NORTHEAST UTILITIES

THE CONNECTICUT LIGHT AND POWER COMPANY
WESTERN MASSACHUSETTS ELECTRIC COMPANY
HOLYOKE WATER POWER COMPANY
NORTHEAST UTILITIES SERVICE COMPANY
NORTHEAST NUCLEAR ENERGY COMPANY

General Offices • Selden Street, Berlin, Connecticut

P.O. BOX 270
HARTFORD, CONNECTICUT 06141-0270
(203) 666-6911

December 14, 1983

Docket No. 50-423

B10978

Mr. B. J. Youngblood, Chief
Licensing Branch No. 1
Division of Licensing
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Dear Mr. Youngblood:

Millstone Nuclear Power Station, Unit No. 3
Transmittal of Viewgraphs Presented
in Applicant's November 29, 1983
Meeting with Geosciences Branch

Attached is one set of the viewgraphs used in the Applicant's presentation to the Geosciences Branch on November 29, 1983 at Bethesda, Maryland. A copy of these viewgraphs was also hand-delivered to Ms. E. L. Doolittle on December 13, 1983.

Some of the viewgraphs are color composites and therefore did not reproduce. Please note that these are annotated to reference specific figures, or overlays of figures, contained in "Seismological and Geological Studies, Miramichi Area, New Brunswick and Central New Hampshire" prepared by Weston Geophysical Corporation.

If you have any questions regarding this information, please contact our licensing representative, Ms. C. J. Shaffer, directly.

Very truly yours,

NORTHEAST UTILITIES SERVICE COMPANY

W. G. Counsil

W. G. Counsil
Senior Vice President

cc: Ms. E. L. Doolittle
NRC Project Manager

B001
1/1

MILLSTONE
SOIL AMPLIFICATION
— "SHAKE" ANALYSES
UNIT 3

VIEWGRAPHS PRESENTED
BY FRANK VETERE
OF STONE & WEBSTER

AT NOVEMBER 29, 1983
MEETING AT BETHESDA, MD.
(GEOSCIENCES BRANCH AND
APPLICANT)

SSE DETERMINATION
MILLSTONE 3
FSAR

- SITE IN SOUTHEASTERN NEW ENGLAND - MARITIME PROVINCE
- MAXIMUM HISTORICAL EARTHQUAKE INTENSITY VI (MM)

ADJACENT PROVINCES

- NEW ENGLAND PROVINCE

  INTENSITY VII (MM)

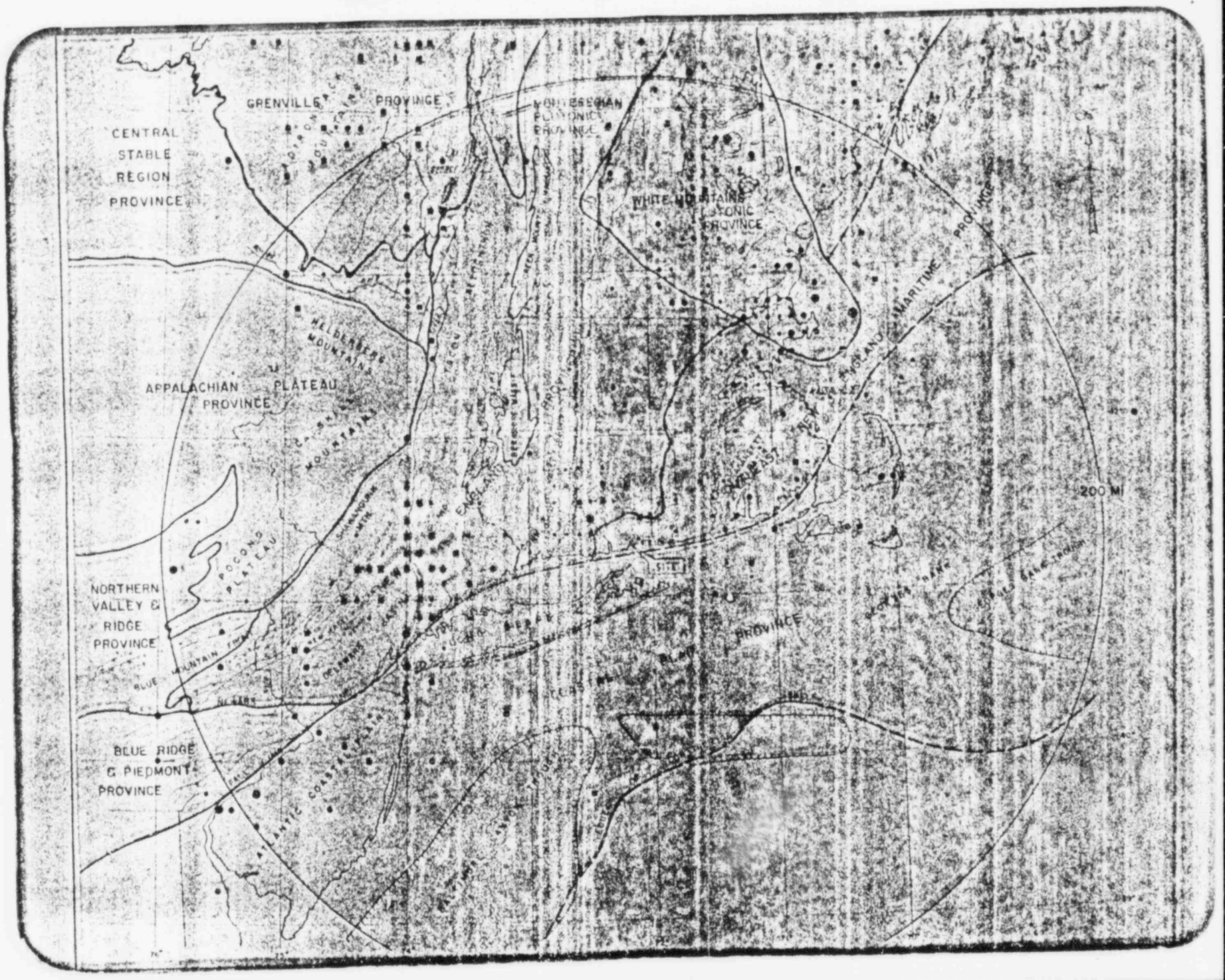
  1568, 1791 MOODUS

- COASTAL PLAIN PROVINCE

  INTENSITY VII(MM)

  1871, 1884, 1927 NORTHERN NEW JERSEY

  1927 ASBURY PARK



FSAR Fig. 2.5.2-2
Epicenters of Earthquakes within 200 Mile Radius

MAXIMUM HISTORICAL SITE INTENSITY

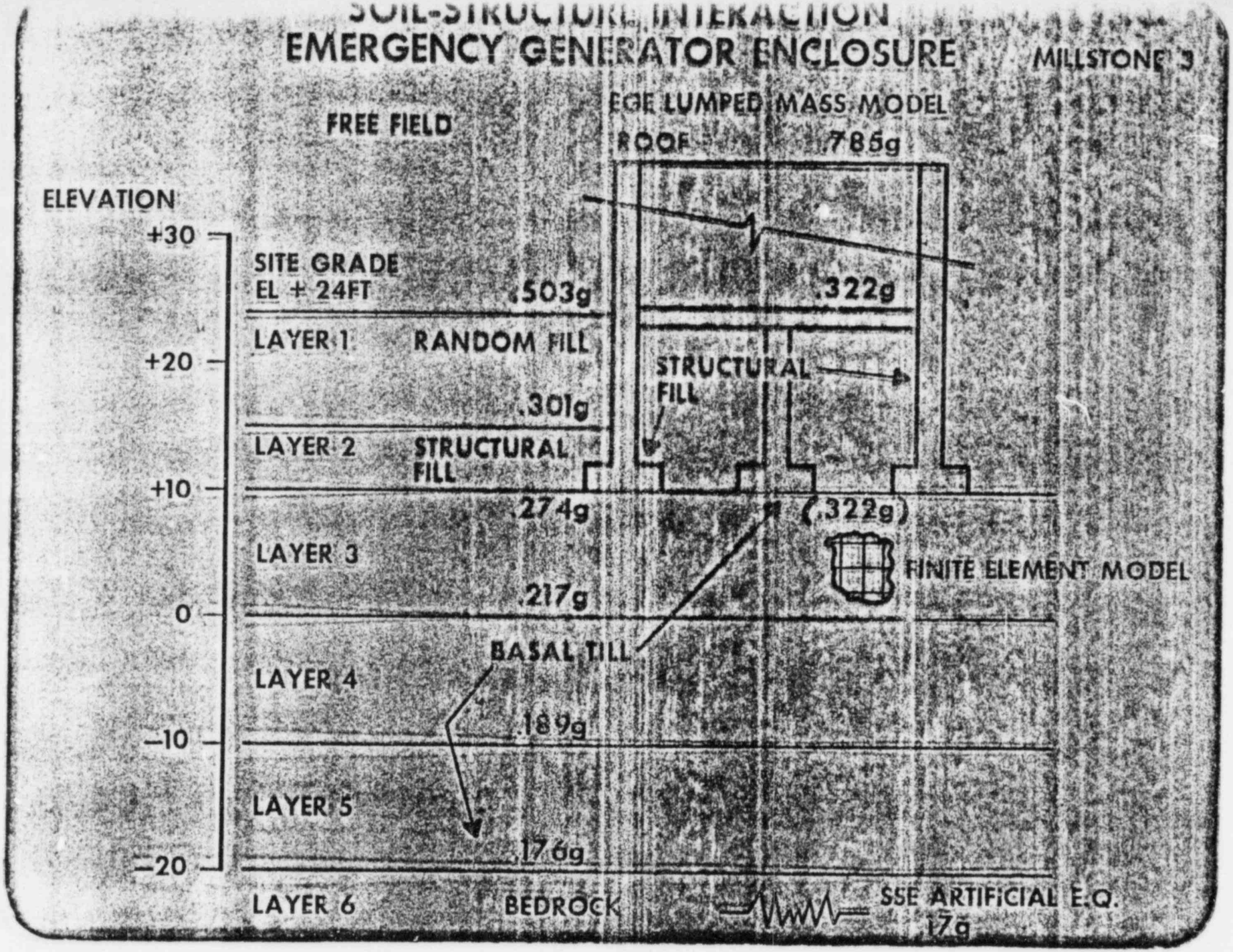
- 1775 CAPE ANN V-VI (MM)
- 1791 MOODUS V (MM)
- 1737, 1884 NEW YORK CITY V (MM)

MAXIMUM EARTHQUAKE POTENTIAL

- INTENSITY VII (MM)
- WITHIN 10-20 KM OF SITE
- FROM ADJACENT PROVINCES

CORRELATION WITH PEAK HORIZONTAL ACCELERATION

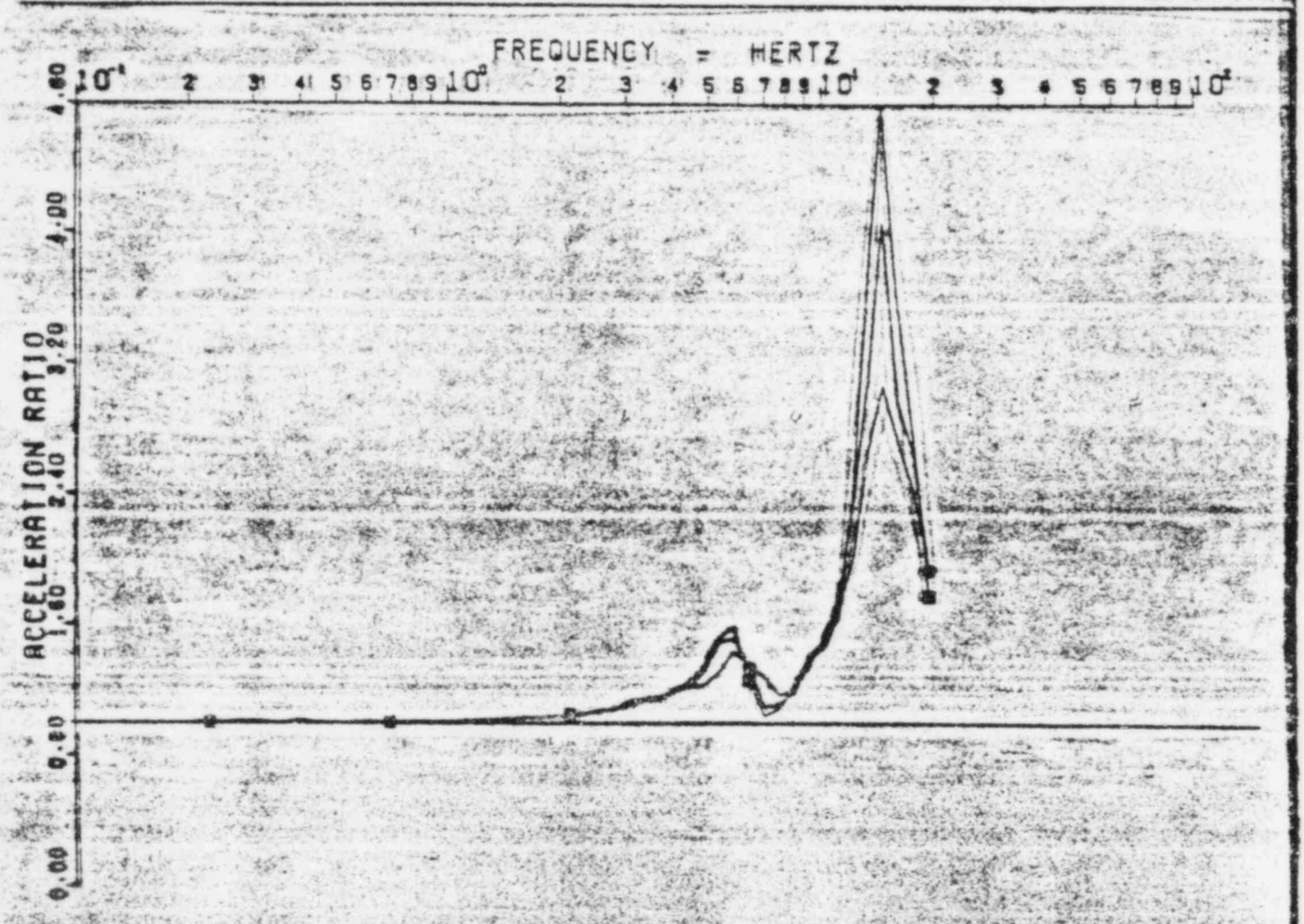
- MURPHY & O'BRIEN (1977) - 0.10g FOR VII (MM)
- SITE SSE IS .17g


SOIL-STRUCTURE INTERACTION
EMERGENCY GENERATOR ENCLOSURE
MILLSTONE 3
FREE FIELD
EGE LUMPED MASS MODEL
ROOF
.785g
ELEVATION
+30
SITE GRADE
EL + 24FT
.503g
.322g
LAYER 1 RANDOM FILL
+20
.301g
STRUCTURAL FILL
LAYER 2 STRUCTURAL FILL
+10
.274g
(.322g)
LAYER 3
.217g
FINITE ELEMENT MODEL
0
BASAL TILL
LAYER 4
.189g
-10
LAYER 5
.176g
-20
LAYER 6 BEDROCK
SSE ARTIFICIAL E.Q.
.17g

FREE FIELD SHAKE ANALYSIS
EMERGENCY GENERATOR ENCLOSURE (EGE)

LAYER	TOP ELEVATION	TAFT			PARKFIELD			PACOIMA DAM		
		G	D	a_h	G	D	a_h	G	D	a_h
RANDOM FILL	+ 24 FT	613	.087	.35	457	.140	.68	576	.101	.38
STRUCTURAL FILL	+ 15 FT	778	.104	.22	825	.116	.31	697	.120	.28
BASAL TILL	+ 10 FT	18800	.014	.18	18715	.014	.33	17968	.019	.21
BASAL TILL	0 FT	17850	.018	.18	17249	.022	.30	16913	.024	.21
BASAL TILL	- 10 FT	16981	.022	.17	16077	.025	.22	15470	.029	.19
BEDROCK	- 20 FT			.17			.16			.17

G = STRAIN CORRECTED SHEAR MODULUS (KSF)
D = STRAIN CORRECTED DAMPING RATION
a_h = PEAK HORIZONTAL GROUND ACCELERATION (g)



SPECTRUM USING 2048 POINTS AT 0.010 SECONDS

- ■ 0.020 DAMPING - MILLSTONE 3 ARTIFICIAL EARTHQUAKE (SUBLAYER 3 / SUBLAYER 6
- ● 0.050 DAMPING - MILLSTONE 3 ARTIFICIAL EARTHQUAKE (SUBLAYER 3 / SUBLAYER 6
- ▶ 0.100 DAMPING - MILLSTONE 3 ARTIFICIAL EARTHQUAKE (SUBLAYER 3 / SUBLAYER 6

