EARTHQUAKE ACTIVITY IN THE YELLOWSTONE REGION

Preliminary Epicenters

July 1 – September 30, 2018

Prepared by the University of Utah Seismograph Stations and funded by
the U.S. Geological Survey (Cooperative Agreement No. G16AC00029)

January 24, 2019

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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July 1 – September 30, 2018

by J. Farrell, R. Burlacu, P. M. Roberson, J. M. Hale, N. Forbes, and B. Johnson
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: *http://www.seis.utah.edu* (aka *quake.utah.edu*)

During the three-month period July 1 through September 30, 2018, the University of Utah Seismograph Stations (UUSS) located 312 earthquakes within the Yellowstone region (Figure 1). The total includes 20 earthquakes in the magnitude 2 range. The largest event to occur during this period was a magnitude 2.9 earthquake on September 11th. There were no earthquakes 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 2018). 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 *http://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

none

Notable Swarm Seismicity

During the report period, there were five 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 17 earthquakes ($0.4 \leq M \leq 1.6$) occurred about 5.5 mi NW of Norris Junction, YNP from July 16th – 18th.
B. A swarm of 63 earthquakes ($0.2 \leq M \leq 2.3$) occurred about 5.2 mi NW of Norris Junction, YNP from July 20th – 27th.
C. A swarm of 13 earthquakes ($0.1 \leq M \leq 2.2$) occurred about 7 mi N of West Yellowstone, MT from August 2nd – 3rd.
D. A swarm of 14 earthquakes ($1.0 \leq M \leq 2.0$) occurred about 3 mi N of West Thumb Geyser Basin, YNP on August 26th.
E. A swarm of 12 earthquakes ($0.5 \leq M \leq 2.4$) occurred about 17.5 mi ENE of West Yellowstone, MT from August 29th – 30th.

These swarms are labeled in Figure 1.

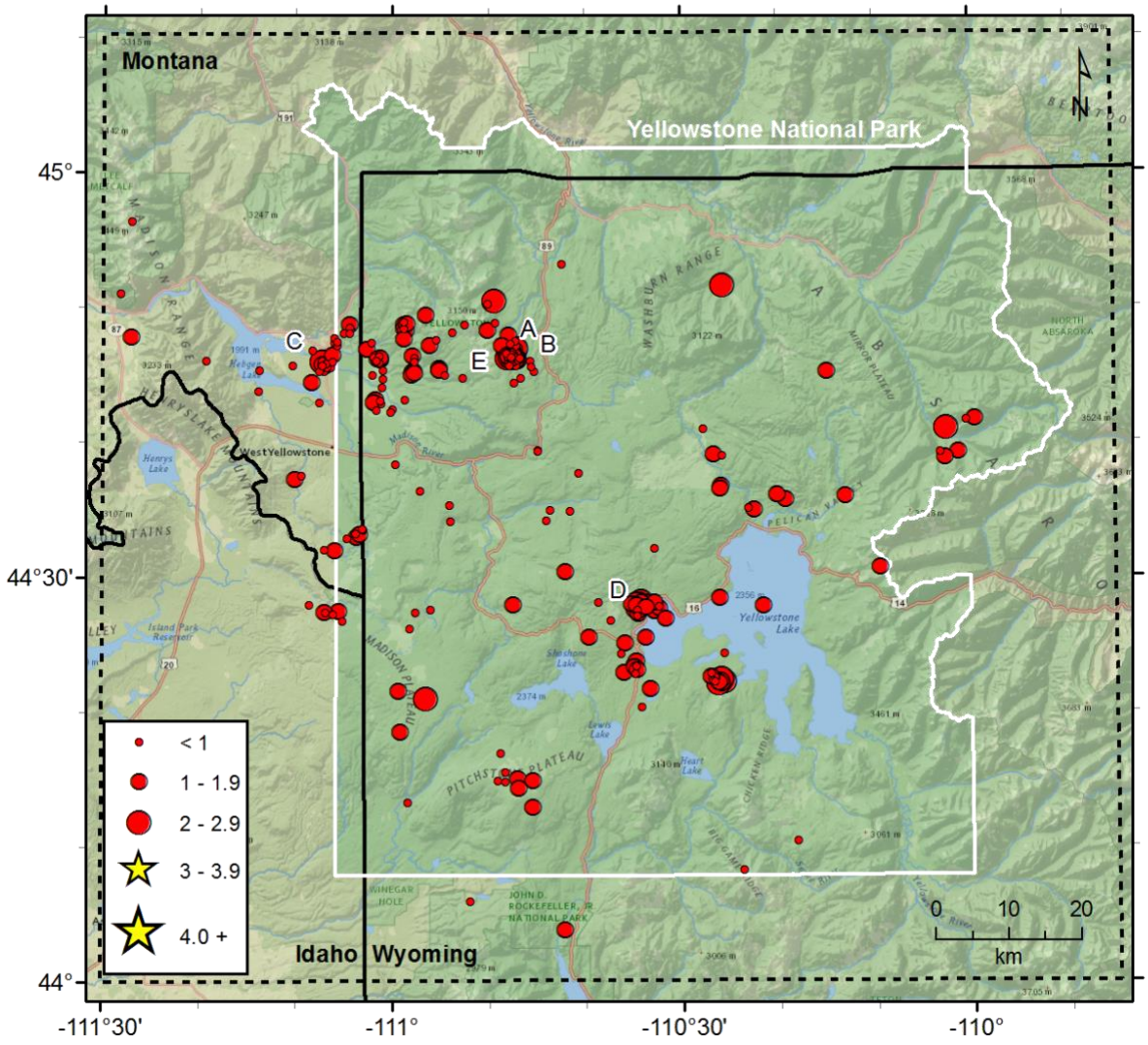

Figure 1. Epicenters of earthquakes located by the University of Utah Seismograph Stations, July 1, 2018, through September 30, 2018. Earthquake swarms (labeled A–E) are discussed in the text.

