



# Milos: a sustainable case of mining & tourism



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**Group Sustainable Development Manager**



1st International Conference on  
Volcanic Landscapes

Santorini, October 2014

*Natural resources. Industrial solutions.*



Our Purpose

**We provide  
industrial solutions globally,  
by developing and transforming  
natural resources into  
value creating products**



**IBECO**

**STOLLBERG**



**NYCO**



# Transforming natural resources / Industrial minerals to provide industrial solutions globally

Bentonite

Wollastonite

Perlite

Continuous  
Casting Fluxes

Specialty  
Minerals



## Metallurgy

- Continuous steel casting
- Iron ore pelletizing
- Alumina
- Refractories
- Iron smelting



## Foundry

- Various foundry applications



## Construction

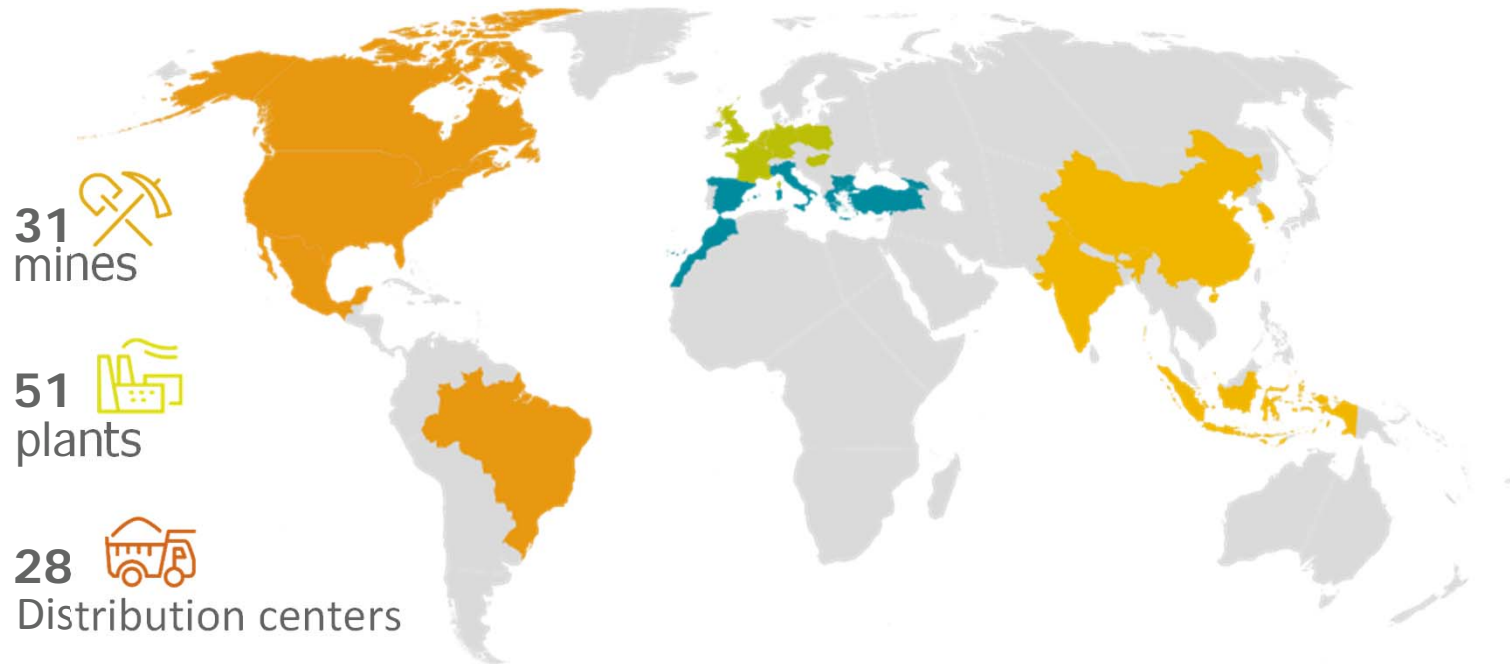
- Constr. & building materials
- Civil engineering
- Cements
- Drilling
- Cryogenics
- Other



