# Bulletin of World Volcanism

## Issue: December 2012

## NEW ACTIVITY/UNREST



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## NEW INSIGHTS



## VOLCANO ANALYSIS



## PLINY AWARD OF THE YEAR

## *CONTINUING ACTIVITY*



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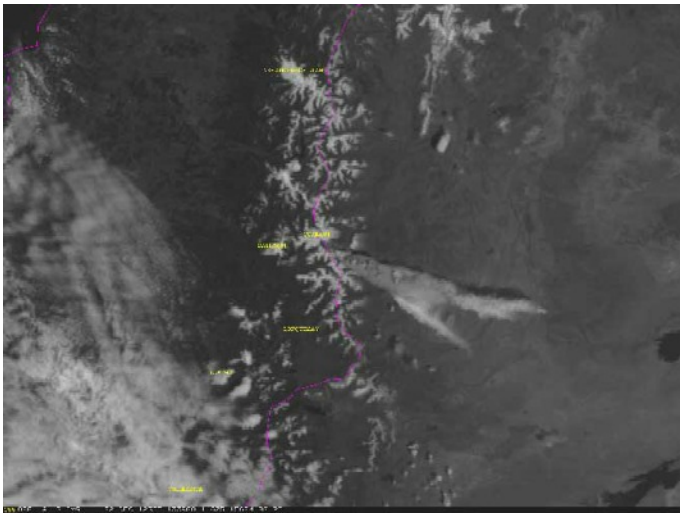
## FALSE REPORTS OF VOLCANIC ACTIVITY

A report of a volcanic eruption in Rasuwa, Nepal, was actually a large Forest fire.

# WORLDWIDE MONTHLY VOLCANIC ACTIVITY



*Above; the initial eruption plume from Copahue on 22 December.*

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

A satellite image taken at 10:45 (UTC), 22nd December shows an ash plume from Copahue drifting 110 KM SE form the volcano.
A Satellite image taken on 14:45 (UTC) on 22 November shows a large ash plume reaching a height of 9.5 KM and drifting 300 KM from Copahue volcano. Ash fall was reported in Loncopue village in Argentina, 50 KM SE of the volcano. A 15 KM exclusion zone was set up around the volcano. The Alert Level for the volcano was initially raised from GREEN to ORANGE, then to RED.

On 22nd December at 21:43 (local time), a strong harmonic tremor was noted from the volcano. After this episode (which lasted around 5 minutes), two explosions took place accompanied by loud noises. Strong incandescence was visible from an area of the summit crater during the explosions (probably meaning that these explosions were phreatomagmatic).

The SERNAGEOMIN reported that from 23rd – 24th December, strombolian explosions ejected ash to a height of 450 M; the tremor signal was low. The Buenos Aires VAAC reported that on 23rd December, satellite imagery show gas and steam plumes with possible small ash content drifting SE.

Activity at the volcano on 25th December was low, with a dozen small explosions detected; the tremor signal was low. The Buenos Aires VAAC stated that on 24th December, an ash plume from Copahue drifted to the Atlantic Ocean (around 800 KM away). The Alert Level was lowered to ORANGE. The SERNAGEOMIN reported fresh ash emissions on 27th December, with ash plume rising to a height of 3 KM and drifting 50 KM NE. Strong S02 emissions were detected. On 28th December, incandescence was detected on webcam images, indicating small strombolian activity from the summit. The SERNAGEOMIN reported that eruptive activity continued until 29th December, during the eruption, a small lava dome was emplaced which is now cooling.

**NAME: Yeni Bulunan**
**LOCATION: Turkey**
**HEIGHT: - 200 M?**
**TYPE: Submarine Volcano**
**COORDINATES: Unknown**

A volcanic eruption most probably started in the Marmaris Sea between the Turkish mainland and the Greek island of Symi in December. Many earthquakes were detected in the region in the past few months. A study by scientists of Istanbul's Technical University revealed two active vents at a depth of 200 M below sea level on an N-S trending fissure 2.5 – 3 KM in length. A rise in sea temperature was detected above the vents, suggesting eruptions of lava. For purposes of future reference to this volcano the name 'Yeni Bulunan' meaning 'New Found' in Turkish has been given.

**NAME: San Cristobal**
**LOCATION: Nicaragua**
**HEIGHT: 1745 M**
**TYPE: Stratovolcano**
**COORDINATES: 12.702°N 87.004°W**

The INETER reported that at 18:00 (local time) on 25th December, seismic activity began to increase. At 20:00 (local time), a series of small explosions were detected. Activity continued until 10:00 (local time) on 26th December. The Darwin VAAC reported ash plumes reaching heights of 2.4 KM.

The INETER reported that on 26th December, activity resumed later in the day with 4 more explosions detected, with ash plume rising 500 – 800 M above the crater. The Darwin VAAC reported ash plumes rising to an altitude of 4.2 KM. Ash fall was reported 6 KM away from the volcano. The INETER reported that on 27th December, modest volcanic activity continued.

*Above; eruption of San Cristobal volcano in December.*

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

On 1st December, the MODVOLC stated that thermal anomalies detected at Tolbachik indicated that the lava flows were now 15 KM long. The data also indicated that the activity is now concentrated on the southern part of the fissure.

The KVERT reported on 5th December that a gas-and-ash plume rose to a height of 4 KM a.s.l. Thermal anomalies indicate that the lava flow is now being channelled down a single route. The KVERT stated that this activity is most probably building a new cinder cone.

On 7th December, the KVERT reported that seismic signals were weaker than that of those the previous week. More explosive activity is beginning to take over as most of the activity was focused on the southern vent. The Tokyo VAAC reported that ash plumes from Tolbachik rose to a height of 4 KM. Lava had flowed 17 – 20 KM away from the S fissure by 7th December. Ash plumes rose less than 500 M during 1st – 5th December, and minor ash fall was reported in Kozyrevsk (40 KM NW) and Klyuchi (65 KM NW) villages on 3rd December. Gas-and-steam plumes drifted 250 KM SE on 5th December, and rose as high as 1 KM during 7th – 11th December and drifted SW and W
One Newspaper article reported that effusion rates may be higher than in 1975 (The Great Tolbachik Fissure Eruption). If this is true, it is the largest eruption ever recorded from Tolbachik.
The Tokyo VAAC reported ash plumes reported 4.5 KM high ash plumes on 13th December.

