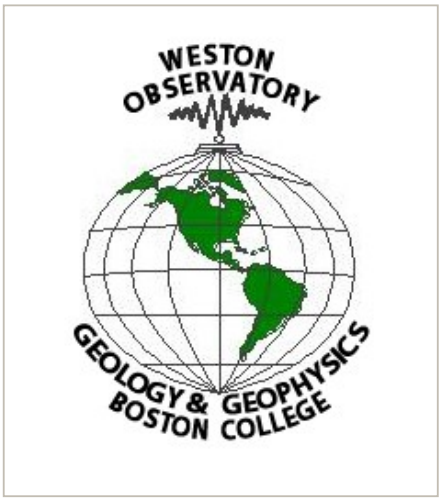
NESN

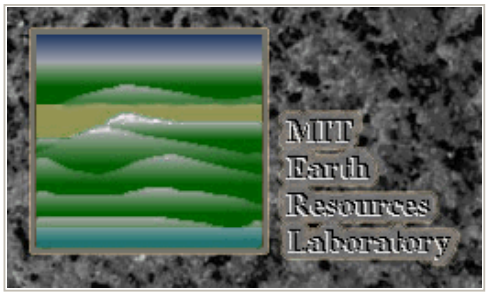
A STUDY OF NEW ENGLAND SEISMICITY

Quarterly Earthquake Report

July - September, 2003

New England
Seismic Network





Weston Observatory

381 Concord Road

Weston, MA 02493

Earth Resources Lab

Massachusetts Institute of Technology

42 Carleton Street

Cambridge, MA 02142

John E. Ebel, Principal Investigator

Weston Observato ry

Dept. of Geology and Geophysics

Boston College

381 Concord Road

Weston, MA 02493

Email: ebel@bc.edu

Award # 1434-HQ-98-AG-01943

M. Nafi Toksöz, Principal Investigator

Earth Resources Lab

Dept. of Earth, Atmospheric, and Planetary Sciences

Massachusetts Institute of Technology

42 Carleton Street

Cambridge, MA 02142

Email: toksoz@mit.edu

Award # 1434-HQ-98-AG-01926

Prepared by Anastasia Macherides Moulis

Email: macherid@bc.edu

October, 2003

for

United States Geological Survey

905 National Center

12201 Sunrise Valley Drive

Reston, Virginia 20192

Notice

Network operation supported by the U.S. Geological Survey (USGS), Department of the Interior, under USGS award number 1434-HQ-98-AG-01943 and award number 1434-HQ-98-AG-01926. Theviews and conclusions contained in this document are those of the authors andshould not be interpreted as necessarily representing the official policies,either expressed or implied, of the U.S. Government.

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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 ofthe 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 ofthe NESN for the period July - September, 2003. 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 5 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 sensorand 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 5 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 at www.bc.edu/westonobservatory. Waveform data are saved in Nanometrics, ASCII, and SEED formats and are available by contacting, Anastasia Macherides Moulis, via email at macherid@bc.edu. Earthquake lists can be found at www.bc.edu/westonobservatory. Currently available on the Weston Observatory web page is the full catalog of northeastern U.S. earthquake activity to 2003. This will be updated as new Northeastern U.S. Seismic Network Quarterly Earthquake Reports 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/westonobservatory or contact:

Robert Cicerone

MITEarth Resources Lab

42 Carleton Street

Cambridge, MA 02142

Voice: 617-253-7863 / FAX: 617-253-6385 / Email: cicerone@erl.mit.edu

Prof. John Ebe l

Weston Observatory

381 Concord Road

Weston, MA 02493

Voice: 617-552-8319 / FAX: 617-552-8388 / Email: ebel@bc.edu

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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 = st ation 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. D ate = 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 se paration, 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 arr ival

   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 arriva l
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 = sign al 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 = neares t station recording event
3. Arrival Time = phase arrival time, Hr (hour):Mn (minute):Sec (second)

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TABLE 1

WESTON OBSERVATORY PERSONNEL

617-552-8319kafka@bc.edu617-552-8332johnson@bc.edu

Name	Network Position	voice phone	email address
John E. Ebel	Principal Investigator	ebel@bc.edu	
Alan Kafka	Research Seismologist	617-552-8300	
Anastasia Macherides Moulis	Seismic Analyst	617-552-8325	macherid@bc.edu
Edward Johnson	Project Engineer		
Patricia Tassia	Administrative Secretary	617-552-8311	tassia@bc.edu
Dina Smith	Assistant to the Director	617-552-8335	dina.smith.1@bc.edu
		617-552-8300	
Weston Observatory		617-552-8388 (FAX)	

MIT/ERL PERSONNEL

Principal Invest igator617-253-7863cicerone@erl.mit.eduAdministrator617-253-7797

Name	Network Position	voice phone	email address
M. Nafi Toksöz	617-253-7852	toksoz@mit.edu	
Robert Cicerone	Research Seismologist		
Heather Hooper	Seismic Analyst	617-253-6290	
Sara Brydges	sara@erl.mit.edu		
		617-253-8027	
Earth Resources Lab		617-253-6385 (FAX)	

