

Membership of the Sierra Leone Platform at the Continental Margin of the Republic of Guinea

Moussa Keita^{1*}, Daouda Konate², Youssouf Conde³, Mohamed Lamine Keita⁴

^{1,3,4}Center the Scientific Research and Oceanographic of Rogbane Conakry -Guinea
moussa201062[at]yahoo.fr

²Higher Institute of Science and Veterinary Medicine of Dalaba – Guinea
daoudakonate48[at]gmail.com

Fisheries and Aquaculture Department, Higher Institute of Science and Veterinary Medicine of Dalaba - Guinea

Abstract: *Previously considered as mysterious without limit because little known, arousing respect and admiration, the world ocean constitutes an immense reservoir of food and energy resources on which the world population bases its hope to fill its deficits in the face of its development ambitions and its demography. galloping. To achieve this goal, man must face all the challenges associated with the exploitation of the ocean's mineral, energy and biological resources. This requires perfect mastery of the laws of this environment, in-depth studies to be carried out, and the use of modern techniques and technologies, based on adapted methods and principles, framed by international laws and conventions. The Montego Bay Convention of 1982 devotes its article 76 to the rights of coastal States wishing to extend their continental shelf beyond 200 nautical miles. This deep desire results from the obsession of States to enlarge their territory; which is the manifestation of the power to protect, conserve and radiate over maritime areas still untouched by any influence, and whose geological and geomorphological characteristics are identical to those of the territory of the State concerned. This power is expressed by its reinforced presence on the high seas, by virtue of the rights which allow it to carry out protection activities and exploitation of the seabed. To this end, the Republic of Guinea attaches great importance to the delimitation and extension of its continental shelf given the economic and strategic challenges of this area. It has all the assets to achieve this.*

Keywords: Space, maritime, resources, mineral, biological, convention, Montego Bay, continental shelf, 200 nautical miles, obsession, territory, oceans, state, coastal, power, virgin, geology, geomorphology, exploitation, delimitation, extension.

1. Introduction

The study of the extension of the continental shelf reveals a new relationship between the State and its territory. After long years of debate and misunderstanding, the extension established the continental shelf as an accessory territory of the coastal State. This type of territory is distinguished from other maritime and land territories. It is negotiated, defined or delimited prior to any occupation and use without even having the assurance that it will be able to meet the expectations of finding wealth there, without even having the means, for the moment, to explore these depths. States measure and define these sea beds, pressed by the pace of the extension process. This awareness by States of the importance of this space leads them to demonstrate an unprecedented sensitivity to the defense and protection of their rights, transforming the extension procedure into a procedure of negotiation and dialogue between all. Thus, the obsession with territory expressed during the creation and negotiation of the continental shelf area is complemented by a frantic implementation of the extension procedure, testimony of a new stage in the history of this space. States are trying everything for everything. This reinforced presence of coastal states on their offshore territory offers them a unique opportunity to act as guardians of the common interest and to reinterpret it. The Montego Bay Convention (CMB), by introducing the principle of natural extension of the land territory into the spatial definition of the extended continental shelf, recognizes the membership of this marine space to the coastal State and the direct attachment of the continental shelf to its territory. The principle of natural extension is both a legal condition and a

scientific criterion for the extension of the plateau. The introduction of geological and geomorphological criteria links this territorial space to the “natural fact”. The latter reveals, when read in conjunction with the exclusivity of the sovereign rights of the coastal state, that the continental shelf is not only a legal space where the coastal state exercises limited rights, it is in fact the accessory territory of the coastal State. Having observed an identity of geological and geomorphological characteristics between the continental shelf of the Republic of Guinea and the platform of Sierra Leone, a fact confirmed by other researchers such as Hékinian et al., 1978: “The slope of the continental margin of the Republic of Guinea seems to incorporate the platform of Sierra Leone if this is the case, the platform of Sierra Leone, with its seamounts would be perceived as the natural extension of the mainland of the Republic of Guinea ...”(Figure 1). It is this reality that our study must support in accordance with the criteria of paragraph 3 of article 76 of the United Nations Convention on the Law of the Sea (UNCLOS), which states: fact confirmed by other researchers such as Hékinian et al., 1978: “The slope of the continental margin of the Republic of Guinea seems to incorporate the platform of Sierra Leone if this is the case, the platform of Sierra Leone, with its seamounts would be seen as the natural extension of the landmass of the Republic of Guinea ...”(Figure 1). It is this reality that our study must support in accordance with the criteria of paragraph 3 of article 76 of the United Nations Convention on the Law of the Sea (UNCLOS), which states: fact confirmed by other researchers such as Hékinian et al., 1978: “The slope of the continental margin of the Republic of Guinea seems to incorporate the platform of Sierra Leone if this is the case, the platform of Sierra Leone, with its seamounts would be

