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2021 Cumbre Vieja volcanic eruption

An eruption at the Cumbre Vieja volcanic ridge, comprising the southern half of the Spanish island of La Palma in the Canary Islands, took place between 19 September and 13 December 2021.[7] It was the first volcanic eruption on the island since the eruption of Teneguía in 1971.[8] At 85 days, it is the longest known and the most damaging volcanic eruption on La Palma since records began.[9][10][11] The total damage caused by the volcano amounts up to 843 million euros.[5]

The lava flow covered over 1000 hectares, prompting the evacuation of around 7,000 people. The lava flow was about 3.5 kilometres (2.2 miles) wide at its widest point, about 6.2 kilometres (3.9 miles) long and reached the sea, destroying more than 3,000 buildings, cutting the coastal highway and forming a new peninsula.[12][13] The town of Todoque, including its easternmost neighbourhood Los Campitos, was completely destroyed by lava, which also reached La Laguna (a town within the municipality of Los Llanos de Aridane).[14][15] One death has been linked to the volcano but the cause has yet to be determined.[16]

2021 Tajogaite eruption

The eruption seen at night on 20 September 2021

Volcano	Tajogaite
Start date	19 September 2021[1]
Start time	15:12 WEST (14:12 UTC)[2]
End date	13 December 2021[3]
Type	Fissure eruption Strombolian eruption
Location	La Palma, Spain 28°36′54″N 17°52′07″W
VEI	3[4]
Impact	843 million euros (total material damage, as of December 2021)[5]
Deaths	1[6]

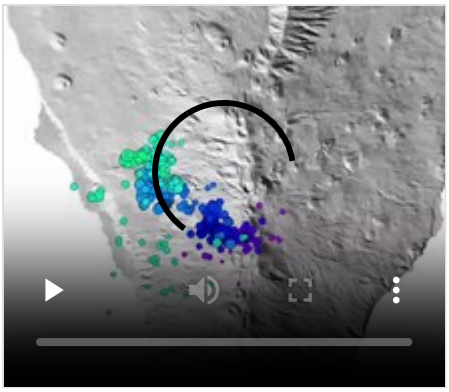
Previous eruptions

The Cabeza de Vaca area is northwest of the two 1949 eruptive centers, San Juan and Duraznero. During the 1949 eruption, fault displacements also had westward components with movement down the volcano's flanks.[17]

The last subaerial eruption in Spain, also on La Palma, was the 1971 Teneguía eruption, which asphyxiated a nearby photographer with its fumes.[18] The eruption also caused some property damage to roads, crops, and homes.[19] The last eruption of any kind in the Canaries was the 2011–2012 eruption of El Hierro,[20] a submarine volcano.[21]

Earthquake swarm before eruption

An earthquake swarm started under Cumbre Vieja on 11 September 2021. It slowly migrated to the surface, with earthquakes of up to around mb_{Lg} magnitude 3.5,[22][23] and more than 22,000 earthquakes were recorded in the space of a



An animation of the earthquake swarm from the start until 19 September

week.[24] A yellow warning of potential volcanic activity was issued on 13 September, covering 35,000 people in the municipalities of Los Llanos de Aridane, Fuencaliente, El Paso and Villa de Mazo.[25] At least 40 individuals and some livestock on La Palma were evacuated by authorities due to this warning,[26] although no complete evacuation of the vicinity around the volcano had been declared.[26]

Lava flows (red) as of 23 November 2021

Eruption

The eruption began at 14:13 local time (14:13 UTC) on 19 September 2021 in a forested area[21][27] called "Cabeza de Vaca",[24] of Montaña Rajada, in the Las Manchas section of the municipality of El Paso.[25][28]

Around 300 people from the local area were evacuated shortly after the eruption,[29] and then a further 700 people (including 500 tourists) were evacuated from the Los Llanos de Aridane coastal region in case the lava flowed to the sea and cut off the main access roads.[30] The total number of evacuees is now estimated to be 5,000 [31] to 10,000.[21][32] The alert level was raised to its highest level—red—due to the eruption.[31]

The eruption took place from at least five main vents.[33]

On the fourth day, according to the Volcanological Institute of the Canary Islands, the volcano entered a more explosive phase, expelling less volcanic gas.[34]

For its first two months, the eruption was assigned a rating on the Volcanic Explosivity Index (VEI) of VEI 2 (on a scale of 8). On 20 November 2021, the scientific committee of the Canary Islands Volcanic Emergency Plan (Pevolca) raised the rating from VEI 2 to VEI 3. Though in modern eruptions where it can be measured, eruption column height is often seen as a more accurate measure, in this case the change was based on the 10 million cubic metres of ejected material measure alone. The VEI rating was increased despite no change in the eruptive mechanism or explosiveness.[35]

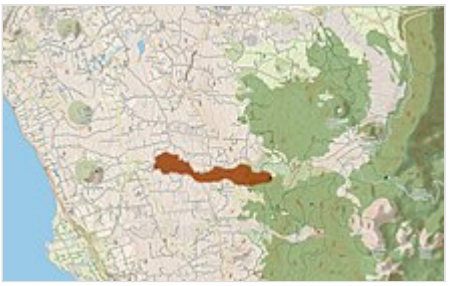
Lava flows and earthquakes

September

On the afternoon of 19 September, the Emergency Committee of the General Hospital of La Palma suspended all non-urgent surgeries, outpatient consultations and patient visits, with exceptions in the latter case, as a preventive measure to guarantee the hospital's capacity to attend in the event that it was required due to the eruption.[36] The hospital resumed normal operations the following day.[37]

Area covered by the lava flow on Monday afternoon 20 September, by Copernicus EMS — Mapping

On the morning of 20 September, the Canarian Ministry of Education ordered the suspension of all classes in the schools of the nearby municipalities of El Paso, Los Llanos de Aridane and Tazacorte.[38] That same morning, direct flights to the island of La Gomera were suspended, but were restored a few hours later. The day before, the public company in charge of civil air navigation and civil airports in Spain, ENAIRE, together with Eurocontrol, activated the action procedure for volcanic ash, but assured the public that air traffic over the Canary Islands was not affected.[39]



Close-up view of the area covered by the lava flow as of 20 September 2021

On 20 September, around two hundred houses have been destroyed by the flow, according to local authorities. No casualties were reported and flights continued into the islands.[21][40][41]

In the early afternoon of 21 September, the lava reached the neighborhood of Todoque, in the municipality of Los Llanos de Aridane, with 1,200 inhabitants. At the end of that day, 185 buildings were destroyed, 400 hectares of arable land were burnt and 5,500 people were evacuated.[42] Los Campitos public school in Los Llanos de Aridane is among those affected, which was destroyed on Monday 20 September.[43]

The eruption on 20 September

On 24 September, the eruptive activity intensified, with further ash and volcanic material falling greater distances, forcing firefighters to withdraw from the neighbourhood of Todoque. Two new vents had opened in the side of the main cone, outpouring lava. Authorities extended the exclusion zone and ordered the evacuation of the neighbourhoods of Tajuya, Tacande de Abajo and Tacande de Arriba in the afternoon. Several civilian airlines suspended flights to the island due to the ash cloud.[44][45]

On 25 September, Aena, the operator of the La Palma Airport, suspended all flights due to ash accumulation with cleaning tasks underway. On the same day, a part of the volcano's principal cone collapsed and a new emissive vent opened to the west of the principal cone (or possibly a previous one that had reopened). The new lava flow followed the previous path, although slightly widening in area.[46][47]

On 26 September, the previously stalled lava flows started again to advance towards the coast, destroying the Todoque neighbourhood church of Saint Pius X and advancing to the sea at a speed of 100 to 200 metres (330 to 660 feet) per hour, mostly on top of the older flow. Meanwhile, the volcano seemed to have entered a more stabilised period after the previous days of more explosive eruptions with a slight fall in seismic activity that took place at deeper depths than before, according to IGN.[48][49]

The church of Saint Pius X in Todoque was destroyed by the reinvigorated lava flow on 26 September

On 28 September, at around 23:02 local time (22:02 UTC), the lava flow reached the sea at the Beach of Los Guirres, also called New Beach, of the municipality of Tazacorte. The heating of the seawater to a high temperature might produce laze containing emissions of sulfuric, hydrochloric, and hydrofluoric acid into the air.[50] Traces of sulphur dioxide emissions from the volcano had been detected in the upper stratosphere as far north as Scandinavia, but the actual impacts of the SO_2 emissions on the weather and air quality were said to be globally negligible so far, mostly due to the emitted amounts and their altitude.[51] Earlier on that day, Spain's government classified the island of La Palma as a disaster zone, due to the steadily increasing property and economic damage caused by the eruption, a move that will trigger emergency subsidies and other support measures.[12]

