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NEW ACTIVITY/UNREST

CONTINUING ACTIVITY

Continued on the inside

VOLCANO EXPRESS

BULLETIN INFORMATION

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FALSE REPORTS OF VOLCANIC ACTIVITY

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WORLDWIDE MONTHLY VOLCANIC ACTIVITY

VOLCANOES ORGANISED BY THE CAVW/GVP VOLCANO NUMBER CODE

NAME: White Island
LOCATION: New Zealand
HEIGHT: 321 M
TYPE: Stratovolcanoes
COORDINATES: 37.52°S 177.18°E

On 9th July GeoNet Data Centre reported that over the previous few weeks very small volcanic earthquakes occurred at White Island approximately every 70 seconds; the hundreds of small bursts created a unique daily pattern on the seismograph. The pattern of the volcanic earthquakes changed over time; the tremor bursts changed in size and frequency and sometimes merged into continuous tremor. Neither increased gas emissions nor changes in the hot lake and recently-erupted lava dome suggested that the process creating the earthquakes, possibly fluid moving through a crack, was occurring.
The Alert Level for White Island was raised to 1 (on a scale of 1-5) after a visit to the island revealed that the active crater showed vigorous gas emissions and minor ejections of mud and debris.

NAME: Makura
LOCATION: Caldera? or Stratovolcano
HEIGHT: 321 M
TYPE: Stratovolcanoes
COORDINATES: 16.992°S 168.592°E

A magnitude 4.3 earthquake occurred on 20th July on Emae island.

NAME: Merapi
LOCATION: Indonesia (Central Java)
HEIGHT: 2968 M
TYPE: Stratovolcano
COORDINATES: 7.542°S 110.442°E

Locals reported an eruption of dark red material at 04:15 on 22nd July to a height of 1 KM that continued until 05:30. Rainfall that was occurring at the time, mixed with the ash to create a heavy mud that forced locals to evacuate the slopes of the volcano, who later returned later in the day. The eruption produced a loud booming sound that was heard 30 KM away and ash fall was reported in many areas surrounding the volcano.

Above; strombolian activity in the summit cone of Raung volcano, Indonesia on 21st July.

NAME: Raung
LOCATION: Indonesia (Eastern Java)
HEIGHT: 3332 M
TYPE: Stratovolcano
COORDINATES: 8.125°S 114.042°E

A photo dated 21st July 2013 shows minor strombolian activity in the intracaldera cone.

NAME: Iwo-Tori-Shima
LOCATION: Japan (Ryukyu Islands)
HEIGHT: 212 M
TYPE: Complex Volcano
COORDINATES: 27.877°N 128.224°E

The Tokyo VAAC stated on 6th July that a pilot reported an ash plume from the volcano rising to a height of 2.1 KM and drifting around 40 nautical miles. Satellite images showed a faint ash-like plume.

NAME: Ketoi
LOCATION: Russia (Kuril Islands)
HEIGHT: 1172 M
TYPE: Stratovolcano
COORDINATES: 47.35°N 152.475°E

The SVERT reported that on 25th July a thermal anomaly from Ketoi's Pallas Peak was observed in satellite imagery along with gas-and-steam emissions drifting 100 km NW. On 27th July gas-and-steam emissions possibly containing ash drifted 45 KM SSE.

NAME: Chirinkotan
LOCATION: Russia (Kuril Islands)
HEIGHT:724 M
TYPE: Stratovolcano
COORDINATES: 48.98°N 153.48°E

The SVERT reported that steam-and-gas emissions from Chirinkotan were detected on 25th and 26th June. The SVERT reported that steam-and-gas emissions from Chirinkotan were observed on 3rd July and a thermal anomaly was detected on 4th July.
The SVERT reported that weak steam-and-gas emissions from Chirinkotan were observed on 12th July and a thermal anomaly was detected during 12th – 13th July.
The SVERT reported that a thermal anomaly and possible weak steam-and-gas emissions from Chirinkotan were observed on 16th and 18th July.
The SVERT reported that a thermal anomaly from Chirinkotan was observed on 22nd July. Weak steam-and-gas emissions and a weak thermal anomaly were observed on 25th July.

NAME: Pavlof
LOCATION: USA (Alaska)
HEIGHT: 2519 M
TYPE: Stratovolcano
COORDINATES: 55.42°N 161.887°W

According to news articles, ash plumes from Pavlof caused airlines to cancel one flight and reroute six more on 25th June. AVO reported that during 25th – 26th June seismicity declined, and consisted of intermittent bursts of tremor and occasional small explosions. Satellite images showed a plume containing small amounts of ash drifting NW, and strong thermal anomalies at the summit. Pilot reports on 26th June indicated that plumes rose to altitudes between 6.1 – 7.6 KM a.s.l., and then to heights just above the summit later that day. Seismicity during 26th June – 1st July continued at low levels and consisted primarily of periodically continuous, low-level tremor. Thermal anomalies at the summit detected in satellite images were strong during 26th – 29th June and weak during 30th June – 1st July. Activity further declined during 1st – 2nd July; tremor and explosions were no longer detected in seismic and pressure sensor data. Satellite images did not detect elevated surface temperatures, volcanic gas, or ash emissions, and there were no visual observations from pilots or from webcam images of any eruptive activity since 26th June. AVO lowered the Aviation Colour Code to Yellow and the Volcano Alert Level to Advisory.

NAME: Veniaminof
LOCATION: USA (Alaska)
HEIGHT: 2507 M
TYPE: Stratovolcano
COORDINATES: 56.17°N 159.38°W

The AVO reported that the ongoing low-level eruption of Veniaminof, characterized by lava effusion and emission of minor amounts of ash and steam, continued during 26th June – 2nd July, indicated by nearly continuous volcanic tremor and occasional small explosions detected by the seismic network. Satellite images showed elevated surface temperatures at the cinder cone inside the caldera consistent with lava effusion. During 26th – 30th June web camera images from Perryville (32 KM SSE) showed a small light-coloured plume rising above the cone to just above the rim of the caldera, and night time images showed persistent incandescence from the cone.
The AVO reported that the ongoing low-level eruption of Veniaminof, characterized by lava effusion and emission of minor amounts of ash and steam, continued during 3rd – 9th July, indicated by nearly continuous volcanic tremor and occasional small explosions detected by the seismic network. Satellite images showed elevated surface temperatures at the cinder cone inside the caldera consistent with lava effusion most days. Images also showed that most of the lava flows travelled S of the cone a short distance (hundreds of meters). The web camera in Perryville (32 KM SSE) recorded very weak emissions of vapour, possibly containing minor amounts of ash, within the caldera for several hours on 9th July.
The AVO reported that the ongoing low-level eruption of Veniaminof, characterized by lava effusion and emission of minor amounts of ash and steam, continued during 10th – 16th July, indicated by nearly continuous volcanic tremor and occasional small explosions detected by the seismic network. Satellite images showed elevated surface temperatures at the cinder cone inside the caldera consistent with lava effusion. Images also showed that most of the lava flows travelled S of the cone a short distance (hundreds of meters). The web camera in Perryville (32 KM SSE) recorded very weak emissions of vapour, possibly containing minor amounts of ash,

within the caldera during 9th – 10th July; incandescence from the cone was visible during 10th – 11th July.
The AVO reported that the ongoing low-level eruption of Veniaminof, characterized by lava effusion and emission of minor amounts of ash and steam, continued during 17th – 23rd July, indicated by nearly continuous volcanic tremor and occasional small explosions detected by the seismic network. On most days satellite images showed elevated surface temperatures at the cinder cone inside the caldera consistent with lava effusion. The web camera in Perryville (32 KM SSE) recorded nighttime incandescence and low-level ash-and-steam plumes during 22nd – 23rd July.
The AVO reported that the ongoing low-level eruption of Veniaminof, characterized by lava effusion and emissions of minor amounts of ash and steam, continued during 24th – 30th July, indicated by fluctuating volcanic tremor and occasional small explosions detected by the seismic network. On most days satellite images showed elevated surface temperatures at the cinder cone inside the caldera consistent with lava effusion. On 25th July a pilot reported an ash plume that rose 60 – 100 M above the cone and drifted almost 25 KM S, and a "river of lava" flowing down from the cone. On 27th July a pilot observed an ash emission that rose 300 – 600 M and drifted NW. A water-rich plume likely containing minor amounts of ash was detected in satellite images drifting NW at an altitude of 4.5 KM a.s.l. on 29th July.

