

Fall in number and magnitude of La Palma earthquakes in last 24 hours

- **PM10 particles below daily legal limit at all stations except Los Llanos de Aridane, where the population is advised to limit outdoor activities**
- **PEVOLCA operating shuttle bus service between 10.00 and 24.00 to ensure safety of public and avoid traffic casualties**
- **Traffic to Los Llanos de Aridane and Tazacorte will be diverted via El Paso and Hermosilla roads at specific times.**

The last 24 hours have brought a fall in the number and magnitude of earthquakes, although the rate of lava emitted from the vent in the north-west flank of the main cone of the eruption has increased. This lava is flowing on top of the oldest lava and also on the flow in zone 3. It overflowed several existing volcanic tubes and channels this morning. These were among the conclusions of the scientific committee discussed at today's meeting of the Steering Committee of the Canary Islands' Volcano Emergencies Plan (PEVOLCA), which was chaired by Julio Pérez, the Plan's head and minister for public administration, security and justice in the Canarian government.

In the post-meeting press conference, PEVOLCA technical director Miguel Ángel Morcuende reported that a fall in both the number and magnitude of the earthquakes has been observed in the last 24 hours, although this has not been accompanied by a reduction in lava emissions. The lava remains very fluid and is feeding the flows travelling through zones 3 and 9, in addition to the original flow, albeit to a lesser extent.

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With respect to seismicity, María José Banco - spokeswoman for the scientific committee and director of the National Geographic Institute (IGN) in the Canary Islands - reported that the number and magnitude of earthquakes has fallen in the past 24 hours, with no earthquakes felt by the population. The highest magnitude recorded was 3.5 mbLg. The pattern of ground deformation continues to be stable.

Regarding air quality, Morcuende said that the values for particles less than 10 microns (PM10) remain below the daily limit at most stations on the island, except Los Llanos de Aridane, where occasional spikes due to ash fall associated with the eruption and the wind have caused the limits to be exceeded. Accordingly, the PEVOLCA authorities recommend that people in Los Llanos de Aridane should limit outdoor activities as long as the southerly wind continues. The public are also advised to wear FFFP2 masks and goggles when outdoors.

With respect to the lava flows, the technical director stated that the flow no. 3, which expanded and merged with no. 9, has travelled south and is occupying level ground. It does not appear to be heading towards the sea. According to Morcuende, the magma from the vent is abundant and fluid. It is advancing along hollow channels and areas with older flows, and is increasing in height and thickness as a result. Some sections of flow no. 1 are now more than 30 metres in height. The other flows are being monitored closely but have not moved in recent hours.

María José Blanco reported that the most noteworthy phenomenon in the last 48 hours has been the emission of a large volume of ash, which has covered the entire north and north-west of the island, accompanied at times by powerful audible explosions. This episode may have been caused by an intense degassing process, she explained.

Blanco added that the most powerful explosions have produced flashes of lightning and shockwaves, with recent hours bringing an increase in lava from the vent in the north-west flank of the main cone.



The scientific committee spokeswoman added that the eruption column and cloud have been measured at 4500 metres today.

Meanwhile, flights at La Palma airport may be affected in the coming hours due to the anticipated position of the ash cloud, which is expected to move NW and N.

The total area of the island affected by the eruption now stands at around 963 hectares. The maximum width between the far edges of the flows remains at approximately 3000 metres, although there are parts within this area which have not been damaged by the lava.

Latest figures from the Copernicus satellite indicate that the number of buildings destroyed or damaged by the eruption remains unchanged at 2708, of which 2562 have been completely destroyed and 146 have been damaged or are at risk. These figures will be cross-referenced with Land Registry data in the coming days.

The total area of farmland affected is estimated to be 279.88 hectares, 13.27 more than the previous figure. Of these, 156.7 hectares are banana plantations, 58.76 are vineyards, and 23.82 are avocado crops.

