

I.O.S.

Geological and Geophysical
studies of continental margins

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Geological and Geophysical
studies of continental margins

NATURAL ENVIRONMENT RESEARCH COUNCIL

INSTITUTE OF OCEANOGRAPHIC SCIENCES

Geological and geophysical studies of continental margins - 10 year forward look, 1979.

Synopsis

Geological and geophysical research will be undertaken on the structural and stratigraphic evolution of Atlantic margins adjacent to and opposite the British Isles and including those where an understanding of their geological evolution is needed for the subsequent exploration, assessment and exploitation of hydrocarbon resources in deep ocean environments. Specific elements of the proposal include geological and geophysical surveys allied to existing and proposed deep ocean drilling programmes and the analysis and interpretation of data from other sources. It is proposed to devote a special effort to advice on factors likely to govern territorial limits for the Department of Energy/FCO. A preliminary outline is suggested for work to be done in the latter half of the ten year period when it is expected that attention will turn increasingly to investigation of the major processes and the seismo-stratigraphy of margin sedimentation.

Summary of probable costs £K
1978 September prices
(projects submitted)

	1979-80	80-81	81-82	82-83	83-84
IOS staff & other recurrent	231*	166*	148*	138	45
Overheads and rentals	61	66	59	59	20
Cruise costs + commercial surveys	370	271	260	260	
Totals	662	503	467	457	65
Direct staff m.y.	7.3	7.3	6.8	6.8	2.5

* incl. £10K p.a. for sub-contract

Purpose of the proposal

The principal objective of the proposed programme is to understand the sequence of events in the development of a rifted continental margin from the earliest rifting stage to the present. In particular the programme is directed, by way of a comparison of margins of contrasting structural style and sedimentary history, towards understanding of every stage of tectonic development and of depositional and environmental conditions. The understanding will provide government and industry with criteria to assess the resource potential of the North Atlantic margins.

Justification

Exploration for hydrocarbons is based on structural studies, stratigraphic and palaeogeographic analysis, physical and chemical analyses of the organic matter preserved in the sediments, the porosity of the sediments, which controls the migration and accumulation of hydrocarbons, and the temperature gradients required to turn organic matter into liquid petroleum. In the largely unexplored and undrilled deep water of the margins, exploration can be guided most effectively by a knowledge of the processes by which margins have evolved in space and time. The proposed regional and geophysical studies to be carried out by IOS, allied to the future deep drilling programmes of IPOD and the Department, will provide a needed background both to the growing commercial interest in the potentially productive margins of the North Atlantic region, and to the progressing programme of survey being carried out for the Department of Energy by the Institute of Geological Sciences.

A Forward Look for 10 years is outlined. Details of a proposed programme for the next few years are given in the attached project descriptions. They are designed to build on the substantial advances made during 1975-78 using a scientific analysis of multichannel seismic surveys and long-range sonar surveys combined with the results of IPOD drilling in the Bay of Biscay and on the Rockall Plateau. Substantial long term benefits will accrue to both UK government and industry by provision of early exploration data and criteria to assist in more effective planning of commercial exploration and exploitation of hydrocarbon resources in areas where prospects seem promising.

Background R & D Information

The larger part of the sediments contained beneath the ocean basins underlie the continental margins of the world. The nature of these sediments, their history and indeed that of the margins as a whole remain little known yet is of considerable importance since these areas are potentially rich in hydrocarbons and have remained largely unexplored.

The purpose of the IOS continental margin research programme is to understand the structural and stratigraphic evolution of the margins and to define criteria that can be used in assessments of hydrocarbon prospectivity.

Criteria for assessment of hydrocarbon prospectivity

Concentration of hydrocarbons into commercially exploitable quantities calls for the coincidental combination of various geological factors throughout long periods of geological time.

Principal among these factors are:

- (1) Generation of hydrocarbons in sufficient quantity.
- (2) Presence of reservoir rocks of sufficient thickness, porosity and permeability.
- (3) Structures large enough to justify exploration and exploitation.

