

Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

January

2019

Prepared by
The National Centre for Geophysical Research
Bhannes

*P.o.b. : 165432
Ashrafyeh Beirut 1100-2040*

*Tel : +9614-981885
Fax : +9614-981886
Email : geophys@cnrs.edu.lb*

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	Nov2000-Sep2012
FKH	3414.69N	3624.61E	1152	FAKEHEH	Opened Dec 2004
RCY	3329.79N	3550.14E	1370	RACHAYA	Opened Jun 2006
BEYL	3352.30N	3529.59E	49	BEIRUT	Opened Jul 2006
NAQL	3307.02N	3508.46E	83	NAQOURA	Jul2008-Jan2012
DQRL	3342.34N	3534.21E	963	DEIR QAMAR	Opened Mar 2010
QRWL	3332.86N	3540.93E	875	QARAOUN	Opened Oct 2011
SHBL	3320.90N	3544.63E	1422	CHEBAA	Opened Oct 2011
ZAHL	3351.48N	3553.12E	1211	ZAHLE	Opened Aug 2015
BEIL	3432.50N	3611.08E	572	BEINO	Opened Jan 2017

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.

January 1 2019 Hour: 2:9 35.1

Agency: REL Regional

EMSC OT=02:09:35.1 39.38N 40.49E 5Km M=4.1 EASTERN TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		211	5.82								
FKH	SZ			EP		211	6.96								
HWQ	BZ			EP		211	11.12								
BHL	BZ			EP		211	14.87								
DQRL	SZ			EP		211	20.12								
QRWL	SZ			EP		211	23.16								
SHBL	SZ			EP		211	23.73								

January 1 2019 Hour: 10:57 9.5

Lat: 34.60N

Lon: 34.10E

Depth: 34

Agency: REL Regional

Magnitudes: 3.1MC REL

Rms: 0.1 secs

CYPRUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	163	118	EP		1057	32.79	0.02							1.0
DQRL	SZ	168	126	EP		1057	33.40	-0.03							1.0
HWQ	BZ	174	101	EP		1057	34.29	0.15							1.0
HWQ	BN	174	101	ES		1057	52.28	-0.14							1.0
QRWL	SZ	187	128	EP		1057	35.71	-0.06							1.0
BEIL	BZ	192	91	EP		1057	36.33	0.00	55						1.0
RCY	SZ	202	127	EP		1057	37.60	-0.05							1.0
RCY	SN	202	127	ES		1057	58.76	0.24							1.0
SHBL	SZ	206	132	EP		1057	38.12	-0.05							1.0
SHBL	SN	206	132	ES		1057	59.30	-0.11							1.0
FKH	SZ	216	100	EP		1057	39.46	0.03							1.0

January 1 2019 Hour: 11:40 5.1

Agency: REL Regional

EMSC OT=11:40:05.1 34.66N 23.79E 10Km M=4.8 CRETE, GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1142	27.23								
RCY	SZ			EP		1142	27.07								
BEIL	SZ			EP		1142	28.52								
FKH	SZ			EP		1142	32.33								

January 1 2019 Hour: 13:36 20.1

Lat: 33.88N

Lon: 35.63E

Depth: 24

Agency: REL Local

Magnitudes: 2.1MC REL

Rms: 0.1 secs

METN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	4	39	EP		1336	24.00	-0.07	18						1.0
DQRL	SZ	20	196	EP		1336	25.03	-0.06							1.0
DQRL	SN	20	196	ES		1336	28.85	0.09							1.0
QRWL	SZ	37	172	EP		1336	27.06	0.02							1.0
QRWL	SN	37	172	ES		1336	32.13	-0.03							1.0
HWQ	BZ	53	33	EP		1336	29.31	0.05							1.0
SHBL	SZ	60	170	EP		1336	30.18	0.01							1.0

