## **Appendix A**: The list of reliable historical earthquakes most probably associated with the DST activity that affected Israel and its close surroundings

Following is the list of reliable historical earthquakes that in our opinion are most probably associated with the activity of the Dead Sea Transform (DST) and were felt or caused damage in Israel and its close surroundings. The list covers the period between c.760-750 BCE and 1927 CE. Each entry contains the following information: **Date**: time of occurrence in year and whenever possible - also the month, day and hour. Asterisk (*) denote earthquake that caused damage in Israel; **U:** uncertainty of the origin time (in years); **Type**: the type of event (following Salamon 2009): S - Single, C - Cluster, F - Foreshock, A - Aftershock, FM - Foreshock and Main, MA - Main and Aftershock; FMA - Foreshock, Main and Aftershock, and U - Undefined; **Rel.**: degree of reliability: $V_R$ - Very high, $H_R$ – High and $M_R$ – Moderate (further details in Table 1); **Zone**: association of the event with a geographic region of the DST (see Fig. 1): N – North (northern Lebanon and Syria), C – central (Israel and southern Lebanon), S – South (southern Israel, Sinai and Gulf of Aqaba); **Most damaged or felt locations**: localities reported to have been most severely affected or felt; **Description**: a short description and comments with some selected references and citations; **Modern References**: abbreviated catalogues, articles and reappraisals that were used during the compilation process of the event's entry (see Appendix 4 for abbreviations).