These factors apply equally to deep water, shallow water and land areas. The prospectivity criteria are largely based on experience developed in the exploration and exploitation of hydrocarbons contained in sediments deposited in relatively shallow water or continental environments. These criteria are a natural reflection of the past concentration of hydrocarbon exploration in areas most amenable to drilling and subsequent exploitation.

However, the deeper water continental margins are now beginning to be the subject of exploration.

The sediments of the margin bridge the transition between those of epicontinental realm, currently the focus of most exploration activity and the pelagic sediments of the deep ocean basins. As yet our knowledge of the geological conditions obtaining in these deep waters is scanty, although the few data that are available caution against extrapolation of shelf conditions. Any attempt to define prospectivity and to identify the hydrocarbon potential of this poorly known domain can at present therefore be little more than an informed guess.

Some of the unknowns in prospectivity analyses for deep water areas are reviewed below.

(1) Generation of hydrocarbons

An adequate supply of organic carbon within the sediments is a prerequisite and although it is clear that most continental margin sediments do contain organic carbon it is often widely

disseminated. The type of kerogen also plays an important part in determining whether oil or gas is generated; the presence of marine carbon being necessary for oil and terrestrial carbon for gas. Recent studies emphasise additional important qualifying factors such as the episodicity in the supply of terrestrial carbon to the sea, and the necessity for reducing or oxygen deficient conditions for oil generation. These conditions are far removed from those observed at the present day seabed but have existed in the past in Late Jurassic and Albian time. Any assessment of organic matter accumulation thus requires a knowledge of the changing depositional environment (restricted or open) of passive margins and the palaeogeography and climatology of the adjacent ocean basin.

Consideration of average geothermal gradients has been used to indicate that a minimum thickness of 3 km of overburden is required if the oil generation threshold of 70°C is to be reached. However, the present temperatures are implicitly assumed to be representative of thermal conditions since deposition of the sediments. This assumption may not be valid since the temperature-time history of sediments inferred from subsidence studies suggests that temperature gradients may have been very much higher at the time of formation of the margin. A good understanding of the relationship between subsidence, heat flow and temperature offers the opportunity of predicting maturation in a quantitative way.

(2) Reservoir rocks

Occurrence of reservoir rocks within continental margin sediments is not easily predictable. Coring of the present seabed shows the predominant lithologies are fine grained oozes (chalks) and lutites (shales). These do not, generally, form suitable

in shallow water now lie in great depths and large deeply buried deltaic wedges are now known. Nearly all potential reservoir rocks would seem to have formed in shallow water or to consist of sediment derived from shallow water sources. Among the more important factors controlling the accumulation and present depth and distribution of suitable reservoir rocks are the subsidence of the margin in time and space and the effects of eustatic changes in sea level on the supply of clastic material. Further, there is evidence of significant oceanographic influence on the supply of carbonate to margin sediments. A good understanding of oceanic influences on sedimentary sequences is more likely to aid seismic facies analysis than extrapolation from the epicontinental realm.

(3) Structure

The most striking structural features of passive margins are the tilted and rotated fault blocks associated with the rifting of the margin. The over-lying sediment cover exhibits little structural deformation. Observations of NE Atlantic passive margins show significant differences in structural style exemplified by flexural and lystric faulting respectively. It appears that the development of one or other of these types is reflected in the volume and lithology of contemporaneous sediments and by major differences in the depth of deposition in the newly formed basin.

Description of the work

The first phase of the programme outlined in the attached project proposals / has been designed to make the best use of the multichannel seismic surveys, allied to deep sea drilling, made in 1975-76 and 1976-77. This will be done by a study of problems of continental margin geology with special reference to the scientifically and economically significant continent-ocean boundary on margins of known contrast in structural style and history, / and by the examination of the margins facing the Rockall

Plateau and the SW Approaches such as East Greenland and the Grand Banks.

It is intended that the results of the proposed programme will be used to aid selection of sites in the future North Atlantic drilling phase of IPOD. A special effort is proposed to provide the Department of Energy with advice on the scientific arguments underlying geologic and morphologic criteria for determining boundaries particularly in connexion with UNLOSC. The following elements will be found in the projects:

(a) Continent-ocean boundary

The continent-ocean boundary has considerable scientific and economic significance for it marks the transition between the thicker continental crust and the thinner, chemically different, oceanic crust. The rifted and subsided continental crust may contain prerifting sedimentary basins.

