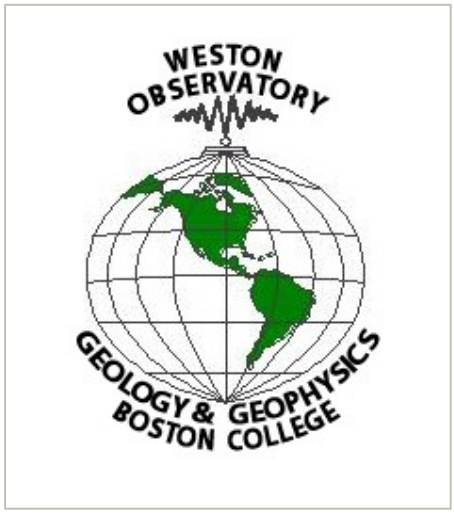
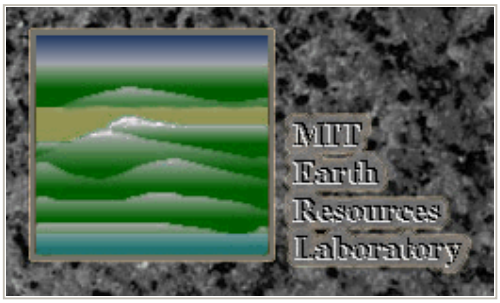
A STUDY OF NEW ENGLAND SEISMICITY

Quarterly Earthquake Report

July - September, 2001

New England
Seismic Network





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Notice

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Introduction

The New England Seismic Network (NESN) is operated collaboratively by the Weston Observatory (WES) of Boston College and the Earth Resources Lab (ERL) of the Massachusetts Institute of Technology. The mission of the NESN is to operate and maintain a regional seismic network with digital recording of seismic ground motions for the following purposes: 1) to determine the location and magnitude of earthquakes in and adjacent to New England and report felt events to public safety agencies, 2) to define the crust and upper mantle structure of the northeastern United States, 3) to derive the source parameters of New England earthquakes, and 4) to estimate the seismic hazard in the area.

This report summarizes the work of the NESN for the period July - September, 2001. It includes a brief summary of the network's equipment and operation, and a short discussion of data management procedures. A list of participating personnel is given in Table 1. There were 9 earthquakes that occurred within or near the network during this reporting period. Phase information for these earthquakes is included in this report.

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Current Network Operation and Status

The New England Seismic Network currently consists of 14 broadband three-component, 4 short-period vertical, and 8 strong-motion stations. The coordinates of the stations are given in Table 2, and maps of the weak- and strong-motion networks are shown in Figures 1 and 2, respectively.

WES now operates 13 stations with broadband instruments consisting of Guralp CMG-40T three-component sensors. Ground motions recorded by these sensors are digitized at 100 sps with 16-bit resolution. Additional gain-ranging provides 126 dB dynamic range. These stations are operated in dialup mode with waveform segments of suspected events transmitted in digital mode to Weston Observatory for analysis and archiving. During the year 2001, two new seismic stations were added to the WES network. Station UMM was placed in northeastern Maine and station FFD was placed in central New Hampshire. Station MIM, in central Maine was dismantled. WES also maintains 8 SMA-1 strong-motion instruments in New England.

ERL at MIT currently operates 4 short-period stations, all located within 100 km of Boston. The short- period instruments have 1.0 Hz L4C vertical seismometers. Data recorded by these seismometers is transmitted continuously in analog mode to ERL and digitized (12-bit) into a PC at 50 sps. A data acquisition program on the PC triggers on events detected in the short-period data streams and saves them to a disk for manual analysis. Station WFM also has a new three-component, high dynamic range instrument. The instrument has a CMG-40T sensor and transmits 3-channel, 24-bit data at 100 sps continuously to a central processor (Pentium PC) at ERL. Waveform windows of suspected events are extracted from the data stream, analyzed and archived with the short-period data. WES and ERL record some stations in analog format on helicorders to provide additional data for analysis.

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Seismicity

There were 9 earthquakes that occurred in or adjacent to the NESN during this reporting period. A summary of the location data is given in Table 3. Figure 3 shows the locations of these events. Figure 4 shows the locations of all events since the beginning of network operation in October, 1975.

Table 4 gives the station phase data and detailed hypocenter data for each event listed in Table 3. In addition to NESN data, arrival time and magnitude data sometimes are contributed for seismic stations operated by the Geological Survey of Canada (GSC), the Lamont-Doherty Cooperative Seismographic Network., and the US National Seismic Network. Final locations for this section were computed using the program HYPO78. For regional events (those too far from the NESN to obtain accurate locations and magnitudes) phase data are given for NESN stations, but the entry in Table 3 lists the hypocenter and geographic location information adopted from the authoritative network. Accordingly, the epicenter is plotted on the maps using the entry from Table 3.

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Data Management

Recent event locations are available via FTP at: SEISMOEAGLE.BC.EDU. Waveform data are saved in Nanometrics, ASCII, and SEED formats and are available via SEISMOEAGLE.BC.EDU or through personal contact. Earthquake lists can be fingered at QUAKE@SEISMOEAGLE.BC.EDU. Weston Observatory maintains two web pages with information about local earthquakes: "http://www.bc.edu:80/bc_org/avp/cas/wesobs/" and "http://seismoeagle.bc.edu/". The latter page is still under contruction. Currently available on the seismoeagle web page is the full catalog of northeastern U.S. earthquake activity to 1992. This will be updated as new Northeastern U.S. Seismic Network Bulletins are produced.

