

**Advanced Multicomponent
Seismic Software**

**Analysis of seismic data recorded in April 2026
by network C8 (stations SV1S-SV5S)
at Aquistore test site**

Report AQ-2026-04-IM

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1. Station performance

Station performance for April 2026 is summarized in Figure 1, and their state-of-health parameters are shown in Figure 2. Only stations SV1S to SV4S are shown, and station SV5S had a failed sensor and was offline.

Power-supply voltages looked generally good and station operation was practically uninterrupted. However, as in the preceding reports, a couple issues may require attention:

- The power-source voltage at station SV3S frequently dropped below the optimal level (Figure 2). This situation should improve after replacing the cellular modems as suggested in earlier reports.
- Sensor “mass position” voltage at station SV3S varies and occasionally reaches the critical levels of ± 2.5 . These variations may be related to variation of soil moisture and temperature. Adjustment of sensor mass position or (preferably) replacement to a self-levelling sensor may be needed.
- Stations SV3S and SV4S show time intervals contaminated with series of spikes. This issue may be related to changing mass positions above, power voltage variations, seasonal variations, or deteriorating sensor cables.

Network C8: Data retrieval summary from 2026-04-01 to 2026-05-01

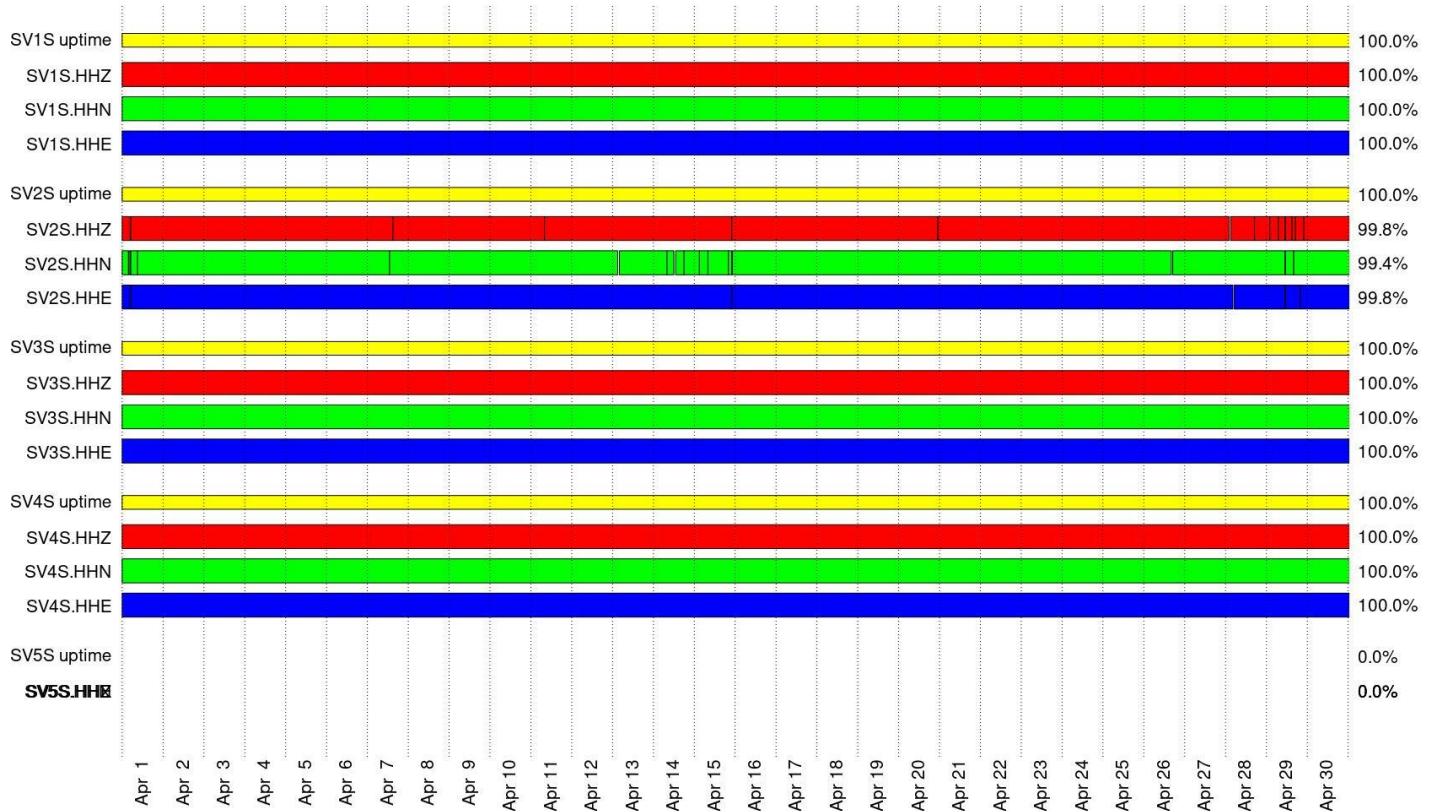


Figure 1. Retrieved data intervals for all channels (red, green, and blue bars) and uptimes (yellow). Total percentages of measured uptime and data retrieval are shown on the right. Gaps in yellow bars are insignificant and only show lapses in probing procedures. Station SV5S was offline in April 2026.

State of health for station C8.SV1S (NE01) from 2026-04-01 to 2026-05-01

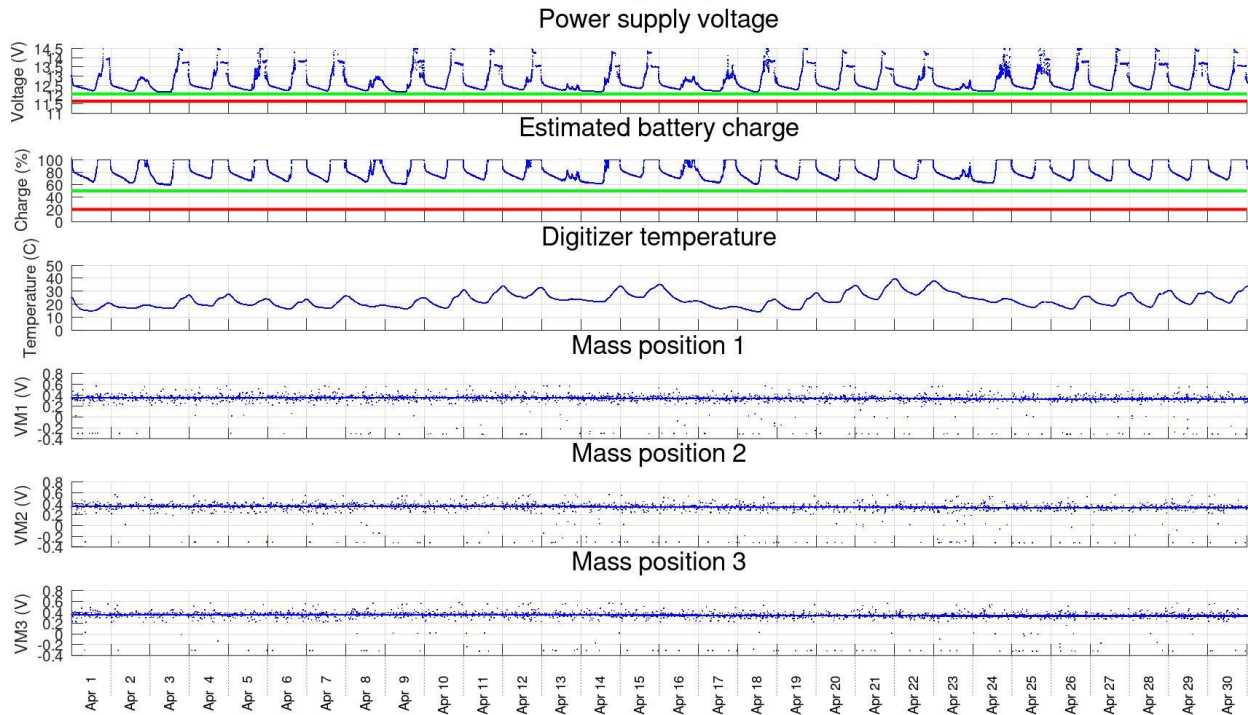


Figure 2. State of health parameters for each station (SV1S here). Image headings: power supply voltage, estimated battery charge levels, temperature on board, voltages measuring mass positions.

State of health for station C8.SV2S (SW01) from 2026-04-01 to 2026-05-01

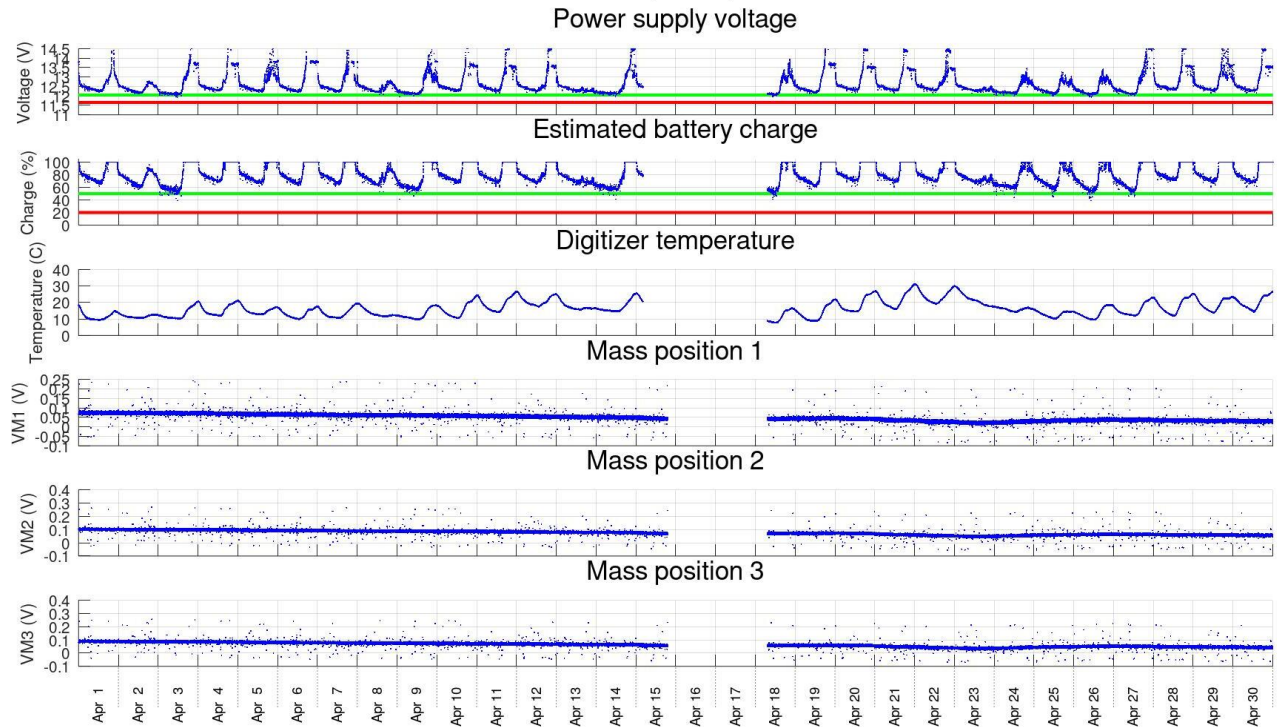


Figure 2, continued, station SV2S. The gap on April 16-18 was due to a lapse in manual downloading of SOH data from the Taurus recorder.

State of health for station C8.SV3S (NW01) from 2026-04-01 to 2026-05-01

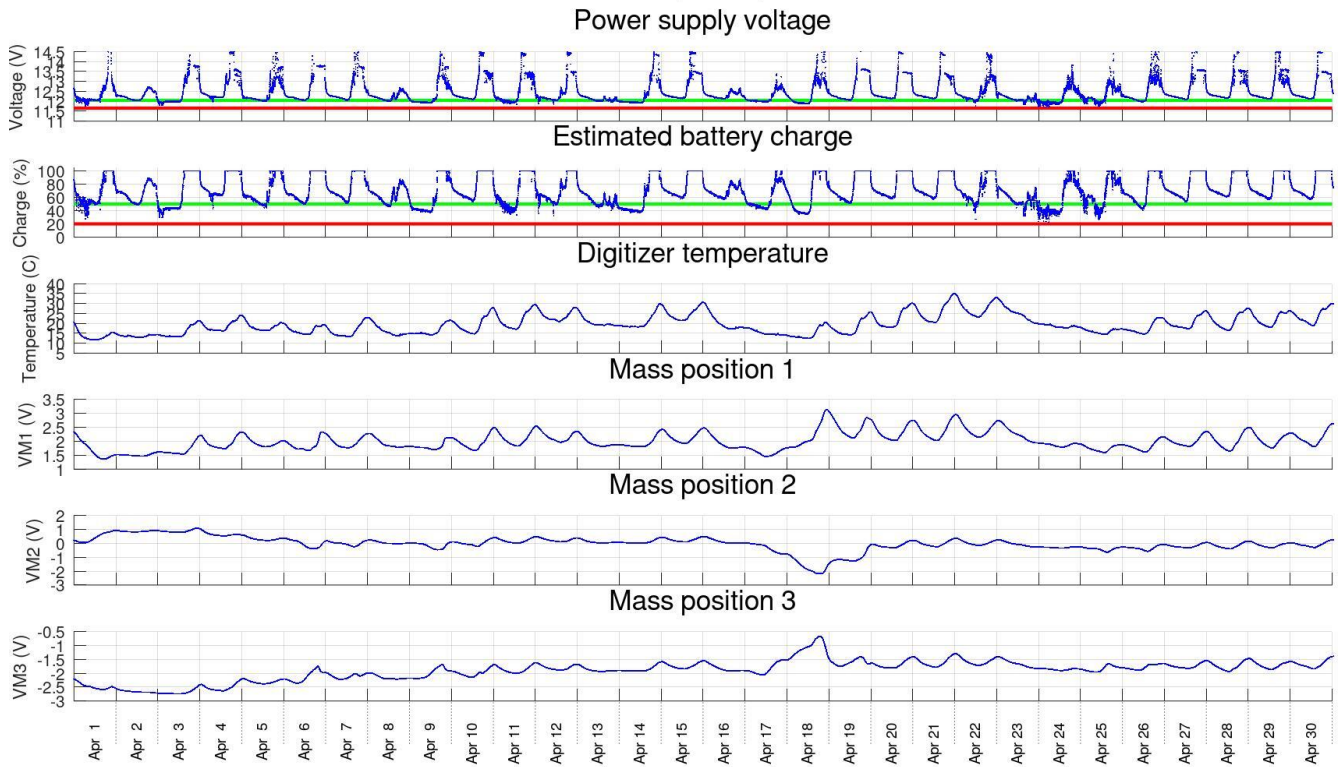


Figure 2, continued, station SV3S.

State of health for station C8.SV4S (SE01) from 2026-04-01 to 2026-05-01

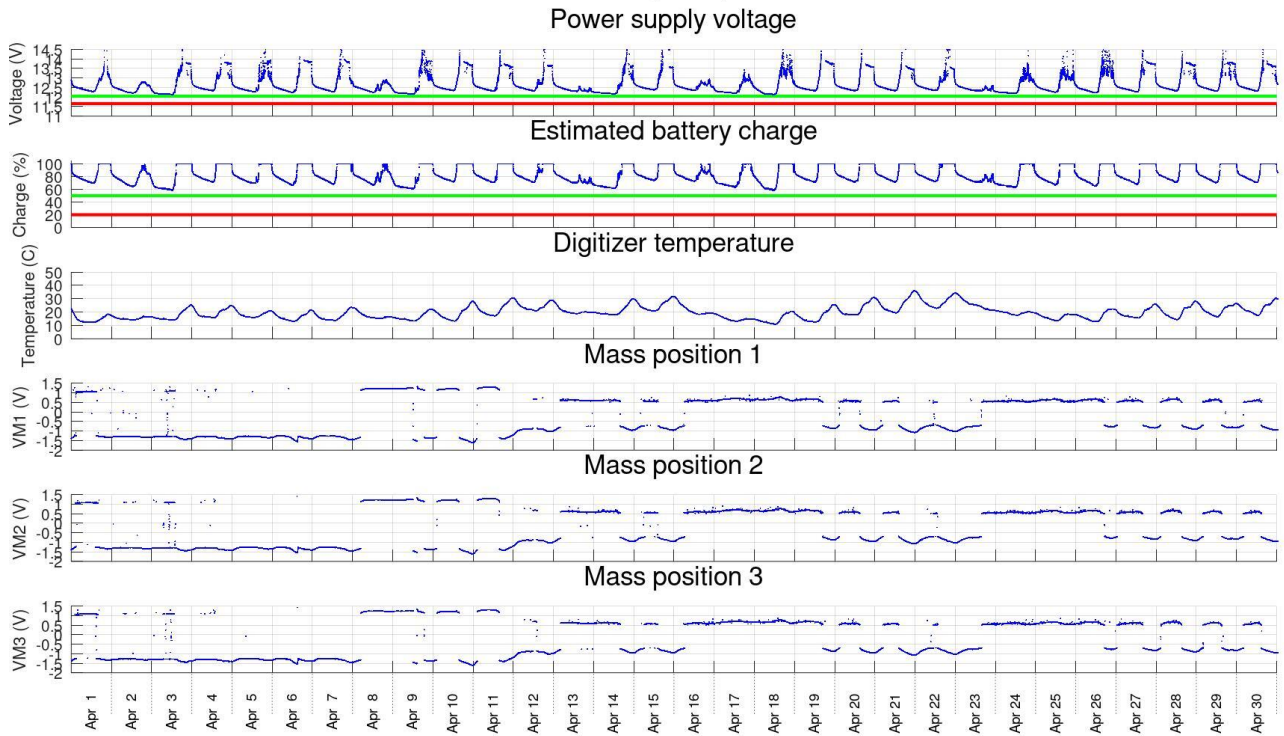


Figure 2, continued, station SV4S.

Data recovery

Data recovery from the operational stations SV1S – SV4S was nearly 100% (Figures 1 and 2).

2. Data quality

Figure 3 shows two measures of data quality evaluated for each channel:

- 1) Numbers of spikes and tears (sharp changes of DC level) within 1-hour time intervals;
- 2) 1-hour interval root-mean square (RMS) average amplitudes in each channel.

