Global Geoparks in Portugal

Global Geoparks are listed in order of acceptance into the Global Geoparks Network

Naturtejo Global Geopark, Portugal

Geology: Naturtejo Global Geopark is located at the southern border of the Central-Iberian Zone, one of the terranes that constituted the Iberian Massif during the Variscan Orogeny. 170 geosites were identified to tell locals and visitors the stories from Earth in this region of Iberia, from Neoproterozoic to Quaternary times. An internationally known trace fossil site records the behaviour of large trilobite communities at the dawn of the Ordovician biodiversification event. The Variscan orogeny is well documented here, including anatectic granite development and related tin-wolfram (gold) ore bodies, as well as the Alpine orogeny that has shaped the landscape, mostly by reactivation of older very large faults. There are well developed examples of Inselberg and Appalachian-type landforms as well as a complete history of the Tagus river recorded in the alluvial terraces, where the first hominids in the region thrived some 300,000 years ago and the last remains of forest elephants in Europe were found. Iron age-to-1960s mining heritage is also preserved in nationally important sites.

Geography: Naturtejo Global Geopark is a territory of 4624,4 km^2 located within the boundaries of six municipalities: Castelo Branco, Idanha-a-Nova, Nisa, Oleiros, Proença-a-Nova and Vila Velha de Ródão. The Global Geopark is located in the so called Southern Iberian Meseta, a polygenetic peneplain cut by the Tagus river into a deep valley at the south and bordered on the north by the Central Iberian Belt. The landscape is composed of a wide plain broken by residual relief coming from past climates and a staircase of flat topped tectonic-faulted blocks deeply incised by rivers and streams that are more prominent towards the north.

The territory is located in the Centre Region of Portugal, between Beira Baixa and Alentejo provinces, on the border with Spain, with 88,164 inhabitants in the latest census of 2011 concentrated in the single city of Castelo Branco and more than 400 villages. People live mostly from services and commerce but agriculture (olive oil, cheese and meat) and forestry are still very important.

Education and Sustainable Development: Naturtejo is responsible for a broad number of educational programs devoted to local schools, but also including international school visits every year. From kindergarten to university and senior college, the Global Geopark offer a wide range of educational activities especially prepared by our team of geologists and former school teachers, both at the geosites and local museums, but also in the classroom, according to the Ministry of Education' curricula. The Naturtejo Global Geopark educational programmes were awarded internationally by Skal International and the national exams on geology and natural sciences include many examples of the Global Geopark's diversity almost every year.

Naturtejo is a public-private partnership responsible for fostering sustainable development in the territory of the Global Geopark. Together with the 6 municipalities and more than 50 associate and partner companies, Naturtejo provides scientific and technical support for protection of geological heritage and regional development projects to organize sustainable tourism diversification and promotion under the umbrella of the Global Geopark.