January 3 2019 Hour: 13:6 36.0

Lat: 33.37N

Lon: 35.62E

Depth: 0

Agency: REL Local

Magnitudes: 2.8MC REL

Rms: 0.1 secs

MARJAAYOUN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	SZ	12	100	EP		13	6	37.98	0.01	49					1.0
QRWL	SZ	21	17	EP		13	6	39.30	-0.08						1.0
QRWL	SN	21	17	ES		13	6	41.91	0.03						1.0
RCY	SZ	25	55	EP		13	6	40.00	-0.03						1.0
RCY	SN	25	55	ES		13	6	43.01	0.00						1.0
DQRL	SZ	38	353	EP		13	6	42.10	-0.00						1.0
DQRL	SN	38	353	ES		13	6	46.59	-0.02						1.0
BHL	BZ	60	3	EP		13	6	45.69	0.06						1.0
HWQ	BZ	106	17	EP		13	6	53.75	0.72						0.2
FKH	SZ	122	37	EP		13	6	55.68	0.00						0.2
BEIL	SZ	140	22	EP		13	6	58.49	-0.05						0.2

January 6 2019 Hour: 17:27 18.9 Agency: REL Distant

EMSC OT=17:27:18.9 2.30N 126.77E 40Km M=6.6 MOLUCCA SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1740	12.88								
BEIL	SZ			EP		1740	13.63								
BHL	BZ			EP		1740	14.41								
RCY	SZ			EP		1740	15.14								

January 7 2019 Hour: 22:42 5.1 Lat: 33.88N Lon: 36.03E Depth: 0 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.1 secs

BAALBECK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	35	274	EP		2242	10.65-0.08								1.0
BHL	BN	35	274	ES		2242	14.88 0.02								1.0
HWQ	BZ	44	350	EP		2242	12.31 0.01								1.0
RCY	SZ	47	203	EP		2242	12.52-0.12	36							1.0
RCY	SN	47	203	ES		2242	18.19-0.00								1.0
DQRL	SZ	47	245	EP		2242	12.64-0.04								1.0
QRWL	SZ	49	221	EP		2242	13.16 0.09								1.0
FKH	SZ	53	41	EP		2242	13.70-0.06								1.0
SHBL	SZ	65	204	EP		2242	15.76 0.14								1.0
BEIL	SZ	74	11	EP		2242	17.83 0.68								0.2

January 8 2019 Hour: 11:48 23.6 Lat: 33.36N Lon: 35.90E Depth: 1 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.1 secs

SYRIA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	SZ	14	266	EP		1148	25.98-0.00								1.0
RCY	SZ	16	340	EP		1148	26.22-0.09	25							1.0
RCY	SE	16	340	ES		1148	28.34 0.05								1.0
QRWL	SZ	29	317	EP		1148	28.45 0.12								1.0
QRWL	SN	29	317	ES		1148	31.74-0.05								1.0
DQRL	SZ	49	322	EP		1148	31.53-0.03								1.0

January 10 2019 Hour: 3:24 53.6 Agency: REL Regional

EMSC OT=03:24:53.6 37.02N 37.48E 12Km M=3.2 CENTRAL TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		325	36.92								
FKH	SZ			EP		325	39.73								
HWQ	BZ			EP		325	41.61								
DQRL	SZ			EP		325	51.26								
RCY	SZ			EP		325	53.85								
SHBL	SZ			EP		325	55.04								

January 10 2019 Hour: 14:31 34.2 Lat: 33.68N Lon: 37.02E Depth: 0 Agency: REL Regional
Magnitudes: 3.2MC REL Rms: 0.1 secs

SYRIA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	85	318	EP		1431	47.61-0.22	73							1.0
FKH	SN	85	318	ES		1431	58.03 0.11								1.0
RCY	SZ	112	260	EP		1431	52.37 0.11								1.0
RCY	SN	112	260	ES		1432	5.46-0.17								1.0
HWQ	BZ	120	304	EP		1431	53.54 0.05								1.0
BEIL	SZ	123	321	EP		1431	53.92-0.12								1.0
BEIL	SN	123	321	ES		1432	8.78 0.06								1.0
SHBL	SZ	124	253	EP		1431	54.36 0.11								1.0
QRWL	SZ	125	264	EP		1431	54.41 0.02								1.0
BHL	BZ	129	282	EP		1431	55.01-0.02								1.0
DQRL	SZ	135	272	EP		1431	55.99 0.07								1.0

January 10 2019 Hour: 17:039.5

Agency: REL Distant

EMSC OT=17:00:39.5 27.11S 175.53W 10Km M=5.8 KERMADEC ISLANDS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		1720	38.23								
BHL	BZ			EP		1720	38.04								
FKH	SZ			EP		1720	38.98								
DQRL	SZ			EP		1720	40.20								
RCY	SZ			EP		1720	40.01								
SHBL	SZ			EP		1720	40.20								

