Induced Seismicity Monitoring Project (ISMP): April 2019-March 2020 Report

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Executive Summary

The BC Seismic Research Consortium (BC SRC) was established in 2012 by Geoscience BC, the Canadian Association of Petroleum Producers (CAPP), Natural Resources Canada (NRCan) and the BC Oil and Gas Commission (BCOGC). It followed a recommendation from the BCOGC in response to concerns regarding induced seismicity associated with hydraulic fracturing in the Horn River Basin. The Yukon Geological Society briefly joined the consortium in 2016 to provide an expanded and comprehensive network covering oil and gas activity in Northeast British Columbia (NE BC), unfortunately, due to funding challenges the YGS left the consortium the following year. The BC SRC is responsible for maintaining a seismic array of 10 stations (NBC1-8 and NAB1-2). They also have access to additional 11 stations (the 1E network) that are maintained by the BCOGC and Pacific Geoscience Center partnership and 2 stations from NRCan (total of 23 stations). It also works with the NRCan to oversee the collection and analysis of the seismic data collected.

The BC SRC comprises representatives from each of the consortium partners— Geoscience BC, CAPP, BCOGC, NRCan, and the BC Oil and Gas Research and Innovation Society (BC OGRIS). Funding for the BC SRC is shared between Geoscience BC and the BC OGRIS.

This report provides a summary of the actions and research taken by the BC SRC for the period between April 2019 and April 2020. First, an update on seismic monitoring in NE BC is provided which is then followed by an overview of the recorded seismicity. Currently, 38 seismographic stations are used by the BC SRC for monitoring of induced seismicity in NE BC. Between the period April 1, 2019 and March 13, 2020 563 earthquakes with local magnitude between 0.8 and 4.2 occurred in NE BC with local magnitude determination using the updated method (Babaie Mahani and Kao, 2020). Most of these events, which have magnitude < 2, clustered within the BCOGC ground motion monitoring areas in the Montney play. Various research items are discussed in the report including compilation of comprehensive earthquake catalogue, velocity and density models for earthquake location, local magnitude determination, analysis of earthquake focal mechanism, stress field, and the automatic earthquake catalogue for the BCOGC via Seiscomp3 module at the NRCan office in Sidney, BC. Moreover, ongoing projects are discussed and the list of publications and presentations by the members of the BC SRC are provided. This report includes an appendix providing the parameters of the recorded earthquakes for the period April 1, 2019 to March 13, 2020.

Update on Seismic Monitoring in NE BC

During July, September, and October 2019, 12 new stations were installed in the southern Montney play of NE BC; 5 stations belong to the public 1E network and 7 stations belong to the McGill University research network. Note that data from all of these stations are used for automatic earthquake location via the Seiscomp3 system at the NRCan office in Sidney, BC. By installing these stations, the total number of seismographic stations in NE BC that are used for induced seismicity monitoring and research has reached 38 (Figure 1). Table 1 provides the parameters for each of these stations.

Table 1. Seismic stations in NE BC used for induced seismicity monitoring project. Note that station NAB2 is in fact located in Alberta.

Array	FDSN code	Station	Latitude	Longitude	Status	Start date	End date
CNSN plus	1E	MONT1	55.910149	-120.586540	Public	2018-10-01	2021-10-01
CNSN plus	1E	MONT2	56.019718	-120.046967	Public	2018-10-01	2021-10-01
CNSN plus	1E	MONT3	56.005779	-120.453880	Public	2018-10-01	2021-10-01
CNSN plus	1E	MONT4	57.318409	-122.705673	Public	2018-10-01	2021-10-01
CNSN plus	1E	MONT5	57.026909	-122.336029	Public	2018-10-16	2021-10-01
CNSN plus	1E	MONT7	56.307949	-122.031609	Public	2018-10-16	2021-10-01
CNSN plus	1E	MONT8	56.067310	-120.777428	Public	2019-07-15	2021-10-01
CNSN plus	1E	MONT9	55.803902	-120.538757	Public	2019-10-07	2021-10-01
CNSN plus	1E	MONTA	56.104321	-121.070038	Public	2019-10-05	2021-10-01
CNSN plus	1E	BCH1A	55.832432	-120.258957	Public	2019-10-04	2021-10-01
CNSN plus	1E	BCH2A	55.946072	-120.356102	Public	2019-10-05	2021-10-01
McGill	XL	MG01	56.054840	-120.637993	Research	2017-06-19	2020-12-31
McGill	XL	MG02	55.866791	-120.083992	Research	2017-06-14	2020-12-31
McGill	XL	MG03	55.912151	-120.441360	Research	2017-06-16	2020-12-31
McGill	XL	MG04	55.991360	-120.338043	Research	2017-06-17	2020-12-31
McGill	XL	MG05	55.895142	-120.301949	Research	2017-06-15	2020-12-31
McGill	XL	MG07	55.783562	-120.402420	Research	2017-08-02	2020-12-31
McGill	XL	MG08	55.841160	-120.873070	Research	2017-06-14	2020-12-31
McGill	XL	MG09	55.744190	-120.779617	Research	2017-06-18	2020-12-31
McGill	XL	MG10	55.722851	-120.063347	Research	2019-10-01	2020-12-31
McGill	XL	RU01	56.145069	-120.480042	Research	2019-07-30	2020-12-31
McGill	XL	RU02	56.131989	-120.188187	Research	2019-07-30	2020-12-31
McGill	XL	RU03	55.807442	-121.134506	Research	2019-09-26	2020-12-31
McGill	XL	RU04	55.961369	-121.038788	Research	2019-10-03	2020-12-31
McGill	XL	RU05	56.180611	-120.733391	Research	2019-10-04	2020-12-31
McGill	XL	RU06	55.989590	-120.526909	Research	2019-09-29	2020-12-31
CNSN	CN	BMTB	56.045100	-122.133200	Public	2017-09-18	2599-12-31
CNSN	CN	FNSB	58.806100	-122.732800	Public	2017-08-02	2599-12-31
CNSN	CN	NBC1	59.655940	-123.823710	Public	2013-03-01	2599-12-31
CNSN	CN	NBC2	59.773460	-122.487760	Public	2013-03-01	2599-12-31
CNSN	CN	NBC3	59.637160	-120.668750	Public	2013-03-01	2599-12-31
CNSN	CN	NBC4	55.687280	-120.660240	Public	2013-03-01	2599-12-31
CNSN	CN	NBC5	57.523110	-122.677630	Public	2013-03-01	2599-12-31
CNSN	CN	NBC6	58.583890	-121.333920	Public	2013-03-01	2599-12-31
CNSN	CN	NBC7	56.267790	-120.842620	Public	2014-08-10	2599-12-31
CNSN	CN	NBC8	56.573080	-122.404410	Public	2016-01-01	2599-12-31
CNSN	CN	NAB1	56.766290	-121.258670	Public	2014-08-19	2599-12-31
CNSN	CN	NAB2	58.595030	-119.165590	Public	2015-09-01	2599-12-31

