EARTHQUAKE ACTIVITY IN THE YELLOWSTONE REGION

Preliminary Epicenters

April 1 – June 30, 2021

Prepared by the University of Utah Seismograph Stations and funded by
the U.S. Geological Survey (Cooperative Agreement No. G21AC10068)

September 30, 2021

Foreword and Data Explanation

This report contains an epicenter map (Figure 1) and listings of earthquakes (Tables 1 and 2) detected and located in the Yellowstone region (lat. 44° 00′ – 45° 10′ N, long. 109° 45′ – 111° 30′ W). The computer program HYPOINVERSE-2000 (F. W. Klein, 2012, U.S. Geological Survey Open-File Report 02-171 revised) was used to process the earthquake data. This report also includes maps and a table of operating seismograph stations in the University of Utah's Yellowstone seismic network (Figure 2, Table 3).

The earthquake listing in Table 2 is estimated to be systematically complete above magnitude 1.5 within Yellowstone. *These data are preliminary—both the locations and magnitudes in this table are subject to revision.*

The following data are listed for each earthquake in Table 2:

- Date (yymmdd) and origin time in Coordinated Universal Time (UTC). To convert to local time, subtract seven hours for Mountain Standard Time (MST) and six hours for Mountain Daylight Time (MDT). During the report period, local time was MDT.

- Earthquake location coordinates in degrees and minutes of north latitude and west longitude, and depth in kilometers below sea level. Note that prior to October 1, 2012, the earthquake depths in these quarterly reports were computed relative to a datum of 2000 m above sea level.

- "*" indicates poor depth resolution: no recording stations within 10 km or twice the depth.

- MAG, the computed Richter local magnitude (M_L) for each earthquake. "W" indicates that peak amplitude measurements from Wood-Anderson records were used. Otherwise, the estimate is calculated from signal durations and is more correctly identified as coda magnitude (M_C). The notation "--" indicates that a reliable magnitude estimate could not be made.

- NO, the number of P and S readings used in the solution.

- GAP, the largest azimuthal separation in degrees between recording stations used in the solution.

- DMN, the epicentral distance in kilometers to the closest station.

- RMS, the weighted root-mean-square of the travel-time residuals in seconds:

$$RMS = \left(\frac{\sum_i (W_i R_i)^2}{\sum_i (W_i)^2} \right)^{\frac{1}{2}}$$

where: R_i is the observed minus the computed arrival time for the i-th P or S reading, and W_i is the relative weight given to the i-th P or S arrival time (0.0 for no weight through 1.0 for full weight).

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April 1 – June 30, 2021

by J. Farrell, R. Burlacu, P. M. Roberson, J. M. Hale, B. Ericksen, and Z. Claerhout
with contributions by
K. D. Koper, R. B. Smith, J. C. Pechmann, and K. L. Pankow

University of Utah Seismograph Stations
115 South 1460 East, Room 107 FASB
Salt Lake City, UT 84112-0102
Tele: (801) 581-6274 FAX: (801) 585-5585
email: *jamie.farrell@utah.edu*
URL: *https://www.seis.utah.edu* (aka *quake.utah.edu*)

During the three-month period April 1 through June 30, 2021, the University of Utah Seismograph Stations (UUSS) located 560 earthquakes within the Yellowstone region (Figure 1). The total includes 1 earthquake in the magnitude 3 range, and 29 earthquakes in the magnitude 2 range. The largest event to occur during this period was a magnitude 3.1 earthquake on June 28. No earthquakes were reported felt in the region during the report period (see Table 1, a cumulative tabulation of earthquakes that were felt in the Yellowstone region during 2021). Additional information on earthquakes within the Yellowstone region is available from the University of Utah Seismograph Stations.

Online Information

A complete copy of this report, including maps and the earthquake catalog, is available on the UUSS web site at *https://quake.utah.edu/earthquake-center/quarterly-seismicity-reports*.

Note: On October 1, 2012, UUSS began using the ANSS Quake Monitoring System (AQMS) software package for data acquisition and data processing. The primary effect on the data reported herein comes from computing the earthquake locations with a newer version of the computer program HYPOINVERSE-2000 (F. W. Klein, 2012, U.S. Geological Survey Open-File Report 02-171 revised) and a revised and expanded set of velocity models. As implemented at UUSS, this new version of the location program accounts for station elevation differences more accurately and reports focal depths relative to sea level instead of the 2000 m elevation datum used previously.

For earthquakes of magnitude 3 and larger in the Yellowstone region, the U. S. Geological Survey automatically posts a Community Internet Intensity Map (CIIM) on its "Did You Feel It?" web page at http://earthquake.usgs.gov/earthquakes/dyfi/. We encourage anyone who feels an earthquake to report their observations on this interactive web site; felt information is available by zip code on the CIIM site or can be obtained from UUSS directly.

Earthquakes of Magnitude 3.0 or Larger

M_L 3.1	June 28	08:02 MDT	11.0 mi NE of West Yellowstone, MT

Notable Swarm Seismicity

During the report period, there were six earthquake swarms in the Yellowstone region. For reporting purposes, we use the Mogi definition [Mogi, 1963] of a swarm and require each swarm to have ten or more earthquakes. Note that typically, around 50% of Yellowstone earthquakes occur as part of a seismic swarm [Farrell et al., 2009].

A. A swarm of 10 earthquakes ($-0.1 \leq M \leq 1.5$) occurred about 12.0 mi NE of West Yellowstone, MT from May 7th – 8th.
B. A swarm of 117 earthquakes ($0.1 \leq M \leq 2.5$) occurred about 4.7 mi SE of Madison Junction, YNP from June 21st – 23rd.
C. A swarm of 18 earthquakes ($-0.4 \leq M \leq 1.4$) occurred about 7.3 mi N of West Yellowstone, MT from June 22nd – 24th.
D. A swarm of 147 earthquakes ($-0.8 \leq M \leq 3.1$) occurred about 11.4 mi NE of West Yellowstone, MT from June 26th – 30th.
E. A swarm of 22 earthquakes ($-0.4 \leq M \leq 1.0$) occurred about 4.3 mi E of Madison Junction, YNP from June 27th – 30th.
F. A swarm of 51 earthquakes ($-0.6 \leq M \leq 1.6$) occurred about 8.0 mi N of West Yellowstone, MT from June 29th – 30th.

These swarms are labeled in Figure 1.

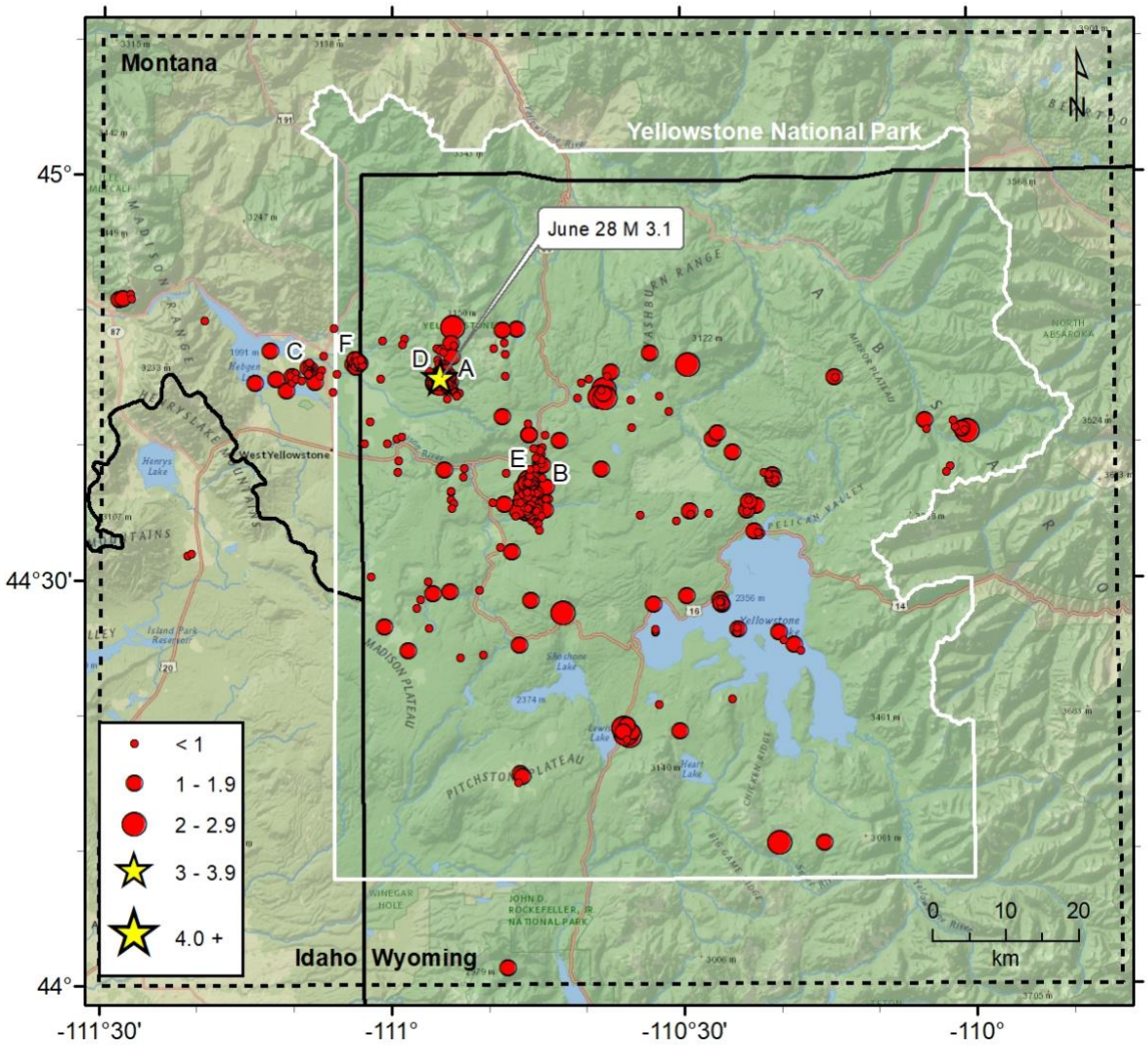

Figure 1. Epicenters of earthquakes located by the University of Utah Seismograph Stations, April 1, 2021, through June 30, 2021. Earthquake swarms (labeled A–F) are discussed in the text.

Table 1

EARTHQUAKES FELT IN THE YELLOWSTONE REGION
January 1, 2021, to June 30, 2021

Date	Time†	Felt Information‡	Latitude	Longitude	Magnitude§
February 09	00:18 MST 07:18 UTC	Yellowstone. Felt (II) at West Yellowstone, MT.	44º 39.00′	111º 06.90′	M_L 2.2

† Times are listed both as Local Time—Mountain Standard Time (MST) or Mountain Daylight Time (MDT)—and as Coordinated Universal Time (UTC).
? Indicates on-line reports that appear questionable given the distance from the source
‡ *CIIM* indicates the availability of a Community Internet Intensity Map (http://earthquake.usgs.gov/earthquakes/dyfi), compiled by the U.S. Geological Survey (USGS); *ShakeMap* indicates the availability of computer-generated maps of ground-shaking (*https://quake.utah.edu*), produced by the University of Utah Seismograph Stations (UUSS). Roman numerals correspond to the Modified Mercalli intensity scale. Unless otherwise indicated, felt information is from the USGS (1) CIIM reports and/or (2) PDE Monthly (or) Weekly Listing Files (http://earthquake.usgs.gov/data/pde.php).
§ Richter local magnitude (M_L) or coda magnitude (M_C) determined by UUSS. If labeled "NEIC," data are from the National Earthquake Information Center of the USGS.

