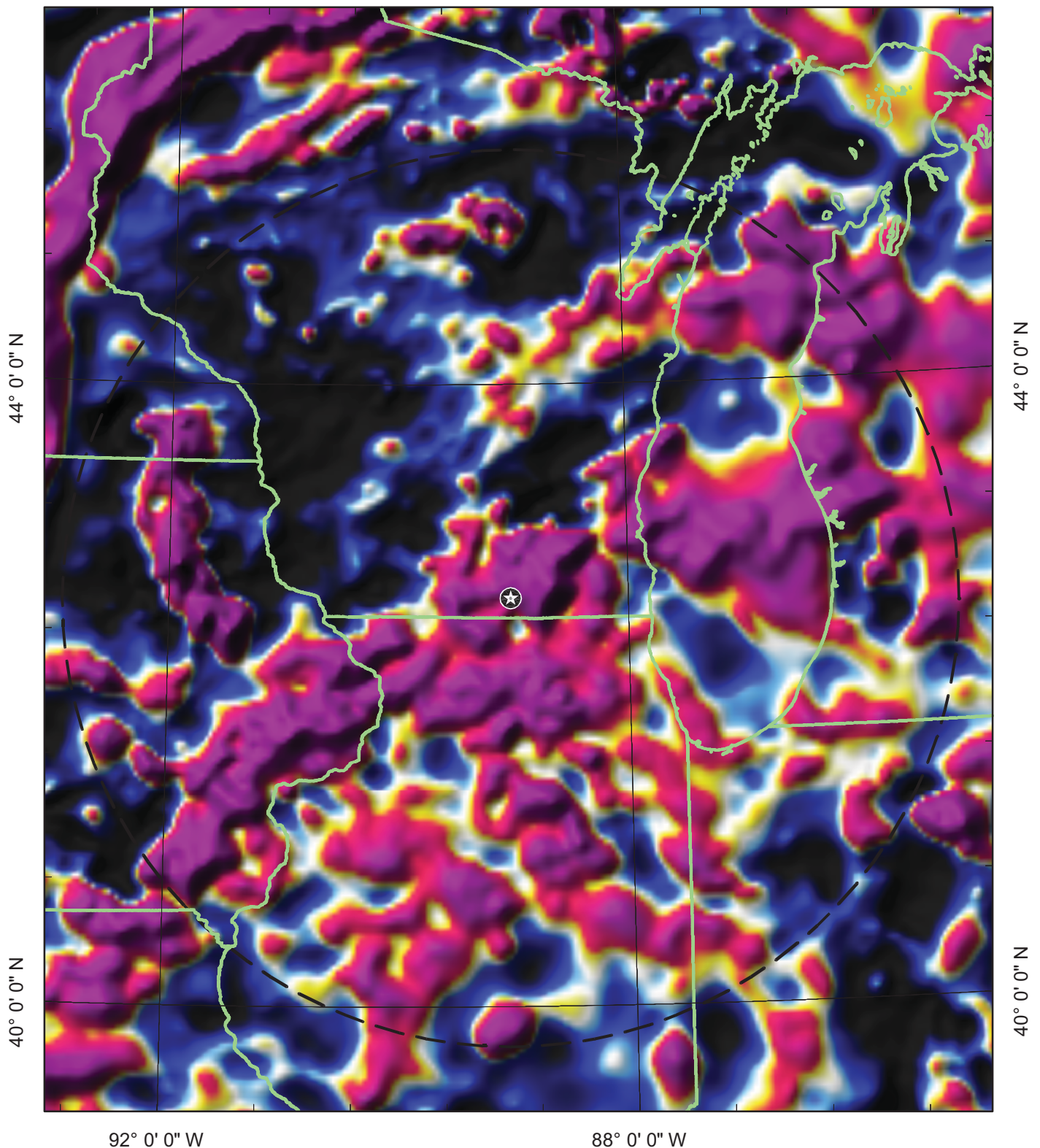


Figure 2.5-7 – Magnetic Anomaly Map of Wisconsin and Northern Illinois

92° 0' 0" W

88° 0' 0" W



**LEGEND**

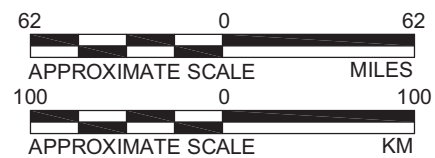
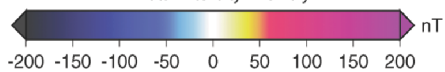


SHINE SITE



200 MILE (322 KM) RADIUS

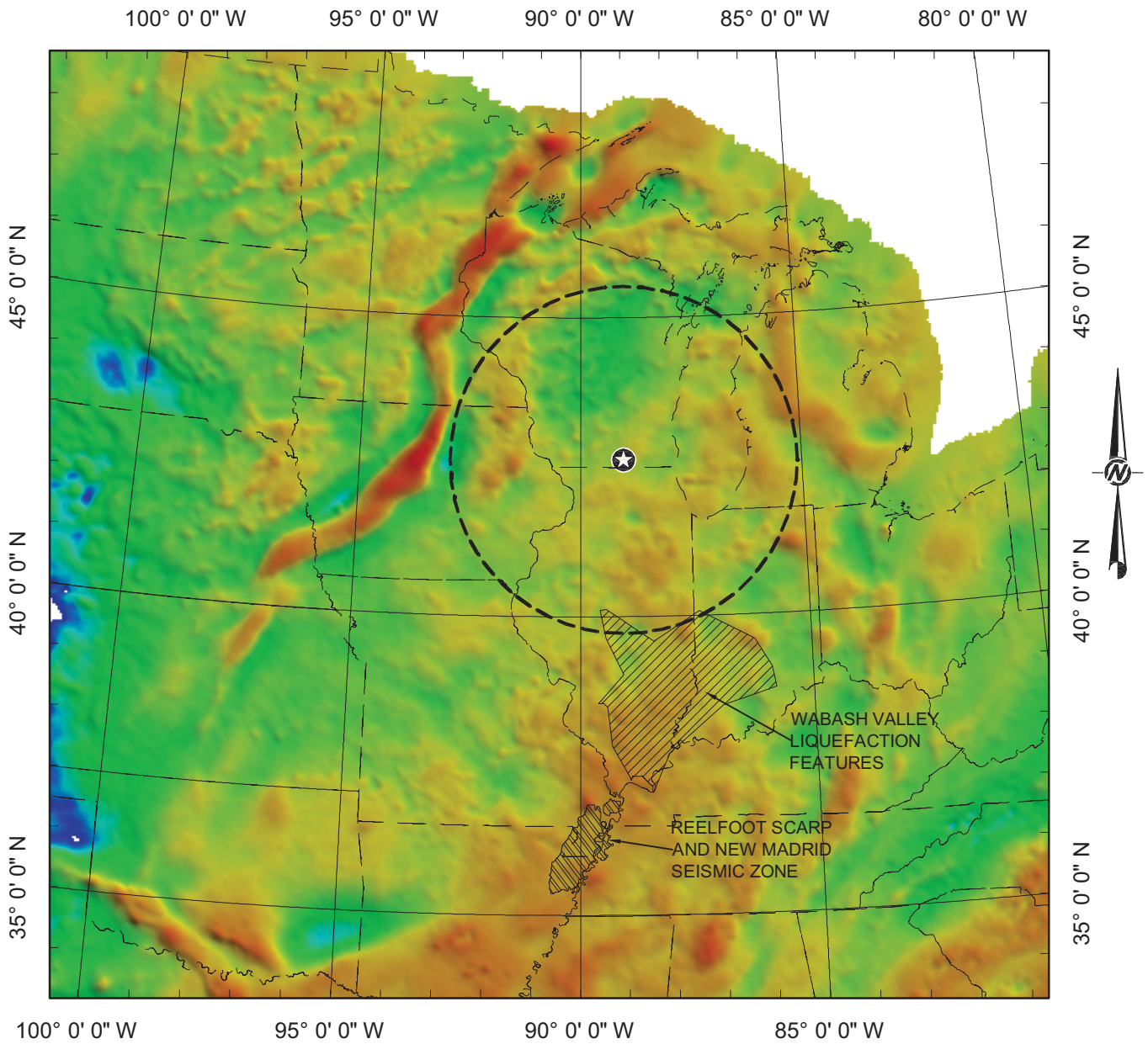
Total Intensity Anomaly



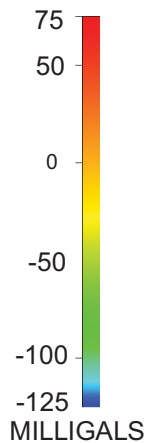
**REFERENCE**

1.) MAUS ET AL., 2009.