## Specialties

- Glass & ceramics
- Plastics
- Horticulture
- Pet litter absorbents
- Other





### Americas

- 4 countries
- 25 site locations

### N. Europe

- 7 countries
- 28 site locations

### S. Europe

- 7 countries
- 45 site locations

### Asia/Pacific

- 4 countries
- 13 site locations

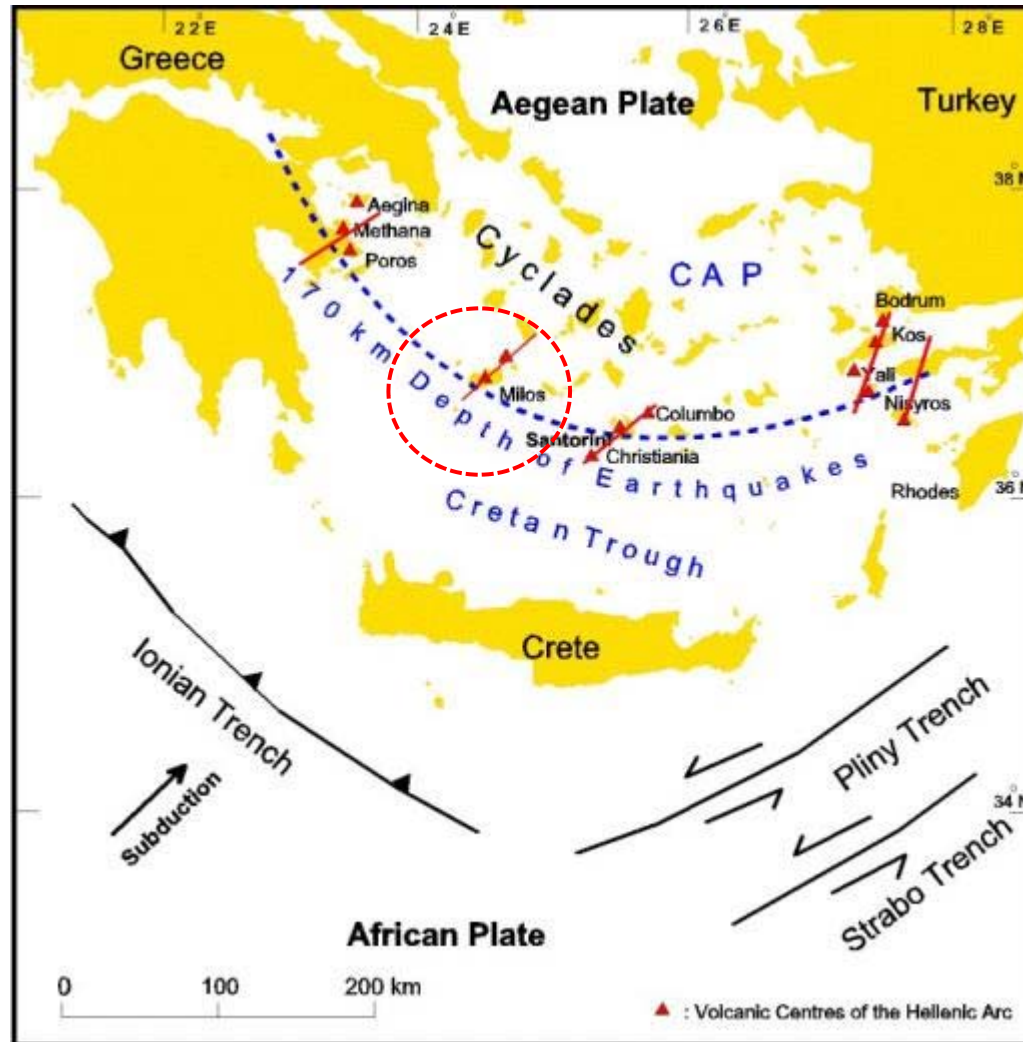




- ▶ S&B has been present on the island since 1934
- ▶ Active in mining and processing of industrial minerals: bentonite and perlite
- ▶ World-class reserves and top quality minerals
- ▶ Biggest employer on the island
- ▶ Employs 18% of Milos workforce and contributes 1/3 of Milos GDP
- ▶ Respect for Sustainable Development principles

The case of Milos









- ▶ A volcanic island belonging to the Cyclades
- ▶ 5,000 inhabitants
- ▶ Endowed by nature with unique “natural resources”



Unique flora...



# Pancratium maritimum





...and fauna

Macrovipera Schweizeri





Unique landscapes due to nature creations





Unique landscapes due to nature creations





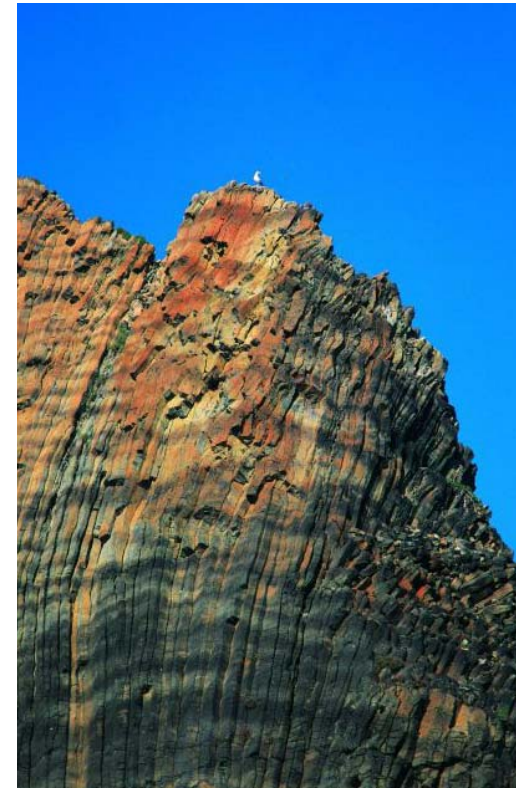
# Unique landscape due to nature creations