Dates
Year of GGN membership entry: 2006
Subsequent Revalidation: 2019

Official Website
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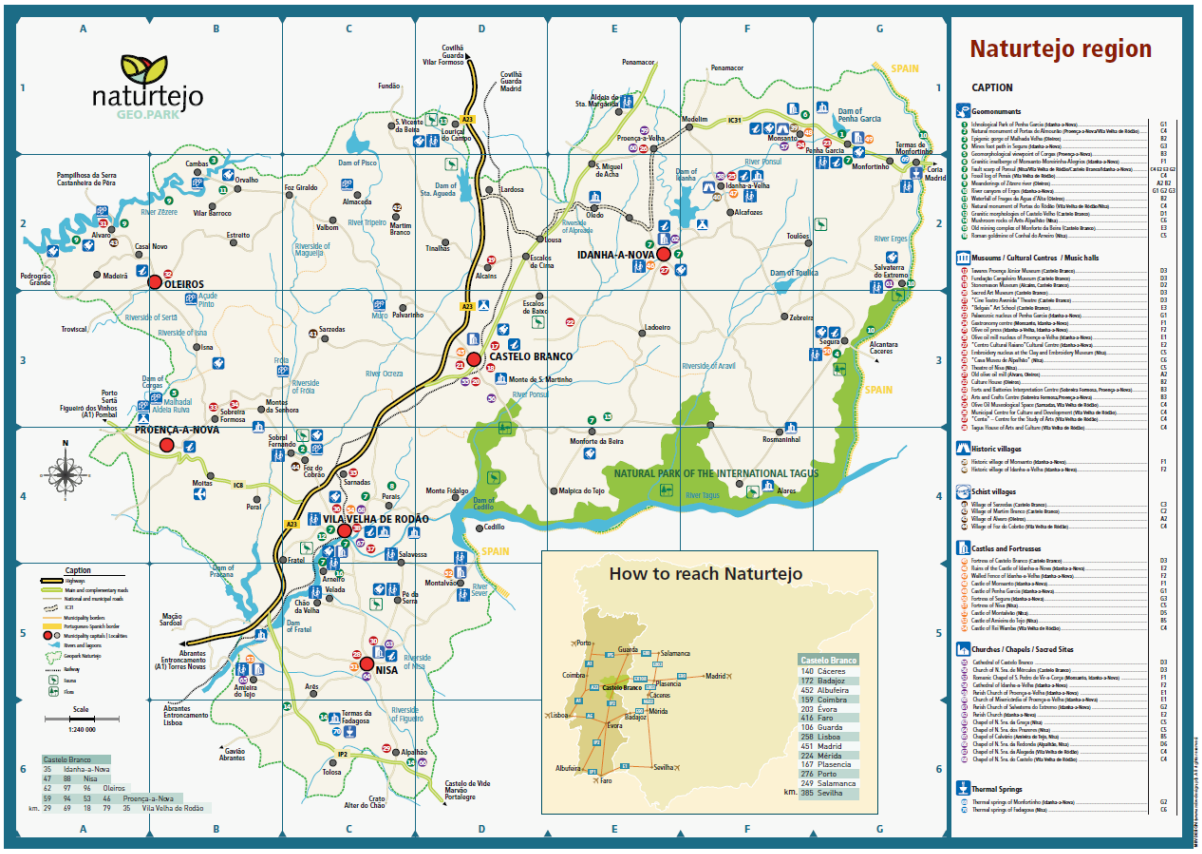
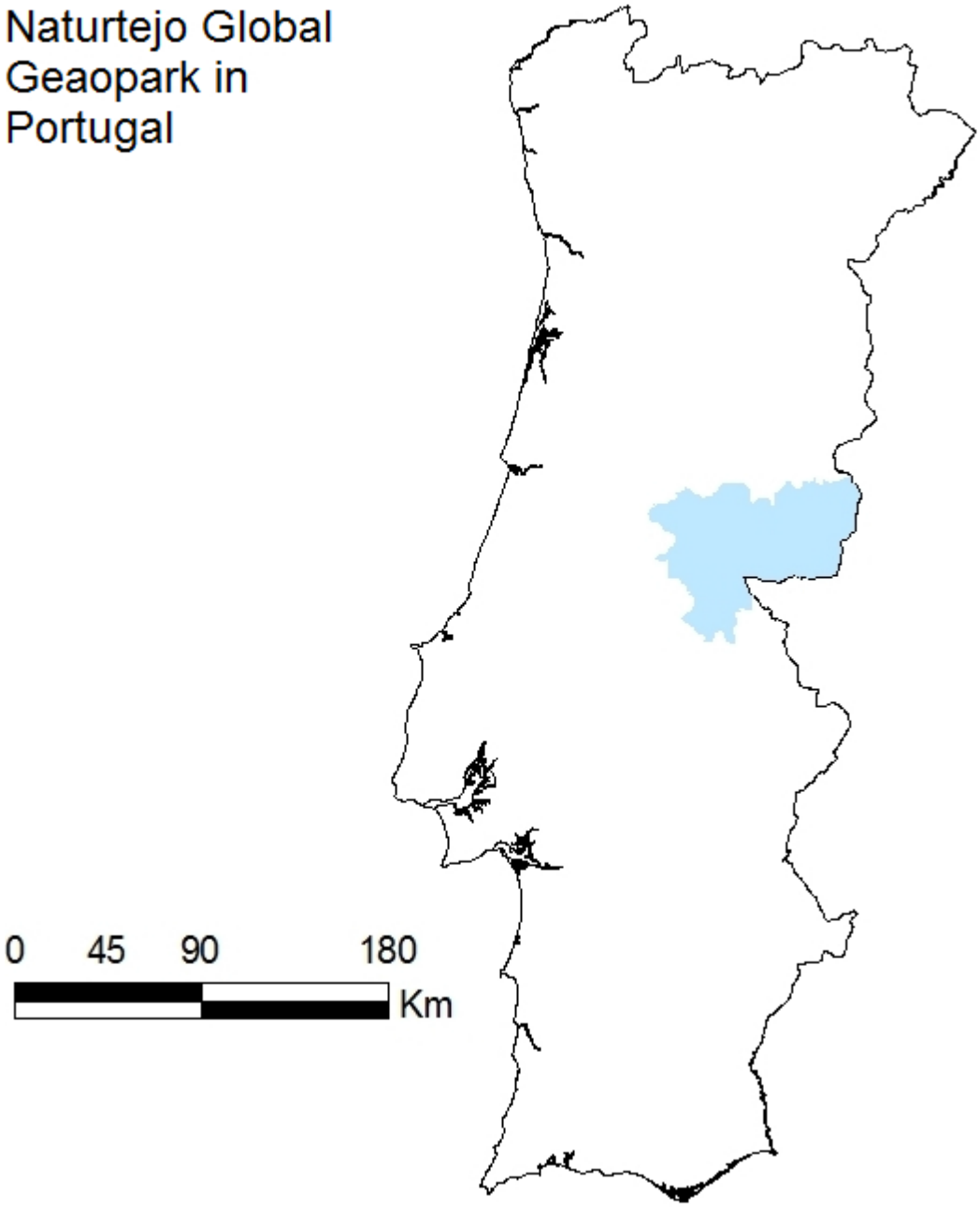
Map of Naturtejo Global Geopark