Table 1

EARTHQUAKES FELT IN THE YELLOWSTONE REGION
January 1, 2018 to September 30, 2018

Date	Time†	Felt Information‡	Latitude	Longitude	Magnitude§
February 25	08:10 MST 15:10 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 45.24′	110º 59.70′	M_L 3.0
May 06	08:54 MDT 14:54 UTC	Yellowstone. Felt (II) at Yellowstone National Park.	44º 45.12′	110º 57.84′	M_L 3.1
May 25	02:04 MDT 08:04 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 45.72′	111º 07.62′	M_L 2.6

† 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 (*http://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
September 30, 2018

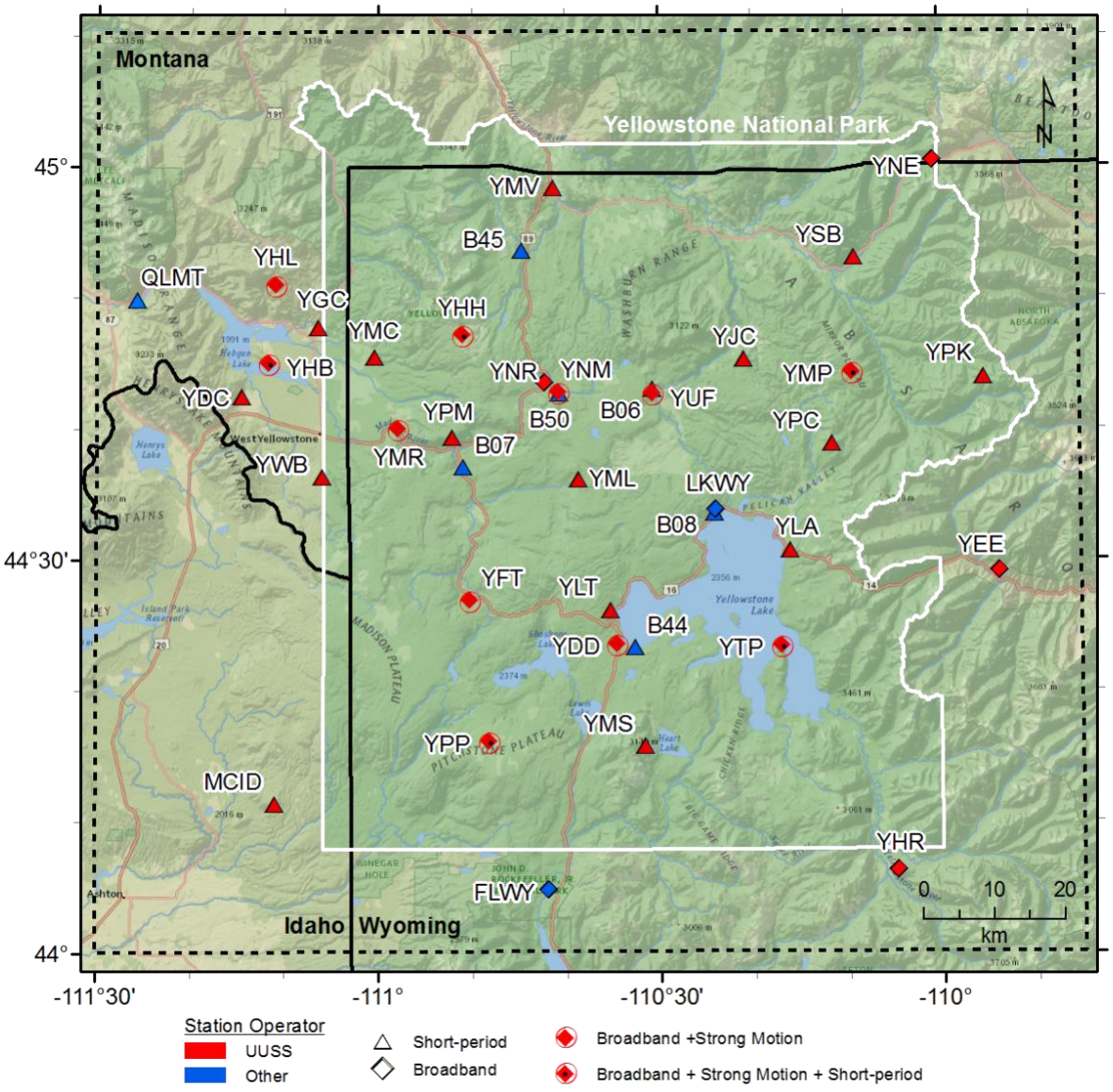

Figure 2. Seismograph stations of the Yellowstone Seismic Network as of September 30, 2018.

