

# Mapping the formation of an underwater volcano

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On Oct. 9 an underwater volcano started to emerge in waters off El Hierro Island in the Canaries, Spain. Researchers of the Spanish Institute of Oceanography (IEO, Ministry of Science and Innovation) only needed 15 days to map its formation in high resolution. The volcanic cone has reached a height of 100 m and the lava tongue flows down its side, even though its activity has slowed down in the past few days.

"This is probably the first time that such a young [underwater volcano](#) has been mapped in such [high resolution](#)," explains Juan Acosta, head of the IEO campaign set to study the volcanic cone that emerged this month near El Hierro island in the Canaries.

On the 9th October, scientists of Spain's National Geographic Institute (Spanish Ministry of Development) detected the initial seismic movements that gave way to the birth of the underwater volcano. Then, by the 24th of this month, scientists on board the IEO's ship Ramón Margalef had already completed the bathymetry (mapping of the sea bed) with unprecedented precision.

The boat has a cutting-edge sensor system which means that details of less than 10 metres can be observed on the sea bed. The bathymetry was obtained in two days by tracing parallel scans.

In 1998, within the framework in Spanish Exclusive Economic Zone, researchers of the IEO and Spain's Marine Hydrographic Institute (Spanish Ministry of Defence) also mapped the same area from within

the oceanographic ship Hespérides. Using a geographic information system, these images have now been superimposed onto those just taken and thus the birth of the volcano has been confirmed.

Acosta says that "it is spectacular to see how what was once an underwater valley is now a volcanic cone with its descending [lava](#) tongue."

The base of the volcano lies at a depth of 300 m. It is conical and 100 m high with a base diameter of 700 m and a crater width of 120 m. The volume of the volcano is around 0.012 km<sup>3</sup>, 0.07 km<sup>3</sup> of which is made up of its lava tongue that is slowly filling the adjacent valley.

Scientists have also created graphs of the gas plumes that are consistently coming out of the main crater and the surrounding cracks. However, at present the possible development and risks of the volcano have not been officially declared. Their mission is to provide data to those in charge of the Special Civil Protection Plan for Emergency Volcanic Risk in the Canary Islands (PEVOLCA) as a way of aiding them in the decision making process.

Named Bimbache after the first settlers of El Hierro Island, this scientific campaign is currently entering its second phase under the orders of the researcher Francisco Sánchez who is also from the IEO.

Until the 31st October, photographs and videos will be taken of the volcanic cone with an array of high resolution cameras which will be pulled by the remote observation submarine Liropus. From there, a third stage is predicted to get underway. This will involve the analysis of the currents and the physicochemical properties of the columns of water that surround the new volcano.

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