Location of Naturtejo Global Geaopark in Portugal



Arouca Global Geopark, Portugal

Geology: The Arouca Global Geopark territory is framed in the major morphostructural unit of the Iberian Peninsula – the Hesperian Massif, which is the largest fragment of the Variscan basement that crops out in Europe. In the Arouca Global Geopark are three main lithological groups: i) the basement, formed by metasedimentary rocks with Neoproterozoic to middle Cambrian in age (630-520 My); ii) the Paleozoic sequence, represented by the Ordovician, Silurian and Carboniferous rocks; and iii) the magmatic bodies represented by the sin-orogenic granitoids differentiated into six main plutonic bodies. Besides the diversity of the Variscan magmatic rocks, some other important late variscan dyke rocks are known partly linked to relevant mineralizations that gave mining recognition to this region. With international significance stands out the Giant Trilobites of Canelas, the Birthing Stones of Castanheira and the Paiva valley Lower Ordovician ichnofossils.

Geography: Arouca Global Geopark comprises an area of 327 km^2 and its borders are coincident with the Municipality of Arouca within the broader Oporto Metropolitan Area. This territory is located on the western border of the north sub-plateau of the Iberian Peninsula, and is characterized by mountains carved by narrow valleys. The average altitudes range from 200 to 600 m but exceeds 1000 m in Freita (1100 m) and Montemuro (1222 m) mountains. The population living in the territory is 22.359 inhabitants. The use of the territory covers 0.4 % industrial area, 5.4 % urban area, 43 % National Ecological Reserve and 7.1 % National Agricultural Reserve. About 47 % of the territory belongs to Natura 2000 network of protected areas.

Education and Sustainable Development: The Arouca Global Geopark has been implementing actions towards territorial sustainability, taking into consideration its natural and cultural heritage, promoting science knowledge and encouraging behaviour changes. The Educational Programs and Educational Projects of the Global Geopark involve as much as possible the educational community and are based on a set of field trips along the territory mostly focused on the regional geological heritage. These Educational Projects include school contests, educational exhibitions, geological story books, pedagogical games and training courses for teachers and local guides. Other educational projects, like “Geoinvolve Project” and “Communitarian Tourism Project”, promote the development of new skills in the local communities, and the excellence of this territory, certified also with the European Charter for Sustainable Development.