The KVERT reported on 17th December that Tolbachik was undergoing vigorous eruptive activity. The tremor signal had doubled in size compared to previous days. Strong seismicity was detected. Ash plumes rose less than 1 KM and


*Top; one of the cinder cones in eruption on the flank of Tolbachik on 6 December, a very fluid lava flow can be seen travelling from it.*

*Middle; strombolian activity of one of the cinder cones on 8 December.*

*Bottom; fire fountains and an ash-laden plume from one of the cinder cones on Tolbachik.*

drifted in multiple directions, and at least two cones grew above the fissure. A very large thermal anomaly on the N part of Tolbachinsky Dol was visible in satellite imagery.

The KVERT reported that from 17th – 21st December 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 that travelled 17 – 20 KM during 17th – 21st December. Strong

seismicity was detected. Gas-and-ash plumes drifted in multiple directions, and a fifth cone grew above the fissure. A very large thermal anomaly on the N part of Tolbachinsky Dol was visible 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 21st – 28th December. Strong seismicity was detected. Gas-and-ash plumes drifted in multiple directions, and a fifth cone continued to grow above the fissure. A very large thermal anomaly on the N part of Tolbachinsky Dol was visible daily in satellite imagery.

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

IG reported that on 1st December there was 47 mm of rainfall on the upper E and NE flanks of Tungurahua, generating lahars that descended the Vazcún drainage on the N flank. Seismic stations began recording signals representing the lahars at 15:56, and by 16:05 (local time?) contingency plans were activated to warn people downstream. People at the resort of El Salado had been evacuated by the time the lahars reached the area. The lahar was 6 m deep, carried blocks 1 – 3 M in diameter, and covered drinking water tanks in some areas.

Seismicity at Tungurahua reported by IG increased during 12th – 14th December. A large explosion at 14:35 (local time) on 14th December produced a "cannon shot" sound and shook the ground. An ash-and-steam plume rose 6 – 7 KM and drifted NW. Pyroclastic flows travelled down the SW flank. The Washington VAAC reported that an 11-KM-wide detached ash plume was observed in satellite imagery drifting 17 KM SE. On 15th December, IG reported that an explosion was followed by an ash-and-gas plume that rose 2 KM above the crater and drifted S and SE. Small amounts of ash fell in Runtún (6 KM NNE).

*Above; large ash plume from Tungurahua on 16 December.*

On 16th December a large explosion generated ash plumes that rose to a maximum height of 7 KM and contained lightning. Other explosions generated ash plumes that rose 2 KM. Satellite imagery showed ash plumes drifting 140 KM NW, and 110 KM NE at an altitude of 7.9 KM a.s.l. Tephra fell in Cotaló (8 KM NW), Pondoa (8 KM N), Runtún, and Pillate (8 KM W), and coarse ash fell in Baños (8 KM N), Vascún, and Ulba (NNE). Medium-to-fine-grained ash fell in Palitahua (S), Choglontús (SW), Manzano (8 KM SW), Capil, Guadalupe Observatory (11 KM N), Cevallos (23 KM NW), Tisaleo (29 KM NW), Ambato (31 KM NW), Patate (NW), Píllaro, Pelileo (8 KM N), Salcedo, and Pujilí Latacunga, Rio Verde, Agoyán, and Palora. The larger explosions during the morning produced "cannon shots" that broke a window in a local building, and were followed by pyroclastic flows that descended the SW and NW flanks. During 16th – 17th December incandescent blocks were ejected from the crater and rolled down the flanks.

On 17th December satellite images showed ash plumes drifting 50 – 130 KM NE, and a dense ash plume drifting over 200 KM NE at an altitude of 7 KM a.s.l. A thermal anomaly was also detected. IG noted that explosions continued to generate ash plumes, but with progressively decreasing ash content. Ash plumes drifted NNE and NE, causing ash fall in communities downwind. According to a news article, some of these communities were evacuated.

The VAAC noted that a thermal anomaly was detected on 18th December. Ash plumes drifted 70 KM W and 40 KM SW. IG reported that seismicity remained elevated, and two pyroclastic flows travelled at most 3 – 4 KM down the flanks and burned vegetation. Explosions rattled structures and ejected incandescent blocks. Ash plumes rose 2 – 3 KM above the crater and drifted NW, W, and SW. Ash fell in multiple areas, and accumulated between 1 and 2 mm during 17th – 18th December in Juive (7 KM NNW).

The IG reported that during 19th – 25th December, activity at Tungurahua remained high. On 19th December there were 60 explosions detected by the seismic network; explosions vibrated structures and were often heard by local residents. Ash plumes rose 2 KM above the crater and drifted SW, causing ash fall in communities downwind including Choglontús (SW), Manzano (8 KM SW), Palitahua (S), and Puela (8 KM SW). The next day 78 explosions were detected, roaring was heard, and windows vibrated. Ash plumes rose 1 KM and drifted W and SW. Ash fall was reported in Manzano, Palitahua, and Choglontús. A pyroclastic flow, generated after an explosion, travelled 2 KM down drainages on the NW flank.
During 21-25 December explosions ejected incandescent blocks that rolled as far as 1 km down the flanks. Gas-and-ash plumes rose less than 2 km above the crater and drifted W and NW. On 22 December ash fall was reported in Pillate and Manzano, and lava fountains 500 m high were observed at night. On 23 December explosions rattled windows. Strombolian explosions ejected incandescent blocks more than 500 m above the crater that rolled 1 km down the W and NW flanks. The next day seismicity decreased and minor ash fall Choglontús in was reported.

**NAME: Paluweh**
**LOCATION: Indonesia (Lesser Sundra Islands)**
**HEIGHT: 875 M**
**TYPE: Stratovolcano**
**COORDINATES: 8.32°S 121.708°E**

A VolcanoDiscovery tour to Paluweh volcano from 30th November – 2nd December revealed that a new lava dome is growing next to the old 1982 dome. At the time of visit the lava dome was 150 M high and is the new high point of the island, its basal diameter is estimated at around 200 – 250 M. The dome was very active, with incandescence taking place in many different places on the lava dome. A vent on the upper eastern part of the dome had periods of intense ash venting lasting several hours accompanied by a jet turbine like noises. No large pyroclastic flows have occurred from the dome. The lava dome was named "Rerombola", meaning "the friendly one" in local dialect.

The Darwin VAAC reported that on 6th and 8th December ash plumes from Paluweh rose to an altitude of 3.7 KM a.s.l. and drifted 35 – 75 KM NW, W, and SW.

