

# Catalog Statistics

C. Mueller, USGS

NSHMP Workshop, Memphis, Feb 2012



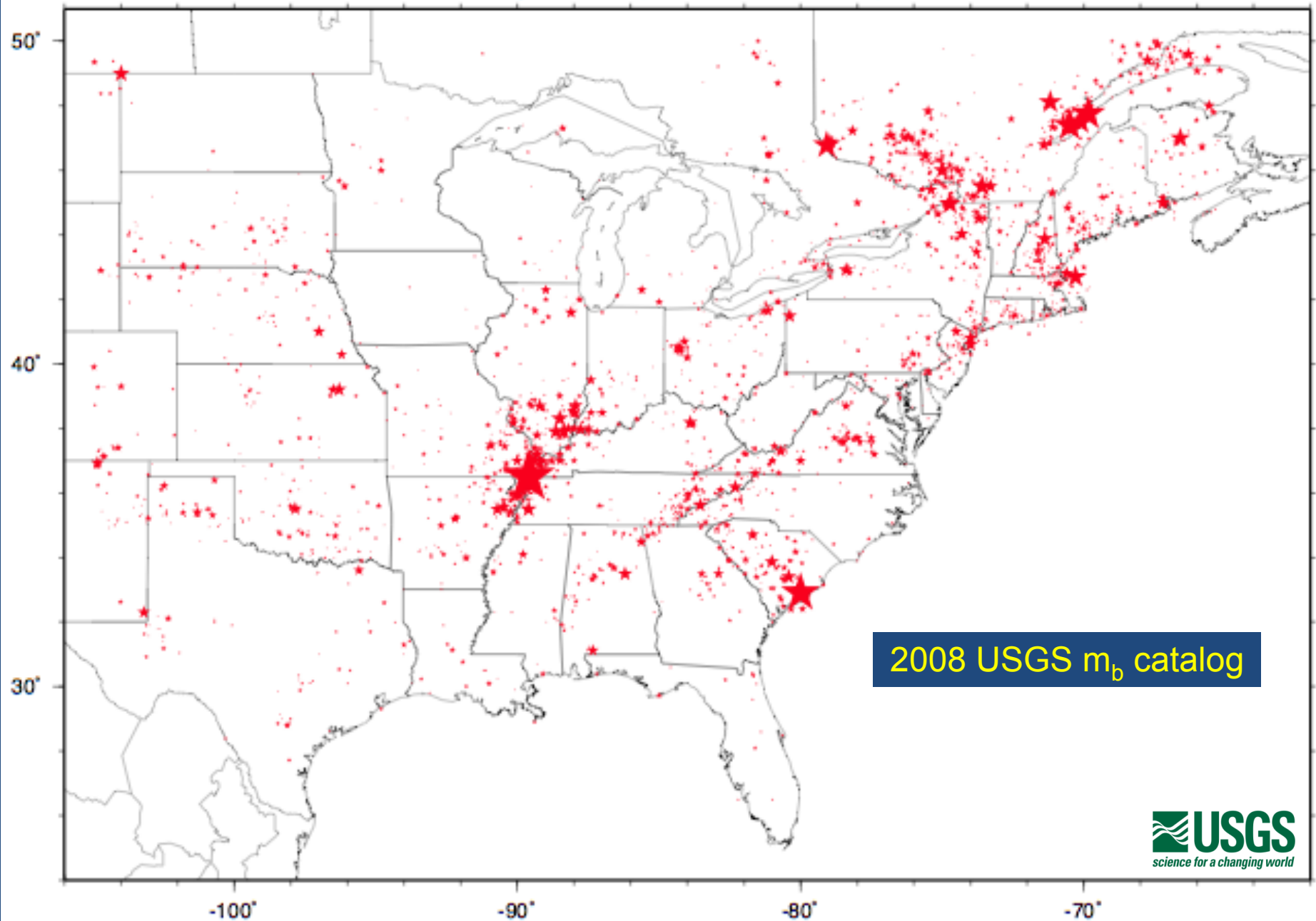
## For Catalog Comparisons...

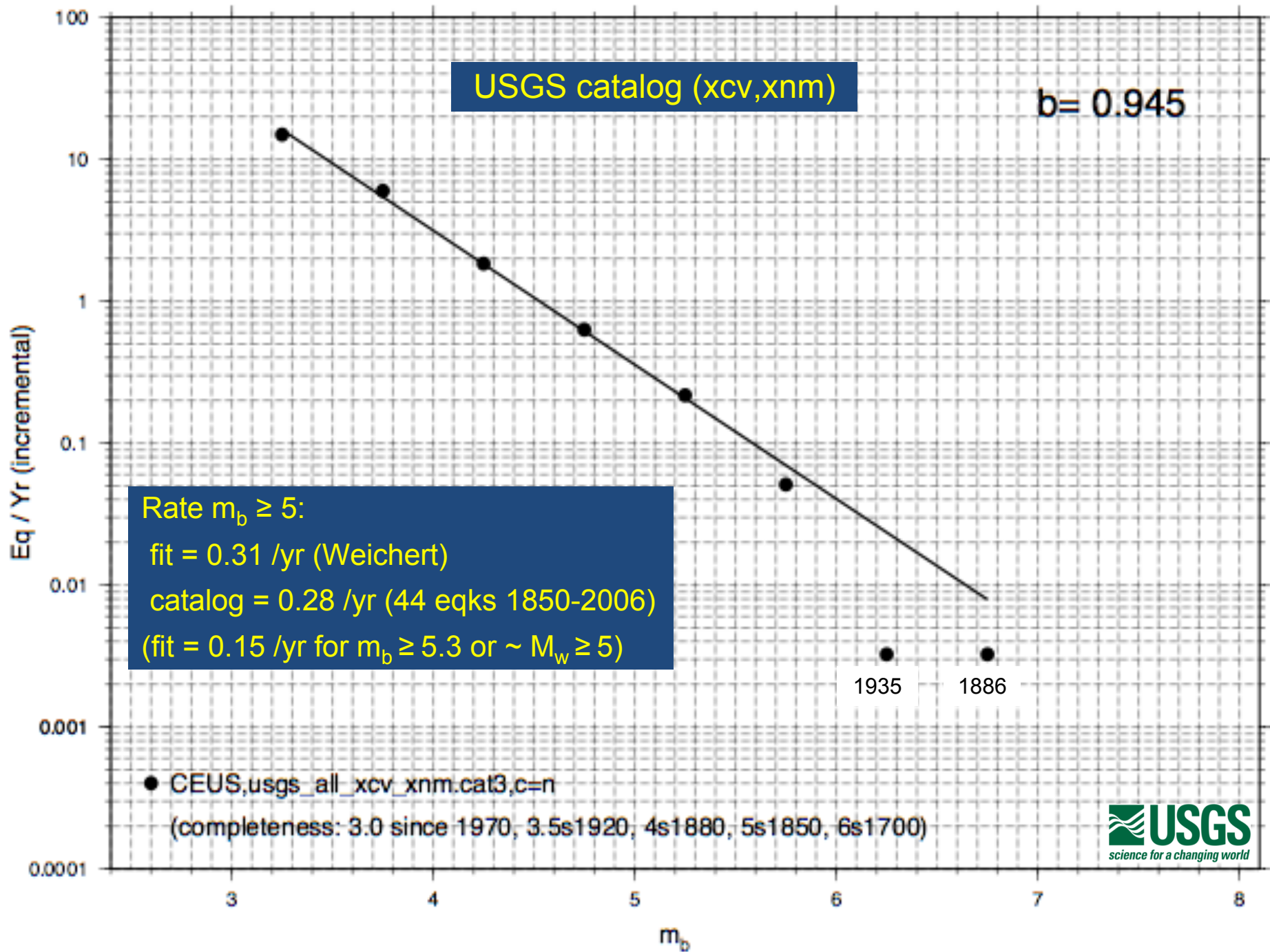
- ✓ 1700-2006
- ✓ Gardner & Knopoff decluster
- ✓ exclude Charlevoix & New Madrid