Table 2. Earthquakes in the Yellowstone Region: July 1–September 30, 2018

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
180701	11:17:23.41	44º50.52’	110º49.42’	9.5	2.0W	19	101	6	0.17
180701	16:37:32.90	44º27.92’	110º21.58’	4.4	1.5	11	90	9	0.09
180703	02:35:28.94	44º22.52’	110º25.99’	8.9	2.0	11	133	9	0.12
180703	02:37:59.60	44º22.36’	110º26.12’	10.9	1.3	16	111	9	0.17
180703	02:38:04.10	44º22.14’	110º26.28’	7.3	2.3	10	114	9	0.14
180703	16:06:45.26	44º37.29’	111º10.19’	13.1	1.9W	21	106	6	0.17
180704	07:53:52.12	44º43.80’	111º13.94’	13.4	0.2	8	133	2	0.16
180705	01:09:30.89	44º22.29’	110º25.65’	11.1	2.5W	24	112	9	0.18
180705	04:13:19.08	44º22.16’	110º25.97’	11.1	1.6W	16	113	9	0.16
180705	05:13:44.87	44º22.38’	110º26.86’	10.2	0.8	16	109	8	0.09
180705	05:50:02.56	44º27.60’	110º34.34’	3.9	1.3	11	73	3	0.08
180705	05:53:02.86	44º27.59’	110º34.97’	1.9	1.9	16	67	3	0.11
180705	05:55:52.47	44º28.16’	110º32.89’	1.2	1.1	10	69	5	0.25
180705	06:00:48.75	44º27.62’	110º34.64’	4.1	0.8	9	143	3	0.11
180705	06:01:45.22	44º27.33’	110º34.59’	1.1	1.8W	12	76	2	0.15
180705	06:03:50.38	44º27.94’	110º34.80’	3.6	1.0	8	147	3	0.09
180705	06:04:34.57	44º25.57’	110º33.81’	1.9	1.1	7	118	2	0.19
180705	06:05:48.33	44º25.61’	110º39.65’	-2.6	1.9	6	136	6	0.24
180705	06:25:11.17	44º27.22’	110º34.64’	5.4	0.5	11	110	6	0.11
180705	17:06:53.44	44º22.27’	110º26.23’	10.4	1.2	14	111	9	0.19
180706	03:17:57.56	44º22.66’	110º26.72’	11.6	0.9	15	118	8	0.16
180707	05:06:11.21	44º22.69’	110º27.09’	11.6	1.0	14	106	7	0.08
180707	13:43:06.73	44º14.97’	110º49.19’	7.1	0.8	7	192	3	0.12
180709	08:17:08.24	44º22.33’	110º26.68’	10.4	0.7	11	109	8	0.14
180710	18:05:49.49	44º22.93’	110º27.08’	10.3	0.3	13	114	7	0.26
180710	18:06:01.55	44º22.55’	110º26.94’	7.9	0.9	12	130	8	0.14
180710	21:28:03.10	44º21.63’	110º59.44’	10.9	1.0	13	139	16	0.27
180711	04:32:24.45	44º20.41’	110º34.20’	5.5	0.5	12	125	6	0.22
180711	16:20:37.75	44º28.00’	110º47.58’	1.9	1.2	12	115	4	0.09
180711	20:12:49.74	44º08.37’	110º23.75’	14.1	0.8	16	152	25	0.34
180712	03:05:07.55	44º13.03’	110º45.49’	1.1	1.2	12	107	7	0.11
180712	12:35:05.11	44º48.13’	111º04.48’	6.9	0.6	8	198	3	0.08
180713	03:23:58.36	44º06.07’	110º52.03’	9.6	0.9	12	97	14	0.18
180715	15:05:54.97	44º37.58’	111º09.48’	9.3	0.5	13	142	5	0.14
180715	17:55:57.76	44º36.00’	110º13.02’	5.8	1.8	11	177	11	0.14
180716	17:37:24.92	44º46.29’	110º46.93’	3.3	1.6	17	93	6	0.11
180716	17:40:16.58	44º46.10’	110º47.02’	2.1	1.4	17	113	6	0.13
180716	17:40:38.06	44º46.27’	110º46.82’	2.1	0.3	11	116	6	0.26
180716	17:52:34.22	44º46.09’	110º47.50’	3.3	1.0	9	109	5	0.07
180716	17:57:52.47	44º46.01’	110º47.33’	3.8	1.2	15	89	5	0.11
180717	01:27:34.29	44º46.63’	110º47.09’	2.8	0.7	10	205	5	0.11
180717	01:46:44.60	44º45.01’	111º02.09’	8.4	0.0	10	226	2	0.19
180717	07:29:04.92	44º46.27’	110º47.20’	3.2	1.2W	17	112	5	0.13
180717	08:31:43.44	44º46.17’	110º47.31’	2.6	1.0W	17	110	5	0.13
180717	08:54:38.06	44º46.32’	110º47.00’	3.1	0.7W	12	198	6	0.14