MIT/ERL provides two internet utilities, the MIT/ERL web-site ("www-erl.mit.edu/NESN/homepage.html") and an anonymous FTP directory, to distribute seismic data. SESAME (Seismic Event Server at MIT/ERL) is the web data server that distributes catalogs, reports, earthquake bulletins, and epicenter and station maps (including an archive of recent seismic events). The FTP site, named "sunda.mit.edu", is the current facility available to download waveform data recorded by the MIT NESN. The client machine IP number must be forwarded to us for the client to gain access to the anonymous FTP directory. After logging on, the user changes directories to "pub/seismic". Waveforms of individual events for the period April 1995 through the present are accessed as Unix-compressed SAC files, through the anonymous FTP directory. A "readme" file offers further explanation about the data. Older waveform data in SAC format (1981 - March 1995) will be made available on the FTP site upon request.

For more information on matters discussed in this report or general earthquake information (reports, maps, catalogs, etc.) consult our web-sites www-erl.mit.edu/NESN and www.bc.edu:80/bc_org/avp/cas/wesobs/ or contact:

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Explanation of Tables

Table 1: List of personnel operating the NESN

Table 2: List of Seismic and Strong Motion Stations

1. Code = station name
2. Lat = station latitude, degrees north
3. Long = station longitude, degrees west
4. Elev = station elevation in meters
5. Location = geographic location
6. Operator = network operator

Table 3: Earthquake Hypocenter List

1. Date = date event occurred, Yr (year)/Mo (month)/Dy (day)
2. Time = origin time of event, Hr (hour):Mn (minute):Sec (second) in UCT (Universal Coordinated Time, same as Greenwich Mean Time)
3. Lat = event location, latitude north in degrees
4. Long = event location, longitude west in degrees
5. Depth = event depth in kilometers
6. Mag = event magnitude
7. Int = event epicentral intensity
8. Location = event geographic location

Table 4: Earthquake detailed hypocenter and phase data list

Table Header: detailed hypocenter data

1. Geographic location
2. DATE = date event occurred, yr/mo/dy (year/month/day)
3. ORIGIN = event origin time (UCT) in hours, minutes, and seconds
4. LAT N = latitude north in degrees and minutes
5. LONG W = longitude west in degrees and minutes
6. DEPTH = event depth in kilometers
7. MN = Nuttli Lg phase magnitude with amplitude divided by period
8. MC = signal duration (coda) magnitude

   WES: 2.23 Log(FMP) + 0.12Log(Dist) - 2.36 (Rosario, 1979)
   MIT: 2.21 Log(FMP) - 1.7 (Chaplin *et al.*, 1980)

9. ML = local magnitude

   WES: calculated from Wood-Anderson seismograms (Ebel, 1982)
   GSC (Geological Survey of Canada): Richter Lg magnitude

10. GAP = largest azimuthal separation, in degrees, between stations
11. RMS = root mean square error of travel time residual in seconds

12. ERH = standard error of epicenter in kilometers
13. ERZ = standard error of event depth in kilometers
14. Q = solution quality of hypocenter

    A = excellent
    B = good
    C = fair
    D = poor

Table Body: earthquake phase data

1. STN = station name
2. DIST = epicentral distance in kilometers
3. AZM = azimuthal angle in degrees measured clockwise between true north and vector pointing from epicenter to station
4. Description of onset of phase arrival

    I = impulsive
    E = emergent

5. R = phase

    P = first P arrival
    S = first S arrival

6. M = first motion direction of phase arrival

    U = up or compression
    D = down or dilatation

7. K = weight of arrival

    0 = full weight (1.0)
    1 = 0.75 weight
    2 = 0.50 weight
    3 = 0.25 weight
    4 = no weight (0.0)

8. HRMN = hour and minute of phase arrival
9. SEC = second of phase arrival
10. TCAL = calculated travel time of phase in seconds
11. RES = travel time residual (error) of phase arrival
12. WT = weight of phase used in hypocentral solution
13. AMX = peak-to-peak ground motion, in millimicrons, of the maximum envelope amplitude of vertical-component signal, corrected for system response
14. PRX = period in seconds of the signal from which amplitude was measured
15. XMAG = Nuttli magnitude recorded at station
16. FMP = signal duration (coda), in seconds, measured from first P arrival
17. FMAG = coda magnitude recorded at station

Table 5: Microearthquakes and other non-locatable events

1. Date = date event occurred, Yr (year)/Mo (month)/Dy (day)
2. Sta = nearest station recording event
3. Arrival Time = phase arrival time, Hr (hour):Mn (minute):Sec (second)

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TABLE 1

WESTON OBSERVATORY PERSONNEL

Name	Network Position	voice phone	email address
John E. Ebel	Principal Investigator	617-552-8319	ebel@bc.edu
Alan Kafka	Research Seismologist	617-552-8300	kafka@bcvms.bc.edu
Susan O'Connor	Seismic Analyst	617-552-8337	dannolfo@bc.edu
Edward Johnson	Project Engineer	617-552-8332	johnson@bcvms.bc.edu
Patricia Tassia	Administrative Secretary	617-552-8311	tassia@bcvms.bc.edu
W. Richard Ott, S.J.	Assistant to the Director	617-552-8335	ottwi@mail1.bc.edu
Weston Observatory		617-552-8300 617-552-8388 (FAX)	

MIT/ERL PERSONNEL

Name	Network Position	voice phone	email address
M. Nafi Toksöz	Principal Investigator	617-253-7852	toksoz@mit.edu
Robert Cicerone	Research Seismologist	617-253-7863	cicerone@erl.mit.edu
Heather Hooper	Seismic Analyst	617-253-6290	

Sara Brydges	Administrator	617-253-7797	sara@erl.mit.edu
Earth Resources Lab		617-253-8027 617-253-6385 (FAX)	