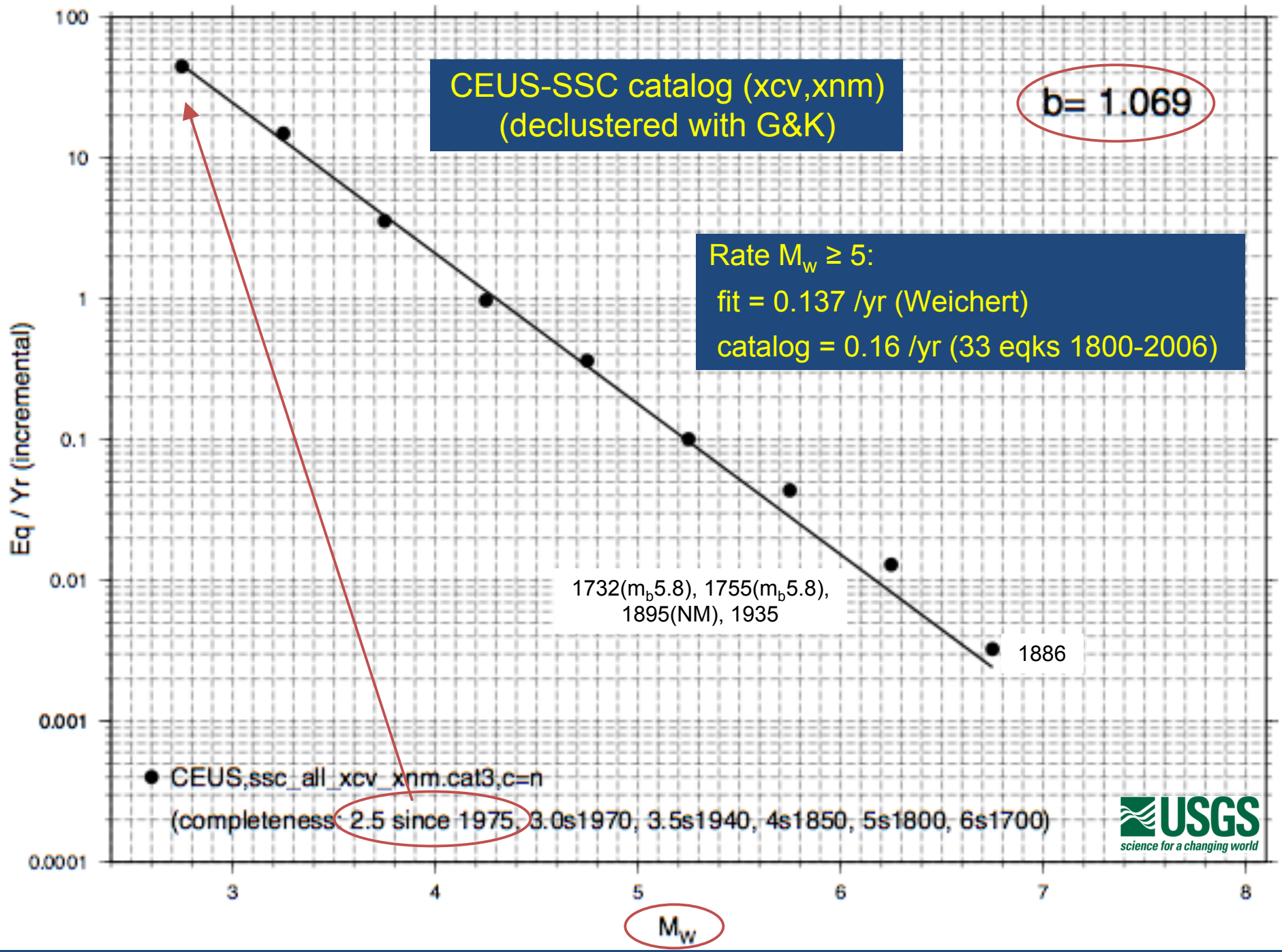
USGS/NSHMP catalog:  $m_b$ -based

CEUS-SSC catalog:  $M_W$ -based

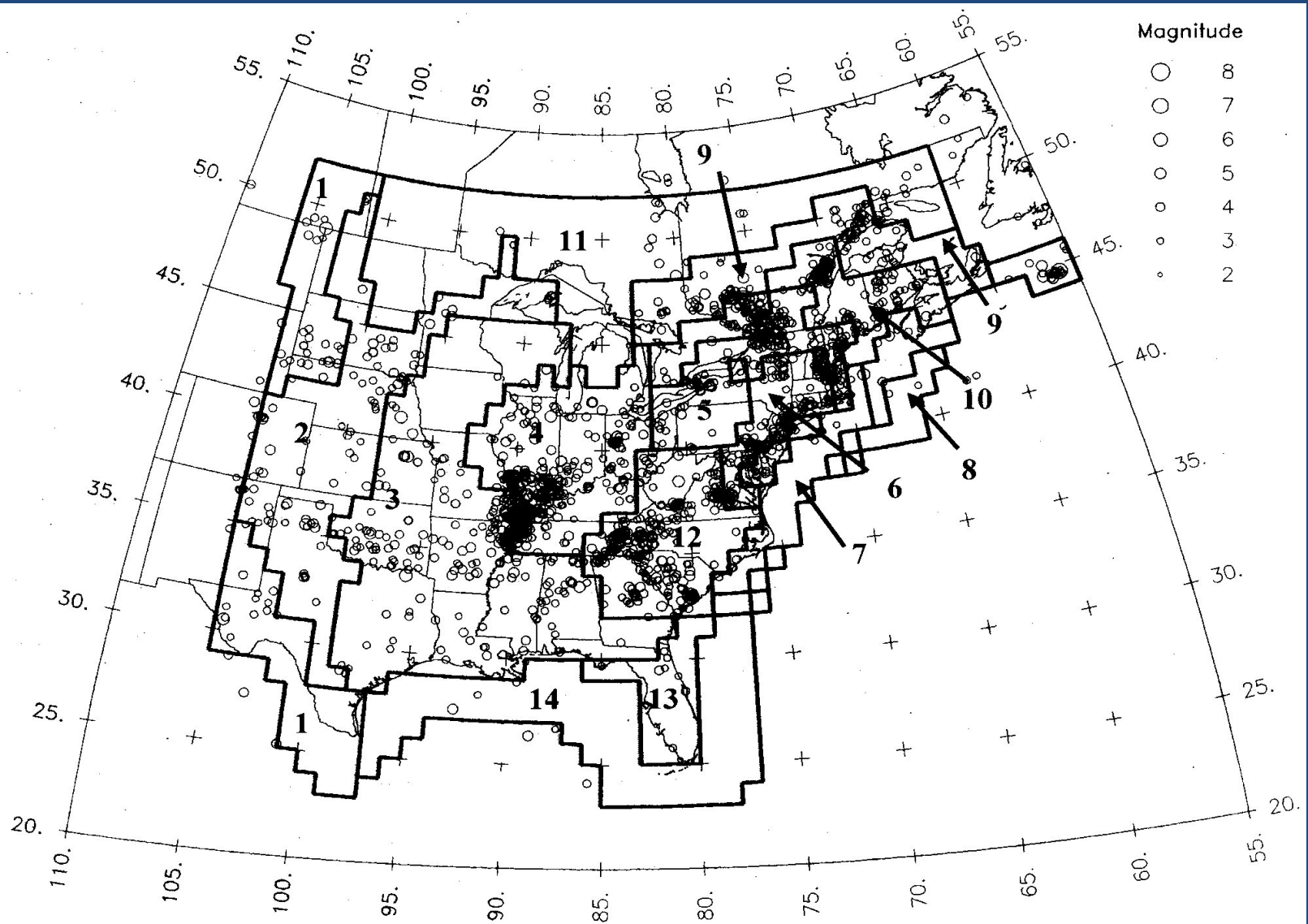
usgs\_all.cat3 (mb>3,1700-2006,G&K)







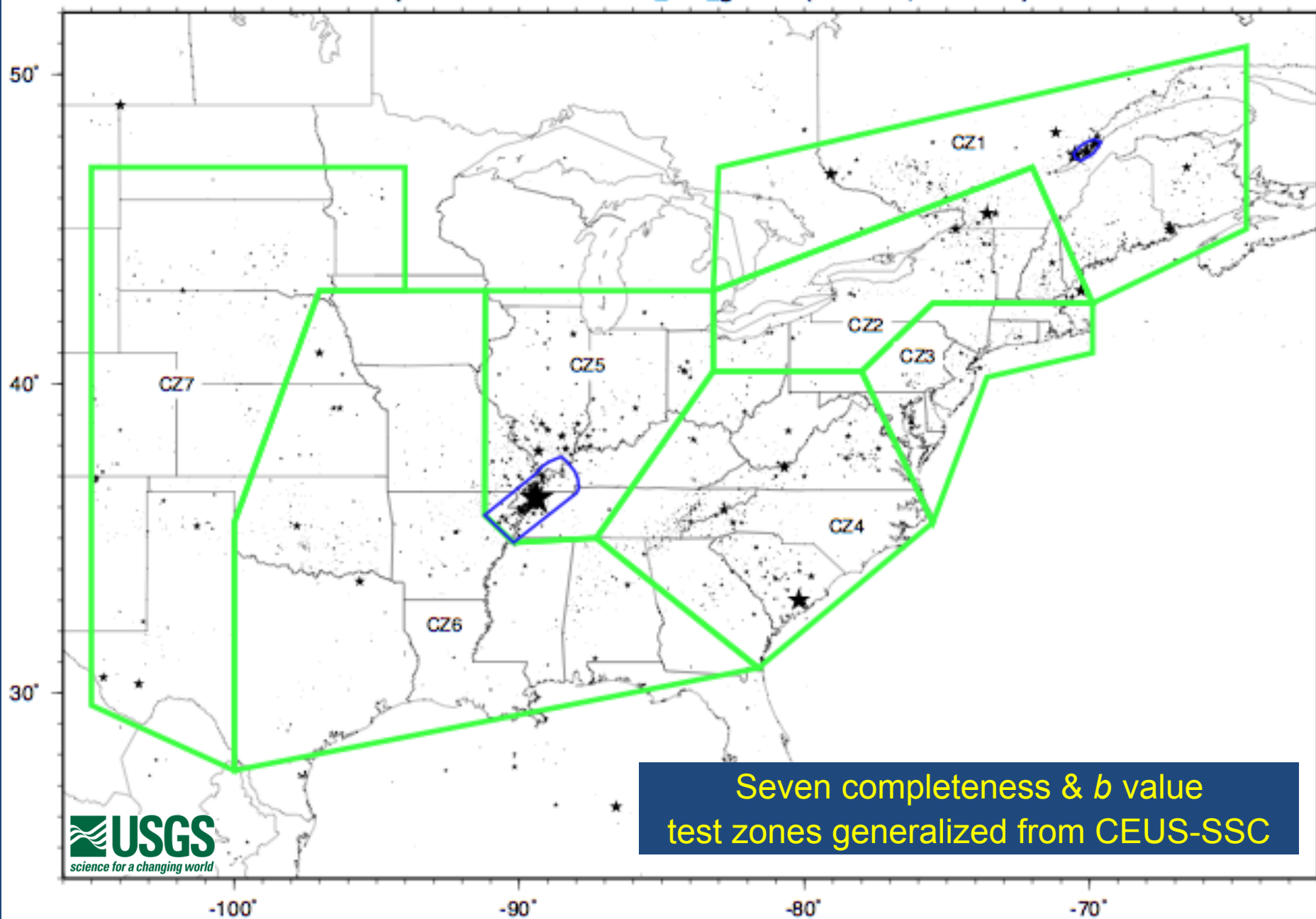
## Explore finer-scale completeness & *b* value zonation