A total of 463 people are being accommodated in hotels at present, nine more than yesterday. Of these, 70 are in a hotel in Los Llanos de Aridane and 393 in Fuencaliente. In addition, 43 dependent persons (one less than yesterday) are being accommodated in community health centres on the island. No-one is currently staying in the el Fuerte barracks.

The Steering Committee noted further that no new issues have arisen as regards water and energy supplies, or phone networks. Work on the desalination plants for irrigation water is focused at present on adjustments to pressure to ensure appropriate volumes of water in the irrigation network.

PEVOLCA goal: safety

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Morcuende highlighted the safety aim of the free bus service put in place by the Plan authorities and the La Palma Cabildo for people wanting to see the volcano. “Here at PEVOLCA, we want to ensure the safety of visitors to La Palma, residents of the island and emergency personnel, and also to prevent road traffic casualties” he explained.

The shuttle service had to be increased yesterday evening due to the number of users, which was proof that it was helping avoid cars parking on the sides of the LP-3 road, where people tend to stop to view the volcano. The shuttle departs every 20 minutes from the old airport at Buenavista (Breña Baja) to Tajuya Square in El Paso. Today (Sunday) and tomorrow - the All Saints’ Day holiday - the service will operate from 10:00 until 22:40, with the last return from Tajuya at 24:00.

In addition, as of last Friday light vehicles on the downward side of the LP-3 road (in the direction of Los Llanos de Aridane, Tazacorte and Tijarafe) are being rerouted along the El Paso and Hermosilla roads at peak traffic times (usually late evening). The purpose of the diversion is to keep the LP-3 free for priority use by heavy vehicles, emergency vehicles and public transport.

Daily Scientific Committee Report

Prior to the meeting of the Steering Committee, the Plan’s Scientific Committee met and heard the findings of its members on the evolution of the eruption since yesterday. The Scientific Committee is coordinated by the Canary Island government’s Directorate General for Safety and Emergencies and comprises representatives of Spain’s National Geographical Institute (IGN), Science Research Council (CSIC), Canarian Institute of Vulcanology (Involcan), Spanish Geological and Mining Institute (IGME), National Institute of Meteorology (AEMET), National Oceanographic Institute (IEO), and the universities of La Laguna and Las Palmas de Gran Canaria.

Its conclusions were as follows:

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“The fissure eruption continues to display a strombolian mechanism (a hybrid mechanism with, simultaneously, phases of explosivity that produce pyroclast deposits and effusive phases that trigger lava flows). The effusive phases are more common at present. In vulcanology, the magnitude of volcanic eruptions is measured on the Volcanic Explosivity Index (VEI) on a scale of 0 to 8; the estimated VEI of the present eruption is 2 so far. The eruption behaviour pattern remains the same as during the last three days.

The morphology of the cone is repeatedly changing as a result of the successive growth and reconfiguration processes. The eruption process can consist of episodes of higher and lower strombolian activity, together with pulses with phreatomagmatic activity.

The most noteworthy phenomenon in the last 48 hours has been the emission of a considerable volume of ash which has covered the entire north and north-west of the island, accompanied occasionally by powerful audible explosions. This episode may have been caused by an intense degassing process.

There were also flashes of lightning and shockwaves from the most powerful explosions (waves from explosions that trigger gas flows travelling at speeds greater than the speed of sound).

Recent hours have seen an increase in lava emissions from the vent in the NW flank of the main cone. The lava is travelling in the same directions as noted in the last report, although it overflowed several existing volcanic channels and tubes this morning. Lava flows 1 and 3 (which has now reached flow 9) have advanced very little in the last 24 hours.

Several vents remain active with intermittent activity (pyroclasts and lava), which varies as the configuration of the eruption zone changes. The emergence of new vents in the vicinity of the main cone cannot be ruled out, nor can other surface observables (visible gas emissions) inside the exclusion zone.

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The volcanic plume height has been measured at 09:30 today at 4500 m.