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
180717	09:43:10.28	44º46.21’	110º47.16’	3.6	0.9	16	112	5	0.15
180717	10:34:32.17	44º46.08’	110º47.30’	3.5	0.6	14	110	5	0.13
180717	10:50:35.28	44º46.09’	110º47.31’	3.9	0.9W	15	110	5	0.13
180717	13:01:03.85	44º46.38’	110º47.24’	4.1	1.2W	16	112	5	0.13
180717	14:54:31.09	44º46.26’	110º47.37’	3.3	1.4W	15	111	5	0.15
180717	20:31:51.46	44º46.46’	110º47.70’	4.7	1.5W	20	109	5	0.21
180718	03:24:56.50	44º46.42’	110º47.85’	4.6	0.9W	16	107	4	0.21
180718	06:23:55.31	44º46.41’	110º47.52’	3.3	0.5W	9	195	5	0.11
180718	13:14:46.18	44º37.79’	110º40.71’	7.1	0.8	15	134	4	0.19
180719	18:04:16.05	44º27.42’	110º57.63’	5.7	0.8	12	116	10	0.22
180719	20:30:45.29	44º26.28’	110º58.23’	11.0	0.7	10	119	11	0.12
180720	00:17:07.45	44º47.73’	110º58.80’	9.8	1.1W	20	127	5	0.15
180720	23:18:22.89	44º46.46’	110º47.83’	5.2	0.8	13	107	4	0.19
180721	03:39:15.98	44º48.23’	110º53.79’	9.6	0.8W	13	126	4	0.14
180721	20:35:54.38	44º46.01’	110º47.47’	2.9	0.6	9	184	5	0.10
180722	01:12:35.08	44º46.59’	110º47.52’	5.3	1.2W	13	111	5	0.20
180722	03:35:38.62	44º46.52’	110º47.52’	5.1	1.1W	16	111	5	0.22
180722	05:22:50.57	44º10.52’	110º18.19’	6.5*	0.8	18	159	24	0.14
180722	08:05:27.50	44º46.44’	110º47.62’	5.9	1.1W	14	109	5	0.21
180722	17:31:10.41	44º33.58’	111º03.05’	12.4	0.1	15	128	6	0.17
180722	17:31:27.48	44º33.32’	111º03.86’	13.4	0.8W	16	139	6	0.15
180722	17:31:48.43	44º33.67’	111º03.15’	12.8	0.0	13	128	6	0.18
180722	17:34:14.12	44º33.01’	111º03.70’	14.6	1.5W	26	128	7	0.20
180722	17:39:41.42	44º33.21’	111º03.43’	14.5	1.1W	24	127	7	0.20
180722	19:38:31.99	44º46.44’	110º47.70’	5.4	1.1W	19	89	5	0.22
180723	05:26:36.83	44º45.33’	110º57.82’	7.0	1.5W	21	106	3	0.16
180723	11:16:55.02	44º46.33’	110º47.60’	4.8	1.5W	17	89	5	0.21
180723	11:17:01.78	44º46.07’	110º47.18’	2.2	1.0	8	112	6	0.15
180723	13:11:45.06	44º46.58’	110º47.71’	5.4	1.1W	14	110	5	0.20
180723	14:10:27.16	44º46.60’	110º48.04’	5.6	0.8W	13	108	4	0.16
180724	07:46:30.38	44º46.53’	110º47.41’	4.9	1.0	20	91	5	0.19
180724	11:07:56.92	44º46.92’	110º47.34’	8.3	1.6	22	73	5	0.23
180724	12:47:42.67	44º45.06’	110º58.06’	7.9	1.2W	17	103	3	0.17
180724	13:52:46.97	44º46.35’	110º47.71’	4.7	0.2	13	109	5	0.21
180724	20:17:10.78	44º46.70’	110º47.62’	7.6	2.1W	21	90	5	0.19
180724	21:35:19.47	44º46.99’	110º47.12’	9.0	2.0W	19	99	5	0.22
180725	02:39:55.12	44º46.41’	110º47.62’	4.9	1.8W	12	110	5	0.14
180725	02:40:02.53	44º46.32’	110º48.10’	5.1	2.3W	12	105	4	0.18
180725	04:30:39.65	44º47.18’	110º47.14’	4.9	0.5	6	283	5	0.08
180725	05:24:26.92	44º46.73’	110º48.29’	5.4	1.3W	13	105	4	0.19
180725	06:44:06.57	44º44.80’	110º52.69’	-1.5	0.4	7	107	5	0.09
180725	09:11:54.90	44º46.62’	110º47.92’	5.1	1.5W	11	90	4	0.18
180725	09:12:06.83	44º46.38’	110º47.75’	5.0	2.1W	14	89	5	0.12
180725	09:16:52.11	44º27.68’	110º56.10’	6.0*	0.9	9	107	19	0.09
180725	09:18:05.18	44º46.51’	110º47.81’	6.7	1.7W	19	88	4	0.18