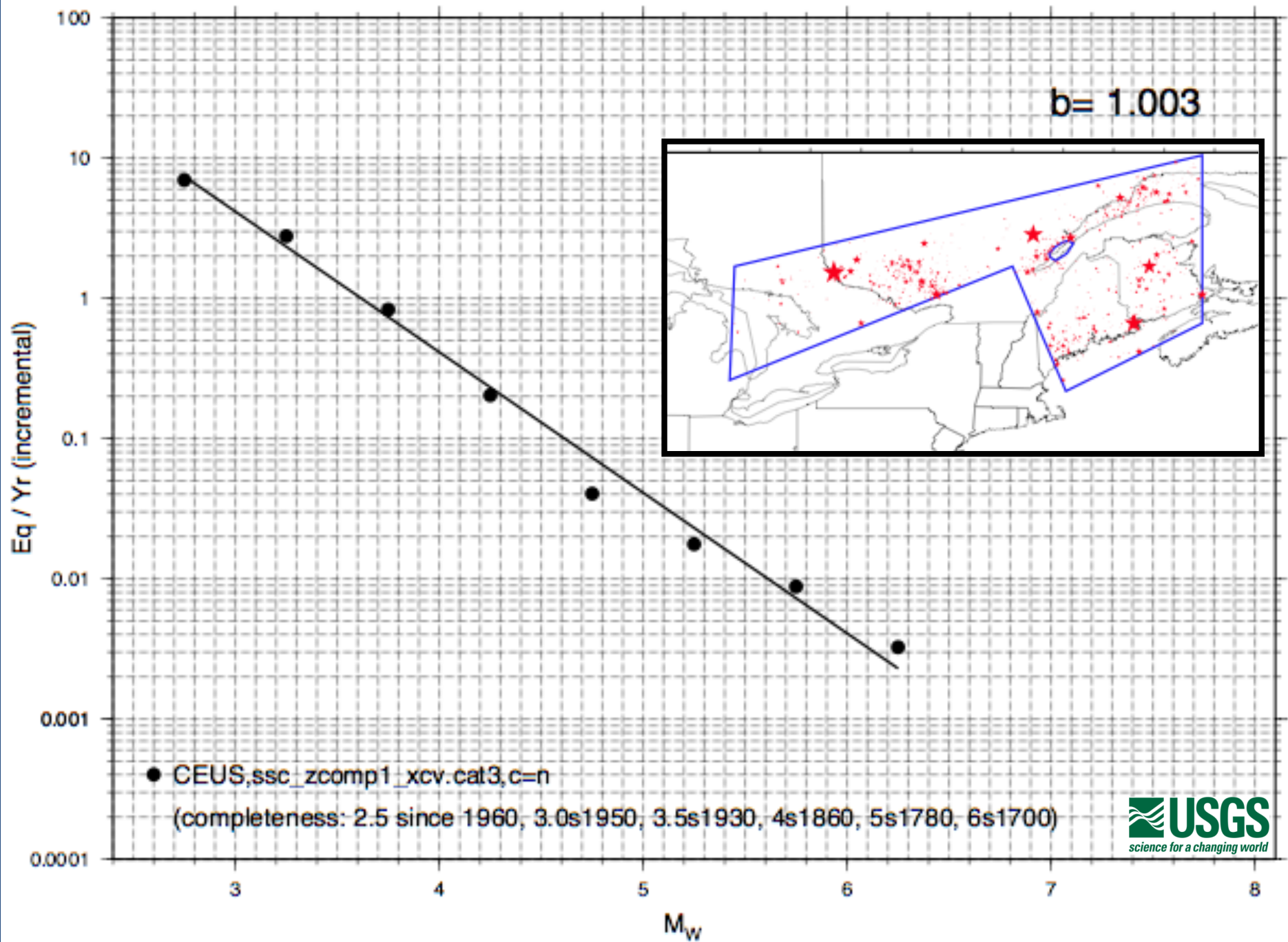
**Figure 3.5-2**  
**CEUS SSC Project earthquake catalog and modified catalog completeness regions.**



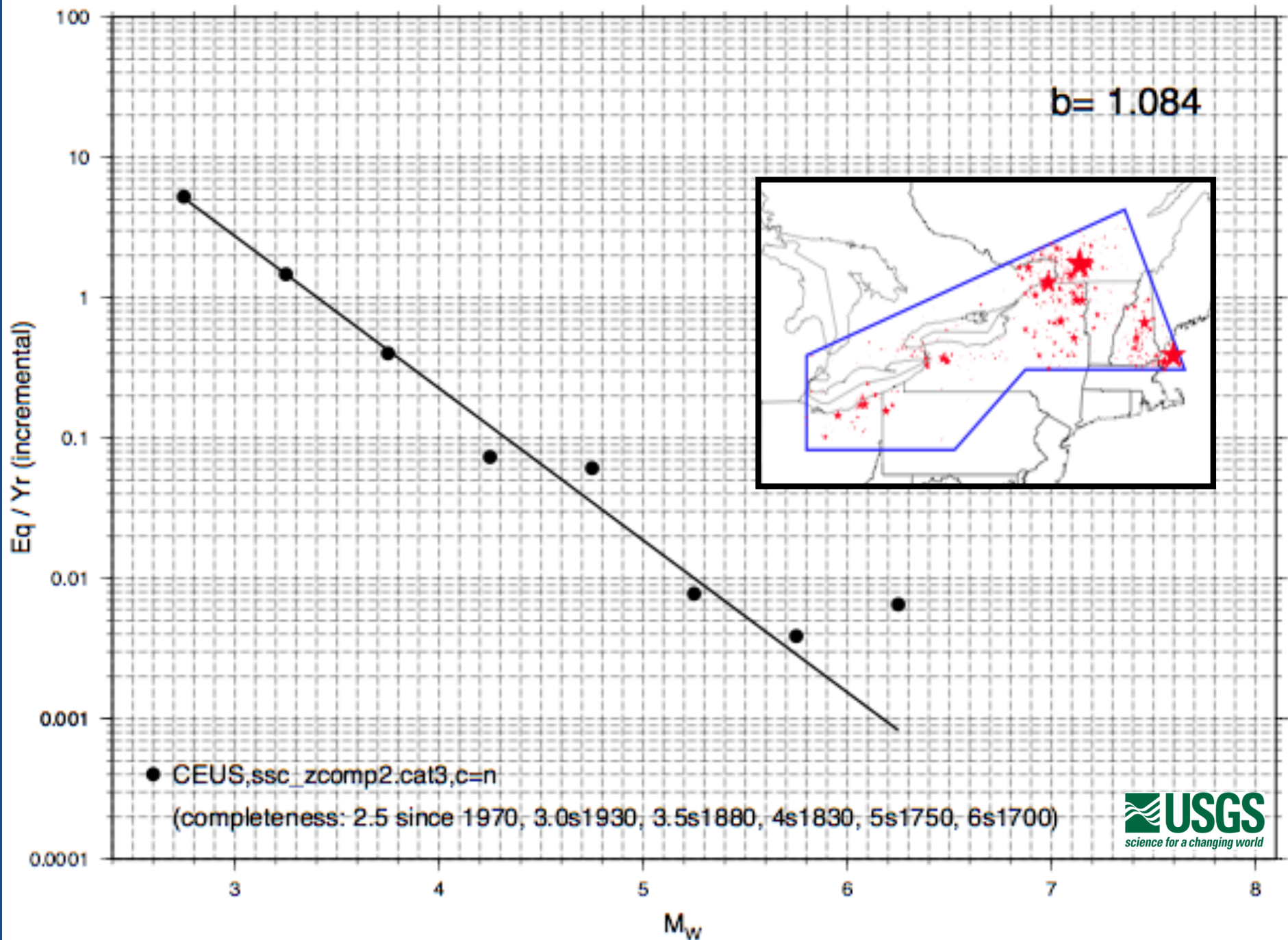
completeness zones & emm\_ssc\_gk.cat3 (Mw $\geq$ 2.5,1700-2006)