NAME: Momotombo
LOCATION: USA (Alaska)
HEIGHT: 1297 M
TYPE: Stratovolcano
COORDINATES: 12.422°N 86.540°W

The INETER reported that from 1st – 2nd July a swarm of M 3.0 earthquakes occurred

NAME: Turrialba
LOCATION: Costa Rica
HEIGHT: 3340 M
TYPE: Stratovolcano
COORDINATES: 10.025°N 83.767°W

The OVSICORI-UNA reported significant seismic activity at Turrialba starting on 14th July. Low-frequency signals indicating fluid movement grew

Above; Momotombo volcano, Nicaragua

from an average of less than 200 events per day to over 600 events on 14th July, reaching a peak of activity with over 1,000 events on 15th July. Low-frequency tremor was detected during 18th – 19th July. Elevated seismicity remained at least through the report posting on 20th July. No morphological changes at the surface were observed. On 23rd – 24th the seismic crises continued, small explosion signals (probably due to small phreatic eruptions) were also reported.

NAME: Ubinas
LOCATION: Peru
HEIGHT: 5672 M
TYPE: Stratovolcano
COORDINATES: 16.355°S 70.903°W

The Buenos Aires VAAC reported that, although a pilot reported an ash plume from Ubinas rising to an altitude of 5.5 KM a.s.l. and drifting W on 4th July, there was no ash detected in clear satellite images.

CONTINUING ACTIVITY

NAME: Ol Doinyo Lengai
LOCATION: Tanzania
HEIGHT: 2962 M
TYPE: Stratovolcano
COORDINATES: 2.764°S 35.914°E

A recent visit to the volcano noted a small active natrocarbonitie lava cone on the western side of the 2008 crater. From the crater rim “sloshing” of lava was heard and the NW part of the crater rim had many cracks which were emitting gases.

NAME: Manam
LOCATION: Papua New Guinea
HEIGHT: 1807 M
TYPE: Stratovolcano
COORDINATES: 4.080°S 145.037°E

The RVO reported that the increased activity at Manam noted during 17th – 18th June continued on 19th June, and then declined on 20th June. On 19th June diffuse dark grey ash plumes that rose 200 M above the summit crater were accompanied by deep, loud explosive and booming noises occurring at short intervals. Very loud explosions accompanied by shock waves were heard at much longer intervals. Observers noted ejected incandescent lava fragments at night.

Decreased activity that started on 20th June carried through 30th June, and was characterized by diffuse ash emissions at the beginning of the period changing to diffuse white vapour emissions towards the end. Diffuse grey emissions rose from Main Crater during 19th – 22nd June; explosion and booming noises were reported during 19th – 20th June. Seismicity was low. Activity at Southern Crater and Main Crater was low during 1st – 14th July; both craters emitted white vapour.

The RVO reported that activity at Manam's Main and Southern craters was low. White vapour plumes were observed rising from both craters when weather conditions were clear.

NAME: Ulawun
LOCATION: Papua New Guinea (New Britain)
HEIGHT: 2334 M
TYPE: Stratovolcano
COORDINATES: 5.05°S 151.33°E

The RVO reported that activity at Ulawun was low during 1st – 14th July. Emissions from the summit crater consisted of white vapour during 1st – 7th July, and then changed to occasionally sub-continuous, light grey ash clouds during 8th and 11th- 14th July. Ash clouds changed to grey-brown on 14th July.

Seismic activity was low from 1st July through the early part of 13th July. RSAM increased from about 07:00 on 14th July onwards with the emergence of continuous volcanic tremors until it reached a peak of 700 just after 03:00 on 15th July. The RVO noted that the last significant volcanic

Above; an ash and steam eruption from Ulawun, PNG

tremors at Ulawun were recorded in May and June 2012.

The RVO reported that activity at Ulawun was low during 15th – 21st July. Emissions from the summit crater were light grey during 15th – 16th July, and then changed to white vapour during 17th – 21st July.

RSAM from volcanic tremors had increased on 14th July and reached a peak of 700 just after 03:00 on 15th July. RSAM then decreased to 80 on 21st July, which also marked the cessation of volcanic tremors.

NAME: Rabaul
LOCATION: Papua New Guinea (New Britain)
HEIGHT: 688 M
TYPE: Pyroclastic Shield
COORDINATES: 4.271°S 152.203°E

The RVO reported that during 16th June – 14th July, white-to-light-grey plumes sometimes containing fine ash rose at most 2 KM from Rabaul caldera's Tavurvur cone and drifted NW and SE. Roaring and rumbling noises also continued, and seismicity was low. Ashfall was reported in areas downwind including Rabaul town (3 – 5 KM NW) during 16th – 30th June. The lava dome on the crater floor of

Above; time-lapse photo showing incandescence at the summit of Karangetang.

Tavurvur continued to glow; on 26th June and 4th July observers near the dome noted brief incandescence at the vent associated with strong and rapid venting. Explosions during 10th – 14th July generated dense grey ash clouds that drifted NW, causing ashfall between Namanula Hill (3 KM W) and Malaguna No.1 (NW), and Pilapila and Tavui Point.

The RVO reported that during 15th – 21st July low-level activity consisted of discrete emissions of pale grey ash plumes occurring at short intervals. Some emissions were explosive and generated plumes that rose 2 KM above the crater. Plumes drifted E, NE, N, NW, W, and SW, and deposited minor amounts of ash in areas downwind mainly between Nodup and Rapolo (with Rabaul Town, 3-5 KM NW, in between), and to a lesser extent in the Vulcan area. Roaring and rumbling noises also continued, often in conjunction with explosions.

NAME: Batu Tara
LOCATION: Indonesia (Lesser Sundra Islands)
HEIGHT:748 M
TYPE: Stratovolcano
COORDINATES: 7.792°S 123.579°E

The Darwin Volcanic Ash Advisory Centre (VAAC) reported that on 14th July an ash plume from Batu Tara rose to an altitude of 2.1 KM a.s.l. and drifted about 40 KM NW.

NAME: Lokon-Empung
LOCATION: Indonesia (Sulawesi)
HEIGHT:1580 M
TYPE: Stratovolcano
COORDINATES: 1.358°N 124.792°E

According to local newspapers on 5th July, at 12:43 (local time) a small explosion ejected blocks and bombs to a height of 700 M. An ash plume was seen drifting SSW.

NAME: Karangetang [Api Siau]
LOCATION: Indonesia (Sangihe Islands)
HEIGHT:1784 M
TYPE: Stratovolcano
COORDINATES: 2.78°N 125.40°E

The CVGHM stated on 26th July that the occurrence of rock avalanches descending Karangetang's flanks decreased during 2013; the last one occurred on 7th July, and travelled 2 KM down the Batuawang and Kahetang (E) drainages. Although fog often prevented visual observations, white plumes were sometimes seen rising up to 500 M from two craters. Incandescence from the lava dome was reflected in the plume at night. Seismicity fluctuated, but signals indicating avalanches declined. Based on the cessation of avalanches, visual observations, and decreasing seismicity, the Alert Level was lowered to 2 (on a scale of 1-4) on 26th July.

NAME: Suwanose-Jima
LOCATION: Japan (Ryukyu Islands)
HEIGHT:799 M
TYPE: Stratovolcanoes
COORDINATES: 29.635°N 129.716°E

The Tokyo VAAC reported on 9th July that a pilot observed an ash plume from Suwanose-jima that rose to an altitude of 1.5 KM a.s.l. Ash was not detected in satellite images.