The lava flow into the sea created a new lava delta,[52] or *fajana*.[53] As of 30 September 2021, this was 20 hectares (49 acres) in size and continuing to grow.[52] It was 27.7 hectares (68 acres) by 2 October. The new land is claimed by the Spanish Government.[53]

The course of the molten lava flow between its source (right) and the sea (left), seen by Copernicus on 1 October

October

On 1 October, a new vent opened, the third in addition to the main crater. This emitted two streams of lava that cut the important LP2 highway and threatened more of the populated area of Los Llanos de Aridane.[54] The total amount of lava emitted since the eruption began was by now estimated to be at least 80 million cubic metres.[54]

On 4 October, the main cone of the volcano collapsed, increasing the lava flow.[55]

On 7 October, at 12:17 local time, an earthquake of magnitude 4.3 mbLg was detected on the island at a depth of 35 km. This was the strongest earthquake since the start of the eruption. By the end of the day, the lava had covered 422 hectares of land and the lava delta had grown to cover an area of 38 hectares.[56]

By 8 October, according to the Copernicus Emergency Management Service, the lava flow had affected 497 hectares of land and more than 1100 buildings had been destroyed.[57][58][59]

On 9 October, part of the north face of the volcano collapsed, causing the lava within the crater to spill out. Three new lava streams were formed.[60]

On 10 October, large chunks of red-hot lava the size of three-storey buildings rolled down and one of the new lava streams reached Callejón de la Gata, an industrial area of Los Llanos de Aridane, and destroyed what was left of the town of Todoque.[61][62]

On 11 October, the northern side of the volcanic crater collapsed creating a new lava flow which threatened another urban district known as La Laguna.[63]

By 12 October, the lava flow had covered over 595 hectares. A fire at a cement factory and the risk of lava affecting more factories and warehouses in an industrial area led to the confinement of 3,500 people in El Paso and Los Llanos de Aridane, with the northern lava flow around 300 metres from the sea. A magnitude 4.1 earthquake also occurred at a depth of 11 kilometers.[64]

Molten lava flow seen by Copernicus on 10 October

On 13 October, the strongest earthquake since the start of the earthquake storm was felt across the island, with magnitude 4.4 at a depth of 36 km.[65]

The northern lava flow entered La Laguna on 14 October, destroying a football pitch and a supermarket, as well as other buildings.[66] By 15 October, further evacuations of regions that might be affected by the lava flow meant that nearly 7,000 people had been displaced, and the lava flow covered over 670 hectares.[67]

A magnitude 4.6 earthquake occurred at 4:41am on 16 October, along with a 4.5 earthquake at 6:07am, both at a depth of 37 km below Mazo.[68]

On 17 October, the advance of the lava flows had slowed. There were plans to rescue five dogs who are trapped in a water tank between lava flows, although it was confirmed that one of them had died.[69] The rescue would involve a specialist company, and the use of drones that usually transport cargo to ships in Gibraltar.[70] By the evening, though, the lava flows reactivated, and it was expected that a second one of them will reach the sea shortly. Another earthquake of magnitude 4.6 occurred below Mazo.[71] Meanwhile, 4,500 children went back to school again for the first time in 30 days, despite the volcanic eruption and COVID-19, with students from Los Campitos and Todoque relocated to a building in Los Llanos.[72] The lava flows have also impacted industrial structures such as cement plants, which have also caused gas clouds and explosions, and have affected flights at Tenerife North–Ciudad de La Laguna Airport.[73]

By 19 October, one month after the start of the eruption, the lava had covered 762 hectares (1,880 acres) of land, almost 30% of which were banana plantations, 1086 land plots, 1692 buildings and 56.4 kilometres (35.0 mi) of roads.[74]

On 24 October, a magnitude 4.9 earthquake occurred beneath Mazo at 4:34pm.[75] The total extent of the lava flows had by now covered an area of at least seven square kilometres.[63]

On 25 October, the intensity of the earth tremors had increased and the lava flows to date had destroyed over 2,000 buildings.[76]

On 26 October, a magnitude 4.8 earthquake under Mazo was also felt in Tenerife, La Gomera and El Hierro.[77] The upper main part of the volcano also had a partial collapse, with the resulting lava flow following the previous flows into the sea.[78]

As of 26 October 2021, the lava that has flowed from the volcano (on 26 October estimated to be 215 million cubic metres) has destroyed or affected over 2,100 buildings, over 66 kilometres (41 mi) of roads and covered an area of over 900 hectares (2,200 acres), with volcanic ash fall covering over 5,500 hectares (14,000 acres) within the limits of the monitored area, according to estimates from visual and radar satellite data by the Copernicus EMS.

On 27 October, the volcano emitted at least 50,000 tons of sulphur dioxide gas.[76] This caused the authorities to advise the public to close the windows of their homes and remain indoors.

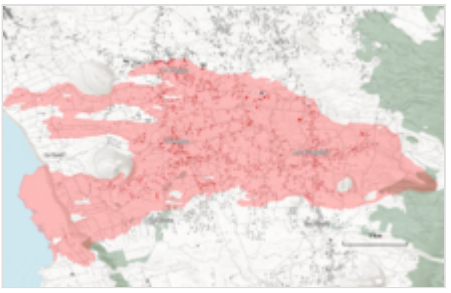
On 28 October, at least 8 earthquakes over a magnitude 4 were felt in La Palma.[76]

On 29 October, the lava flows had covered a total of around 900 hectares and a total number of 7000 people had been evacuated from the surrounding area.[76]

On 30 October, a magnitude 5 earthquake occurred, again under Mazo.[79] The area covered by lava flows had increased to around 963 hectares.[76]

On 31 October, a second magnitude 5 earthquake occurred and it was reported that more would be expected. The area covered by lava flows had increased to at least 1000 hectares. It was also reported that all hotels, hostels, guest-houses, etc. at La Palma were fully booked on account of the large number of tourists travelling there wanting to see the volcano.[76]

Three-dimensional visualisation (from Copernicus Sentinel-2 satellite imagery) of the Tajogaite vent and its lava flows as of January 2022



Extent of lava coverage by 23 November (Copernicus EMS), with highlight of destroyed buildings in Todoque, La Laguna and Los Campitos[57]

November

On 10 November, a second lava flow reached the sea.[76][63]

On 14 November, a 72-year-old man died from injuries sustained when the roof of his house collapsed while he was clearing ash off it. His death was the first associated with the eruption.[80]

On 15 November, a third lava flow reached the sea increasing the island area by a further 40 hectares. Volcanic activity had lessened although the local air quality was still serious.[76]

On 20 November, the Volcanic Explosivity Index (VEI) was upgraded from VEI 2 to VEI 3, when the ejected pyroclastic material reached 10 million m^3. It was expressly emphasized that the upgrade does not mean an increased risk, since the activity of the volcanic eruption had not increased.[81]

On 25 November, a new fissure opened to the south of the original cone, spewing lava which was less viscous and flowed faster.[82]

On 28 November, at 03:00 local time (02:00 UTC), a new fissure opened at the foot of the northeastern flank of the main cone, spewing lava and pyroclastic ash.[83]