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **1** | **c.760-750 BCE*** | ±10 | S | $H_R$ | C | Judea | Damaging event during mid-8th century BCE. Amos references his prophecy according to an earthquake occurred two years before in a time frame that can be reconstructed today, during the reign of Uziah and Jerova'm, kings of Judea and Israel, respectively. Consequently, we assume the event had indeed occurred and was significant enough to be remembered and documented. However, apart from Amos, there are only a few late secondary sources (**AM**; **GCT** and references therein) that imply of a possible damage in Jerusalem but they cannot be authenticated. Other archaeological evidence cannot be unequivocally associated with this event (**AM**) | AM; GCT; AM2; SAL; SAL2; WALE; BEN; ZIL2 |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **2** | **31 early spring BCE*** | ±1 | S | $H_R$ | C | Judea | Destructive event occurred in the Judea area of that time. Josephus notes that during the Actium war a devastating earthquake occurred killing 30,000 people (Josephus Ant. 15, 121-124; Josephus Bel. 1, 369-379). Generally, Josephus is considered reliable but tends to exaggerate (**BR**; **MZ**) and thus 30,000 deaths seems to be overestimated. Since Judea of that time extended up to Syria and Hawran and the reports are related to Herod's battle with the Nabataeans, the epicentral region might be north of what we reckon today as Judea. The supposed damage to Jerusalem (**AAT**) and the Galilee (**SI**) are contradicted by **AM**. Paleoseismic evidence near Deir-Hajla (**RH**) and Qumran (**NURO**) were questioned by **AM** and **KA3,** respectively, although **KEN** dated possible seismic activity at that time in a Ze'elim gully. **KA2** notes that this was probably a moderate event. **WEC2** found evidence for a possible event between 392 B.C.E. and 91 C.E. Indeed, this evidence can be related with the 31 BCE event, but also with another, undocumented one. **KEN** dated an event between 50 BCE – 230 CE and associated it with this event. | AM; GCT; KA; KA2; SAL; BR; MZ; AAT; SI; RH; NURO; KA3; KEN; AMM; WEC2 |
| **3** | **303 Apr 2*** | - | S | $H_R$ | C-N | Sidon, Tyre | Damaged mainly the south Lebanese littoral. Eusebius and Orosius date the event to 303 and describe damage in Syria, Sidon and Tyre (**AM; GCT**). They describe large numbers of people (Eusebius) or thousands (Orosius) who were killed. The numbers however, seems to be exaggerated. The fact that the affected cities are located along the Lebanese littoral may suggest that the event | AM; GCT; SAL; SAL2; RUS; SDM; WEC2 |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | may have been generated somewhere offshore. **WEC2** found an evidence for a possible event between 250–310 C.E or 269–329 C.E. or 294–369 C.E. | |
| **4** | **363 May 18-19 (night)*** | - | MA | $V_R$ | C | Palestine | Two earthquakes, on Sunday, 18/05 at the 3rd and 9th hours after sunset (i.e., Monday, 19/05 at around 03:00). The latter seems to have been less damaging and affected the northern parts of Palestine (**AM**; **GCT; KA**). The damage in Antioch (modern Antakya) as reported by Libanius seems to have resulted from the 365 earthquake (see Appendix 3). The earthquake extent is described in a contemporary Syrian letter attributed to Cyril, the Bishop of Jerusalem (Brock 1977). The record of damage in Petra is supported by three inscriptions found in Zoar of 4 people who perished during the earthquake (**MEI**). Additional questionable records of the earthquake are also found in archaeological excavations (**RUS**; **RUS2**) and paleoseismic findings (**KEN**). **WEC2** found an evidence for a possible event between 294–369 C.E. **KEN** dated an event between 358 and 580 and associated it with this event. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores. | AM; GCT; KA; SAL; RUS; RUS2; SDM; KEN; AMM; WEC2; MIG |
| **5** | **418/419*** | ±1 | U | $M_R$ | C | Palestine | Affected Palestine at that time. The event was reported by two contemporary writers, Augine and Idatius. **AM** suggests that Augine, claiming that "great cities collapsed", could be interpreted as a theological poet while Idatius, reporting that "Jerusalem as well as others were shaken" was writing when in fact he was living far away in the Roman province. Archaeological remains | AM; GCT; KA; SAL; RUS; MIG |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | (**RUS**) need further authentication. **MIG** suggest it was recorded in lacustrine sediments at the Dead Sea shorelines. | |
| **6** | **502 Aug 22 night*** | - | S | $H_R$ | C-N | Akko | Damage reported along the northern coastline of Palestine at that time. The absence of damage inland may suggest an offshore epicenter (**AM**). **WEC2** found an evidence for a possible event between 505 and 593. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores. | AM; GCT; KA; SAL; RUS; SDM; WEC2; MIG |
| **7** | **551 Jul 9*** | - | MA | $V_R$ | C-N | Lebanon, Syria | Damaged mainly the south Lebanese littoral. John of Ephesus describes a tsunami and two events, about 1 hour apart from each other. According to **AM**, Agathias mentions this event in reference to Alexandria, where he was that year. However, **GCT** places this report in 554 as an event felt in Egypt and adds an event, also reported by Agathias that occurred during 554-558 in the island of Cos. This and the facts that only the coastal cities in Lebanon were damaged and that there was a tsunami, leads to an assumption that Agathias might have duplicated a remote event. The other alternative is that the epicenter was in the sea or inland, very close to the shore (**AM**). Caesarea and Gush-Halav could have been also affected (**RUS**). Jerusalem was not reported as damaged. **WEC2** found an evidence for a possible event between 505–593 C.E. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GCT; KA; SAL; SAL2; RUS; SDM; DAR; AMA; ELI; WEC2; MIG |
| **8** | **634 Sep*** | ±2 | MA | $M_R$ | C | Palestine, Jerusalem | Affected Palestine at the time. The event is based upon the evidence of Theophanes (ca. 778-845), credited as reliable (**AM**; **GCT**). Byzantine sources (Michael the | AM;GCT;KA;SAL;RUS; SDM; WEC2; |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Syrian, 12th century) and Arabic sources (al-Makin, Abu'l Fara) seem to copy Theophanes. **AM** proved that the testimony of Michael the Syrian is somehow vague, stressing that contemporary source remains silent. **WEC2** found an evidence for a possible event between 619–684 C.E. | |
| **9** | **659 Jun 7 (659 Sep-660 Aug)*** | - | MA | $M_R$ | C | Palestine, Jericho | Probably caused damage to central Palestine at the time. The date of event is confused in the Maronite chronicles and also by Theophanes though their implication of damaged localities seems to be correct (**AM**; **GCT**). Archaeological evidence (**RUSS**) is not decisive. The 659 Jun 9th is probably an aftershock of this event (**AM**). **WEC2** found an evidence for a possible event between 619 and 684. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GCT; KA; SAL; RUS; BM; BM4; WEC2; MIG |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **10** | **749/early* 750** | ±1 | FM | $H_R$ | C | Palestine | An event that occurred in 749 which can be reliably dated according to numismatic evidence found in the ruins of Bet-She'an (Schitopolis) by **TSFO**. The historical sources partly support this claim but add 1 or 2 additional possible earthquakes. The near-contemporary Byzantine chronicler Theophanes reports on 3 earthquakes: (1) in 745/6 (6238, Alexandrian system) in Palestine, Syria and along the Jordan River (Theophanes); (2) 748/9 (6241) in Syria and Mesopotamia (Theophanes); and (3) 755/6 (6248) in Palestine and Syria (Theophanes). Theophanes was most likely using primary sources but may have also been confused, replacing damage that resulted in the first event with that of the second. The claim of 3 earthquakes is also supported by other two groups of sources (see **GCT; AM; KA; KA2**): (1) Syrian sources (e.g., Pseudo Dionysius that relies on contemporary accounts); (2) 4 Arabic writers (al-Dhahabi, al-Suyuti, Mujir al-Din and al-Ulaimi) who also add damage to Al-Aqsa in 757. Other studies referencing a single event, such as **MARG,** ignore most of the mid-8$^{th}$ century reports, describing at least two destructive earthquakes. **KA2** reinforces 3 earthquakes and notes that: (1) all single-event reports do not supply full date, i.e., day, month, year; (2) they neglect the dating according to the 'Feast of the Mary for the seeds' holyday; and (3) they mention in Palestine only Tiberias, Mt. Tabor and Jericho but not Jerusalem (in contradiction to the Arab sources). **AM**: The extent of damage, when referring to | AM; GCT; KA2; MAR; MAR2; TSFO; WE; AM4; BEG; AMA; MIG |
| **11** | **756(757) Mar 9*** | ±1 | U | $M_R$ | C | Palestine | | AM;GCT;KA;KA2;SAL; SDM; |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | a single event (Cairo-Tiberias-Nicea-Khabura) is enormous and implies an earthquake that could hardly be generated by a geological strike-slip fault structure (as demonstrated in **WECO).** Thus, it is more likely that 3 separate earthquakes had occurred. **MIG** suggest the 749 earthquake was recorded in lacustrine sediments along the Dead Sea shores | |
| **12** | **1033 Dec 05 (night)*** | - | MA | $V_R$ | C | Ramla, Palestine, Syria (?) | Large earthquake heavily damaging Ramla and other cities in the center of Palestine. The main source is the letter of Salomon ben-Zemah (Ya'ari 1943, 70-73). **GC** places the epicenter in Palestine while **AM** claims the earthquake occurred in Syria. There are also reports of an associated tsunami (**SAL2** and references therein). The 1034 Feb 17$^{th}$ is probably a belated aftershock. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GC; SAL; SAL2; AMJA; AMA; MIG |
| **13** | **1063 Aug*** | - | MA | $M_R$ | U | Syrian littoral | **AM**: The earthquake struck the Lebanese coast from Antakya to Tyre. The source was probably offshore between the Lebanese coast and Cyprus. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GC; SAL; SDM; MIG |
| **14** | **1068 Mar 18*** | - | MA | $H_R$ | S | Gulf of Elat | Destructive earthquake reported in several independent Arabic sources (**AM; GC; KA**). **GC** places the epicenter at 34.95° / 29.55° with $I_0$ =IX and Me=8.1. Based on paleoseismic study, **ZIL** attributes a magnitude of 6.6 – 7 according to a vertical displacement of 1 m. | AM; GC; KA; SAL; SAL2; AMJA; AMA |
| **15** | **1068 May 29*** | - | S | $M_R$ | C | Ramla | Close in time to the 1068 March earthquake (see previous entry) but probably not related to it (**AM**). The primary source for both the earthquakes is Ibn al-Banna | AM; GC; SAL; MIG |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | who mentions two dates: March 18th and May 29th. All other sources are secondary and cite each other (**GC; AM**). **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | |
| **16** | **1105 Dec 24 evening** | - | S | $H_R$ | C | Jerusalem | Felt earthquake that was recorded by an eye witness (Fulcher of Chartres), accounted as reliable, and several creditable secondary sources. (**AM**). The earthquake did not result in damage but was felt in Jerusalem ( **GC)** | AM;GC;KA; |
| **17** | **1113 Jul 18** | - | MA | $H_R$ | C | Jerusalem | **AM**: Based upon the testimony of Fulcher of Chartres, probably an eye witness. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; MIG |
| **18** | **1117 Jun 26*** | - | S | $H_R$ | C | Jerusalem | | AM; KA; SAL |
| **19** | **1157 Aug 12 (night)*** | - | FMA | $V_R$ | N | Apamea | Very destructive earthquake occurred in the northern part of the DST. **AM**: It ends a period of over a year of foreshocks. Probably occurred at the collision of the DST with the East Anatolian Fault with an epicenter near Apamea, Shaizar and Hama (**AM**). **GC** (relies on Ibn al-Jawzi) dates the earthquake to have occurred between August 9th and September 7th. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GC; SAL; SAL2; AMJA; SDM; RAP; MIG |
| **20** | **1170 Jun 29 (0345)*** | - | FM | $V_R$ | C-N | Shaizar | Relatively large earthquake (**HOAV; AMJA; KA; AM; GC**) in northern Syria that was felt in what is present-day Iraq. Many of the localities that were hit by previous earthquakes were not completely repaired when the earthquake struck. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GC; KA; SAL; SAL2; AMJA; SDM; RAP; HOAV; AMA; MIG |
| **21** | **1202 May 20 (0240)*** | - | MA | $V_R$ | C-N | Baalbek | Destructive earthquake in Lebanon, ground breakage north of the Hula pull-apart basin (**EMARB; MABBEE**). | AM; GC; KA; SAL; SAL2; |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Wide extent, casualties and many affected localities (**AM; GC**). **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AMME; AMJA; SDM; HOAV; DAKL2; AMM; AMA; MIG |
| **22** | **1212 May 01*** | - | FMA | $H_R$ | S | Gulf of Aqaba | Moderate earthquake that affected southern Palestine at the time. The main evidence is that of the contemporary Arabic scholar Abu-Shama. **GC** and **AM** estimate the origin to be in the Gulf of Aqaba region. **KEN** dated an earthquake between 1220 and 1390 and associated it to this earthquake. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GC; KA; SAL; AMM; AMA; MIG |
| **23** | **1293 Jan 11–Feb 08*** | ±1 | S | $H_R$ | C | Palestine. | Was felt in the center-south of Palestine (Ramla, Lud, Gaza, Qaqun, Tafilah), destroying many houses (**AM, GC**). **KEN** dated an earthquake between 1270 and 1400 and associated it to this earthquake. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GC; KA; SAL; KEN; AMM; AMA; MIG |
| **24** | **1458 Nov 16*** | - | S | $H_R$ | C | Karak | Probably occurred in the Dead Sea area and reported by several contemporary writers (**AM; GC** and references therein). **GC** placed the epicenter near Karak (Jordan). **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; GC; KA; SAL; AMA; MIG |
| **25** | **1546 Jan 14 (Afternoon)*** | - | MA | $V_R$ | C | Palestine | Moderate earthquake that affected central Palestine at the time and reported to topple down the bell tower of the Church of the Holy Sepulchre (**AMKA**). Occurred only 30 years after the Ottoman conquest which probably explains the absence of Arabic sources mainly from Egypt and Syria (**AM**). The primary source is a | AM; KA; AM2; SAL; SAL2; AMKA; BM; SDM; SHAL; AMA; MIG |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Venetian letter, probably copied from the account published in Beinart (1955) which resembles the Venetian letter and might be merely a copy of it (**SHAL; BRA**). **BM** assigns a magnitude of 7.0 and epicentral intensity of X-XI. Alternatively, **AMKA** analyzed the spread of damage and suggest that this was a magnitude 6 event, similar to the 1927 Jericho earthquake. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | |
| **26** | **1588 Jan 04 (13:00) *** | - | S | $M_R$ | S | Elat | **AM**: Destructive earthquake in northern Saudi Arabia and southern Palestine at the time. The earthquake was felt also in Cairo and east of the DST (mostly by pilgrims to Mecca and Medina). **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM; KA; SAL; AMA; MIG |
| **27** | **1643 Mar 23*** | - | S | $H_R$ | C | Jerusalem | Light earthquake felt in Jerusalem, according to the contemporary source of Paisios, future bishop of Jerusalem (**AM**). | AM |
| **28** | **1753 Dec 16** | - | S | $M_R$ | C | Jerusalem | Light earthquake felt in Jerusalem. The source of al-Budayyri that **AM** is based upon, needs further verification. However, **AM** also bases on Tobler who, although born almost 100 years later, is known for his reliability. Thus, moderate reliability was attributed to the earthquake. | AM; |
| **29** | **1759 Oct 30 (03:45) *** | - | F (S?) | $V_R$ | C-N | Safed | Strong shock in northern Israel-Southern Lebanon in the area confined to Safed-Tiberias-Benot Ya'akov bridge and Quneitra. **AM**: Probably a foreshock of the Nov 25 earthquake. DAKL2 claim that this is not a foreshock but rather separate earthquake acting on the Rachaya segment. | AM;KA;SAL;SAL 2;AMBR;TMK; MAR2; SDM; EMARB; DAKL; DAKL2 |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **30** | **1759 Nov 25 (19:23) *** | - | FMA | $V_R$ | C-N | Litany, Northern Palestine | A most destructive earthquake that (**AM**) generated landslides, changes in water course and ground breakage in south Lebanon and northern Galilee (**AM)**. Many reporting sources. **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM;SAL;SAL2;AMBR;AMJA;TMK; SDM; DAKL; ODON; KA; AMBR; MAR2; EMARB; DAKL; DAKL2; GOM; MIG |
| **31** | **1783 Jul 20** | - | C | $H_R$ | C-N | Tripoli | **AM**: Earthquake felt in the region of Tripoli, Lebanon and also report of damage from rock fall near Nablus, not necessarily from or due to an earthquake. | AM |
| **32** | **1817 Mar*** | - | S | $H_R$ | C | Jerusalem | **AM**: Some damage in Jerusalem (a Greek and an Armenian Church as well as part of the Church of the Holy Sepulchre) | AM; |
| **33** | **1834 May 26 (13:00) *** | - | S | $V_R$ | C | Palestine | Damaging earthquake in central Palestine at the time. Occurred during the Fellahin siege of Jerusalem (**AM**). The main source is Neofitus, a contemporary monk from Mar Saba who witnessed the earthquake and described in detail the earthquake and its effects (Spyridon 1938). **KEN** dated an earthquake in the 19$^{th}$ and associated it to this earthquake. Confirmed also by **MIG** | AM; SAL; KEN; AMM; MIG |
| **34** | **1837 Jan 01 (16:35) *** | - | MA | $V_R$ | C-N | Palestine, Syria | Damaging earthquake in southern Lebanon and northern Palestine at the time. The earthquake was felt also in central Israel and the Nile Delta, Egypt. Most of the information comprises reports of survivors and aid delegations (e.g., Calman 1837; Thomson 1837; Ya'ari 1943). This earthquake is probably followed by two aftershocks on the 16$^{th}$ Jan and 20$^{th}$ of May (**AM**). Confirmed also by geological evidence (**MIG**) | AM; SAL; AM3; NEM; AMJA; SDM; ODON; MIG |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **35** | **1839*** | ±1 | S | $M_R$ | S | St. Catherine | **AM**: light earthquake mentioned by Grigoriadis, a near contemporary writer. However, the source of the earthquake is questionable; there are no other supportive reports of damage in the southern DST area (Elat or Aqaba). | AM; AMA |
| **35** | **1854 Nov 3** | - | S | $M_R$ | C | Dead Sea, Jerusalem | **AM**: Felt only. The only source is the **PER** catalogue. | AM; PER |
| **37** | **1859 Oct 24 (05:15)** | - | S | $H_R$ | C | Jerusalem | **AM**: A strong earthquake but without reported damage. | AM; GII |
| **38** | **1863 Sep 24 (20:15)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **39** | **1864 Feb 19 (midnight)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **40** | **1864 Mar 24 (02:30)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **41** | **1868 Jan 24 (15:50)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **42** | **1868 Oct 7 (19:30)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **43** | **1873 Feb 14** | - | S | $M_R$ | C | Jerusalem, Akko, Sur | **AM**: Felt only. This earthquake may have combined either with the one reported on 9.2.1873 that affected the Antakya region or with the one of 29.6.1873 that affected Jerusalem and Jaffa. | AM; SDM; GII |
| **44** | **1873 Jun 29 (02:30)** | - | S | $H_R$ | C | Jerusalem, Jaffa | **AM**: Felt only. | AM; |
| **45** | **1874 Mar 03 (01:40)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **46** | **1875 Mar 28 (02:48)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **47** | **1877 Feb 15 (07:15)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **48** | **1877 Mar 14 (06:15)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **49** | **1879 May 19 (06:00)** | - | S | $H_R$ | C | Haifa | **AM**: Strong earthquake at 06:00 lasted for only a few seconds. | AM; |
| **50** | **1879 Dec 31 (09:00)** | - | S | $H_R$ | C | Jerusalem | **AM**: Felt only. | AM; |
| **51** | **1889 Aug 23 (19:00)** | - | S | $H_R$ | C | Safed | **AM**: Felt only. According to newspaper report from 13.09.1889. | AM; |
| **52** | **1889 Dec 11 (00:25)** | - | S | $M_R$ | C | Jerusalem | **AM** after **AAT**: Felt only. | AM; AAT |
| **53** | **1893 Jan 12 (04:00)** | - | S | $M_R$ | C | Jerusalem | **AM** after **AAT**: Felt only. | AM; AAT |
| **54** | **1898 Mar 19** | - | S | $M_R$ | C | Carmel, Haifa | Felt only. Occurred at 11:20 and lasted about 3 seconds (**AAT**). | AM; AAT |
| **55** | **1900 Jan 5** | ±1 | S | $M_R$ | C | Palestine | Slight shock felt in the Galilee, Jerusalem and Hebron. The earthquake is listed by **AAT** who use **SI**, **WI**, **BL**, **AB** and some extracts written by the Meteorological Service of Israel. | AAT; |
| **56** | **1903 Mar 29** | - | C | $H_R$ | C | Palestine | Felt only. The earthquake is listed by **AAT** who use **SI**, **WI**, **BL**, **AB** and some extracts from the meteorological station notebooks of the Meteorological Service of Israel. | AAT; SAL3 |
| **57** | **1903 Dec 19 (00:20-00:44(?)** | - | C | $M_R$ | C | Jerusalem, Jaffa, Hebron | Felt only. **AAT** use some extracts from the meteorological station notebooks of the Meteorological Service of Israel. | AAT |
| **58** | **1907 Feb 1 (01:00)** | - | S | $M_R$ | C | Hebron | Felt only. **AAT** use some extracts from the meteorological station notebooks of the Meteorological | AAT |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | Service of Israel. | |
| **59** | **1907 Jun 22 (15:32)** | - | S | $H_R$ | C-N | | Felt only. According to **SAL3** based upon **BM3.** | SAL3; BM3 |
| **60** | **1907 Jul 22 (17:40)** | - | U | $H_R$ | C-N | | Felt only. According to **SAL3** based upon **SHA2.** | SAL3; SHA2 |
| **61** | **1910 Jul 10 (19:54)-** | - | S | $H_R$ | C-N | | Felt only. According to **SAL3** based upon **SHA2.** | SAL3; SHA2 |
| **62** | **1914 Jun 24 (16:40)** | - | S | $M_R$ | C | Tabgha | **AAT**: Felt only. | AAT |
| **63** | **1918 Sep 29 (20:17)** | - | S | $H_R$ | C-N | Syria | Damaging earthquake in northern Syria (**SAL3)**. **AM5** places the source origin near Cyprus. The event was probably slightly felt in Haifa and maybe at Qalqiliya (**AAT**). Although it might not be related to DST activity, we include it in this list for being felt in Israel. | SAL3; AAT; AM5; |
| **64** | **1921 Apr-Jun** | - | C | $M_R$ | C | Galilee | Felt only. According to **AAT**, 15 slight earthquakes during April-June felt in the Galilee. | AAT |
| **65** | **1922 May 5,8 and 9** | - | C | $M_R$ | C | Galilee | Felt in northern Mandatory Palestine (**AAT**). | AAT |
| **66** | **1922 May 21, 22 and 23** | - | C | $M_R$ | C | Galilee | Felt in northern Mandatory Palestine (**AAT).** | AAT |
| **67** | **1923 Feb 27 (18:15)** | - | S | $V_R$ | C | Allone-Abba (Waldheim) | Felt only. **SAL3** based upon **IRPG.** | AAT; SAL3; IRPG |
| **68** | **1923 Dec 21 (14:11)** | - | S | $H_R$ | N | | Felt only. **SAL3** based upon **RIME.** | SAL3; RIME |
| **69** | **1924 Feb 27 (20:04)** | - | S | $H_R$ | C | Palestine | Felt only. **AAT** based upon **BM** and **SI**. However, **BM** draws from **SI** whereas the latter does not mention his sources. Yet, in light of contemporaneous **SI**, the earthquake is ascribed with high reliability | AAT; SAL3; BM;SI |
| **70** | **1926 Jun 26** | - | S | $H_R$ | C | Jerusalem | Felt only. **AAT** base upon **BM** and **SI**. However, **BM** | AAT; BM; SI |