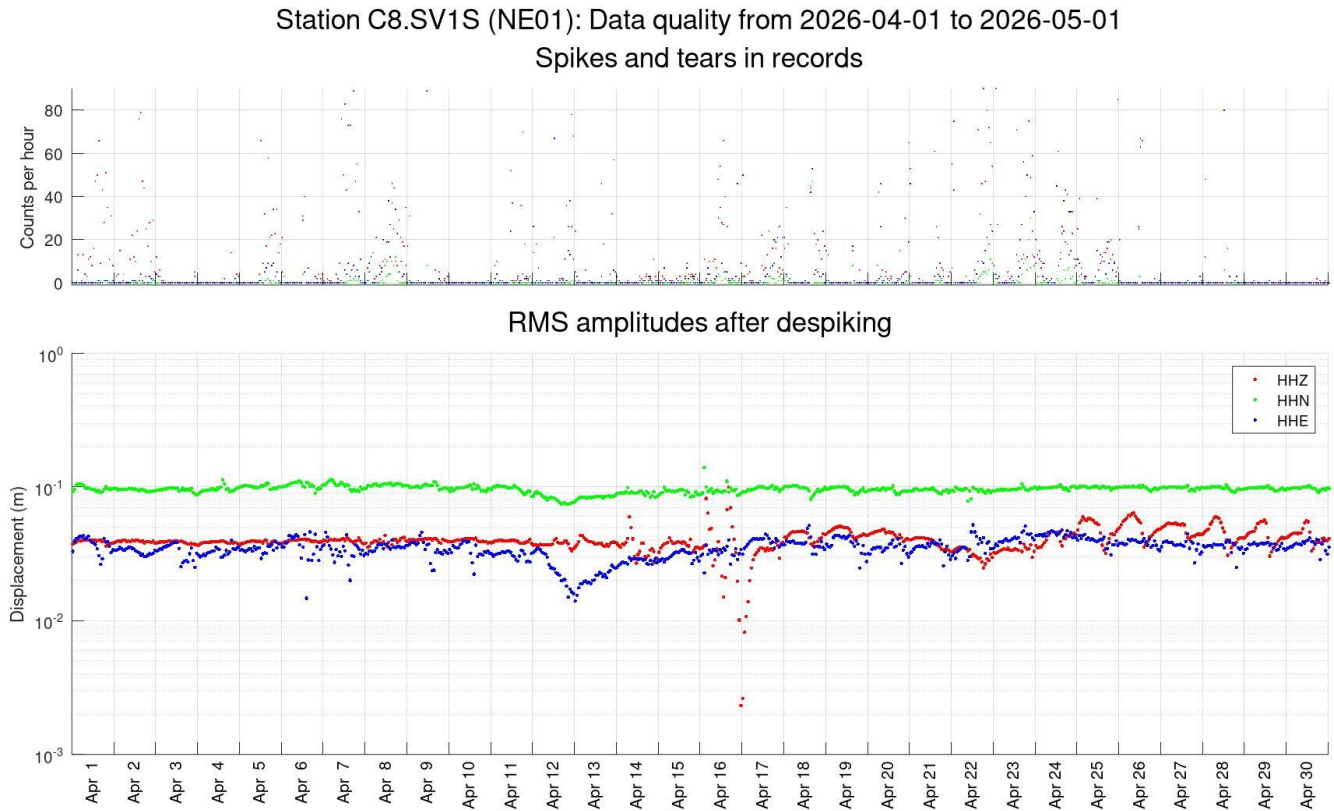


Figure 3. Measures of data quality in hour-long intervals. Station names and time intervals are indicated in plot headings (SV1S in this plot). Red, green, and blue colours correspond to channels HHZ, HHN, and HHE, respectively (as in Figure 1).

Top panels: Numbers of spikes and tears per hour auto-detected in data records.

Bottom panels: RMS ground displacements (meters).

Station C8.SV2S (SW01): Data quality from 2026-04-01 to 2026-05-01
Spikes and tears in records

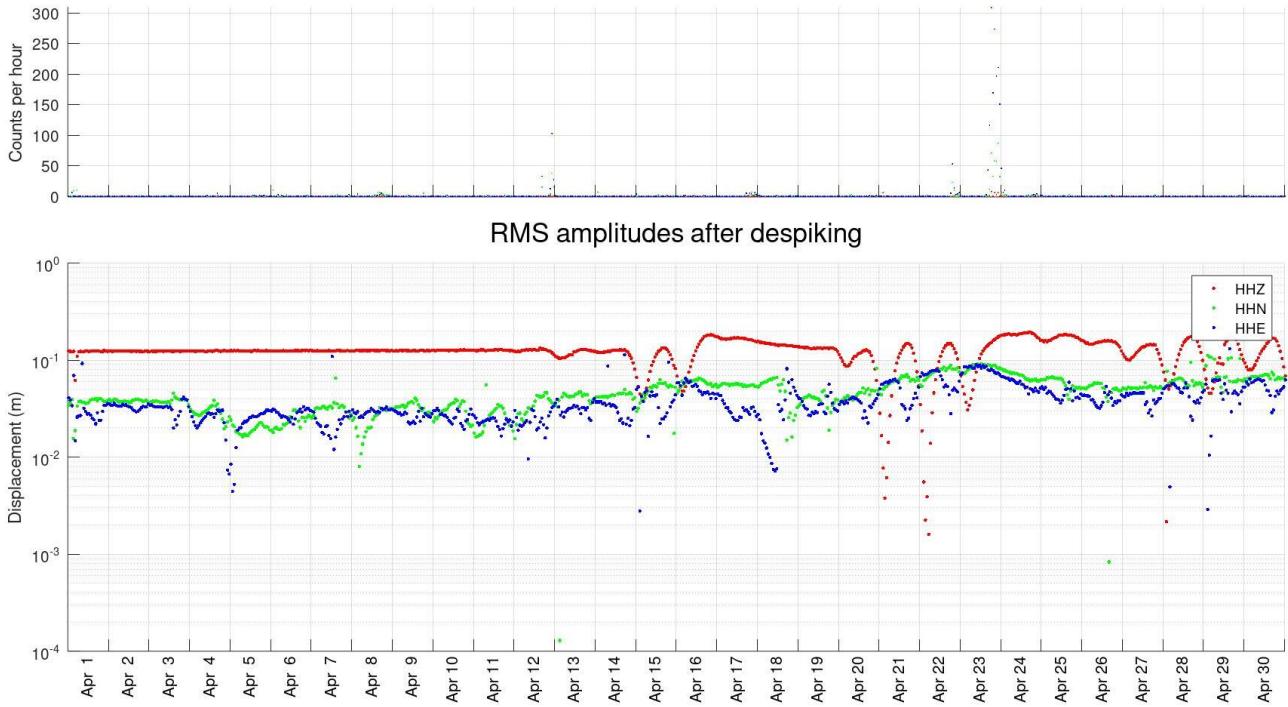


Figure 3, continued. Station SV2S.

Station C8.SV3S (NW01): Data quality from 2026-04-01 to 2026-05-01
Spikes and tears in records

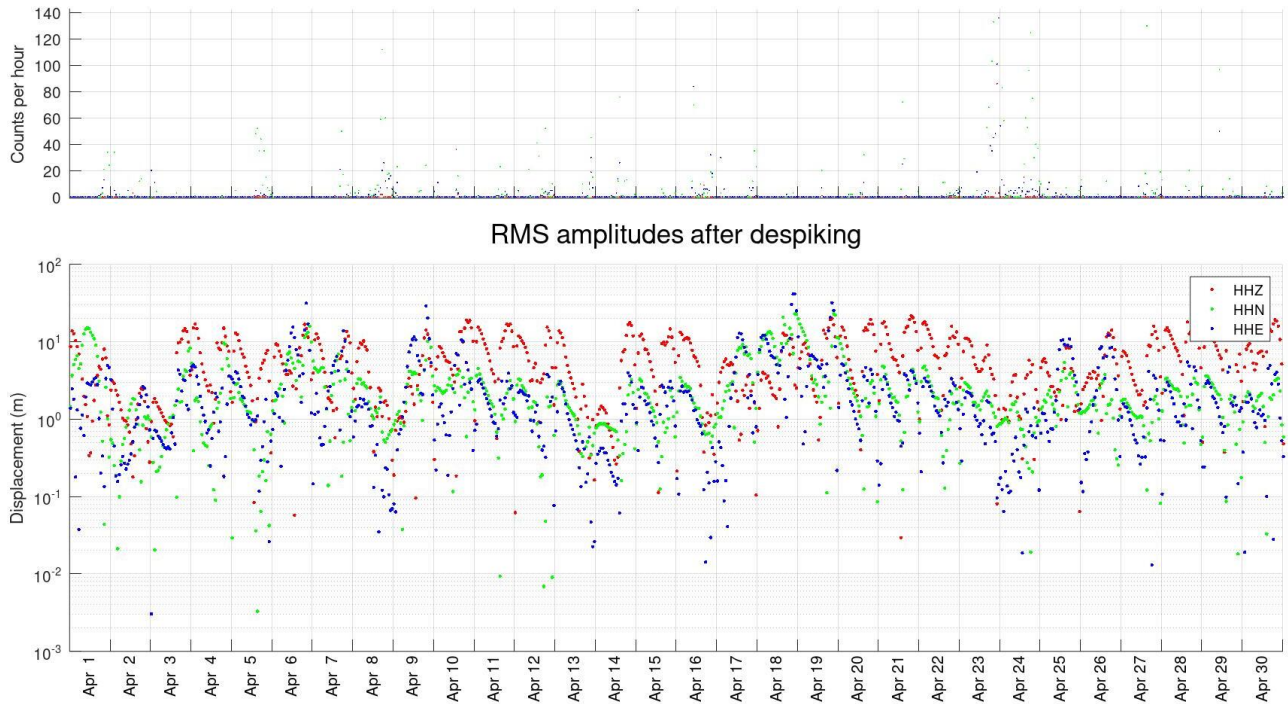


Figure 3, continued. Station SV3S.

Station C8.SV4S (SE01): Data quality from 2026-04-01 to 2026-05-01
Spikes and tears in records

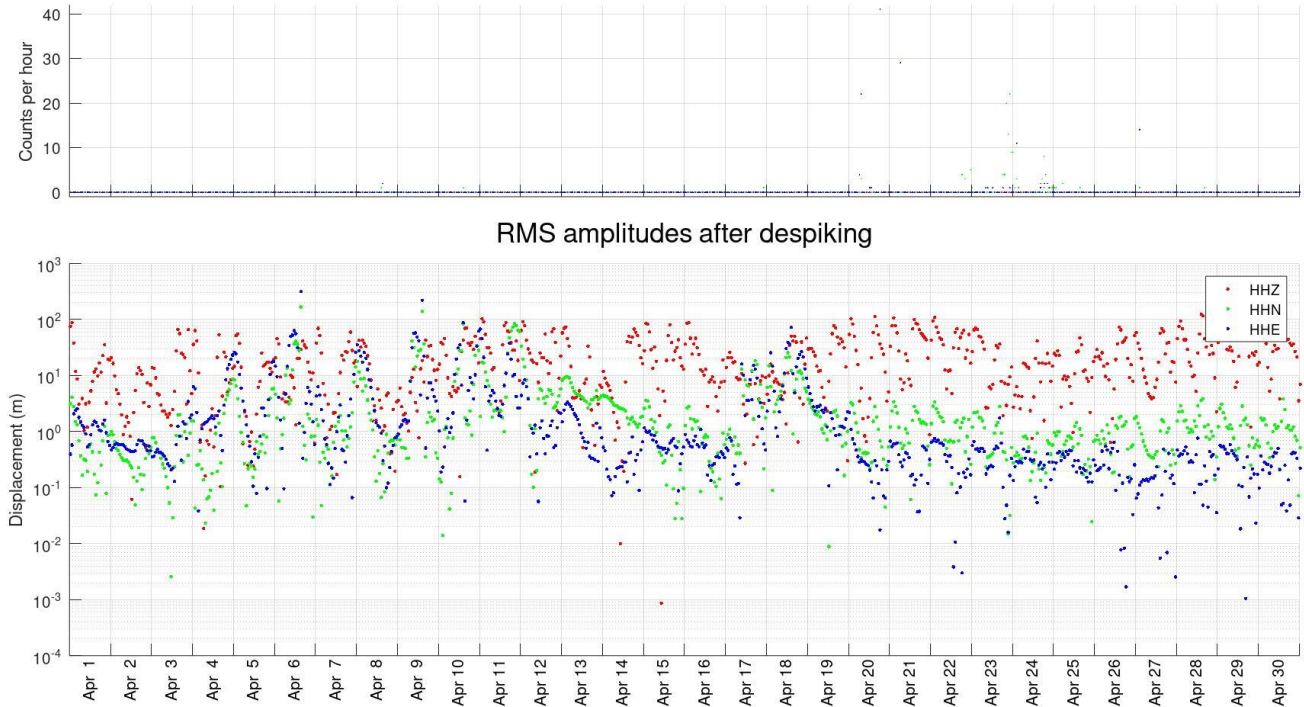


Figure 3, continued. Station SV4S.

3. Processing procedure and parameters

Processing procedure and parameters were the same as in previous reports.

4. Seismic event detection

The classification of seismic events used in these reports and numbers of events detected in April 2026 are shown in Table 2.

Table 2. Classification of seismic events and numbers of detections at Aquistore broadband seismic array

Event class code	Class name	Identification criteria	Number of detections in this report
1	Teleseismic	Hypocentral distance $D > 1000$ km, presence in catalogues	16
2	Regional	$100 < D < 1000$ km, presence in catalogues	1

3	Local	Approx. $4 < D < 100$ km	-----
3a	Possible mine blasts	Characteristic waveforms, amplitudes, back-azimuths east of Aquistore, D about 12-15 km	16
3b	Mining-related	Low frequencies, extended repeated wavetrains low arrival velocities related to surface waves	4 (selected from numerous occurrences)
4	Proximity (close local)	$D < 3-4$ km, deviation of array moveouts from plane-wave patterns, high frequency	-----
4a	Surface sources near array	Large travel-time moveouts, variable back-azimuths	1
4b	Target zone	Source at recognizable nonzero depth, small travel-time moveouts, high frequency	0

Automatic detections

The procedure of multichannel automatic detections is being revised and not shown in the present report.

Event bulletins

Earthquake data bulletins for the period of this report were obtained from NEIC (USGS) and NRCAN web services (Figure e). Events larger than magnitude 2.5 were taken from USGS, and all available events were retrieved from NRCAN. Events with magnitudes above the selected $magnitude \propto distance^{1.5}$ threshold (dashed green line in Figure e) were reviewed interactively (next section).

Events from 2026-04-01 to 2026-05-01
21 regional
1942 teleseismic

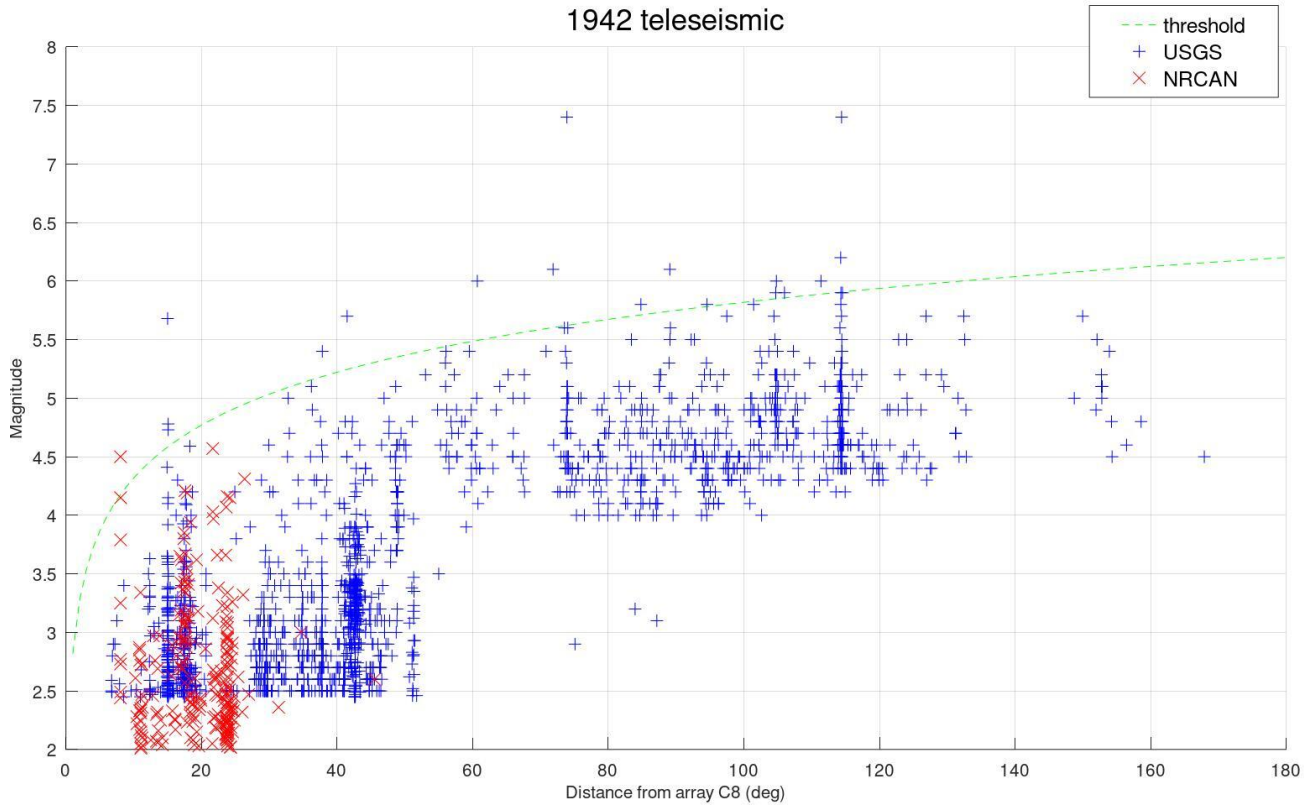


Figure 5. Magnitudes and distances from Aqistore for earthquake parameters downloaded from USGS and NRCAN databases (legend). Dashed green line shows the detection threshold above which a manual review of events was performed.

Teleseismic events (class 1)

Above the threshold line in Figure 5, 16 teleseismic events (class 1 in Table 2) were identified in April 2026 (Figure 6). Time zeros in Figure 6 plots are located at the times of P-wave arrivals at the Aquistore array predicted in the reference model IASP91 and corrected interactively. Blue bars near *time* = 0 are interactive picks of P-wave arrival times.