The continent-ocean boundary of passive margins with transform faulting appears to differ from that if there was rifting. Multichannel seismic surveys across the boundary in the Bay of Biscay and west of Rockall show considerable variation suggesting that an important factor influencing the geology of the boundary may be the altitude of the continent at the time of rifting. In many areas, however, oceanic magnetic anomalies and a characteristic isostatic gravity anomaly suggest that the boundary may be a narrow linear zone. It is proposed to examine the continent-ocean boundary in the following areas and manner.

(i) Northern Rockall Plateau (see Project 1)

The nature of the transition between the Rockall Plateau micro-continent and Faeroe microcontinent is not known but it has significant economic implications. A preliminary survey was made in late 1978 of the low col connecting these areas using seismic equipment, gravimeter and magnetometer. The limited survey extends the existing multichannel coverage and contributes to the comparison with the East Greenland margin proposed elsewhere in this programme.

(ii) Bay of Biscay (see Project 2)

Multichannel seismic surveys made for IPOD and latterly for the Department of Energy by 'Oil Hunter' under contract to NERC have shown that a zone of transition between continent and ocean can be clearly identified on the seismic records. It is proposed to carry out a detailed survey of the deep structure of the boundary in these areas during 1980-81 using seismic refraction and an expanded multichannel hydrophone technique. Information on the nature of the boundary when added to the stratigraphic data will be used in a reconsideration of facies models of early rift margin evolution and their economic implications. These surveys will be used to identify candidate drill sites for the IPOD programme.

(b) Comparative studies of continental margins - North Atlantic Ocean

(i) Grand Banks and the Southwestern Approaches (see Project 2)

Structural analysis of data taken during previous cruises to the north margin of the Bay of Biscay have shown a significant variation with time in the trend of the tilted and rotated fault blocks that underlie the margin. It is associated with an

increase in the relative depth of these blocks that may have important implications for the facies of early margin sediments. Understanding of its nature is limited by lack of information on the comparable and previously adjacent slope between the Orphan Knoll and Grand Banks where some wells exist. A comparison of the margin between the Grand Banks and Orphan Knoll and that in the Southwestern Approaches will provide key palaeogeographic and structural information critical to understanding the evolution of the epicontinental basins of the Celtic Sea and the early rifting history of the Bay of Biscay.

(ii) Rockall Plateau and East Greenland (see Project 1)

Studies of the western continental margin of the Rockall Plateau made during 1975-76 have shown that the margin is flexured and that the tilted and rotated fault block structure of the Southwestern Approaches is absent. The study of the transition between the Faeroes and Rockall Plateau described in (i) will complete the study of the west margin of the Plateau and provide a valuable base for a comparative study of the East Greenland margin north and south of the Denmark Strait.

(c) International Phase of Ocean Drilling (IPOD) (see Project 3)

The programme has been and will remain closely linked to the International Phase of Ocean Drilling 1979-81 during which ten or eleven holes will be drilled on the margins around the British Isles. As an independent and subsequently the UK member of the Passive Margin Panel, the Project Leader has been responsible for the identification of drilling targets and selection of sites in the North East Atlantic. The Project Leader is also the UK alternate member on the IPOD Planning

Committee and Chairman of the North East Atlantic Working Group. Direct participation in the continental margin drilling programme of IPOD has involved discussion of fundamental problems of passive margins at high level and has given access to data from a variety of passive margins that aid understanding of NE Atlantic margins. The Project Leader was Co. Chief Scientist of Leg 48 of IPOD during which seven holes were drilled in the Bay of Biscay and on the Rockall Plateau. The Leg 48 drilling was the first serious attempt to address the problems of passive margin drilling and has resolved some but raised others. The results from the 1979-81 programme will be of direct relevance to many of the problems outlined above and to the IOS continental margin programme. It is expected that the results from the 1979-81 programme will be of great relevance to Mesozoic palaeogeography, maturation studies and assessing the related subsidence history of the margins.