NAME: Sakura-Jima
LOCATION: Japan (Kyushu)
HEIGHT:1117 M
TYPE: Stratovolcano
COORDINATES: 31.585°N 130.657°E

The JMA reported that during 25th – 28thJune Sakura-jima's Showa Crater had four explosions, ejecting tephra that fell at most 1.3 KM from the crater. Crater

Above; the o-take crater of Suwanose-Jima, Japan

incandescence was occasionally detected at night. Based on information from JMA, the Tokyo VAAC reported that on 26th June explosions were detected. Explosions on 1st July generated plumes that rose over 1.2 KM a.s.l.

The JMA reported that two explosions at Sakura-jima's Showa Crater were detected during 5th – 8th July; cloud cover prevented visual observations of the crater. Crater incandescence was occasionally detected at night. The Tokyo VAAC reported that during 8th – 9th July explosions generated plumes that rose to altitudes of 1.8 – 3.7 KM a.s.l. and drifted NE, E, and SE.

The JMA reported that 17 explosions at Sakura-jima's Showa Crater were detected during 8th – 15th July; incandescence from the crater was occasionally observed at night. Explosions during 10th – 11th July generated ash plumes that rose 3 – 3.4 KM above the crater. Based on information from JMA, the Tokyo VAAC reported that during 10th – 16th July explosions generated plumes that rose to altitudes of 1.5 – 4.6 KM a.s.l. and drifted N, NE, ENE, and E. Ash was detected in satellite images. During 10th and 14th – 15th July pilots observed ash plumes that rose to altitudes of 1.5 – 4 KM a.s.l. and drifted NE and E.

The JMA reported that five explosions at Sakura-jima's Showa Crater were detected during 16th – 19th July, and ejected tephra as far as 1.3 KM. A large plume rose 3.5 KM above the crater on 16th July. Incandescence from the crater was observed at night during 18th – 19th July. Based on information from JMA, the Tokyo VAAC reported that during 18th – 21st July explosions generated plumes that rose to altitudes of 2.4 – 4.3 KM a.s.l. and drifted N, E, SE, and S. Ash was sometimes detected in satellite images. On 19th July a pilot observed an ash plume that rose to an altitude of 6.1 KM a.s.l. and drifted SE.

The JMA reported that 10 explosions at Sakura-jima's Showa Crater were detected during 22nd – 26th July, and ejected tephra as far as 1.3 KM. Explosions at 16:35 and 23:33 on 22nd July generated ash plumes that rose 3.2 and 3 KM above the crater rim, respectively. Based on information from JMA, the Tokyo VAAC reported that during 24th – 30th July explosions generated plumes that rose to altitudes of 1.8 – 3.7 KM a.s.l. and drifted E and SE. During 24th – 27th and 29th July pilots observed ash plumes that rose to altitudes of 2.7 – 5.5 KM a.s.l. and drifted E and SE.

NAME: Chirpoi
LOCATION: Russia (Kuril Islands)
HEIGHT: 742 M
TYPE: Caldera
COORDINATES: 46.525°N 150.875°E

The SVERT reported that a thermal anomaly over Snow, a volcano of Chirpoi, was detected in satellite images on 14th July.

The SVERT reported that possible steam-and-gas emissions from Snow, a volcano of Chirpoi, were detected in satellite images on 23rd July.

NAME: Kizimen
LOCATION: Russia (Kamchatka)
HEIGHT: 2376 M
TYPE: Stratovolcano
COORDINATES: 55.130°N 160.32°E

The KVERT reported that during 21st – 28th June moderate seismic activity continued at Kizimen. Video and satellite data showed that lava continued to extrude from the summit, producing incandescence, strong gas-and-steam activity, and hot avalanches on the W and E flanks. A thermal anomaly was detected in satellite images during 21st – 23rd June; cloud cover prevented views of the volcano on the other days.

The KVERT reported that during 28th June – 5th July, moderate seismic activity continued at Kizimen. Video and satellite data showed that lava continued to extrude from the summit, producing incandescence, strong gas-and-steam activity, and hot avalanches on the W and E flanks. A thermal anomaly was detected in satellite images on 28th June, and during 1st and 3rd – 4th July.

The KVERT reported that during 5th – 12th July moderate seismic activity continued at Kizimen. Video and satellite data showed that lava continued to extrude from the summit, producing incandescence, strong gas-and-steam activity, and hot avalanches on the W and E flanks. A thermal anomaly was detected in satellite images on 5th and 9th July.

The KVERT reported that during 12th – 19th July moderate seismic activity continued at Kizimen. Video and satellite data showed that lava continued to extrude from the summit, producing incandescence, strong gas-and-steam activity, and hot avalanches on the W and E flanks. A thermal anomaly was detected in satellite images during 15th – 18th July.

The KVERT reported that during 19th – 26th July moderate seismic activity continued at Kizimen. Video

and satellite data showed that lava continued to extrude from the summit, producing incandescence, strong gas-and-steam activity, and hot avalanches on the W and E flanks. A thermal anomaly was detected in satellite images during 19th – 20th and 23rd July; cloud cover obscured views on the other days.

NAME: Shiveluch
LOCATION: Russia (Kamchatka)
HEIGHT: 3283 M
TYPE: Stratovolcano
COORDINATES: 56.653°N 161.360°E

The KVERT reported that during 21st – 28th June a viscous lava flow effused on the N flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. The seismic network detected a strong explosive eruption that occurred on 27th June from 07:10 to 08:00. The Aviation Colour Code was raised to RED. Ash plumes drifted SE and SW, likely at altitudes of 10 – 12 KM a.s.l. About 2 mm of red ash fell in Klyuchi Village, 50 KM SW; ashfall was also reported in Lazo Village. Later that day the Alert Level was lowered back to ORANGE.

Two ash explosions that occurred on 28th June at 05:06 and 10:01 produced ash plumes that rose to altitudes of 7 and 6 KM a.s.l., respectively.

The Tokyo VAAC reported that during 29th – 30th June an ash plume rose to an altitude of 5.5 – 6.4 KM a.s.l. and drifted E and SE.

The KVERT reported that during 28th June – 5th July, a viscous lava flow effused on the N flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Ash plumes as high as 6 KM a.s.l. were observed during 27th – 28th June and 3rd July. Satellite images detected a daily thermal anomaly, and ash plumes that drifted 35 KM SE on 3rd July.

The KVERT reported that during 5th – 12th July a viscous lava flow effused on the N flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Ash plumes as high as 4.5 KM a.s.l. were observed during 5th – 6th July. Satellite images detected a daily thermal anomaly.

The KVERT reported that during 12th – 19th July a viscous lava flow effused on the N flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Based on notices from Yelizovo Airport (UHPP), the Tokyo VAAC reported that on 15th July an ash plume rose to an altitude of 4.6 KM a.s.l. and drifted E. The KVERT noted that satellite images detected a thermal anomaly on 15th, 17th, and 18th July; cloud cover prevented observations on the other days.

The KVERT reported that during 19th – 26th July a viscous lava flow effused on the N flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Satellite images detected a daily thermal anomaly. Based on analyses of satellite images, the Tokyo VAAC reported a possible eruption on 27th July. Ash was detected in images the next day. The VAAC also noted that, according to the Kamchatka Branch of Geophysical Services (KBGS; Russian Academy of Sciences), ash plumes rose to altitudes of 6.1 – 6.4 KM a.s.l. on 27th and 29th July. The KVERT reported that at 13:17 on 29th July an explosion was observed by a web camera. An ash cloud detected in satellite images rose to an altitude of 3.5 KM a.s.l. and drifted 60 KM ESE; the cloud was 15 KM long and 7 KM wide.

NAME: Tolbachik
LOCATION: Russia (Kamchatka)
HEIGHT: 3682 M
TYPE: Shield Volcano
COORDINATES: 55.830°N 160.330°E

The KVERT reported that the S fissure along the W side of Tolbachinsky Dol, a lava plateau on the SW side of Tolbachik, continued to produce very fluid lava flows during 21st -28th June that travelled to the W, S, and E sides of the plateau. Cinder cones continued to grow along the S fissure and weak gas-and-steam plumes were observed. A large thermal anomaly on the N part of Tolbachinsky Dol was visible daily in satellite imagery.

