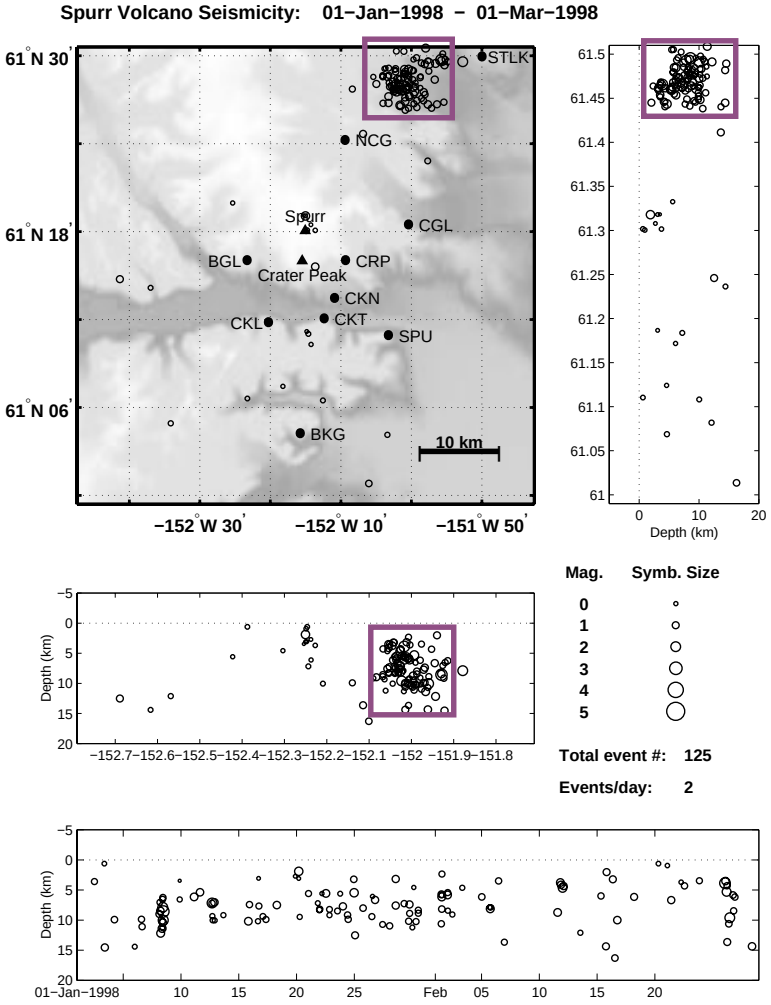

Figure 3a: Locatable Spurr seismic events in space and time for January and February. The tight cluster of events in the box is not related to Mount Spurr volcanism.

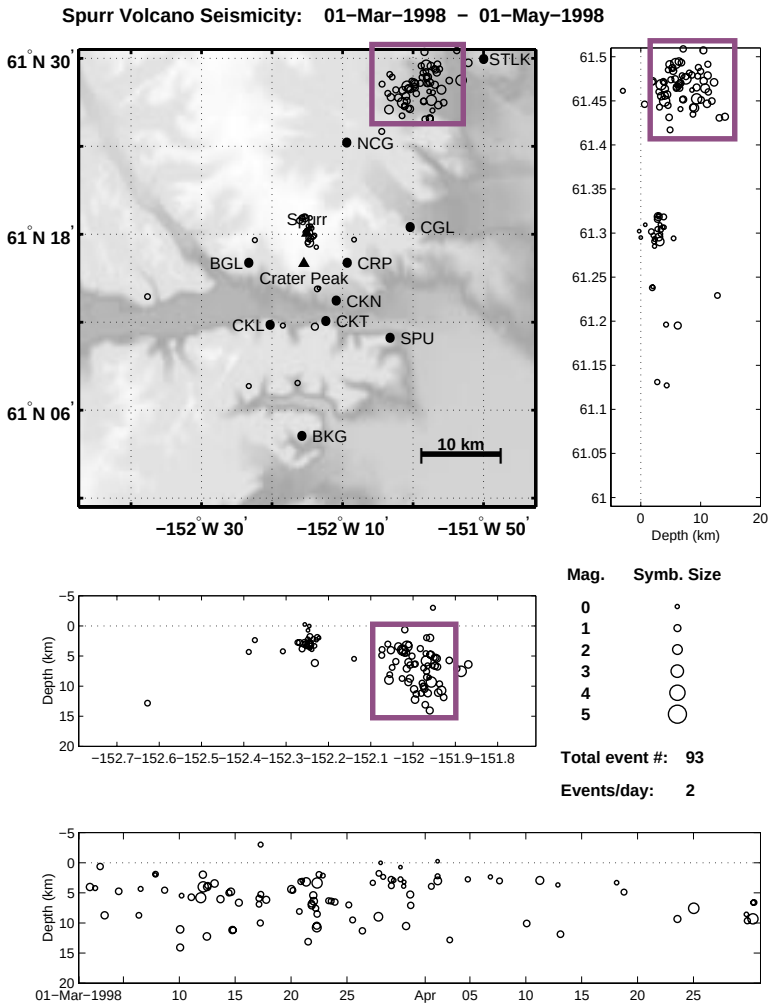

Figure 3b: Locatable Spurr seismic events in space and time for March and April. The tight cluster of events in the box is not related to Mount Spurr volcanism.

NCG is particularly important with respect to the detection and location of Strandline Lake earthquakes since it is the closest operational station to these events; although seismic station STLK is located closer to these events, it was operational for only a brief period of time following its installation during the fall of 1997. An apparent decrease in activity is observed on the time-depth plot (fig. 13B), which corresponds fairly well with the outage of station NCG.

Redoubt

During January-February, a total of 23 earthquakes were located in the vicinity of Redoubt (figs. 4A, 13A and 14A). The largest such event had a magnitude of 2.0. Of the 23 located earthquakes, 16 of them were located within 10 km of the summit of Redoubt. Twelve of these events, including the magnitude 2.0 event, were located about 3-5 km north of the summit. Three other events formed a northeast-southwest trending line about 7 to 9 km north of the summit. The final “proximal” event was located ~9 km northwest of the summit. The remaining seven earthquakes were located quite some distance from Redoubt and are probably regional tectonic events unrelated to Redoubt Volcano. The number of events located within 10 km of Redoubt during January-February is nearly twice that of the previous two-month period. However, this value agrees quite well with the 15 events predicted from the 4-year mean seismicity rate.

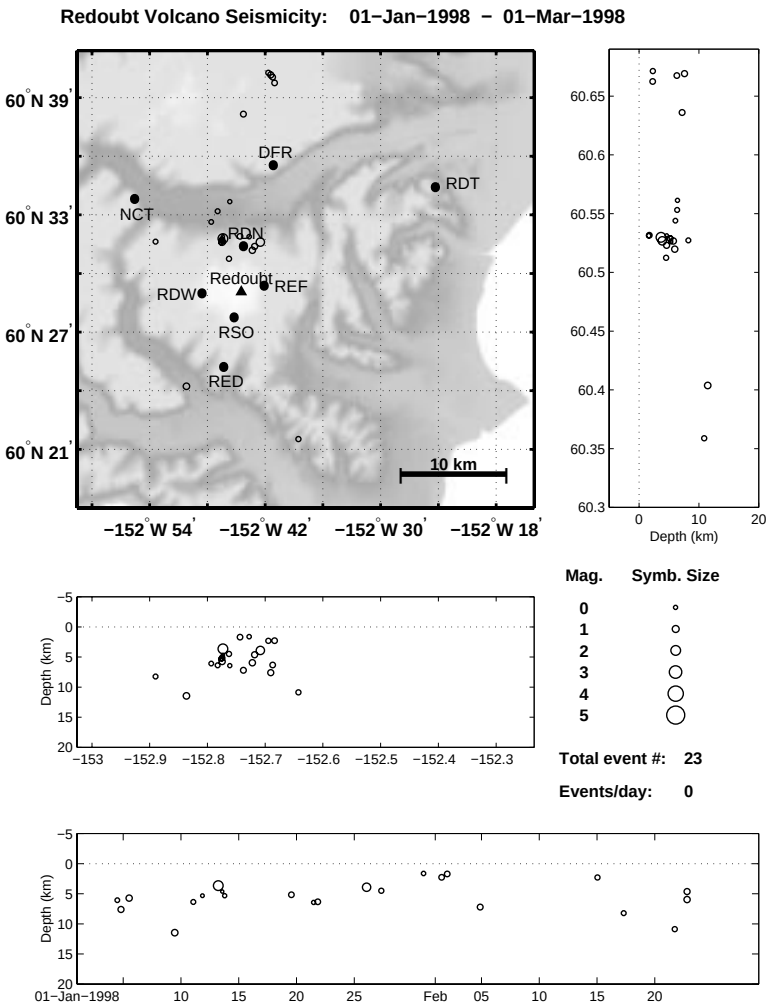

Figure 4a: Locatable Redoubt seismic events in space and time for January and February.

