



Graphic design Laboratorio Grafica e Immagini | INGV

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## Strombolian Activity

Stromboli is an "open conduit" volcano with magma always present at nearly surficial levels. The usual



activity of the volcano, called "Strombolian" in international literature, consists in a continuous emission of gas and in frequent explosions emitting jets of hot gas with fragments of glowing lava and solid blocks ripped from the conduit walls. This kind of activity persists since at least 2000 years. The exit speed of the jets varies from 20 to 120 meters per second, with heights from 100 to 200 meters and an explosion frequency of 3 to 7 per hour. Usually the emitted material falls inside the crater area, where hazard is always extremely high and access is forbidden. Periods of total inactivity when only gas without magma is emitted, are very rare. Usual Strombolian activity is occasionally interrupted by major eruptive crises with the emission of lava flows (and/or more violent explosions), sometimes accompanied by slope collapses which in turn may generate tsunamis. At Pizzo Sopra la Fossa,

overlooking the crater rim, under unfavorable wind conditions, the presence of gas and ash may hamper visibility and create breathing difficulties.



## Major Explosions

They may occur at any moment without any obvious precursory signal. The jets can be as high as 500 meters and the debris fall within a range of several hundred meters, investing also the area where there may be visitors. On average, a few major explosions occur every year but their frequency may increase, following unusual periods of volcanic rest.

## Explosive Paroxysms

are the most energetic volcanic explosions of Stromboli and may affect residential areas with fallout of bombs, blocks, ash, and fires in vegetation; small glowing avalanches (gas clouds loading magma fragments that rapidly descend the slopes of the volcano) may also be generated. The most violent historical event of this kind occurred in September 1930, crushing roofs and causing serious damages to

buildings in the villages of Ginostra and Stromboli. A small glowing avalanche also occurred. The episode left 6 dead and 24 wounded people and the vast



economic damage caused the depopulation of the island (from around 3000 inhabitants to the present-day 350). The most recent explosive paroxysms occurred in 2003 and 2007.

## Lava Flows

Over the past 100 years a lava flow has been emitted, on average, every four years. The most recent effusion phases occurred in 2002-2003 and 2007 eruptions. Lava flows are frequently preceded by an intensified explosive activity. The morphology of the volcano obliges the lava to flow down the northwestern slope where it is confined within the Sciara del Fuoco depression down to the sea where steam columns are formed.

## Sciara del Fuoco Landslides

Scoriae and blocks emitted by the Strombolian

activity, together with impact dislodged boulders, continuously roll down to the sea along the steep slope of Sciara del Fuoco. When lava flow are emitted,



magma may be intruded in small fractures affecting the stability of the Sciara del Fuoco slope up to produce partial collapses.

## Tsunami

During the most violent eruptive phases, parts of the unstable submarine and sub-aerial flanks of the cone, as those of Sciara del Fuoco, may collapse and slide. The sudden sliding into the sea of huge volumes of rocks may generate dangerous tsunamis which invest the entire coast of the island and may affect also the other Aeolian Island and the Sicilian and Calabrian coasts. The most recent tsunami occurred on 30 December 2002 and fortunately it did not cause casualties that instead occurred during the 1930 eruption tsunami. Tsunami may occur also because of sea-floor displacement caused by strong earthquakes with epicenter far from the island.



## REMEMBER THAT:

if you wish to venture on the volcano above 400 meters, you must be accompanied by authorized alpine/volcanological guide, wear a helmet and follow the guide's directions at all times.

## WHAT TO DO IN CASE OF:

### High Energy Explosions

If you are on the volcano top, reach the nearest shelter (a structure created to withstand the fall of volcanic bombs or rocks):

- If you are far from the shelter, keep calm and follow the guide's directions.
- If you are in the valley areas of Vallonazzo or Forgia Vecchia, immediately move away toward higher flanks.
- If you are near the coast line, move inland and uphill following the "exit" street signs.

### Lava Flows

Obtain information on the locations to reach to safely observe the phenomenon.

### Sciara del Fuoco Landslides

Navigation and bathing are always forbidden within 400 meters from the coast along the entire area in front of Sciara del Fuoco.

### Tsunami

If you are on a beach and see the sea retreating, or hear a strong explosion, or feel an earthquake, and in any case at the sound of the siren, move inland and uphill by following the "exit" street signs. If you are at sea, move immediately offshore.

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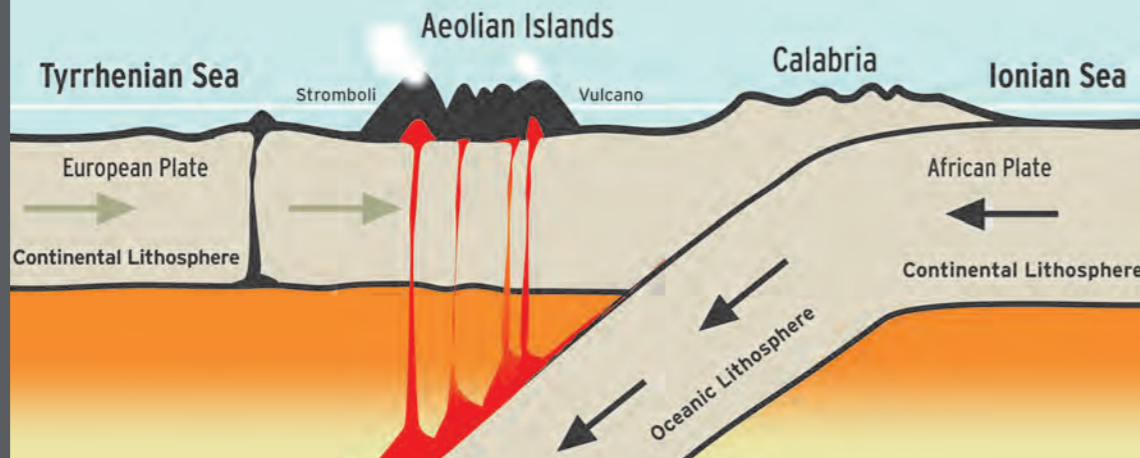