The KVERT reported that the S fissure along the W side of Tolbachinsky Dol, a lava plateau on the SW side of Tolbachik, continued to produce very fluid lava

Above; erupting cinder cone and lava flow on the S fissure of Tolbachik on 22nd July

flows during 28th June – 5th July that travelled to the W, S, and E sides of the plateau. Cinder cones continued to grow along the S fissure and weak gas-and-steam plumes were observed. A large thermal anomaly on the N part of Tolbachinsky Dol was visible daily in satellite imagery.
The KVERT reported that the S fissure along the W side of Tolbachinsky Dol, a lava plateau on the SW side of Tolbachik, continued to produce very fluid lava flows during 5th – 12th July that travelled to the W, S, and E sides of the plateau. Cinder cones continued to grow along the S fissure and weak gas-and-steam plumes were observed. A large thermal anomaly on the N part of Tolbachinsky Dol was visible daily in satellite imagery.
The KVERT reported that the S fissure along the W side of Tolbachinsky Dol, a lava plateau on the SW side of Tolbachik, continued to produce very fluid lava flows during 12th – 19th July that travelled to the W, S, and E sides of the plateau. Cinder cones continued to grow along the S fissure and weak gas-and-steam plumes were observed. A large thermal anomaly on the N part of Tolbachinsky Dol was visible daily in satellite imagery.
The KVERT reported that the S fissure along the W side of Tolbachinsky Dol, a lava plateau on the SW side of Tolbachik, continued to produce very fluid lava flows during 19th – 26th July that travelled to the W, S, and E sides of the plateau. Cinder cones continued to grow along the S fissure and weak gas-and-steam plumes were observed. A thermal anomaly on the N part of Tolbachinsky Dol was visible daily in satellite imagery.

NAME: Kilauea
LOCATION: USA (Hawaii)
HEIGHT: 1222 M
TYPE: Shield Volcano
COORDINATES: 19.421°N 155.287°W

During 26th June – 2nd July, HVO reported that the circulating lava lake occasionally rose and fell in the deep pit within Kilauea's Halema'uma'u Crater but remained about 40-45 m below the crater floor. The plume from the vent continued to deposit variable amounts of ash, spatter, and Pele's hair onto nearby areas.
At Pu'u 'O'o Crater, glow emanated from three spatter cones and a small lava pond on the E part of the crater floor. The Kahauale'a 2 lava flows (formerly known as the Kahauale'a II lava flow), fed by the NE spatter cone, were active as far N as 2.6 KM and as far NNW as 1.9 KM, and burned forest in both areas. At about 22:30 on 18th June breakouts from the Kahauale'a 2 lava tube, near the NE spatter cone and high on the NE flank of Pu'u 'O'o cone, produced lava flows that travelled N down the flank. On 27th June the Kahauale'a 2 flow field was mapped and found to be 40 percent larger than when it was last mapped on 11th June.
Peace Day activity, fed by lava tubes extending from Pu'u 'O'o, consisted of some breakout activity on the pali and coastal plain, and ocean entries at locations inside and outside the National Park boundary.

During 3rd – 9th July, the HVO reported that the circulating lava lake occasionally rose and fell in the deep pit within Kilauea's Halema'uma'u Crater. The plume from the vent continued to deposit variable amounts of ash, spatter, and Pele's hair onto nearby areas.
At Pu'u 'O'o Crater, glow emanated from three spatter cones and a small lava pond on the E part of the crater floor. Branches of the Kahauale'a 2 lava flow, fed by the NE spatter cone, were active as far N as 2.6 KM and as far NNW as 1.9 KM, and burned forest in both areas. Peace Day activity, fed by lava tubes extending from Pu'u 'O'o, consisted of some breakout activity on the pali and coastal plain, and ocean entries at locations inside and outside the National Park boundary.

During 10th – 16th July, the HVO reported that the circulating lava lake occasionally rose and fell in the deep pit within Kilauea's Halema'uma'u Crater. The plume from the vent continued to deposit variable amounts of ash, spatter, and Pele's hair onto nearby areas.
At Pu'u 'O'o Crater, glow emanated from three spatter cones and a small lava pond on the E part of the crater floor. The Kahauale'a 2 lava flow branches, fed by the NE spatter cone, were active as far N as 2.6 KM and as far NNW as 1.9 KM, and burned forest in both areas. Peace Day activity, fed by lava tubes extending from Pu'u 'O'o, consisted of some breakout activity on the pali and coastal plain, and ocean entries at locations inside and outside the National Park boundary.

During 17th – 23rd July, the HVO reported that the circulating lava lake occasionally rose and fell in the deep pit within Kilauea's Halema'uma'u Crater. The plume from the vent continued to deposit variable amounts of ash, spatter, and Pele's hair onto nearby areas. On 19th July several pieces of the pit wall fell into the lake.
At Pu'u 'O'o Crater, glow emanated from three spatter cones and a small lava pond on the E part of the crater floor. The Kahauale'a 2 lava flow branches, fed by the

NE spatter cone, were active as far N as 2.6 KM and as far NNW as 1.9 KM, and burned forest in both areas. Peace Day activity, fed by lava tubes extending from Pu'u 'O'o, consisted of some breakout activity on the pali and coastal plain, and an ocean entry at a location E and outside of the National Park boundary.

During 24th – 30th July, the HVO reported that the circulating lava lake occasionally rose and fell in the deep pit within Kilauea's Halema'uma'u Crater. The plume from the vent continued to deposit variable amounts of ash, spatter, and Pele's hair onto nearby areas. The lake level receded during 25th – 26th July and was 75 M below the Halema'uma'u Crater floor on 26th July. The inner ledge, a long-time fixture within the vent, started collapsing at 20:30 on 25th July; several pieces of the pit wall fell into the lake on both days. The lake level started to rise again and was 65 and 67 M below the crater floor on 28th and 29th July, respectively.

At Pu'u 'O'o Crater, glow emanated from three spatter cones and a small lava pond on the E part of the crater floor. The Kahauale'a 2 lava flow branches, fed by the NE spatter cone, were active as far NE as 3.2 KM and as far NW as 2 KM, and burned forest in two locations at the N edge of the 1983-1986 'a'a flows from Pu'u 'O'o. Peace Day activity, fed by lava tubes extending from Pu'u 'O'o, consisted of some breakout activity on the pali and coastal plain, and an ocean entry outside of the National Park boundary to the E.

NAME: Popocatepetl
LOCATION: Mexico
HEIGHT: 5426 M
TYPE: Stratovolcano
COORDINATES: 19.023°N 98.622°W

The CENAPRED reported that on 3rd July the seismic network detected 84 emissions from Popocatépetl. Diffuse ash plumes at 07:05 and 08:25 rose almost 2 KM above the crater. Starting at 17:42 tremor was accompanied by persistent emissions of gas and ash that rose 3.5 KM. Incandescent tephra was ejected short distances onto the N and E flanks. During 3rd – 4th July, tremor and 99 emissions were detected, and incandescence from the crater was observed. Steam-and-gas plumes continued to rise above the crater and incandescent tephra was ejected onto the N and E flanks. According to news articles, multiple airlines canceled 47 flights to and from the México City (65 KM NW) and Toluca (105 KM WNW) airports on 4th July. Flights resumed later that day. Ash fell in areas as far as México City (70 KM NW).

Above; Popocatepetl towers over Mexico City.

Gas, steam, and ash plumes drifted NW on 5th July, and almost continuous tremor was recorded. CENAPRED staff, with support of the Ministry of the Navy of México, conducted an overflight and observed continuously ejected incandescent tephra deposited at most 1.5 KM away on almost all flanks, and an ash plume that rose 2 KM. Cloud cover often obscured visual observations. A news article stated that four airlines canceled a total of 17 flights.

