

Republic of Lebanon
National Council for Scientific Research

Provisional Seismological Bulletin

from the

NATIONAL SEISMIC NETWORK

July

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.

July 1 2019 Hour: 0:37 36.8 Agency: REL Distant
EMSC OT=00:37:36.8 41.24N 142.19E 56Km M=5.1 HOKKAIDO, JAPAN REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BEIL SZ EP 049 32.34
 FKH SZ EP 049 32.60
 HWQ BZ EP 049 33.30
 ZAHL SZ EP 049 35.84
 BHL BZ EP 049 36.10
 DQRL SZ EP 049 36.73

July 1 2019 Hour: 16: 9 19.9 Lat: 33.76N Lon: 35.74E Depth: 5 Agency: REL Local
Magnitudes: 2.9MC REL Rms: 0.1 secs
ALEY REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 DQRL SZ 17 250 EP 16 9 22.77-0.01 55 1.0
 DQRL SN 17 250 ES 16 9 25.03 0.10 1.0
 ZAHL SZ 18 50 EP 16 9 22.92 0.01 1.0
 BHL BZ 18 334 EP 16 9 22.87-0.13 1.0
 QRWL SZ 24 193 EP 16 9 23.82-0.03 1.0
 QRWL SN 24 193 ES 16 9 26.77-0.03 1.0
 RCY SZ 30 163 EP 16 9 24.79-0.08 1.0
 RCY SN 30 163 ES 16 9 28.60 0.03 1.0
 SHBL SZ 45 180 EP 16 9 27.30 0.04 1.0
 HWQ BZ 61 18 EP 16 9 29.68-0.07 1.0
 FKH SZ 82 49 EP 16 9 33.25 0.07 1.0
 BEIL SZ 96 25 EP 16 9 35.52 0.10 1.0

July 1 2019 Hour: 16:59 26.3 Agency: REL Distant
EMSC OT=16:59:26.3 9.21N 124.18E 554Km M=5.9 BOHOL, PHILIPPINES
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 FKH SZ EP 1710 55.44
 BEIL SZ EP 1710 56.07
 HWQ BZ EP 1710 57.04
 ZAHL SZ EP 1710 57.74
 RCY SZ EP 1710 58.22
 BHL BZ EP 1710 58.36
 SHBL SZ EP 1710 58.78
 QRWL SZ EP 1710 58.71

July 1 2019 Hour: 17:13 31.4 Agency: REL Distant
EMSC OT=17:13:31.4 15.45S 167.53E 123Km M=6.0 VANUATU
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BEIL SZ EP 1732 32.31
 HWQ BZ EP 1732 32.53

July 2 2019 Hour: 1: 7 27.6 Lat: 33.76N Lon: 35.73E Depth: 8 Agency: REL Local
Magnitudes: 2.6MC REL Rms: 0.0 secs
ALEY REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 DQRL SZ 16 249 EP 1 7 30.59 0.03 33 1.0
 DQRL SN 16 249 ES 1 7 32.77 0.00 1.0
 BHL BZ 18 336 EP 1 7 30.76-0.01 1.0
 ZAHL SZ 18 52 EP 1 7 30.81 0.00 1.0
 QRWL SZ 24 192 EP 1 7 31.60-0.08 1.0
 RCY SZ 31 162 EP 1 7 32.70-0.03 1.0
 RCY SN 31 162 ES 1 7 36.57 0.03 1.0
 SHBL SZ 46 179 EP 1 7 35.10 0.04 1.0
 HWQ BZ 61 19 EP 1 7 37.54 0.04 0.2
 BEIL SZ 96 25 EP 1 7 43.21 0.11 0.2

July 2 2019 Hour: 3:43 48.6 Lat: 32.18N Lon: 35.62E Depth: 0 Agency: REL Regional
Magnitudes: 3.3MC 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	130	5	EP		344	9.49	-0.10	79						1.0
SHBL	SN	130	5	ES		344	25.13	-0.00							1.0
RCY	SZ	148	8	EP		344	12.09	-0.14							1.0
QRWL	SZ	152	2	EP		344	12.87	0.03							1.0
DQRL	SZ	169	359	EP		344	15.34	-0.07							1.0
DQRL	SN	169	359	ES		344	35.32	0.06							1.0
ZAHL	SZ	188	8	EP		344	18.38	0.30							1.0
BHL	BZ	191	1	EP		344	18.43	-0.06							1.0
HWQ	BZ	235	7	EP		344	23.53	-0.37							0.2
FKH	SZ	241	18	EP		344	24.56	-0.08							0.2

