

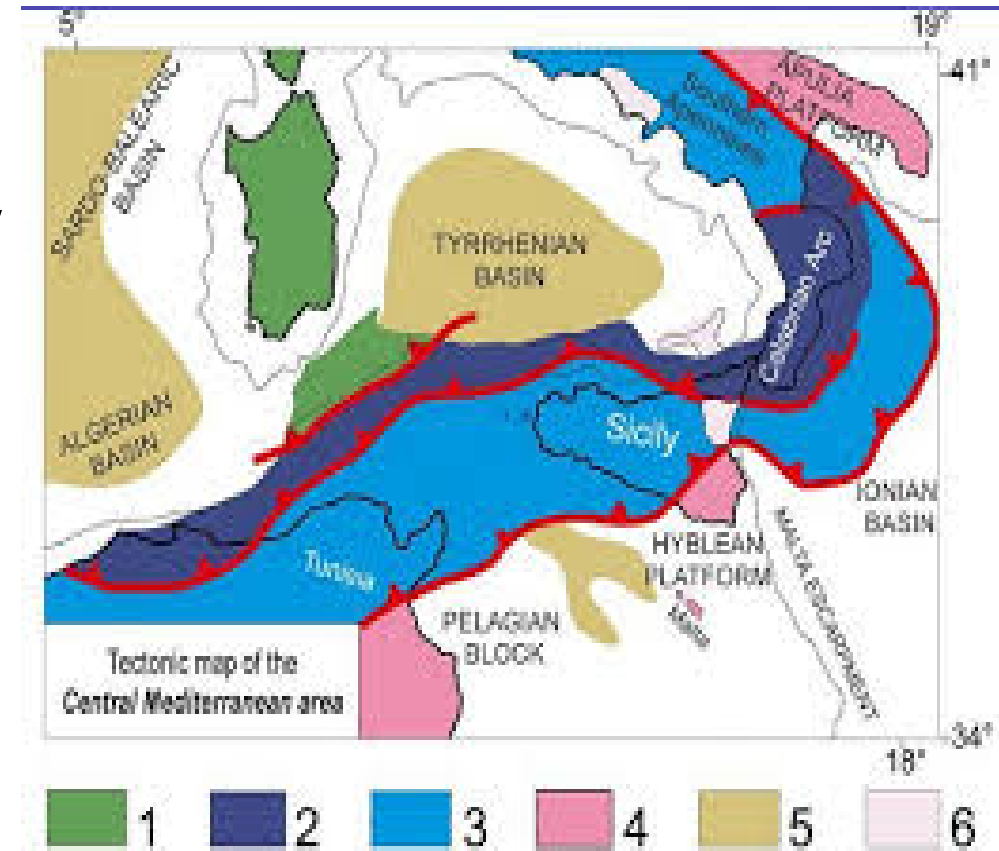
Sicily: **land of sun and fire**



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Brief geological story of southern Tyrrhenian sea

