EARTHQUAKE ACTIVITY IN THE YELLOWSTONE REGION

Preliminary Epicenters

October 1 – December 31, 2017

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

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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 through 02:00 (2:00 a.m.) on November 5 and MST thereafter.

- 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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October 1 – December 31, 2017

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During the three-month period October 1 through December 31, 2017, the University of Utah Seismograph Stations (UUSS) located 260 earthquakes within the Yellowstone region (Figure 1). The total includes 8 earthquakes in the magnitude 2 range. The largest event to occur during this period was a magnitude 2.3 earthquake on December 18th. 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 2017). 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 four 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 32 earthquakes ($0.1 \leq M \leq 2.2$) occurred about 7 mi NE of West Yellowstone, MT from October 27th – November 1st.
B. A swarm of 22 earthquakes ($0.1 \leq M \leq 2.2$) occurred about 3 mi NE of West Thumb, YNP from October 31st – November 1st.
C. A swarm of 18 earthquakes ($-0.4 \leq M \leq 1.7$) occurred about 16 mi ENE of West Yellowstone, MT on December 5th.
D. A swarm of 15 earthquakes ($-0.5 \leq M \leq 1.2$) occurred about 13 mi NE of Old Faithful, YNP from December 17th – 18th.

These swarms are labeled in Figure 1.

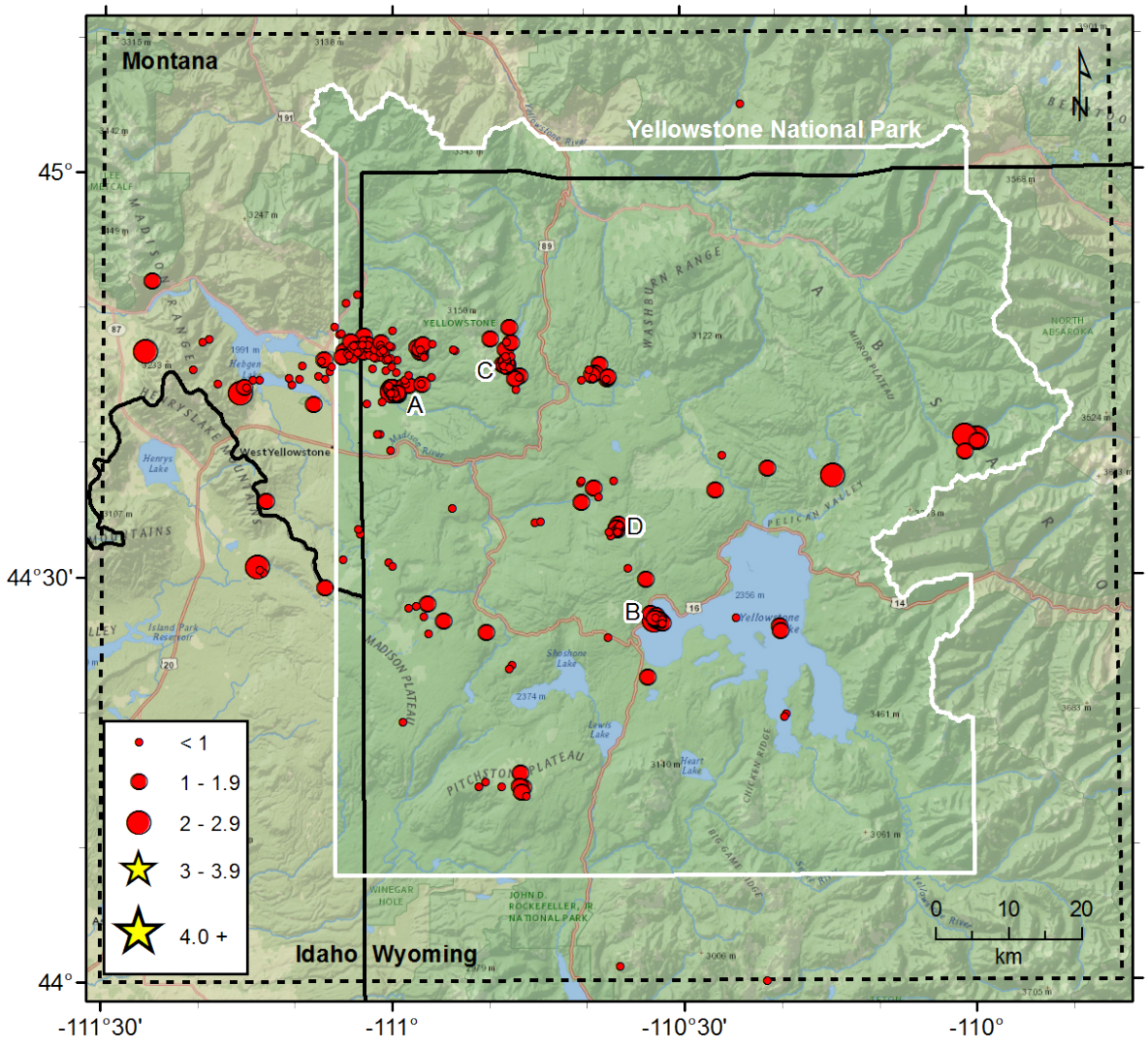

Figure 1. Epicenters of earthquakes located by the University of Utah Seismograph Stations, October 1, 2017 through December 31, 2017. Earthquake swarms (labeled A–D) are discussed in the text.