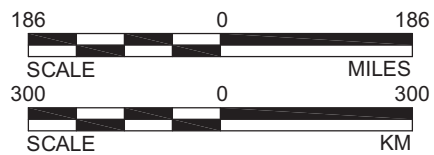
Figure 2.5-8 – Regional Bouguer Gravity Anomaly Map



**LEGEND**



- SHINE SITE
- 200 MILE (322 KM) RADIUS

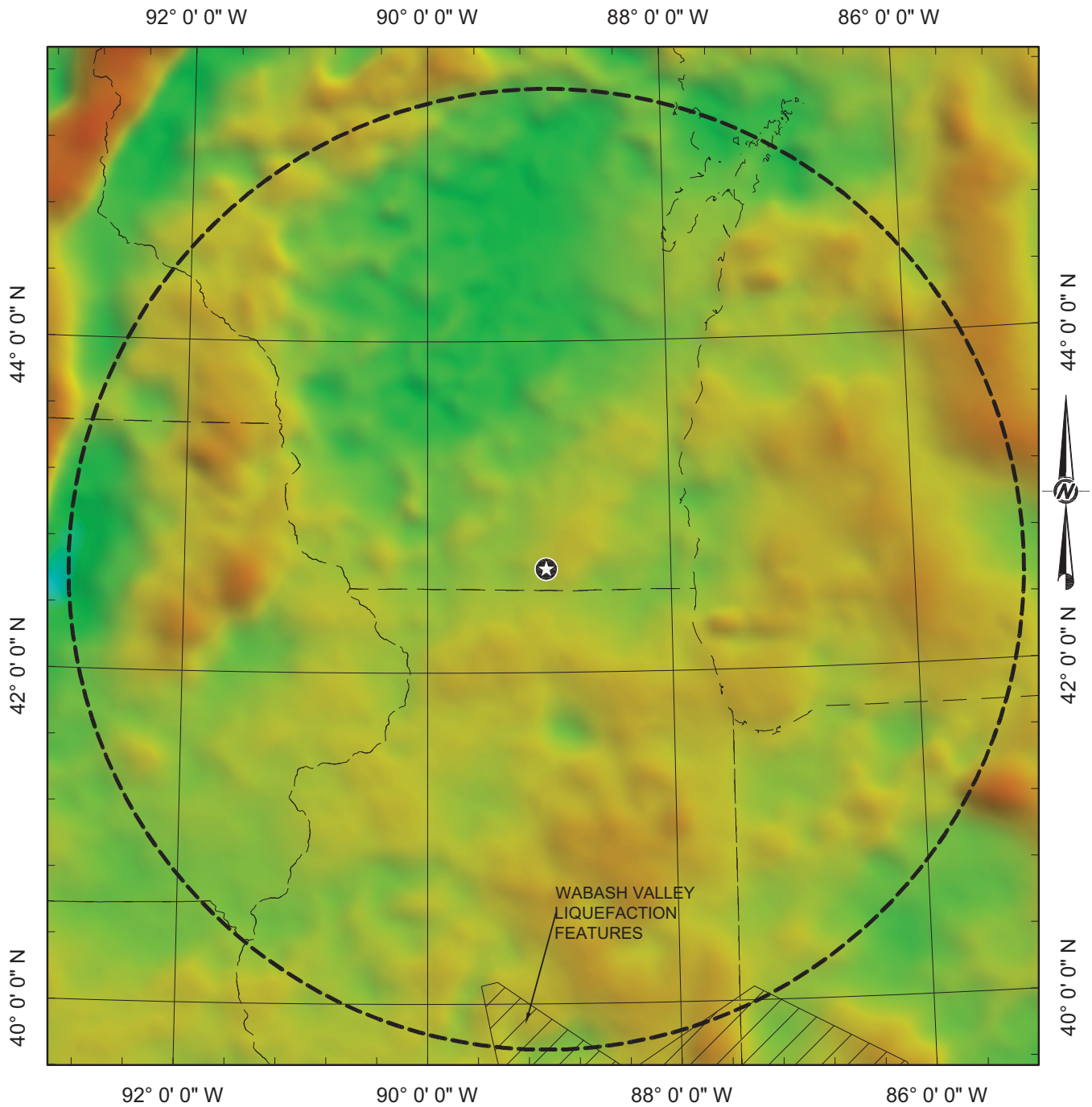


**REFERENCE**

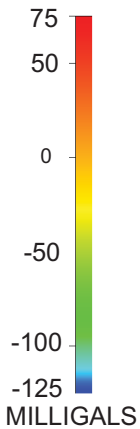
- 1.) KUCKS, R.P., 1999.
- 2.) USGS, 2012c.



**Figure 2.5-9 – Bouguer Gravity Anomaly Map of Wisconsin and Northern Illinois**



**LEGEND**



- ★ SHINE SITE
- 200 MILE (322 KM) RADIUS

**REFERENCE**

- 1.) KUCKS, R.P., 1999.

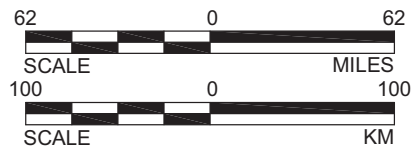
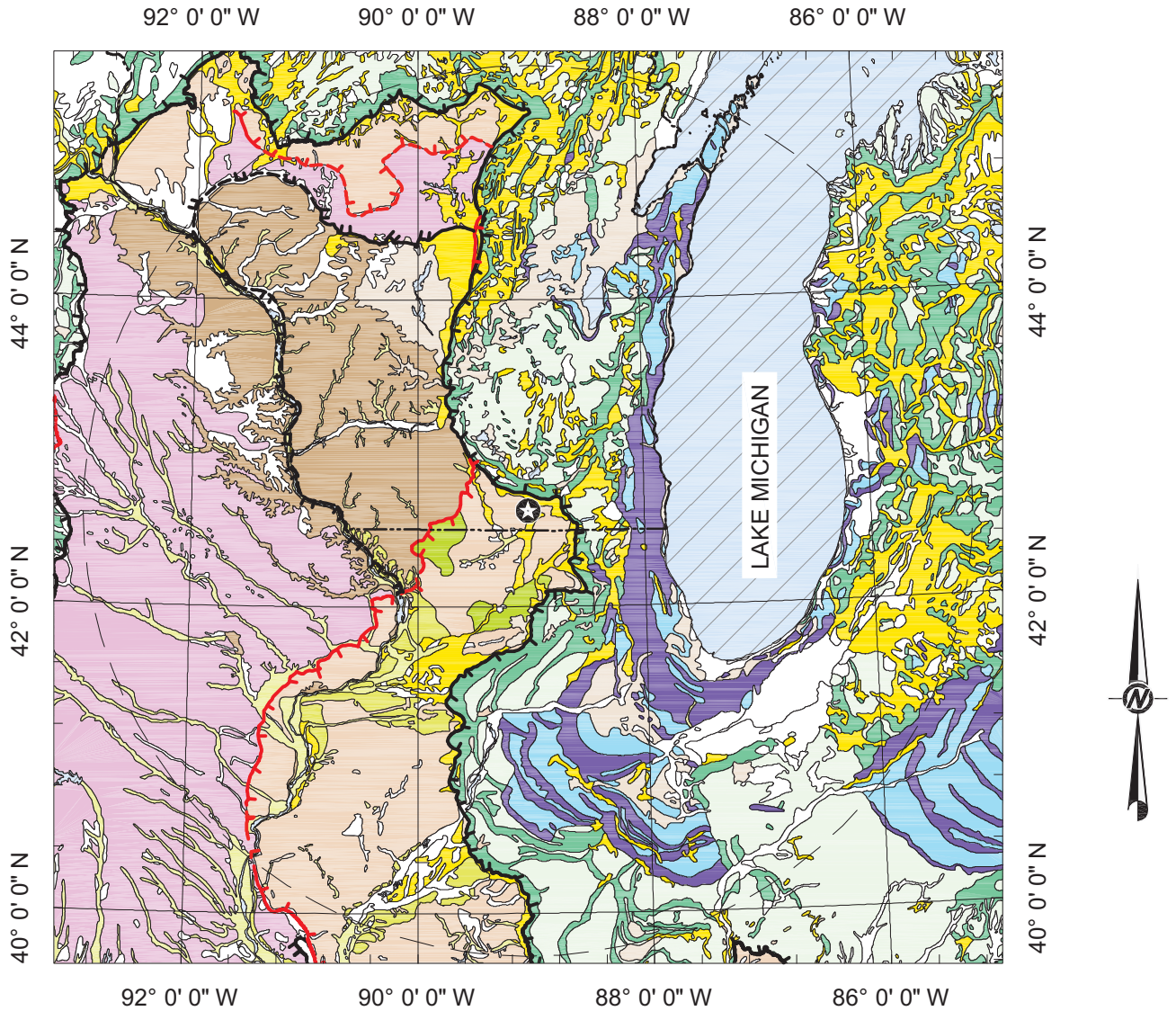


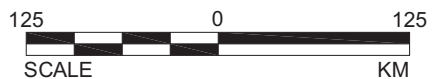
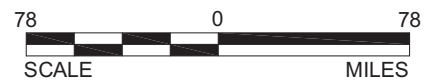
Figure 2.5-10 – Regional Surficial Geology Map



**LEGEND**

**SURFICIAL GEOLOGIC UNIT**

- CLAY AND SILT, GLACIAL AND POST GLACIAL LAKE DEPOSITS - HOLOCENE AND LATE WISCONSIN AGE
- GLACIOFLUVIAL OUTWASH DEPOSITS - LATE WISCONSIN AND HOLOCENE (?)
- CHANNEL AND FLOOD PLAIN ALLUVIUM OF HOLOCENE AND LATE WISCONSIN AGE
- END-MORAINE DEPOSITS, CLAYEY TILL - LATE WISCONSIN AND HOLOCENE (?)
- GROUND-MORAINE DEPOSITS, LOAMY TILL - LATE WISCONSIN AND HOLOCENE (?)
- GROUND-MORAINE DEPOSITS, CLAYEY TILL - LATE WISCONSIN AND HOLOCENE(?)
- END-MORAINE DEPOSITS, LOAMY TILL - LATE WISCONSIN AND HOLOCENE (?)
- CLAYEY TO LOAMY TILL - ILLINOIAN
- GROUND-MORAINE DEPOSITS, LOAMY TILL - ILLINOIAN
- LOAMY TILL - PRE-ILLINOIAN
- COLLUVIUM AND SHEETWASH ALLUVIUM - QUATERNARY AGE AGE
- SILT (LOESS) - HOLOCENE AND LATE WISCONSIN
- REFER TO REFERENCE FOR UNIT DESIGNATION
- LAKES