July 3 2019 Hour: 1: 2 13.4 Agency: REL Regional

EMSC OT=01:02:13.4 34.98N 27.80E 51Km M=4.6 EASTERN MEDITERRANEAN SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		1 3	45.53								
BHL	BZ			EP		1 3	46.39								
QRWL	SZ			EP		1 3	46.59								
HWQ	BZ			EP		1 3	47.29								
ZAHL	SZ			EP		1 3	48.42								
SHBL	SZ			EP		1 3	48.35								
RCY	SZ			EP		1 3	49.05								
BEIL	SZ			EP		1 3	49.33								
FKH	SZ			EP		1 3	52.99								

July 3 2019 Hour: 3:45 29.0 Agency: REL Distant

EMSC OT=03:45:29.0 22.20S 179.50W 595Km M=5.8 SOUTH OF FIJI ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		4 4	5.63								
HWQ	BZ			EP		4 4	4.64								

July 3 2019 Hour: 17:42 9.9 Lat: 34.04N Lon: 35.96E Depth: 6 Agency: REL Local

Magnitudes: 3.0MC REL

KESROUAN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	21	200	EP		1742	13.36	-0.20							1.0
HWQ	BZ	26	357	EP		1742	14.01	-0.31	57						1.0
BHL	BZ	32	242	EP		1742	15.00	-0.23							1.0
FKH	SZ	47	61	EP		1742	17.70	0.13							1.0
FKH	SN	47	61	ES		1742	23.51	0.25							1.0
DQRL	SZ	52	225	EP		1742	18.18	-0.16							1.0
DQRL	SN	52	225	ES		1742	25.45	0.84							1.0
BEIL	SZ	59	20	EP		1742	19.57	0.07							1.0
QRWL	SZ	61	206	EP		1742	19.72	0.01							1.0
RCY	SZ	61	191	EP		1742	19.87	0.00							1.0
RCY	SN	61	191	ES		1742	26.94	-0.32							1.0
SHBL	SZ	79	195	EP		1742	22.67	-0.07							1.0

July 4 2019 Hour: 2:17 58.3 Agency: REL Distant

EMSC OT=02:17:58.3 28.52N 104.84E 10Km M=5.2 EASTERN SICHUAN, CHINA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		227	50.25								
HWQ	BZ			EP		227	52.13								
BHL	BZ			EP		227	54.18								
SHBL	SZ			EP		227	54.80								

July 5 2019 Hour: 14:19 3.9 Lat: 32.57N Lon: 30.85E Depth: 49 Agency: REL Regional
Magnitudes: 4.4MC REL Rms: 0.2 secs

EASTERN MEDITERRANEAN SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	458	73	EP		1420	3.08	-0.03							1.0
DQRL	SN	458	73	ES		1420	47.06	0.18							1.0
QRWL	SZ	464	75	EP		1420	3.76	-0.07	236						1.0
SHBL	SZ	465	78	EP		1420	3.69	-0.38							1.0
SHBL	SN	465	78	ES		1420	48.69	0.13							1.0
BHL	BZ	471	70	EP		1420	5.05	0.30							1.0
RCY	SZ	476	76	EP		1420	5.19	-0.25							1.0
RCY	SN	476	76	ES		1420	51.01	0.07							1.0
ZAHL	SZ	490	72	EP		1420	7.17	0.09							1.0
HWQ	BZ	510	67	EP		1420	9.20	-0.27							1.0
HWQ	BN	510	67	ES		1420	57.58	-0.38							1.0
BEIL	SZ	541	65	EP		1420	13.42	0.24							1.0
FKH	SZ	549	69	EP		1420	14.57	0.36							1.0

July 6 2019 Hour: 0:10 40.5 Agency: REL Distant
EMSC OT=00:10:40.5 30.45S 177.75W 10Km M=5.2 KERMADEC ISLANDS, NEW ZEALAND

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		030	34.04								
HWQ	BZ			EP		030	33.58								