STONE & WEBSTER ENGINEERING CORPORATION

RATIO OF ACCELERATION RESPONSE SPECTRA VS FREQUENCY

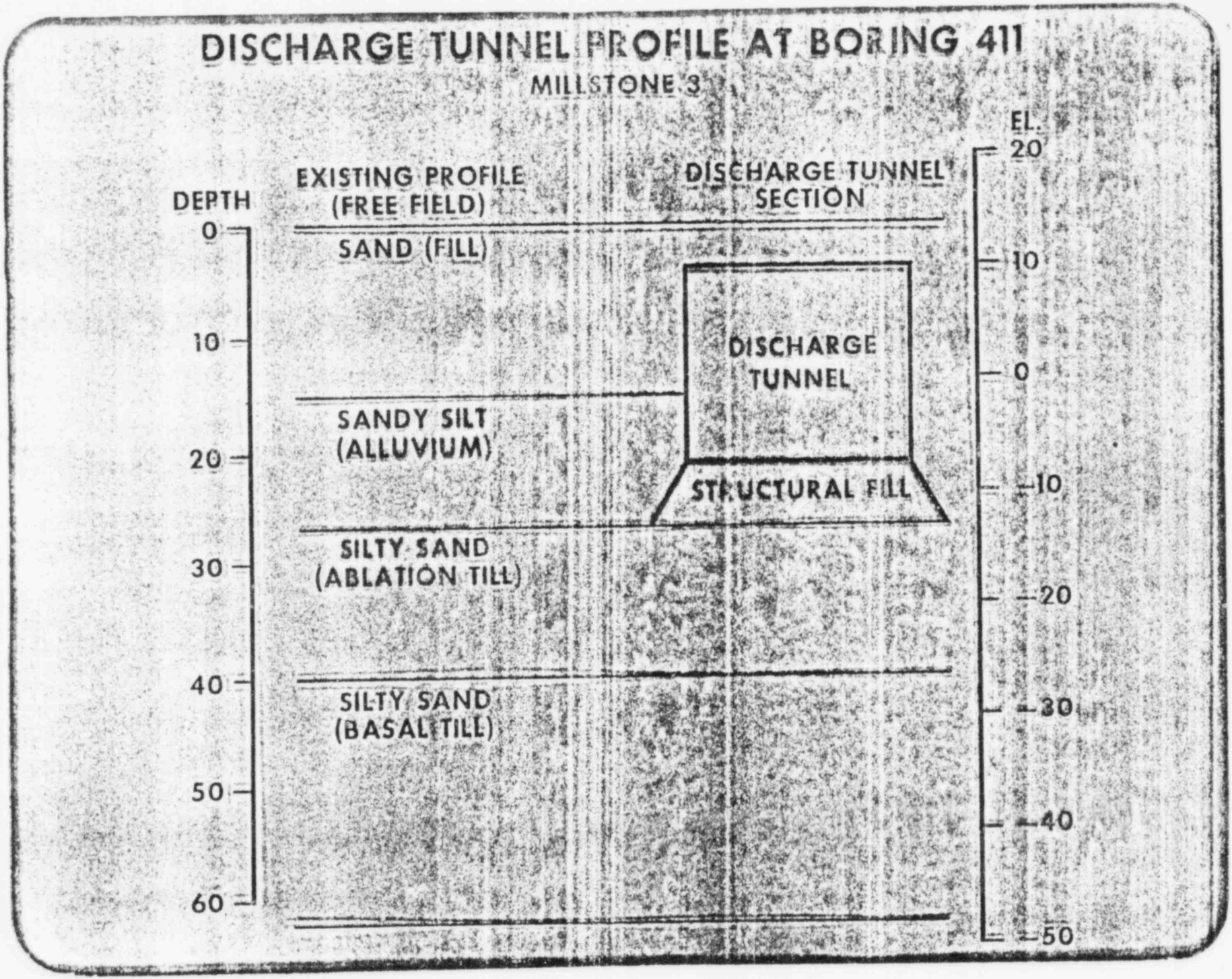
PAGE NO. 6
PRELIMINARY
ITEM 1200

CLIENT NUSCO - MILLSTONE NUCLEAR POWER STATION J.O. NO. CALC 12179

SUBJECT EMERGENCY GENERATOR ENCLOSURE - FSAR ART DATE 10/26/93 BY FS-VETERE

FREE FIELD ADJ. TO FGE CHECKED BY

BASED ON COMPUTER RUN S5664301 ON 10/25/83 AT 16.21.41 BY FS-VETERE
PROGRAM ST-211 SHAKE - VER 05 LEV 01 - COMPILED ON 81.028 AT 12.18.20


DISCHARGE TUNNEL PROFILE AT BORING 411
MILLSTONE 3
DEPTH
EXISTING PROFILE (FREE FIELD)
DISCHARGE TUNNEL SECTION
EL.
0
10
20
30
40
50
60
SAND (FILL)
SANDY SILT (ALLUVIUM)
SILTY SAND (ABLATION TILL)
SILTY SAND (BASAL TILL)
DISCHARGE TUNNEL
STRUCTURAL FILL
20
10
0
-10
-20
-30
-40
-50

FREE FIELD SHAKE ANALYSIS
DISCHARGE TUNNEL
ABLATION TILL LAYERS

TOP OF LAYER ELEVATION	TAFT				HELENA				PARKFIELD				PACOIMA DAM			
	G	D	a_h	τ_{max}	G	D	a_h	τ_{max}	G	D	a_h	τ_{max}	G	D	a_h	τ_{max}
-13 FT	243	.215	.13	1252	284	.175	.09	545	260	.206	.11	887	290	.165	.04	481
-17 FT	241	.216	.12	1289	281	.182	.22	588	258	.207	.11	927	292	.161	.08	461
-22 FT	241	.217	.15	1289	278	.186	.18	619	256	.208	.15	963	302	.150	.13	410

G = STRAIN CORRECTED SHEAR MODULUS (KSF)
D = STRAIN CORRECTED DAMPING RATION
a_h = PEAK HORIZONTAL GROUND ACCELERATION (g)
τ_{max} = INDUCED SHEAR STRESSES (psf)

BEACH AREA SHAKE ANALYSIS
EARTHQUAKE INDUCED SHEAR STRESSES (τ_{max})

DEPTH(FT)	OLYMPIA 1965	HELENA	PACOIMA DAM
5	171	154	170
15	377	396	408
25	448	546	555
35	504	644	643
42.5	546	680	668

(τ_{max} IN PSF)

SEISMIC HAZARD AND DESIGN SPECTRA AT MILLSTONE NUCLEAR POWER PLANT UNIT 3

VIEWGRAPHS PRESENTED
BY ROBIN McGUIRE
DAMES & MOORE

AT NOVEMBER 29, 1983 MEETING
AT BETHESDA, MD
(GEOSCIENCES BRANCH AND APPLICANT)

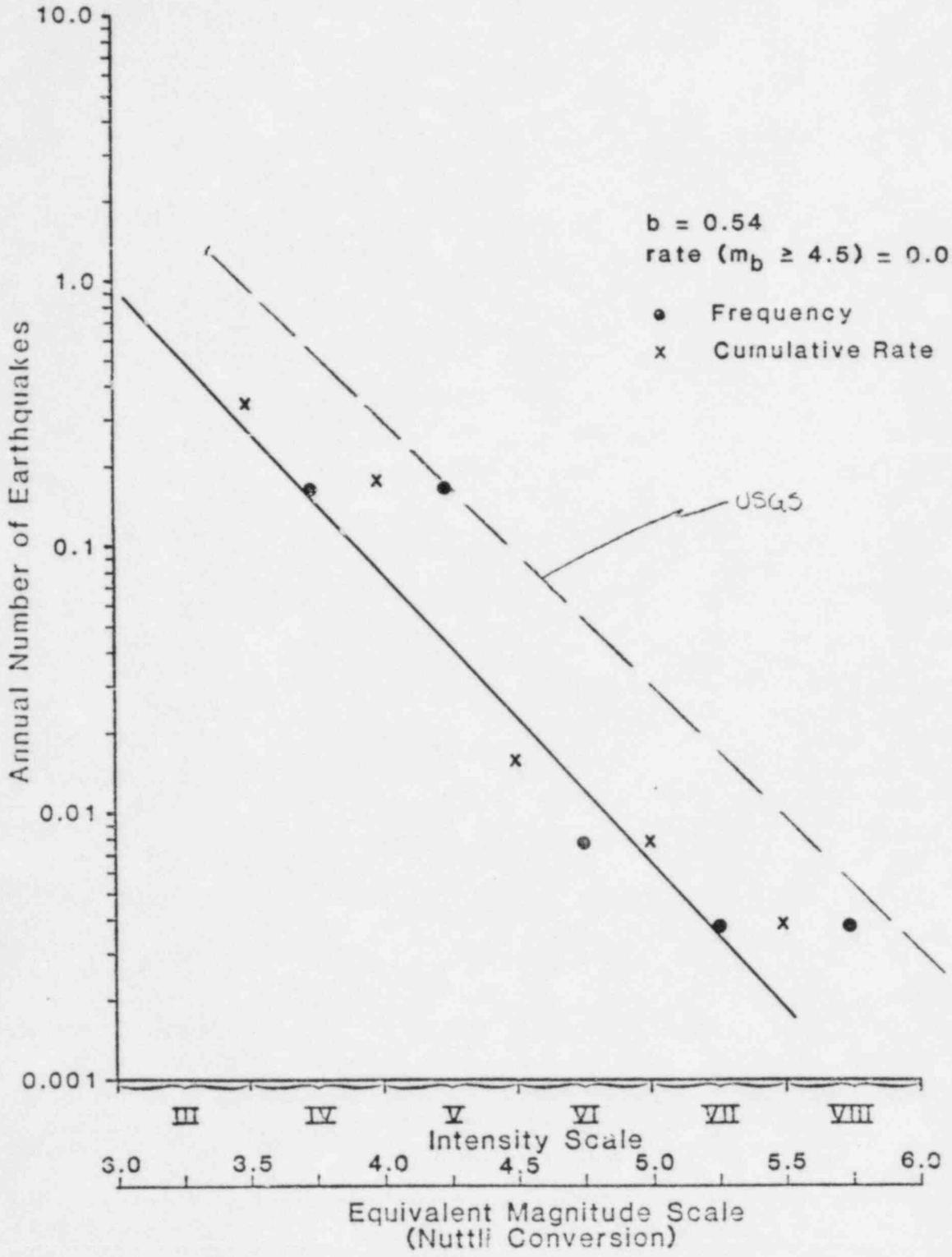
USGS Zone 10 1

USGS DATA
SOURCE FREQUENCY DISTRIBUTION PLOT OF EARTHQUAKES BY DECADE AND INTENSITY

	INTENSITY 3.0≤I<4.0	4.0≤I<5.0	5.0≤I<6.0	6.0≤I<7.0	7.0≤I<8.0	8.0≤I<9.0	9.0≤I<10
1620	.	.	.	1	.	.	.
1630	2	.	.	.	.	.	.
1640	.	2	.	.	.	.	.
1650	.	1	1	.	.	.	.
1660	.	1	.	.	.	.	.
1670	.	.	.	.	.	.	.
1680	.	1	.	.	.	.	.
1690	.	.	.	.	.	.	.
1700	1	1	.	.	.	.	.
1710	.	.	.	.	.	.	.
1720	.	.	.	.	1	.	.
1730	1	3	.	.	.	.	.
1740	3	2	.	1	.	.	.
1750	2	2	.	.	.	1	.
1760	2	2	1	.	.	.	.
1770	.	.	.	.	.	.	.
1780	1	1	.	.	.	.	.
1790	.	.	.	.	.	.	.
1800	1	5	.	.	.	.	.
1810	1	.	1	1	.	.	.
1820	.	1	1	.	.	.	.
1830	1	1	.	.	.	.	.
1840	1	3	1	.	.	.	.
1850	3	1	2	.	.	.	.
1860	2	1	.	.	.	.	.
1870	1	2	1	.	.	.	.
1880	1	2	2	.	.	.	.
1890	1	.	.	.	.	.	.
1900	2	3	3	.	.	.	.
1910	1	3	.	.	.	.	.
1920	2	5	1	.	.	.	.
1930	.	2	.	.	.	.	.
1940	1	2	.	.	.	.	.
1950	1	2	1	.	.	.	.
1960	1	1	2	.	.	.	.
1970	1	2	2	.	.	.	.
1980	.	.	.	.	.	.	.
		$\frac{5}{30}$	$\frac{5}{30}$	$\frac{2}{260}$	$\frac{1}{260}$	$\frac{1}{260}$	
rate		0.1667	0.1667	0.0077	0.0038	0.0038	
cum. rate		0.3488	0.1821	0.0154	0.0077	0.0038	

Date	Intensity	m_b
1954	5.0	3.9
1963	5.0	3.8
1967	5.0	3.1
1971	5.0	2.3
1976	5.0	2.9

$b = 0.54$
$\sigma = 0.100$
rate $\geq 4.5 = 0.1542$



b-Value Plot from Intensity Distribution

USGS Zone 107

Key: A(B)
A = Total Number of earthquakes per time interval.
B = Number with independent magnitude determination.

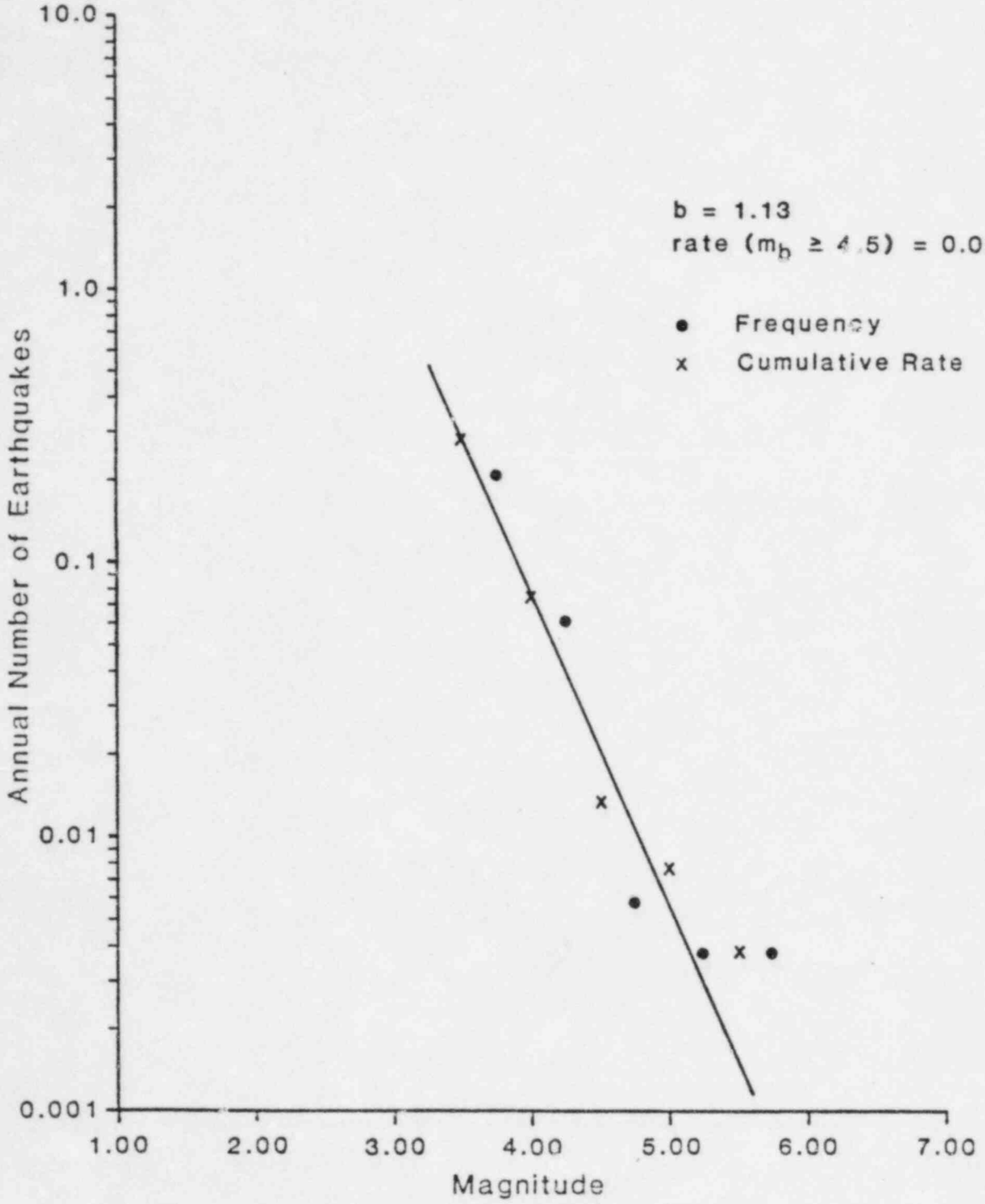
USGS Zone 107
(Nuttli Conversion)

b = 1.13
σ = 0.116
rate ≥ 4.5 = 0.0205

SSSS USGS ZONE 5 SSSS

MAGNITUDE

DECADE	2.25	2.75	3.25	3.75 13/62	4.25 5/82	4.75 1/172	5.25 1/262	5.75 1/262	6.25	6.75
1976 - 1982	21(21)	8(8)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1971 - 1975	9(9)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1961 - 1970	3(3)	2(1)	1(0)	2(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1951 - 1960	0(0)	1(0)	1(0)	2(1)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)
1941 - 1950	1(1)	2(0)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1931 - 1940	0(0)	3(0)	1(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1921 - 1930	0(0)	0(0)	2(0)	5(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1911 - 1920	0(0)	2(0)	1(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1901 - 1910	0(0)	1(0)	2(0)	4(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1891 - 1900	0(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1881 - 1890	0(0)	0(0)	1(0)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1871 - 1880	0(0)	3(0)	1(0)	2(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1861 - 1870	0(0)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1851 - 1860	0(0)	0(0)	3(0)	2(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1841 - 1850	0(0)	0(0)	1(0)	3(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1831 - 1840	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1821 - 1830	0(0)	0(0)	1(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1811 - 1820	0(0)	0(0)	1(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1801 - 1810	0(0)	2(0)	0(0)	4(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1791 - 1800	0(0)	1(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1781 - 1790	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1771 - 1780	0(0)	1(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1761 - 1770	0(0)	0(0)	1(0)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1751 - 1760	0(0)	1(0)	3(0)	2(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)
1741 - 1750	0(0)	3(0)	3(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1731 - 1740	0(0)	0(0)	1(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1721 - 1730	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1711 - 1720	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1701 - 1710	0(0)	1(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1691 - 1700	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1681 - 1690	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1671 - 1680	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1661 - 1670	0(0)	3(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1651 - 1660	0(0)	0(0)	0(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1641 - 1650	0(0)	0(0)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1631 - 1640	0(0)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1621 - 1630	0(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1611 - 1620	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1601 - 1610	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1591 - 1600	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1581 - 1590	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1571 - 1580	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1561 - 1570	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1551 - 1560	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1541 - 1550	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1531 - 1540	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
rate	0.2097	0.0610	0.0058	0.0038	0.0038					
cum. rate	0.2841	0.0744	0.0134	0.0076	0.0038					



b-Value Plot from Magnitude Distribution (using Nuttli Conversion)

USGS Zone 107

Key: A(B)
A = Total number of earthquakes per time interval.
B = Number with independent magnitude determinations