Table 1

EARTHQUAKES FELT IN THE YELLOWSTONE REGION
January 1, 2017 to December 31, 2017

Date	Time†	Felt Information‡	Latitude	Longitude	Magnitude§
January 20	09:37 MST 16:37 UTC	Yellowstone. Felt (II) at West Yellowstone, MT.	44º 48.07′	110º 59.06′	M_L 3.3
June 15 June 16	18:48 MDT 00:48 UTC	Yellowstone. Felt (IV) at West Yellowstone, MT.	44º 46.86′	111º 01.98′	M_W 4.4
June 15 June 16	19:03 MDT 01:03 UTC	Yellowstone. Felt (II) at West Yellowstone, MT.	44º 46.56′	111º 02.34′	M_L 3.1
June 15 June 16	19:46 MDT 01:46 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 47.22′	111º 02.22′	M_L 2.9
June 16	07:17 MDT 13:17 UTC	Yellowstone. Felt (II) at West Yellowstone, MT.	44º 47.28′	111º 01.20′	M_L 2.6
June 18 June 19	21:12 MDT 03:12 UTC	Yellowstone. Felt (IV) at West Yellowstone, MT.	44º 47.16′	111º 01.50′	M_L 3.0
June 26	16:35 MDT 22:35 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 48.24′	111º 01.26′	M_L 2.7
July 16	10:30 MDT 16:30 UTC	Yellowstone. Felt (II) at West Yellowstone, MT.	44º 45.44’	111º 00.82’	M_L 2.9
July 16	11:21 MDT 17:21 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 45.44’	111º 00.82’	M_L 3.4
July 16	11:28 MDT 17:28 UTC	Yellowstone. Felt (II) at West Yellowstone, MT.	44º 45.59’	111º 00.67’	M_L 2.8
July 18	14:31 MDT 20:31 UTC	Yellowstone. Felt (IV) at West Yellowstone, MT.	44º 46.56’	111º 02.26’	M_W 3.6
August 01	07:16 MDT 13:16 UTC	Yellowstone. Felt (IV) at West Yellowstone, MT.	44º 47.68’	111º 04.75’	M_L 3.1
August 01	09:15 MDT 15:15 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 47.83’	111º 04.60’	M_L 2.8
August 02 August 03	18:18 MDT 00:18 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 47.98’	111º 03.85’	M_L 2.8
August 03	12:38 MDT 18:38 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 47.45’	111º 04.37’	M_L 2.8

Table 1

EARTHQUAKES FELT IN THE YELLOWSTONE REGION
January 1, 2017 to December 31, 2017

August 05	05:17 MDT 11:17 UTC	Yellowstone. Felt (V) at West Yellowstone, MT.	44º 47.23'	111º 04.30'	M_L 3.3
August 14 August 15	20:03 MDT 02:03 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 46.93'	111º 03.09'	M_L 3.0
August 20 August 21	21:00 MDT 03:00 UTC	Yellowstone. Felt (III) at West Yellowstone, MT.	44º 47.83'	111º 05.36'	M_L 3.3
September 16 September 17	23:38 MDT 05:38 UTC	Yellowstone. Felt (III) at Yellowstone National Park.	44º 18.89'	110º 50.21'	M_L 3.2
September 26	00:31 MDT 06:31 UTC	Yellowstone. Felt (III) at Yellowstone National Park.	44º 48.17'	110º 39.38'	M_L 2.9

† 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
December 31, 2017

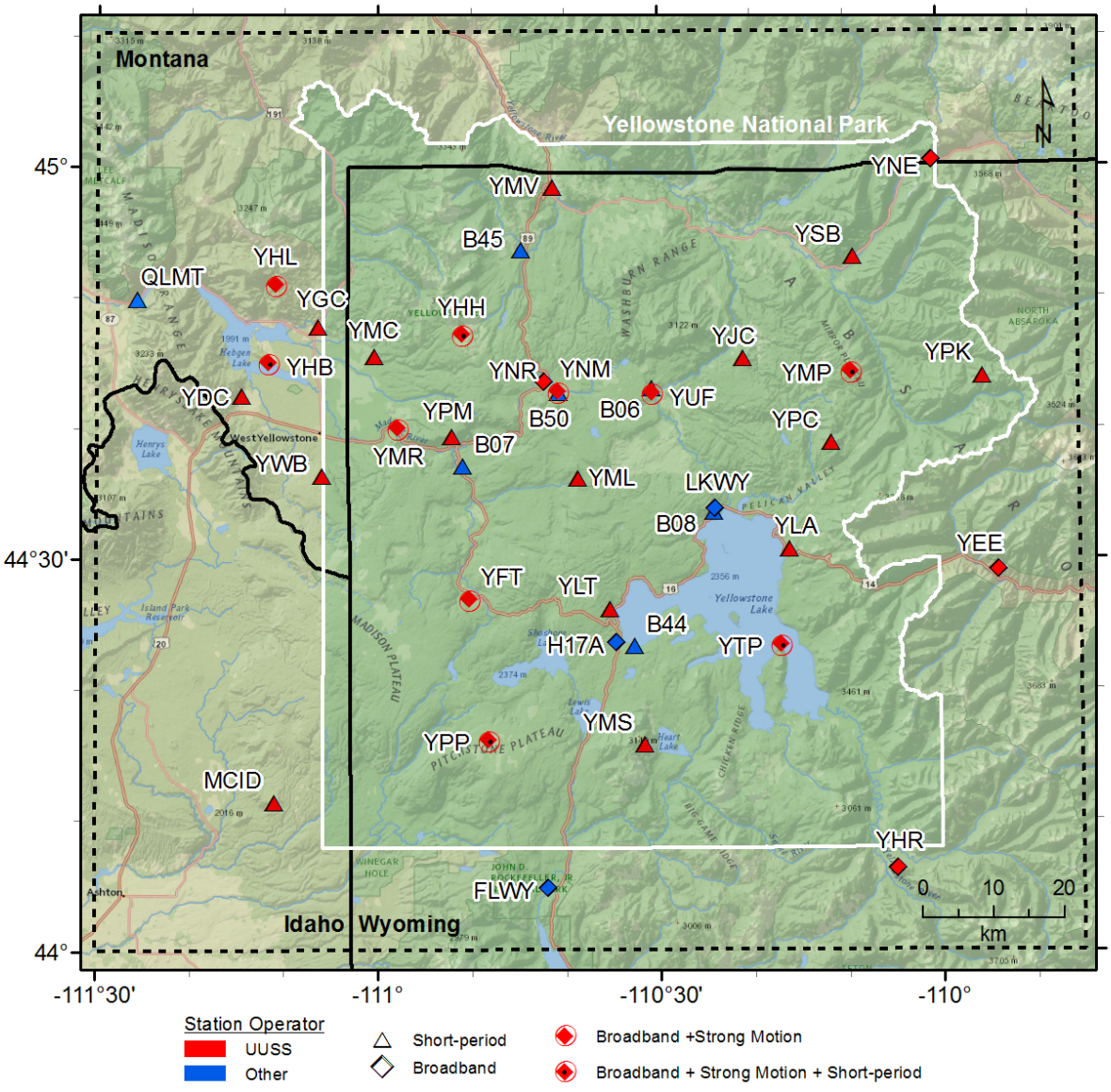

Figure 2. Seismograph Stations of the Yellowstone Seismic Network as of December 31, 2017

