

Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

December

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Prepared by
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GENERAL BULLETIN INFORMATION

The National Centre for Geophysical Research is a governmental agency established 1975 in Lebanon by the National Council for Scientific Research (CNRS). The mission of the Centre, among other assignments, is the monitoring of seismic activity within the national territory. Currently, the national seismic network is under deployment; it has been officially registered as GRAL, an acronym for Geophysical Research Arrays of Lebanon. Station coordinates and status are given below.

Since 1993, the Centre has been participating in a regional initiative by the UNESCO and the USGS known as RELEMR, i.e. Reducing Earthquake Losses in the Eastern Mediterranean Region.

Within this framework, the Centre routinely contributes to the database set up for this purpose and maintained by the Euro-Mediterranean Seismological Centre (EMSC). For coherence, the Centre has adopted the recommended seismic analysis system SEISAN developed by Jens Havskov and Lars Ottemoller from the University of Bergen, Norway.

The localization program currently used for locating earthquakes is Hypocenter (Lienert et al., 1986). Plane parallel layers are assumed for local and regional events, while the IASPEI travel time tables are used for distant events.

The velocity model used for all local and regional events is the one currently adopted by the RELEMR initiative.

P-wave velocity (km/sec)	depth to top of layer (km)
6.2	0.0
6.8	14.0
8.05	34.0
8.25	50.0
8.5	80.0

Magnitudes are calculated from the coda duration. The coda wave magnitude is estimated via the formula:

$$M_c = 0.08 + 1.63 * \log_{10}(T) + 0.0009 * D.$$

where T is the coda duration (sec) and D is the epicentral distance (km). The coefficients above were adopted at the outset of our Centre in 1980 and thus are still in use for the sake of continuity.

All available coda values are used for magnitude calculations. No station corrections are used for either travel times or magnitudes calculations. The V_p/V_s velocity ratio used in both layered models above is 1.74.

As a general policy, neither depths, nor epicenters, are fixed unless stated otherwise since this might restrict later use of the data. Consequently, some event locations might be unrealistic such as zero depth earthquakes or teleseismic locations off by 1000 km. However, the locations are based on the available data and reflect the localization procedure and the models used.

STATIONS USED

The stations listed below are operated by the National Centre for Geophysical Research. They constitute the basic setup of the National Seismic Network of Lebanon.

However, readings from other cooperating agencies are also used in locating the events and thus more stations may appear in the event lists than in the station list; it is worth mentioning the systematic use of arrival times from the Cypriot seismic network CSS in order to constrain events corresponding to an active zone off the Lebanese shorelines.

STATION	LATITUDE	LONGITUDE	HEIGHT (m)	NAME	COMMENTS
BHL	3354.25N	3539.25E	1000	BHANNES	Opened May 1980
HWQ	3416.68N	3556.78E	1161	HAWQA	Opened Jan 2001
MATL	3329.32N	3519.78E	5	MATARIH	Opened Nov 2000
FKH	3414.69N	3624.61E	1152	FAKEHEH	Opened Dec 2004
RCY	3329.79N	3550.14E	1370	RACHAYA	Opened Jun 2006
DWR	3323.13N	3524.08E	420	DWEIR	Scheduled 2003
BEYL	3352.30N	3529.59E	49	BEIRUT	Opened Jul 2006
NAQL	3307.02N	3508.46E	83	NAQOURA	Opened Jul 2008
DQRL	3342.34N	3534.21E	963	DEIR QAMAR	Opened Mar 2010

REGIONAL AND DISTANT EARTHQUAKES

Because regional events and teleseisms are not localized, but simply identified, EMSC determination data are given along with phase arrivals (in general first arrival) at the stations of our network.

MACROSEISMIC DATA

Macroseismic data, if available, are included in the bulletin.

MONTHLY EPICENTER MAPS

Maps will be found on the last page.

ELECTRONIC PUBLICATION

This provisional bulletin is available for download in pdf format on:
<http://www.cnrs.edu.lb/grdownload.html>

REFERENCES

- Havskov, J. and Ottemoller, L.(2001). SEISAN: The Earthquake Analysis Software. -version 7.2-
Institute of Solid Earth Physics, University of Bergen.
<http://www.ifjf.uib.no/seismo/software/seisan.html>
- Lienert, B.R., Berg, E. and Frazer, L.N.(1986). Hypocenter: An earthquake location method using centered, scaled, and adaptively least squares. Bull. Seism. Soc. Am., 76., pp 771-783.