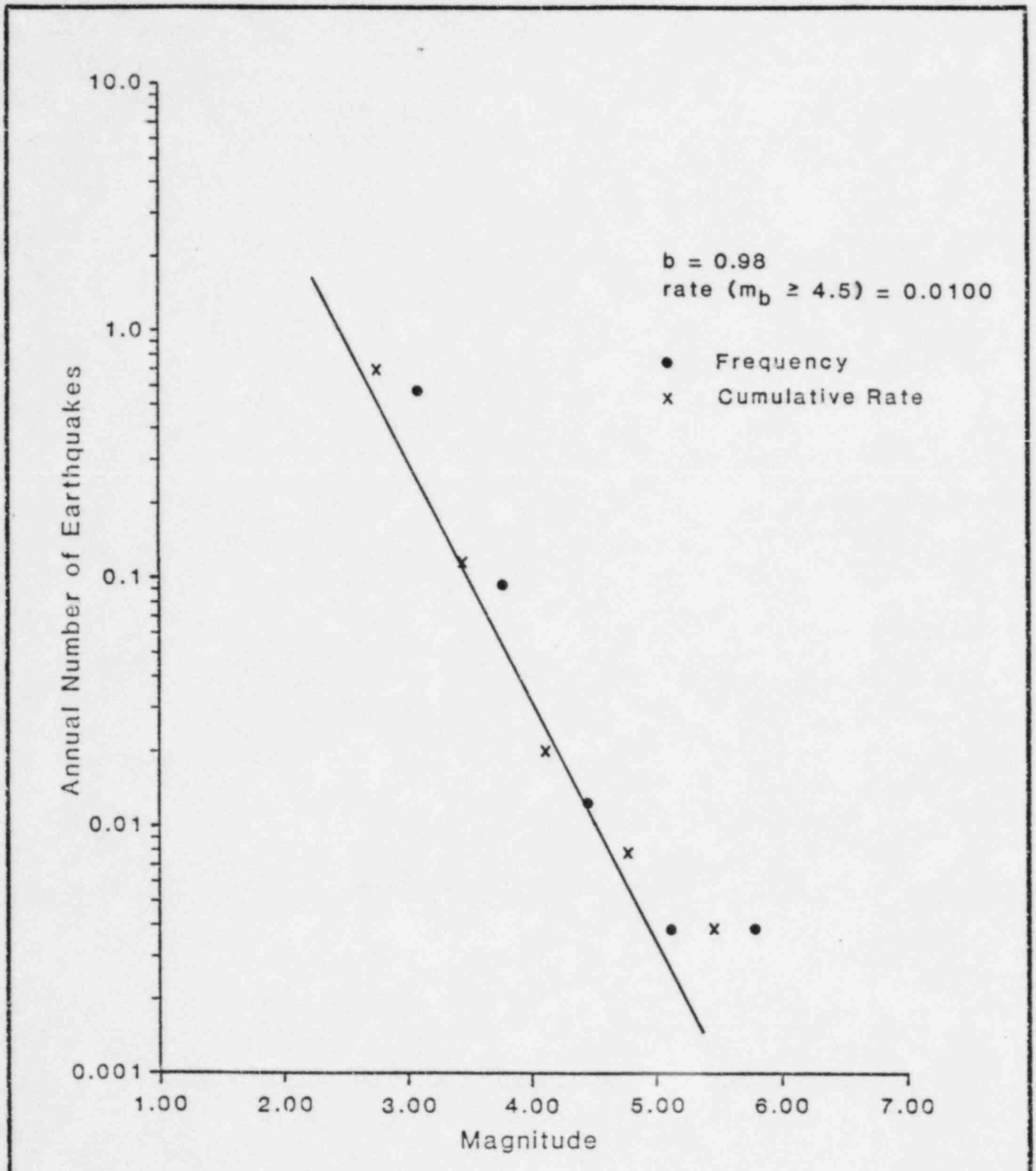
USGS Zone 107 (Weston Conversion)

b = 0.78
σ = 0.184
rate ≥ 4.5 = 0.0100

$$$$$ USGS ZONE 5 $$$$$

MAGNITUDE

DECADE	1.11	1.78	2.45	3.12 4/4	3.79 3/32	4.46 1/32	5.13 1/2.62	5.80 1/2.62	6.47	7.14
1976 - 1982	3(3)	11(11)	11(11)	0(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)
1971 - 1982	3(3)	2(2)	4(4)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1961 - 1970	0(0)	2(1)	4(3)	1(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)
1951 - 1960	0(0)	1(0)	1(0)	1(0)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)
1941 - 1950	0(0)	3(1)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1931 - 1940	0(0)	5(0)	1(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1921 - 1930	0(0)	4(0)	2(0)	5(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1911 - 1920	0(0)	2(0)	1(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1901 - 1910	0(0)	1(0)	2(0)	4(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1891 - 1900	0(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1881 - 1890	0(0)	7(0)	1(0)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1871 - 1880	0(0)	5(0)	1(0)	2(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1861 - 1870	0(0)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1851 - 1860	0(0)	0(0)	3(0)	2(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1841 - 1850	0(0)	0(0)	1(0)	3(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1831 - 1840	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1821 - 1830	0(0)	0(0)	1(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1811 - 1820	0(0)	0(0)	1(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1801 - 1810	0(0)	2(0)	0(0)	4(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1791 - 1800	0(0)	1(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1781 - 1790	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1771 - 1780	0(0)	1(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1761 - 1770	0(0)	0(0)	1(0)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1751 - 1760	0(0)	1(0)	3(0)	2(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)
1741 - 1750	0(0)	5(0)	3(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1731 - 1740	0(0)	0(0)	1(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1721 - 1730	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1711 - 1720	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1701 - 1710	0(0)	1(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1691 - 1700	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1681 - 1690	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1671 - 1680	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1661 - 1670	0(0)	3(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1651 - 1660	0(0)	0(0)	0(0)	1(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1641 - 1650	0(0)	0(0)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1631 - 1640	0(0)	0(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1621 - 1630	0(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1611 - 1620	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1601 - 1610	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1591 - 1600	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1581 - 1590	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1571 - 1580	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1561 - 1570	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1551 - 1560	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1541 - 1550	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1531 - 1540	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
rate				0.5714	0.0938	0.0122	0.0038	0.0038		
cum. rate				0.6850	0.1136	0.0198	0.0076	0.0038		



b-Value Plot from Magnitude Distribution
(using Weston Conversion)

USGS Zone 107

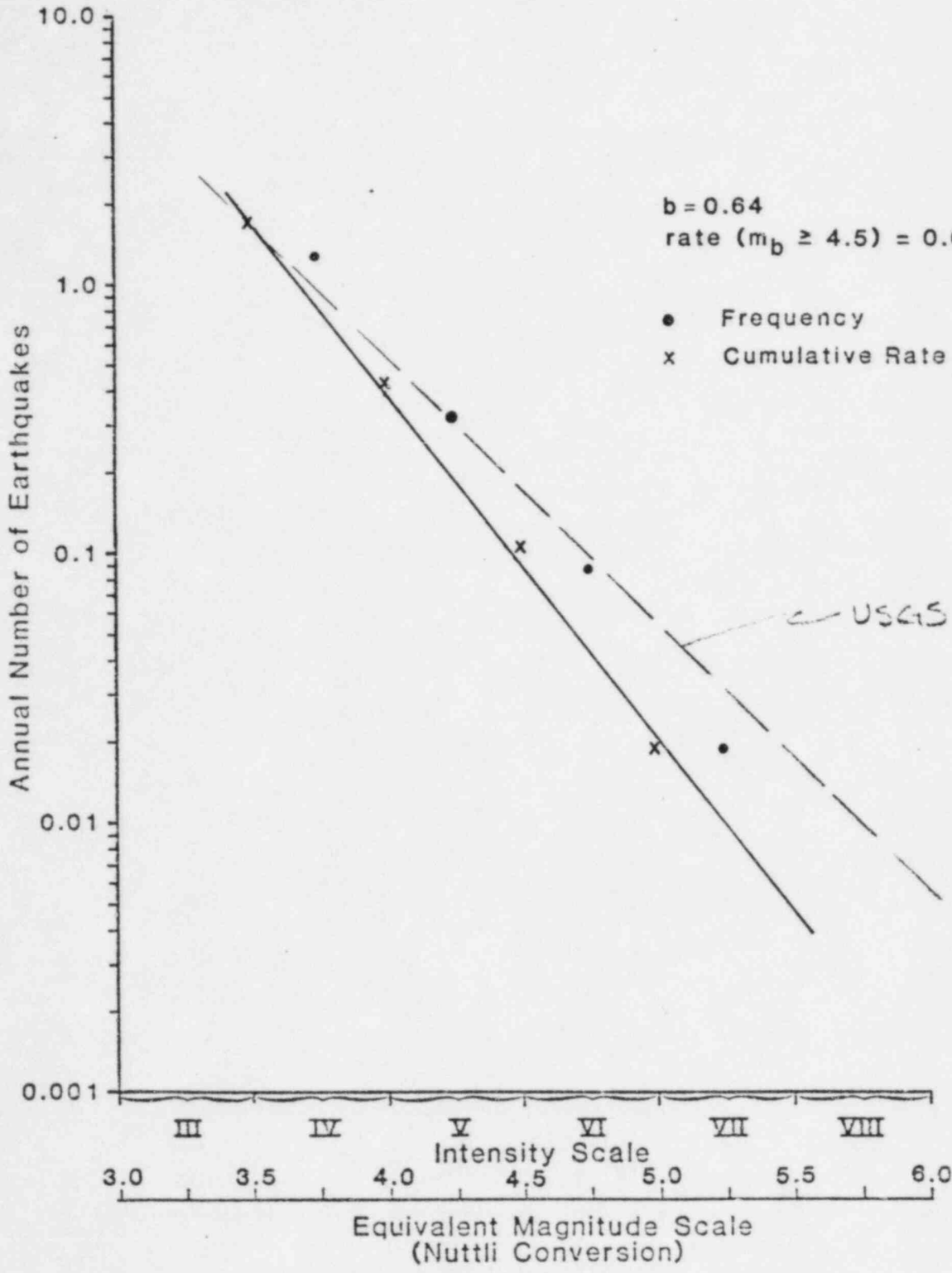
USGS Zone 103

USGS DATA
SOURCE FREQUENCY DISTRIBUTION PLOT OF EARTHQUAKES BY DECADE AND INTENSITY

	INTENSITY 3.0≤I<4.0	4.0≤I<5.0	5.0≤I<6.0	6.0≤I<7.0	7.0≤I<8.0	8.0≤I<9.0
1560	.	.	.	1	.	.
1570	.	.	1	.	.	.
1580	.	.	1	.	.	.
1590	.	.	1	.	.	.
1600	.	.	.	.	.	.
1610	.	.	.	.	.	.
1620	.	.	.	.	.	.
1630	.	.	.	.	.	.
1640	.	.	.	.	.	.
1650	.	.	.	.	.	.
1660	.	.	.	.	.	.
1670	.	1	.	.	.	.
1680	.	.	.	.	.	.
1690	.	1	.	.	.	.
1700	.	1	.	.	.	.
1710	.	1	.	.	.	.
1720	.	1	.	.	1	.
1730	.	.	.	.	.	.
1740	.	.	.	.	.	.
1750	.	.	.	.	.	.
1760	.	.	.	.	.	.
1770	.	.	.	.	.	.
1780	.	.	.	.	.	.
1790	.	.	.	1	.	.
1800	3	.	.	.	.	.
1810	4	.	.	.	.	.
1820	.	1	.	.	.	.
1830	.	.	1	.	.	.
1840	4	.	4	.	1	.
1850	1	3	.	.	.	.
1860	2	1	.	.	.	.
1870	1	1	4	.	1	.
1880	2	2	2	.	1	.
1890	.	3	2	.	.	.
1900	.	2	.	1	.	.
1910	2	2	.	.	.	.
1920	1	2	4	.	1	.
1930	6	5	3	.	.	.
1940	3	3	1	.	.	.
1950	1	9	2	1	.	.
1960	.	2	6	1	.	.
1970	2	[13]	4	4	.	.
1980	.	.	.	.	.	.
		13/10	20/60	7/80	5/260	0/260
rate		1.3000	0.3333	0.0875	0.0192	0
cum. rate		1.7400	0.4400	0.1067	0.0192	0

Date	Intensity	m_b
1961	5.0	4.3
1961	5.0	4.3
1964	5.0	4.3
1967	5.0	4.3
1968	5.0	3.3
1968	5.0	3.0
1972	5.0	4.3
1972	5.0	3.5
1973	5.0	3.8
1978	5.0	3.0

b = 0.64
σ = 0.0634
rate ≥ 4.5 = 0.8767



b-Value Plot from Intensity Distribution

USGS Zone 103

Key: A(B)

A = Total number of earthquakes per time interval.

B = Number with independent magnitude determination.

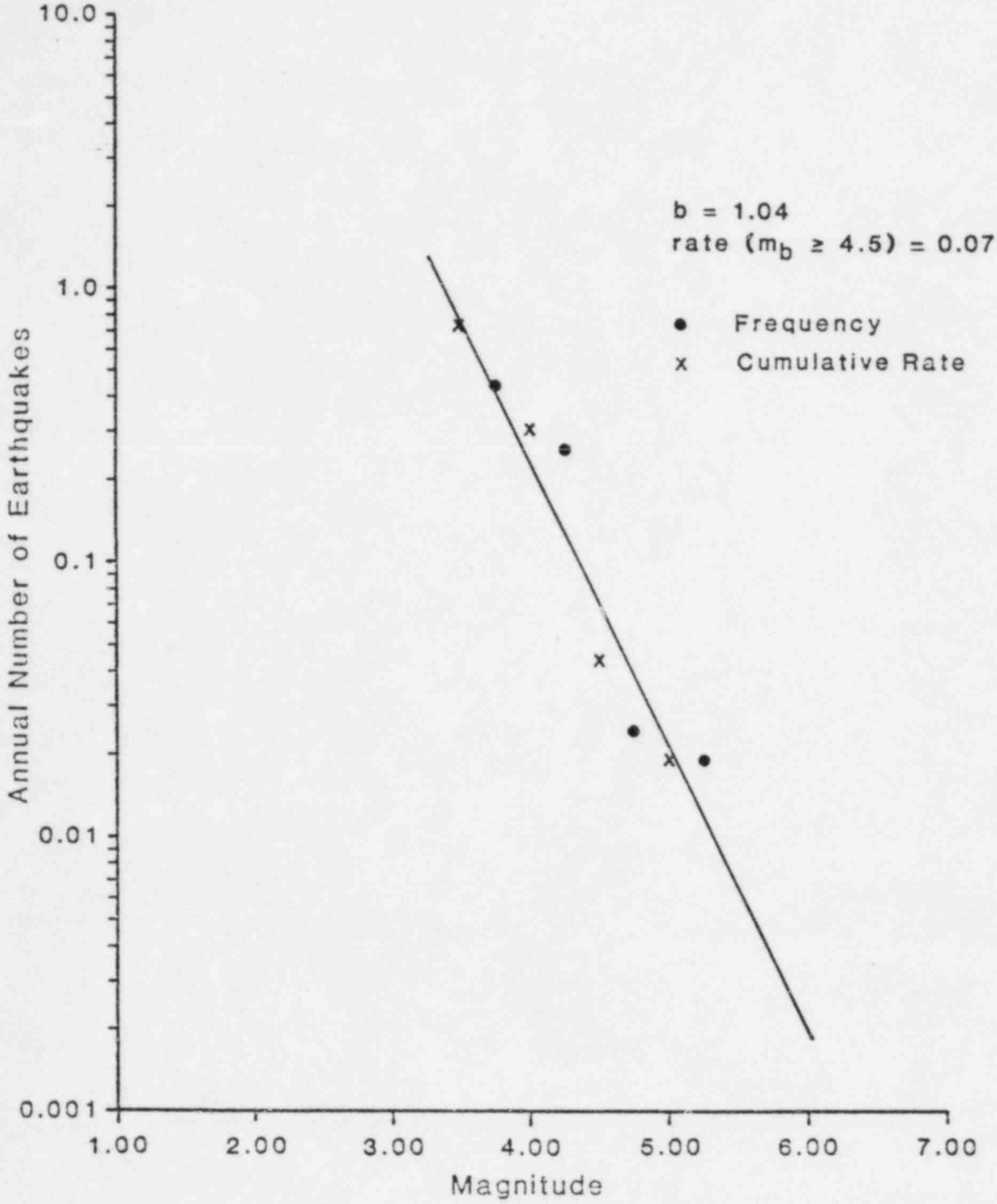
USGS Zone 103 (Nuttli Conversion)

b = 1.04
σ = 0.125
rate ≥ 4.5 = 0.0712

$$$$$ USGS ZONE 3 $$$$$

MAGNITUDE

DECADE	2.25	2.75	3.25	3.75 14/32	4.25 12/62	4.75 2/82	5.25 3/262	5.75 0/262	6.25	6.75
1976 - 1982	38(38)	16(15)	4(4)	1(1)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1971 - 1975	1(1)	1(1)	0(0)	3(1)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1961 - 1970	1(1)	0(0)	1(1)	2(0)	5(1)	0(0)	0(0)	0(0)	0(0)	0(0)
1951 - 1960	0(0)	2(0)	2(1)	8(0)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1941 - 1950	1(1)	3(1)	2(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1931 - 1940	0(0)	7(0)	6(0)	5(0)	4(2)	0(0)	0(0)	0(0)	0(0)	0(0)
1921 - 1930	0(0)	2(0)	2(0)	2(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1911 - 1920	0(0)	0(0)	2(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1901 - 1910	0(0)	4(0)	0(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1891 - 1900	0(0)	1(0)	0(0)	3(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1881 - 1890	0(0)	3(0)	2(0)	2(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1871 - 1880	0(0)	3(0)	0(0)	1(0)	4(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1861 - 1870	0(0)	0(0)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1851 - 1860	0(0)	1(0)	2(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1841 - 1850	0(0)	0(0)	4(0)	0(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1831 - 1840	0(0)	0(0)	0(0)	0(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1821 - 1830	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1811 - 1820	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1801 - 1810	0(0)	1(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1791 - 1800	0(0)	2(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1781 - 1790	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1771 - 1780	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1761 - 1770	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1751 - 1760	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1741 - 1750	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1731 - 1740	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1721 - 1730	0(0)	1(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1711 - 1720	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1701 - 1710	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1691 - 1700	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1681 - 1690	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1671 - 1680	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1661 - 1670	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1651 - 1660	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1641 - 1650	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1631 - 1640	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1621 - 1630	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1611 - 1620	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1601 - 1610	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1591 - 1600	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1581 - 1590	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1571 - 1580	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1561 - 1570	0(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1551 - 1560	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1541 - 1550	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1531 - 1540	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
rate				0.4375	0.2581	0.0244	0.0191	0		
cum. rate				0.7391	0.3016	0.0435	0.0191	0		



b-Value Plot from Magnitude Distribution (using Nuttli Conversion)

USGS Zone 103

Key: A(B)
A = Total number of earthquakes per time interval.
B = Number with independent magnitude determinations.

