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THE BASQUE COAST GEOPARK: SUPPORT FOR GOOD PRACTICES IN GEOTOURISM

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Abstract: Over an eight-year period, a wide variety of geology and nature tours has been created in the Basque Coast Geopark, offering many different options to a very diverse public: varying duration of the visits and difficulty of the routes, different topics, prices, types of experience, etc. Examples include boat trips to observe the main coastal outcrop, visits on foot to different geosites, or combined land and sea visits, etc. Despite there being no tradition of geotourism in the zone, or any history of paid guided tours, the geopark's model is successful. This makes us determined to consolidate what has been achieved and prepare to take on new challenges.

Key words: geopark, geotourism, good practices, working groups, network

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INTRODUCTION

European Geoparks assisted by UNESCO offer a unique context for sustainable development based on a special geological heritage. These territories are members of a broad Network (European Geoparks and Global Geoparks Network) which has high quality standards in relation to the sustainable management of geological heritage. The survival of the Network itself depends on a continuous process of quality improvement, a process which is connected to the acquisition of new tools for sustainable management.

In 2003 the first systematic drafts for methodology and evaluation processes were proposed (Zouros et al., 2003) and were completed at the meeting held in the Madonie Geopark (Sicily, Italy) in October 2004, where the role of UNESCO was defined (Madonie Declaration). Since then the activities' evaluation process has been refined through the continuous exchange of ideas between Network members.

Geological heritage management covers various facets: geoconservation, geotourism, education, provision of information, promotion of local products, etc., with the aim of improving the geopark inhabitants' quality of life. Management of the geological heritage, through sustainable tourism, is one of the most powerful tools to achieve this goal.

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THE BASQUE COAST GEOPARK

The geopark is located on the west coast of Gipuzkoa province, in the Autonomous Community of the Basque Country, in northern Spain (figure 1). The 89-sqkm geopark includes the municipalities of Zumaia, Deba and Mutriku, and is inhabited by around 19,700 people. Extended information in Llordés and Baceta, 2009 and www.geoparkea.com.

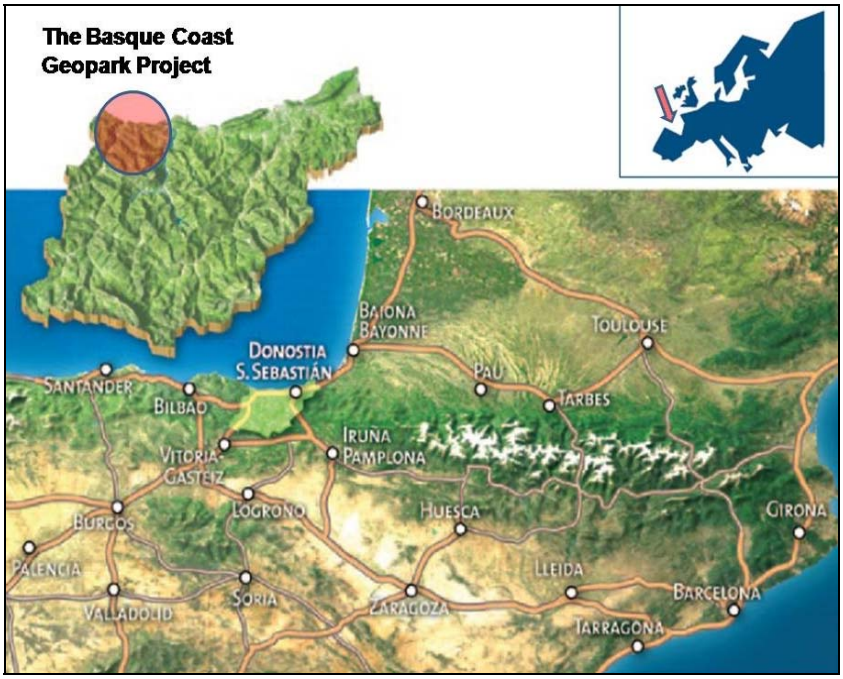

Figure 1. The Basque Coast Geopark is located in the north-west part of the Province of Gipuzkoa (Basque Country, Spain)
(Source: Basque Country 's Topographic Map)

In this territory, where the western Pyrenees (Basque Mountains) meet the ocean, two geological domains stand out: the coastal flysch succession and the karst landform of limestone massifs from the Lower Cretaceous, which defines the inland zone.

The exceptional geographical location and excellent infrastructure mean that the region is in a key location, with very good connections to all the main Basque cities. For example, San Sebastián can be reached by car in 30 minutes and Bilbao in less than 50 minutes. The French border is 35 km to the east.