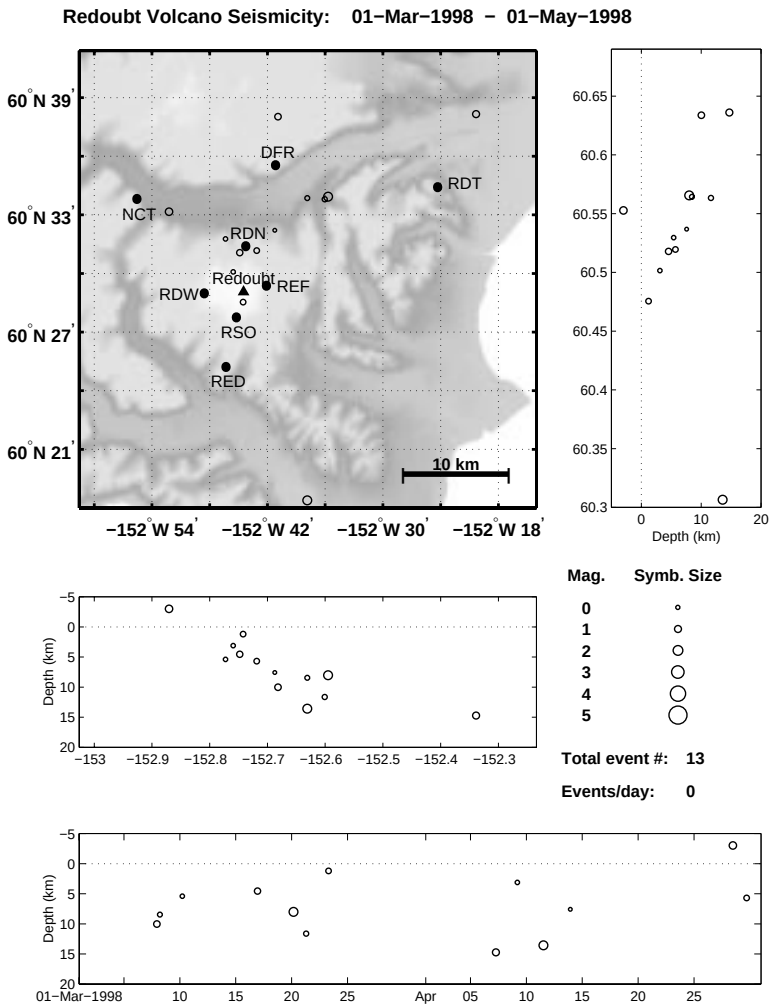

Figure 4b: Locatable Redoubt seismic events in space and time for March and April.

A total of 13 earthquakes, the largest of which had a magnitude of 1.7, were located in the Redoubt region during March-April (figs. 4B, 13B and 14B). Six events were located within 10 km of the summit of Redoubt. Of these six events, one was located about 1 km south of the summit while the other five proximal events were located 2-7 km from the summit in a diffuse zone roughly north of the summit (the region north-northwest to north-northeast of the summit). The remaining seven earthquakes were located at distances greater than 10 km from Redoubt and, therefore, probably represent regional tectonic seismicity not related to volcanic activity in the Redoubt area. The number of events located close (≤ 10 km) to Redoubt during March-April was only half that of the previous two-month period and less than half the number of events predicted from the 4-year mean seismicity rate.

Iliamna

Thirteen earthquakes were located in the vicinity of Iliamna during January-February (figs. 5A, 13A and 14A). The largest such event had a magnitude of 0.8 and was located about 1 km east-northeast of the summit of Iliamna. Eight additional events were located in this general area thus forming a cluster of activity slightly east of the summit. Four earthquakes formed a second cluster of activity 4-7 km south of the summit. Seismicity has been located in both these regions on and off for the past several months. The number of earthquakes located in the

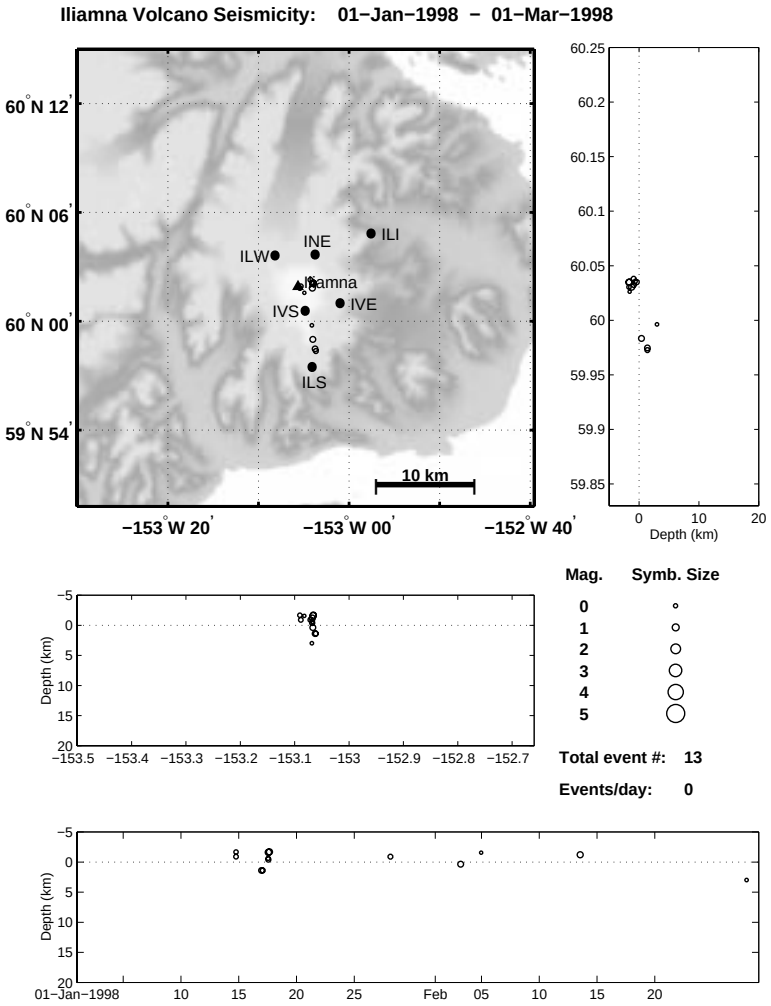

Figure 5a: Locatable Iliamna seismic events in space and time for January and February.

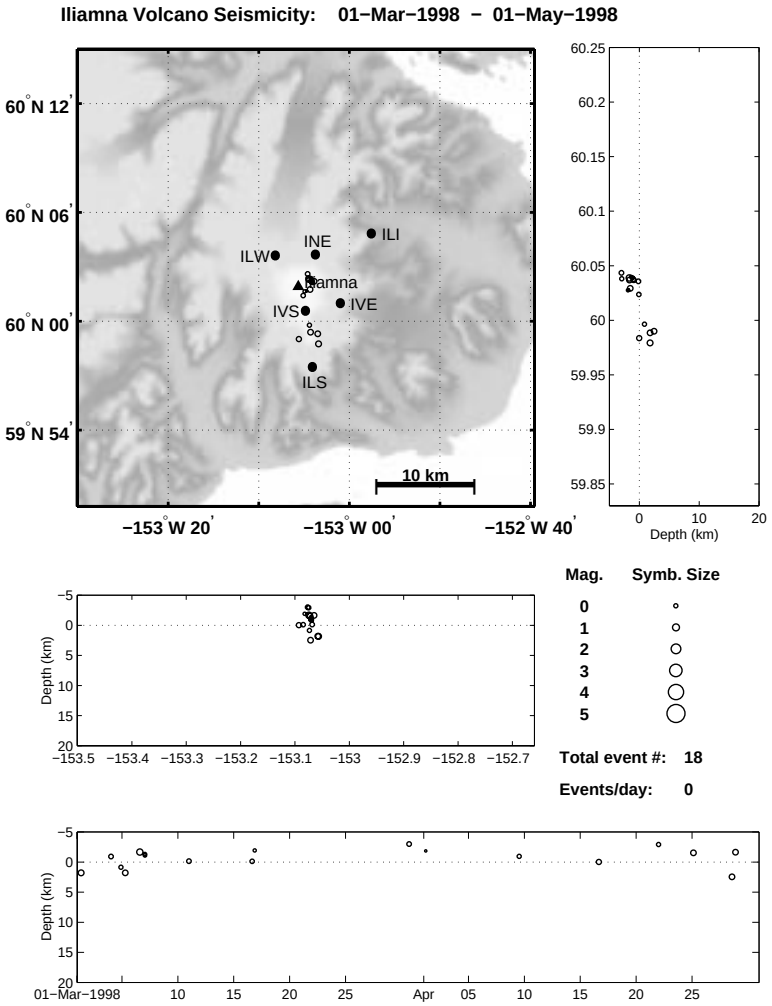

Figure 5b: Locatable Iliamna seismic events in space and time for March and April.