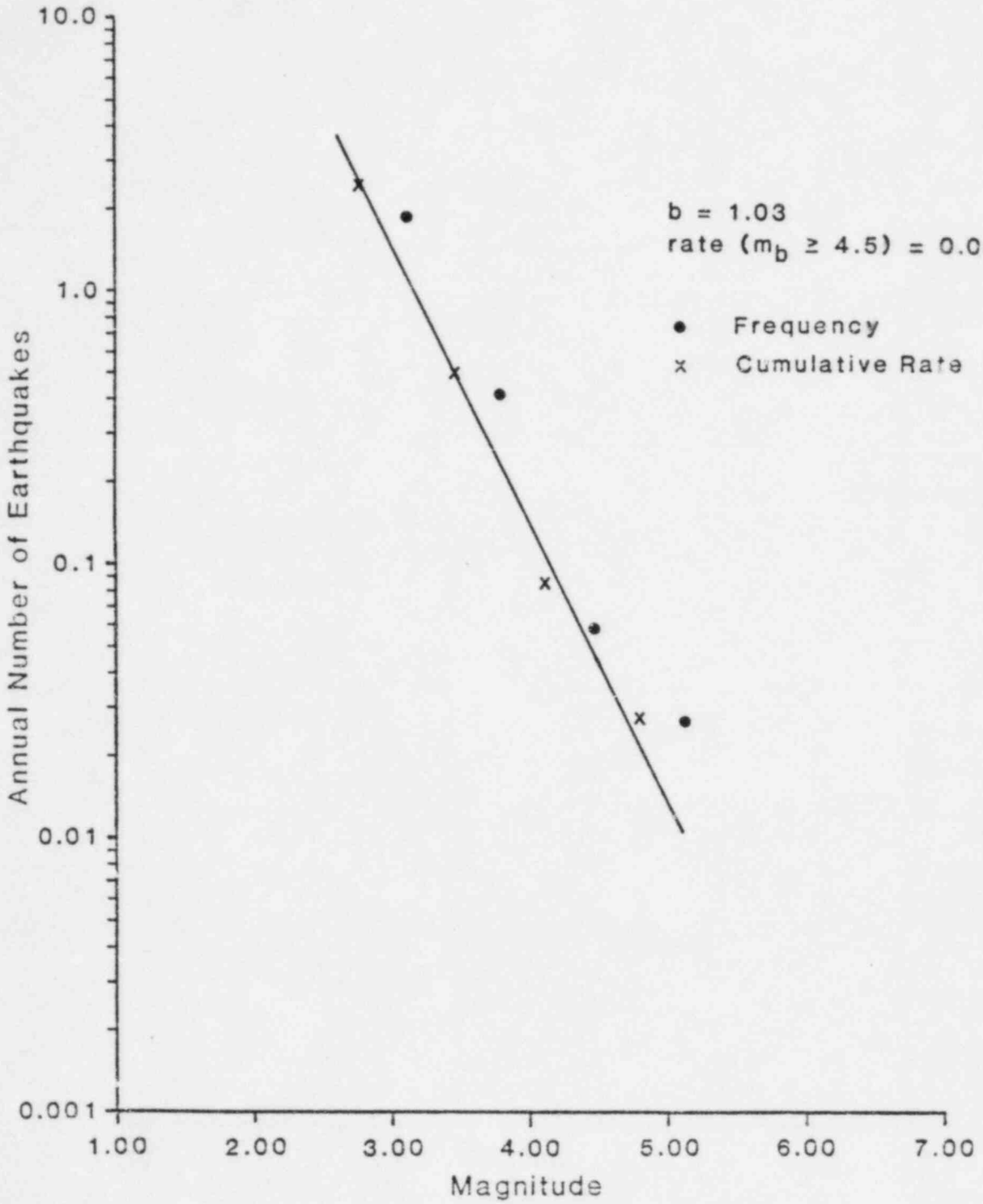
USGS Zone 103
(Weston Conversion)

$$$$$ USGS ZONE 3 $$$$$

b = 1.02
σ = 0.132
rate ≥ 4.5 = 0.0441

MAGNITUDE

DECADE	1.11	1.78	2.45	3.12	3.79	4.46	5.13	5.80	6.47	7.14
				13/1	9/22	2/52	3/112	0/112		
1976 - 1982	5(5)	20(19)	15(15)	13(13)	2(2)	0(0)	0(0)	0(0)	0(0)	0(0)
1971 - 1982	0(0)	0(0)	2(2)	2(0)	2(1)	0(0)	0(0)	0(0)	0(0)	0(0)
1961 - 1970	0(0)	0(0)	1(1)	3(1)	5(1)	0(0)	0(0)	0(0)	0(0)	0(0)
1951 - 1960	0(0)	2(0)	1(0)	9(1)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1941 - 1950	0(0)	3(1)	3(1)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1931 - 1940	0(0)	7(0)	6(0)	5(0)	2(0)	2(2)	0(0)	0(0)	0(0)	0(0)
1921 - 1930	0(0)	2(0)	2(0)	2(0)	4(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1911 - 1920	0(0)	0(0)	2(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1901 - 1910	0(0)	4(0)	0(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1891 - 1900	0(0)	1(0)	0(0)	3(0)	2(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1881 - 1890	0(0)	3(0)	2(0)	2(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1871 - 1880	0(0)	3(0)	0(0)	1(0)	4(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1861 - 1870	0(0)	0(0)	2(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1851 - 1860	0(0)	1(0)	2(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1841 - 1850	0(0)	0(0)	4(0)	0(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1831 - 1840	0(0)	0(0)	0(0)	0(0)	2(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1821 - 1830	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1811 - 1820	0(0)	0(0)	4(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1801 - 1810	0(0)	1(0)	3(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1791 - 1800	0(0)	2(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1781 - 1790	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1771 - 1780	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1761 - 1770	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1751 - 1760	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1741 - 1750	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1731 - 1740	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)
1721 - 1730	0(0)	1(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1711 - 1720	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1701 - 1710	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1691 - 1700	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1681 - 1690	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1671 - 1680	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1661 - 1670	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1651 - 1660	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1641 - 1650	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1631 - 1640	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1621 - 1630	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1611 - 1620	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1601 - 1610	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1591 - 1600	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1581 - 1590	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1571 - 1580	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1561 - 1570	0(0)	0(0)	0(0)	0(0)	0(0)	1(0)	0(0)	0(0)	0(0)	0(0)
1551 - 1560	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1541 - 1550	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
1531 - 1540	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)	0(0)
rate				1.8571	0.4091	0.0577	0.0268	0		
cum. rate				2.3507	0.4936	0.0845	0.0268	0		



b-Value Plot from Magnitude Distribution (using Weston Conversion)

USGS Zone 103

Seismogenic Zone	Original Weights	Alternative Weights
Geologic Province zones	0.10	0.10
Tectonic Province zones	0.25	0.10
U.S. Geological Survey zones	0.15	0.25
Northern Appalachian zone	0.25	0.10
Decollement zone, Versions 1 & 2	0.05	0.25
Mesozoic Rift zones, Versions 1 & 2	0.10	0.10
Mesozoic Intersection zones, Versions 1 & 2	0.05	0.05
Mafic Pluton zones	0.05	0.05
Total	1.00	1.00

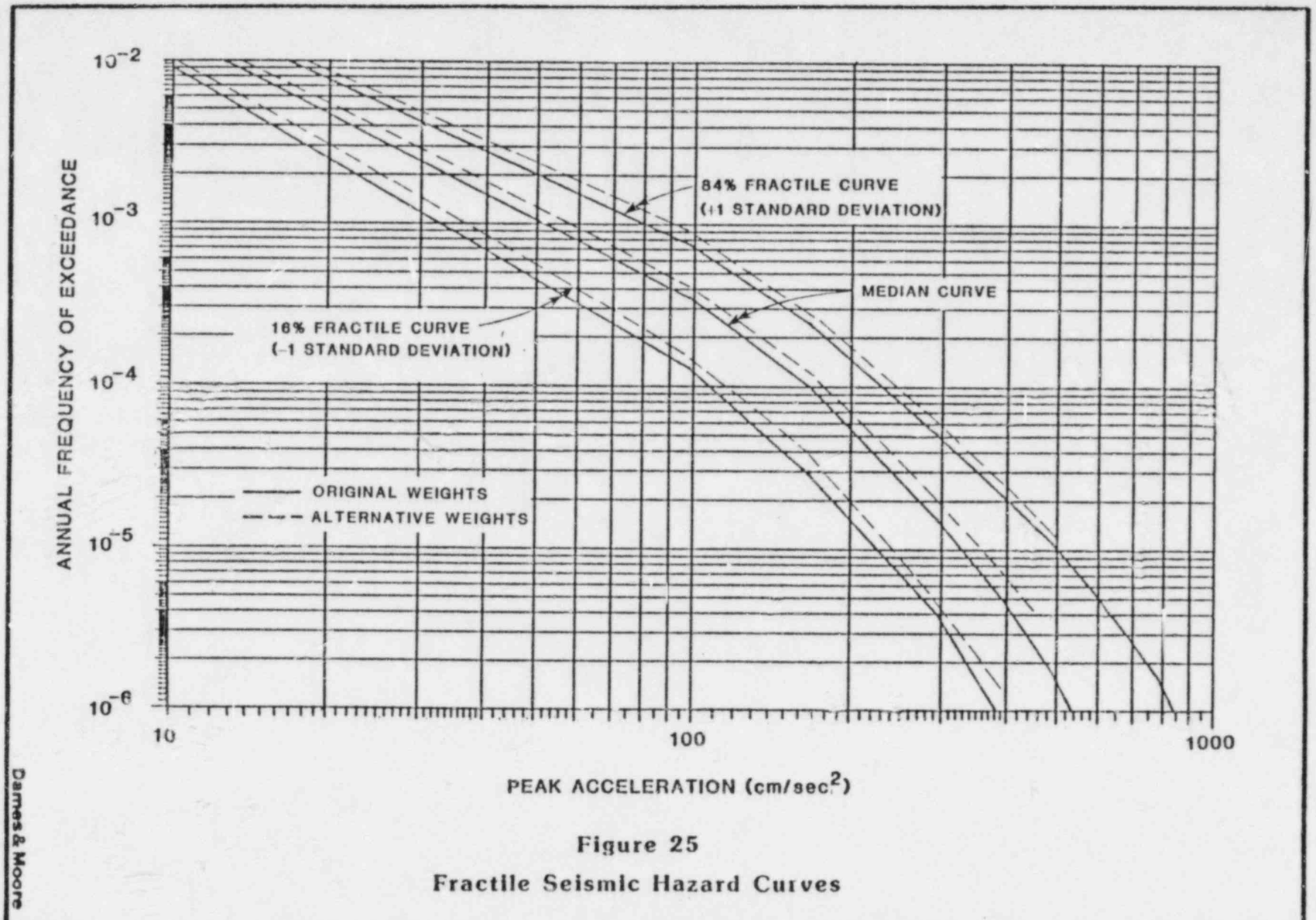


Figure 25

Fractile Seismic Hazard Curves

VIEWGRAPHS PRESENTED
BY LANE SCHULTZ OF WESTON GEOPHYSICAL

AT NOVEMBER 29, 1983
MEETING AT BETHESDA, MD
(GEOSCIENCES BRANCH AND APPLICANT)

GEOLOGIC OVERVIEW

Weston Geophysical

MILLSTONE - NEW BRUNSWICK GEOLOGIC DIFFERENTIATION

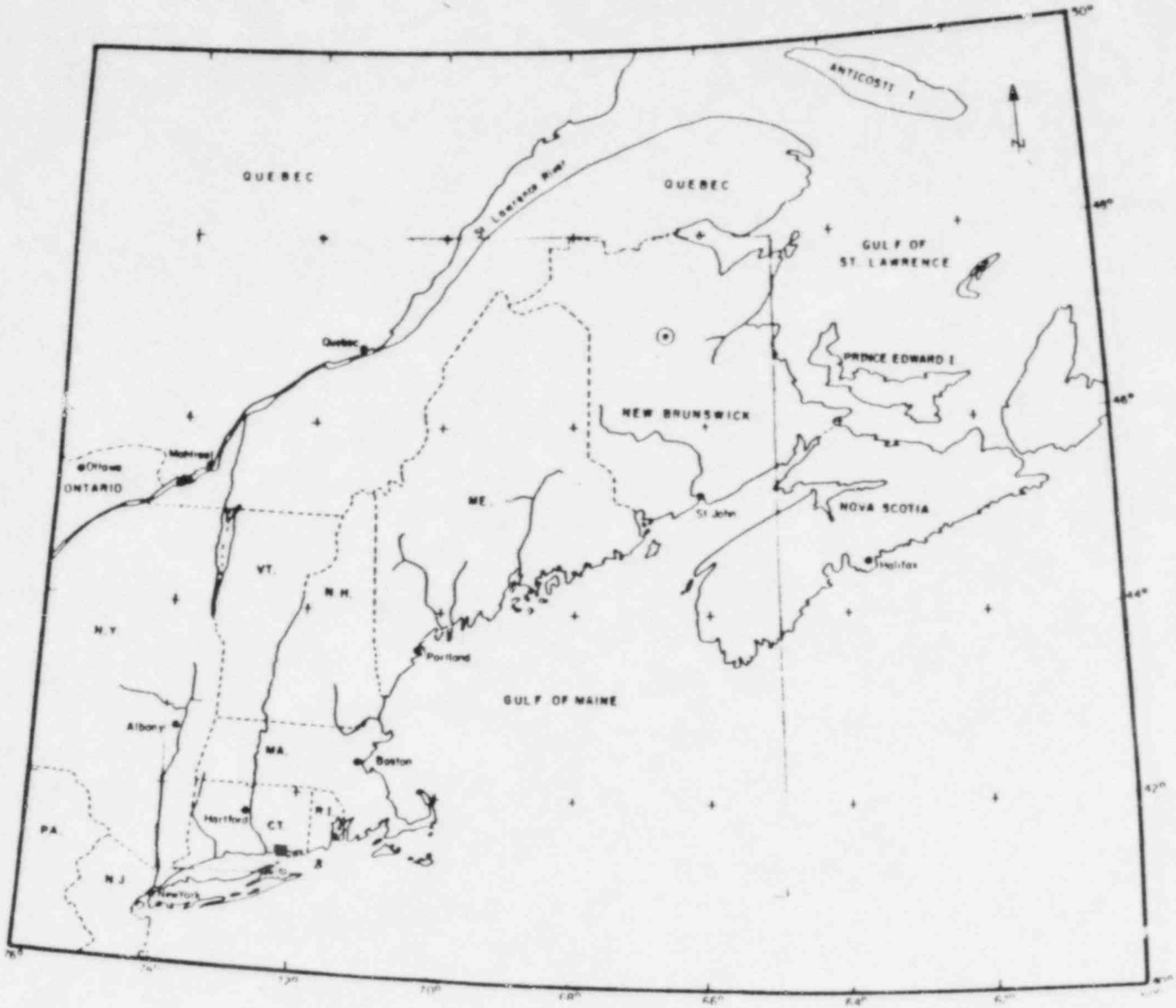
1 - CONVERGENCE OF GEOLOGIC-GEOPHYSICAL-SEISMOLOGICAL DATA INDICATESTHE PRESENCE OF EARTHQUAKE CAUSATIVE STRUCTURE AT NEW BRUNSWICK AREA.

2 - NO SUCH SPATIAL CORRELATION IS DEFINED AT THE MILLSTONE AREA.

3 - THE ORIGIN OF FAULTING IN OUTCROP AND EXPOSED BY TRENCHING AT NEW BRUNSWICK AREA IS EQUIVOCAL.

4 - FAULTING EXPOSED BY CONSTRUCTION AT THE MILLSTONE SITE HAS BEEN MAPPED, DATED AND DETERMINED NONCAPABLE.

5 - THE GEOLOGICAL-GEOPHYSICAL-SEISMOLOGICAL CHARACTERISTICS OF THE MILLSTONE SITE AND THE NEW BRUNSWICK AREA ARE DIFFERENT.



INDEX MAP

EXPLANATION

AREA OF REGIONAL MAPS

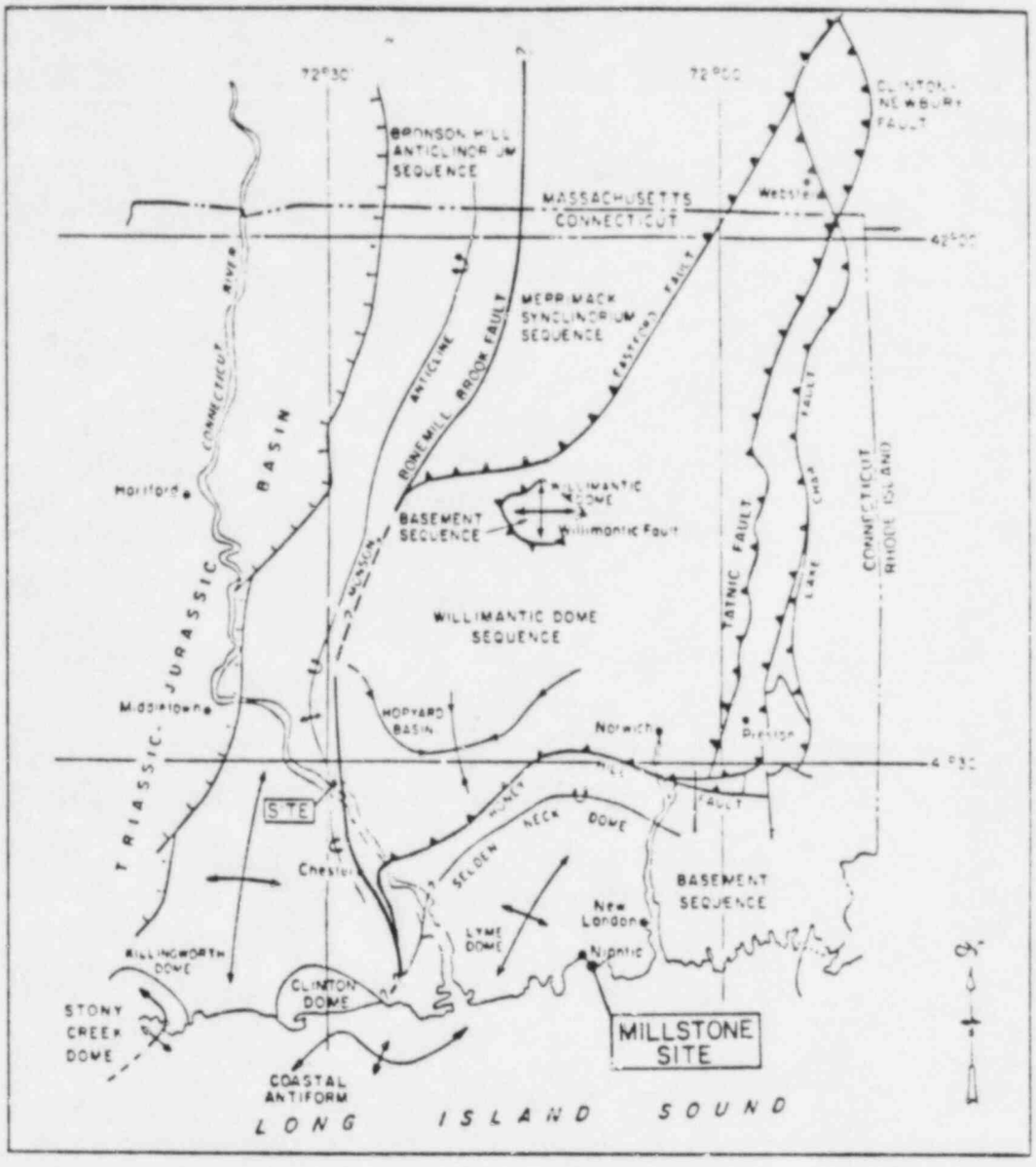
NEW BRUNSWICK EARTHQUAKE EPICENTRAL LOCATION