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TABLE 2

SEISMIC STATIONS OF THE NEW ENGLAND SEISMIC NETWORK

WES

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	
GLO	42.6403	-70.7272	15.2	Gloucester, MA	MIT
HNH	43.7050	-72.2860	180.0	Hanover, 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	10.0	New Haven, CT	WES
PQI	46.6710	-68.0168	175.0	Presque Isle, ME	WES

STRONG MOTION STATIONS OF THE NEW ENGLAND SEISMIC NETWORK

SM2-73.10Newport, RISM4-71.30WES42.39-71.54WES

Code	Lat	Long	Location	Operator
SM1	44.90	-67.25	Dennysville, ME	WES
44.49	Essex Junction, VT	WES		
SM3	41.45	-71.33	WES	
42.38	-71.32	Weston, MA	WES	
SM5	42.66	Lowell, MA		
SM6	42.30	-71.34	Natick, MA	WES
SM7	Huds on, MA	WES		
SM8	44.48	-69.61	North Vassalboro, ME	

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TABLE 3

NEW ENGLAND AND ADJACENT REGIONS

July - September, 2003

Date	Time	Lat	Long	Depth	Mag	Int	Location
Yr/Mo/Dy	Hr:Mn:Sec			(km)			
2003/07/22	11:41:15.66	42.7723	-70.0235	11.04	3.6		MA, 57.9 KM ENE OF GLOUCESTER
2003/08/20	01:58:18.96	46.3992	-75.0597	0.27	3.2		CANADA, 37 KM SSE OF MONT-LAURIER ONTARIO
2003/08/22	18:31:25.84	44.5317	-69.7765	16.66	2.2		ME, 9.3 KM WSW OF WATERVILLE
2003/08/22	18:32:38.75	44.4322	-69.6683	16.13	2.4		ME, 13 KM S OF WATERVILLE
2003/08/26	18:24:18.62	40.6110	-75.0850	0.77	3.6		NJ, 4.5 KM N OF MILFORD

* indicates Mc rather than Mn.