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criteria of paragraph 3 of article 76 of the United Nations Convention on the Law of the Sea (UNCLOS), which states:

*“The continental margin is the submerged extension of the land mass of the coastal state ; it is made up of the seabed corresponding to the plateau, the slope and the glacis as well as their subsoil. It does not include the deep ocean depths, with their ocean ridges, nor their subsoil”.
“Whereas the continental shelf is the natural extension of the territory of the coastal state”.*

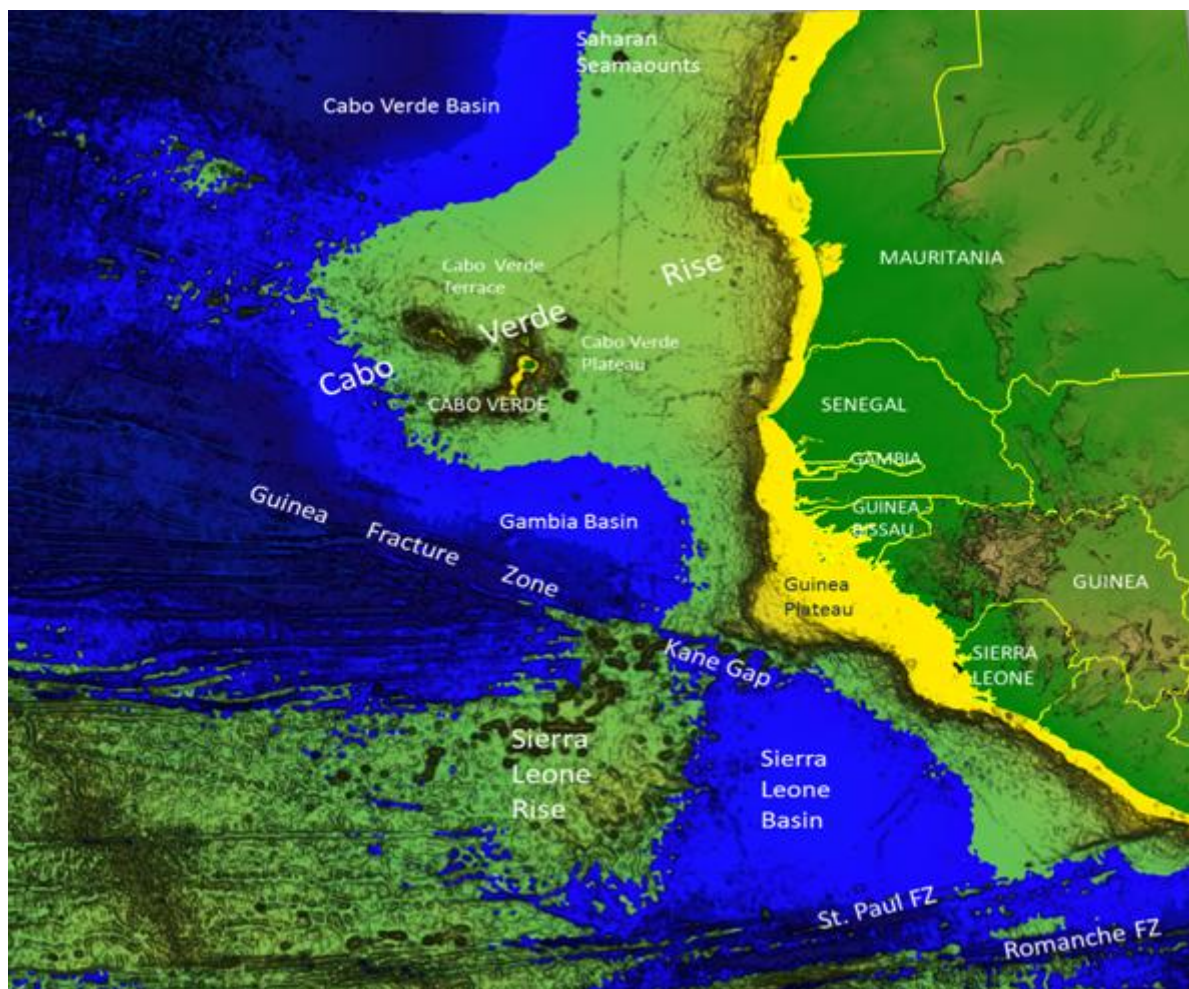


Figure I: Map illustrating the main geomorphological features of the continental margin and the deep ocean off West Africa

Other researchers add to the previous findings such as Blarez (E), Mascle (J.) et al., 1986 and again Tricart (J) [3], who indicate that “Off Guinea, the continental shelf is exceptionally wide: up to 200 km against 70 on both sides. It is formed of probably Mesozoic sandstone plunging towards the north, in which the basic lavas are intercalated: lithology similar to that of Foutah Djallon. Off Sierra Leone, the plateau is made up of Precambrian, Paleozoic and Cretaceous. Everywhere, the Cenomanian is strongly discordant on formations vigorously affected by tectonics. This discrepancy is a major cut. From the base of the Cenomanian, the stratigraphic planes are more or less parallel to each other, only the variations in thickness of the floors, controlled by an uneven subsidence, attenuate this regional parallelism. The intense fracturing ended before the