MILLSTONE SITE

0 100 200 MILES

0 100 200 KM

STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	INDEX MAP- REGIONAL STUDY AREA	
	WESTON GEOPHYSICAL CORP.	FIGURE 3.1



LEGEND

- DOME
- BASIN
- ANTICLINE
- TRACE OF THE AXIAL PLANE OF AN OVERTURNED ANTICLINE
- TRACE OF THE AXIAL PLANE OF AN OVERTURNED SYNCLINE
- HIGH-ANGLE FAULT
- THRUST FAULT
- TRIASSIC JURASSIC BORDER FAULT

REFERENCES

Goldsmith and Dixon (1968), Goldsmith (196?), Lundgren and Thurrell (1973), Watson (197?), Pease (1978)

0 5 10 15

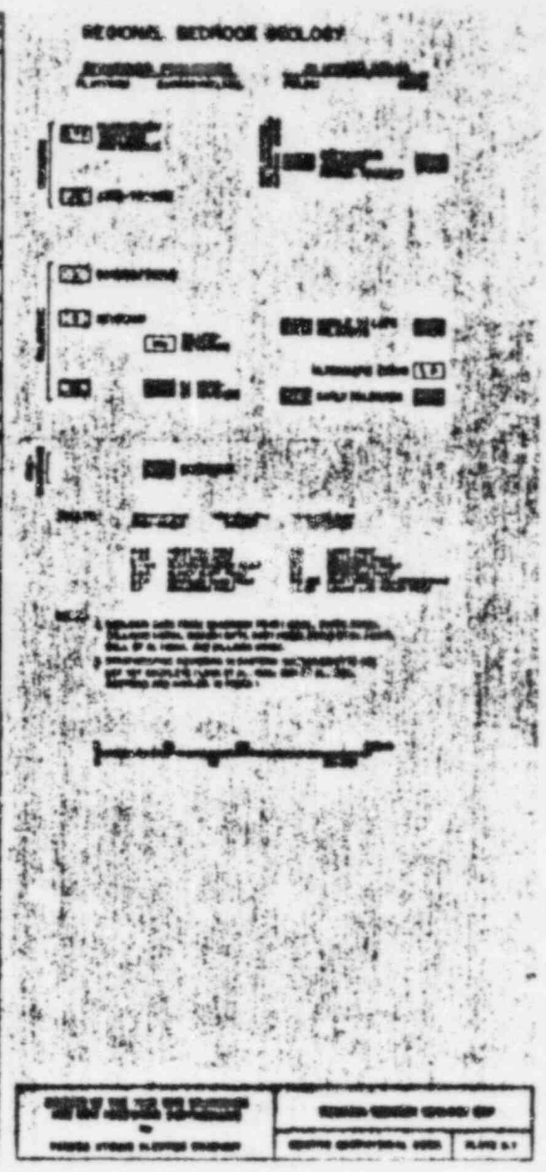
SCALE - MILES

GENERALIZED REGIONAL TECTONIC ELEMENTS

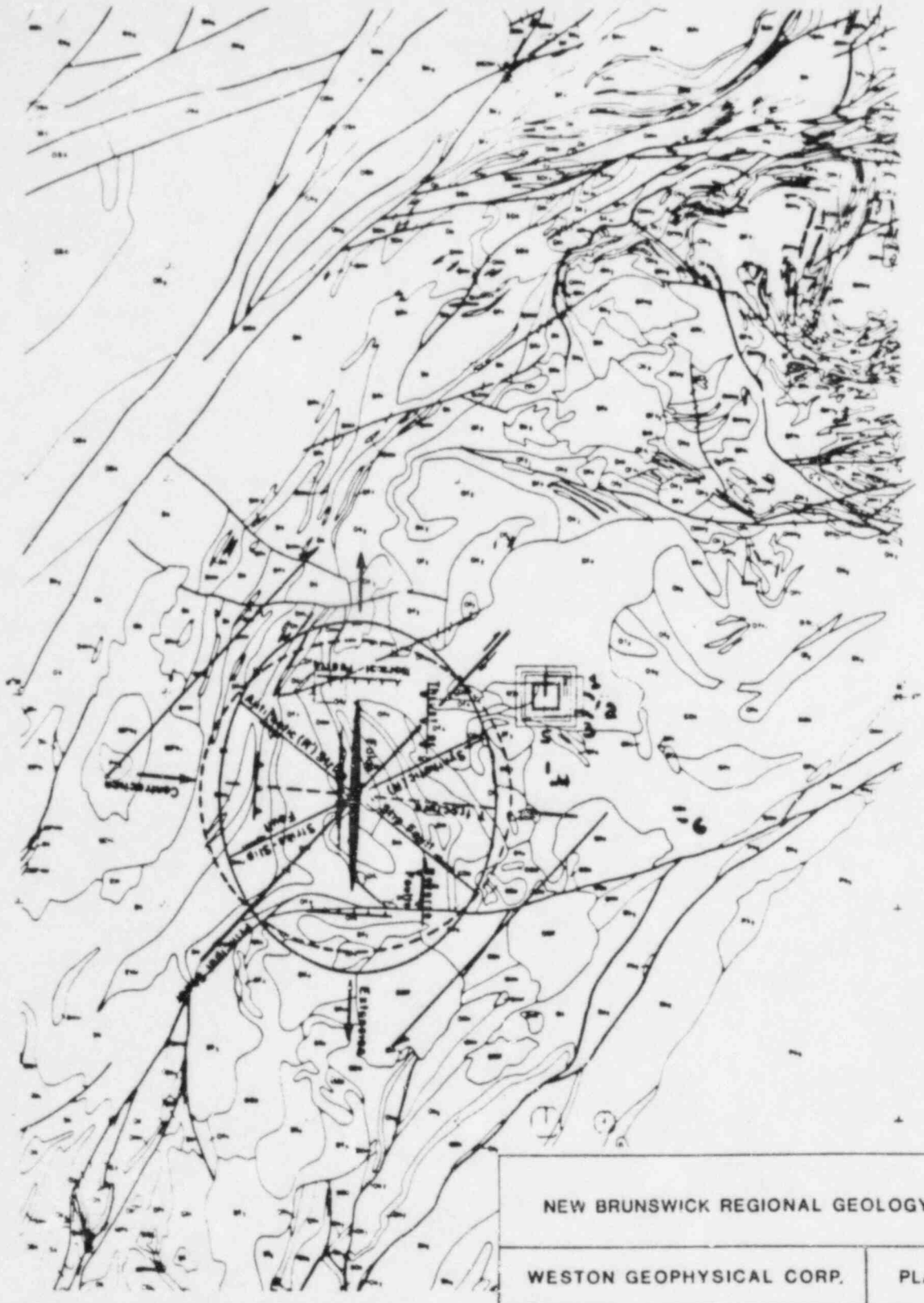
GEOLOGICAL AND SEISMOLOGICAL STUDIES
PART I - 1979 NRC INFORMATION REQUEST

HADDAM NECK NUCLEAR STATION
NORTHEAST UTILITIES

WESTON GEOPHYSICAL CORP | FIG 2



STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	REGIONAL BEDROCK GEOLOGY MAP WESTON GEOPHYSICAL CORP. — PLATE 3.1



NEW BRUNSWICK REGIONAL GEOLOGY MAP

WESTON GEOPHYSICAL CORP. | PLATE 4.1

STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES

for

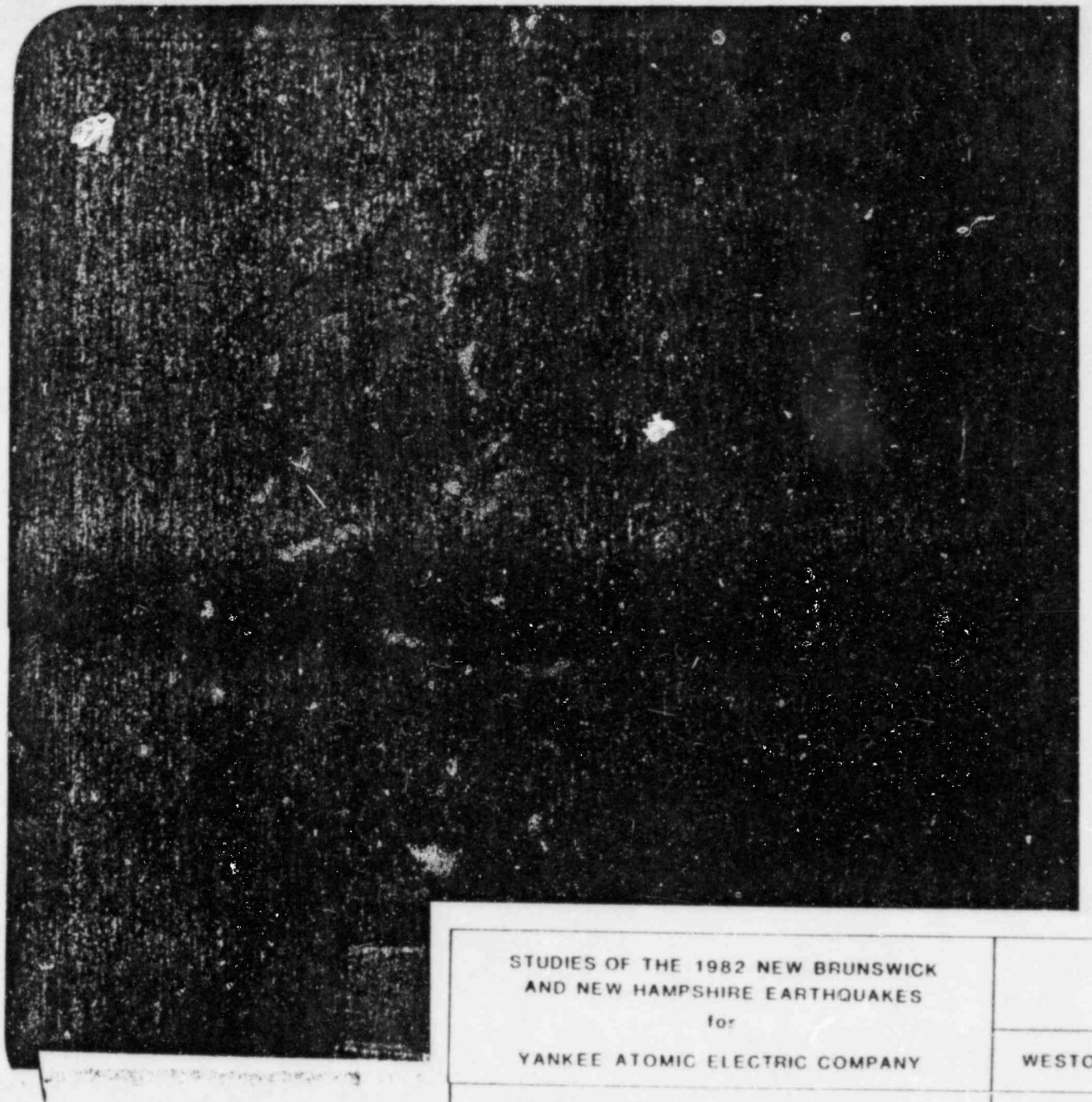
YANKEE ATOMIC ELECTRIC COMPANY

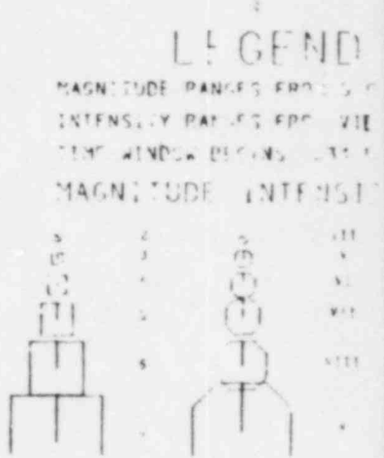
HISTORICAL DATA AROUND THE NEW BRUNSWICK 1982 EVENTS

WESTON GEOPHYSICAL CORP. | FIGURE 4.7

NEW BRUNSWICK HYPOTHETICAL STRESS ORIENTATION MAP

WESTON GEOPHYSICAL CORP. | FIGURE 4.37





STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	SEISMICITY 1700–1982 5.1 ≤ M ≤ 7.5 I = VII to X
	WESTON GEOPHYSICAL CORP. — FIGURE 3.13
STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	NEW BRUNSWICK REGIONAL AEROMAGNETIC MAP
	WESTON GEOPHYSICAL CORP. — FIGURE 4.5

SUMMARY

	MILLSTONE	NEW BRUNSWICK (1982 Earthquake Epicentral Area)
LITHOLOGY	Avalonian Basement (biotite–quartz–plagioclase gneiss)	North Pole Pluton (Felsic composition)
METAMORPHISM (Regional grade)	Amphibolite facies	Greenschist facies
DEFORMATION — Ductile	Avalonian–Taconian–Acadian	Taconian–Acadian
DEFORMATION — Brittle	Permian–T_R /J_R–Cretaceous	Post Devonian dike emplacement
TECTONIC SETTING	Avalonian terrane	Deep-seated intrusive

VIEWGRAPHS PRESENTED
BY GEORGE KLIMKIEWICZ
OF WESTON GEOPHYSICAL

AT NOVEMBER 29, 1983
MEETING AT BETHESDA, MD
(GEOSCIENCES BRANCH AND APPLICANT)

SEISMOLOGIC OVERVIEW

AGENDA

NORTHEAST UTILITIES - MNP-3
Nov. 29, 1983

APPLICANT'S POSITION ON Q230.4 & Q230.6 (N.U. ; C.S.)

- MMI VII ($5.3m_b$) are appropriate criteria for SSE
- FSAR 0.17g SSE spectra are conservative

TECHNICAL BASES FOR APPLICANT'S POSITION

- MNP-3 FSAR (S & W ; F.V.)
- MNP-3 Seismic Hazard Analysis (D & M ; R.M.)
- New Brunswick Epicentral Area Study (WGC ; L.S.)

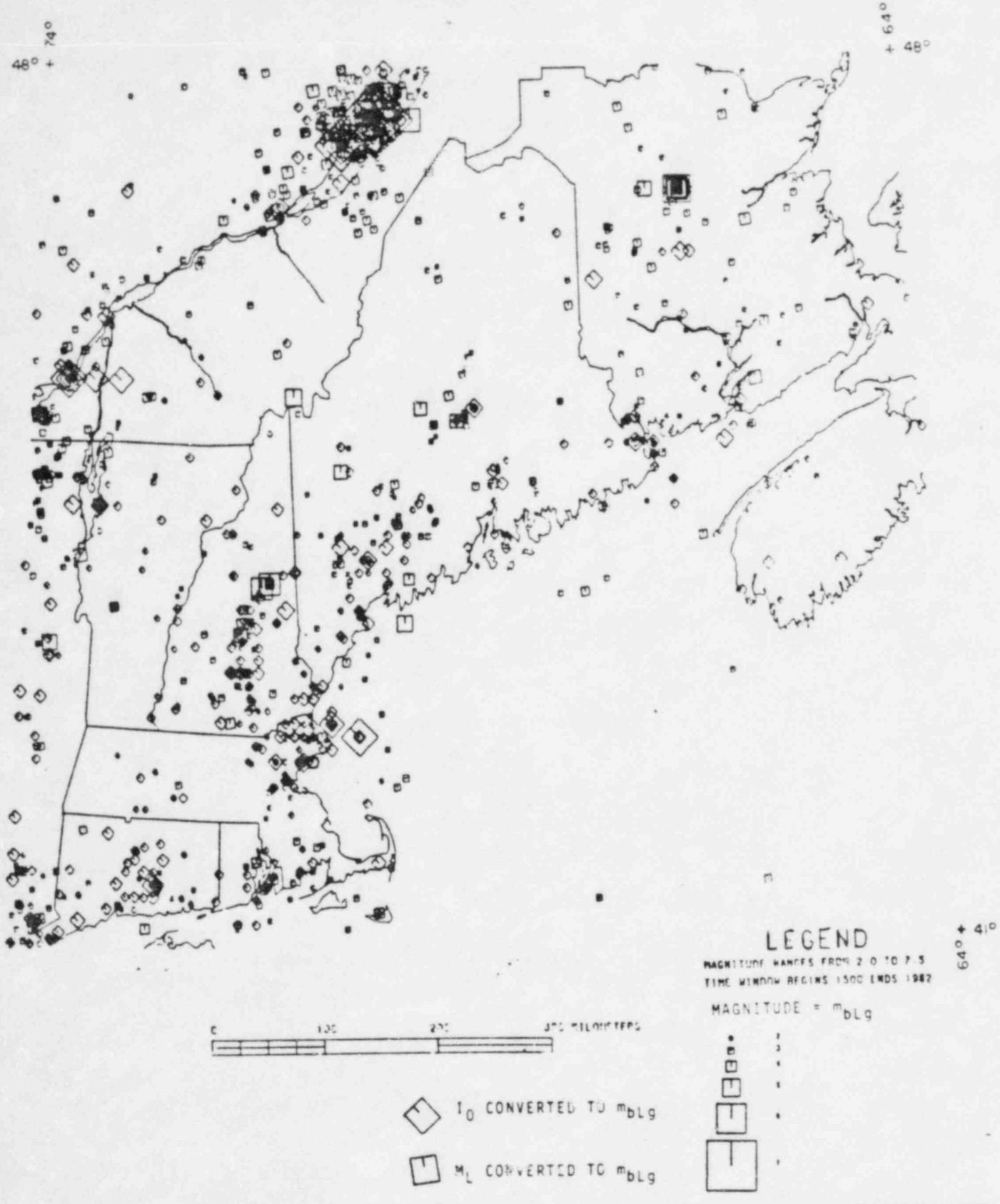
  Preliminary Comparisons of
  New Brunswick Epicentral Area
  and MNP-3 Site Area
  Geology and Geophysics (WGC ; L.S.)
  Seismology (WGC ; G.K.)