SHINE SITE

--- 200 MILE (322 KM) RADIUS

— CONTACT

LIMIT OF GLACIAL ADVANCE - DASHED WHERE INFERRED HATCHURES POINT IN DIRECTION OF GLACIATED AREA

— LATE WISCONSIN

— ILLINOIAN

— PRE-ILLINOIAN

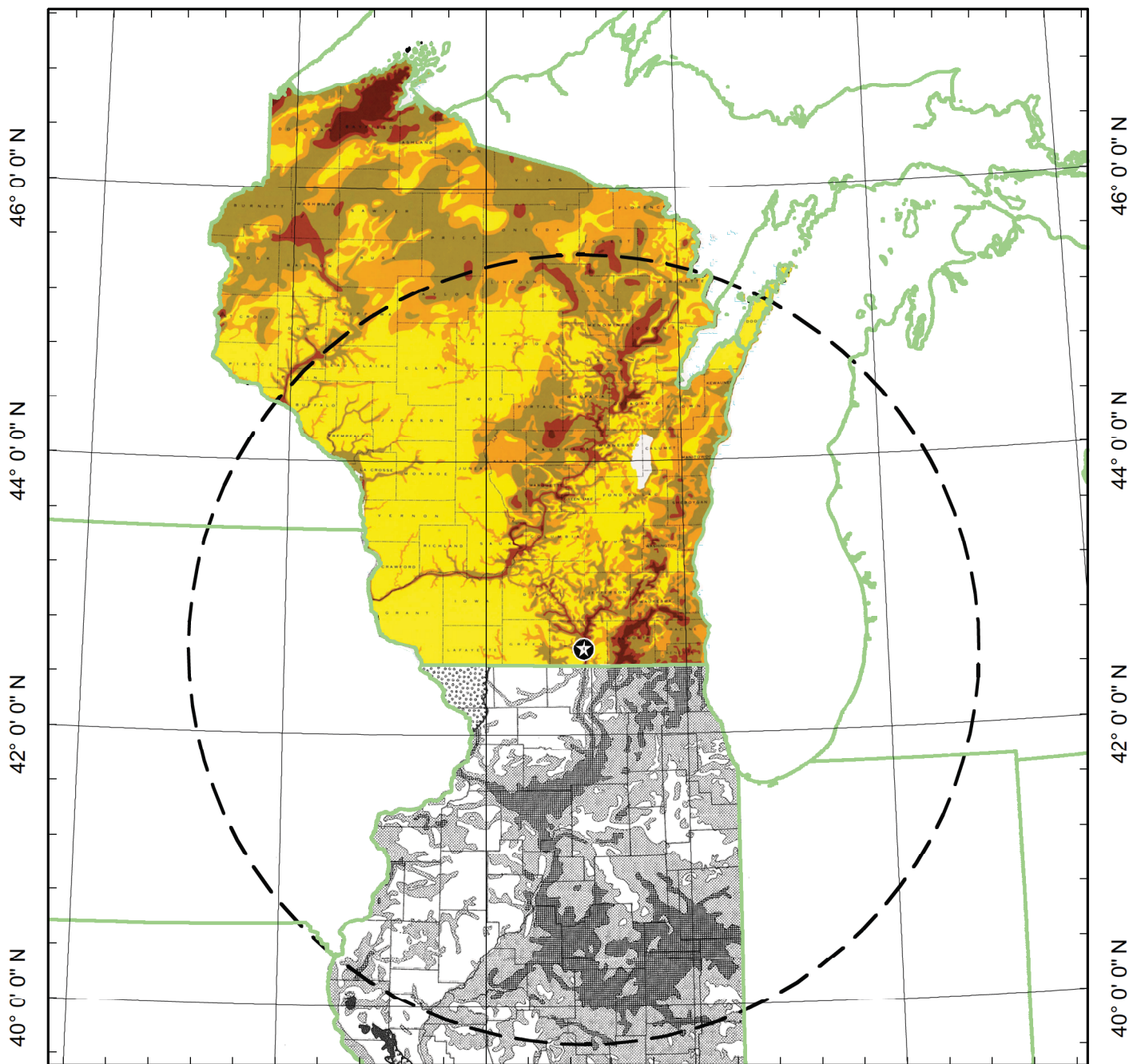
**REFERENCE**

- 1.) FULLERTON ET AL., 2003.



Figure 2.5-11 – Unconsolidated and Drift Thicknesses Map for Wisconsin and Northern Illinois

94° 0' 0" W      92° 0' 0" W      90° 0' 0" W      88° 0' 0" W      86° 0' 0" W      84° 0' 0" W



94° 0' 0" W      92° 0' 0" W      90° 0' 0" W      88° 0' 0" W      86° 0' 0" W

**LEGEND**

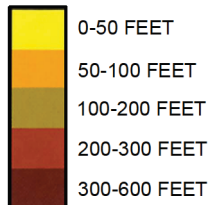


SHINE SITE

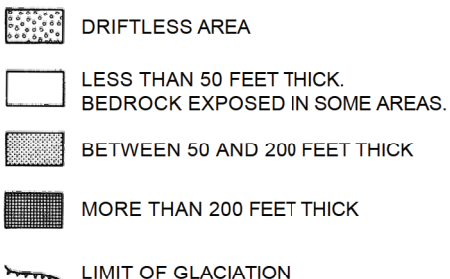
— — — — — 200 MILE (322 KM) RADIUS

**LEGEND FOR WISCONSIN**

THICKNESS OF UNCONSOLIDATED MATERIAL



**LEGEND FOR ILLINOIS**



**REFERENCE**

- 1.) ILLINOIS: PISKIN, K., AND BERGSTROM, R.E., 1975.
- 2.) WISCONSIN: WGNHS, 1983.

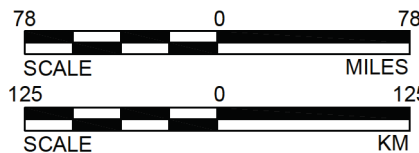
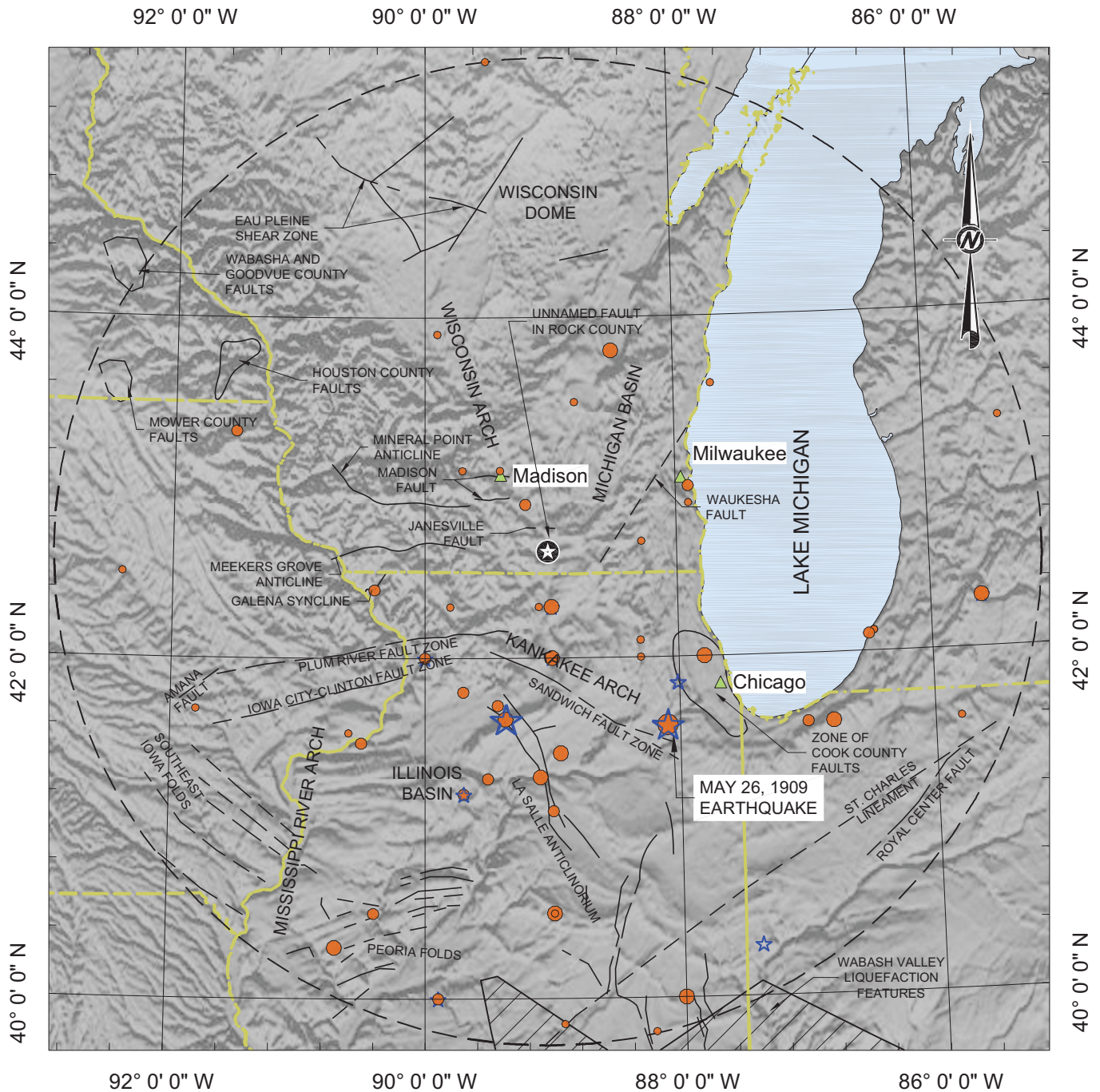


Figure 2.5-12 – Historical Earthquake Epicenters



**LEGEND**

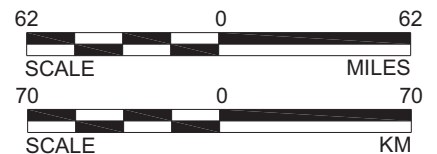
- SHINE SITE
- 200 MILE (322 KM) RADIUS
- FAULT AND FOLD TREND