Surface winds today will be NE with breezes in the west of the island, but veering E-SE at low to middle troposphere levels. The anticipated position of the ash cloud today is NW-N, which might affect operations at the island's airport. Conditions in the coming days will be similar to today: NE winds at surface level, E-SE at low to middle levels. Temperature inversion: 2-4°C, with lower and upper boundaries at 600 m and 1200 m respectively. The inversion is expected to remain unchanged in the coming days. Relative humidity of 70-80% up to the inversion level and 10-30% above this (dry and stable atmosphere).

Seismicity continues to be largely concentrated close to that of early days, at depths of between 10 and 15 km. Earthquakes deeper than 20 km are also being recorded. The number and magnitude of earthquakes have fallen in the last 24 hours, with no earthquakes felt. The highest magnitude recorded is 3.5 mbLg. The high amplitude values of the tremor signal remain unchanged, with intensification pulses. The seismicity at intermediate and deep levels is part of the same current eruption process. No significant surface seismicity is being recorded at present. Current levels of seismicity continue to suggest that further earthquakes may be felt by the population and could reach intensities of VI (EMS), with minor rockfalls possible on steep slopes. Relevant information on this aspect is included in the Recommendations section below.

Ground deformation is stable at stations closest to the eruption zone, with those furthest away continuing to reflect slight regional deflation.

During yesterday (30/10), sulphur dioxide (SO₂) emissions associated with the volcanic plume (visible emissions of volcanic gases) continued to fall, in line with the pattern of the last 6 days, reaching 7700 tonnes per day according to estimates using mobile (maritime) miniDOAS-type remote optical sensors (values typically underestimated compared to satellite data). Diffuse emissions of carbon dioxide

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(CO₂) associated with the 220 km² of the Cumbre Vieja volcanic rift (non-visible emissions of volcanic gases) fell between 12-22/10 but have risen since 22/10, reaching an estimated 1450 tonnes per day on 30/10. Diffuse CO₂ emissions monitored at the Los Llanos de Aridane geochemical station (LP10) show a higher magmatic-hydrothermal fraction than that observed at the Fuencaliente station (LP08). All these geochemical observations are consistent with the current eruption process.

In terms of air quality, average levels of SO₂ concentrations remained unchanged yesterday at stations throughout the island and were considerably lower than the hourly limits (350 µg/m³). The highest hourly value of 200 µg/m³ was recorded at 07:00 horas at the Los Llanos de Aridane, Tazacorte and El Paso stations. The average values continued until approximately 13:00. From this time onwards, concentrations of the gas, which is associated with the eruption process, fell and the daily limit of 125 µg/m³ was not exceeded at any of the air quality monitoring stations. Late last night and during the early hours of this morning, values increased at El Paso, Puntagorda and Los Llanos de Aridane, although the maximum levels recorded were lower than yesterday. These values fell gradually throughout the night and are low at present.

With regard to particles below 10 microns (PM₁₀), values below the daily limit of 50 µg/m³ continue to be recorded at all stations on the island except Los Llanos de Aridane, where they increased during yesterday and reached a high of 499 µg/m³ at midnight. Although they subsequently fell rapidly overnight, they have risen considerably this morning, reaching 368 µg/m³ at 10:00. Measurements at this station continue to reflect ash fall from the volcano, which is heavily influenced by daily eruption and wind dynamics. As a result of this situation, the station exceeded the daily PM₁₀ limit, recording a figure of 141 µg/m³. The limit was not exceeded at other stations on the island, where values remain low.