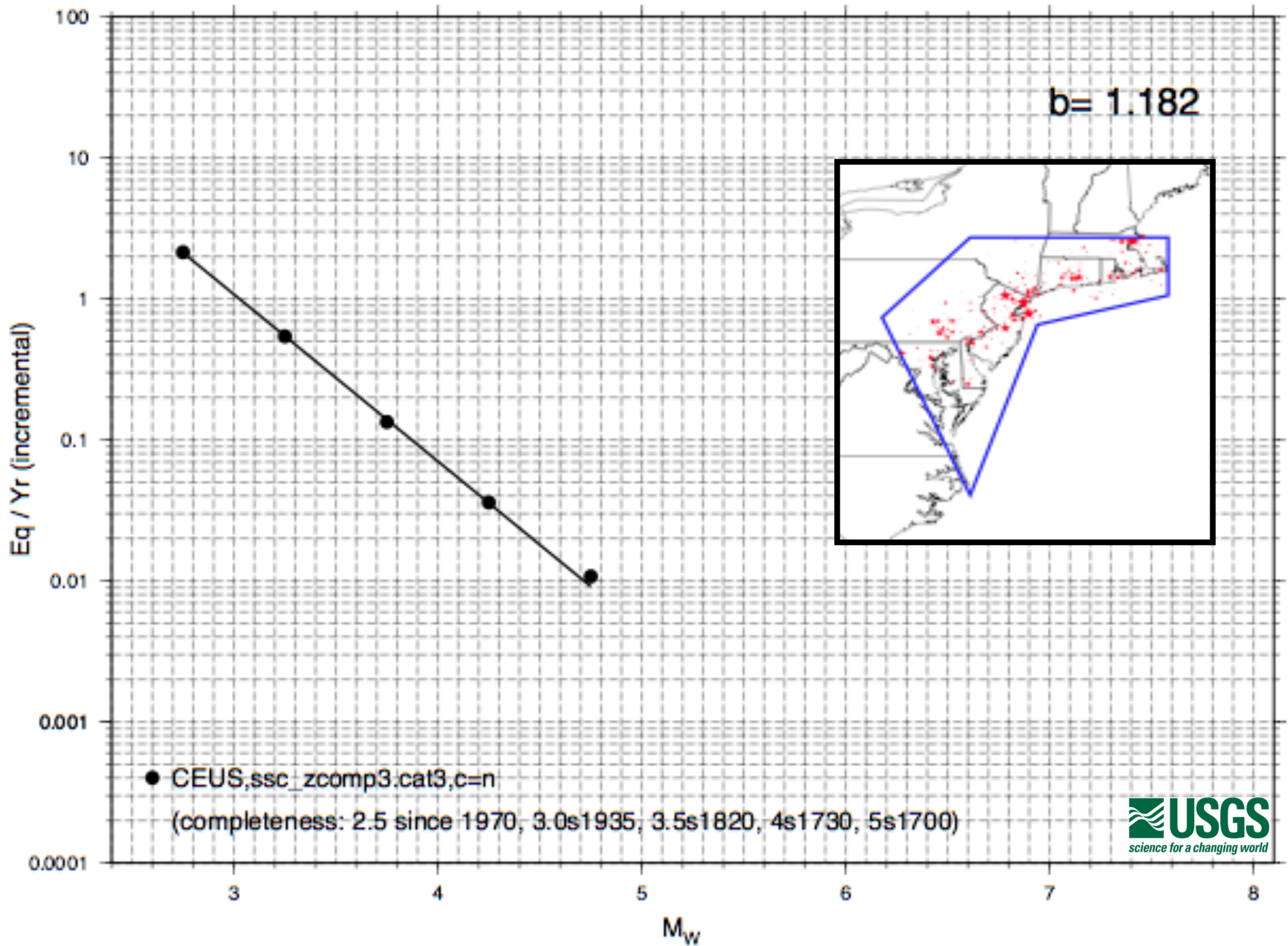


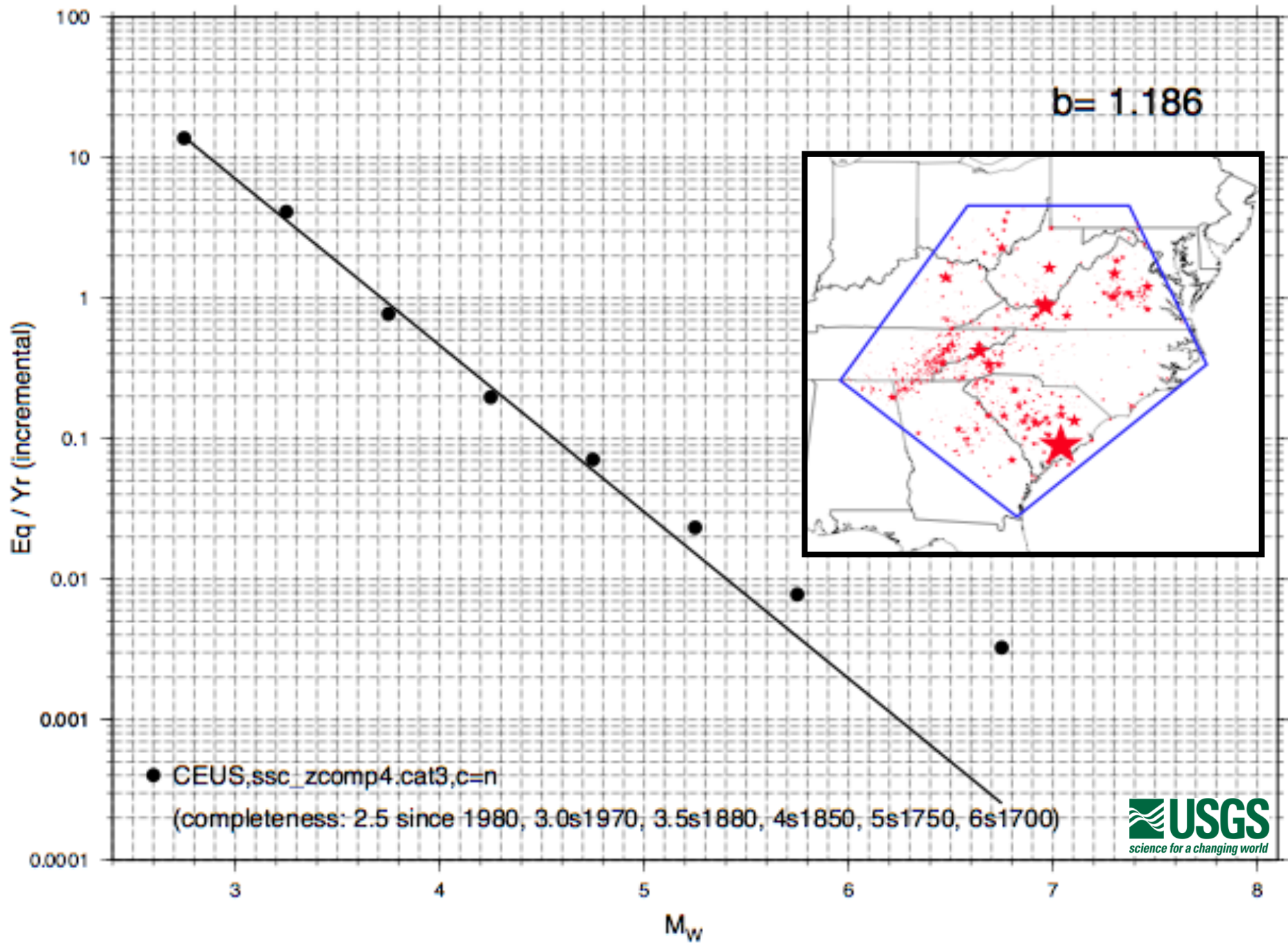
Seven completeness & *b* value test zones generalized from CEUS-SSC