| No. | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged or felt locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | **(19:46)** | | | | | | draws from **SI** whereas the latter does not mention his sources. Yet, in light of contemporaneous **SI**, the earthquake is ascribed -high reliability | |
| **71** | **1927 Jul 11 (15:04)*** | - | MA | $V_R$ | C | Nablus, Ramla | Moderate destructive earthquake with a series of aftershocks (**SAL**). About 300 hundred casualties. Magnitude estimated as ML = 6.2 with the epicenter at the north of the Dead Sea (**AVN; AVN2; ZOMA**). **KEN** dated an earthquake to the 20$^{th}$ century and associated it to this event. Confirmed also by **MIG** | AVN; AVN2; SAL; ZOMA; AAT; BM2; AMA; VEST; SHA; KEN; AMM; MIG |

## **Appendix B:** Questionable earthquakes that were allegedly affected Israel and its surrounding

Following is the list of questionable earthquakes, duplicated records, erroneous entries or reported earthquakes that appear in the literature without any support of historical, archaeological or paleoseismic references. This list summarizes our present state of knowledge and understandings and may be changed or updated if new information emerges. Each entry contains the following information: **Date**: time of occurrence in years and whenever possible – also the month, day and hour; **U:** uncertainty of the time origin (in years); **Type**: the type of occurrence (following Salamon 2009): S - Single, C - Cluster, F - Foreshock, A - Aftershock, FM - Foreshock and Main, MA - Main and Aftershock; FMA - Foreshock, Main and Aftershock and U - Undefined; **Rel.**: degree of reliability: $P_R$ - Poor and $D_R$ – Doubtful and (see further details in Table 1); **Most allegedly damaged locations**: reported localities of maximal damage; **Why doubtful**: a short explanation for doubtfulness, description, comments, references and citations of the relevant historical sources ; **Modern References**: abbreviated catalogues, articles and reappraisals that were used during the compilation process of this list (see Appendix 4 for abbreviations).