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TABLE 4

EARTHQUAKE PHASE DATA LIST
NEW ENGLAND AND ADJACENT REGIONS
July - September, 2003

```
SOUTHEAST MAINE CRUSTAL MODEL
03JUL22 MA, 36 MI (57.9 KM) ENE OF GLOUCESTER
 DATE     ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS  ERH  ERZ Q
 30722 1141 15.66 42-46.34  70- 1.41   11.04  3.6  .0     182   .47  2.1  1.3 C
 STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES   WT AMX PRX XMAG FMP FMAG
 BCX 105.9 243 EPD0 1141 32.71  17.05  17.11  -.08 3.78
               S 1 1141 46.59  30.93  30.45   .43 2.80
 WES 114.9 248 EP 3 1141 33.50  17.84  18.53  -.70  .89
              ES 4 1141 47.00  31.34  32.99 -1.66  .00
 HRV 129.4 257 EP 0 1141 36.35  20.69  20.82  -.16 3.58
               S 3 1141 51.15  35.49  37.06 -1.62  .22
 FFD 153.7 300 EPD2 1141 40.56  24.90  24.13   .75 1.56
               S 4 1141 60.49  44.83  42.95  1.84  .00
 BRY 156.9 233 EPD1 1141 40.69  25.03  24.53   .44 2.461475 .20  3.7
               S 0 1141 59.32  43.66  43.67  -.11 3.34
 WVL 197.4   8 EPU0 1141 45.26  29.60  29.53   .06 3.00 282 .16  3.2
               S 2 1141 67.63  51.97  52.56  -.61 1.45
QUA2 199.1 254 EPU0 1141 45.10  29.44  29.75  -.33 2.951196 .31  3.7
               S 3 1141 67.57  51.91  52.95 -1.09  .60
 HNH 211.1 299 EPD2 1141 47.77  32.11  31.22   .87 1.291067 .20  3.8
               S 4 1141 76.46  60.80  55.56  5.19  .00
 MIV 318.8 297 EP 0 1141 60.05  44.39  44.51  -.17 1.97
 MOQ 334.1 328 EP 3 1142  3.19  47.53  46.41   .98  .39
               S 1 1142 38.81  83.15  82.61   .29 1.36
MANY 362.1 242  P 4 1141 73.45  57.79  49.87  7.90  .00
 NCB 365.4 291 EP 1 1141 65.71  50.05  50.27  -.31 1.18
 GGN 366.1  45 EP 3 1142  4.58  48.92  50.36 -1.44  .17
               S 4 1142 41.88  86.22  89.64 -3.43  .00
ARNY 376.2 244  P 2 1141 66.77  51.11  51.60  -.56  .72
 PAL 377.6 239 EP 4 1141 61.95  46.29  51.77 -5.50  .00
 TBR 392.2 242  P 3 1141 68.02  52.36  53.58 -1.26  .23
 MNT 418.4 316  P 3 1142 13.58  57.92  56.82  1.08  .22
               S 1 1142 56.58 100.92 101.14  -.25  .84
BRNJ 443.7 238 EP 4 1141 77.50  61.84  59.94  1.90  .00
 QCQ 456.3 347 EP 2 1142 17.80  62.14  61.50   .63  .38
               S 3 1142 64.77 109.11 109.47  -.39  .20
 PQI 461.5  20 EPC1 1142 17.49  61.83  62.14  -.34  .56 274 .30  3.7
               S 4 1142 84.60 128.94 110.61 18.28  .00
 DPQ 486.1 333 EP 1 1142 21.26  65.60  65.17   .44  .40
               S 3 1142 70.88 115.22 116.00  -.77  .13
 WBO 489.2 300  P 3 1142 22.72  67.06  65.55  1.50  .04
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```
BINY 494.2 263   P 2 1142 22.80  67.14  66.18   .89  .21
                 S 4 1142 67.28 111.62 117.80 -6.31  .00
 A11 497.0 358   P 3 1142 22.95  67.29  66.51   .77  .10
                 S 0 1142 74.48 118.82 118.39   .41  .45
 A54 521.5 357   P 1 1142 25.75  70.09  69.54   .49  .18
 A16 521.8   0   P 1 1142 25.51  69.85  69.58   .27  .18
                 S 3 1142 80.90 125.24 123.86  1.38  .03
 TRQ 526.2 317   P 3 1142 27.75  72.09  70.12  1.98  .00
 LMQ 531.3 357   P 1 1142 26.95  71.29  70.75   .47  .12
                 S 4 1142 80.15 124.49 125.94 -1.57  .00
 LMN 538.9  51   P 3 1142 25.88  70.22  71.70 -1.53  .01
                 S 4 1142 80.03 124.37 127.62 -3.35  .00
 GAC 544.2 307   P 2 1142 29.21  73.55  72.35  1.19  .02
 A61 546.9 359   P 0 1142 28.22  72.56  72.68  -.13  .03
                 S 3 1142 83.63 127.97 129.38 -1.42  .00
KGNO 547.6 287   P 4 1142 31.70  76.04  72.77  3.27  .00
 A21 548.7   3   P 2 1142 29.04  73.38  72.89   .48  .00
 A64 561.8   1   P 1 1142 30.43  74.77  74.52   .23  .00
                 S 4 1142 85.80 130.14 132.65 -2.54  .00
 DAQ 584.8 351   P 1 1142 33.44  77.78  77.36   .26  .00
                 S 4 1142 90.00 134.34 137.70 -3.64  .00
 GRQ 629.0 313   P 1 1142 39.11  83.45  82.81   .60  .00
CRLO 689.3 302   S 4 1143 54.51 158.85 160.66 -1.86  .00