July 7 2019 Hour: 2:38 32.3 Lat: 33.37N Lon: 35.81E Depth: 1 Agency: REL Local
Magnitudes: 3.2MC REL Rms: 0.1 secs

HASBAYA REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
SHBL	SZ	7	247	EP		238	33.46	0.04	81						1.0
RCY	SZ	14	10	EP		238	34.46	-0.10							1.0
RCY	SN	14	10	ES		238	36.22	-0.03							1.0
QRWL	SZ	23	329	EP		238	35.93	-0.03							1.0
DQRL	SZ	43	329	EP		238	39.27	0.03							1.0
ZAHL	SZ	54	7	EP		238	41.04	0.01							1.0
BHL	BZ	61	346	EP		238	42.01	-0.06							1.0
BHL	BN	61	346	ES		238	49.32	-0.00							1.0
HWQ	BZ	101	7	EP		238	48.75	0.15							1.0
HWQ	BN	101	7	ES		239	0.57	-0.12							1.0
FKH	SZ	112	30	EP		238	50.43	0.16							1.0
BEIL	SZ	134	15	EP		238	53.88	0.06							1.0

July 7 2019 Hour: 15: 8 39.5 Agency: REL Distant
EMSC OT=15:08:39.5 0.53N 126.17E 20Km M=6.9 MOLUCCA SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		1521	35.48								
BEIL	SZ			EP		1521	35.96								
HWQ	BZ			EP		1521	37.11								
ZAHL	SZ			EP		1521	37.66								
RCY	SZ			EP		1521	37.93								
BHL	BZ			EP		1521	38.20								

July 7 2019 Hour: 18:49 2.1 Agency: REL Distant
EMSC OT=18:49:02.1 23.76S 179.97W 526Km M=5.3 SOUTH OF FIJI ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		19 7	44.32								
RCY	SZ			EP		19 7	46.03								
BEIL	SZ			EP		19 7	45.02								
BHL	BZ			EP		19 7	46.15								
QRWL	SZ			EP		19 7	46.33								
SHBL	SZ			EP		19 7	46.63								
DQRL	SZ			EP		19 7	46.73								

July 8 2019 Hour: 7:032.6 Agency: REL Distant
EMSC OT=07:00:32.6 31.83N 49.55E 10Km M=5.7 WESTERN IRAN
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 FKH SZ EP 7 3 11.40
 BEIL SZ EP 7 3 14.77
 RCY SZ EP 7 3 17.22
 QRWL SZ EP 7 3 19.25

July 10 2019 Hour: 1:849.4 Agency: REL Distant
EMSC OT=01:08:49.4 20.57S 178.18W 537Km M=4.7 FIJI REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BEIL SZ EP 127 31.89
 HWQ BZ EP 127 32.34
 ZAHL SZ EP 127 33.24
 BHL BZ EP 127 33.29
 RCY SZ EP 127 33.34
 DQRL SZ EP 127 33.99
 QRWL SZ EP 127 33.84
 SHBL SZ EP 127 33.94

July 10 2019 Hour: 18:5846.4 Agency: REL Regional
EMSC OT=18:58:46.4 36.49N 29.10E 15Km M=3.5 WESTERN TURKEY
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 DQRL SZ EP 19 0 10.83
 HWQ BZ EP 19 0 12.58
 QRWL SZ EP 19 0 13.86
 BEIL SZ EP 19 0 13.53
 RCY SZ EP 19 0 15.57

July 10 2019 Hour: 22:2539.7 Lat: 34.14N Lon: 36.93E Depth: 6 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 50 284 EP 2225 47.76-0.07 80 1.0
 FKH SN 50 284 ES 2225 53.68-0.16 1.0
 BEIL SZ 82 303 EP 2225 53.17 0.14 1.0
 HWQ BZ 92 280 EP 2225 54.67 0.01 1.0
 HWQ BN 92 280 ES 2226 5.78 0.06 1.0
 ZAHL SZ 102 253 EP 2225 56.36 0.19 1.0
 BHL BZ 121 258 EP 2225 58.88-0.12 1.0
 RCY SZ 124 235 EP 2225 59.26-0.21 1.0
 RCY SN 124 235 ES 2226 14.18 0.09 1.0
 QRWL SZ 133 241 EP 2226 0.85 0.09 1.0
 DQRL SZ 135 250 EP 2226 1.08 0.04 1.0
 SHBL SZ 141 232 EP 2226 1.87-0.06 1.0