Seismicity between April 1, 2019 and March 13, 2020

Figure 1 shows the seismicity in NE BC between April 1, 2019 and March 13, 2020 from the Seiscomp3 earthquake catalogue. There are 563 events with local magnitude between 0.8 and 4.2. With the exception of the events that occurred in the south and to the left of the Cordilleran deformation front (Figure 1), most of the earthquakes are concentrated within the Montney play and are related to oil and gas activities. The small number of events to the south and outside of the Montney play are most likely mining-related. Figure 2 shows the frequency-magnitude distribution of the events within the Montney Play. Parameters for each event (date, time, latitude, longitude, depth, and magnitude) are presented in the appendix. Figure 3 shows the peak ground acceleration (PGA) and peak ground velocity (PGV) from all the events that occurred and located within NE BC. Note that Figure 3 include data for the last 10 years and is from a comprehensive dataset explained in section GMPE of this report. Also shown in Figure 3 are the corresponding ground-motion amplitudes for various levels of the modified Mercalli intensity (MMI) based on the relationship provided by Worden et al. (2020) for California.
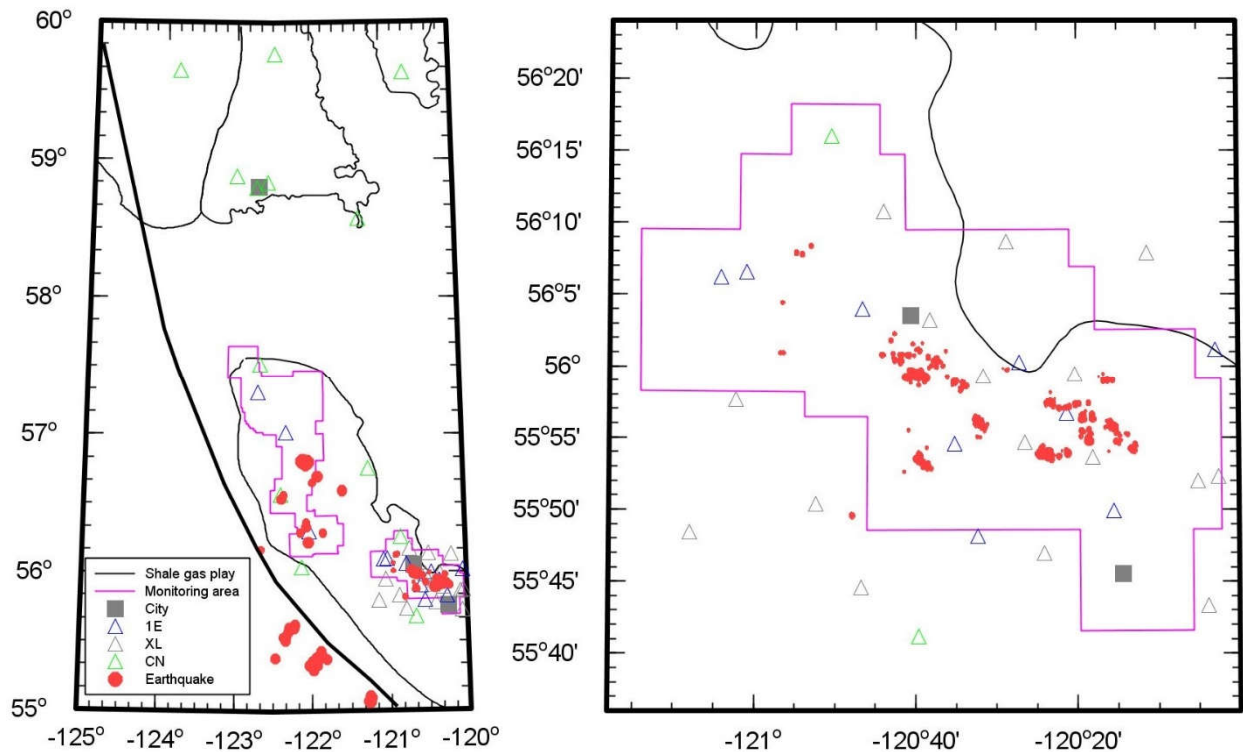
Figure 1. Map of NE BC depicting the shale gas plays of Montney, Liard, Horn River, and Cordova along with the BCOGC monitoring areas in the southern and northern Montney. Also shown are the seismographic stations belonging to the 1E, XL, and CN networks. Circles show the confirmed earthquakes by the Seiscomp3 earthquake location module between April 1, 2019 and March 13, 2020. Solid black line shows the approximate eastern limit of the Cordilleran deformation front. Events outside of the Montney play and to the left of the deformation front are probably mining blasts. The map on the right shows the blow-up of the southern Montney area.
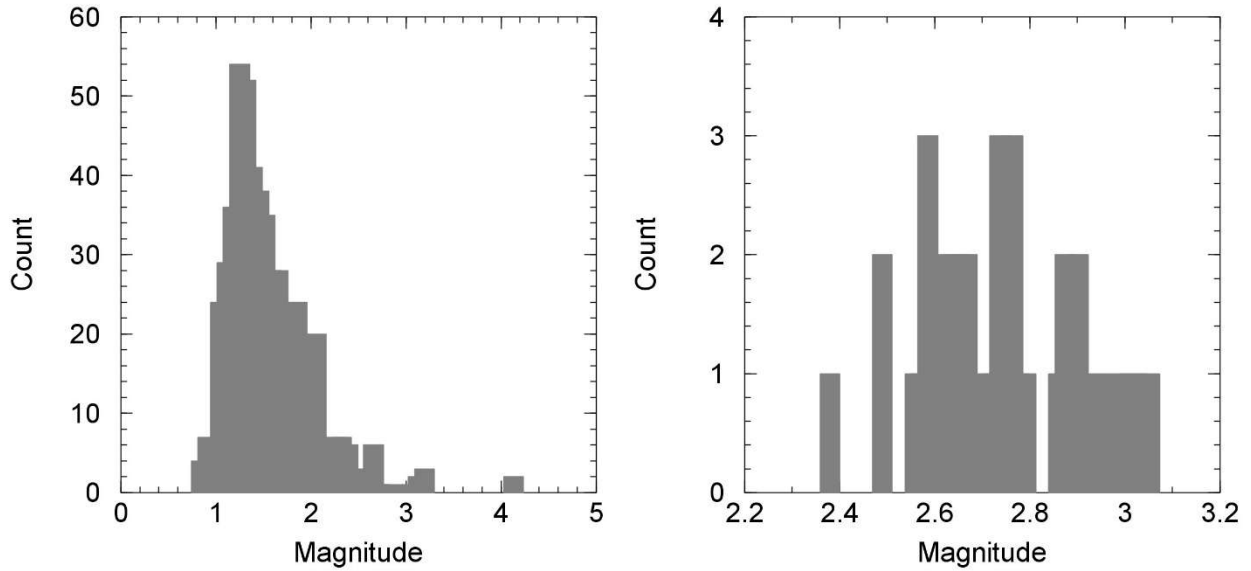
Figure 2. Frequency-magnitude distribution of the earthquakes occurred between April 1, 2019 and March 13, 2020 (Figure 1) within the Montney play (left) and outside (right).
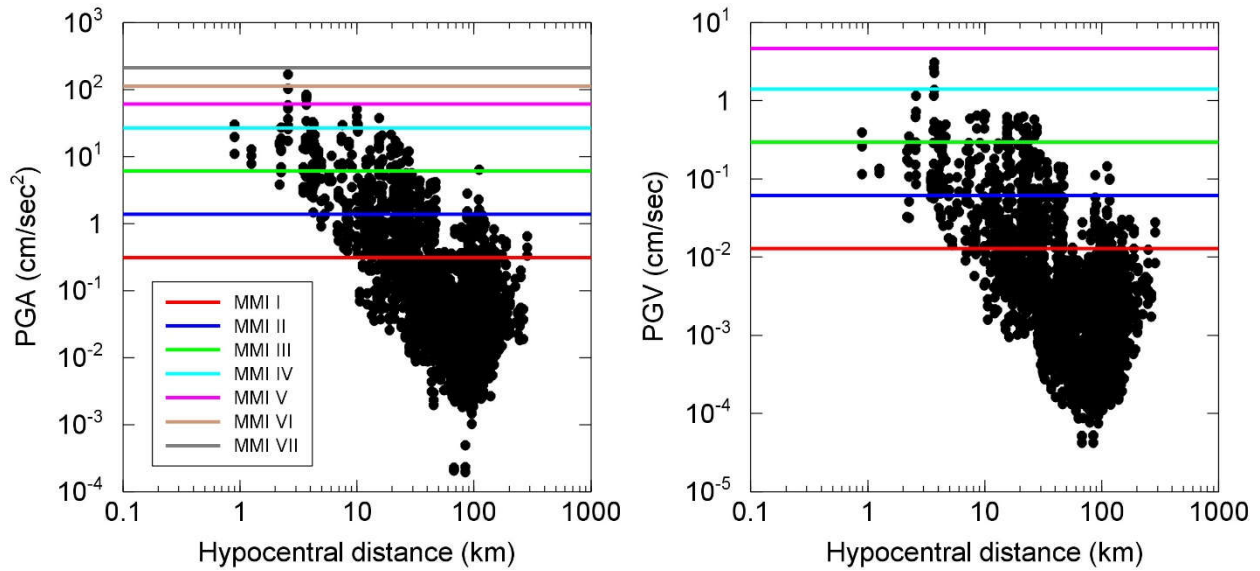
Figure 3. PGA (left) and PGV (right) from earthquakes occurred and located in NE BC in the last 10 years. Solid horizontal lines show the MMI at different levels.

Comprehensive Earthquake Catalogue

Earthquake catalogues documenting the time, location, and magnitude of past earthquakes are the fundamental basis for understanding the seismological process and seismic hazard. An event catalogue for earthquakes in the Western Canada Sedimentary Basin (WCSB) was compiled from several published