Table 2. Earthquakes in the Yellowstone Region: October 1–December 31, 2017

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
171002	02:23:09.05	44°44.30’	111°10.49’	4.9	0.7	8	82	2	0.05
171002	13:01:08.12	44°46.77’	111°05.04’	11.2	1.3	17	69	3	0.09
171005	13:05:07.30	44°46.33’	111°05.21’	11.7	1.2	21	87	3	0.16
171006	23:02:45.89	44°45.83’	110°48.10’	5.4	1.1	15	85	5	0.18
171007	02:05:56.34	44°14.61’	110°51.08’	6.1	0.4	6	219	5	0.09
171007	02:06:20.41	44°13.85’	110°46.17’	4.6	0.9	12	116	5	0.32
171007	02:07:22.11	44°14.55’	110°48.75’	6.8	0.9	9	176	3	0.18
171007	14:16:04.92	44°14.57’	110°46.93’	4.3	1.2	9	110	4	0.24
171008	15:42:32.98	44°47.17’	111°00.11’	9.6	0.3	10	202	3	0.15
171009	05:35:50.31	44°47.89’	111°02.95’	9.1	1.5	21	70	5	0.14
171009	08:09:21.24	44°46.54’	111°04.57’	10.0	0.2	14	130	3	0.13
171009	23:44:40.41	44°47.29’	111°01.25’	8.0	0.6	10	205	3	0.13
171009	23:45:28.59	44°46.89’	111°00.96’	7.7	0.2	8	246	3	0.16
171010	03:25:19.53	44°46.32’	111°04.45’	10.0	0.7	18	127	4	0.15
171010	04:11:05.86	44°47.31’	110°56.83’	7.6	1.2	18	159	6	0.13
171010	11:15:59.81	44°46.67’	111°04.74’	10.1	0.2	9	131	3	0.12
171010	12:00:45.25	44°46.22’	111°04.06’	10.1	0.2	7	129	4	0.10
171010	17:47:23.85	44°39.51’	111°00.24’	9.6	0.9	7	124	10	0.06
171015	11:19:00.20	44°33.61’	111°03.56’	8.9	0.5	13	133	6	0.18
171015	11:27:30.94	44°33.31’	111°03.39’	6.3	0.6	7	135	7	0.06
171015	22:10:09.71	44°00.16’	110°21.54’	8.5*	0.9	10	198	29	0.14
171016	15:01:05.52	44°46.79’	111°01.13’	8.1	0.9W	11	160	2	0.13
171017	08:35:24.22	44°44.09’	111°15.41’	13.0	1.7W	18	134	3	0.13
171017	08:38:20.93	44°44.10’	111°15.16’	12.1	0.9	15	134	3	0.13
171017	13:54:54.39	44°45.29’	111°06.52’	9.2	0.5	13	77	5	0.11
171018	06:07:25.19	44°19.39’	110°58.90’	7.9	0.8	8	149	15	0.13
171018	13:49:04.81	44°47.21’	111°00.32’	9.7	0.1	10	152	3	0.06
171020	05:42:28.63	44°47.67’	110°49.81’	6.4	1.1W	21	108	2	0.18
171020	11:14:22.54	44°30.73’	110°35.63’	5.4	0.5	10	168	8	0.11
171020	19:01:42.43	44°44.39’	110°57.06’	9.8	0.7	16	118	5	0.16
171020	21:30:54.04	44°44.68’	110°58.70’	4.7	0.6	12	135	3	0.14
171020	21:43:41.18	44°45.02’	110°58.31’	2.2	0.5	10	135	3	0.18
171020	23:50:43.89	44°45.22’	110°59.58’	6.8	0.5	11	129	1	0.07
171021	01:59:56.05	44°46.65’	111°00.80’	8.1	0.5	12	185	2	0.07
171021	02:02:25.68	44°27.18’	110°56.75’	5.0	0.8	10	112	9	0.19
171021	06:26:59.45	44°45.39’	111°00.64’	8.0	0.8W	16	101	0	0.14
171021	09:33:12.15	44°46.94’	111°03.89’	8.3	1.2W	21	137	4	0.17
171021	10:13:25.39	44°46.71’	111°03.63’	7.8	0.4	17	136	4	0.14
171021	15:08:05.32	44°46.39’	111°01.24’	7.2	0.9	14	151	2	0.10
171021	21:01:46.66	44°36.64’	110°39.11’	1.0	1.3	9	141	1	0.13
171024	15:01:22.39	44°44.68’	111°14.55’	13.5	0.5	9	127	4	0.04
171024	16:05:35.43	44°27.02’	110°24.44’	4.5*	0.5	16	97	12	0.13
171024	19:39:39.12	44°31.41’	111°05.14’	10.6	0.6	12	138	9	0.10
171026	10:48:09.47	44°47.02’	111°01.16’	8.5	0.5	21	146	3	0.17
171027	01:54:11.37	44°47.40’	111°01.21’	8.4	1.1W	20	152	4	0.15

