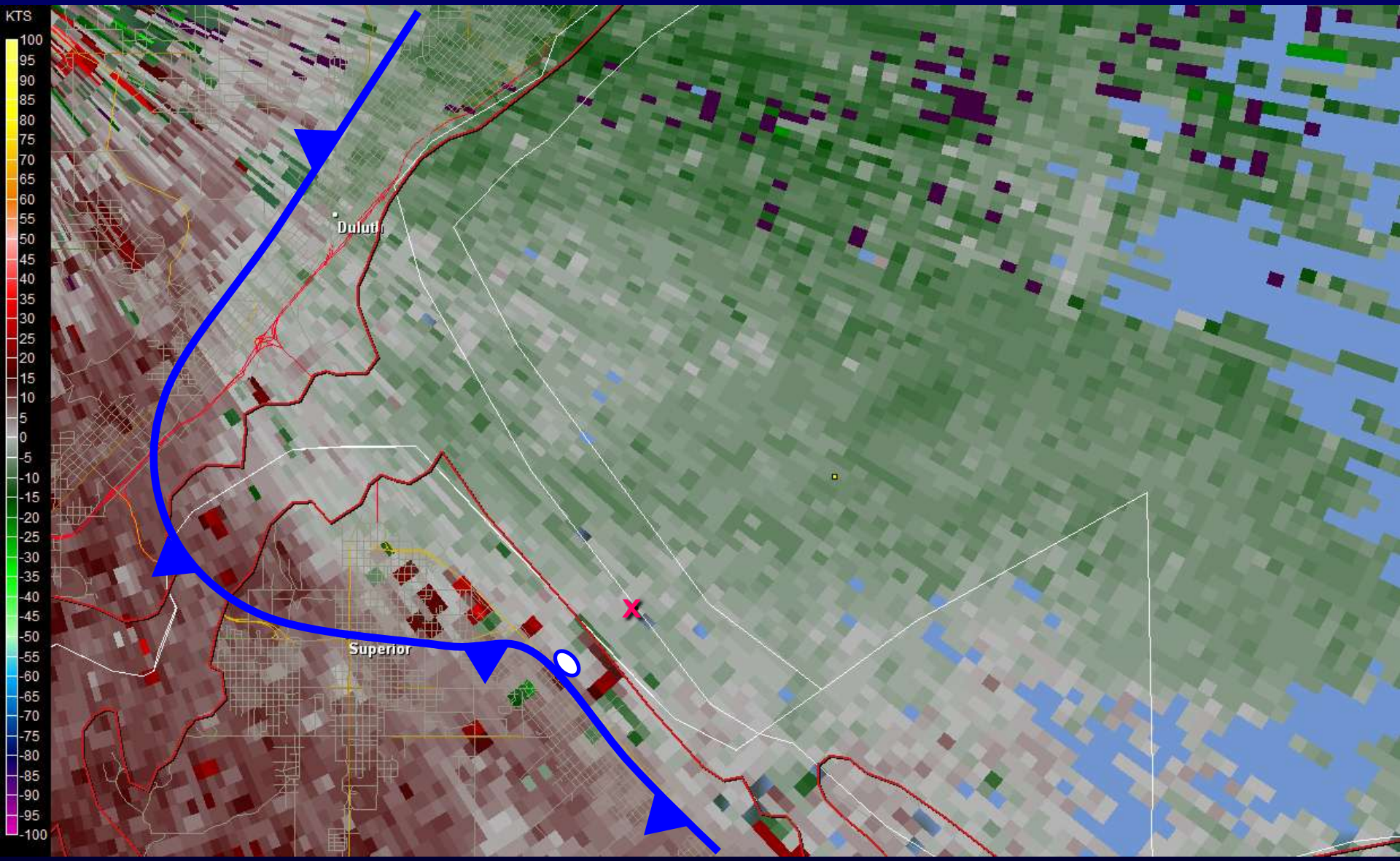
KDLH 0.5 degree base velocity: 1106 AM CDT 8/9/2012