catalogues for the area including Babaie Mahani et al. (2017, 2019), Visser et al. (2017, 2020), Babaie Mahani and Kao (2018), Alberta earthquake catalogue (2019), and NRCan and Seiscomp3 earthquake catalogues. Catalogue pairs were compared to remove the duplicate events with spatiotemporal threshold of 0.09 degree and 10 seconds. The compiled event catalogue includes 18706 earthquakes with magnitudes up to 4.6 for the period between May 20, 1966 and March 13, 2020 in NE BC. Figure 4 shows the cumulative number of recorded events and magnitude of completeness versus year. The magnitude of completeness was calculated for each year with more than 100 recorded events. Magnitude of completeness significantly decreased after 2013 because of the start of installation of seismographic stations in NE BC. The further decrease for the years 2017 and 2018 is due to the large number of events that were located manually which is presented in Visser et al. (2020).
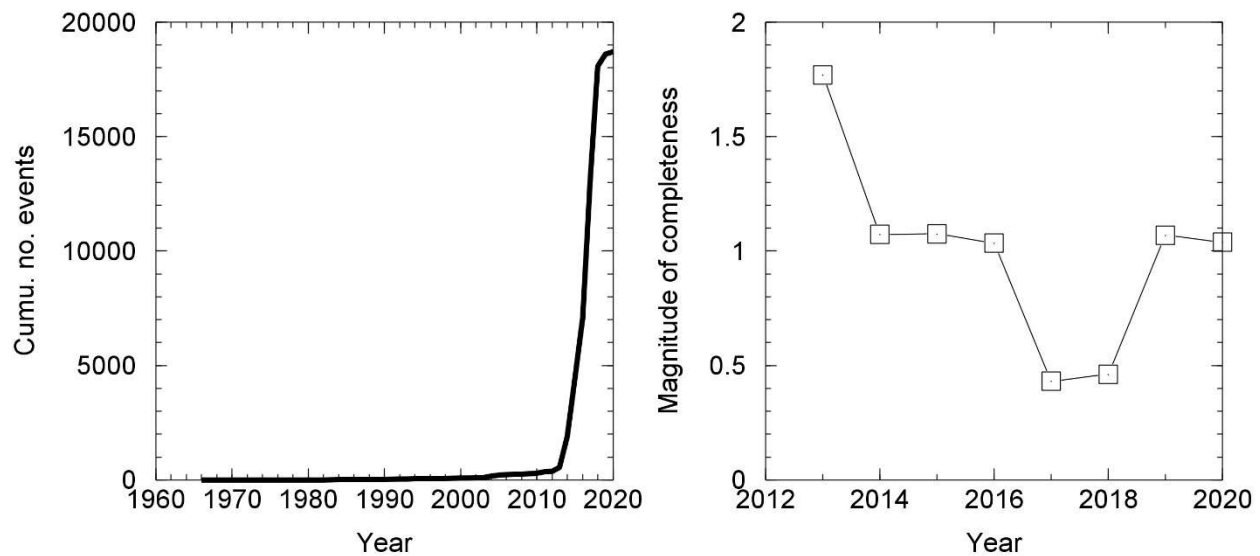
Figure 4. Cumulative number of recorded events (left) and magnitude of completeness (right) versus year in NE BC.

Velocity and Density Models for the Montney Play

Using the available well logs, 1D velocity and density models applicable across the unconventional Montney play trend in NE BC, were constructed to better reflect variations in sub-Triassic stratigraphy and structure within the region. For the upper 4 km of the sedimentary stratigraphy, hundreds of well logs were reviewed, from which 29 logs were considered in building these models. For depths below 4 km, the models were extended using results from the southern Alberta refraction experiment (Clowes et al., 2002). The detailed velocity models have resulted in significant improvement in earthquake location determination across NE BC. Currently, a paper on this work is in under preparation for submission to Seismological Research Letters.

Update on the Local Magnitude Determination within WCSB

Using a comprehensive earthquake dataset for the period 2014-2018 (inclusive), an update on the distance correction model in the local magnitude calculation of local earthquakes in WCSB (Babaie Mahani and Kao, 2020) were provided. A total of 33995 vertical Wood-Anderson amplitudes from 3575 earthquakes recorded at 56 seismographic stations were used in the regression. The revised formula can better characterize the attenuation effect associated with the unique geological and tectonic configuration of the WCSB. As a result, it provides higher consistency between magnitude values calculated at individual stations and the final event magnitude over a wide hypocentral distance range from 2 to 600 km, and therefore is a reasonable alternative to the original Richter formula for regulatory purposes in NE BC and western Alberta. An extended abstract on this subject has been accepted for the 2020 Geoconvention in Calgary and published in the CSEG RECORDER.

Source Mechanism and Stress Field within the Montney Play

Babaie Mahani et al. (2020) provided a close look at the source mechanism of hydraulically fractured induced earthquakes and the *in situ* stress field within the southern Montney unconventional play in NE BC. P-wave first-motion focal mechanisms were obtained for 66 earthquakes with magnitudes between 1.5 and 4.6. Results show that strike-slip movement is the prevailing source mechanism for the events in this area, although reverse faulting is also observed for a few earthquakes. The best-fitting nodal plane mostly strikes at ~60°, with most events having dip angles of >60°. The orientation of the three principal compressive stresses (S_1>S_2>S_3) and the relative intermediate principal stress magnitude (R) were obtained in five clusters. Assuming the best-fitting nodal plane to be the causative fault, R values are mostly between 0.8 and 0.9 suggesting that the magnitude of S_2 and S_3 are similar, which is consistent with strike-slip or reverse-faulting regimes. The plunge of S_1 varies between 1° and 3°, with its trend varying between 21° and 34°. On the other hand, the plunge of S_3 varies between 22° and 50°, with its trend varies between 292° and 302°. The trend of maximum horizontal stress was calculated to vary from 22° to 33°, in comparison with the average trend of 41° from the World Stress Map. Through analysis of the Coulomb failure criterion and Mohr diagrams, the amount of pore-pressure increase necessary to initiate shear slip was estimated to range between 4 and 29 MPa (average of 14±8 MPa) in the study area.

Seiscomp3 Catalogue for BCOGC

Currently, the Seiscomp3 module at the NRCan office in Sidney, BC, automatically locates earthquakes occurring in NE BC. Events are further analyzed and confirmed by seismic analysts with the catalogue using the local magnitude determination method outlined above. The BCOGC is actively working on a web platform to make this data more easily available.

GMPE (ongoing project)

Ground Motion Prediction Equations (GMPE) are the essential ingredient of seismic hazard assessments and ShakeMap systems. Using a ground motion dataset of 16432 three-component waveforms from 1594 earthquakes with magnitude between 2.5 and 4.6 recorded at hypocentral distances between 0.7 and 300 km, a GMPE is under calibration for the WCSB. Several processing steps were applied to each waveform to calculate ground motion parameters, including removing mean and trends, and correction for instrument response. PGA, PGV, and 5%-damped pseudo-response spectral acceleration (PSA) at 30 log-spaced frequencies between 0.2 and 50 Hz are included in the ground motion dataset. Moment magnitude (M_w) was either taken from the earthquake catalogue or estimated based on PSA at frequencies 3.3, 1, and 0.3 Hz (e.g. Novakovic et al., 2018). Vs_{30} (shear-wave velocity in the top 30 meters of the soil column) for each station was obtained based on the available measurements for stations in British Columbia and Alberta (e.g. Farrugia et al., 2017; Monahan et al., 2018). Figure 5 (left) shows the magnitude-distance distribution of the ground motion amplitudes (geometric mean of the horizontal components) with known M_w and Vs_{30}. Figure 5 (right) shows PGA versus hypocentral distance for different magnitude bins. Using the compiled dataset as shown in Figure 5, published generic GMPE models are calibrated with the observed motions to produce an appropriate model for ground motion estimation and seismic hazard assessment in WCSB. For this purpose, we utilize the regionally adjustable generic model of Yenier and Atkinson (2015). Calibration is performed through analysis of the residuals between the observed and predicted values to determine terms for the source, path, and site. The calibrated GMPE robustly mimics the observed motions over all magnitudes and distances.
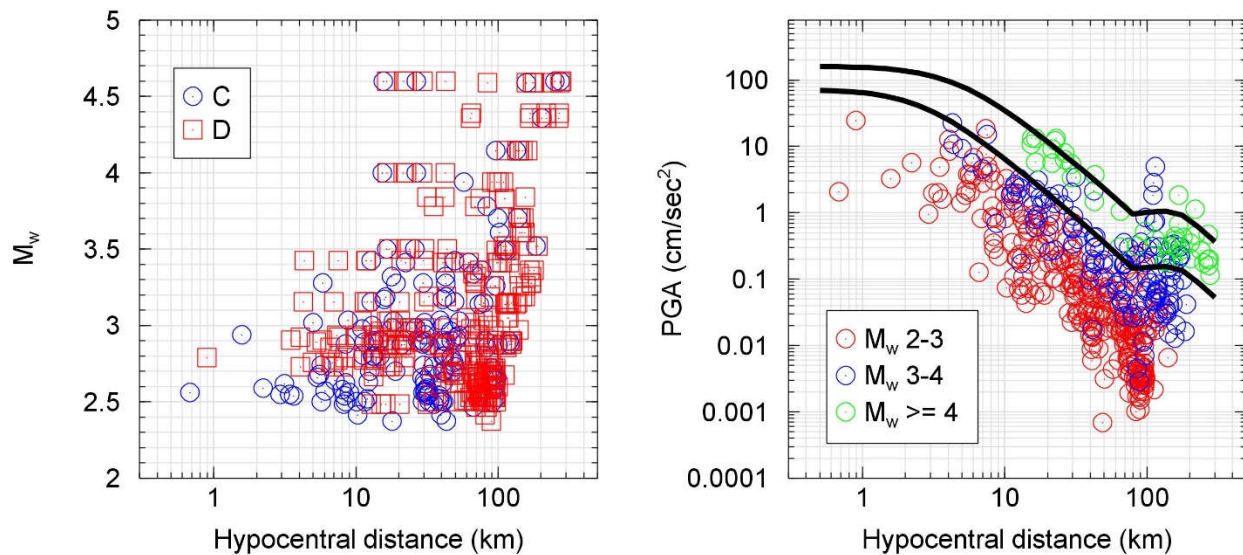

Figure 5. (left) distribution of ground motion amplitudes (geometrical mean of the horizontal components) with M_w and hypocentral distance, grouped by NEHRP site classes (C and D). (right) PGA versus hypocentral distance grouped into three magnitude bins. The GMPE for PGA for M_w=3.5 and M_w=4.5 is shown for site class C.

Communication and Extension Plan

The members of the BC SRC have presented the following papers or presentations since April 2019.