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### The Aeolian Archipelago

comprises seven islands representing the subaerial part of a large volcanic complex, most of which lies under the sea. The volcanic arc extends for about 200 km in the Tyrrhenian Sea. The Aeolian volcanic islands formed in the last 250,000 years, while the underwater portions are older; the oldest is the submarine volcano Sisifo, to the northwest of the island of Alicudi, which is 1.3 million years old.



### The island of Stromboli

is just a small part of a large volcanic edifice, with a roughly cone shape. From the sea bottom (1500 m b.s.l) it rises to a height of 924 meters on the top of "Vancori". It is estimated that the surface of the island (around 12.5 km<sup>2</sup>) is 25 times smaller than the undersea base of the entire volcano. The lava forming the cliff of Strombolicchio is the oldest product of the volcanic activity. The main island was formed in different phases in the last 85,000 years, characterized by the alternating emission of lava flows and fragmented products of the explosive activity. The eruptive centers were progressively displaced to north-west. The growth of the volcano was accompanied by numerous landslides and collapses of its summit and slopes, resulting in deep depressions, the main and most recent of which is the

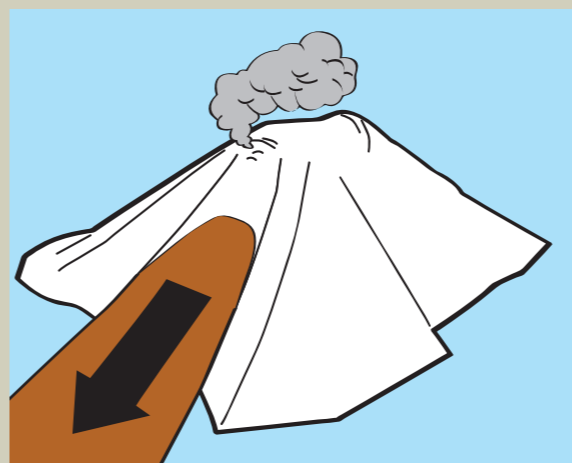
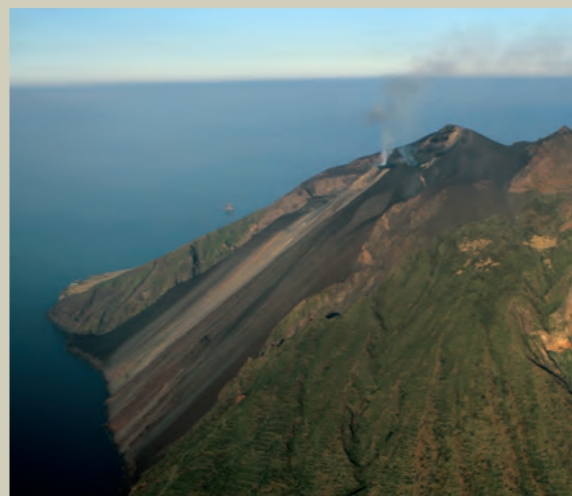
### Sciara del Fuoco

#### Strombolicchio

About 200,000 years ago, the oldest eruptive center of Stromboli was located where Strombolicchio stands today. The cone was made of overlaid strata of lava and loose material (scoriae, lapilli, ash) produced by its explosive activity. At the center of the cone there was the feeding conduit, a roughly cylindrical structure, through which the magma was emitted to the surface. With time, the activity of this eruptive center ceased and the cone of Strombolicchio was gradually eroded by the sea, revealing the central cylinder in which the lava had solidified (neck), forming a massive structure that was more resistant to erosion than the surrounding loose material.

#### The Sciara del Fuoco

is a huge depression with a horse-shoe shape which formed about 5000 years ago when the north-western side of Stromboli volcanic cone collapsed. Undersea surveys show that the depression of the Sciara del Fuoco extends to a depth of at least 700 meters below the sea. The Sciara del Fuoco is the most recent of a series of collapses which affected the summit of the volcano (Vancori). The cause of the collapse can be found in the sum of various factors, instability of the fractured flank, excessive weight due to accumulation of erupted products, pressure by magma intrusions along the main fissure of the island, on a NE-SW axis, perpendicular to the axis of the Sciara del Fuoco. Sciara del Fuoco is unstable and subject to frequent partial collapses. The most recent occurred on 30 december 2002 and the sliding into the sea of a subaerial and submarine part of the structure caused a tsunami with a run-up of 11 meters.



Because of their frequent eruptions, Stromboli, Vulcano and Etna were the volcanoes better known by ancient Greeks and Romans. Since ancient times, Stromboli was called "the lighthouse of the Mediterranean" for the brightness of its frequent explosions, visible from great distances.