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TABLE 2

SEISMIC STATIONS OF THE NEW ENGLAND SEISMIC NETWORK

Code	Lat	Long	Elev (m)	Location	Operator
BCX	42.3350	-71.1705	61.0	Chestnut Hill, MA	WES
BRY	41.9178	-71.5388	380.0	Smithfield, RI	WES
DNH	43.1225	-70.8948	24.0	Durham, NH	MIT
DXB	42.0610	-70.6992	8.0	Duxbury, MA	MIT
FFD	43.4702	-71.6533	131.0	Franklin Falls Dam, NH	WES
GLO	42.6403	-70.7272	15.2	Gloucester, MA	MIT
HNH	43.7050	-72.2860	180.0	Hanover, NH	WES
NH1	43.5473	-71.5743	402.0	Sanbornton, NH	WES
QUA2	42.2789	-72.3525	168.0	Belchertown, MA	WES
TRY	42.7311	-73.6669	131.0	Troy, NY	WES
UMM	44.7100	-67.4583	35.0	Machias, ME	WES
VT1	44.3317	-72.7536	410.0	Waterbury, VT	WES
WES	42.3850	-71.3220	60.0	Weston, MA	WES
WFM	42.6106	-71.4906	87.5	Westford, MA	MIT
WVL	44.5648	-69.6575	85.0	Waterville, ME	WES
YLE	41.3100	-72.9269	914.0	New Haven, CT	WES
PQI	46.6710	-68.0168	175.0	Presque Isle, ME	WES

STRONG MOTION STATIONS OF THE NEW ENGLAND SEISMIC NETWORK

Code	Lat	Long	Location	Operator
SM1	44.90	-67.25	Dennysville, ME	WES
SM2	44.49	-73.10	Essex Junction, VT	WES
SM3	41.45	-71.33	Newport, RI	WES
SM4	42.38	-71.32	Weston, MA	WES
SM5	42.66	-71.30	Lowell, MA	WES
SM6	42.30	-71.34	Natick, MA	WES
SM7	42.39	-71.54	Hudson, MA	WES
SM8	44.48	-69.61	North Vassalboro, ME	WES

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TABLE 3

EARTHQUAKE HYPOCENTER LIST
NEW ENGLAND AND ADJACENT REGIONS
July - September, 2001

< /tr>

Date Yr/Mo/Dy	Time Hr:Mn:Sec	Lat	Long	Depth (km)	Mag	Int	Location
2001/07/02	01:00:17.59	44.5457	-68.8227	13.44	1.3		ME, PENOBSCOT REGION
2001/07/13	16:27:09.40	45.0708	-69.2153	25.11	1.6		ME, S OF DOVER-FOXCROFT
2001/07/14	10:32:54.40	45.0483	-69.5935	9.49	1.7		ME, 25 KM SW OF DOVER-FOXCROFT
2001/07/14	20:08:29.37	40.9398	-74.3527	5.07	2.1		NJ, 36 KM NNW OF NEWARK
2001/07/17	14:41:20.64	39.9562	-76.3833	2.91	1.8		PA, MILLERSVILLE
2001/07/31	04:35:34.00	44.7785	-67.9192	13.82	2.0		ME, 36 KM WNW OF MACHIHAS
2001/08/15	14:44:34.85	42.0932	-72.3217	13.30	2.1		MA, SOUTHBRIDGE

2001/08/22	10:36:47.48	44.4113	-65.6722	12.50	2.4		NS, 74 KM NNE OF YARMOUTH
2001/09/16	21:24:53.94	44.9298	-72.1952	3.43	1.8		VT, NEWPORT

* indicates Mc rather than Mn.

