



graphic design Laboratorio Grafica e Immagini | INGV

Open daily  
July - September  
9:30 - 12:30 | 17:00 - 20:00  
free entrance

**Recent activity**  
The historic volcanic activity, occurred mostly at La Fossa cone, is characterized by explosive eruptions alternated with quite period. The most recent eruption (1888-1890) gave name to the explosive "vulcanian" type of activity. Still nowadays the large lava bombs emitted during



the eruption can be seen in the crater area. In case of volcanic reactivation, hazardous explosive phenomena are to be expected. Since 1890, the volcano is affected by crises (the most recent in 2004) consisting of a strong increase of the crater fumarolic activity, i.e. gas output and temperature (up to 700°C), chemical changes indicative of an increasing input of magmatic gases (mostly CO<sub>2</sub> and He), chemical variations in the thermal waters, increase of diffuse CO<sub>2</sub> flux from the soil, weak associated seismicity.

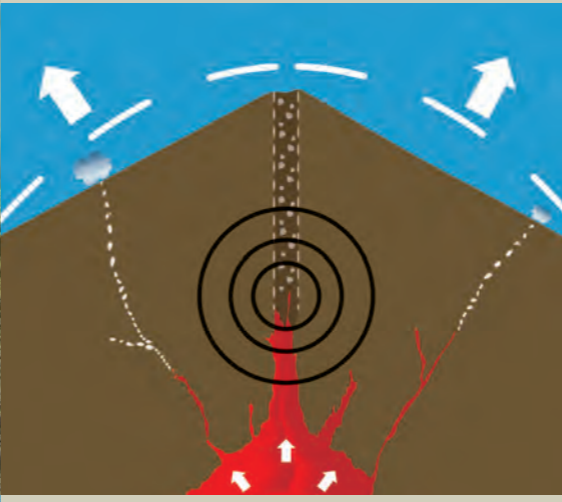
**La Fossa crater rim fumaroles**  
"La Fossa" crater is characterized by fumarolic activity which produces the spectacular coloured deposits of sublimates made of sulfur, chlorides and bromides of ammonium, sodium and potassium, lead and bismuth sulfides and salts, sulfates and borates. Fumaroles have a variable temperature and during crises it may reach 700 °C. The present T is of 400-500 °C. The gas emitted by fumaroles consists mainly of water vapour and, in order of decreasing abundance, of CO<sub>2</sub>, SO<sub>2</sub> and acid gases like HCl and HF. In the last few years, many fumaroles migrated towards the inner part of the crater, where it is very dangerous to descend.



**The Baia di Levante hydrothermal system**  
On the east coast of the isthmus, the area between the Faraglione and Vulcanello is affected by an intense upraise of hot fluids with produce many small fumaroles. The area with the highest emission and strong tourist appeal is that of the "mud pool" and the sea-shore in front of it. The fumaroles of the Baia di Levante have temperature around 100 °C and chemical composition typical of hydrothermal systems with high levels of CO<sub>2</sub> and H<sub>2</sub>S, gas with smell of rotten eggs.



**Forecasting volcanic eruptions**  
Forecasting a volcanic eruption, i.e. anticipating when it will occur and the damage it will produce in the surrounding area, is one of the main aims of volcanology. The risk varies from volcano to volcano according to the characteristics of the expected eruption (explosivity and energy) and to the number of buildings and people within the danger zones. A detailed study of past eruptions of each volcano will allow a fairly accurate estimate of what can be expected from future eruptions. Volcanic surveillance is a complex system involving monitoring of physical, chemical and geological phenomena which help to forecast a volcanic eruption. During the process leading to reactivation the magma rises toward the surface, producing a deformation of the volcanic edifice, anomalous seismicity,



gravimetric and magnetic anomalies, changes in temperature and composition of thermal waters and fumaroles. All these precursory phenomena can be monitored and related alarms can be issued in advance. At Vulcano these parameters are continuously monitored by the INGV permanent networks. If anomalous values occur, the information is used to assess the level of the hazard keeping informed the Civil Protection.



**ATTENTION: CAUTION WHILE VISITING THE CRATER AREA**  
The fumarolic gases are toxic and harmful: inhalation is dangerous and the use of appropriate protection masks is needed.  
The high temperatures in the proximity of fumaroles can cause burns and it is recommended to wear appropriate shoes.  
Attention, metal objects can be ruined in contact with the gas.  
Do not go inside the crater: there may be dangerous concentrations of carbon dioxide, an asphyxiating gas that accumulates in depressions.

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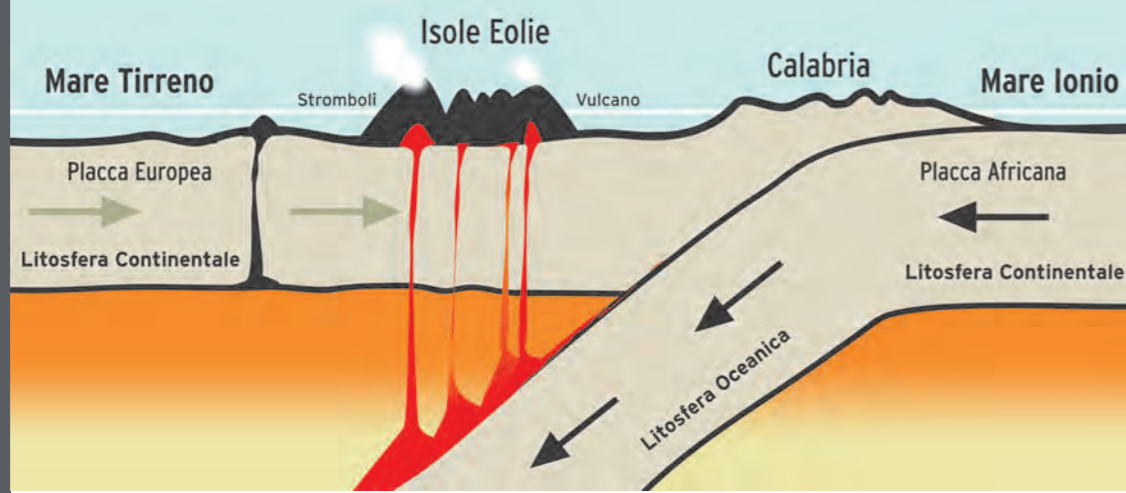
**il vulcanoinforma**  
VOLCANOLOGICAL CENTRE