end of the Albian. At around 8 ° N, a setback within a WE fracture zone separates the Sierra Leone platform from that of Guinea.

The continental slope is on average 6 ° to the right of Guinea, and 8 ° off Sierra Leone. It is chopped with faults separating narrow thongs.

The Sierra Leone platform is located to the southwest of the Guinea terrace, between the Guinea fracture zone to the north and that of Saint-Paul to the south (Figures 1 and 3). It is about 600 km long and 400 km wide.

Indeed, previous research attests that this platform is characterized in the literature as having probably been a

“continental point” linking Africa and South America, when the latter were components of the Gondwana supercontinent (Yunov, 1996). It is established that said platform is an abnormal morphological formation with pronounced

topographical expression in relation to the abyssal plain which surrounds it (Hékinian et al, 1978) The Col de Guinée connects the two underwater formations.

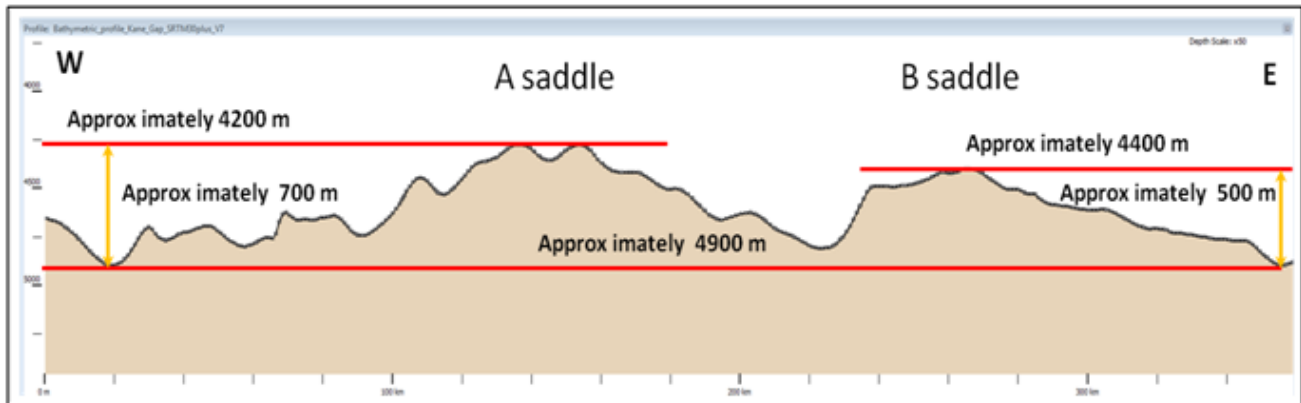


Figure 2: Bathymetric profile along the Kane Gap showing high saddle areas (connecting the two formations). The profile is extracted from data in the SRTM30plus_V7 grid