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TABLE 4

EARTHQUAKE PHASE DATA LIST
NEW ENGLAND AND ADJACENT REGIONS
July - September, 2001

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NORTHWEST MAINE CRUSTAL STRUCTURE
01JUL02 ME, PENOBSCOT REGION
 DATE      ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS   ERH   ERZ Q
010702   1 0 17.59 44-32.74   68-49.36   13.44   1.3          140   0.48   6.3   5.4 D
 STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 WVL   67.2 269 IPD0   1 0 29.27   11.68   11.06   0.62 1.24   16 .17   1.3
                 S 0   1 0 36.88   19.29   19.69 -0.41 1.28
 UMM 109.9   80 IPU0   1 0 35.95   18.36   17.79   0.56 1.15   11 .15   1.4
                 S 0   1 0 48.90   31.31   31.67 -0.38 1.18
 PQI 244.5   15   S 4   1 1 25.26   67.67   63.71   3.91 0.00
 WES 313.8 220 EP 4    1 1  9.46   51.87   44.36   7.51 0.00
                 S 0   1 1 36.23   78.64   78.96 -0.33 0.63
 LMN 347.4   65   P 4   1 1  4.10   46.51   48.50 -1.99 0.00
                 S 4   1 1 42.82   85.23   86.33 -1.10 0.00
 LMQ 353.5 341   P 0   1 1  6.47   48.88   49.26 -0.44 0.52
                 S 4   1 1 44.12   86.53   87.68 -1.27 0.00
 DAQ 423.3 334   S 4   1 1 57.56   99.97 103.01 -3.32 0.00
SOUTH & COASTAL NEW ENGLAND, CHIBURIS, 1979
01JUL13 ME, S OF DOVER-FOXCROFT
 DATE      ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS   ERH   ERZ Q
010713 1627   9.40 45- 4.25   69-12.92   25.11   1.6          170   0.52   9.2  15.3 D
 STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 WVL   69.9 211 IPD3 1627 21.38   11.98   11.75   0.22 0.89   10 .11   1.1
                 S 3 1627 29.62   20.22   20.92 -0.72 0.86
 UMM 144.5 106 IPD0 1627 32.03   22.63   22.03   0.59 2.91   37 .13   2.1
                 S 3 1627 48.08   38.68   39.22 -0.56 0.74
 PQI 200.7   28 IPD3 1627 38.28   28.88   28.98 -0.13 0.65
                 S 2 1627 60.90   51.50   51.58 -0.13 1.30
 LMQ 288.4 343   P 4 1627 42.25   32.85   39.80 -7.02 0.00
 LMN 355.4   76   P 1 1627 57.45   48.05   48.07 -0.03 1.08
                 S 3 1627 94.32   84.92   85.57 -0.65 0.35
 GSQ 456.3   21   P 1 1627 68.34   58.94   60.53 -1.60 0.22
NORTHWEST MAINE CRUSTAL STRUCTURE
01JUL14 ME, 25 KM SW OF DOVER-FOXCROFT
 DATE      ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS   ERH   ERZ Q
010714 1032 54.40 45- 2.90   69-35.61    9.49   1.7          208   0.33   7.0   9.4 D
 STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 WVL   57.9 186 IPD2 1033   4.47   10.07    9.53   0.53 0.85   13 .11   1.1
                 S 1 1033 11.03   16.63   16.95 -0.35 1.36