January 10 2019 Hour: 18:2437.2

Agency: REL Regional

EMSC OT=18:24:37.2 34.43N 26.61E 10Km M=4.9 CRETE, GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		1826	27.42								
QRWL	SZ			EP		1826	27.09								
SHBL	SZ			EP		1826	29.26								
RCY	SZ			EP		1826	29.09								
ZAHL	SZ			EP		1826	28.93								
HWQ	BZ			EP		1826	30.07								
BEIL	SZ			EP		1826	31.85								
FKH	SZ			EP		1826	35.03								

January 12 2019 Hour: 7:2311.6

Agency: REL Regional

EMSC OT=07:23:11.6 36.48N 28.80E 2Km M=4.0 DODECANESE IS -TURKEY BORDER REG

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		724	42.05								
BEIL	SZ			EP		724	42.96								
RCY	SZ			EP		724	44.47								
FKH	SZ			EP		724	46.89								

January 13 2019 Hour: 1:203.0

Lat: 33.60N

Lon: 35.76E

Depth: 5

Agency: REL Local

Magnitudes: 2.8MC REL

Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	10	229	EP		120	4.96	0.03	49						1.0
QRWL	SN	10	229	ES		120	6.40	0.08							1.0
RCY	SZ	14	150	EP		120	5.44	-0.13							1.0
DQRL	SZ	21	302	EP		120	6.62	0.04							1.0
DQRL	SN	21	302	ES		120	9.16	-0.03							1.0
ZAHL	SZ	30	23	EP		120	8.11	0.04							1.0
BHL	BZ	35	344	EP		120	8.47	-0.26							1.0
HWQ	BZ	77	13	EP		120	15.60	0.14							1.0
FKH	SZ	93	40	EP		120	18.15	0.06							1.0
BEIL	SZ	111	21	EP		120	20.92	0.03							1.0

January 13 2019 Hour: 2:3814.1

Lat: 34.01N

Lon: 36.13E

Depth: 2

Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.1 secs

BAALBECK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	28	233	EP		238	18.65	0.01							1.0
ZAHL	SN	28	233	ES		238	21.96	-0.00							1.0
HWQ	BZ	34	331	EP		238	19.63	-0.08							1.0
HWQ	BN	34	331	ES		238	23.82	-0.01							1.0
FKH	SZ	37	45	EP		238	20.26	0.07	39						1.0
BHL	BZ	45	255	EP		238	21.42	0.00							1.0
BHL	BN	45	255	ES		238	26.83	0.03							1.0
BEIL	SZ	60	5	EP		238	23.77	-0.00							1.0
DQRL	SZ	61	237	EP		238	24.10	0.07							1.0
RCY	SZ	63	205	EP		238	24.11	-0.15							1.0
QRWL	SZ	65	219	EP		238	24.76	0.06							1.0

January 17 2019 Hour: 12:15 28.8 Lat: 35.90N Lon: 35.19E Depth:122 Agency: REL Regional
 Magnitudes: 3.3MC REL Rms: 0.1 secs

OFFSHORE SYRIA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ	193	159	EP		1215	58.26	0.16							1.0
HWQ	BN	193	159	ES		1216	19.80	0.04							1.0
FKH	SZ	215	149	EP		1216	0.34	0.08	65						1.0
FKH	SN	215	149	ES		1216	23.76	0.05							1.0
BHL	BZ	226	169	EP		1216	1.30	0.28							1.0
ZAHL	SZ	235	164	EP		1216	2.77	0.10							1.0
QRWL	SZ	265	170	EP		1216	5.81	0.09							1.0
RCY	SZ	273	167	EP		1216	7.08	0.20							1.0

January 18 2019 Hour: 3:26 20.2 Lat: 36.06N Lon: 35.85E Depth: 2 Agency: REL Regional
 Magnitudes: 3.2MC REL Rms: 0.0 secs