Southeast of the Kane Gap Strait the Margin experienced the dextral stalling movement of the African Plate as it passed the South American Plate. This shear set up a pull-out regime during the Jurassic continental rifting and the break up in which the Sierra Leone basin was formed (Antobreh et al, 2009).

The Sierra Leone Basin is separated from the Gambia Basin to the north, south-west by the Sierra Leone Platform (or Ride). The ridge (or platform) is a complex tectonic volcanic formation characterized by seamounts with rugged topography.

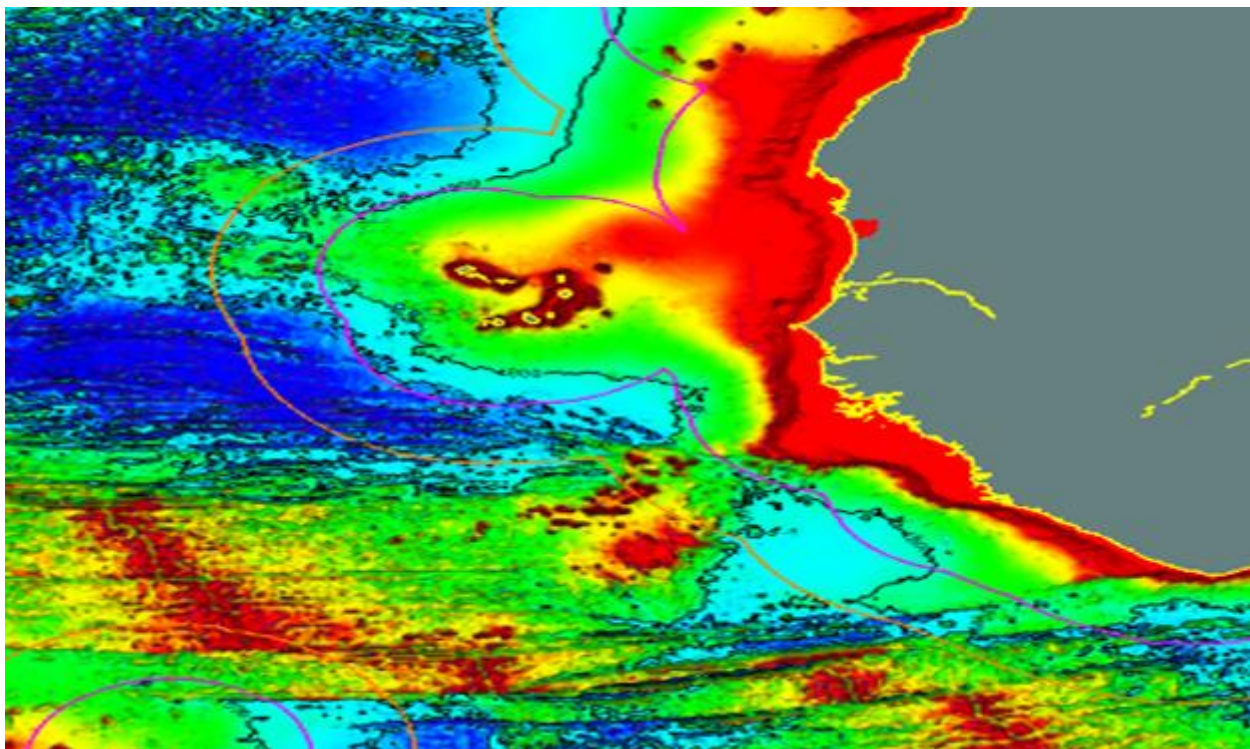


Figure 3: Map illustrating the belonging of the Sierra Leone platform to the Continental Margin of the Republic of Guinea, with indication of the 200 mile line (in purple) and the 350 mile line (in orange).