Presentations:

- Kao, H., R. Visser, R. Dokht, S. Venables, A. Babaie Mahani, Y. Liu, and F. Tan (2019). Quantitative Relationship Between Injection Operations and Induced Seismicity in the Southern Montney Play, British Columbia, Canada, *American Geophysical Union annual meeting, December 9-13, 2019, San Francisco, CA*
- Babaie Mahani, A. (2019). A Systematic Study of Earthquake Source Mechanism and Regional Stress Field in the Southern Montney Unconventional Play of Northeast British Columbia, Canada, *CSUR Induced Seismicity Workshop V, October 17, 2019, Calgary*
- Eaton, D. W., A. Babaie Mahani, R. Salvage, H. Kao, and M. van der Baan (2019). A Tale of Three Earthquakes: New Insights into Fault Activation in Light of Recent Occurrences in Western Canada, *New Directions in Geosciences for Unconventional Resources, October 15-17, 2019, Banff, Canada (extended abstract)*

Technical Papers:

- Babaie Mahani, A., D. Malytskyy, R. Visser, M. Hayes, M. Gaucher, and H. Kao (2020). Velocity and Density Models for Montney Unconventional Resource Play in Northeast British Columbia, Canada, Applicable to Induced Seismicity Monitoring and Research, *for submission to seismological research letters*
- Visser, R., H. Kao, B. Smith, C. Goerzen, B. Kontou, R.M.H. Dokht, J. Hutchinson, F. Tan, and A. Babaie Mahani (2020). A Comprehensive Earthquake Catalogue for the Fort St. John-Dawson Creek Region, British Columbia, 2017-2018, *Geological Survey of Canada Open File, 8718, 28 pages, https://doi.org/10.4095/326015 (open access)*
- Babaie Mahani, A. and H. Kao (2020). Determination of Local Magnitude for Induced Earthquakes in the Western Canada Sedimentary Basin: An Update, *RECORDER, V. 45, No. 02, 12 pages, https://csegrecorder.com/assets/pdfs/2020/2020-04-RECORDER-Determination_of_Local_Magnitude.pdf*
- Babaie Mahani, A., F. Esfahani, H. Kao, M. Gaucher, M. Hayes, R. Visser, and S. Venables (2020). A Systematic Study of Earthquake Source Mechanism and Regional Stress Field in the Southern Montney Unconventional Play of Northeast British Columbia, Canada, *Seismological Research Letters, Vol. 91, No. 1, p. 195-206, https://doi.org/10.1785/0220190230*
- Babaie Mahani, A. (2020). Systematic Study of Earthquake Source Mechanism and Regional Stress Field in the Southern Montney Unconventional Play of Northeastern British Columbia (NTS 093P/09, 10, 15, 16, 094A/01, 02, 07, 08); *in Geoscience BC Summary of Activities 2019: Energy and Water, Geoscience BC, Report 2020-02, p. 13-18, http://www.geosciencebc.com/i/pdf/SummaryofActivities2019/EW/Project%202012-SEIS01_EW_SOA2019.pdf*
- Babaie Mahani, A., H. Kao, G. M. Atkinson, K. Assatourians, K. Addo, and Y. Liu (2019). Ground Motion Characteristics of the 30 November 2018 Injection-Induced Earthquake Sequence in Northeast British Columbia, Canada, *Seismological Research Letters, Vol. 90, No. 4, p. 1457-1467, https://doi.org/10.1785/0220190040*

Conclusions

With 12 new stations having been installed during July, September, and October 2019 in the southern Montney play of NE BC, monitoring of induced seismicity has further improved in the area. A total of 563 earthquakes with local magnitude between 0.8 and 4.2 were manually confirmed by the Seiscomp3 module at the NRCan office in Sidney, BC for the period April 1, 2019 to March 13, 2020, with the majority of the events occurring within the Montney play. Various research projects were performed by the members of the BC SRC during the last year. These projects include compilation of a comprehensive earthquake catalogue from existing datasets, velocity and density models for the Montney play, update on determination of local magnitude within WCSB, earthquake source mechanism and analysis of the stress field within the Montney play, and automatic compilation of earthquake catalogue for BCOGC. Moreover, a new GMPE is under calibration for WCSB. Finally, the list of presentations and publications by the members of the BC SRC is included.

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Appendix A: Earthquakes recorded between April 1, 2019 and March 13, 2020

Date	Time	Latitude	Longitude	Depth (km)	Magnitude
2020-03-13	07:10:14	55.996	-120.479	1.7	1.0
2020-03-13	06:53:29	55.997	-120.476	1.4	1.4
2020-03-13	06:45:47	55.999	-120.486	1.8	0.8
2020-03-13	06:23:03	55.997	-120.481	1.7	1.0
2020-03-11	02:01:27	56.014	-120.696	1.3	1.9
2020-03-10	09:53:25	55.998	-120.640	1.9	1.3
2020-03-08	02:03:47	56.014	-120.736	0.1	1.9
2020-03-07	22:41:33	55.918	-120.539	1.6	1.3
2020-03-07	14:09:47	55.918	-120.534	1.4	1.3
2020-03-06	18:37:59	55.926	-120.683	1.9	1.4
2020-02-04	08:52:34	55.983	-120.589	1.4	1.4
2020-02-04	08:41:20	56.012	-120.626	1.9	1.3
2020-02-04	08:38:12	56.007	-120.630	1.4	1.3
2020-02-04	08:25:48	56.012	-120.623	1.9	1.4
2020-02-03	19:35:03	55.972	-120.575	1.4	1.4
2020-02-03	18:39:30	55.976	-120.572	1.6	1.3
2020-02-03	18:37:31	55.985	-120.588	1.5	1.2
2020-02-03	18:19:13	55.975	-120.576	1.4	1.1
2020-02-03	16:45:29	55.983	-120.584	0.9	2.0
2020-02-03	12:32:48	55.982	-120.567	1.4	1.2
2020-02-03	09:11:20	55.980	-120.567	1.2	1.5
2020-02-03	08:26:51	55.982	-120.572	0.9	1.5
2020-02-03	07:58:49	55.983	-120.569	1.1	1.4
2020-02-03	07:29:31	55.981	-120.571	1.4	1.1
2020-02-03	05:59:55	55.982	-120.567	1.4	1.3
2020-02-03	05:40:56	56.370	-122.074	2.3	2.3
2020-02-03	05:11:59	55.980	-120.569	1.6	1.2
2020-02-03	05:07:04	55.977	-120.573	1.8	1.0
2020-02-03	04:35:14	55.978	-120.566	1.6	1.0
2020-02-03	03:48:47	55.982	-120.569	1.4	1.3
2020-02-03	03:14:28	55.978	-120.566	1.4	1.3
2020-02-03	02:34:44	55.978	-120.571	1.6	0.9
2020-02-03	02:27:35	55.980	-120.569	1.6	1.1
2020-02-02	20:48:35	55.977	-120.572	1.4	1.3
2020-02-02	20:14:42	55.977	-120.572	1.3	1.1
2020-02-02	17:55:17	55.972	-120.571	1.9	1.1
2020-02-02	11:09:55	55.978	-120.591	1.4	1.0
2020-02-01	09:15:40	55.978	-120.566	1.4	1.2
2020-02-01	05:48:44	55.981	-120.586	1.4	1.4

2020-02-01	04:36:13	55.977	-120.565	1.6	1.3
2020-02-01	03:19:59	55.975	-120.571	1.4	1.3
2020-02-01	02:12:37	55.977	-120.565	1.2	1.6
2020-01-31	21:52:48	55.977	-120.565	1.4	1.6
2020-01-31	21:50:45	55.981	-120.586	1.6	1.6
2020-01-31	20:22:17	55.978	-120.571	1.6	1.3
2020-01-31	20:13:51	55.981	-120.591	1.6	1.3
2020-01-31	19:08:41	55.977	-120.567	1.6	1.6
2020-01-31	18:19:25	55.977	-120.562	1.6	1.9
2020-01-31	18:04:18	55.978	-120.571	1.4	1.5
2020-01-31	17:37:00	55.979	-120.564	1.6	1.5
2020-01-31	14:06:13	55.978	-120.571	1.4	1.3
2020-01-31	12:31:31	55.976	-120.572	1.2	1.3
2020-01-31	10:20:30	55.978	-120.571	1.4	1.5
2020-01-30	13:09:54	55.984	-120.586	1.4	1.2
2020-01-29	23:43:37	56.001	-120.625	0.9	1.9
2020-01-29	04:27:58	56.001	-120.610	1.1	1.3
2020-01-27	22:24:24	56.014	-120.681	0.2	2.0
2020-01-27	05:05:54	56.174	-122.668	4.5	2.5
2020-01-26	16:47:53	56.016	-120.941	0.1	1.6
2020-01-26	13:23:38	56.016	-120.946	0.1	1.5
2020-01-25	10:26:31	55.989	-120.602	4.0	1.7
2020-01-24	15:07:10	56.571	-122.369	11.0	2.6
2020-01-23	04:25:28	55.993	-120.650	1.9	1.2
2020-01-20	15:10:22	55.983	-120.275	2.4	1.3
2020-01-19	15:47:07	55.993	-120.675	1.9	1.5
2020-01-17	15:42:18	55.985	-120.270	1.6	1.9
2020-01-17	11:45:18	55.984	-120.263	2.3	1.3
2020-01-17	01:39:24	55.986	-120.275	1.9	1.4
2020-01-16	20:38:36	55.984	-120.263	2.3	1.1
2020-01-16	17:05:30	56.001	-120.635	1.4	1.5
2020-01-16	12:35:53	55.983	-120.270	1.6	1.5
2020-01-16	10:11:07	55.985	-120.260	1.4	1.5
2020-01-16	02:50:47	55.986	-120.275	2.1	1.2
2020-01-16	02:37:27	55.983	-120.260	1.4	1.4
2020-01-16	00:42:03	55.983	-120.270	1.4	1.7
2020-01-15	23:36:38	55.985	-120.265	1.9	1.4
2020-01-15	20:45:19	55.984	-120.263	1.8	1.2
2020-01-15	20:01:01	55.986	-120.280	1.9	1.1
2020-01-15	18:22:49	55.984	-120.263	2.3	1.3
2020-01-15	17:05:32	55.986	-120.280	2.6	1.1
2020-01-15	14:30:02	55.986	-120.275	1.9	1.2