July 11 2019 Hour: 22:5615.4 Lat: 33.78N Lon: 35.77E Depth: 2 Agency: REL Local
 Magnitudes: 2.6MC REL Rms: 0.1 secs
ALEY REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 ZAHL SZ 14 52 EP 2256 17.70 0.00 1.0
 BHL BZ 17 322 EP 2256 18.09-0.15 34 1.0
 DQRL SZ 20 245 EP 2256 18.79 0.04 1.0
 DQRL SN 20 245 ES 2256 21.34 0.12 1.0
 QRWL SZ 27 197 EP 2256 19.67-0.19 1.0
 RCY SZ 32 169 EP 2256 20.70 0.02 1.0
 RCY SN 32 169 ES 2256 24.60 0.02 1.0
 SHBL SZ 48 183 EP 2256 23.25 0.02 1.0
 HWQ BZ 57 17 EP 2256 24.65-0.03 1.0
 BEIL SZ 92 24 EP 2256 30.49 0.15 1.0

July 16 2019 Hour: 17: 7 17.2 Lat: 33.55N Lon: 36.31E Depth: 9 Agency: REL Regional
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
RCY	SZ	44	262	EP		17	7	24.38	-0.17		45				1.0
RCY	SN	44	262	ES		17	7	30.10	0.10						1.0
ZAHL	SZ	52	311	EP		17	7	25.55	-0.15						1.0
SHBL	SZ	57	247	EP		17	7	26.66	0.08						1.0
QRWL	SZ	58	269	EP		17	7	26.76	0.05						1.0
DQRL	SZ	70	284	EP		17	7	28.65	-0.03						1.0
DQRL	SN	70	284	ES		17	7	37.26	0.08						1.0
BHL	BZ	72	303	EP		17	7	28.81	-0.11						1.0
FKH	SZ	77	7	EP		17	7	29.91	0.14						1.0
HWQ	BZ	87	338	EP		17	7	31.30	0.03						1.0

July 17 2019 Hour: 15:49 12.4 Lat: 33.73N Lon: 35.51E Depth: 18 Agency: REL Local
Magnitudes: 2.3MC REL Rms: 0.0 secs

ALEY REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	7	117	EP		1549	15.65	0.03		23					1.0
DQRL	SN	7	117	ES		1549	18.00	0.02							1.0
BHL	BZ	23	36	EP		1549	17.08	-0.11							1.0
QRWL	SZ	26	142	EP		1549	17.55	0.02							1.0
QRWL	SN	26	142	ES		1549	21.30	-0.01							1.0
ZAHL	SZ	38	68	EP		1549	19.10	0.00							1.0
RCY	SZ	40	131	EP		1549	19.48	0.01							1.0
SHBL	SZ	48	153	EP		1549	20.54	-0.03							1.0
HWQ	BZ	73	34	EP		1549	24.24	0.08							1.0

July 18 2019 Hour: 21:56 11.9 Agency: REL Regional
EMSC OT=21:56:11.9 32.97N 32.35E 40Km M=3.2 EASTERN MEDITERRANEAN SEA

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ			EP		2156	54.18								
SHBL	SZ			EP		2156	54.39								
QRWL	SZ			EP		2156	54.81								
RCY	SZ			EP		2156	58.31								
HWQ	BZ			EP		2156	59.00								
ZAHL	SZ			EP		2156	57.37								

July 19 2019 Hour: 1:33 45.5 Agency: REL Regional
EMSC OT=01:33:45.5 36.03N 31.06E 80Km M=3.8 WESTERN TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		134	47.10								
HWQ	BZ			EP		134	48.83								
DQRL	SZ			EP		134	47.76								
BEIL	SZ			EP		134	49.28								
ZAHL	SZ			EP		134	50.13								
QRWL	SZ			EP		134	50.78								
RCY	SZ			EP		134	52.84								
SHBL	SZ			EP		134	53.06								

July 19 2019 Hour: 11:13 14.9 Agency: REL Regional
EMSC OT=11:13:14.9 38.12N 23.52E 13Km M=5.3 GREECE

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		1115	48.85								
BEIL	SZ			EP		1115	51.18								
RCY	SZ			EP		1115	52.39								
SHBL	SZ			EP		1115	52.39								