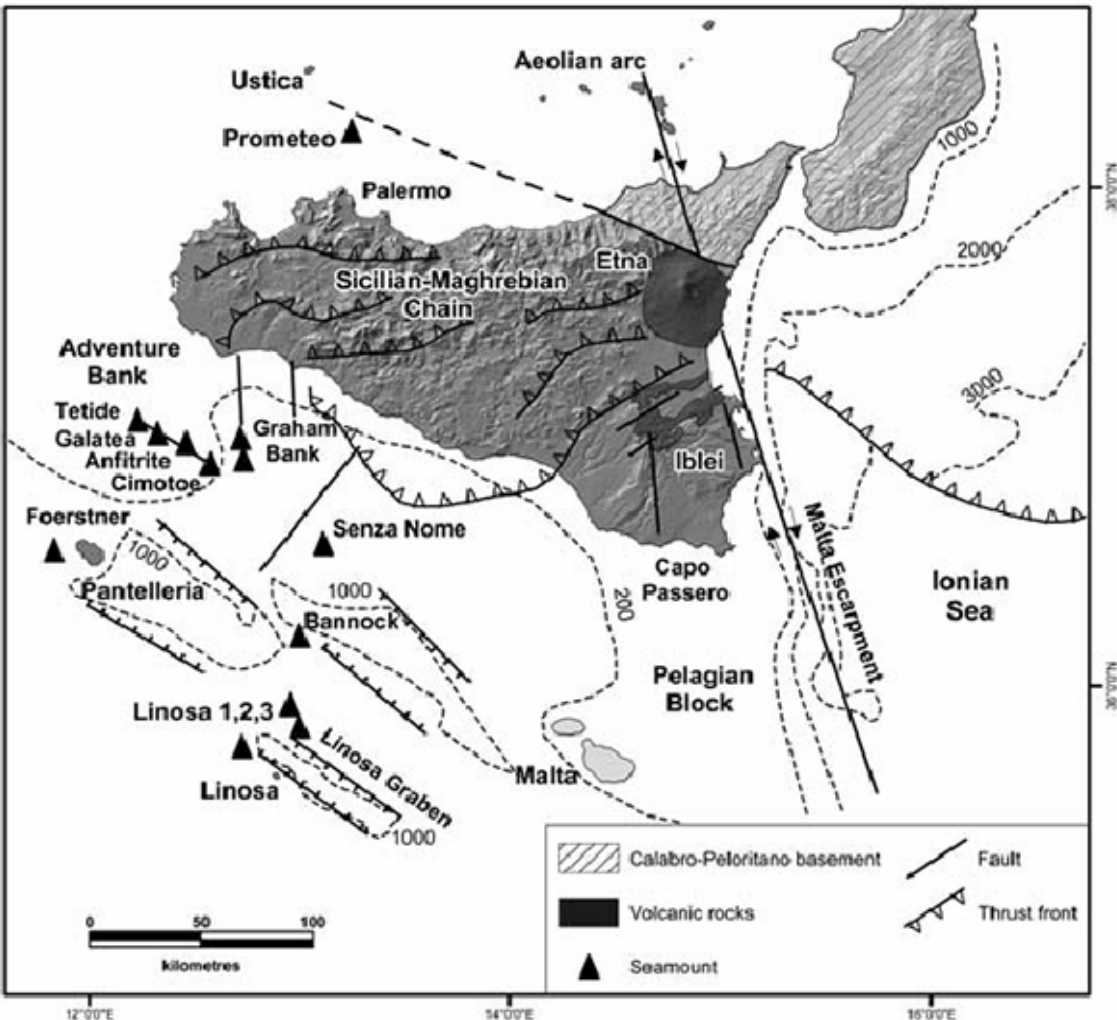
- Sicily is located on the margin of interaction between the African continent and the Eurasia.
- 7-8 thousand years ago, to the eastern massif "sardo-corso", the crust got thinned and stretched, forming – 2 thousand years ago – the Tyrrhenian sea, which has been widening again with basaltic seabed near Calabria.



Magmatic land of Sicily

The magmatic area of Sicily is formed by several volcanoes:

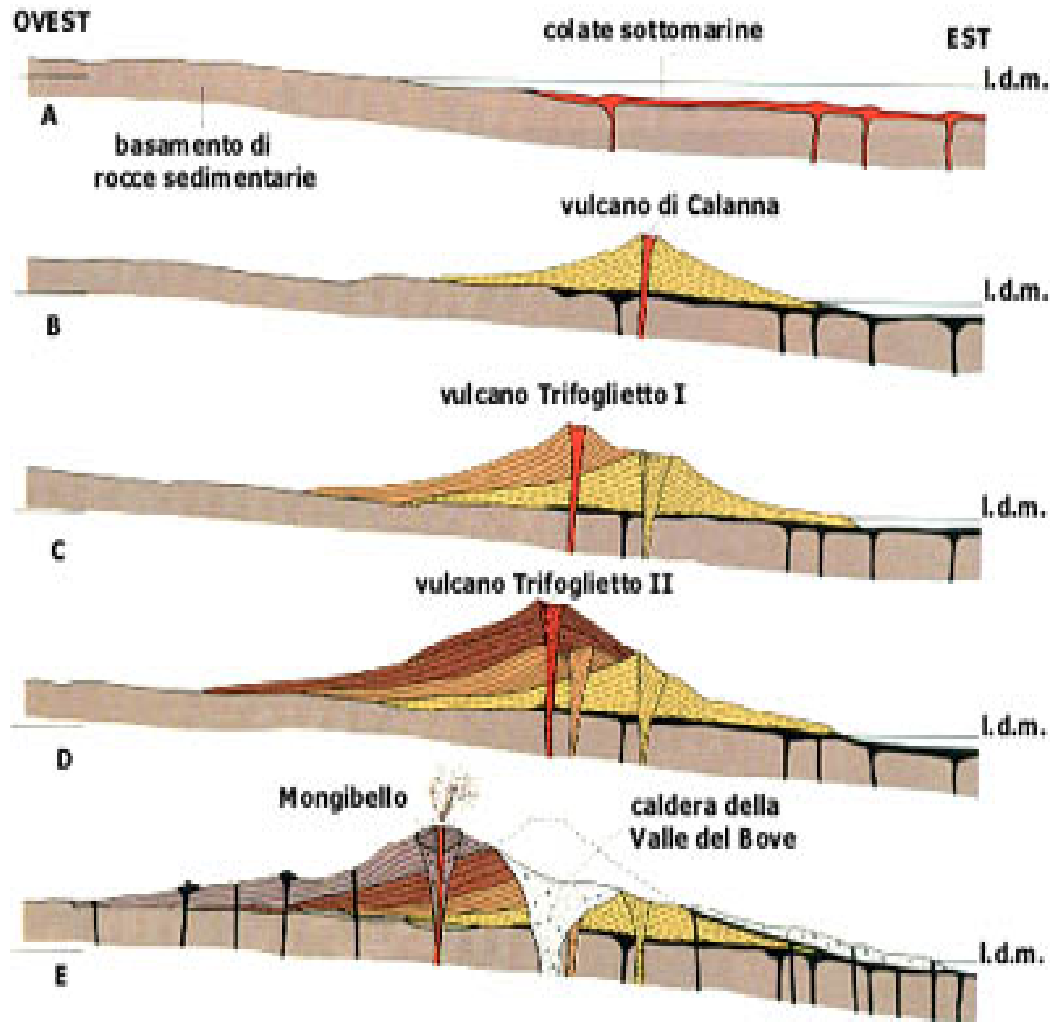
- *On the eastern side of Sicily: **Etna**, set on the subduction system between the African and European plates*
- *Strait of Sicily: **Pantelleria**, **Linosa** and some seamounts, set on the continental margin of African lithosphere.*
- ***South Tyrrhenian**: the **Prometeo** lava field and **Ustica** island (0,75-0,13 thousand years ago), localized to western of Eolian islands.*