Dates
Year of GGN membership entry: 2009
Subsequent Revalidation: 2017

Official Website
http://www.geoparquearouca.com/?lg=en

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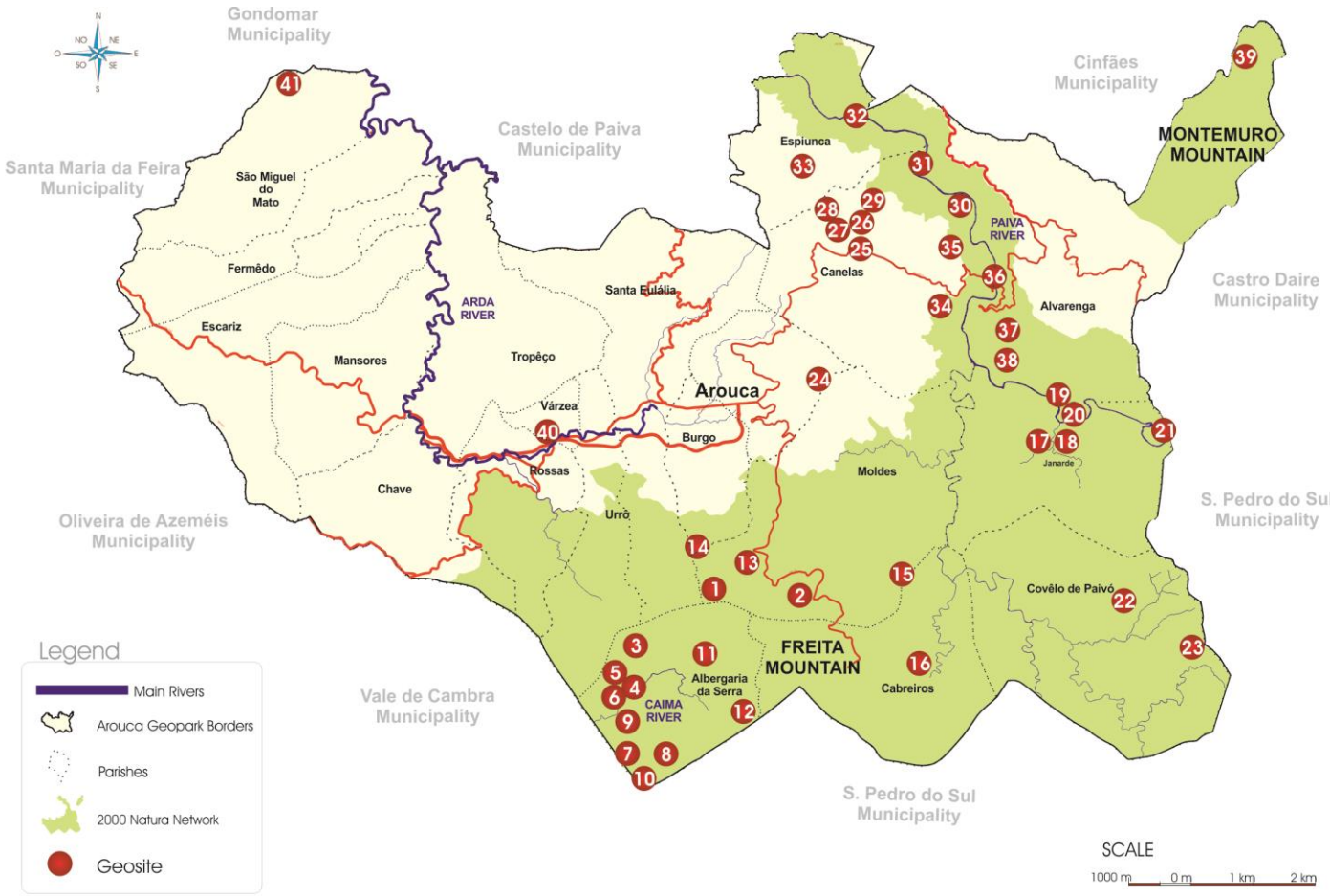
Map of Arouca Global Geopark