The territory encompasses a 23 km coastline consisting largely of steep cliffs affected by tides and includes one of the most extensive intertidal abrasion platforms in Europe (figure 2). The coastal area contains a complete record of the important boundaries between geological ages such as the Cretaceous/Tertiary (K-T boundary) and the Palaeocene/Eocene boundary, and also includes the stratotypes (international references) for two stage boundaries within the Palaeocene (Danian-Selandian and Selandian-Thanetian). See for example, Schmitz et al., 1998 and Pujalte et al., 2009.

There are Cretaceous flysch outcrops in the northernmost part of the territory. They consists of a thick and monotonous turbidite succession of axial flows (from E to W), deposited in the Pyrenean ridge, with interspersed layers mainly consisting of hemipelagic marls and limestones. A more calcareous lowermost unit and another upper, detritic calcareous unit are worthy of note.

The Mesozoic-Cenozoic transit is characterised by a stratigraphic continuity and a lithological appearance. The boundary can mainly be identified by the change in the microfauna. The boundary was also recorded by a centimetre-thick layer of iridium-rich clay.

There are outcrops of Tertiary materials in the northern part of the territory, which date from the Palaeocene to the Lower Eocene. The Palaeocene is represented by the so-called "*Danian Limestone Formation*", which contains several lithologies that are very typical of this region (red layers), locally eroded by submarine canyons that were filled during the Thanetian Stage.

Figure 2. A unique coast, which reveals 60 million years of uninterrupted geological history, in a spectacular landscape created by the continuous action of the sea. (Source: J.P. Llordés)

Figure 3. Two Paleocene stratotypes limits were defined in Itzurun beach during the Paleocene Workshop held in June 2007 (Pujalte et al., 2009): Selandian - Danian (S / D) and Thanetian - Selandian (T/ S). Source: J.P. Llordés

The limit Danian - Selandian (D/S) is defined in Itzurun beach, 49 m above the K-T limit and can be recognized by an abrupt lithologic change to clay facies, associated with a sea level fall (Molina, 1994). Estimated age: 60.5 Million years (My). The limit Selandian /

Thanetian (S/T) is also defined in Itzurun beach, and the limit coincides with the change of magnetic cron 26n/26r. Estimated age: 58.7 My (Roggenthen, 1976). See figure 3.

The Lower Eocene is represented by a very homogeneous turbidite sedimentation, with the currents from east to west. It contains alternating layers of sandy limestones and calcareous marls. The highest stratigraphic layers are found in the E and are characterised by bands of sandy calcareous marls between the sandstone units. The marine sedimentation continued intermittently until the start of the Oligocene (not represented in the territory). At this stage, the sea retreated until it was almost as far back as today's coastline, whilst the Alpine folding lifted up the Pyrenees.

The folded layers of the Geopark's coast can be explained by several generations of folds, formed in different post-Eocene deformation phases, with a subhorizontal axial plane. This structure is strongly north-vergent. The most outstanding characteristic of the Tertiary coastal range in the Zumaia area is the inversion of the series, with overturned dips that become normal towards the E.

Due to the multitude of limits and the high quality of the outcrops, Zumaia section is especially relevant for the construction of geological time scales based on:

- Analysis of carbon and oxygen isotopes (Charisi and Schmitz, 1995).
- Magnetostratigraphic analysis layer by layer (Roggenthen, 1976).
- Cicloestratigrafía: constant alternation between marly and calcareous layers responds faithfully to the climate-astronomical Milankovitch cycles. This phenomenon has become one of the biggest attractions for scientists (Pujalte et al., 1994).
- Paleontological analysis and Icno-Palaentology: Zumaia rocks contain abundant fossils of marine invertebrates (ammonites, inoceramids) as well as microfossils (foraminifers, plankton). See for example, Arenillas and Molina, 1996; Pujalte et al., 1994 see figure 4.
- Icno-Paleontology: The layers of flysch are a true natural museum of fossil footprints of the hemipelagic environment.

Figure 4. The layers of flysch are a true natural museum of fossil footprints (Icno-fossil: *Chondrites*) of the hemipelagic environment, Source: J.I. Baceta

Inland the landscape is dominated by hilly countryside, where much of the agricultural activity takes place. A group of mountains composed of Urgonian limestone — former barrier reefs — can be found in the southern part of the region (figure 5).

The most characteristic palaeogeography during the Lower Albian shows reef systems in raised zones, separated by terrigenoussystems into intra-platform ridges. This structure is attributed to the transtension effects caused by the drifting of Iberia. The Basque-Cantabrian Basin experienced its period of greatest subsidence during the Aptian-Albian, due to the NE-SW and NW-SE crustal extension.