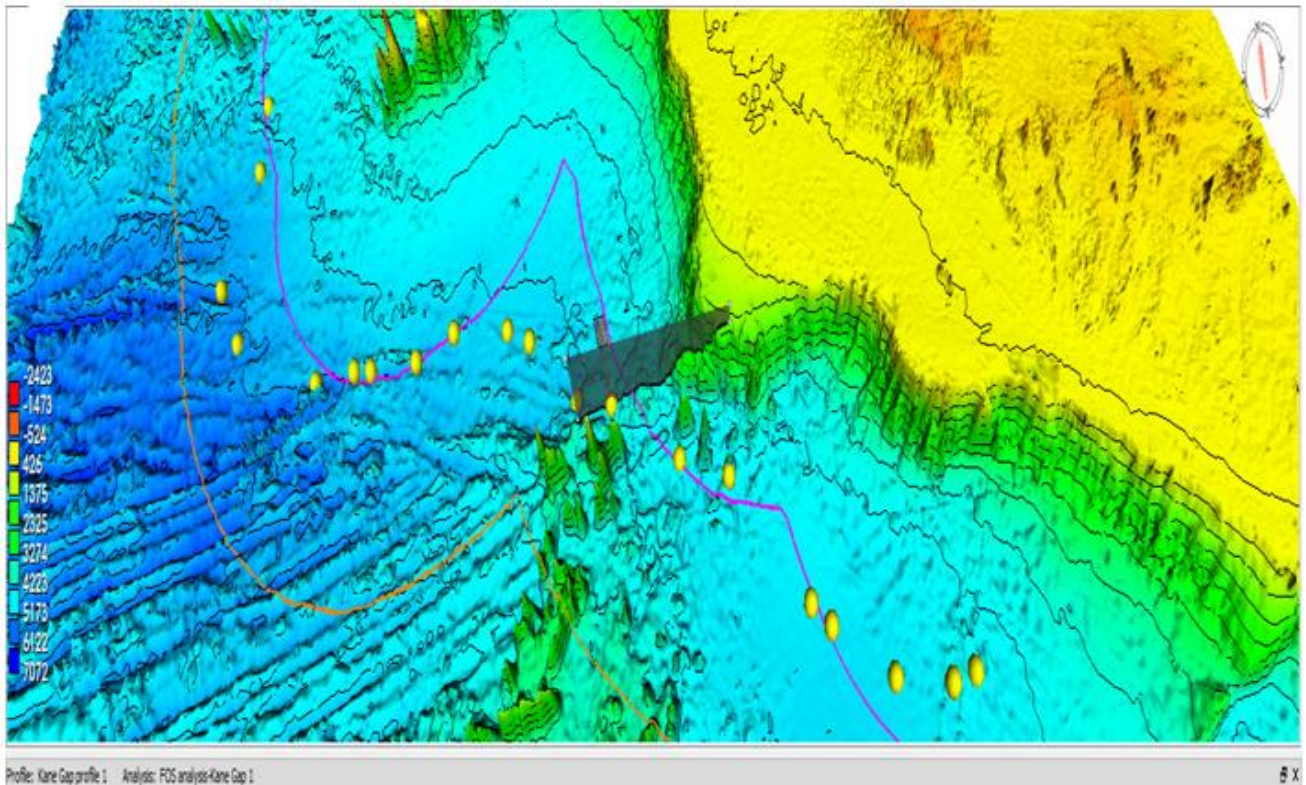


Figure 4: Map illustrating the bathymetry of the continental shelf of West Africa, with indication of the 200 nautical mile line (in purple), that of the 350 nautical mile constraint (in red) and the location of the foot slope (yellow balls) from the 200 mile line. In the Guinean Plateau, the northernmost foot of the slope is beyond 200 nautical miles, and even better at the very beginning of the Sierra Leone Platform

2. Methodological Approach

Materials and Database

Materials: Single-beam echosounder, multibeam echosounder, lateral sonar, interferometric lateral sonar, refraction-seismometer, reflection-seismometer, acoustic depth sounder, gravimeter, magnetometer, satellites and Geocap, Advance, Promax software, SRTM ...