1 Detrelo da Malhada viewpoint
GPS/WGS84 - 40°53'07.1"N 8°15'16.7"W

2 Côto do Boi
GPS/WGS84 - 40°53'13.0"N 8°13'47.3"W

3 S. Pedro Velho granitic dome
GPS/WGS84 - 40°52'30.6"N 8°16'50.6"W

4 Caima river potholes
GPS/WGS84 - 40°51'48.0"N 8°16'57.3"W

5 Mizarela geological contact
GPS/WGS84 - 40°51'53.5"N 8°17'06.9"W

6 Mizarela waterfall
GPS/WGS84 - 40°51'49.5"N 8°17'08.5"W

7 Pedras Parideiras (Rocks delivering stones)
GPS/WGS84 - 40°51'02.1"N 8°16'58.9"W

8 Castanheira folds
GPS/WGS84 - 40°50'49.8"N 8°16'16.6"W

9 Cabaços quartz dike
GPS/WGS84 - 40°51'25.9"N 8°16'50.8"W

10 Costa da Castanheira viewpoint
GPS/WGS84 - 40°50'37.3"N 8°16'39.5"W

11 Maize bread rocks of Junqueiro
GPS/WGS84 - 40°52'02.4"N 8°15'41.6"W

12 Serlei granitic gnammas
GPS/WGS84 - 40°51'19.2"N 8°15'32.98"W

13 Espinho spheroidal weathering
GPS/WGS84 - 40°53'42.5"N 8°14'57.7"W

14 Viveiros da Granja boulders
GPS/WGS84 - 40°53'31.0"N 8°15'29.2"W

15 Pena Amarela wolfram mine
GPS/WGS84 - 40°53'34.2"N 8°12'12.2"W

16 Rio de Frades wolfram and tin mine
GPS/WGS84 - 40°53'34.2"N 8°12'12.2"W

17 Ichnofossils from Mourinha
GPS/WGS84 - 40°55'12.72"N 8°9'24.44"W

18 Paiva River library
GPS/WGS84 - 40°55'13.25"N 8°9'22.05"W

19 Roman "Conheiras" of Janarde
GPS/WGS84 - 40°55'31.12"N 8°9'13.96"W

20 Paiva River meanders and fluvial deposits
GPS/WGS84 - 40°55'39.41"N 8°8'58.85"W

21 Ichnofossils from Meitriz
GPS/WGS84 - 40°55'32.18"N 8°7'24.65"W

22 Regoufe wolfram and tin mine
GPS/WGS84 - 40°52'46.5"N 8°7'59.1"W

23 "Hell's door" and "the claw"
GPS/WGS84 - 40°52'24.4"N 8°6'35.7"W

24 Senhora da Mó viewpoint
GPS/WGS84 - 40°55'58.6"N 8°13'31.3"W

25 Geological Interpretative Centre of Canelas
GPS/WGS84 - 40°57'44.70"N 8°12'57.24"W

26 Late Ordovician glaciomarine diamictites
GPS/WGS84 - 40°57'53.6"N 8°13'22.1"W

27 Silurian graptolites
GPS/WGS84 - 40°57'53.47"N 8°13'27.49"W

28 Carboniferous conglomerate
GPS/WGS84 - 40°57'57.5"N 8°13'36.4"W

29 Gralheira d'Água quartzitic ridge
GPS/WGS84 - 40°58'05.1"N 8°13'16.6"W

30 Vau river beach
GPS/WGS84 - 40°58'34.9"N 8°11'21.1"W

31 Gola do Salto site
GPS/WGS84 - 40°59'26.66"N 8°12'23.53"W

32 Espiunca tectonic features
GPS/WGS84 - 40°59'35.5"N 8°12'40.9"W

33 Ichnofossils from Vila Cova
GPS/WGS84 - 40°58'33.23"N 8°14'08.46"W

34 Ichnofossils from Vilarinho
GPS/WGS84 - 40°57'30.18"N 8°12'16.26"W

35 Agueiras waterfall
GPS/WGS84 - 40°57'53.4"N 8°11'07.8"W

36 Epigenetic gorge of the Paiva River
GPS/WGS84 - 40°57'26.9"N 8°10'26.2"W

37 Ichnofossils from Cabanas Longas
GPS/WGS84 - 40°56'41.7"N 8°10'30.7"W

38 Mira Paiva site
GPS/WGS84 - 40°56'13.9"N 8°10'21.9"W

39 Pedra Posta viewpoint
GPS/WGS84 - 41°00'27.2"N 8°06'09.1"W

40 Pedra Má hornfels
GPS/WGS84 - 40°55'08.54"N 8°18'12.93"W

41 Sobreiros viewpoint
GPS/WGS84 - 41°00'12.0"N 8°23'07.6"W

Map of Portugal showing location and size of Arouca Global Geopark

Azores Global Geopark, Portugal

Geology: The Azores archipelago is located at the triple junction of the North American, Eurasian and African lithospheric plates. These oceanic volcanic islands emerge from the Azores Plateau, which is defined by the 2,000 meters bathimetric line and is roughly N-S crossed by the Mid-Atlantic Ridge. The oldest terrestrial volcanism (about 8 million years) is present on Santa Maria Island, while Pico is the youngest island of the archipelago that emerged about 300,000 years ago. There are 27 main volcanic systems, with 16 major central volcanoes (12 of them silicic and with summit subsidence calderas) and 11 volcanic ridges associated with basaltic fissure volcanism, among which 9 polygenetic volcanoes and 7 fissural ridges are active. The small insular territory has about 1,750 monogenetic volcanoes, tectonic structures, Miocene sedimentary rocks and offshore deep-sea hydrothermal fields and seamount volcanoes.

Geography: The Azores Global Geopark is located in the North Atlantic Ocean between the European and American continents, roughly between the latitudes 37-40° North and the longitudes 24-32° West, and at the distance of 1,815 km from the Portugal mainland. The Global Geopark area is 12,884 km^2, including the 2,324 km^2 of the 9 islands territory and 10,560 km^2 with 4 marine geosites of international to national relevance. The archipelago is a Portuguese autonomous region composed of nine islands, which are dispersed along a 600 km length narrow band with a WNW-ESE trend. The islands have different surface areas (17 to 745 km^2) and are distributed in three groups: the Eastern Group (São Miguel and Santa Maria islands), the Central Group (Terceira, Graciosa, São Jorge, Pico and Faial islands) and the Western Group (Flores and Corvo islands). The archipelago includes 19 municipalities and 156 civil parishes and has a population of 246,772 inhabitants.

Education and Sustainable Development: The Azores Global Geopark combines the protection and promotion of its geological heritage with the sustainable development of their communities, with a socio-economic, educational, environmental and cultural focus. Environmental education and awareness activities focus on the volcanic origin of the islands, its geolandscapes and geological processes, in close cooperation with the regional network of "Ecotecas". Several initiatives are addressed to schools, the general population and also to the visitors of the Global Geopark, and allow through learning, exploration and discovery to reveal the secrets of *GEA*-Mother Earth. The balanced and sustainable economic development of the territory is ensured by the promotion and development of traditional activities and local products, namely those high-quality agro-industry sector products (e.g. cheese, meat, tea, wines), and a strong emphasis on geotourism as a holistic approach focused on valuing the volcanic nature of the territory and its footprint on the Azorean biodiversity, culture, architecture, traditions and ethnography.