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DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
180725	09:23:41.59	44º46.34’	110º47.92’	5.0	1.0W	8	107	4	0.12
180725	09:41:42.05	44º46.52’	110º47.80’	6.4	1.2W	12	109	5	0.18
180725	09:48:49.22	44º46.63’	110º47.84’	6.3	1.5W	19	90	4	0.18
180725	10:48:29.12	44º46.70’	110º47.42’	7.7	1.2W	16	90	5	0.20
180725	10:49:59.07	44º46.56’	110º47.47’	7.7	2.1W	24	91	5	0.19
180725	10:51:50.73	44º46.37’	110º47.75’	5.5	1.1W	13	89	5	0.18
180725	11:02:54.10	44º46.44’	110º48.02’	4.9	0.5	12	106	4	0.15
180725	11:10:08.33	44º46.55’	110º47.67’	6.6	1.5W	15	89	5	0.18
180725	11:38:45.82	44º46.57’	110º47.73’	6.4	1.4W	16	89	5	0.19
180725	11:40:43.19	44º46.28’	110º47.64’	4.2	1.0	9	191	5	0.08
180725	11:52:36.22	44º47.02’	110º47.32’	9.2	2.2W	22	74	5	0.22
180725	11:52:54.98	44º46.25’	110º47.26’	2.6	1.2	8	91	5	0.08
180725	11:55:20.00	44º46.60’	110º47.90’	5.3	1.2W	14	90	4	0.18
180725	13:19:51.03	44º46.64’	110º47.79’	5.2	1.5W	16	90	4	0.18
180725	14:09:17.56	44º46.23’	110º47.67’	4.8	0.5	9	108	5	0.15
180725	15:43:11.62	44º46.25’	110º47.71’	3.1	1.0W	11	107	5	0.09
180725	15:48:58.72	44º46.22’	110º47.67’	4.8	0.5	11	108	5	0.16
180725	15:58:03.70	44º46.60’	110º47.55’	4.3	0.6	7	201	5	0.06
180725	16:08:51.01	44º46.52’	110º48.08’	4.9	1.0W	12	106	4	0.16
180725	23:00:47.66	44º46.12’	110º47.46’	3.3	1.0W	6	109	5	0.04
180725	23:05:12.09	44º46.37’	110º47.24’	6.5	1.6W	11	112	5	0.13
180725	23:08:29.78	44º46.21’	110º47.39’	4.8	1.6W	13	110	5	0.15
180725	23:31:15.21	44º46.07’	110º47.63’	3.6	1.1	7	107	5	0.08
180726	01:39:10.55	44º46.43’	110º47.77’	4.9	1.4W	15	107	5	0.16
180726	02:46:21.76	44º46.12’	110º46.88’	2.2	0.9W	11	194	6	0.12
180726	03:43:02.42	44º46.19’	110º47.52’	5.1	0.9W	13	109	5	0.17
180726	15:13:29.19	44º44.47’	110º47.42’	-0.4	0.6W	7	149	7	0.15
180726	15:18:36.19	44º46.12’	110º46.95’	5.3	1.3W	18	113	6	0.20
180726	16:27:47.50	44º45.71’	110º47.39’	-0.2	0.8W	6	107	6	0.04
180726	16:28:49.85	44º46.47’	110º47.31’	6.6	1.7W	16	91	5	0.21
180726	16:38:02.44	44º46.11’	110º46.97’	2.1	0.5	10	113	6	0.17
180726	17:48:47.22	44º46.34’	110º47.24’	0.5	0.5	14	112	5	0.30
180726	18:09:45.84	44º46.47’	110º47.40’	5.2	1.3W	13	111	5	0.17
180726	18:13:03.04	44º46.30’	110º47.22’	4.2	0.8W	12	113	5	0.16
180726	18:33:32.64	44º46.29’	110º47.19’	4.9	1.0	15	113	5	0.14
180726	18:34:12.87	44º46.40’	110º47.36’	4.5	1.6W	16	112	5	0.17
180726	18:36:13.33	44º46.27’	110º46.94’	2.0	0.8	14	115	6	0.13
180726	19:40:47.96	44º46.32’	110º47.25’	5.0	1.7W	15	112	5	0.14
180727	05:09:08.12	44º46.08’	110º45.72’	1.6	0.8W	14	126	7	0.11
180727	08:50:48.50	44º45.69’	110º47.13’	1.3	0.7W	11	179	6	0.14
180727	11:38:30.51	44º24.40’	110º25.67’	8.7	0.9	13	92	11	0.18
180727	14:39:58.44	44º23.45’	110º34.81’	3.9	--	13	108	3	0.16
180727	14:41:04.47	44º23.83’	110º34.75’	3.9	1.8W	18	76	3	0.19
180727	19:37:01.25	44º14.43’	110º46.96’	6.7	1.1	10	93	4	0.37
180727	21:21:29.23	44º47.99’	110º47.91’	3.5	1.5	17	101	4	0.22

Table 2. Earthquakes in the Yellowstone Region: July 1–September 30, 2018

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
180728	00:07:59.49	44º22.92’	110º34.88’	3.6	--	11	108	2	0.22
180728	00:07:59.94	44º22.98’	110º36.12’	1.6	1.6W	13	124	2	0.17
180728	08:20:58.50	44º26.85’	110º37.44’	16.6	0.9	6	210	3	0.02
180728	11:47:43.19	44º39.47’	110º44.88’	7.7	0.4	9	118	8	0.14
180728	11:52:41.45	44º39.41’	110º44.95’	2.7	0.4	8	118	8	0.11
180728	18:26:49.81	44º23.43’	110º34.96’	2.7	1.1	10	143	3	0.11
180728	18:27:29.57	44º23.54’	110º35.01’	2.7	1.9W	13	138	3	0.06
180728	18:27:54.93	44º23.21’	110º34.68’	1.9	1.0	7	147	3	0.18
180728	21:20:46.92	44º44.10’	111º01.11’	8.5	0.3	8	118	3	0.10
180728	21:20:52.33	44º44.73’	111º01.03’	9.2	0.3	6	131	2	0.10
180728	21:22:15.42	44º45.36’	111º00.96’	10.0	0.6	10	122	1	0.12
180729	03:54:45.47	44º46.08’	111º07.29’	8.6	0.7	12	80	3	0.11
180729	08:39:38.32	44º45.16’	110º57.78’	7.4	1.1W	15	104	3	0.11
180729	22:32:45.41	44º45.51’	110º55.21’	8.4	1.0W	10	147	6	0.10
180729	22:32:45.45	44º45.36’	110º55.17’	7.8	1.0W	13	105	7	0.11
180730	10:05:41.56	44º50.28’	110º50.16’	8.7	-0.1	9	135	6	0.10
180731	10:10:41.54	44º45.26’	110º57.94’	7.7	1.3W	16	105	3	0.15
180731	16:08:46.91	44º42.89’	111º01.14’	7.7	0.5W	10	70	5	0.11
180802	06:42:38.46	44º47.18’	110º56.16’	6.7	1.0W	14	120	6	0.11
180802	22:24:32.00	44º45.59’	111º07.07’	8.8	0.5	16	69	4	0.19
180803	01:16:50.64	44º30.74’	110º09.52’	6.1	1.7	12	119	9	0.09
180803	02:24:33.64	44º45.70’	111º07.34’	7.1	0.1	8	192	6	0.20
180803	03:24:23.43	44º45.79’	111º06.95’	10.4	1.1W	19	71	4	0.18
180803	03:56:45.27	44º45.58’	111º06.44’	10.6	0.6W	10	90	4	0.19
180803	04:46:10.30	44º45.94’	111º07.20’	11.0	2.2W	27	52	4	0.13
180803	05:09:03.43	44º45.85’	111º06.94’	9.7	0.5	16	71	4	0.16
180803	05:28:19.33	44º46.00’	111º07.35’	11.2	2.1W	27	51	4	0.14
180803	05:28:46.75	44º46.02’	111º06.26’	5.1	0.4	11	129	7	0.17
180803	20:21:43.16	44º45.57’	111º06.82’	9.4	0.5	16	74	4	0.21
180803	20:22:17.09	44º45.33’	111º07.14’	9.9	0.6	14	69	5	0.17
180803	20:49:27.93	44º45.37’	111º13.83’	11.8	0.4	11	191	3	0.15
180803	21:14:54.41	44º45.81’	111º07.35’	10.2	1.6W	20	77	4	0.17
180803	21:32:54.86	44º45.75’	111º07.24’	10.4	1.6	20	76	4	0.16
180803	22:12:11.50	44º45.34’	111º07.56’	7.6	0.4	7	86	5	0.11
180804	02:03:07.53	44º46.91’	111º02.62’	8.1	1.2W	18	117	4	0.12
180804	02:15:40.29	44º43.19’	111º01.82’	9.0	1.3W	21	63	5	0.11
180804	03:01:59.43	44º35.01’	110º22.56’	3.2	1.0	12	69	3	0.17
180804	03:31:24.37	44º46.39’	110º47.91’	5.0	0.7	15	107	4	0.21
180804	06:19:52.11	44º43.13’	111º01.27’	8.2	0.0	12	112	5	0.18
180804	06:20:10.00	44º43.02’	111º01.94’	10.2	1.2W	14	83	5	0.17
180804	06:23:58.14	44º42.43’	111º01.71’	8.2	0.8W	13	115	6	0.10
180804	06:24:05.88	44º43.20’	110º58.76’	2.1	0.5W	9	167	5	0.20
180804	07:41:15.02	44º47.56’	110º47.31’	7.2	0.5	11	212	5	0.14
180804	10:32:10.89	44º47.23’	110º48.61’	4.9	1.1W	17	104	3	0.19
180806	02:33:40.22	44º35.39’	110º54.06’	10.4	0.9	7	155	5	0.10