Figure 5. Itziar Sanctuary and Andutz Mountain (Deba, Mesozoic reef limestone)
(Source: J.P. Llordés)

To sum up, the outstanding geomorphology and landscapes of the Geopark are mainly the result of the combination of a varied geological substrate and unique climatic conditions dating as far back as the Pleistocene and up to the present day. On a large scale, two geomorphological elements stand out: the coastal geomorphology of flysch succession subject to an open, mesotidal coastal regime, gives rise to the formation of a very extensive wave-cut platform, along with series of promontories, coves and different types of accumulation (sandy or pebble beaches, accumulations of topple deposits, etc.), and the karst landform of the limestone massifs from the Lower Cretaceous that define the inland zone, include a large number of forms, both superficial (karren, poljes) and endokarstic (caves, shafts, emergences etc.).

The municipalities of Deba and Mutriku have one of the greatest concentrations of caves of archaeological significance in the whole of Gipuzkoa province. In Deba we find two important archaeological sites from the Upper Palaeolithic period, namely the Ekain and Praileaitz caves. The cave paintings in Ekain cave (in particular the figures of horses), are one of the best examples of Franco-Cantabrian art. As a result, the Ekain cave was declared a UNESCO World Heritage Site in 2008. The replica of the Ekain cave, Ekainberri, can be visited in the neighbouring town of Zestoa.

The educational value of this heritage is also very important, as evidenced by the success that has been achieved by initiatives such as the Algorri Interpretation Centre of Zumaia (Hilario, 2008) and the Nautilus Fossil Museum (Mutriku).

GOOD PRACTICES IN GEOTOURISM

Geotourism in this area started in 2002, when the first guided walks to the Zumaia outcrop began, including places such as the K-T boundary, and also day-long hikes along the outcrop between Deba and Zumaia, which offers a continuous geological record spanning 60 million years. Over the years, new activities and facilities have sprung up

along the whole coast, resulting in a high level of geotourism development in the area. The number of agencies promoting geotourism has been growing, including tourist information centres, town councils, regional organisations, the Gipuzkoa Provincial Council and the Basque Government, as well as private initiatives, which have also played a very important role in its development. There have been increasing numbers of programmed geotourism visits each year, thanks to the growth in demand and the response from the bodies involved in managing and developing this zone. Thus, for 2010, a programme of over 170 geotourism tours has been organised in the zone.

When analysing the development of geotourism in the area, it is interesting to identify the keys to the initiative's success. A large number of important factors explain this phenomenon, some of which are listed below:

1. The special characteristics of the zone, such as the temperate climate, which allows outdoor activities during most of the year, good access to these coastal municipalities from outside the area, the wide range of services offered (bars, restaurants and accommodation, etc.), the infrastructures (good train and bus connections, pedestrian access routes to the coast, coastal trails, ports and piers, etc.) have all provided excellent foundations for the development of geotourism.
2. This zone is not too far from the main cities and towns in the Basque Country (Bilbao, San Sebastián, Biarritz...), ensuring a large number of potential visitors.
3. The existence of a resource previously little known to the population has been of vital importance: the geological heritage, with its multiple facets, such as the stratigraphic record, geomorphological and landscape assets, its aesthetic qualities, fossils, etc., in addition to the cultural assets of this area, which make this coast quite unique. This geoheritage is also easy to access by foot and boat, and is located very close to towns and villages, which act as gateways. The recognition of this heritage's importance and designations by regional or international bodies, and the interest of the area's media have also played a key role.
4. The motivation of many individuals, institutions and companies that have worked in the zone, displaying great enthusiasm and energy. A large number of personal actions and decisions have been motivated by a common factor: a desire to protect and promote the heritage. One example of this is the amateur fossil collector J.M. Narvaez's determination to collect and conserve the fossils from the coast of Mutriku, and the local municipalities' backing for the creation of interpretation facilities, etc.
5. The fact that the town councils and tourist information centres started to organise geotourism activities in conjunction with private companies. Reasonably priced guided tours have thus been developed, which have been actively promoted since the very beginning.
6. The creative and innovative development of a thematic route, the *Coastal Flysch Route*, has helped integrate and foster the different existing resources. It has included amongst many other things, the design of a brand that promotes all the guided tours on offer with high-quality promotion. This has also led to notable progress in the development of geotourism in the zone (figure 6).
7. The use of new opportunities offered by the Internet (with an online reservation system, see www.flysch.com) to promote and sell these activities has been of particular importance, since it gives visitors more information and makes it easier for them to make reservations. It also makes it easier to organise and manage activities, allowing the number of tours on offer to be increased in accordance with demand.