Table 2. Earthquakes in the Yellowstone Region: October 1–December 31, 2017

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
171027	02:01:40.42	44°46.87’	111°01.25’	8.8	1.6W	22	144	3	0.18
171027	02:08:29.81	44°47.24’	111°01.33’	9.9	1.4W	16	149	3	0.13
171027	02:13:12.16	44°47.00’	111°01.48’	8.3	1.4W	19	146	3	0.15
171027	12:22:43.27	44°44.10’	111°00.06’	7.6	1.4W	16	71	3	0.13
171027	14:06:46.65	44°43.73’	110°59.67’	7.0	1.2W	15	74	4	0.12
171027	16:20:03.43	44°44.83’	110°37.61’	4.1	1.4W	19	116	5	0.16
171027	16:20:32.64	44°44.71’	110°37.69’	4.2	1.5W	19	136	5	0.16
171027	16:21:03.07	44°44.71’	110°37.78’	4.5	0.8	16	136	5	0.18
171028	05:03:25.43	44°44.08’	110°59.95’	8.2	1.6W	20	74	3	0.16
171028	05:29:17.63	44°43.95’	110°59.83’	7.6	1.5W	22	74	3	0.16
171028	07:50:17.51	44°43.68’	110°59.47’	7.3	1.0W	15	76	4	0.14
171028	12:06:46.21	44°44.97’	110°46.75’	7.2	1.5W	23	151	7	0.17
171028	13:17:47.16	44°43.86’	111°00.02’	7.4	1.9W	25	56	3	0.17
171028	13:21:18.82	44°43.46’	110°59.69’	5.9	0.3	11	105	4	0.11
171028	13:24:11.36	44°44.07’	111°00.07’	8.1	1.8W	23	56	3	0.14
171028	13:44:12.34	44°43.93’	110°59.85’	8.3	1.8W	24	59	3	0.13
171028	14:01:37.09	44°43.83’	110°59.75’	7.5	1.7W	17	61	3	0.15
171028	14:42:29.56	44°45.72’	111°09.39’	6.0	0.0	10	105	3	0.08
171028	15:45:32.75	44°43.91’	110°59.79’	6.8	0.4	14	74	3	0.13
171028	16:04:51.18	44°47.61’	111°03.08’	8.4	0.8	14	150	4	0.10
171028	16:05:32.11	44°47.29’	111°03.14’	7.5	0.0	11	186	4	0.12
171028	16:50:47.33	44°43.70’	111°00.17’	6.9	0.1	10	120	3	0.12
171028	18:31:11.52	44°43.75’	110°59.95’	5.7	0.3	15	69	3	0.15
171028	18:34:45.68	44°43.69’	110°59.72’	6.7	0.5	16	83	4	0.16
171028	21:16:10.33	44°43.91’	111°00.19’	7.2	0.6	14	104	3	0.14
171029	04:44:19.77	44°43.71’	110°59.43’	6.4	1.2W	17	78	4	0.14
171029	08:46:42.01	44°43.70’	110°59.82’	6.6	0.2	16	101	4	0.17
171029	11:56:17.81	44°46.83’	110°53.44’	5.9	0.8	9	178	3	0.09
171029	13:07:40.59	44°46.92’	110°53.66’	5.9	0.8W	14	114	4	0.14
171029	19:41:02.84	44°43.84’	110°59.95’	8.3	1.8W	20	56	3	0.13
171029	19:44:21.52	44°44.26’	111°00.41’	8.2	0.5	10	105	2	0.08
171029	20:26:27.77	44°44.14’	111°00.19’	9.2	1.9W	20	53	3	0.12
171029	21:13:10.37	44°43.08’	111°01.04’	5.7	0.5	10	177	5	0.13
171029	23:47:31.81	44°43.45’	111°00.11’	6.3	0.4W	10	121	4	0.13
171030	09:29:53.97	44°43.83’	111°00.02’	7.9	2.2W	19	54	3	0.12
171030	16:52:46.63	44°51.04’	111°03.70’	10.1	0.2	10	248	7	0.17
171030	17:45:46.26	44°43.76’	110°59.93’	6.1	0.6W	10	87	3	0.10
171030	20:41:33.91	44°44.21’	110°58.80’	6.4	1.2W	14	109	3	0.10
171030	20:43:55.62	44°44.37’	110°58.59’	5.9	0.7	12	135	3	0.11
171030	21:22:12.32	44°44.28’	110°58.35’	6.5	1.1W	19	107	4	0.14
171031	04:56:33.94	44°26.91’	110°32.56’	3.3	1.2	16	75	4	0.15
171031	04:56:43.44	44°26.94’	110°32.63’	3.5	1.3W	17	97	4	0.16
171031	04:57:03.10	44°26.75’	110°32.23’	2.3	1.2	12	142	4	0.17
171031	04:57:20.34	44°26.90’	110°32.68’	3.1	1.6W	18	73	4	0.13
171031	04:57:47.14	44°26.86’	110°32.65’	3.5	1.5W	20	73	4	0.13