2020-01-15	10:46:35	55.984	-120.273	1.8	0.8
2020-01-15	10:25:41	55.986	-120.275	2.6	0.9
2020-01-15	05:20:37	56.001	-120.635	1.9	1.0
2020-01-14	07:07:22	55.988	-120.289	5.8	0.9
2020-01-14	04:16:20	56.008	-120.622	3.6	1.7
2020-01-13	22:09:12	55.606	-122.241	1.9	2.6
2020-01-13	12:50:30	55.985	-120.270	1.9	1.2
2020-01-13	11:37:24	55.991	-120.280	2.1	1.1
2020-01-13	02:10:35	55.986	-120.280	1.9	1.4
2020-01-13	00:08:38	55.986	-120.280	2.1	1.1
2020-01-12	17:53:57	55.983	-120.280	1.4	1.8
2020-01-12	11:26:20	55.986	-120.280	1.9	1.0
2020-01-12	08:34:47	55.983	-120.280	1.1	1.7
2020-01-12	05:02:32	55.986	-120.280	2.4	1.2
2020-01-05	07:19:46	56.013	-120.670	1.4	1.3
2020-01-05	03:31:49	56.013	-120.641	1.4	1.4
2020-01-05	03:21:38	56.012	-120.641	0.4	1.8
2020-01-04	02:17:57	56.540	-122.395	0.3	2.7
2020-01-01	04:08:16	56.020	-120.662	4.4	1.1
2019-12-29	18:17:51	55.442	-121.882	0.0	2.7
2019-12-28	10:27:54	56.014	-120.683	0.6	1.9
2019-12-28	02:40:46	56.014	-120.734	0.3	1.6
2019-12-26	13:02:32	56.000	-120.623	1.8	1.3
2019-12-24	18:17:34	55.414	-121.883	0.0	2.6
2019-12-23	23:15:51	55.529	-122.340	0.0	3.0
2019-12-22	23:39:17	55.331	-121.951	9.6	2.8
2019-12-21	06:31:50	56.008	-120.631	0.2	1.7
2019-12-20	23:02:39	55.509	-122.342	0.0	2.8
2019-12-19	18:03:30	55.409	-121.911	11.6	2.7
2019-12-19	11:30:54	56.014	-120.686	0.1	1.4
2019-12-16	13:36:00	55.989	-120.688	1.0	1.8
2019-12-15	09:27:22	55.988	-120.676	0.9	1.9
2019-12-15	04:04:29	56.004	-120.625	1.9	1.3
2019-12-06	01:04:38	55.962	-120.379	4.4	0.9
2019-12-05	23:08:17	55.333	-121.939	2.4	2.7
2019-12-05	09:45:21	55.955	-120.397	4.1	1.3
2019-12-05	04:34:07	55.960	-120.391	4.4	1.1
2019-12-04	23:15:53	55.959	-120.388	3.6	2.3
2019-12-04	19:44:22	55.959	-120.397	4.5	1.2
2019-12-04	14:32:55	55.956	-120.384	4.7	1.4
2019-12-04	08:43:04	55.956	-120.381	1.6	1.1
2019-12-04	08:17:18	55.956	-120.386	1.4	1.3

2019-12-04	07:44:29	55.956	-120.386	1.6	1.3
2019-12-04	07:12:52	55.954	-120.382	4.0	2.1
2019-12-04	06:45:22	55.956	-120.381	1.9	1.1
2019-12-04	06:35:13	55.956	-120.381	1.6	1.2
2019-12-04	06:18:22	55.956	-120.391	1.4	1.3
2019-12-04	06:15:50	55.956	-120.386	1.4	1.4
2019-12-04	06:11:04	55.958	-120.394	1.3	1.2
2019-12-04	05:58:21	55.956	-120.386	1.1	1.4
2019-12-04	05:50:52	55.956	-120.386	1.4	1.6
2019-12-04	05:41:22	55.952	-120.371	4.0	2.1
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2019-12-04	05:27:39	55.958	-120.382	4.5	1.3
2019-12-04	05:14:42	55.956	-120.384	4.4	1.5
2019-12-04	05:08:31	55.956	-120.383	4.6	1.3
2019-12-04	04:59:52	55.956	-120.384	4.4	1.3
2019-12-04	04:53:38	55.955	-120.386	4.4	1.2
2019-12-04	04:35:13	55.957	-120.395	4.2	1.3
2019-12-04	04:29:01	55.959	-120.383	4.5	1.0
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2019-12-04	03:34:11	55.956	-120.386	4.6	1.2
2019-12-04	03:13:43	55.958	-120.384	4.7	1.1
2019-12-04	02:58:43	55.959	-120.386	4.4	1.4
2019-12-04	02:35:14	55.957	-120.388	4.6	1.4
2019-12-04	02:26:34	55.957	-120.389	4.0	1.5
2019-12-04	01:42:52	55.960	-120.394	4.6	1.3
2019-12-04	00:33:05	55.959	-120.397	4.6	1.2
2019-12-04	00:26:20	55.960	-120.394	4.7	1.3
2019-12-03	06:06:31	55.957	-120.398	4.5	1.4
2019-12-03	05:49:45	55.957	-120.398	4.6	1.5
2019-12-03	05:18:18	55.957	-120.396	4.6	1.3
2019-12-03	05:02:56	55.956	-120.397	4.6	1.3
2019-12-03	04:30:36	55.958	-120.398	4.6	1.6
2019-12-02	04:56:03	55.951	-120.362	6.1	1.6
2019-12-02	02:43:03	55.951	-120.355	4.7	1.5
2019-12-02	02:00:33	55.952	-120.358	4.5	1.3
2019-12-02	01:44:07	55.953	-120.356	4.5	1.4
2019-12-01	22:43:57	55.953	-120.349	4.7	1.7
2019-12-01	16:35:49	55.954	-120.350	4.8	1.5
2019-12-01	04:06:08	55.957	-120.339	4.5	1.6
2019-12-01	02:32:05	55.957	-120.335	4.2	2.0
2019-12-01	01:56:46	55.955	-120.337	3.8	1.8
2019-12-01	01:29:09	55.957	-120.329	3.5	1.9

2019-11-30	07:32:47	56.812	-122.062	3.3	4.1
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2019-11-29	12:20:10	55.990	-120.684	3.1	1.5
2019-11-29	06:03:54	55.901	-120.220	3.9	1.4
2019-11-28	08:13:09	55.987	-120.687	3.9	2.3
2019-11-26	10:38:28	55.907	-120.216	4.4	1.1
2019-11-26	06:42:44	55.909	-120.213	4.0	1.7
2019-11-26	06:15:25	56.133	-120.915	3.7	1.9
2019-11-26	04:46:56	55.988	-120.685	4.6	1.2
2019-11-26	04:41:25	55.988	-120.688	4.5	1.1
2019-11-26	02:35:26	55.987	-120.684	3.8	2.3
2019-11-25	22:28:05	55.903	-120.213	4.4	1.0
2019-11-25	09:18:06	55.996	-120.680	4.3	1.4
2019-11-25	07:26:29	55.995	-120.674	4.0	2.0
2019-11-25	07:13:56	55.995	-120.681	4.3	1.2
2019-11-25	06:47:33	55.996	-120.680	4.3	1.4
2019-11-25	06:43:47	55.993	-120.675	3.8	1.5
2019-11-25	06:16:37	55.907	-120.214	3.2	2.2
2019-11-25	00:39:14	56.131	-120.902	3.9	1.9
2019-11-24	14:40:08	55.902	-120.216	3.6	2.0
2019-11-24	13:49:06	55.990	-120.674	4.4	1.2
2019-11-24	12:53:10	55.905	-120.219	4.8	1.5
2019-11-24	12:49:57	55.992	-120.679	3.7	1.5
2019-11-24	11:54:26	55.904	-120.222	3.1	2.2
2019-11-24	00:46:55	55.998	-120.680	4.4	1.2
2019-11-23	23:45:13	55.992	-120.679	4.2	1.6
2019-11-23	17:45:58	55.997	-120.680	4.2	1.8
2019-11-23	15:29:47	55.991	-120.681	4.7	1.8
2019-11-23	15:23:23	55.992	-120.676	4.1	2.3
2019-11-23	14:02:14	55.996	-120.676	4.4	2.1
2019-11-23	12:35:41	55.991	-120.672	4.3	1.8
2019-11-23	09:15:27	55.989	-120.677	4.7	1.7
2019-11-22	18:20:24	56.006	-120.696	4.3	1.5
2019-11-22	08:57:44	55.991	-120.669	3.9	1.7
2019-11-22	07:24:22	56.004	-120.699	4.2	1.4
2019-11-22	03:39:14	55.992	-120.670	4.0	1.9
2019-11-22	02:21:12	55.990	-120.666	3.3	1.8
2019-11-21	08:57:46	55.982	-120.678	4.1	1.2
2019-11-21	01:22:24	55.994	-120.667	3.8	1.6
2019-11-21	01:12:09	55.994	-120.665	4.0	1.9
2019-11-20	18:00:28	55.994	-120.675	4.1	1.4
2019-11-20	15:32:20	56.140	-120.884	3.5	1.8