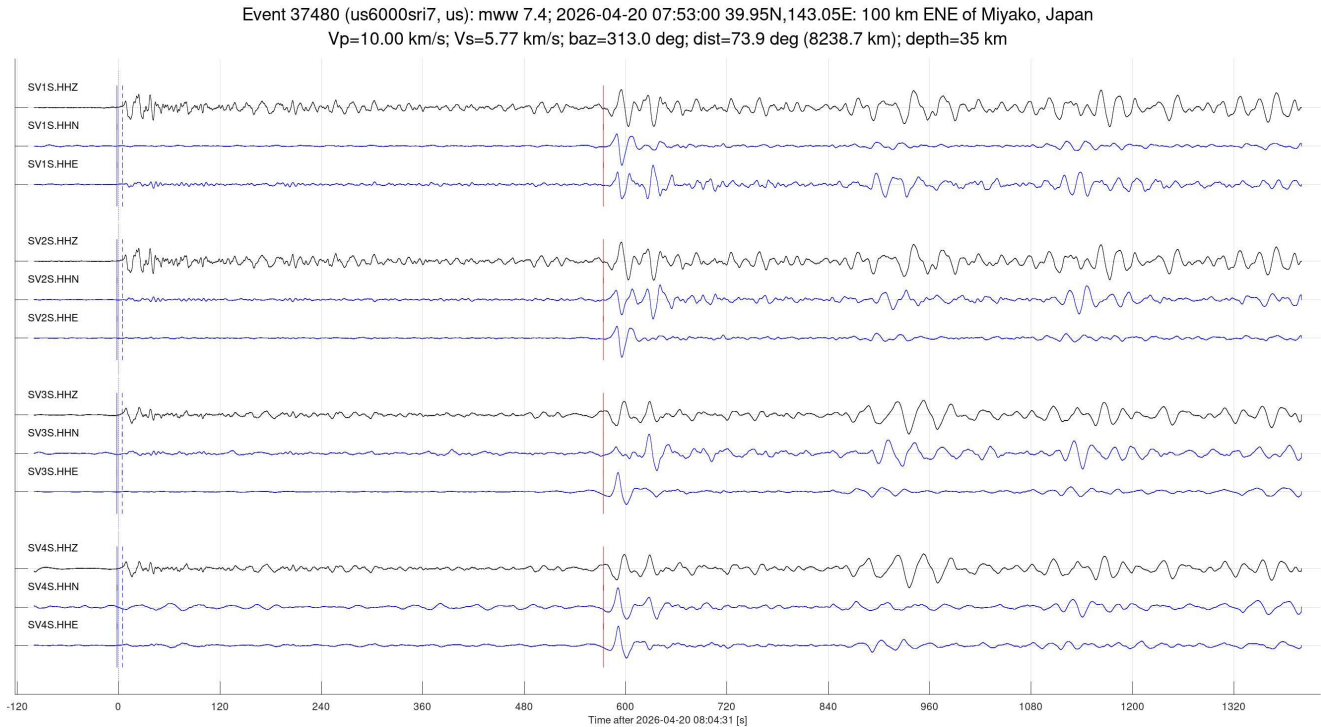


Figure 6. Teleseismic events detected at Aquistore in April 2026. Plot headings show catalogue IDs, magnitudes, times, distances in degrees, source coordinates and localities, back-azimuths ('baz='), distances ('dist=') and source depths. Vertical-component records are shown in black, and horizontal components in blue. Blue and red bars indicate the P-wave and S-wave picks, respectively. Ignore the (experimental) cyan and dashed bars.

Event 37518 (us6000sred, us): mwr 6.1; 2026-04-19 17:34:47 15.13S,173.62W: 93 km NNE of Hihifo, Tonga
Vp=10.00 km/s; Vs=5.77 km/s; baz=245.6 deg; dist=89.1 deg (9932.2 km); depth=36 km

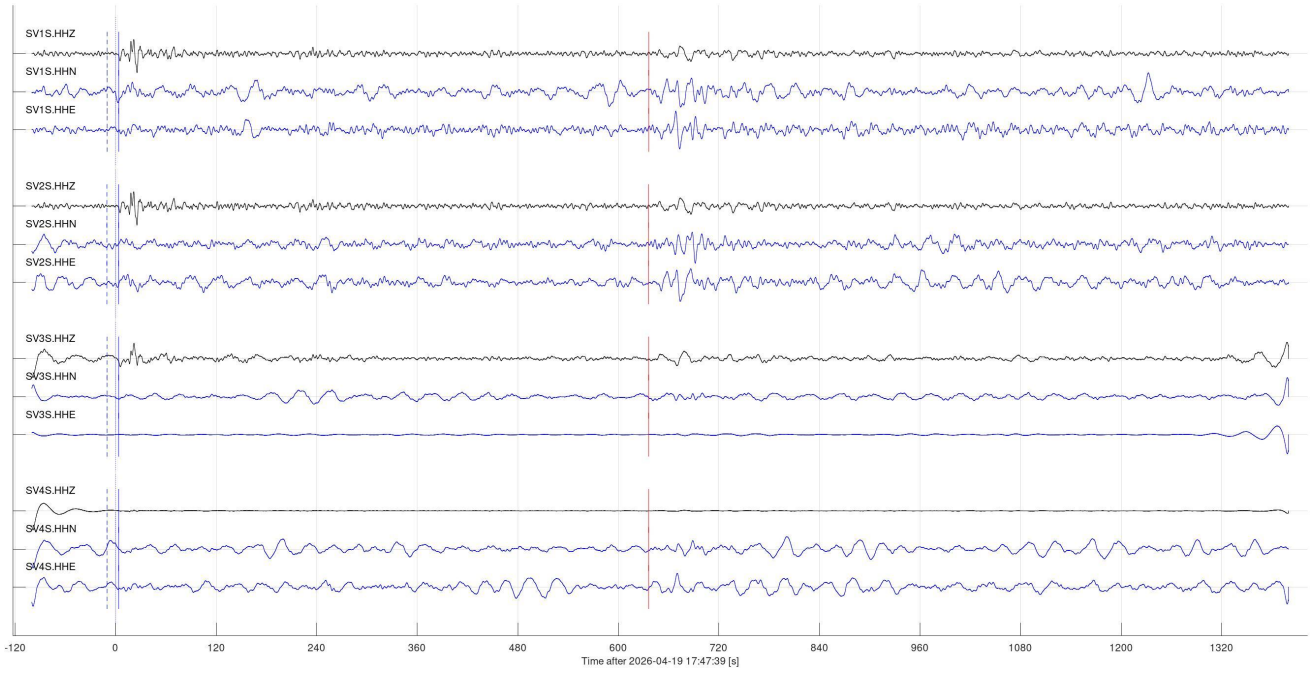


Figure 6, continued.

Event 37532 (nn00915543, nn): mwr 4.7; 2026-04-19 14:39:16 39.27N,119.09W: 20 km SE of Silver Springs, Nevada
Vp=10.00 km/s; Vs=5.77 km/s; baz=235.4 deg; dist=15.1 deg (1681.9 km); depth=6.00 km

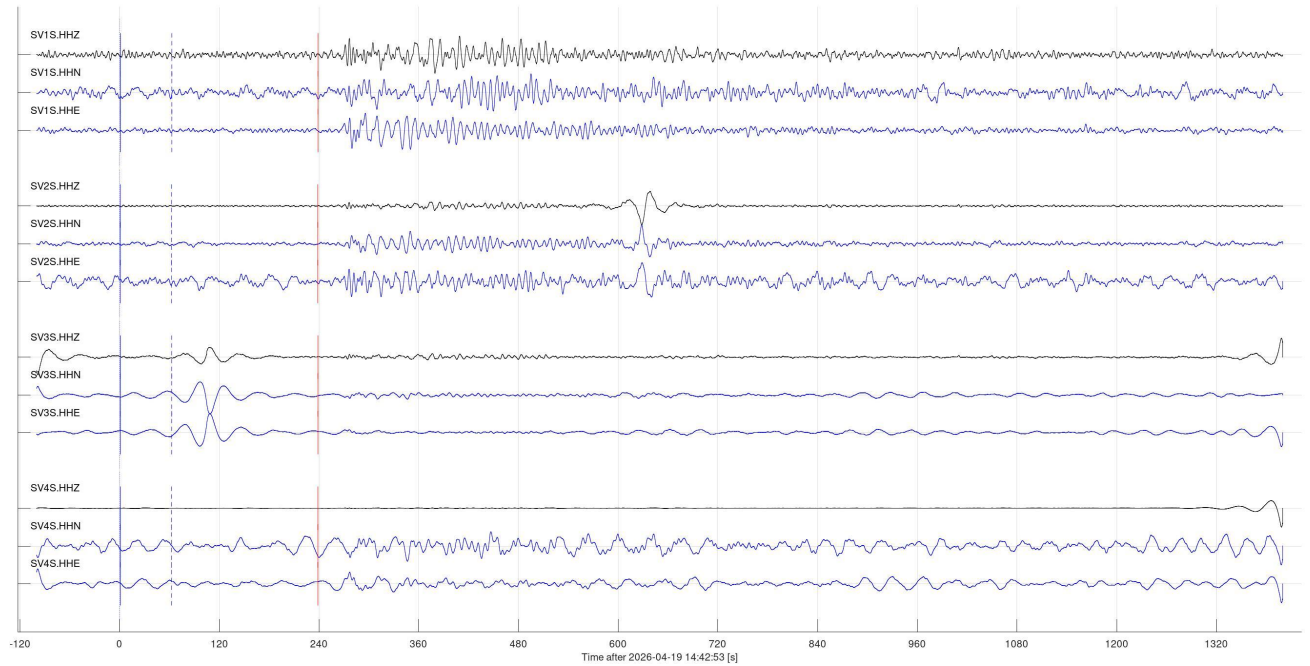


Figure 6, continued.

Event 37604 (us6000sr3l, us): mww 5.9; 2026-04-18 10:47:55 32.09S,178.06W: south of the Kermadec Islands
Vp=10.00 km/s; Vs=5.77 km/s; baz=238.0 deg; dist=104.7 deg (11674.7 km); depth=10 km

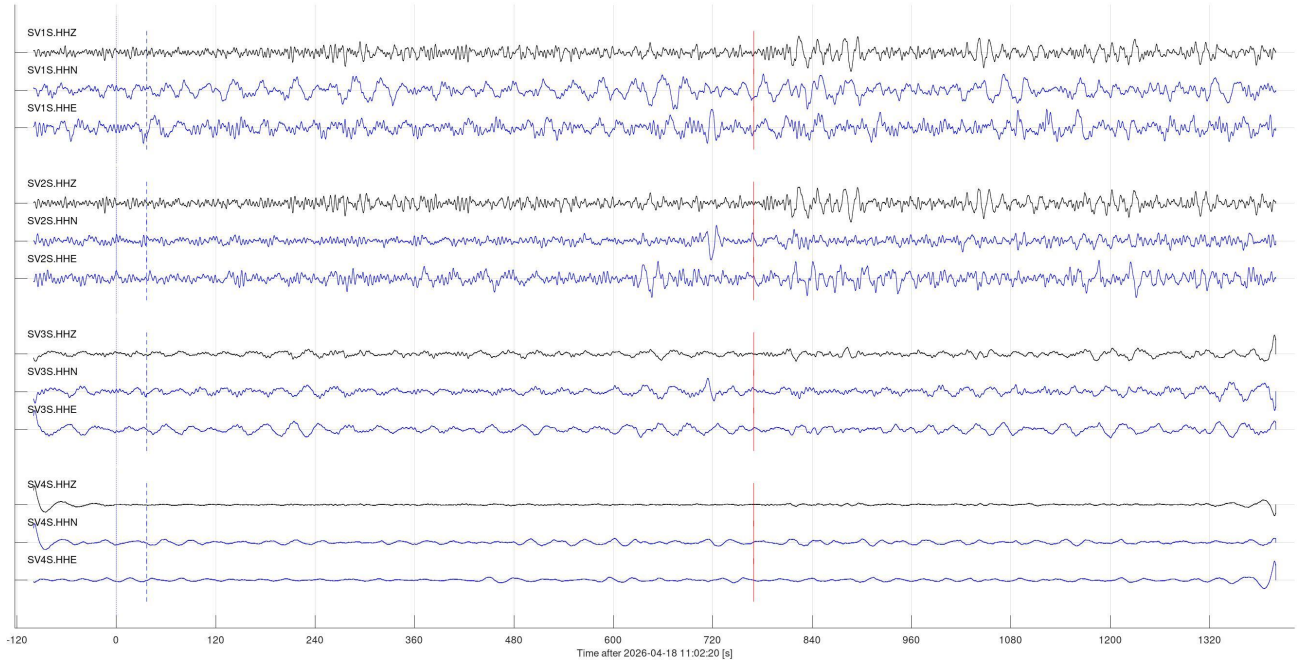


Figure 6, continued.

Event 37690 (us6000sqjb, us): mww 6.0; 2026-04-16 13:30:01 32.21S,178.05W: south of the Kermadec Islands
Vp=10.00 km/s; Vs=5.77 km/s; baz=237.9 deg; dist=104.8 deg (11684.4 km); depth=10 km

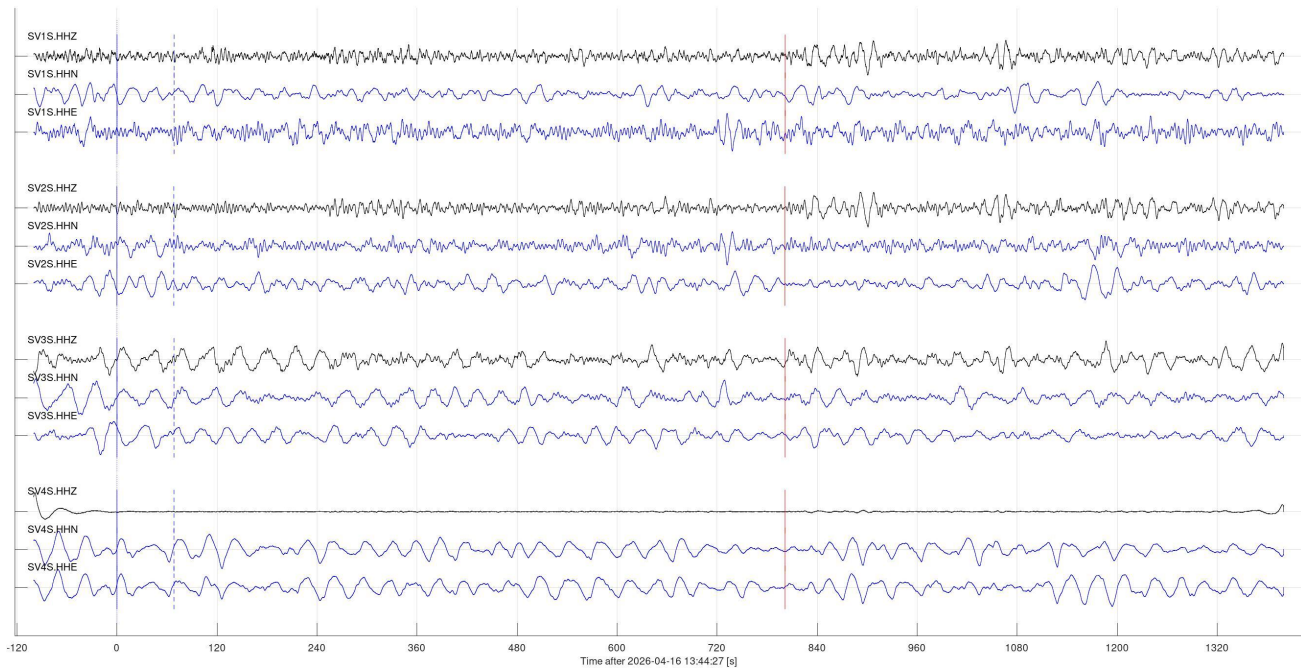


Figure 6, continued.

Event 37734 (us6000sq5z, us): mww 5.7; 2026-04-15 06:56:03 9.92N,86.38W: 72 km SW of Tamarindo, Costa Rica
Vp=10.00 km/s; Vs=5.77 km/s; baz=154.7 deg; dist=41.5 deg (4624.4 km); depth=20 km

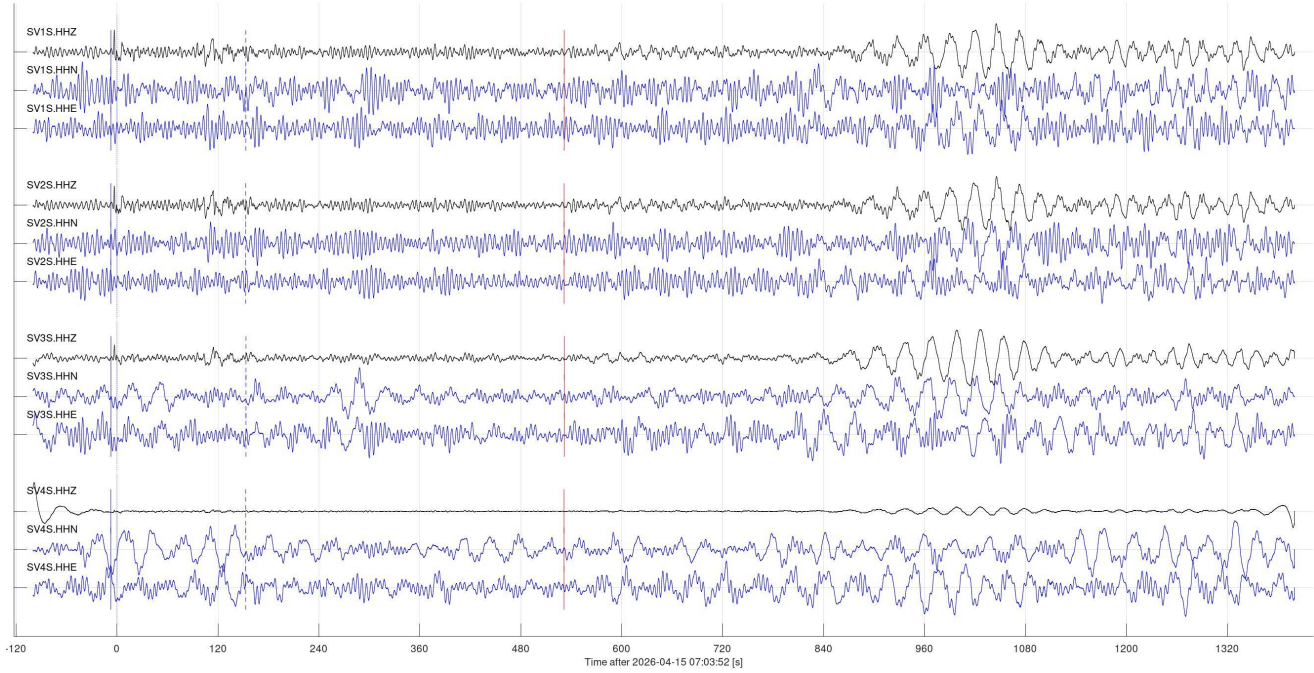


Figure 6, continued.