Vulcanoes of Tirreno



Etna Evolution

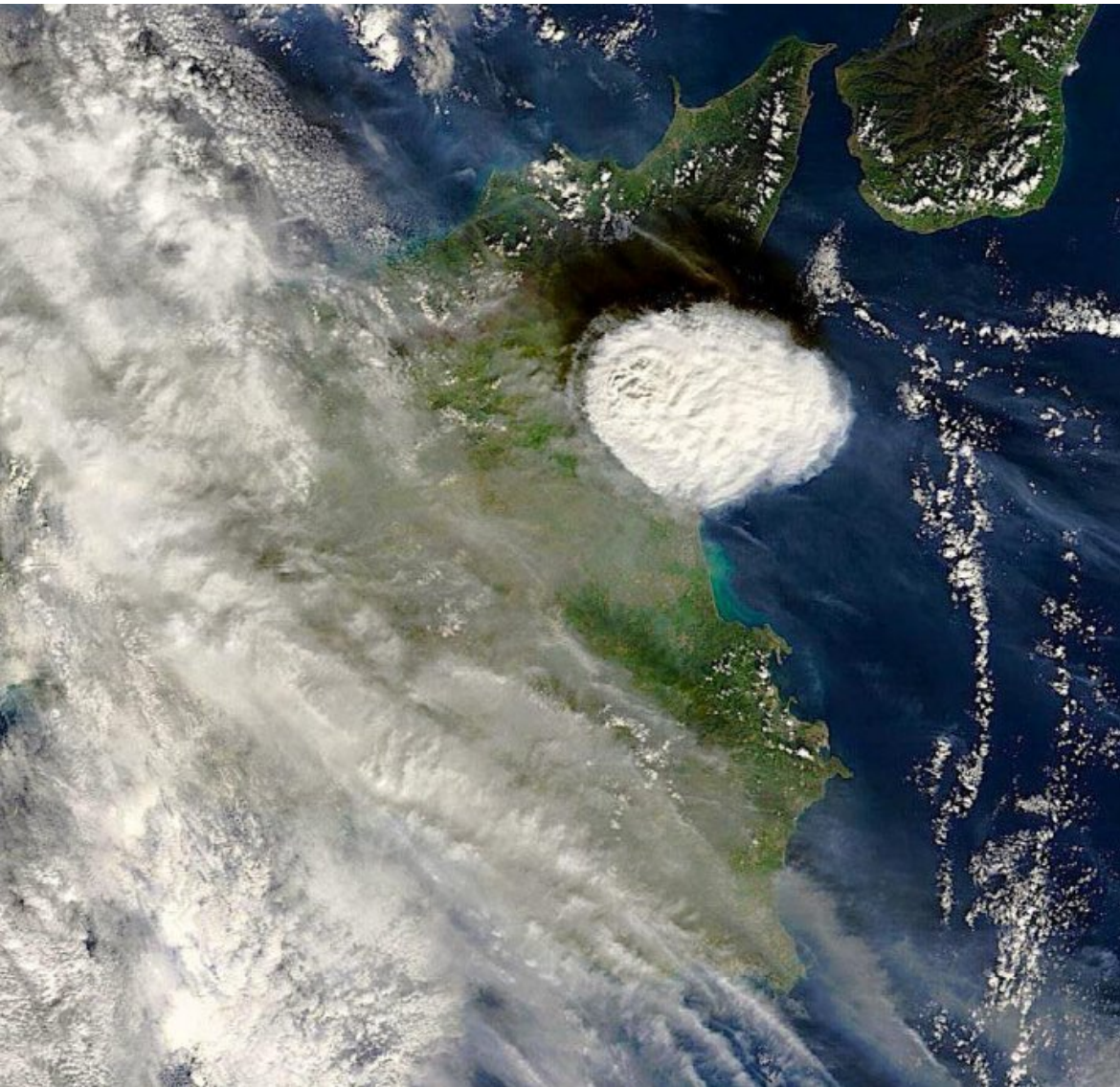


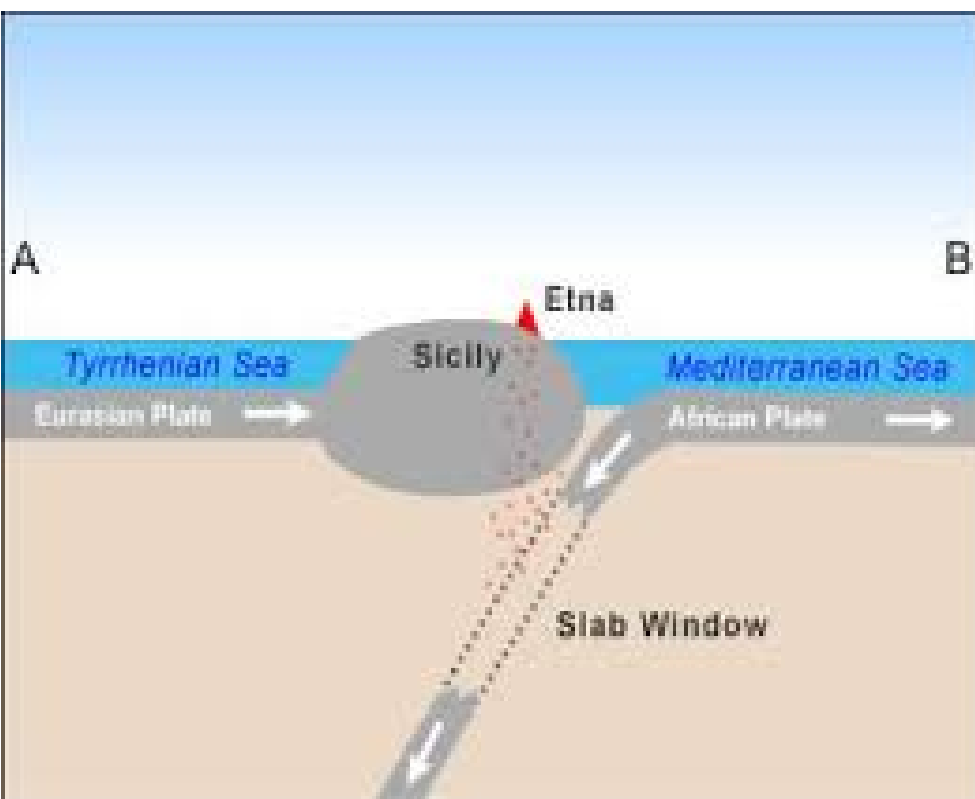
- **First period** – (photo A) – 600.000 years ago – emission of lava flows underwater in the pre-etneo gulf - ; today “pillows lava” and columnar basalt are still observed.
- **Second period** – (photo B) – 120.000/100.000 years ago – lava flowing formed a shield volcano. Successively the magma became less fluid; there have been alternated emission of lava and explosive phases.
- **Third period** – (photo C e D) – 80.000 years ago – there is a formation of a volcano for superimposition of further volcanoes – Trifoglietto I and II – and each of them moved westward compared to the previous.
- **Fourth Period** – 35.000 years ago – a huge volcano , the **Mongibello** (or as it is named in italian “Monte dei Monti”), over 3.000 mt high.
- 10.000 years ago, into eastern side, there was a landslide for collapse, it form a caldera, which gave life to the “**Valle del Bove**”.

ETNA

- Photo of the december eruption of Etna









Gole dell'Alcantara



There are some geological structures connected to Etna activity.

- *The columnar basalts are rock formation known for their regular aspect. They have typical forms such as: the organ pipes, the columns, the arches ...*
- *During the cooling of the thick lava flow which contracts forming fractures extended perpendicular and parallel, separating the columns with an hexagonal base, whose diameter depends on the speed of cooling.*

Columnar basalts

The shape of the fractures could reach the appearance of piles of poles settled horizontally or vertically, as in the Alcantara's Gorges.



Columnar basalts –

The shape of the fractures could reach the appearance of a pavement built by the man, as in the Acitrezza's small harbour.



Acitrezza



Acicastello – *The Norman castle was erected on a basaltic rock over the sea in 1076. It has an important strategic position. Initially the rock raised on an isolated position; later, in 1169, an eruption joined it to the mainland.*



Eolic Islands

The seven Eolian Islands are the emerged part of an imposing volcanic arc, originated in the Quaternary period, having almost a semicircular shape and about 200 Km long. It includes the emerged islands and five underwater volcanoes: Eolo, Enarete and Sisifo on the West side of Alicudi, Alcione on the North side of Stromboli.