July 19 2019 Hour: 15:1 19.9 Lat: 36.40N Lon: 35.69E Depth: 0 Agency: REL Regional
Magnitudes: 3.7MC REL Rms: 0.1 secs

TURKEY REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ	211	167	EP		15	1	52.09-0.04	123						1.0
BEIL	SN	211	167	ES		15	2	15.96-0.04							1.0
HWQ	BZ	236	174	EP		15	1	55.50 0.14							1.0
HWQ	BN	236	174	ES		15	2	21.37-0.25							1.0
FKH	SZ	248	164	EP		15	1	56.97 0.19							1.0
BHL	BZ	276	181	EP		15	2	0.26-0.09							1.0
ZAHL	SZ	282	176	EP		15	2	1.05-0.03							1.0
DQRL	SZ	299	182	EP		15	2	3.19 0.08							1.0
DQRL	SN	299	182	ES		15	2	35.18 0.09							1.0
QRWL	SZ	316	180	EP		15	2	5.08-0.17							1.0
RCY	SZ	322	178	EP		15	2	5.90-0.14							1.0
RCY	SN	322	178	ES		15	2	40.40 0.20							1.0
SHBL	SZ	338	179	EP		15	2	8.11 0.05							1.0

July 19 2019 Hour: 16:47 7.0 Agency: REL Regional
EMSC OT=16:47:07.0 37.68N 37.44E 2Km M=3.7 CENTRAL TURKEY

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BEIL	SZ			EP		1647	59.57								
FKH	SZ			EP		1648	2.57								
HWQ	BZ			EP		1648	3.85								
BHL	BZ			EP		1648	10.36								
DQRL	SZ			EP		1648	13.72								
RCY	SZ			EP		1648	14.96								
QRWL	SZ			EP		1648	15.07								
SHBL	SZ			EP		1648	17.37								

July 19 2019 Hour: 17:12 27.2 Lat: 33.79N Lon: 35.77E Depth: 8 Agency: REL Local
Magnitudes: 2.5MC REL Rms: 0.1 secs

ALEY REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	13	53	EP		1712	29.85	0.02							1.0
BHL	BZ	17	320	EP		1712	30.26-0.08		28						1.0
DQRL	SZ	21	244	EP		1712	31.03	0.12							1.0
DQRL	SN	21	244	ES		1712	33.66	0.00							1.0
QRWL	SZ	28	198	EP		1712	31.87-0.09								1.0
RCY	SZ	33	170	EP		1712	32.76	0.02							1.0
RCY	SN	33	170	ES		1712	36.85	0.01							1.0
SHBL	SZ	49	183	EP		1712	35.23-0.01								1.0
HWQ	BZ	57	16	EP		1712	36.50	0.03							1.0

July 20 2019 Hour: 22:35 33.2 Agency: REL Distant
EMSC OT=22:35:33.2 31.19S 178.23W 40Km M=5.2 KERMADEC ISLANDS REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ			EP		2255	22.33								
HWQ	BZ			EP		2255	21.59								

July 21 2019 Hour: 18:12 27.4 Lat: 36.15N Lon: 36.12E Depth: 0 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	178	178	EP		1812	55.48-0.08		89						1.0
BEIL	SN	178	178	ES		1813	16.37-0.02								1.0
HWQ	BZ	208	184	EP		1812	58.77-0.67								1.0
FKH	SZ	213	173	EP		1813	0.15 0.13								1.0
BHL	BZ	253	190	EP		1813	4.83-0.12								1.0
ZAHL	SZ	255	185	EP		1813	5.31 0.04								1.0
DQRL	SZ	276	191	EP		1813	7.89 0.08								1.0
QRWL	SZ	291	188	EP		1813	9.76 0.02								1.0
RCY	SZ	295	185	EP		1813	10.66 0.36								1.0

RCY	SN	295	185	ES		1813	42.07	0.05										1.0
SHBL	SZ	313	186	EP		1813	12.66	0.22										1.0

July 21 2019 Hour: 23:20 17.5 Lat: 33.58N Lon: 35.58E Depth: 12 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.0 secs