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OBLIGATIONS AND RECOMMENDATIONS

SEA PLUME:

- Particular attention should be paid to the wind forecast to monitor possible changes in direction by the sea plume and act accordingly, particularly in the case of persons with weakened respiratory systems (asthma sufferers, for example) as they are more vulnerable to lower concentrations.
- Eye flushing is also recommended after every exposure given that symptoms are often not noticed until later.
- Sea plumes can be noted up to several kilometres from the source, albeit in a more diluted form. If a plume reaches residential areas, the public are advised to stay indoors if possible and close all doors and windows.
- For safety reasons, research vessels undertaking scientific work in the zone are recommended to keep a distance of at least 500 m in zones with active lava deltas (fed by lava and with visible manifestations) and 200 m in more stable zones. Sailing for scientific purposes related to the management of the emergency is authorised at closer distances on the responsibility of the vessel owner and captain, provided that approval has been sought from the PEVOLCA technical management and Harbourmaster.

LAVA FLOWS:

- The public are also advised not to go near the lava flows due to the risk posed by exposure to gases, possible rockfalls and the high temperatures.
- Given its thickness at certain points, break-ups of the lava front may occur and lead to the formation of large fragments of lava in steeper parts. Depending on the terrain, these may travel distances of several metres from the flow front very quickly after detachment. Small pyroclastic flows are also possible on very steep slopes.

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FALLING PYROCLASTS:

- The public are reminded that an exclusion zone with a radius of 2.5 km is in force around the vents to minimise the risk of impact of pyroclasts and exposure to volcanic gases.
- If explosive activity becomes more intense, some violent detonations may cause windows to break. People are advised to stay away from windows up to 5 km from the cone.
- In areas affected by heavy ash fall (where ground deposits are clearly seen) and particularly if haze is visible, the public are advised to stay indoors. When outdoors, the wearing of FFP2 masks and goggles is recommended.
- If ash reaches other islands, the wearing of surgical masks is recommended. Roof terraces with ash deposits of several centimetres should be cleaned. The procedure recommended by the civil protection authorities for ash removal from roofing and floors (moisten the ash, protect eyes, wear a mask, protect skin, etc, see attached document) should be followed closely. FFP2 masks and gloves should be worn when clearing ash, which should be moistened slightly before brushing. Blowers should not be used except for the cleaning of airport premises by specialist personnel wearing appropriate PPE. Blowers increase the resuspension of the particulates most harmful to health.

For their safety, scientists working on land inside the exclusion zone are advised to stay at least 1000 m from the main emission zone. They may move closer for scientific observations related to the management of the emergency, with the approval of the PEVOLCA technical authorities.

At distances of less than 3km from the current emission zone in the southern sector and inside the exclusion zone, particular attention should be paid to any observable phenomena and exposure should be kept to a minimum.

SEISMIC MOVEMENTS

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- The PEVOLCA scientific committee monitors the volcanic activity constantly.
- Take preventive measures both at work and at home: secure bookshelves and lamps, and remove large objects from furniture.

Outdoors:

If you are outdoors when an earthquake occurs, head for open spaces and stay clear of structures that might fall to the ground. Stay away also from areas at risk of landslide.

For your own safety, please remember the following self-protection recommendations:

- Head for open spaces.
- Stay away from buildings, balconies, traffic lights, street lights, overhead cables and trees.
- Stay clear of areas at risk of landslides/rockfalls.
- Follow the recommendations issued by the authorities and keep up to date with news from official sources and the media.
- If in a vehicle, reduce your speed and, when possible, switch off your engine -away from buildings and hilly areas. Turn on your hazard lights and stay in the vehicle until the earthquake ends.

Indoors:

If you are indoors when an earthquake occurs, remain calm and follow these self-protection recommendations:

- Do not go outside during the earthquake.
- Take shelter in a doorway or under a solid piece of furniture such as a table.
- Stay away from windows.
- If you need to leave your home, turn off the water, gas and electricity.
- In case of evacuation, use the stairs not the lift.

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- Follow the recommendations issued by the authorities and keep up to date with information from official sources and the media.

People on the island of La Palma are advised to wear FFP2 masks when outdoors.

Exclusion zones at sea and on land must still be observed to ensure the safety of the population.

Continuous monitoring of seismic activity has been stepped up and any significant change observed will be notified. Be on the alert for information issued by the appropriate Civil Protection authorities.”