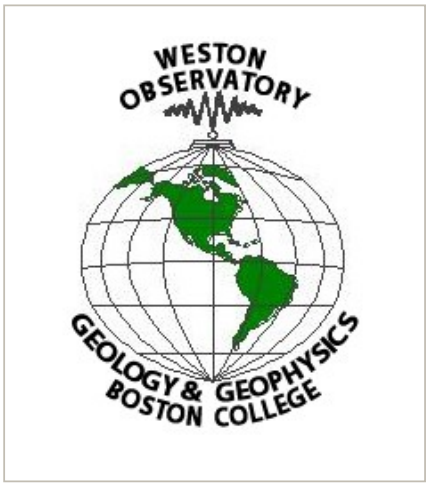
A STUDY OF NEW ENGLAND SEISMICITY

Quarterly Earthquake Report

October-December, 2005

New England

Seismic Network



Weston Observatory

381 Concord Road

Weston, MA 02493

NEW ENGLAND SEISMIC NETWORK

John E. Ebel, Principal Investigator

Weston Observatory

Dept. of Geology and Geophysics

Boston College

381 Concord Road

Weston, MA 02493

Email: ebel@bc.edu

Award # 04HQAG0020

Prepared by Anastasia Macherides Moulis

and Dina Smith

January 2, 2006

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 04HQAG0020. The views 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.

Quarterly Earthquake Report

October-December, 2005

Table of Contents

Introduction

The New England Seismic Network (NESN) is operated by the Weston Observatory (WES) of Boston College. 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 October-December, 2005. 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 12 earthquakes that occurred within or near the network during this reporting period. Phase information for these earthquakes is included in this report.

Return to Table of Contents

Current Network Operation and Status

The New England Seismic Network of Weston Observatory of Boston College currently consists of 12 broadband three-component and 8 analog 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. The 12 stations consist 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. Weston Observatory also maintains 8 SMA-1 strong-motion instruments in New England.

Return to Table of Contents

Seismicity

There were 12 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.

Return to Table of Contents

Data Management

Recent event locations are available at http://aki.bc.edu/cgi-bin/NESN/recent_events.pl. Waveform data are saved in Nanometrics, ASCII, and SEED formats and are available by contacting, Anastasia Macherides Moulis, via email. Earthquake lists can be found at www.bc.edu/research/westonobservatory/northeast/eqcatalogs/. Currently available on the Weston Observatory web page is the full catalog of northeastern U.S. earthquake activity to the present time. This will be updated as new Northeastern U.S. Seismic Network Quarterly Earthquake Reports are produced.

For more information on matters discussed in this report or general earthquake information (reports, maps, catalogs, etc.) consult our web site www.bc.edu/westonobservatory or contact:

Anastasia Macherides Moulis

Weston Observatory

381 Concord Road

Weston, MA 02493

Voice: 617-552-8325 / FAX: 617-552-8388 / Email: anastasia.macherides.1@bc.edu

Dina Smith

Weston Observatory

381 Concord Road

Weston, MA 02493

Voice: 617-552-8335 / FAX: 617-552-8388 / Email: dina.smith.1@bc.edu

Prof. John Ebel

Weston Observatory

381 Concord Road

Weston, MA 02493

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

Return to Table of Contents

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

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)

Return to Table of Contents

TABLE 1

WESTON OBSERVATORY PERSONNEL

Name	Position	voice phone	email address
John E. Ebel	Observatory Director, Seismologist, Principal Investigator	617-552-8319	ebel@bc.edu
Alan Kafka	Research Seismologist	617-552-8300	kafka@bc.edu
Anastasia Macherides Moulis	Seismologist, Analyst	617-552-8325	macherid@bc.edu
Dina Smith	Associate Director of Operations, Seismologist	617-552-8335	dina.smith.1@bc.edu
Michael Hagerty	New England Seismic Network Manager, Seismologist	617-552-8337	hagertmb@bc.edu
		617-552-8300	
Weston Observatory		617-552-8388 (FAX)	

Return to Table of Contents

TABLE 2

SEISMIC STATIONS OF THE NEW ENGLAND SEISMIC NETWORK

WES43.7050-72.3525Belchertown, MATroy, NYWESUMMWES42.3850WESYLEPQI46.6710

Code	Lat	Long	Elev (m)	Location	Operator
BCX *	42.3350	-71.1705	61.0	Chestnut Hill, MA	WES
BRYW	41.9178	-71.5388	380.0	Smithfield, RI	WES
FFD	43.4702	-71.6533	131.0	Franklin Falls Dam, NH	
HNH	-72.2860	180.0	Hanover, NH	WES	
QUA2	42.2789	168.0	WES		
TRY	42.7311	-73.6669	131.0		
44.7100	-67.4583	35.0	Machias, ME	WES	
VT1	44.3317	-72.7536	410.0	Waterbury, VT	WES
-71.3220	60.0	Weston, MA	WES		
WVL	44.5648	-69.6575	85.0	Waterville, ME	
41.3100	-72.9269	10.0	New Haven, CT	WES	
-68.0168	175.0	Presque Isle, ME	WES		

* = not in operation during this quarter

STRONG MOTION STATIONS OF THE NEW ENGLAND SEISMIC NETWORK

SM2-73.10Newport, RISM4-71.30WESSM742.39-71.54WES

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
Huds on, MA	WES			
SM8	44.48	-69.61	North Vassalboro, ME	

Return to Table of Contents

TABLE 3

NEW ENGLAND AND ADJACENT REGIONS

October-December, 2005

Date M/D/Y	Time (UTC) Hr:Mn:Sec	Lat	Long	Depth (km)	Mag	Int	Location
10/01/2005	07:01:45.59	46.71	-76.44	17.26	2.6		PQ, 48KM NW OF MANIWAKI
10/03/2005	03:47:34.79	46.87	-64.74	25.30	2.9		NB, 20KM NNE OF RICHIBUCTO, OFFSHORE
10/03/2005	17:37:01.99	43.44	-71.65	10.19	1.5		NH, 1KM SW OF FRANKLIN
10/03/2005	20:08:20.77	43.60	-72.34	08.63	1.3		NH-VT BORDER, 9KM SW OF LEBANON NH
10/10/2005	23:22:39.38	42.65	-71.28	09.03	1.4		MA, NE OF LOWELL
10/20/2005	21:16:29.78	44.68	-80.45	13.93	4.3		ON, 12.5KM N OF THORNBURY
10/31/2005	23:59:30.55	43.26	-77.30	07.51	2.6*	LD	NY, 12KM NE OF WEBSTER
11/16/2005	19:08:43.74	43.45	-71.51	09.94	1.2		NH, 11.26KM E OF FRANKLIN
11/17/2005	17:39:38.84	41.94	-70.67	00.12	2.3		MA, 2KM SOUTH OF PLYMOUTH CENTER
12/09/2005	03:35:47.26	40.98	-74.39	03.40	2.1*	LD	NJ, 11.9KM NW OF WAYNE
12/12/2005	00:50:22.85	43.62	-73.97	01.37	1.9*	LD	NY, 40KM NW OF WEST GLEN FALLS
12/21/2005	03:32:43.94	45.70	-73.82	08.91	2.9*		PQ, 28KM NW OF MONTREAL

* indicates Mc rather than Mn.