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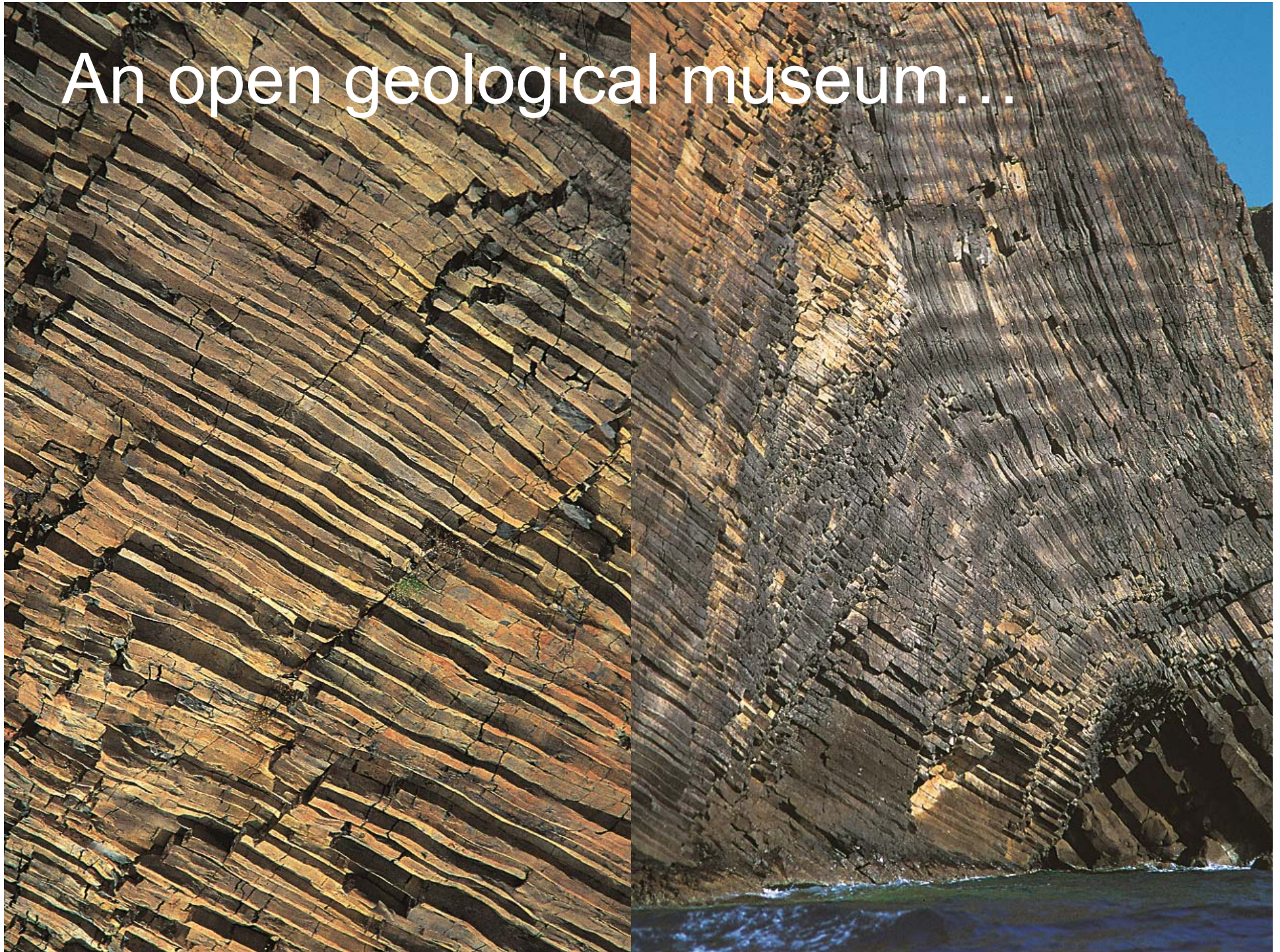
# An open geological museum...

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An open geological museum...





a typical fishermen village of Milos





‘ Syrmata’, boat shelters are caving structures, most probably started from experienced miners...



# Unique minerals

Bentonite



Perlite



Siliceous Stone



Sulfur



Obsidian



Baryte



Kaolin



Manganese

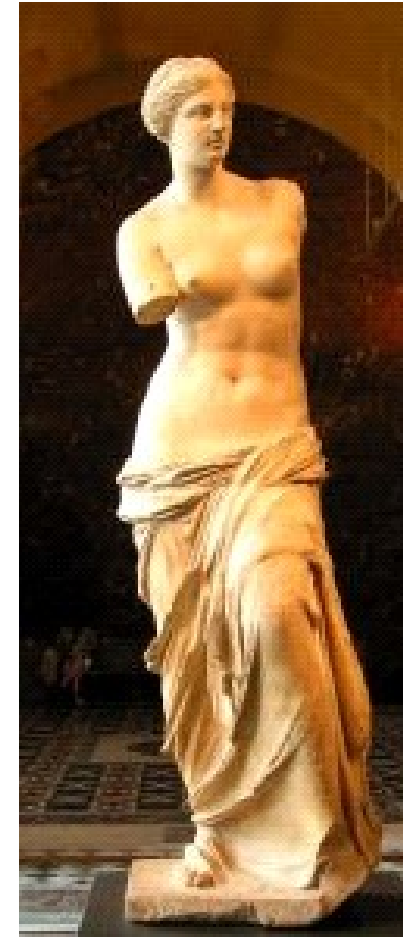


An important mining history,  
started 8000 BC





Roman theater for 5.000 people



**Venus of Milos**

# Continued for centuries....





# A dynamic mining present





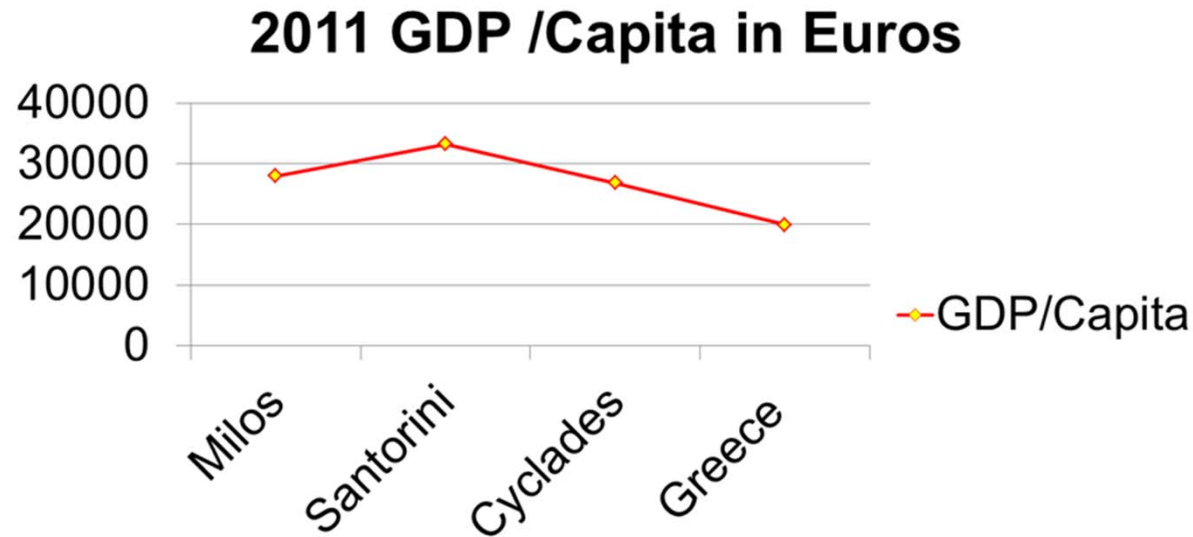
# ...and a dynamic mining activity today