Yellowstone Seismic Network
June 30, 2021

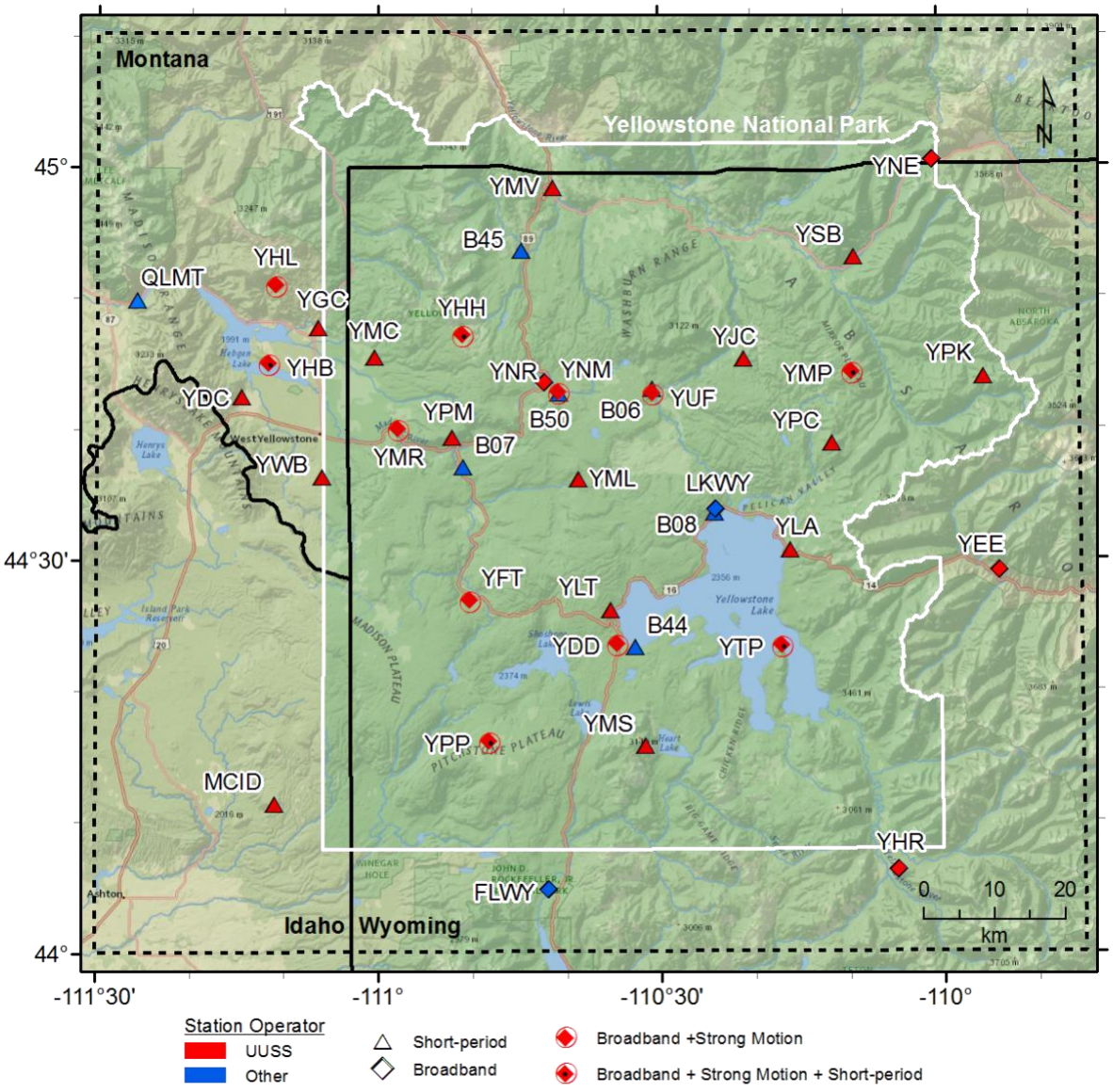

Figure 2. Seismograph stations of the Yellowstone Seismic Network as of June 30, 2021.

Table 2. Earthquakes in the Yellowstone Region: April 1–June 30, 2021

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210401	04:32:25.22	44º20.89’	110º32.45’	2.7	0.5	14	97	6	0.17
210401	22:40:19.95	44º26.55’	110º56.16’	13.2	0.2	9	270	8	0.22
210401	22:40:30.12	44º24.83’	110º58.30’	11.2	1.3W	13	242	12	0.30
210401	22:59:18.98	44º27.99’	110º57.41’	8.2	0.6	12	250	10	0.21
210401	23:00:31.29	44º26.63’	111º00.81’	6.3*	1.1W	19	132	14	0.24
210404	03:44:45.98	44º45.80’	110º54.21’	2.7	0.3	11	149	5	0.10
210404	06:39:48.38	44º26.38’	110º32.82’	2.0	0.4	8	135	3	0.10
210404	06:40:22.82	44º26.21’	110º32.79’	2.6	0.8	11	105	3	0.09
210404	06:40:34.83	44º26.27’	110º32.80’	3.3	0.7	9	131	3	0.14
210404	12:36:33.26	44º37.95’	110º21.47’	6.9	0.7	16	70	9	0.13
210408	01:26:46.20	44º47.76’	111º00.95’	7.5	0.6W	12	202	4	0.13
210408	13:24:15.52	44º45.39’	110º37.31’	3.1	1.5W	19	137	6	0.16
210408	14:18:28.20	44º45.16’	110º37.67’	3.6	0.3	15	98	6	0.26
210411	11:16:00.06	44º41.20’	110º01.67’	12.5	0.9	10	96	10	0.13
210411	11:32:42.03	44º37.89’	110º02.61’	12.6	-0.3	7	186	15	0.14
210411	11:34:11.17	44º38.34’	110º02.23’	10.1	0.7	9	105	14	0.15
210411	12:41:07.48	44º43.50’	110º54.27’	0.9	0.3	10	95	8	0.17
210413	04:45:14.66	44º44.95’	110º39.62’	3.6	0.4	10	248	4	0.14
210413	18:15:55.81	44º35.10’	110º23.31’	3.2	0.2	8	163	3	0.09
210413	21:03:20.09	44º35.18’	110º23.27’	2.9	1.4W	8	163	3	0.08
210419	10:05:19.20	44º44.97’	111º01.15’	5.1	0.2	12	200	1	0.14
210421	16:27:24.55	44º42.52’	110º31.27’	2.3	0.1	9	123	1	0.15
210421	16:27:33.86	44º43.61’	110º32.33’	1.7	0.4	8	211	2	0.07
210421	16:38:58.65	44º45.97’	110º29.27’	4.8	2.2W	19	108	6	0.20
210421	22:26:02.40	44º49.23’	111º19.48’	10.1	0.9	15	95	13	0.17
210423	05:00:11.57	44º44.97’	110º14.08’	8.7	1.2	9	108	6	0.06
210423	05:01:31.85	44º44.98’	110º14.03’	3.2	0.1	8	108	6	0.08
210424	10:00:35.74	44º50.80’	111º27.04’	9.4	0.3	9	150	2	0.14
210425	10:42:38.36	44º50.77’	111º28.32’	9.3	1.3	13	105	4	0.11
210426	09:08:22.50	44º35.25’	110º44.13’	7.2	1.1W	17	84	8	0.15
210426	09:08:51.45	44º33.74’	110º44.79’	2.5	--	9	95	9	0.23
210426	09:12:29.47	44º35.22’	110º44.34’	8.1	1.3W	16	85	9	0.17
210426	09:14:30.62	44º36.09’	110º44.05’	5.1	0.8	11	136	7	0.17
210426	15:22:33.91	44º44.92’	111º09.95’	9.4	0.3	13	115	2	0.20
210426	18:58:04.71	44º10.60’	110º20.12’	10.4	2.1W	22	66	18	0.17
210426	21:16:39.51	44º44.86’	111º12.02’	12.7	1.0W	16	134	0	0.18
210426	21:28:32.82	44º45.56’	111º07.33’	11.0	0.4W	11	115	4	0.16
210427	02:33:38.67	44º47.19’	110º49.43’	5.1	0.4	12	182	2	0.06
210427	09:07:52.47	44º48.73’	110º53.65’	10.6	2.5W	34	72	4	0.19
210429	02:49:45.36	44º50.80’	111º27.92’	11.9	1.0	11	152	23	0.12
210429	05:10:23.41	44º24.83’	110º17.82’	8.4	0.6	8	118	3	0.05
210429	12:30:13.98	44º25.25’	110º18.53’	7.6	1.2W	18	72	4	0.19
210429	23:23:04.58	44º43.95’	111º06.10’	11.4	0.6W	15	99	7	0.21
210504	19:32:03.70	44º37.84’	110º20.99’	6.2	0.6	14	72	9	0.08
210507	03:28:55.71	44º44.44’	110º53.67’	3.8	-0.1	8	109	6	0.06