LD indicates magnitude as calculated by Lamont Doherty Earth Observatory

Return to Table of Contents

TABLE 4

EARTHQUAKE PHASE DATA LIST
NEW ENGLAND AND ADJACENT REGIONS
October-December, 2005

```
D5A01A.XX
NORTHERN NY AND ADIRONDACKS
05OCT01 CANADA, PQ, 48KM (30MI) NW OF MANIWAKI
  DATE     ORIGIN    LAT N     LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51001  7 1 45.59 46-42.62  76-26.53  17.26  2.6  .0      97   .50  1.5  1.2 C
  STN  DIST AZM  RMK HRMN    SEC    TOBS    TCAL    RES   WT AMX PRX XMAG FMP FMAG
  GRQ  46.0 105 EP 1  7 1 52.83    7.24    7.56   -.38 2.15
 CRLO 103.9 224 EP 1  7 1 61.55   15.96   16.13   -.21 1.92
                ES 1  7 1 73.95   28.36   28.72   -.41 1.90
  GAC 134.4 146 EP 0  7 2  6.62   21.03   20.72    .29 2.38
                ES 0  7 2 22.42   36.83   36.89   -.08 2.38
  TRQ 154.7 111 EP 0  7 2  9.63   24.04   23.78    .26 2.27
                ES 1  7 2 28.30   42.71   42.33    .38 1.68
  OTT 156.7 159 EP 1  7 2 10.03   24.44   24.06    .36 1.69
                ES 0  7 2 28.49   42.90   42.83    .05 2.26
 VLDQ 173.6 334 EP 3  7 2 13.77   28.18   26.14   2.02  .06
                ES 4  7 2 35.25   49.66   46.53   3.09  .00
  EEO 201.4 268 EP 2  7 2 16.01   30.42   29.58    .77  .96
                ES 2  7 2 37.66   52.07   52.65   -.70  .96
  WBO 210.6 155 EP 3  7 2 17.34   31.75   30.71   1.03  .44
                ES 2  7 2 39.45   53.86   54.66   -.82  .90
  MNT 256.0 122 EP 1  7 2 22.37   36.78   36.32    .44 1.25
                ES 2  7 2 49.40   63.81   64.65   -.88  .77
 KGNO 276.0 181 EP 3  7 2 26.42   40.83   38.79   2.03  .03
                ES 2  7 2 55.30   69.71   69.04    .65  .76
  DPQ 280.3  91 EP 1  7 2 24.47   38.88   39.32   -.44 1.15
                ES 1  7 2 55.07   69.48   69.99   -.52 1.14
 SADO 301.3 224 EP 1  7 2 27.17   41.58   41.90   -.37 1.06
                ES 3  7 2 59.15   73.56   74.59  -1.10  .29
 WLVO 345.6 206 EP 3  7 2 34.41   48.82   47.38   1.43  .18
  NCB 350.7 150 EPD0  7 2 34.06   48.47   48.01    .36 1.14
                ES 3  7 2 72.40   86.81   85.45   1.18  .23
  MOQ 359.7 116 EP 0  7 2 35.01   49.42   49.13    .15 1.09
                ES 3  7 2 72.12   86.53   87.44  -1.16  .21
  DAQ 417.2  70 EP 3  7 2 40.85   55.26   56.22  -1.13  .15
                ES 3  7 2 84.16   98.57  100.08  -1.80  .04
 LBNH 447.2 128 EP 2  7 2 46.30   60.71   59.92    .73  .29
  EFO 461.6 209 EP 4  7 2 44.34   58.75   61.70  -2.99  .00
  A54 465.2  80 EP 4  7 2 45.42   59.83   62.14  -2.38  .00
  LMQ 473.5  79 EP 4  7 2 46.77   61.18   63.17  -2.07  .00
  A61 493.5  77 EP 4  7 2 49.05   63.46   65.64  -2.19  .00
  TRY 493.9 154 ES 2  7 3 43.30 117.71 116.93    .69  .16  47 .40  2.9
  FFD 521.3 134 ES 1  7 3 49.00 123.41 122.95    .43  .12
 QUA2 590.1 147 ES 2  7 4  4.34 138.75 138.07    .62  .00   6 .28  2.4
  HRV 607.2 140 ES 4  7 4 19.30 153.71 141.81 11.84  .00
  WES 630.0 140 ES 4  7 4 21.20 155.61 146.84  8.75  .00   7 .31  2.5
  CNQ 687.8  65 EP 2  7 3 14.50  88.91  89.62   -.75  .00
                ES 4  7 3 82.86 157.27 159.53  -2.32  .00
  MNQ 707.6  53 EP 3  7 3 16.82  91.23  92.07   -.93  .00
                ES 4  7 3 85.89 160.30 163.89  -3.75  .00
  GSQ 740.8  71 EP 1  7 3 21.43  95.84  96.17   -.34  .00
                ES 4  7 3 91.08 165.49 171.18  -5.71  .00
  ICQ 751.2  65 EP 0  7 3 22.97  97.38  97.45   -.08  .00
  SMQ 818.9  62 EP 4  7 3 28.55 102.96 105.81  -2.92  .00
D5A03A.XX
NORTHWEST MAINE CRUSTAL STRUCTURE
05OCT03 CANADA, NB, 20KM (12.4MI) NNE OF RICHIBUCTO, OFFSHORE
  DATE     ORIGIN    LAT N     LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51003  347 34.79 46-52.29  64-44.45  25.30  2.9  .0     182   .46  1.5  2.0 C
  STN  DIST AZM  RMK HRMN    SEC    TOBS    TCAL    RES   WT AMX PRX XMAG FMP FMAG
```

```
   LMN 113.4 183 EP 1  347 52.35  17.56  18.22  -.72 2.53
                 ES 3  347 65.27  30.48  32.43 -2.06  .06
   PQI 251.1 265 EP 1  348 10.86  36.07  35.50   .54 1.77 105 .19  2.9
                 ES 0  348 38.03  63.24  63.19   .00 2.41
   GGN 253.0 220 EP 1  348 10.92  36.13  35.74   .38 1.78
                 ES 1  348 38.10  63.31  63.61  -.32 1.80
   HAL 264.1 160 EP 1  348 12.22  37.43  37.11   .31 1.71
                 ES 0  348 40.79  66.00  66.05  -.07 2.31
   GSQ 288.1 322 EP 2  348 15.69  40.90  40.06   .82  .98
                 ES 1  348 45.91  71.12  71.31  -.22 1.59
   UMM 319.9 221 EP 2  348 19.69  44.90  44.00   .89  .85  38 .21  2.6