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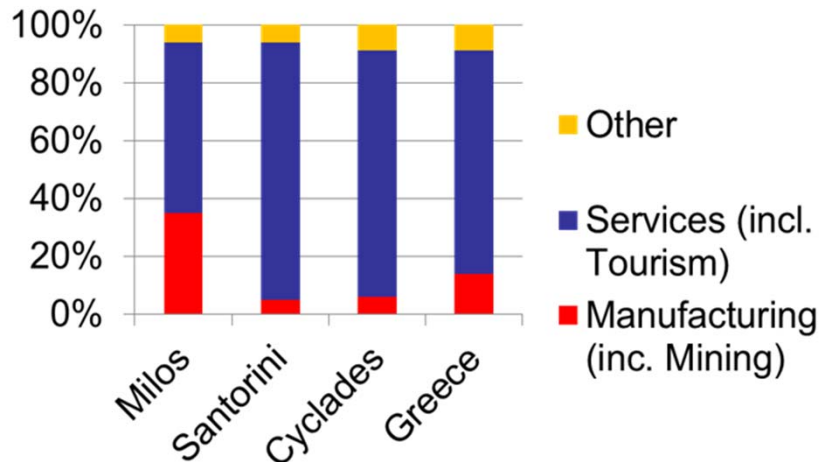


## GDP per capita comparison



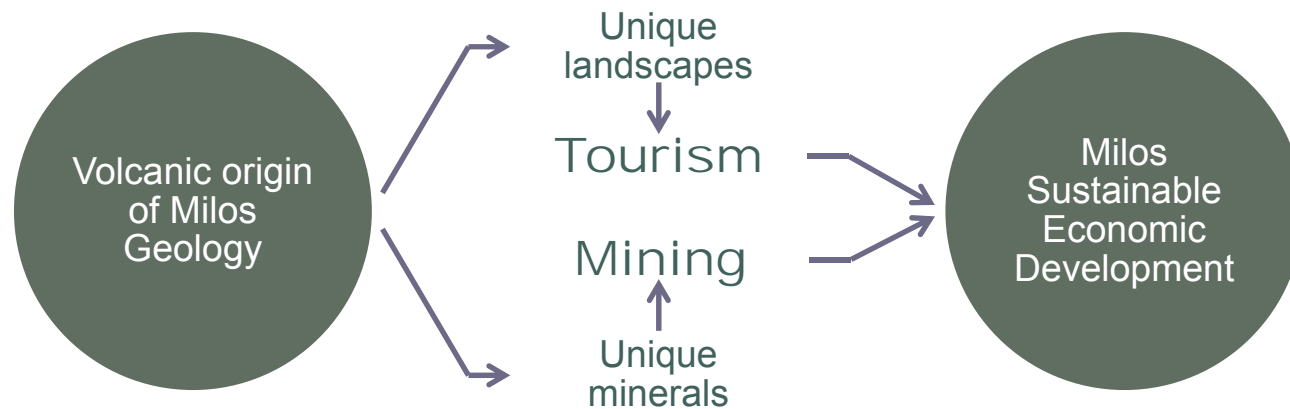
- ▶ Milos GDP higher than Greece's average
- ▶ No unemployment

Milos vs. Santorini , Cyclades & Greece GDP



- ▶ Currently **mining** accounts for 30% of Milos GDP
- ▶ Mining is a year-round economic activity – no seasonality
- ▶ 1.5 million MTs of industrial minerals extracted annually
- ▶ More than 80% exported overseas
- ▶ Services (incl. tourism & public services) account for 55% of domestic product
- ▶ 100-135,000 visitors/year with **tourism** activity peaking in July-August





**Tourism & Mining are driving the economic development of Milos hand-in-hand**



MILOS MINING MUSEUM



Milos Conference Center  
George Eliopoulos



S&B Group  
volunteerism  
initiative

*live brighter*



Πολιτιστικός  
Σύλλογος  
Πολλωνίων | Cultural  
Center  
of Pollonia



*all the secrets of Milos land*

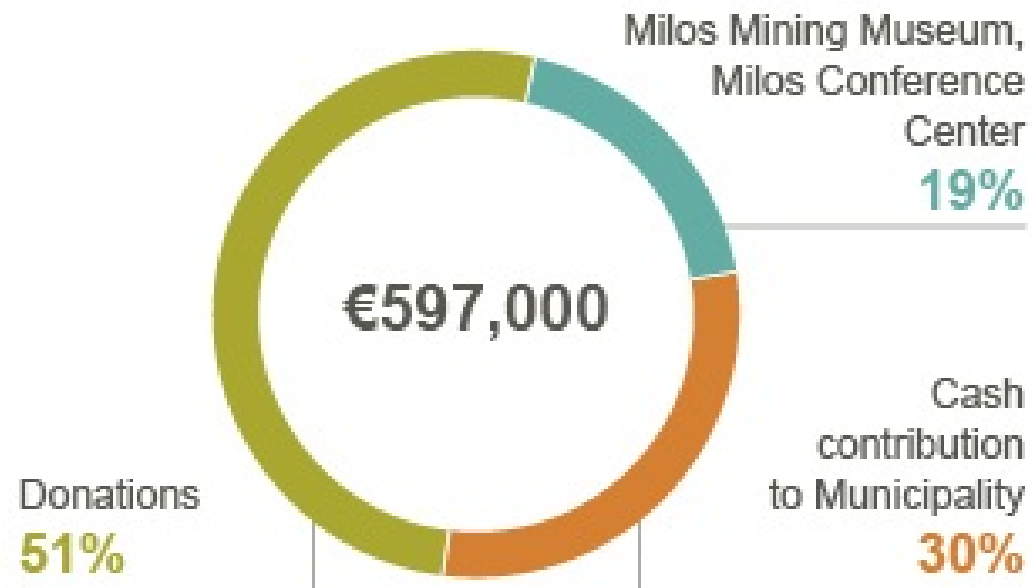


- ▶ Support to various local associations and causes
- ▶ Empowering young people through Scholarship schemes, Internships and Environmental education
- ▶ Volunteerism initiatives
- ▶ Infrastructure works: roads, football field, Pollonia Wi Fi
- ▶ Conservation work in areas degraded by fire, grazing or other human activities
- ▶ Culture and tourism