 UMM 172.8 103 IPD3 1033 22.49   28.09   27.34   0.74 0.28   38 .15   2.2
                 S 1 1033 43.15   48.75   48.66   0.07 1.05
 PQI 217.9   34 EP 0 1033 27.40   33.00   32.91   0.05 1.24
                 S 0 1033 52.78   58.38   58.59 -0.26 1.22
 LMQ 283.6 349   P 4 1033 29.50   35.10   41.01 -5.99 0.00
 LMN 384.7   77   P 3 1033 46.37   51.97   53.50 -1.53 0.00
                 S 4 1033 86.55   92.15   95.23 -3.08 0.00
SOUTH & COASTAL NEW ENGLAND, CHIBURIS, 1979
01JUL14 NJ, 36 KM NNW OF NEWARK
 DATE      ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS   ERH   ERZ Q
010714 20 8 29.37 40-56.39   74-21.16    5.07   2.1          141   0.29   1.6   1.3 B
 STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 GPD   12.6 314   P 0 20 8 31.62    2.25    2.28 -0.03 1.74
                 S 1 20 8 33.28    3.91    4.05 -0.15 1.30
 TBR   25.0   26   P 0 20 8 33.80    4.43    4.26   0.13 1.70
                 S 2 20 8 37.01    7.64    7.58 -0.02 0.85
 PAL   38.0   79   P 1 20 8 35.90    6.53    6.39   0.14 1.24
                 S 0 20 8 40.70   11.33   11.37 -0.05 1.65
LSCT 125.1   49   P 1 20 8 49.55   20.18   20.40 -0.27 1.03
                 S 3 20 8 64.24   34.87   36.31 -1.53 0.10
 NED 179.2 220   P 2 20 8 57.55   28.18   28.26 -0.08 0.60
                 S 3 20 8 77.29   47.92   50.30 -2.38 0.00
BINY 194.7 316   P 1 20 8 60.00   30.63   30.17   0.38 0.84
                 S 2 20 8 82.72   53.35   53.70 -0.49 0.57
QUA2 223.5   48 EP 4 20 8 65.39   36.02   33.72   2.27 0.00   16 .12   2.1
                 S 2 20 8 90.45   61.08   60.03   1.00 0.38
 WES 299.0   58 EP 4 20 8 77.51   48.14   43.05   5.08 0.00
 NCB 336.8    2   P 4 20 8 81.53   52.16   47.72   4.36 0.00
SOUTH & COASTAL NEW ENGLAND, CHIBURIS, 1979
01JUL17 PA, MILLERSVILLE
 DATE      ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS   ERH   ERZ Q
010717 1441 20.64 39-57.37   76-23.00    2.91       1.8       240   0.16   2.3   1.0 B
 STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 MVL    5.5   30   P 0 1441 21.47    0.83    1.07 -0.24 1.26
                 S 0 1441 22.61    1.97    1.91   0.06 1.31
SSPA 148.5 301   P 1 1441 45.03   24.39   24.09   0.27 0.78
                 S 0 1441 63.55   42.91   42.88 -0.02 1.06
 GPD 201.1   54   P 0 1441 51.89   31.25   31.20   0.05 0.96
                 S 0 1441 76.28   55.64   55.54   0.10 0.96
 PAL 239.8   61   P 3 1441 58.08   37.44   35.98   1.46 0.00
                 S 1 1441 84.51   63.87   64.05 -0.18 0.66
BINY 250.6    8   P 4 1441 89.71   69.07   37.32 31.67 0.00
QUA2 425.7   53   S 4 1442 93.39 132.75 104.89 27.81 0.00