OFFSHORE TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ	172	170	EP		326	47.10	0.00	62						1.0
BEIL	SN	172	170	ES		327	7.04	0.00							1.0
HWQ	BZ	198	177	EP		326	50.62	0.05							1.0
HWQ	BN	198	177	ES		327	13.24	0.01							1.0
FKH	SZ	208	166	EP		326	51.89	0.00							1.0
FKH	SN	208	166	ES		327	15.37	0.01							1.0
BHL	BZ	240	184	EP		326	55.84	0.02							1.0
ZAHL	SZ	245	179	EP		326	56.48	0.04							1.0
DQRL	SZ	263	186	EP		326	58.70	0.03							1.0
QRWL	SZ	280	183	EP		327	0.57	0.16							0.2
RCY	SZ	285	180	EP		327	1.45	0.02							1.0

January 18 2019 Hour: 20:42 21.0 Lat: 35.13N Lon: 32.81E Depth: 26 Agency: REL Regional
 Magnitudes: 3.3MC REL Rms: 0.4 secs

CYPRUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	295	117	EP		2043	0.78	0.54							1.0
DQRL	SZ	299	121	EP		2043	1.50	0.37							1.0
HWQ	BZ	303	107	EP		2043	2.42	0.08	64						1.0
HWQ	BE	303	107	ES		2043	33.68	0.73							1.0
BEIL	SZ	316	101	EP		2043	3.97	0.07							1.0
BEIL	SN	316	101	ES		2043	35.15	0.52							1.0
ZAHL	SZ	316	116	EP		2043	4.20	0.21							1.0
ZAHL	SN	316	116	ES		2043	35.60	0.22							1.0
QRWL	SZ	318	123	EP		2043	4.23	0.09							1.0
RCY	SZ	333	122	EP		2043	6.39	0.34							1.0
FKH	SZ	345	106	EP		2043	7.64	0.12							1.0

January 19 2019 Hour: 13:47 51.1 Agency: REL Regional

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		1347	57.64								
FKH	SZ			EP		1348	2.38								
ZAHL	SZ			EP		1348	8.05								
DQRL	SZ			EP		1348	10.63								
QRWL	SZ			EP		1348	11.68								
RCY	SZ			EP		1348	12.93								

January 19 2019 Hour: 14:42 32.2 Lat: 33.44N Lon: 35.64E Depth: 1 Agency: REL Local
 Magnitudes: 2.5MC REL Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	12	18	EP		1442	34.06	0.18	29						1.0
RCY	SZ	19	71	EP		1442	35.38	0.06							1.0
RCY	SN	19	71	ES		1442	37.64	0.03							1.0
DQRL	SZ	30	347	EP		1442	37.18	0.11							1.0
DQRL	SN	30	347	ES		1442	40.73	0.07							1.0

BHL	BZ	51	1	EP		1442	40.43	-0.07									1.0
ZAHL	SZ	51	26	EP		1442	40.56	0.04									1.0
HWQ	BZ	97	17	EP		1442	47.80	-0.06									1.0

January 19 2019 Hour: 14:57 54.5 Lat: 33.66N Lon: 32.24E Depth: 3 Agency: REL Regional
Magnitudes: 3.9MC REL Rms: 0.1 secs

EASTERN MEDITERRANEAN SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	309	88	EP		1458	38.63	-0.01							1.0
DQRL	SN	309	88	ES		1459	11.31	0.02							1.0
BHL	BZ	317	84	EP		1458	39.71	0.01							1.0
QRWL	SZ	320	91	EP		1458	40.11	0.13							1.0
QRWL	SN	320	91	ES		1459	13.70	0.07							1.0
RCY	SZ	334	92	EP		1458	41.97	0.13							1.0
RCY	SN	334	92	ES		1459	16.66	-0.21							1.0
ZAHL	SZ	338	85	EP		1458	42.36	0.02							1.0
HWQ	BZ	349	78	EP		1458	43.52	-0.17							1.0
BEIL	SZ	377	74	EP		1458	46.95	-0.10	131						1.0
BEIL	SN	377	74	ES		1459	26.05	0.12							1.0
FKH	SZ	391	79	EP		1458	48.81	-0.00							1.0

January 20 2019 Hour: 6:40 52.9 Lat: 36.13N Lon: 36.08E Depth: 83 Agency: REL Regional
Magnitudes: 3.4MC REL Rms: 0.2 secs