Event 38440 (nn0914068, nn): mw 5.7; 2026-04-14 01:29:12 39.33N,119.01W: 20 km ESE of Silver Springs, Nevada
Vp=10.00 km/s; Vs=5.77 km/s; baz=235.4 deg; dist=15.0 deg (1671.9 km); depth=5.00 km

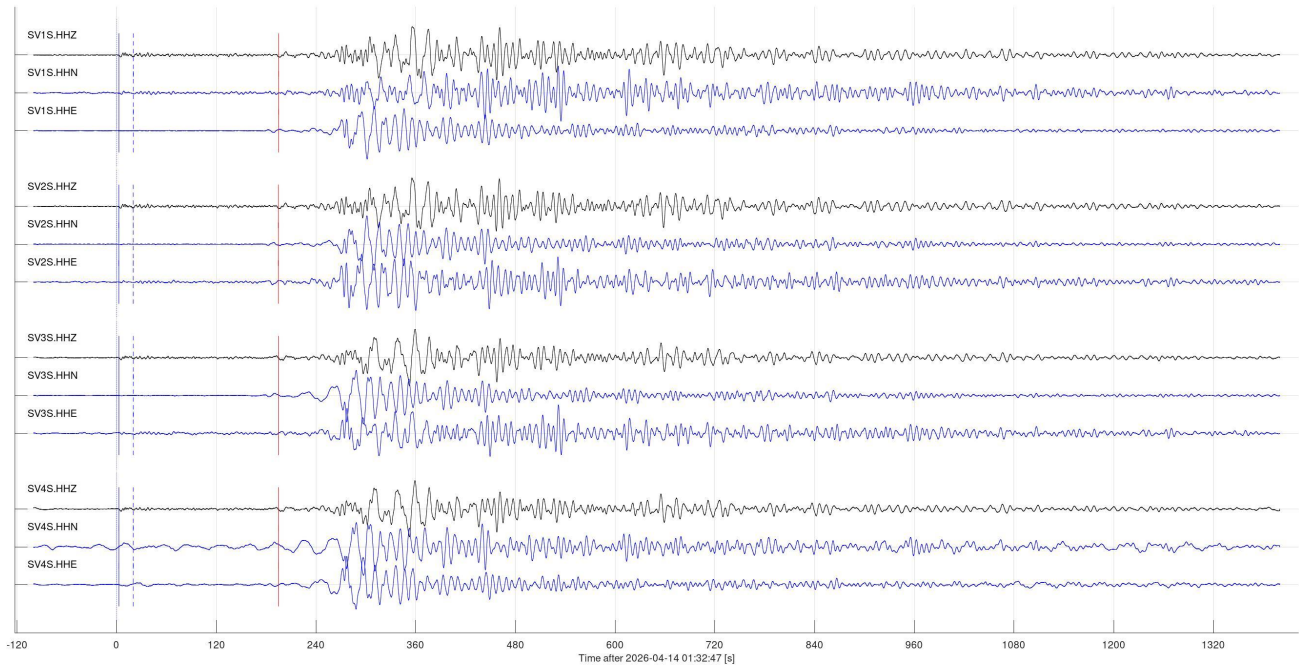
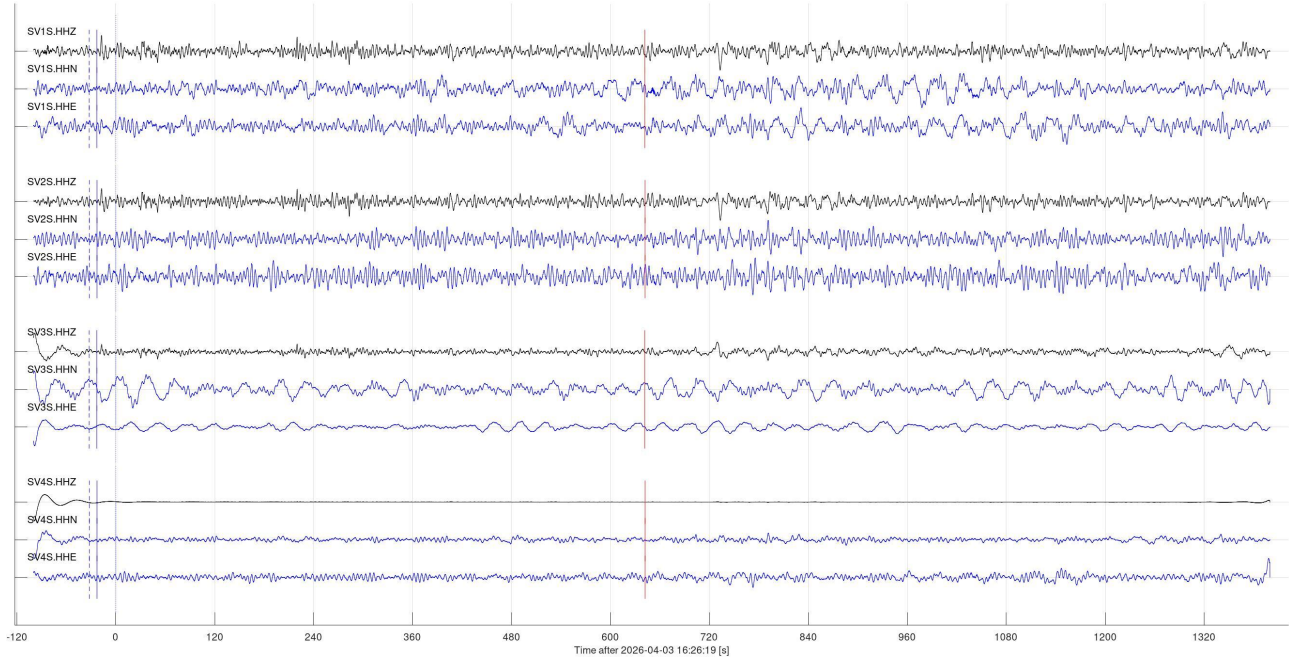
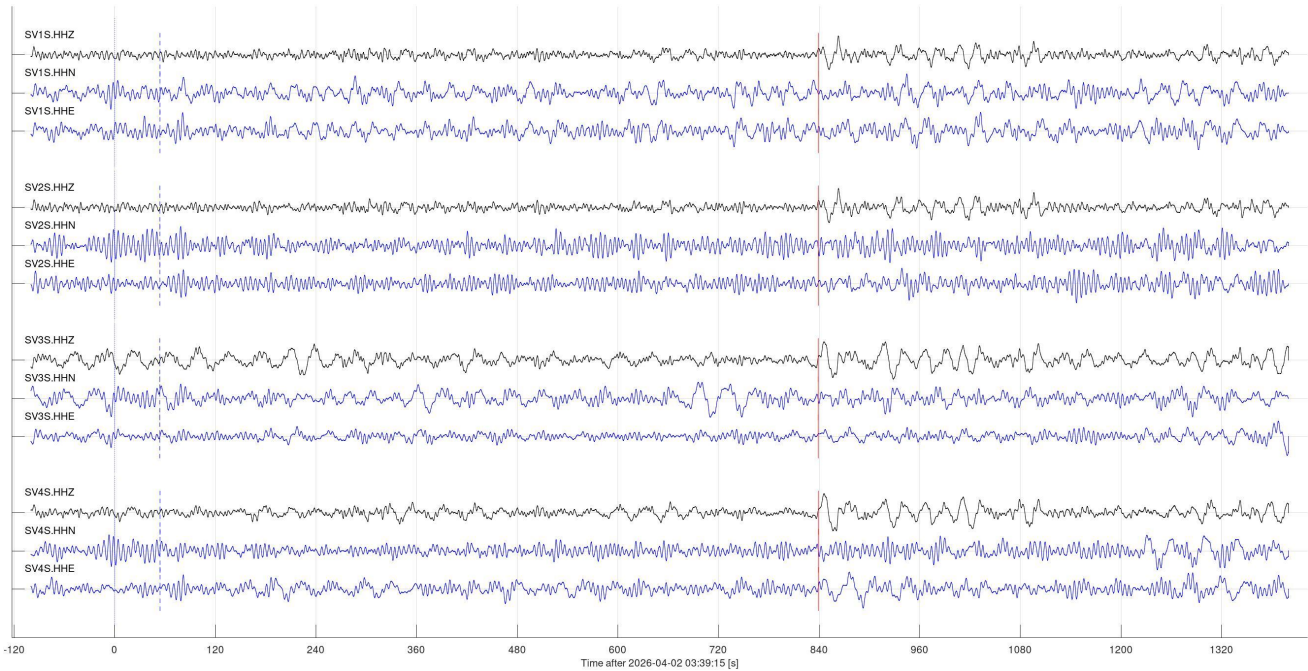


Figure 6, continued.

Event 41559 (us6000smda, us): mww 5.8; 2026-04-03 16:12:58 36.55N,70.85E: 35 km S of Jurm, Afghanistan
Vp=10.00 km/s; Vs=5.77 km/s; baz=4.9 deg; dist=94.6 deg (10543.7 km); depth=186 km



Event 41687 (us6000slwy, us): mwb 6.2; 2026-04-02 03:23:54 1.18N,126.44E: 113 km WNW of Ternate, Indonesia
Vp=10.00 km/s; Vs=5.77 km/s; baz=303.5 deg; dist=114.3 deg (12742.6 km); depth=35 km



Event 41711 (us6000slss, us): mww 7.4; 2026-04-01 22:48:13 1.12N,126.30E: 126 km WNW of Ternate, Indonesia
Vp=10.00 km/s; Vs=5.77 km/s; baz=303.6 deg; dist=114.4 deg (12757.3 km); depth=35 km

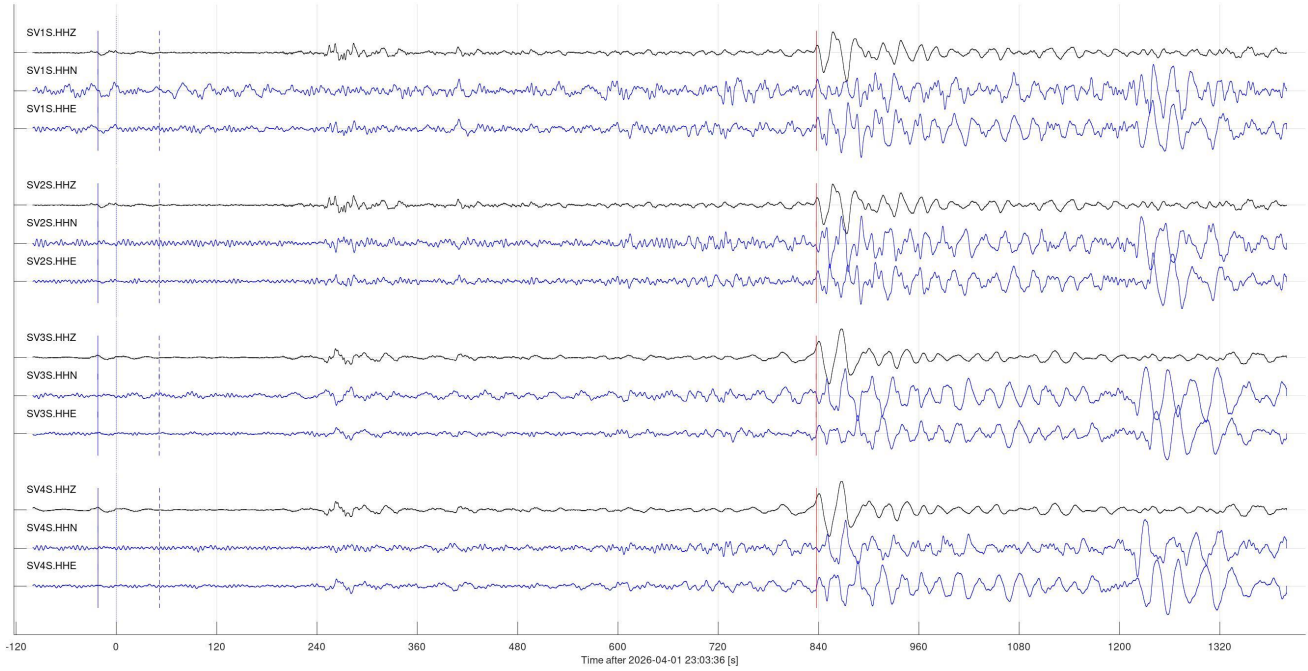


Figure 6, continued.

Event 41728 (us7000s9cg, us): mww 6.0; 2026-04-01 11:20:26 7.06S,76.12W: 27 km ESE of Picota, Peru
Vp=10.00 km/s; Vs=5.77 km/s; baz=148.9 deg; dist=60.7 deg (6766.4 km); depth=109 km

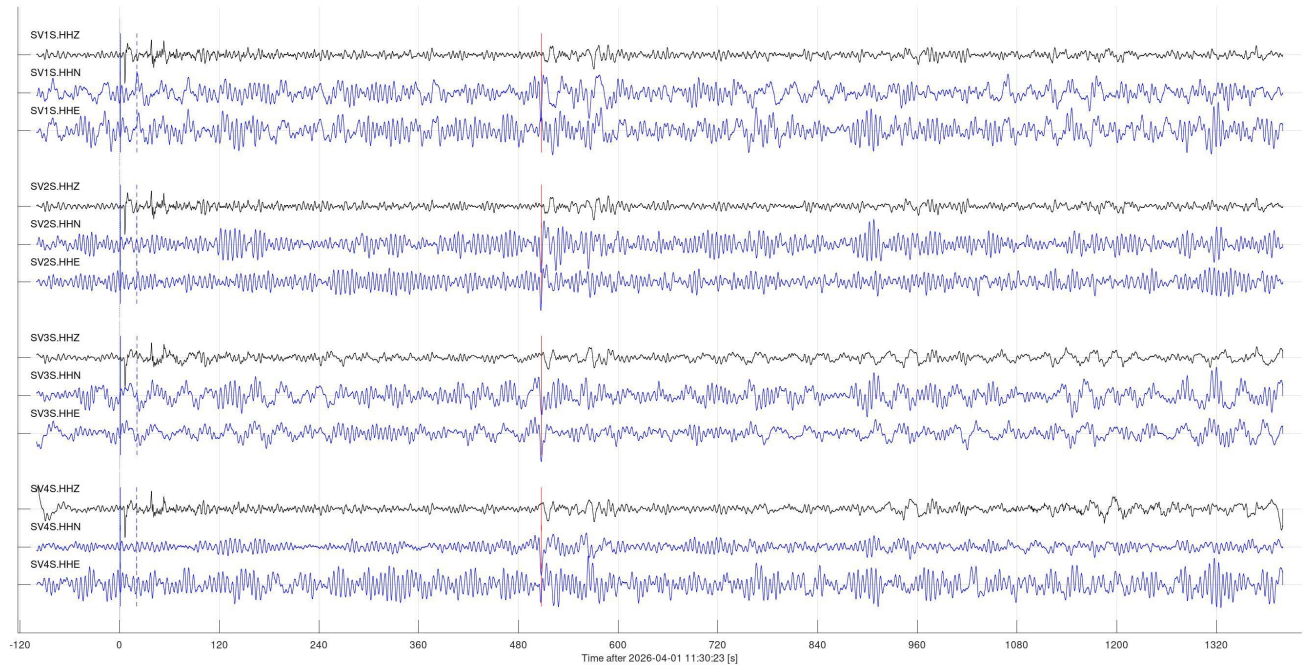


Figure 6, continued.

Event 42259 (us6000smj4, us): mww 6.0; 2026-04-04 10:34:32 4.89N,126.10E: 90 km SE of Sarangani, Philippines
Vp=10.00 km/s; Vs=5.77 km/s; baz=305.9 deg; dist=111.4 deg (12417.5 km); depth=100 km

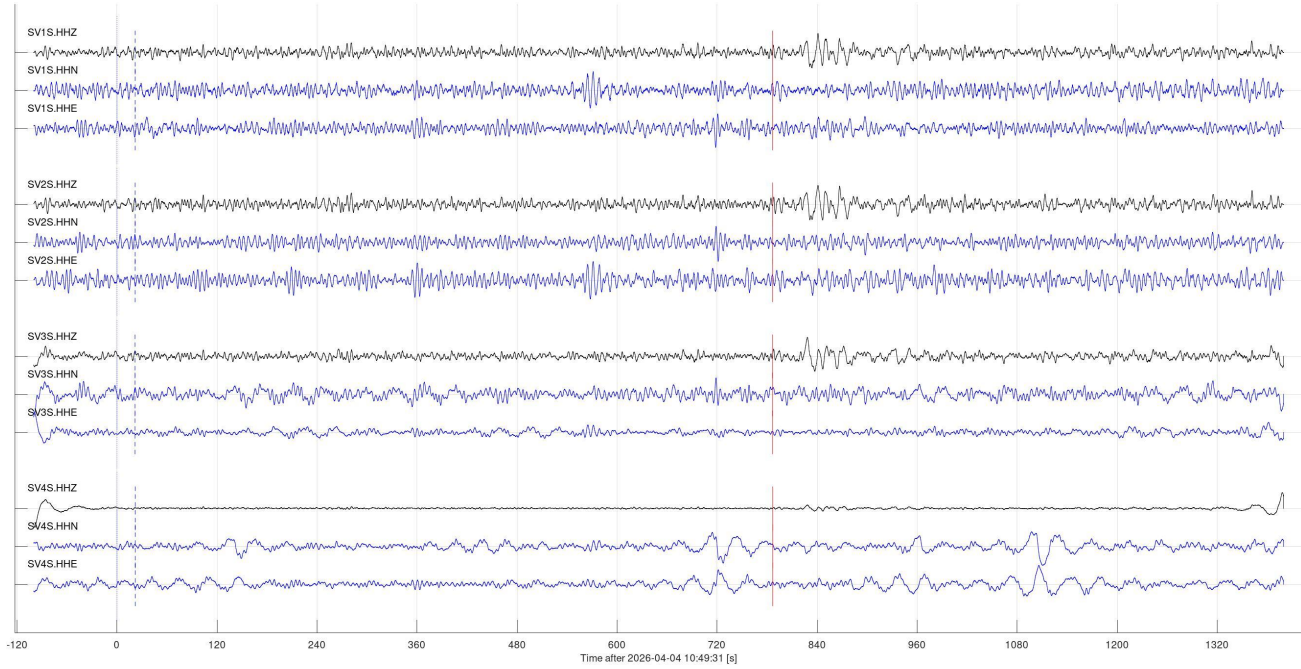


Figure 6, continued.

Event 42296 (nn00916046, nn): mwr 4.8; 2026-04-22 17:23:37 39.28N,119.10W: 19 km SE of Silver Springs, Nevada
Vp=10.00 km/s; Vs=5.77 km/s; baz=235.4 deg; dist=15.1 deg (1681.9 km); depth=3.00 km

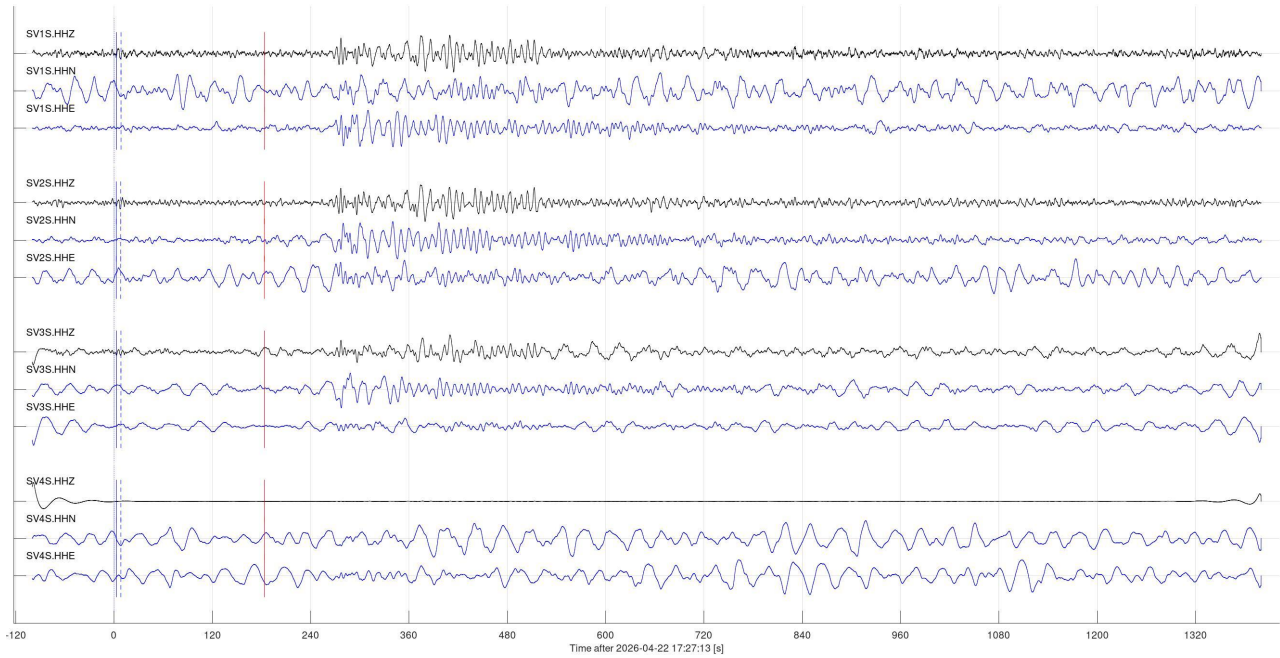


Figure 6, continued.