- **Lipari** *is the biggest island of the archipelago. It is the emerged part of a big volcanic complex that is about 1600 m. high but that emerged only for 602 m. on the sea level. Lipari has to be still considered an active volcano. Evidence of volcanic activities are the fumaroles, responsible of the formation of kaolinite quarries, and the thermal springs.*
- **Panarea** – *is the oldest of the Eolian islands, that originated from a single volcanic field.*
- **Salina** – *Nowdays, it is formed by two great volcanic cones, that differ one another only of 100 m. height: Monte dei Porri (860 m.) and Monte Fossa delle Felci (760 m.).*

Isole Eolie:

Stromboli

Stromboli is the last island emerged from the sea; a smaller isle, «**Strombolicchio**», came out from one side of Stromboli.

The volcanic building, that went down to 3000 mt depth, was as big as Etna, but only the top was visible.

After thousand years, the north-western part of Neo-Stromboli subsided, therefore the crater has been found on the margin that makes the '**Sciara del Fuoco**', where the lava is still sliding.

Stromboli is the typical example of layer volcano, which alternates lava flows to explosions emitting pumice and lapilli.



Vulcano

The island originated from the fusion of the biggest «**Vulcano della Fossa**» with «**Vulcanello**», connected to island. The last eruption occurred in 1888-1890, but the volcano has never ceased its activity even today there are some phenomena: «fumarole», steam jets and the presence of «fanghi sulfurei», with therapeutic properties.



Alicudi



Alicudi is the westernmost island of the Aeolian archipelago. The island's shape is almost circular with a surface of about 5 Km² and constitutes the emerging part of an extinct volcano (675 m.s.l.m.).

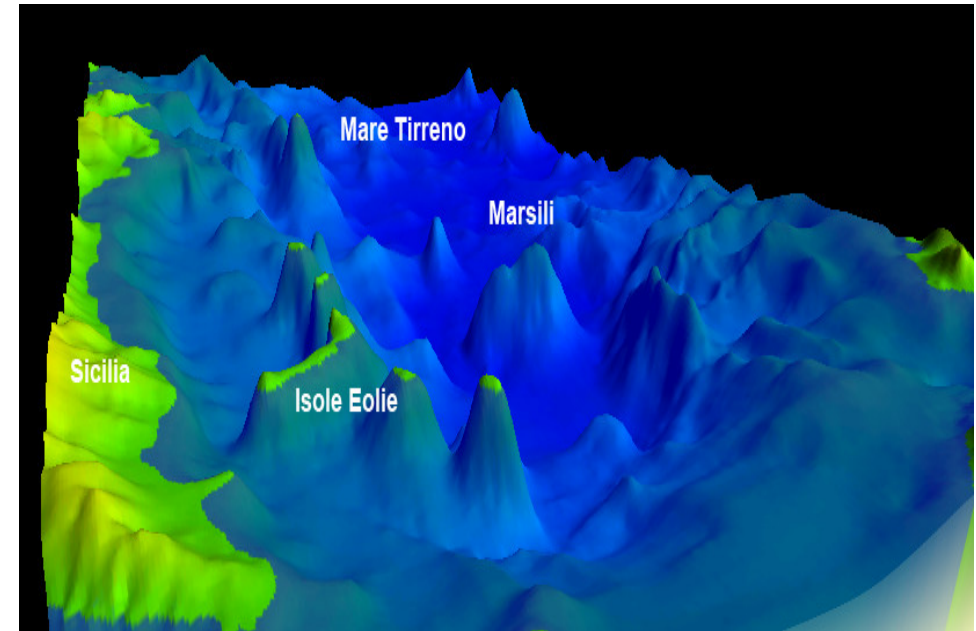
Filicudi

Filicudi is dominated by Fossa delle Felci mountain, an extinct volcano 773 m height. There have been other seven extinct volcanoes for long time and consequentially strongly matted by erosion. Their population is about 200 inhabitants (that become about 3000 in the summer).



Marsili :

- *The Marsili's magmas are similar to those observed over the Aeolian arc for their composition, whose volcanic activity is due to the subduction of ancient Thetid crust (ionic subduction). It is supposed that the starting age of the Marsili's volcanic activity goes back to 200.000 years ago.*
- *The Marsili is a submarine volcano belonging to the Aeolian island arc. It is located about 140 Km north of Sicily and about 150 Km west of Calabria and it is the widest European volcano.*
- *It is potentially considered dangerous because it could provoke tsunamis in the costal regions of southern Italy because of an extended collapse in a single event of a ridge of the mountain.*
- *It was discovered in the 20_{th} century. The volcanic phenomenon on Marsili's mountain are still active and on the sides a lot of satellite volcano equipment is spread. It is added between the dangerous submarine volcanoes of the Tyrrhenian seen together with Magnaghi, Vavilov and Palinuro.*



*With his 70 Km of length and 30 Km of largeness (equal to 2.100 Km² of surface) the Marsili is one of the largest volcanoes of Europe.
The mountain it rises for about 3.000 m. from the seafloor reaching with scale the top share of about 450 m. beneath of the Tyrrhenian surface.*



Neverland: Ferdinanda, Graham or Giulia.