IOS staff may participate in one or other of the NE Atlantic IPOD legs depending on their timing.

(d) Synthesis and Interpretation (see Project 4)

One of the principal objectives of the work, from the Department's point of view, will be to gain an estimate of the hydrocarbon reserves that may be expected in deeper water areas under United Kingdom jurisdiction.

As the work at sea progresses its results, and information obtained elsewhere, will be drawn together to form the basis of a general assessment of the likely occurrence of source rocks, reservoir formations and other conditions for the existence of recoverable reserves.

This process will be an iterative one: its results will become available throughout the course of the observational and experimental work.

(e) Legal Regime of Continental Margins (see Project 5)

Considerable demand has been found to exist for advice from IOS on scientific criteria for the delineation of boundaries in geological and sedimentary provinces in connexion, among other things, with discussions taking place in the United Nations Conference on the Law of the Sea.

It is proposed to make specific provision, for two years in the first instance, for staff and support services to meet the demand.

Preliminary proposal for continuation

The programme up till 1982 will have defined a number of problems related to facies analysis, subsidence history and the age of deep reflectors that will require the addition of lithological and biostratigraphic data for their solution.

At the present time, it seems most likely that the emphasis of the work during this later period will turn toward a search for a more detailed understanding of the nature and development of the sedimentary sequences of continental margins. Three principal types of study are foreseen. - methods of work may include coring and drilling in addition to the geophysical techniques already in use.

(a) Sedimentation processes on the slope and rise

The research will be concerned with a study of the relative roles of the gross sedimentary processes in shaping the past and present morphology of the slope and rise. It is expected that the results will help to improve the understanding of petroleum formation and the development of reservoir capacity. This will also be relevant to the problems of installation of seabed structures in deep water.

(b) Seismo-stratigraphy of passive margins

The research will be concerned with the influence of palaeocirculation changes and eustatic changes in sea level on the stratigraphy of slope and rise sediments. Special attention will be paid to the chronostratigraphic significance of seismic reflection and to seismic sequence analysis.

(c) Deep structure of passive margins

The research will be concerned with an examination of continent-ocean boundaries along rifted and passive margins.

The development of the programme will depend strongly on the results of the work defined in the first part of this proposal. It may also be necessary to include a return to areas examined in a preliminary way and cruises to others of relevance to D. of En. which may have come to notice as a result of Science Vote studies and the IPOD programme in the Atlantic Ocean.

Principal milestones of research programme

Key objectives of the programme will be to produce syntheses for the following regions and aspects of margin geology. Detailed subject headings are given in the appended project proposals