Event 42340 (us6000sshc, us): mww 5.8; 2026-04-24 03:18:53 34.93N,25.83E: 11 km SE of Ierápetra, Greece
Vp=10.00 km/s; Vs=5.77 km/s; baz=39.9 deg; dist=84.8 deg (9456.6 km); depth=13 km

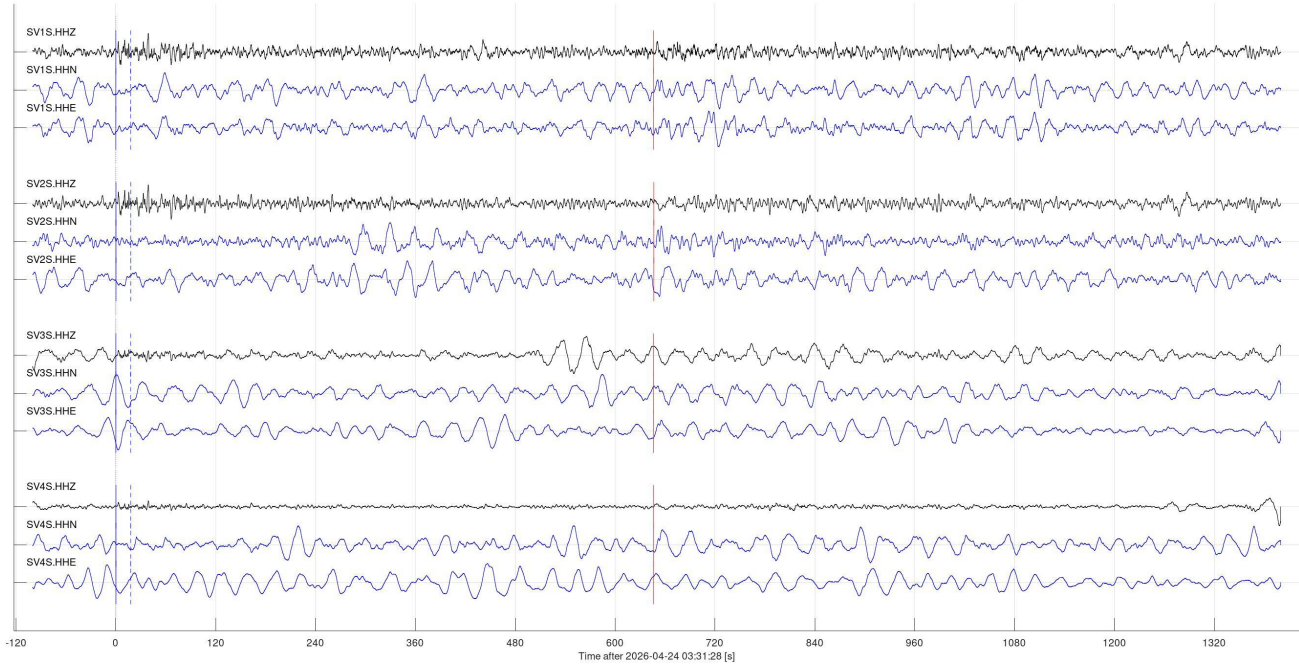


Figure 6, continued.

Event 42526 (us6000sssg, us): mww 5.4; 2026-04-25 08:05:56 53.59N,164.91W: 83 km SE of Akutan, Alaska
Vp=10.00 km/s; Vs=5.77 km/s; baz=301.0 deg; dist=37.8 deg (4216.5 km); depth=35 km

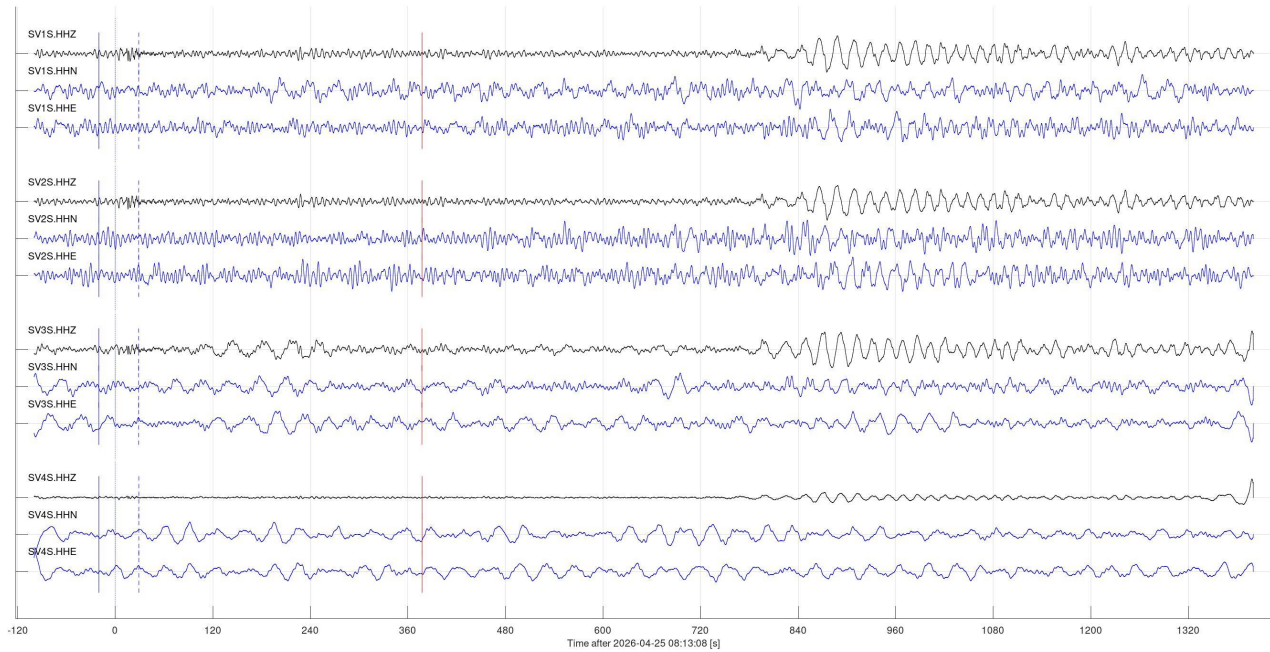


Figure 6, continued.

Event 42546 (us6000st1m, us): mww 6.1; 2026-04-26 20:23:56 42.63N,142.96E: 18 km W of Sarabetsu, Japan
Vp=10.00 km/s; Vs=5.77 km/s; baz=314.8 deg; dist=71.8 deg (8011.3 km); depth=81 km

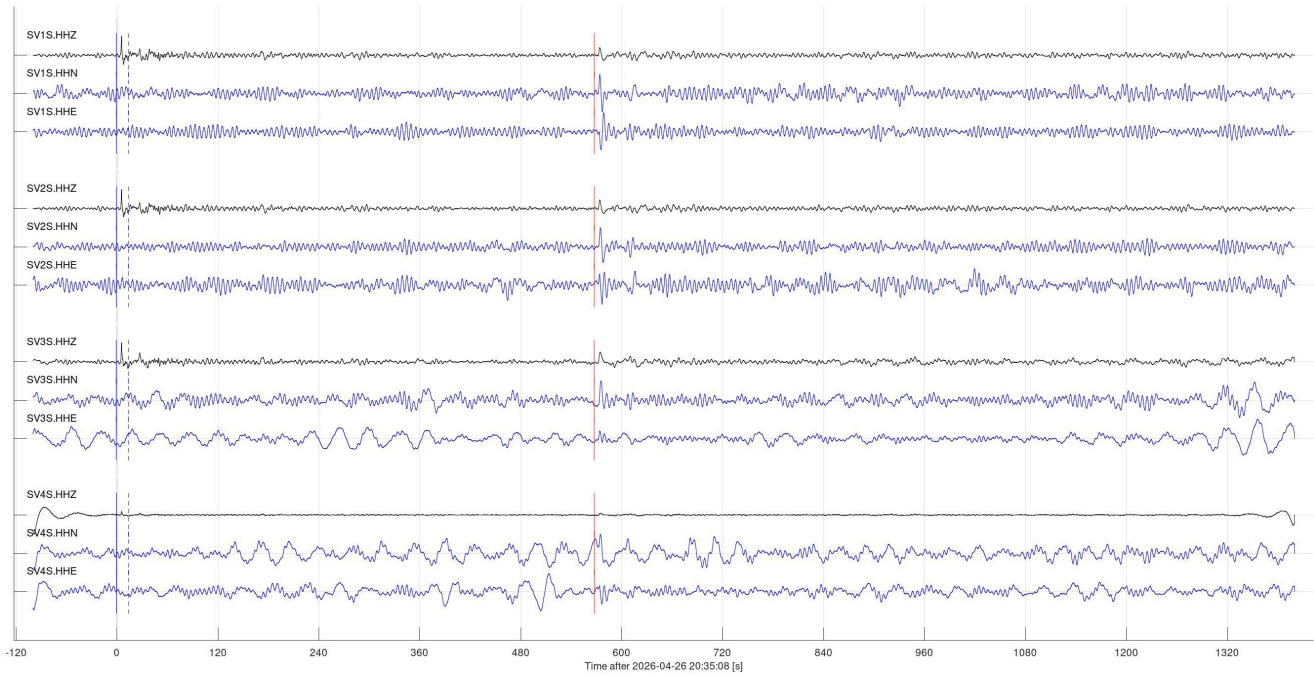


Figure 6, continued.

Regional events (class 2)

One industry-related regional seismic events in Alberta (class 2 in Table 2) was identified at Aquistore stations in the reporting period (Figure 7).

Event 36340 (20260401.2327002, cn): -- 4.5; 2026-04-01 23:27:30 53.93N,113.39W: Industry-related event 11 km WNW of Sturgeon County AB felt
 Vp=6.20 km/s; Vs=3.50 km/s; baz=310.9 deg; dist=8.0 deg (897.4 km); depth=3.80 km

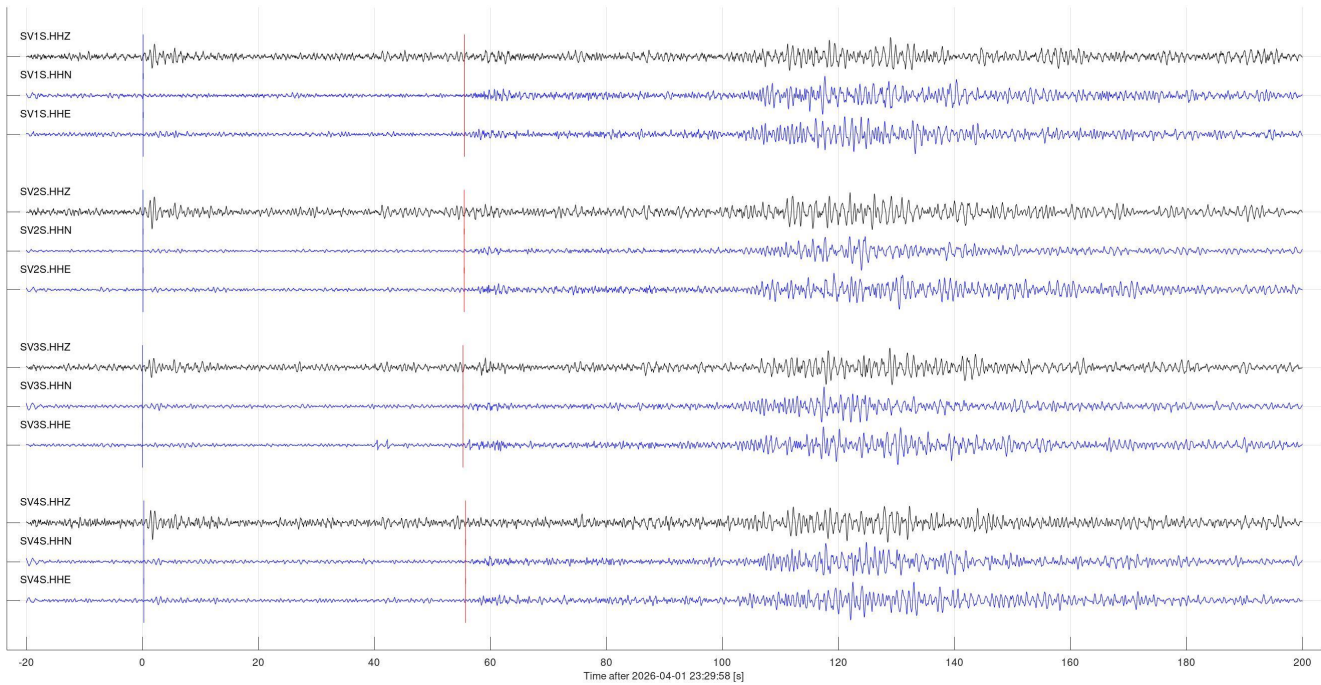


Figure 7. Regional seismic event detected at Aquistore in April 2026. Plot heading is as in Figure 6.

Local events (classes 3 and 4)

The following subsections summarize observations of event classes 3 and 4 in Table 2.

Possible mine blasts at the Estevan mine (class 3a)

16 events were identified as mine blasts in the area of Estevan coal mining (Figure 8). It appears that some of these blasts are weaker and located at greater distance from the seismic array than most events recorded in 2025. A more detailed analysis locations require an updated

Event 43175 at 2026-04-01 21:08:15, 'Local': Possible mine blast near Estevan, SK (farther away?)
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

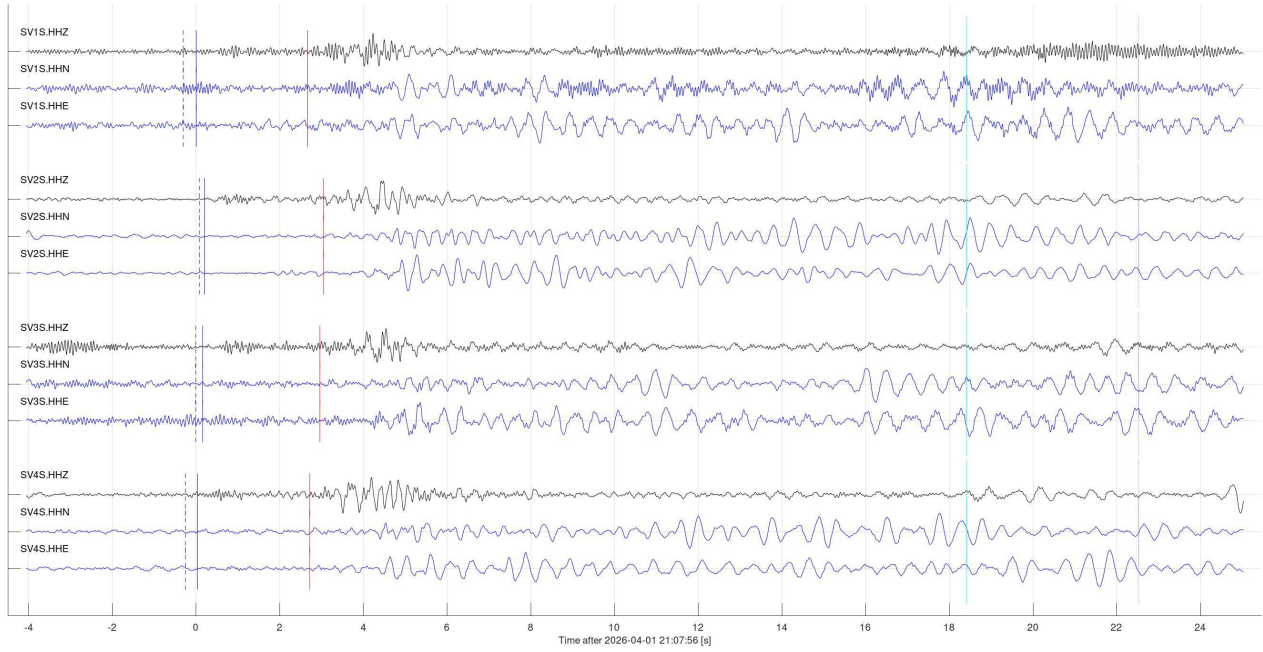


Figure 8. Seismic arrivals produced by mine blasts at the Estevan mine. Colours and labels are as in Figure 6.

Event 44673 at 2026-04-04 21:07:16, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

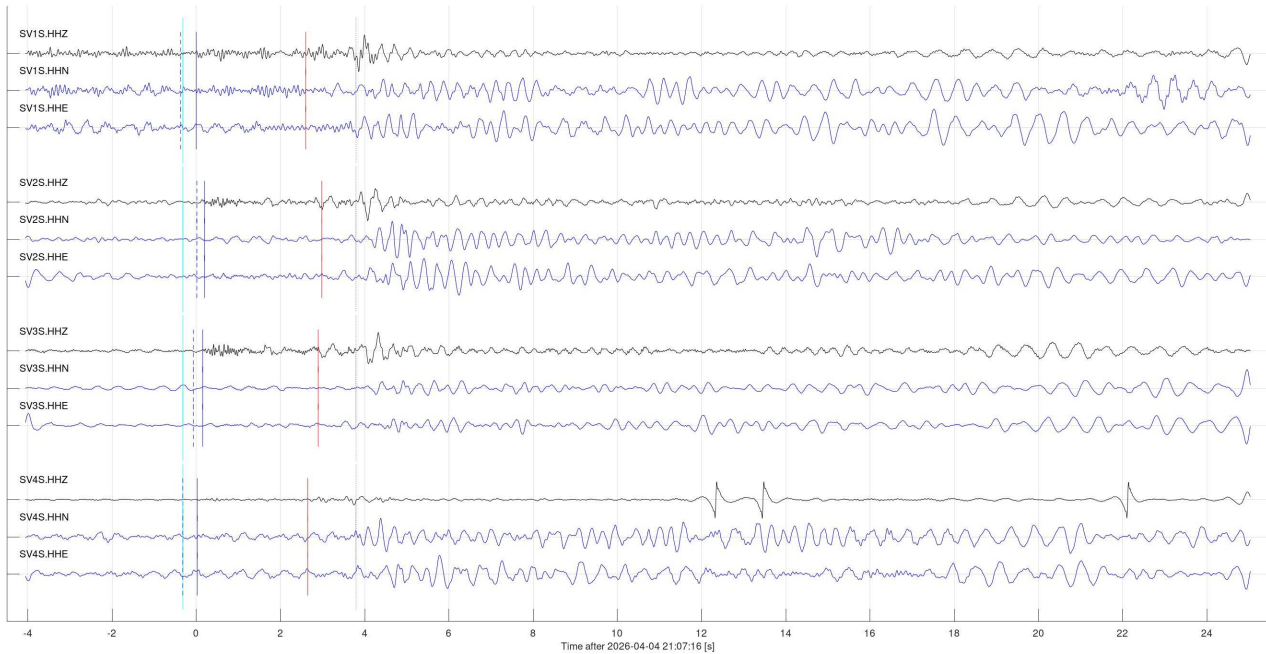


Figure 8, continued.