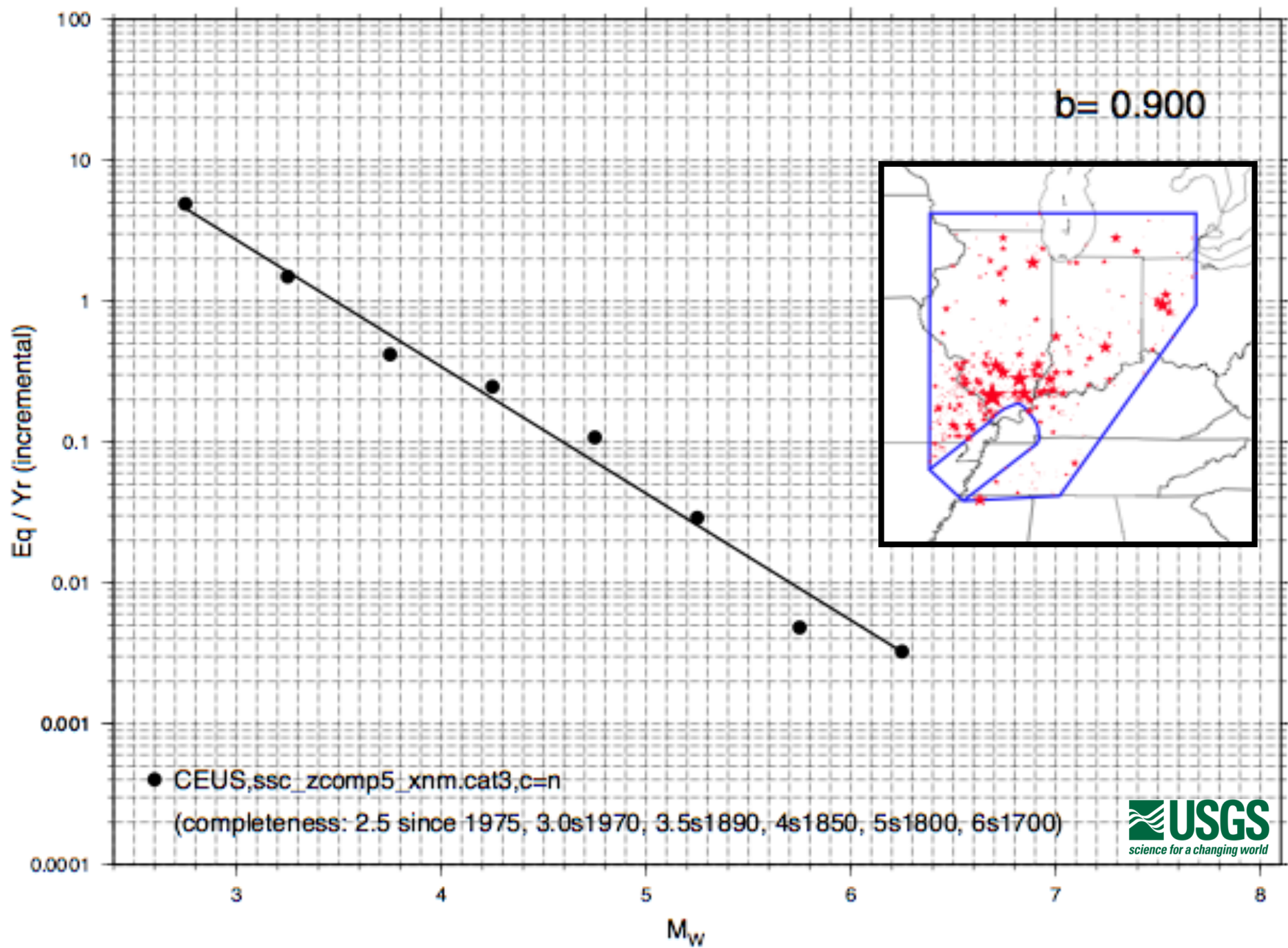


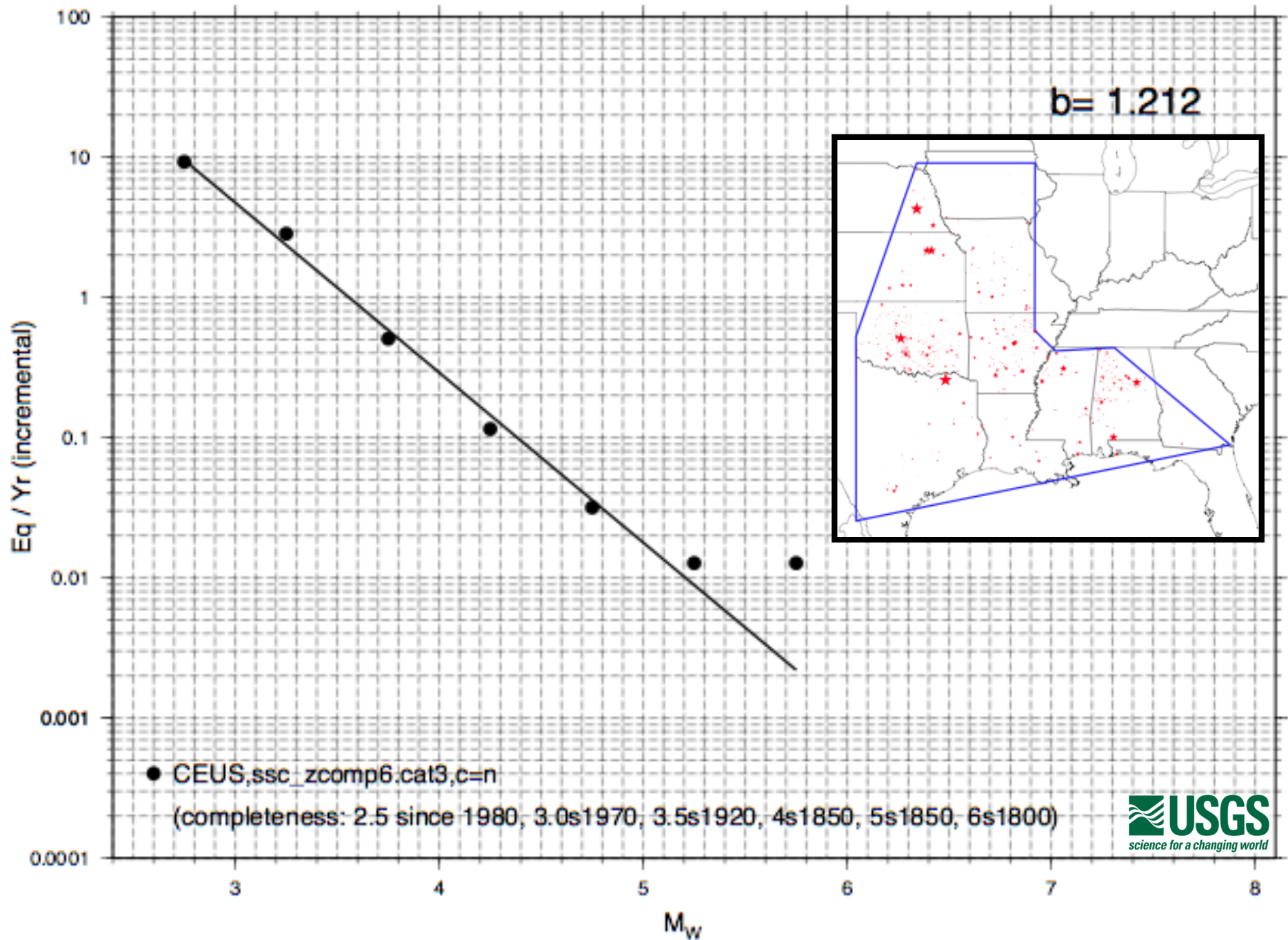




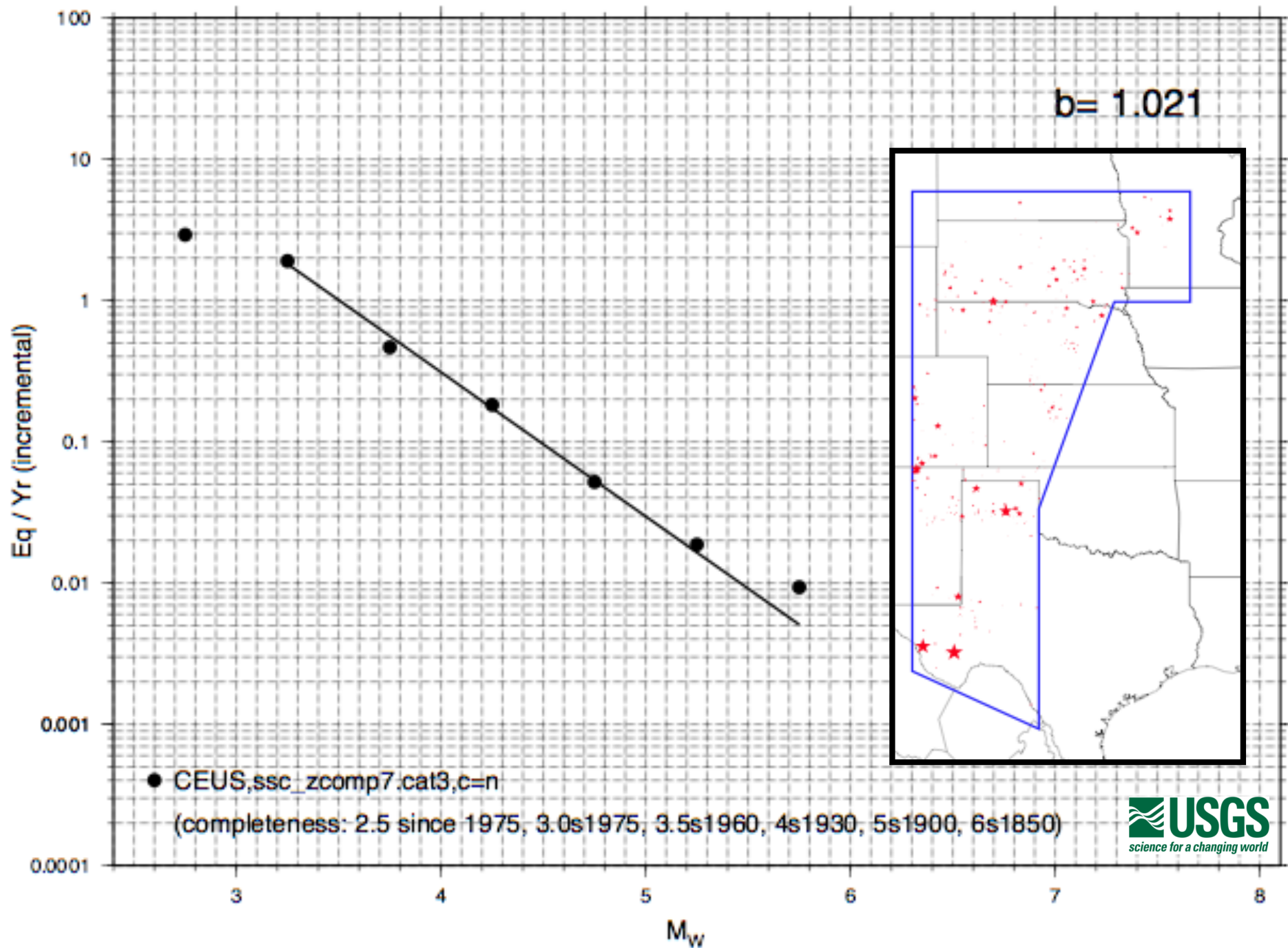