Abbreviations:

TIME: Origin time in UTC (hr. min. and sec.) or data file onset time if event is not located.

LAT: Latitude of epicenter

LON: Longitude of epicenter

DEPTH: Focal depth in kilometer (trailing F indicates fixed depth)

AGENCY: REL throughout the bulletin, aka. REsearch Lebanon

MAGNITUDES: Up to 3 different magnitudes can be given followed by type and reporting agency, e.g. 3.1 MC REL - coda magnitude calculated according to above mentioned formula.

EMSC: Euro-Mediterranean Seismological Centre.

OT: Origin Time

RMS: Root mean square value of travel time residuals

STAT: Station code

CO: Component; S:short period, L:long period, B:broadband.

DIST: Epicenter distance (km)

AZI: Azimuth from source to station

PHAS: Phase; The first letter characterizes onset E(mergent) or I(mpulsive)

P: Polarity (C for compression, D for dilatation)

HR: Hour

MN: Minute

SECON: Seconds

TRES: Residual (seconds)

CODA: Signal duration in seconds

AMPL: Ground Amplitude ($0.5 * (\text{peak to peak})$), (nm) at period PERI

PERI: Period where amplitude is measured

BAZ: Back azimuth (station to event)

ARES: Back azimuth residual

VELO: Apparent phase velocity (km/sec)

WT: Weight of phase in the location

*: An asterisk before the phase arrival time implies a potential timing error. If an S phase is read, differential S-P times will be used in the hypocenter location.

December 1 2010 Hour: 0:50 22.0

Agency: REL Distant

EMSC OT=00:50:22.0 02.69N 99.01E 165Km Mw=5.5 NORTHERN SUMATRA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1 0	54.85								
BHL	BZ			EP		1 0	55.45								
BEYL	BZ			EP		1 0	55.93								
DQRL	SZ			EP		1 0	56.35								

December 1 2010 Hour: 5: 8 51.4

Lat: 31.51N Lon: 35.38E Depth: 0 Agency: REL Regional

Magnitudes: 3.7MC REL

Rms: 0.3 secs

EMSC OT=05:08:49.0 31.50N 35.46E 2Km ML=3.5 DEAD SEA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ	179	353	EP		5 9	19.45-0.12								1.0
DQRL	SZ	244	4	EP		5 9	27.74-0.04								1.0
DQRL	SN	244	4	ES		5 9	54.77 0.05								1.0
BHL	BZ	266	6	EP		5 9	30.80 0.21	124							1.0
BHL	BN	266	6	ES		5 9	59.82 0.21								1.0
HWQ	BZ	311	10	EP		5 9	37.00 0.83								1.0
HWQ	BE	311	10	ES		510	9.06-0.27								1.0

December 1 2010 Hour: 10:10 42.1

Lat: 34.42N Lon: 36.72E Depth: 1 Agency: REL Local

Magnitudes: 2.9MC REL

Rms: 0.1 secs

NEBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	35	235	EP		1010	47.48-0.18	52							1.0
FKH	SN	35	235	ES		1010	51.88 0.07								1.0
HWQ	BZ	73	257	EP		1010	53.99 0.18								1.0
HWQ	BN	73	257	ES		1011	2.45-0.05								1.0
BHL	BZ	114	240	EP		1011	0.19-0.23								0.2
RCY	SZ	131	219	EP		1011	3.36 0.15								1.0
DQRL	SZ	133	233	EP		1011	3.22-0.15								1.0

December 1 2010 Hour: 10:13 0.0

Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1013	39.44								
HWQ	BZ			EP		1013	46.69								

December 1 2010 Hour: 19:48 0.8

Lat: 33.15N Lon: 35.34E Depth: 0 Agency: REL Local

Magnitudes: 2.9MC REL

Rms: 0.1 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	66	19	EP		1948	11.23-0.16								1.0
DQRL	SN	66	19	ES		1948	19.29 0.05								1.0
BHL	BZ	89	19	EP		1948	15.26 0.11	50							1.0
BHL	BN	89	19	ES		1948	25.77-0.02								1.0
HWQ	BZ	138	24	EP		1948	23.00 0.05								1.0
HWQ	BN	138	24	ES		1948	39.33-0.03								1.0