The Darwin VAAC reported that during 14th – 15th December, ash plumes from Paluweh rose to an altitude of 3 KM a.s.l. and drifted 35 – 65 KM NW and W. On 17th December an ash plume rose to an altitude of 1.5 KM a.s.l. and drifted 55 KM E. The next day an ash plume drifted 55 KM E at altitudes of 3.4 – 3.7 KM a.s.l.

*Top; the new lava dome at Paluweh. Many incandescent areas can be seen.*

*Below; the small new lava dome at White Island, the first recorded at the volcano.*

A VolcanoDiscovery report noted that pyroclastic flows from Paluweh's lava dome reached the sea on the south side of the island, destroying vegetation.

From 24th – 26th December, VolcanoDiscovery reported that ash plumes rose daily from the growing lava dome; it is possible that pyroclastic flows were produced, travelling down the S and SE sides of the volcano.

The Darwin VAAC reported that during 19th and 21st – 23rd December, ash plumes from Paluweh rose to altitudes of 2.4 – 2.7 KM a.s.l. and drifted 55 – 75 KM E, SW,W, and NW.

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

A new spiny lava dome was noted by GNS scientists in a small crater (created by eruptions earlier in 2012). It is not known when the dome formed but it

was most probably after the ash emissions earlier this year. The dome may have been spotted 2 weeks before the scientists did. This is the first lava dome ever recorded at White Island. It is not known if the dome is still growing. The Alert Level was raised from 1 to 2. Continuous volcanic tremor was noted on 14th December. Incandescence was noted on webcams on 22nd and 23rd December.

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

The CONRED reported that on the morning of 18th December three small explosions of gas-and-ash were detected at the volcano, the explosions created a small crater. This is the first eruptive activity recorded at Pacaya since October 2010.

On 29th December, the INSIVUMEH reported that 3 explosions from the volcano produced ash plumes that rose to a height of 3 KM; the CONRED reported that the ash plumes drifted 5 KM west and southwest.

*Above; small ash emission from Pacaya on 18 December.*

**NAME: Langila**
**LOCATION: Papua New Guinea**
**HEIGHT: 1330 M**
**TYPE: Complex Volcano**
**COORDINATES: 5.525°S 148.42°E**

The Darwin VAAC reported that on 1st December, Langila emitted an ash plume to a height of 1.5 KM. A MSAT satellite image taken on 2nd December showed a small ash plume drifting to the NW. A low thermal anomaly was also detected.

More ash plumes were observed on the 6th December.

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

The SVERT reported that from 11th – 19th and from 21st – 22nd December, a thermal anomaly was detected at Chirpoi volcano. On 15th and 19th December, a gas and steam plume was detected in satellite imagery. The SVERT stated that it is possible a lava flow is effusing on the SE slope of the volcano.

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

The RVO reported that starting on 6th November through 30th November, Ulawun produced pale grey and brown ash plumes that rose 200 M and drifted in multiple directions. Ash fall was reported on the N and NW flanks, in Voluvolu, Noau, Ubili (10 KM NW), and Ulamona (10 KM NW). Low rumbling was heard on 18th November.

The RVO reported that dense grey-brown ash plumes continued to rise 200 M from Ulawun during 1st – 7th December. Ash fall was reported on the NW flanks, in Ubili (10 KM NW) and Ulamona (10 KM NW). A small landslide scar appeared near the N valley flank vent, reportedly caused by movement of a large boulder and loose material, triggered by a M 6.1 earthquake that occurred near Pomio (55 KM SSE) on 19th November.

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

A newspaper noted that on 1st December, Lokon-Empung produced an ash plume between 1 KM or 2 KM at around 16:11 (local time). Ash emissions were

*Above; Ulawun emit's a steam plume in 2009.*


*Above; ash plume from Lokon-Empung on 27 December.*

continuing at 17:00 (local time). On 2nd December, Lokon-Empung was producing a constant emission of ash, punctuated by explosions.

On 3rd December, another explosion occurred at 15:42 (local time) producing an ash plume that rose to a height of 4 KM a.s.l. ash falls were reported 6 KM west of the volcano. On 6th December, following an increase in degassing a large explosion occurred from Lokon-Empung at 17:18 (local time). The explosion ejected incandescent blocks. An ash plume reached a height of 3.5 KM and drifted south.

Three small explosions were detected on 9th December at 13:42, 14:10, and 15:03 (all local time).

On 10th December an ash plume rose to an altitude of 4.3 KM a.s.l.
The Darwin VAAC reported that ash plumes rose from Lokon-Empung on 17th December.

At 17:24 (local time), 24th December, an explosion from Lokon-Empung produced ash falls 6 KM away from the volcano. On 25th December (at 6:15, local time), a small explosion produced an ash plume that rose a few hundred metres above the volcano.

On 27th December, an explosion at 16:50 (local time) produced a sizeable ash plume.

**NAME: Marapi**
**LOCATION: Indonesia (Sumatra)**
**HEIGHT: 2891 M**
**TYPE: Complex Volcano**
**COORDINATES: 0.381°S 100.473°E**

Marapi volcano produced small ash plumes on the morning of 11th December.

**NAME: Unnamed**
**LOCATION: Black Sea**
**HEIGHT: Unknown**
**TYPE: Submarine Volcano**
**COORDINATES: Unknown**

An underwater volcanic eruption was detected in the Black Sea on 23rd December when it damaged an underwater (160 KM long) cable, breaking it in four places. The cables showed traces of fire and its protective casing was damaged.

**NAME: Aoba**
**LOCATION: Vanuatu**
**HEIGHT: 1496 M**
**TYPE: Shield Volcano**
**COORDINATES: 15.40°S 167.83°E**

A sulphur dioxide plume was seen drifting NW over the volcano on 24th December.

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

A strong S02 cloud was visible above the volcano on 18th December.

**NAME: Adatara**
**LOCATION: Japan (Honshu)**
**HEIGHT: 1718 M**
**TYPE: Stratovolcanoes**
**COORDINATES: 37.644°N 140.286°E**

A shallow M 3.6 earthquake occurred near Adatara volcano on 18th December.

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

*Above; the summit of the large Aoba volcano contains two crater lakes*

*Fresh spatter cones in the North Crater of Ol Doinyo Lengai on 16 September, 2012*

A small expedition to the volcano in September 2012 by Frank Moeckel and Wendy Blank noted on a trek to the North crater on September 16th fresh spatter cones were seen on the crater floor. Lava spattering was observed from the active vents, a boiling noise was heard from the bottom of the north crater and a strong smell of H2S was noted. It is likely that activity continues into 2013.