SSPA 696.4 250 EP 3 1142 45.28  89.62  91.13 -1.54  .00
 GSQ 719.3  18   P 2 1142 50.04  94.38  93.96   .42  .00
 CNQ 741.3  12   P 1 1142 52.59  96.93  96.68   .22  .00
SADO 766.6 287   P 0 1142 55.85 100.19  99.81   .35  .00
 ICQ 779.8  16   P 0 1142 56.88 101.22 101.43  -.22  .00
VLDQ 831.0 316   P 3 1143  4.50 108.84 107.76  1.07  .00
 EEO 836.3 301   S 4 1143 85.36 189.70 192.96 -3.38  .00
 SMQ 866.4  17   P 1 1143  7.03 111.37 112.13  -.82  .00
                 S 4 1143 85.68 190.02 199.59 -9.67  .00
 MNQ 867.7   6   P 2 1143  7.26 111.60 112.29  -.77  .00
                 S 4 1143 92.37 196.71 199.87 -3.32  .00
SE OF NEW YORK, HUGHES & LUETGERT
03AUG20 CANADA, ONTARIO, 48.2 KM (30 MI) NNW OF HAWKESBURY,
                      56.3 KM (35 MI) WSW OF STE AGATHE DES MONTS,
                      69 KM (42.9 MI) SW OF MONT-LAURIER
 DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
 30820  158 18.70 46-  .32  74-59.04  11.16  3.1  .0     130   .49  1.9  2.1 C
 STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
MSNY 112.3 175   P 1  158 36.32  17.62  17.28   .33 1.80
                 S 0  158 49.47  30.77  30.75   .00 2.39
 BGR 139.2 160   P 3  158 41.31  22.61  21.36  1.20  .53
                 S 1  158 56.46  37.76  38.03  -.35 1.69
 LOZ 157.2 168   P 0  158 42.71  24.01  24.08  -.14 2.15
                 S 2  158 60.97  42.27  42.86  -.71 1.06
 PTN 159.2 180   P 2  158 43.76  25.06  24.38   .65 1.06
                 S 0  158 62.21  43.51  43.40   .06 2.14
CRLO 185.7 271 EP 1  158 46.75  28.05  28.27  -.25 1.50
                 S 1  158 69.10  50.40  50.32   .03 1.50
 MOQ 226.1 110 EP 4  158 51.99  33.29  33.58  -.43  .00
 NCB 233.9 165   P 1  158 53.40  34.70  34.54   .06 1.30
                 S 1  158 80.85  62.15  61.48   .49 1.30
 MIV 243.3 152   P 2  158 54.12  35.42  35.70  -.33  .84
                 S 3  158 81.70  63.00  63.55  -.64  .42
 VT1 255.6 137 EPD4  159  2.06  43.36  37.21  6.13  .00 460 .19  3.6
                 S 4  159 90.03 131.33  66.24 65.06  .00
 MDV 264.4 147   P 2  158 56.74  38.04  38.31  -.29  .78
                 S 3  158 86.09  67.39  68.19  -.83  .38
 QCQ 297.6  73 EP 3  159  2.35  43.65  42.40  1.23  .33
VLDQ 300.0 321 EP 4  159  3.75  45.05  42.70  2.33  .00
ACCN 309.4 160   P 2  159  2.33  43.63  43.86  -.29  .66
                 S 4  159 40.63  81.93  78.08  3.75  .00
 EEO 322.9 283 EP 1  159  4.31  45.61  45.53   .01  .93
 HNH 332.8 140 EPC0  159  6.11  47.41  46.75   .63 1.18  53 .26  2.7
SADO 353.3 247 EP 3  159  7.43  48.73  49.28  -.59  .27
                 S 4  159 45.10  86.40  87.73 -1.40  .00
 DAQ 358.4  53 EP 3  159  7.45  48.75  49.90 -1.31  .24
 A54 385.1  65 EP 3  159 10.33  51.63  53.20 -1.63  .18
 FFD 386.1 137 EPC3  159 13.57  54.87  53.33  1.52  .20 249 .22  3.6
                 S 4  159 63.36 104.66  94.93  9.70  .00
 LMQ 394.8  64 EP 3  159 12.13  53.43  54.40 -1.04  .20
BINY 431.1 191   P 4  159 22.98  64.28  58.89  5.31  .00
                 S 4  159 70.65 111.95 104.82  6.99  .00
 WES 497.5 144 EPC3  159 39.55  80.85  67.09 13.75  .00  34 .36  2.8
                 S 4  159 95.32 136.62 119.42 17.19  .00
 PQI 541.9  82   S 4  159   .00  41.30 129.16-87.91  .00  28 .24  3.0
 GPD 555.8 176   P 3  159 32.25  73.55  74.28  -.79  .00
                 S 4  159 88.55 129.85 132.22 -2.48  .00
 UMM 606.6 104 EPC4  159 24.24  65.54  80.55-15.02  .00  18 .26  2.9
 MNQ 682.4  43 EP 2  159 47.44  88.74  89.91 -1.26  .00
SOUTHEAST MAINE CRUSTAL MODEL
03AUG22 ME, 5.6 KM (3.5 MI) WSW OF OAKLAND, 9.3 KM (5.8 MI) WSW OF WATERVILLE,
            22.5 KM (14 MI) NNW OF AUGUSTA
 DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
 30822 1831 25.84 44-31.90  69-46.59  16.66  2.1  .0     198   .45 28.7  1.6 D
 STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
 WVL   8.7  91 EPD0 1831 28.38   2.54   3.04  -.51 1.85 418 .14  1.8
                 S 1 1831 31.84   6.00   5.40   .58 1.36
 UMM 185.1  84 EPU3 1831 53.02  27.18  27.45  -.28  .32  35 .16  2.2
