The french national programme for claiming continental shelf beyond 200 Miles

*Using global bathymetric models in the context of an Extended Continental Shelf submission*
The French national programme for claiming the continental shelf beyond 200 M
• An introduction to E.C.S

• Building a submission

• The french experience
  – *Using global bathymetric models*

• Conclusions
UNLCOS Article 76

E.C.S

![Diagram showing ocean zones including baseline, territorial sea, contiguous zone, exclusive economic zone, continental shelf, and high seas. The continental shelf is extended beyond 200 NM.]
UNLCOS Article 76
UNLCOS Article 76

The continental shelf of a coastal State:

- Is the natural prolongation of the landmass
- Extends to the outer edge of the continental margin
- The outer limit of the continental shelf is defined by points distant from each other less than 60 M
- These points may not lie beyond 350 M from the territorial sea baselines or 100 M from the isobath 2,500 m
- These points must satisfy one of two criteria: the Hedberg criterion or the Gardiner criterion
UNLCOS Article 76

- The Hedberg criterion

![Diagram showing the Hedberg criterion with FOS and Hedberg line markers.]
UNLCOS Article 76

- The Gardiner criterion

![Diagram showing Gardiner line and depth calculations]
UNLCOS Article 76

- 350 miles
- Isobath 2500 m + 100 Miles
- FOS + 60 M
- 200 miles
- Sediment thickness 1%
- Foot of slope
- Isobathe 2500 m

Outer limit

100 miles
60 miles
200 miles
Claiming extended C.S

- The State makes a submission to the U.N containing data and documents to support its claim.

- The submission is examined by the Commission for the Limits of the Continental Shelf (CLCS).

- The CLCS is composed of 21 scientific experts elected among states parties to the convention.

- The CLCS examines the E.C.S limits submitted by the State and produces recommendations.
CLCS Scientific and technical guidelines

In 1999, the CLCS adopted its scientific and technical guidelines

- primarily intended to assist coastal States in preparing their submissions.

- also designed to provide an important scientific and technical reference for the consideration of these submissions and the preparation of the Commission's own recommendations.

- form the basis on which the Commission shall provide advice, if requested by coastal States during the preparation of their necessary data.
4.2. Sources of data and hydrographic measurements

4.2.1. The complete bathymetric database used in the delineation of the 2,500 m isobath in a submission may only include a combination of the following data:

- Single-beam echo sounding measurements;
- Multi-beam echo sounding measurements;
- Bathymetric side-scan sonar measurements;
- Interferometric side-scan sonar measurements; and
- Seismic reflection-derived bathymetric measurements.
4.2.6. Other sources of evidence, such as satellite altimetry-derived bathymetric data or imaging side-scan sonar information, will not be regarded as admissible for the purpose of delineating the 2,500 m isobath. This information, however, might be useful as additional qualitative information in support of other parts of a submission but will not be considered during the determination of this or any other isobaths. However, this data will be considered admissible as supporting information in a submission.
Global bathymetric models and Article 76

- Altimetry predicted and Gebco bathymetric models are not acceptable to determine E.C.S limits.

- However, they are the only comprehensive data sources in offshore areas concerned by an E.C.S submission.

- Although they are not acceptable to locate important features like the 2,500 m isobath and the foot of slope in the final submission...

- ...they are widely used at different stages while building an E.C.S submission.
E.C.S claiming process

- *Desktop study*
- *Data acquisition*
- *Data processing and interpretation*
- *Writing the submission and GIS*
- *Deposit to the U.N*
- *Examination by the CLCS and interactions with the State*
- *Adoption of the recommendation*
E.C.S claiming process

- **Possibility for a State to provide Preliminary Information before making a full submission:**
  - Desktop study only
  - Does not require data acquisition before making a full submission

*France has made preliminary information for 3 areas and full submissions for 8 areas.*
*Two of these 8 submissions are joint submissions.*
EXTRAPLAC – Using Global Bathymetric models