TURKEY REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ	176	177	EP		641	18.31	-0.30	83						1.0
BEIL	SN	176	177	ES		641	37.94	0.32							1.0
HWQ	BZ	205	183	EP		641	21.81	-0.25							1.0
FKH	SZ	211	172	EP		641	23.08	0.38							1.0
FKH	SN	211	172	ES		641	44.43	-0.32							1.0
BHL	BZ	249	189	EP		641	26.99	-0.21							1.0
ZAHL	SZ	252	184	EP		641	27.65	0.11							1.0
DQRL	SZ	272	190	EP		641	29.85	-0.04							1.0
QRWL	SZ	288	187	EP		641	31.99	0.25							1.0
RCY	SZ	292	184	EP		641	32.34	0.05							1.0

January 21 2019 Hour: 23:59 21.0 Agency: REL Distant
EMSC OT=23:59:21.0 10.30S 119.00E 10Km M=6.0 SUMBA REGION, INDONESIA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		2412	22.36								
BEIL	SZ			EP		2412	23.08								
HWQ	BZ			EP		2412	22.99								
BHL	BZ			EP		2412	23.62								
DQRL	SZ			EP		2412	24.52								

January 22 2019 Hour: 19:1 44.4 Agency: REL Distant
EMSC OT=19:01:44.4 43.09S 42.21E 10Km M=6.7 PRINCE EDWARD ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
RCY	SZ			EP		1913	34.29								
QRWL	SZ			EP		1913	34.72								
BHL	BZ			EP		1913	36.13								
HWQ	BZ			EP		1913	38.19								
FKH	SZ			EP		1913	38.19								
BEIL	SZ			EP		1913	39.38								

January 23 2019 Hour: 17:52 56.0 Agency: REL Distant
EMSC OT=17:52:56.0 30.52S 177.88W 10Km M=5.2 KERMADEC ISLANDS, NEW ZEALAND

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1812	49.10								
BEIL	SZ			EP		1812	49.20								
RCY	SZ			EP		1812	49.40								
BHL	BZ			EP		1812	50.07								
SHBL	SZ			EP		1812	50.43								

January 23 2019 Hour: 21:48 12.8 Lat: 32.86N Lon: 35.51E Depth: 0 Agency: REL Regional
 Magnitudes: 3.0MC REL Rms: 0.2 secs

DEAD SEA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	SZ	58	22	EP		2148	22.18	0.02	56						1.0
SHBL	SN	58	22	ES		2148	29.17	0.07							1.0
RCY	SZ	77	24	EP		2148	25.03	-0.11							1.0
RCY	SN	77	24	ES		2148	34.54	0.25							1.0
QRWL	SZ	78	12	EP		2148	25.21	-0.08							1.0
DQRL	SZ	94	4	EP		2148	27.82	-0.05							1.0
DQRL	SN	94	4	ES		2148	38.52	-0.51							1.0
BHL	BZ	116	7	EP		2148	31.48	-0.04							1.0
ZAHL	SZ	116	18	EP		2148	31.55	0.10							1.0
HWQ	BZ	162	15	EP		2148	38.66	0.11							1.0
FKH	SZ	175	29	EP		2148	40.57	0.17							1.0
BEIL	SZ	196	19	EP		2148	43.32	0.05							1.0

January 24 2019 Hour: 14:30 54.3

Agency: REL Regional

EMSC OT=14:30:54.3 35.94N 28.14E 60Km M=5.3 EASTERN MEDITERRANEAN SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		1432	24.69								
DQRL	SZ			EP		1432	25.13								
HWQ	BZ			EP		1432	27.42								
QRWL	SZ			EP		1432	27.86								
ZAHL	SZ			EP		1432	27.70								
BEIL	SZ			EP		1432	28.69								
SHBL	SZ			EP		1432	29.64								
RCY	SZ			EP		1432	29.78								
FKH	SZ			EP		1432	32.53								

January 24 2019 Hour: 16:18 38.8 Lat: 33.48N Lon: 35.70E Depth: 0 Agency: REL Local
 Magnitudes: 2.5MC REL Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	8	347	EP		1618	40.02	-0.08	30						1.0
RCY	SZ	13	79	EP		1618	40.79	-0.03							1.0
SHBL	SZ	15	165	EP		1618	40.95	-0.19							1.0
SHBL	SN	15	165	ES		1618	43.05	0.15							1.0
DQRL	SZ	28	334	EP		1618	43.38	0.04							1.0
DQRL	SE	28	334	ES		1618	46.74	0.02							1.0
ZAHL	SZ	46	22	EP		1618	46.23	0.09							1.0