SOCIO-ECONOMICS BENEFITS

According to the Provincial Council of Gipuzkoa (2004), in 2004 tourism expenditure in Gipuzkoa accounted for 7.5% of the province's GDP, and was at that time its fourth most important economic activity, with a 34.5% increase over the previous

five years. According to the same source, the average amount spent by visitors who did not stay overnight in the province was 50 € per day, and for tourists who did stay overnight it was 80 € per day.

Figure 6. Geotourism by boat to observe the main coastal outcrop. Boat trips combine the interpretation of the natural and cultural heritage.
(Source: J.P. Llordés)

Over the last few years, here has been a positive trend in tourism activity in this area, probably as a result of the initiatives carried out there. According to results released by the Spanish National Statistics Institute (INE 2009), the number of overnight stays in the geopark territory has increased by 44% over the past four years, reaching a total of 111,920 overnight stays. It should also be noted that the geopark area has experienced greater growth than the surrounding region.

Moreover, in summer 2010, a total of 32 people were employed as either full-time, part-time or occasional guides in the geopark territory and in its associated resources. The activities of local companies working in this field (tourism, interpretation centres, environmental education, etc.) have been consolidated, which also constitutes a positive result.

SUPPORTING FOR GOOD PRACTICES

The GEOGARAPEN Association is the managing body for the Basque Coast Geopark (figure 7), with the general meeting and board of directors sitting at the core. Since the candidacy was presented in November 2009, new partners have been brought on board and although the joining process is still open, the Association currently has enough partners to ensure the project's long-term position.

The Association represents a broad spectrum of managing organisations from the territory, covering the full hierarchy of the official authority of the Basque country: at the municipal level, the mayors of Zumaia, Deba and Mutriku as founding members; at the provincial level, Gipuzkoa Provincial Council (Diputación Foral de Gipuzkoa); at the regional level, the Government of the Basque Autonomous Community, which is in the process of being incorporated (Basque Government). In the public sphere, the Association has also incorporated the University of the Basque Country (EHU – UPV, Universidad del País Vasco), the Aranzadi Society of Sciences (Sociedad Científica Aranzadi, a not-for-profit society), UNESCO Etxea (the regional delegation for UNESCO), and the local development organisations for both the rural and socioeconomic areas.

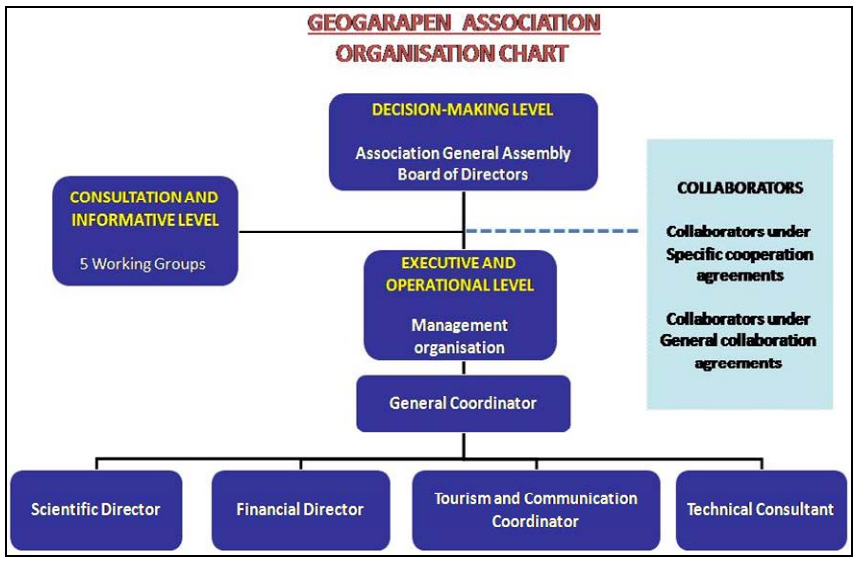

Figure 7. Organisation chart for the Basque Coast Geopark Managing Body. All partners attend the General Meeting. In addition to this, the Association has set up a number of agreements with other collaborators on the project, from both the public and private sectors (Source: C. Iturrriagagoitia)

The strength of this management structure, unique in the Basque Country, allows us to develop and connect up in a local network, under the umbrella of the geopark, all sustainable development activities.

The management body is supported by the active collaboration taking place between the partners and collaborators, which are organised into five specific working groups, which bring knowledge, standards and agency to the different work areas of the entire territory: (1) Science and territory; (2) Environment and sustainable development; (3) Tourism and geotourism; (4) Culture and local development and (5) Coordinating group.