                 ES 3  348 55.07  80.28  78.31  1.94  .04
   ICQ 349.6 327 EP 1  348 23.02  48.23  47.66   .55 1.17
                 ES 0  348 59.57  84.78  84.84  -.08 1.62
   CNQ 367.0 317 EP 0  348 24.73  49.94  49.81   .10 1.48
                 ES 0  348 63.50  88.71  88.66  -.01 1.48
   A21 385.6 284 EP 2  348 27.55  52.76  52.10   .65  .64
                 ES 1  348 67.14  92.35  92.74  -.41  .98
   SMQ 399.9 339 EP 0  348 28.83  54.04  53.87   .11 1.21
                 ES 2  348 69.95  95.16  95.88  -.83  .57
   A64 403.7 285 EP 1  348 28.57  53.78  54.34  -.59  .87
                 ES 3  348 70.73  95.94  96.73  -.83  .28
   A16 404.7 279 EP 4  348 23.20  48.41  54.47 -6.06  .00
                 ES 2  348 71.25  96.46  96.95  -.49  .58
   A61 414.8 283 EP 0  348 30.73  55.94  55.71   .21 1.09
                 ES 0  348 73.92  99.13  99.17  -.06 1.09
   LMQ 429.9 280 EP 0  348 32.45  57.66  57.57   .01  .97
                 ES 3  348 76.32 101.53 102.48 -1.08  .20
   A54 434.7 279 EP 2  348 33.94  59.15  58.17   .92  .42
                 ES 2  348 77.69 102.90 103.54  -.75  .45
   WVL 463.6 236 EP 2  348 37.06  62.27  61.73   .52  .34  44 .28  3.0
   MNQ 503.5 324 EP 1  348 41.18  66.39  66.66  -.36  .28
                 ES 3  348 91.80 117.01 118.65 -1.81  .02
   DAQ 505.6 284 EP 0  348 41.80  67.01  66.92  -.07  .36
                 ES 3  348 93.20 118.41 119.12 -1.00  .08
   MOQ 606.3 253 EP 3  348 52.92  78.13  79.35 -1.36  .00
   DPQ 613.9 268 EP 0  348 55.08  80.29  80.29   .00  .00
  LBNH 632.3 242 EP 2  348 58.10  83.31  82.57   .68  .00
   FFD 661.7 235 EP 0  349   .76  85.97  86.19  -.25  .00
   HNH 688.5 239 EP 0  349  4.53  89.74  89.50   .21  .00  30 .39  3.1
   WES 722.3 226 EP 0  349  8.70  93.91  93.67   .23  .00  22 .47  2.9
   HRV 726.2 228 EP 1  349  9.40  94.61  94.15   .43  .00
   TRQ 756.9 265 EP 3  349 11.45  96.66  97.94 -1.29  .00
                 ES 4  349 75.01 160.22 174.34-14.13  .00
  QUA2 791.0 230 ES 4  351  4.76 209.97 181.84 28.07  .00  23 .37  3.2
   NCB 809.4 247 EPD0  349 19.20 104.41 104.43  -.12  .00
   GAC 837.4 261 EP 1  349 22.32 107.53 107.88  -.37  .00
   TRY 842.9 237 EPD0  349 23.60 108.81 108.57   .19  .00  20 .51  3.0
   WBO 843.6 256 EP 4  349 20.55 105.76 108.64 -2.90  .00
   GRQ 851.0 268 EP 2  349 23.73 108.94 109.56  -.67  .00
  VLDQ 967.7 278 EP 3  349 40.27 125.48 123.97  1.48  .00
  CRLO 974.7 265 ES 0  351 17.22 222.43 222.19   .18  .00
   EEO1094.5 269 ES 4  351 38.73 243.94 248.53 -4.72  .00
D5A03B.XX
HUGHES AND LUETGERT NH
05OCT03 NH, 1KM (0.6MI) SW OF FRANKLIN
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51003 1737  1.99 43-26.29  71-39.30  10.19  1.5  .0     165   .25  1.2   .8 B
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
  FFD   3.5   2 EP 0 1737  3.97   1.98   1.81   .15 1.27
                ES 0 1737  5.22   3.23   3.22  -.03 1.29
  HNH  58.9 300 EP 0 1737 12.03  10.04   9.94   .07 1.16  22 .17  1.4
                ES 0 1737 19.40  17.41  17.69  -.34 1.09
 LBNH  91.7 346 EPD0 1737 17.69  15.70  15.19   .45  .91
                ES 0 1737 28.58  26.59  27.03  -.55  .78
  HRV 103.8 176 EPD0 1737 19.30  17.31  17.06   .21 1.03
                ES 0 1737 32.50  30.51  30.38   .08 1.05
  WES 120.2 167 EP 0 1737 21.70  19.71  19.60   .10 1.01  36 .24  1.9
                ES 0 1737 36.50  34.51  34.88  -.39  .93
 QUA2 140.8 204 EP 0 1737 24.86  22.87  22.80   .04  .96   9 .31  1.4
                ES 0 1737 42.69  40.70  40.59   .06  .96
  NCB 215.4 286 EP 0 1737 34.70  32.71  32.77  -.16  .78
                ES 0 1737 60.70  58.71  58.33   .20  .78
D5A03C.XX
HUGHES AND LUETGERT NH
05OCT03 NH-VT BORDER, 9KM (5.6MI)SW OF LEBANON NH, 12KM (7.4MI) SSW OF HANOVER NH
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51003 20 8 20.77 43-36.32  72-20.57   8.63  1.3  .0     105   .50  2.3  3.9 C
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
  HNH  12.0  23 EP 1 20 8 23.74   2.97   2.50   .44 1.34  70 .11  1.2
                ES 1 20 8 24.82   4.05   4.45  -.46 1.33
  FFD  57.8 105 ES 1 20 8 37.60  16.83  17.31  -.52 1.20
 LBNH  78.1  25 EP 2 20 8 34.55  13.78  13.03   .69  .75
                ES 0 20 8 43.99  23.22  23.19  -.08 1.59
  HRV 137.8 152 ES 2 20 8 61.48  40.71  39.88   .77  .63
 QUA2 147.4 180 ES 0 20 8 63.30  42.53  42.52  -.05 1.35   5 .14  1.3
  NCB 156.7 285 EP 2 20 8 47.08  26.31  25.34   .86  .58