**NAME: Sangeang Api**
**LOCATION: Indonesia (Lesser Sundra Islands)**
**HEIGHT: 1949 M**
**TYPE: Complex Volcano**
**COORDINATES: 8.20°S 119.07°E**

The CVGHM reported that during November through mid-December observers at the Sangeang, Bima observation post (50 KM SW) noted occasional diffuse white plumes rising 5 – 15 M above Sangeang Api's crater. The lava dome and surrounding areas had not changed compared to October observations. Avalanches had occurred on the W and SW flanks. Earthquakes had declined. The Alert Level was lowered to 2 (on a scale of 1 – 4) on 21st December.

## CONTINUING ACTIVITY

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

The IG reported that seismicity at Reventador was high during 5th – 11th December and indicated multiple explosions almost daily. Plumes were observed although cloud cover often prevented visual observations. On 5th December a steam plume rose 1.5 KM and drifted NW. The next day a steam-and-ash plume rose 2 KM above the lava dome and drifted SE. A steam-and-ash plume rose 1 KM on 8th December and drifted WSW, towards Chaco.

Another steam-and-ash plume was observed on 11th December.

**NAME: Etna**
**LOCATION: Italy (Sicily)**
**HEIGHT: 3330 M**
**TYPE: Stratovolcanoes**
**COORDINATES: 37.734°N 15.004°E**

Small strombolian explosions were seen on webcams on the night of 25th – 26th December. The explosions were from the New South East Crater.

**NAME: Ambrym**
**LOCATION: Vanuatu**
**HEIGHT: 1334 M**
**TYPE: Pyroclastic Shield**
**COORDINATES: 16.25°S 168.12°E**

A NASA Earth Observatory satellite photo taken on December 13th shows the two lava lakes at Ambrym's Marum and Benbow craters to be active. Large steam plumes rose from both craters.


*Above; NASA satellite photo of Ambrym on 13 December, see above description.*

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

Small earthquakes continued to occur beneath the volcano, sometimes accompanied by small ash eruptions.

**NAME: Kliuchevskoi**
**LOCATION: Russia (Kamchatka)**
**HEIGHT: 4835 M**
**TYPE: Stratovolcano**
**COORDINATES: 56.057°N 160.638°E**

The KVERT reported that during 30th November – 7th December, video footage and satellite imagery showed Strombolian explosions at Kliuchevskoi, along with crater incandescence and gas-and-steam emissions. A weak thermal anomaly was detected in


*Above; webcam capture showing strombolian activity at the summit crater of Kliuchevskoi on 4 December.*

satellite images during 1st and 4th – 6th December; cloud cover obscured views on the other days.

The KVERT reported that during 7th – 14th December, video footage and satellite imagery showed Strombolian explosions at Kliuchevskoi, along with crater incandescence and gas-and-steam emissions. A thermal anomaly was detected in satellite images during 7th – 8th, 10th, and 12th – 13th December; cloud cover obscured views on the other days.

The KVERT reported that during 14th – 21st December, video footage and satellite imagery showed Strombolian explosions at Kliuchevskoi, along with crater incandescence and gas-and-steam emissions. A thermal anomaly was detected in satellite images on 16th and 18th December; cloud cover obscured views on the other days

**NAME: Machin**
**LOCATION: Colombia**
**HEIGHT: 2650+ M**
**TYPE: Stratovolcano**
**COORDINATES: 4.48°N 75.392°W**

A large volcano-tectonic earthquake occurred near Machin volcano on December 7th.

**NAME: Heard**
**LOCATION: Indian Ocean (owned by Australia)**
**HEIGHT: 2745 M**
**TYPE: Stratovolcano**
**COORDINATES: 53.106°S 73.513°E**

Thermal anomalies were detected at Heard volcano in December; it is likely that eruptive activity continues at Heard.

**NAME: Kilauea**
**LOCATION: USA (Hawaiian Islands)**
**HEIGHT: 1222 M**
**TYPE: Shield Volcano**

*Above; aerial view of the small Machin volcano, Colombia.*

**COORDINATES: 19.421°N 155.287°W**

During 28th November – 1st January, the HVO reported that on most days the circulating lava lake periodically rose and fell in the deep pit within Kilauea's Halema'uma'u Crater. Occasional measurements indicated that the gas 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, lava circulated within the perched lava lake at the NE part of the crater, and glow emanated from spatter cones on the SE part of the crater floor and from a spatter cone at the NW edge.

Lava overflowed the lava lake on 24th November and 2nd December.

Lava flows remained active in two branches on the coastal plain: a small W branch, and a larger E branch with scattered activity extending from the pali to the coast E of the easternmost boundary of Hawai'i Volcanoes National Park. During 28th – 30th November steam plumes did not rise from the ocean entry point; on 30th November geologists confirmed that active lava flows were 100 M from the coast.

Lava again entered the ocean during 1st – 2nd and 4th December.

From 5th – 11th December the HVO reported that at Pu'u 'O'o Crater, lava circulated within the perched lava lake at the NE part of the crater, and glow emanated both from spatter cones on the SE part of the crater floor and from a spatter cone at the NW edge. The lava lake briefly overflowed on 5th December, and small, short-lived lava flows emanated from the spatter cones during 7th – 9th December. Through the week a spatter cone formed over the lava lake, covering the surface.

Lava flows remained active in two branches on the coastal plain: a small W branch and a larger E branch with scattered activity extending from the pali to the

coast E of the easternmost boundary of Hawai'i Volcanoes National Park. An ocean entry was marked by a weak and variable plume near Kupapa'u, with lava entering the water in at least two different areas.