Iliamna region during January-February is nearly half that of the previous two months. This value is also much lower than the 28 located events predicted from the 10-month mean seismicity rate.

During March-April, a total of 18 earthquakes, the largest of which had a magnitude of 0.8, were located in the Iliamna area (figs. 5B, 13B and 14B). As was the case with the January-February data the seismicity can be divided into two clusters of activity, one a little east of the summit and the other one to the south of the summit. Thirteen events were located in a north-south trending zone of activity ~1 km east of the summit. The remaining five events were located about 4-6 km south of the summit. Although the number of events located during this two-month interval is a bit greater than that of the previous two-month period, it is considerably lower than the number of events predicted from the 10-month mean seismicity rate for Iliamna.

Katmai

During January-February, a total of 128 earthquakes were located in the Katmai/ Valley of Ten Thousand Smokes region (figs. 6A, 13A and 14A). The largest event located during this period of time had a magnitude of 1.9. This event was located about 3 km west-southwest of Mageik. As usual, most of the seismicity occurred in the Martin/ Mageik region. Additional activity was clustered around the Novarupta and Katmai areas. In an effort to be a bit more precise in the association of seismicity to specific volcanoes the NEAREST program was employed to determine distances from the epicenters to the various volcanoes in the region. Events located within 5 km of a volcano were designated as being from that volcano.

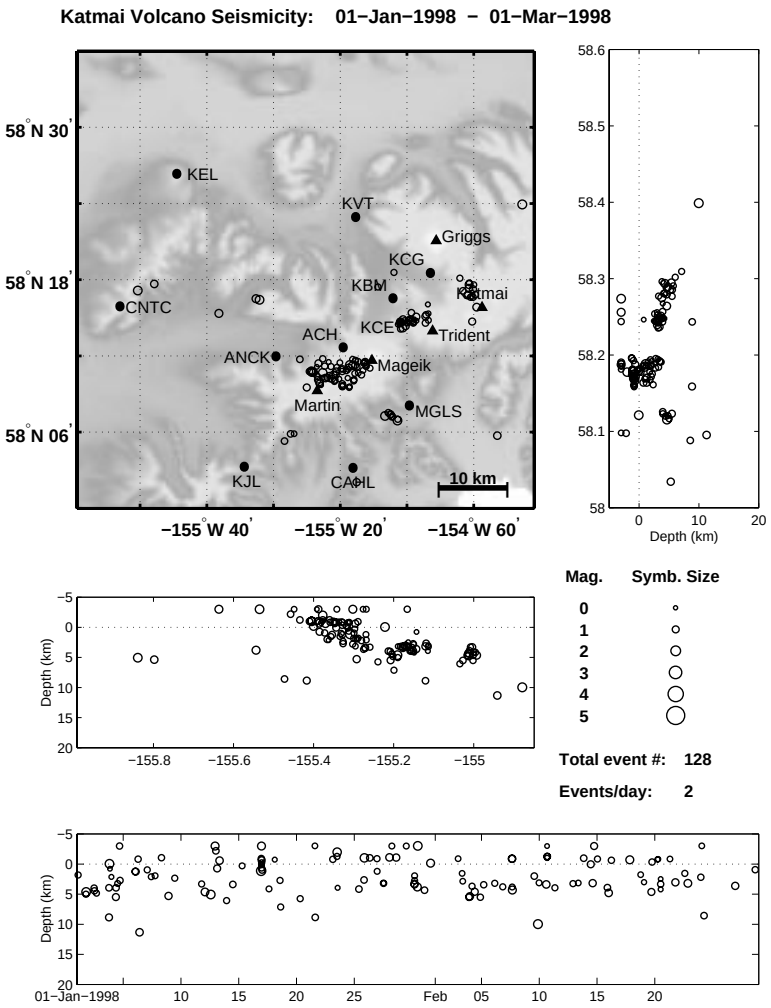

Figure 6a: LocatableKatmai seismic events in space and time for January and February.

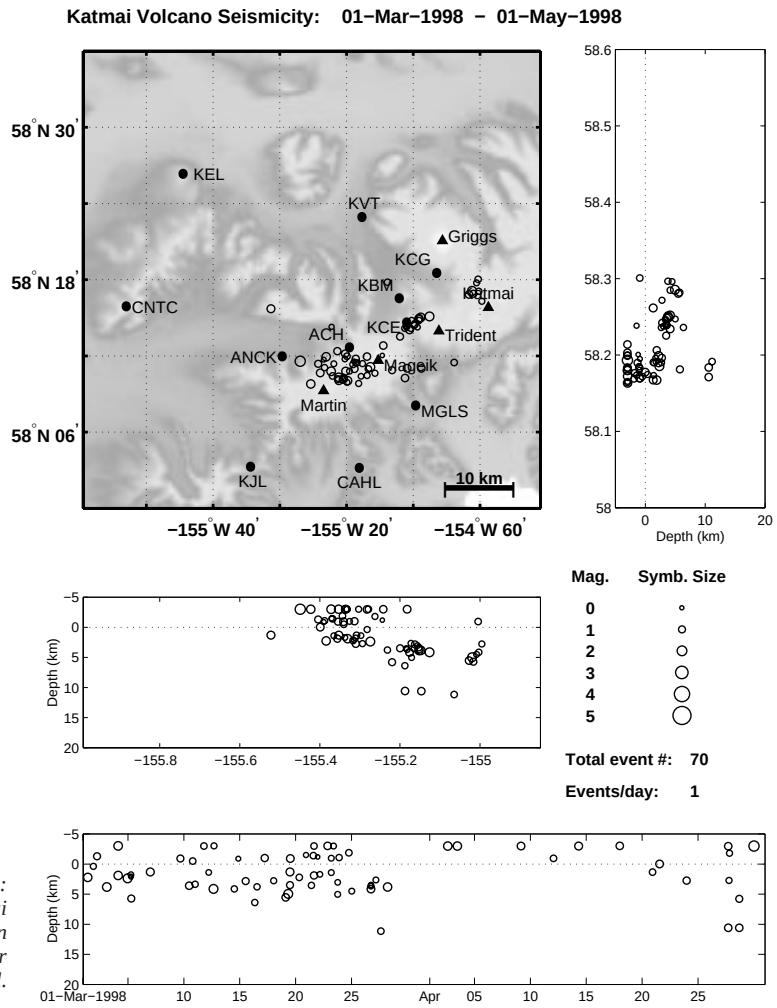

Figure 6b: Locatable Katmai seismic events in space and time for March and April.

Volcano/Region	January-February 1998	March-April 1998	November-December 1997	Predicted from the Mean Seismicity Rate
Entire Map Area	128	71	154	170
Griggs	0	0	0	1
Katmai	12	7	24	20
Mageik	19	15	38	36
Martin	48	27	37	66
Martin/Mageik	67	42	75	102
Novarupta	21	13	31	28
Trident	5	1	1	8

Also given are the corresponding values for the previous two-month interval (November-December 1997), the next interval (March-April 1998) as well as the expected values based upon the 8-month mean seismicity rates (see the mean seismicity rate article in this Bimonthly Report). The total number of earthquakes located within the map area was greater during the previous two-month interval. For the most part, this was also the case with the events assigned to the various volcanoes. The only exception to this was the activity associated with Trident Volcano, which was greater than that of November-December. The number of events located during January-February for the entire map area as well as the six individual volcanoes was much lower than the number of events predicted from the 8-month mean seismicity rates for those areas.