| No. | Date (y/m/d/h) | U | Type | Rel. | Most damaged locations | Why doubtful | Modern References |
|---|---|---|---|---|---|---|---|
| **1** | **2100-1700 BCE** | ±400 | S | $P_R$ | Sodom, Judea | The claim that the destruction of Sodom, Gomorrah, Admah, Zebo'im and Zoar (Genesis, 19.24-28; 29.23: Bible 1989) was a result of an earthquake is not decisive. Strabo, a 1st century BCE writer, mentions earthquakes as a possible cause for ruins near Masada but also cites an alternative physical explanation suggested by the 3rd BCE writer Eratosthenes (Strabo 16.2 42, 44). No other supportive source or evidence is found and thus the alleged event needs further authentication. | AM; BEN; |
| **2** | **c.1400 BCE** | ±100 | S | $P_R$ | Jericho | The tumbling down of Jericho's walls (Joshua, 6.20-21: Bible 1989) as an outcome of an earthquake is not significantly supported by other literary sources. Some archaeoseismic evidence implies possible earthquake damage in the middle of the 2nd millennium BCE (**AM** and references therein) but its relation to the conquest of Jericho by Joshua needs further authentication. | AM; BEN; |
| **3** | **c.1225-1175 BCE** | ±50 | C | $D_R$ | Eastern Mediterranean | A storm of quakes might have occurred and damaged several archaeological sites in the Eastern Mediterranean including Palestine. This is bases only on archaeology with no decisive evidence of damage that could be unequivocally associated | NUCL |

| No. | Date (y/m/d/h) | U | Type | Rel. | Most damaged locations | Why doubtful | Modern References |
|---|---|---|---|---|---|---|---|
| | | | | | | with an earthquake (**NUCL**) | |
| **4** | **c.1070 BCE** | ±50 | S | $P_R$ | Mizpeh, Judaea | Josephus describes a battle taken place in Mizpeh, north of Jerusalem, but the other details seem to be incidental (Josephus 6.2). Furthermore, Josephus' sources of the event remain anonymous. | AM; |
| **5** | **590 BCE** | - | - | $D_R$ | Tyre | **KA2** pointed out the entry citation by **PLKO**, **BM** and **SI** with no specific reference of occurrence. | BM; PLKO; SI; SDM; KA2 |
| **6** | **525 BCE** | - | - | $D_R$ | Sidon | | |
| **7** | **148 Feb 21 (or 130) BCE** | ±20 | S | $P_R$ | Antakya | The only source is Malalas, living in the 6th century, who cites Domnianus, 5th century writer (**AM, GCT**). He does not mention an earthquake but rather the phrase "wrath of god" and apparently confuses the date and the details implying that perhaps there was more than one event or the damage was resulted by an outer invasion. **WEC2** found an evidence of event between 392 BCE and 91 CE and imply of possible association. | AM; GCT; SAL; AW; WEC2 |
| **8** | **139 BCE** | ±1 | S | $P_R$ | Akko | No reference of earthquake but rather a record of sea waves that flooded the shore between Tyre and Akko (**SAL2** and references therein). Had there been an earthquake, it may have occurred offshore, west of the DST (**AM**). | AM; SAL2 |
| **9** | **92 Feb 28 BCE** | - | S | $D_R$ | | **KA2**: **BM** places earthquake of M7.1, relying on **PLKO** who do not quote a reference but probably use **SI** and **WI**. **WI** uses **MA** who uses **VH**. The latter author does not mention any of his sources and is probably responsible for the confusion. **WEC2** found an evidence of event between 392 BCE and 91 CE and imply of possible association. | AM;KA2;SAL2; BM; PLKO; SI; WI; MA; VH; WEC2 |
| **10** | **44-32 BCE** | ±6 | S | $D_R$ | Salamis | No contemporary sources (including the near contemporaneous Josephus that remains silent). **AM**: This is probably a duplication of the 15 BCE Cyprus earthquake in which the convention Salamis/Diospolis (nowadays Lod) was confused with Salamis in Cyprus. | AM; |
| **11** | **19** | - | S | $D_R$ | Sidon, Syria | The reference in SDM relies upon **BM**, **PLKO** and **SI** who in turn | SDM; PLKO; SI; |

| No. | Date (y/m/d/h) | U | Type | Rel. | Most damaged locations | Why doubtful | Modern References |
|---|---|---|---|---|---|---|---|
| | | | | | | do not cite their historical sources. | BM |
| **12** | **33** | ±1 | S | $P_R$ | Jerusalem | Matthew reports of two earthquakes during the crucifixion and resurrection of Jesus. Though contemporaneous, his testimony is strongly doubted as being associated with theological interests. The secondary sources, Eusebius and Orosius, use Matthew and mix his report with sun eclipse and an earthquake that occurred in Bithynia (**KA**). Paleoseismic findings (**MIG**; **WILL**) suggest that an earthquake occurred close to this date. However, it could have been a rather small earthquake (M >= 5.5) that left sedimentary evidence but no meaningful damage to inhabited sites. **WEC2** found an evidence of event between 392 B.C.E.–91 C.E. and imply of possible association. **KEN** dated an event between 5 and 50 CE and associated it to this event | AM;KA;AM2; KEN; AMM; WEC2 |
| **13** | **2nd century (c.110-114?)** | ±5 | S | $P_R$ | Petra, Masada, Avdat | **AM** questionably refers to an event between c.110-114. Other scholars (e.g., **KOMA; NEG**) imply of possible damage to structures in the ancient Negev cities. However they rely only on archaeological excavations that imply possible damage but not necessarily from an earthquake. | AM; KOMA; NEG; AMA |
| **14** | **<597** | ? | S | $P_R$ | Areopolis | According to an inscription found in Areopolis which implies restoration of the city but not necessarily damage from an earthquake (**AM**). | AM; |
| **15** | **835** | ±1 | C | $D_R$ | | Al-Suyuti probably duplicated the 713 event with this entry (**AM**; **GCT**). | AM;GCT;SAL; SDM; GII |
| **16** | **853 Jun 12 - 854 Jun1** | ±1 | S | $P_R$ | Tiberias | Only a single secondary source which uses unknown sources (**AM; GCT**). | AM;GCT;KA;SAL; SDM; |
| **17** | **873** | ? | ? | $P_R$ | Qasr Tilah | Based on archaeological remain (**HNA**). No supportive historical sources | HNA |
| **18** | **1016 Aug 27** | - | S | $P_R$ | Jerusalem | **AM**: The Dome of the Rock in Jerusalem was allegedly damaged. The only reports are secondary sources that do not mention an earthquake occurrence. | AM;KA; |

| No. | Date (y/m/d/h) | U | Type | Rel. | Most damaged locations | Why doubtful | Modern References |
|---|---|---|---|---|---|---|---|
| **19** | **1047** | - | S | $P_R$ | Ramla | **AM**: The only reporting source is the secondary al-Fariqi. | AM; |
| **20** | **1091 Feb 12** | - | C | $P_R$ | St. Catherine | Only one anonymous source dating this event based on Archbishop John the Athenian's death. The interpretation of this source yields two possible dates of occurrence: 1091 or March 1068 (**AM**) | AM;SAL; AMA |
| **21** | **1114 Apr-May** | - | C | $P_R$ | Jerusalem? Sea of Galilee | Although Jerusalem is mentioned in the chronicle of 'Historia Hierosolymitanae' to have been hit, it is not mentioned by Fulcher (**AM**). Thus, had the earthquake occurred, it was probably felt north of Jerusalem (perhaps near the Sea of Galilee) | AM; |
| **22** | **1119 CE** | ±1 | S | $P_R$ | Hebron | Cave collapse in Hebron (Khalil). The cause is not mentioned. | AM; |
| **23** | **c.1150** | ? | S | $P_R$ | Mar Elias, St. John | **GC**: Date of occurrence, according to the pilgrim John Phocas, is not clear. **AM** doubts the event on the basis that Mar Elias was already ruined on June 7, 659. | AM;GC;SAL; |
| **24** | **1261** | ±1 | S | $P_R$ | Acre | Seven islets sank off the coast of Akko but without specifically mentioning an earthquake (**AM**). | AM;SAL2; |
| **25** | **1267 Dec 8** | - | S | $P_R$ | Jordan River | **AM** following **WAT**: alleged evidence of landslide that dammed the Jordan River. The event is also mentioned by al-Maqziri, secondary source. | AM; |
| **26** | **1366 Oct** | - | S | $P_R$ | Safed | **AM, GC**: According to a vague report of the secondary al-Imad. | AM;GC; |
| **27** | **1504** | ±1 | C | $P_R$ | Jerusalem | **AM**: Based upon al-Umari. Needs further examination. | AM; |
| **28** | **1532** | ±1 | S | $D_R$ | Bet Lehem | **AM**: Based upon unknown source. Further verification is needed. | AM; |
| **29** | **1557 Feb** | - | S | $P_R$ | Jerusalem | **AM**: Vague report of an earthquake in Jerusalem. | AM;SAL; |
| **30** | **1605 Jan 08** | - | C | $D_R$ | Saba | Questionable report (**AM**; **KA**). | AM;KA; GII |
| **31** | **1644** | ±1 | S | $P_R$ | Jerusalem | **AM**: Probably duplicated from the 1643, March 23 event. | AM; |
| **32** | **1762** | ±1 | S | $P_R$ | Akko | **AM**: Sole report with no other supportive evidence. | AM; |
| **33** | **1769** | | S | $D_R$ | Palestine | **AM**: Probably wrong entry of **ARV.** | AM; ARV |
| **34** | **1802** | ±1 | S | $P_R$ | Aleppo | The claim that this event was felt also in Palestine at that time is rejected by **AM**. Suggests that these reports are associated with the 1822 earthquake (Appendix 3). | AM;KA; SDM; |

| No. | Date (y/m/d/h) | U | Type | Rel. | Most damaged locations | Why doubtful | Modern References |
|---|---|---|---|---|---|---|---|
| **35** | **1838** | | S | $D_R$ | Judea | Wrong entry in **ARV** has led to duplication of the 1838 Cyprus earthquake. | AM; ARV |
| **36** | **1843 May 12** | - | S | $P_R$ | Jerusalem | **AM**: Appears in **TOB** but needs further authentication. | AM; TOB |
| **37** | **1844-1845** | ±1 | C | $P_R$ | Jerusalem | **AM**: Cited in **AMI** without supporting source. | AM; AMI |
| **38** | **1848 Apr 26** | - | S | $P_R$ | Dead Sea | Reports only in the Dead Sea onboard a boat. The reporter also mentions rock fall from cliffs 9 hours later. No other reports and the fact that he was on a boat might cause some confusion (**AM**). | AM; |
| **39** | **1857 Sep 21** | - | S | $P_R$ | Jerusalem | **AM**: Cited in **AMI** without supporting source. | AM; AMI |
| **40** | **1876 Nov 21 (01:00)** | - | S | $P_R$ | Nazareth | **AM**: Cited in **AMI** without supporting source. | AM; AMI |
| **41** | **1885 Mar 13 (11:00)** | - | S | $P_R$ | Jerusalem | **AM**: Cited in **AMI** without supporting source. | AM; AMI |