Event 44674 at 2026-04-06 21:31:17, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

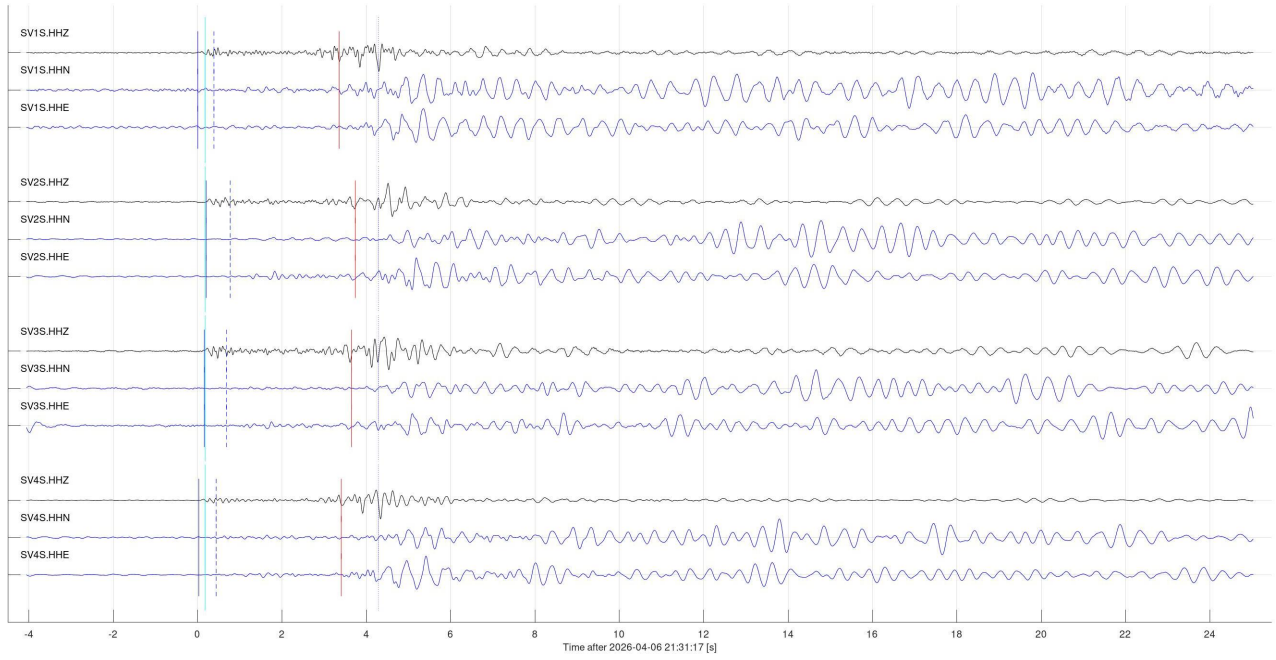


Figure 8, continued.

Event 44675 at 2026-04-07 21:12:38, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

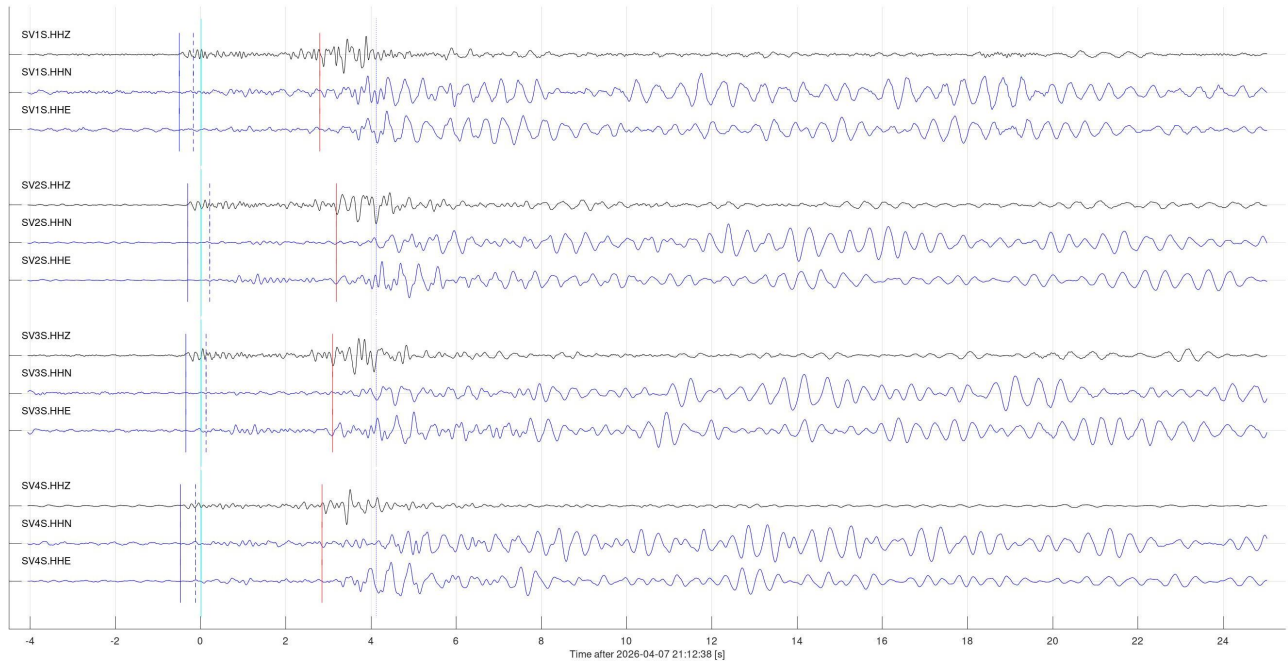


Figure 8, continued.

Event 44676 at 2026-04-08 21:08:23, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

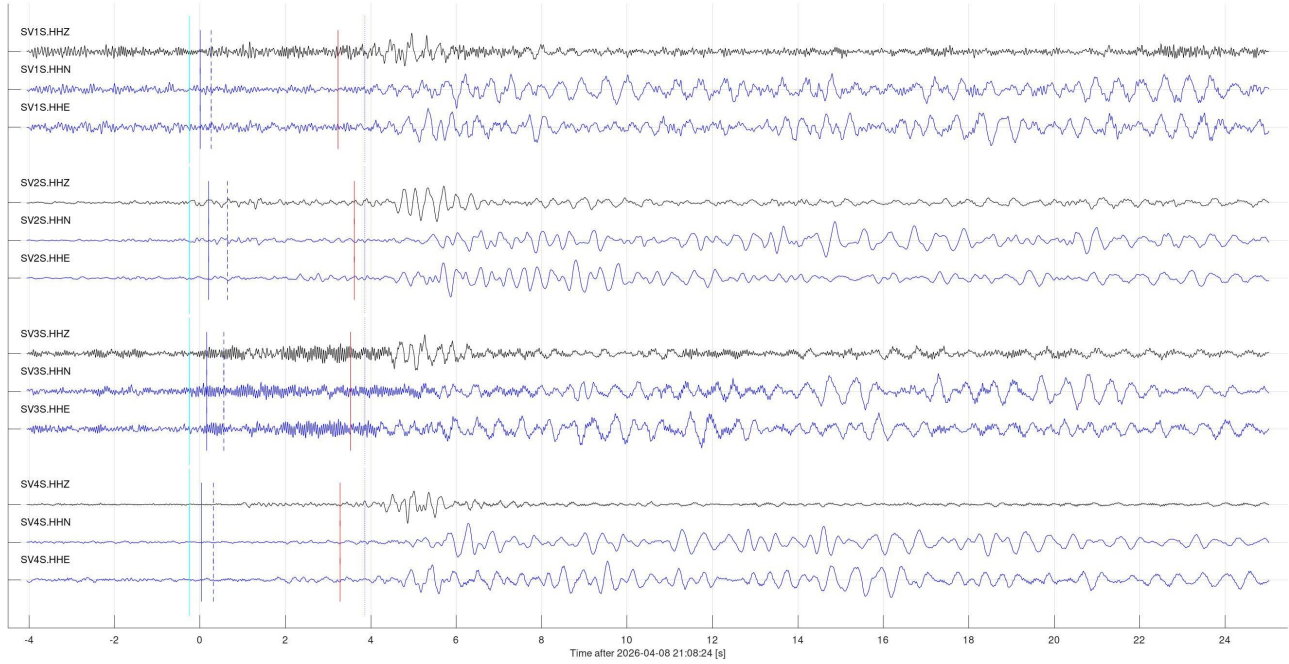


Figure 8, continued.

Event 44677 at 2026-04-09 21:16:06, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

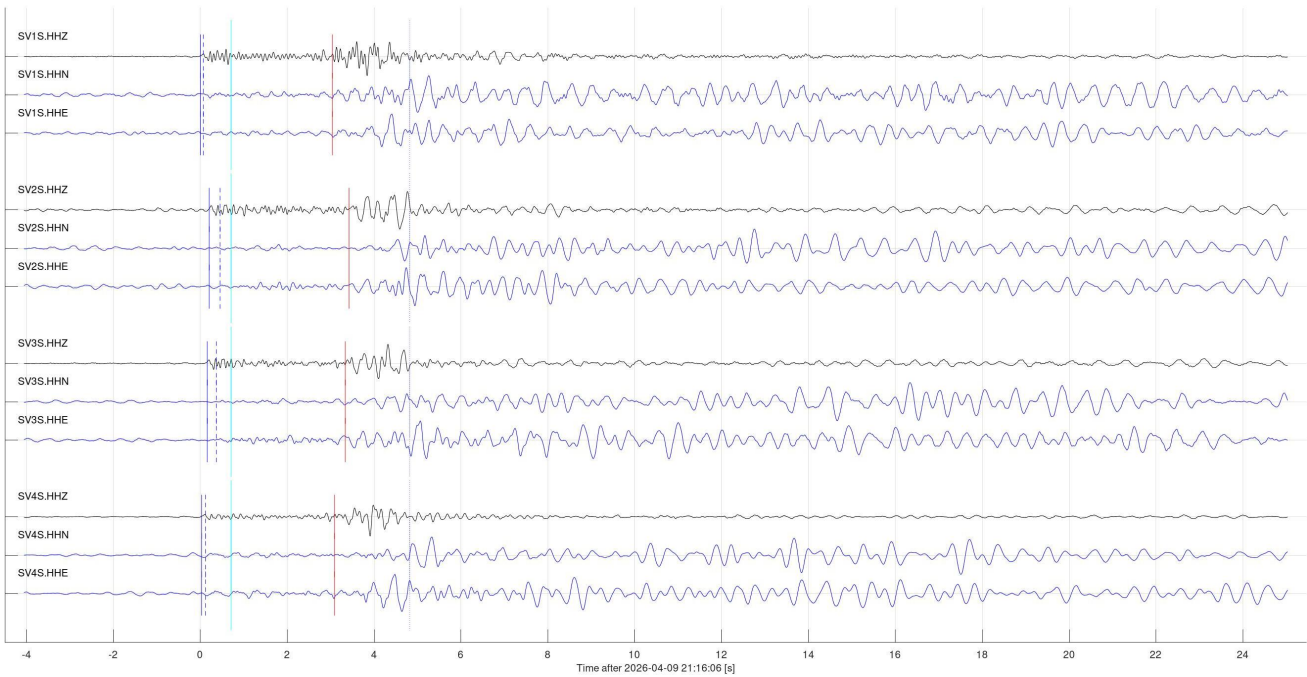


Figure 8, continued.

Event 44679 at 2026-04-11 21:13:12, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

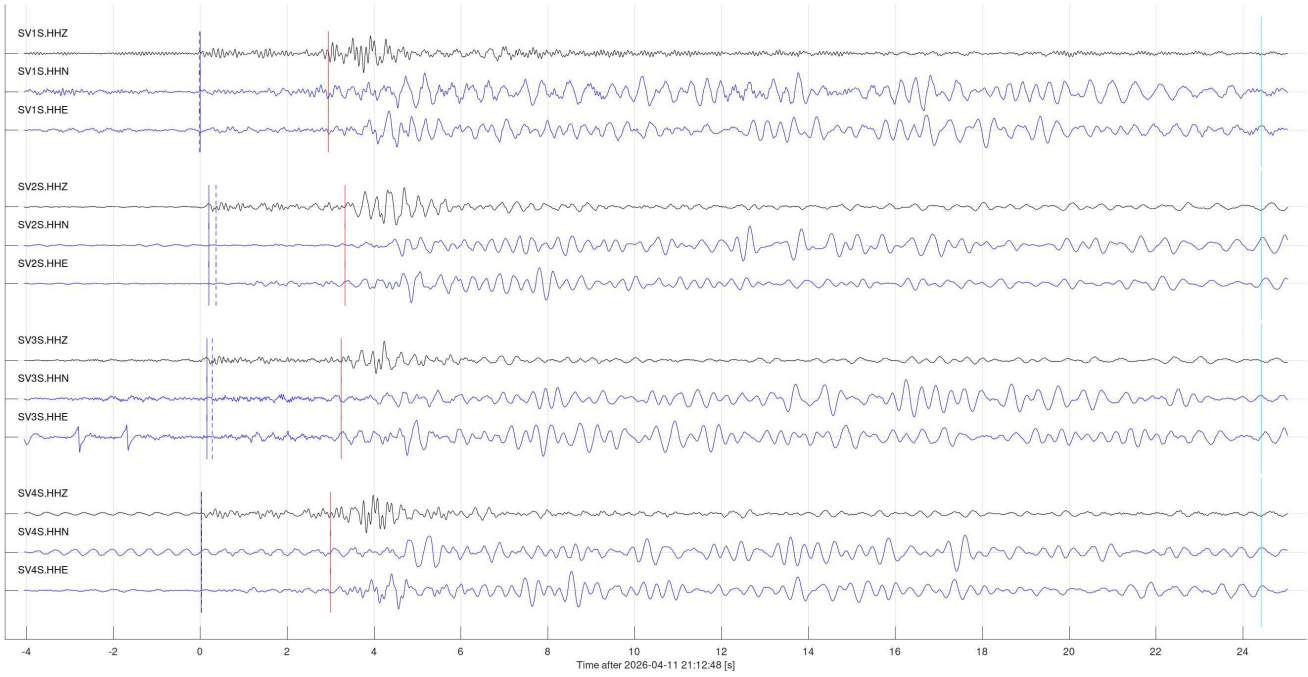


Figure 8, continued.

Event 44681 at 2026-04-12 21:13:16, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

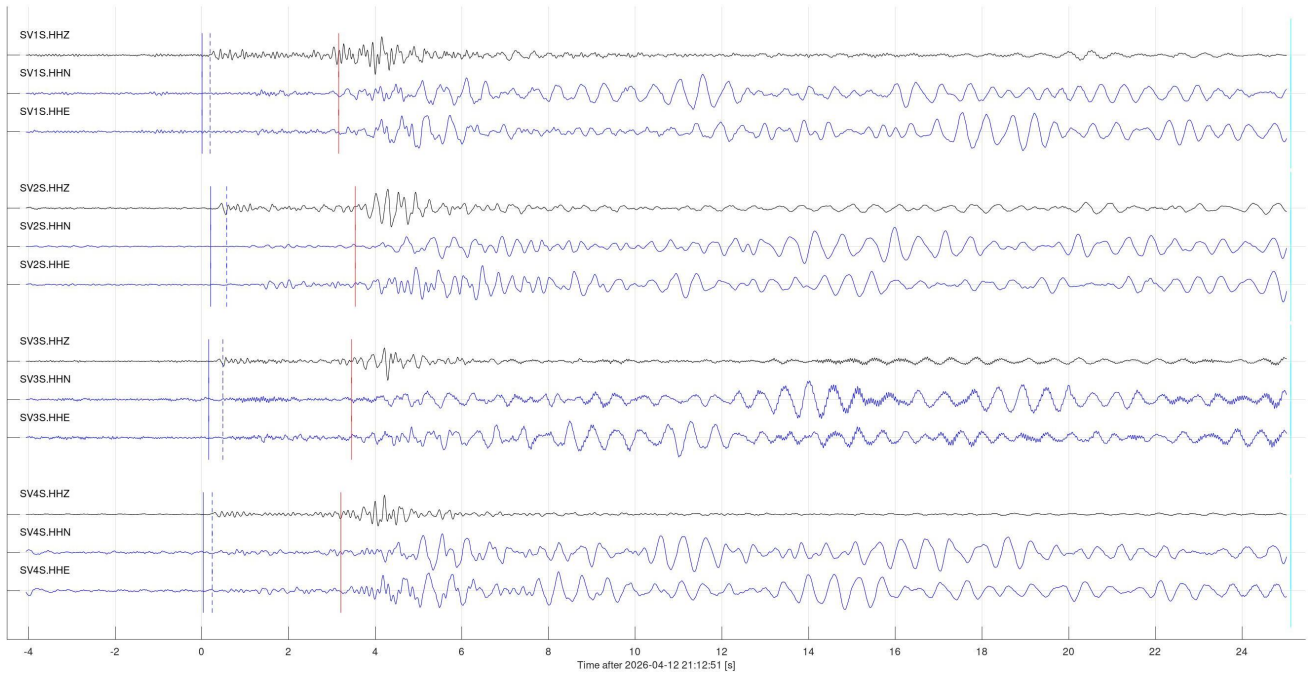
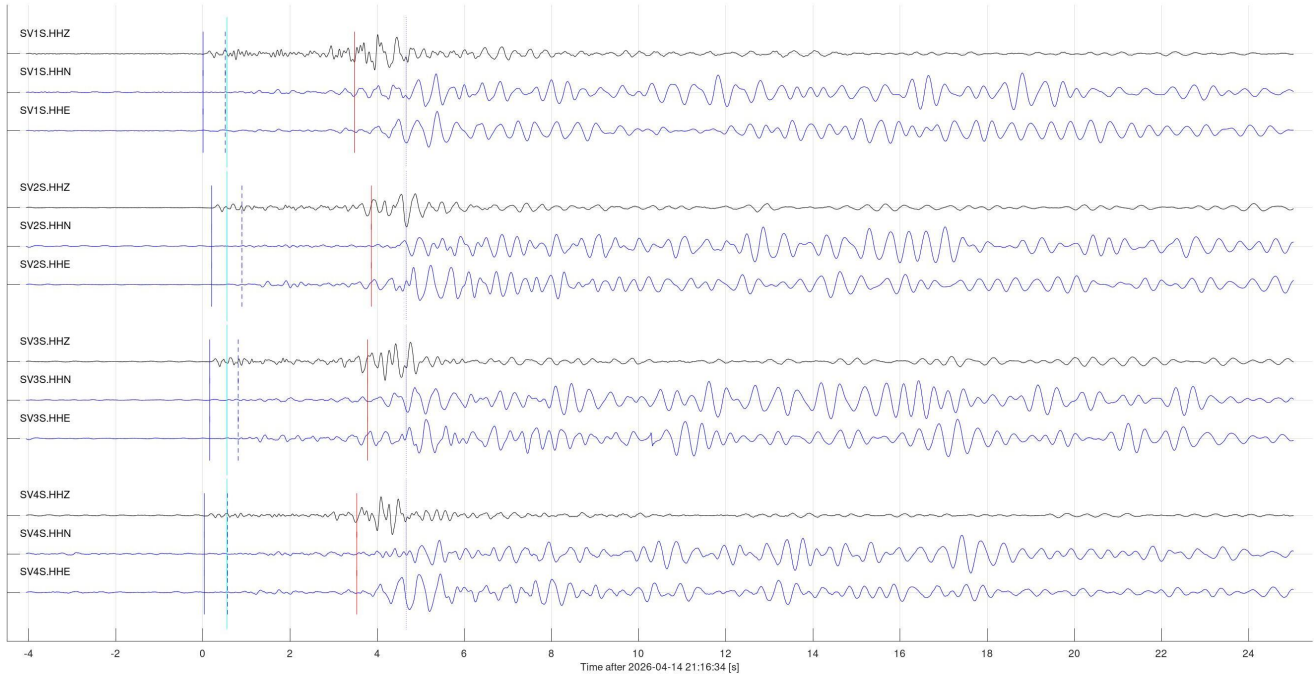
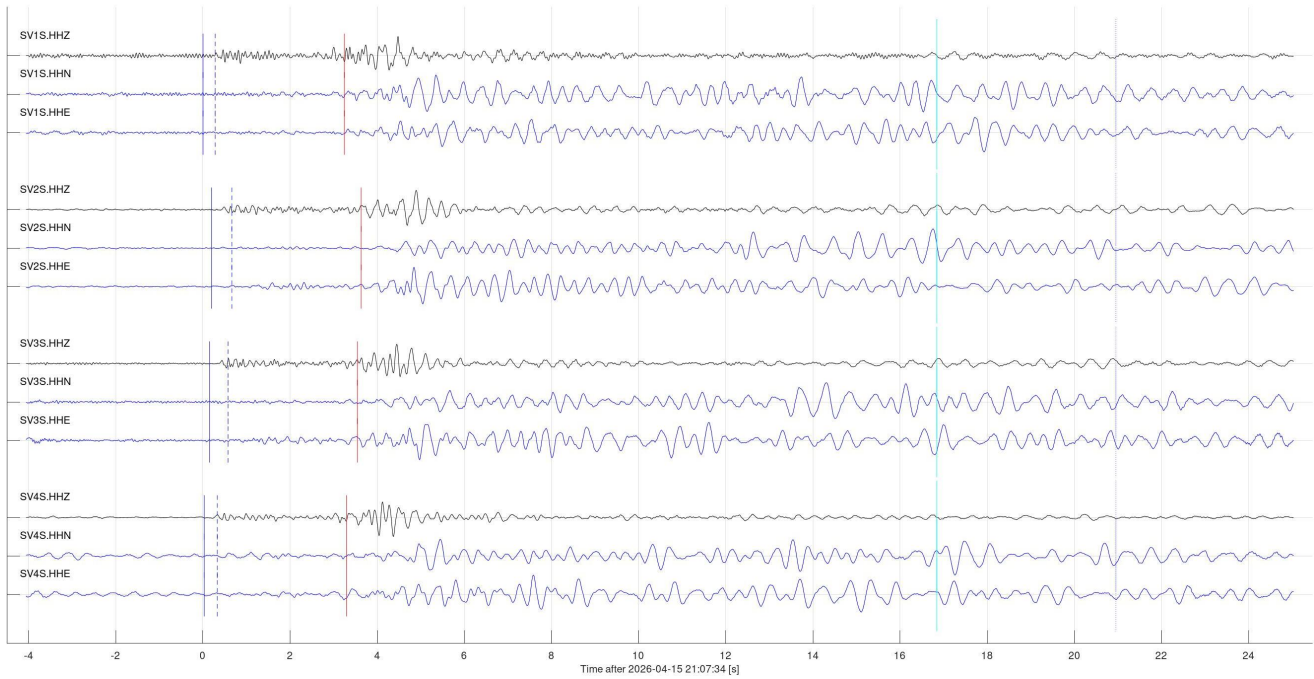