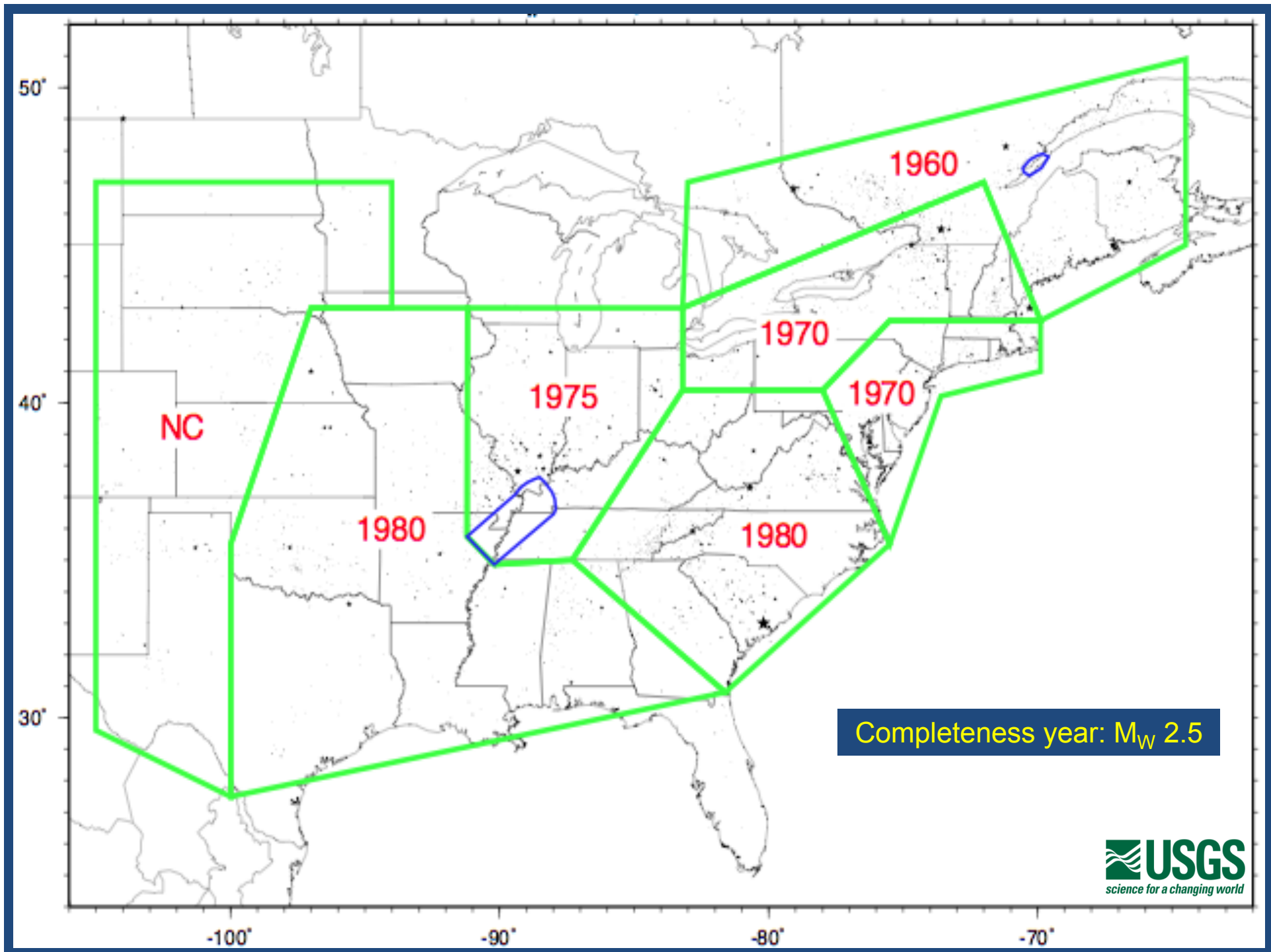


CEUS completeness zone #3

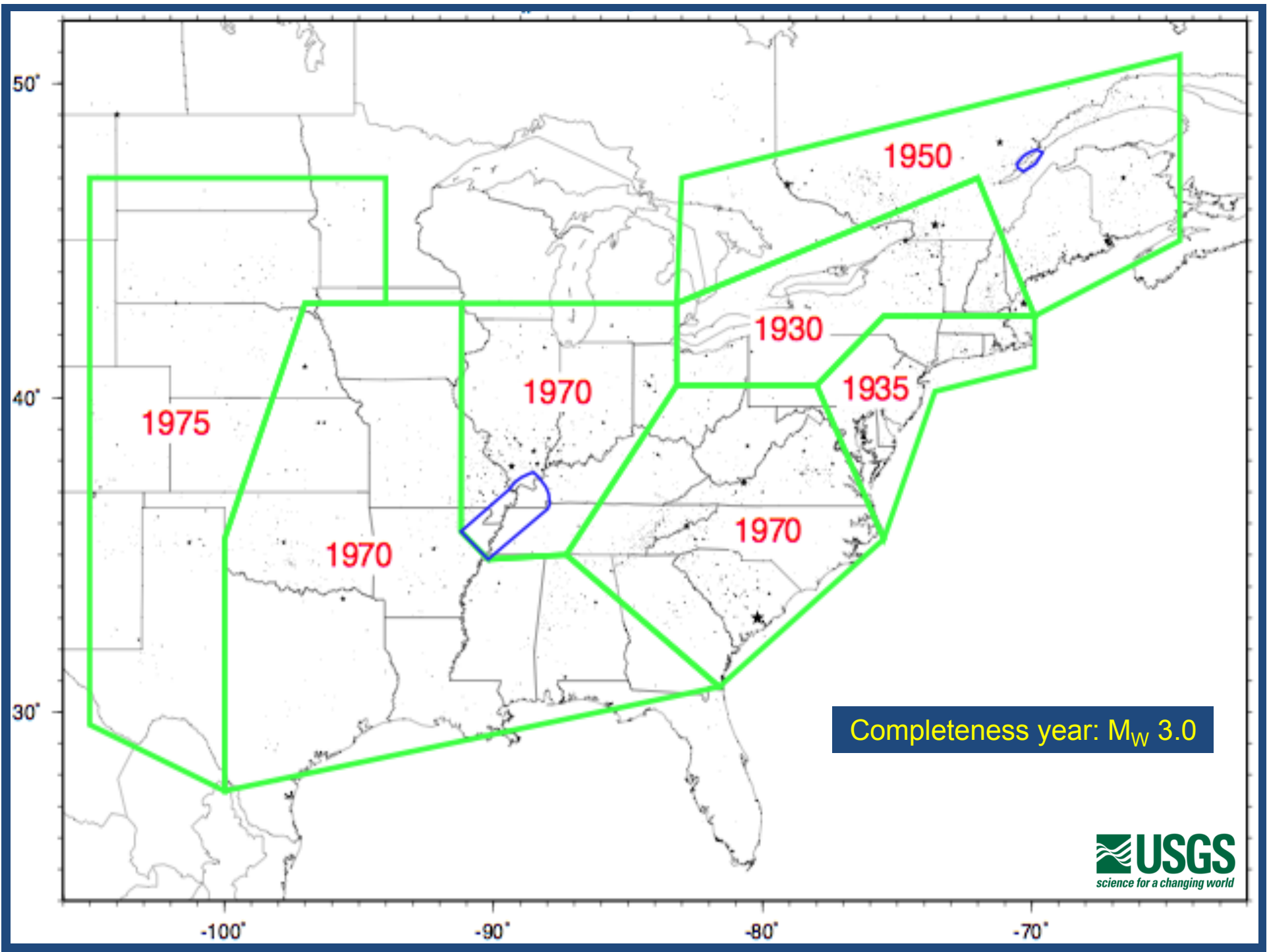
CEUS-SSC Mw catalog (G&K)

