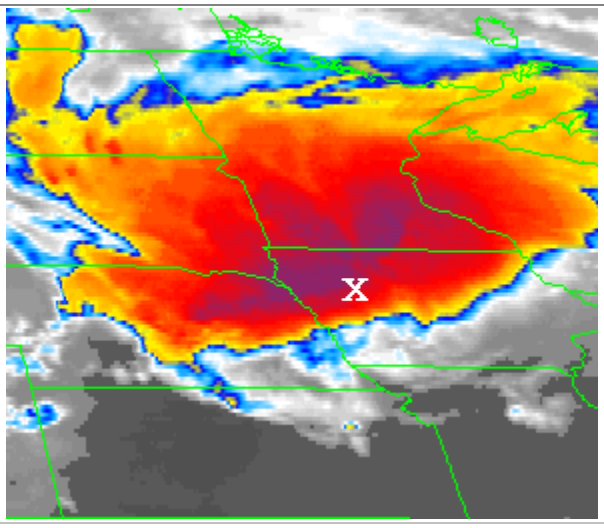
Galva, IA Tornado

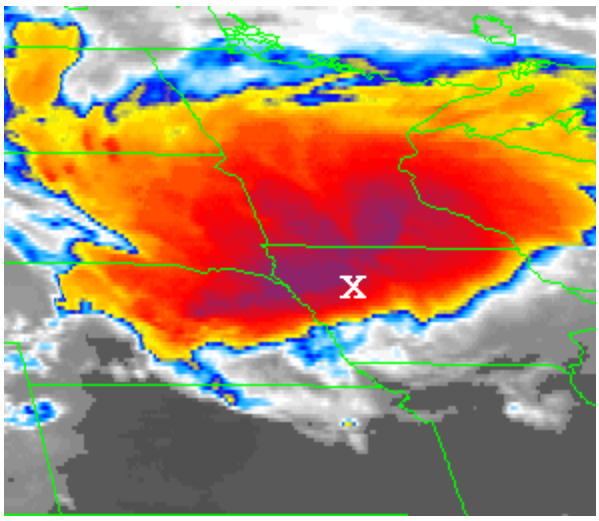
1994



A large mesoscale convective complex with an embedded tornado occurring near the white "X" over Galva, IA encompasses the Midwest in the early pre-dawn hours at 0901 UTC (0401 CDT) on June 5, 1994.

Image Information			
Satellite System		**Image Specifics**	
Satellite Name	GOES 8	Channel Band	No. 4 (Infrared)
Date	June 5, 1994	Resolution	4-km
Julian Date	156	Orbit No./Dir	NA
Time	0901 UTC 0401 CDT	Entity ID	NA
Instrument System	Imager	Area	Iowa
Data Type	Sector		

Event Discussion



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Conditions at the Time of the Image

The color-enhanced infrared image of 0901 UTC June 5, 1994 from the GOES 8 satellite depicted above shows a large mesoscale convective complex (MCC) over the Upper Midwest. The bright red area is a result of a shield of cirrus clouds over the top of the complex. At the time of the image, a weak tornado is in progress about two miles SE of Galva, IA underneath the white "X". Unlike large tornado-producing supercell thunderstorms, which often have distinctive comma-shaped features, no special features near the tornado show in this image. A second F1 tornado on the Fujita Scale occurred near Sulphur Springs to the northeast of Galva about twenty minutes later. Damage in both cases was minor.

History of the Storm

Two mesoscale convective systems developed over South Dakota and northern Nebraska during the afternoon and evening hours of June 4, 1994, and these merged into one large mesoscale convective complex. The initial storms were triggered by an approaching cold front and an upper level trough moving through the north central U.S.

The first severe weather with the system occurred near Promise, SD at 1615 CST (2215 UTC) when 0.75 inch diameter hail fell in the area. Progressively stronger storms occurred throughout the evening hours culminating in a severe hailstorm which began near Ree Heights, SD at 1844 CST (0044 UTC June 5). This storm flattened over 70 thousand acres of cropland and killed 13 calves and about 50 pigs. A weak F0 tornado did minor damage with this storm. Meanwhile, in Nebraska, an F3 tornado had done minor damage as it passed over mostly open countryside near Hay Springs beginning at 1705 MST (2205 UTC).

The thunderstorms in the MCC weakened during the evening hours as the system moved into Iowa. In general, most of the storms produced only heavy rainfall and gusty winds. The first severe weather reported in Iowa came from north of Sioux City in Plymouth County where winds of 70 to 80 mph knocked down trees and caused some roof damage at 0311 CDT (0811 UTC) on June 5. Other areas reported spotty wind damage, and the first small tornado (F1) touched down one-half mile west of Galva at 0355 CDT (0855 UTC). A few outbuildings were destroyed along its three mile path, which lasted six minutes.

Two other weak tornadoes were associated with this complex: an F1 with a path of 3.5 miles in Buena Vista County beginning at 0420 CDT (0920 UTC), and a brief touchdown of an F1 in Taylor County at 0645 CDT (1145 UTC). High winds resulted in two minor injuries at a campground in Buena Vista County at 0400 CDT (0900 UTC) at the same time as the tornado.

Mesoscale Convective Complex Tornadoes

This MCC is typical of those which occur over much of the Midwest U.S. during the summer months. The thunderstorms within the complex are numerous and often produce very heavy rainfall, damaging winds, and hail. Tornadoes do occur, but usually they are relatively weak in intensity. From a satellite perspective, however, MCC systems appear quite ominous. The numerous thunderstorms inject large amounts of water vapor into the upper troposphere where it spreads out as a cirrus overcast over the entire active complex and often for many miles downwind. Being at a high altitude, the cirrus clouds are cold and appear as bright red on most color enhanced infrared images.

The infrared image depicted in our gallery at 0901 UTC shows the MCC as the Galva IA F1 tornado, which lasted from 0355 CDT till 0401 CDT, was in progress. The image offers an example of the inherent limitations to satellite data in trying to determine tornadic thunderstorms from space-based platforms. This event was at night (therefore no visible scenes are available), and the structure of tornado-producing thunderstorms, which sometimes can be observed from satellites images, is obscured by the cirrus clouds.

Citing this Article

McCown, Sam, “Galva, IA Tornado 1994”, June 1994, National Climatic Data Center, Asheville, NC