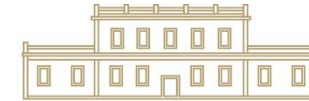
## 2013 Social Contribution to Milos Community



S&B's contribution to tourism since the early 1990s was manifested through infrastructure works, and notably the Milos Mining Museum and the Milos Conference Center



# Milos Conference Center



**Milos Conference Center**  
George Eliopoulos

- Established by Mrs. Kitty Kyriacopoulos in her father's George Eliopoulos memory.
- Inaugurated in 2000 and operates with the support of S&B
- Modern facilities hosting international conferences, conventions, and symposia
- Also hosts local cultural and social events
- 400 events since its establishment
- An old kaolin plant

# S&B's contribution: Milos Conference Center







MILOS MINING MUSEUM

- Founded in **1998** and operating with the support of S&B Industrial Minerals S.A.
- Aims to honor the island's geological and mining history
- **10.000** visitors/annum
- Unique obsidian exhibition, as well as various temporary exhibitions
- Has produced documentaries, publications
- Organizes educational programs
- Member of the European Museum Forum

# S&B's contribution: Milos Mining Museum





S&B's next step...

- In 2011 a sharp decline in the number of Milos tourists was noted, resulting from the on-set of the Greek crisis
- S&B took on the challenge to create a branded product that would promote tourism, building on Milos' comparative advantages

## MILOTERRANEAN was born!

- The project was initiated in the autumn of 2012.



*all the secrets of Milos land*



## MILOTERRANEAN | geo experience

**Milos** > the island with a unique geology & mining history

**terra** > earth (terranean>terra)

**terranean** > referring to the Mediterranean Sea

**experience** > all the secrets of Milos land

### The Audience:

The **Inquisitive global Traveler**  
who loves **Nature and Action**



## **7 routes selected and mapped out**

6 on the island of Milos and 1 on Kimolos, which belongs to the same island complex

## **Concise texts/‘guides’ compiled for each route**

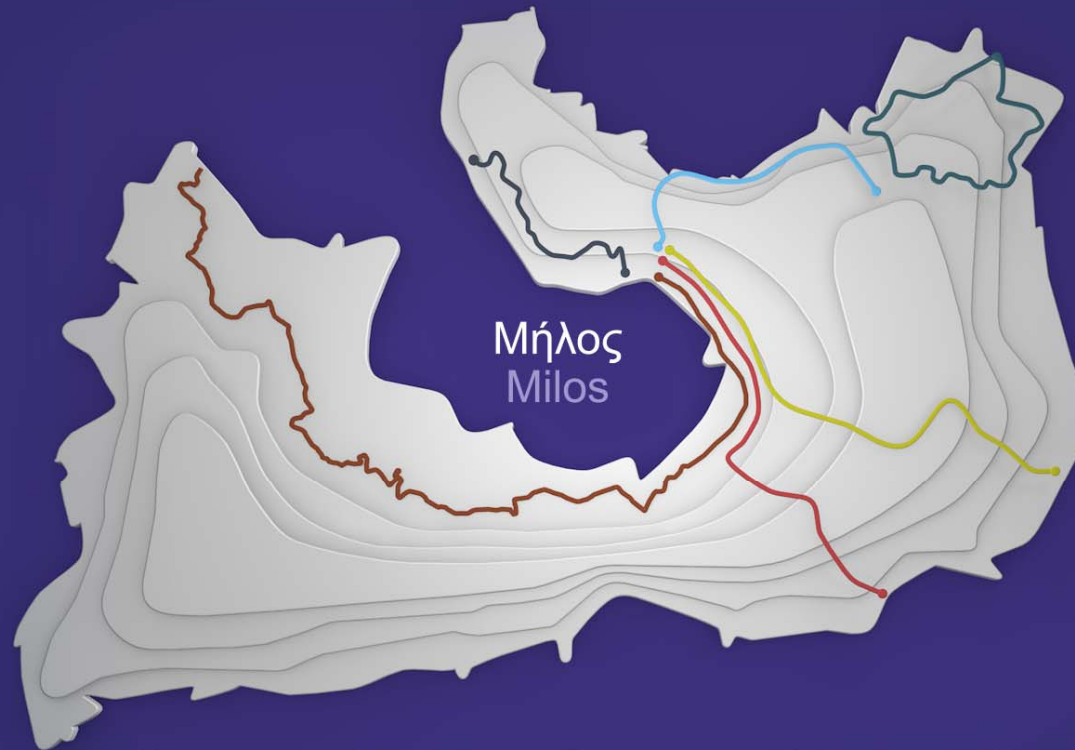
A group of geologists, mining engineers, foresters, cartographers, historians and communication specialists combined their expertise and insights

## **The Tools**

- hard copy maps with GPS precision (bilingual: en/gr)
- bilingual website ([www.miloterranean.gr](http://www.miloterranean.gr)) with maps in Googlemaps background & concise texts on points of interest
- routes‘ signposting
- e-news







1  
MILOTERRANEAN  
GEO WALKS  
Βάνι - Vaní

2  
MILOTERRANEAN  
GEO WALKS  
Βερίστειο - Volcano

3  
MILOTERRANEAN  
GEO WALKS  
Θειουρυχεία - Sulfur Mines

4  
MILOTERRANEAN  
GEO WALKS  
Αγγερά - Aggeria

5  
MILOTERRANEAN  
GEO WALKS  
Κίμαλος - Kimaolos

6  
MILOTERRANEAN  
GEO WALKS  
Σαρκενίτικο - Sarakenitiko

7  
MILOTERRANEAN  
GEO WALKS  
Μύχια - Mychia

			<b>4</b> ώρες/hours	<b>24</b> χλμ/km
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**1**

**MILOTERRANEAN  
GEO WALKS**

**Βάνι - Vaní**







Route 1 - Vani: destination is the obsolete manganese exploitation plant at the homonymous cape of NW Milos...