1. Regional syntheses

Southern Rockall Trough

South Western Approaches

North West Spain

East Greenland/Rockall Plateau

Grand Banks/South West Approaches

2. Assessment of IPOD drilling results and their implications for margin evolution in the NE Atlantic.

3. Facies analysis of margin sediments and sedimentary sequences.

4. Subsidence history and prediction of facies.

5. Predictability of paleotemperature gradients and hydrocarbon maturation.

6. Palaeogeographic development of NE Atlantic passive margins.

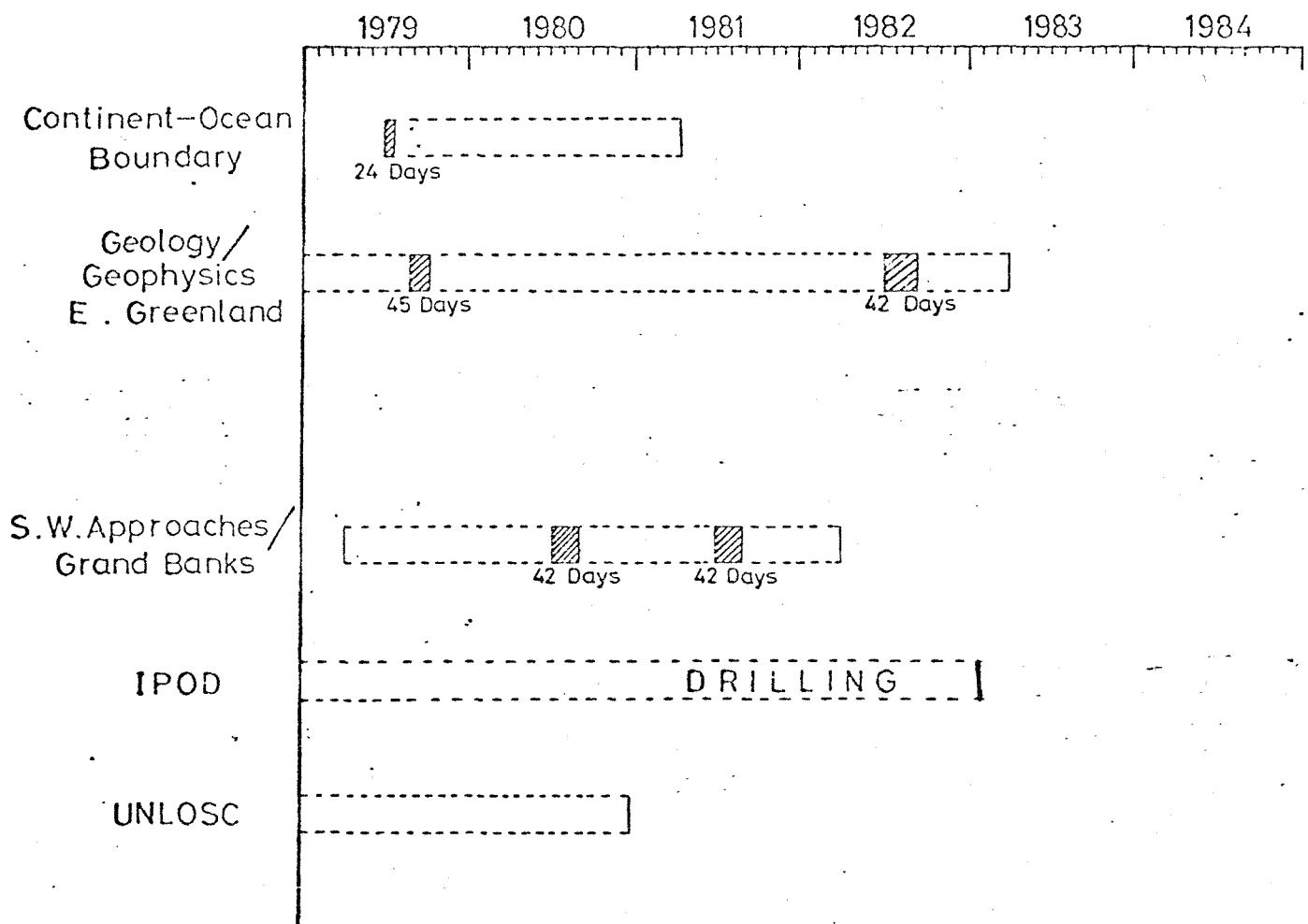
7. Gravity and magnetic models of passive margins.

8. Seismic sequences on passive margins - criteria for hydrocarbon prospectivity.

9. Legal regime of continental margins.

It is proposed to have a major programme review point in Spring 1982.

FIELD STUDIES 1979-82



DRAFT

NATURAL ENVIRONMENT RESEARCH COUNCIL
INSTITUTE OF OCEANOGRAPHIC SCIENCES

Geological and geophysical studies of continental margins

Project title 1. Northern Atlantic Margins - Rockall and East Greenland (the NW Margin)

Synopsis IOS will complete geological and geophysical studies of the continental margins to the NW of the United Kingdom (the Rockall margin) and on the eastern side of Greenland. A substantial amount of work has already been done, future work at sea will include two cruises to the Greenland Margin, in 1979 and 1982. There are close ties with IPOD related work described elsewhere. Close cooperation with Durham University is assured by a sub-contract.

The results of the work together with information for IPOD and from commercial sources will be used to reconstruct the history of the Continental Margin to the NW of the British Isles and criteria derived from the reconstruction will be used as the basis for a general assessment of the likely occurrence of source rocks, reservoir formations and the physical conditions required for hydrocarbon formation, migration and entrapment. This assessment will provide a basis for the Department and industry to estimate the hydrocarbon reserves that may be recoverable.