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210507	04:15:56.00	44º44.59’	110º54.24’	7.7	1.5W	19	102	7	0.13
210507	04:26:19.22	44º44.46’	110º53.83’	4.8	0.8W	10	111	6	0.06
210508	01:30:48.50	44º44.88’	110º54.23’	8.5	-0.1	8	124	6	0.18
210508	01:31:00.09	44º46.56’	110º53.74’	7.8	1.0W	9	164	4	0.26
210508	01:34:07.83	44º44.04’	110º53.36’	2.0	0.7W	8	106	7	0.18
210508	01:58:47.23	44º44.69’	110º54.29’	8.1	1.2W	13	111	6	0.15
210508	02:35:23.78	44º44.68’	110º53.94’	7.2	1.4W	10	117	6	0.11
210508	02:46:07.38	44º45.14’	110º54.18’	8.3	1.1W	12	118	6	0.17
210508	02:47:20.82	44º44.06’	110º53.44’	2.0	0.7W	8	122	7	0.11
210508	10:25:44.00	44º31.83’	111º21.15’	15.9	0.9	9	152	22	0.09
210508	10:47:42.37	44º36.06’	110º43.76’	9.4	0.9W	15	124	7	0.14
210508	11:03:33.13	44º34.19’	110º45.02’	4.8	0.7W	8	143	9	0.09
210508	12:26:02.60	44º31.98’	111º20.76’	16.6	0.9W	14	114	21	0.15
210510	15:12:42.66	44º42.11’	110º48.59’	3.4	1.1W	10	89	7	0.12
210511	12:08:59.16	44º15.11’	110º46.96’	4.3	0.1	6	115	3	0.09
210511	14:08:30.59	44º44.58’	111º14.19’	10.7	1.1W	15	119	3	0.18
210512	06:35:55.11	44º44.63’	110º55.09’	2.4	-0.1	11	115	7	0.11
210512	20:26:32.52	44º39.47’	110º24.77’	2.3	1.1W	10	193	10	0.07
210513	19:50:45.40	44º47.58’	110º53.89’	5.0	1.6W	20	127	4	0.16
210514	00:14:27.20	44º25.60’	110º19.59’	2.5	-0.2	7	122	5	0.11
210514	17:35:57.35	44º41.73’	110º04.80’	9.2	1.8	11	134	8	0.16
210516	20:56:27.24	44º25.23’	110º46.84’	5.3*	1.5	7	253	15	0.09
210516	20:56:38.15	44º28.27’	110º33.01’	2.1	1.7	8	147	5	0.17
210517	05:17:42.96	44º43.77’	110º53.30’	2.1	-0.2	10	94	7	0.10
210517	05:18:05.60	44º43.84’	110º53.34’	2.8	0.2	12	95	7	0.11
210517	05:18:32.05	44º43.72’	110º53.31’	2.1	-0.7	10	93	7	0.13
210517	05:22:46.94	44º43.92’	110º53.54’	3.1	0.3	10	98	7	0.12
210517	05:23:21.30	44º43.73’	110º53.26’	2.0	-0.5	10	93	7	0.11
210517	12:39:55.81	44º41.80’	111º02.27’	11.3	0.6	13	89	7	0.18
210517	16:08:00.76	44º46.68’	111º07.07’	8.8	0.1	10	138	2	0.20
210518	12:43:10.38	44º43.79’	110º38.13’	5.6	1.1	19	134	4	0.14
210518	13:08:04.66	44º44.17’	110º37.99’	5.4	2.2W	21	129	4	0.16
210518	14:48:50.60	44º43.58’	110º38.40’	6.2	2.1W	11	162	3	0.16
210518	14:49:40.13	44º43.52’	110º37.95’	6.4	2.0W	24	132	4	0.15
210518	15:51:38.17	44º44.11’	110º38.27’	5.5	0.7	13	136	4	0.14
210519	03:30:00.84	44º35.39’	110º53.77’	10.3	0.0	11	121	5	0.16
210519	18:24:02.02	44º45.40’	111º10.10’	14.2	0.9	9	154	2	0.20
210520	00:33:53.24	44º44.67’	111º10.38’	9.3	0.7	9	75	2	0.09
210520	07:05:10.97	44º38.34’	110º52.56’	5.5	-0.1	9	161	3	0.03
210520	07:12:21.28	44º35.78’	110º53.61’	11.0	0.1	13	121	4	0.13
210520	07:17:29.09	44º37.73’	110º52.62’	7.2	-0.1	11	188	3	0.04
210520	13:18:02.14	44º47.42’	110º53.57’	4.9	0.6W	8	138	3	0.09
210522	00:03:43.04	44º21.28’	110º24.89’	9.9	0.9	12	148	11	0.07
210523	04:40:16.05	44º37.39’	110º20.31’	6.9	0.6	11	128	9	0.06
210523	11:18:28.54	44º18.81’	110º36.22’	3.7	1.2	14	127	9	0.14

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210523	11:18:49.00	44º18.82’	110º35.37’	3.5	1.8W	13	129	9	0.12
210523	11:19:03.00	44º19.33’	110º35.83’	4.8	1.5	11	126	8	0.12
210523	11:19:56.60	44º18.70’	110º35.92’	3.6	2.3W	17	128	9	0.11
210523	11:20:18.86	44º19.10’	110º36.15’	3.9	2.0	16	125	9	0.12
210523	11:53:01.95	44º18.57’	110º35.53’	5.2	2.5W	25	119	10	0.19
210523	12:02:06.37	44º18.24’	110º35.80’	0.6	0.7	12	131	10	0.12
210524	02:17:10.23	44º38.24’	110º54.61’	10.6	1.2W	11	136	4	0.12
210524	21:14:30.84	44º29.33’	110º50.98’	1.6	0.6	11	165	4	0.19
210526	12:55:34.78	44º10.60’	110º15.50’	10.4	1.3	19	89	16	0.18
210526	19:26:49.72	44º40.42’	110º26.79’	2.2	1.2	11	210	7	0.16
210526	19:30:08.97	44º40.84’	110º26.28’	2.0	1.1	11	221	7	0.18
210526	21:02:10.63	44º46.02’	110º54.49’	5.2	0.6W	7	158	5	0.05
210527	00:10:39.64	44º26.17’	110º20.08’	4.9	1.0	10	97	6	0.10
210528	04:07:32.21	44º46.79’	110º48.25’	4.7	0.9W	13	200	4	0.13
210528	11:42:17.22	44º32.54’	110º48.82’	8.9	0.6W	11	130	9	0.24
210530	03:57:58.74	44º28.39’	110º26.05’	3.0	0.5	9	106	10	0.11
210530	06:21:05.89	44º28.46’	110º26.03’	5.9	0.5	7	123	10	0.05
210530	08:40:13.97	44º28.16’	110º26.00’	2.0	0.7	8	109	10	0.27
210530	10:16:25.93	44º28.58’	110º26.13’	6.0	1.4W	16	78	10	0.14
210530	10:17:58.06	44º28.39’	110º26.09’	3.5	0.3	8	123	10	0.11
210530	10:34:58.01	44º28.31’	110º26.04’	2.2	1.3W	11	108	10	0.07
210530	10:35:13.67	44º28.22’	110º25.92’	2.7	1.7W	11	81	10	0.08
210530	12:28:30.81	44º28.27’	110º26.00’	2.0	0.8	9	81	10	0.09
210530	16:42:14.06	44º29.22’	110º54.03’	8.7	1.5	9	183	6	0.23
210530	16:43:27.17	44º29.08’	110º55.79’	1.5	1.2	6	199	8	0.27
210601	04:02:45.04	44º01.40’	110º48.09’	10.3	1.5W	18	95	11	0.21
210601	19:21:01.80	44º38.04’	110º59.37’	9.9	-0.2	9	182	4	0.14
210602	04:21:02.15	44º40.88’	110º00.36’	15.0	2.7W	17	109	9	0.11
210602	18:10:42.14	44º41.02’	110º01.01’	13.5	1.6	13	102	9	0.18
210602	19:34:45.84	44º38.89’	110º59.32’	9.5	0.2	9	137	3	0.15
210602	19:46:38.85	44º41.69’	110º01.86’	12.8	0.8	9	160	10	0.17
210603	00:57:34.91	44º41.01’	110º00.63’	13.5	0.8	10	163	9	0.17
210603	05:44:11.74	44º35.50’	110º22.29’	2.1	1.5	14	70	4	0.22
210604	17:35:30.08	44º40.17’	111º00.52’	5.1	0.5	10	189	3	0.19
210606	11:02:12.44	44º30.02’	110º56.29’	2.1	0.7	10	156	10	0.25
210606	14:23:29.19	44º35.13’	110º29.21’	5.3	1.7W	13	119	7	0.15
210606	14:25:19.06	44º34.90’	110º29.11’	5.9	0.8	7	116	7	0.05
210606	14:25:38.21	44º34.43’	110º30.58’	5.8	0.6	5	117	9	0.01
210607	04:07:36.69	44º47.02’	111º12.68’	9.7	1.2W	13	145	4	0.17
210607	16:38:52.10	44º48.66’	111º06.01’	7.9	0.4	14	182	2	0.20
210608	08:56:15.92	44º40.20’	111º02.84’	4.7	0.7W	9	97	7	0.15
210609	09:13:33.68	44º45.19’	111º10.60’	8.4	0.6W	11	115	2	0.15
210609	15:03:52.85	44º39.04’	110º44.72’	5.3	0.6	10	126	9	0.10
210609	15:07:36.28	44º38.66’	110º44.56’	5.1	0.6	12	134	9	0.17
210609	15:15:56.93	44º38.98’	110º45.06’	3.8	0.6	9	128	8	0.14

Table 2. Earthquakes in the Yellowstone Region: April 1–June 30, 2021

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210609	15:17:47.34	44º38.56’	110º44.43’	4.9	1.0W	10	136	9	0.13
210609	15:20:07.68	44º38.95’	110º44.97’	3.0	0.2	8	209	9	0.07
210609	15:21:44.38	44º38.58’	110º44.61’	5.0	1.0	9	136	9	0.10
210610	12:17:47.94	44º37.57’	110º20.87’	6.3	0.7	9	129	8	0.06
210611	02:37:15.34	44º47.94’	110º58.73’	6.6	0.9W	14	166	5	0.09
210611	05:30:12.05	44º47.49’	110º58.93’	7.2	0.9W	18	158	4	0.16
210611	08:56:31.88	44º35.78’	110º23.14’	3.0	1.2	10	106	4	0.15
210611	09:03:48.67	44º35.91’	110º23.12’	2.8	0.7	6	125	4	0.13
210612	03:35:04.99	44º45.32’	111º05.72’	12.4	0.6	17	90	5	0.14
210612	04:40:34.54	44º44.84’	111º09.39’	5.5	-0.7	9	114	3	0.19
210612	17:53:11.87	44º40.53’	110º59.49’	5.2	0.5	12	78	2	0.16
210613	02:05:25.47	44º15.56’	110º46.60’	3.0	1.4	13	95	3	0.20
210613	02:08:59.80	44º15.80’	110º46.81’	3.5	1.7	11	94	2	0.13
210613	08:18:20.57	44º51.13’	111º27.15’	9.7*	0.7	18	188	21	0.14
210613	21:50:24.52	44º40.77’	110º45.78’	5.7	1.4W	19	70	7	0.14
210613	22:08:21.04	44º40.77’	110º45.82’	6.1	1.8W	21	55	7	0.17
210614	16:39:56.01	44º38.22’	110º38.29’	4.9	1.0	18	69	4	0.18
210615	05:43:36.06	44º37.66’	110º44.41’	8.4	0.2	11	157	8	0.10
210615	06:22:05.93	44º28.64’	110º57.06’	4.2	0.2	12	110	10	0.20
210615	08:49:28.68	44º44.65’	110º40.39’	1.9	0.3	10	175	3	0.10
210615	08:49:38.30	44º43.56’	110º40.82’	2.0	0.6	10	236	1	0.19
210615	11:20:46.81	44º40.40’	110º42.65’	9.7	1.1W	15	114	5	0.13
210615	11:37:26.23	44º41.64’	110º45.88’	2.2	-0.4	13	102	7	0.13
210615	12:33:50.71	44º47.21’	110º55.36’	8.3	0.4	14	173	6	0.12
210615	14:13:31.25	44º24.35’	110º52.94’	2.8	0.8	8	140	6	0.11
210615	14:14:58.11	44º24.56’	110º50.56’	4.4	0.8	8	130	5	0.08
210616	10:27:38.29	44º30.37’	111º02.19’	15.1	0.9W	19	137	12	0.16
210617	03:36:03.71	44º47.22’	110º54.84’	7.6	0.3W	13	159	5	0.19
210618	20:30:28.12	44º26.16’	110º24.44’	3.4*	0.5	8	129	11	0.07
210619	16:56:58.08	44º26.36’	110º24.27’	1.8*	1.3	10	89	11	0.23
210619	17:58:42.18	44º45.22’	110º54.12’	8.1	0.7	11	131	6	0.15
210619	17:59:27.30	44º44.93’	110º54.27’	6.4	0.5	9	125	6	0.14
210620	04:50:03.68	44º26.53’	110º24.37’	6.0	0.5	8	123	11	0.07
210620	04:50:09.28	44º26.16’	110º24.41’	6.0	0.5	6	129	11	0.27
210620	20:00:40.97	44º28.88’	110º29.54’	5.2	1.1	11	81	9	0.04
210620	20:12:13.89	44º46.80’	110º33.21’	2.3	1.2	11	240	8	0.20
210621	07:29:33.96	44º40.65’	110º59.02’	5.2	0.2	14	76	2	0.15
210621	14:33:47.63	44º35.14’	110º47.00’	7.8	1.0W	21	80	6	0.26
210621	14:34:11.02	44º35.60’	110º46.25’	5.4	1.2W	16	102	7	0.21
210621	14:34:29.56	44º35.84’	110º49.60’	10.7	0.5	10	141	3	0.35
210621	14:34:51.69	44º34.85’	110º47.22’	5.4	0.5	10	166	6	0.23
210621	14:35:24.78	44º35.38’	110º45.74’	4.2	1.5	10	133	8	0.25
210621	14:36:35.24	44º35.16’	110º45.22’	5.1	1.0	14	93	8	0.19
210621	14:36:48.44	44º37.28’	110º45.92’	2.3	--	10	168	7	0.18
210621	14:36:53.87	44º36.92’	110º46.52’	5.8	1.0W	10	240	6	0.21