                ES 1 20 8 65.65  44.88  45.11  -.41  .98
  WES 159.1 148 ES 3 20 8 65.51  44.74  45.77 -1.05  .24   5 .10  1.4
D5A10A.XX
SOUTH & COASTAL NEW ENGLAND, CHIBURIS, 1979
05OCT10 MA, 2.7KM (1.67MI) NE OF LOWELL
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51010 2322 39.38 42-38.76  71-17.14   9.03  1.4  .0     202   .26  1.7  1.9 B
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
  HRV  27.2 235 EP 1 2322 43.86   4.48   4.78  -.33  .92
                ES 0 2322 48.16   8.79   8.51   .22 1.27
  WES  29.2 186 EP 0 2322 44.45   5.07   5.09  -.02 1.27  43 .21  1.3
                ES 0 2322 48.32   8.94   9.06  -.13 1.27
  FFD  96.3 342 ES 0 2322 67.45  28.07  28.07  -.03 1.10
 QUA2  96.7 245 EP 1 2322 55.60  16.22  15.83   .37  .81  13 .12  1.4
                ES 0 2322 67.46  28.08  28.18  -.14 1.10
  HNH 143.0 325 EP 1 2322 62.95  23.57  22.86   .69  .62  11 .16  1.6
                ES 0 2322 79.99  40.61  40.68  -.12  .99
 LBNH 184.5 344 EP 3 2322 69.56  30.19  28.48  1.64  .00
                ES 1 2322 89.88  50.51  50.70  -.30  .65
D5A20A.XX
SE OF NEW YORK, HUGHES & LUETGERT
05OCT20 CANADA, ONTARIO, 12.5KM (7.77MI) N OF THORNBURY
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51020 2116 29.78 44-40.83  80-27.19  13.93  4.3  .0     246   .49  4.8  4.5 C
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
 SADO 104.4  85  P 0 2116 45.77  15.99  16.12  -.17 1.50
                 S 0 2116 58.72  28.94  28.70   .17 1.50
 HGVO 192.9 172 EP 0 2116 59.33  29.55  29.22   .29 1.20
                 S 0 2116 81.34  51.56  52.01  -.52 1.20
  EFO 198.9 153 EP 0 2117   .30  30.52  29.97   .52 1.18
                ES 0 2117 23.57  53.79  53.35   .38 1.18
```

```
 CRLO 284.0  58 EP 0 2117 10.03  40.25  40.47  -.25  .89
  TRQ 491.8  70 EP 0 2117 34.92  65.14  66.13  -.99  .20
  NCB 503.3  99 EP 0 2117 35.00  65.22  67.56 -2.44  .16
                ES 0 2117 69.40  99.62 120.25-20.81  .00
  TRY 588.4 112 EP 0 2117 47.60  77.82  78.06  -.29  .001372 .80  4.3
  HNH 661.8  99 EP 0 2117 57.20  87.42  87.12   .27  .001153 .60  4.4
 LBNH 679.9  94 EP 0 2117 57.50  87.72  89.36 -1.70  .00
 QUA2 707.4 112 EP 0 2117 58.60  88.82  92.75 -3.96  .00 533 .60  4.1
  FFD 717.4 101 EP 0 2118  5.50  95.72  93.98  1.72  .00
  YLE 718.9 121 ES 0 2119 45.30 195.52 167.63 27.89  .00 817 .70  4.3
  HRV 757.8 109 EP 0 2118  5.70  95.92  98.97 -3.08  .00
  WES 781.4 109 EP 0 2118  8.00  98.22 101.88 -3.67  .00 589 .70  4.2
  BRY 785.8 113 EP 0 2118 23.20 113.42 102.42 10.94  .00 594 .70  4.2
D5B01A.XX
SE OF NEW YORK, HUGHES & LUETGERT
05OCT31 NY, 12KM (7.45MI) NE OF WEBSTER
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51031  23 59 30.55 43-15.55  77-18.20   7.51   .0  .0     174   .41  1.8  1.7 C
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
 WLVO 115.1 310 ES 0   0 0  2.10 ******  31.43   .10 1.53
 STCO 151.9 268 ES 0   0 0 12.00 ******  41.42  -.01 1.40
 PKRO 162.7 299 ES 0   0 0 15.08 ******  44.35   .12 1.36
 TYNO 209.4 265 EP 0   0 0  2.52  31.97  31.85   .09 1.20
                ES 0   0 0 27.79 ******  56.69   .49 1.18
 SADO 223.4 319 EP 0   0 0  4.29  33.74  33.57   .13 1.15
                ES 0   0 0 30.28 ******  59.75  -.10 1.15
 ACTO 226.9 280 EP 0   0 0  4.45  33.90  34.00  -.17 1.13
                ES 0   0 0 30.57 ******  60.52  -.61 1.10
 HGVO 232.2 262 EP 0   0 0  5.71  35.16  34.66   .46 1.10
                ES 0   0 0 31.09 ******  61.70 -1.23  .81
  WBO 252.6  40 EP 0   0 0  7.47  36.92  37.18  -.27 1.04
 ELGO 257.7 280 EP 0   0 0 10.76  40.21  37.80  2.35  .04
                ES 0   0 0 38.02 ******  67.29   .07 1.03
  NCB 260.9  72 EP 0   0 0  9.29  38.74  38.21   .43 1.01
                ES 0   0 0 39.24 ******  68.01   .50 1.00
 ACCN 295.3  87 EP 0   0 0 13.15  42.60  42.45   .09  .89
                ES 0   0 0 45.57 ******  75.56  -.65  .87
  TRY 302.3 101 ES 4   0 0 48.60 ******  77.09   .87  .00
  MIV 317.4  73 EP 0   0 0 15.24  44.69  45.17  -.54  .79
                ES 0   0 0 51.18 ******  80.41   .13  .82
 BRCO 349.3 288 EP 0   0 0 19.70  49.15  49.12  -.02  .70
                ES 0   0 0 58.52 ******  87.43   .45  .70
  HNH 408.8  83 ES 4   0 0 76.00 ****** 100.51  4.88  .00
 QUA2 419.4 105 ES 4   0 0 80.70 ****** 102.83  7.26  .00
 LBNH 447.0  76 EP 4   0 0 35.90  65.35  61.17  4.11  .00
                ES 4   0 0 87.10 ****** 108.89  7.55  .00
  FFD 458.3  87 EP 4   0 0 43.70  73.15  62.57 10.55  .00