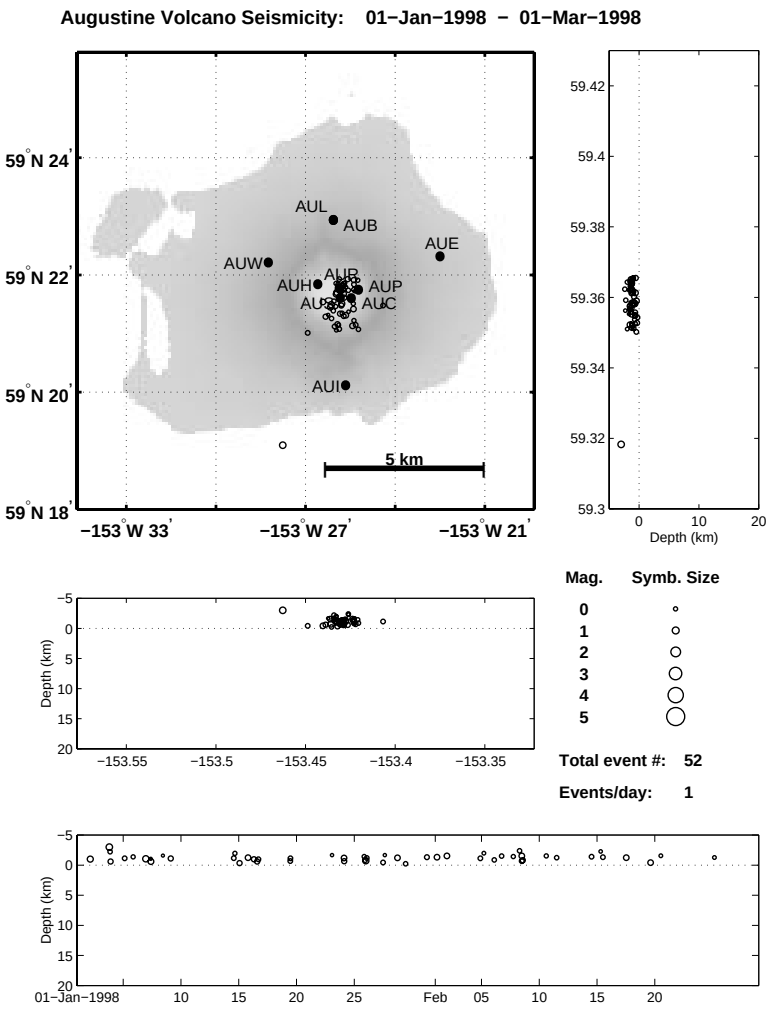

Figure 7a: Locatable Augustine seismic events in space and time for January and February.

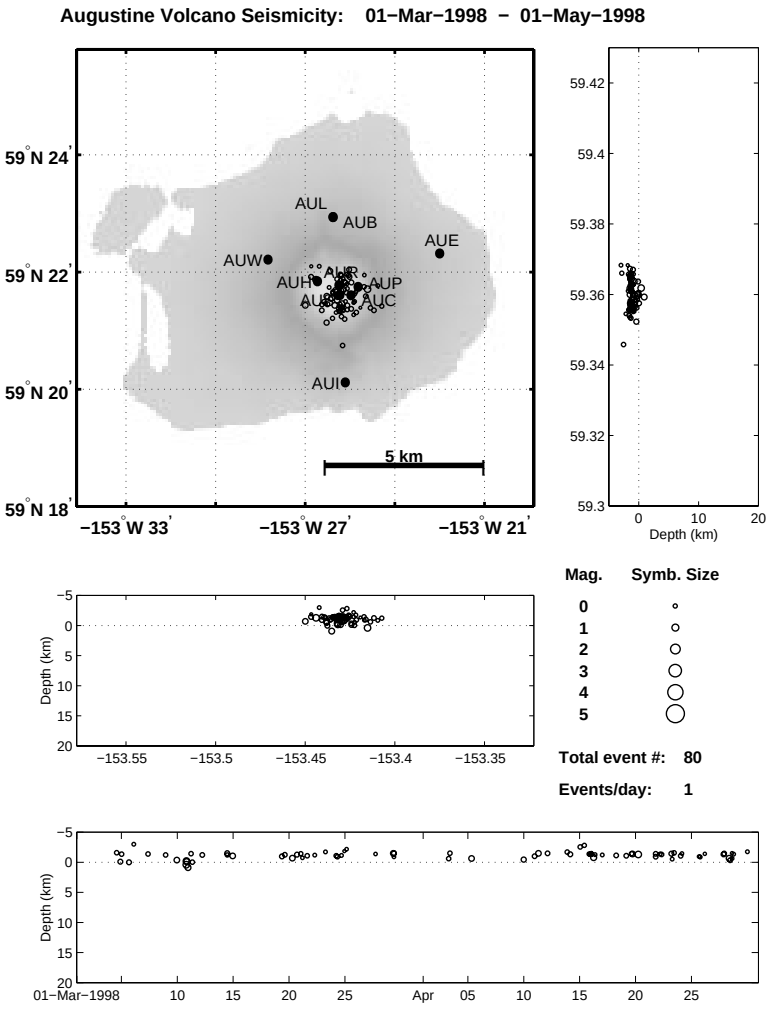

Figure 7b: Locatable Augustine seismic events in space and time for March and April.

Seventy-one earthquakes were located in the Katmai/ Valley of Ten Thousand Smokes region during March-April (figs. 6B, 13B and 14B). The largest of these events had a magnitude of 2.2 and was located about 6 km west-northwest of Martin. Of the 71 located earthquakes, 63 of them were assigned to the various volcanoes in the manner described above. The number of earthquakes associated with each of the volcanoes is summarized in the table above. The number of events located at each of the volcanoes as well as in the region in general was quite a bit lower than the corresponding values for January-February. This is also the case with the values predicted based upon the 8-month mean seismicity rates. This fairly dramatic decrease in seismicity is, for the most part, due to outages and intermittent operation of seismic stations ACH and KCG. Both of these stations have three-components and are two of the better stations of the Katmai network. Since these stations are employed in the detection and/or location of the vast majority of the seismicity in this region, their absence is definitely noticeable in terms of the numbers of earthquakes located and/or detected. This fact is illustrated quite well by comparing the Helicorder counts (fig. 13B) to the detected event (fig. 14B) and time-depth (fig. 5B) plots for Katmai. Although the detected event and time-depth plots indicate a dramatic decrease in seismicity during April, no such decrease is apparent on the plot of the Helicorder event counts; the Helicorder event counts show the seismic activity to have remained relatively constant throughout this time period.

Augustine

During January-February, a total of 52 earthquakes were located in the vicinity of Augustine (figs. 7A, 13A and 14A). One of these

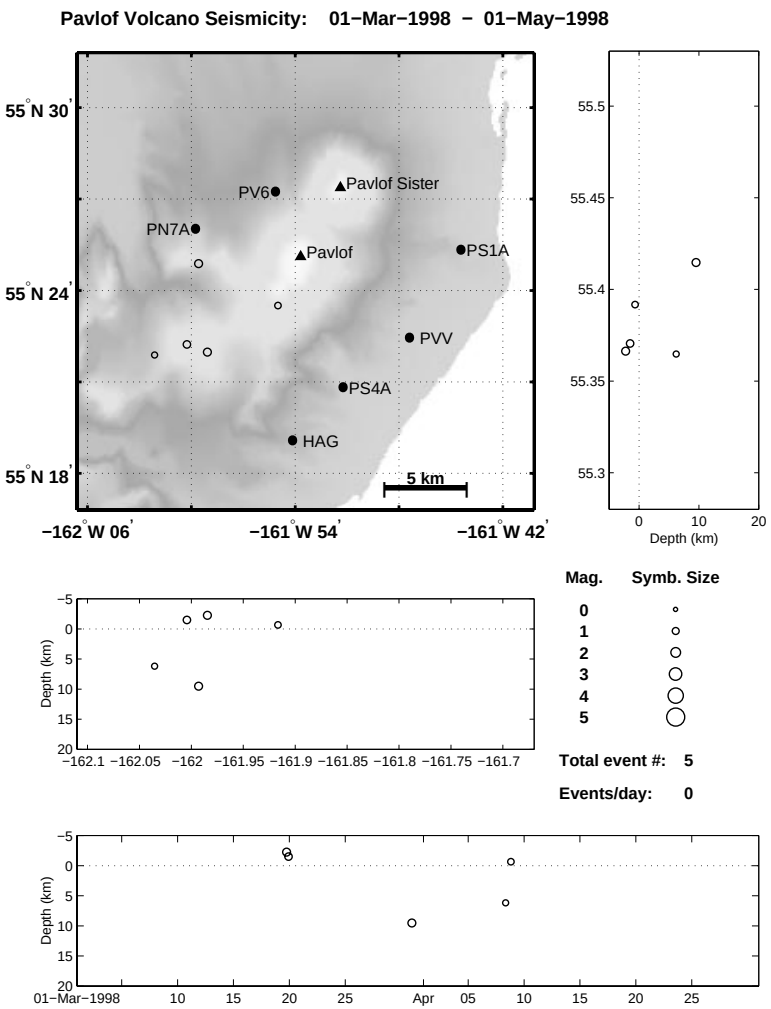

Figure 8a: Locatable Pavlof seismic events in space and time for March and April.

events is located ~1 km off the southern shore of Augustine Island. This event is believed to be related to the movement of shore-ice. The remaining 51 earthquakes were all located at shallow depth in close proximity (≤ 2 km) of the summit. The largest such event had a magnitude of 0.8. The number of Augustine earthquakes located during January-February is much greater than that of the previous two-month period. This value is also about three times the level predicted from the 4-year mean seismicity rate for Augustine.