**MAGNITUDE**

- 0 to 2.9
- 3 to 3.9
- 4 to 4.9
- 5 to 5.9

**EPICENTER WITH FELT INTENSITY AT JANESVILLE (MMI)**

- NO MMI VALUE
- MMI 5

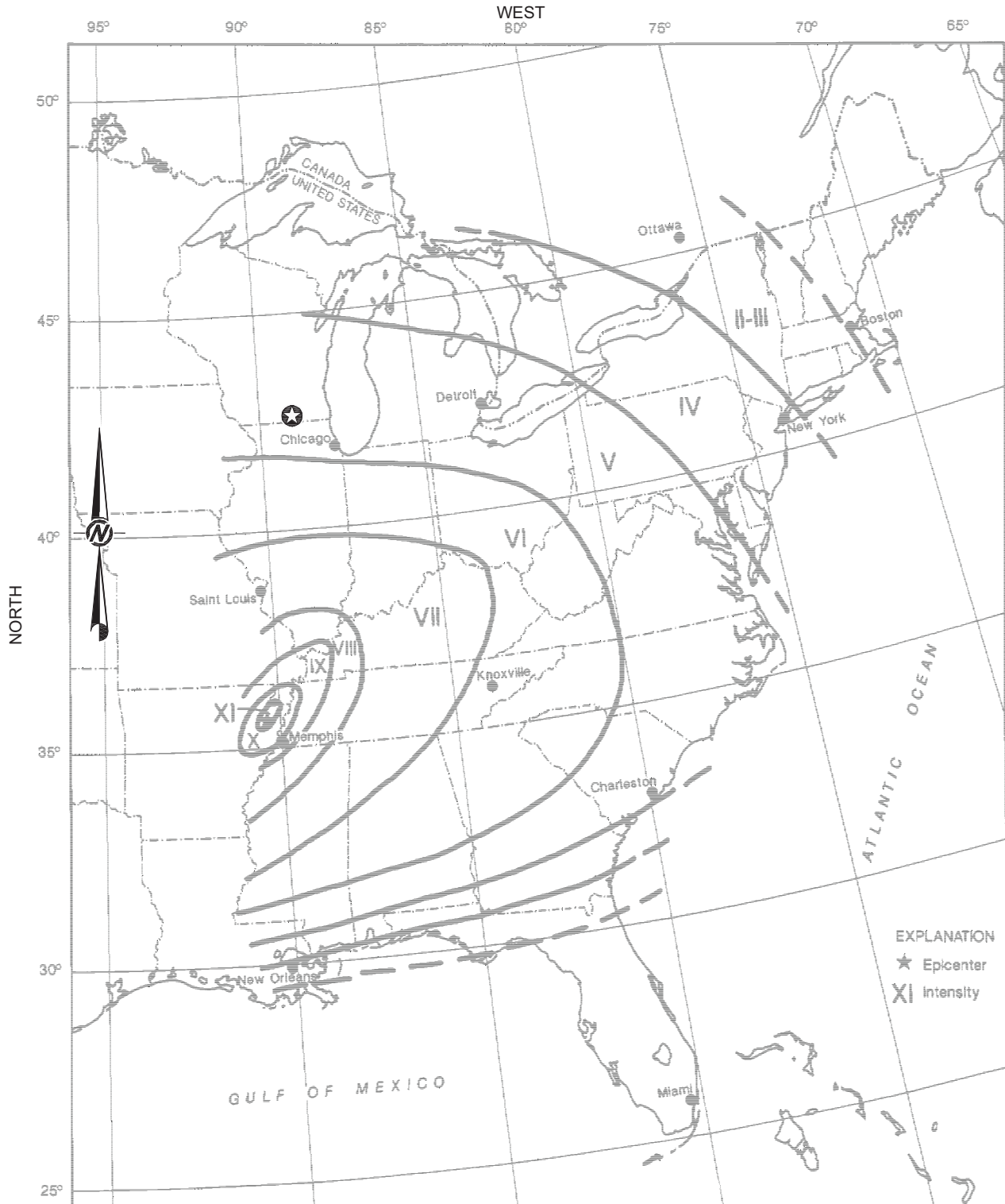


**REFERENCE**

- 1.) EARTHQUAKE LOCATIONS: CEUS-SSC, 2012 AND NEID, 2012.
- 2.) FAULT REFERENCE: GARRITY, C.P., AND SOLLER, D.R., 2009.



Figure 2.5-13 – Isoseismal Map December 16, 1811 Earthquake



**LEGEND**

★ SHINE SITE

**REFERENCE**

1.) STOVER, C.W. AND COFFMAN, J.L., 1993.

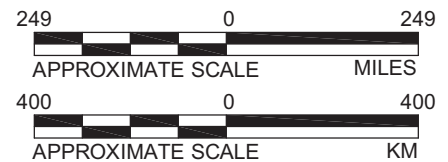
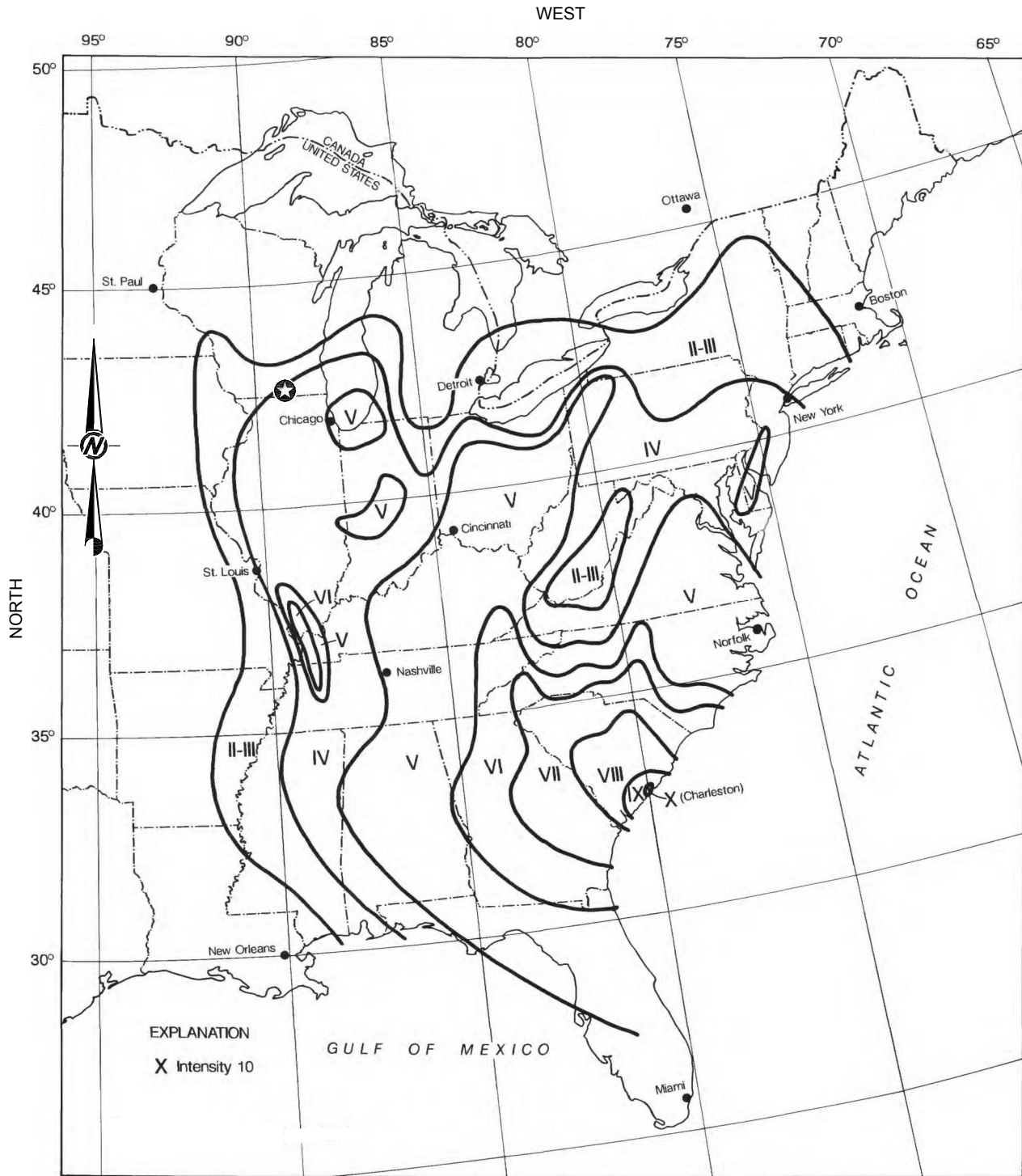


Figure 2.5-14 – Isoseismal Map September 01, 1886 Earthquake



**LEGEND**

☉ SHINE SITE

**REFERENCE**

1.) ISOSEISMAL MAP OF 09/01/1886 EARTHQUAKE FROM (STOVER, C.W. AND COFFMAN, J.L., 1993).