A final report on the project is expected in 1983-84.

Summary of expected costs £K 1978 September prices	1979-80	80-81	81-82	82-83	83-84
IOS staff and other recurrent costs	119	50	40	90	45
Overheads and rentals	30	15	12	41	20
Cruise costs	234	-	-	260	-
 Totals	383	65	52	391	65
 Direct and sub-contracted Staff effort m.y.	3.6	2.5	2.2	3.8	2.5

Purpose of the work

The objective is to understand the development of the rifted continental margin to the NW of the United Kingdom (the Rockall margin) hence to synthesize and interpret the geological and geophysical observations so that the basis is laid for an assessment of the prospects for hydrocarbon extraction in waters controlled by UK or in which UK has an interest.

Description of the work

Several geophysical cruises have already been made by IOS over the Rockall continental margin. Their results have been supplemented by the purchase of commercially acquired data and by results of the International Phase of Ocean Drilling (IPOD) of the Deep Sea Drilling Project.

The principal remaining components of work at sea will be cruises to the East Greenland margin and the Northeast Greenland margin.

The results of the work will be used, with information from university workers, foreign surveys, the IPOD programme, commercial drilling etc. to improve the method of hydrocarbon prospectivity analyses by developing new criteria for deeper water.
1979-80

A forty-five day survey of the East Greenland margin will be made from a chartered vessel during Autumn 1979 using the IOS 6-channel seismic reflection system, gravity, magnetics and GLORIA Mk II. The survey is being planned in collaboration with the Geological Survey of Greenland and Durham University.

Analysis and interpretation of the 1978 Rockall-Faeroe survey will be made using previously purchased and publicly available seismic surveys.

A sub contract has been let to the University of Durham to employ a research assistant who will help with the cruise programme for the East Greenland Margin and the subsequent working up and interpretation of the observations. His presence at

Durham will take advantage of the well known expertise there and also ensure easy and convenient access to information already obtained about the margin.

Arrangements have been made with the University to ensure confidentiality where appropriate.

1980-81

The main effort will be on the analysis and interpretation of the results of the 1979 East Greenland survey. Evaluation of the data will include consideration of the BNOC hole in the northern Rockall Trough.

1981-82

Evaluation of the geological and geophysical data collected on the East Greenland margin in 1979 will be completed and compared to the west margin of the Rockall Plateau in preparation for the second cruise scheduled for 1982-83.

The sub contract to Durham University will be completed.

1982-83

A six week geological and geophysical survey will be made of the East Greenland margin between 72°N and 60°N. The survey will use gravity, magnetics and the IOS 6-channel seismic reflection system and GLORIA Mk II.

Data from the East Greenland Survey will be interpreted and published as appropriate.

1983-84

Completion of the interpretation of the observations and preparation of final synthesis of results.

Schedule of reports

The following reports are proposed

1979-80

- 1.1 Structure of the south Rockall Trough
- 1.2 Preliminary report of East Greenland cruise

1980-81

- 1.3 Final report of East Greenland cruise. Synthesis for the Rockall Plateau and East Greenland margin including an examination of BNOC drilling results in the North Rockall Trough.
- 1.4 Subsidence history and likely hydrocarbon maturation in passive margins near the UK - a) the Northwest margin

1981-82

- 1.5 Interpretation of seismic sequences in refited passive margins - implication for hydrocarbon prospectivity
- 1.6 Gravity and magnetic models of passive margins