Table 2. Earthquakes in the Yellowstone Region: July 1–September 30, 2018

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
180807	10:19:57.43	44º41.00’	110º02.51’	14.7	2.5	9	151	11	0.20
180807	14:58:55.77	44º48.36’	110º50.08’	4.1	1.0	16	115	2	0.20
180808	17:37:08.23	44º45.69’	110º47.89’	2.2	-0.1	8	172	5	0.10
180809	00:41:47.99	44º46.11’	110º47.61’	4.2	0.7	7	186	5	0.09
180809	00:43:21.15	44º49.46’	110º56.55’	7.1	1.5W	16	144	8	0.15
180809	06:29:45.29	44º15.64’	110º48.38’	5.7	--	7	171	1	0.22
180809	15:14:08.38	44º17.01’	110º48.82’	11.0	0.8	7	161	2	0.16
180810	05:48:16.01	44º48.33’	110º58.57’	7.5	1.2W	20	133	6	0.15
180810	16:58:32.52	44º48.75’	110º58.78’	11.1	1.7W	23	72	6	0.21
180810	19:09:42.44	44º48.50’	110º58.78’	7.0	1.4W	21	135	6	0.17
180811	20:45:19.47	44º39.15’	110º26.67’	4.8	1.3W	17	123	9	0.17
180812	02:03:58.55	44º38.42’	110º59.70’	11.4	0.4W	13	111	4	0.19
180812	20:25:14.24	44º46.41’	110º57.95’	6.3	1.2W	16	115	4	0.13
180813	06:36:49.55	44º28.52’	110º26.11’	4.9	1.3W	12	96	10	0.13
180813	10:26:33.35	44º44.79’	110º46.71’	5.8	0.9W	8	163	7	0.07
180813	10:49:24.47	44º48.86’	110º49.30’	4.7	-0.7	12	115	4	0.10
180814	10:29:05.28	44º46.79’	110º47.87’	6.9	1.1W	22	108	4	0.21
180814	15:46:04.45	44º46.56’	110º47.72’	5.6	1.1W	19	89	5	0.22
180815	19:34:01.00	44º34.17’	110º54.05’	12.3	0.6W	10	162	7	0.23
180815	23:20:04.61	44º36.14’	110º20.15’	6.3	1.2	12	85	7	0.15
180816	03:30:28.33	44º42.97’	111º07.60’	14.8	0.2	18	81	7	0.15
180816	05:17:15.60	44º15.13’	110º47.12’	6.8	1.8W	21	91	3	0.26
180816	05:18:32.02	44º14.92’	110º48.32’	3.5	0.7	9	107	2	0.27
180816	06:58:23.33	44º32.07’	111º07.12’	14.1	0.2	9	146	8	0.09
180817	06:13:08.20	44º46.24’	111º01.55’	9.9	1.6W	23	112	2	0.16
180817	06:33:44.73	44º46.45’	111º01.38’	10.1	0.1	13	139	2	0.12
180817	06:33:53.23	44º45.98’	111º01.43’	8.5	0.5	12	132	2	0.13
180817	08:48:45.12	44º46.06’	111º01.72’	10.0	0.1	11	132	2	0.08
180817	10:30:48.66	44º46.17’	111º01.27’	10.0	1.5W	24	111	2	0.15
180817	12:05:07.77	44º46.15’	111º01.24’	9.1	1.3W	21	111	2	0.16
180817	13:22:11.13	44º46.28’	111º01.25’	9.9	1.2W	15	112	2	0.13
180818	07:48:10.17	44º46.07’	110º47.88’	2.8	1.0	10	105	5	0.05
180818	13:19:16.50	44º53.26’	110º42.40’	8.3	0.8	9	249	3	0.14
180818	15:01:13.68	44º45.64’	110º45.60’	4.9	0.8	22	99	6	0.20
180820	09:49:36.25	44º48.99’	110º58.86’	7.9	0.7	16	118	7	0.17
180820	17:49:28.50	44º48.51’	110º58.77’	8.5	0.9	17	135	6	0.15
180821	05:31:17.81	44º48.82’	110º58.48’	10.9	1.0	15	138	7	0.21
180821	08:02:30.63	44º27.76’	110º32.38’	3.8	1.4	15	72	5	0.11
180821	08:02:47.46	44º27.51’	110º32.94’	5.5	1.8W	13	67	4	0.13
180821	08:31:05.05	44º27.87’	110º32.38’	3.3	0.1	13	137	5	0.13
180821	13:13:09.90	44º28.22’	110º38.66’	3.5	0.2	6	226	6	0.14
180822	06:36:05.97	44º32.16’	110º32.85’	2.5*	0.1	12	103	11	0.12
180823	09:56:42.58	44º35.75’	110º19.31’	5.1	1.5	11	147	7	0.08
180824	05:54:08.27	44º45.24’	110º14.94’	4.6	1.1	8	116	8	0.15
180824	08:57:13.51	44º47.61’	110º55.49’	5.9	0.8	14	123	6	0.14