JEZZINE REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
QRWL	SZ	11	112	EP		2320	20.15	-0.08	25						1.0
DQRL	SZ	14	357	EP		2320	20.57	-0.01							1.0
DQRL	SN	14	357	ES		2320	22.86	0.04							1.0
RCY	SZ	26	112	EP		2320	22.23	-0.01							1.0
SHBL	SZ	30	149	EP		2320	22.94	0.05							1.0
SHBL	SN	30	149	ES		2320	26.87	0.01							1.0
BHL	BZ	36	11	EP		2320	23.70	-0.05							1.0
ZAHL	SZ	42	43	EP		2320	24.65	0.05							1.0

July 22 2019 Hour: 1: 8 31.3 Lat: 33.65N Lon: 35.56E Depth: 5 Agency: REL Local
Magnitudes: 2.4MC REL Rms: 0.0 secs

CHOUF REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
DQRL	SZ	7	6	EP		1 8	32.82	-0.02	26						1.0
DQRL	SN	7	6	ES		1 8	34.01	0.02							1.0
QRWL	SZ	16	134	EP		1 8	33.93	-0.08							1.0
QRWL	SN	16	134	ES		1 8	36.03	0.01							1.0
BHL	BZ	30	16	EP		1 8	36.26	0.01							1.0
RCY	SZ	30	123	EP		1 8	36.34	0.04							1.0
SHBL	SZ	37	153	EP		1 8	37.39	0.03							1.0
ZAHL	SZ	38	52	EP		1 8	37.53	-0.01							1.0

July 22 2019 Hour: 22:59 1.5 Agency: REL Distant
EMSC OT=22:59:01.5 26.61N 55.10E 10Km M=5.0 SOUTHERN IRAN

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
FKH	SZ			EP		23 3	8.75								
RCY	SZ			EP		23 3	11.94								
BEIL	SZ			EP		23 3	12.44								
SHBL	SZ			EP		23 3	12.44								
HWQ	BZ			EP		23 3	13.54								
QRWL	SZ			EP		23 3	13.83								
BHL	BZ			EP		23 3	14.93								

July 23 2019 Hour: 23: 8 52.0 Agency: REL Distant
EMSC OT=23:08:52.0 33.87S 179.21W 10Km M=5.5 SOUTH OF KERMADEC ISLANDS

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
HWQ	BZ			EP		2328	43.28								
BHL	BZ			EP		2328	43.89								

July 24 2019 Hour: 16:37 4.5 Lat: 34.26N Lon: 36.56E 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
FKH	SZ	14	264	EP		1637	6.66	-0.19	42						1.0
BEIL	SZ	47	312	EP		1637	12.19	0.08							1.0
BEIL	SN	47	312	ES		1637	17.71	-0.01							1.0
HWQ	BZ	57	272	EP		1637	13.67	-0.06							1.0
HWQ	BN	57	272	ES		1637	20.57	0.04							1.0
ZAHL	SZ	77	235	EP		1637	17.11	0.18							1.0
RCY	SZ	108	219	EP		1637	21.92	-0.06							1.0
DQRL	SZ	110	237	EP		1637	22.41	0.05							1.0
QRWL	SZ	113	226	EP		1637	22.77	-0.07							1.0
SHBL	SZ	126	217	EP		1637	24.96	0.04							1.0

July 24 2019 Hour: 21:32.0 Lat: 37.39N Lon: 36.32E Depth: 7 Agency: REL Regional
Magnitudes: 4.0MC 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	317	182	EP		21	4	6.68	0.04	176					1.0
BEIL	SN	317	182	ES		21	4	39.44	-0.23						1.0
HWQ	BZ	347	186	EP		21	4	10.48	-0.02						1.0
HWQ	BN	347	186	ES		21	4	46.62	0.22						1.0
FKH	SZ	349	179	EP		21	4	10.71	-0.06						1.0
BHL	BZ	392	189	EP		21	4	15.78	-0.18						1.0
ZAHL	SZ	394	186	EP		21	4	16.46	0.18						1.0
DQRL	SZ	415	190	EP		21	4	18.32	-0.42						1.0
QRWL	SZ	431	188	EP		21	4	20.68	0.03						1.0
RCY	SZ	435	186	EP		21	4	21.13	-0.05						1.0
SHBL	SZ	452	187	EP		21	4	23.76	0.48						1.0

July 27 2019 Hour: 7:33 57.3 Lat: 33.93N Lon: 35.63E Depth: 0 Agency: REL Local
Magnitudes: 2.3MC REL Rms: 0.0 secs