Database: Most of the bathymetric and seismic data come from the Geophysical Data System (Geodas) of the National Ocean and Atmosphere Administration (NOAA), the National Geophysical Data Center (NGDC) in Colorado, United States. The additional bathymetric and seismic data come from the French Institute for Research for the Exploitation of the Sea (IFREMER) and from the Marine Geophysical Data Management System (MG_DMS) Geocap / AS.

The bathymetric grid derived by satellite ETOPO1, ETOPO2 and SRTM30plus_v4 (Topographic Radar mission) were used.

All data has been collected, reformatted and made available by GRID-Arendal's "One Stop Data Shop" (www.continentshelf.org).

Data analyzes were carried out using the Geocap software and its CNUDM module (www.geocap.no). The methodology used is described in the software documentation.

The total sediment thickness of the world ocean and marginal seas (World Data Center for Geophysics and Marine Geology in Boulder, Colorado, USA), was used as a first approximation to determine the thickness of the sedimentary rock layer.

To these imported data, it is necessary to add the equipment for the acquisition of complementary data such as: single and multibeam echosounders, lateral and interferometric sonars, seismic-reflection.

3. Methods

To achieve our results we have followed the following steps:

- 1) Determination of the sediment thickness; we used the seismic-reflection and seismic-refraction method as recommended by the Commission on the Limits of the Continental Shelf (CLCS) of the United Nations Convention on the Law of the Sea (UNCLOS).
- 2) Determination of the position of the foot of the slope using bathymetric data during the geomorphological analysis;
- 3) Determination of the location of the foot of the slope: as recommended by the CLCS is carried out using the combination of information on bathymetry, acoustic reflexivity of the seabed and the sedimentary structure.
- 4) The unidirectional seismic was used for the determination of the sediment thickness and the refinement of the characteristics of the final multibeam seismic surveys,
- 5) To obtain the bathymetric data: we used a single and multibeam echosounder, a lateral sonar for seismic

reflection and a subsoil profiler, for the sedimentary structure; it is this recorded data packet which is referred to here as “analog data packet”.

In general, five (5) scientific methodologies are applied by coastal states to determine the outer limits of the continental shelf, in accordance with UNCLOS.

The geological methods (based on the evaluation of the thickness of the sedimentary rocks) use the Gardiner formula, (sedimentary criterion):

$$dY/dX \geq 1 ;$$

Or

dy is the variation in depth;
dx that of the sedimentary thickness.

There is a legal framework necessary to understand the requirements and implications of setting the outer limits of the continental shelf;

The geoscience framework consists of the following methods:

The geodesic, hydrographic, geophysical, geomorphological or Hedberg's formula or distance formula (60 nautical miles) from the foot of the slope. These methods are subject to two constraints, one of distance (350 nautical miles) from the baseline; and the other depth (the isobath 2500 m + 100 nautical miles) of the baseline from which the breadth of the territorial sea is measured.

4. Results

The Sierra Leone platform is the submerged extension of the land territory of the Republic of Guinea for the following reasons:

- The part of the Sierra Leone platform existing between the extension line and that of the 350 nautical miles of the Guinean continental shelf, sufficiently proves that it is only an integral part of the continental margin of the Republic of Guinea;
- Both platforms present identical geomorphological and geological characteristics with volcanic formations covered with sediment and seamounts (guyots);
- There is no sharp limit between the two formations which, moreover, in the past, constituted the same compact block, the two seal zones of FIG. 2 make it both;
- The northernmost foot of Guinean slope is not only beyond 200 nautical miles, but also attests to the conformity of the thickness of the sediments as required by article 76 of the Commission des Limites du Plateau Continental (CLPC), United Nations (Fig. 3).
- As it stands, although the Sierra Leone platform does not belong to any coastal State, it comes under the International Seabed Authority, therefore a heritage of humanity, the Republic of Guinea (State Party) to the United Nations Convention on the Law of the Sea (UNCLOS), having in the future the obligation to continue the extension of its continental shelf within the limits of the extension constraints, must claim until satisfaction, the belonging of the Sierra Leone platform to its continental margin; in accordance with the provisions of Article 76 of UNCLOS.