NORTHWEST MAINE CRUSTAL STRUCTURE
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01JUL31 ME, 36 KM WNW OF MACHIAS
 DATE     ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS  ERH  ERZ Q
010731  435 34.00 44-46.71  67-55.15  13.82  2.0          158  0.47  3.1  4.0 C
 STN   DIST AZM  RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 UMM   37.3 102 IPU1  435 40.53    6.53    6.45   0.08 3.11 175 .17  2.0
                 S 2  435 45.06   11.06   11.48  -0.43 2.05
 PQI 210.5 358 IPD4  435 67.53   33.53   31.56   1.94 0.00  21 .19  2.1
                 S 3  435 91.35   57.35   56.18   1.12 0.61
 LMN 271.8   64  P 1  436 13.10   39.10   39.13  -0.02 1.69
LBNH 324.3 259  P 3  436 21.73   47.73   45.61   2.07 0.07
                 S 2  436 55.14   81.14   81.18  -0.15 0.91
 A16 339.9 332  P 0  436 21.60   47.60   47.53   0.07 1.70
                 S 4  436 55.75   81.75   84.61  -2.86 0.00
 MOQ 346.9 280  P 3  436 24.35   50.35   48.41   1.81 0.15
                 S 0  436 60.29   86.29   86.16  -0.12 1.64
 A54 354.7 327  P 0  436 23.42   49.42   49.37   0.00 1.58
                 S 2  436 60.71   86.71   87.87  -1.27 0.64
 LMQ 359.6 329  P 1  436 24.20   50.20   49.97   0.16 1.15
                 S 3  436 61.52   87.52   88.95  -1.55 0.24
 A61 364.8 333  P 1  436 24.89   50.89   50.62   0.27 1.12
 A64 371.3 336  P 0  436 25.48   51.48   51.42   0.04 1.44
                 S 3  436 63.28   89.28   91.53  -2.28 0.02
 DPQ 433.4 299  P 3  436 34.28   60.28   59.09   1.20 0.20
                 S 4  436 68.85   94.85 105.17-10.32 0.00
 GSQ 463.9   8  P 1  436 37.37   63.37   62.85   0.52 0.52
                 S 4  436 82.55 108.55 111.87  -3.33 0.00
 ICQ 529.6   5  P 0  436 44.83   70.83   70.96  -0.13 0.17
                 S 4  436 95.44 121.44 126.30  -4.87 0.00
SOUTH & COASTAL NEW ENGLAND, CHIBURIS, 1979
01AUG15 MA, SOUTHBRIDGE
 DATE     ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS  ERH  ERZ Q
010815 1444 34.85 42- 5.59  72-19.30  13.30  2.1 2.1      115  0.53  1.9  2.4 D
 STN   DIST AZM  RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
QUA2   20.8 353 IPU0 1444 38.75    3.90    4.10  -0.23 1.76 227 .06  1.9  74  2.0
                 S 0 1444 42.14    7.29    7.30  -0.06 1.76
 BRY   67.7 107  P 3 1444 48.07   13.22   11.17   2.06 0.06 100 .06  2.2
                 S 2 1444 55.28   20.43   19.88   0.56 0.79
LSCT   88.0 238 EP 0 1444 49.07   14.22   14.24  -0.06 1.53
                ES 2 1444 59.81   24.96   25.34  -0.47 0.76
 WES   88.7  69 IPD0 1444 49.89   15.04   14.35   0.69 1.48  54 .07  2.1  63  2.1
                 S 2 1444 59.58   24.73   25.54  -0.82 0.73