METN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
BHL	BZ	4	146	EP		733	57.82	-0.09	22						1.0
BHL	BN	4	146	ES		733	58.39	0.00							1.0
ZAHL	SZ	25	109	EP		734	1.31	0.01							0.2
DQRL	SZ	26	193	EP		734	1.36	-0.08							1.0
DQRL	SN	26	193	ES		734	4.58	0.05							1.0
QRWL	SZ	43	174	EP		734	4.20	-0.01							1.0
QRWL	SN	43	174	ES		734	9.37	0.03							1.0
HWQ	BZ	48	37	EP		734	5.07	0.04							1.0
RCY	SZ	52	159	EP		734	5.70	0.04							1.0
SHBL	SZ	66	171	EP		734	7.88	0.01							1.0

July 27 2019 Hour: 15:20 24.1 Lat: 33.04N Lon: 35.61E Depth: 2 Agency: REL Regional
Magnitudes: 2.4MC 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	37	20	EP		1520	30.24	0.13							1.0
SHBL	SN	37	20	ES		1520	34.51	-0.02							1.0
RCY	SZ	55	23	EP		1520	32.94	-0.13	25						1.0
RCY	SN	55	23	ES		1520	39.69	0.02							1.0
QRWL	SZ	57	7	EP		1520	33.36	0.00							1.0
DQRL	SZ	74	357	EP		1520	35.93	-0.20							0.2
ZAHL	SZ	95	16	EP		1520	39.32	-0.10							0.2
HWQ	BZ	141	13	EP		1520	46.81	0.15							0.2

July 27 2019 Hour: 17:34 40.2 Lat: 34.05N Lon: 35.93E Depth: 0 Agency: REL Local
Magnitudes: 2.8MC REL Rms: 0.1 secs

KESROUAN REGION

STAT	CO	DIST	AZI	PHASE	P	HRMN	SECON	TRES	CODA	AMPL	PERI	BAZ	ARES	VELO	WT
ZAHL	SZ	21	192	EP		1734	43.60	-0.10	45						1.0
HWQ	BZ	26	3	EP		1734	44.41	0.02							1.0
HWQ	BN	26	3	ES		1734	47.48	0.02							1.0
BHL	BZ	30	239	EP		1734	45.05	-0.07							1.0
BEIL	SZ	60	23	EP		1734	49.82	-0.04							1.0
QRWL	SZ	60	203	EP		1734	50.07	0.14							1.0
RCY	SZ	62	188	EP		1734	50.26	0.06							1.0
RCY	SN	62	188	ES		1734	57.43	-0.13							1.0
SHBL	SZ	79	193	EP		1734	53.07	0.01							1.0
SHBL	SN	79	193	ES		1735	2.64	0.10							1.0

July 27 2019 Hour: 18:31 8.1 Agency: REL Distant
EMSC OT=18:31:08.1 33.17N 137.26E 376Km M=6.3 S. COAST OF HONSHU, JAPAN
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 HWQ BZ EP 1842 38.50
 BHL BZ EP 1842 40.49

July 30 2019 Hour: 1:21 27.8 Agency: REL Distant
EMSC OT=01:21:27.8 20.98S 178.89W 613Km M=5.3 FIJI REGION
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL BZ EP 140 1.59
 HWQ BZ EP 140 1.59

July 31 2019 Hour: 4:40 3.9 Agency: REL Regional
EMSC OT=04:40:03.9 35.32N 24.97E 80Km M=5.0 CRETE, GREECE
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 DQRL SZ EP 442 5.74
 BHL BZ EP 442 5.99
 QRWL SZ EP 442 7.20
 SHBL SZ EP 442 8.51
 HWQ BZ EP 442 8.41
 RCY SZ EP 442 9.26
 BEIL SZ EP 442 10.72
 FKH SZ EP 442 14.04

July 31 2019 Hour: 15: 2 35.0 Agency: REL Distant
EMSC OT=15:02:35.0 16.21S 167.98E 192Km M=6.5 VANUATU
 STAT CO DIST AZI PHASE P HRMN SECON TRES CODA AMPL PERI BAZ ARES VELO WT
 BHL BZ EP 1521 29.11
 HWQ BZ EP 1521 28.74

Epicentral Map of Lebanon

JULY 2019