## **Appendix C**: Reliable earthquakes originated either along or off the DST that reported erroneously to cause damage in Israel

Reliable earthquakes originated either along or off the DST that were erroneously related in the literature to cause damage in Israel. Each entry contains the following information: **Date**: time of occurrence in years and wherever possible - also month, day and hour; **U:** uncertainty of the time of origin (in years); **Type**: the type of occurrence (following Salamon 2009): S - Single, C - Cluster, F - Foreshock, A - Aftershock, FM - Foreshock and Main, MA - Main and Aftershock; FMA - Foreshock, Main and Aftershock and U - Undefined; **Rel**: degree of reliability: $V_R$ - Very high, $H_R$ - High, $M_R$ – Moderate and U – Undefined (see further details in Table 1); **Zone**: association of the event with a geographic region: CA – Cypriot arc, EAF – East Anatolian fault, HA – Hellenic arc, SG – Suez Gulf and regions of the DST (Fig. 1): N – North (northern Lebanon and Syria), C – central (Israel and southern Lebanon), S – South (southern Israel, Sinai and Gulf of Aqaba); **Most damaged locations**: reported localities of maximal damage; **Description**: a short description, comments and citations of the relevant historical sources; **Modern References**: abbreviated catalogues, articles and reappraisals that were used during the compilation process of this list (see Appendix 4 for abbreviations).

| No | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **1** | **c.198 BCE** | ±1 | S | $H_R$ | C-N | Sidon | The earthquake is reported by Posidoinus, near contemporary and a highly reliable source that was born 60 years later (**GCT**). The shocks were felt in Phoenicia and with less intense in Syria. The earthquake seems to be accurate but the reported damage is probably exaggerated. | AM;GCT;SAL;SAL 2; SDM; AW |
| **2** | **c.65 BCE** | ±5 | S | $M_R$ | N | Northern Syria | According to Justin, the earthquake happened during Tigranes's occupation of Syria (83-69 BCE) and hit several unspecified cities, probably in northern Syria. The earthquake was mistakenly imported to pre 90's catalogues (e.g., **AAT**, **BM**) as occurred in Jerusalem (see **KA2** and references therein). **KEN** dated an earthquake between 200 and 40 BCE and associated it to this earthquake. | AM; GCT; KA2; SAL; SDM; AAT; BM; GII; KEN; AMM |
| **3** | **c.20 BCE** | ±5 | S | $M_R$ | CA (?) | Egypt | This earthquake is based upon the evidence of the | AM; KA; SAL; |

| No | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | contemporary Strabo and the 3rd – 4th century Eusebius, both referring to a phenomenon that was not necessarily the result of an earthquake in Egypt. It could have been duplicated from the 15-17 BCE earthquake that allegedly occurred in Cyprus (**AM**). For further details see **SAL; SAL2; KA**. **GII** refers to 26 BCE | SAL2; GII |
| **4** | **17-15 BCE** | ±2 | S | $M_R$ | CA | Cyprus | The earthquake is recorded by Dio Cassius who, though a 3rd century writer, is considered reliable (**AM**) and this is also supported by Eusebius. The earthquake affected Cyprus and there is no evidence of damage in Israel, Lebanon or Syria. | AM; GCT; KA |
| **5** | **76** | ±1 | S | $M_R$ | CA | Cyprus | **AM**: This earthquake is recorded by secondary but reliable sources of Eusebius and Orosius. The question whether there was a tsunami remains unresolved. | AM; |
| **6** | **115 Dec 13** | - | MA | $H_R$ | N | Antioch (modern Antakya) | Large earthquake that almost totally ruined Antioch (modern Antakya) and its surrounding cities (**AM**; **GCT**; **KA**). The alleged tsunami (**SAL2** and references therein) in Caesarea (**REI**) and along the coast down to Yavne is questionable as there are no supporting contemporary indications for this claim. Yet, the earthquake is mentioned in several catalogues (e.g., **AAT**) as hitting or at least affecting Israel. | AM;GCT;KA;SAL; SAL2;AMJA; SDM;REI; AAT |
| **7** | **127-130** | ±3 | S | $H_R$ | EAF (?) | Nicopolis, Neocaesarea (Asia Minor) | This earthquake is likely to have occurred in Asia Minor and not in the DST area. The confusion is the interpretation of Eusebius's report replacing NeoCaesarea and Nicopolis in Greece (Asia Minor) with Caesarea and Nicopolis (Emmaus) in Palestine (**AM**; **KA**). **WEC2** match this earthquake to seismic activity in northern Israel between 137 and 206 CE. In light of the confusion in the sources, it is most likely that these are | AM;GCT;KA;SAL; WEC2 |

| No | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | two separate earthquakes. | |
| **8** | **341** | ±1 | MA | $H_R$ | CA | Salamis (Cyprus) | **AM**, **GCT**: Occurred in Cyprus. | AM;GCT;SAL;SAL 2; SDM; |
| **9** | **347 Sep (348/349)** | ±1 | S | $M_R$ | C-N | Beirut | Based upon the two Secondary but reliable sources of Theophanes and Cedrenus. **WEC2** found evidence for a possible earthquake between 269 and 329 CE or 294–369 CE but they point it might be associated with the 303 or 363 CE earthquakes (appendix A). | AM;GCT;SAL;SAL 2; SDM; GII; WEC2 |
| **10** | **365 Jul 21** | - | S | $V_R$ | HA | Crete-Peloponnese | Was probably generated in the Hellenic Arc (**AM**; **GCT**; **SAL2**) and was mistakenly adopted by early catalogues as having occurred in Palestine. | AM;GCT;SAL2; AMA |
| **11** | **c.388** | ±10 | S | $P_R$ | EAF | Constantinople | **AM**: There are 3 references of John Chrysostom for the occurrence of an earthquake. Two of them are not decisive and the third implies an earthquake that lasted for 3 days. Orosius (contemporary) and Marcelinus Comes ($5^{th}$-$6^{th}$ centuries) report of an earthquake that struck the vicinity of Constantinople in c.395. Since the nature of Chrysostom's writing is preaching along with the fact that he was living in Constantinople, he might have used this earthquake for his own interests and apply damage also to Antioch (modern Antakya). Thus, the evidence of Orosius is more acceptable (this is also supported by **GCT**). | AM; GCT |
| **12** | **395** | ±1 | MA | $H_R$ | EAF | Constantinople | See the previous entry. | AM; GCT; KA; SDM; |
| **13** | **455 Sep** | - | S | $H_R$ | U | Tripoli | The main source for this earthquake is the near-contemporary Malalas who allegedly is counted as using reliable primary sources. The fact that he was close to the earthquake (491-578) attributes reliability to that earthquake. However, Malalas does not mention any | AM;GCT; SDM; |

| No | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | other damaged location (in particular Antakya). Moreover, no other source reports damage in major cities (e.g., Damascus, Beirut). This leads to the option that the earthquake did actually occur but rather offshore (**AM**; **GCT**). Note that Michael the Syrian attributes effects to 'all the entire inhabited world' – maybe an earthquake that happened far away and affected the Mediterranean. | |
| **14** | **601 Apr 2** | - | S | $M_R$ | U | | **AM**: Might have occurred somewhere in northern Syria or Iraq. Most of the reported damage was in Turkey. | AM;GCT;SAL; SDM; |
| **15** | **c.746 Jan** | ±3 | MA | $M_R$ | N | Syria | See discussion in appendix 1, entry 10 | AM;KA;KA2;SAL;SAL2;MAR; SDM; AM4 |
| **16** | **796 Apr** | - | S | $M_R$ | HA | | **AM**: Probably the Hellenic Arc. | AM;GCT; |
| **17** | **813-820** | ±7 | S | $P_R$ | EAF | Constantinople | Two incomplete sources imply a possible earthquake somewhere between 813 and 820 (**GCT**). **AM** claims the earthquake occurred in Constantinople in 815 CE | AM;GCT; |
| **18** | **860 Jan 29** | ±1 | MA | $M_R$ | HA | Gulf of Antakya | **AM**: The earthquake could have been related to the Hellenic Arc or, though less probable, to the north of the DST. **GII** refers to 859 CE. | AM;GCT;KA;SAL; SAL2; SDM; |
| **19** | **952** | ±1 | MA | U | EAF | Maras | Occurred in southern Anatolia (**AM**; **GCT**). | AM;GCT;SAL; SDM; |
| **20** | **956 Jan 5** | - | S | $M_R$ | SG | Egypt | Reports of damage in Egypt, the report of al-Masudi about a report in Syria has no other authentication (AM; AMA) | AM; AMA; GII; |
| **21** | **991 Apr 5** | - | MA | $M_R$ | C-N | Damascus | According to several independent secondary sources (**AM**; **GCT**; **KA**). **MIG** suggest it was recorded in lacustrine sediments alond the Dead Sea shores | AM; GCT; KA; SAL; SAL2; SDM; GII; MIG |
| **22** | **1002 Nov 10-** | ±1 | S | $M_R$ | EAF | Northern Syria | **AM** refers to an earthquake in northern Syria affecting | AM; GC; SDM; |