On 6th July low-frequency, high-amplitude tremor was accompanied by gas, steam, and ash emissions that rose 2 KM and drifted NW. At 13:30 the low-frequency tremor amplitude decreased, followed by diminishing emissions of gas and ash which drifted NW. The National Coordination of Civil Protection (CNPC) of the Ministry of Interior (SEGOB), CENAPRED, and Scientific Advisory Committee raised the Alert Level to Yellow, Phase Three. The public was reminded not to approach the crater within a 12-KM radius. Later that day gas-and-ash plumes rose 3 KM and drifted NW. Three explosions were detected, but cloud cover prevented visual confirmation. News articles noted ash again in parts of México City; ash accumulation was much greater in areas closer to the volcano.

During 7th – 9th July tremor was accompanied by persistent emissions of steam, gas, and small amounts of ash that drifted WSW and NW; cloud cover continued to hinder visual observations. Three explosions increased gas-and-ash emissions.

Incandescence and ejected incandescent tephra were sometimes observed. During an overflight on 7th July, scientists observed that a new lava dome, 250 M in diameter, had recently formed in the crater. Explosions on 8th July generated ash plumes that rose 1 KM and drifted NW, and explosions on 9th July generated an ash plume that rose 1.5 KM and drifted SW.

CENAPRED reported that scientists aboard an overflight of Popocatépetl on 10th July confirmed the presence of a new lava dome that was 250 M wide and 20 M thick. During 10th – 16th July seismicity indicated continuing gas-and-steam emissions that sometimes contained ash; cloud cover often prevented visual confirmation. Incandescence from the crater was observed at night during 9th – 11th July. Plumes with small amounts of ash were observed at 15:56 and 17:36 on 10th July, and an explosion was detected at 22:59. Medium-sized explosions at 19:49 on 11th July, and at 01:37 and 03:00 on 12th July, ejected incandescent tephra 2 KM onto the E flank and 1 KM onto the N flank. According to a news article, on 12th July a flight into and out of México City's (65 KM NW) international airport was canceled and operations at a small airport in Puebla (~50 KM to the E) were suspended.

Early on 13th July a gas-and-ash plume was observed drifting NE. During 13th – 14th July steam, gas, and ash emissions rose from the SE part of the crater, some incandescence from the crater was observed, and a dense steam-and-gas plume was noted. On 15th July a plume of steam, gas, and ash rose 1 KM and drifted W. During an overflight later that day scientists observed a 200-M-wide and 20-to-30 M deep crater where the lava dome had been; explosions during the previous few days had destroyed the dome. At 00:36 on 16th July a steam-and-gas plume containing minor amounts of ash rose from the crater. Incandescence emanating from the crater was also observed early that day.

The CENAPRED reported that during 17th – 23rd July seismicity at Popocatépetl indicated continuing gas-and-steam emissions that sometimes contained ash; cloud cover often prevented visual confirmation. Incandescence from the crater was occasionally observed. On 17th July an explosion was detected at 15:16. During a period of clear weather on 19th July observers noted steam-and-gas plumes drifting W. An explosion at 15:33 generated a steam, gas, and ash plume that rose 700 M above the crater and drifted NW. Another explosion was detected at 22:57. On 20th July steam-and-gas plumes rose 1 KM and drifted SW; steam, gas, and ash emissions rose 1.2 KM and drifted WSW. Steam-and-gas plumes were bluish on 21st July; the plumes rose 500 M and drifted NW. An explosion at 03:43 on 23rd July generated an ash plume that rose 1.1 KM and drifted NW.

NAME: Santa Maria
LOCATION: Guatemala
HEIGHT: 3772 M
TYPE: Stratovolcano
COORDINATES: 14.756°N 91.552°W

During 26th June – 2nd July, the INSIVUMEH reported that ash plumes frequently rose from Santa María's Santiaguito lava-dome complex. Explosions during 26th – 28th June generated ash plumes that rose at most 900 M and drifted SW; ashfall was reported in Monte Claro (S) and Finca La Florida (5 KM S) during 27th – 28th June. Avalanches originated from the lava flow on the S flank and from the SW lava dome, and produced pyroclastic flows on 27th June. An explosion at dawn on 28th June produced rumbling and degassing noises. Four moderate explosions during the morning of 30th June generated ash plumes that rose as high as 1 KM and drifted S and SE. Rockfalls occurred on the flanks, and ash fell in San José, La Quina, and the region of Calahuaché.

Explosions during 1st – 2nd July generated incandescent avalanches from the S dome; a white plume rose 300 M above the crater. Grey plumes rose 400 M and drifted N.

NAME: Fuego
LOCATION: Guatemala
HEIGHT: 3763 M
TYPE: Stratovolcano
COORDINATES: 14.473°N 90.880°W

The INSIVUMEH reported that explosions from Fuego on 26th June generated shock waves and ash plumes that rose 400 M and drifted SW. On 27th June explosions produced ash plumes that rose 550 M and drifted 10 KM. Shock waves vibrated structures in areas including Sangre de Cristo (8 KM WSW), Panimaché (8 KM SW), and Morelia (9 KM SW). Lahars descended the Las Lajas and El Jute drainages (SE), carrying blocks up to 1.5 M in diameter as well as tree trucks and branches.

On 28th June Vulcanian explosions produced shockwaves felt by local populations within 15 KM. Explosions also generated ash plumes that rose 100 –

200 M and drifted W, and ejected incandescent tephra 150 M above the crater. Ashfall was reported in Panimaché, Morelia, and Sangre de Cristo. A lava flow was active on the flank.

During 29th June – 2nd July explosions generated ash plumes that rose 500 – 600 M and mostly drifted W and NW.

The INSIVUMEH reported that explosions from Fuego during 3rd – 9th July generated ash plumes that rose 100 – 175 M above the crater and drifted 4 – 10 KM W and NW on most days. During 4th – 5th and 8th – 9th July shock waves vibrated structures in areas including Sangre de Cristo (8 KM WSW), Panimaché (8 KM SW), and Morelia (9 KM SW). On 5th July lahars descended the Las Lajas and El Jute drainages (SE), carrying blocks up to 50 cm in diameter.

NAME: Pacaya
LOCATION: Guatemala
HEIGHT: 2552 M
TYPE: Complex Volcano
COORDINATES: 14.381°N 90.601°W

The INSIVUMEH reported that blue-coloured emissions from Pacaya were visible drifting SW and W at low altitudes on 26th June. Strombolian activity was observed from MacKenney cone the following day; weak-to-moderate explosions ejected small amounts of tephra 8 M above the crater that were then deposited on the W flank. Audible explosions were noted up to 5 KM away.

Incandescence was visible at night on 27th June. White fumarolic plumes rose 300 M above the cone on 28th and 30th June; white and blue fumarolic plumes drifted SW during 1st – 2nd July. A recent investigation of MacKenney cone determined that a 15 M high cone had been the source of recent explosive activity.

In a special bulletin on 24 July, the INSIVUMEH noted that the eruption at Pacaya had been changing during the previous few days, especially the seismic pattern. Seismic signals indicating explosions and ejections of material lasted up to seven minutes; the events were low frequency and long duration. The cone continued to grow and was 30 M high earlier in the week. By 24th July the cone was 4 M above the MacKenney crater rim. Seismicity again increased. On 25th July weak explosions and incandescence from the cone were observed at night. Rumbling was heard. On 29th July incandescence from the crater was observed for a few hours in the morning, and a plume rose at most 100 m and drifted S. An eruption on 30th July included a high-energy phase that lasted for four hours and incandescent material that was ejected 250 M above the cone. A diffuse ash plume drifted 2 KM N, causing ashfall in areas downwind, and another ash plume drifted 5 KM S. Activity then declined considerably; explosions were not observed and seismicity decreased, although signals indicating fluid movement continued to be detected.

NAME: Nevado Del Ruiz
LOCATION: Colombia
HEIGHT: 5321 M
TYPE: Stratovolcano
COORDINATES: 4.895°N 75.322°W

The INGEOMINAS reported on 11th July that at 11:43 (local time) a phase of tremor occurred at the volcano. Webcams noted a weak emission of ash to a height of about 900 M above the crater. Light ash fall was reported near the entrance to the National Park. The Washington VAAC noted a minor ash plume in satellite images.