                 S 1 1831 74.93  49.09  48.87   .20  .97
 FFD 191.2 232 EPU1 1831 53.81  27.97  28.21  -.26  .94
                 S 4 1831 81.93  56.09  50.21  5.84  .00
 HNH 220.9 245 EPU4 1831 55.22  29.38  31.87 -2.52  .00  16 .13  2.1
                 S 2 1831 83.14  57.30  56.73   .52  .56
SOUTHEAST MAINE CRUSTAL MODEL
03AUG22 ME, 12.25 KM (7.6 MI) NNE OF AUGUSTA, 13 KM (8 MI) S OF WATERVILLE, 14 KM (8.7 MI) SSE OF OAKLAND
 DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
 30822 1832 38.75 44-25.93  69-40.10  16.13  2.4  .0     156   .54  2.9  1.3 D
 STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
 WVL  10.9   1 EPD0 1832 41.46   2.71   3.14  -.44 1.37
                 S 0 1832 44.77   6.02   5.59   .41 1.37
 UMM 178.2  80 EPU0 1833  5.17  26.42  26.65  -.24  .95  61 .14  2.5
                 S 0 1833 26.68  47.93  47.43   .48  .93
 FFD 191.8 236 EPU0 1833  6.29  27.54  28.33  -.81  .84
                 S 4 1833 27.64  48.89  50.42 -1.57  .00
```

```
 HNH 224.6 249 EPU4 1833 12.80  34.05  32.38  1.64  .00  25 .13  2.3
               S 1 1833 37.36  58.61  57.64   .92  .55
QUA2 323.3 222 EPU4 1833 63.72  84.97  44.56 40.37  .00  10 .12  2.4
SOUTHEAST MAINE CRUSTAL MODEL
03AUG26 NJ, 4.5 KM (2.8 MI) S OF BLOOMSBURY, 4.5 KM (2.8 MI) N OF MILFORD,
          14.5 KM (9 MI) SE OF EASTON,PA, 51.5 KM (32 MI) NNW OF TRENTON,NJ
 DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
 30826 1824 18.62 40-36.66  75- 5.10    .77  3.6  .0     149   .47  2.3  3.2 C
 STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
BRNJ  44.7  80 EP 3 1824 26.28   7.66   7.51   .14  .88
               ES 3 1824 32.40  13.78  13.37   .40  .87
CONY  52.4  85 EP 4 1824 54.29  35.67   8.76 26.83  .00
               S 4 1824 81.14  62.52  15.60 46.78  .00
 GPD  69.4  49 EP 3 1824 29.81  11.19  11.46  -.33  .83
               ES 3 1824 38.51  19.89  20.40  -.62  .79
 TBR  93.6  51 EP 3 1824 33.55  14.93  15.30  -.41  .79
               ES 3 1824 44.89  26.27  27.24 -1.04  .58
CPNY  97.2  78 EP 3 1824 34.52  15.90  15.87   .03  .79
               S 4 1824 46.37  27.75  28.25  -.50  .00
 PAL 108.4  66 EP 3 1824 35.80  17.18  17.66  -.50  .74
               ES 4 1824 48.98  30.36  31.43 -1.10  .00
ARNY 112.1  47 EP 3 1824 36.55  17.93  18.25  -.39  .75
               ES 3 1824 50.29  31.67  32.48  -.94  .62
MANY 122.9  56 EP 3 1824 38.05  19.43  19.96  -.55  .72
               ES 4 1824 52.81  34.19  35.53 -1.37  .00
BINY 191.1 337 EP 0 1824 48.72  30.10  29.83   .19 2.50
               ES 0 1824 71.73  53.11  53.10  -.13 2.50
SDMD 200.6 228 EP 3 1824 49.34  30.72  31.00  -.28  .60
               S 4 1824 72.42  53.80  55.18 -1.38  .00
SSPA 237.3 271 EP 0 1824 54.33  35.71  35.53   .15 2.17
               S 0 1824 81.51  62.89  63.24  -.40 2.15
QUA2 294.1  51 EPD1 1825  1.29  42.67  42.55   .09 1.33 529 .30  3.6
               S 4 1825 39.47  80.85  75.73  5.06  .00
ACCN 329.6  21 EP 0 1825  6.18  47.56  46.93   .57 1.47
               S 1 1825 42.96  84.34  83.53   .70 1.06
 HRV 361.6  54 EP 3 1824 68.81  50.19  50.88  -.72  .30
 WES 370.8  58 EPD3 1825 10.85  52.23  52.02   .20  .31 188 .25  3.4
               S 4 1825 61.15 102.53  92.59  9.92  .00
 BCX 378.8  60 EPD0 1825 12.37  53.75  53.00   .72 1.09 809 .61  3.8
               S 4 1825 62.44 103.82  94.34  9.43  .00
 NCB 379.9  11 EP 0 1825 12.58  53.96  53.13   .73 1.08
               S 3 1825 54.51  95.89  94.58  1.14  .18
 MDV 407.8  23 EP 1 1825 15.05  56.43  56.57  -.17  .74
               S 3 1825 60.49 101.87 100.70  1.13  .15
 HNH 414.2  34 EPD4 1825 21.39  62.77  57.37  5.37  .00 511 .45  3.7
               S 4 1825 70.93 112.31 102.12 10.13  .00
 WVL 622.3  46 EPD0 1825 42.78  84.16  83.07  1.08  .00 181 .52  3.6
               S 4 1825 70.71 112.09 147.86-35.79  .00
 UMM 773.3  54 EP 4 1827 14.67 176.05 101.70 74.34  .00 202 .67  3.8
               S 4 1827 54.57 215.95 181.02 34.91  .00
```