                ES 4   0 0 89.70 ****** 111.38  7.73  .00
  WES 498.9 101 ES 4   0 1 43.00 ****** 120.29 12.13  .00
D5B16A.XX
HUGHES AND LUETGERT NH
05NOV16 NH, 11.26KM (7MI) E OF FRANKLIN
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51116 19 8 43.74 43-27.06  71-30.78   9.94  1.2  .0     193   .41  2.5  1.7 C
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
  FFD  11.6 281 EPD0 19 8 46.33   2.59   2.56   .01 1.37
                ES 0 19 8 47.84   4.10   4.55  -.49 1.36
  HNH  68.5 294 EP 0 19 8 55.65  11.91  11.48   .39 1.22  11 .09  1.2
                ES 0 19 8 64.64  20.90  20.44   .40 1.22
 LBNH  93.8 339 EP 0 19 8 59.50  15.76  15.52   .18 1.16
                ES 0 19 8 71.10  27.36  27.62  -.37 1.15
  HRV 105.0 182 ES 2 19 8 75.56  31.82  30.72  1.04  .44
  WES 119.5 172 ES 0 19 8 78.20  34.46  34.72  -.28 1.10   5 .08  1.3
 QUA2 147.2 208 ES 2 19 8 84.40  40.66  42.36 -1.75  .08   2 .08  1.1
  TRY 192.7 245 ES 0 19 8 97.10  53.36  53.40  -.13  .91
  NCB 226.0 285 ES 4 19 8 79.94  36.20  60.72-24.70  .00
D5B17A.XX
SOUTH & COASTAL NEW ENGLAND, CHIBURIS, 1979
05NOV17 MA, 2KM (1.2MI) SOUTH OF PLYMOUTH CENTER
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51117 1739 38.84 41-56.64  70-40.06    .12  2.3 2.4     293   .41  3.0  3.9 C
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
  BRY  72.4 268 EPD0 1739 50.63  11.79  12.09  -.36 1.52 149 .09  2.3
                ES 0 1739 60.70  21.86  21.52   .24 1.54
  WES  72.9 312 EPC0 1739 50.72  11.88  12.18  -.31 1.52 106 .07  2.2 100  2.4
                ES 0 1739 60.63  21.79  21.68   .09 1.53
  HRV  96.5 310 EPC0 1739 54.50  15.66  16.07  -.44 1.43
                ES 0 1739 67.40  28.56  28.61  -.10 1.46
 QUA2 144.3 285 EP 0 1740  3.10  24.26  23.66   .58 1.29
                ES 0 1740 20.96  42.12  42.11  -.04 1.31
  FFD 187.8 335 EP 3 1740 10.39  31.55  29.89  1.64  .14
                ES 3 1740 33.31  54.47  53.20  1.24  .24
  HNH 236.2 326 EPD3 1740 16.93  38.09  35.87  2.19  .01
                ES 3 1740 44.90  66.06  63.84  2.17  .02
  TRY 262.3 289 ES 4 1740 53.00  74.16  69.57  4.50  .00
 LBNH 274.9 338 ES 4 1740 56.00  77.16  72.33  4.72  .00
  NCB 367.1 308 EP 4 1740 37.00  58.16  52.03  6.03  .00
                ES 4 1740 80.10 101.26  92.61  8.48  .00
D5C09A.XX
SE OF NEW YORK, HUGHES & LUETGERT
05DEC09 NJ, 11.9KM (7.4MI) NW OF WAYNE
  DATE     ORIGIN    LAT N    LONG W   DEPTH   MN  MC  ML GAP   RMS  ERH  ERZ Q
  51209  335 47.26 40-58.59  74-23.47   3.40   .0  .0      85   .37   .9  1.8 C
  STN  DIST AZM  RMK HRMN   SEC   TOBS   TCAL   RES   WT AMX PRX XMAG FMP FMAG
  GPD   7.4 308   P 0  335 48.35   1.09   1.27  -.24 1.32
                S 0  335 49.59   2.33   2.26  -.04 1.34
  TBR  23.2  38   P 0  335 50.30   3.04   3.62  -.62 1.23
                S 0  335 53.81   6.55   6.44   .04 1.30
 BRNJ  35.8 204   P 0  335 52.53   5.27   5.53  -.28 1.25
                S 0  335 56.56   9.30   9.85  -.57 1.21
  PAL  40.7  86   P 0  335 53.52   6.26   6.28  -.04 1.25
                S 0  335 58.37  11.11  11.17  -.10 1.25
 CPNY  41.7 120   P 0  335 53.61   6.35   6.44  -.09 1.25
                S 0  335 59.01  11.75  11.46   .29 1.25
 ARNY  43.1  33   P 0  335 54.06   6.80   6.64   .08 1.25
                S 0  335 59.55  12.29  11.82   .34 1.25
 MANY  51.7  58   P 0  335 55.26   8.00   7.95   .02 1.23
                S 0  335 61.69  14.43  14.16   .24 1.23
  NED 180.3 218   P 0  336 15.27  28.01  27.57   .42  .90
                S 0  336 37.61  50.35  49.08  1.25  .61
  MVL 198.4 237   P 0  336 17.48  30.22  30.34  -.15  .87
                S 0  336 41.62  54.36  54.01   .31  .87
  TRY 203.9  17 EP 4  336  1.07  13.81  31.19-17.43  .00
                ES 0  336 43.30  56.04  55.51   .43  .84
 QUA2 223.2  50 ES 3  336 47.09  59.83  60.37  -.59  .19
 ACCN 274.0  13   P 0  336 26.93  39.67  40.19  -.58  .65
                S 0  336 61.27  74.01  71.53  2.37  .00
  WES 299.6  59 ES 4  336 61.00  73.74  77.15 -3.43  .00
```

```
  NCB 332.9    2 ES 4   336 76.40   89.14   84.47   4.49   .00
  HNH 349.3   30 ES 4   336 81.20   93.94   88.08   5.80   .00
  MIV 351.3   12  P 0   336 36.86   49.60   49.73   -.19   .49
                S 0   336 75.66   88.40   88.53   -.22   .49
  FFD 357.6   39 EP 0   336 38.30   51.04   50.50    .51   .47
               ES 4   336 83.30   96.04   89.90   6.11   .00
 LBNH 415.2   29 ES 4   336 99.20 111.94 102.56   9.27   .00
D5C12A.XX
SE OF NEW YORK, HUGHES & LUETGERT