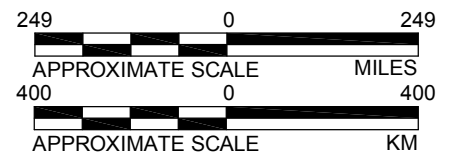
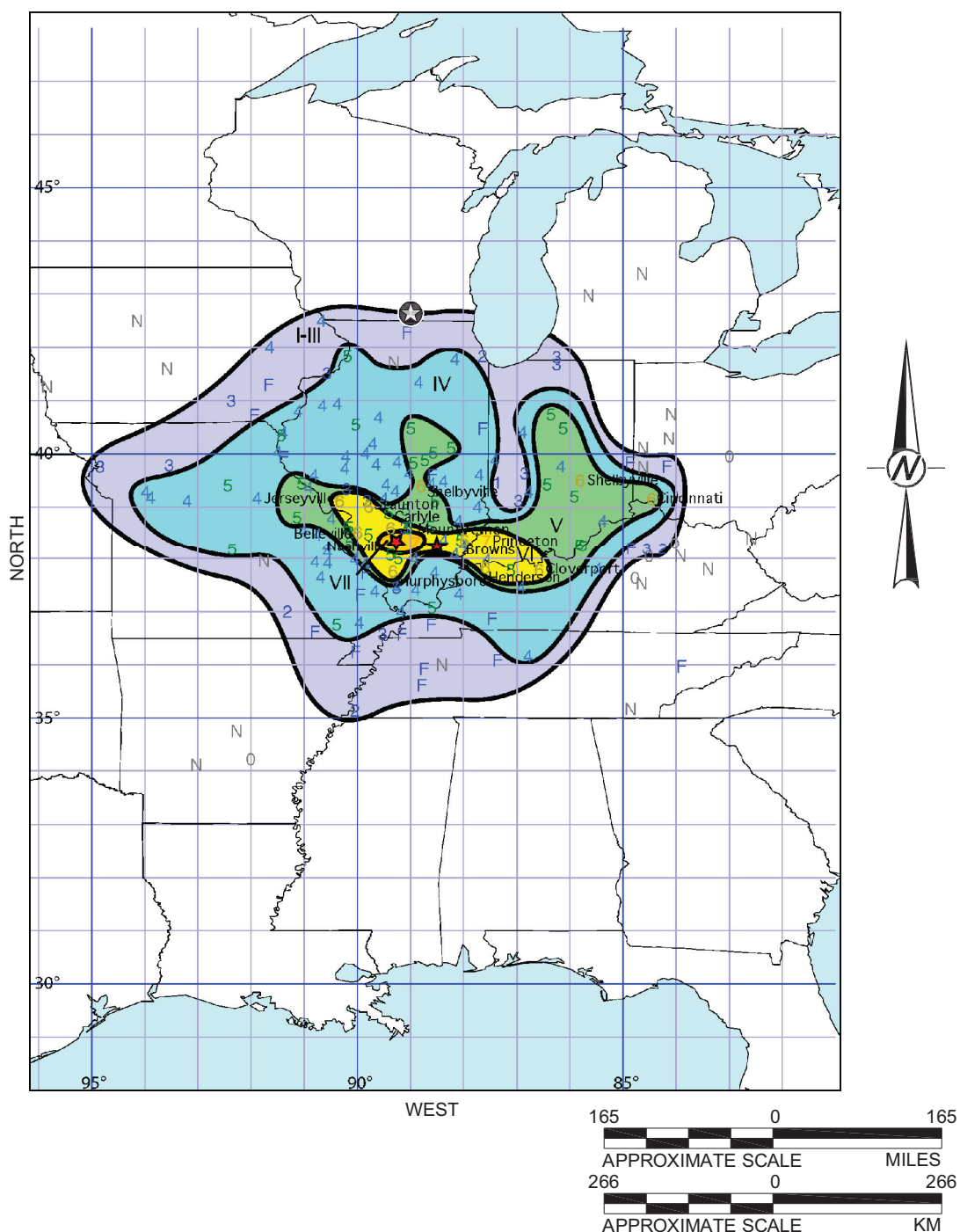




Figure 2.5-15 – Isoseismal Map September 27, 1891 Earthquake



## LEGEND

★ SHINE SITE

NUMBERS ARE MMI ASSIGNMENTS:

F - DENOTES THAT THE EVENT WAS FELT, BUT THAT THE INFORMATION IS NOT SUFFICIENT TO ASSIGN AN MMI.

O - DENOTES THAT THE EVENT WAS REPORTED AS NOT FELT.

N - DENOTES THAT THE EVENT WAS NOT MENTIONED AND IS PRESUMED "NOT FELT".

THE THICK BLACK ISOSEISMAL LINES ENCLOSE ISOSEISMAL AREAS.

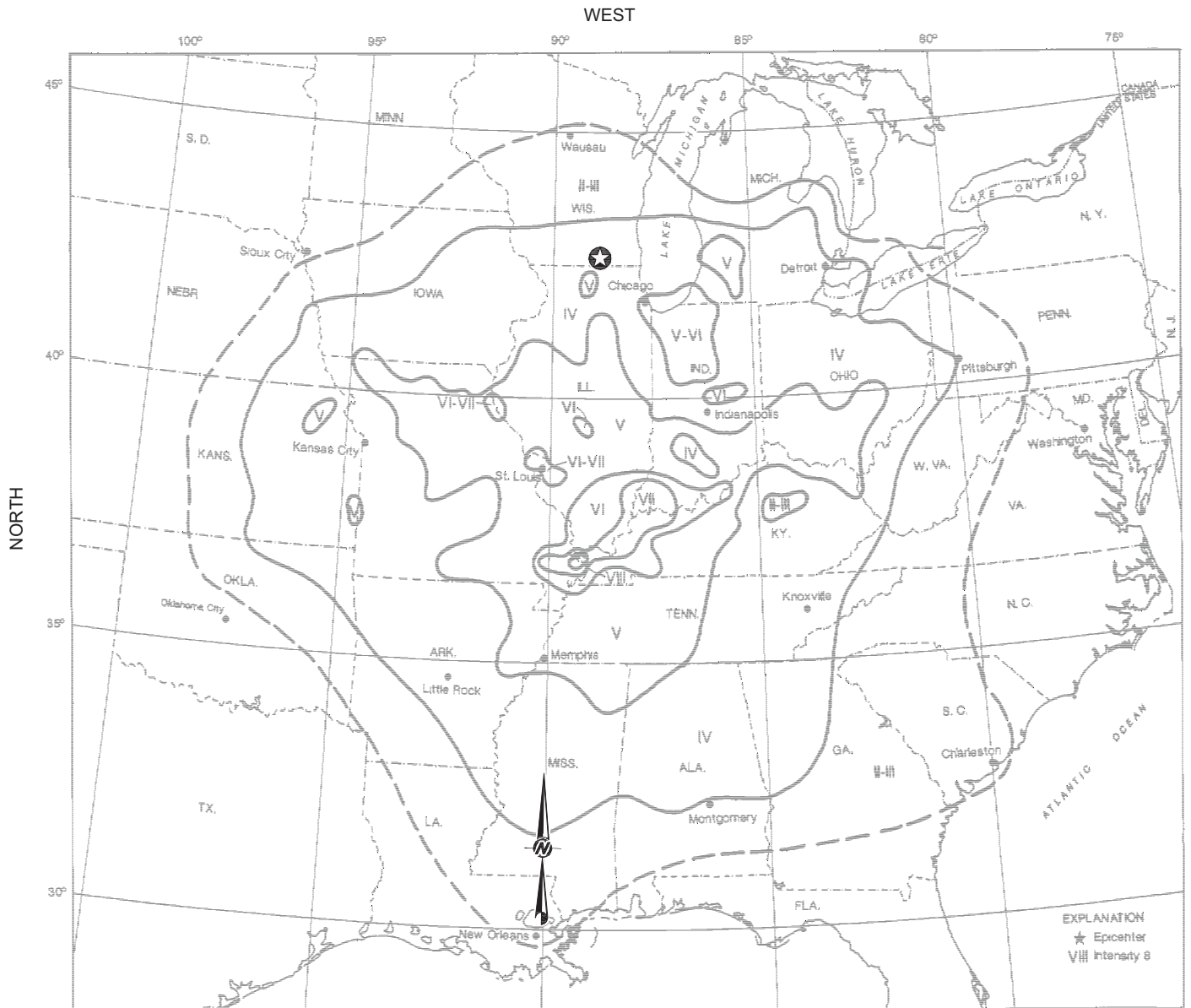
THE EASTERN RED STAR IS STOVER AND COFFMAN'S (1993) EPICENTER LOCATION.

THE WESTERN RED STAR IS BAKUN AND HOPPER'S (2004) PREFERRED EPICENTER LOCATION.

## REFERENCE

- 1.) BAKUN, W.H. AND HOPPER, M.G., 2004.

Figure 2.5-16 – Isoseismal Map October 31, 1895 Earthquake



**LEGEND**

★ SHINE SITE

**REFERENCE**

1.) STOVER, C.W. AND COFFMAN, J.L., 1993.

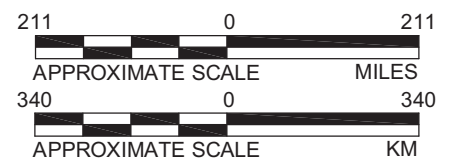
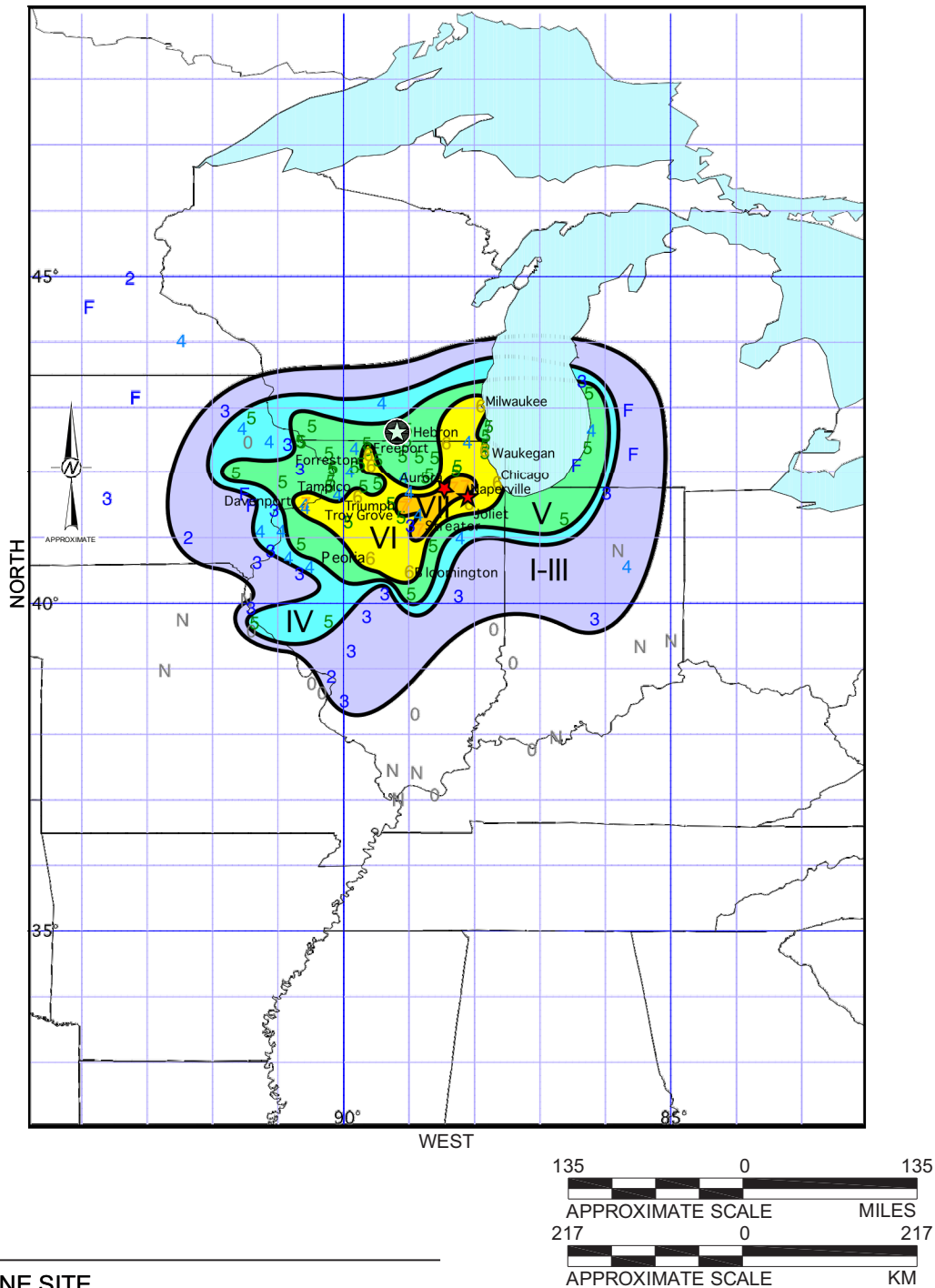