Dates
Year of GGN membership entry: 2013
Subsequent Revalidation: 2017

Official Website
http://www.azoresgeopark.com/?lang=EN

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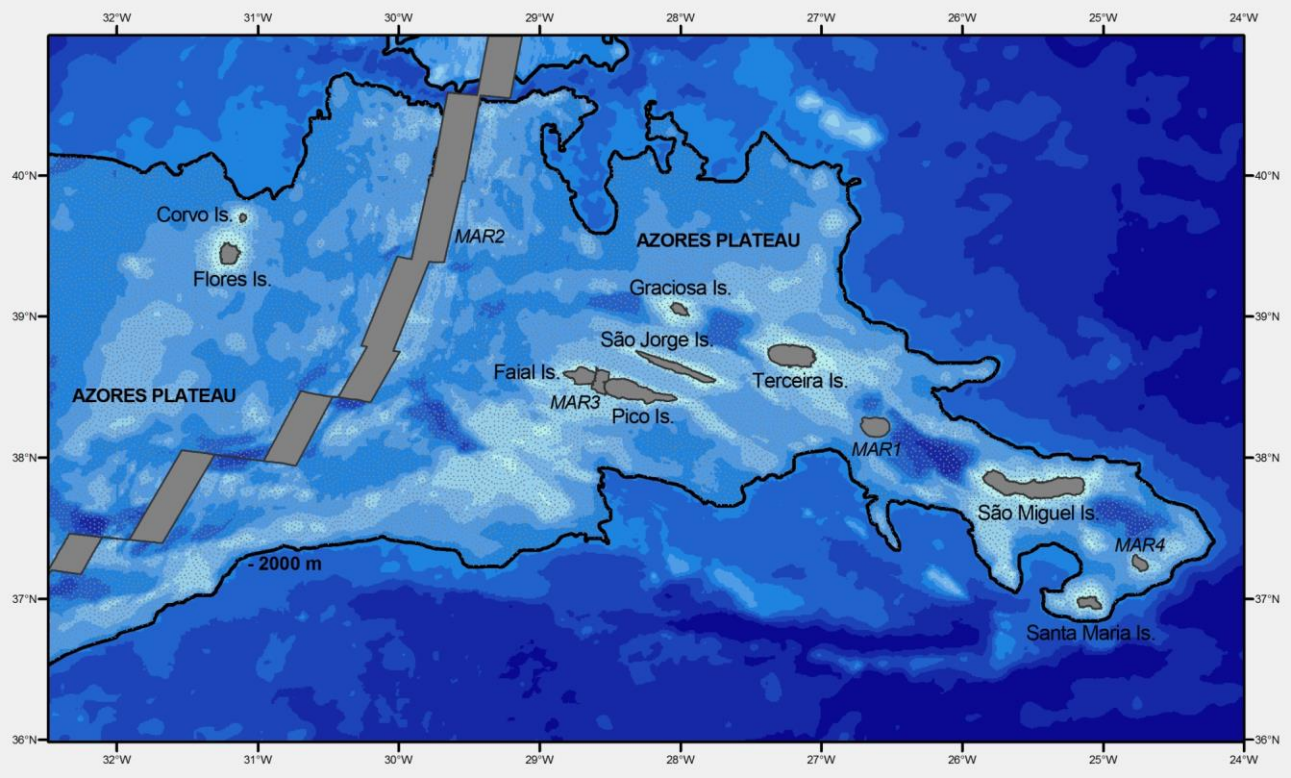
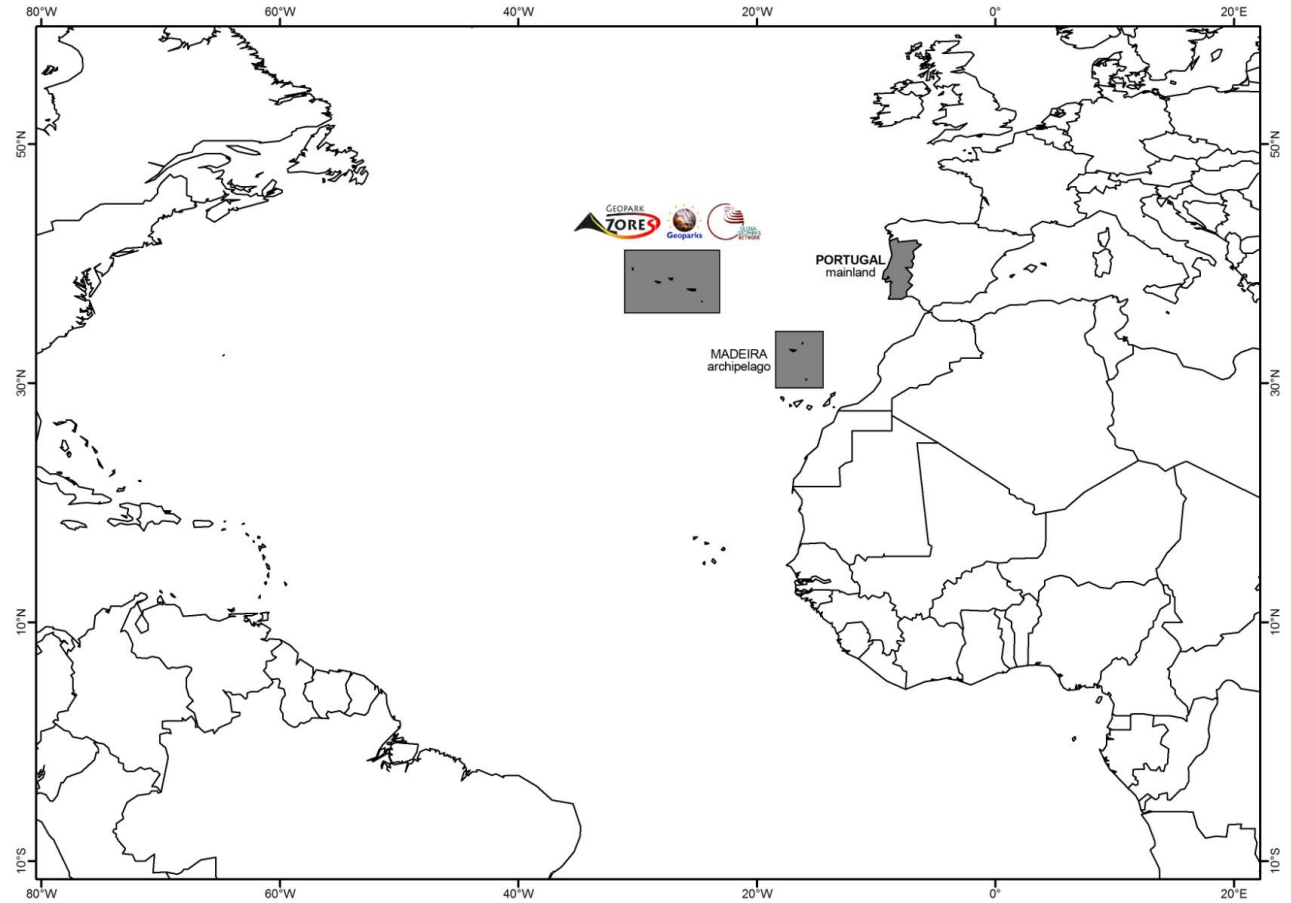
Map of Azores Global Geopark