Table 2. Earthquakes in the Yellowstone Region: July 1–September 30, 2018

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
180826	08:34:56.45	44º35.13’	110º23.14’	4.8	0.2	9	165	3	0.11
180826	20:12:16.44	44º28.15’	110º34.28’	4.0	1.1W	9	130	4	0.11
180826	20:13:33.86	44º27.89’	110º34.60’	5.5	1.5W	10	145	3	0.10
180826	20:27:23.48	44º28.30’	110º34.49’	3.8	1.9W	14	71	4	0.08
180826	20:32:00.56	44º28.01’	110º34.04’	4.2	1.2W	12	135	4	0.10
180826	20:32:39.17	44º28.19’	110º33.79’	4.3	1.5	10	77	4	0.04
180826	20:33:15.15	44º28.21’	110º34.55’	3.8	1.7W	15	71	4	0.12
180826	20:36:20.13	44º28.07’	110º34.45’	3.6	1.7W	15	72	4	0.11
180826	20:45:17.43	44º27.93’	110º34.55’	3.6	2.0W	11	72	3	0.12
180826	20:55:52.83	44º28.26’	110º34.32’	4.0	2.0W	18	72	4	0.13
180826	20:56:12.65	44º27.82’	110º33.75’	4.1	1.0	7	139	4	0.09
180826	20:59:39.27	44º28.18’	110º34.48’	4.0	1.5W	15	71	4	0.09
180826	21:05:06.98	44º26.96’	110º31.74’	1.3	1.2W	7	173	5	0.02
180826	21:31:21.50	44º28.31’	110º34.90’	3.5	1.5W	9	125	4	0.11
180826	22:04:27.99	44º28.06’	110º35.22’	4.8	1.3W	10	118	3	0.10
180829	08:54:19.18	44º47.79’	111º27.17’	10.9	1.2	9	223	4	0.14
180829	17:19:13.91	44º46.73’	110º47.69’	4.9	0.9	15	92	5	0.18
180829	17:42:10.49	44º46.61’	110º47.56’	5.0	1.8W	22	90	5	0.19
180829	18:07:29.88	44º46.41’	110º47.49’	4.6	2.3W	22	86	5	0.22
180829	18:17:30.60	44º46.75’	110º47.52’	5.6	0.9	14	91	5	0.19
180829	18:31:10.40	44º46.55’	110º47.40’	4.4	1.2	13	91	5	0.15
180829	18:42:24.53	44º46.58’	110º47.37’	4.8	0.7	13	91	5	0.17
180829	18:42:43.73	44º46.68’	110º47.61’	5.7	0.6	13	91	5	0.23
180829	19:16:33.85	44º46.44’	110º47.25’	4.3	0.8	13	113	5	0.21
180829	19:41:27.55	44º39.06’	110º25.86’	3.8	0.6	10	128	10	0.20
180829	19:44:34.94	44º46.37’	110º47.85’	4.8	2.3W	21	84	5	0.19
180830	00:24:17.72	44º45.30’	110º45.31’	4.3	0.8	16	99	5	0.16
180830	02:00:01.87	44º46.59’	110º47.63’	4.8	0.5	16	90	5	0.20
180830	03:55:45.74	44º46.92’	110º47.46’	5.0	2.2W	23	91	5	0.20
180831	04:47:08.32	44º51.05’	111º28.29’	12.6	0.8	12	190	4	0.16
180901	15:36:23.28	44º36.46’	110º57.19’	12.7	0.3	14	121	7	0.17
180903	02:31:30.02	44º32.94’	111º04.68’	17.6	0.1	13	153	7	0.28
180903	09:30:13.14	44º34.96’	110º41.56’	6.8	0.6W	16	98	5	0.25
180903	13:09:22.19	44º41.02’	110º27.80’	5.0	0.6	9	112	5	0.09
180903	23:38:39.37	44º25.14’	110º35.92’	3.1	1.1W	13	101	2	0.11
180904	13:13:27.01	44º47.34’	110º47.72’	4.3	0.2	12	208	4	0.19
180904	13:48:55.85	44º45.72’	111º10.40’	10.2	0.5	11	120	2	0.17
180905	00:10:25.03	44º36.76’	110º25.95’	4.0	1.5W	12	131	6	0.15
180905	03:53:07.14	44º36.60’	110º26.07’	5.3	1.3	10	178	6	0.17
180905	05:03:39.04	44º46.63’	110º48.17’	4.4	0.2	18	105	4	0.19
180905	21:39:48.47	44º46.44’	110º47.95’	2.4	0.6	11	106	4	0.10
180907	12:50:27.31	44º39.20’	110º01.28’	13.1	1.6W	21	110	12	0.21
180907	20:43:26.42	44º38.83’	110º02.69’	10.1	1.6	11	101	12	0.15
180907	20:55:37.32	44º39.23’	110º03.12’	10.2	0.8	9	137	13	0.17
180908	23:26:45.08	44º46.37’	111º01.93’	5.2	0.5W	16	112	3	0.17