NAME: Galeras
LOCATION: Colombia
HEIGHT: 4276 M
TYPE: Complex Volcano
COORDINATES: 1.22°N 77.37°W

INGEOMINAS webcams captured small ash plumes from the volcano on 3rd July. NOAA satellite images showed a small S02 plume.

NAME: Reventador
LOCATION: Ecuador
HEIGHT: 3562 M
TYPE: Stratovolcano
COORDINATES: 0.077°S 77.656°W

The IG reported that during 10th – 16th July seismic activity at Reventador was high; weather conditions mostly prevented visual observations of the crater.

During partially clear views on 13th July, observers noted a new lava flow on the S flank. At 15:00 on 15th July continuous tremor was detected, which intensified at 20:00, and then decreased at midnight. Intense Strombolian activity during this time was characterized by variable-magnitude explosions and roaring. Explosions generated blocks that rolled down the flanks. Incandescence from the lava flow on the S flank was observed.

The IG reported that during 17th – 19th July seismic activity at Reventador remained high; at times periods of increased seismicity were followed by relatively quiet episodes. The seismic network recorded long-

period signals, rockfalls, explosions, and emissions. Based on reports from observers at camp San Rafael, cloud cover often prevented visual observations, although on 18th July a new lava flow on the E flank was observed with a video camera, and a gas-and-ash plume was observed rising 1 KM. During 21st – 22nd July gas plumes with low ash content rose to low heights.

The IG reported that during 24th – 30th July seismic activity at Reventador remained high and was characterized by explosions, low-intensity emissions, and long-period earthquakes indicting fluid movement. Cloud cover mostly prevented visual observations. On 26th July an explosions generated a low-altitude ash plume that drifted W.

NAME: Tungurahua
LOCATION: Ecuador
HEIGHT: 5023 M
TYPE: Stratovolcano
COORDINATES: 1.467°S 78.442°W

The IG reported that seismic activity at Tungurahua was at low levels during 10th – 11th July, increased to moderate levels on 12th July, and increased again to moderate-to-high levels on 13th July; the number and type of events gradually and constantly increased. Cloud cover prevented visual observations of the crater. A total of 266 long-period events were recorded from 15:00 on 13th July through the time of a large explosion at 06:47 on 14th July, which was heard in areas as far as Guayaquil (about 180 KM SW).

At 06:51 an ash plume generated by the explosion rose 5.1 KM above the crater and several significant pyroclastic flows descended the Achupashal ravine (NW). Continuous tremor was detected until 08:40, and then seismicity dramatically decreased. At 08:42 the plume rose to 8.3 KM above the crater and drifted N, W, and S. At 09:30 the plume drifted N and was observed drifting over the E parts of Quito (130 KM N). Heavy amounts of ash and tephra fell in areas near the volcano including Bilbao (W, 4 cm diameter), Chacauco (NW, 5 cm diameter), Cotaló (8 KM NW), Cahuají (8 KM SW), Choglontus (SW), El Manzano (8 KM SW), Puela (8 KM SW), and Penipe (15 KM SW); thinner deposits were reported in towns including Pelileo (8 KM N), Ambato (31 KM N), Cevallos (23 KM NW), Colta (45 KM SW), Guanujo (65 kKM WSW), and Guaranda (65 KM WSW), and in the cantons of Guano (30 KM SW), Valencia, Empalme, Buena Fé, and areas in the province of Manabi (180 KM NW). According to news articles, over 200 people were evacuated from Cusua, Chacauco, and Juive.

On 15th July steam plumes were observed rising from the crater during times of better visibility. Long-period earthquakes and tremor were detected during 15th – 16th July. Ash fall was reported in El Manzano on 16th July; cloud cover continued to prevent observations of the crater.

IG reported that at night during 16th – 17th July observers noted incandescent blocks falling onto Tungurahua's flanks. Cloud cover often prevented observations. An explosion was heard in Ambato (31 KM N) on 16th July. Explosions were detected on 17th July, and white ash fall was reported in Choglontus (SW). Steam-and-ash plumes were observed rising 1.5 KM and drifting W. During 18th – 19th July Strombolian activity ejected blocks that rolled 500 M down the flanks. Ash fell in Choglontus. Seismicity remained high during 17th – 19th July; 18-33 long-period earthquakes, 53-82 tremors indicting emissions, and 3-6 explosions were recorded per day.

On 19th July an ash plume rose 1 KM and drifted SW. The geodetic monitoring system indicated an inflationary trend on the N flank and deflation SW of the volcano, indicating the presence of a magma body about 2 KM below the crater. During 19th – 20th July ashfall was reported in Choglontus and El Manzano (8 KM SW). On 20th July 127 long-period earthquakes, 71 tremors indicting emissions, and 43 explosions were detected.

Seismicity again increased on 21st July; 220 long-period earthquakes, three periods of tremor indicating emissions, and 15 explosions were detected. The three periods of tremor were characterized by two 1-hour-long sessions and a third period lasting at least eight hours. Explosions vibrated nearby structures, and ejected blocks onto the upper parts of the flanks. Gas-and-ash plumes rose as high as 5 KM, and produced ash fall in Cevallos (23 KM NW), Tisaleo (29 KM NW), Mapayacu (SW), Choglontus, and El Manzano.

Strombolian activity overnight during 21st-22nd July ejected blocks that rolled 500 M down the flanks. Strong explosions again vibrated structures, and ash emissions rose 1 KM. Ashfall was noted in El Manzano, Pillate, Chacuaco and Cahuaji. On 23rd July ash plumes rose 1.5 KM and drifted WSW. Strombolian activity was observed overnight and roaring was heard. Ashfall was reported in Cahuají and Choglontus. Seimscity decreased but still remained high during 22nd – 23rd July; 22-40 long-period earthquakes, 7-12 tremors indicting emissions, and 4-9 explosions were detected per day.

The IG reported that activity at Tungurahua remained high during 24th – 30th July. Although cloud cover often prevented visual observations of the crater, plumes were observed almost daily.

Roaring was also regularly reported. On 24th July an ash plume rose 5 KM above the crater and drifted WNW, causing black ashfall in El Manzano (8 KM SW), Choglontus (SW), Puela (8 KM SW), Cahuají (8 KM SW), and minor ashfall in Cevallos (23 KM NW), Quero (20 KM NW), and Mocha (25 KM WNW). On 25th July ashfall was reported in El Manzano, Choglontus, and Cahuají. An explosion at 18:35 generated an ash plume that rose 2 KM and drifted W. The next day windows vibrated at the Tungurahua Observatory (OVT) in Guadalupe (14 KM N). Minor amounts of ash fell in El Manzano, Choglontus, Puela, Mocha, and in the sectors of Guaranda (65 KM WSW), Salinas, and Guanujo (65 km WSW). Overnight during 26th – 27th July Strombolian activity ejected blocks that rolled 300 M down the flanks. At 19:47 a strong explosion vibrated windows at OVT and in El Manzano and Pillate (8 KM W). An ash plume rose 2 KM and drifted WSW; minor ashfall was reported in Bilbao (W), Quero, and Mocha. Later that day ash emissions rose 500 M and drifted SW.

Activity increased on 28th July; at 06:26 a higher number of long-period earthquakes were detected, explosions became more frequent and larger, blocks were ejected, and ash emission rose from the crater. An explosion at 07:23 generated a small pyroclastic flow that descended the N flank. Ash fell in Choglontus, El Manzano, Mocha, and Tisaleo (29 KM NW). Activity remained high the next day; ash plumes rose 2 KM and drifted WNW. During 28th – 29th July and ashfall was reported in Mocha, Quero, Tisaleo, Cevallos, and Pillate.

NAME: Copahue
LOCATION: Chile/Argentina border
HEIGHT: 2997 M
TYPE: Stratovolcano
COORDINATES: 37.85°S 71.17°W

On 6th July, a degassing plume was observed at the volcano. Small ash emissions also occurred. A faint S02 plume was seen in satellite images.