A total of 80 earthquakes, the largest of which had a magnitude of 0.9, were located in the vicinity of Augustine during March-April (figs. 7B, 13B and 14B). All of these events were located at shallow depth within the volcanic pile, proximal (≤ 2 km) to the summit. The number of events located at Augustine during March-April exceeds both that of the previous two-month interval and the 17 earthquakes predicted from the 4-year mean seismicity rate. In fact, this appears to be the largest number of events located in the Augustine area by AVO during a two-month time period.

Aniakchak

No earthquakes were located in the Aniakchak region during both of the two-month intervals (January-February and March-April) discussed in this Bi- monthly Report.This low level of activity is also apparent on the Helicorder and detected event plots (figs. 13A ,14A, 13B and 14B).

Pavlof

No earthquakes were located in the Pavlof region during January-February. The low level of activity in the Pavlof region is also apparent in the plots of the Helicorder event counts and the detected events (figs. 13A and 14A). From the one-year mean seismicity rate, one would expect there to be one to two events located in this area over a two-month time period.

During March-April, a total of five earthquakes were located in the Pavlof region (figs. 8B, 13B and 14B). All five of these events were designated as being b-type events due to the relatively low-frequency content of their waveforms. The largest such event had a magnitude of 1.4. There were two events of this magnitude. One of them was located about 7 km west of Pavlof and had a hypocentral depth of nearly 10 km. The other magnitude 1.4 event was located about 8 km southwest of Pavlof with a shallow (above sea-level) hypocentral depth. This location is quite close (< 1 km) to Hague Volcano. Two other events were located in this same general area. One of these events was located about 9 km southwest of Pavlof or ~1 km west-northwest of Hague, while the other event was located about 11 km west-southwest of Pavlof or ~3 km west of Hague. Of these two events the latter one had a hypocentral depth of about 6 km while the former was located at shallow depth. The final earthquake was located about 3 km south-southwest of Pavlof or ~6 km east-northeast of Hague, with a shallow hypocentral depth. It is not clear what the significance of these five events is. The number of events located during this two-month interval is over half the number of Pavlof events located during the entire year of 1997. As such this value is much greater than the two located events predicted from the 1-year (1997) mean seismicity rate.

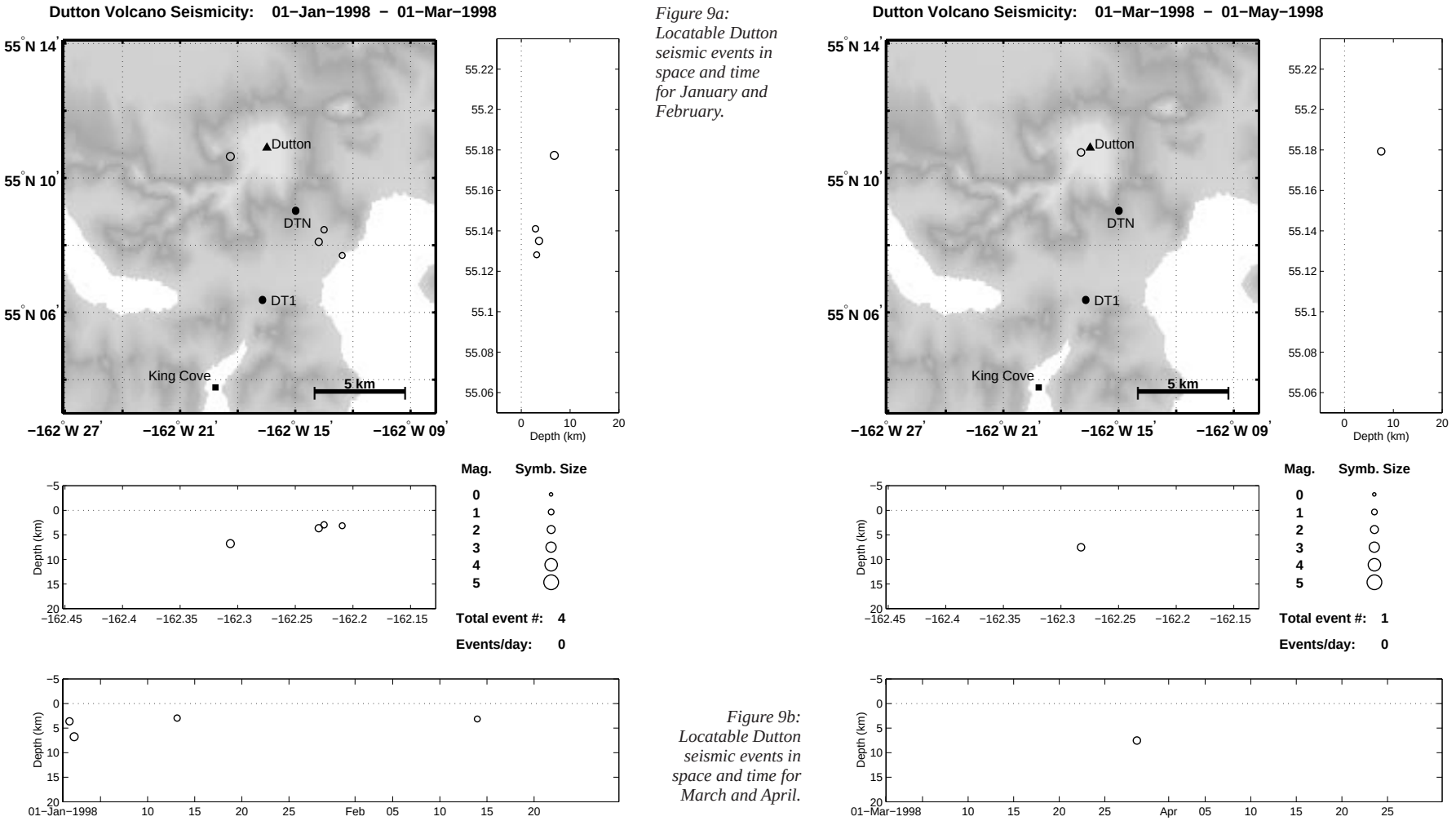

Figure 9a: Locatable Dutton seismic events in space and time for January and February.

Figure 9b: Locatable Dutton seismic events in space and time for March and April.

Dutton

Four earthquakes were located in the Dutton region during January-February (figs. 9A, 13A and 14A). The largest of these events had a magnitude of 2.0 and was located about 2 km west-southwest of the summit of Dutton at a depth of nearly 7 km. The remaining three events were located 5-7 km southeast of Dutton near Belkofski Bay. During December, another earthquake was located in the same general area as these three events. The number of earthquakes located during January-February is significant not only in that it exceeds that of the previous two-month interval but it also surpasses the number of events located in the vicinity of Dutton for the entire year of 1997; only a total of three earthquakes were located in the Dutton region during 1997.

A single earthquake was located in the Dutton region during March-April (figs. 9B, 12B and 13B). This event had a magnitude of 1.8 and was located about 0.6 km west-southwest of the summit of Dutton at a depth of about 8 km. This event was located closer to Dutton than any events previously located by AVO in this region. The number of events located in the Dutton area during March-April was less than that for January-February, but was in line with the number of events predicted from the 1-year mean seismicity rate.

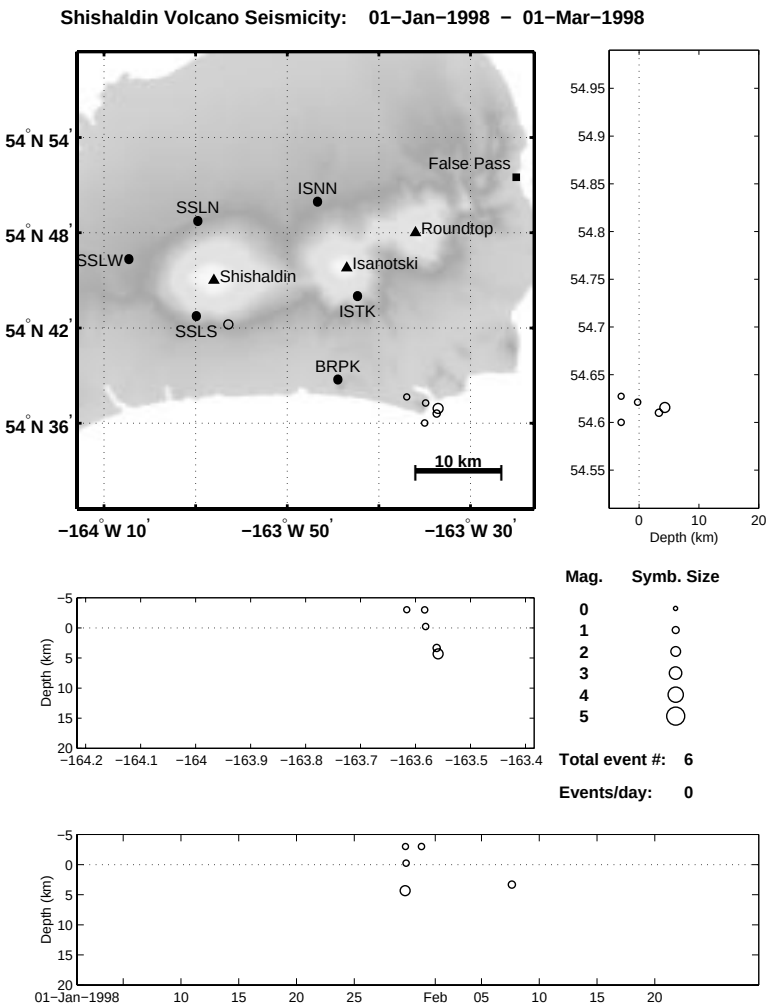

Figure 10a: Locatable Shishaldin seismic events in space and time for January and February.