05DEC12 NY, 40KM (24.9MI) NW OF WEST GLEN FALLS
  DATE      ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS  ERH  ERZ Q
  51212   050 22.85 43-37.05   73-58.55    1.37    .0  .0      157    .30  1.0 **** C
  STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
 ACCN   36.0 136   P 0  050 28.53    5.68    5.54    .07 1.16
                S 0   050 32.67    9.82    9.87   -.16 1.16
  NCB   44.0 333   P 0  050 29.66    6.81    6.77   -.07 1.14
                S 0   050 35.02   12.17   12.06   -.07 1.14
  MIV   62.1  35   P 0  050 32.17    9.32    9.54   -.27 1.09
                S 0   050 39.67   16.82   16.98   -.25 1.09
  TRY 101.6 166 ES 0   050 50.50   27.65   27.71   -.16 1.01
  LOZ 121.5 336   P 0  050 41.42   18.57   18.60   -.10  .97
                S 0   050 56.11   33.26   33.11    .02  .97
  PTN 133.3 323   P 0  050 43.41   20.56   20.40    .13  .94
                S 0   050 59.43   36.58   36.31    .21  .94
  HNH 136.6  86 ES 0   050 59.80   36.95   37.22   -.33  .92
 LBNH 178.6  67 ES 0   051 12.00   49.15   48.64    .40  .83
  FFD 188.6  95 ES 0   051 15.30   52.45   51.34   1.07  .66
 QUA2 199.2 138 ES 3   051 19.60   56.75   54.24   2.45  .00
  WES 256.1 122 ES 3   051 33.60   70.75   67.93   2.80  .00
D5C21A.XX
NORTHERN NY AND ADIRONDACKS
05DEC21 CANADA, QC, 28KM (17.4MI) NW OF MONTREAL
  DATE      ORIGIN     LAT N     LONG W    DEPTH    MN  MC  ML GAP    RMS  ERH  ERZ Q
  51221   332 43.94 45-42.18   73-49.10    8.91    .0 2.9       81    .35   .7  1.2 C
  STN   DIST AZM   RMK HRMN    SEC    TOBS    TCAL    RES    WT AMX PRX XMAG FMP FMAG
  MNT   27.0 146   P 0  332 48.22    4.28    4.44   -.18 2.06
                S 0   332 51.85    7.91    7.90   -.03 2.06
  TRQ   81.2 315   P 1  332 56.19   12.25   12.58   -.33 1.37
                S 0   332 66.41   22.47   22.39    .08 1.85
  GAC 129.3 270   P 0  333  3.69   19.75   19.86   -.12 1.66
                S 1   333 19.51   35.57   35.36    .20 1.24
  MOQ 129.7 110   P 0  333  4.21   20.27   19.93    .20 1.66
                S 2   333 20.31   36.37   35.48    .64  .80
  DPQ 135.1  36   P 1  333  4.95   21.01   20.75    .27 1.23
                S 0   333 20.90   36.96   36.93    .03 1.63
  WBO 138.2 236   P 0  333  5.16   21.22   21.22    .00 1.62
                S 0   333 21.72   37.78   37.77    .00 1.62
  OTT 152.2 257   P 1  333  7.50   23.56   23.34    .21 1.18
                S 1   333 25.81   41.87   41.55    .30 1.18
  MIV 182.4 173   P 2  333 11.16   27.22   27.92   -.75  .67
                S 4   333 31.70   47.76   49.70 -2.03  .00
  GRQ 186.9 303   P 1  333 12.11   28.17   28.52   -.40 1.06
                S 3   333 32.69   48.75   50.76 -2.10  .00
  NCB 195.2 189   P 2  333 13.00   29.06   29.54   -.58  .68                152  2.9
                S 0   333 36.70   52.76   52.58    .00 1.40
 LBNH 220.7 137 EPD2  333 17.40   33.46   32.69    .71  .61                131  2.9
               ES 3   333 44.40   60.46   58.19   2.17  .00
  HNH 253.1 151 EP 4   333 25.50   41.56   36.69   4.84  .00
               ES 4   333 52.20   68.26   65.31   2.90  .00
 KGNO 267.2 232   P 1  333 22.77   38.83   38.43    .39  .83
 CRLO 278.9 278   P 1  333 24.20   40.26   39.88    .35  .79
                S 4   333 52.67   68.73   70.99 -2.31  .00
  FFD 301.9 145 EP 3   333 28.60   44.66   42.71   1.93  .02
               ES 4   333 67.40   83.46   76.03   7.40  .00
  DAQ 319.2  38   P 1  333 28.39   44.45   44.85   -.56  .66
                S 4   333 61.21   77.27   79.83 -2.85  .00
  A54 325.8  53   P 2  333 28.71   44.77   45.66   -.95  .39
                S 3   333 62.92   78.98   81.28 -2.40  .00
  A11 326.4  58   P 2  333 30.56   46.62   45.74    .87  .40
  LMQ 337.2  53   P 2  333 30.35   46.41   47.07   -.73  .40
                S 4   333 65.42   81.48   83.78 -2.43  .00
  A61 360.9  52   P 1  333 33.69   49.75   50.00   -.26  .56
  A64 381.6  52   S 4  333 75.27   91.33   93.56 -2.27  .00
 VLDQ 385.3 314   P 3  333 38.82   54.88   53.02   1.84  .01
  EEO 418.8 284   P 3  333 42.96   59.02   57.15   1.80  .01
                S 4   333 82.64   98.70 101.73 -3.15  .00
 SADO 431.0 256   P 1  333 42.20   58.26   58.65   -.43  .35
                S 4   333 84.90 100.96 104.40 -3.51  .00
  ICQ 650.1  49   S 4  333   .00   16.06 152.56******  .00
  MNQ 655.3  35   S 4  334 73.52 149.58 153.71 -4.28  .00
  SMQ 731.1  47   S 0  334 94.39 170.45 170.36   -.02  .00
```