Map of Portugal (showing location of Azores Global Geopark)



Terras de Cavaleiros Global Geopark, Portugal

Geology: In the territory of the Global Geopark the geological history of over 500 million years is very well documented. Like pages in a book, different stacked portions of rocks that once formed an ancient oceanic crust and an even older continental crust tell the story of the area. The geology is expressed by the Pre-Mesozoic allochthonous geological units, namely the Parautochthonous Complex (equivalent to the Iberian Massif autochthonous stratigraphic sequence), the Allochthonous Basal Complex (continental passive margin of the Iberian Terrane), the Allochthonous Ophiolite Complex (complete ophiolite sequence) and the Allochthonous Upper Complex (complete continental lithospheric sequence). Furthermore, there can be found sediments that prove the existence of an ancient fluvial network that once drained to the interior of the Iberian Peninsula as well as active faults, such as the Vilariça fault which crosses the whole territory of the Global Geopark.

Geography: The Terras de Cavaleiros Global Geopark is located in the northeast of Portugal and corresponds to the area of the municipality of Macedo de Cavaleiros with about 700 km^2. The Global Geopark is at a distance of 181 km from Porto, 505 km from Lisbon and 401 km from Madrid. The territory's dominant altitudes range between 400 and 800 m, with the Nogueira mountain as its highest peak (1320 m) and the Sabor River as the lowest point (200 m). Another river was dammed to create the artificial lake of Azibo's Lagoon which is classified as protected landscape and important habitat to various rare species.