 BCX   98.8  74 IP 0 1444 50.98   16.13   15.88   0.25 1.50
                 S 2 1444 61.51   26.66   28.27  -1.61 0.37
 YLE 100.5 210  P 3 1444 51.43   16.58   16.15   0.44 0.37
                 S 3 1444 62.62   27.77   28.74  -0.96 0.34
 FFD 162.4  20  P 0 1445  0.71   25.86   25.29   0.57 1.26
                 S 0 1445 19.58   44.73   45.02  -0.29 1.29
 HNH 179.1   1 EP 4 1444 58.65   23.80   27.35  -3.58 0.00
                ES 4 1444 81.85   47.00   48.69  -1.74 0.00
 PAL 179.5 228 EP 4 1445  2.49   27.64   27.40   0.25 0.00
                ES 4 1445 23.24   48.39   48.76  -0.37 0.00
 GPD 214.7 236 ES 4 1445 30.60   55.75   56.50  -0.75 0.00
LBNH 240.6   8 EP 4 1445 13.99   39.14   34.95   4.13 0.00
                ES 4 1445 41.88   67.03   62.21   4.72 0.00
 NCB 259.9 323 ES 4 1445 47.19   72.34   66.45   5.75 0.00
NORTHWEST MAINE CRUSTAL STRUCTURE
01AUG22 NS, 74 KM NNE OF YARMOUTH
 DATE     ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS  ERH  ERZ Q
010822 1036 47.48 44-24.68  65-40.33  12.50  2.4          260  0.08  6.7  5.5 D
 STN   DIST AZM  RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 UMM 145.7 283 IPU0 1037 10.97   23.49   23.46   0.02 1.31  74 .14  2.4
                 S 0 1037 29.22   41.74   41.75  -0.03 1.31
 LMN 174.0  23  P 0 1037 14.62   27.14   27.19  -0.05 1.24
 PQI 310.9 324 EP 0 1037 31.59   44.11   44.09  -0.01 0.88
                 S 4 1037 75.27   87.79   78.49   9.25 0.00
 GSQ 512.5 348  P 1 1037 56.77   69.29   68.98   0.30 0.27
SOUTHEAST MAINE CRUSTAL MODEL
01SEP16 VT, NEWPORT
 DATE     ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS  ERH  ERZ Q
010916 2124 53.94 44-55.79  72-11.71   3.43  1.8           76  0.40  1.3  2.0 C
 STN   DIST AZM  RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
LBNH   79.6 164  P 1 2125  7.19   13.25   12.94   0.25 1.63
                 S 2 2125 16.34   22.40   23.03  -0.74 0.99
 VT1   79.9 214 EP 3 2125  8.75   14.81   12.99   1.80 0.06
                ES 1 2125 17.21   23.27   23.12   0.11 1.63
HBVT   93.5 228  P 1 2125  9.45   15.51   15.15   0.30 1.58
                 S 4 2125 16.34   22.40   26.97  -4.68 0.00
 PNY 107.9 264  P 0 2125 11.41   17.47   17.44   0.00 2.04
                 S 1 2125 24.55   30.61   31.04  -0.48 1.48
 HNH 136.2 183 EP 1 2125 16.07   22.13   21.93   0.17 1.43  28 .20  1.9
                ES 3 2125 32.03   38.09   39.04  -1.00 0.37
 NCB 193.3 237  P 1 2125 24.01   30.07   29.80   0.19 1.23
                 S 0 2125 47.22   53.28   53.05   0.09 1.65
 DPQ 199.8 347  P 2 2125 24.63   30.69   30.60   0.10 0.81