Table 2. Earthquakes in the Yellowstone Region: October 1–December 31, 2017

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
171031	04:58:02.63	44º26.66’	110º32.13’	2.2	0.1	12	139	4	0.13
171031	04:58:10.47	44º26.93’	110º32.10’	2.2	0.2	9	146	4	0.14
171031	04:58:37.72	44º26.52’	110º32.08’	2.0	0.7	11	134	4	0.12
171031	05:00:45.84	44º26.72’	110º32.46’	2.0	1.9W	17	71	4	0.13
171031	05:05:19.66	44º26.84’	110º32.61’	3.7	1.3W	11	149	4	0.07
171031	05:05:57.83	44º26.81’	110º32.54’	3.5	1.7W	21	70	4	0.10
171031	05:06:20.71	44º26.86’	110º32.78’	3.9	1.9W	10	129	6	0.04
171031	05:06:43.78	44º26.77’	110º32.18’	2.2	1.4	9	142	4	0.17
171031	05:07:40.40	44º26.92’	110º32.44’	3.2	1.6W	8	148	4	0.03
171031	05:10:18.98	44º27.03’	110º32.80’	3.1	0.3	17	71	4	0.19
171031	05:10:36.13	44º26.69’	110º32.37’	2.1	0.7	11	141	4	0.12
171031	05:10:49.59	44º26.60’	110º32.05’	1.8	1.2	13	83	4	0.18
171031	05:11:51.51	44º27.01’	110º32.88’	3.5	1.2	18	70	3	0.14
171031	05:12:27.55	44º26.82’	110º32.90’	4.0	2.2W	14	129	3	0.11
171031	05:13:24.09	44º26.81’	110º32.17’	2.3	0.4	9	143	4	0.13
171031	05:13:58.45	44º27.20’	110º32.75’	3.8	1.4W	13	94	4	0.14
171031	08:04:00.07	44º43.42’	110º59.56’	6.7	0.2	9	100	4	0.11
171031	16:23:54.13	44º46.32’	111º01.75’	8.0	0.4	13	182	2	0.17
171031	16:24:06.95	44º46.75’	111º01.29’	7.0	0.4	10	206	3	0.15
171031	18:29:49.54	44º43.55’	110º59.66’	7.4	1.4W	19	60	4	0.12
171031	18:34:14.83	44º45.53’	111º02.07’	7.0	0.5	12	130	2	0.12
171101	01:08:28.15	44º29.85’	110º33.79’	4.0	1.1W	18	60	7	0.10
171101	06:54:18.36	44º27.36’	110º33.32’	3.6	1.6W	17	64	3	0.10
171101	08:22:20.24	44º43.64’	110º59.65’	6.7	1.5W	21	60	4	0.15
171101	08:25:47.62	44º43.57’	110º59.72’	6.9	1.5W	20	59	4	0.13
171101	20:36:29.81	44º26.84’	110º54.67’	1.8	1.4W	12	102	6	0.25
171103	08:56:25.95	44º14.52’	110º46.51’	5.8	1.8W	14	79	4	0.17
171103	20:46:42.79	44º37.21’	110º37.04’	4.3	0.9W	13	121	3	0.11
171103	21:57:40.86	44º43.56’	110º59.40’	6.1	1.2W	16	75	4	0.12
171104	07:09:31.38	44º43.80’	110º59.97’	7.2	0.8W	14	119	3	0.10
171104	11:22:23.02	44º27.83’	110º58.37’	3.7*	0.7W	9	231	11	0.15
171104	21:00:00.54	44º15.53’	110º46.83’	3.8	1.4	8	125	2	0.15
171105	04:31:54.66	44º42.93’	111º02.68’	6.2	0.3	7	133	6	0.10
171105	13:13:33.96	44º43.63’	110º59.85’	7.1	0.6	18	69	4	0.16
171105	14:44:36.13	44º30.84’	111º13.91’	16.2	2.0W	25	163	15	0.15
171105	15:18:45.77	44º30.62’	111º13.77’	13.7	0.8	7	185	15	0.11
171105	18:05:10.61	44º43.72’	110º59.57’	6.4	1.2W	16	76	4	0.12
171106	05:37:18.72	44º30.42’	111º13.32’	15.8	0.9	20	162	15	0.17
171106	08:48:51.79	44º42.82’	111º08.14’	7.7	1.0	20	83	6	0.16
171106	23:02:59.13	44º46.19’	110º59.49’	8.8	0.3	8	204	2	0.08
171107	12:21:27.49	44º35.17’	110º53.84’	11.3	0.7	12	78	5	0.07
171107	22:16:40.11	45º05.02’	110º23.67’	14.2*	0.9	16	111	29	0.26
171109	08:36:15.05	44º45.44’	111º20.76’	12.7	0.4	10	96	10	0.09
171109	13:11:52.12	44º48.65’	111º06.06’	8.9	0.3	10	182	2	0.19
171109	15:14:16.82	44º48.09’	111º05.30’	5.0	0.2	8	206	2	0.07

Table 2. Earthquakes in the Yellowstone Region: October 1–December 31, 2017

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
171110	11:06:37.85	44°48.02’	111°05.54’	5.2	0.6	14	144	1	0.12
171110	17:20:36.16	44°35.60’	110°40.41’	7.9	1.1W	12	159	3	0.10
171110	18:07:04.68	44°44.64’	111°13.77’	18.7	0.5	6	142	4	0.21
171111	03:06:20.66	44°19.67’	110°19.54’	8.5	0.8	18	146	8	0.16
171112	11:54:27.11	44°45.65’	111°00.10’	5.0	0.6	11	207	0	0.15
171113	10:54:04.90	44°47.30’	111°02.59’	7.6	0.3	10	169	4	0.09
171113	18:55:01.49	44°47.26’	111°02.61’	8.0	1.4W	14	142	4	0.06
171113	19:04:15.84	44°50.36’	111°04.86’	10.2	0.3	8	251	11	0.17
171113	20:30:51.89	44°46.32’	111°00.22’	6.0	0.1	6	152	1	0.05
171114	05:54:26.65	44°44.99’	111°07.65’	9.0	0.4	9	133	5	0.11
171114	06:35:58.70	44°51.93’	111°25.02’	12.8	1.1	14	116	4	0.12
171114	07:06:35.39	44°28.06’	110°56.32’	3.2	1.1W	10	108	8	0.17
171116	14:14:51.07	44°46.42’	110°56.67’	4.9	0.9W	16	155	5	0.14
171117	10:02:30.09	44°46.74’	111°03.02’	9.2	1.6W	21	88	4	0.16
171120	10:00:30.44	44°44.73’	110°47.29’	5.4	1.3W	19	86	7	0.15
171121	13:24:23.47	44°44.87’	110°55.99’	8.7	0.9	18	119	6	0.15
171124	09:49:58.96	44°45.68’	111°06.36’	11.7	0.1	12	112	7	0.12
171125	12:28:44.16	44°39.07’	110°25.80’	4.0	0.9	10	208	10	0.08
171125	16:30:29.20	44°40.64’	111°01.54’	1.9	0.5	13	65	5	0.27
171126	08:04:34.66	44°40.66’	111°01.29’	7.2	0.6W	14	63	5	0.12
171126	09:49:52.26	44°46.21’	111°00.47’	7.8	-0.1	7	200	1	0.10
171126	12:59:40.13	44°14.95’	110°50.40’	5.3	0.8	9	217	4	0.12
171126	13:28:27.92	44°47.49’	111°19.72’	10.9	0.8	13	129	9	0.10
171126	20:32:30.68	44°46.71’	111°25.67’	14.1	2.1W	23	92	6	0.14
171128	16:55:48.89	44°47.44’	110°47.66’	4.3	1.0	14	202	4	0.10
171128	17:09:25.24	44°47.45’	110°48.12’	5.3	0.6	12	109	4	0.21
171128	17:49:31.09	44°48.55’	110°47.89’	6.2	1.3	17	195	5	0.13
171128	20:10:37.42	44°26.32’	110°19.98’	8.6	1.4	18	99	6	0.16
171128	20:55:06.53	44°26.02’	110°19.86’	9.4	1.2	15	112	6	0.11
171128	21:04:51.82	44°44.62’	110°40.38’	2.3	-0.1	6	172	3	0.12
171128	21:10:49.67	44°45.14’	110°39.00’	2.6	1.5W	11	164	5	0.13
171128	21:14:33.57	44°45.02’	110°39.32’	2.1	1.4	8	280	4	0.15
171128	21:14:44.31	44°45.42’	110°39.55’	1.7	0.9	9	275	5	0.13
171128	21:18:29.73	44°44.76’	110°39.14’	2.2	0.3	14	178	4	0.22
171128	21:20:34.35	44°45.76’	110°38.46’	3.2	1.6W	18	167	6	0.17
171130	07:38:02.05	44°36.44’	110°26.50’	4.8	1.1W	18	104	6	0.12
171130	15:16:00.58	44°47.20’	111°04.08’	10.7	0.2	5	293	6	0.03
171130	22:22:36.40	44°23.61’	110°47.66’	2.0	0.8	7	111	7	0.09
171130	22:37:04.50	44°23.26’	110°47.97’	2.0	0.6	6	168	8	0.16
171201	17:23:04.29	44°19.91’	110°19.37’	10.7	0.9	14	202	7	0.18
171202	05:39:48.07	44°46.14’	111°00.67’	8.8	0.3	14	136	1	0.16
171202	05:43:01.27	44°47.47’	111°04.33’	7.8	1.3W	23	118	3	0.14
171202	17:46:46.61	44°44.36’	110°56.94’	10.1	1.1W	15	118	5	0.14
171203	00:43:11.37	44°43.98’	110°47.16’	2.8	-0.2	10	141	8	0.08
171203	00:43:22.58	44°44.85’	110°46.88’	7.4	0.1	10	163	7	0.06