From 12th – 18th December, the HVO reported that at Pu'u 'O'o Crater, glow emanated from spatter cones on the SE part of the crater floor, from a spatter cone at the NW edge of the floor, and from a lava lake on the NE part of the floor which was mostly covered by a spatter cone. The lava lake overflowed during 12th – 13th December, and on 13th December lava flowed from the SW spatter cone. On 14th December the N rim of the NE spatter cone/lava lake collapsed and was followed by a brief overflow of the lake. A larger lava flow issued from a spatter cone on the N edge of the crater floor, followed by another smaller flow; both flows travelled W, then split and flowed N and S. Another rim collapse from the NE spatter cone/lava lake and small overflow were observed the next day. Lava flows remained active in two branches on the coastal plain: a small W branch, and a larger E branch with scattered activity extending from the pali to the coast E of the easternmost boundary of Hawai'i Volcanoes National Park. An ocean entry was marked by a weak and variable plume near Kupapa'u, with lava entering the water in at least two different areas. A new lava flow at the top of the pali was observed on 11th December. On 15th December observers noted that lava flows were active in a 1-km-wide area that stretched from near the base of the pali to the coast. On 16th December, the HVO noted that a lava delta at the ocean entry had slowly grown to be 50 M wide.

From 19th – 25th December, the HVO reported that at Pu'u 'O'o Crater, glow emanated from spatter cones on the SE part of the crater floor, from a spatter cone at the NW edge of the floor, and from a circulating lava lake on the NE part of the floor. During 21st – 24th December a few brief and short lava flows issued from the spatter cones at the S edge of the crater floor. Lava flows were active in a 1-KM-wide area that stretched from near the base of the pali to the coast. There were no webcam recordings of any ocean entry plumes or reports suggesting that lava had been entering the ocean since 17th December.

From 26th – 1st January, the HVO reported that at Pu'u 'O'o Crater, glow emanated from spatter cones on the SE part of the crater floor, from a spatter cone at the NW edge of the floor, and from a circulating lava lake on the NE part of the floor. The lava lake briefly overflowed on 27th December. During 29th – 30th December lava flowed from the easternmost spatter cone in the S part of the crater floor. Lava flows were active in a 1-KM-wide area that stretched from near the base of the pali to the coast. During 28th – 30th December web cameras recorded infrequent and weak steam plumes from lava sporadically entering the ocean at multiple locations.

**NAME: Pagan**
**LOCATION: Mariana Islands (owned by the USA)**
**HEIGHT: 570 M**
**TYPE: Stratovolcanoes**
**COORDINATES: 18.13°N 145.80°E**

Large steam plumes were visible on satellite imagery on 11th December. Large hot spots are detected frequently at the volcano.

On 13th December, the Darwin VAAC reported that on 13th December, ash emissions were reported from the volcano.

**NAME: Nisyros**
**LOCATION: Greece**
**HEIGHT: 698 M**
**TYPE: Stratovolcano**
**COORDINATES: 36.586°N 27.160°E**

Many earthquakes have been reported near the island since the end of November. The earthquakes are located 10 – 20 KM from Nisyros volcano. On 13th December, two quakes at magnitudes of 2.1 and 3.1 were detected near the volcano. [These events may be related to the probable submarine eruption between the Greek island of Symi and the Turkish mainland around 48 KM away. See page 3]

**NAME: Batu Tara**
**LOCATION: Indonesia (Komba Island)**
**HEIGHT: 748 M**
**TYPE: Stratovolcano**
**COORDINATES: 7.792°S 123.579°E**

On 14th December, a larger than normal explosion from Batu Tara produced an ash plume to a height of 2.4 KM a.s.l. and drifted 75 KM NW.

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

On 29th December, the INGEOMINAS reported that a small ash emission occurred from the volcano.

**NAME: Santa Maria**
**LOCATION: Guatemala**
**HEIGHT: 3772 M**
**TYPE: Stratovolcano**

**COORDINATES: 14.756°N 91.552°W**

The INSIVUMEH reported that during 1st – 2nd December, incandescent avalanches descended the SW lava dome. During 3rd – 4th December a new lava flow in the crater was incandescent, and produced block avalanches and ash plumes which drifted 10 KM W and SW.

The INSIVUMEH reported that during 6th – 7th December, incandescence from Santa María's Santiaguito lava-dome complex was visible, and an explosion generated an ash plume that rose 300 M and drifted E. During 8th – 11th December avalanches were produced from the fronts of lava flows on the SE, S, and SW flanks. A recent lava flow travelled 700 M down the S flank. Ash plumes that rose from the avalanches drifted 10 KM W and SW. Crater incandescence was observed at night. A special bulletin on 11th December noted that a new lava flow had travelled down the N flank. Crater incandescence continued to be observed at night.

The INSIVUMEH reported that during 12th – 13th December incandescence from Santa María's Santiaguito lava-dome complex was visible and lava flows were active on the flanks. During 13th – 14th December avalanches were produced from the fronts of lava flows on the SE flank. Ash plumes that rose from the avalanches drifted 10 KM S, producing ash fall in La Florida (5 KM S) and El Faro (SW flank). During 15th – 18th December incandescence emanated from the SW part of the lava dome. Avalanches were again produced from the fronts of lava flows on the SE flank. Ash plumes from the avalanches drifted 8 KM during 15th – 16th December.

**NAME: Karymsky**
**LOCATION: Russia (Kamchatka)**
**HEIGHT: 1536 M**
**TYPE: Stratovolcano**
**COORDINATES: 54.05°N 159.45°E**

The KVERT reported that weak-to-moderate seismic activity at Karymsky was detected during 29th November – 7th December. Seismic data indicated that ash plumes possibly rose to an altitude of 3 KM a.s.l. during 29th – 30th November.

The KVERT reported that weak-to-moderate seismic activity at Karymsky was detected during 7th – 14th December. Seismic data indicated that ash plumes possibly rose to an altitude of 3 KM a.s.l. on 12th December. Satellite imagery showed a thermal anomaly on the volcano on 9th and 12th – 13th December.

The KVERT reported that weak-to-moderate seismic activity at Karymsky was detected during 14th – 21st December. Seismic data indicated that ash plumes possibly rose to an altitude of 3 KM (9,800 ft) a.s.l. during 13th – 15th December. Volcanologists observed weak gas-and-steam activity on 18th December. Satellite imagery showed a thermal anomaly on the volcano on 20th December.

The KVERT reported that weak-to-moderate seismic activity at Karymsky was detected during 21st – 28th December. Satellite imagery showed a thermal anomaly on the volcano during 26th – 27th December.

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

The KVERT reported that during 30th November – 7th December weak-to-moderate seismic activity at Kizimen was detected. Video and satellite images showed lava flows effusing from the summit and the E flank, summit incandescence, strong gas-and-steam activity, and hot avalanches on the S flank. A thermal anomaly was detected in satellite images during 1st and 4th – 7th December; cloud cover obscured views on the other days

The KVERT reported that seismic activity at Kizimen had gradually decreased. Video data showed incandescence from the crater and moderate gas-and-steam activity. Satellite images detected a thermal anomaly over the volcano but the intensity of the anomaly had also gradually decreased. On 12th December the Aviation Colour Code was lowered to Yellow. On 27th December, the KVERT lowered the alert level to GREEN stating the eruption of Kizimen that began in 2010 ended on 27th December.