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TABLE 5

MICROEARTHQUAKES AND OTHER NON-LOCATABLE EVENTS

Date	Arrival Time
Yr/Mo/Dy	Sta Hr:Mn:Sec

None recorded this period.

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NESN Station Map

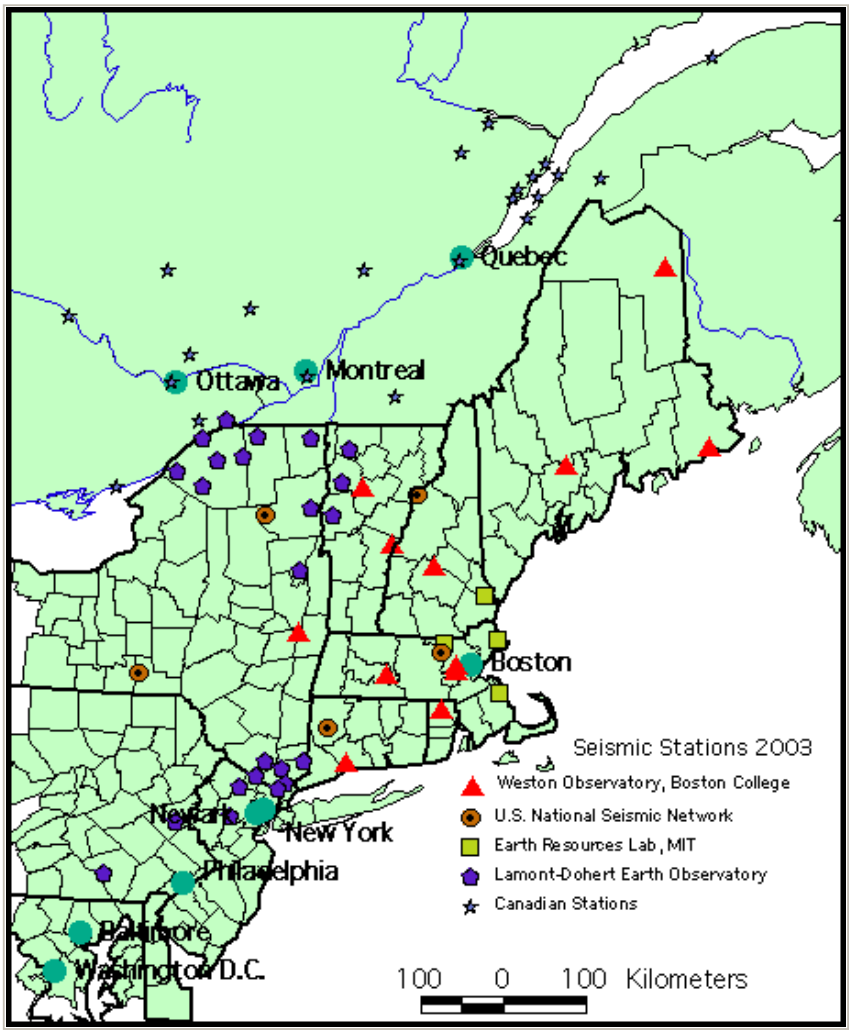

Figure 1: Map of stations of the New England Seismic Network (NESN) in operation during period July - September, 2003. Also included are the US National Seismic Network stations operating in New England during this period.

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NESN Strong-Motion Station Map