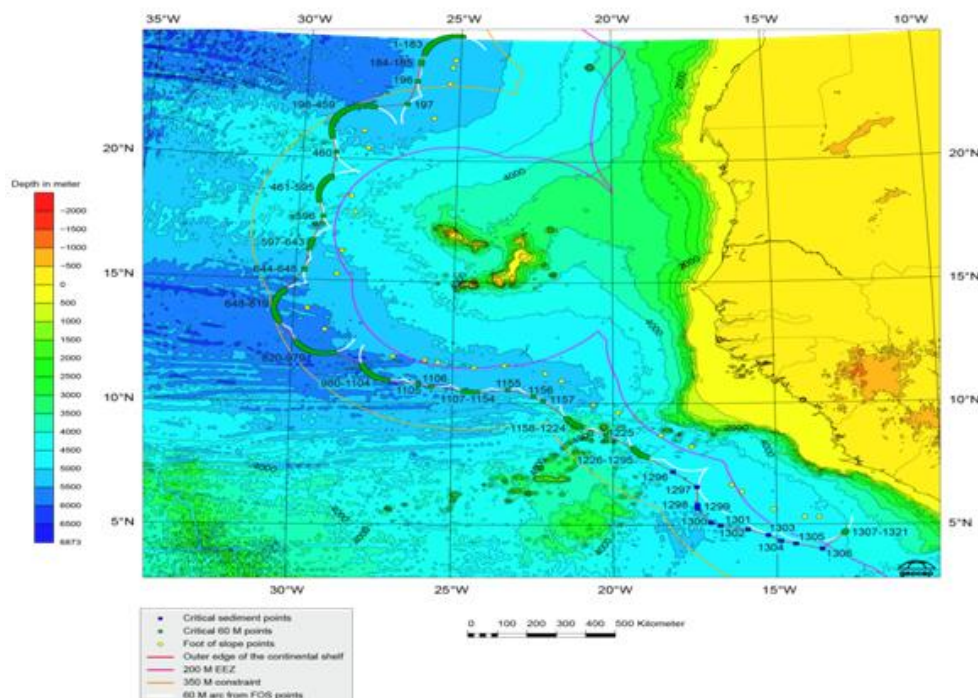


Figure 5: Map showing the outer boundary line and the fixed points on which it is based. The fixed points delimiting the outer limit are in indexed colors to show which provision of Article 76 has been invoked to establish each point. The numbering of the outer limit fixed points follows the numbering of the outer edge fixed points, except for the points marked OC, which are points on the line 350 M of fixed constraint.

5. Conclusion

This work would like to take up the great challenge launched to Guinea during the delimitation of its maritime border with Guinea-Bissau. It nourishes the ambition to have Guinea reconquer part of its territory long ignored. The extension of Guinea's continental shelf beyond 200 nautical miles was a prerequisite for the proclamation of the Sierra Leone platform belonging to the continental margin of the Republic of Guinea. The identity of the geomorphological, geological and even paleogeographic characteristics, coupled with the principle of natural extension which characterize these two formations, the existence of an equally important part of the said platform between the extension line of the Guinean plateau and the constraint of 350 nautical miles, the location of the Guinean foot of the slope on the border with Guinea-Bissau.

6. Recommendation

At the end of this study, we will never stop repeating that the Sierra Leone platform is the submerged extension of the land mass of the Republic of Guinea. Its proclamation and recognition by the United Nations will depend on the commitment, competence and perspicacity of the Guinean authority. The latter must know that any maritime zone which does not belong to the heritage of humanity is an integral part of the sovereignty of the coastal State, on condition that it proclaims it. In other words, "The sovereign rights of a coastal state do not exist legally until it has proclaimed them. In the absence of a proclamation, natural resources belong to the legal regime of the high seas", therefore to the heritage of humanity. In all cases.

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