Figure 2.5-17 – Isoseismal Map May 26, 1909 Earthquake



**LEGEND**

★ SHINE SITE

NUMBERS ARE MMI ASSIGNMENTS:

F - DENOTES THAT THE EVENT WAS FELT, BUT THAT THE INFORMATION IS NOT SUFFICIENT TO ASSIGN AN MMI.

O - DENOTES THAT THE EVENT WAS REPORTED AS NOT FELT.

N - DENOTES THAT THE EVENT WAS NOT MENTIONED AND IS PRESUMED "NOT FELT".

THE THICK BLACK ISOSEISMAL LINES ENCLOSE ISOSEISMAL AREAS.

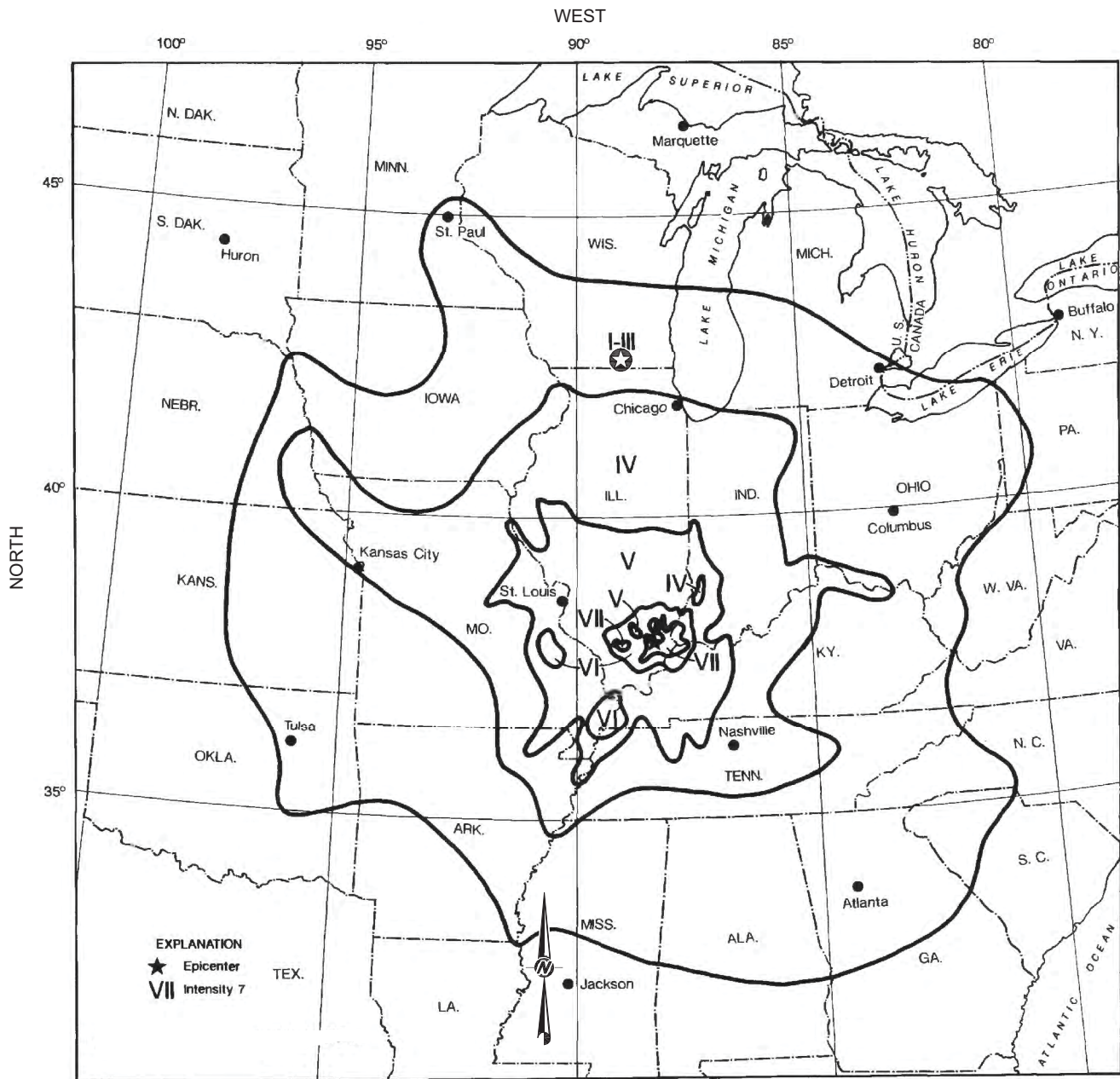
THE EASTERN RED STAR IS STOVER AND COFFMAN'S (1993) EPICENTER LOCATION.

THE WESTERN RED STAR IS BAKUN AND HOPPER'S (2004) PREFERRED EPICENTER LOCATION.

**REFERENCE**

- 1.) BAKUN, W.H. AND HOPPER, M.G., 2004.

Figure 2.5-18 – Isoseismal Map November 09, 1968 Earthquake



**LEGEND**

★ SHINE SITE

**REFERENCE**

1.) STOVER, C.W. AND COFFMAN, J.L., 1993.

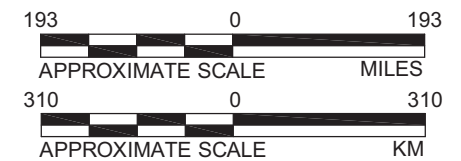
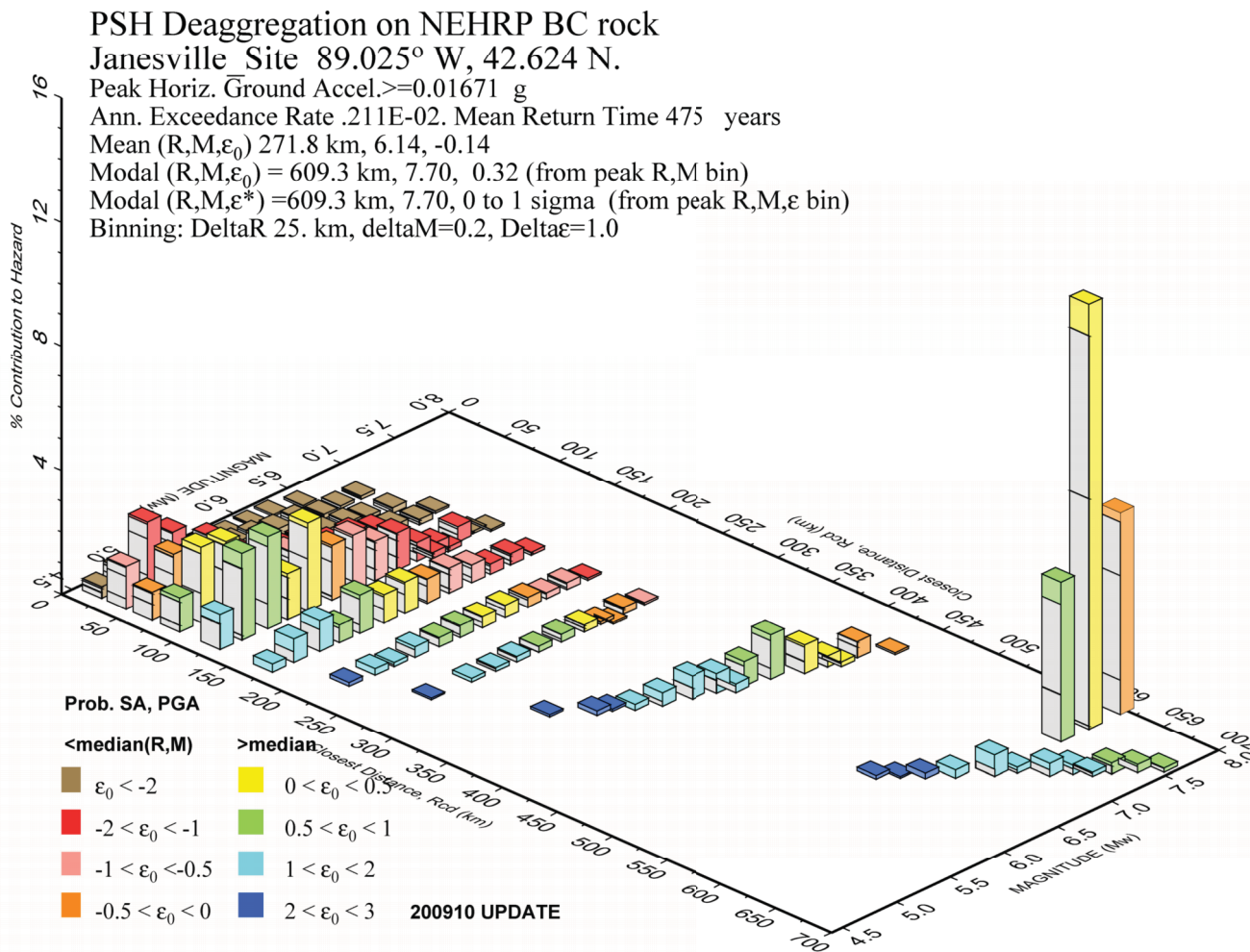


Figure 2.5-19 – Deaggregation of USGS 2008 PSHA Model for 475-Year Return Period PGA



Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on rock with average  $v_s = 760$  m/s top 30 m.  
 USGS CGHT PSHA2008 UPDATE Bins with lt 0.05% contrib. omitted

**NOTE**

1.) CALCULATION FOR SHINE SITE  
 (42.624°N, 89.025°W) FROM THE 2008  
 USGS NATIONAL PSHA ( $V_s^{30} = 760$  m/s,  
 SITE CLASS BC).