2019-11-20	05:28:02	55.990	-120.667	4.2	1.3
2019-11-20	05:24:33	56.008	-120.697	4.4	2.1
2019-11-19	23:05:04	55.986	-120.678	4.4	1.2
2019-11-19	21:49:02	55.993	-120.665	4.4	1.1
2019-11-19	17:53:18	56.339	-122.076	1.4	2.7
2019-11-19	11:07:44	55.987	-120.667	4.2	1.2
2019-11-19	10:13:14	55.978	-120.661	3.5	1.6
2019-11-19	09:56:54	55.989	-120.661	4.2	0.9
2019-11-19	09:38:51	55.991	-120.661	3.8	1.2
2019-11-19	06:52:06	56.008	-120.702	4.3	1.4
2019-11-19	04:20:32	55.990	-120.656	3.9	1.3
2019-11-19	03:48:16	55.992	-120.663	3.9	1.1
2019-11-19	03:31:32	56.008	-120.702	4.1	1.5
2019-11-19	03:17:23	55.985	-120.662	4.0	1.2
2019-11-19	02:30:08	55.989	-120.665	4.1	1.1
2019-11-19	02:05:00	55.986	-120.668	4.1	1.1
2019-11-19	00:25:01	55.990	-120.654	4.0	1.5
2019-11-18	23:48:25	55.994	-120.665	3.9	1.3
2019-11-18	22:22:58	55.987	-120.661	4.0	1.3
2019-11-18	19:24:43	56.007	-120.697	3.8	2.1
2019-11-18	04:22:15	55.989	-120.651	3.5	2.5
2019-11-18	03:53:15	56.300	-122.154	2.8	2.6
2019-11-18	02:47:08	55.986	-120.661	4.3	1.6
2019-11-17	23:26:08	55.116	-121.259	2.9	2.9
2019-11-17	22:59:26	56.009	-120.709	4.3	1.6
2019-11-17	14:17:44	56.007	-120.712	4.0	1.7
2019-11-17	07:59:57	56.011	-120.712	4.4	1.4
2019-11-17	07:40:09	55.992	-120.651	4.2	1.5
2019-11-16	18:09:46	55.369	-121.924	1.1	2.7
2019-11-16	14:19:45	55.989	-120.654	3.4	1.8
2019-11-15	09:10:48	56.018	-120.605	5.0	1.4
2019-11-15	08:42:54	55.984	-120.650	4.4	1.2
2019-11-14	20:33:13	56.015	-120.713	4.3	1.3
2019-11-14	06:04:10	56.016	-120.713	0.0	1.6
2019-11-14	04:35:38	56.014	-120.698	4.0	2.0
2019-11-13	21:49:51	55.393	-121.841	5.1	2.5
2019-11-13	19:55:06	55.982	-120.649	3.5	1.5
2019-11-11	23:12:12	55.401	-121.876	0.0	2.6
2019-11-10	23:12:43	55.411	-121.876	0.0	2.9
2019-11-10	23:05:30	55.626	-122.224	3.5	2.8
2019-11-09	10:55:40	56.787	-122.092	2.3	2.4
2019-11-08	11:41:01	56.786	-122.086	1.2	2.4

2019-11-06	20:40:29	56.659	-121.996	9.1	2.4
2019-11-05	05:21:52	56.027	-120.653	6.7	1.1
2019-11-04	18:11:43	55.338	-121.928	0.0	2.6
2019-11-03	18:39:07	55.060	-121.281	0.0	2.6
2019-11-01	19:05:35	55.328	-122.014	0.0	2.7
2019-10-31	22:22:11	56.298	-121.858	3.3	2.3
2019-10-28	22:07:52	55.297	-121.982	0.0	2.7
2019-10-25	23:10:43	55.368	-122.006	6.1	2.6
2019-10-25	19:58:28	56.027	-120.672	4.2	1.6
2019-10-23	15:46:53	56.706	-121.925	1.3	3.1
2019-10-22	00:14:53	55.942	-120.543	4.4	1.2
2019-10-21	23:53:40	55.942	-120.542	4.3	1.5
2019-10-21	23:46:47	55.942	-120.542	4.3	1.2
2019-10-21	23:40:03	55.940	-120.545	4.4	1.3
2019-10-21	23:28:41	55.941	-120.543	4.1	1.7
2019-10-21	23:10:37	55.941	-120.545	4.3	1.2
2019-10-21	23:04:45	55.943	-120.544	4.3	1.2
2019-10-21	22:47:50	55.942	-120.545	4.3	1.2
2019-10-21	22:43:27	55.941	-120.546	4.3	1.2
2019-10-21	22:39:18	55.940	-120.546	4.2	1.1
2019-10-21	22:33:24	55.941	-120.541	4.6	1.1
2019-10-21	22:02:32	55.932	-120.535	4.0	1.2
2019-10-21	18:10:06	55.608	-122.292	6.2	2.8
2019-10-21	07:50:52	55.940	-120.546	4.4	1.0
2019-10-21	07:36:39	55.942	-120.543	4.3	1.0
2019-10-21	03:15:04	55.940	-120.539	4.5	1.5
2019-10-20	23:25:14	55.939	-120.536	3.0	1.7
2019-10-20	22:40:13	55.941	-120.537	4.4	1.3
2019-10-20	22:23:29	55.941	-120.538	4.3	1.4
2019-10-20	22:13:59	55.940	-120.541	4.3	1.1
2019-10-20	21:57:56	55.939	-120.537	4.5	1.2
2019-10-20	21:46:03	55.938	-120.547	4.7	1.1
2019-10-20	18:12:31	55.336	-122.013	0.0	2.6
2019-10-20	00:25:43	55.938	-120.538	4.4	1.3
2019-10-20	00:06:25	55.937	-120.536	3.9	1.6
2019-10-19	23:37:51	55.938	-120.537	4.3	1.6
2019-10-19	18:02:53	55.935	-120.530	3.3	2.1
2019-10-19	17:29:17	55.936	-120.536	4.4	1.2
2019-10-19	16:35:04	55.936	-120.541	4.3	1.6
2019-10-19	13:55:55	55.941	-120.541	4.2	1.1
2019-10-19	13:52:53	55.939	-120.539	4.6	1.0
2019-10-19	13:44:26	55.940	-120.539	4.5	1.0

2019-10-19	11:30:57	55.938	-120.535	4.5	1.5
2019-10-19	11:04:29	55.937	-120.534	4.4	1.1
2019-10-19	08:37:26	55.936	-120.536	4.4	1.3
2019-10-19	07:36:16	55.936	-120.534	4.2	1.3
2019-10-19	07:15:35	55.938	-120.536	4.3	1.3
2019-10-19	07:02:53	55.936	-120.536	4.6	1.3
2019-10-19	06:45:37	55.937	-120.538	4.2	1.4
2019-10-19	06:17:18	55.936	-120.535	4.7	1.2
2019-10-19	06:04:20	55.934	-120.535	4.3	1.1
2019-10-17	19:20:21	55.939	-120.539	4.5	1.6
2019-10-17	18:04:31	55.547	-122.336	0.0	3.0
2019-10-17	16:03:13	55.933	-120.535	4.6	1.4
2019-10-17	15:30:23	55.933	-120.534	4.5	1.2
2019-10-17	12:02:39	55.939	-120.534	3.7	1.6
2019-10-17	11:44:07	55.934	-120.532	4.3	1.2
2019-10-17	11:39:38	55.940	-120.540	4.5	1.2
2019-10-17	11:03:43	55.933	-120.529	4.3	1.4
2019-10-17	08:01:13	55.934	-120.529	4.2	1.5
2019-10-17	07:44:30	55.936	-120.538	4.3	1.3
2019-10-17	07:27:15	55.937	-120.542	4.5	1.1
2019-10-17	06:48:06	55.938	-120.537	4.3	1.2
2019-10-17	06:46:15	55.939	-120.538	4.5	1.2
2019-10-17	06:37:43	55.939	-120.538	4.5	1.2
2019-10-17	04:24:51	55.898	-120.396	4.2	1.4
2019-10-17	02:36:24	55.899	-120.394	3.4	1.6
2019-10-17	01:45:15	55.898	-120.402	4.6	1.0
2019-10-16	23:12:08	55.409	-121.886	0.0	2.6
2019-10-16	22:56:40	55.938	-120.548	5.3	1.1
2019-10-16	22:51:25	55.902	-120.397	4.6	1.3
2019-10-16	22:23:19	55.901	-120.398	4.4	1.3
2019-10-16	22:14:07	55.938	-120.537	4.5	1.3
2019-10-16	22:05:24	55.898	-120.395	3.5	2.1
2019-10-16	21:05:46	55.937	-120.534	4.7	1.2
2019-10-16	20:41:44	55.937	-120.534	4.4	1.3
2019-10-16	20:35:29	55.938	-120.534	4.5	1.4
2019-10-16	20:17:24	55.938	-120.533	4.2	1.2
2019-10-16	19:53:42	55.938	-120.536	4.8	1.2
2019-10-16	19:35:24	55.900	-120.396	4.0	1.8
2019-10-16	19:28:35	55.937	-120.536	4.6	1.3
2019-10-16	19:25:11	55.937	-120.537	4.6	1.1
2019-10-16	19:22:23	55.938	-120.536	4.5	1.2
2019-10-16	19:09:56	55.939	-120.535	3.9	1.2