| No | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| | **1003 Oct 29** | | | | | | the regions of al-Wasim and al-Thughur based on al-Istakhri and Thagri Birdi. **GC** use the report of Matthew of Edessa to imply an additional earthquake in the Edessa region. | SAL |
| **23** | **1032/3 Mar 6** | ±1 | S | $P_R$ | EAF | Constantinople | **AM** interprets this earthquake as occurred on Mar 6, 1033 in Constantinople. | AM; GII |
| **24** | **1063 Aug** | - | MA | $M_R$ | U | Syrian littoral | **AM**: The earthquake struck the Lebanese coast from Antakya to Tyre. The source was probably offshore between the Lebanese coast and Cyprus. | AM;GC;SAL; SDM; |
| **25** | **1114 Nov 29** | - | FM | $V_R$ | EAF | Antakya, Maras | **AM**: Large earthquake close to the East Anatolian Fault. The 1114 Aug 10$^{th}$ and Nov 13$^{th}$ are probably foreshocks of the 1114 Nov 29 earthquake | AM;SDM; GC |
| **26** | **1120 Jan 1** | - | S | $M_R$ | EAF | Probably Edessa | **AM**: Based upon the testimony of Michael the Syrian. | AM; |
| **27** | **1127 Feb** | - | S | $M_R$ | EAF | Probably Edessa | | |
| **28** | **1127 Nov** | - | C | $M_R$ | EAF | Probably Edessa | | |
| **29** | **1287 Feb 16** | - | F | $H_R$ | N | Safitha (in Syria | The earthquakes in Feb 1287 contain three entries, all by one contemporary source (Ibn Zahir). **AM** imply of two foreshocks in northern Syria but **SAL** and **GC** refer to it as 3 separate earthquakes. | AM;GC;SAL; SDM; |
| **30** | **1303 Aug 8 (03:30)** | - | S | $V_R$ | HA | Crete, Nile River | Large earthquake originating on the Hellenic Arc and generating damage and tsunami in the eastern Mediterranean (**AM; GC**). The littoral extending between Palestine and Syria suffered a tsunami (**SAL2**). **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores. | AM; GC; KA; SAL2; AMA; MIG |

| No | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **31** | **1344 Jan 3** | - | S | $H_R$ | EAF | Aintab | Occurred in southern Turkey (**AM; GCT**). | AM;GC;SAL; SDM; |
| **32** | **1425 Jun 23** | - | S | $M_R$ | SG | Gulf of Suez | Affected the Gulf of Suez (**AM**) | AM; GC ; AMA |
| **33** | **1457 Apr 23** | - | S | $H_R$ | EAF | Eastern Anatolia | **AM**: Occurred in Eastern Anatolia. | AM; GII |
| **34** | **1481 Mar 18** | - | C | $H_R$ | HA | | Series of earthquakes originating in the eastern Mediterranean (**AM; GC**). | AM;GC; AMA |
| **35** | **1568 Oct 10** | - | FM | $H_R$ | CA | Cyprus | Affected Cyprus and the Syrian coast (**AM**). | AM; SDM |
| **36** | **1801 Oct 10** | - | S | $M_R$ | SG | Gulf of Suez | **AM**: Felt in Cairo. There is no other evidence of an earthquake; had it occurred, it probably originated in the Gulf of Suez | AM; |
| **37** | **1814 Jun 27** | - | FM | $H_R$ | SG | Cairo, Suez | **AM**: This is probably an earthquake that affected Cairo and implies that the source was not in one of the DST southern segments. | AM;KA; AMA; GII |
| **38** | **1822 Aug 13 (20:40)** | - | FMA | $V_R$ | EAF | Southeastern Anatolia | Destructive earthquake that seems to have occurred at the junction between the northern section of the DST and the East Anatolian fault (EAF). The earthquake was felt from Gaza to the Black Sea and was accompanied by ground fissures, landslides and liquefaction. Aftershocks continued probably until March 1824 (**AM**). **MIG** suggest it was recorded in lacustrine sediments along the Dead Sea shores | AM;SAL;SAL2; SDM; MIG |
| **39** | **1846 Mar 28** | - | S | $V_R$ | HA | | **AM**: Offshore epicenter, probably around the Hellenic Arc. | AM; |
| **40** | **1847 Aug 7** | - | S | $V_R$ | SG | Egypt | Damaged Cairo and it vicinity **(AM; AMA)** | AM; AMA |

| No | Date (y/m/d/h) | U | Type | Rel. | Zone | Most damaged locations | Description | Modern References |
|---|---|---|---|---|---|---|---|---|
| **41** | **1856 Oct 12** | | S | $V_R$ | HA | Crete | **AM**: Large earthquake with an epicentral region offshore from Crete. | AM;SAL2; |
| **42** | **1863 Apr 22** | | S | $V_R$ | HA | Rhodes | **AM**: Occurred in the eastern part of the Hellenic Arc near Rhodes. | AM; AMA |
| **43** | **1868 Feb 20 (03:15)** | - | C | $H_R$ | SG | Alexandria | Probably originated in the Gulf of Suez. | AM; AMA |
| **44** | **1870 Jun 24 (17:00)** | - | S | $V_R$ | HA | Eastern Mediterranean | Affected Eastern Mediterranean (**AM**) | AM;SAL2; AMA |
| **44** | **1872 Apr 3** | - | S | $V_R$ | EAF | Southern Anatolia | **AM**: Occurred in southern Anatolia. | AM; GII |
| **46** | **1896 Jun 29** | - | FMA | $H_R$ | CA | Cyprus | **AM**: Damaging earthquake in Cyprus at 20:48 was preceded by many foreshocks and followed by aftershocks. | AM; GII |

## **Appendix D**: List of abbreviations

**Critical catalogues and reappraisals**

AG: Agnon (2014)
AM: Ambraseys (2009)
AM2: Ambraseys (2005a)
AM4: Ambraseys (2005b)
AM5: Ambraseys (1992)
AMA: Ambraseys et al. (1994)
AW: Ambraseys and White (1997)
BR: Broshi (1982)
GCT: Guidoboni et al. (1994)
GC: Guidoboni and Comastri (2005)
KA: Karcz (1987)
KA2: Karcz (2004)
SAL: Salamon (2009)
MZ: Mazar (1982)
SAL2: Salamon et al. (2011)

**Catalogues and lists**

AAT: Amiran et al. (1994)
AMI: Amiran (1952)
ARV: Arvanitakis (1903)
AB: Abel (1931)
BL: Blanckenhorn (1905)
BM: Ben-Menahem (1991)

BRA: Braslavsky (1956)
GII: GII ()
IRPG: IPRG (1982-1993)
MA: Mallet (1852)
PER: Perrey (1850)
PLKO: Plassard and Kogoj (1968)
SDM: Sbeinati et al. (2005)
SHAL: Shalem (1955)
SI: Sieberg (1932)
TUAR: Turcotte and Arieh (1988)
VH: von Hoff (1840)
WI: Willis (1928)

**Focused investigations**

AM3: Ambraseys (1997)
AMBR: Ambraseys and Barazangi (1989)
AMJA: Ambraseys and Jackson (1998)
AMKA: Ambraseys and Karcz (1992)
AMME: Ambraseys and Melville (1988)
AUS: Austin et al. (2000)
AVN: Avni (1999)
AVN2: Avni et al. (2002)
BEG: Begin (2005)
BEN: Bentor (1989)
BM2: Ben-Menahem et al. (1976)
BM3: Ben-Menahem and Aboodi (1981)
BM4: Ben-Menahem (1981)

BM5: Ben-Menahem (1979)
DAR: Darawcheh et al. (2000)
GOM: Gomez et al. (2003)
HOAV: Hough and Avni (2010)
MARG: Margalioth (1960)
ODON: Katz and Crouvi (2007)
RAP: Raphael (2010)
RIME: Riad and Meyers (1985)
RUS: Russell (1985)
RUS2: Russell (1980)
SAL3: Salamon et al. (1996)
SHA: Shapira et al. (1993)
SHA2: Shapira (1979)
VEST: Vered and Striem (1977)
WECO: Wells and Coppersmith (1994)
ZOMA: Zohar and Marco (2012)

**Archaeoseismic remains and paleoseismic evidence**

AAK: Akyuz et al. (2006)
AMM: Agnon et al. (2006)
DAKL: Daëron et al. (2007)
DAKL2: Daëron et al. (2005)
ELI: Elias et al. (2007)
EMARB: Ellenblum et al. (1998)
GMD: Gomez et al. (2001)
HNA: Hayens et al. (2006)
KA3: Karcz and Kafri (1978)