Return to Table of Contents

TABLE 5

MICROEARTHQUAKES AND OTHER NON-LOCATABLE EVENTS

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

Return to Table of Contents

NESN Station Map

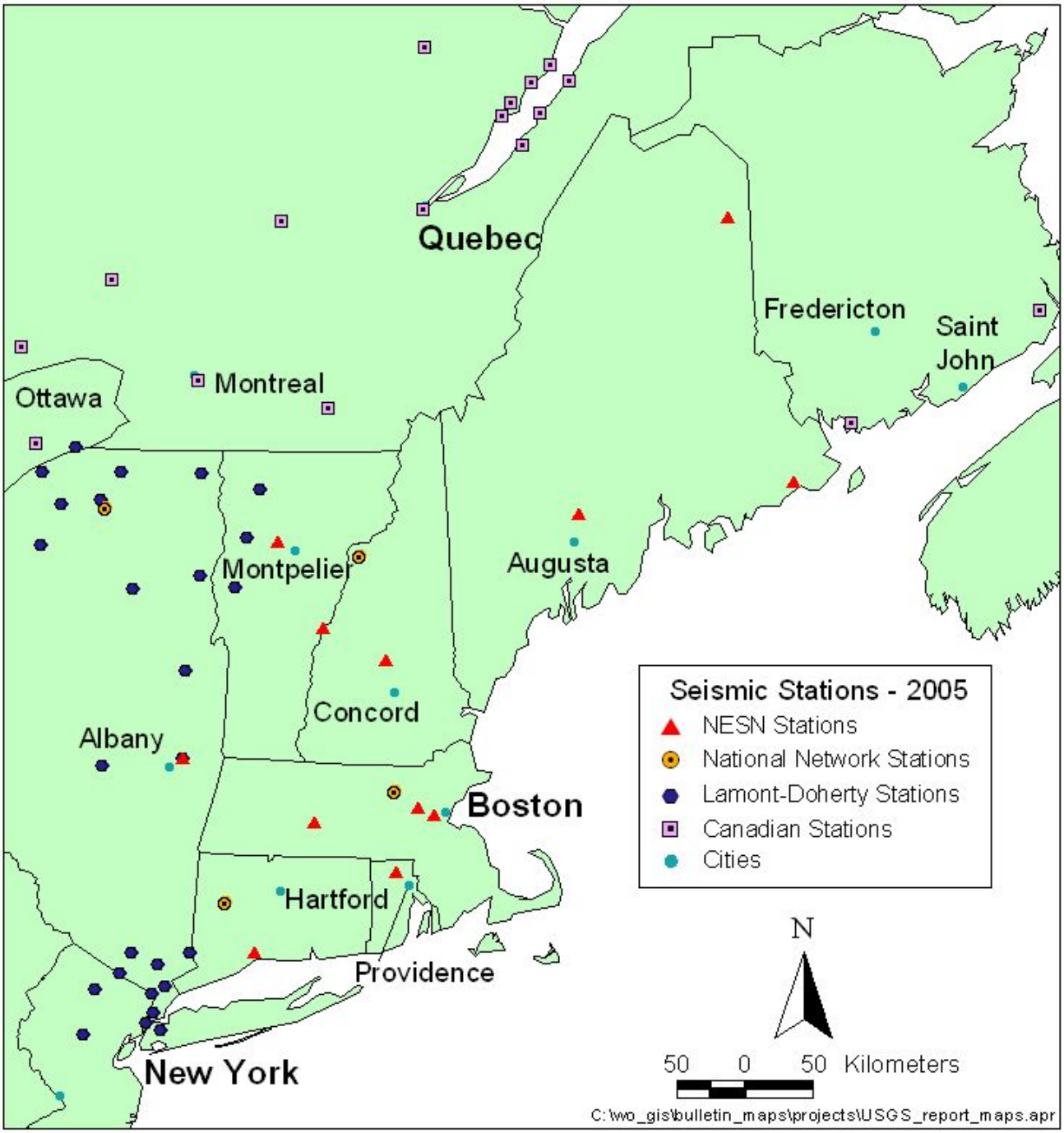


Figure 1: Map of stations of the New England Seismic Network (NESN) in operation during the period of this report. Also included are other Northeast U.S. and Canadian seismic stations in operation during this period.

Return to Table of Contents

NESN Strong-Motion Station Map

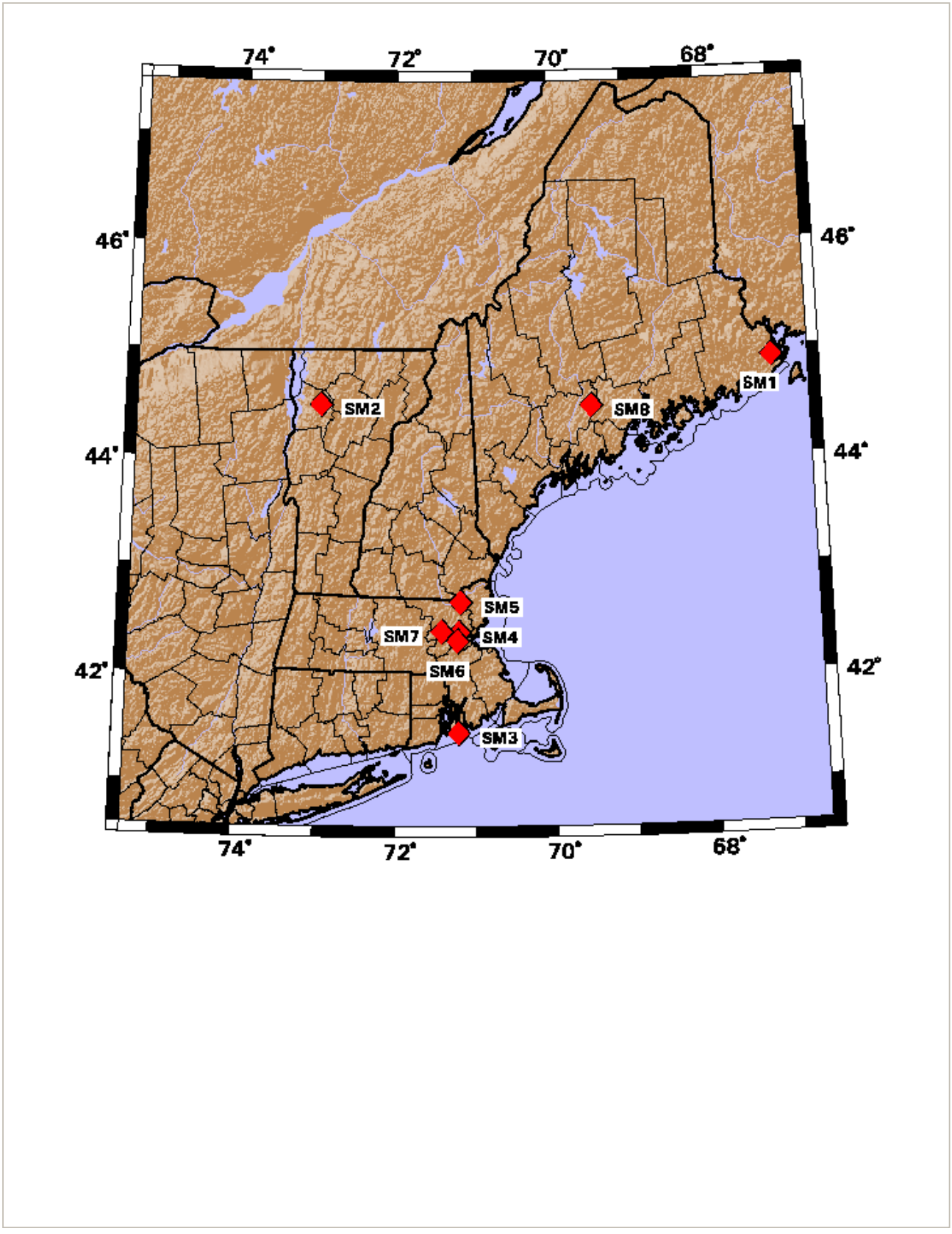


Figure 2: Map of strong-motion stations of the New England Seismic Network (NESN) in operation during the period of this report.