### The Aeolian Archipelago

The Aeolian Archipelago comprises seven islands representing the subaerial part of a large volcanic arc of about 200 km, most of which lies under the sea. The Aeolian islands formed during the last million years. Only Lipari, Stromboli, Vulcano e perhaps Panarea are still active, whereas in the other islands volcanism is extinct since more than 5000 years. Arc volcanism, like that of circumpacific "belt of fire", is typically generated in subduction zones. Due to



collision, an oceanic lithospheric plate slides beneath a continental one generating earthquakes along an inclined plane (plane of Benioff). At depth, the plate melts producing magma which rises to create volcanic island arcs (like Japan). To the south of the Tyrrhenian Sea, the subduction of the African plate

beneath the European one produced the volcanic arc of the Aeolian Islands.

#### The geological history of Vulcano

Vulcano, with its 22 square km is, for extension, the third island of the Aeolian Archipelago, after Lipari and Salina. It is entirely made of volcanic

rocks. The island has a maximum height of 500 m a.s.l. and represents only a small part of a large volcanic edifice that extends under the sea down to 1 km depth.

#### The island comprises five main volcanic structures:

##### PRIMORDIAL VOLCANO

It is the oldest part of the island, formed between 120,000 and 100,000 years ago. It consists of a cone made by the overlapping of lava flows and subordinate levels of explosive origin. Originally, the cone had a diameter of about 5 km at sea level and a height of 800-1000 m a.s.l.

##### THE PIANO CALDERA

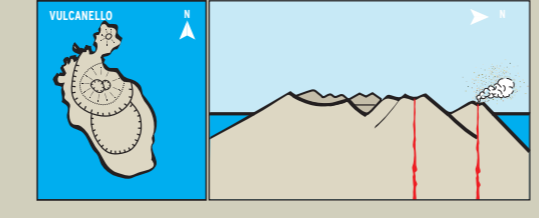
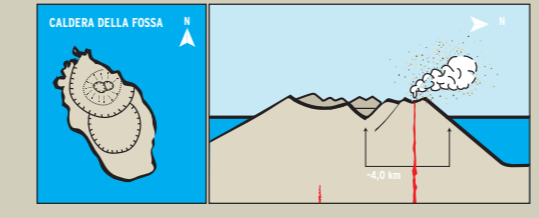
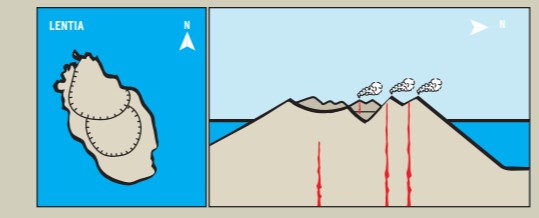
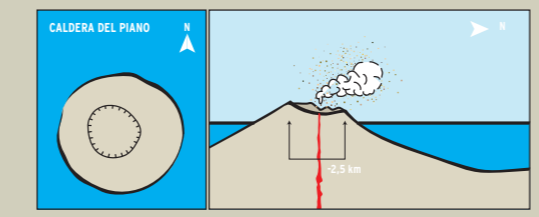
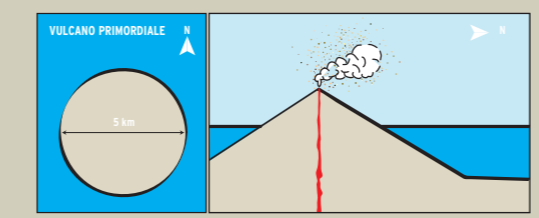
It formed about 100,000 years ago, due to a violent explosive eruption and the subsequent collapse of the primordial cone. The huge depression had a diameter of about 2.5 km and sub-vertical walls of at least 300 m. Many eruptions, occurred between 99,000 and 50,000 years ago, then filled the caldera.

##### LENTIA

Located in the NE part of the island, it consists of a series of lava flows and domes emitted between 24,000 and 15,000 years ago. This lava complex was cut by a new collapse which caused the formation of La Fossa Caldera.

##### LA FOSSA CALDERA

It consists of a sub-circular depression, located NW of the Piano Caldera. At its centre rises the La Fossa active



ve volcanic cone, formed since 6000 years B.P. by the accumulation of pyroclastic deposits and minor lava flows. Its most recent eruption occurred in 1888-1890.

##### VULCANELLO

It forms the northernmost part of the island and consists of a lava platform on which three partly co-penetrated volcanic cones grew up. They are aligned W-NW. Vulcanello formed as an independent islet in 183 b.C. Only in 1550 A.D., during its last eruption, it was joined to the main island by accumulation of pyroclastic deposits which formed the isthmus between the two docks of Levante and Ponente.