December 1 2010 Hour: 19:55 43.0

Agency: REL Distant

EMSC OT=19:55:43.0 30.15N 51.58E 10Km mb=5.2 SOUTHERN IRAN

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1959	0.15								
BHL	BZ			EP		1959	0.44								
DQRL	SZ			EP		1959	1.08								

December 3 2010 Hour: 0:24 51.3

Lat: 33.08N Lon: 35.42E Depth: 15 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.1 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ	26	278	EP		024	56.20 0.05	38							1.0
NAQL	SN	26	278	ES		024	59.70-0.02								1.0
DQRL	SZ	70	12	EP		025	2.50-0.18								1.0
BHL	BZ	94	14	EP		025	6.27 0.18								1.0

BHL	BN	94	14	ES		025	17.02	0.00									1.0
HWQ	BZ	141	20	EP		025	13.06	-0.05									1.0
HWQ	BE	141	20	ES		025	29.26	0.03									1.0

December 3 2010 Hour: 14:29 43.1 Lat: 33.97N Lon: 35.69E Depth: 13 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	8	204	EP		1429	45.79	-0.03	28						1.0
BHL	BN	8	204	ES		1429	47.82	0.02							1.0
DQRL	SZ	31	201	EP		1429	48.70	0.01							1.0
DQRL	SN	31	201	ES		1429	52.81	0.00							1.0
HWQ	SZ	42	35	EP		1429	50.28	0.02							1.0
HWQ	SN	42	35	ES		1429	55.52	-0.01							1.0

December 3 2010 Hour: 15:32 12.0 Lat: 33.89N Lon: 35.45E Depth: 7 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	19	86	EP		1532	15.22	-0.03	34						1.0
BHL	BE	19	86	ES		1532	17.69	0.01							1.0
DQRL	SZ	24	152	EP		1532	15.95	-0.02							1.0
DQRL	SN	24	152	ES		1532	18.95	0.01							1.0
HWQ	BZ	62	47	EP		1532	22.16	0.05							1.0
HWQ	BN	62	47	ES		1532	29.60	-0.03							1.0

December 3 2010 Hour: 19:42 11.3 Lat: 33.12N Lon: 35.40E Depth: 15 Agency: REL Local
Magnitudes: 3.3MC REL Rms: 0.2 secs

SOUTH LEBANON
Earthquake was felt

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ	24	269	EP		1942	15.87	-0.01							1.0
NAQL	SN	24	269	ES		1942	19.29	0.01							1.0
DQRL	SZ	67	14	EP		1942	21.85	-0.25							1.0
DQRL	SN	67	14	ES		1942	30.10	0.01							1.0
BEYL	BZ	84	6	EP		1942	24.95	0.41							1.0
BHL	BZ	90	15	EP		1942	25.50	-0.02	86						1.0
HWQ	BZ	138	21	EP		1942	32.74	0.16							1.0

December 3 2010 Hour: 21:50 9.9 Lat: 34.10N Lon: 36.22E Depth: 33 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

HERMEL BAALBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ	32	308	EP		2150	17.26	0.04	41						1.0
HWQ	BN	32	308	ES		2150	22.56	-0.03							1.0
BHL	BZ	56	248	EP		2150	20.10	0.01							1.0
BHL	BN	56	248	ES		2150	27.61	0.02							1.0
DQRL	SZ	74	234	EP		2150	22.24	-0.04							1.0

December 3 2010 Hour: 22:33 0.0 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		2234	15.75								
HWQ	BZ			EP		2234	16.86								

December 4 2010 Hour: 1: 2 37.0 Lat: 33.79N Lon: 35.79E Depth: 2 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	18	315	EP		1 2	39.94	0.00	46						1.0
BHL	BN	18	315	ES		1 2	42.10	0.01							1.0
DQRL	SZ	23	245	EP		1 2	40.70	-0.01							1.0
DQRL	SN	23	245	ES		1 2	43.43	0.00							1.0
HWQ	SZ	56	15	EP		1 2	46.08	0.04							1.0
HWQ	SN	56	15	ES		1 2	52.68	-0.03							1.0

December 4 2010 Hour: 3:49 11.0

Agency: REL Regional

EMSC OT=03:49:11.0 36.44N 26.39E 121Km ML=4.4 DODECANESE ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ			EP		350	58.59								
BHL	BZ			EP		350	59.34								
DQRL	SZ			EP		351	0.03								
HWQ	BZ			EP		351	1.58								