KAG: Kagan et al. (2011)
KEN: Ken-Tor et al. (2001)
KOMA: Korjenkov and Mazor (1999)
MABBEE: Marco et al. (1997)
MAR: Marco et al. (2003)
MAR2: Marco (2008)
MEI: Meimaris and Kritikakou (2005)
MIG: Migowski et al. (2004)
NEG: Negev (1974)
NEM: Nemer and Meghraoui (2006)
NUCL: Nur and Cline (2000)
NURO: Nur and Ron (1996)
RH: Reches and Hoexter (1981)
REI: Reinhardt et al. (2006)
TMK: Nemer et al. (2008)
TSFO: Tsafrir and Foester (1992)
WALE: Wachs and Levitte (1984)
WE: Wechsler et al. (2009)
WEC2: Wechsler et al. (2014)
WILL: Williams et al. (2011)
ZIL: Zilberman et al. (2005)
ZIL2: Zilberman et al. (2004)

## HISTORICAL SOURCES USED TO CLARIFY SPECIFIC REPORTS OF EARTHQUAKES


Beinart CH (1955) The earthquake in Eretz Israel in January 1546. Bulletin of the Israel Exploration Society 19:29-34

Bible (1989) New international version. Hodder & Stoughton, London

Blanckenhorn M (1905) Uber die letzten Erdbeben in Palastina und die Erforschung etwaiger kunftiger. ZDPV 28:206-218

Brock SP (1977) A letter attributed to Cyril of Jerusalem on the rebuilding of the temple. Bulletin of the School of Oriental and African Studies 40: 267-286

Calman SE (1837) Description of Part of the Scene of the Late Earthquake in Syria. J. Darling, London

Josephus, Antiquities of the Jews, Whitson edn. (translated by Thackeray, H. and Marcus, R.)

Josephus Yosef Ben Matityahu [Titus] Flavius Josephus - History of the Jewish War against the Romans, . Carmel, Jerusalem (translated to Hebrew by Liza Ulman)

Margalioth M (1960) A new document for the Fast of the Earthquake. Tarbitz 29:339-344

Spyridon SN (1938) Annals of Palestine: 1821-1841. The Palestine Oriental Society XVIII: 63-132

Strabo, The geography of Strabo. W. Heinemann, 1917-1949, London (translated by Jones, H.L.)

Theophanes, The Chronicle of Theophanes Confessor. Clarendon Press, Oxford

Thomson WM (1837) Syria and the Holy Land. Journal of Mr. W. M. Thomson on a visit to Safet and Tiberias. Missionary Herald 33: 433-447

Ya'ari A (1943) The letter of Salomon ben-Zemah in Letters of Eretz Israel. Gazit, Tel Aviv, Tel Aviv


## MODERN REFERENCES


Abel FM (1931) Geographie de la Palestine. Gabalda, Paris

Agnon A (2014) Pre-instrumental earthquakes along the Dead Sea Rift. In: Garfunkel Z, Ben-Avraham Z, Kagan E (eds) Dead Sea Transform Fault System: Reviews, Modern Approaches in Solid Earth Sciences, vol 6. Springer, Dordrecht, pp 207-261

Agnon A, migowski C, Marco S (2006) Interclast breccia layers in laminated sequences: recorders of paleo-earthquakes. Geological Society of America Special Paper 401:195-214

Akyuz HS, Altunel E, Karabacak V, Yalciner CC (2006) Historical earthquake activity of the nothern part of the Dead Sea Fault zone, southern Turkey. Tectonophysics 426:281-293

Ambraseys NN (1992) Reappraisal of the seismic activity in Cyprus: 1894-1991. Bulletino di Geofisica Teorica ed Applicata XXXIV:41-81

Ambraseys NN (1997) The earthquake of 1 January 1837 in Southern Lebanon and Northern Israel. Annals of Geophysics 11:923-935

Ambraseys NN (2005a) Historical earthquakes in Jerusalem - A methodological discussion. Journal of Seismology 9:329-340

Ambraseys NN (2005b) The seismic activity in Syria and Palestine during the middle of the 8th century; an amalgamation of historical earthquakes. Journal of Seismology 9:115-125

Ambraseys NN (2009) Earthquakes in the Mediterranean and Middle East. A Multidisciplinary Study of Seismicity up to 1900, 1 edn. Cambridge University Press, New York

Ambraseys NN, Barazangi M (1989) The 1759 Earthquake in the Bekaa Valley - Implications for earthquake hazard assessment in the eastern Mediterranean region. Journal of Geophysical Research-Solid Earth and Planets 94:4007-4013

Ambraseys NN, Jackson JA (1998) Faulting associated with historical and recent earthquakes in the Eastern Mediterranean region. Geophysical Journal International 133:390-406

Ambraseys NN, Karcz I (1992) The earthquake of 1546 in the Holy Land. Terra Nova 4:253-262

Ambraseys NN, Melville CP (1988) An analysis of the Eastern Mediterranean earthquake of 20 May 1202. In: Lee WKH, Meyers, H., and Shimazaki, K. (ed) Historical Seismograms and Earthquakes of the World, vol 1. 1 edn., San Diego, California, pp 181-200

Ambraseys NN, Melville CP, Adams RD (1994) The Seismicity of Egypt, Arabia and the Red Sea: A Historical Review. Cambridge University Press, Cambridge

Ambraseys NN, White D (1997) The seismicity of the eastern Mediterranean region 550-1BC: a reappraisal. Journal of Earthquake Engineering 1:603-632

Amiran DHK (1952) A Revised Earthquake-Catalogue of Palestine. Israel Exploration Journal 1:223-246

Amiran DHK, Arieh E, Turcotte T (1994) Earthquakes in Israel and adjacent areas: Macroseismic observation since 100 B.C.E.. Israel exploration Journal 44:260-305

Arvanitakis GL (1903) Contribution for the study of earthquakes in Syria and Palestine. Himerologion, Hierosolymon:158-191

Austin AS, Franzb GW, Frostc EG (2000) Amos's earthquake: An extraordinary Middle East eeismic event of 750 B.C.. International Geology Review 42:657-671

Avni R (1999) The 1927 Jericho earthquake, comprehensive macroseismic analysis based on contemporary sources. Dissertation, Ben Gurion University

Avni R, Bowman D, Shapira A, Nur A (2002) Erroneous interpretation of historical documents related to the epicenter of the 1927 Jericho earthquake in the Holy Land. Journal of Seismology 6:469–476

Begin BZ (2005) Destructive Earthquakes in the Jordan Valley and the Dead Sea - their Recurrence Intervals and the Probability of their Occurence. Geological Survey of Israel

Ben-Menahem A (1979) Earthquake Catalog for the Middle East (92 B.C.-1980 A.D.). Bollettino di Geofisica Teorica ed Applicata 21:245-310

Ben-Menahem A (1981) Variation of sleep and creep along the Levant Rift over the past 4500 years. Tectonophysics 80:183-197

Ben-Menahem A (1991) Four thousand years of seismicity along the Dead Sea rift. Journal of Geophysical Research 96:195 - 216

Ben-Menahem A, Aboodi E (1981) Micro-and macroseismicity of the Dead Sea rift and off-coast eastern Mediterranean. Tectonophysics 80:199-233

Ben-Menahem A, Nur A, Vered M (1976) Tectonics, Seismicity and structure of the afro-Eurasian Junction-the Breaking of the Incoherent plate. Phys Earth Planet Interiors 12:1-50

Bentor YK (1989) Geological events in the Bible. Terra Nova 1:326-338

Braslavsky J (1956) The earthquake of the year 1546. Bulletin of the Israel Exploration Society 19:230-235

Broshi M (1982) The credibility of Josephus. In: Rappaport U (ed) Josephus Flavius. Historian of Eretz-Israel in the Hellenistic-Roman Period. Yad Ben Zvi, Jerusalem,

Daëron M, Klinger Y, Tapponnier P, Elias A, Jacques E, Sursock A (2005) Sources of the large A.D. 1202 and 1759 Near East earthquakes. Geology 33:529-532. doi:10.1130/G21352.1

Daëron M, Klinger Y, Tapponnier P, Elias A, Jacques E, Sursock A (2007) Long record of 10 to 13 paleoearthquakes on the Yammouneh fault, Levant system, Lebanon. Bulletin of the Seismological Society of America 97:749-771

Darawcheh R, Margottini C, Paolini S (2000) The 9 July 551 AD Beirut Earthquake, Eastern Mediterranean Region. Journal of Earthquake Engineering 4:403-414

Elias A et al. (2007) Active thrusting offshore Mount Lebanon: source of the tsunami-genic A.D. 551 Beirut-Tripoli earthquake. Geology 35:755-758. doi:10.1130/G23631A.1

Ellenblum R, Marco S, Agnon A, Rockwell T, Boas A (1998) Crusader castle torn apart by earthquake at dawn, 20 May 1202. Geology 26:303-306

GII List of historical earthquakes. Lod, Israel (Geophysical Institute of Israel, unpublished dataset)

Gomez F et al. (2003) Holocene faulting and earthquake recurrence along the Sergahya brach of the Dead Sea fault system in Syria and Lebanon. Geophysical Journal International 153:658-674

Gomez F et al. (2001) Coseismic displacements along the Serghaya fault: an active branch of the Dead Sea Fault system in Syria and Lebanon. Journal of Geological Society 158:405-408

Guidoboni E, Comastri A (2005) Catalogue of Earthquakes and Tsunamis in the Mediterranean Area from the 11th to the 15th Century. INGV-SGA, Bologna

Guidoboni E, Comastri A, Traina G (1994) Catalogue of Ancient Earthquakes in the Mediterranean Area up to the 10th Century. ING-SGA, Bologna