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210621	15:03:55.33	44º35.18’	110º46.01’	7.6	0.6	7	124	7	0.11
210621	15:15:33.03	44º35.41’	110º45.83’	7.8	0.5	7	122	7	0.13
210621	16:31:46.83	44º35.97’	110º46.06’	8.2	0.9	13	113	7	0.21
210621	16:44:12.60	44º35.89’	110º45.72’	5.0	1.2	15	115	7	0.25
210621	16:46:08.08	44º35.73’	110º45.88’	6.6	1.3	14	73	7	0.18
210621	16:47:18.16	44º35.52’	110º46.20’	6.5	0.9W	14	75	7	0.18
210621	16:47:27.32	44º34.65’	110º45.23’	6.9	1.3	10	135	9	0.19
210621	16:49:19.43	44º35.65’	110º45.77’	6.9	1.4W	21	88	7	0.20
210621	16:49:23.67	44º37.01’	110º45.55’	3.5	1.4W	9	170	7	0.15
210621	16:49:41.70	44º35.47’	110º45.39’	5.3	1.3	11	123	8	0.17
210621	16:50:02.79	44º35.86’	110º45.64’	7.0	0.8	14	102	7	0.26
210621	16:50:39.30	44º35.90’	110º45.82’	7.4	1.3W	20	86	7	0.20
210621	16:50:49.29	44º38.02’	110º48.19’	4.9	0.6	10	198	4	0.09
210621	16:55:12.47	44º35.68’	110º45.95’	7.5	2.4W	26	54	7	0.17
210621	16:56:42.46	44º36.66’	110º46.24’	4.3	1.0	11	179	6	0.20
210621	16:58:10.74	44º35.38’	110º45.83’	6.8	1.3W	12	107	7	0.15
210621	16:59:37.79	44º36.08’	110º46.50’	5.5	1.3	16	75	6	0.28
210621	17:00:13.04	44º35.66’	110º45.53’	3.3	0.9W	15	71	9	0.23
210621	17:00:24.75	44º35.74’	110º45.77’	7.3	1.8W	17	73	7	0.22
210621	17:01:43.27	44º35.60’	110º46.00’	6.4	1.4	14	118	7	0.22
210621	17:02:07.92	44º35.61’	110º45.40’	5.8	0.8	14	121	8	0.29
210621	17:02:25.67	44º36.41’	110º46.07’	6.1	2.0W	24	86	7	0.22
210621	17:05:49.49	44º35.20’	110º45.32’	4.0	0.8W	12	92	8	0.09
210621	17:08:29.69	44º27.62’	110º42.30’	3.1*	2.5W	12	264	17	0.18
210621	17:10:10.76	44º35.82’	110º46.50’	7.7	1.8W	18	89	6	0.10
210621	17:11:51.16	44º35.97’	110º46.09’	7.7	2.1W	24	130	7	0.15
210621	17:12:30.82	44º36.22’	110º45.90’	5.9	1.4	13	186	7	0.14
210621	17:12:42.03	44º36.35’	110º46.00’	6.1	2.1W	24	97	7	0.16
210621	17:12:48.83	44º37.38’	110º45.76’	4.0	2.4W	14	160	7	0.24
210621	17:14:40.35	44º35.19’	110º45.86’	6.6	1.3W	18	98	8	0.18
210621	17:15:06.05	44º37.22’	110º46.14’	2.2	1.0	10	235	6	0.13
210621	17:15:28.11	44º36.16’	110º46.20’	6.6	1.8W	28	73	6	0.21
210621	17:15:40.36	44º36.19’	110º45.65’	5.5	1.6	12	112	7	0.25
210621	17:16:39.26	44º36.40’	110º46.22’	5.1	1.3W	21	85	6	0.22
210621	17:20:10.84	44º35.94’	110º45.86’	7.0	2.5W	30	86	7	0.18
210621	17:20:42.31	44º37.24’	110º45.89’	5.2	1.7W	25	70	7	0.20
210621	17:21:53.81	44º36.88’	110º46.02’	5.5	1.0W	20	96	6	0.18
210621	17:23:07.11	44º35.80’	110º46.19’	6.5	2.0W	21	104	7	0.20
210621	17:25:54.92	44º35.96’	110º46.18’	7.0	0.9	15	131	7	0.16
210621	17:26:45.91	44º37.01’	110º45.57’	2.1	0.6	11	123	7	0.16
210621	17:27:51.96	44º35.78’	110º45.93’	7.7	2.3W	27	56	7	0.18
210621	17:30:25.38	44º37.29’	110º45.50’	4.3	0.5W	10	98	7	0.15
210621	17:32:19.58	44º36.59’	110º45.93’	4.8	1.0W	15	127	7	0.19
210621	17:33:04.37	44º36.56’	110º46.01’	4.1	0.2	9	137	7	0.15
210621	17:36:26.85	44º35.92’	110º45.56’	7.8	1.5W	19	86	7	0.15

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210621	17:38:28.82	44º36.61’	110º45.71’	6.2	1.2W	18	84	7	0.18
210621	17:40:58.17	44º35.62’	110º46.21’	10.1	0.7W	11	75	7	0.15
210621	17:41:24.30	44º35.79’	110º46.76’	6.6	0.1	8	99	6	0.06
210621	17:41:36.23	44º35.82’	110º47.06’	7.7	0.1	7	110	6	0.11
210621	17:41:53.72	44º36.41’	110º46.54’	10.6	0.4	6	106	6	0.14
210621	17:49:12.73	44º37.00’	110º45.92’	2.2	0.7	13	171	7	0.14
210621	17:50:04.84	44º35.69’	110º45.67’	2.2	1.1	10	119	7	0.18
210621	17:53:35.65	44º35.64’	110º45.28’	6.4	1.1	14	70	8	0.27
210621	17:59:18.53	44º35.74’	110º45.81’	5.3	2.1W	22	87	7	0.18
210621	18:00:44.03	44º35.60’	110º45.51’	6.9	1.2W	18	88	8	0.20
210621	18:03:59.65	44º36.31’	110º45.77’	5.2	0.9	12	110	7	0.22
210621	18:04:50.00	44º36.06’	110º45.44’	4.9	0.7	13	71	8	0.26
210621	18:05:03.36	44º36.49’	110º45.07’	2.5	0.6	11	77	8	0.25
210621	18:06:12.19	44º35.57’	110º45.38’	7.0	2.1W	22	87	8	0.16
210621	18:11:19.91	44º36.23’	110º45.56’	4.7	0.9	11	196	7	0.10
210621	18:11:30.84	44º36.16’	110º45.36’	5.2	0.8	10	196	8	0.14
210621	18:11:48.21	44º34.27’	110º44.89’	2.4	0.5	9	165	9	0.32
210621	18:12:12.67	44º38.37’	110º45.17’	5.6	0.9	8	105	8	0.26
210621	18:16:22.61	44º35.67’	110º45.59’	7.1	1.6W	20	87	8	0.19
210621	18:18:30.60	44º36.54’	110º45.24’	6.3	1.1W	13	125	8	0.20
210621	18:23:32.06	44º35.96’	110º45.40’	7.6	1.9W	23	86	8	0.17
210621	18:26:53.20	44º35.11’	110º45.49’	9.1	1.3W	22	72	8	0.16
210621	18:27:10.30	44º34.84’	110º44.56’	2.5	0.3	11	189	9	0.16
210621	18:29:01.26	44º36.32’	110º45.34’	5.9	0.9W	19	88	8	0.19
210621	18:30:35.21	44º35.22’	110º45.79’	6.7	0.8	12	107	8	0.16
210621	18:30:40.06	44º35.03’	110º46.14’	9.4	1.8W	7	124	7	0.09
210621	18:50:01.25	44º35.81’	110º45.76’	6.2	0.9	12	115	7	0.21
210621	18:50:36.06	44º35.70’	110º45.50’	5.5	1.3W	22	87	8	0.23
210621	18:52:39.38	44º36.01’	110º45.68’	7.0	1.5W	10	186	7	0.11
210621	18:52:52.35	44º36.11’	110º45.52’	4.7	2.2W	8	187	7	0.10
210621	18:56:21.95	44º36.87’	110º45.53’	1.9	0.9	10	173	7	0.15
210621	19:02:51.93	44º36.37’	110º44.73’	9.9	1.8	14	125	8	0.17
210621	19:10:37.00	44º34.96’	110º45.96’	9.2	0.8W	9	126	8	0.13
210621	19:13:22.39	44º35.37’	110º46.17’	7.0	2.0W	16	91	7	0.15
210621	19:19:01.19	44º36.19’	110º45.75’	4.8	1.0	18	128	7	0.17
210621	19:37:59.68	44º36.57’	110º45.40’	5.0	0.6W	15	126	7	0.16
210621	19:51:57.93	44º35.77’	110º45.63’	2.1	1.2	9	207	7	0.12
210621	20:16:53.47	44º35.89’	110º45.53’	8.1	1.3W	18	86	7	0.14
210621	20:17:20.37	44º36.28’	110º45.45’	7.7	1.4W	18	85	7	0.15
210621	20:55:16.05	44º36.43’	110º46.38’	5.0	1.3W	17	86	6	0.17
210621	20:59:05.93	44º35.99’	110º46.08’	6.9	1.7W	25	104	7	0.19
210621	21:02:27.35	44º36.40’	110º46.00’	4.9	1.2W	14	128	7	0.14
210621	21:04:18.66	44º37.21’	110º45.58’	3.1	1.0	12	123	7	0.19
210621	21:04:44.72	44º35.41’	110º45.39’	2.0	1.3	5	215	8	0.25
210621	21:05:34.50	44º34.99’	110º45.07’	8.5	1.6	10	132	9	0.15