ADDITIONAL COMPARATIVE STUDIES

- Task Descriptions & Schedule (WGC ; G.K.)
- Preliminary Findings (WGC ; G.K.)

SOIL AMPLIFICATION - "SHAKE" ANALYSES (S & W ; F.V.)

SUMMARY (N.U. ; C.S.)



STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	REGIONAL SEISMICITY 1500-1982 $M \geq 2.0$	
	WESTON GEOPHYSICAL CORP.	FIGURE 3.2


CANADA
LAKE SUPERIOR
LAKE MICHIGAN
LAKE HURON
LAKE ONTARIO
LAKE ERIE
Sources
Extent of Settled Area
Prior to 1650
1650 to 1699
1700 to 1769
1770 to 1799
1800 to 1849
1850 to 1890
EXPANSION AND SETTLEMENT IN THE
COLONIES AND EASTERN UNITED STATES
1650 - 1890
prepared by
WESTON GEOPHYSICAL CORPORATION

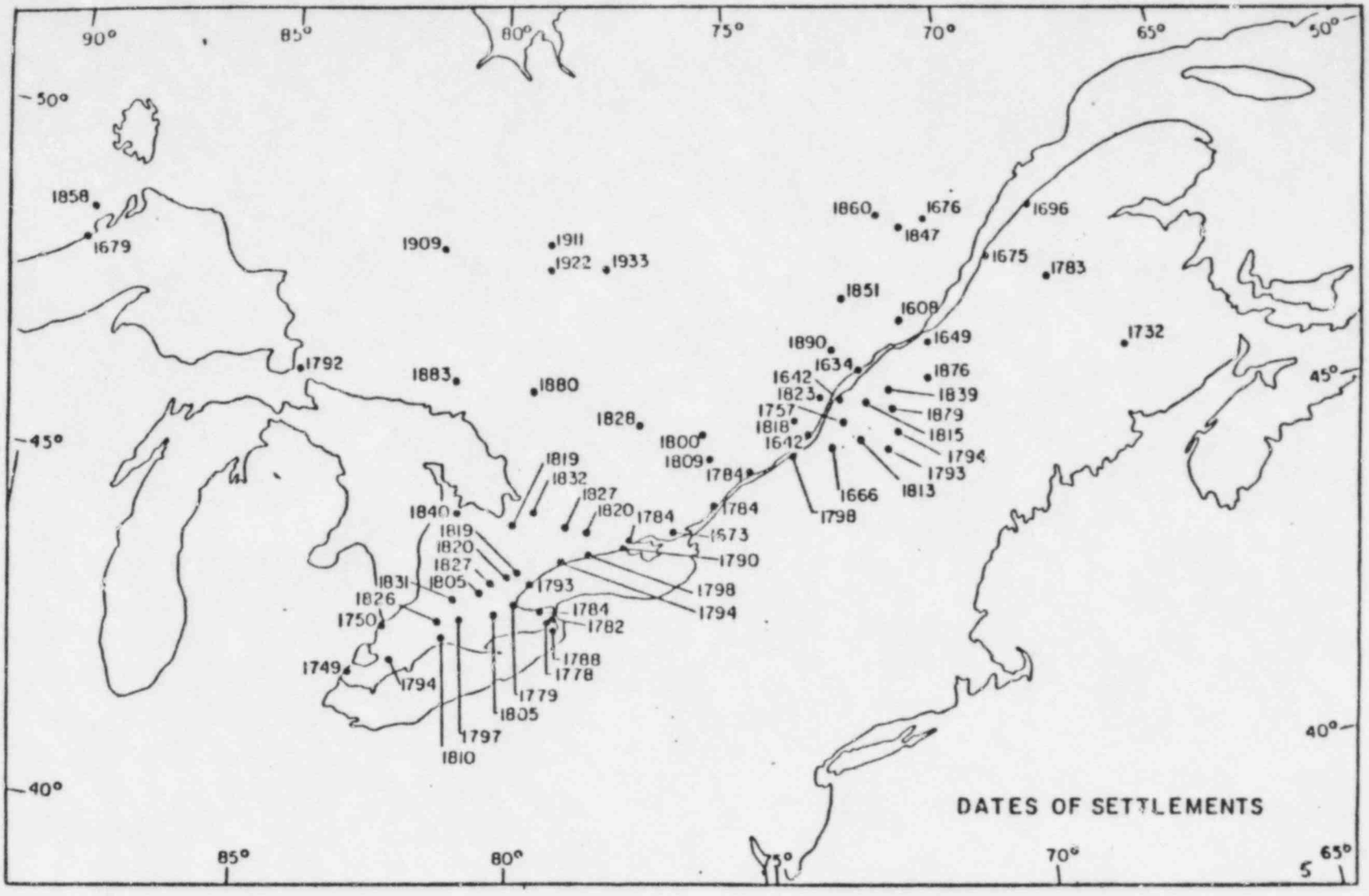


FIGURE 4

SETTLEMENTS IN CANADA

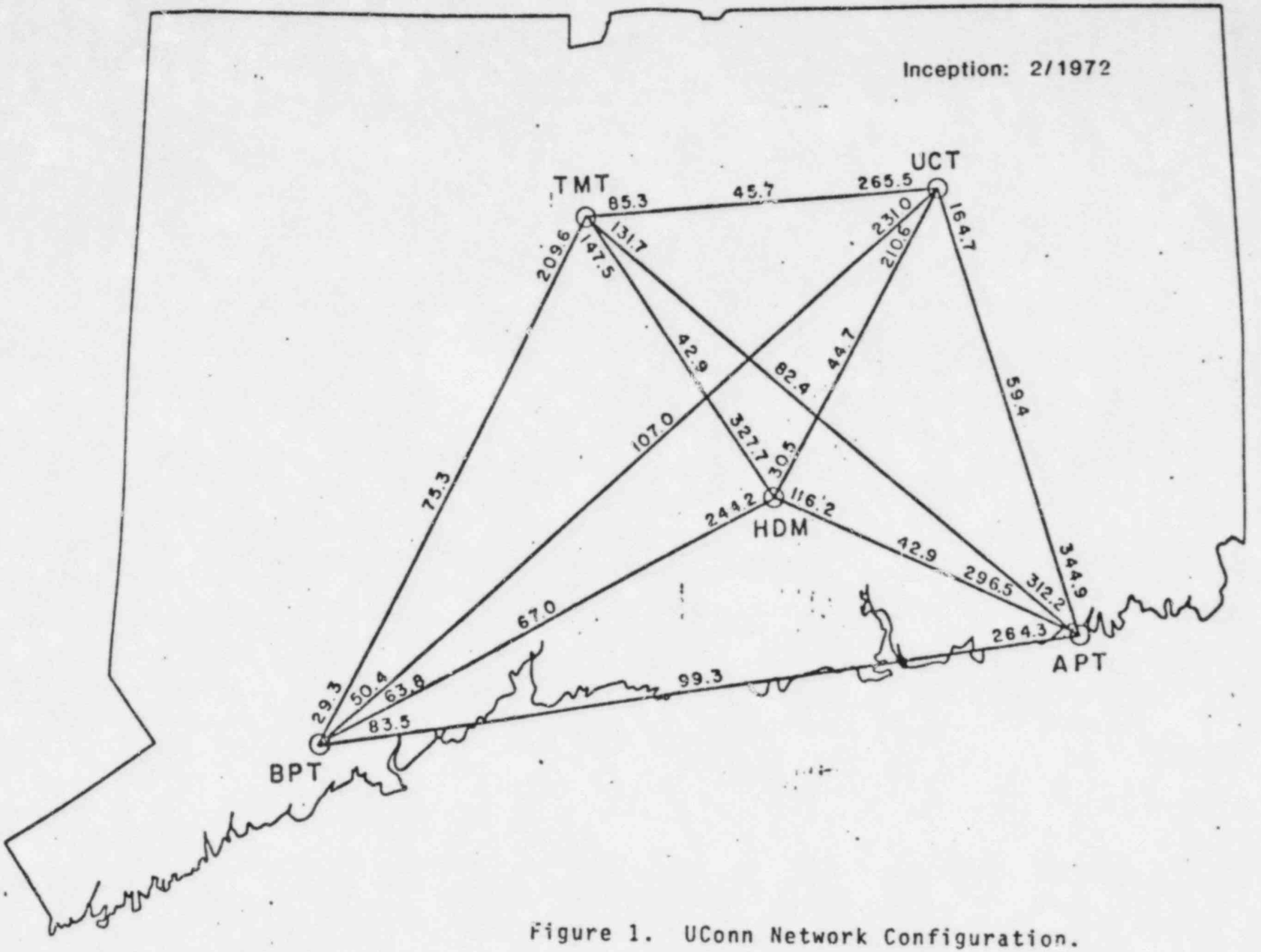
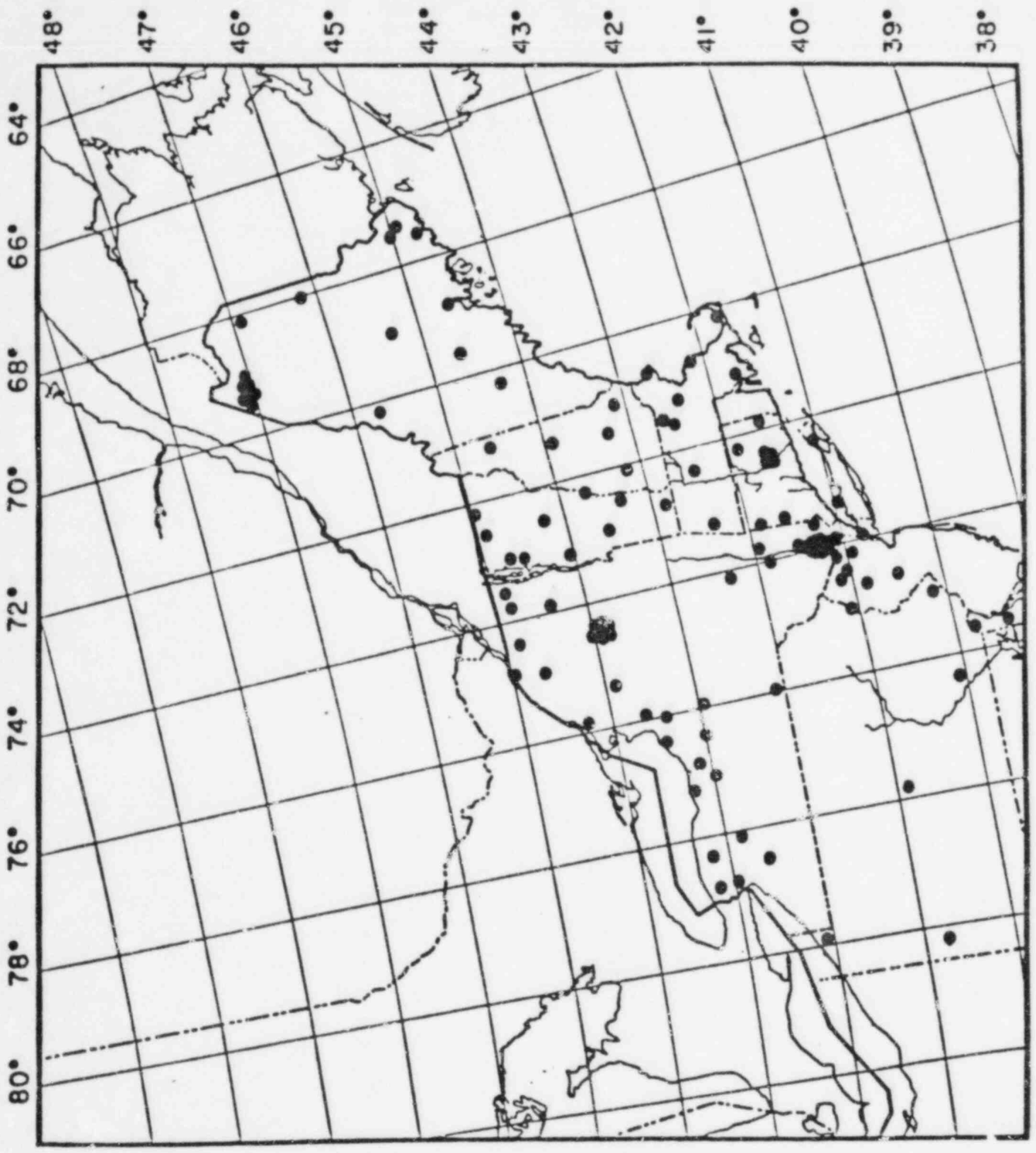


Figure 1. UConn Network Configuration.



Seismic Stations operating during the period

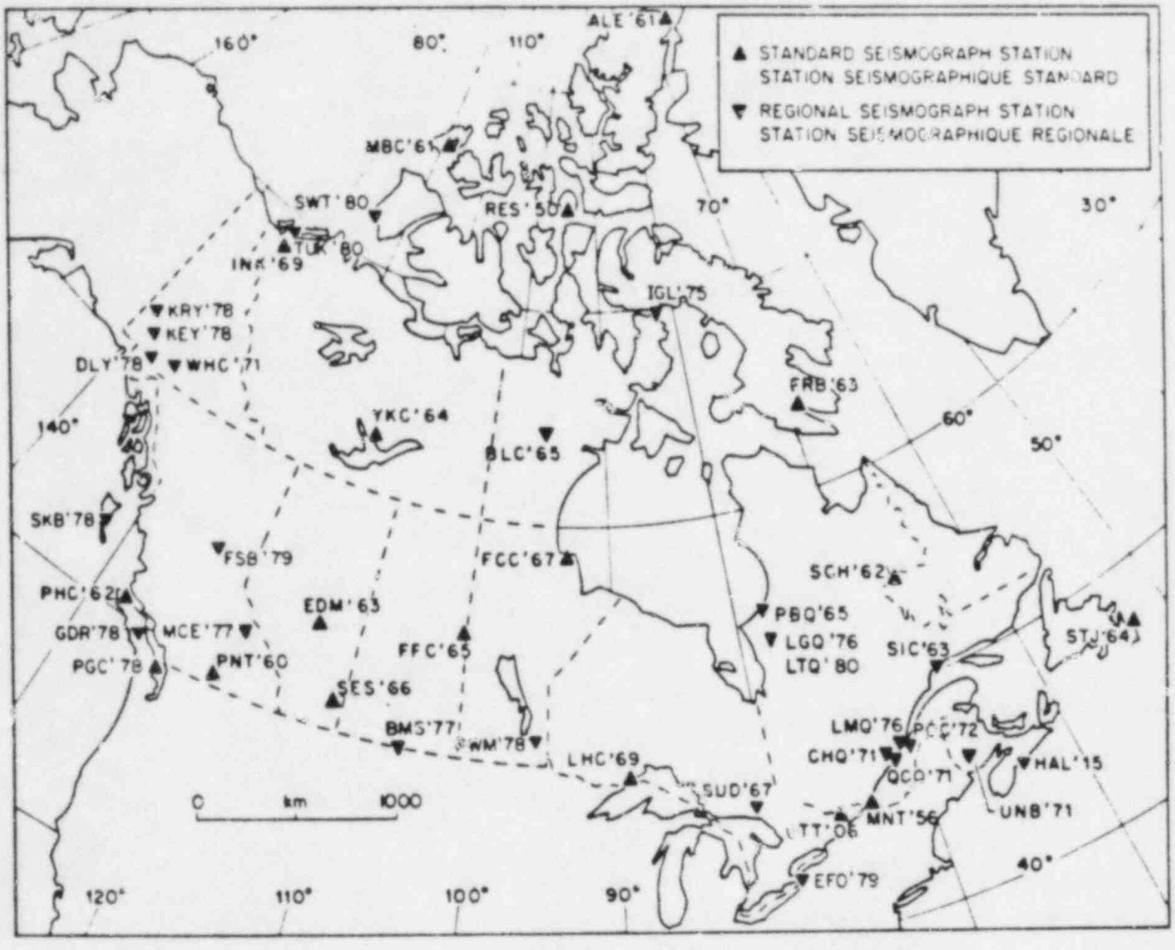
JULY - SEPTEMBER

1981

Northeastern U.S. Seismic Network

Bulletin No. 24

STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	NORTHEASTERN UNITED STATES SEISMIC NETWORK - 1981	
	WESTON GEOPHYSICAL CORP.	FIGURE 3.5



Seismological Series
Number 86
Ottawa, Canada 1981

STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	CANADIAN STANDARD AND REGIONAL SEISMOGRAPH NETWORK - 1980	
	WESTON GEOPHYSICAL CORP.	FIGURE 3.3