Emerged from the sea opposite Sciacca in June 1831, it sank Sicilies, Britain three months after while a dispute was occurring for his possession between the kingdom of the two Sicilies, Britain and France.



The Ferdinandeian island, today, is reduced to a bench submarine volcanic that rises up 6-7 m. below sea level and it is yet very active in terms of greenhouse gas.

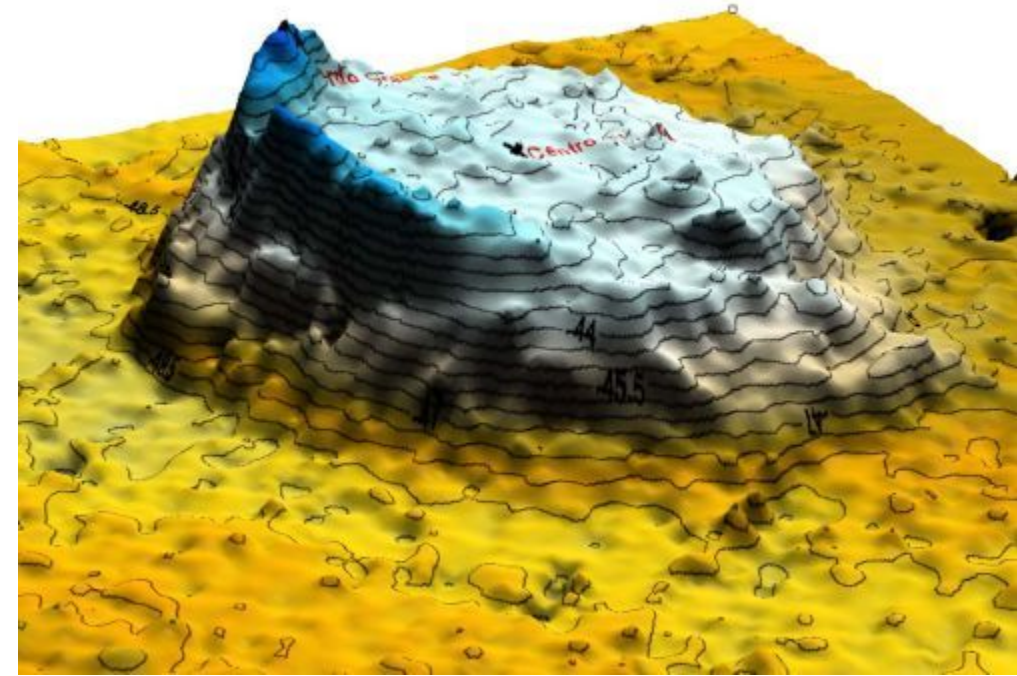
The discovery of the Empedocle volcano highlights that actually the Ferdinandeian island constituted – with neighbour benches “Terribile” and “Nerita” – one of the cones accessories of Empedocle, a volcano building comparable to Etna for base width.