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210621	21:07:09.55	44º36.35’	110º45.81’	4.9	0.6	7	193	7	0.14
210621	21:16:16.86	44º32.14’	110º47.63’	3.8	1.0	8	195	10	0.14
210621	21:44:55.03	44º36.01’	110º46.27’	3.7	0.9	10	91	6	0.19
210621	21:47:35.35	44º36.35’	110º46.08’	2.8	0.9	7	193	7	0.14
210621	22:07:54.80	44º36.64’	110º46.14’	5.0	1.2W	15	186	6	0.14
210621	22:23:21.73	44º36.02’	110º46.16’	5.8	1.5W	22	87	7	0.18
210622	00:22:12.07	44º35.18’	110º45.05’	6.3	0.6	12	91	9	0.14
210622	00:29:51.43	44º36.90’	110º44.09’	6.3	1.3W	12	76	7	0.27
210622	00:32:32.67	44º36.54’	110º45.65’	2.9	0.3	10	188	7	0.18
210622	00:32:44.04	44º37.08’	110º45.64’	2.1	0.8W	10	127	7	0.13
210622	03:05:10.68	44º34.93’	110º45.71’	7.1	0.9W	12	73	8	0.13
210622	03:05:10.74	44º34.85’	110º45.68’	6.1	0.9W	12	99	8	0.16
210622	06:54:40.44	44º35.35’	110º45.95’	5.5	0.1	11	122	7	0.25
210622	08:51:25.11	44º45.54’	111º08.58’	9.7	-0.4	10	90	4	0.16
210622	09:31:31.63	44º35.60’	110º45.95’	5.1	0.6W	11	103	7	0.20
210622	09:32:30.23	44º35.66’	110º45.68’	5.8	0.6W	11	104	7	0.21
210622	10:16:41.73	44º45.32’	111º08.69’	9.0	--	11	82	4	0.17
210622	10:17:52.44	44º45.27’	111º08.69’	8.0	-0.4	10	80	4	0.15
210622	10:18:41.22	44º45.35’	111º08.34’	8.8	-0.4	14	78	5	0.19
210622	10:19:43.82	44º45.80’	111º08.64’	11.6	0.7W	15	91	4	0.15
210622	10:20:49.11	44º45.68’	111º08.30’	8.7	-0.2	10	85	5	0.14
210622	10:26:19.92	44º45.71’	111º08.64’	10.8	1.4W	20	89	4	0.15
210622	10:44:27.79	44º41.32’	110º35.15’	4.6	0.3	15	142	6	0.20
210622	10:44:36.18	44º43.39’	110º35.26’	2.0	0.4	8	191	6	0.26
210622	11:14:54.75	44º46.15’	111º08.58’	11.1	-0.4	11	96	4	0.16
210622	11:27:20.05	44º45.41’	111º08.60’	8.6	-0.4	11	93	4	0.18
210622	11:27:34.48	44º45.36’	111º08.55’	8.8	-0.2	11	81	4	0.17
210622	13:45:21.48	44º35.88’	110º45.24’	5.9	0.9	12	70	8	0.12
210622	13:47:42.86	44º36.48’	110º45.35’	4.8	0.6	18	101	7	0.18
210622	14:11:17.70	44º37.23’	110º45.34’	2.3	0.6	13	167	7	0.14
210622	14:28:58.81	44º45.93’	111º08.63’	10.6	0.9W	12	93	4	0.16
210622	14:31:40.15	44º35.47’	110º46.29’	5.1	0.6	16	98	7	0.23
210622	14:31:50.83	44º36.13’	110º47.05’	6.7	0.7	10	108	5	0.19
210622	15:24:58.32	44º45.81’	111º08.06’	8.6	0.4	15	85	4	0.19
210622	16:15:10.39	44º45.49’	111º08.35’	7.5	0.5	13	82	5	0.14
210622	17:43:55.77	44º45.32’	111º08.68’	8.5	-0.1	14	81	4	0.19
210622	17:44:23.86	44º45.63’	111º08.77’	8.9	-0.3	11	89	4	0.23
210622	18:27:07.14	44º45.58’	111º08.08’	7.6	0.5	16	81	5	0.19
210622	21:56:12.64	44º35.97’	110º46.22’	6.4	1.0	9	156	7	0.15
210622	22:54:51.28	44º47.05’	110º55.10’	6.7	0.1	15	155	5	0.15
210622	22:54:51.39	44º46.90’	110º54.64’	6.2	-0.1	9	189	5	0.14
210622	23:27:41.54	44º45.57’	111º08.49’	6.4	-0.3	9	145	4	0.11
210623	03:53:35.30	44º36.54’	110º46.32’	2.1	0.6	9	97	6	0.24
210623	03:53:51.59	44º18.86’	110º30.37’	4.9	0.9	10	135	6	0.08
210623	12:06:08.72	44º45.19’	110º48.24’	3.3	0.4	8	155	5	0.11

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210624	05:11:51.74	44º45.97’	111º08.75’	12.6	-0.1	11	96	4	0.14
210624	07:43:34.11	44º41.05’	110º04.59’	12.3	0.6	10	142	9	0.13
210624	08:17:04.94	44º46.25’	111º03.54’	10.5	-0.1	13	130	4	0.15
210624	20:34:03.41	44º34.88’	110º34.31’	9.8	0.8	8	263	6	0.19
210625	22:55:40.39	44º36.57’	110º53.89’	11.1	0.6	11	178	4	0.10
210625	23:03:52.99	44º36.61’	110º53.88’	11.1	0.5	11	178	4	0.11
210625	23:07:21.58	44º36.01’	110º53.88’	11.7	0.7W	13	110	4	0.11
210626	03:15:33.81	44º36.66’	110º53.90’	10.0	0.1	10	178	4	0.16
210626	05:21:51.73	44º45.14’	110º54.68’	9.0	-0.3	12	112	6	0.10
210626	11:05:34.78	44º45.36’	110º54.50’	8.1	0.4W	13	115	6	0.12
210626	11:05:52.65	44º45.09’	110º54.59’	8.5	0.4W	14	110	6	0.12
210626	15:42:50.51	44º45.26’	110º54.65’	8.7	0.8W	15	114	6	0.09
210626	15:45:04.87	44º45.10’	110º54.43’	7.2	0.1	11	130	6	0.15
210627	07:20:42.72	44º47.60’	110º48.37’	5.1	0.6W	15	186	4	0.09
210627	14:05:45.13	44º33.64’	110º22.51’	3.8	1.0	10	88	2	0.13
210627	14:12:14.06	44º33.47’	110º21.87’	2.2	0.7	8	129	3	0.11
210627	14:12:44.33	44º33.51’	110º22.17’	2.3	0.3	7	130	3	0.07
210627	15:14:03.28	44º33.35’	110º22.04’	2.3	0.6	7	128	3	0.09
210627	17:58:56.64	44º45.25’	110º54.81’	8.9	0.6	15	115	6	0.09
210627	19:31:55.86	44º44.65’	110º54.36’	6.8	-0.1	7	118	7	0.07
210627	20:40:25.45	44º44.43’	110º54.14’	4.4	-0.2	12	112	7	0.12
210627	20:40:42.32	44º37.76’	110º45.75’	4.6	0.5	11	156	7	0.13
210627	20:48:03.64	44º36.21’	110º45.88’	2.5	0.3	7	197	7	0.08
210627	20:48:35.68	44º37.19’	110º45.77’	2.3	-0.1	8	171	7	0.07
210627	20:48:43.14	44º35.69’	110º48.38’	1.1	1.0	9	115	4	0.24
210627	20:57:26.99	44º37.27’	110º46.10’	7.9	0.6	12	169	6	0.14
210627	20:58:48.09	44º36.05’	110º46.11’	5.2	0.7	8	201	7	0.07
210627	20:59:45.83	44º38.24’	110º45.71’	4.4	0.1	7	144	7	0.09
210627	20:59:55.55	44º37.85’	110º45.83’	3.9	0.7	8	153	7	0.10
210627	21:00:17.17	44º37.13’	110º45.81’	5.8	0.4	8	173	7	0.10
210627	21:00:50.17	44º36.60’	110º46.08’	5.1	0.3	6	187	6	0.10
210627	21:01:30.83	44º37.77’	110º45.71’	2.0	0.4	12	156	7	0.18
210627	21:49:51.48	44º37.19’	110º45.80’	7.7	0.9W	18	99	7	0.21
210627	21:49:51.53	44º36.61’	110º45.75’	6.4	0.9W	14	106	7	0.19
210628	03:23:34.49	44º45.07’	110º54.51’	7.5	0.3	14	109	6	0.12
210628	03:41:32.78	44º44.03’	111º10.92’	10.9	1.3W	18	90	2	0.17
210628	05:18:30.61	44º44.40’	110º54.21’	4.4	-0.3	12	112	7	0.11
210628	05:18:37.17	44º44.35’	110º54.10’	3.1	-0.1	10	110	7	0.11
210628	05:24:16.21	44º45.40’	110º54.62’	8.4	0.5W	15	117	6	0.11
210628	05:24:41.37	44º44.96’	110º54.74’	7.5	0.7W	17	97	7	0.13
210628	05:34:30.95	44º44.93’	110º54.60’	7.9	0.9W	20	96	6	0.17
210628	05:35:56.62	44º45.26’	110º54.71’	8.8	1.4W	18	98	6	0.10
210628	06:42:31.19	44º44.35’	110º54.05’	3.9	-0.3	13	110	7	0.16
210628	07:42:53.44	44º44.96’	110º54.43’	7.0	0.4W	16	108	6	0.12
210628	10:27:12.46	44º44.58’	110º54.43’	2.2	0.0	12	117	7	0.20