Figure 8, continued.

Event 44682 at 2026-04-14 21:16:35, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km



Event 44683 at 2026-04-15 21:07:51, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km



Event 44684 at 2026-04-16 21:10:07, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

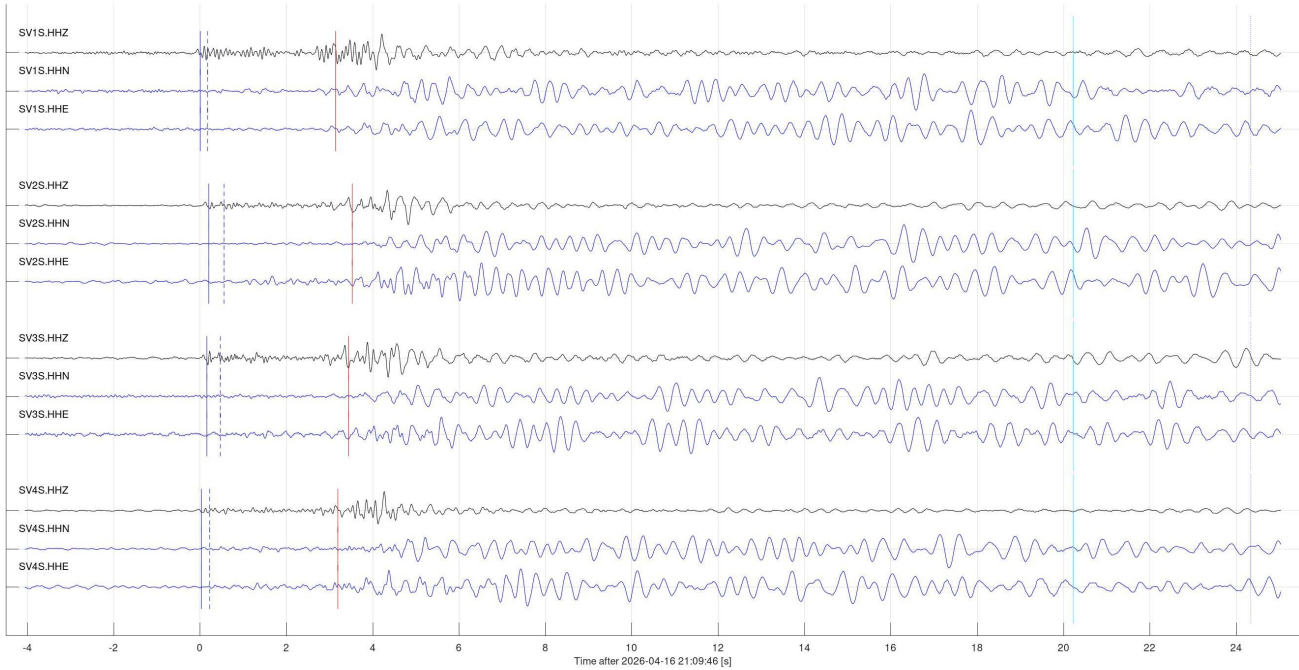


Figure 8, continued.

Event 44685 at 2026-04-21 21:32:58, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

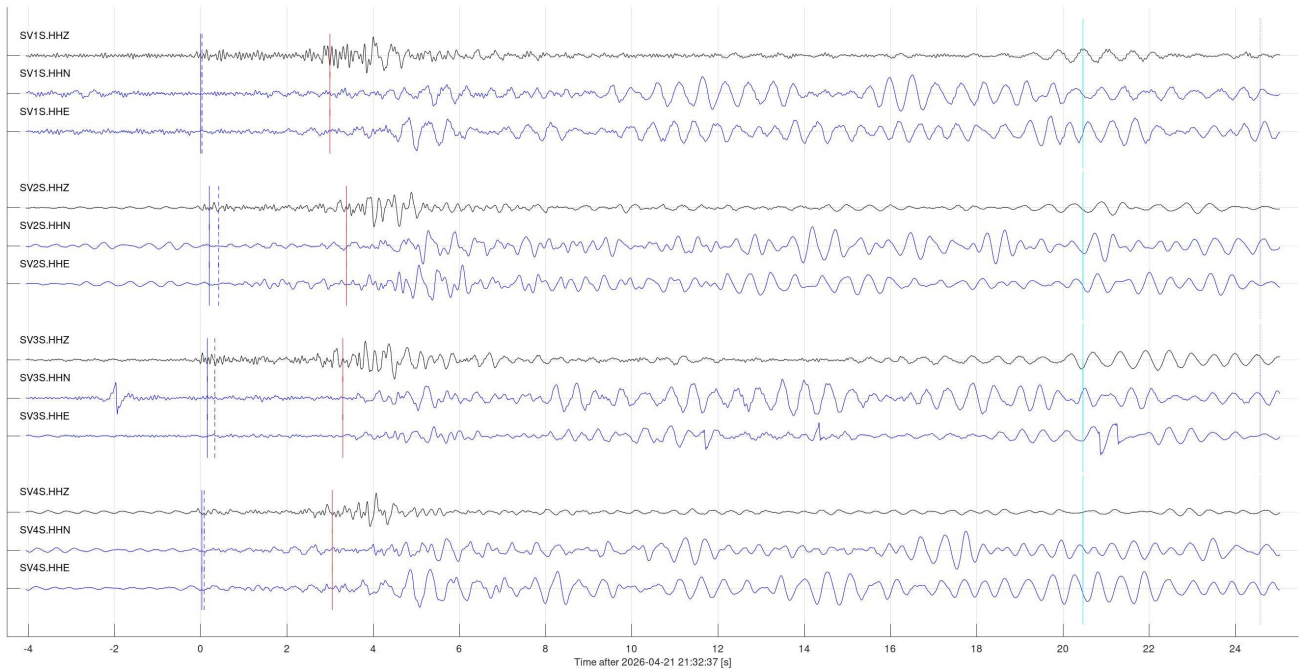


Figure 8, continued.

Event 44686 at 2026-04-22 21:10:02, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=20.0 km; depth=0.00 km

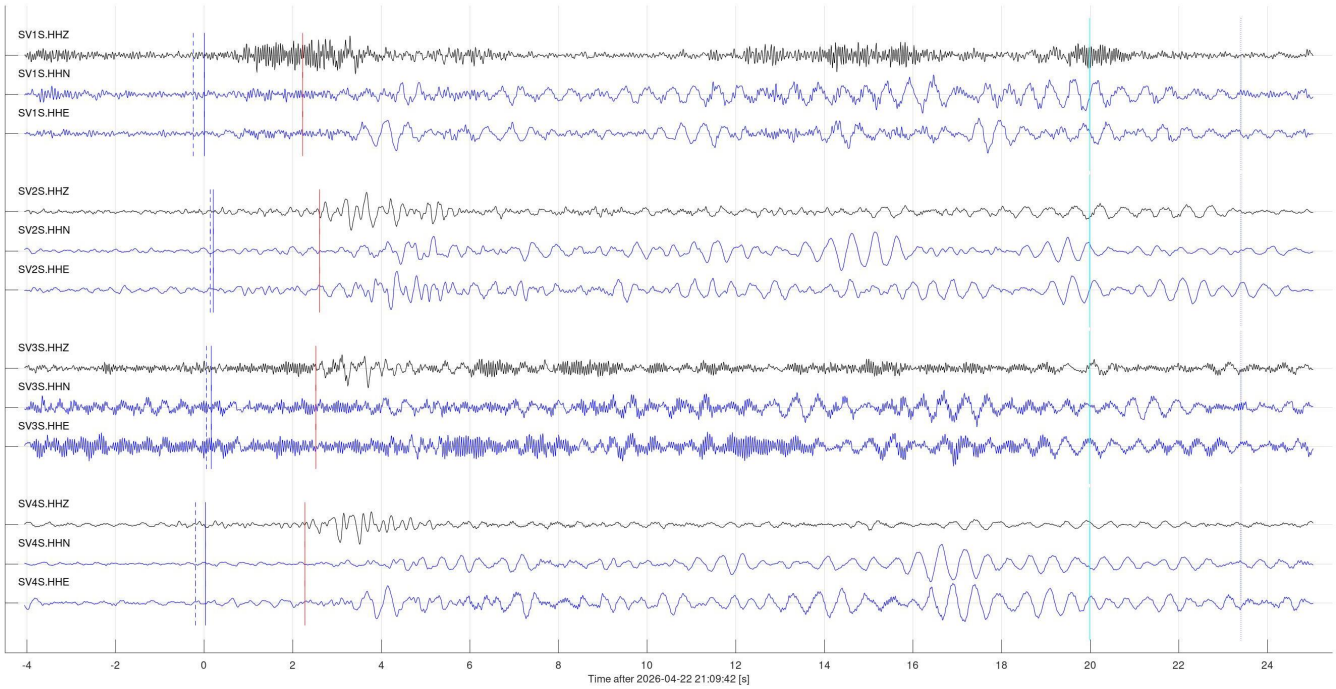


Figure 8, continued.

Event 44687 at 2026-04-24 22:19:58, 'Local': Possible mine blast near Estevan, SK (weak?)
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km

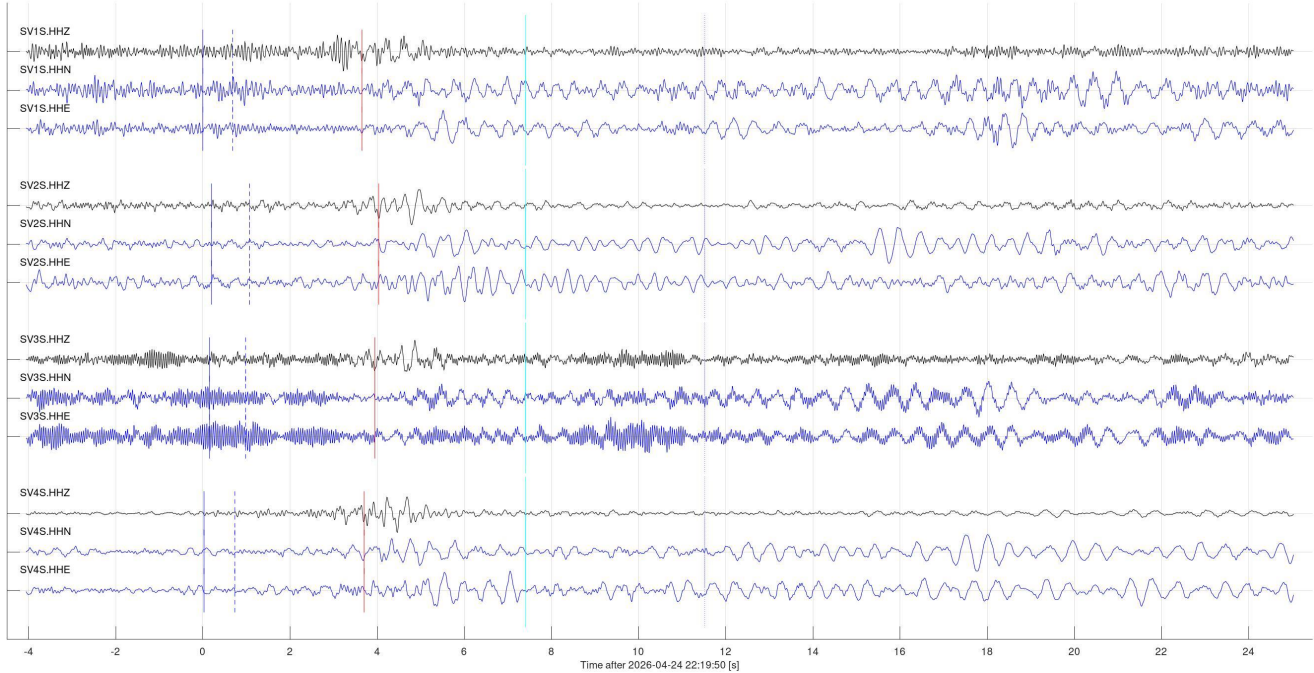
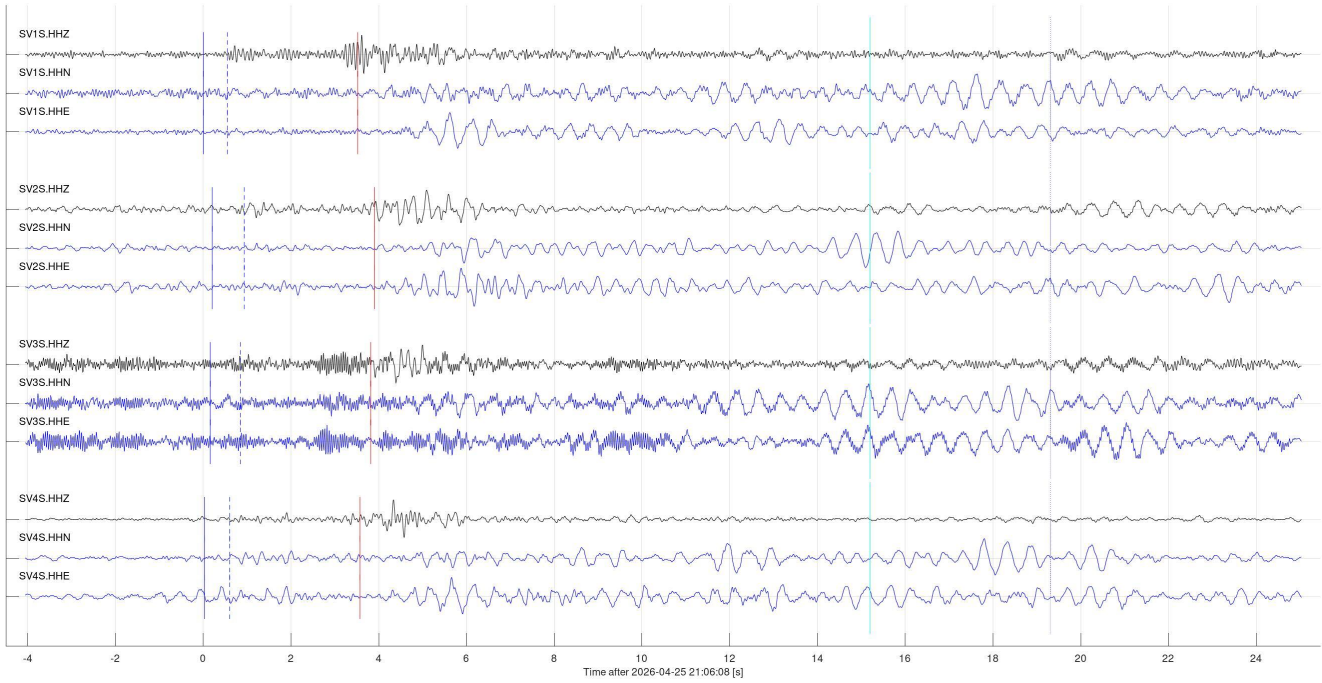
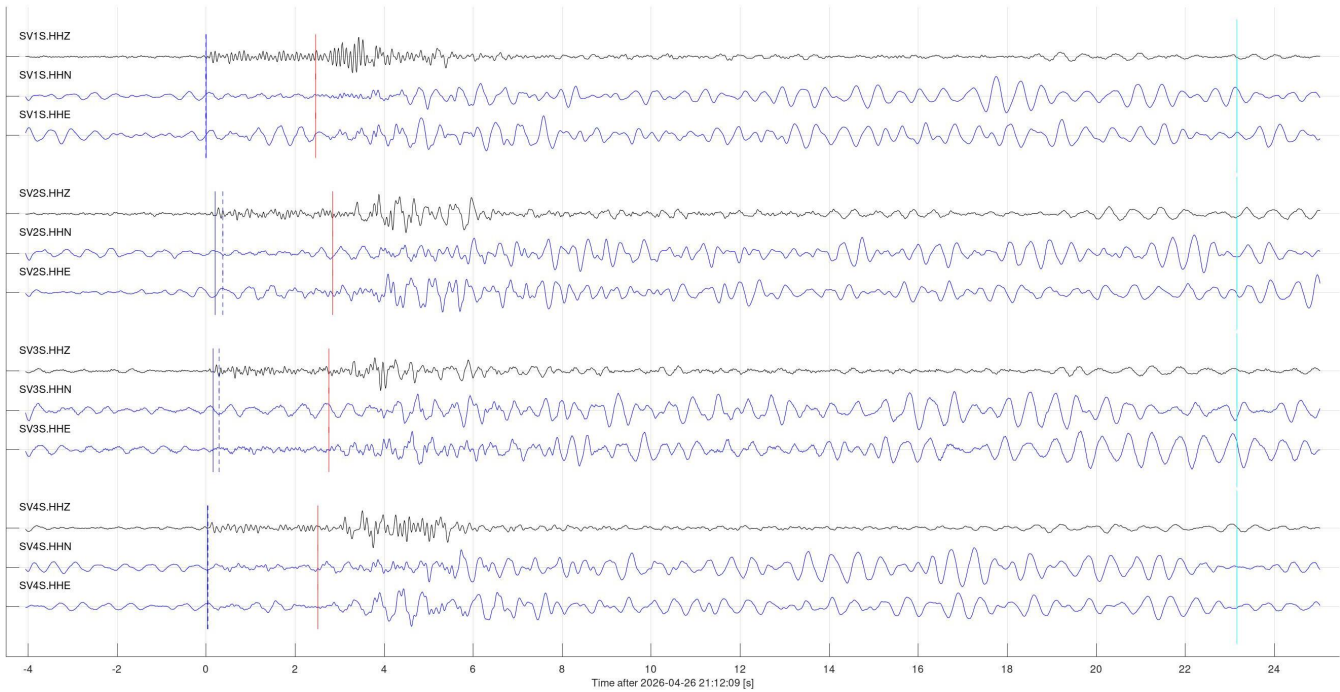


Figure 8, continued.