December 4 2010 Hour: 5:15 19.5

Lat: 33.12N

Lon: 35.44E

Depth: 0

Agency: REL Local

Magnitudes: 3.4MC REL

Rms: 0.1 secs

SOUTH LEBANON

Earthquake was felt

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ	28	268	EP		515	24.01	0.06							1.0
NAQL	SN	28	268	ES		515	27.23	-0.04							1.0
DQRL	SZ	66	11	EP		515	30.05	0.00							1.0
DQRL	SN	66	11	ES		515	37.83	-0.05							1.0
BEYL	BZ	83	3	EP		515	32.93	0.07							1.0
BHL	BZ	89	13	EP		515	33.68	-0.10	98						1.0
HWQ	BZ	136	20	EP		515	41.56	0.12							1.0
HWQ	BN	136	20	ES		515	57.56	-0.14							1.0
FKH	SZ	153	36	EP		515	44.06	0.10							1.0

December 4 2010 Hour: 5:23 52.0

Lat: 33.10N

Lon: 35.45E

Depth: 6

Agency: REL Local

Magnitudes: 2.8MC REL

Rms: 0.1 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	69	9	EP		524	3.31	0.20	44						1.0
DQRL	SN	69	9	ES		524	11.16	-0.18							1.0
BHL	BZ	92	12	EP		524	7.06	0.24							1.0
HWQ	BZ	139	19	EP		524	14.25	0.35							1.0
HWQ	BN	139	19	ES		524	29.72	-0.39							1.0

December 4 2010 Hour: 10: 2 38.2

Lat: 33.89N

Lon: 36.71E

Depth: 22

Agency: REL Local

Magnitudes: 3.1MC REL

Rms: 0.1 secs

DAMASCUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	48	325	EP		10 2	46.52	0.03							1.0
FKH	SN	48	325	ES		10 2	52.58	-0.02							1.0
HWQ	BZ	82	302	EP		10 2	51.46	0.06							1.0
RCY	SZ	92	242	EP		10 2	52.85	0.00							1.0
RCY	SN	92	242	ES		10 3	3.67	0.01							1.0
BHL	BZ	97	271	EP		10 2	53.46	-0.14	60						1.0
DQRL	SZ	107	259	EP		10 2	55.10	0.05							1.0
DQRL	SN	107	259	ES		10 3	7.52	0.03							1.0

December 4 2010 Hour: 15:46 0.0

Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1546	52.42								
HWQ	BZ			EP		1546	54.81								

December 4 2010 Hour: 17:28 57.3

Lat: 33.11N

Lon: 35.33E

Depth: 2

Agency: REL Local

Magnitudes: 2.9MC REL

Rms: 0.1 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	70	19	EP		1729	8.46	-0.16	47						1.0
DQRL	SE	70	19	ES		1729	16.95	-0.01							1.0
BHL	BZ	93	19	EP		1729	12.41	0.03							1.0
BHL	BN	93	19	ES		1729	23.59	0.08							1.0
HWQ	BZ	142	24	EP		1729	20.07	0.13							1.0
HWQ	BN	142	24	ES		1729	36.59	-0.08							1.0

December 4 2010 Hour: 17:35 15.5 Lat: 33.13N Lon: 35.50E Depth: 9 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	64	6	EP		1735	25.84	-0.17	50						1.0
DQRL	SN	64	6	ES		1735	33.88	0.10							1.0
BHL	BZ	87	10	EP		1735	29.70	0.06							1.0
BHL	BN	87	10	ES		1735	40.05	-0.04							1.0
HWQ	BZ	134	18	EP		1735	36.65	0.11							1.0
HWQ	BN	134	18	ES		1735	52.04	-0.06							1.0

December 4 2010 Hour: 19:19 45.4 Lat: 33.38N Lon: 35.39E Depth: 0 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.1 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	39	25	EP		1919	51.75	0.04							1.0
DQRL	SE	39	25	ES		1919	56.40	-0.01							1.0
BEYL	BZ	55	10	EP		1919	54.25	0.04							0.2
BHL	BZ	63	23	EP		1919	55.37	-0.09	61						1.0
BHL	BN	63	23	ES		1920	2.96	0.02							1.0
HWQ	SZ	112	27	EP		1920	3.81	0.44							0.2