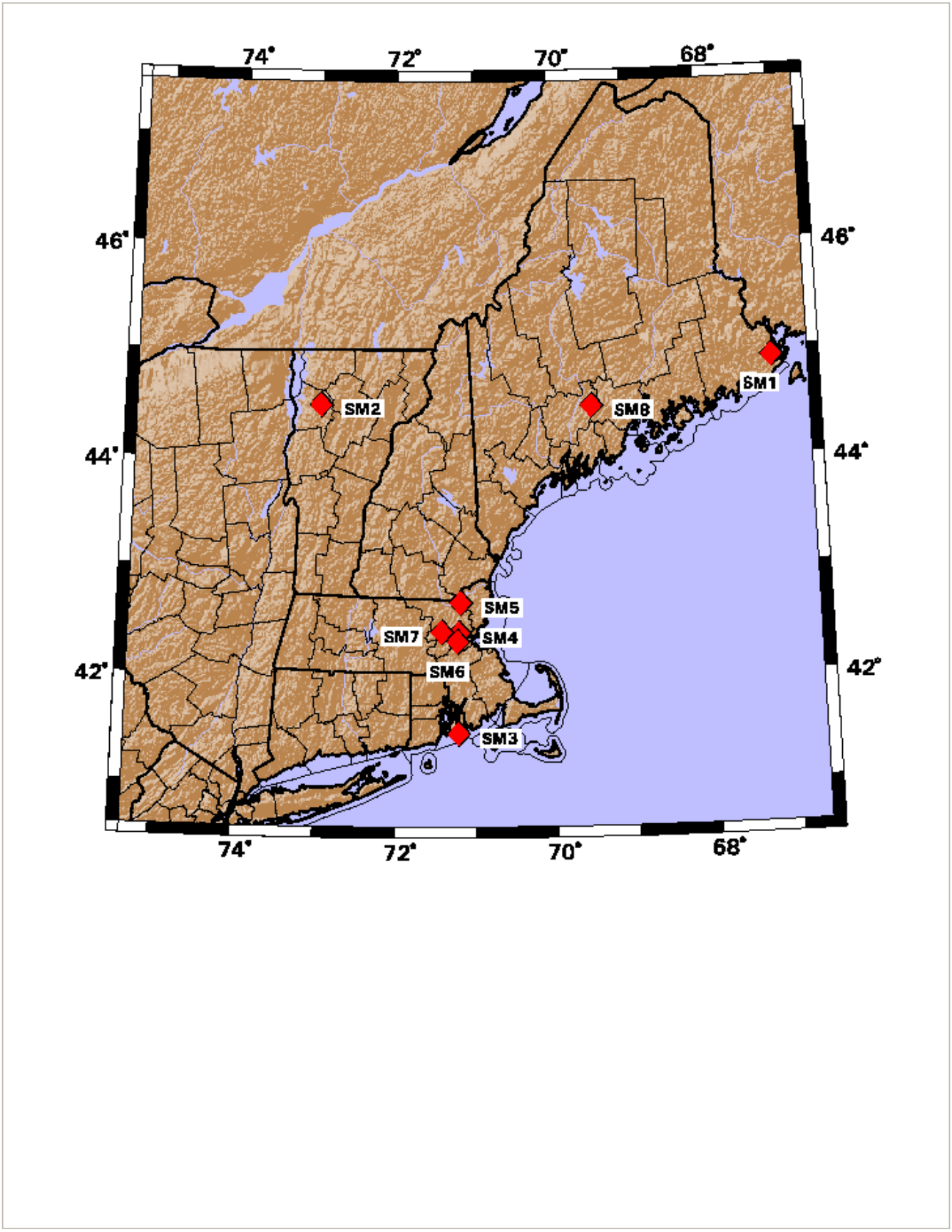

Figure 2: Map of strong-motion stations of the New England Seismic Network (NESN) in operation during period July - September, 2003.

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NESN Quarterly Seismicity Map

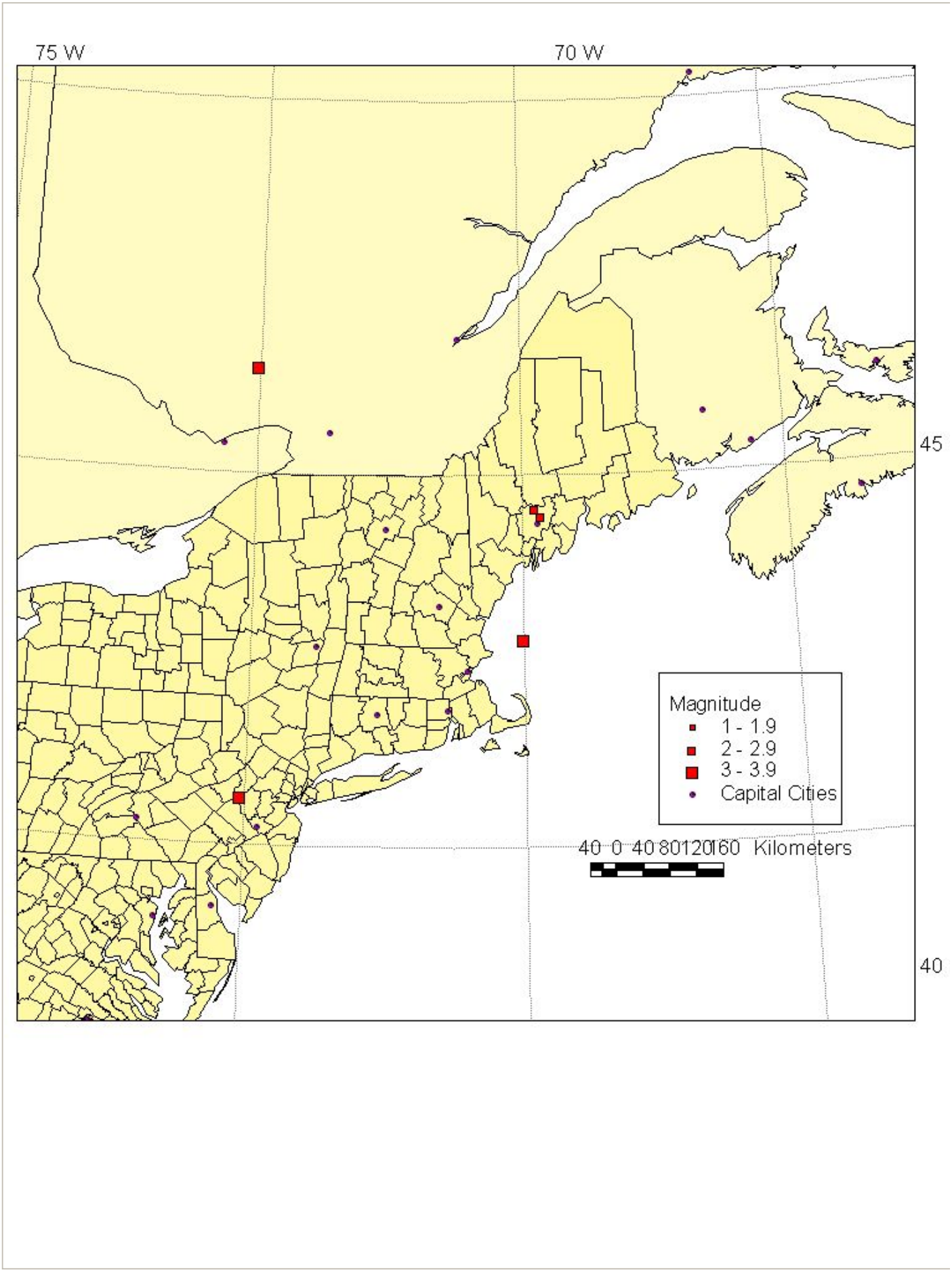
75 W
70 W
45
40
Magnitude
1 - 1.9
2 - 2.9
3 - 3.9
Capital Cities
40 0 40 80 120 160 Kilometers

Figure 3: Earthquake epicenters located by the NESN during period July - September, 2003.