**REFERENCE**

1.) USGS, 2012a.



Figure 2.5-20 – Deaggregation of USGS 2008 PSHA Model for 2,475-Year Return Period PGA

**PSH Deaggregation on NEHRP BC rock**

Janesville Site 89.025° W, 42.624 N.

Peak Horiz. Ground Accel.  $\geq 0.05015$  g

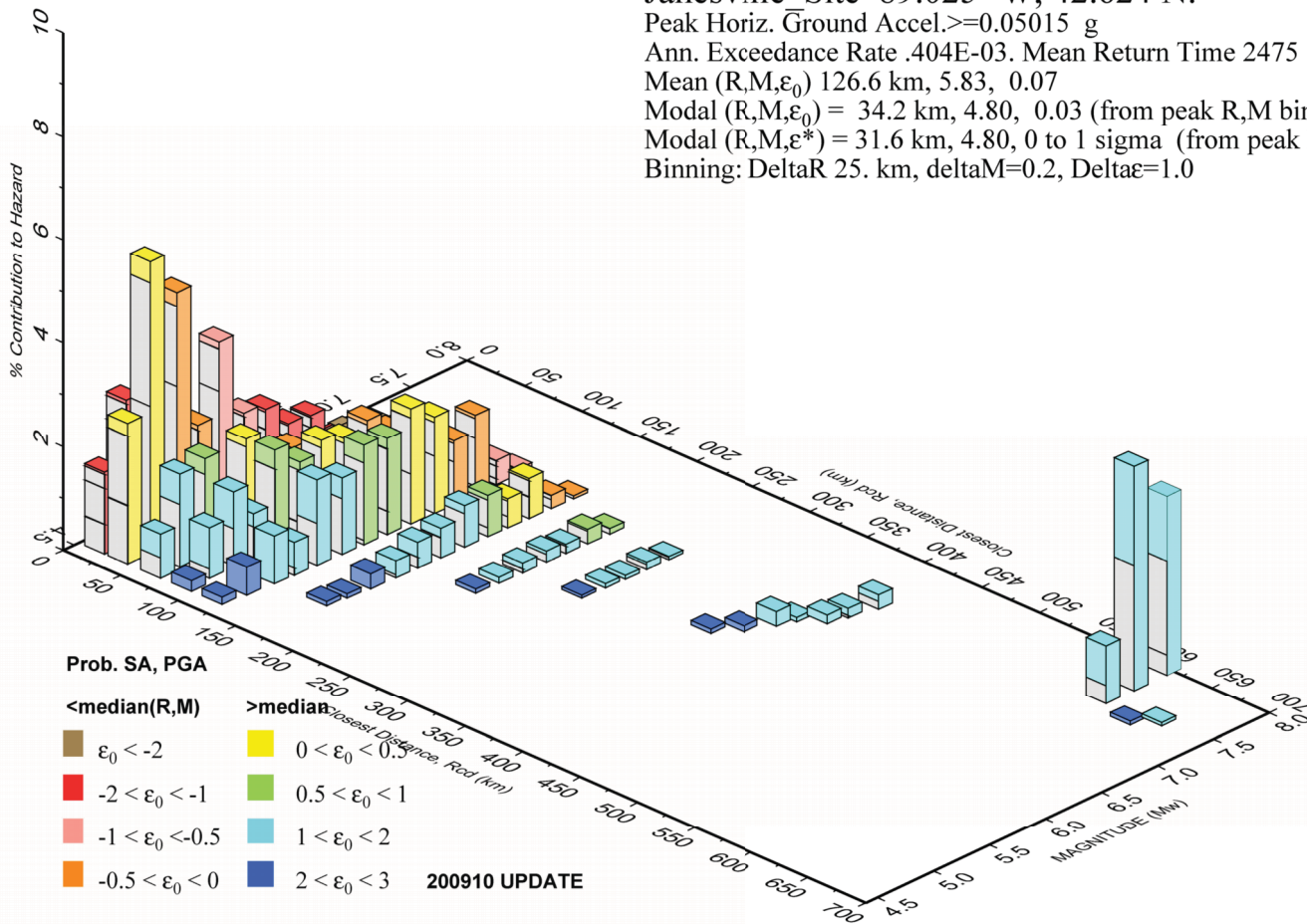
Ann. Exceedance Rate .404E-03. Mean Return Time 2475 years

Mean (R,M, $\epsilon_0$ ) 126.6 km, 5.83, 0.07

Modal (R,M, $\epsilon_0$ ) = 34.2 km, 4.80, 0.03 (from peak R,M bin)

Modal (R,M, $\epsilon^*$ ) = 31.6 km, 4.80, 0 to 1 sigma (from peak R,M, $\epsilon$  bin)

Binning: DeltaR 25. km, deltaM=0.2, Delta $\epsilon$ =1.0



Distance (R), magnitude (M), epsilon (E) deaggregation for a site on rock with average  $v_s = 760$  m/s top 30 m.

USGS CGHT PSHA2008 UPDATE Bins with lt 0.05% contrib. omitted

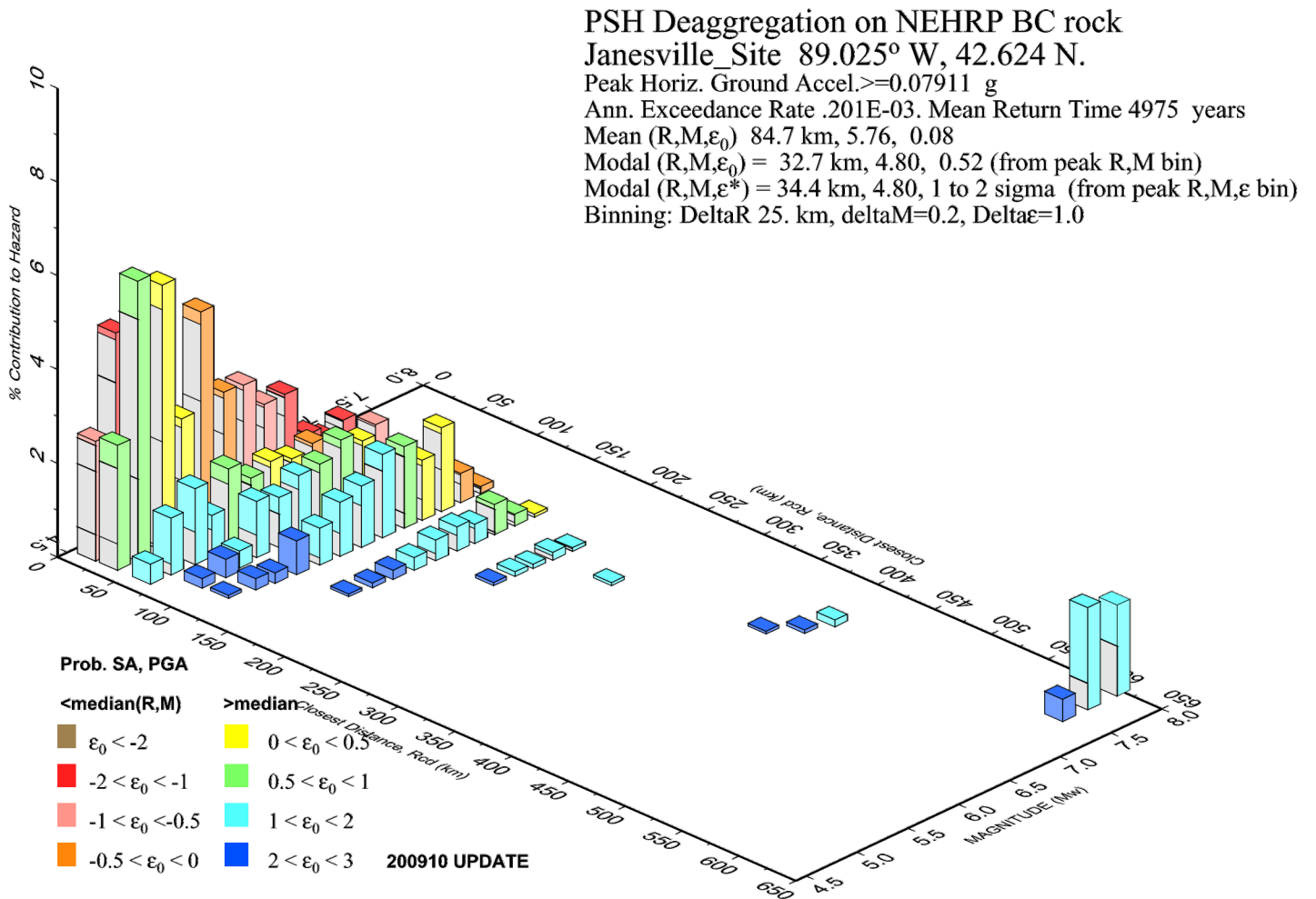
**NOTE**

1.) CALCULATION FOR SHINE SITE (42.624°N, 89.025°W) FROM THE 2008 USGS NATIONAL PSHA ( $V_s^{30} = 760$  m/s, SITE CLASS BC).

**REFERENCE**

1.) USGS, 2012a.