On 28th December, activity renewed at Kizimen, with a new lava dome being built at the summit, with a lava flow travelling down the NE flank accompanied by ash emissions and avalanches.

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

The RVO reported that during 1st – 7th December both diffuse and dense ash plumes rose 500 M above Manam's Southern Crater and drifted NW. Ash fall was reported in areas downwind. Roaring and

*Kizimen in October 2012.*

rumbling were heard, and became loud and frequent on 4th December. Ejected incandescent tephra was observed at night, and a small volume of lava effused from a SE valley vent that formed in August. Small volumes of lava also flowed from a vent, adjacent to the first vent, which opened in late November. White vapour plumes rose from Main Crater during the reporting period. Data from the electronic tiltmeter showed a long-term inflationary trend towards the E. RVO warned residents to stay away from the four main radial valleys, especially to the SE and SW, because products of the current activity are channelled into them.

The RVO reported that during 8th – 14th December both diffuse and dense ash plumes rose 400 M above Manam's Southern Crater and drifted NW. Ejected incandescent tephra was observed at night, and small volumes of lava continued to flow from two vents located on the upper slopes of the SE valley. White vapour plumes rose from Main Crater during the reporting period.

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

The CENAPRED reported that during 4th – 11th December, seismicity at Popocatépetl indicated continuing gas-and-steam emissions that contained minor amounts of ash. Incandescence from the crater was observed at night. Cloud cover often prevented observations; gas-and-steam plumes were observed drifting NE, E, and SSE during periods of clearer weather. Ash plumes observed during 7th – 8th December rose at most 1 KM and drifted NE

The CENAPRED reported that during 12th – 18th December seismicity at Popocatépetl indicated continuing gas-and-steam emissions that contained minor amounts of ash. Variable incandescence from the crater was observed most nights. During 13th – 15th December gas-and-steam plumes rose at most 1 KM above the crater and drifted NE, E, and SE. On 17th December ejected incandescent tephra landed 500 M away from the crater on the NE flank.

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

The JMA reported that during 3rd – 7th December explosions from Sakura-jima's Showa Crater ejected tephra as far as 1.3 KM from the crater. A very small eruption occurred at Minami-dake Crater on 6th December. The Tokyo VAAC reported that explosions during 5th – 10th December often produced plumes that rose to altitudes of 1.2 – 4.3 KM a.s.l. and drifted SW, S, SE, and E. A pilot reported that an ash plume drifted E at an altitude of 2.1 KM a.s.l. on 7th December.

The JMA reported that during 10th – 14th December explosions from Sakura-jima's Showa Crater ejected tephra as far as 1.8 KM from the crater. Very small eruptions occurred at Minami-dake Crater periodically. The Tokyo VAAC reported that explosions during 12th – 18th December often produced plumes that rose to altitudes of 1.5 – 2.4 KM a.s.l. and drifted N, NE, E, and SE. Pilots reported that ash plumes rose to an altitude of 2.1 KM a.s.l. on 13th and 16th December.

The JMA reported that during 25th – 28th December explosions from Sakura-jima's Showa Crater ejected tephra as far as 1.8 KM from the crater. A small pyroclastic flow travelled 500 M E. Very small eruptions periodically occurred at Minami-dake Crater.


*Small ash plume from Sakura-Jima's Showa crater in 2009.*

*Above; pyroclastic flow from Shiveluch volcano on 30 December.*

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

The KVERT reported that during 30th November – 7th December, a viscous lava flow continued to effuse on the NW flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Satellite imagery showed a thermal anomaly on the lava dome during 29th November and 3rd – 6th December; cloud cover obscured views on the other days.

The KVERT reported that during 7th – 14th December a viscous lava flow continued to effuse on the NW flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Satellite imagery showed a daily thermal anomaly on the lava dome.

The KVERT reported that during 14th – 21st December, a viscous lava flow continued to effuse on the NW flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Satellite imagery showed a daily thermal anomaly on the lava dome.

The KVERT reported that during 21st – 28th December, a viscous lava flow continued to effuse on the NW flank of Shiveluch's lava dome, accompanied by hot avalanches, incandescence, and fumarolic activity. Satellite imagery showed a daily thermal anomaly on the lava dome.

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

The Darwin VAAC reported that on 16th December an ash plume from Karangetang rose to a height of 3 KM a.s.l. and drifted 110 KM SW.

**NAME: Bagana**
**LOCATION: Papua New Guinea (Bougainville Autonomous terr.)**
**HEIGHT: 1750 M**
**TYPE: Lava Cone**
**COORDINATES: 6.140°S 155.195°E**

The RVO reported that white vapour from Bagana was emitted during 1st November – 12th December. Occasional weak incandescence from the crater was observed at night during 3rd – 8th, 10th, 17th – 20th, and 29th – 30th November. An eruption during 12:00 – 13:00 on 13th December was followed by light ash fall in Arawa (40 KM SE) and heavier ash fall in Manetai (11 KM E). A small amount of ash fall was reported in Arawa the next day; the volcano was mostly quiet during 14th – 15th December.

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

The INSIVUMEH reported that during 12th – 14th December explosions from Fuego produced ash plumes that rose about 140 – 190 M and drifted SW. Incandescent lava flows travelled 150 – 200 M down the flanks. During 15th – 16th December lava flows travelled 200 M SW down the Taniluya drainage, producing incandescent block avalanches from the lava-flow fronts. Explosions during 17th – 18th December produced ash plumes that rose 400 M and drifted 7 KM W and SW. Incandescence emanated 150 M above the crater. Blocks from lava-flow fronts in the Taniluya drainage rolled down the flanks, reaching vegetated areas.

**NAME: Stromboli**
**LOCATION: Italy (Aeolian Islands)**
**HEIGHT: 924 M**
**TYPE: Stratovolcano**
**COORDINATES: 38.789°N 15.213°E**

On 23rd December, Stromboli had an intense period of volcanic activity. A small pyroclastic flow was noted, probably due to a small collapse of a ridge at the end of the crater terrace; a new lava flow began to emit from a (new?) vent on the eastern crater terrace, on 25 December, lava's reached the Sciara del Fuoco. Incandescent blocks detached from the lava flow front and rolled down the slope.