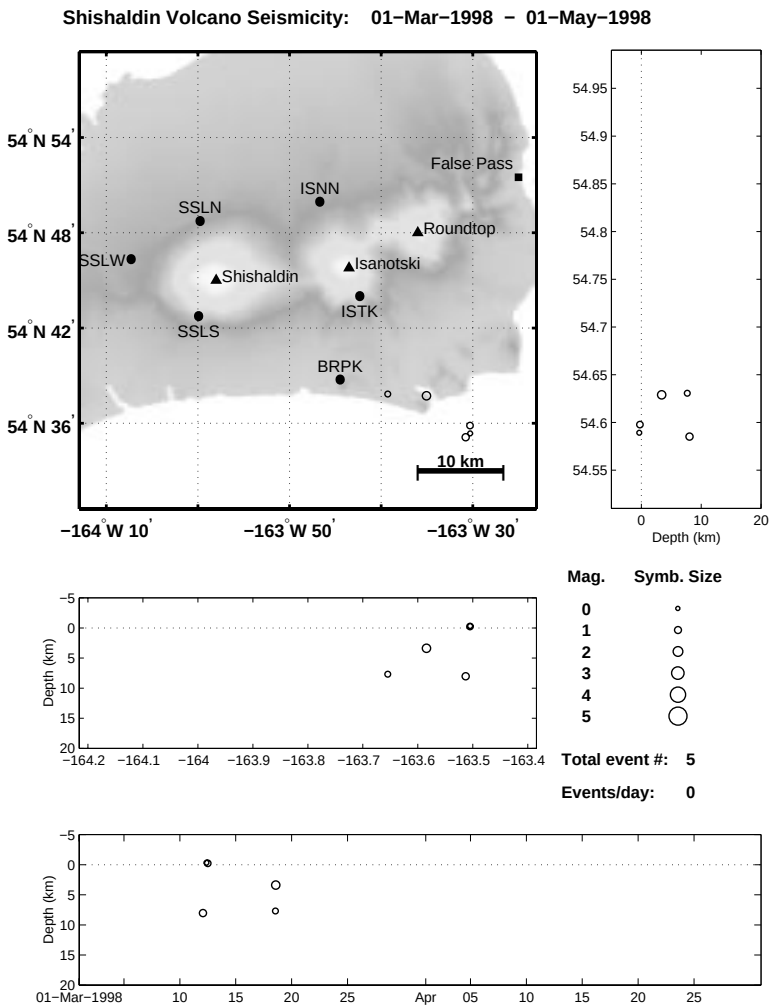

Figure 10b: Locatable Shishaldin seismic events in space and time for March and April.

Shishaldin

A total of six earthquakes were located in the vicinity of Shishaldin during January-February (figs. 10A, 13A and 14A). The largest Shishaldin event located during this time period had a magnitude of 2.1. This event was located about 2 km east of Cape Lazaref. Four additional events were also located in this area (the Cape Lazaref Seismic Zone). The sixth earthquake was located about 6 km south-southeast of the summit of Shishaldin. This event was designated as being a b-type event due to its relatively low frequency waveform. The hypocentral depth of this earthquake was nearly 36 km. Therefore, the low-frequency content of its waveform is likely just the result of the natural filtering out of the higher frequency components by the earth; the greater the length of the ray path the more apparent this effect is. This event appears on neither the time-depth plot nor the cross-sections. This is because its hypocentral depth exceeds the maximum plotted depth of 20 km. The number of events located during this two-month period is only slightly lower than the number of events located during November-December. However, this value is much lower than the 15 events predicted from the 4-month mean seismicity rate for Shishaldin. This apparent discrepancy may simply be the result of random fluctuations in the seismicity rate either during the period over which the rate was computed or during the current two-month time period. The former explanation is quite likely the case since the rate was determined over a time period of only four months, which may not have been a long enough time to average out fluctuations in the observed seismicity rate. The continued accumulation

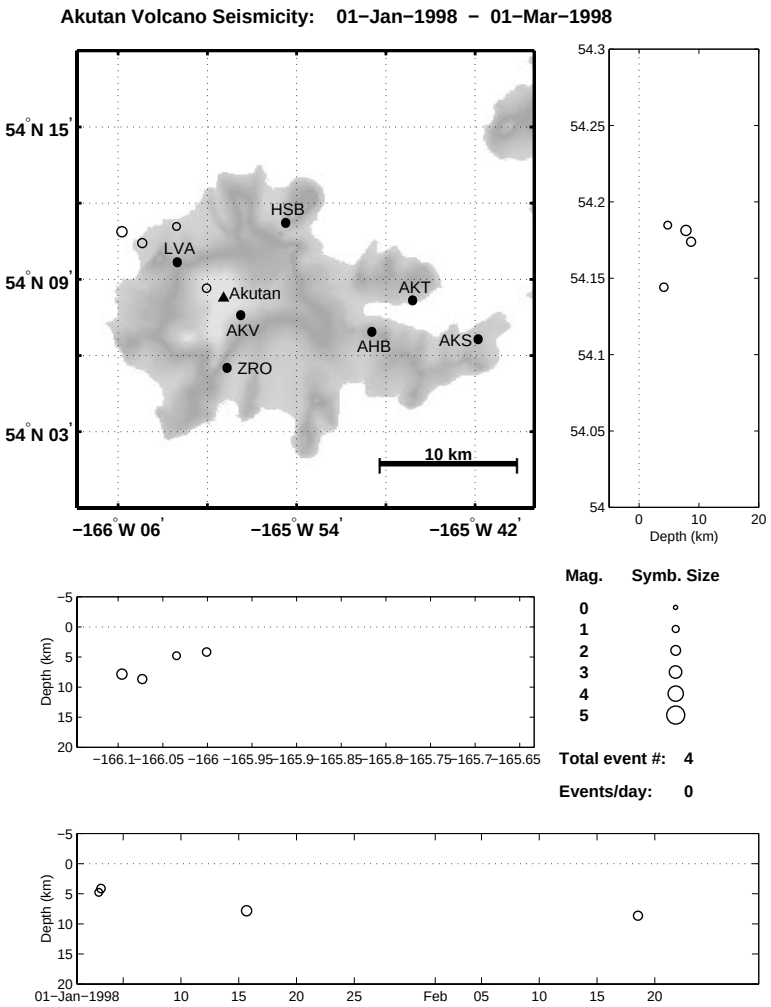

Figure 11a: Locatable Akutan seismic events in space and time for January and February.

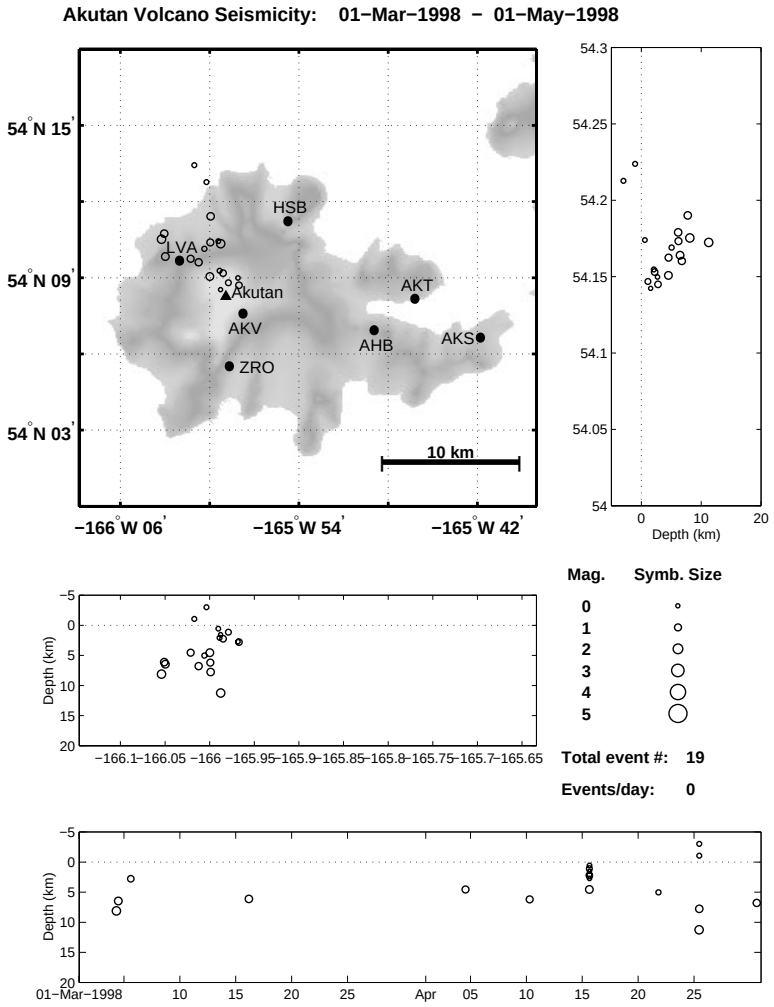

Figure 11b: Locatable Akutan seismic events in space and time for March and April.

of data from the Shishaldin region will eventually resolve this issue.