Table 2. Earthquakes in the Yellowstone Region: July 1–September 30, 2018

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
180909	17:28:21.14	44º48.52’	111º04.46’	10.0	0.9W	12	158	8	0.13
180909	22:17:53.18	44º48.37’	111º04.31’	8.3	0.9W	18	129	7	0.14
180910	05:36:16.95	44º46.48’	111º01.88’	5.2	0.6	20	113	3	0.18
180910	09:40:22.55	44º27.31’	111º06.23’	9.7	0.6W	12	147	17	0.19
180910	11:33:56.75	44º27.43’	111º07.08’	15.7	1.0W	14	152	17	0.18
180910	11:33:57.18	44º26.81’	111º05.23’	8.6*	0.8W	11	162	18	0.18
180910	15:02:54.91	44º27.47’	111º06.98’	15.1	0.8W	17	150	16	0.21
180910	16:39:44.55	44º27.55’	111º05.62’	14.3	1.0W	13	144	16	0.27
180910	19:07:09.57	44º27.99’	111º08.69’	6.0*	0.5	11	159	16	0.12
180911	13:30:53.52	44º51.65’	110º25.73’	10.6	2.8W	34	81	13	0.21
180911	19:42:40.97	44º47.23’	111º05.70’	9.2	0.6	13	131	1	0.15
180912	04:36:56.52	44º45.03’	110º54.56’	5.6	0.0	14	121	6	0.14
180912	11:30:32.97	44º47.39’	111º02.21’	7.9	0.9W	17	122	4	0.15
180913	07:41:08.43	44º30.48’	110º42.14’	2.5*	1.1	6	110	12	0.16
180913	13:59:32.74	44º21.06’	110º56.57’	3.8*	2.0W	19	102	14	0.24
180913	18:12:18.45	44º44.46’	111º08.34’	13.1	1.2W	12	63	5	0.12
180914	04:13:22.12	44º56.34’	111º27.16’	6.1	0.8	11	179	12	0.11
180915	06:32:02.50	44º42.30’	111º00.20’	7.2	0.2	14	103	5	0.13
180915	07:35:47.56	44º42.53’	110º59.97’	6.3	0.7W	13	102	5	0.12
180915	11:08:10.91	44º48.75’	111º04.45’	10.0	1.3W	19	133	8	0.13
180916	00:01:47.35	44º03.98’	110º42.29’	6.4	1.4	12	128	2	0.10
180916	16:17:41.63	44º46.03’	111º19.39’	5.1	0.2	8	176	9	0.07
180916	19:19:36.60	44º46.50’	111º06.22’	9.4	0.9	16	74	2	0.17
180916	19:51:59.41	44º32.03’	111º06.00’	13.3	1.7W	19	141	8	0.19
180917	02:31:24.11	44º48.13’	111º05.04’	10.4	0.6W	13	124	2	0.18
180918	09:08:18.70	44º35.00’	110º43.67’	8.3	0.9W	21	116	7	0.19
180918	09:18:15.92	44º34.26’	110º44.09’	6.1	0.5W	7	150	8	0.08
180919	14:44:48.48	44º21.81’	110º33.33’	6.4	1.7W	16	102	9	0.27
180923	15:26:21.41	44º13.37’	110º58.45’	14.1	0.9	10	102	17	0.16
180924	09:31:31.40	44º24.37’	110º36.33’	2.8	0.7	17	75	3	0.12
180924	14:29:48.37	44º18.59’	110º59.25’	8.9*	1.5	9	115	20	0.21
180925	17:26:32.33	44º14.98’	110º45.48’	11.3	1.6	9	124	19	0.15
180927	11:37:52.55	44º48.72’	110º52.52’	5.5	0.6	23	127	3	0.21
180928	09:36:25.36	44º46.85’	111º08.33’	10.1	0.3	19	102	3	0.18
180929	02:14:58.67	44º46.14’	110º57.73’	8.1	0.7W	21	113	4	0.16
180929	08:13:37.82	44º46.00’	110º57.69’	7.9	-0.2	18	135	4	0.16
180929	11:42:00.76	44º47.79’	111º06.05’	12.9	0.3	11	139	0	0.12
180929	18:32:23.57	44º41.63’	110º00.44’	14.6	0.8	10	123	8	0.20
180929	18:47:10.59	44º41.69’	109º59.62’	16.6	1.7	7	107	7	0.08
180929	23:28:03.79	44º47.40’	111º06.04’	11.7	0.8W	15	100	1	0.17
180929	23:30:59.80	44º47.48’	111º05.74’	11.9	0.2	12	136	1	0.12
180930	01:07:27.70	44º46.31’	110º57.72’	9.1	0.2	9	141	4	0.12

number of earthquakes = 312

* indicates poor depth control

W indicates Wood-Anderson data used for magnitude calculation

Table 3
UNIVERSITY OF UTAH YELLOWSTONE SEISMIC NETWORK
Operating Seismograph Stations
September 30, 2018

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	Taurus	Digital	USGS
YFT	Old Faithful (YNP), WY	HH[ZEN]	3	WY	44° 27.05′	110° 50.24′	2292	Compact	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	ANSS-130	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	ANSS-130	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 July 1–September 30, 2018

September 6, 2018: Station H17A renamed YDD and added to WY network