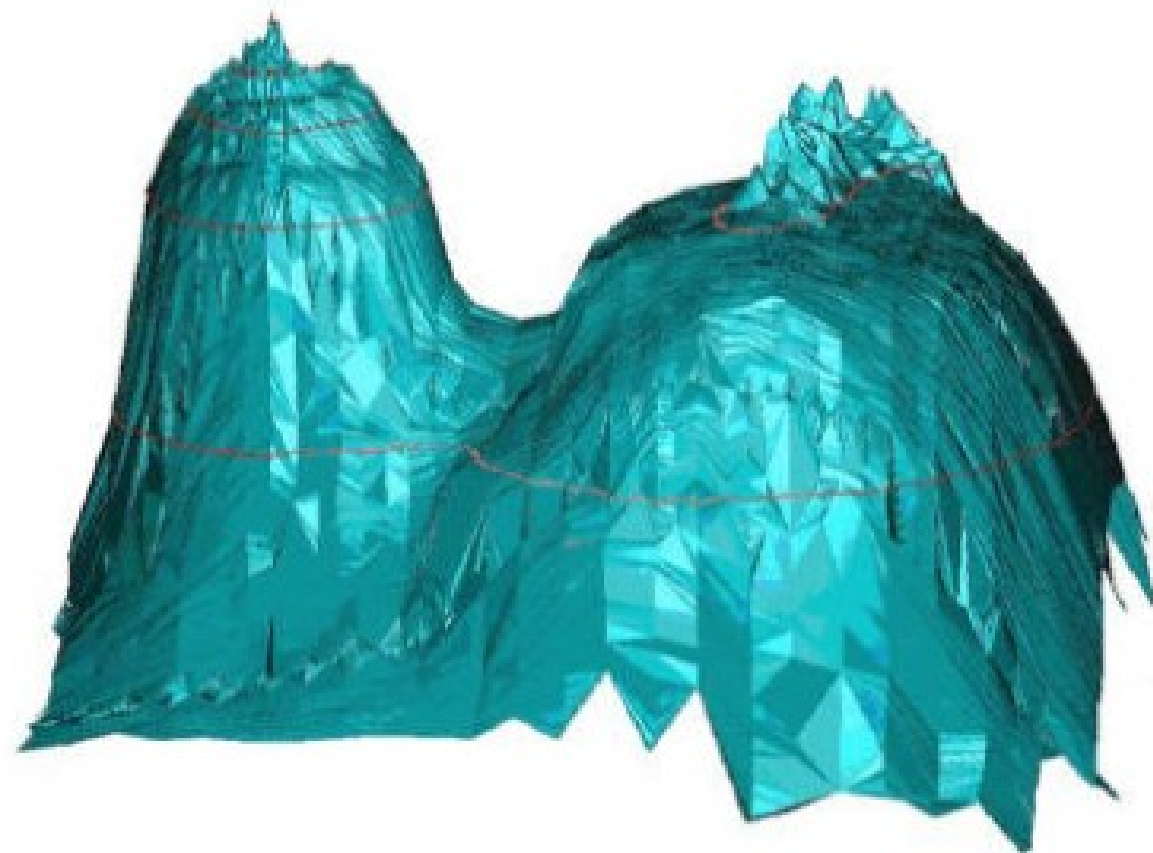
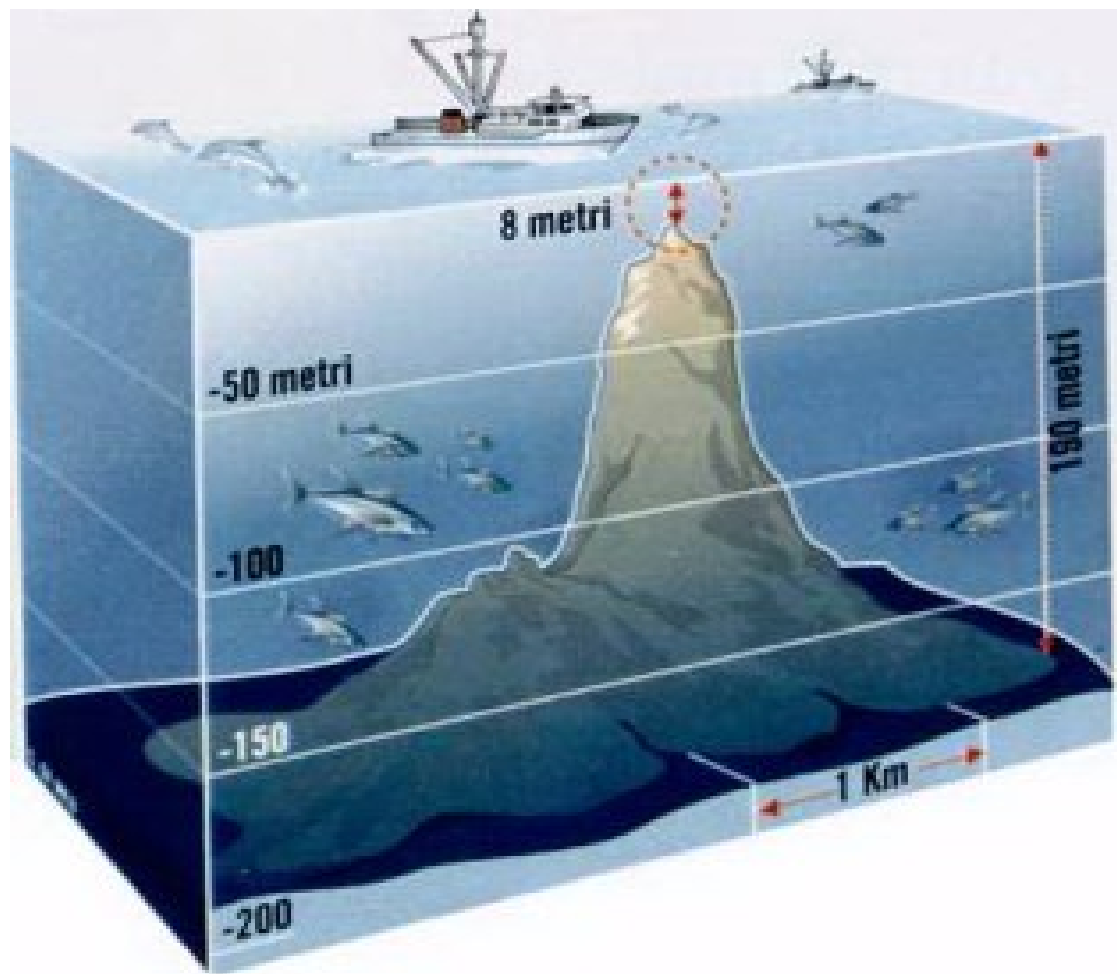
Empedocle

The volcanism in the Sicilian channel, where the Earth crust is interested by phenomena of refting and subdaction, is very active.