Figure 2.5-21 – Deaggregation of USGS 2008 PSHA Model for 4,975-Year Return Period PGA



Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on rock with average vs= 760. m/s top 30 m.  
 USGS CGHT PSHA2008 UPDATE Bins with lt 0.05% contrib. omitted

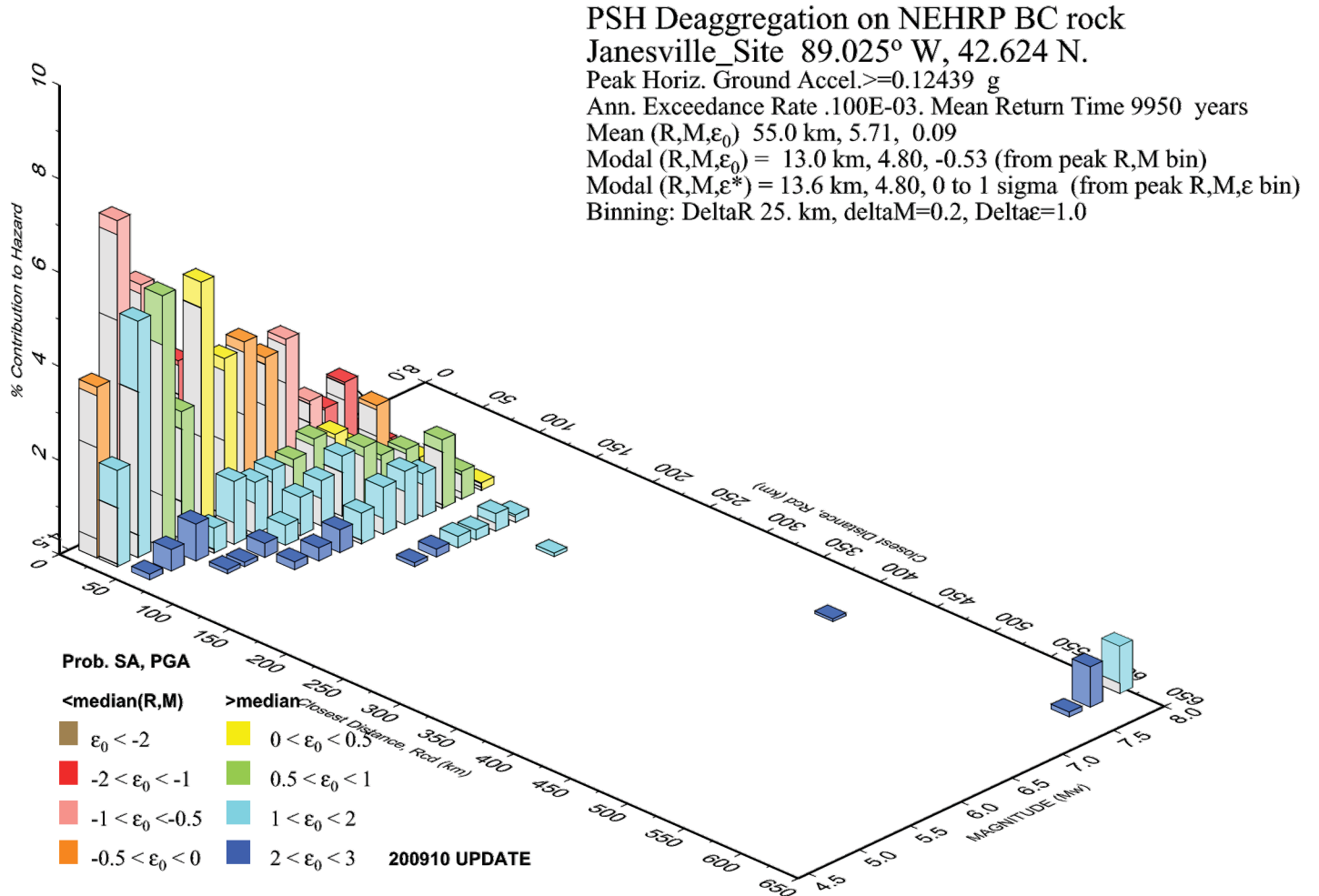
**NOTE**

1.) CALCULATION FOR SHINE SITE (42.624°N, 89.025°W) FROM THE 2008 USGS NATIONAL PSHA ( $V_s^{30} = 760$  m/s, SITE CLASS BC).

**REFERENCE**

1.) USGS, 2012a.

Figure 2.5-22 – Deaggregation of USGS 2008 PSHA Model for 9,950-Year Return Period PGA



Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on rock with average  $v_s = 760$  m/s top 30 m.  
 USGS CGHT PSHA2008 UPDATE Bins with lt 0.05% contrib. omitted

**NOTE**

1.) CALCULATION FOR SHINE SITE (42.624°N, 89.025°W) FROM THE 2008 USGS NATIONAL PSHA ( $V_s^{30} = 760$  m/s, SITE CLASS BC).

**REFERENCE**

1.) USGS, 2012a.



Figure 2.5-23 – Deaggregation of USGS 2008 PSHA Model for 19,900-Year Return Period PGA

PSH Deaggregation on NEHRP BC rock

Janesville\_Site 89.025° W, 42.624 N.

Peak Horiz. Ground Accel.  $\geq 0.1943$  g

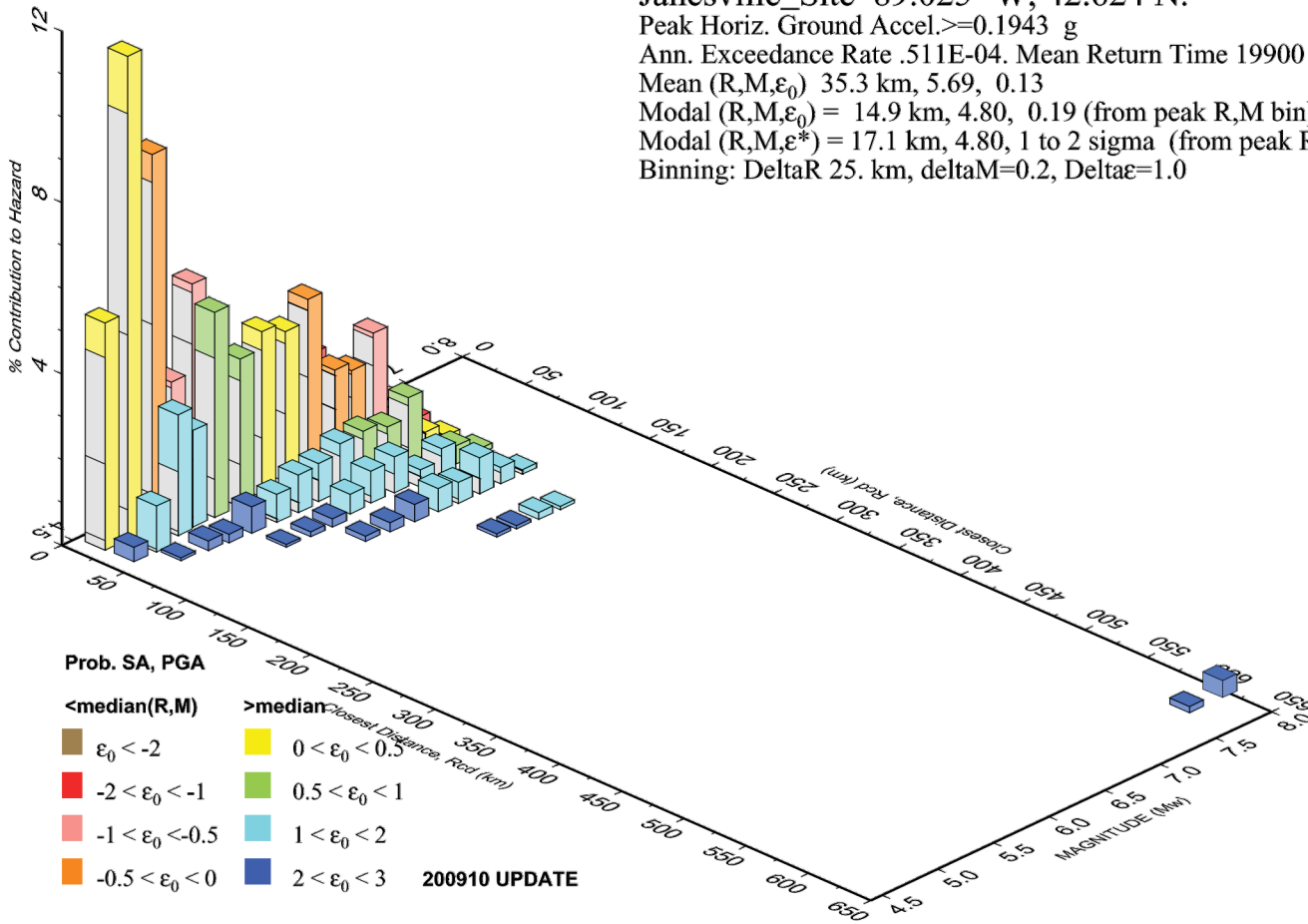
Ann. Exceedance Rate .511E-04. Mean Return Time 19900 years

Mean (R,M, $\epsilon_0$ ) 35.3 km, 5.69, 0.13

Modal (R,M, $\epsilon_0$ ) = 14.9 km, 4.80, 0.19 (from peak R,M bin)

Modal (R,M, $\epsilon^*$ ) = 17.1 km, 4.80, 1 to 2 sigma (from peak R,M, $\epsilon$  bin)

Binning: DeltaR 25. km, deltaM=0.2, Delta $\epsilon$ =1.0



Distance (R), magnitude (M), epsilon (E0,E) deaggregation for a site on rock with average vs= 760. m/s top 30 m.

USGS CGHT PSHA2008 UPDATE Bins with lt 0.05% contrib. omitted

**NOTE**

1.) CALCULATION FOR SHINE SITE (42.624°N, 89.025°W) FROM THE 2008 USGS NATIONAL PSHA ( $V_s^{30} = 760$  m/s, SITE CLASS BC).

**REFERENCE**

1.) USGS, 2012a.