January 24 2019 Hour: 20: 5 0.6 Lat: 32.79N Lon: 35.33E Depth: 0 Agency: REL Regional
 Magnitudes: 3.5MC REL Rms: 0.2 secs

DEAD SEA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	SZ	73	32	EP		20 5	12.40	-0.00	112						1.0
SHBL	SN	73	32	ES		20 5	21.15	0.04							1.0
QRWL	SZ	90	21	EP		20 5	15.21	0.03							1.0
RCY	SZ	91	31	EP		20 5	15.12	-0.26							1.0
DQRL	SZ	104	12	EP		20 5	17.49	0.09							1.0
DQRL	SN	104	12	ES		20 5	29.92	0.12							1.0
BEYL	SZ	121	7	EP		20 5	20.19	0.06							1.0
BHL	BZ	127	14	EP		20 5	21.18	0.04							1.0
ZAHL	SZ	129	23	EP		20 5	21.37	-0.10							1.0
HWQ	BZ	175	19	EP		20 5	28.30	0.05							1.0
FKH	SZ	190	32	EP		20 5	30.44	0.06							1.0
BEIL	SZ	210	22	EP		20 5	33.01	0.23							1.0

January 25 2019 Hour: 16:27 31.8 Lat: 34.03N Lon: 35.99E Depth: 8 Agency: REL Local
 Magnitudes: 2.9MC REL Rms: 0.1 secs

BAALBECK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	22	207	EP		1627	35.38	-0.26							1.0
HWQ	BZ	27	351	EP		1627	36.14	-0.28							1.0
HWQ	BN	27	351	ES		1627	40.07	0.20							1.0
BHL	BZ	35	245	EP		1627	37.36	-0.17							1.0
BHL	BN	35	245	ES		1627	41.94	0.13							1.0
FKH	SZ	45	59	EP		1627	39.20	0.04							1.0
DQRL	SZ	54	227	EP		1627	40.50	-0.02							1.0
BEIL	SZ	59	17	EP		1627	41.39	0.03							1.0
QRWL	SZ	61	208	EP		1627	41.81	0.06							1.0
RCY	SZ	62	194	EP		1627	41.96	0.16	50						1.0
RCY	SN	62	194	ES		1627	49.27	0.03							1.0
SHBL	SZ	80	197	EP		1627	44.76	0.07							1.0

January 26 2019 Hour: 19:56 43.3

Agency: REL Distant

EMSC OT=19:56:43.3 21.18S 178.85W 585Km M=6.2 FIJI REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ			EP		2015	19.49								
HWQ	BZ			EP		2015	18.38								
FKH	SZ			EP		2015	18.75								
BHL	BZ			EP		2015	18.98								
RCY	SZ			EP		2015	19.49								
BEIL	SZ			EP		2015	19.86								
SHBL	SZ			EP		2015	19.86								

January 27 2019 Hour: 11:22 25.8 Lat: 33.82N Lon: 36.80E Depth: 6 Agency: REL Regional

Magnitudes: 3.4MC REL

Rms: 0.2 secs

SYRIA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	59	323	EP		1122	35.49	0.09	99						1.0
FKH	SN	59	323	ES		1122	42.43	-0.07							1.0
ZAHL	SZ	85	273	EP		1122	39.53	0.04							1.0
ZAHL	SN	85	273	ES		1122	49.76	0.14							1.0
HWQ	BZ	94	303	EP		1122	40.68	-0.24							1.0
RCY	SZ	96	248	EP		1122	41.26	-0.11							1.0
BEIL	SZ	98	325	EP		1122	41.85	0.24							1.0
BHL	BZ	106	275	EP		1122	42.60	-0.28							1.0
QRWL	SZ	108	254	EP		1122	43.09	-0.01							1.0
SHBL	SZ	111	242	EP		1122	43.75	0.14							1.0
DQRL	SZ	114	264	EP		1122	44.15	0.07							1.0

January 28 2019 Hour: 5:13 56.2 Lat: 34.33N Lon: 36.41E Depth: 6 Agency: REL Local