Five earthquakes were located in the Shishaldin region during March-April (figs. 10B, 13B and 14B). Actually, all five of these events occurred over the period of a week during March. The largest such event had a magnitude of 1.5 and was located a little over 1 km north of Cape Lazaref. Another event was located about 5 km west-northwest of Cape Lazaref while the remaining three earthquakes were located offshore about 6 km to the southeast of Cape Lazaref. The number of earthquakes located in the Shishaldin area during March-April is nearly the same as that of the previous two-month period, and as such is also much lower than the number of located events predicted from the Shishaldin 4-month mean seismicity rate.

Akutan

Four earthquakes were located in the Akutan region during January-February 1998 (figs. 11A, 13A and 14A). The largest such event had a magnitude of 2.2 and was located offshore ~1 km northwest of Lava Point, which is about 9 km northwest of the summit. Two other events were located in the same general area about 6-7 km northwest of the summit. The fourth event was located much closer to Akutan. This event was located about 1 km northwest of the summit. The number of events located at Akutan during January-February is double that of the previous two-month interval. This value is, however, about half the number predicted from the 10-month mean seismicity rate.

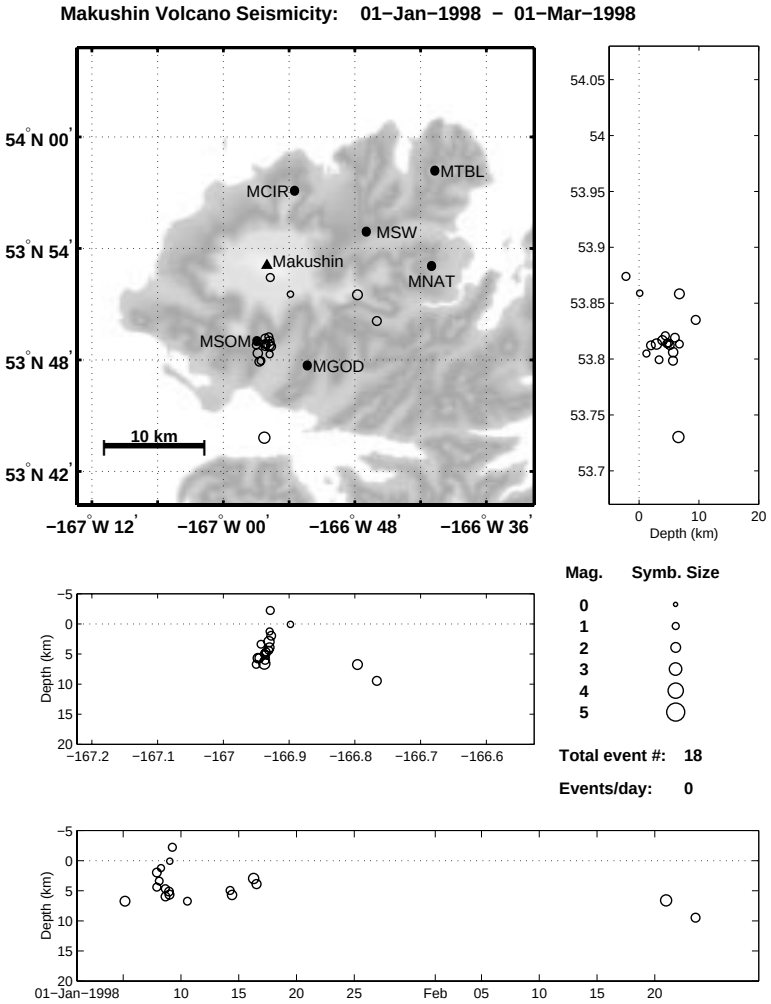

Figure 12a: Locatable Makushin seismic events in space and time for January and February.

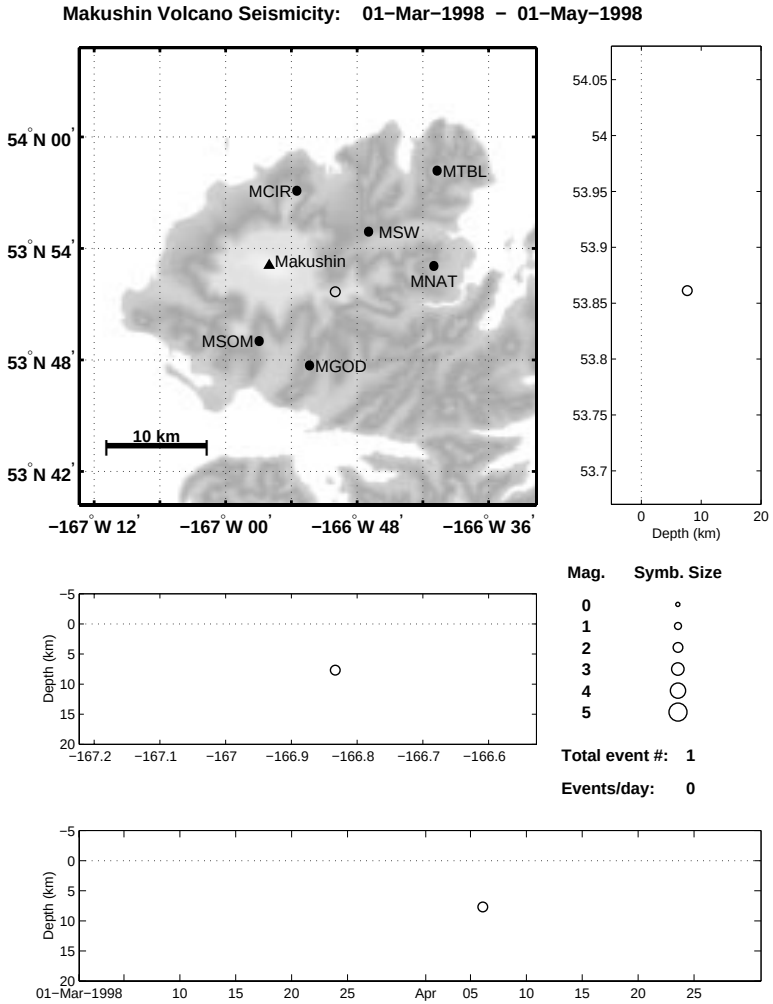

Figure 12b: Locatable Makushin seismic events in space and time for March and April.

A dramatic increase in the number of earthquakes located in the vicinity of Akutan occurred during March-April. A total of 19 earthquakes were located in the Akutan region during this time period (figs. 11B, 11B and 12B). Much of this seismicity occurred during two short-lived bursts. Seven earthquakes occurred on April 15 over a period of time of just slightly over a minute. On April 25, another burst of activity lasting about 4 minutes produced four events. The largest earthquake located during this two-month period had a magnitude of 1.5. Two events were of this magnitude. One of these events was located about 4 km north of the summit of Akutan while the other one was located about 6 km northwest of the summit. The seismicity formed a fairly diffuse zone of activity extending northwest from the summit area. This region has been seismically active in the past and more or less correlates with the location and orientation of ground cracks observed in this area during the 1996 field season (see the July-August 1996 Bimonthly Report). The number of events located in the Akutan region during March-April far exceeds that of the previous two-month interval as well as the seven located earthquakes predicted from the 1-year mean seismicity rate. It is difficult to say at this time exactly what the significance of this heightened level of activity is.