...but the route will also take you through Alykes, the old salt works, nowadays an important wetland...





Milos secret:

Would you believe that there used to be a perlite mine in Ahivadolimni, which is now completely reclaimed and turned into still another wetland...?







# MILOTERRANEAN GEO WALKS

Ηφαίστειο - Volcano

145'	2-4	4-5	13
ΩΡΕΣ/HOURS	ΩΡΕΣ/HOURS	ΩΡΕΣ/HOURS	ΧΑΜ/KM







Route 2 - Volcano: destination of this route is Kalamos, the broader area of the nowadays inactive Fyriplaka volcano, where you can admire the “fumaroles”, vents in the natural rock, from which steam comes out ...







The Fyriplaka volcano is one of those that gave birth to the island itself, a couple of billion years ago! This is the volcano's caldera, nowadays a green meadow...







...Where you can also see the famous Milos perennial cedar trees ...



## Milos secret



Did you know that an archaeological survey by the University of Glasgow has shown that Aghia Kyriaki was a settlement in antiquity for the exploitation and processing of minerals, as early as the late Hellenistic and Roman times?



Θειούραχεια - Sulfur Mine

 <b>2</b>	 <b>2-3</b>	 <b>4-5</b>	<b>13</b>
ΟΡΕΙΣ/HOURS	ΟΡΕΙΣ/HOURS	ΟΡΕΙΣ/HOURS	ΧΑΜ/KM







Route 3 - Sulfur Mine: destination of this route is the obsolete sulfur mine and processing plant...







...but the route will also take you through Demenagaki, one of the two prehistoric obsidian quarries of the island...







MILOTERRANEAN  
GEO WALKS

Θεσσαλονίκη - Sulfur Mine

as well as through slopes of low hills with strange rock shapes (noches), sometimes resembling animal heads...





Milos secret



Did you know that the ruined church of Christ, just past Zephyria, the old capital of Milos, was in its entirety built with Milos' perlite ?



**4**

**MILOTERRANEAN  
GEO WALKS**

Άγερριό - Aggeria

	<b>2</b>		<b>3-4</b>		<b>4-5</b>	<b>12</b>
	ΩΡΕΣ/HOURS		ΩΡΕΣ/HOURS		ΩΡΕΣ/HOURS	ΧΛΜ/KM