2019-10-16	18:52:44	55.900	-120.396	4.1	1.9
2019-10-16	18:28:33	55.897	-120.396	3.0	2.5
2019-10-16	17:18:27	55.902	-120.394	4.1	1.7
2019-10-16	16:50:32	55.899	-120.394	4.2	2.0
2019-10-16	16:22:14	55.899	-120.395	4.5	1.4
2019-10-16	16:09:43	55.900	-120.398	4.5	1.3
2019-10-16	15:48:44	55.899	-120.397	4.4	1.5
2019-10-16	11:14:57	55.938	-120.536	4.5	1.2
2019-10-16	10:27:20	55.938	-120.536	4.5	1.2
2019-10-16	04:46:59	55.938	-120.531	4.4	1.5
2019-10-16	01:39:07	55.934	-120.544	4.5	1.4
2019-10-15	22:31:55	55.898	-120.399	4.5	1.2
2019-10-15	20:49:59	55.900	-120.399	4.5	1.4
2019-10-15	19:07:39	55.896	-120.395	4.7	1.3
2019-10-15	18:37:21	55.904	-120.394	4.4	1.3
2019-10-15	18:22:50	55.901	-120.398	4.5	1.1
2019-10-15	17:14:39	55.900	-120.394	4.5	1.6
2019-10-15	17:05:21	55.901	-120.392	4.5	1.7
2019-10-15	08:35:37	55.934	-120.534	4.7	1.3
2019-10-14	08:44:41	55.932	-120.537	4.4	1.3
2019-10-14	08:39:04	55.933	-120.536	4.4	1.2
2019-10-14	08:05:11	55.932	-120.534	4.5	1.3
2019-10-13	22:36:03	55.932	-120.533	4.5	1.4
2019-10-13	20:24:47	55.930	-120.537	4.5	1.0
2019-10-13	14:30:01	55.932	-120.544	4.4	1.1
2019-10-13	13:27:06	55.931	-120.543	4.6	1.4
2019-10-13	06:28:12	55.930	-120.524	3.9	2.0
2019-10-13	01:06:09	55.098	-121.275	1.6	3.1
2019-10-12	07:30:33	55.933	-120.532	4.5	1.2
2019-10-11	11:07:57	55.931	-120.532	4.2	0.9
2019-10-10	06:45:39	56.031	-120.718	3.5	1.7
2019-10-08	22:09:31	55.930	-120.522	4.4	1.4
2019-10-08	21:24:54	55.934	-120.535	4.7	1.5
2019-10-08	13:44:04	55.899	-120.401	3.1	3.1
2019-10-08	12:07:23	55.929	-120.529	4.5	1.8
2019-10-08	04:48:55	55.931	-120.526	3.9	1.7
2019-10-08	02:15:59	55.937	-120.535	4.7	1.3
2019-10-08	01:14:43	55.932	-120.537	5.0	1.2
2019-10-08	01:09:29	55.936	-120.531	4.4	1.7
2019-10-07	22:34:38	55.933	-120.518	4.5	1.3
2019-10-06	02:14:41	55.925	-120.524	4.2	1.3
2019-10-05	09:07:17	55.898	-120.408	3.5	3.2

2019-10-05	05:15:28	55.898	-120.403	4.0	2.4
2019-10-05	04:07:44	55.900	-120.411	4.8	1.6
2019-10-05	03:40:54	55.898	-120.399	3.4	2.1
2019-10-04	22:34:47	55.901	-120.407	3.1	2.1
2019-10-04	21:13:04	55.897	-120.408	4.9	1.6
2019-10-04	16:30:38	55.899	-120.388	4.6	1.6
2019-10-04	15:43:42	55.896	-120.397	4.4	1.5
2019-10-04	14:23:47	55.898	-120.395	3.3	1.6
2019-10-04	11:12:13	55.897	-120.397	4.4	1.9
2019-10-04	10:41:05	55.898	-120.396	4.1	1.7
2019-10-04	09:48:45	55.901	-120.410	4.5	1.4
2019-10-04	04:10:47	55.894	-120.393	3.4	2.2
2019-10-04	03:59:42	55.899	-120.418	4.6	1.3
2019-10-04	03:56:39	55.897	-120.393	3.7	1.8
2019-10-04	02:34:37	55.898	-120.395	4.5	1.5
2019-10-04	01:43:42	55.896	-120.395	4.7	1.4
2019-10-04	00:42:33	55.896	-120.393	4.3	1.4
2019-10-03	20:07:24	55.898	-120.389	4.5	1.2
2019-10-03	20:01:19	55.896	-120.390	4.8	1.9
2019-10-03	19:16:43	55.892	-120.386	3.0	2.2
2019-10-03	17:50:34	55.898	-120.388	4.6	1.9
2019-10-03	05:34:55	55.894	-120.394	4.5	1.6
2019-10-03	05:32:04	55.894	-120.389	3.5	2.3
2019-10-03	03:36:38	55.895	-120.389	4.4	1.3
2019-10-03	01:42:12	55.893	-120.391	4.4	1.5
2019-10-03	00:31:32	55.897	-120.387	4.2	2.1
2019-10-02	23:55:36	55.900	-120.395	3.9	1.9
2019-10-02	23:15:51	55.894	-120.388	4.6	1.5
2019-10-02	22:49:41	55.896	-120.389	4.5	1.5
2019-10-02	22:20:22	55.896	-120.395	3.1	2.0
2019-10-02	21:23:21	55.898	-120.406	7.2	1.7
2019-10-02	20:49:42	55.898	-120.397	3.8	1.8
2019-10-02	20:41:38	55.901	-120.395	3.9	2.1
2019-10-02	20:06:52	55.897	-120.392	3.3	2.2
2019-10-02	19:42:35	55.897	-120.383	4.3	1.5
2019-10-02	19:36:36	55.899	-120.397	3.9	1.9
2019-10-02	19:32:40	55.902	-120.399	4.3	1.5
2019-10-02	18:13:23	55.902	-120.390	3.3	2.5
2019-10-02	16:37:42	55.903	-120.390	4.6	1.9
2019-10-02	16:06:55	55.899	-120.396	4.3	2.0
2019-10-02	15:19:06	55.903	-120.395	4.2	1.7
2019-10-02	14:44:11	55.901	-120.401	4.6	1.8

2019-10-02	07:35:05	55.907	-120.405	4.2	1.5
2019-10-01	23:24:37	55.902	-120.397	4.6	2.0
2019-10-01	22:51:42	55.906	-120.408	6.0	2.1
2019-10-01	20:19:50	55.900	-120.392	4.1	1.8
2019-10-01	06:14:46	56.297	-121.855	3.2	2.6
2019-09-29	21:14:54	56.019	-120.658	4.3	1.7
2019-09-29	18:14:53	55.606	-122.231	2.8	2.9
2019-09-29	15:32:35	56.020	-120.666	4.1	1.5
2019-09-29	03:34:47	56.022	-120.660	3.9	1.2
2019-09-29	01:53:22	55.100	-121.241	4.9	2.7
2019-09-28	09:27:31	56.006	-120.615	4.2	1.5
2019-09-28	01:53:26	55.076	-121.286	0.0	2.7
2019-09-27	10:35:53	56.018	-120.660	4.7	1.2
2019-09-18	18:26:29	55.070	-121.253	1.3	2.9
2019-09-16	22:08:36	55.357	-121.977	0.5	2.5
2019-09-14	12:50:13	56.226	-122.041	3.0	3.2
2019-09-12	01:18:56	55.927	-120.265	4.7	1.3
2019-09-12	01:17:05	55.926	-120.259	2.9	1.5
2019-09-11	15:47:09	55.935	-120.261	3.8	1.5
2019-09-11	15:32:48	55.932	-120.260	4.8	1.4
2019-09-11	13:25:32	55.827	-120.798	4.6	2.0
2019-09-11	11:44:04	55.931	-120.256	3.8	1.8
2019-09-11	11:33:13	55.930	-120.253	3.2	1.8
2019-09-11	11:31:27	55.930	-120.260	4.6	1.7
2019-09-11	11:21:47	55.929	-120.264	4.7	1.0
2019-09-11	10:54:03	55.828	-120.799	4.1	1.5
2019-09-11	01:58:22	55.931	-120.261	4.7	0.9
2019-09-10	22:11:08	55.932	-120.263	4.7	1.2
2019-09-10	22:01:48	55.930	-120.260	4.8	1.3
2019-09-10	13:53:45	55.901	-120.268	4.6	1.0
2019-09-09	23:28:18	55.930	-120.266	5.0	1.2
2019-09-09	23:14:47	55.932	-120.264	3.8	1.7
2019-09-09	18:14:54	55.403	-121.897	3.5	2.9
2019-09-09	08:12:50	55.912	-120.253	2.1	2.1
2019-09-09	06:26:28	55.922	-120.231	4.2	1.5
2019-09-08	06:27:35	56.004	-120.624	4.5	1.2
2019-09-08	00:29:04	55.924	-120.252	4.8	1.4
2019-09-07	22:01:58	55.921	-120.254	4.7	1.1
2019-09-07	20:36:13	55.922	-120.248	4.5	1.6
2019-09-06	13:38:41	55.934	-120.264	4.8	1.4
2019-09-05	14:36:59	55.930	-120.262	3.8	1.7
2019-09-05	11:40:31	55.926	-120.252	3.3	1.9