December 4 2010 Hour: 20: 5 33.4 Lat: 33.10N Lon: 35.33E Depth: 5 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.2 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	71	18	EP		20 5	44.73	-0.17	35						1.0
DQRL	SN	71	18	ES		20 5	53.36	-0.05							1.0
BHL	BZ	94	19	EP		20 5	48.58	-0.07							1.0
BHL	BN	94	19	ES		20 6	0.13	0.19							1.0
HWQ	BZ	143	23	EP		20 5	56.20	0.25							1.0
HWQ	BN	143	23	ES		20 6	12.49	-0.15							1.0

December 5 2010 Hour: 2: 3 58.7 Lat: 33.09N Lon: 35.47E Depth: 9 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.3 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ	31	276	EP		2 4	3.95	0.02	39						1.0
NAQL	SN	31	276	ES		2 4	7.81	0.00							1.0
DQRL	SZ	69	7	EP		2 4	9.95	-0.04							1.0
DQRL	SN	69	7	ES		2 4	18.37	0.02							1.0
BEYL	BZ	87	1	EP		2 4	12.89	0.11							0.2
BHL	BZ	92	10	EP		2 4	13.51	-0.08							1.0
HWQ	BZ	139	18	EP		2 4	21.81	1.29							0.2

December 5 2010 Hour: 8:11 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		812	13.71								
RCY	SZ			EP		812	12.89								

December 5 2010 Hour: 12:37 23.2 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ			EP		1237	34.25								
DQRL	SZ			EP		1237	38.25								
HWQ	BZ			EP		1237	47.91								

December 5 2010 Hour: 12:48 37.7 Lat: 34.35N Lon: 36.60E Depth: 5 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.2 secs

NEBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	21	238	EP		1248	40.40	-0.84	48						0.2
FKH	SN	21	238	ES		1248	43.95	0.07							1.0
HWQ	BZ	61	263	EP		1248	47.66	0.07							1.0

HWQ	BN	61	263	ES	1248	54.82	-0.09										1.0
BHL	BZ	100	241	EP	1248	53.88	-0.04										1.0
RCY	SZ	118	217	EP	1248	56.49	-0.15										1.0
DQRL	SZ	119	234	EP	1248	56.94	0.18										1.0

December 5 2010 Hour: 13:35 3.3 Lat: 33.65N Lon: 35.83E Depth: 14 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.1 secs

CENTRAL BEKAA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ	17	179	EP		1335	6.95	-0.05	42						1.0
RCY	SE	17	179	ES		1335	9.78	0.02							1.0
DQRL	SZ	25	284	EP		1335	8.10	0.07							1.0
DQRL	SN	25	284	ES		1335	11.58	0.03							1.0
BHL	BZ	33	330	EP		1335	8.94	-0.16							1.0
HWQ	BZ	71	8	EP		1335	14.74	0.09							1.0
FKH	SZ	85	39	EP		1335	16.77	0.01							1.0

December 5 2010 Hour: 14:52 23.0 Lat: 33.79N Lon: 35.78E Depth: 0 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	17	318	EP		1452	25.85	0.00	32						1.0
DQRL	SZ	22	245	EP		1452	26.55	0.03							1.0
DQRL	SN	22	245	ES		1452	29.09	-0.02							1.0
RCY	SZ	33	171	EP		1452	28.34	0.02							1.0
RCY	SN	33	171	ES		1452	32.21	-0.02							1.0
HWQ	BZ	56	16	EP		1452	32.13	-0.01							1.0

December 5 2010 Hour: 23:20 17.0 Agency: REL Regional

EMSC OT=23:20:17.0 35.33N 28.58E 48Km mb=4.5 EAST MED SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ			EP		2321	39.74								
DQRL	SZ			EP		2321	41.43								
BHL	BZ			EP		2321	42.07								
HWQ	BZ			EP		2321	44.09								

December 6 2010 Hour: 4:7 45.8 Lat: 33.24N Lon: 35.06E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

OFFSHORE SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	70	42	EP		4 7	57.10	-0.01	43						1.0
DQRL	SN	70	42	ES		4 8	5.47	0.01							1.0
BHL	BZ	92	37	EP		4 8	0.66	0.01							1.0
BHL	BE	92	37	ES		4 8	11.61	-0.01							1.0
HWQ	BZ	141	35	EP		4 8	8.47	0.00							1.0