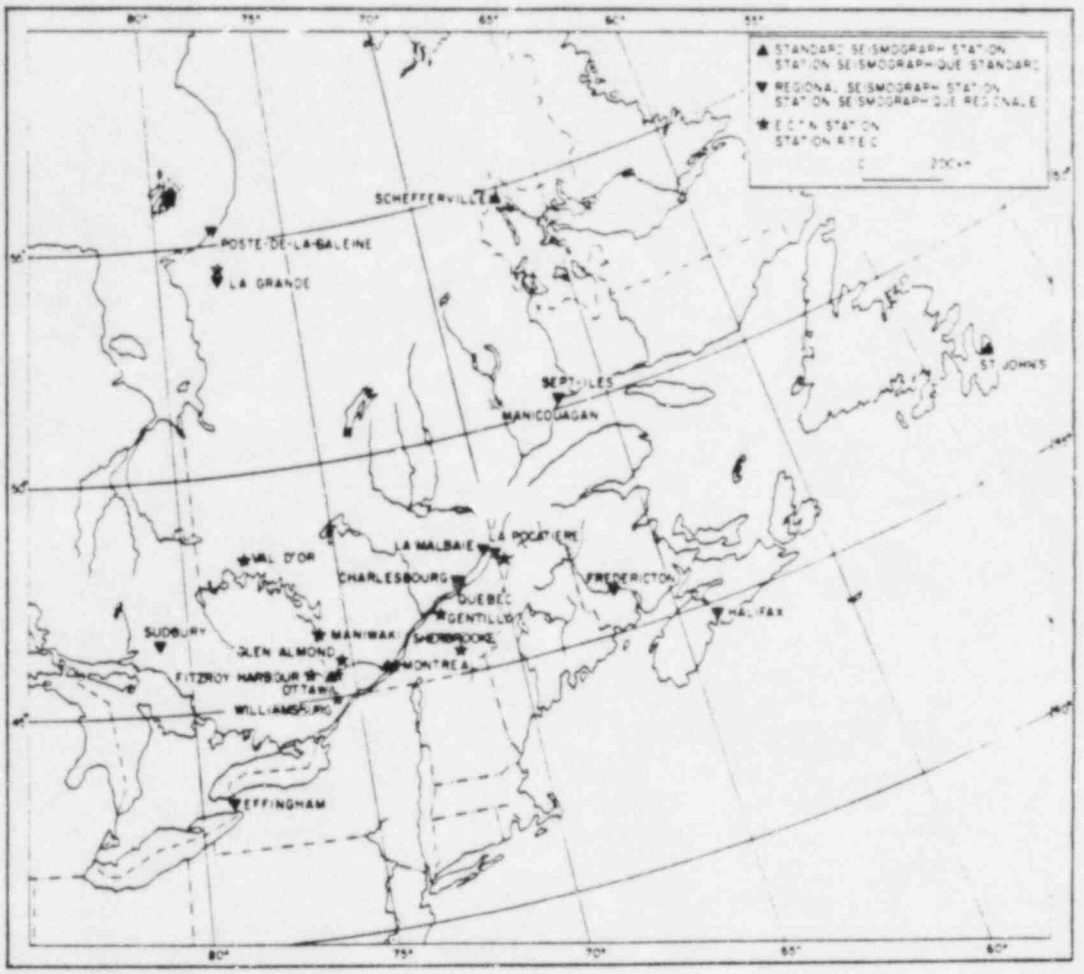
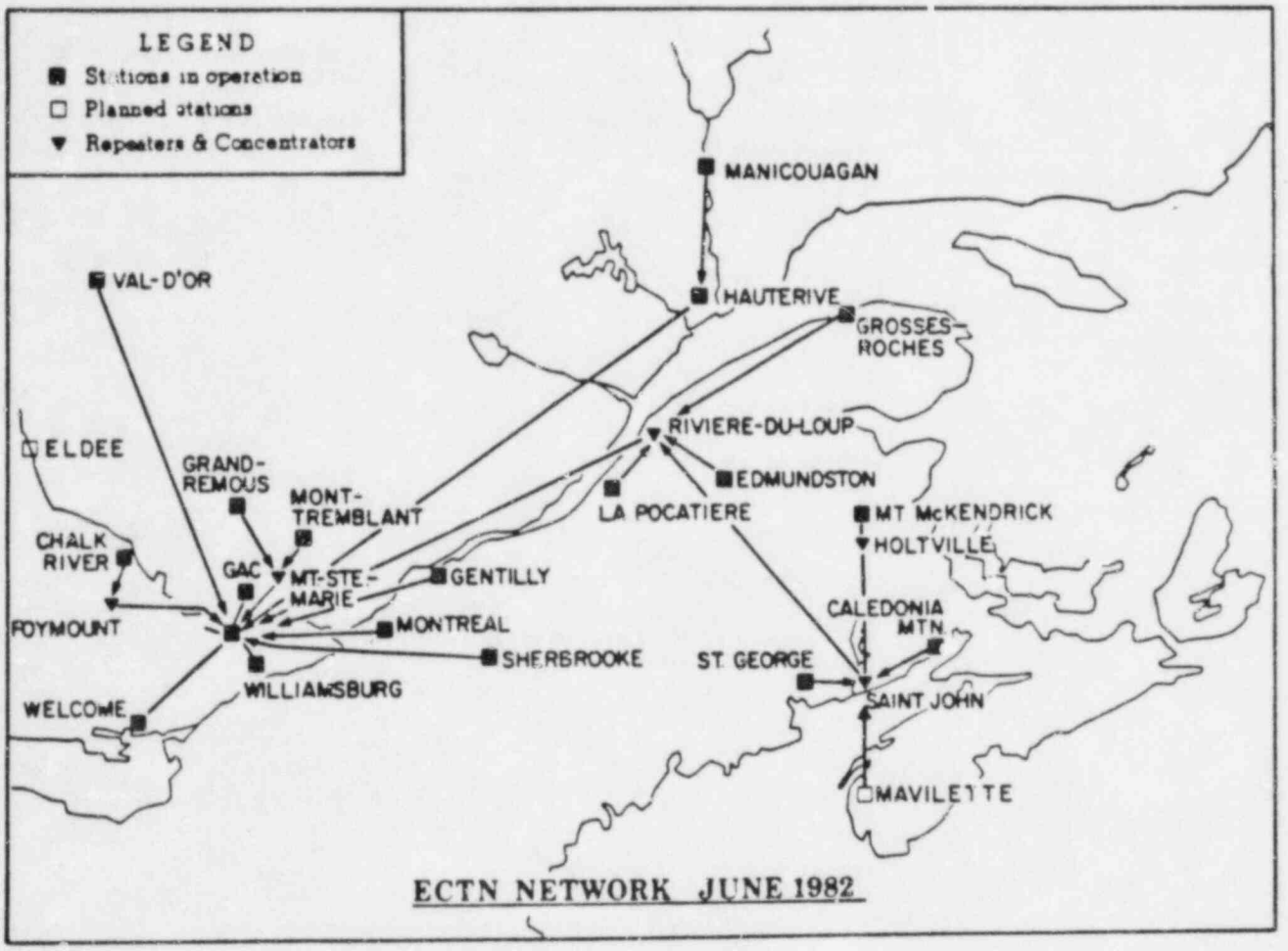
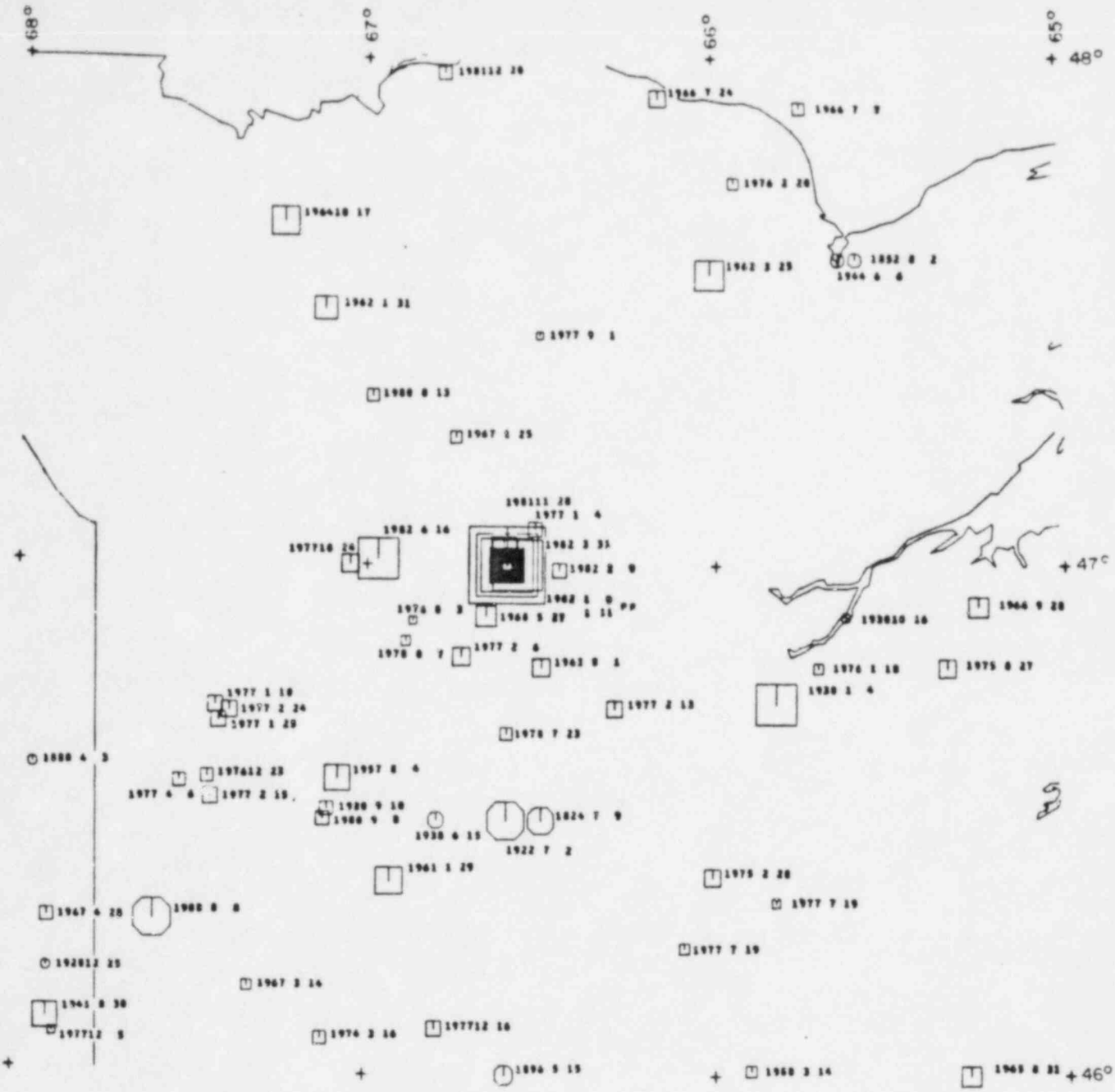


Figure 2. Eastern Canada Telemetered Network and Other Stations - 1980.
Stations du Réseau de télémetrie de l'Est du Canada et autres stations - 1980.



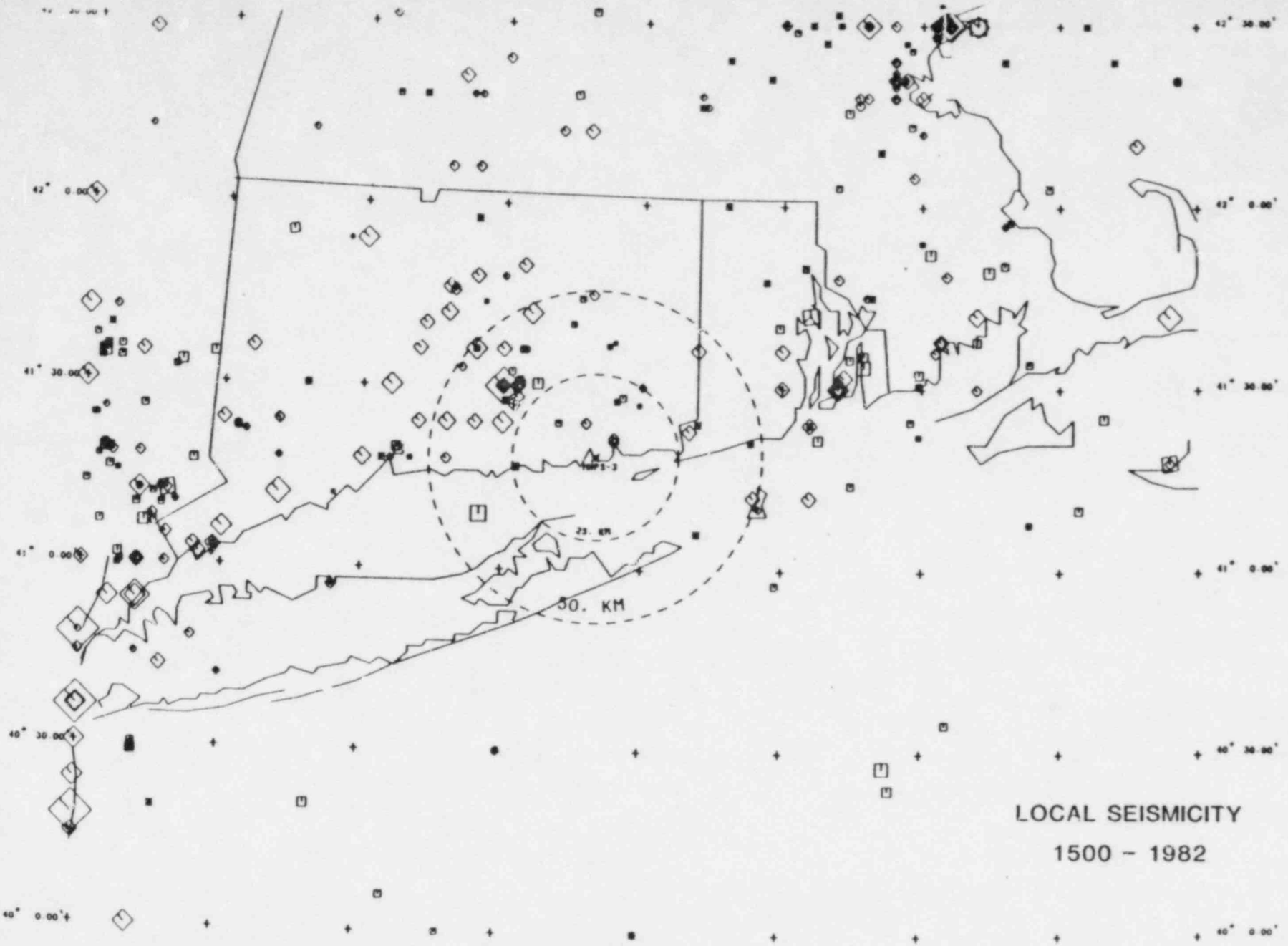
STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	EASTERN CANADA TELEMETERED NETWORK - 1982	
	WESTON GEOPHYSICAL CORP.	FIGURE 3.4



LEGEND

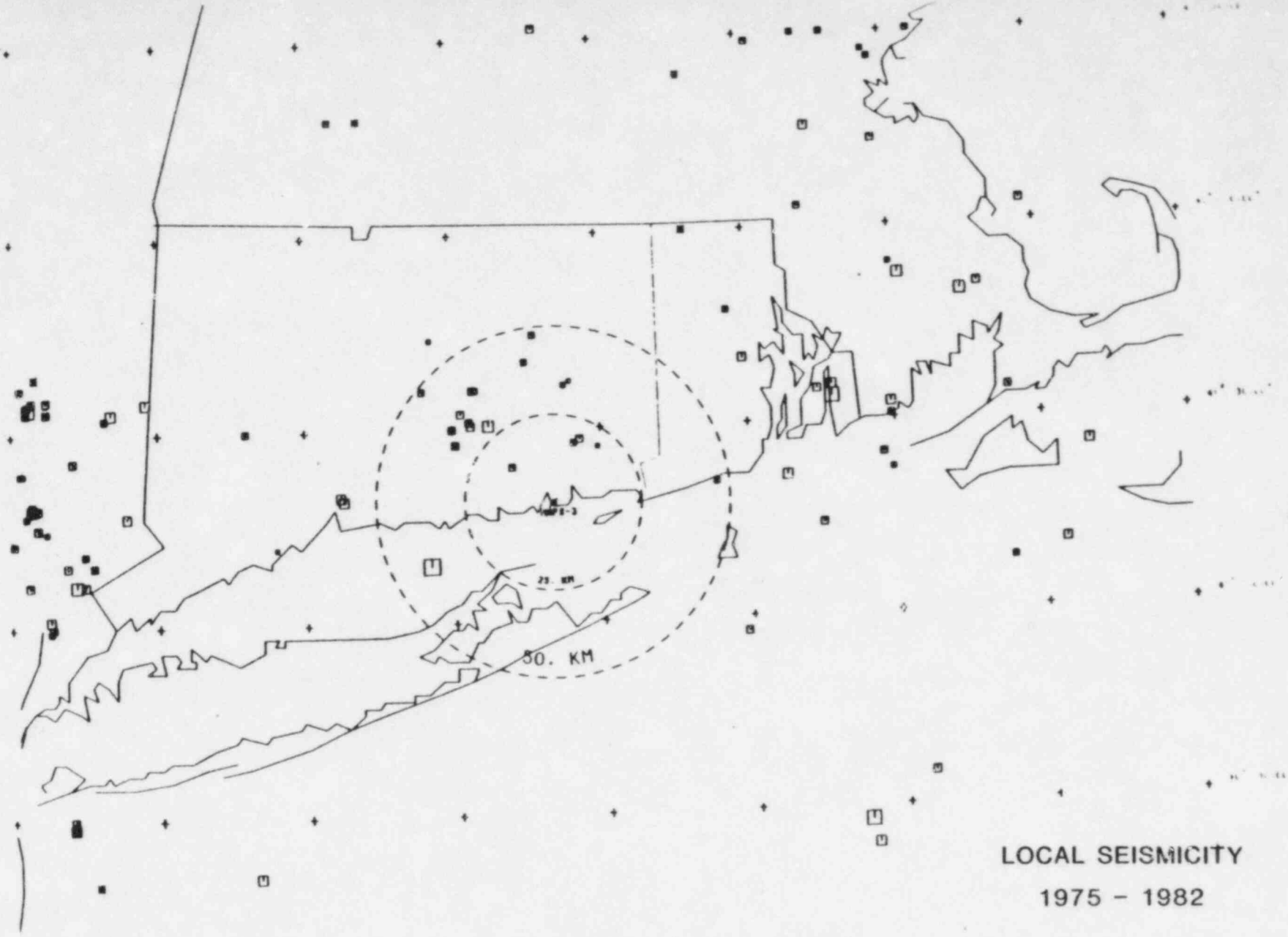
MAGNITUDE RANGES FROM 0.0 TO 7.5
INTENSITY RANGES FROM I TO X
TIME WINDOW BEGINS 1500 ENDS 1982

STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	HISTORICAL DATA AROUND THE NEW BRUNSWICK 1982 EVENTS
	WESTON GEOPHYSICAL CORP. — FIGURE 4.7