December

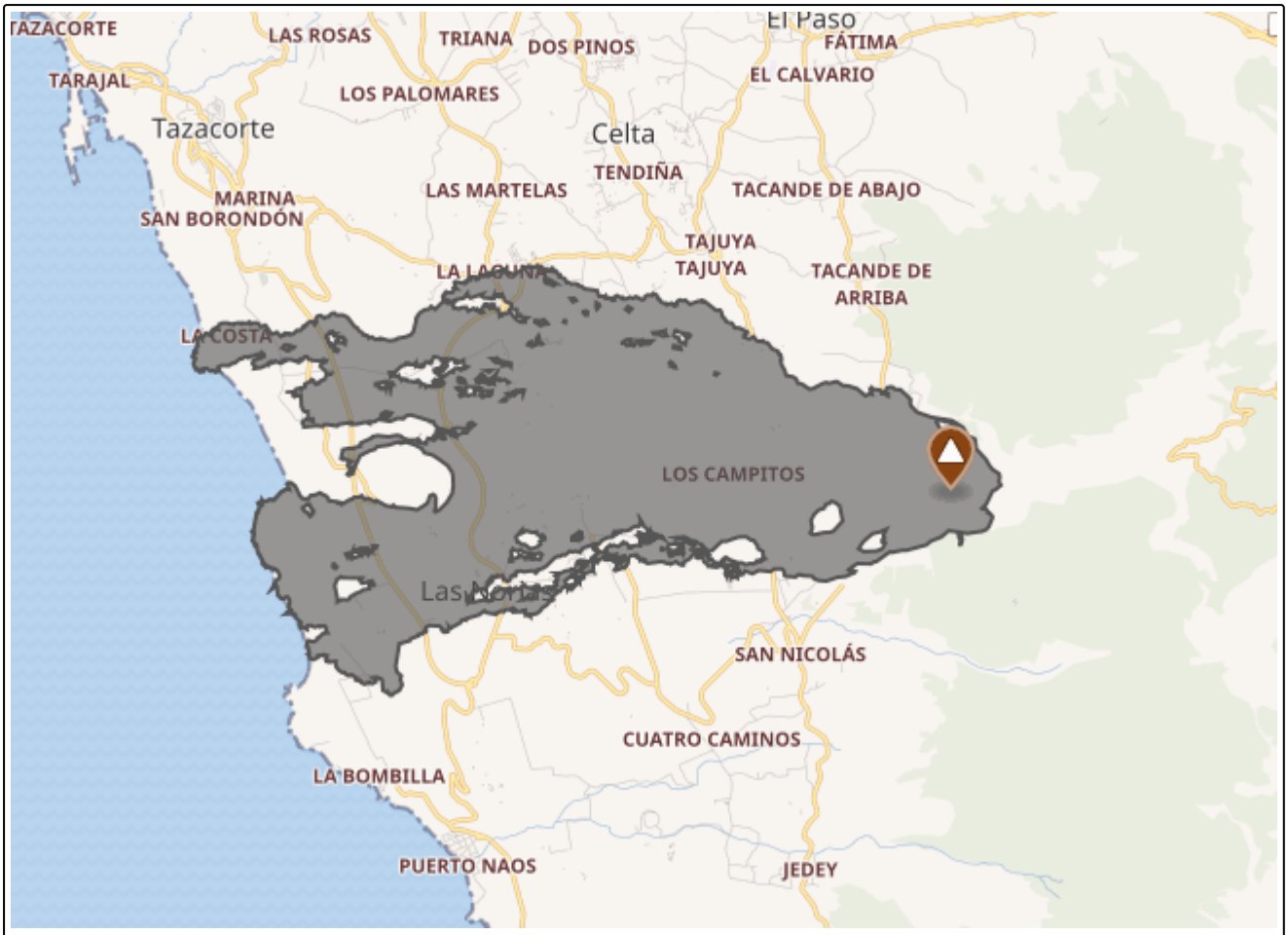
On 12 December, the volcanic eruption broke the local record, when it reached 85 days of continuous activity. The eruption is considered to be the longest known eruption of a volcano on La Palma. Previously, the eruption of the Tajuya Volcano in 1585 was the longest at 84 days. No reliable data is available about previous volcanic eruptions.[9][10]

On 13 December, the volcano released large amounts of toxic sulphur dioxide gas. As a result, the authorities ordered 30,000 residents of three municipalities to remain indoors.[84][10] On the same day, the volcanic eruption ceased.[85][86][87][88]

On 25 December, the eruption was declared to have ended after three months.[89][90]

The eruption on 4 December

Map of the affected areas



Interactive map of the lava extent, mapped and updated by collaborators of OpenStreetMap

Political reactions

Prime Minister of Spain Pedro Sánchez went to the archipelago shortly after the eruption to see the situation on La Palma first-hand, the coordination of the system and the protocols activated, postponing a trip to New York to attend the Seventy-sixth session of the United Nations General Assembly.[91]

King Felipe VI called the President of the Canary Islands, Ángel Víctor Torres, on the afternoon of the eruption to inquire about the situation.[91] The following day during the opening ceremony of the university year in Córdoba, the King sent a message of support to "those who are suffering the evacuation of their homes" and thanked the emergency services for their work.[92] A few days later, he, accompanied by Queen Letizia, travelled to the island.[93][94]

On 19 September, the European Union, on request of Spanish General Directorate for Civil Protection and Emergencies (CENEM), activated the Copernicus Emergency Management Service – Mapping to monitor the eruption[57] and the President of the European Commission Ursula von der Leyen announced via Twitter that "additional support, if necessary," would be made available to the Spanish government.[95]

On 20 September, the Minister of Industry, Trade and Tourism, Reyes Maroto, declared that the eruption on La Palma could be used as a tourist attraction to lure visitors.[96] Her comments caused widespread criticism, because homes, public buildings and businesses began to be destroyed by the lava flows. Later, due to mounting criticism, including from opposition politicians, Reyes Maroto retracted her words.[96]

The Bishop of Tenerife, Bernardo Álvarez Afonso, offered Mass on 22 September at the Sanctuary of Nuestra Señora de las Nieves in La Palma, together with the priests of the island, to pray for the end of the eruption.[97] At the Angelus on Sunday 26 September, Pope Francis expressed his "closeness and solidarity with those affected by the eruption of the volcano on the island of La Palma, in the Canary Islands".[98] The Todoque Church was subsequently destroyed by the lava flow on 26 September.[99]

La Palma Eruption Dec. 12 2021
From Monumento Natural del Teide

The ash plume seen from Tenerife on 30 September 2021; the Cumbre Vieja ridge can be seen on the left.

On 24 September, Prime Minister, Pedro Sánchez announced that at the next meeting of the council of ministers, on 28 September, the island will be declared a disaster area, that the government is preparing a reconstruction plan and a set of immediate measures to provide housing for those families whose homes have been destroyed.[100]

Name

The eruption source is a new vent of the Cumbre Vieja dorsal. As of 29 September 2021, the new vent was still officially unnamed. Volcano vents on La Palma have traditionally been either given Guanche names or, more rarely and not in recent times, named after the Saint on whose feast day the eruption began.[102][88][103] An early proposal for a Guanche name for the new vent was Jedey, after a nearby village, but this was not received favourably.[104][102][88] A newer proposal is Tajogaite,[105] after the Guanche name for Montaña Rajada ("Cracked Mountain"), the area directly downhill from the eruption site.[105][102] This name has since gained wider support.[104][102]

See also

- Cumbre Vieja tsunami hazard
- Geology of the Canary Islands

- List of volcanoes in Spain

Volcanic vents on La Palma have sometimes been named after the saint of the day they erupted. In this case, the saint would be Saint Januarius (*san Genaro*).[101] This painting by Mattia Preti depicts his beheading with Vesuvius in eruption as a background.

References

1. "Entra en erupción el volcán en La Palma" (https://elpais.com/ciencia/2021-09-19/entra-en-erupcion-el-volcan-en-la-palma.html). El País. 19 September 2021. Retrieved 19 September 2021.
2. "El volcán Cumbre Vieja en La Palma entra en erupción" (https://www.canarias7.es/nacional/volcan-cumbre-vieja-palma-6273272442001-20210919151505-vi.html). 19 September 2021.
3. "Concerns remain as La Palma volcanic eruption ends: 'The post-volcano will be tougher than the volcano' " (https://english.elpais.com/spain/2021-12-27/concerns-remain-as-la-palma-volcanic-eruption-ends-the-post-volcano-will-be-tougher-than-the-volcano.html). EL PAÍS. 27 December 2021. Retrieved 27 December 2021.
4. "Cumbre Vieja" (https://volcano.si.edu/volcano.cfm?vn=383010&vtab=Eruptions). *Global Volcanism Program*. Smithsonian Institution.
5. "Canarias remite al Gobierno una evaluación de daños del volcán de La Palma por 842,33 millones" (https://www.europapress.es/islas-canarias/noticia-canarias-remite-gobierno-evaluacion-danos-volcan-palma-84233-millones-20211204160648.html). *Europa Press* (in Spanish). 4 December 2021.
6. "Encuentran muerto a un hombre de 70 años que participaba en la limpieza de ceniza por la erupción de La Palma" (https://cadenaser.com/emisora/2021/11/13/radio_club_tenerife/1636808493_329941.html) (in Spanish). Cadena Ser. 13 November 2021. Retrieved 22 December 2021.
7. Carracedo, Juan C.; Troll, Valentin R.; Day, James M. D.; Geiger, Harri; Aulinas, Meritxell; Soler, Vicente; Deegan, Frances M.; Perez-Torrado, Francisco J.; Gisbert, Guillem; Gazel, Esteban; Rodriguez-Gonzalez, Alejandro (May 2022). "The 2021 eruption of the Cumbre Vieja volcanic ridge on La Palma, Canary Islands" (https://onlinelibrary.wiley.com/doi/10.1111/gto.12388). *Geology Today*. **38** (3): 94–107. doi:10.1111/gto.12388 (https://doi.org/10.1111%2Fgto.12388). ISSN 0266-6979 (https://www.worldcat.org/issn/0266-6979). S2CID 246950800 (https://api.semanticscholar.org/CorpusID:246950800).
8. Carracedo, Juan Carlos; Troll, Valentin R. (1 January 2021), "North-East Atlantic Islands: The Macaronesian Archipelagos" (https://www.sciencedirect.com/science/article/pii/B9780081029084000278), in Alderton, David; Elias, Scott A. (eds.), *Encyclopedia of Geology (Second Edition)*, Oxford: Academic Press, pp. 674–699, ISBN 978-0-08-102909-1, retrieved 10 October 2021