December 6 2010 Hour: 7:14 35.3 Lat: 34.05N Lon: 35.28E Depth: 13 Agency: REL Local
Magnitudes: 3.0MC REL Rms: 0.0 secs

OFFSHORE CENTRAL LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	38	115	EP		714	41.85	-0.01							1.0
DQRL	SZ	47	145	EP		714	43.18	0.00	58						1.0
DQRL	SN	47	145	ES		714	49.04	0.01							1.0
HWQ	BZ	66	68	EP		714	46.09	0.01							1.0
HWQ	BN	66	68	ES		714	54.06	0.00							1.0

December 8 2010 Hour: 22:54 44.0 Agency: REL Regional

EMSC OT=22:54:44.0 36.17N 35.86E 15Km ML=3.2 CENTRAL TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		2255	17.05								
FKH	SZ			EP		2255	19.18								
BHL	BZ			EP		2255	22.23								
DQRL	SZ			EP		2255	24.89								

December 9 2010 Hour: 8:129.4 Lat: 34.07N Lon: 36.11E Depth: 18 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.1 secs

HERMEL BAALBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ	28	327	EP		8	1	34.84	0.02		42				1.0
HWQ	BN	28	327	ES		8	1	38.85	0.01						1.0
FKH	SZ	34	54	EP		8	1	35.55	-0.04						1.0
FKH	SN	34	54	ES		8	1	40.18	0.02						1.0
BHL	BZ	46	247	EP		8	1	37.12	-0.15						1.0
DQRL	SZ	64	232	EP		8	1	40.02	0.14						1.0

December 9 2010 Hour: 13:944.2 Lat: 34.56N Lon: 36.40E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.0 secs

HERMEL BAALBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	35	178	EP		13	9	49.72	-0.06		44				1.0
FKH	SN	35	178	ES		13	9	53.97	0.03						1.0
HWQ	BZ	52	233	EP		13	9	52.54	0.04						1.0
HWQ	BE	52	233	ES		13	9	58.63	-0.03						1.0
DQRL	SZ	121	219	EP		1310		3.77	0.03						1.0

December 12 2010 Hour: 7:35 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		735		41.40							
FKH	SZ			EP		735		43.15							

December 14 2010 Hour: 23:2 0.0 Agency: REL Regional

EMSC OT=23:02:00.0 36.58N 28.07E 70Km mb=4.3 DODECANESE ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		23	3	35.43							
DQRL	SZ			EP		23	3	36.02							
HWQ	BZ			EP		23	3	37.15							

December 15 2010 Hour: 3:2132.1 Lat: 33.31N Lon: 35.39E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.2 secs

SOUTH LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
NAQL	SZ	32	227	EP		321		37.24	0.02		44				1.0
NAQL	SE	32	227	ES		321		41.13	0.13						1.0
DQRL	SZ	47	21	EP		321		39.60	-0.05						1.0
DQRL	SN	47	21	ES		321		45.30	0.07						1.0
BHL	BZ	70	20	EP		321		42.82	-0.59						1.0
HWQ	BZ	119	26	EP		321		51.76	0.48						1.0

December 17 2010 Hour: 9:3749.0 Agency: REL Regional

EMSC OT=09:37:49.0 36.95N 24.00E 105Km ML=4.9 SOUTHERN GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		940		7.24							
DQRL	SZ			EP		940		7.84							
FKH	SZ			EP		940		12.67							

December 19 2010 Hour: 19:51 6.5 Lat: 35.06N Lon: 36.53E Depth: 11 Agency: REL Regional
Magnitudes: 3.1MC REL Rms: 0.1 secs

EMSC OT=19:51:05.0 35.30N 36.59E 20Km ML=3.3 SYRIA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	91	187	EP		1951		21.02	-0.01		60				1.0
FKH	SE	91	187	ES		1951		31.82	0.01						1.0
HWQ	BZ	102	212	EP		1951		22.55	-0.10						1.0
HWQ	BN	102	212	ES		1951		34.57	-0.06						1.0
BHL	BZ	151	213	EP		1951		30.03	0.12						1.0
BHL	BE	151	213	ES		1951		47.31	0.05						1.0
DQRL	SZ	174	211	EP		1951		33.09	0.00						1.0