KDLH Radar Data



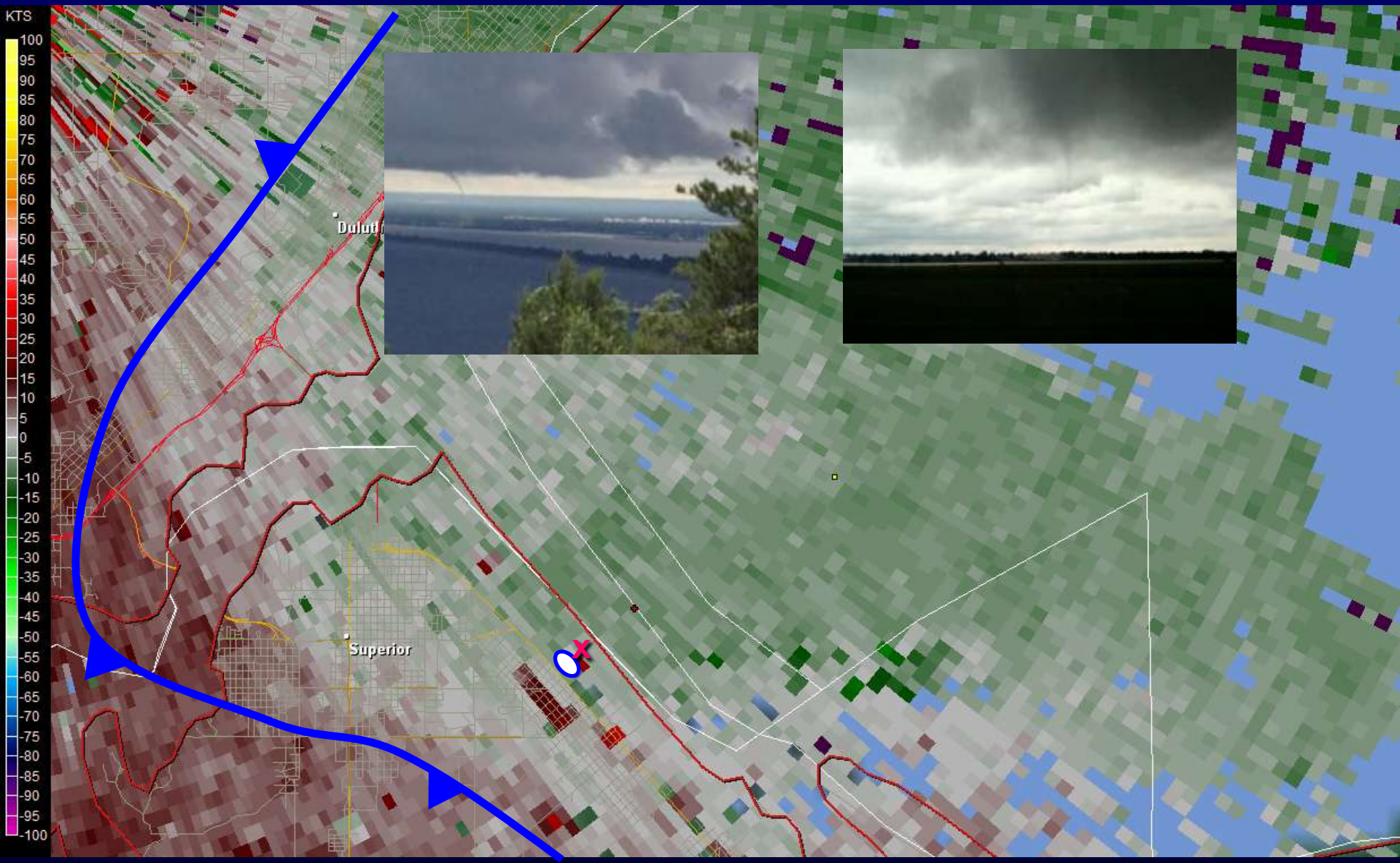
KDLH 0.5 degree base velocity: 1110 AM CDT 8/9/2012

KDLH Radar Data



KDLH 0.5 degree base velocity: 1115 AM CDT 8/9/2012

KDLH Radar Data



KDLH 0.5 degree base velocity: 1120 AM CDT 8/9/2012

End