Makushin

Eighteen earthquakes were located in the Makushin region during January-February (figs. 12A, 13A and 14A). The largest such event had a magnitude of v2.5 and was located beneath Makushin Bay about 18 km south of the summit of Makushin. A seismic swarm consisting of

13 earthquakes, the largest of which had a magnitude of 2.2, occurred January 7-16. These events were located about 4 km southeast of Pakushin Cone (~8-10 km south of Makushin) and had hypocentral depths of about 1-7 km. Two of the remaining four events were located fairly close to the summit. One of these events was located about 2 km south of the summit while the other event was located about 4 km southeast of the summit. Both of these events had shallow (< 1 km) hypocentral depths.

The two final events were located 9 and 12 km east-southeast of the summit at depths of 7 and 10 km respectively. The number of events located during this two-month period was much greater than the mere two events located in this region during November-December. This value is also slightly greater than the 15 earthquakes predicted from the one-year mean seismicity rate.

One earthquake was located in the vicinity of Makushin during March-April (figs. 12B, 13B and 14B). This event had a magnitude of 2.0 and was located about 7 km east-southeast of the summit of Makushin at a depth of about 8 km. The number of located earthquakes for March-April is much lower than that of the previous two-month period as well as the number of located events predicted from the 1-year mean seismicity rate.

Scott Stihler, Dan Wiesneth, Michelle Harbin, Aaron Pearson, Chris Larsen, Scott Dreher, Pete Stelling, Michelle Coombs, Art Jolly, Steve McNutt, Bob Hammond, Guy Tytgat, and John Benoit

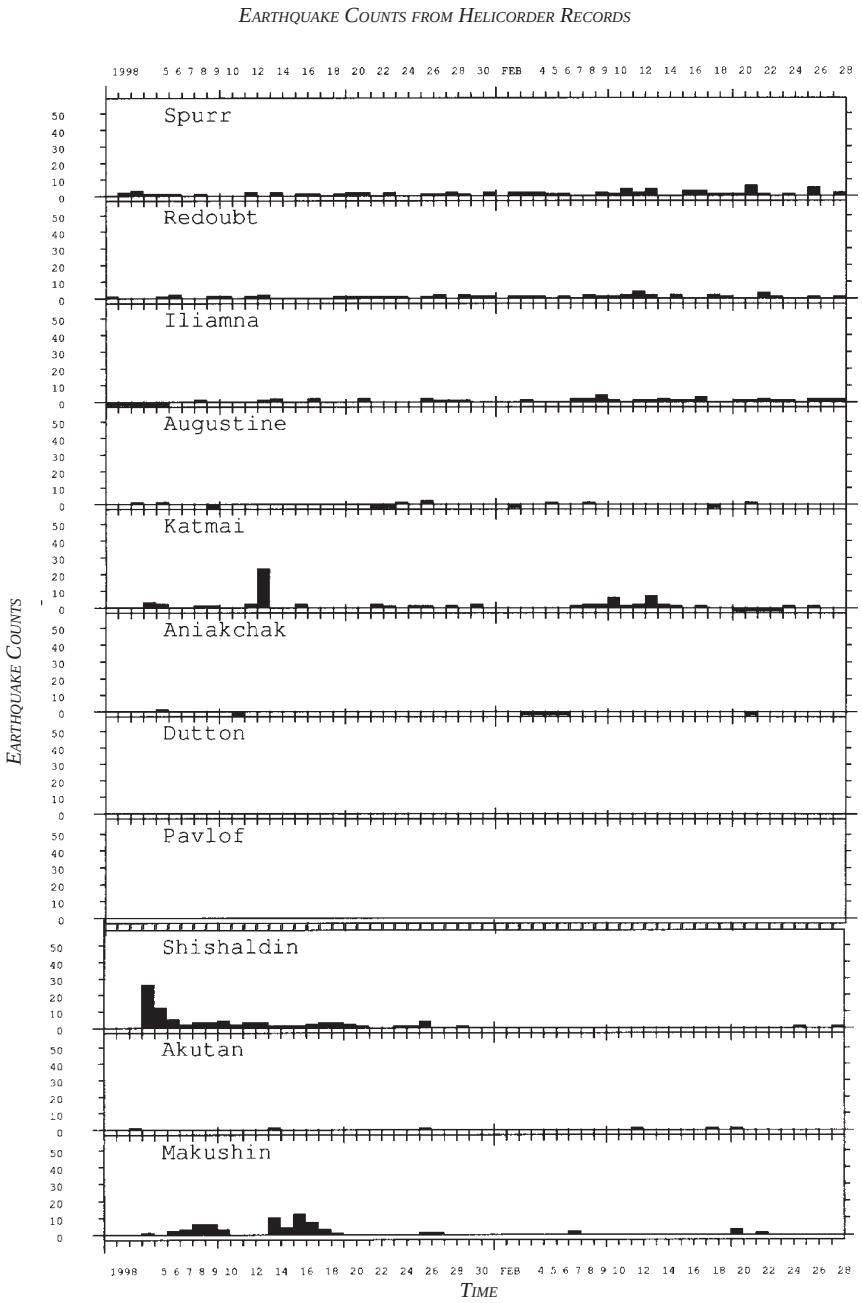

Figure 13a: Histogram of seismic events counted from Helicorder records during January through February.

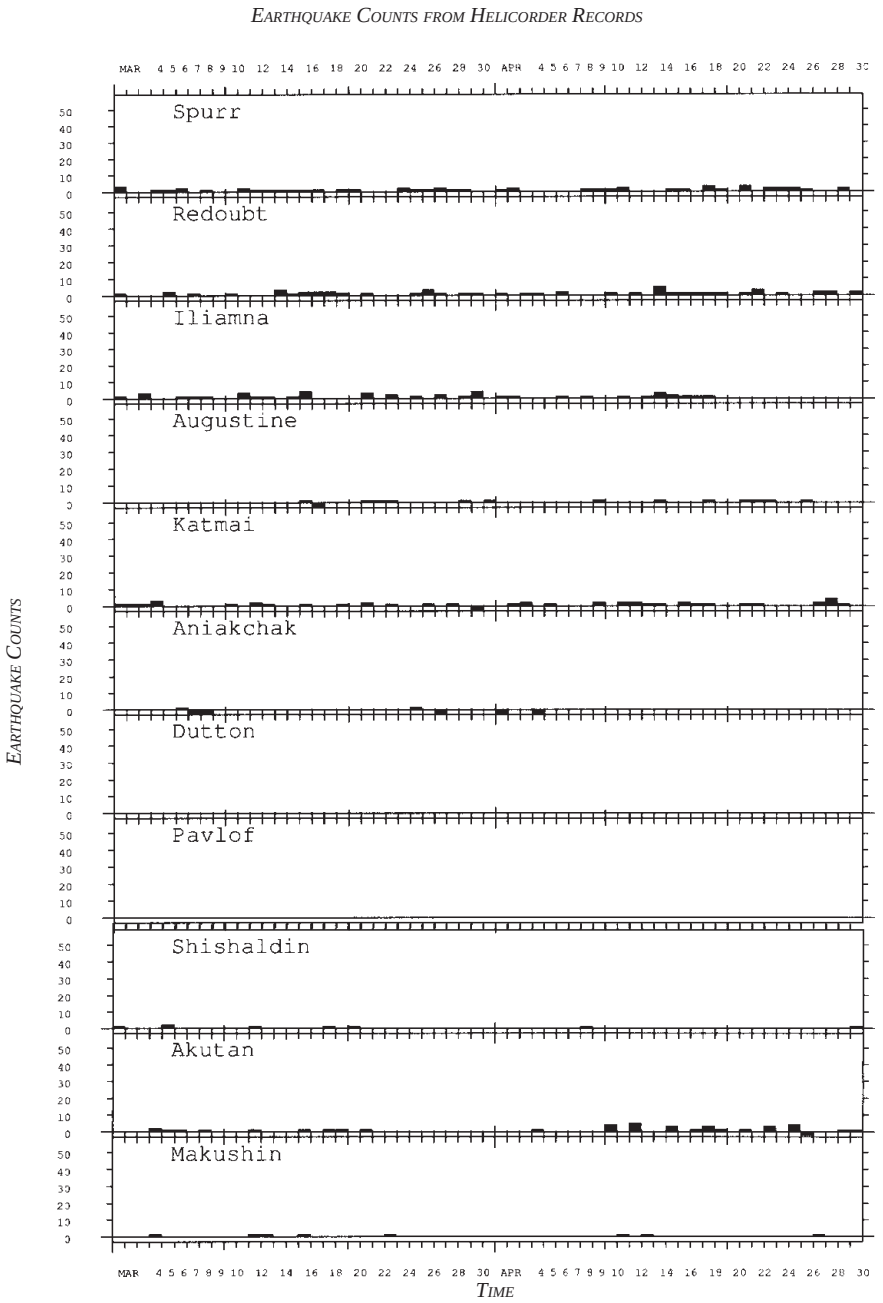

Figure 13b: Histogram of seismic events counted from Helicorder records during March through April.