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210628	10:56:53.82	44º44.91’	110º54.44’	6.8	-0.3	8	126	6	0.09
210628	10:56:54.41	44º28.57’	110º45.69’	2.2	1.5W	12	92	7	0.16
210628	11:23:20.24	44º48.59’	110º47.09’	4.2	1.2W	22	103	6	0.20
210628	13:42:11.17	44º44.62’	110º54.97’	9.0	2.0W	24	95	7	0.15
210628	13:43:22.27	44º44.98’	110º54.72’	8.3	1.2W	20	97	6	0.17
210628	14:01:31.25	44º45.06’	110º54.68’	9.9	1.3W	18	111	6	0.13
210628	14:01:51.81	44º44.85’	110º54.38’	7.2	-0.1	13	106	6	0.13
210628	14:02:04.32	44º44.83’	110º54.91’	7.6	1.8W	22	96	7	0.17
210628	14:02:29.54	44º45.11’	110º55.01’	10.9	3.1W	34	98	7	0.18
210628	14:03:42.06	44º44.73’	110º54.72’	7.6	1.4	17	95	7	0.13
210628	14:06:58.93	44º44.67’	110º55.37’	9.4	1.8W	19	95	7	0.11
210628	14:08:02.67	44º45.08’	110º54.79’	8.4	0.7W	15	112	6	0.12
210628	14:08:11.93	44º44.75’	110º54.60’	2.4	-0.2	8	122	7	0.18
210628	14:09:37.73	44º45.25’	110º54.82’	8.7	0.7W	15	115	6	0.13
210628	14:14:19.67	44º45.23’	110º54.69’	9.1	-0.7	7	114	6	0.07
210628	14:14:25.00	44º45.12’	110º54.77’	6.9	-0.3	10	140	6	0.11
210628	14:14:32.30	44º45.26’	110º54.95’	8.7	0.4	12	116	6	0.10
210628	14:16:42.51	44º44.65’	110º55.26’	9.1	2.3W	26	95	7	0.15
210628	14:24:48.16	44º45.11’	110º54.88’	8.3	0.2	16	113	6	0.18
210628	14:38:30.37	44º45.10’	110º54.80’	8.1	1.2W	20	112	6	0.19
210628	14:46:57.62	44º44.72’	110º55.05’	8.7	1.4W	20	95	7	0.17
210628	14:58:04.42	44º45.26’	110º54.53’	8.2	0.6	17	113	6	0.17
210628	14:59:23.30	44º45.25’	110º54.46’	8.4	1.2W	19	112	6	0.17
210628	15:29:41.02	44º44.96’	110º54.74’	8.8	2.5W	26	106	7	0.16
210628	15:34:02.35	44º44.76’	110º54.32’	5.2	0.1	10	121	6	0.11
210628	15:34:06.15	44º44.31’	110º54.06’	2.1	0.7W	10	109	7	0.11
210628	15:35:48.75	44º45.21’	110º54.90’	7.2	0.8W	14	114	6	0.16
210628	15:37:06.25	44º44.97’	110º55.01’	6.4	0.6	16	111	7	0.18
210628	15:37:35.05	44º45.15’	110º54.81’	8.1	1.4W	18	113	6	0.18
210628	15:41:59.42	44º45.33’	110º54.86’	8.3	0.4	14	117	6	0.14
210628	15:47:49.61	44º44.05’	110º53.67’	2.6	-0.2	7	168	9	0.16
210628	15:48:24.30	44º44.61’	110º54.05’	4.7	0.1	12	116	6	0.17
210628	15:49:10.86	44º44.84’	110º54.59’	5.3	0.1	11	125	7	0.19
210628	15:49:10.94	44º44.61’	110º54.51’	4.6	0.0	11	119	7	0.20
210628	15:50:47.91	44º45.05’	110º54.92’	7.2	0.6W	15	112	7	0.19
210628	16:05:24.82	44º44.19’	110º54.44’	2.1	-0.4	9	122	7	0.17
210628	16:05:34.37	44º44.84’	110º54.49’	5.5	0.1	10	125	6	0.15
210628	16:06:19.76	44º44.46’	110º53.87’	3.4	-0.3	11	111	6	0.15
210628	16:09:43.07	44º44.95’	110º54.66’	8.1	1.0	19	109	6	0.17
210628	16:10:32.42	44º44.95’	110º54.83’	8.4	0.9W	12	110	7	0.15
210628	16:10:45.11	44º43.93’	110º52.98’	2.3	-0.5	8	94	7	0.20
210628	16:11:01.84	44º45.55’	110º56.12’	7.1	-0.1	9	153	6	0.14
210628	16:12:11.69	44º44.76’	110º54.62’	5.4	0.0	14	106	7	0.20
210628	16:12:48.15	44º45.07’	110º55.14’	6.4	0.9W	16	113	7	0.15
210628	16:13:15.12	44º45.21’	110º54.83’	7.7	0.6W	9	114	6	0.06

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210628	16:13:19.62	44º45.19’	110º54.96’	7.1	1.2W	12	114	7	0.09
210628	16:14:13.61	44º45.13’	110º54.83’	7.8	0.8W	16	113	6	0.08
210628	16:19:20.30	44º45.29’	110º54.72’	8.1	0.9W	16	115	6	0.12
210628	16:22:10.22	44º44.81’	110º54.36’	6.6	0.3	12	105	6	0.09
210628	16:33:25.50	44º45.04’	110º54.90’	5.1	0.4	9	132	7	0.10
210628	16:41:34.65	44º45.18’	110º54.73’	7.7	1.5W	19	114	6	0.13
210628	16:43:21.93	44º45.21’	110º54.79’	7.9	1.1W	15	115	6	0.11
210628	16:45:23.12	44º44.87’	110º54.52’	5.9	0.6	9	125	6	0.10
210628	16:59:01.89	44º44.91’	110º54.52’	6.1	0.4	10	127	6	0.10
210628	16:59:30.83	44º44.95’	110º54.46’	7.3	0.7W	16	108	6	0.11
210628	17:08:09.63	44º45.01’	110º54.71’	8.2	1.7W	21	97	6	0.16
210628	17:09:44.36	44º45.04’	110º54.56’	7.9	0.4	11	110	6	0.09
210628	17:11:34.10	44º45.05’	110º54.54’	8.1	0.5	11	109	6	0.09
210628	17:12:38.55	44º44.59’	110º54.21’	4.6	-0.6	11	116	7	0.16
210628	17:13:02.00	44º44.64’	110º54.46’	4.8	0.1	12	119	7	0.17
210628	17:43:06.58	44º44.70’	110º54.32’	4.9	0.6	11	120	6	0.14
210628	18:00:19.44	44º44.41’	110º55.16’	2.3	0.1	11	117	7	0.28
210628	18:05:57.82	44º45.10’	110º54.53’	8.5	0.3	11	110	6	0.10
210628	18:10:09.60	44º45.20’	110º54.54’	7.1	0.4	12	112	6	0.09
210628	18:18:11.32	44º45.11’	110º54.79’	8.6	2.2W	21	97	6	0.15
210628	18:22:48.68	44º45.16’	110º54.77’	7.8	1.4W	16	113	6	0.09
210628	18:25:11.45	44º44.40’	110º54.01’	2.1	0.5	12	111	7	0.17
210628	18:25:29.57	44º44.37’	110º54.07’	2.2	-0.5	10	111	7	0.14
210628	18:28:55.63	44º44.52’	110º54.36’	4.8	0.3	13	116	7	0.17
210628	18:37:50.15	44º45.15’	110º54.55’	8.1	1.1W	15	112	6	0.11
210628	19:41:41.10	44º45.27’	110º54.97’	7.5	0.3	12	117	6	0.11
210628	20:02:53.92	44º45.25’	110º54.92’	8.5	1.5W	16	115	6	0.12
210628	21:37:03.31	44º45.24’	110º54.60’	7.3	1.4W	19	113	6	0.13
210628	21:49:28.76	44º44.85’	110º54.50’	5.4	0.5	10	125	6	0.13
210628	22:27:31.57	44º44.76’	110º54.51’	4.9	0.3	11	123	7	0.13
210628	23:53:02.52	44º37.74’	110º20.59’	4.8	1.5	13	103	9	0.11
210628	23:58:20.24	44º37.48’	110º20.57’	5.0	1.3	9	129	9	0.07
210629	01:10:04.33	44º44.78’	110º54.39’	5.7	0.1	10	122	6	0.13
210629	05:14:20.81	44º44.94’	110º55.01’	8.9	2.2W	28	96	7	0.17
210629	05:17:49.90	44º45.12’	110º54.78’	8.2	0.5W	13	112	6	0.10
210629	06:11:48.79	44º44.96’	110º54.66’	7.2	0.9W	15	97	6	0.13
210629	07:13:50.94	44º45.15’	110º54.89’	7.6	-0.1	10	134	6	0.10
210629	10:08:41.95	44º44.54’	110º54.32’	5.0	0.1	11	116	7	0.14
210629	11:09:53.74	44º44.64’	110º54.46’	5.2	0.0	11	119	7	0.13
210629	11:10:20.75	44º44.81’	110º54.73’	5.8	-0.8	11	125	7	0.15
210629	11:10:44.16	44º44.50’	110º54.44’	4.1	-0.8	11	115	7	0.16
210629	11:11:05.64	44º45.01’	110º54.73’	8.4	1.7W	21	97	6	0.13
210629	11:17:49.50	44º45.02’	110º54.48’	7.3	-0.2	12	109	6	0.14
210629	11:18:54.00	44º44.58’	110º54.86’	2.4	-0.1	7	199	7	0.10
210629	12:00:40.61	44º44.81’	110º54.62’	5.8	0.0	9	124	7	0.12

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210629	12:30:23.30	44º44.88’	110º54.58’	6.3	0.9W	15	108	6	0.13
210629	12:45:42.70	44º44.69’	110º54.44’	4.9	0.2	10	120	7	0.10
210629	13:03:48.84	44º44.64’	110º54.25’	5.7	0.0	11	118	7	0.10
210629	13:52:56.29	44º45.16’	110º54.27’	6.9	0.2	8	131	6	0.11
210629	15:03:55.29	44º48.52’	110º48.54’	4.6	1.1W	19	193	4	0.13
210629	15:24:19.54	44º44.68’	110º54.27’	4.3	-0.1	10	119	6	0.09
210629	15:45:51.13	44º44.96’	110º54.22’	8.0	0.9W	10	126	6	0.14
210629	16:06:24.09	44º45.08’	111º10.37’	11.5	1.0W	17	87	2	0.16
210629	16:07:17.86	44º45.17’	111º07.48’	10.4	0.3	12	101	6	0.09
210629	16:54:23.47	44º44.76’	110º54.11’	5.3	0.4	8	119	6	0.10
210629	17:41:39.72	44º45.71’	110º54.67’	10.3	0.9W	11	150	6	0.13
210629	17:41:39.72	44º45.73’	110º54.94’	10.2	0.9W	14	124	6	0.11
210629	18:29:35.82	44º45.81’	110º54.67’	10.8	0.4	15	125	6	0.08
210629	18:29:40.47	44º45.25’	110º54.48’	2.0	0.4	7	135	6	0.22
210629	18:49:31.92	44º45.71’	110º54.45’	8.3	0.1	14	121	5	0.11
210629	19:06:14.71	44º46.46’	111º03.87’	11.3	0.8	17	131	4	0.12
210629	19:28:33.64	44º45.08’	110º55.08’	8.6	1.6W	19	98	7	0.12
210629	19:44:37.45	44º46.51’	111º03.79’	11.2	0.4	10	132	4	0.12
210629	20:38:20.47	44º46.04’	111º04.02’	10.9	1.6W	19	96	4	0.14
210629	20:39:12.56	44º46.27’	111º03.67’	10.7	1.1W	16	130	5	0.13
210629	20:47:27.76	44º46.31’	111º03.69’	10.7	-0.3	8	130	5	0.14
210629	20:47:43.57	44º46.68’	111º03.73’	10.9	0.1	13	135	5	0.14
210629	20:53:50.67	44º46.43’	111º03.81’	10.3	0.8W	17	127	5	0.12
210629	20:58:05.81	44º46.07’	111º03.69’	11.0	1.3W	18	128	4	0.15
210629	21:13:48.80	44º39.42’	110º44.57’	7.3	0.9	11	119	8	0.10
210629	21:32:16.73	44º46.23’	111º03.43’	10.3	0.7	16	131	4	0.20
210629	21:34:16.40	44º44.83’	110º54.50’	5.2	0.3	11	124	6	0.16
210629	22:02:57.38	44º46.06’	111º03.71’	10.6	1.2W	19	127	5	0.17
210629	22:07:36.02	44º46.17’	111º03.60’	10.3	0.8W	17	129	4	0.18
210629	22:09:37.68	44º46.36’	111º03.85’	10.4	1.0W	14	131	5	0.09
210629	22:24:01.48	44º46.21’	111º03.77’	10.6	1.1W	17	129	5	0.17
210629	23:02:43.14	44º44.97’	110º54.94’	7.9	1.4W	18	96	7	0.16
210629	23:03:54.14	44º45.09’	110º54.84’	7.1	0.4	13	112	6	0.15
210629	23:04:50.37	44º45.22’	110º55.06’	7.7	0.7W	16	115	7	0.17
210629	23:04:56.96	44º44.11’	110º53.69’	2.5	-0.1	8	173	7	0.13
210629	23:07:53.50	44º44.86’	110º54.92’	8.1	0.9W	14	109	7	0.17
210629	23:10:22.89	44º45.22’	110º54.83’	7.8	1.3W	18	115	6	0.16
210629	23:11:31.04	44º44.70’	110º54.16’	5.3	0.4	12	118	6	0.15
210629	23:14:52.71	44º44.51’	110º54.55’	2.2	0.1	10	116	7	0.16
210629	23:18:37.00	44º46.10’	111º03.69’	11.1	0.3	13	130	4	0.15
210629	23:22:29.33	44º44.75’	110º54.56’	5.3	0.0	12	122	7	0.15
210629	23:39:28.14	44º45.27’	110º54.80’	7.6	0.1	15	115	6	0.20
210630	00:12:22.52	44º46.18’	111º03.35’	10.8	0.8W	17	130	4	0.17
210630	00:13:43.12	44º45.13’	110º54.93’	7.8	--	8	134	7	0.07
210630	00:13:44.20	44º44.91’	110º54.94’	7.3	1.4W	21	96	7	0.17