The Empedocle volcano was discovered a few years ago, during an oceanographic cruise that had, as an aim, to film a popular scientific documentary on the so called Ferdinandea island; it is a submerged volcano located next to Agrigento coasts. The volcanic structure of 'Empedocle' is about 400 meters deep, with a diameter of 30 km.

It was colled 'Empedeocle' for the famouse Greek philosopher and naturalist.





Pelagic Islands: Lampedusa and Lampione belong to the African continental plate; they raised about two million years ago.

Linosa is of volcanic origin and its structure rises from 1500 meters deep.

It originated in the ancient quaternary, following eruptions happened in the breakline that runs between the East Coast of Sicily and the shoreline of Tunisi.

The same volcanic axis gave origin to the Pantelleria island, whose emerging part rapresents the top of bigger below structures.

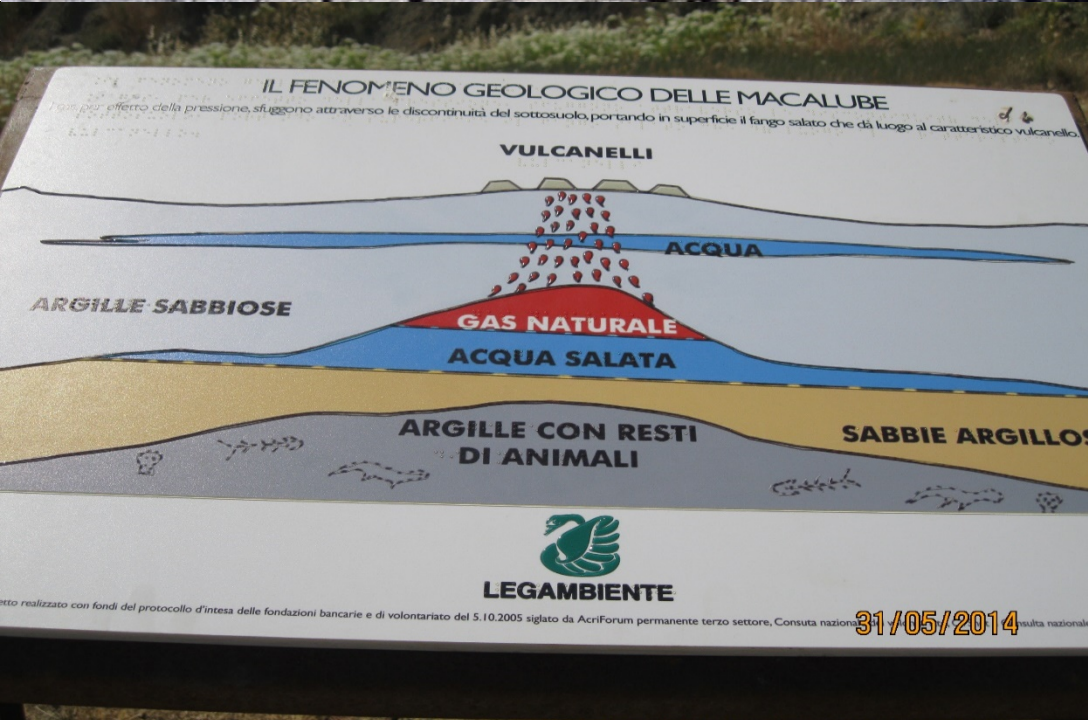
- ***Pantelleria*** – it's the biggest of Sicilian satellite islands and it is also the most western. It is 120 km far from Sicily and 70 km far from Tunisian Coast. Its territory has a volcanic origin and it presents a lot of phenomena of secondary volcanism that shows the volcano is still active. The last eruption occurred in 1891, on the north-western submerged part of the slope.

Ustica has a volcanic origin; in fact there are some hilly reliefs that once were ancient volcanoes. (Punta Maggiore, 244 m; Guardia dei Turchi, 238 m).

Ustica's magmas rise from a magma coming out the depth of the Earth's mantle. For this reason *Ustica Island* is different from the *Eolian Islands* and more similar to *Etna*.

Maccalube - Aragona

The Vulcanelli developed by a rare geological phenomenon, the 'sedimentary volcanism' that depends on the presence of inconsistent argillaceous ground layered in salt water, that overcome methane gas pressured bubbles. The gas rises from the surface through discontinuities of the soil dragging clay sediments and water like a volcanic crater.



Le salinelle - Paternò

In the province of Catania, the phenomenon is called 'salinelle'; the mud etnei volcanoes are the result of the gas emission of magmatic origin; whose ascent would be made up of old magmatic pipes.