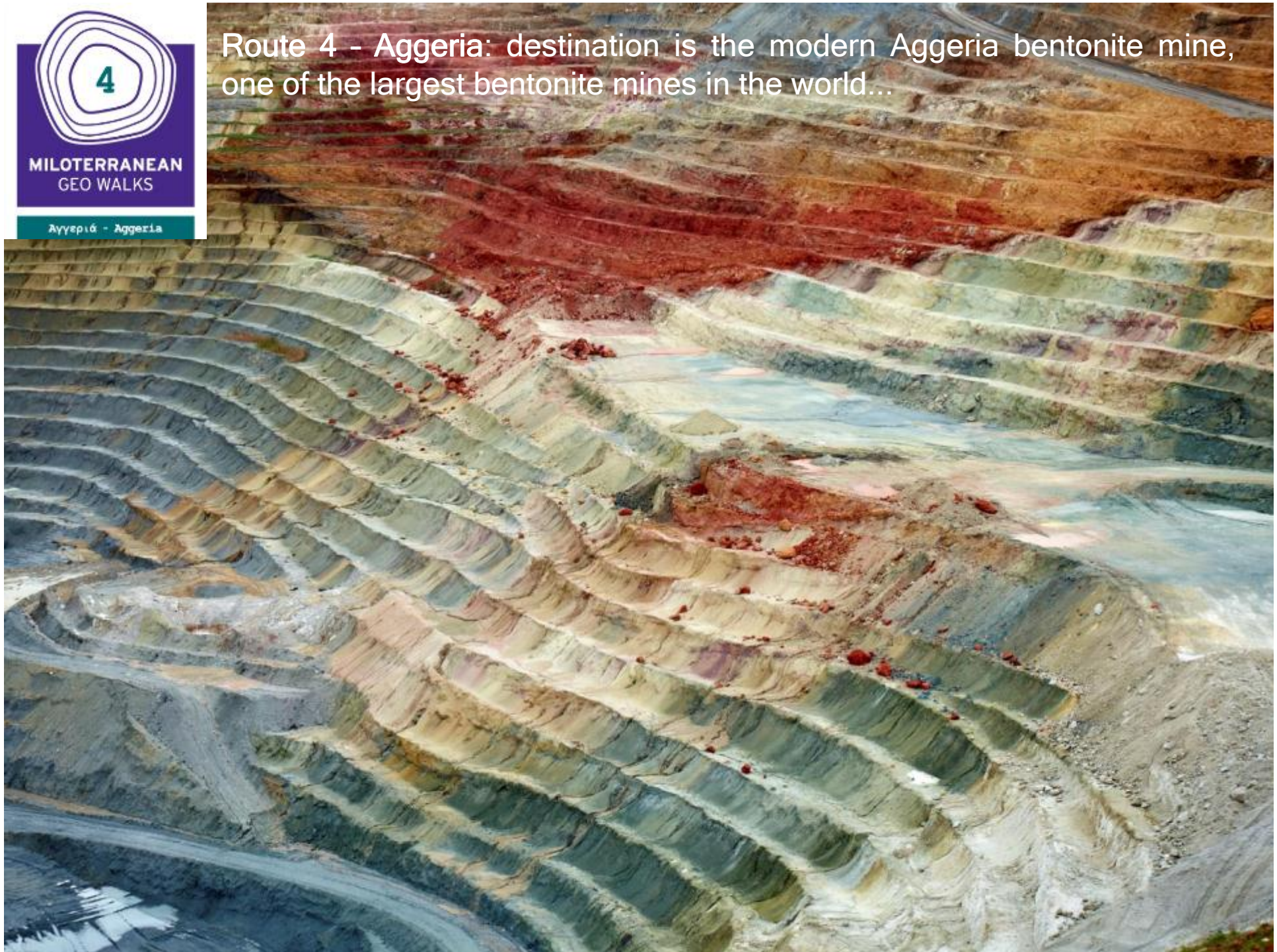




MILOTERRANEAN  
GEO WALKS

Αγερσία - Aggeria

Route 4 - Aggeria: destination is the modern Aggeria bentonite mine, one of the largest bentonite mines in the world...







MILOTERRANEAN  
GEO WALKS

Αγγερίο - Aggeria

... but this circular route will also take you through picturesque Pollonia village, right across Kimolos island...





## Milos secret



Did you know that Fylakopi is one of the most important prehistoric settlements of the Cycladic civilization, a sub-period of which bears its name? And that its various building periods can be distinguished in phases, exactly like in Troy? And that its peak was initially attributed to the important role it held in obsidian trading?





# Wealth due to mining in prehistoric era



- **Phlakopi** : A prehistoric settlement on Milos, trading obsidian.
- *Milos obsidian has been identified in mainland Greece & other SE Mediterranean prehistoric settlements*



... another stop in this route would be S&B's plant nursery, where dozens of species of local plants are reproduced for use in the company's reclamation works.





2 | 4,5  
HOURS | KM

6  
MILOTERRANEAN  
GEO WALKS  
Σαρακηνίσιο - Sarakiniko







Route 6 - Sarakiniko: destination is the magnificent beach of Sarakiniko on Milos' northern coast, with the otherworldly lunar beauty of its sun-washed rocks ...







... but the route will take you through the characteristic small island Kofto, meaning “cut off”, which was actually the case, since this small island was once cut off the main body of Milos







Aghios Konstantinos is the picturesque coast village, where route 6 actually starts...







... and where you can admire the rock-cut underground chapel of Aghios Konstantinos, dug into the soft rock.





## Milos secret



In all the small beaches on your way from Mytakas to Sarakiniko you may notice diatomite, a fossilized mineral, originating mostly from bivalves and echinoids