Event 44688 at 2026-04-25 21:06:23, 'Local': Possible mine blast near Estevan, SK (weak?)
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=24.0 km; depth=0.00 km



Event 44689 at 2026-04-26 21:12:32, 'Local': Possible mine blast near Estevan, SK
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=20.0 km; depth=0.00 km



Events related to mining operations (class 3b)

Numerous mining- and industrial-operations related seismic events were observed in the area. Many such events may be produced by trains. Figure 9 illustrates four such events.

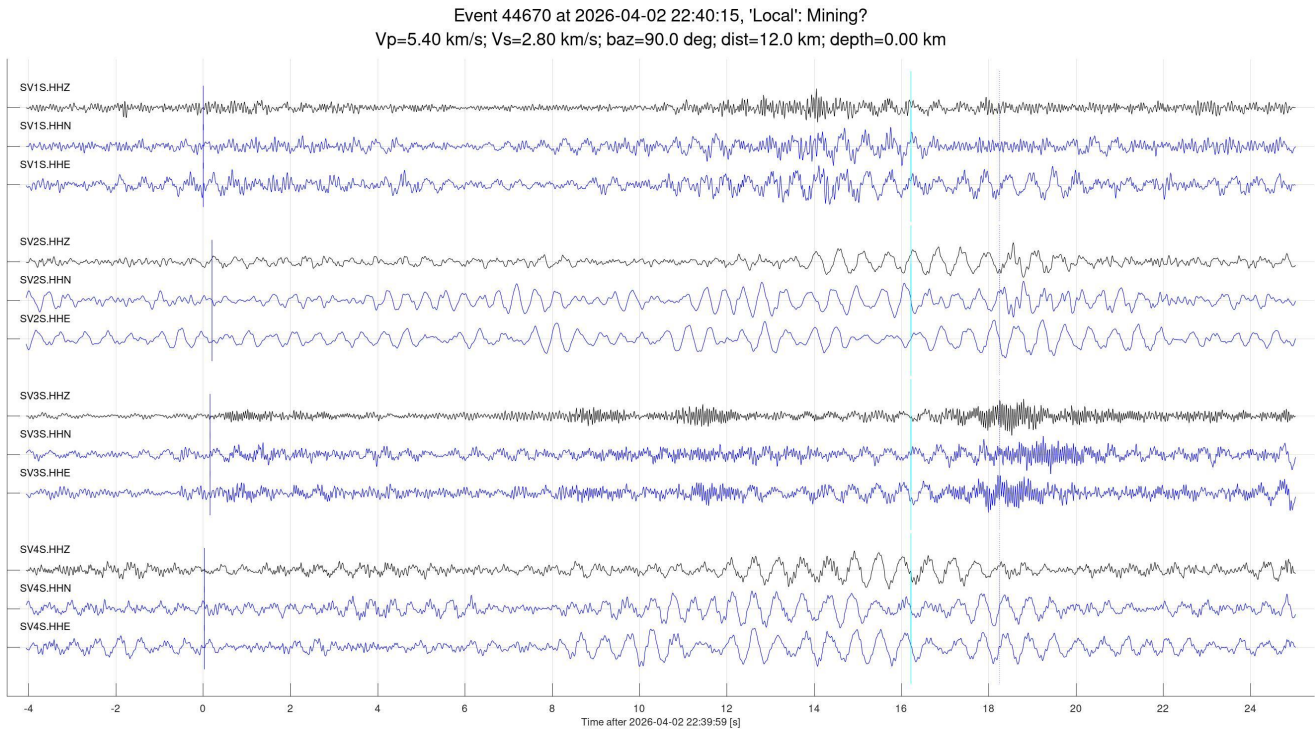


Figure 9. Sample events interpreted as due to mining activity in the area. Lines, colour bars and labels are as in the preceding figures.

Event 44672 at 2026-04-03 22:54:32, 'Local': Mining?
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=12.0 km; depth=0.00 km

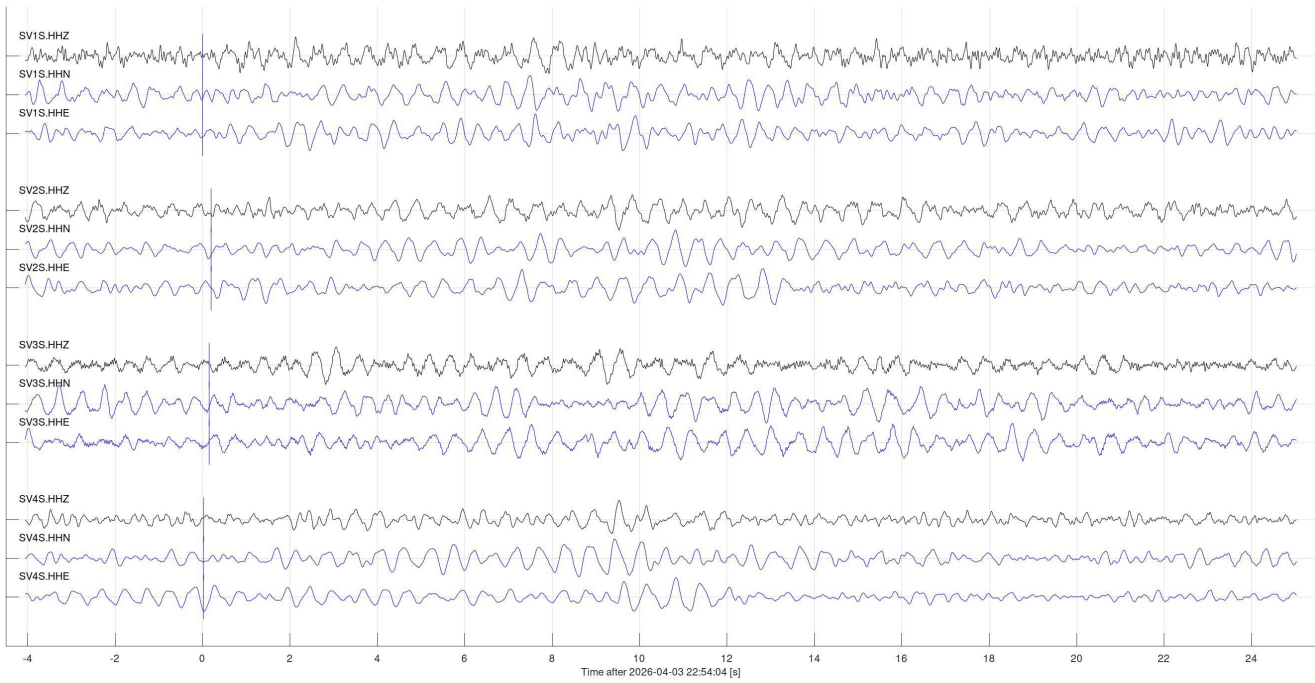


Figure 9, continued.

Event 44680 at 2026-04-12 20:00:33, 'Local': Mining or train?
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=12.0 km; depth=0.00 km

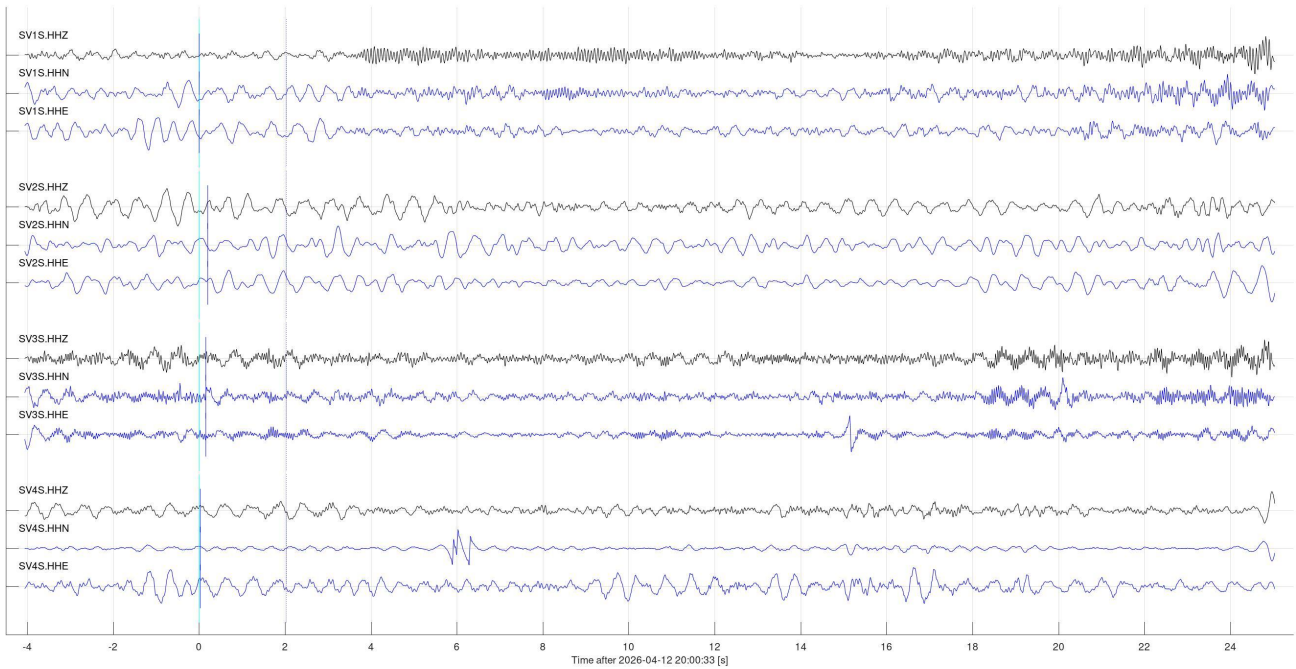


Figure 9, continued.

Event 44691 at 2026-04-29 19:56:55, 'Local': Mining? (20-min series of strikes at 80-100 sec intervals)
Vp=5.40 km/s; Vs=2.80 km/s; baz=90.0 deg; dist=12.0 km; depth=0.00 km

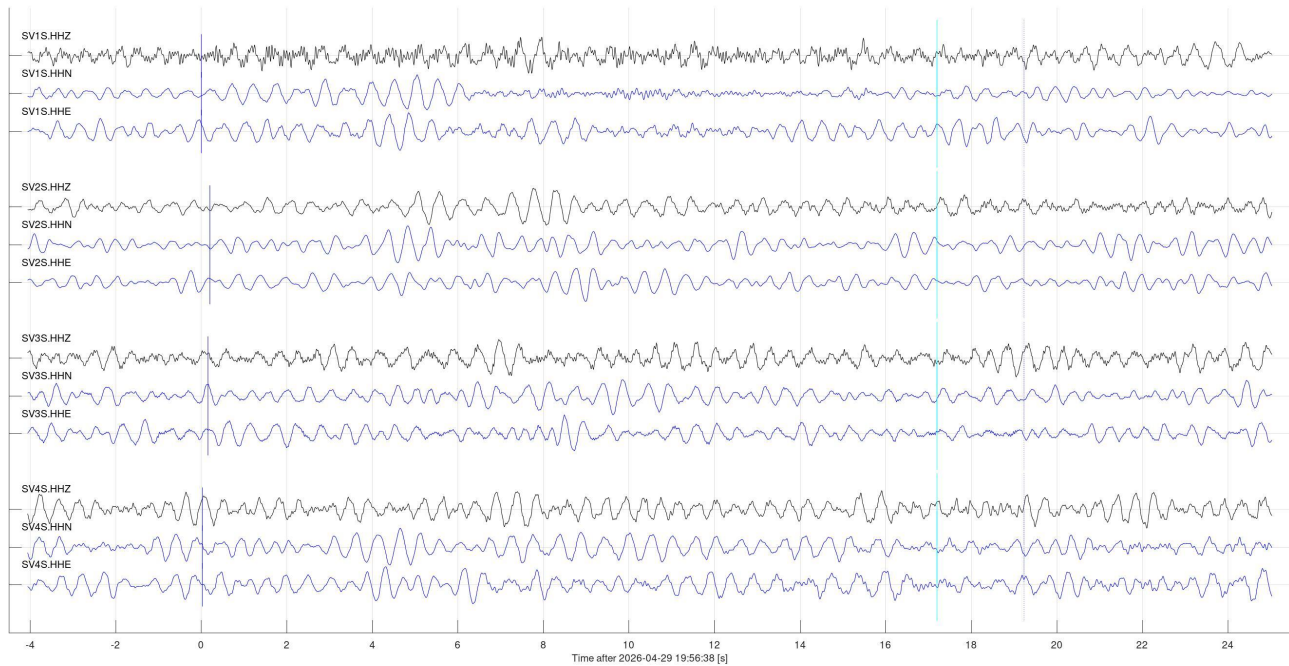


Figure 9, continued.

Events in array proximity (classes 4a and 4b)

One seismic event were identified as possibly (inconclusively) occurring in the proximity of the array (class 4a) (Figure 10). Clear identification of such events and separation from class 3b and recordings of trains is difficult. No events which could be related to class 4b (impulsive and higher-frequency) were found.

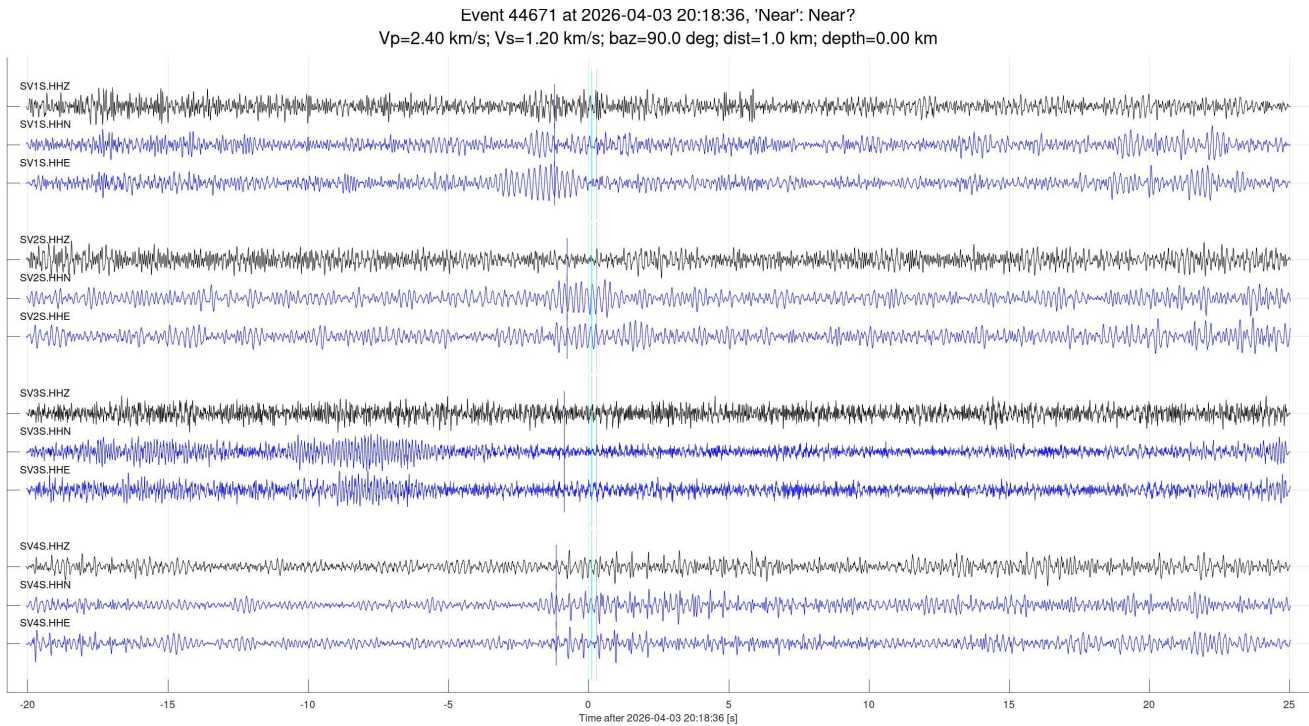


Figure 10. Possible events occurring near surface in the proximity of the array (class 4a in Table 2). Lines, colour bars and labels are as in the preceding figures. Seismic velocity estimates shown in the headers (particularly P-wave) are from an averaged model and require further analysis.

5. SEGY files

Event time windows are provided in SEGY format in the attached zipped archive, separately for teleseismic and regional event detections. Subdirectory names and file naming convention and header formats are described in our reports for August and October 2024.

6. Conclusions and recommendations

Seismic array operation:

- For stations SV1S to SV4S, station uptime and data retrieval was nearly 100%.
- Station SV5S has a failed sensor (possibly sensor cable) and was operating offline, with no usable data expected.

- It is urgently recommended to switch to cell routers with lower power consumption, such as Sierra RV55. This will likely require switching to a different internet provider (Bell, Rogers, or Tellus). Recommendations for the routers were given in my March 2026 report.
- It is recommended to consider upgrading the sensor at station SV3S to a self-leveling Thrillium and seismometer at SV2S to Centaur.

Data and observations:

- 16 teleseismic events, one regional events, and 16 mine blasts were detected in April 2026.
- Numerous local events were observed, likely related to mining operations or freight trains. These events were not catalogued or analyzed in detail.
- One events possibly occurring near surface in the vicinity of the array was noted inconclusively.
- No events occurring at the reservoir level were identified.