9. "Spanish island volcano eruption hits local record of 85 days" (https://apnews.com/article/science-business-environment-and-nature-canary-islands-spain-eade125082d77bc1c8c1bebbde78b04a). Associated Press. 12 December 2021.
10. "Lockdown lifted for 33,000 confined on La Palma due to bad air quality from volcano" (https://english.elpais.com/spain/2021-12-13/lockdown-lifted-for-33000-confined-on-la-palma-due-to-bad-air-quality-from-volcano.html?outputType=amp). El País. 13 December 2021.
11. "The new volcano is the most damaging among the historical eruptions on La Palma" (https://www.canarianweekly.com/posts/new-volcano-most-damaging). *Canarian Weekly*. 20 October 2021.
12. "Spain declares volcano hit La Palma as disaster zone" (https://www.majorcadailybulletin.com/news/international/2021/09/28/90129/spain-declares-palma-disaster-zone.html). *www.majorcadailybulletin.com*. 28 September 2021. Archived (https://web.archive.org/web/20210929075130/https://www.majorcadailybulletin.com/news/international/2021/09/28/90129/spain-declares-palma-disaster-zone.html) from the original on 29 September 2021. Retrieved 29 September 2021.
13. 20minutos (4 October 2021). "Últimas noticias de las erupciones volcánicas en La Palma" (https://www.20minutos.es/noticia/4842865/0/directo-ultimas-noticias-erupcion-volcan-la-palma-canarias-espana-videos/). *www.20minutos.es – Últimas Noticias* (in Spanish). Archived (https://web.archive.org/web/20211004122104/https://www.20minutos.es/noticia/4842865/0/directo-ultimas-noticias-erupcion-volcan-la-palma-canarias-espana-videos/) from the original on 4 October 2021. Retrieved 4 October 2021.
14. "La lava del volcán de La Palma llega a la zona urbana de La Laguna" (https://www.eldiario.es/canariasahora/islas/lava-volcan-palma-llega-zona-urbana-laguna_1_8413468.html). *eldiario.es* (in Spanish). 20 October 2021. Retrieved 20 October 2021.
15. Day, James M. D.; Troll, Valentin R.; Aulinas, Meritxell; Deegan, Frances M.; Geiger, Harri; Carracedo, Juan Carlos; Pinto, Guillem Gisbert; Perez-Torrado, Francisco J. (1 November 2022). "Mantle source characteristics and magmatic processes during the 2021 La Palma eruption" (https://doi.org/10.1016%2Fj.epsl.2022.117793). *Earth and Planetary Science Letters*. **597**: 117793. Bibcode:2022E&PSL.59717793D (https://ui.adsabs.harvard.edu/abs/2022E&PSL.59717793D). doi:10.1016/j.epsl.2022.117793 (https://doi.org/10.1016%2Fj.epsl.2022.117793). ISSN 0012-821X (https://www.worldcat.org/issn/0012-821X). S2CID 252480769 (https://api.semanticscholar.org/CorpusID:252480769).
16. "Encuentran muerto a un hombre de 70 años que participaba en la limpieza de ceniza por la erupción de La Palma" (https://cadenaser.com/emisora/2021/11/13/radio_club_tenerife/1636808493_329941.html). *Cadena SER* (in Spanish). 13 November 2021. Retrieved 14 November 2021.
17. "Global Volcanism Program | La Palma" (https://volcano.si.edu/volcano.cfm?vn=383010). *Smithsonian Institution | Global Volcanism Program*. Archived (https://web.archive.org/web/20210923031540/https://volcano.si.edu/volcano.cfm?vn=383010) from the original on 23 September 2021. Retrieved 20 September 2021.
18. Carracedo, Juan Carlos; Troll, Valentin R. (2016). *The Geology of the Canary Islands* (https://www.elsevier.com/books/the-geology-of-the-canary-islands/troll/978-0-12-809663-5). Elsevier. pp. 127, 159.
19. "El volcan Teneguía causo daños por valor de seis millones de pesetas" (http://hemeroteca-paginas.lavanguardia.com/LVE07/HEM/1972/04/15/LVG19720415-012.pdf) (PDF). *La Vanguardia Española* (in Spanish): 12. 15 April 1972. Archived (https://web.archive.org/web/20210916172014/http://hemeroteca-paginas.lavanguardia.com/LVE07/HEM/1972/04/15/LVG19720415-012.pdf) (PDF) from the original on 16 September 2021. Retrieved 4 October 2021.

20. Carracedo, Juan Carlos; Torrado, Francisco Pérez; González, Alejandro Rodríguez; Soler, Vicente; Turiel, José Luis Fernández; Troll, Valentin R.; Wiesmaier, Sebastian (March 2012). "The 2011 submarine volcanic eruption in El Hierro (Canary Islands)" (https://onlinelibrary.wiley.com/doi/10.1111/j.1365-2451.2012.00827.x). *Geology Today*. **28** (2): 53–58. doi:10.1111/j.1365-2451.2012.00827.x (https://doi.org/10.1111%2Fj.1365-2451.2012.00827.x). hdl:10261/77891 (https://hdl.handle.net/10261%2F77891). S2CID 55833380 (https://api.semanticscholar.org/CorpusID:55833380).
21. Suarez, Borja (19 September 2021). "Lava pours out of volcano on la Palma in Spain's Canary Islands" (https://www.reuters.com/world/europe/people-evacuated-spanish-island-la-palma-after-volcano-eruption-warning-2021-09-19/). *Reuters*. Archived (https://web.archive.org/web/20210922212034/https://www.reuters.com/world/europe/people-evacuated-spanish-island-la-palma-after-volcano-eruption-warning-2021-09-19/) from the original on 22 September 2021. Retrieved 19 September 2021.
22. "LA PALMA UPDATE: The intensity of earthquakes has increased" (https://www.canarianweekly.com/posts/la-palma-update-sunday-1909). *Canarian Weekly*. 19 September 2021. Archived (https://web.archive.org/web/20210923112736/https://www.canarianweekly.com/posts/la-palma-update-sunday-1909) from the original on 23 September 2021. Retrieved 20 September 2021.
23. "Noticias e informe mensual de vigilancia volcánica" (https://www.ign.es/web/resources/volcanologia/html/CA_noticias.html) (in Spanish). Instituto Geográfico Nacional. 2 October 2021. Archived (https://web.archive.org/web/20211002193904/https://www.ign.es/web/resources/volcanologia/html/CA_noticias.html) from the original on 2 October 2021. Retrieved 3 October 2021.
24. Suarez, Borja (19 September 2021). "Lava shoots up from volcano on La Palma in Spain's Canary Islands" (https://www.reuters.com/world/europe/people-evacuated-spanish-island-la-palma-after-volcano-eruption-warning-2021-09-19/). *Reuters*. Archived (https://web.archive.org/web/20210922212034/https://www.reuters.com/world/europe/people-evacuated-spanish-island-la-palma-after-volcano-eruption-warning-2021-09-19/) from the original on 22 September 2021. Retrieved 19 September 2021.
25. Salas, Javier; Vega, Guillermo (19 September 2021). "Volcano erupts on Canary Island of La Palma" (https://english.elpais.com/science-tech/2021-09-19/volcano-erupts-on-canary-island-of-la-palma.html). *EL PAÍS*. Archived (https://web.archive.org/web/20210922193916/https://english.elpais.com/science-tech/2021-09-19/volcano-erupts-on-canary-island-of-la-palma.html) from the original on 22 September 2021. Retrieved 19 September 2021.
26. Borja Suarez. "People evacuated on Spanish island of La Palma after volcano eruption warning" (https://www.iol.co.za/news/world/people-evacuated-on-spanish-island-of-la-palma-after-volcano-eruption-warning-7973a88a-4c07-4472-86bd-1a53a664e959). Independent Online. Archived (https://web.archive.org/web/20210919213115/https://www.iol.co.za/news/world/people-evacuated-on-spanish-island-of-la-palma-after-volcano-eruption-warning-7973a88a-4c07-4472-86bd-1a53a664e959) from the original on 19 September 2021. Retrieved 19 September 2021.
27. Jones, Sam (19 September 2021). "Spanish Canary Island volcano erupts after weeks of earthquakes" (https://www.theguardian.com/world/2021/sep/19/spanish-canary-island-volcano-erupts-after-weeks-of-earthquakes). *The Guardian*. Archived (https://web.archive.org/web/20210922214523/https://www.theguardian.com/world/2021/sep/19/spanish-canary-island-volcano-erupts-after-weeks-of-earthquakes) from the original on 22 September 2021. Retrieved 20 September 2021.