December 20 2010 Hour: 6:22 28.1 Lat: 36.16N Lon: 35.95E Depth: 2 Agency: REL Regional
Magnitudes: 3.5MC REL Rms: 0.7 secs

EMSC OT=06:22:26.0 36.21N 35.86E 5Km ML=3.3 CENTRAL TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ	209	180	EP		622	58.93	-1.05							1.0
HWQ	BN	209	180	ES		623	23.56	0.00							1.0
FKH	SZ	217	169	EP		623	0.18	-0.77	92						1.0
BHL	BZ	252	186	EP		623	5.90	0.61							1.0
BHL	BE	252	186	ES		623	32.81	0.01							1.0
DQRL	SZ	275	187	EP		623	9.05	0.94							1.0

December 20 2010 Hour: 18:41 59.0

Agency: REL Distant

EMSC OT=18:41:59.0 28.49N 59.25E 4Km Mw=6.5 SOUTHEASTERN IRAN

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1846	38.09								
HWQ	BZ			EP		1846	40.42								
BHL	BZ			EP		1846	42.00								
DQRL	SZ			EP		1846	43.49								

December 20 2010 Hour: 21:31 15.7 Lat: 35.23N Lon: 38.67E Depth: 0 Agency: REL Regional
Magnitudes: 4.3MC REL Rms: 0.4 secs

EMSC OT=21:31:15.0 35.20N 38.60E 2Km ML=4.4 SYRIA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	234	243	EP		2131	50.13	-0.84							1.0
HWQ	SZ	271	248	EP		2131	55.48	-0.05							1.0
HWQ	SN	271	248	ES		2132	25.08	0.10							1.0
BHL	BZ	313	243	EP		2132	0.51	-0.30	260						1.0
BHL	BN	313	243	ES		2132	34.20	0.05							1.0
BEYL	BZ	328	244	EP		2132	3.06	0.51							0.2
DQRL	SZ	331	240	EP		2132	3.20	0.19							1.0

December 21 2010 Hour: 15:51 39.8 Lat: 33.82N Lon: 35.70E Depth: 14 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	10	334	EP		1551	42.71	0.04	38						1.0
BHL	BN	10	334	ES		1551	44.82	-0.01							1.0
DQRL	SZ	18	223	EP		1551	43.47	-0.04							1.0
DQRL	SN	18	223	ES		1551	46.28	0.00							1.0
BEYL	BZ	20	286	EP		1551	43.71	0.00							1.0
HWQ	BZ	55	24	EP		1551	48.98	0.08							1.0
HWQ	BN	55	24	ES		1551	55.59	-0.07							1.0

December 21 2010 Hour: 17:19 41.0

Agency: REL Distant

EMSC OT=17:19:41.0 26.93N 143.71E 20Km Mw=7.4 BONIN ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1732	31.90								
HWQ	BZ			EP		1732	33.33								
BHL	BZ			EP		1732	35.27								
BEYL	BZ			EP		1732	35.61								
DQRL	SZ			EP		1732	36.11								
NAQL	SZ			EP		1732	38.55								

December 22 2010 Hour: 0:11 3.8 Lat: 33.78N Lon: 35.80E Depth: 0 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.2 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	19	315	EP		011	6.82	-0.07	36						1.0
BHL	BE	19	315	ES		011	9.16	0.01							1.0
DQRL	SZ	23	248	EP		011	7.51	-0.02							1.0
DQRL	SN	23	248	ES		011	10.27	0.01							1.0
BEYL	BZ	30	289	EP		011	9.43	0.77							0.2
HWQ	BZ	57	14	EP		011	12.98	0.02							1.0

December 22 2010 Hour: 11:27 52.8 Lat: 34.09N Lon: 35.62E Depth: 7 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.0 secs

KESROUANE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	21	172	EP		1127	56.40	-0.02	42						1.0
BHL	BN	21	172	ES		1127	59.13	0.01							1.0
HWQ	BZ	36	55	EP		1127	58.84	0.02							1.0
HWQ	BN	36	55	ES		1128	3.28	-0.01							1.0
DQRL	SZ	43	186	EP		1127	59.85	0.00							1.0
DQRL	SN	43	186	ES		1128	5.07	0.00							1.0

December 22 2010 Hour: 13:57 1.5 Lat: 34.60N Lon: 36.39E Depth: 0 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs

HERMEL BAALBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	39	177	EP		1357	7.63	-0.20	53						1.0
FKH	SN	39	177	ES		1357	12.60	0.10							1.0
HWQ	BZ	54	229	EP		1357	10.30	0.06							1.0
HWQ	BN	54	229	ES		1357	16.57	-0.11							1.0
BHL	BZ	102	222	EP		1357	18.19	0.13							1.0
DQRL	SZ	124	218	EP		1357	21.62	0.02							1.0

December 23 2010 Hour: 2: 5 11.2 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		2 5	14.43								
HWQ	BZ			EP		2 5	16.83								
BHL	BZ			EP		2 5	22.59								

December 23 2010 Hour: 13:24 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1324	57.12								
DQRL	SZ			EP		1324	44.31								

December 23 2010 Hour: 14: 0 31.0 Agency: REL Distant

EMSC OT=14:00:31.0 53.10N 171.21E 10Km Mw=6.4 ALEUTIAN ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1413	4.99								
HWQ	BZ			EP		1413	5.50								
BHL	BZ			EP		1413	6.72								
DQRL	SZ			EP		1413	8.60								

December 25 2010 Hour: 13:35 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1335	58.20								
HWQ	BZ			EP		1335	59.28								

December 25 2010 Hour: 17: 1 6.0 Agency: REL Regional

EMSC OT=17:01:06.0 35.70N 35.14E 35Km MD=3.6 COAST OF SYRIA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		17 1	29.66								
BHL	BZ			EP		17 1	33.20								
FKH	SZ			EP		17 1	33.40								
DQRL	SZ			EP		17 1	35.05								
NAQL	SZ			EP		17 1	42.63								

December 25 2010 Hour: 21:15 39.1 Lat: 33.94N Lon: 35.27E Depth: 25 Agency: REL Local
Magnitudes: 3.7MC REL Rms: 0.0 secs

OFFSHORE CENTRAL LEBANON

Earthquake was felt

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEYL	BZ	22	111	EP		2115	44.29	-0.01							1.0
BHL	BZ	35	96	EP		2115	45.93	-0.03	163						1.0
BHL	BN	35	96	ES		2115	51.06	0.03							1.0

DQRL	SZ	38	133	EP		2115	46.26	0.00									1.0
DQRL	SN	38	133	ES		2115	51.54	-0.01									1.0
HWQ	BZ	73	59	EP		2115	51.06	0.05									1.0
HWQ	BN	73	59	ES		2115	59.78	-0.03									1.0
FKH	SZ	110	72	EP		2115	56.45	0.00									1.0

December 26 2010 Hour: 1:5 50.7 Lat: 34.31N Lon: 36.61E Depth: 0 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs

NEBEK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	20	250	EP		1	5	53.85	-0.09		50				1.0
FKH	SN	20	250	ES		1	5	56.33	0.02						1.0
HWQ	BZ	62	267	EP		1	6	0.70	0.06						1.0
HWQ	BN	62	267	ES		1	6	7.97	-0.01						1.0
BHL	BZ	99	244	EP		1	6	6.68	-0.03						1.0
DQRL	SZ	117	236	EP		1	6	9.67	0.05						1.0

December 26 2010 Hour: 10:11 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1012	10.35								
FKH	SZ			EP		1012	3.58								

December 26 2010 Hour: 10:13 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1013	58.83								
HWQ	BZ			EP		1014	6.50								

December 27 2010 Hour: 10:58 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1058	34.07								
HWQ	BZ			EP		1058	41.23								

December 28 2010 Hour: 8:52 0.0 Agency: REL Local

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		852	54.77								
BHL	BZ			EP		852	55.57								

December 30 2010 Hour: 15:13 5.8 Lat: 33.86N Lon: 35.76E Depth: 14 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs

BEIRUT REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	11	298	EP		1513	8.83	-0.03		33					1.0
BHL	BN	11	298	ES		1513	11.11	0.01							1.0
DQRL	SZ	24	226	EP		1513	10.50	0.05							1.0
DQRL	SN	24	226	ES		1513	13.84	-0.02							1.0
HWQ	SZ	50	21	EP		1513	14.12	-0.04							1.0
HWQ	SN	50	21	ES		1513	20.35	0.03							1.0
FKH	SZ	74	54	EP		1513	17.73	0.00							1.0

Epicentral Map of Lebanon

December 2010