Hayens JM, Niemi TM, Attalah M (2006) Evidence for ground-rupturing earthquakes on the northern Wadi Araba fault at the archaeological site of Qasr Tilah, Dead Sea Transform fault system, Jordan. Journal of Seismology 10:415-430 doi:10.1007/s10950-006-9028-9

Hough SE, Avni R (2010) The 1170 and 1202 CE Dead Sea Rift earthquakes and long-term magnitude distribution of the Dead Sea fault zone Israel. Journal of Earth Sciences 58:295-308

IPRG (1982-1993) Earthquakes in and around Israel. Holon, Israel

Kagan EJ, Stein M, Agnon A, Neumann F (2011) Intrabasin paleoearthquake and quiescence correlation of the late Holocene Dead Sea. Journal of Geophysical Research: Solid Earth (1978–2012) 116 doi:10.1029/2010JB007452

Karcz I (1987) Bibliographic Reliability of Catalogues of Historic Earthquakes in and around Israel. Catalogue of Turcott and Arieh (1986). Geological Survey of Israel, Jerusalem

Karcz I (2004) Implications of some early Jewish sources for estimates of earthquake hazard in the Holy Land. Annals of Geophysics 47:759-792

Karcz I, Kafri U (1978) Evaluation of supposed archaeoseismic damage in Israel. Journal of Archaeological Science 5:237-253

Katz O, Crouvi O (2007) The geotechnical effects of long human habitation (2000 < years): Earthquake induced landslide hazard in the city of Zefat, northern Israel. Engineering Geology 95:57-78

Ken-Tor R, Agnon A, Enzel Y, Stein M (2001) High-resolution geological record of historic earthquakes in the Dead Sea basin. Journal of Geophysical Research 106:2221-2234

Korjenkov AM, Mazor E (1999) Seismogenic origin of the ancient Avdat ruins, Negev Desert, Israel. Natural Hazards 18:193-226

Mallet (1852) Third Report on the Facts of Earthquakes Phaenomena. Twenty second meeting of the British association for the Advancement of Science

Marco S (2008) Recognition of earthquake-related damage in archaeological sites: examples from the Dead Sea fault zone. Teconophysics 453:148-156

Marco S, Agnon A, Ellenblum R, Eidelman A, Basson U, Boas A (1997) 817-year-old walls offset sinisterly 2.1 m by the Dead Sea Transform. Israel Journal of Geodynamics 24:11-20

Marco S, Hartal M, Hazan N, Lev L, Stein M (2003) Archaeology, history, and geology of the A.D. 749 earthquake, Dead Sea Transform. Geology 31:665-668

Mazar B (1982) Josephus Flavuis - The historian of Jerusalem. In: Rappaport U (ed) Josephus Flavius. Historian of Eretz-Israel in the Hellenistic-Roman Period. Yad Ben Zvi, Jerusalem,

Meimaris EY, Kritikakou IK (2005) Inscriptions from Palastina Tertia. The Greek Inscriptions from Ghor es-Safi (Bizantine Zoora). Eptalofos, Athens

Migowski C, Agnon A, Bookman R, Negendank JFW, Stein M (2004) Recurrence pattern of Holocene earthquakes along the Dead Sea transform revealed by varve-counting and radiocarbon dating of lacustrine sediments. Earth and Planetary Science Letters 222:301–314

Negev A (1974) The Churches of the Central Negev. An Archaeological Survey. Revue Biblique 3:400-422

Nemer T, Meghraoui M (2006) Evidence of coseismic ruptures along the Roum fault (Lebanon): a possible source for the AD 1837 earthquake Journal Of Structural. Geology 28:1483-1495

Nemer T, Meghraoui M, Khair K (2008) The Rachaya-Sergahaya fault system (Lebanon): Evidence of coseismic ruptures, and the AD 1759 earthquake sequence. Journal of Geophysical Research 113 doi:10.1029/2007JB005090

Nur A, Cline EH (2000) Poseidon's horses: Plate tectonics and earthquake storms in the Late Bronze Age Aegean and Eastern Mediterranean. Journal of Archaeological Science 27:43-63

Nur A, Ron H (1996) The walls came tumbeling down: Eatrthquake history of the Holy Land. In: Stiros S, Jones RE (eds) Archaeoseismology. Exeter: Short Run Press, pp 7-85

Perrey (1850) Mémoires sur les tremblements de terre ressentis dans la peninsule Turco-ellenique et en Syrie. Mémoires couronnées et mémoires des savant etrangers. Bruxelles vol 23.

Plassard J, Kogoj B (1968) catalouges des seismes ressentis au Liban vol t. IV. Annales Memoirs de l'Observatoireb de Ksara, vol cahier 1, 1962 2nd ed.

Raphael K (2010) The impact of the 1157 and 1170 Syrian earthquakes on Crusader–Muslim politics and military affairs. Special Paper - Geological Society of America 471:59-66

Reches Z, Hoexter DF (1981) Holocene seismic and tectonic activity in the Dead Sea area. Tectonophysics 80:235-254

Reinhardt EG et al. (2006) The tsunami of 13 December A.D. 115 and the destruction of Herod the Great's harbor at Caesarea Maritima, Israel. Geology 34:1061-1064

Riad S, Meyers H (1985) Earthquake Catalog for the Middle East countries 1900-1983. vol SE-40. World Data Center-A for Solid Earth Geophysics

Russell KW (1980) The earthquake of May 19, A.D. 363. Bulletin of the American Schools of Oriental Research 238:47-64

Russell KW (1985) The earthquake chronology of Palestine and northwest Arabia from the 2nd through the mid-8th century A.D.. Bulletin of the American Schools of Oriental Research 260:37-59

Salamon A (2009) Patterns of seismic sequences in the Levant-interpretation of historical seismicity. Journal of Seismology 14:339-367

Salamon A, Hofstetter A, Garfunkel Z, Ron H (1996) Seismicity of the eastern Mediterranean region: perspective from the Sinai subplate. Tectonophysics 263:293–305

Salamon A, Rockwell T, Guidoboni E, Comastri A (2011) A critical evaluation of tsunami records reported for the Levant coast from the second millennium BCE to the present. Israel Journal of Earth Sciences 58:327-354

Sbeinati MR, Darawcheh R, Mouty M (2005) The historical earthquakes of Syria: an analysis of large and moderate earthquakes from 1365 B.C. to 1900 A.D.. Annals of Geophysics 48:347-435

Shalem N (1955) Comments on the paper by Beinart: Earthquakes in Eretz Israel in 1456 Bulletin of the Israel Exploration Society 19:235-236

Shapira A (1979) Re-determined magnitudes of earthquakes in the Afro-Eurasian junction Israel. Journal of Earth Science 28:107-109

Shapira A, Avni R, Nur A (1993) A new estimate for the epicenter of the Jericho earthquake of 11 July 1927. Israel Journal of Earth Science 42:93-96

Sieberg A (1932) Untersuchungen Uber Erbeben und Bruchschollenbau im ostlichen Mittelmeergebiet Denkfchriften der Medizinisch Natur-wissenschaftlichen Gesellschaft. zu Jena 18:159-273

Tsafrir Y, Foester G (1992) The dating of the earthquake of the sabbatical-year of 749ce in Palestine. Bulletin of the School of Oriental and African Studies-University of London 55:231-235

Turcotte T, Arieh E (1988) Catalog of Earthquakes in and around Israel. Israel Electric Corporation, Haifa

Vered M, Striem HL (1977) A macroseismic study and the implications of structural damage of two recent major earthquakes in the Jordan rift. Bulletin of the Seismological Society of America 67:1607-1613

von Hoff KEA (1840) Geschichte der Naturlichen Veranderungen der Erdoberflach. In: Chronik der Erdbeben und Vulcan-Ausbrüche, vol 4.

Wachs D, Levitte D (1984) Earthquake Risk and Slope Stability in Jerusalem. Environmental Geology and Water Sciences 6:183-186

Wechsler N, Katz O, Dray Y, Gonen I, Marco S (2009) Estimating location and size of historical earthquake by combining archaeology and geology in Umm-El-Qanatir, Dead Sea Transform. Natural Hazards 50:27-43

Wechsler N, Rockwell T, Klinger Y, Stepacikova P, Kanari M, Marco S, Agnon A (2014) A paleoseismic record of earthquakes for the Dead Sea Transform fault between the first and seventh centuries C.E.: Nonperiodic behavior of a plate boundary fault. Bulletin of the Seismological Society of America 104:3. doi:10.1785/0120130304

Wells DL, Coppersmith KJ (1994) New Empirical Relationships Among Magnitude, Rupture Length, Rupture Width, Rupture Area, And Surface Displacement. Bulletin Of The Seismological Society Of America 84:974-1002

Williams BJ, Schwab JM, Brauer A (2011) An early first-century earthquake in the Dead Sea. International Geology Review:1-10

Willis B (1928) Earthquakes in the Holy Land. Bulletin of the Seismological Society of America 18:72-103

Zilberman E, Amit R, Bruner I, Nachmias Y (2004) Neotectonic and paleoseismic study—Bet Shean Valley. Geological Survey of Israel, Jerusalem

Zilberman E, Amit R, Porat N, Enzel Y, Avner U (2005) Surface ruptures induced by the devastating 1068 AD earthquake in the southern Arava valley, Dead Sea Rift, Israel. Tectonophysics 408:79-99

Zohar M, Marco S (2012) Re-estimating the epicenter of the 1927 Jericho earthquake using spatial distribution of intensity data. Journal of Applied Geophysics 82:19-29. doi:10.1016/j.jappgeo.2012.03.004