28. "Máxima alerta en La Palma: Entra en erupción el volcán Cumbre Vieja de La Palma | Canariasenred – Noticias de Canarias" (https://diariodeavisos.elespanol.com/canariasenred/maxima-alerta-en-la-palma-entra-en-erupcion-el-volcan-cumbre-vieja-de-la-palma/) (in Spanish). 19 September 2021. Archived (https://web.archive.org/web/20210923112839/https://diariodeavisos.elespanol.com/canariasenred/maxima-alerta-en-la-palma-entra-en-erupcion-el-volcan-cumbre-vieja-de-la-palma/) from the original on 23 September 2021. Retrieved 20 September 2021.
29. "La Palma island volcano erupts spewing lava, ash and pyroclastic debris, local evacuations begin" (https://thecanarynews.com/2021/09/la-palma-island-volcano-erupts-spewing-lava-ash-and-pyroclastic-debris-local-evacuations-begin/). *The Canary – News, Views & Sunshine*. 19 September 2021. Archived (https://web.archive.org/web/20210921003953/https://thecanarynews.com/2021/09/la-palma-island-volcano-erupts-spewing-lava-ash-and-pyroclastic-debris-local-evacuations-begin/) from the original on 21 September 2021. Retrieved 19 September 2021.
30. Day, James M. D.; Troll, Valentin R.; Aulinas, Meritxell; Deegan, Frances M.; Geiger, Harri; Carracedo, Juan Carlos; Pinto, Guillem Gisbert; Perez-Torrado, Francisco J. (1 November 2022). "Mantle source characteristics and magmatic processes during the 2021 La Palma eruption" (https://doi.org/10.1016%2Fj.epsl.2022.117793). *Earth and Planetary Science Letters*. **597**: 117793. Bibcode:2022E&PSL.59717793D (https://ui.adsabs.harvard.edu/abs/2022E&PSL.59717793D). doi:10.1016/j.epsl.2022.117793 (https://doi.org/10.1016%2Fj.epsl.2022.117793). ISSN 0012-821X (https://www.worldcat.org/issn/0012-821X). S2CID 252480769 (https://api.semanticscholar.org/CorpusID:252480769).
31. "La Palma | La lava sigue avanzando, última hora sobre la erupción del volcán en directo" (https://www.lavanguardia.com/vida/20210919/7732122/volcan-la-palma-erupcion-lava-magma-ultima-hora-en-directo.html). *La Vanguardia* (in Spanish). 19 September 2021. Archived (https://web.archive.org/web/20210922210429/https://www.lavanguardia.com/vida/20210919/7732122/volcan-la-palma-erupcion-lava-magma-ultima-hora-en-directo.html) from the original on 22 September 2021. Retrieved 19 September 2021.
32. Salas, Javier; Vega, Guillermo (20 September 2021). "Lava from volcanic eruption on Canary Island razes around a hundred homes" (https://english.elpais.com/science-tech/2021-09-20/lava-from-volcanic-eruption-on-canary-island-razes-around-a-hundred-homes.html). *El País*. Translated by Hunter, Simon. Archived (https://web.archive.org/web/20210922192043/https://english.elpais.com/science-tech/2021-09-20/lava-from-volcanic-eruption-on-canary-island-razes-around-a-hundred-homes.html) from the original on 22 September 2021. Retrieved 20 September 2021.
33. "Explota una quinta boca de lava del volcán en La Palma en directo" (https://diariodeavisos.elespanol.com/canariasenred/explota-una-quinta-boca-de-lava-del-volcan-en-la-palma-en-directo/). *Canariasenred – Noticias de Canarias* (in Spanish). Diario de Avisos. 19 September 2021. Archived (https://web.archive.org/web/20210921130037/https://diariodeavisos.elespanol.com/canariasenred/explota-una-quinta-boca-de-lava-del-volcan-en-la-palma-en-directo/) from the original on 21 September 2021. Retrieved 19 September 2021.
34. "El volcán de La Palma entra en una nueva fase más explosiva" (https://www.eldiario.es/canariasahora/lapalmaahora/sociedad/volcan-palma-entra-nueva-fase-explosiva-liberar-energia_1_8324805.html) (in Spanish). 21 September 2021. Archived (https://web.archive.org/web/20210922214532/https://www.eldiario.es/canariasahora/lapalmaahora/sociedad/volcan-palma-entra-nueva-fase-explosiva-liberar-energia_1_8324805.html) from the original on 22 September 2021. Retrieved 22 September 2021.
35. EFE (20 November 2021). "El volcán de La Palma sube el índice de explosividad por la emisión de piroclastos" (https://www.efe.com/efe/espana/portada/el-volcan-de-la-palma-sube-indice-explosividad-por-acumulacion-piroclastos/10010-4680441) [The La Palma volcano increases the explosivity index due to the emission of pyroclasts]. *Erupción La Palma* (in Spanish). EFE. Retrieved 23 November 2021.

36. "El Hospital de La Palma reorganiza su actividad para garantizar la atención sanitaria ante la erupción" (https://www.europapress.es/islas-canarias/noticia-hospital-palma-reorganiza-actividad-garantizar-atencion-sanitaria-erupcion-20210919214709.html). *Europa Press*. 19 September 2021. Archived (https://web.archive.org/web/20210922222641/https://www.europapress.es/islas-canarias/noticia-hospital-palma-reorganiza-actividad-garantizar-atencion-sanitaria-erupcion-20210919214709.html) from the original on 22 September 2021. Retrieved 20 September 2021.
37. "El Hospital de La Palma retoma este martes su actividad habitual" (https://www.europapress.es/islas-canarias/noticia-hospital-palma-retoma-martes-actividad-habitual-20210920184824.html). *Europa Press*. 20 September 2021. Archived (https://web.archive.org/web/20210922222641/https://www.europapress.es/islas-canarias/noticia-hospital-palma-retoma-martes-actividad-habitual-20210920184824.html) from the original on 22 September 2021. Retrieved 20 September 2021.
38. "Suspenden las clases en El Paso, Los Llanos de Aridane y Tazacorte" (https://www.europapress.es/islas-canarias/noticia-suspenden-clases-paso-llanos-aridane-tazacorte-20210919200914.html) (in Spanish). 20 September 2021. Archived (https://web.archive.org/web/20210922223558/https://www.europapress.es/islas-canarias/noticia-suspenden-clases-paso-llanos-aridane-tazacorte-20210919200914.html) from the original on 22 September 2021. Retrieved 20 September 2021.
39. "Recuperados los vuelos a La Gomera que habían sido cancelados tras la erupción" (https://www.lavanguardia.com/vida/20210920/7732770/cancelados-vuelos-gomera-repercusion-erupcion-volcan-la-palma.html) (in Spanish). 20 September 2021. Archived (https://web.archive.org/web/20210923025008/https://www.lavanguardia.com/vida/20210920/7732770/cancelados-vuelos-gomera-repercusion-erupcion-volcan-la-palma.html) from the original on 23 September 2021. Retrieved 20 September 2021.
40. "Canaries volcano streams slow down, homes destroyed, thousands flee" (https://www.reuters.com/world/europe/thousands-flee-lava-spewing-volcano-spains-la-palma-island-destroys-houses-2021-09-20/). *Reuters*. 21 September 2021. Archived (https://web.archive.org/web/20210922223704/https://www.reuters.com/world/europe/thousands-flee-lava-spewing-volcano-spains-la-palma-island-destroys-houses-2021-09-20/) from the original on 22 September 2021. Retrieved 21 September 2021.
41. Vega, Guillermo (20 September 2021). "Lava from volcanic eruption on La Palma measures an average of six meters high and is flowing at 700 meters per hour" (https://english.elpais.com/spain/2021-09-20/lava-from-volcanic-eruption-on-la-palma-measures-an-average-of-six-meters-high-and-is-flowing-at-700-meters-per-hour.html). *El País*. Translated by Hunter, Simon. Archived (https://web.archive.org/web/20210922224727/https://english.elpais.com/spain/2021-09-20/lava-from-volcanic-eruption-on-la-palma-measures-an-average-of-six-meters-high-and-is-flowing-at-700-meters-per-hour.html) from the original on 22 September 2021. Retrieved 20 September 2021.
42. "Volcán en La Palma, la erupción en directo. La lava sale por cuatro bocas, arrasa 185 edificaciones y "avanza inexorablemente hacia el mar" " (https://www.elmundo.es/ciencia-y-salud/ciencia/2021/09/21/6149104ffc6c833b748b4598.html) (in Spanish). 21 September 2021. Archived (https://web.archive.org/web/20210923073447/https://www.elmundo.es/ciencia-y-salud/ciencia/2021/09/21/6149104ffc6c833b748b4598.html) from the original on 23 September 2021. Retrieved 21 September 2021.
43. "La lava del volcán de La Palma engulle el colegio público Los Campitos" (https://www.publico.es/sociedad/lava-volcan-palma-engulle-colegio-publico-campitos.html) (in Spanish). 20 September 2021. Archived (https://web.archive.org/web/20210921093021/https://www.publico.es/sociedad/lava-volcan-palma-engulle-colegio-publico-campitos.html) from the original on 21 September 2021. Retrieved 21 September 2021.