Because of their transversal nature, some of the geopark's typical activities are not restricted to one single working group, but must be carried out in greater depth by the managing body, which will benefit from the partial suggestions of this network of working groups.

The group "*Tourism and geotourism*" includes de participation of the Regional Government's Department of Tourism, Municipal Departments of Tourism, tourist offices, local development agencies, tourism sector businesses, journalists, etc.

Main activities of this group are related to: marketing plan, defining new tourism products, managing the geopark's tourism brand, standardisation and approval programme for geopark tourism businesses, coordinating with the regional government's marketing plan, obtaining tourism certification (national and international), promoting and managing tourism via the internet, tourism fairs, press trips, being present in the media, publications and promotional videos, training tourism businesspeople, coordinated activities with other geoparks, etc.

As examples of supporting good practices, it should be mentioned the protocol with the businesses collaborating in the geopark makes it possible to establish and evaluate the specific quality standards that these businesses must comply with in order to be able to benefit from the geopark umbrella, such as for example, knowing about the updated offer of geological information for geotourism. This close collaboration with businesses makes

it possible to know what the evolution of the benefits related to geological heritage management is.

CONCLUSION

Once the geopark concept has been accepted as a strategy model for the territory, geotourism development is planned to take place in three stages in order to integrate all the existing elements in the zone and develop them to their full potential: the coastal stage, which has already been developed, the inland stage and the global stage. The final purpose of this three-stage proposal consists of distributing the benefits generated by geotourism across the whole territory, involving the local population, and contributing to the conservation of the natural and cultural heritage.

REFERENCES

Arenillas I., Molina E., (1996), *Biostratigrafía con foraminíferos planctónicos y eventos paleocenográficos del tránsito Daniense/Selandiense en el corte de Zumaia (Guipúzcoa),* Actas XII Bienal de la Real Sociedad Española de Historia Natural, pp. 272-276 (Madrid);

Charisi S. D., Schmitz, (1995), *Stable (δ13C, δ18O) and strontium (87Sr/86Sr) isotopes through the Paleocene at Gebel Aweina, Eastern Tethyan region,* Palaeogeogr. Palaeoclim. Palaeoecol., 116, pp. 103-129, Amsterdam;

Hilario A., (2008), *El Flysch de Zumaia y Centro Algorri: divulgación geológica y gestión de un afloramiento espectacular (Zumaia, País Vasco),* De Re Metallica, 10-11, pp. 1-9, Sociedad Española para la Defensa del Patrimonio Geológico y Minero (Madrid);

Llordés J. P., Baceta J. I., (2009), *Basque Coast Geopark: An Aspiring Geopark,* In De Carvalho, C. N. and Rodrigues J., (eds.), New Challenges with Geotourism, Proceedings of the VIII European Geoparks Conference, Idanha-a-Nova, Portugal, 14-16 September, pp. 274-278;

Molina E., (1994), *Paleocene section in Spain: chonostratigraphical problems and possibilities,* GFF, 116, pp. 58-60, Stockholm;

Pujalte V., Baceta J. I., Payros A., Orue-Etxebarria X., Serra-Kiel, J. (1994), *Late Cretaceous – Middle Eocene Sequence Stratigraphy and Biostratigraphy of the SW and W Pyrenees (Pamplona and Basque Basins, Spain),* Groupe d'Étude du Paléogene/International Geological Correlation Program 286, Field Seminar Guide-Book, Basque Country, 118 pp. Univ. Basque Country, Bilbao;

Pujalte V., Payros A., Apellaniz E., (2009), *Climate and Biota of the Early Paleogene: recent advances and new perspectives,* Geologica Acta, Vol.7, Num. 1-2, pp. 1-9;

Roggenthen W. M., (1976), *Magnetic stratigraphy of the Paleocene. A comparison between Spain and Italy,* Mem. Geol. Soc. Italy, 15, pp. 73-82. Rome;

Schmitz B., Molina E., Salis K., (1998), *The Zumaya section in Spain: A posible global stratotipe section for the Selandian and Thanetian Stages,* Newsl, Stratigr., 36 (1), pp. 35-42 (Berlin – Stuttgart);

Zouros N., Martini G., Frey M. L., (2003), *2nd European Geoparks Network Meeting,* Proceed. International Symposium Geological Heritage Protection and Local Development, 3-7.10.2003, Levos Island, Greece;

http://www.geoparkea.com (Basque Coast Geopark's website);

http://www.flysch.com (Coastal Flysch Route's website);

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