All volcano reports in this issue are subject to change. All reports in this issue were from the following sources.

Global Reports:

Activolcans: http://activolcans.info/

VolcanoDiscovery: http://www.volcanodiscovery.com/news.html

Global Volcanism Program (Weekly Reports): http://www.volcano.si.edu/reports/usgs/

Volcanolive - John Seach: http://www.volcanolive.com/index.html

And also the writers and commenters of Eruptions and VolcanoCafe.

Also Including:

http://www.voxy.co.nz/

Acronyms and Abbreviations

a.s.l - Above Sea Level

AVO - Alaska Volcano Observatory

CENAPRED - Centro Nacionale de Prevencion de Desastres

CVGHM - Center of Volcanology and Geological Hazard Mitigation

HVO - Hawaii Volcano Observatory

IG - Instituto Geofísico

INETER- Instituto Nicaragüense de Estudios Territoriales

INSIVUMEH - Instituto Nacional de Sismologia, Vulcanologia, Meteorologia e Hidrologia

JMA - Japanese Meteorological Agency

KVERT - Kamchatkan Volcanic Eruption Response Team

MODIS - Moderate Resolution Imaging Spectroradiometer

OVSICORI-UNA - Observatorio Vulcanológico y Sismológico de Costa Rica

RVO - Rabaul Volcano Observatory

SVERT - Sakhalin Volcanic Eruption Response Team

VAAC - Volcanic Ash Advisory Centre

Volcano EX Press

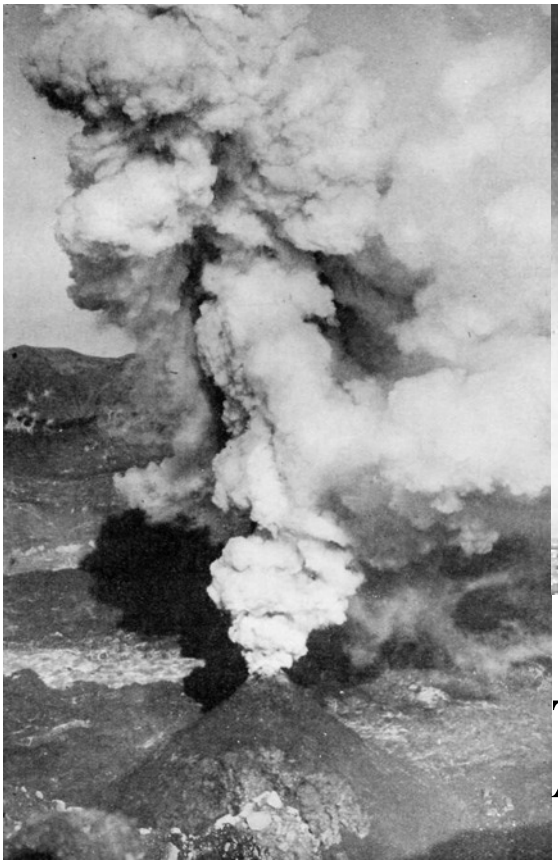
Issue 6, July 2013

The Latest in Volcanoes and Volcanic Eruptions

A Bulletin of World Volcanism magazine

www.volcanismbulletin.org

bulletinwv@hotmail.co.uk



The Cyclic Eruptions of Vesuvius; And What Happens Next?

Possibly the most dangerous volcano on Earth, Vesuvius is currently undergoing a period a calm.

But historical records show that periods of quiet at the volcano are usually followed by large volcanic eruptions.

With the nearby city of Naples and its surroundings being a home to 4 million people, this is a serious issue.

So what will happen to Vesuvius next?, there are currently 2 possibilities.

Continued on page 18

Also in this Issue:

According to records, eruptions at Vesuvius should have resumed after the explosive eruptions in 1944. But the repose period has now exceeded so long that the next eruptions are thought to be the initiation of a new cycle of eruptions at Vesuvius.

These violent (sub-plinian or plinian) eruptions will be followed by centuries of quiet lava effusion from the summit cone.

Cycles

The first cycle (here termed the Naples cycle) is currently the most likely outcome.

The last 'Naples' cycle started in 1631 (although two small eruptions occurred in 1500 and 1570) after the last major eruptions in 1150. So a repose period of around 500 years.

The 1631 eruption of Vesuvius was a violent pinion eruption. After months of earthquakes the volcano erupted, sending large ash plumes into the sub-stratosphere and large pyroclastic flows at the settlements around the Bay of Naples. The eruption killed an estimated 4,000 people.

After the 1631 eruption the eruption for the next 400 years changed, activity was now mostly limited to small effusion of lava flows and spatter cones in the crater of Vesuvius, with occasional explosive events.

The second cycle (the Pompeiian cycle) started around 3800 years ago and had 6 sub-plinian eruptions, including the 79 AD eruption which ended the last Pompeian cycle and began the next one.

If a new Pompeiian cycle is to begin, then a repose period of several centuries is to be expected.

Why These Cycles Happen

Sometimes at Vesuvius, fresh magma is able to travel straight through the magmatic system of the volcano and erupt. However

Above; a contemporary view of the 1631 eruption of Vesuvius, depicting an ash plume and a lava flow travelling to the sea. The area below the volcano is now much more populated than in the 1600's.

when Tephrite magma enters into the volcano at around 1,100 degrees Celsius and enters into one of the volcanoes shallow magma chambers (one was thought to exist 5 km below the volcano during the 79 AD eruption)a process called magma differentiation occurs. The magma has time to evolve into more sticky and gaseous lavas.

This process in maintained by the constant injection of fresh basaltic magmas into the bottom of Vesuvius' magma chamber. As time goes on, the cooler, gaseous magma begins to exert pressure on the chamber; once the pressure is released Vesuvius undergoes a major plinian eruption.

Evacuation Plans

Of course with such potential for large scale eruptions. Meetings in 1991 and 1993 put an action plan in place for those living in the 'Red Zone', the place that would be most effected by the eruptions, which would mean evacuating around 600,000 people in a few hours notice.

Conclusion

No one knows what scale of eruptions will happen at Vesuvius when it reawakens, all we can do is be as best prepared for it as possible. Even so, it still might not be enough if a Pompeii style eruption occurs again.

Volcanic Screams Before Eruption?

Before a volcano usually erupts, a period of tremor called harmonic tremor occurs and is made up of hundreds of small earthquakes which then signal the start of the eruption. These earthquakes can produce high frequency noise that usually is inaudible to humans.

However a group of volcanologists working on Redoubt volcano in Alaska have discovered something incredible.

Redoubt Volcano

Redoubt is a steep sided stratovolcano around 10 km in diameter rising above the cook inlet. Volcanism in the area may have started 800,000 years ago, although much of the cone was built up in the last 200,000 years.

Eruptions in the past have produced extensive lahar deposits. Several historical eruptions are known from the volcano.

The 2009 eruption consisted of ash explosions and the growth of a lava dome at the edge of Redoubts crater.

New Research

New research suggests that immediately prior to the eruption of Redoubt, harmonic tremor reached such a high frequency that it was actually audible.

Apparently no other theories suggested why Redoubts tremor was so much higher than others.

A new theory is that magma is being forced through a narrow conduit deep inside the volcano under enormous pressure. The rock of Redoubt is thought to keep sticking to the side of the conduit and when the pressure is enough, the magma unsticks and moves further. Each of these events causes a small earthquake, until the pressure gets so great that these small earthquakes are being produced constantly until they all meld into one constant sound.

Above; Redoubt Eruption in 2009. Research has apparently showed that this volcano 'screamed' prior to eruption.

What Next?

The researchers hope that this new model could help to provide an early warning system for volcanoes such as Redoubt.

Also, it is known that harmonic tremor builds to a high frequency then stops, then the volcano erupts. This is considered to be because the earthquakes can't keep up anymore.

Could It Work?

Although this work could predict the volcano will erupt, the researchers say that it could only predict up to a few hours before the eruption. Which is defiantly not enough for a mass evacuation for a populated area.