 WVL 205.3 103 EP 4 2125 22.61   28.67   31.28  -2.61 0.00   8 .13  1.8
                ES 1 2125 49.88   55.94   55.67   0.25 1.19
MSNY 210.4 272  S 3 2125 51.72   57.78   56.80   0.96 0.34
 TRQ 233.6 308  P 3 2125 27.80   33.86   34.77  -0.91 0.31
                 S 1 2125 55.37   61.43   61.89  -0.45 1.07
 GAC 271.5 288  P 1 2125 33.62   39.68   39.45   0.23 0.96
                 S 3 2125 66.01   72.07   70.22   1.85 0.03
 WES 291.4 166 EP 4 2125 41.76   47.82   41.91   5.90 0.00   8 .27  1.8
                ES 4 2125 73.35   79.41   74.60   4.79 0.00
 A54 312.8  26  S 3 2125 72.25   78.31   79.29  -1.09 0.20
```

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TABLE 5

MICROEARTHQUAKES AND OTHER NON-LOCATABLE EVENTS

Date Yr/Mo/Dy	Sta	Arrival Time Hr:Mn:Sec
None recorded this period.		

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NESN Station Map

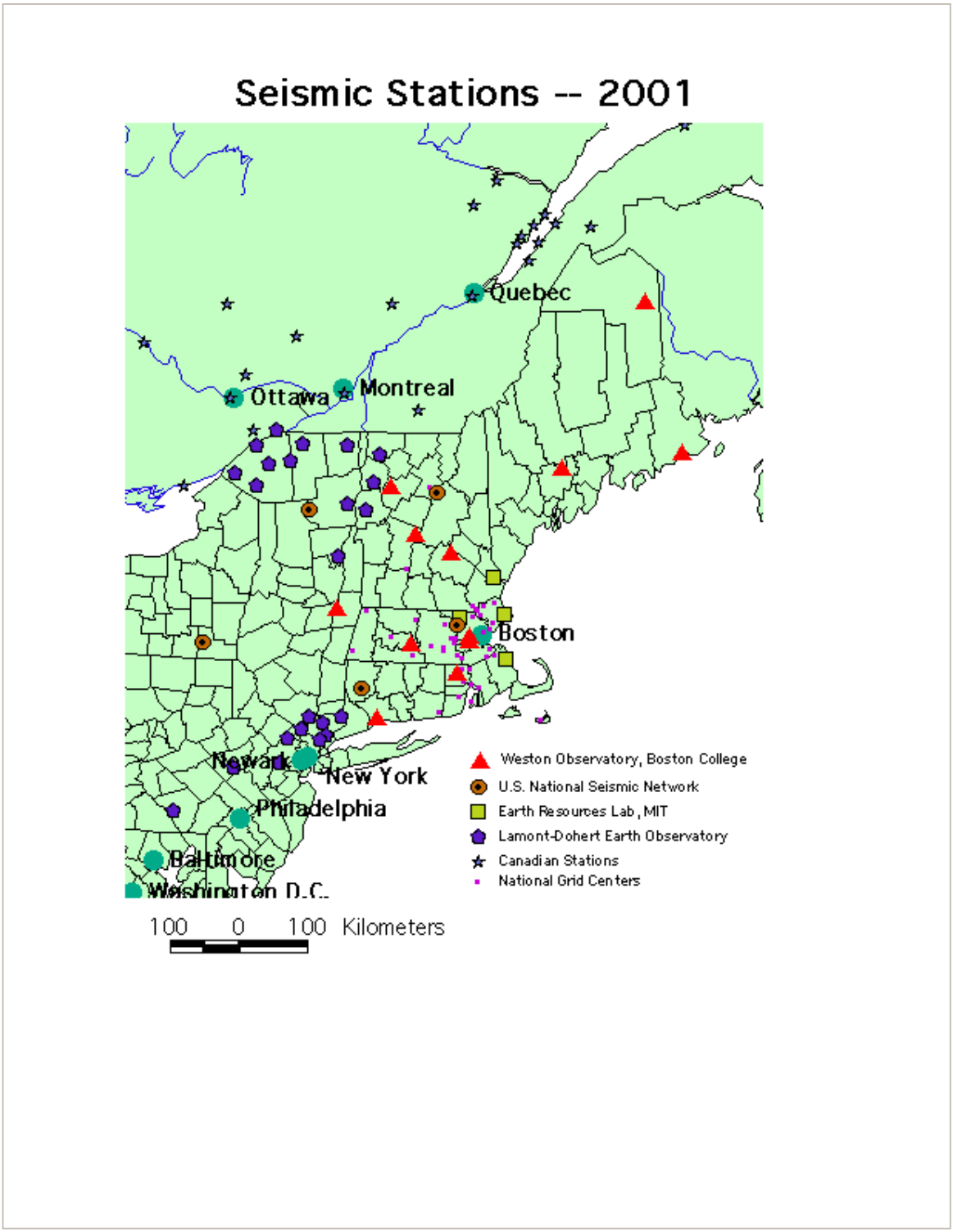

Figure 1: Map of stations of the New England Seismic Network (NESN) in operation during period July - September, 2001. Also included are the US National Seismic Network stations operating in New England during this period.

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NESN Strong-Motion Station Map

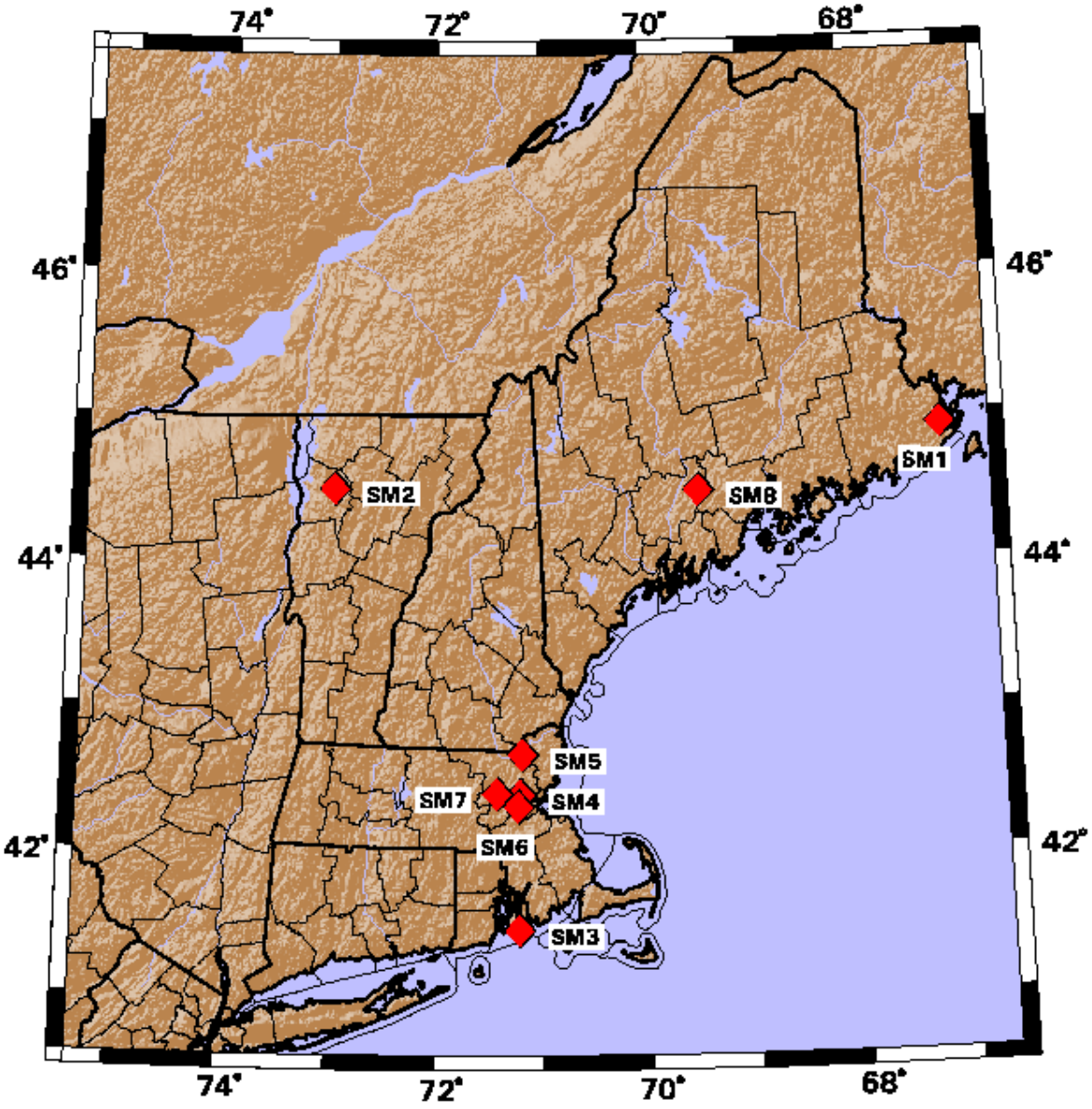

Figure 2: Map of strong-motion stations of the New England Seismic Network (NESN) in operation during period July - September, 2001.

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NESN Quarterly Seismicity Map

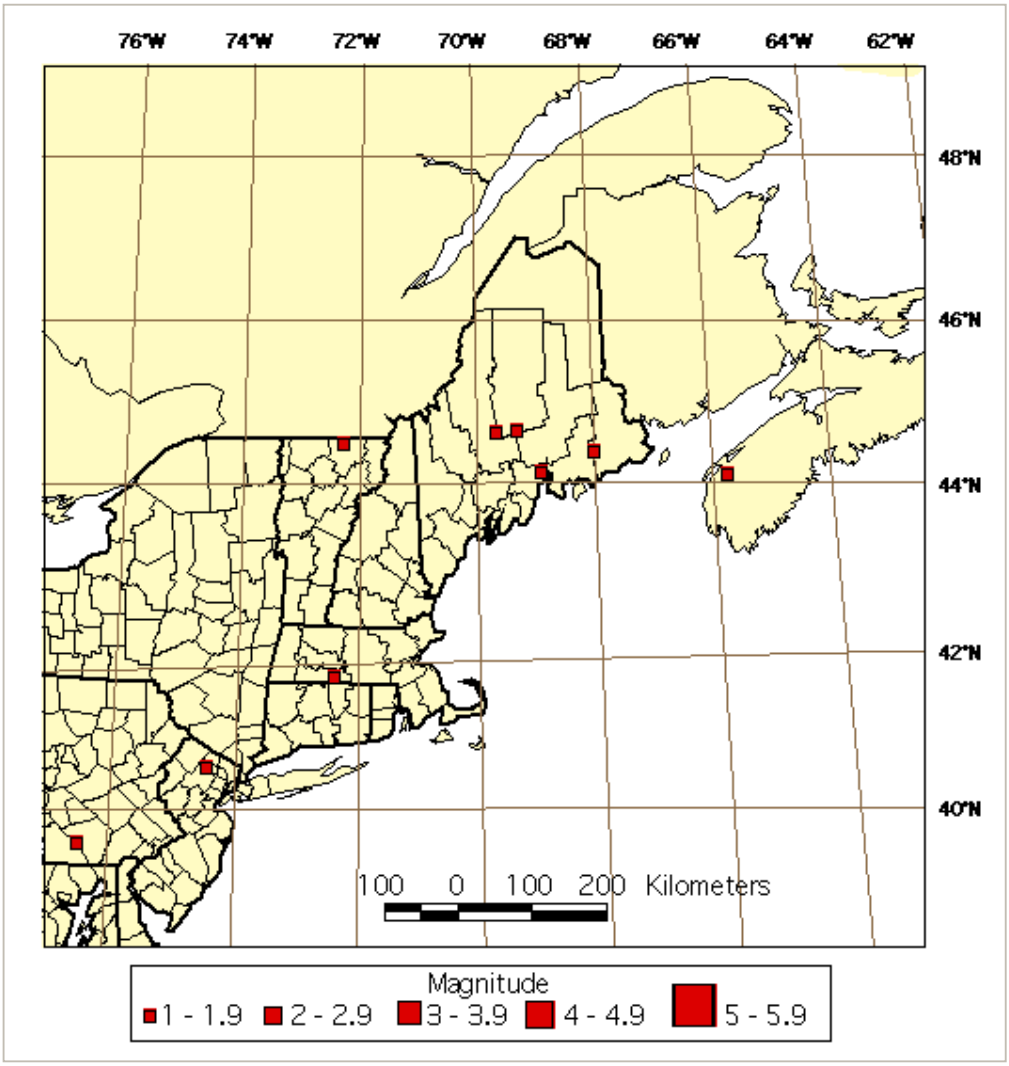

Figure 3: Earthquake epicenters located by the NESN during period July - September, 2001.

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NESN Cumulative Seismicity Map

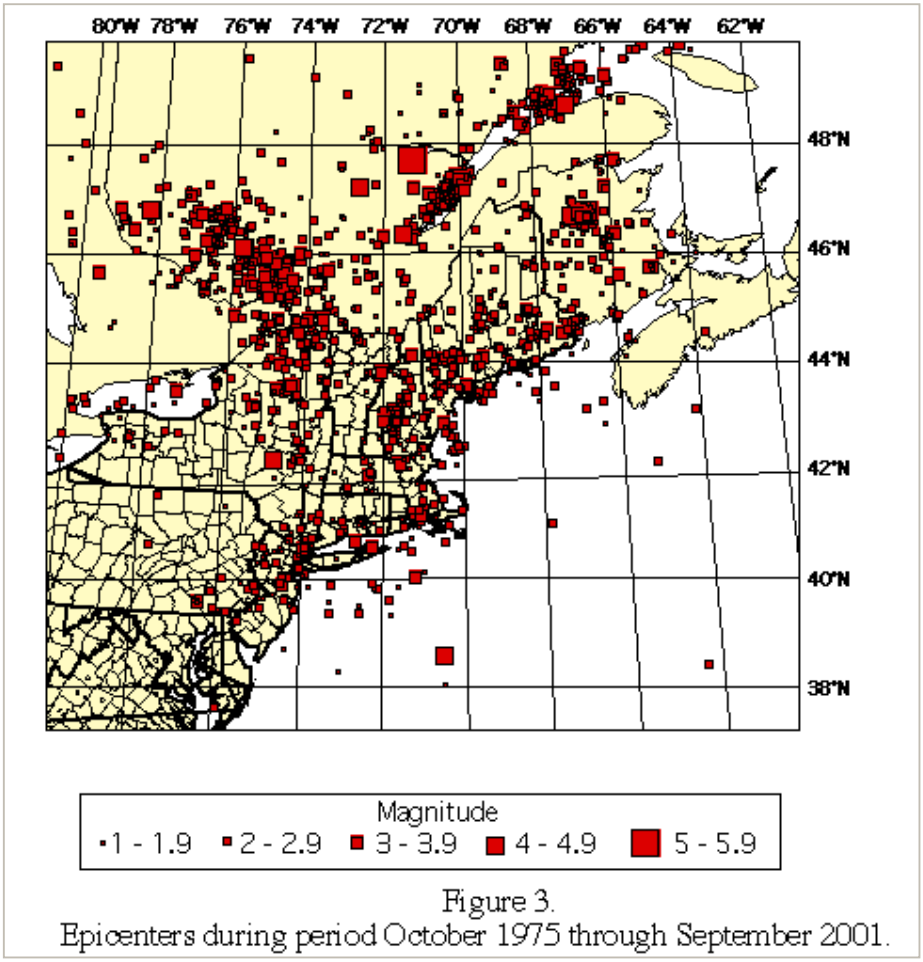

Figure 4: Seismicity for period October, 1975 - September, 2001.

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Acknowledgments

We would like to thank the Undergraduate Research Opportunities Program (UROP) of MIT for its support to the network. Our map database has been developed in-house using ARCINFO and in part basemap data provided by ESRI, Inc. (Arcdata Online), USGS GTOPO30 Elevation Data, and TIGER/Line '94, '95, and '97 (US Census Bureau) spatial data.

References

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Ebel, J.E. (1982), M_L measurements for northeastern United States earthquakes, *Bull. Seism. Soc. Am., 72,* 1367-1378.

Rosario, M. (1979), A coda duration magnitude scale for the New England Seismic Network, *Master's Thesis,* Boston College, 82 pp.

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