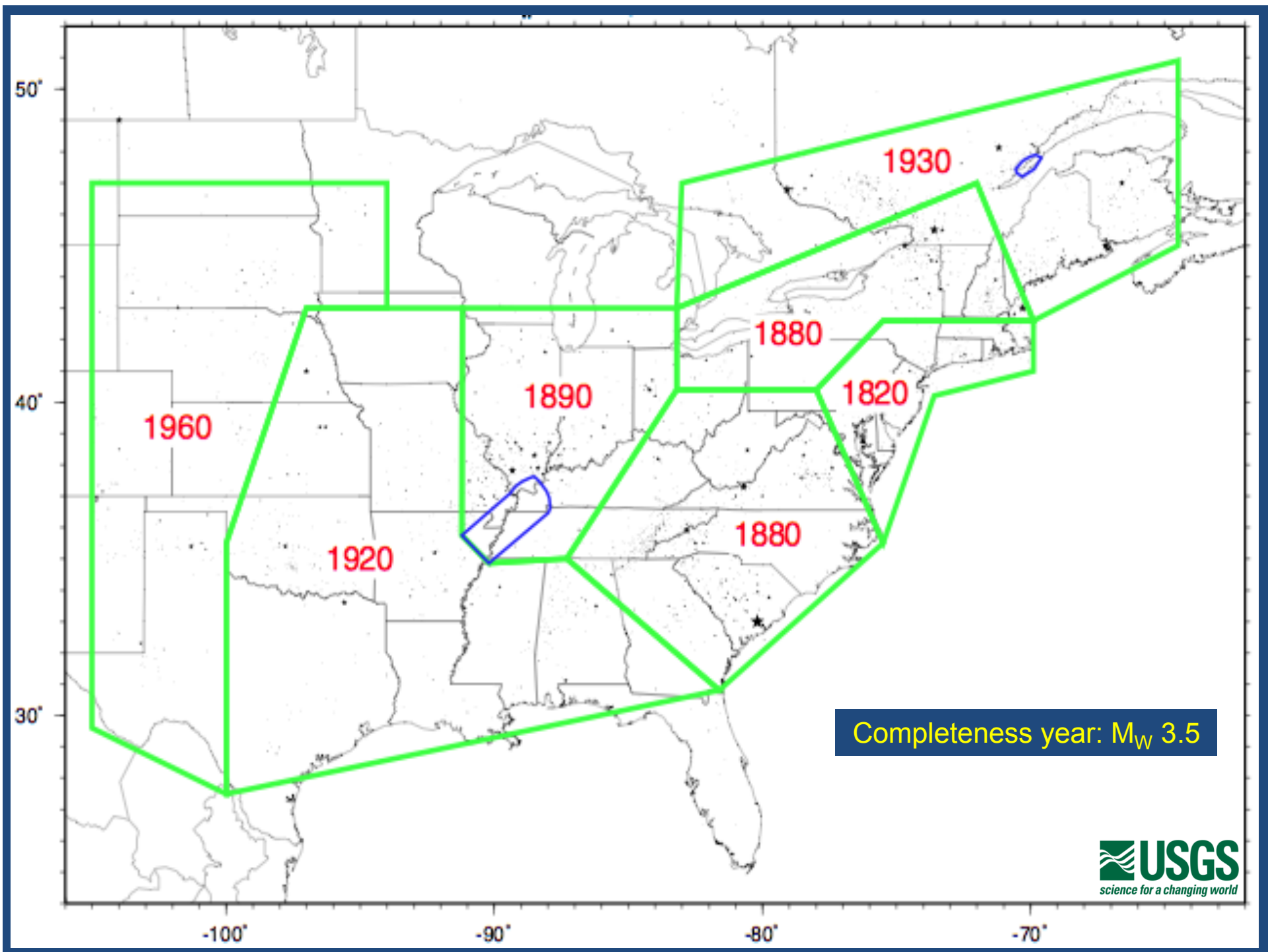
	2.5	3.0	3.5	4.0	4.5	5.0	5.5	6.0
1701-10	2	0	0	0	0	0	0	0
1711-20	1	0	0	0	0	0	0	0
1721-30	2	0	0	0	0	0	0	0
1731-40	2	0	0	0	1	0	0	0
1741-50	1	1	0	1	0	0	0	0
1751-60	4	1	0	0	0	0	0	0
1761-70	0	1	1	1	0	0	0	0
1771-80	1	1	0	0	0	0	0	0
1781-90	2	0	0	0	1	0	0	0
1791-00	7	0	1	2	0	0	0	0
1801-10	7	0	0	0	0	0	0	0
1811-20	1	1	0	1	0	0	0	0
1821-30	5	1	1	0	0	0	0	0
1831-40	6	1	2	0	0	0	0	0
1841-50	3	1	3	1	0	0	0	0
1851-60	4	4	1	0	0	0	0	0
1861-70	1	4	0	0	0	0	0	0
1871-80	0	7	2	0	0	0	0	0
1881-90	6	9	2	0	1	0	0	0
1891-00	18	9	2	2	0	0	0	0
1901-10	8	1	1	0	0	0	0	0
1911-20	4	0	0	0	0	0	0	0
1921-30	14	3	2	0	0	0	0	0
1931-40	12	4	1	1	0	0	0	0
1941-50	9	4	2	0	0	0	0	0
1951-60	9	5	1	0	0	0	0	0
1961-70	5	8	2	0	0	0	0	0
1971-80	28	12	1	0	0	0	0	0
1981-90	20	2	2	1	0	0	0	0
1991-00	26	4	0	0	0	0	0	0
2001-06	5	1	0	0	0	0	0	0

Unstable completeness levels: due to mixed source catalogs?