Magnitudes: 2.7MC REL

Rms: 0.1 secs

BAALBECK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	9	181	EP		513	58.02	-0.09	40						1.0
FKH	SN	9	181	ES		513	59.62	0.09							1.0
BEIL	SZ	32	319	EP		514	1.46	0.06							1.0
BEIL	SN	32	319	ES		514	5.32	0.06							1.0
HWQ	BZ	43	263	EP		514	3.08	-0.17							1.0
RCY	SZ	107	210	EP		514	13.36	-0.01							1.0
RCY	SN	107	210	ES		514	26.19	0.11							1.0
QRWL	SZ	110	218	EP		514	13.80	-0.01							1.0
SHBL	SZ	125	210	EP		514	16.04	-0.05							1.0

January 28 2019 Hour: 21:37 11.4 Lat: 34.97N Lon: 34.16E Depth: 33 Agency: REL Regional
 Magnitudes: 3.2MC REL Rms: 0.6 secs

CYPRUS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ	181	115	EP		2137	36.71	-0.38	67						1.0
HWQ	BN	181	115	ES		2137	56.07	0.01							1.0
BHL	BZ	182	130	EP		2137	36.44	-0.69							1.0
BHL	BN	182	130	ES		2137	56.12	-0.01							1.0
DQRL	SZ	191	137	EP		2137	38.22	-0.14							1.0
BEIL	SZ	191	104	EP		2137	37.37	-0.94							1.0
ZAHL	SZ	201	128	EP		2137	39.57	-0.03							1.0
QRWL	SZ	211	138	EP		2137	40.76	-0.07							1.0
FKH	SZ	222	111	EP		2137	43.86	1.73							1.0
RCY	SZ	225	136	EP		2137	42.68	0.09							1.0
RCY	SN	225	136	ES		2138	5.64	0.00							1.0
SHBL	SZ	232	141	EP		2137	43.89	0.43							1.0

January 29 2019 Hour: 11:52 32.7 Lat: 34.40N Lon: 36.57E Depth: 0 Agency: REL Local
 Magnitudes: 2.8MC REL Rms: 0.1 secs

SYRIA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	23	222	EP		1152	36.10	-0.24	45						1.0
FKH	SN	23	222	ES		1152	39.11	0.07							1.0
BEIL	SZ	39	294	EP		1152	39.02	0.00							1.0
HWQ	BZ	59	257	EP		1152	42.25	0.00							1.0
RCY	SZ	121	215	EP		1152	52.21	0.01							1.0
RCY	SN	121	215	ES		1153	6.58	-0.05							1.0
QRWL	SZ	125	221	EP		1152	52.97	0.09							1.0
SHBL	SZ	139	214	EP		1152	55.25	0.12							1.0

January 29 2019 Hour: 12:27 3.5 Lat: 33.47N Lon: 35.70E Depth: 0 Agency: REL Local
 Magnitudes: 2.5MC REL Rms: 0.1 secs

WEST BEKAA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	9	352	EP		1227	4.87	-0.09	30						1.0
RCY	SZ	13	77	EP		1227	5.70	0.02							1.0
RCY	SN	13	77	ES		1227	7.31	0.03							1.0
SHBL	SZ	14	162	EP		1227	5.79	-0.01							1.0
DQRL	SZ	29	336	EP		1227	8.25	0.09							1.0
DQRL	SN	29	336	ES		1227	11.61	0.01							1.0
HWQ	BZ	93	14	EP		1227	18.43	-0.04							1.0

January 30 2019 Hour: 0:38 16.1 Agency: REL Distant

EMSC OT=00:38:16.1 20.89S 178.12W 478Km M=5.2 FIJI REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		057	4.98								
HWQ	BZ			EP		057	4.68								
FKH	SZ			EP		057	4.92								
BHL	BZ			EP		057	5.54								
ZAHL	SZ			EP		057	6.03								
QRWL	SZ			EP		057	6.60								

January 30 2019 Hour: 7:39 59.4 Lat: 34.26N Lon: 36.40E Depth: 21 Agency: REL Local
 Magnitudes: 2.3MC REL Rms: 0.1 secs

BAALBECK REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ	3	152	EP		740	2.89	-0.04							1.0
FKH	SN	3	152	ES		740	5.54	0.02							1.0
BEIL	SZ	36	328	EP		740	6.00	-0.02	23						1.0
BEIL	SN	36	328	ES		740	10.96	0.04							1.0
HWQ	BZ	42	272	EP		740	6.74	-0.03							1.0
RCY	SZ	100	212	EP		740	15.09	-0.08							1.0
QRWL	SZ	103	220	EP		740	15.58	-0.09							1.0