44. "Volcanic activity increases on La Palma, prompting new evacuations and flight cancelations" (https://english.elpais.com/spain/2021-09-24/volcanic-activity-increases-on-la-palma-prompting-new-evacuations-and-flight-cancelations.html). *El País*. 24 September 2001. Archived (https://web.archive.org/web/20210924163743/https://english.elpais.com/spain/2021-09-24/volcanic-activity-increases-on-la-palma-prompting-new-evacuations-and-flight-cancelations.html) from the original on 24 September 2021. Retrieved 24 September 2001.
45. "Volcán en La Palma, la erupción en directo | Evacuan tres poblaciones tras abrirse dos nuevas bocas eruptivas" (https://www.elmundo.es/ciencia-y-salud/ciencia/2021/09/24/614d0cd0e4d4d866658b45a1.html). *El Mundo* (in Spanish). 24 September 2021. Archived (https://web.archive.org/web/20210924053158/https://www.elmundo.es/ciencia-y-salud/ciencia/2021/09/24/614d0cd0e4d4d866658b45a1.html) from the original on 24 September 2021. Retrieved 24 September 2021.
46. Martinez, Guillermo; Nazca, Jon (25 September 2021). "Airport closed as La Palma volcano eruption intensifies" (https://www.reuters.com/world/europe/red-hot-lava-spews-la-palma-volcano-eruption-intensifies-2021-09-25/). *Reuters*. Archived (https://web.archive.org/web/20210925231357/https://www.reuters.com/world/europe/red-hot-lava-spews-la-palma-volcano-eruption-intensifies-2021-09-25/) from the original on 25 September 2021. Retrieved 25 September 2021.
47. Salas, Javier; Vega, Guillermo (25 September 2021). "El cono principal del volcán de La Palma sufre un derrumbe parcial: "No soporta su propio peso" " (https://elpais.com/sociedad/2021-09-25/el-cono-principal-del-volcan-de-la-palma-sufre-un-derrumbe-parcial-no-soporta-su-propio-peso.html). *El País* (in Spanish). Archived (https://web.archive.org/web/20210925163710/https://elpais.com/sociedad/2021-09-25/el-cono-principal-del-volcan-de-la-palma-sufre-un-derrumbe-parcial-no-soporta-su-propio-peso.html) from the original on 25 September 2021. Retrieved 25 September 2021.
48. "Últimas noticias del volcán en erupción en La Palma, en directo | La lava se mueve a una velocidad de entre 100 y 200 metros por hora" (https://elpais-com.translate.goog/espana/2021-09-26/ultimas-noticias-del-volcan-en-erupcion-en-la-palma-en-directo-la-ultima-hora-de-cumbre-vieja-en-canarias.html). *El País* (in Spanish). 26 September 2021. Retrieved 26 September 2021.
49. Vega, Guillermo; Salas, Javier (26 September 2021). "La colada de lava en La Palma se reactiva y avanza hacia la costa" (https://elpais.com/sociedad/2021-09-26/la-colada-de-lava-en-la-palma-se-reactiva-y-avanza-hacia-la-costa.html). *El País* (in Spanish). Archived (https://web.archive.org/web/20210926193147/https://elpais.com/sociedad/2021-09-26/la-colada-de-lava-en-la-palma-se-reactiva-y-avanza-hacia-la-costa.html) from the original on 26 September 2021. Retrieved 26 September 2021.
50. "La lava del volcán de La Palma alcanza el mar" (https://www.eldiario.es/canariasahora/lapalmaahora/sociedad/lava-volcan-palma-alcanza-mar_1_8326032.html). *elDiario.es* (in Spanish). 29 September 2021. Archived (https://web.archive.org/web/20210929023539/https://www.eldiario.es/canariasahora/lapalmaahora/sociedad/lava-volcan-palma-alcanza-mar_1_8326032.html) from the original on 29 September 2021. Retrieved 29 September 2021.
51. Cereceda, Rafael (30 September 2021). "La Palma volcano: How satellite imagery is helping us understand the eruption" (https://www.euronews.com/2021/09/29/la-palma-volcano-how-satellite-imagery-is-helping-us-understand-the-eruption). *Euronews*. Archived (https://web.archive.org/web/20210929155854/https://www.euronews.com/2021/09/29/la-palma-volcano-how-satellite-imagery-is-helping-us-understand-the-eruption) from the original on 29 September 2021. Retrieved 30 September 2021.

52. "Canary Islands lava peninsula in the Atlantic doubles in size" (https://www.theguardian.com/world/2021/sep/30/canary-islands-lava-peninsula-in-the-atlantic-doubles-in-size), *The Guardian*, 30 September 2021, archived (https://web.archive.org/web/20211001065133/https://www.theguardian.com/world/2021/sep/30/canary-islands-lava-peninsula-in-the-atlantic-doubles-in-size) from the original on 1 October 2021, retrieved 1 October 2021
53. "The 'new land' created by the lava from the volcano now measures 27.7 hectares" (https://www.canarianweekly.com/posts/new-land-created-by%20volcano). *Canarian Weekly*. 2 October 2021. Archived (https://web.archive.org/web/20211002202544/https://www.canarianweekly.com/posts/new-land-created-by%20volcano) from the original on 2 October 2021. Retrieved 2 October 2021.
54. Vega, Guillermo (1 October 2021). "Volcanic eruption on La Palma intensifies as new vent and lava tongues emerge" (https://english.elpais.com/spain/2021-10-01/volcanic-eruption-on-la-palma-intensifies-as-new-vent-and-lava-tongues-emerge.html). *El Pais*. Translated by Kitson, Melissa. Archived (https://web.archive.org/web/20211002210116/https://english.elpais.com/spain/2021-10-01/volcanic-eruption-on-la-palma-intensifies-as-new-vent-and-lava-tongues-emerge.html) from the original on 2 October 2021. Retrieved 2 October 2021.
55. Ahora, Canarias (3 October 2021). "El cono principal del volcán de La Palma sufre un derrumbe parcial y aumenta el caudal de lava" (https://www.eldiario.es/canariasahora/lapalmaahora/cono-principal-volcan-palma-sufre-derrumbe-parcial_1_8363214.html). *ElDiario.es* (in Spanish). Archived (https://web.archive.org/web/20211004122105/https://www.eldiario.es/canariasahora/lapalmaahora/cono-principal-volcan-palma-sufre-derrumbe-parcial_1_8363214.html) from the original on 4 October 2021. Retrieved 4 October 2021.
56. "La Palma registra un terremoto de 4,3: el más intenso desde el inicio de la actividad volcánica" (https://www.rtve.es/noticias/20211007/palma-volcan-terremoto/2183741.shtml). *rtve.es* (in Spanish). 7 October 2021. Retrieved 11 October 2021.
57. "EMSR546: Volcano eruption in La Palma, Spain" (https://emergency.copernicus.eu/EMSR546). *Copernicus Emergency Management Service* — *Mapping*. European Union. 19 September 2021. Retrieved 1 March 2022.
58. @CopernicusEMS (9 October 2021). "Our #RapidMappingTeam has released its 17th updated product for #LaPalma🇪🇸#CumbreVieja eruption using an optical image acquired on 8 October at 12:06 UTC | Extent of the lava flow: 497 ha (+16.5 ha in 24h) | 1,186 destroyed buildings detected (+37)" (https://x.com/CopernicusEMS/status/1446882126289321995) (Tweet) – via Twitter.
59. "La Palma volcano: How satellites help us monitor eruptions" (https://www.esa.int/Applications/Observing_the_Earth/Copernicus/La_Palma_volcano_How_satellites_help_us_monitor_eruptions). *www.esa.int*. European Space Agency. Retrieved 11 October 2021.
60. "Varios derrumbes en la cara norte del volcán de La Palma aceleran el flujo de las coladas" (https://elpais.com/sociedad/2021-10-09/la-cara-norte-del-volcan-de-la-palma-se-derrumba-de-manera-parcial-y-arrasa-nuevas-construcciones.html). *elpais.com* (in Spanish). 9 October 2021. Retrieved 11 October 2021.
61. "La colada norte del volcán de La Palma sepulta dos barrios y está a punto de crear una nueva fajana" (https://www.eldia.es/la-palma/2021/10/11/colada-norte-volcan-la-palma-sepulta-barrios-punto-nueva-fajana-58233268.html). *eldia.es* (in Spanish). 11 October 2021. Retrieved 11 October 2021.
62. Castellanos, Silvio; Medina, Juan (10 October 2021). "Lava blocks the size of buildings falling from La Palma volcano" (https://www.reuters.com/world/europe/lava-blocks-size-buildings-falling-la-palma-volcano-2021-10-10/). *Reuters*. Retrieved 11 October 2021.
63. La Sexta Spanish television channel
64. "New flows increase the destruction of the La Palma volcano" (https://www.canarianweekly.com/posts/new-flows-increase-destruction-la-palma). *Canarian Weekly*. 12 October 2021.