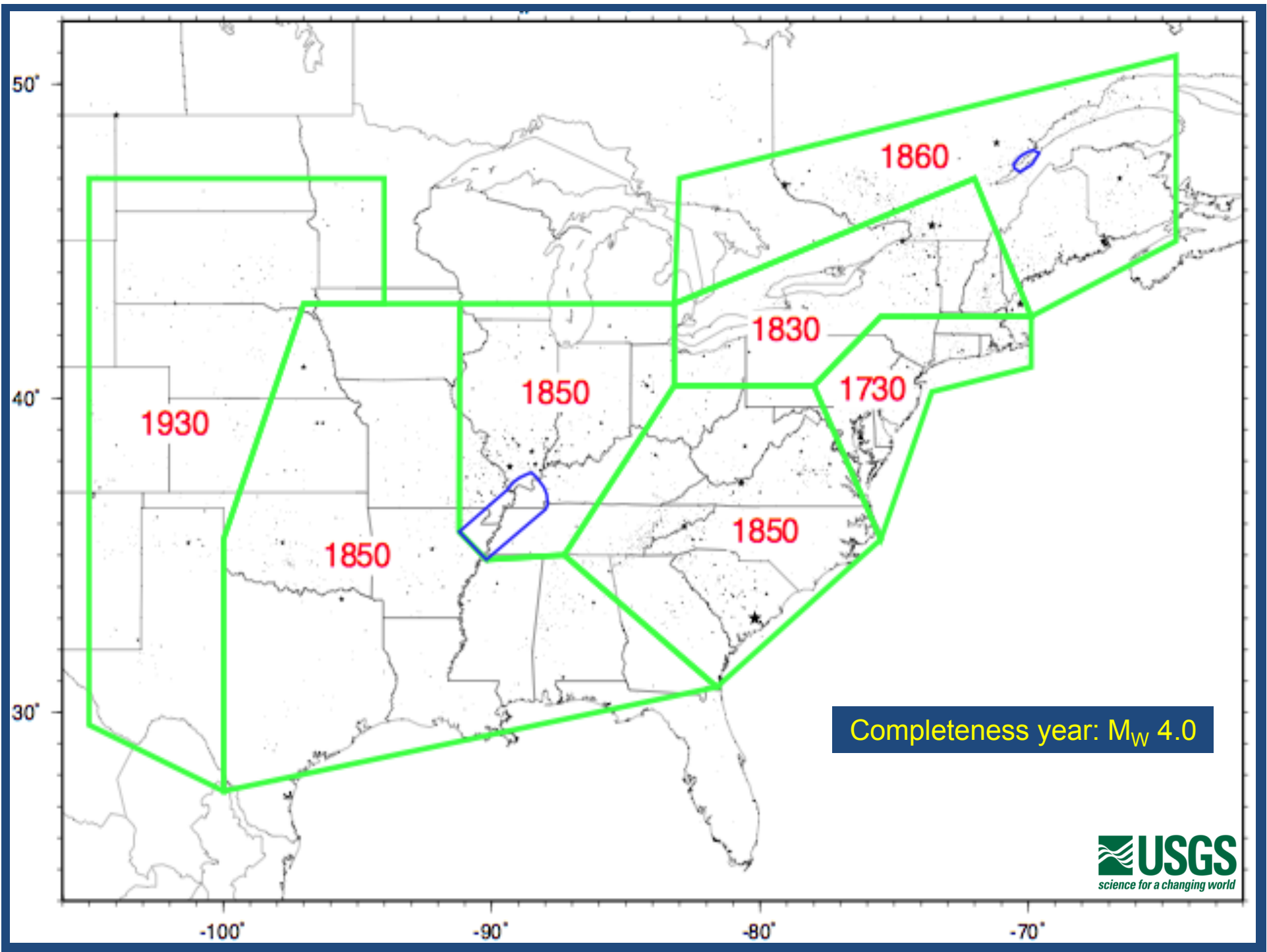


Completeness year:  $M_w$  2.5

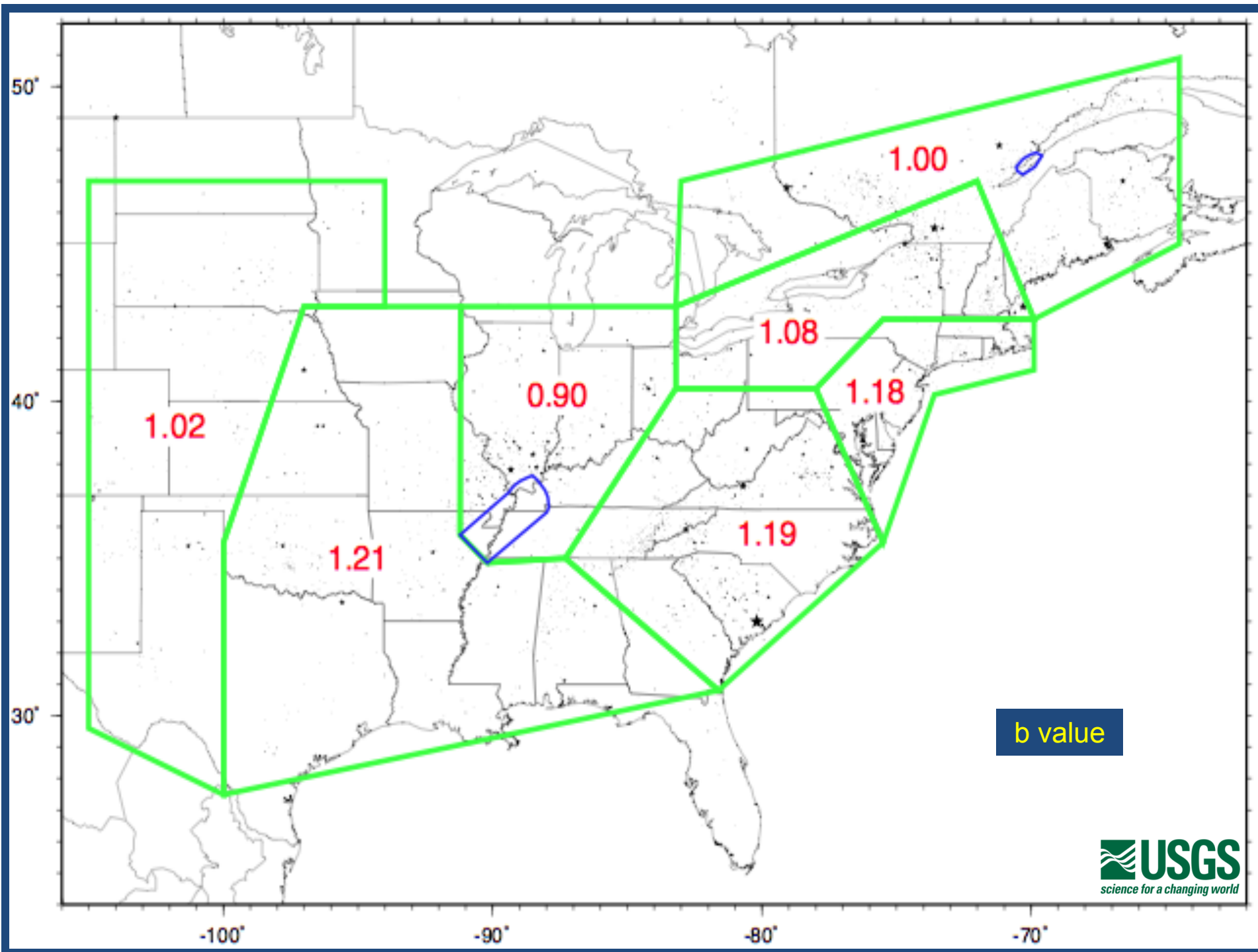




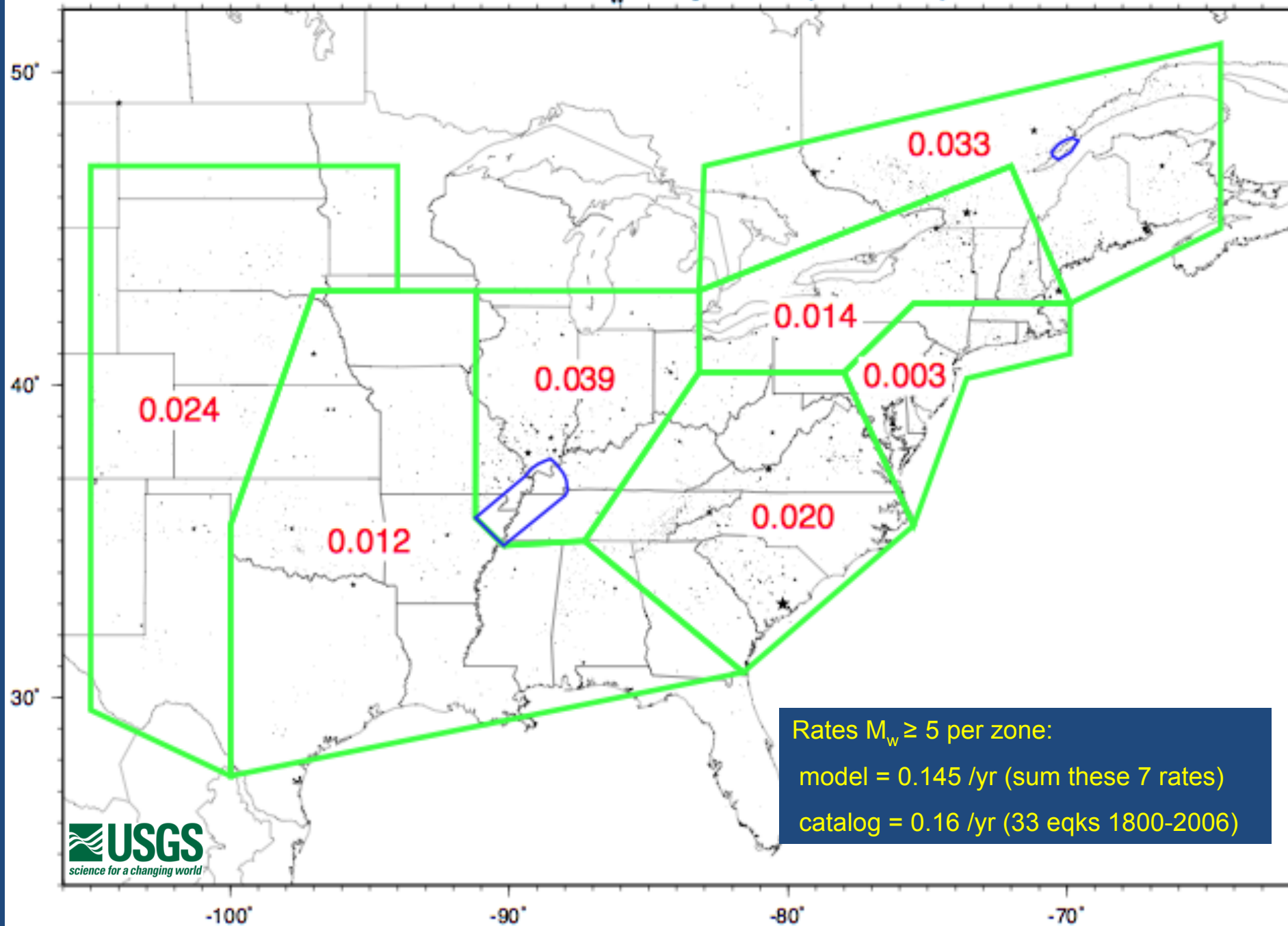




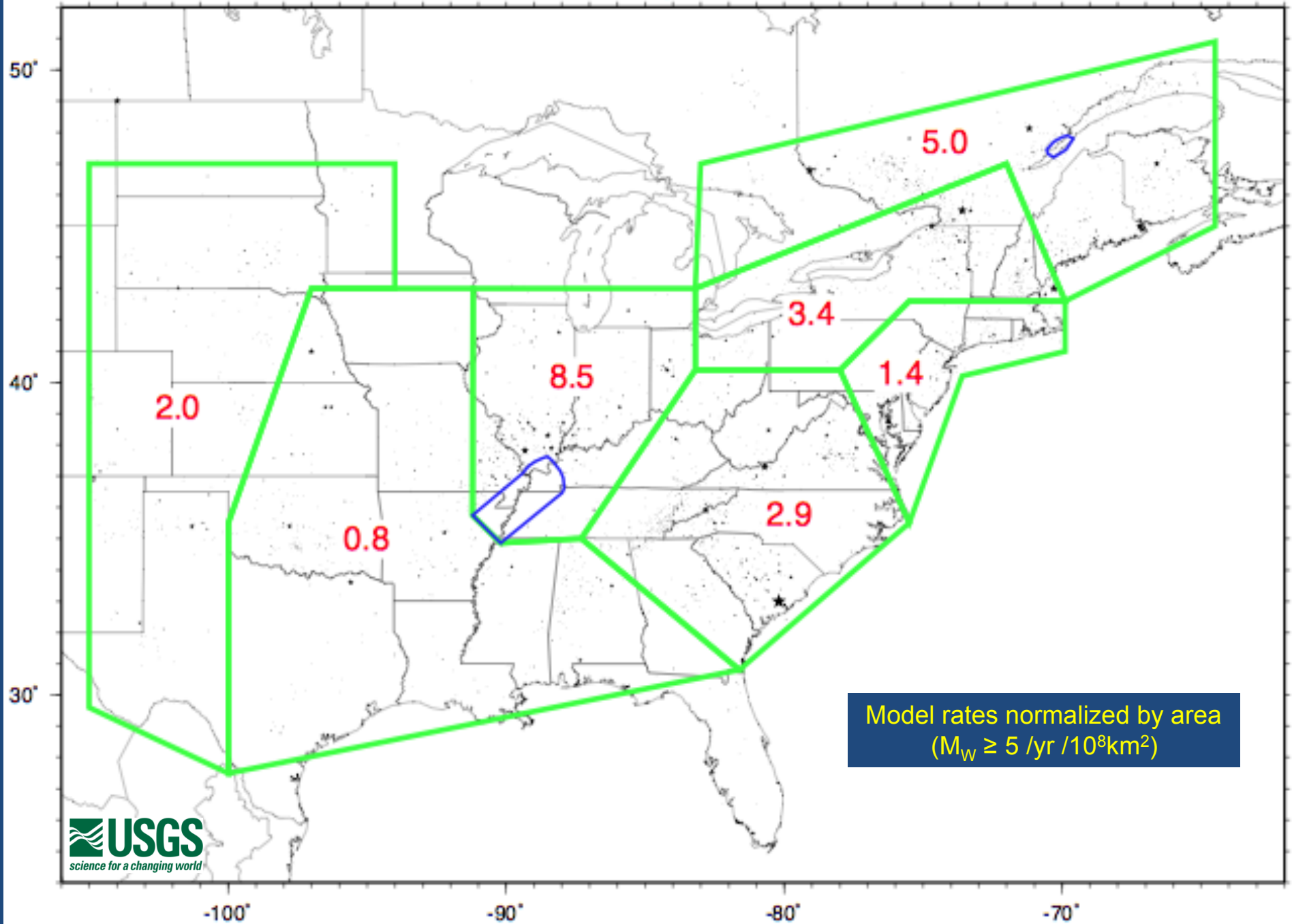
Completeness year:  $M_w$  4.0



### Model Rates: $M_w \geq 5$ /yr /zone (xcv&xnm)



Model Rates:  $M \geq 5$  /yr / $10^8 \text{km}^2$  (xcv&xnm)



Is finer zonation better ... ?