A VolcanoDiscovery tour on 30th December noted near-continuous lava fountaining and spattering at

*Above; a large explosion from the NE crater of Stromboli on 30 December.*

intervals of 10 – 30 minutes; some explosions ejected glowing bombs, while others were rich in ash. The NE vent was very active with explosions of liquid lava travelling in all directions, hundreds of metres high. These explosions occurred every 20 – 30 minutes and were loud enough to rattle windows of nearby houses. Bright glows were visible from the crater terrace, suggesting intermittent lava flow effusion.

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

**Global Reports:**

Activolcans.info

Volcano Discovery: 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

**Also Including:**

SVERT (see Acronyms and Abbreviations): http://www.avo.alaska.edu/activity/avoreport.php?view=kurile

KVERT (see Acronyms and Abbreviations):http://www.avo.alaska.edu/activity/avoreport.php?view=kaminfo

Ol Doinyo Lengai Current News - Fred Belton: http://oldoinyolengai.pbworks.com/w/page/33216377/Lengai%20Current%20News

Trend.az: http://en.trend.az/

And also the writers and commenter's and writers Eruptions.blog (http://www.wired.com/wiredscience/eruptions) and Volcanocafe (http://volcanocafe.wordpress.com/)

**Acronyms and Abbreviations**

a.s.l - Above Sea Level

CENAPRED - Centro Nacionale de Prevencion de Desastres

CONRED - Coordinadora Nacional para la Reducción de Desastres

CVGHM - Center of Volcanology and Geological Hazard Mitigation

GVP - Global Volcanism Program

HVO - Hawaii Volcano Observatory

IG - Instituto Geofísico

INGEOMINAS - Instituto Colombiano de Geología y Minería

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

JMA - Japanese Meteorological Agency

KVERT - Kamchatkan Volcanic Eruption Response Team

MODIS (MODVOLC) - Moderate Resolution Imaging Spectroradiometer

SVERT - Sakhalin Volcanic Eruption Response Team

VAAC- Volcanic Ash Advisory Center

# NEW INSIGHTS

## Small phreatic explosions at Copahue in 2001 and mid-2012

Research on eruptions of Copahue in light of the recent explosive phase (see page 3) revealed small phreatic explosions in 2001 and mid-2012.

**2001 Eruptions**

The Global Volcanism Program's data file on Copahue stated that eruptions from the volcano started in July 1st 2000 and ended on October 18, 2000. A small (abstract) paper by Kathryn S Flynn for The Geological Society of America stated "Copahue erupted in July 2000, and continued into early January 2001"

**Mid - 2012 Eruptions**

The recent phreatomagmatic explosive phase at Copahue (see page 3) were probably preceded by small phreatic explosions in the summer (exact date unknown, most probably August).

A video (taken from a Chilean news channel) uploaded on YouTube by yaggui1 on 8 August: http://www.youtube.com/watch?v=ArkK1_9qX-0 shows phreatic explosions in the crater lake at a unknown date this year. A blog run by a Skier: http://planetskier.blogspot.co.uk/2012/08/volcan-copahue.html shows photos (again taken at an unknown date in 2012) of the volcano with ash dusting ice near its crater; he also reported "Copahue has been in somewhat active mode recently, and is spewing off steam, smoke, and even spreading some ash on the snow fields surrounding the peak"

Ash dusting the ice on the slopes of Copahue , just below the active crater.

Steaming can be seen from the crater, source of small phreatic explosions (probably in August).

For more images visit: http://planetskier.blogspot.co.uk/2012/08/volcan-copahue.html

**REFERENCES**

Global Volcanism Program - Copahue: http://www.volcano.si.edu/world/volcano.cfm?vnum=1507-09=

Flynn K S. 2003. COMPOSITIONAL CHANGES IN THE COPAHUE VOLCANIC HYDROTHERMAL SYSTEM, ARGENTINA, AFTER THE 2000 ERUPTION (abs). Geological Society of America 38th annual meeting.

# VOLCANO ANALYSIS: Kueishantao

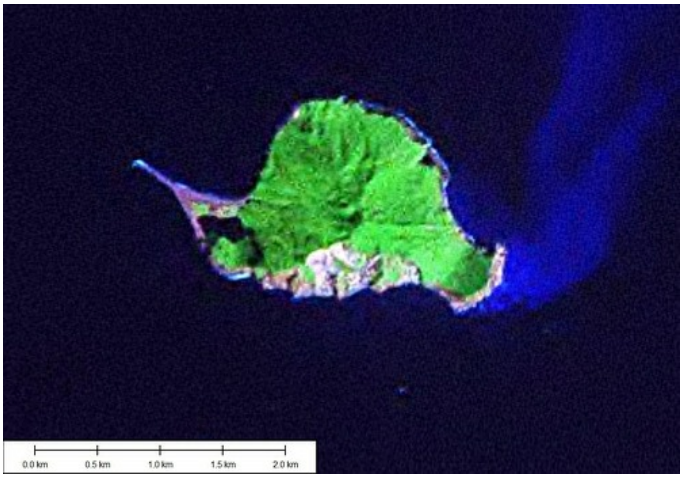
**COORDINATES:** 24.85°N 121.92°E
**LOCATION:** Taiwan
**HEIGHT:** 401 M
**VOLCANO TYPE:** Stratovolcano
**LAST ERUPTION:** 1785 ± 10 years

*Beautiful green fauna disguises Kueishantao's youthful eruptions.*

## Overview

Kueishantao is Taiwan's most famous and youngest active volcano. It is most famous for its vigorous offshore fumaroles that discolour the water.

It is the youngest of a chain of volcanic islands, although the cause for volcanism is not fully explained, it is thought that it occurs in an area where the fault system of Taiwan and the rifting basin of the Okinawa trough meet.




*A landsat image of Kueishantao showing its eroded profile. The blue trail is water discolouration by active fumaroles.*

## Morphology

Kueishantao is situated 9 km West from Taiwan. It is the youngest and northernmost of 5 volcanic islands East of Taiwan. The volcano is composed of andesitic lava flows and pyroclastic deposits. Erosion has removed much of the SE side of the volcano giving it a irregular profile, a large satellite cone is located on the east side of the volcano , much of it has been eroded. Although there is no summit crater, the volcano is determined to be very young, the oldest dated rocks are 0.20 Ma; a lava flow sample from a sequence of volcanic strata yielded an age of 7000 years BP.