2019-09-04	05:22:14	55.921	-120.229	3.6	1.6
2019-09-04	01:15:52	55.919	-120.245	4.7	1.5
2019-09-03	11:42:19	55.936	-120.265	5.1	1.8
2019-09-03	08:34:55	55.914	-120.244	4.5	1.4
2019-09-03	04:31:03	55.910	-120.246	4.6	1.2
2019-09-02	01:31:03	55.931	-120.257	3.0	2.3
2019-09-02	00:59:04	55.930	-120.259	3.2	1.9
2019-09-02	00:32:14	55.930	-120.268	4.8	1.8
2019-09-01	13:53:02	55.930	-120.275	4.6	1.0
2019-09-01	13:47:44	55.929	-120.276	3.8	1.3
2019-09-01	07:55:09	55.936	-120.271	4.4	1.4
2019-09-01	06:16:38	56.075	-120.943	3.2	1.4
2019-08-19	19:41:25	56.605	-121.599	2.8	3.1
2019-08-17	22:14:00	55.386	-122.475	0.0	2.8
2019-08-15	10:59:16	56.000	-120.613	4.7	1.1
2019-08-13	11:36:25	55.893	-120.670	3.8	1.3
2019-08-13	05:19:58	55.891	-120.666	4.0	1.4
2019-08-13	00:02:15	55.890	-120.663	3.7	1.6
2019-08-11	12:06:27	56.802	-122.077	1.3	3.2
2019-08-11	11:44:05	56.779	-122.096	2.7	2.4
2019-08-10	01:57:00	56.039	-120.711	3.0	1.5
2019-08-10	00:42:03	55.906	-120.645	3.8	1.3
2019-08-09	22:18:35	55.395	-121.846	0.0	2.4
2019-08-09	19:00:27	55.879	-120.691	4.0	1.2
2019-08-09	09:46:43	55.898	-120.664	4.3	1.3
2019-08-09	04:37:52	55.901	-120.662	4.2	1.0
2019-08-08	17:32:31	55.896	-120.669	4.2	1.0
2019-08-08	17:11:54	55.895	-120.665	4.0	1.0
2019-08-08	17:00:41	55.895	-120.664	4.4	1.4
2019-08-08	16:48:13	55.894	-120.662	4.5	1.4
2019-08-08	16:31:32	55.892	-120.669	4.5	1.3
2019-08-08	15:30:31	55.894	-120.663	4.2	1.5
2019-08-08	15:12:26	55.895	-120.666	4.2	1.3
2019-08-08	14:15:41	55.897	-120.659	4.1	1.5
2019-08-08	14:12:23	55.895	-120.666	4.2	1.5
2019-08-08	14:09:17	55.899	-120.663	4.0	1.3
2019-08-08	10:23:58	55.893	-120.660	3.7	1.5
2019-08-08	04:20:29	55.892	-120.657	3.7	1.7
2019-08-08	03:42:36	55.892	-120.662	4.0	1.5
2019-08-08	02:07:48	55.892	-120.659	4.8	1.6
2019-08-08	02:04:24	55.892	-120.662	4.5	2.0
2019-08-07	21:59:09	55.891	-120.659	4.4	1.6

2019-08-07	21:45:43	55.892	-120.660	4.3	1.4
2019-08-07	21:28:14	55.895	-120.658	3.7	1.4
2019-08-07	18:49:39	55.900	-120.657	4.6	1.2
2019-08-07	18:30:09	55.896	-120.659	4.0	1.4
2019-08-07	16:09:23	55.894	-120.660	3.8	1.5
2019-08-07	15:33:24	55.897	-120.656	3.9	1.7
2019-08-07	14:49:29	55.894	-120.657	4.0	1.3
2019-08-07	14:34:35	55.894	-120.655	4.0	1.3
2019-08-06	07:06:34	55.894	-120.661	4.5	0.9
2019-08-05	16:22:10	55.888	-120.656	4.4	1.6
2019-08-05	09:46:23	55.884	-120.647	3.8	1.9
2019-08-05	01:44:09	55.892	-120.656	4.5	1.2
2019-08-05	01:28:57	55.893	-120.656	4.2	1.5
2019-08-05	01:11:47	55.886	-120.650	4.5	1.6
2019-08-04	08:02:02	55.885	-120.647	4.4	1.7
2019-08-04	07:07:31	55.881	-120.642	3.9	1.7
2019-08-04	05:48:19	55.882	-120.634	3.4	1.7
2019-08-04	04:02:06	55.890	-120.650	4.4	1.3
2019-08-04	03:06:11	55.885	-120.641	3.5	2.1
2019-08-04	02:22:34	55.883	-120.651	4.6	1.5
2019-08-02	12:37:32	55.884	-120.645	4.9	1.6
2019-08-02	12:24:20	55.888	-120.643	4.2	1.7
2019-08-02	12:07:34	55.885	-120.641	4.7	1.6
2019-08-01	18:12:39	55.389	-121.879	4.9	2.6
2019-07-31	22:03:08	55.888	-120.642	4.2	1.9
2019-07-31	13:02:44	55.888	-120.646	4.8	1.6
2019-07-30	17:40:43	56.779	-122.079	3.6	2.9
2019-07-29	07:57:17	56.009	-120.625	3.3	2.3
2019-07-25	05:38:57	55.911	-120.304	2.9	1.7
2019-07-25	01:18:42	55.918	-120.309	3.4	2.0
2019-07-24	21:59:47	55.914	-120.308	4.6	1.6
2019-07-24	21:51:58	55.913	-120.308	3.2	2.7
2019-07-24	17:52:15	55.914	-120.309	4.3	1.9
2019-07-24	03:03:27	55.927	-120.310	4.0	1.5
2019-07-22	20:11:57	55.916	-120.311	3.6	2.3
2019-07-22	19:59:57	55.917	-120.310	4.4	1.9
2019-07-22	19:33:09	55.919	-120.308	4.3	1.8
2019-07-22	18:59:56	55.921	-120.306	2.1	2.0
2019-07-21	19:45:44	55.947	-120.317	7.1	1.2
2019-07-21	19:06:35	55.381	-121.812	3.7	2.9
2019-07-21	18:11:45	55.536	-122.380	1.3	2.6
2019-07-21	16:33:27	55.939	-120.302	4.0	2.3

2019-07-21	15:42:02	55.927	-120.308	2.8	1.8
2019-07-21	03:03:38	55.942	-120.305	6.2	1.1
2019-07-20	15:30:11	55.926	-120.323	3.4	2.1
2019-07-20	01:56:00	55.938	-120.318	3.9	1.7
2019-07-19	22:17:17	55.581	-122.304	0.0	2.7
2019-07-19	21:16:47	55.957	-120.310	3.8	1.8
2019-07-19	02:03:05	55.938	-120.323	0.0	2.4
2019-07-18	22:06:23	55.332	-122.033	1.6	3.0
2019-07-18	21:30:57	55.944	-120.302	0.0	2.1
2019-07-18	21:15:39	55.943	-120.322	0.0	2.4
2019-07-18	02:45:56	55.919	-120.325	3.9	1.6
2019-07-14	23:26:13	55.924	-120.319	4.3	1.4
2019-07-13	08:59:11	56.821	-122.114	2.6	4.2
2019-05-17	04:54:06	55.996	-120.657	5.0	2.2
2019-05-17	04:12:43	55.988	-120.647	4.5	2.7
2019-04-10	02:43:26	55.903	-120.356	4.8	1.8
2019-04-09	19:09:03	55.899	-120.353	4.6	2.6
2019-04-08	12:17:41	55.901	-120.364	4.7	0.9
2019-04-07	17:49:47	55.896	-120.371	4.6	2.1
2019-04-07	02:05:56	55.897	-120.370	4.8	1.7