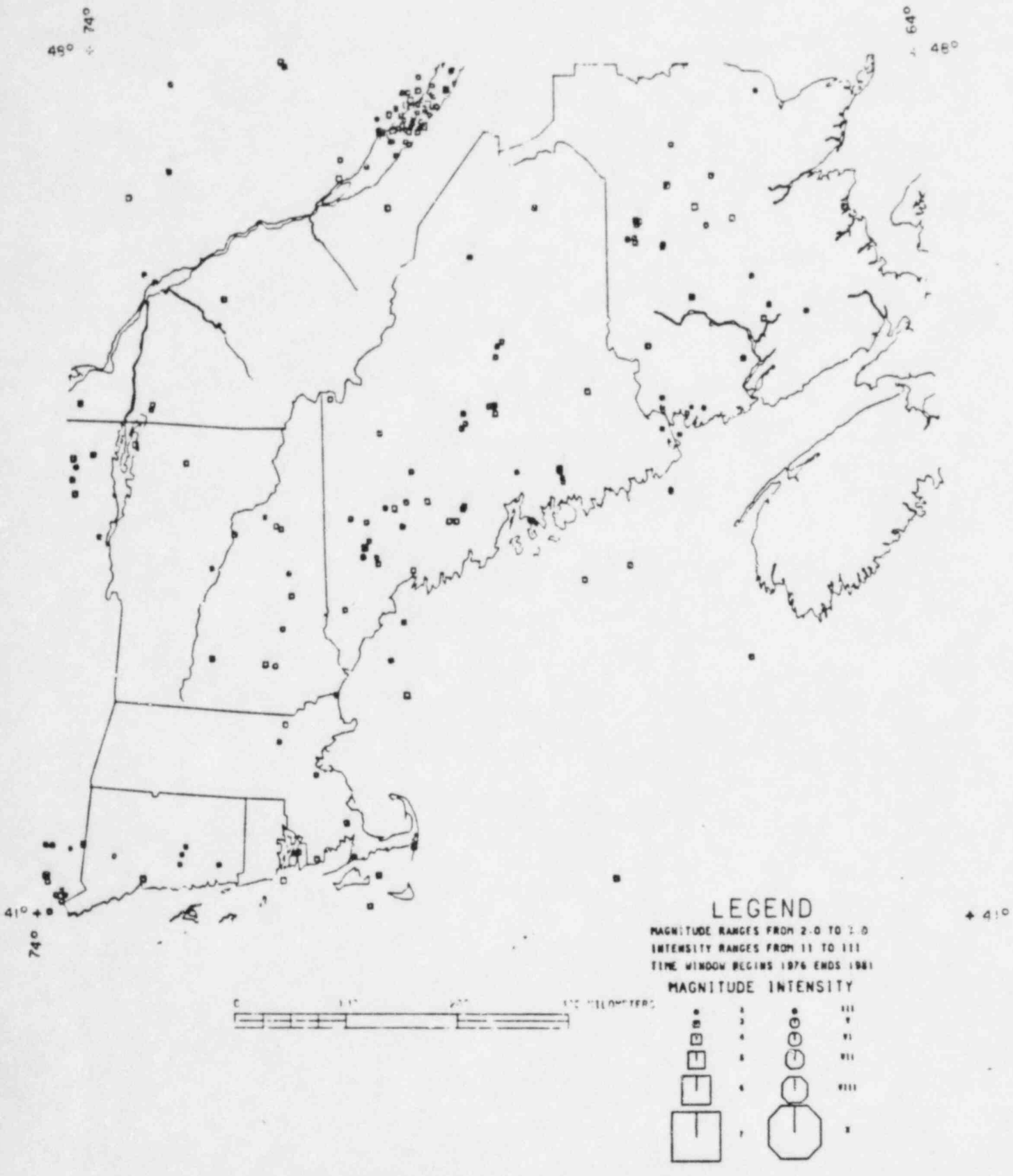
LOCAL SEISMICITY

1500 - 1982

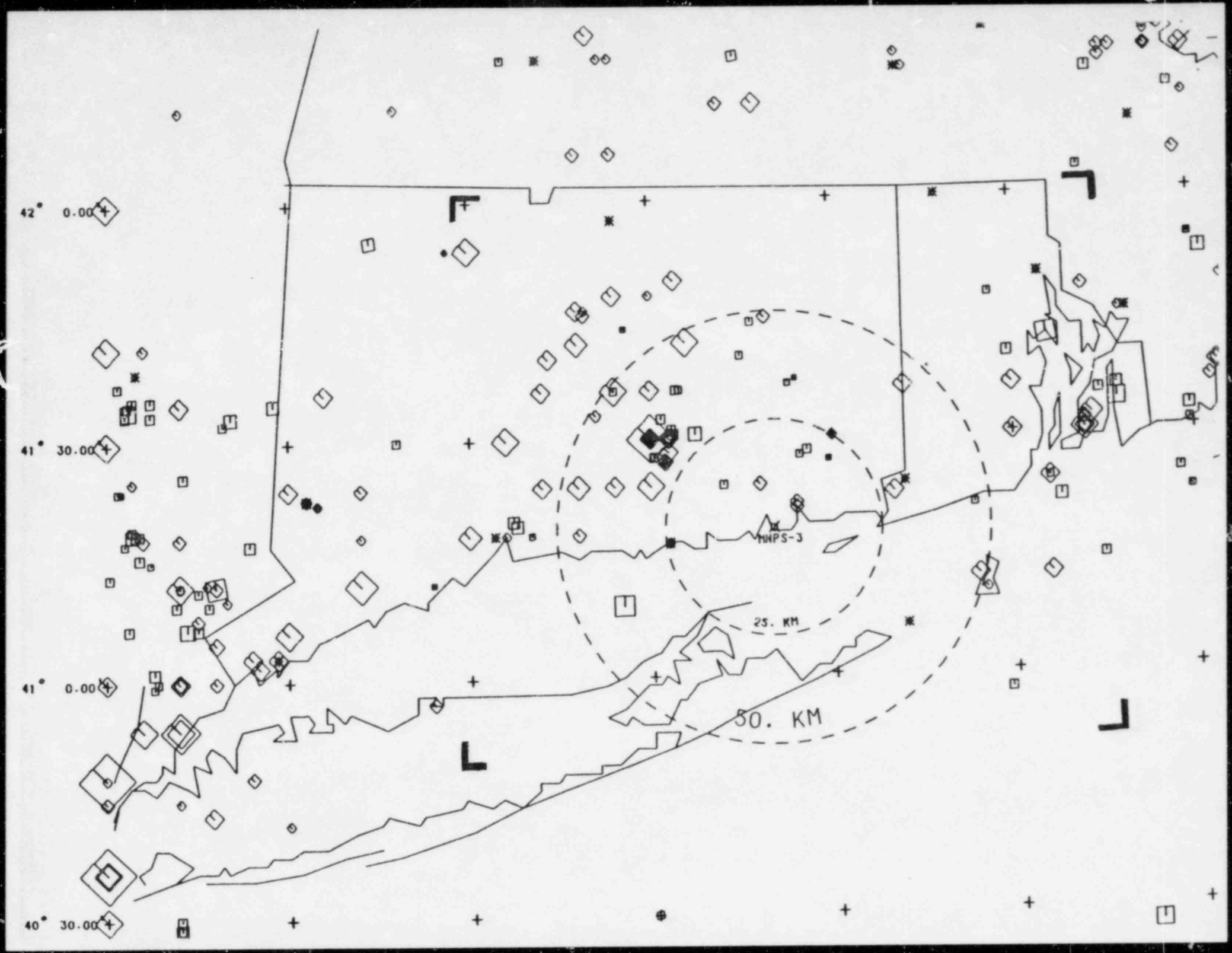


LOCAL SEISMICITY

1975 – 1982

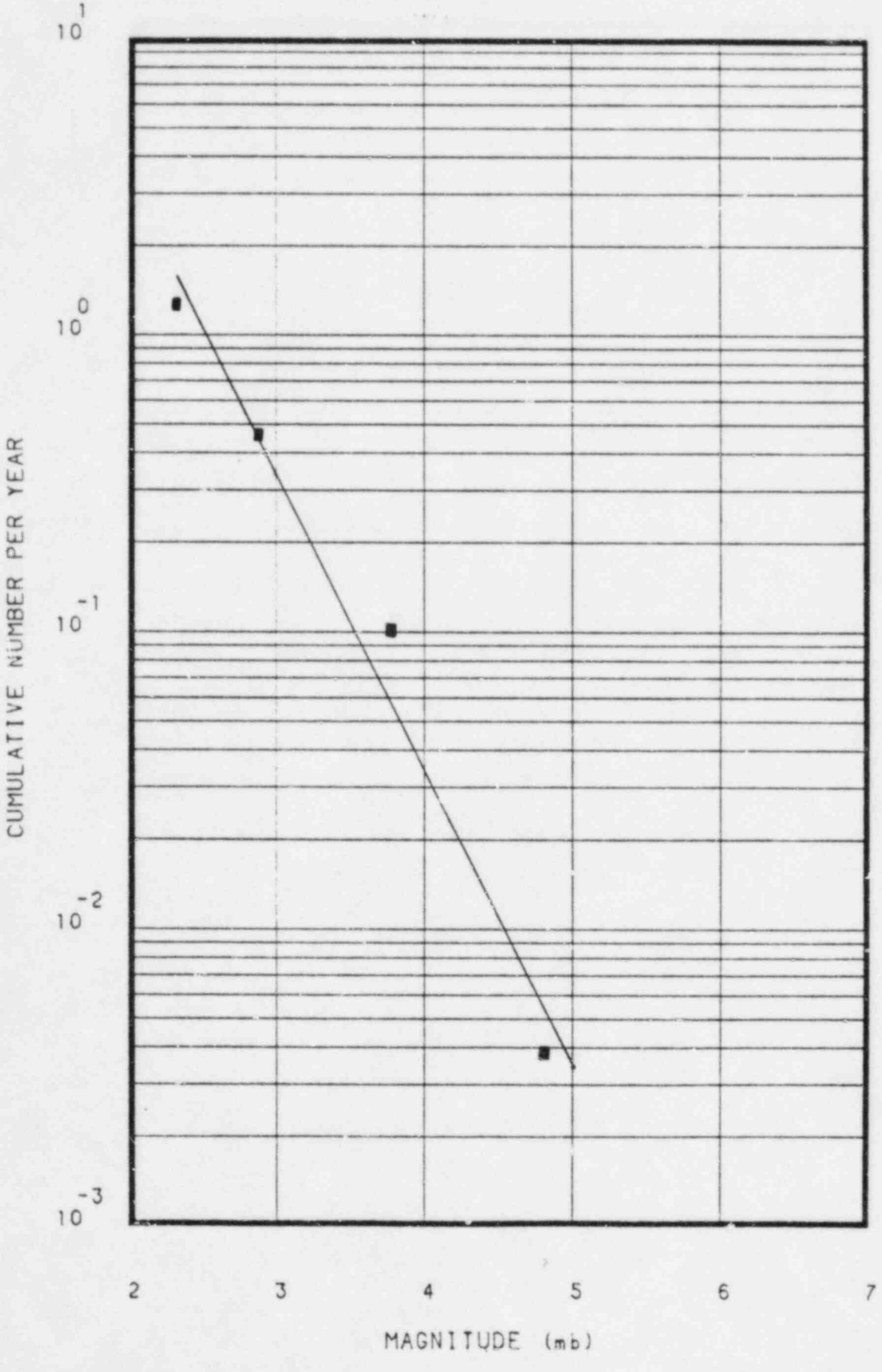


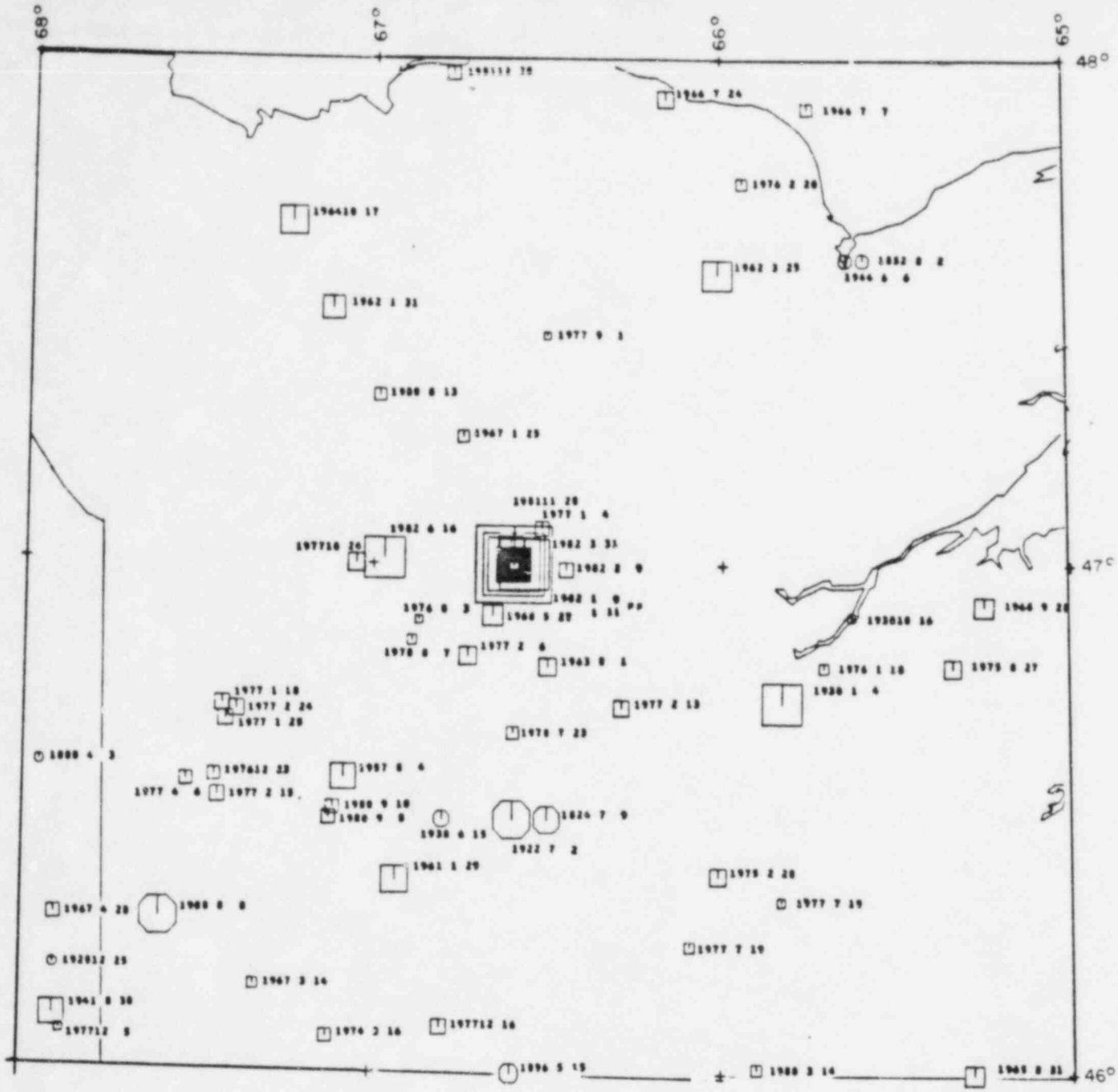
STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	SEISMICITY 1976-1981 $2.0 \leq M \leq 3.0$	
	WESTON GEOPHYSICAL CORP.	FIGURE 3.6


42° 0.00
41° 30.00
41° 0.00
40° 30.00
MNPS-3
25. KM
50. KM

MNP-3 REGION

20324sq.km.





LEGEND

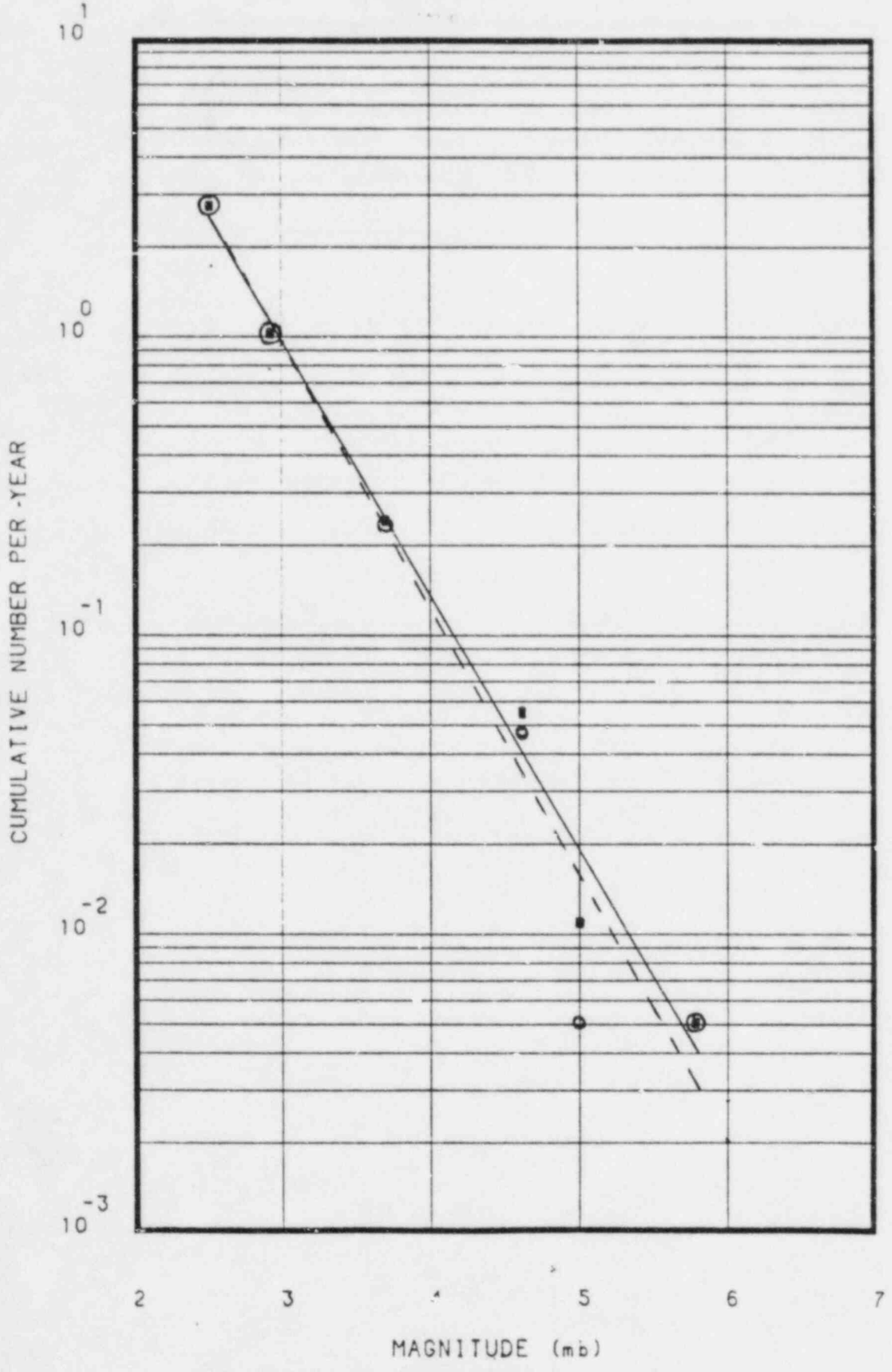
MAGNITUDE RANGES FROM 0.0 TO 7.5
INTENSITY RANGES FROM I TO X
TIME WINDOW BEGINS 1500 ENDS 1982

MAGNITUDE	INTENSITY
2	III
3	V
4	VI
5	VII
6	VIII

STUDIES OF THE 1982 NEW BRUNSWICK AND NEW HAMPSHIRE EARTHQUAKES for YANKEE ATOMIC ELECTRIC COMPANY	HISTORICAL DATA AROUND THE NEW BRUNSWICK 1982 EVENTS
	WESTON GEOPHYSICAL CORP. — FIGURE 4.7

NEW BRUNSWICK REGION

50720sq.km.



RECURRENCE per 1963 sq.km.

(Radius of 25 km.)