## 1785± 10 Years Eruption

Reports from the late-16th century stated that Guishan (Kueishantao) split open with a blood red lava flow.

## Other Activity

Vigorous fumaroles off the SE coast, as well as youthful rocks and historic activity mean that the repose for Kueishantao can only be temporary.

# PLINY AWARD FOR VOLCANIC EVENT OF THE YEAR

At the end of each year, visitors to Erik Klemetti's famous science blog 'Eruptions' were asked to vote for their favourite volcanic event of the year.

"The methodology for voting - I give 5 points for every 1st place vote, 4 points for 2nd place, 3 points for 3rd place and 1 point for every vote 4th place or higher. I received a lot of ballots this year and for the second straight year, the winner was by a sizable margin, both in terms of points ahead of the runner up (56) and number of 1st place votes (24). I've added the total number of points each volcano earned in parentheses next to its name"

**HONOURABLE MENTION**

All received at least 1 vote: Copahue, Chile/Argentina; Katla, Iceland; Kliuchevskoi, Russia; Laguna del Maule, Chile; Lokon, Indonesia; Nyamuragira, Congo; Poas, Costa Rica.

**9. (tie, 7 votes each) Popocatepetl, Bezymianny, White Island**

We start off with a three-way tie of very different volcanoes -- one that looked like it might do something spectacular but never did, one that does spectacular things but in a remote location and one that produced both an explosive eruption and a weird, spiny dome. I know many of us spent the spring intently watching Popocatepetl in Mexico, waiting for a significant eruption, but luckily for all the rumblings, the people living near the volcano didn't face a large eruption. Over in Kamchatka, Bezymianny had a number of explosive eruptions, including a large eruption in late August/early September (see above). Finally, New Zealand's White Island had a small explosive eruption during the same week as Tongariro's eruption. The island volcano then produced a small but very strange-looking dome within the crater (that is still being visited by tourists on a regular basis).

**8. (8 votes)Tungurahua**

***Previous Winners***

**2009: Sarychev Peak**

**2010: Eyjafjallajökull**

**2011: Puyehue - Cordon Caulle**

Tungurahua had an especially active year, with some large explosive events that sent pyroclastic flows down the slopes of the volcano and ash across the region. The activity prompted repeated calls for evacuations around the volcano and significant damage to the crops that grow on the slopes of the Ecuadorian volcano.

**7. (28 votes) Kilauea**

Kilauea is one of the perennial Pliny contenders - landing one spot higher in the 2012 countdown than in 2011, when it actually produced a new fissure eruption (just shows that 2012 was a volcanically-subdued year). We saw rising/falling of the lava lakes, new ocean entries and plenty of lava flows along the

east rift zone of the shield volcano -- all events that should continues into 2013 (although I'm hoping for something big in March when I'll be visiting Kilauea for the first time!)

**6. (36 votes) Fuego**

Guatemala's Fuego had one of its most active years in decades, with multiple large eruptions. One of the biggest was in May, when the volcano not only produced pyroclastic flows and a 5 km / 16,000 foot ash plume, but also an impressive fire fountain and lava flow. These eruptions continued throughout the year, with over 30,000 people evacuated from the region around Fuego during September.

**5. (41 votes) Sakura-Jima**

Much like Kilauea, Japan's Sakurajima is a constant in the Pliny's. Sakurajima kept producing its multitude of small explosive eruptions, many of which are caught on the webcams that are pointed at the volcano. Some of this year's explosions reached even higher than normal, upwards of 6 km / 20,000 feet.

**4. (45 votes) Tongariro**

When most people think about the active volcanoes of New Zealand, Ruapehu springs to mind. However, that volcano merely rumbled in 2012. It was its neighbour, Tongariro, that decided to take action with two explosive eruptions from the Te Maari craters during the summer and fall after months of seismic unrest and increased gas emissions. This was the first eruptive activity on the main Tongariro massif since 1896. Neither eruption was long-lived and mainly appeared to be steam-driven events that sent ash over the region near the volcano. However, any time that is new introduction of heat beneath a volcano, you need to watch to see if new magma might be on its way, so 2013 could be more eruptions at Tongariro.

**3. (105 votes) Havre Seamount**

Considering no one actually noticed the eruption happening until weeks after it was over, Havre makes an impressive showing in the 2012 Pliny rundown. I'm, of course, partial to the eruption as I had a role in tracking down the source of the large pumice raft that was discovered in the Kermadec Islands north of New Zealand during early August. It turns out that the pumice came from a seamount that had not been recognized as an active submarine volcano (it didn't even appear in the Global Volcanic Program database - it does now) - one of three eruptions in/near New Zealand in the course of a few weeks of late July to early August. (see #4 Tongariro and #9 White Island).

**2. (125 votes) Etna**

Etna started the year off with a bang -- multiple paroxysms over the first few months of 2012, extending a string that started in 2011. Some of these paroxysms were spectacular, sending lava flows snaking down the volcano (see above) and producing small pyroclastic flows during explosions when lava would interact with snow. Activity settled down as the year went on, although a new tephra cone grew within the Buoco Nuovo crater. Etna periodically steamed and glowed through the end of the year and a deep-seated seismic swarm closed out 2012 at Sicily's volcano.

**1. (181 votes) Tolbachik**

It is hard to argue with naming an unexpected eruption that produced 20+ km lava flows from multiple fissures the recipient of the 2012 Pliny for Volcanic Event of the Year -- with a gorgeous set of new images to go with the award. In late November, reports began to filter in that a new eruption had started on the slopes of Tolbachik, one of a cluster of Kamchatka volcanoes that includes Bezymianny and Kliuchevskoi. However, unlike its more active neighbours, Tolbachik hadn't erupted in over 36 years. Much like that last eruption in 1976, the latest Tolbachik eruption was a fissure eruption that coalesced into singular vents with long -- and I mean long -- a'a lava flows. As of late December, the eruption was ongoing, steaming away on the snowy slopes of the remote volcano.

**WORDS: ERIK KLEMETTI**


*Tolbachik erupting in November, 2012 Pliny of the year*

Bulletin of World Volcanism

REVIEW OF VOLCANIC ERUPTIONS:

2012

*Updates to the CAVW/GVP records*

**Review of Volcanic Eruptions: 2012, free with the January issue of the Bulletin of World Volcanism.**