SHBL SZ 118 211 EP 740 18.08 0.20 1.0

January 30 2019 Hour: 14:59 1.6 Lat: 34.54N Lon: 36.31E Depth: 2 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.2 secs

AKKAR REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ	12	270	EP		1459	3.61	0.01	39						1.0
BEIL	SN	12	270	ES		1459	5.11	0.07							1.0
FKH	SZ	34	165	EP		1459	7.19	-0.00							1.0
FKH	SN	34	165	ES		1459	11.32	0.03							1.0
HWQ	BZ	45	229	EP		1459	8.66	-0.22							1.0
DQRL	SZ	115	217	EP		1459	21.07	0.80							0.2
RCY	SZ	124	201	EP		1459	22.09	0.41							0.2
QRWL	SZ	125	208	EP		1459	22.09	0.32							0.2
SHBL	SZ	143	202	EP		1459	24.80	0.38							0.2

January 31 2019 Hour: 0:21 7.4 Lat: 33.79N Lon: 35.80E Depth: 7 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.0 secs

ZAHLE REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	11	47	EP		021	9.63	-0.01							1.0
BHL	BZ	18	313	EP		021	10.62	-0.01	28						1.0
BHL	BN	18	313	ES		021	13.05	0.01							1.0
DQRL	SZ	23	246	EP		021	11.37	0.02							1.0
QRWL	SZ	29	202	EP		021	12.16	-0.09							1.0
RCY	SZ	33	174	EP		021	12.88	0.02							1.0
RCY	SN	33	174	ES		021	16.93	0.01							1.0
SHBL	SZ	49	186	EP		021	15.50	0.04							1.0

January 31 2019 Hour: 11:43 20.0 Lat: 32.78N Lon: 35.67E Depth: 0 Agency: REL Regional
Magnitudes: 2.9MC REL Rms: 0.1 secs

DEAD SEA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	SZ	64	7	EP		1143	30.29	-0.02	47						1.0
SHBL	SN	64	7	ES		1143	37.77	-0.15							1.0
RCY	SZ	81	11	EP		1143	33.10	-0.05							1.0
RCY	SE	81	11	ES		1143	43.03	0.17							1.0
QRWL	SZ	85	1	EP		1143	33.89	0.08							1.0
DQRL	SZ	103	355	EP		1143	36.76	0.07							1.0
DQRL	SN	103	355	ES		1143	49.00	-0.03							1.0
BHL	BZ	125	360	EP		1143	40.11	-0.07							1.0
HWQ	BZ	168	9	EP		1143	46.78	0.08							1.0
FKH	SZ	177	23	EP		1143	47.86	-0.08							1.0
BEIL	SZ	202	14	EP		1143	51.10	-0.00							1.0

January 31 2019 Hour: 14:33 57.8 Agency: REL Distant
EMSC OT=14:33:57.8 24.42S 179.84W 508Km M=5.5 SOUTH OF FIJI ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		1452	44.48								
FKH	SZ			EP		1452	44.15								
HWQ	BZ			EP		1452	44.57								
BHL	BZ			EP		1452	45.13								
RCY	SZ			EP		1452	45.70								
SHBL	SZ			EP		1452	46.07								

January 31 2019 Hour: 17:0 28.0 Lat: 33.91N Lon: 35.15E Depth: 44 Agency: REL Local
Magnitudes: 2.7MC REL Rms: 0.2 secs

OFFSHORE CENTRAL LEBANON

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	45	120	EP		17 0	37.33	-0.04							1.0
BHL	BZ	47	91	EP		17 0	37.53	-0.01							1.0
QRWL	SZ	64	129	EP		17 0	39.44	0.08	36						1.0
QRWL	SN	64	129	ES		17 0	47.90	0.12							1.0
ZAHL	SZ	69	95	EP		17 0	39.43	-0.51							1.0

RCY	SZ	79	126	EP	17	0	41.12	-0.02	1.0
SHBL	SZ	83	138	EP	17	0	41.75	0.04	1.0
SHBL	SN	83	138	ES	17	0	51.88	0.02	1.0
HWQ	BZ	84	61	EP	17	0	42.11	0.32	1.0

Epicentral Map of Lebanon

JANUARY 2019