Table 2. Earthquakes in the Yellowstone Region: October 1–December 31, 2017

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
171205	06:42:20.17	44°46.02’	110°48.12’	4.5	0.6	8	178	5	0.10
171205	08:34:06.70	44°45.47’	110°48.32’	3.1	0.7	8	161	5	0.08
171205	10:03:03.69	44°45.71’	110°48.24’	5.0	1.7W	21	80	5	0.11
171205	10:06:19.31	44°46.20’	110°48.19’	4.3	0.6	7	182	4	0.10
171205	10:08:10.79	44°43.70’	111°15.73’	14.6	2.2W	26	98	3	0.15
171205	10:14:00.73	44°45.77’	110°48.01’	3.0	1.0W	12	86	5	0.13
171205	10:15:15.80	44°45.66’	110°48.08’	4.3	1.5W	17	85	5	0.16
171205	10:19:11.68	44°46.03’	110°48.13’	4.2	1.0W	15	85	4	0.10
171205	10:23:30.70	44°45.92’	110°48.05’	4.1	0.6	13	102	5	0.12
171205	10:23:56.95	44°46.45’	110°48.27’	5.6	0.3	11	104	4	0.11
171205	10:25:46.01	44°45.68’	110°48.16’	4.7	1.1W	18	84	5	0.16
171205	10:28:16.38	44°45.71’	110°48.26’	2.8	0.7	11	100	5	0.12
171205	10:28:41.88	44°45.59’	110°47.90’	2.4	-0.4	7	169	5	0.14
171205	10:41:38.11	44°45.73’	110°48.46’	3.6	0.4	11	98	4	0.06
171205	10:42:23.60	44°45.77’	110°48.51’	4.5	1.0W	14	82	4	0.13
171205	10:42:23.60	44°45.74’	110°48.54’	4.3	0.9	14	97	4	0.16
171205	11:12:24.19	44°45.74’	110°48.33’	4.8	1.0W	15	83	5	0.14
171205	11:18:12.65	44°46.40’	110°48.25’	5.1	0.6	14	169	4	0.16
171205	13:12:49.53	44°46.89’	110°48.27’	7.9	1.2W	15	109	4	0.11
171205	22:24:55.74	44°35.65’	111°13.08’	13.6	1.9W	26	118	9	0.14
171207	02:12:34.02	44°46.91’	111°01.05’	8.1	1.6W	20	118	3	0.16
171207	04:27:17.46	44°27.98’	110°57.58’	4.3	0.6	8	221	10	0.08
171207	08:30:31.67	44°46.94’	111°00.98’	8.5	0.9	15	136	3	0.09
171208	21:41:18.69	44°37.53’	110°14.35’	5.5	2.2	13	124	4	0.10
171209	01:05:41.12	44°25.92’	110°56.23’	5.0	0.9	13	110	8	0.10
171209	10:54:21.70	44°25.62’	110°37.74’	1.3	0.6	6	148	3	0.08
171209	13:36:56.79	44°46.61’	110°56.95’	4.9	0.4	11	160	5	0.12
171210	07:01:35.42	44°46.90’	110°57.12’	6.4	0.3	12	193	5	0.10
171211	12:54:28.77	44°34.20’	110°44.69’	5.3	0.6W	13	117	9	0.09
171211	12:54:50.50	44°34.10’	110°45.27’	3.5	0.6	9	142	9	0.10
171212	12:46:15.36	44°47.69’	111°19.04’	9.4	0.2	6	164	10	0.10
171213	09:12:40.38	44°47.04’	111°01.33’	8.4	1.9W	25	138	3	0.16
171214	15:15:43.15	44°25.99’	110°50.26’	2.2	1.2	13	87	2	0.12
171214	17:22:59.67	44°22.61’	110°33.62’	2.9	1.1	13	98	2	0.11
171214	18:54:20.78	44°01.27’	110°36.58’	9.6	0.7	19	147	10	0.13
171215	02:01:50.31	44°44.77’	111°09.69’	8.3	-0.1	14	58	3	0.14
171215	10:45:38.99	44°44.80’	111°10.79’	9.6	0.0	17	63	1	0.14
171217	03:27:55.02	44°33.10’	110°37.43’	2.0	0.1	8	251	6	0.10
171217	07:59:02.86	44°33.71’	110°36.56’	2.1	0.3	11	118	6	0.15
171217	07:59:12.03	44°35.99’	110°38.69’	2.8	0.9	6	266	1	0.03
171217	07:59:37.60	44°33.38’	110°37.59’	2.0	0.1	10	249	6	0.18
171217	08:01:38.93	44°33.64’	110°36.76’	4.8	1.2	12	188	6	0.16
171217	08:04:48.95	44°33.55’	110°36.74’	4.8	1.1W	15	105	6	0.09
171217	08:07:32.26	44°33.74’	110°36.67’	5.5	0.5	13	118	5	0.14
171217	08:08:18.06	44°33.29’	110°36.96’	2.0	0.2	15	102	6	0.19