1982-83

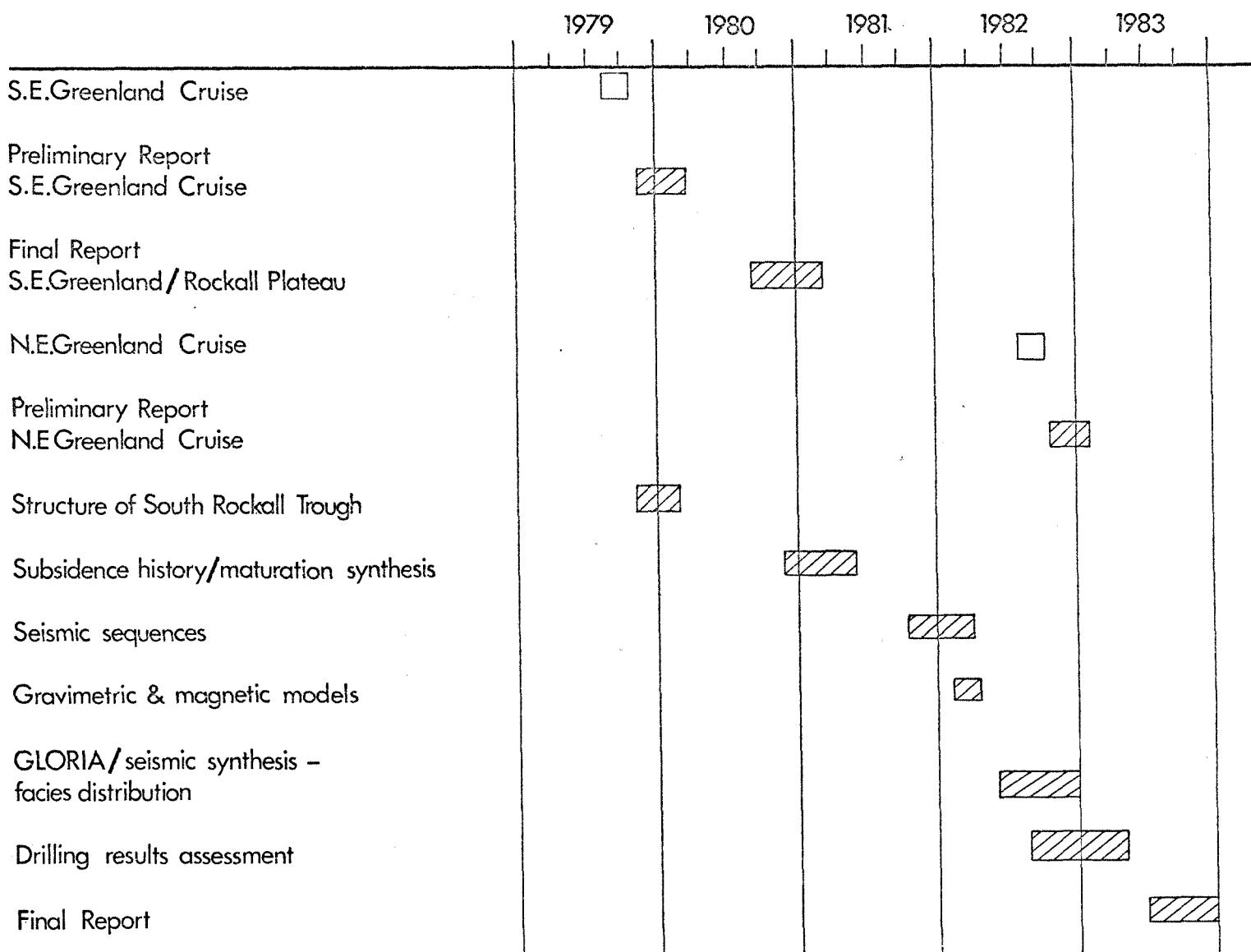
- 1.7 Report of northeast Greenland cruise
- 1.8 Facies distribution on passive margins - synthesis of GLORIA and seismic observations - a) the Northwest margin
- 1.9 Assessment of drilling (IPOD and BNOC) results-a) Northwest margin

1983-84

- 1.10 Final report northeast Greenland "Offshore extension of the Jamieson Land Basin: development of the southern Norwegian Sea and northern North Sea.

I.O.S CONTINENTAL MARGIN PROGRAM

PROJECT 1: NORTH ATLANTIC-ROCKALL & EAST GREENLAND



NATURAL ENVIRONMENT RESEARCH COUNCIL

INSTITUTE OF OCEANOGRAPHIC SCIENCES

Geological and geophysical studies of continental margins

Project title 2. North Atlantic margins - Biscay/SW
Approaches and the Grand Banks (the SW Margin)

Synopsis IOS will continue geological and geophysical studies of the Biscay/SW Approaches margin already commenced and will carry out surveys on the corresponding margin around the Grand Banks of Newfoundland. A substantial cruise program has already been carried out and interpretation of commercial seismic survey is in hand. Future work at sea will include a two ship seismic survey in the Bay of Biscay (in 1979, in collaboration with Institut Francais du Petrole) and two cruises to the Grand Banks (in 1980 and 1981). A reconnaissance survey of the Grand Banks with GLORIA II may be possible in Autumn 1979.