Table 2. Earthquakes in the Yellowstone Region: April 1–June 30, 2021

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210630	00:24:15.07	44º46.22’	111º03.87’	9.2	0.7W	18	129	4	0.19
210630	00:41:36.48	44º46.09’	111º03.63’	9.8	0.8	16	128	4	0.16
210630	00:54:18.80	44º46.25’	111º03.60’	10.2	1.0W	17	130	4	0.16
210630	01:09:40.36	44º46.10’	111º03.60’	11.0	1.3W	19	128	4	0.14
210630	01:10:56.36	44º46.07’	111º03.49’	10.9	1.1W	17	128	4	0.17
210630	01:12:14.76	44º46.11’	111º03.40’	10.3	1.0W	20	129	4	0.18
210630	01:12:48.44	44º46.02’	111º03.53’	10.7	1.2W	17	127	4	0.16
210630	01:12:48.45	44º45.82’	111º03.70’	10.6	1.2W	17	124	4	0.15
210630	01:13:00.00	44º45.87’	111º03.49’	9.2	0.6	13	125	4	0.22
210630	01:30:47.10	44º45.86’	111º03.85’	8.9	-0.1	12	124	5	0.15
210630	01:48:13.04	44º46.17’	111º03.68’	10.7	0.2	16	128	5	0.15
210630	02:49:47.08	44º46.15’	111º03.88’	8.9	0.0	13	127	5	0.14
210630	03:08:49.28	44º46.22’	111º03.47’	10.0	0.9W	18	129	4	0.13
210630	03:09:42.53	44º46.04’	111º03.58’	10.8	1.3W	21	127	4	0.16
210630	03:14:12.31	44º46.02’	111º03.30’	10.2	0.8W	17	128	4	0.16
210630	04:12:26.08	44º46.28’	111º03.71’	10.6	1.2W	19	130	4	0.16
210630	04:31:06.10	44º46.33’	111º03.67’	10.5	0.5W	13	130	4	0.16
210630	04:40:48.50	44º46.20’	111º03.56’	8.2	0.1	17	129	4	0.15
210630	04:49:48.02	44º45.94’	111º03.63’	9.9	0.9W	18	126	4	0.14
210630	04:51:40.95	44º46.08’	111º03.55’	9.1	-0.2	8	196	4	0.12
210630	04:51:48.26	44º45.48’	110º54.76’	5.9	-0.2	6	143	6	0.05
210630	04:52:07.57	44º45.29’	110º54.40’	3.7	-0.5	10	136	6	0.11
210630	04:53:44.73	44º45.99’	111º03.56’	9.5	-0.1	11	127	4	0.15
210630	04:56:25.89	44º46.33’	111º03.56’	9.9	0.4W	15	131	4	0.11
210630	05:11:35.81	44º46.19’	111º04.06’	10.1	0.0	12	128	4	0.10
210630	05:46:16.57	44º46.12’	111º03.44’	10.8	0.2W	14	129	4	0.11
210630	05:57:18.37	44º46.19’	111º03.64’	10.6	0.7W	16	128	4	0.12
210630	05:58:21.44	44º46.11’	111º03.33’	10.3	-0.1	14	129	4	0.14
210630	05:59:09.56	44º46.18’	111º03.78’	11.1	0.9W	16	128	5	0.12
210630	06:08:09.75	44º46.28’	111º03.94’	11.2	0.7W	16	129	4	0.12
210630	06:10:51.56	44º46.09’	111º03.28’	10.1	0.3	11	129	4	0.13
210630	06:19:08.00	44º46.16’	111º03.72’	11.0	0.3	12	128	5	0.12
210630	08:58:19.27	44º46.32’	111º03.51’	9.9	-0.3	11	131	4	0.16
210630	10:27:43.05	44º45.95’	111º03.68’	11.0	1.4W	22	96	4	0.15
210630	10:29:52.68	44º39.13’	110º45.17’	4.8	--	7	204	8	0.08
210630	10:30:06.36	44º39.77’	110º44.67’	6.6	-0.1	12	112	8	0.11
210630	10:58:42.62	44º39.85’	110º44.39’	7.8	-0.1	12	110	7	0.09
210630	10:58:55.34	44º39.81’	110º44.78’	6.0	0.1	11	111	8	0.12
210630	11:01:26.55	44º39.67’	110º44.65’	7.0	-0.4	11	114	8	0.12
210630	11:02:51.98	44º39.82’	110º45.30’	5.5	--	8	111	8	0.08
210630	11:02:56.15	44º38.99’	110º44.54’	8.9	-0.4	9	165	9	0.08
210630	11:03:14.99	44º39.42’	110º44.83’	6.5	-0.3	9	119	8	0.07
210630	11:03:33.48	44º40.80’	110º44.18’	-1.1	-0.2	7	95	6	0.11
210630	11:20:05.94	44º46.07’	111º03.61’	9.3	0.5W	17	128	4	0.17
210630	11:27:29.40	44º39.12’	110º44.68’	7.8	0.3	15	77	9	0.14

Table 2. Earthquakes in the Yellowstone Region: April 1–June 30, 2021

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
210630	11:27:47.00	44º46.35’	111º03.27’	8.3	-0.6	10	132	4	0.16
210630	11:46:44.84	44º45.93’	111º03.11’	9.4	-0.3	12	127	4	0.18
210630	12:16:37.60	44º45.16’	110º54.75’	7.9	0.5	18	113	6	0.17
210630	12:23:56.44	44º44.64’	110º53.81’	3.2	0.2	9	116	6	0.18
210630	14:13:23.89	44º44.66’	110º55.16’	8.9	2.2W	26	95	7	0.17
210630	14:35:55.47	44º46.13’	111º03.93’	10.9	0.8W	15	127	4	0.11
210630	19:00:15.44	44º44.31’	110º54.25’	5.2	-0.2	12	97	7	0.10
210630	19:00:29.43	44º45.02’	110º55.13’	8.9	1.0W	18	113	7	0.18
210630	19:00:44.81	44º44.15’	110º54.40’	2.3	-0.2	10	108	7	0.08
210630	19:01:18.76	44º44.73’	110º55.02’	8.6	0.1	15	107	7	0.20
210630	19:46:36.48	44º44.43’	110º54.28’	6.5	0.5	8	113	7	0.06
210630	20:09:51.54	44º44.54’	110º54.50’	5.7	0.3	11	117	7	0.07
210630	20:10:03.26	44º44.28’	110º54.39’	2.1	-0.4	8	122	7	0.09
210630	21:21:22.89	44º44.70’	111º07.95’	12.1	1.9W	21	64	5	0.15
210630	21:29:39.57	44º34.99’	110º27.19’	4.5	0.6	10	135	5	0.12
210630	23:07:47.08	44º46.33’	110º55.24’	8.4	0.8W	17	139	6	0.18
210630	23:15:23.73	44º44.64’	110º54.40’	2.9	-0.6	7	121	7	0.09
210630	23:18:03.21	44º46.06’	110º55.17’	6.6	-0.3	9	132	6	0.12
210630	23:40:53.88	44º44.96’	110º55.01’	8.1	1.3W	18	96	7	0.17
210630	23:59:25.75	44º46.11’	110º54.91’	8.5	0.6W	17	132	6	0.22

number of earthquakes = 560
* indicates poor depth control
W indicates Wood-Anderson data used for magnitude calculation

Table 3
UNIVERSITY OF UTAH YELLOWSTONE SEISMIC NETWORK
Operating Seismograph Stations
June 30, 2021

SEED Station	Location	SEED Channel	No. of Channels	Network Code	Latitude	Longitude	Elevation (meters)	Sensor	Digitizer	Telemetry	Sponsor
B206*	Canyon206bwy2008, Yellowstone, WY	EH[ZEN]	3	PB	44° 46.66′	110° 30.70′	2400	IESE-S2	Q330	Digital	PBO
B207*	Madisn207bwy2007, Yellowstone, WY	EH[ZEN]	3	PB	44° 37.14′	110° 50.91′	2182	IESE-S2	Q330	Digital	PBO
B208*	Lakejn208bwy2008, Yellowstone, WY	EH[ZEN]	3	PB	44° 33.61′	110° 24.09′	2406	IESE-S2	Q330	Digital	PBO
B944*	Grantt944bwy2008, Yellowstone, WY	EH[ZEN]	3	PB	44° 23.38′	110° 32.63′	2365	IESE-S2	Q330	Digital	PBO
B945*	Panthr944swy2008, Yellowstone, WY	EH[ZEN]	3	PB	44° 53.64′	110° 44.65′	2249	IESE-S2	Q330	Digital	PBO
B950*	Norris950bwy2013, Yellowstone, WY	EH[ZEN]	3	PB	44° 42.77′	110° 40.71′	2328	IESE-S2	Q330	Digital	PBO
FLWY*	Flagg Ranch, WY	BH[ZEN]	3	IW	44° 04.96′	110° 41.96′	2078	3ESP	RT-130	Digital	ANSS
IMW*	Indian Meadows, WY	BH[ZEN]	3	IW	43° 53.58′	110° 56.58′	2670	3ESP	RT-130	Digital	ANSS
LKWY*	Lake, WY	BH[ZEN]	3	US	44° 33.91′	110° 24.00′	2424	STS-2	Q330	Digital	USGS
LOHW*	National Elk Refuge, WY	BH[ZEN]	3	IW	43° 36.76′	110° 36.30′	2245	3ESP	RT-130	Digital	ANSS
MCID	Moose Creek, ID	EHZ	1	WY	44° 11.45′	111° 11.03′	2137	L4C	PSN	Analog	USGS
MOOW*	Moose Ponds, WY	BH[ZEN]	3	IW	43° 44.92′	110° 44.69′	2128	3ESP	RT-130	Digital	ANSS
QLMT*	Earthquake Lake, MT	EHZ	1	MB	44° 49.84′	111° 25.80′	2064	L4C	-	Analog	MBMT
REDW*	Red-Top Meadows, WY	BH[ZEN]	3	IW	43° 21.74′	110° 51.18′	2322	3ESP	RT-130	Digital	ANSS
SNOW*	Snow King Mountain, WY	BH[ZEN]	3	IW	43° 27.75′	110° 45.31′	2390	3ESP	RT-130	Digital	ANSS
TPAW*	Teton Pass, WY	BH[ZEN]	3	IW	43° 29.41′	110° 57.04′	2512	3ESP	RT-130	Digital	ANSS
TPMT*	Teepe Creek, MT	EHZ	1	MB	44° 43.79′	111° 39.94′	2518	L4C	-	Analog	MBMT
YDC	Denny Creek, MT	EHZ	1	WY	44° 42.51′	111° 14.60′	2025	L4C	PSN	Analog	USGS
YDD	Grant Junction, Yellowstone, WY	HH[ZEN]	3	WY	44° 24.00′	110° 34.80′	2400	STS-2	Q330	Digital	NSF
		EN[ZEN]	3					Episensor			
YEE	East Entrance (YNP), WY	HH[ZEN]	3	WY	44° 29.12′	109° 53.81′	2270	Compact	Centaur	Digital	USGS
YFT	Old Faithful (YNP), WY	HH[ZEN]	3	WY	44° 27.05′	110° 50.24′	2292	Compact PH	Centaur	Digital	USGS
		EN[ZEN]	3					Titan			
YGC	Grayling Creek, MT	EHZ	1	WY	44° 47.77′	111° 06.45′	2075	L4C	PSN	Analog	USGS
YHB	Horse Butte, MT	EHZ	1	WY	44° 45.07′	111° 11.71′	2157	L4C	PSN	Analog	USGS
		HH[ZEN]	3					Compact	Centaur	Digital	
		EN[ZEN]	3					Titan			
YHH	Holmes Hill (YNP), WY	EHZ	1	WY	44° 47.30′	110° 51.03′	2717	S13	PSN	Analog	USGS
		HH[ZEN]	3					Trillium 120	Q330	Digital	
		EN[ZEN]	3					Titan			