Return to Table of Contents

NESN Quarterly Seismicity Map

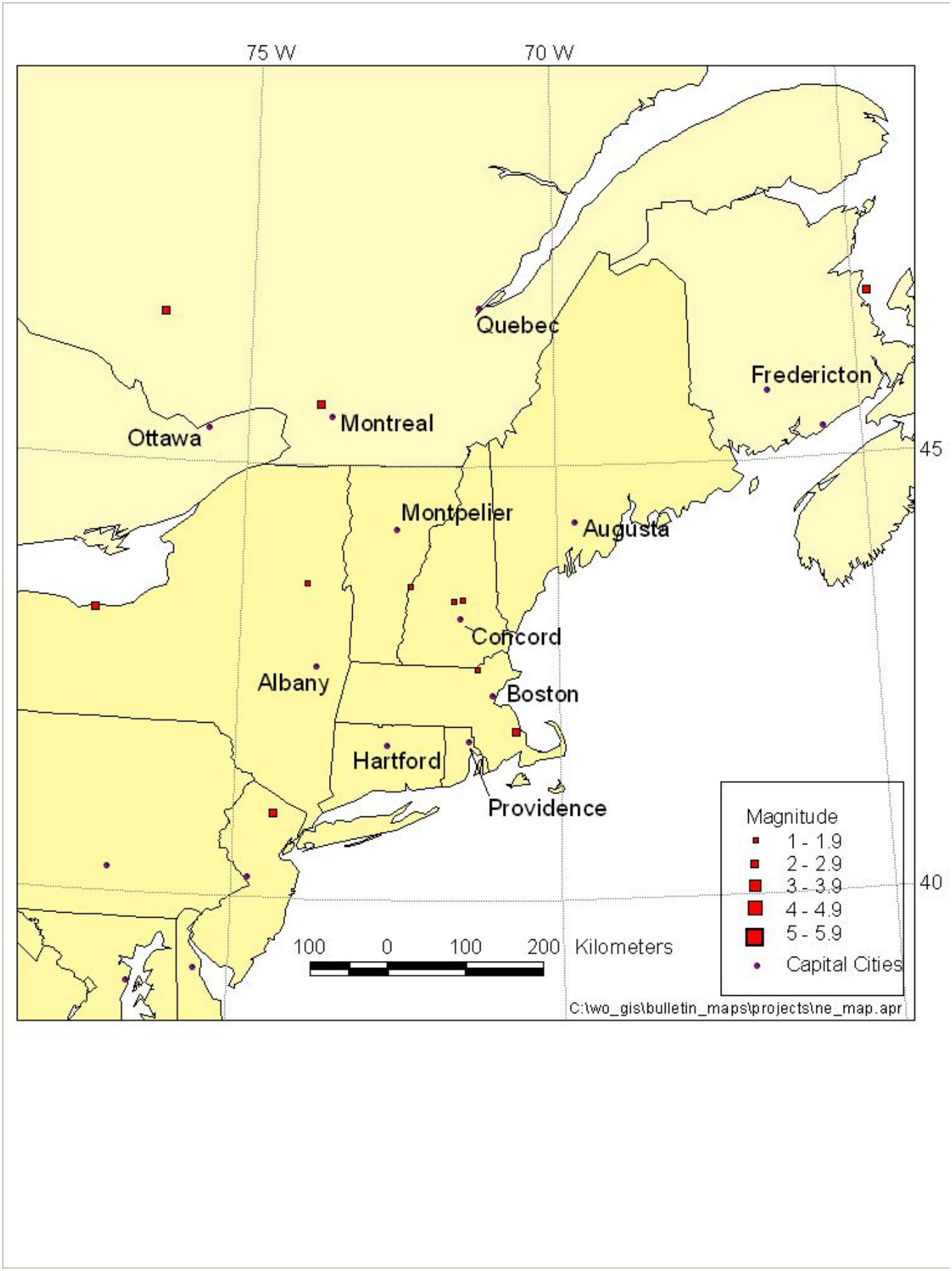


Figure 3: Earthquake epicenters located by the NESN during the period of this report.

Return to Table of Contents

NESN Cumulative Seismicity Map

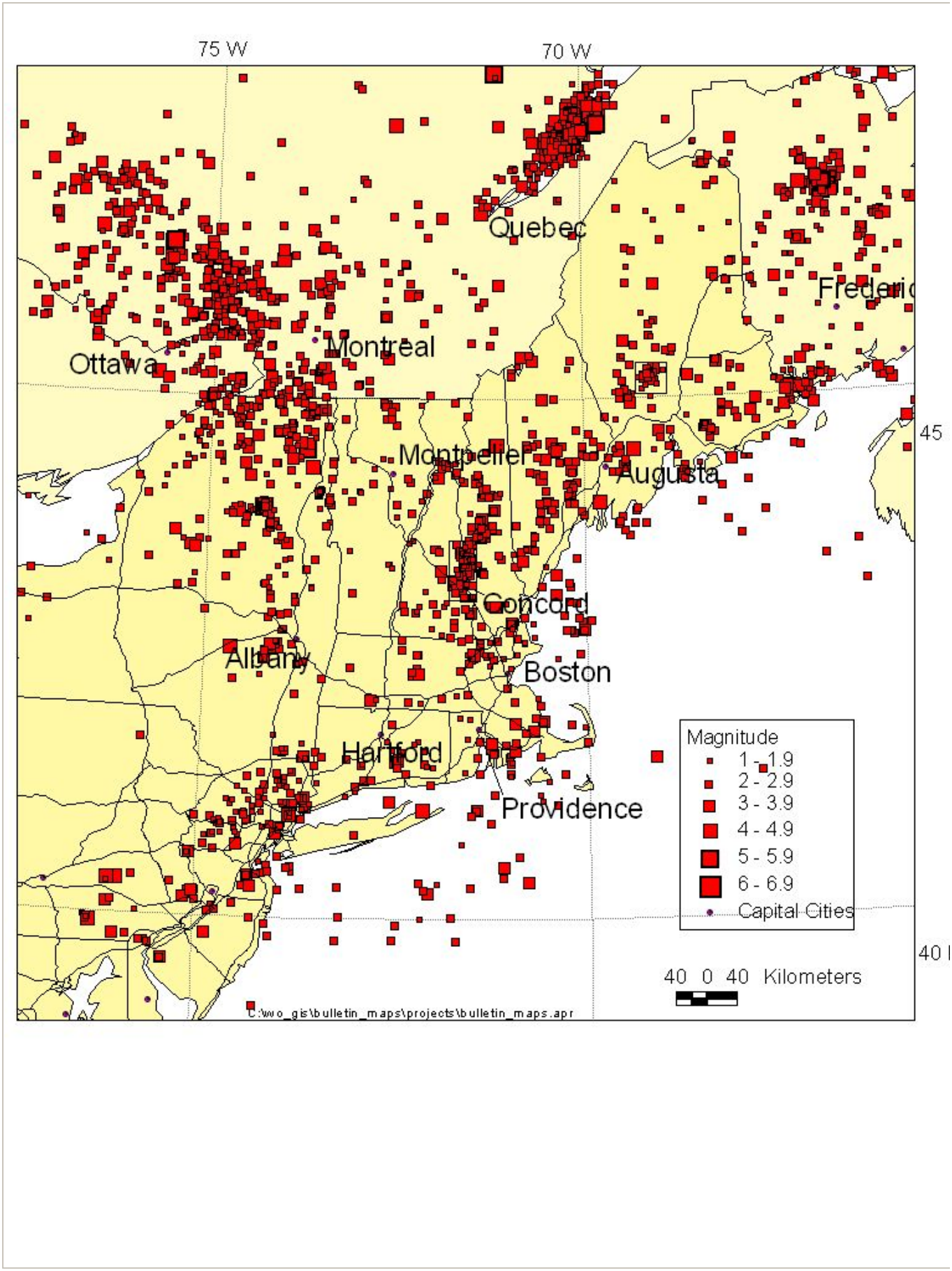


Figure 4: Seismicity for period October, 1975 - December, 2005.

Return to Table of Contents

Acknowledgments

Our map database has been developed in-house using ArcView and in part basemap data provided by ESRI, Inc., USGS GTOPO30 Elevation Data, and TIGER/Line '94, '95, and '97 (US Census Bureau) spatial data.

References

Chaplin, M.P., Taylor, S.R., and Toksöz, M.N. (1980), A coda length magnitude 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.

Return to Table of Contents

Updated: July 12, 2011
Maintained by: Weston Observatory