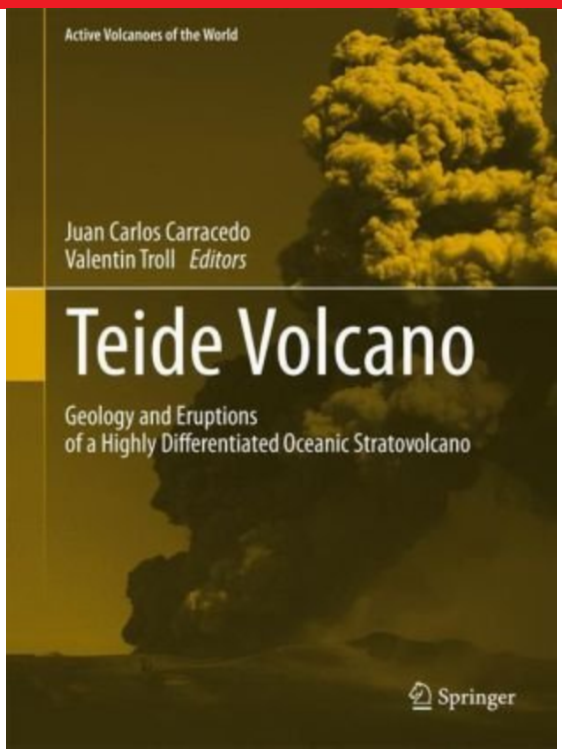
Maybe in time this system could be refined to work better but for now it is just a model.

Upcoming Books

Active Volcanoes of the World

This new series of books published by Springer aims to catalogue volcanoes like never before. The series focuses on one particular volcano or volcanic area active in the last 10,000 years. A series of papers documenting its eruptive history, petrology, geology are presented by experts on each volcano.

The first book (Teide Volcano: Geology and Eruptions of a Highly Differentiated Oceanic Stratovolcano) is available from Springer Publishers website: http://www.springer.com/series/10081



Above; Active Volcanoes of the World: Teide Volcano: Geology and Eruptions of a Highly Differentiated Oceanic Stratovolcano.

Year: 2013

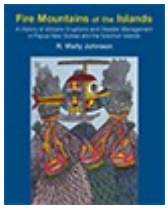
Authors: Various

Pages: 279 (Teide, book 1)

Publisher: Springer

Price: (Teide, book 1) 83.29 euros

Fire Mountains of the Islands : a History of Volcanic Eruptions and Disaster Management in Papua New Guinea and the Solomon Islands



Above; Fire Mountains of the Islands

Written by former Volcanologist at the Rabaul Volcano Observatory, Robert Wally Johnson, this book tells the history of volcanic eruptions in the area of Papua New Guinea.

Year: 2013

Author: R W Johnson

Pages: not disclosed

Publisher: Australia National University

Price: not disclosed

Upcoming Books

Modelling Volcanic Processes: The Physics and Mathematics of Volcanism

In order to predict a volcanoes behaviour, volcanologists must understand the physical process that occur at volcanoes. This book finally fills the whole in volcanological literature in that it contains all of these physical models and state of the art volcano modelling processes. Chapters cover sub-surface magmatic processes right through to eruption.

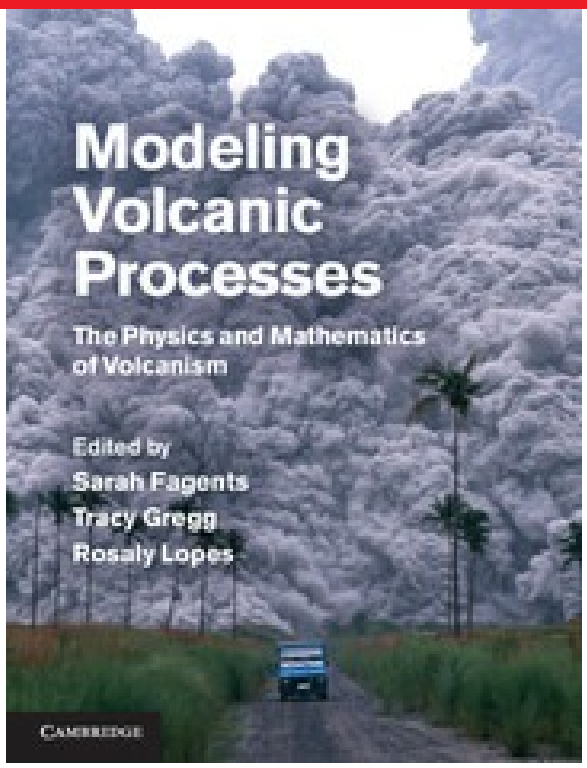
Year: 2013

Authors (editors): S AFagents, T K P Gregg, R M C Lopes

Pages: 431

Publisher: Cambridge University Press

Price: 80.00 US dollars



Above; Modelling Volcanic Processes.

Dangerous Neighbours: Volcanoes and Cities

Many large cities are located in the shadow of active volcanoes. Many fatalities and destruction has come from these volcanoes. Grant Heiken looks at the real threats from volcanic eruptions in populated areas by looking at examples from past threats.

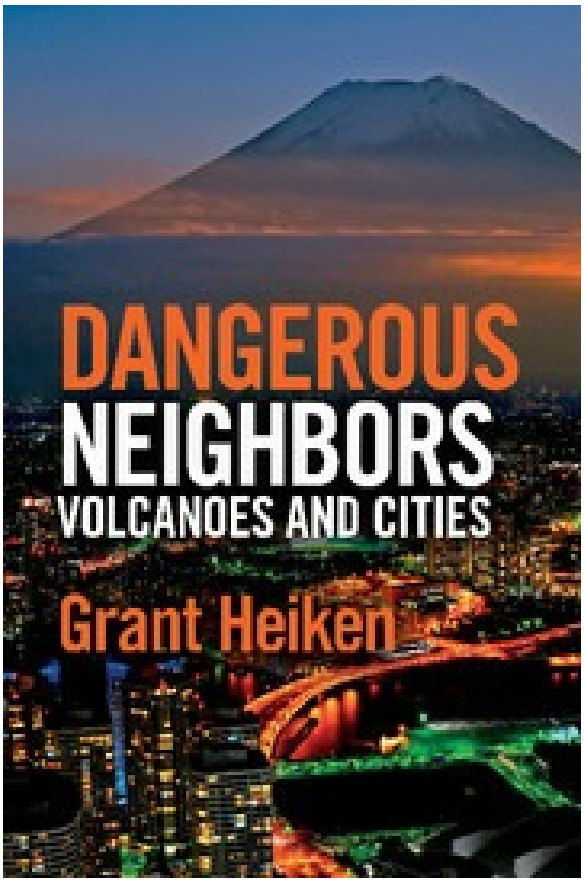
Year: 2013

Author: G Heiken

Pages: 204

Publisher: Cambridge University Press

Price: 30.00 US dollars



Above; Dangerous Neighbours: Volcanoes and Cities

Upcoming Books

Jorullo: The History of the Volcano of Jorullo and the Reclamation of the Devastated District by Animals and Plants

Originally published in 1930 two years after its author, renowned zoologist Hans Gadow died, Cambridge has republished this amazing work detailing the history of the volcanic cone of Jorullo that erupted in Central Mexico and its affects on the local wildlife.

Year: 2013 (republished)

Author: H Gadow

Pages: 122

Publisher: Cambridge University Press

Price: 26.99 US dollars

Website of the Month

Journal of Applied Volcanology (Springer)

Launched last year, the Journal of Applied volcanology is the worlds first open-file (free) volcano journal.

The Journal mainly focuses on Volcanic Risk and Social Impact and is filled with many interesting papers like a refined list of Volcano caused fatalities and even how to make your own ash fall measuring device.

www.appliedvolc.com

Your Thoughts

This month, where do you think the worlds most dangerous volcano is (excluding Vesuvius in Italy)?. Write to us at bulletinwv@hotmail.co.uk and let us know!