SEED Station	Location	SEED Channel	No. of Channels	Network Code	Latitude	Longitude	Elevation (meters)	Sensor	Digitizer	Telemetry	Sponsor
YHL	Hebgen Lake, MT	HH[ZEN]	3	WY	44° 51.05′	111° 10.98′	2691	Trillium 120	Q330	Digital	USGS
		EN[ZEN]	3					Titan			
YHR	Hawk's Rest, WY	HH[ZEN]	3	WY	44° 06.36′	110° 04.90′	2976	Trillium 120	Q330	Digital	USGS
YJC	Joseph′s Coat (YNP), WY	EH[ZEN]	3	WY	44° 45.33′	110° 20.95′	2684	S13	PSN	Analog	USGS
YLA	Lake Butte (YNP), WY	EHZ	1	WY	44° 30.76′	110° 16.12′	2580	L4C	PSN	Analog	USGS
YLT	Little Thumb Creek (YNP), WY	EHZ	1	WY	44° 26.25′	110° 35.28′	2439	L4C	PSN	Analog	USGS
YMC	Maple Creek (YNP), WY	EH[ZEN]	3	WY	44° 45.53′	111° 00.41′	2073	S13	PSN	Analog	USGS
YML	Mary Lake (YNP), WY	EH[ZEN]	3	WY	44° 36.20′	110° 38.63′	2653	S13	PSN	Analog	USGS
YMP	Mirror Plateau (YNP), WY	EHZ	1	WY	44° 44.38′	110° 09.40′	2774	S13	PSN	Analog	USGS
		HH[ZEN]	3					Trillium 120	Q330	Digital	
		EN[ZEN]	3					Titan			
YMR	Madison River (YNP), WY	HH[ZEN]	3	WY	44° 40.12′	110° 57.90′	2149	Trillium 120	Q330	Digital	USGS
		EN[ZEN]	3					Titan			
YMS	Mount Sheridan (YNP), WY	EHZ	1	WY	44° 15.84′	110° 31.67′	3106	L4C	PSN	Analog	USGS
YMV	Mammoth Vault (YNP), WY	EHZ	1	WY	44° 58.42′	110° 41.33′	1829	L4C	PSN	Analog	USGS
YNE	Northeast Entrance (YNP), WY	HH[ZEN]	3	WY	45° 00.46′	110° 00.48′	2343	Compact	Centaur	Digital	USGS
YNM	Norris Museum (YNP), WY	HH[ZEN]	3	WY	44° 43.59′	110° 42.22′	2311	Trillium 240	Q330	Digital	USGS
YNR	Norris Junction (YNP), WY	HH[ZEN]	3	WY	44° 42.93′	110° 40.75′	2336	Trillium 120	Q330	Digital	USGS
		EN[ZEN]	3					Titan			
YPC	Pelican Cone (YNP), WY	EHZ	1	WY	44° 38.88′	110° 11.55′	2932	L4C	PSN	Analog	USGS
YPK	Parker Peak (YNP), WY	EH[ZEN]	3	WY	44° 43.91′	109° 55.32′	2897	L4C	PSN	Analog	USGS
YPM	Purple Mountain (YNP), WY	EHZ	1	WY	44° 39.43′	110° 52.12′	2582	L4C	PSN	Analog	USGS
YPP	Pitchstone Plateau (YNP), WY	EHZ	1	WY	44° 16.26′	110° 48.27′	2707	S13	PSN	Analog	USGS
		HH[ZEN]	3					Trillium 120	Q330	Digital	
		EN[ZEN]	3					Titan			
YSB	Soda Butte (YNP), WY	EHZ	1	WY	44° 53.04′	110° 09.06′	2072	L4C	PSN	Analog	USGS
YTP	The Promontory (YNP), WY	EHZ	1	WY	44° 23.51′	110° 17.10′	2384	L4	PSN	Analog	USGS
		HH[ZEN]	3					Trillium 120	Q330	Digital	
		EN[ZEN]	3					Titan			
YUF	Upper Falls (YNP), WY	HH[ZEN]	3	WY	44° 42.76′	110° 30.71′	2394	40T	ANSS-130	Digital	USGS
		EN[ZEN]	3					Titan			
YWB	West Boundary (YNP), WY	EHZ	1	WY	44° 36.35′	111° 06.05′	2310	L4C	PSN	Analog	USGS

* Station operated by another agency and recorded as part of the Yellowstone Seismic Network
Network Statistics: 150 data channels from 46 stations were being recorded at the end of this report period

EXPLANATION OF TABLE

UURSN Code: Station code formerly used in routine processing. Owing to software limitations, the station code may not be the same code used by the original operator. For multi-component stations, the vertical, east-west, and north-south high gain (low gain) components are identified by an appended Z(V), E(L), and N(M), respectively, in UUSS phase files.

Location: General description of station location. YNP = Yellowstone National Park.

SEED Station: The SEED (Standard for the Exchange of Earthquake Data) station code used by the original operator.

SEED Channel: The SEED format uses three letters to name seismic channels. See <<http://www.iris.edu/manuals/SEEDManual_V2.4.pdf>> for information about the SEED channel naming convention. Relevant sections are reproduced below. In the SEED convention, each letter describes one aspect of the instrumentation and its digitization. The first letter specifies the general sampling rate and the response band of the instrument. Band codes used in this table include:

Band Code	Band Type	Sample Rate	Corner Period
E	Extremely short period	≥ 80 Hertz	< 10 seconds
H	High broadband	≥ 80 Hertz	≥ 10 seconds
B	Broadband	≥ 10 to < 80 Hertz	≥10 seconds
S	Short period	≥ 10 to < 80 Hertz	< 10 seconds

The second letter specifies the family to which the sensor belongs. Sensor families used in this table are:

Instrument Code	Description
H	High gain seismometer
L	Low gain seismometer
N	Accelerometer

The third letter specifies the physical configuration of the members of a multiple axis instrument package. Channel orientations used in this table are:

Z E N Traditional (Vertical, East-West, North-South)

Number of Channels: Total number of waveform channels recorded.

Network Code: The FDSN (Federation of Digital Seismographic Networks) registered network code. See <<http://www.iris.edu/dms/nodes/dmc/services/network_codes>> for information about registered seismograph network codes. Network codes referenced in this table:

Network Code	Network name; Network operator or responsible organization
IE	Idaho National Laboratory Seismic Network
IU	IRIS/USGS Network; USGS Albuquerque Seismological Laboratory
IW	Intermountain West Network, U.S. Geological Survey

MB	Montana Regional Seismic Network; Montana Bureau of Mines and Geology
PB	Plate Boundary Observatory
UU	University of Utah Regional Network; University of Utah
US	US National Network; USGS National Earthquake Information Center
WY	Yellowstone Wyoming Seismic Network; University of Utah

Latitude, Longitude: Sensor location in degrees and decimal minutes; North latitude, West longitude.

Elevation: Sensor altitude in meters above sea level.

Sensor	**Description**
L4, L4C	Mark Products L4 or L4C short-period seismometer
S13, 18300	Geotech S13 or 18300 short-period seismometer
Ranger	Kinemetrics Ranger short-period seismometer
40T	Guralp CMG-40T broadband seismometer
3T	Guralp CMG-3T broadband seismometer
3ESP	Guralp CMG-3ESP broadband seismometer
STS-2	Streckheisen STS-2 broadband seismometer
FBA23	Kinemetrics FBA-23 accelerometer
EpiSensor	Kinemetrics EpiSensor accelerometer
Applied Mems	Applied Mems accelerometer
PA-23	Geotech PA-23 accelerometer
Compact	Nanometrics Compact broadband seismometer
Trillium 120	Nanometrics Trillium 120 broadband seismometer
Trillium 240	Nanometrics Trillium 240 broadband seismometer
Titan	Nanometrics Titan accelerometer
Observer	Refraction Technology (REF TEK) Model 151 Observer broadband seismometer
IESE-S2	Institute of Earth Science and Engineering S-2 model borehole seismometer

Digitizer	**Description**
K2	Kinemetrics Altus Series K2 (19-bit resolution field digitizer)
Etna	Kinemetrics Altus Series Etna (18-bit resolution field digitizer)
72A-07	Refraction Technology (REF TEK) model 72A-07 (24-bit field digitizer)
72A-08	Refraction Technology (REF TEK) model 72A-08 (24-bit field digitizer)
ANSS-130	Refraction Technology (REF TEK) model 130-ANSS/02 (24-bit resolution field digitizer)
RT-130	Refraction Technology (REF TEK) model RT-130 (24-bit resolution field digitizer)
Q330	Quanterra, Inc Q330 digitizer (24-bit resolution field digitizer)
SMART-24	Geotech SMART-24 digitizer (24-bit resolution field digitizer)
PSN	PSN-ADC-SERIAL version III (16-bit resolution field digitizer)
Basalt	Kinemetrics Basalt (24-bit resolution field digitizer)
Taurus	Nanometrics Taurus (24-bit resolution field digitizer)
Centaur	Nanometrics Centaur (24-bit resolution field digitizer)

Telemetry	Description
Analog	Data transmission is analog along part of the transmission pathway
Digital	Data are converted to digital form at the station site
None	On-site recording system

Sponsor (or Operator for stations marked by * in preceding columns)

USGS	U.S. Geological Survey
Utah	State of Utah
ANSS	Advanced National Seismic System
INL	Idaho National Laboratory
MBMT	Montana Bureau of Mines and Geology
PBO	Plate Boundary Observatory
NSF	National Science Foundation

Network Changes During April 1–June 30, 2021

June 09, 2021: Trillium Compact Posthole sensor replaced Trillium Compact sensor at YFT