Education and Sustainable Development: The Global Geopark's offers several educational programs, especially designed for schools complementing their curricula. From a total of 15 programs, which contain biodiversity, culture and history, 11 include also a geological component and take place in the field. In order to support the educational offer and to encourage the learning of the geosciences in a didactically reasonable and enjoyable way, a set of didactic games was developed. The main objective of these games is to learn concepts about geological heritage and to explore the most important places in the area. They combine different educational concepts such as puzzles, board games and interactive approaches and are suitable for children from first grade to high school. The Global Geopark participates in UNESCO's contest "Water that unites us" with the Portuguese Forum of Geoparks, the "Eco-Schools" international program, promoted by ABAE (European Blue Flag Association), and the "Life Science in Summer" program, promoted by the National Agency for Scientific and Technological Culture.

Dates
Year of GGN membership entry: 2014
Subsequent Revalidation: 2018

Official Website
www.geoparkterrasdecavaleiros.com

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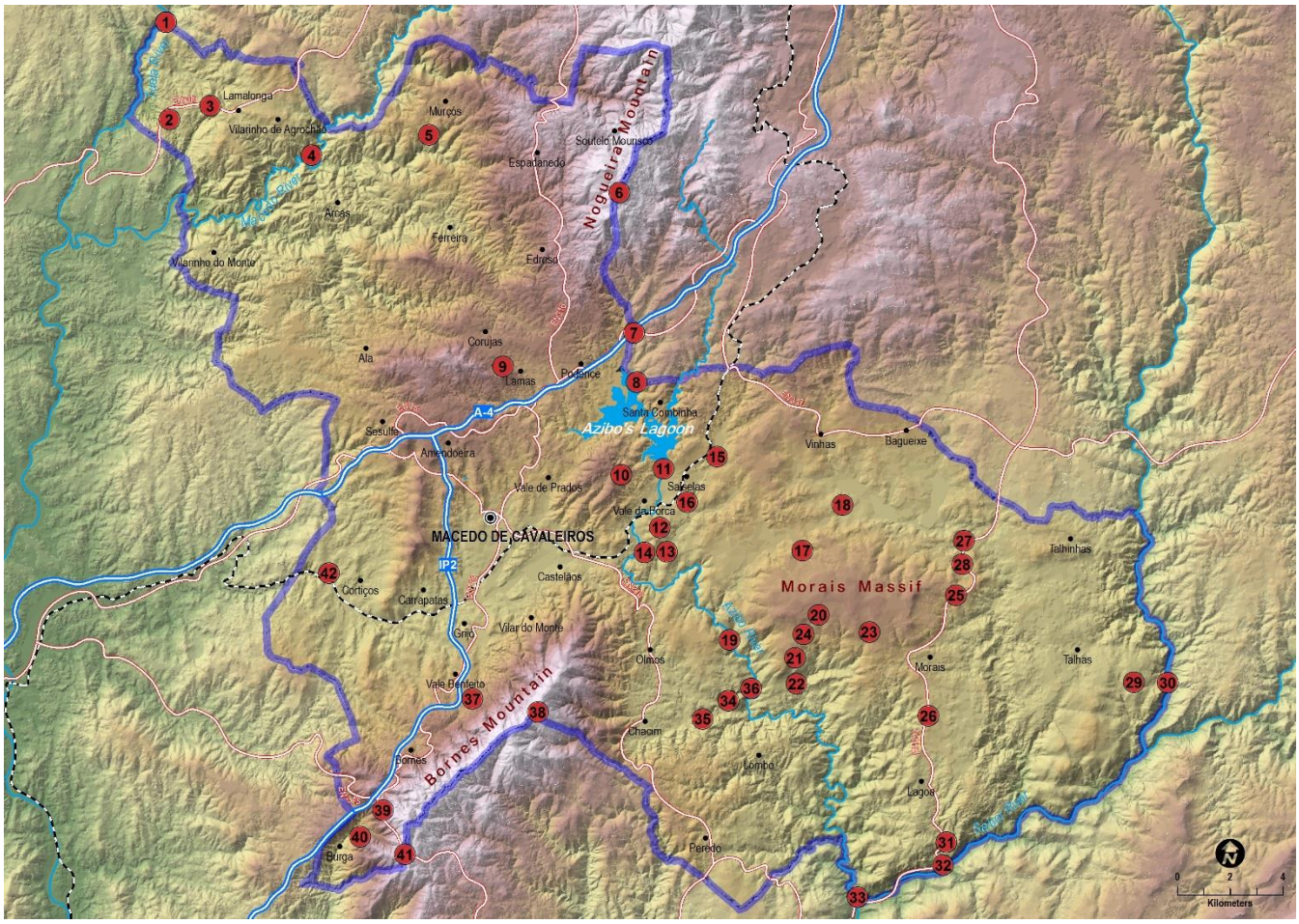
Map of the Terras de Cavaleiros Global Geopark



Map of Portugal showing location and size of the Terras de Cavaleiros Global Geopark