Table 2. Earthquakes in the Yellowstone Region: October 1–December 31, 2017

DATE	ORIGIN TIME	LATITUDE	LONGITUDE	DEPTH	MAG	NO	GAP	DMN	RMS
171217	08:09:13.32	44°33.92’	110°36.53’	5.7	0.2	10	122	5	0.20
171217	08:22:12.09	44°33.94’	110°36.60’	5.6	1.1W	17	110	5	0.11
171217	08:25:32.00	44°33.41’	110°36.74’	4.2	-0.5	12	112	6	0.16
171217	08:25:43.09	44°33.32’	110°36.66’	3.6	0.0	16	104	6	0.19
171217	10:00:39.12	44°33.67’	110°36.54’	5.1	0.8	12	190	6	0.10
171217	13:04:40.41	44°33.62’	110°36.87’	4.8	0.6	14	106	5	0.14
171217	15:14:22.59	44°33.66’	110°36.75’	4.7	1.0	11	188	5	0.15
171218	03:08:09.53	44°47.32’	110°55.90’	9.7	0.7	19	109	6	0.11
171218	06:14:49.91	44°33.91’	110°36.52’	5.6	0.9	15	109	5	0.09
171218	23:44:34.27	44°40.14’	109°59.31’	13.0	2.3W	22	123	9	0.25
171219	01:06:37.72	44°46.70’	110°57.16’	6.7	1.3W	22	131	5	0.13
171219	01:17:56.48	44°46.94’	110°57.12’	6.2	1.3W	21	133	5	0.15
171219	01:18:45.77	44°46.34’	110°56.71’	4.4	0.2	13	182	5	0.14
171219	21:14:47.14	44°31.21’	111°00.41’	2.0*	0.5	11	121	12	0.19
171219	21:15:33.00	44°30.90’	110°59.99’	2.1*	-0.2	7	166	15	0.16
171220	03:04:21.79	44°39.92’	109°59.32’	15.0	1.3	9	183	9	0.21
171220	04:00:42.95	44°39.14’	110°00.60’	10.2	1.9	16	116	11	0.19
171220	10:13:24.73	44°47.08’	110°57.42’	8.1	1.3W	15	170	5	0.12
171221	01:36:22.79	44°14.13’	110°46.67’	5.1	1.1	13	112	4	0.20
171223	04:09:15.70	44°37.20’	110°40.44’	4.9	0.7	12	92	3	0.13
171223	04:10:13.66	44°37.08’	110°40.50’	5.8	0.8	16	96	3	0.14
171224	05:01:32.68	44°46.41’	110°47.66’	5.5	0.8	9	194	5	0.10
171224	05:01:32.86	44°45.79’	110°48.30’	4.5	0.6	16	84	5	0.14
171224	06:48:51.15	44°44.38’	111°18.20’	4.2	0.1	8	145	6	0.15
171224	21:35:36.71	44°40.37’	110°00.63’	15.6	2.0	9	170	10	0.15
171227	00:36:43.62	44°46.18’	111°07.14’	8.6	1.3	19	51	3	0.13
171227	19:57:55.28	44°48.35’	110°59.98’	6.6	0.4	11	169	5	0.10
171227	22:39:44.46	44°46.40’	111°01.95’	5.9	-0.4	8	180	3	0.14
171228	15:11:11.75	44°47.26’	111°02.79’	8.9	1.8W	20	119	4	0.13
171230	03:47:19.12	44°38.04’	110°21.14’	3.1	1.5	12	81	9	0.10
171230	14:54:56.28	44°47.30’	111°02.66’	6.9	0.7	14	146	4	0.12
171230	15:03:12.14	44°46.54’	111°02.48’	6.0	0.2	8	150	3	0.09
171230	19:47:33.47	44°29.27’	111°06.97’	15.1	1.4W	17	149	13	0.20
171230	22:43:56.08	44°44.77’	111°07.05’	7.3	0.3	8	93	6	0.11
171230	22:44:05.62	44°46.11’	111°07.36’	10.0	-0.2	8	121	3	0.10

number of earthquakes = 260
* indicates poor depth control
W indicates Wood-Anderson data used for magnitude calculation

Table 3
UNIVERSITY OF UTAH YELLOWSTONE SEISMIC NETWORK
Operating Seismograph Stations
December 31, 2017