65. "4.4 magnitude earthquake rattles the south of La Palma this afternoon" (https://www.canarianweekly.com/posts/earthquake-rattles-south-la-palma). *Canarian Weekly*. 13 October 2021.
66. "El 'monstruo' de lava arrasa con el supermercado y el campo de fútbol de La Laguna | Canariasenred – Noticias de Canarias" (https://diariodeavisos.elespanol.com/canariasenred/el-monstruo-de-lava-arrasa-con-el-supermercado-y-el-campo-de-futbol-de-la-laguna/) (in Spanish). 14 October 2021.
67. Vega, Guillermo (15 October 2021). "New surge in lava flow fuels fears of further destruction in Spain's La Palma" (https://english.elpais.com/spain/2021-10-15/new-surge-in-lava-flow-fuels-fears-of-further-destruction-in-spains-la-palma.html). *EL PAÍS English Edition*.
68. "La Palma registers the most intense earthquake so far of 4.6 degrees this morning" (https://www.canarianweekly.com/posts/la-palma-most-intense-earthquake). *Canarian Weekly*. 16 October 2021.
69. "The lava flows have not advanced and drone pilots are attempting rescue of four dogs" (https://www.canarianweekly.com/posts/lava-flows-not-advanced-four-dogs-trapped). *Canarian Weekly*. 17 October 2021.
70. Vega, Guillermo (18 October 2021). "Spanish drone company races to save trapped dogs on La Palma with 'unprecedented' rescue mission" (https://english.elpais.com/spain/2021-10-18/spanish-drone-company-races-to-save-trapped-dogs-on-la-palma-with-unprecedented-rescue-mission.html?ssm=FB_CM_EN#Echobox=1634552768). *EL PAÍS English Edition*.
71. "LA PALMA UPDATE: More lava and more earthquakes as eruption enters 5th week" (https://www.canarianweekly.com/posts/la-palma-update-more-lava-more-earthquakes). *Canarian Weekly*. 18 October 2021.
72. Menárguez, Ana Torres (18 October 2021). "Más de 4.000 estudiantes vuelven a las clases en La Palma con un protocolo volcánico que colisiona con el de la covid" (https://elpais.com/educacion/2021-10-18/mas-de-4000-estudiantes-vuelven-a-las-clases-en-la-palma-con-un-protocolo-volcanico-que-colisiona-con-el-de-la-covid.html). *El País* (in Spanish).
73. "La Palma sigue temblando por la fuerza del volcán y la nube de gases la asfixia poco a poco | Canariasenred – Noticias de Canarias" (https://diariodeavisos.elespanol.com/canariasenred/la-palma-sigue-temblando-por-la-fuerza-del-volcan-y-la-nube-de-gases-asfixia-poco-a-poco-a-la-palma/) (in Spanish). 18 October 2021.
74. "One month on, La Palma volcano continues to cause destruction" (https://english.elpais.com/spain/2021-10-19/one-month-on-la-palma-volcano-continues-to-cause-destruction.html). *elpais.com*. 19 October 2021. Retrieved 20 October 2021.
75. "La Palma registers a 4.9 earthquake that shakes the island" (https://www.canarianweekly.com/posts/la-palma-registers-earthquake). *Canarian Weekly*. 23 October 2021.
76. Cadena 24hrs Spanish television news channel
77. "A 4.8 earthquake in La Palma has been felt in Tenerife, including the south" (https://www.canarianweekly.com/posts/earthquake-la-palma-felt-tenerife). *Canarian Weekly*. 26 October 2021.
78. "LA PALMA UPDATE: Lava flows towards the sea without causing further damage" (https://www.canarianweekly.com/posts/la-palma-update-27102021). *Canarian Weekly*. 27 October 2021.
79. "La Palma registers an earthquake of magnitude 5, felt in Tenerife" (https://www.canarianweekly.com/posts/magnitude-five-earthquake-felt-tenerife). *Canarian Weekly*. 30 October 2021.
80. "Encuentran muerto a un hombre de 70 años que participaba en la limpieza de ceniza por la erupción de la Palma" (https://cadenaser.com/emisora/2021/11/13/radio_club_tenerife/1636808493_329941.html). 13 November 2021.

81. "El aporte de lava alimenta principalmente la colada 4 y ocupa nuevo terreno agrícola" (https://www3.gobiernodecanarias.org/noticias/el-aporte-de-lava-alimenta-principalmente-la-colada-4-y-ocupa-nuevo-terreno-agricola/) (in Spanish). Gobierno de Canarias. 20 November 2021.
82. "Involcan confirma la aparición de una nueva boca eruptiva al sur del cono del volcán en La Palma" (https://www.eldiario.es/canariasahora/lapalmaahora/aparece-nuevo-centro-emision-lava-volcan-palma_1_8526228.html) (in Spanish). Diario AS. 25 November 2021.
83. "Se abre una nueva boca en el volcán de La Palma, que forma una colada" (https://www.eldiario.es/canariasahora/sociedad/abre-madrugada-nueva-boca-noroeste-cono-volcan-palma_1_8533033.html) (in Spanish). elDiario.es. 28 November 2021.
84. "El volcán desconcierta con el tremor "desaparecido" y la columna de emisión más alta registrada" (https://www.abc.es/espana/canarias/abci-volcan-desconcierta-tremor-desaparecido-y-columna-emision-mas-alta-registrada-202112141049_noticia.html) (in Spanish). ABC.es. 14 December 2021.
85. Parra, Aritz; Hatton, Barry (15 December 2021). "After 3 tense months, Spanish volcano eruption may be over" (https://apnews.com/article/science-africa-environment-and-nature-canary-islands-volcanic-eruptions-76f9c59735d0e860d2b44222275a994f). *AP NEWS*. Retrieved 20 December 2021.
86. Jones, Sam (15 December 2021). " 'Tremor is zero': La Palma volcano may be calming down" (https://www.theguardian.com/world/2021/dec/15/tremor-is-zero-la-palma-volcano-may-be-calming-down-say-scientists). *The Guardian*. Retrieved 16 December 2021.
87. Trujillo, Marco (16 December 2021). "Inside La Palma's volcano: lull in activity allows look into crater" (https://www.reuters.com/business/environment/end-eruption-spanish-volcano-calm-second-day-2021-12-15/). *Reuters*. Retrieved 16 December 2021.
88. Michelangelo Criado: ¿Cabeza de Vaca, Jedey o Cumbre Vieja? Cómo se nombra un nuevo volcán. (https://elpais.com/ciencia/2021-09-22/cabeza-de-vaca-jedey-o-cumbre-vieja-como-se-nombra-un-nuevo-volcan.html) Archived (https://web.archive.org/web/20210929042603/https://elpais.com/ciencia/2021-09-22/cabeza-de-vaca-jedey-o-cumbre-vieja-como-se-nombra-un-nuevo-volcan.html) 29 September 2021 at the Wayback Machine *El País*, 22 September 2021. Retrieved on 29 September 2021.
89. "Spain declares volcano eruption on La Palma island over after destructive 3 months" (https://www.cbc.ca/news/world/spain-volcano-la-palma-declared-over-1.6298284). *CBC*. 25 December 2021. Archived (https://web.archive.org/web/20211225173511/https://www.cbc.ca/news/world/spain-volcano-la-palma-declared-over-1.6298284) from the original on 25 December 2021. Retrieved 25 December 2021.
90. "Spain's La Palma volcano eruption declared over after three months" (https://www.bbc.com/news/world-europe-59791541). *BBC News*. 25 December 2021.
91. "Sánchez pospone su viaje a Nueva York y viaja a La Palma para seguir la crisis de Cumbre Vieja" (https://www.lavanguardia.com/politica/20210919/7731964/sanchez-cancela-viaje-nueva-york-viaja-canarias-seguir-crisis-cumbre-vieja.html). 19 September 2021. Archived (https://web.archive.org/web/20210922195546/https://www.lavanguardia.com/politica/20210919/7731964/sanchez-cancela-viaje-nueva-york-viaja-canarias-seguir-crisis-cumbre-vieja.html) from the original on 22 September 2021. Retrieved 21 September 2021.
92. "El Rey traslada su "ánimo" a los habitantes de La Palma y agradece la labor de los servicios de emergencia" (https://www.europapress.es/islas-canarias/noticia-rey-traslada-animo-habitantes-palma-agradece-labor-servicios-emergencia-20210920125728.html). 20 September 2021. Archived (https://web.archive.org/web/20210922001417/https://www.europapress.es/islas-canarias/noticia-rey-traslada-animo-habitantes-palma-agradece-labor-servicios-emergencia-20210920125728.html) from the original on 22 September 2021. Retrieved 21 September 2021.