17/49

Samy.YOUSSEF 29 Sept. 2009
The E.C.S claimed by France

Guadeloupe & Martinique
French Guiana

North Atlantic Ocean

Bay of Biscay
Joint submission by France, Ireland, Spain and U.K

EEZ
E.C.S

Recommandation adopted Sept. 2009
Recommandation adopted Feb. 2009
The E.C.S claimed by France

North Atlantic Ocean

Saint-Pierre et Miquelon

EEZ

E.C.S

Indian Ocean

St Paul & Amsterdam

La Réunion

Crozet

Kerguelen
The E.C.S claimed by France
E.C.S claiming process

- Desktop study
- Data acquisition
- Data processing and interpretation
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The desktop study

*The desktop study aims at:*

- **Check the States entitlement to E.C.S**
- **Assess limits of the E.C.S**
- **Assess data to be collected at sea**
The desktop study

Bathymetric data sources

ETOPO 2

GEBCO 1’
The desktop study

Constraint line assessment using Gebco 1’ grid
The desktop study

Assessing foot of slope (FOS) location on GEBCO 1’ Bay of Biscay
The desktop study

Assessing FOS location (French Antilles)

Using Etopo 2’

Using GEBCO 1’
The desktop study
Combined with sediment thickness model to assess Gardiner line
The desktop study

Finding critical FOS positions (Gebco 1’ Bay of Biscay)
The desktop study

Compute 60 M Hedberg line to locate contributing FOSs
The desktop study

Planning Shiptracks - Kerguelen Is.
The submission: data acquisition & use of existing data

*For the specific purpose of E.C.S delimitation and claim, France and its partners in joint submissions have collected:*

- Multibeam echosounder data to prove natural prolongation, locate the foot of slope and the 2,500m isobath
- Gravity and magnetism measurements to support geological considerations
- Seismics to support geological consideration and determine the Gardiner line where it is likely to overcome the Hedberg line
MBES acquisition

Bay of Biscay

(with Ireland, Spain and U.K.)
MBES acquisition

French Antilles
MBES acquisition

La Réunion
MBES DATA

Kerguelen
MBES acquisition Saint-Paul & Amsterdam
MBES acquisition
Crozet (FR) and Prince Edward Is. (S.A)
The submission & its examination by the CLCS

Use of bathymetric data

Bathymetric data are mainly used to:

- **Prove natural prolongation**
  - Support geological context (MBES + global)
  - Show morphologic continuity to FOS (MBES)

- **Locate 2,500m isobath**

- **Locate the base of slope**:
  - FOS is at the maximum change of gradient at the base of the slope (MBES)
  - Is also supported by geological and geophysical considerations (geophysical, MBES, global)

- **Locate FOS**
  - By calculating second derivative grids (MBES)
The submission & its examination by the CLCS

**Use of bathymetric data**

- Prove natural prolongation
  - Support geological context
The submission & its examination by the CLCS

Use of bathymetric data

• Locate 2,500m isobath
The submission & its examination by the CLCS

*Use of bathymetric data*

- Locate the base of slope:
The submission & its examination by the CLCS

Use of bathymetric data

• Locate the base of slope: supported by geological and geophysical considerations (geophysical, MBES, global)
The submission & its examination by the CLCS

*Use of bathymetric data*

- Locate the base of slope: supported by geological and geophysical considerations (geophysical, MBES, global)
The submission & its examination by the CLCS

Use of bathymetric data

- Prove natural prolongation - Show morphologic continuity to FOS (MBES)

Detailed bathymetric profile from Goban to deep ocean floor

Vertical exaggeration = 35
The submission & its examination by the CLCS
Use of bathymetric data

- Prove natural prolongation
  - Show morphologic continuity to FOS (MBES)
The submission & its examination by the CLCS

Use of bathymetric data

- Locate FOS By calculating second derivative grids (MBES)
Conclusions

*Global bathymetric models such as Etopo and Gebco are essential in the process of an E.C.S claim.*

- Make desktop study possible
- Help plan cruises
- Support the argumentation in the submission, and during the process of examination by the CLCS
Conclusions

Desktop Study (GDA 1’- 2003)
68 to 73 000 Sq Kms

Recommendation to France - 2009
72367  Sq Kms