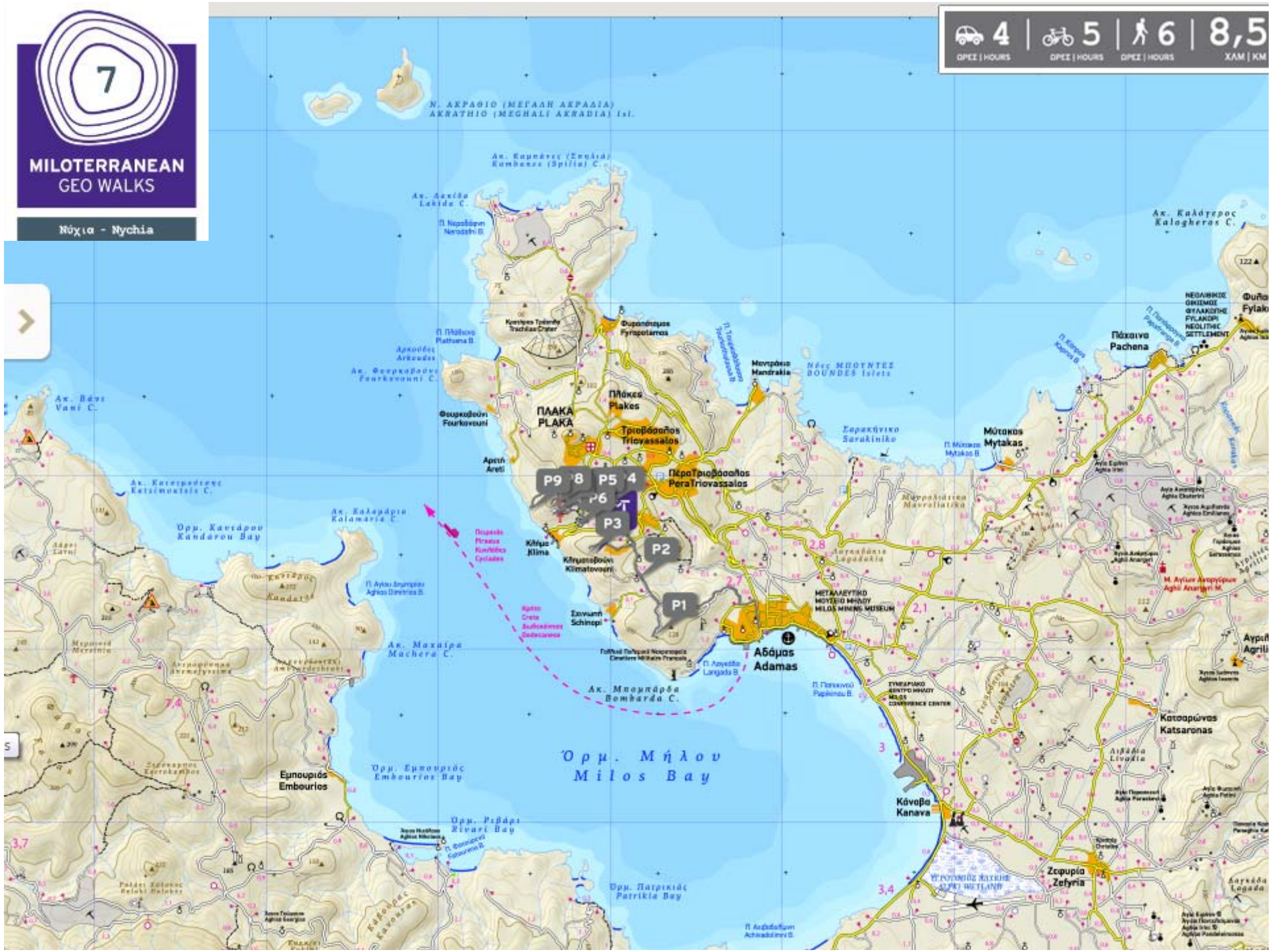




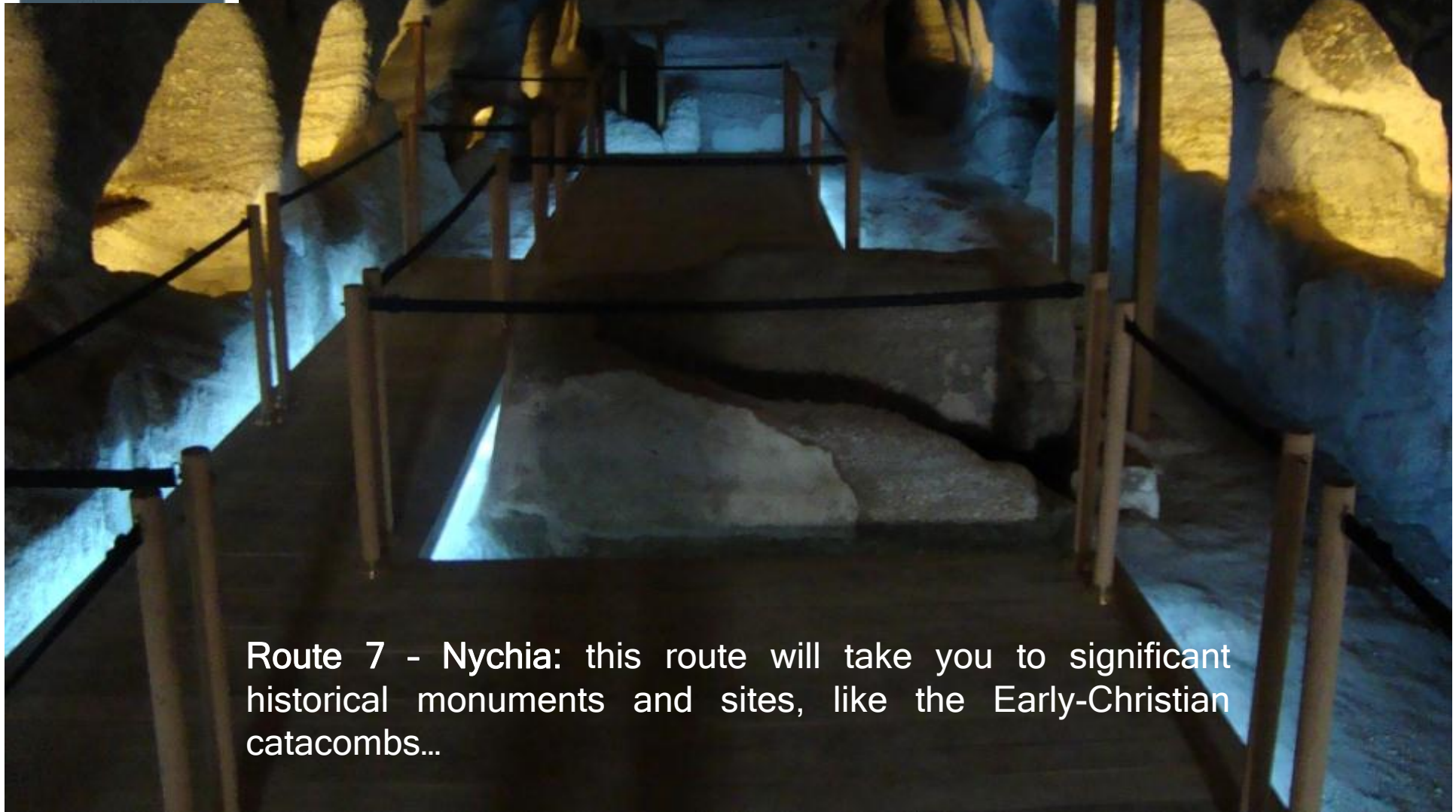
# MILOTERRANEAN GEO WALKS

Νύχια - Nychia

4	5	6	8,5
ΩΡΕΣ   HOURS	ΩΡΕΣ   HOURS	ΩΡΕΣ   HOURS	ΧΑΜ   KM







Route 7 - Nychia: this route will take you to significant historical monuments and sites, like the Early-Christian catacombs...





MILOTERRANEAN  
GEO WALKS

Μύκισα - Mychia

... the ancient hellenistic/roman theater...







MILOTERRANEAN  
GEO WALKS

Νύχια - Nychia

... and the 2<sup>nd</sup> prehistoric obsidian mine on Milos, called Nychia, which means nails, since the wastes of the prehistoric quarrying of obsidian resemble fingernails...





## Milos secret



2<sup>nd</sup> prehistoric obsidian mine on Milos. Obsidian from Milos (Nychia & Demenagaki) was used as raw material for the making of tools and weapons from the Neolithic Age throughout the Bronze Age, i.e. for more than 6 millennia, and traded in the broader Aegean area?





## S&B's new sustainability endeavor on Milos

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## S&B's new sustainability endeavor on Milos

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Thank you !