93. Vega, Guillermo (23 September 2021). "Spain's King Felipe VI and Queen Letizia meet with victims of volcanic eruption on La Palma" (https://english.elpais.com/spain/2021-09-23/spains-king-felipe-vi-and-queen-letizia-meet-with-victims-of-volcanic-eruption-on-la-palma.html). *EL PAÍS English Edition*. Retrieved 14 October 2021.
94. "Spanish Royals and PM Sanchez visit victims of La Palma volcanic eruption" (http://www.news.cn/english/europe/2021-09/24/c_1310205542.htm). *www.news.cn*. Retrieved 14 October 2021.
95. "La Unión Europea ofrece un "apoyo adicional" a La Palma por la erupción del volcán Cumbre Vieja" (https://www.elespanol.com/espana/20210920/union-europea-adicional-palma-erupcion-cumbre-vieja/613440085_0.html) (in Spanish). 20 September 2021. Archived (https://web.archive.org/web/20210922001414/https://www.elespanol.com/espana/20210920/union-europea-adicional-palma-erupcion-cumbre-vieja/613440085_0.html) from the original on 22 September 2021. Retrieved 21 September 2021.
96. "Devastating volcano eruption can be used to lure tourists to Canaries, says minister" (https://www.theguardian.com/world/2021/sep/20/spanish-minister-volcano-tourism-la-palma-canary-islands). *The Guardian*. 20 September 2021. Retrieved 30 September 2021.
97. "Sacerdotes de La Palma y el obispo celebran una misa para pedir a su patrona que "cese la erupción del volcán" " (https://www.canarias7.es/canarias/la-palma/sacerdotes-palma-obispo-20210922145512-nt.html) (in Spanish). 22 September 2021. Archived (https://web.archive.org/web/20210923054303/https://www.canarias7.es/canarias/la-palma/sacerdotes-palma-obispo-20210922145512-nt.html) from the original on 23 September 2021. Retrieved 22 September 2021.
98. "El Papa manifiesta "cercanía y solidaridad" a los damnificados por la erupción en La Palma y al personal de socorro" (https://www.abc.es/sociedad/abci-papa-manifiesta-cercania-y-solidaridad-damnificados-erupcion-palma-y-personal-socorro-202109261253_noticia.html). *ABC* (in Spanish). 26 September 2021. Archived (https://web.archive.org/web/20210926192714/https://www.abc.es/sociedad/abci-papa-manifiesta-cercania-y-solidaridad-damnificados-erupcion-palma-y-personal-socorro-202109261253_noticia.html) from the original on 26 September 2021. Retrieved 26 September 2021.
99. "VIDEO: Lava flows demolish Todoque church in a new wave of destruction" (https://www.canarianweekly.com/posts/lava-demolishes-todoque-church). *Canarian Weekly*. 26 September 2021. Archived (https://web.archive.org/web/20211002221816/https://www.canarianweekly.com/posts/lava-demolishes-todoque-church) from the original on 2 October 2021. Retrieved 2 October 2021.
100. Vega, Guillermo (24 September 2021). "El Gobierno declarará La Palma como zona catastrófica y anuncia un plan de reconstrucción" (https://elpais.com/sociedad/2021-09-24/el-gobierno-declarara-la-palma-como-zona-catastrofica-y-anuncia-un-plan-de-reconstruccion.html) (in Spanish). Archived (https://web.archive.org/web/20210924194325/https://elpais.com/sociedad/2021-09-24/el-gobierno-declarara-la-palma-como-zona-catastrofica-y-anuncia-un-plan-de-reconstruccion.html) from the original on 24 September 2021. Retrieved 24 September 2021.
101. Dávila, Jorge; Pérez, Ramón (27 September 2021). "Tajogaite, un nombre para el volcán de La Palma" (https://www.eldia.es/la-palma/2021/09/27/nombre-volcan-la-palma-tajogaite-57727228.html). *eldia.es* (in Spanish). Retrieved 10 January 2022.

102. “La Palma: Wie soll der “neue” Vulkan denn heissen?” (https://teneriffa-services.com/la-palma-wie-soll-der-neue-vulkan-denn-heissen/) Archived (https://web.archive.org/web/20210929120421/https://teneriffa-services.com/la-palma-wie-soll-der-neue-vulkan-denn-heissen/) 29 September 2021 at the Wayback Machine *teneriffa-services.com*, 27 September 2021. Partial automatic English translation to be found at “Tajogaite, a name for the La Palma volcano,” (https://digismak.com/tajogaite-a-name-for-the-la-palma-volcano/) Archived (https://web.archive.org/web/20210929114932/https://digismak.com/tajogaite-a-name-for-the-la-palma-volcano/) 29 September 2021 at the Wayback Machine *Digis Mak*. Retrieved on 27 September 2021.
103. “Octava erupción en La Palma. Desde que existen registros históricos.” In: Redacción & Agencias, “Cumbre Vieja: ¿por qué erupciona el volcán? ¿Cuánto durará?” (https://www.lavanguardia.com/vida/20210919/7731981/volcan-la-palma-erupcion-cumbre-vieja.html) Archived (https://web.archive.org/web/20210929114916/https://www.lavanguardia.com/vida/20210919/7731981/volcan-la-palma-erupcion-cumbre-vieja.html) 29 September 2021 at the Wayback Machine *La Vanguardia*, 19/22 September 2021. Retrieved on 29 September 2021.
104. Redacción NIUS: “Cumbre Vieja, Cabeza de Vaca, Jedey o Tajogaite: el volcán de La Palma aún no tiene nombre.” (https://www.niusdiario.es/sociedad/medio-ambiente/cumbre-vieja-cabeza-vaca-jedey-o-tajogaite-volcan-la-palma-aun-no-tiene-nombre-oficial_18_3209595168.html) Archived (https://web.archive.org/web/20210929114932/https://www.niusdiario.es/sociedad/medio-ambiente/cumbre-vieja-cabeza-vaca-jedey-o-tajogaite-volcan-la-palma-aun-no-tiene-nombre-oficial_18_3209595168.html) 29 September 2021 at the Wayback Machine *NIUS diario*, 27 September 2021. Retrieved on 27 September 2021.
105. Roger Frey: “Vulkaninformation Donnerstag Morgen. 23 September, 2021.” (https://www.idafe.com/German/51blog_de.html) Archived (https://web.archive.org/web/20210922235542/https://www.idafe.com/German/51blog_de.html) 22 September 2021 at the Wayback Machine *Idafe Blog. Nachrichten von der Insel La Palma*, 23 September 2021. Retrieved on 27 September 2021.

External links

- Current map showing the advance of lava effusions in La Palma eruption (https://lapalma.maps.arcgis.com/apps/StorytellingSwipe/index.html?appid=e81adc67019244f599dd5abe6c3ec9bd) (Cabildo de La Palma)
- Current map of carbon monoxide concentrations near Cumbre Vieja. (https://earth.nullschool.net/#current/chem/surface/level/overlay=cosc/orthographic=-17.83,28.57,9941/loc=-17.855,28.615)
- Current map of sulfur dioxide concentrations near Cumbre Vieja. (https://earth.nullschool.net/#current/chem/surface/level/overlay=so2smass/orthographic=-17.83,28.57,9941/loc=-17.855,28.615)
- EMSR546: Volcano eruption in La Palma, Spain (damage grading maps) (https://emergency.copernicus.eu/EMSR546) – Copernicus Emergency Management Service

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