UURSN Code	Location	SEED Station	SEED Channel	No. of Channels	Network Code	Latitude	Longitude	Elevation (meters)	Sensor	Digitizer	Telemetry	Sponsor
B206*	Canyon206bwy2008, Yellowstone, WY	B206	EH[ZEN]	3	PB	44° 46.66′	110° 30.70′	2400	IESE-S2	Q330	Digital	PBO
B207*	Madisn207bwy2007, Yellowstone, WY	B207	EH[ZEN]	3	PB	44° 37.14′	110° 50.91′	2182	IESE-S2	Q330	Digital	PBO
B208*	Lakejn208bwy2008, Yellowstone, WY	B208	EH[ZEN]	3	PB	44° 33.61′	110° 24.09′	2406	IESE-S2	Q330	Digital	PBO
B944*	Grantt944bwy2008, Yellowstone, WY	B944	EH[ZEN]	3	PB	44° 23.38′	110° 32.63′	2365	IESE-S2	Q330	Digital	PBO
B945*	Panthr944swy2008, Yellowstone, WY	B945	EH[ZEN]	3	PB	44° 53.64′	110° 44.65′	2249	IESE-S2	Q330	Digital	PBO
B950*	Norris950bwy2013, Yellowstone, WY	B950	EH[ZEN]	3	PB	44° 42.77′	110° 40.71′	2328	IESE-S2	Q330	Digital	PBO
FLWY*	Flagg Ranch, WY	FLWY	BH[ZEN]	3	IW	44° 04.96′	110° 41.96′	2078	3ESP	RT-130	Digital	ANSS
H17A*	Grant Junction, Yellowstone, WY	H17A	BH[ZEN]	3	TA	44° 24.00′	110° 34.80′	2400	STS-2	Q330	Digital	NSF
IMW	Indian Meadows, WY	IMW	BH[ZEN]	3	IW	43° 53.58′	110° 56.58′	2670	3ESP	RT-130	Digital	ANSS
LKW*	Lake, WY	LKWY	BH[ZEN]	3	US	44° 33.91′	110° 24.00′	2424	STS-2	Q330	Digital	USGS
LOHW*	National Elk Refuge, WY	LOHW	BH[ZEN]	3	IW	43° 36.76′	110° 36.30′	2245	3ESP	RT-130	Digital	ANSS
MCID	Moose Creek, ID	MCID	EHZ	1	WY	44° 11.45′	111° 11.03′	2137	L4C	PSN	Analog	USGS
MOOW*	Moose Ponds, WY	MOOW	BH[ZEN]	3	IW	43° 44.92′	110° 44.69′	2128	3ESP	RT-130	Digital	ANSS
QLMZ*	Earthquake Lake, MT	QLMT	EHZ	1	MB	44° 49.84′	111° 25.80′	2064	L4C	-	Analog	MBMT
REDW*	Red-Top Meadows, WY	REDW	BH[ZEN]	3	IW	43° 21.74′	110° 51.18′	2322	3ESP	RT-130	Digital	ANSS
SNOW*	Snow King Mountain, WY	SNOW	BH[ZEN]	3	IW	43° 27.75′	110° 45.31′	2390	3ESP	RT-130	Digital	ANSS
TPAW*	Teton Pass, WY	TPAW	BH[ZEN]	3	IW	43° 29.41′	110° 57.04′	2512	3ESP	RT-130	Digital	ANSS
TPMZ*	Teepe Creek, MT	TPMT	EHZ	1	MB	44° 43.79′	111° 39.94′	2518	L4C	-	Analog	MBMT
YDC	Denny Creek, MT	YDC	EHZ	1	WY	44° 42.51′	111° 14.60′	2025	L4C	PSN	Analog	USGS
YEE	East Entrance (YNP), WY	YEE	HH[ZEN]	3	WY	44° 29.12′	109° 53.81′	2270	Compact	Taurus	Digital	USGS
YFT	Old Faithful (YNP), WY	YFT	HH[ZEN]	3	WY	44° 27.05′	110° 50.24′	2292	Compact	Taurus	Digital	USGS
			EN[ZEN]	3					Titan			
YGC	Grayling Creek, MT	YGC	EHZ	1	WY	44° 47.77′	111° 06.45′	2075	L4C	PSN	Analog	USGS
YHB	Horse Butte, MT	YHB	EHZ	1	WY	44° 45.07′	111° 11.71′	2157	L4C	PSN	Analog	USGS
			HH[ZEN]	3					40T	ANSS-130	Digital	
			EN[ZEN]	3					Titan			
YHH	Holmes Hill (YNP), WY	YHH	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			

UURSN Code	Location	SEED Station	SEED Channel	No. of Channels	Network Code	Latitude	Longitude	Elevation (meters)	Sensor	Digitizer	Telemetry	Sponsor
YHL	Hebgen Lake, MT	YHL	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	YHR	HH[ZEN]	3	WY	44° 06.36′	110° 04.90′	2976	Trillium 120	Q330	Digital	USGS
YJCZ	Joseph′s Coat (YNP), WY	YJC	EH[ZEN]	3	WY	44° 45.33′	110° 20.95′	2684	S13	PSN	Analog	USGS
YLAZ	Lake Butte (YNP), WY	YLA	EHZ	1	WY	44° 30.76′	110° 16.12′	2580	L4C	PSN	Analog	USGS
YLT	Little Thumb Creek (YNP), WY	YLT	EHZ	1	WY	44° 26.25′	110° 35.28′	2439	L4C	PSN	Analog	USGS
YMC	Maple Creek (YNP), WY	YMC	EH[ZEN]	3	WY	44° 45.53′	111° 00.41′	2073	S13	PSN	Analog	USGS
YML	Mary Lake (YNP), WY	YML	EH[ZEN]	3	WY	44° 36.20′	110° 38.63′	2653	L4C	PSN	Analog	USGS
YMP	Mirror Plateau (YNP), WY	YMP	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	YMR	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	YMS	EHZ	1	WY	44° 15.84′	110° 31.67′	3106	L4C	PSN	Analog	USGS
YMV	Mammoth Vault (YNP), WY	YMV	EHZ	1	WY	44° 58.42′	110° 41.33′	1829	L4C	PSN	Analog	USGS
YNE	Northeast Entrance (YNP), WY	YNE	HH[ZEN]	3	WY	45° 00.46′	110° 00.48′	2343	Compact	ANSS-130	Digital	USGS
YNM	Norris Museum (YNP), WY	YNM	HH[ZEN]	3	WY	44° 43.59′	110° 42.22′	2311	Trillium 240	Q330	Digital	USGS
YNR	Norris Junction (YNP), WY	YNR	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	YPC	EHZ	1	WY	44° 38.88′	110° 11.55′	2932	L4C	PSN	Analog	USGS
YPK	Parker Peak (YNP), WY	YPK	EH[ZEN]	3	WY	44° 43.91′	109° 55.32′	2897	L4C	PSN	Analog	USGS
YPM	Purple Mountain (YNP), WY	YPM	EHZ	1	WY	44° 39.43′	110° 52.12′	2582	L4C	PSN	Analog	USGS
YPP	Pitchstone Plateau (YNP), WY	YPP	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	YSB	EHZ	1	WY	44° 53.04′	110° 09.06′	2072	L4C	PSN	Analog	USGS
YTP	The Promontory (YNP), WY	YTP	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	YUF	HH[ZEN]	3	WY	44° 42.76′	110° 30.71′	2394	Compact	ANSS-130	Digital	USGS
			EN[ZEN]	3					Titan			
YWB	West Boundary (YNP), WY	YWB	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: 147 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)

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 October 1–December 31, 2017

None