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NESN Cumulative Seismicity Map

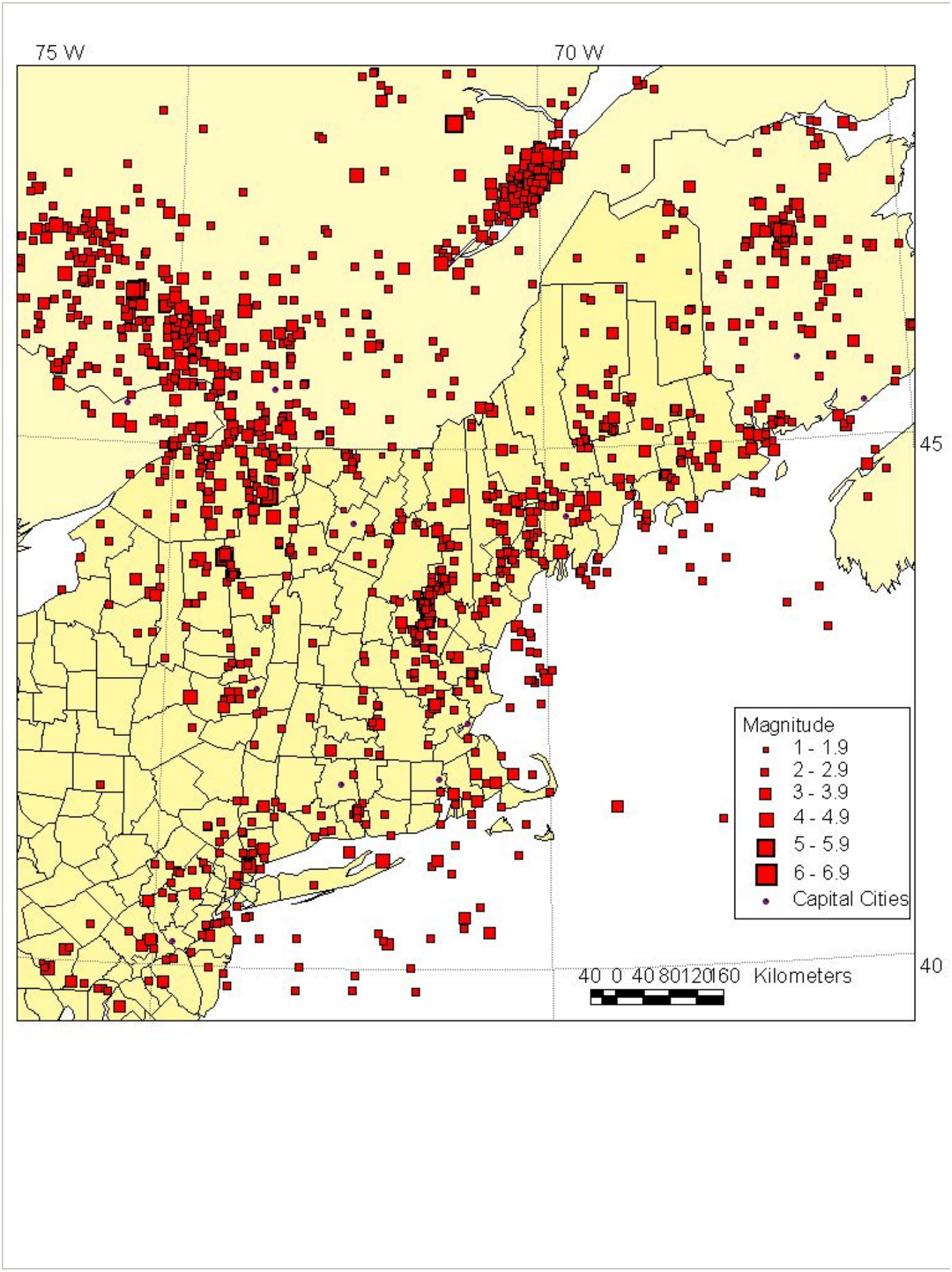
75 W
70 W
45
40
Magnitude
1 - 1.9
2 - 2.9
3 - 3.9
4 - 4.9
5 - 5.9
6 - 6.9
Capital Cities
40 0 40 80 120 160 Kilometers

Figure 4: Seismicity for period October, 1975 - September, 2003.

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Acknowledgments

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

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Chaplin, M.P., Taylor, S.R., and Toksöz, M.N. (1980), A coda lengthmagnitude scale for New England, *Earthquake Notes, 51,* 15-22.

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

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

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Updated: July 12, 2011
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