The results of the work will be used, as in Project 1, with information from other sources to reconstruct the history of the Continental Margin to the Southwest of the British Isles and to provide a basis for an estimate of hydrocarbon reserves.

A final report on the project is expected in 1982-83.

Summary of expected costs £K 1978 September prices	1979-80	80-81	81-82	82-83
IOS staff and other recurrent costs	98	100	90	30
Overheads and rentals	26	45	41	12
Cruise costs	136	230	260	-
 Totals	260	375	391	42
Direct staff effort m.y.	2.8	3.9	3.8	2.2

Purpose of the work

The objective is to understand the sequence of events in the development of the rifted continental margin to the SW of the United Kingdom, hence to synthesize and interpret geophysical observations and thus lay the basis for an assessment of the prospects for hydrocarbon extraction in waters controlled by UK or in which UK has an interest.

Description of the work

Several geophysical cruises have already been made by IOS over the SW Approaches, on the north margin of the Bay of Biscay and the related Iberian Margin. Their results have been supplemented by direct contracting and purchase of commercial multichannel seismic reflexion profiles and by the Leg 48 drilling of the International Phase of Ocean Drilling (IPOD) of the Deep Sea Drilling Project.

The principal remaining components of the work at sea will be a two ship cooperative cruise in the Bay of Biscay and two cruises to the Grand Banks margin.

The results of the work will be used, with information from university workers, foreign surveys, the IPOD programme etc., to improve the method of hydrocarbon prospectivity analysis by developing new criteria for deeper water.

1979-80

A twenty-four day geophysical survey of the continent-ocean boundary in North Biscay will be made from a NERC vessel in summer 1979 using seismic refraction, seismic reflection, gravity and magnetics. The survey is being made in co-operation with the Institut Francais du Petrole using two ships. The survey will provide a good geophysical description of the boundary and will define candidate sites for drilling by IPOD.

If other arrangements permit a GLORIA II survey will be made from a chartered vessel on passage across the Grand Banks.

Compilation of existing geological and geophysical data coverage will begin to provide a basis for the comparative study of the Southwestern Approaches and Grand Banks scheduled for 1980-81 and 1981-82.

1980-81

A six week geological and geophysical survey of the margin of the Grand Banks will be made from RRS 'Discovery' using GLORIA Mk II, gravity, magnetics and the IOS seismic reflection system. It is intended to compare and contrast the structural and stratigraphic evolution of these formerly contiguous margins.

Results of the north Biscay continent-ocean boundary survey will be interpreted. Data from the comparative surveys of the Grand Banks and Southwestern Approaches will be used to prepare structure maps of key horizons and facies maps if sufficient stratigraphic control is available. Purchase of some multichannel commercial seismic information may be proposed.

1981-82

A second six week geological and geophysical survey of the margin of the Grand Banks will be made from RRS 'Discovery' or a vessel chartered by NERC using GLORIA Mk II, gravity, magnetics and the IOS seismic reflection system.

Data from the comparative survey of the Grand Banks and margin west and southwest of the UK will be used with other data to prepare structure and facies maps.

1982-83

Completion of interpretation of the observations and preparation of final synthesis of the results.

Schedule of reports

The following reports are proposed

1979-80

- 2.1 Geology and structure of NW Iberia
- 2.2 Geological and structural synthesis SW Approaches
- 2.3 GLORIA observations NW Spain - facies studies

1980-81

- 2.4 Preliminary report on first Grand Banks cruise
- 2.5 Report on SW Approaches seismic study
- 2.6 GLORIA observations SW Approaches - facies studies
- 2.7 Subsidence history and likely hydrocarbon maturation
in passive margins near the UK - b) the Southwest margin

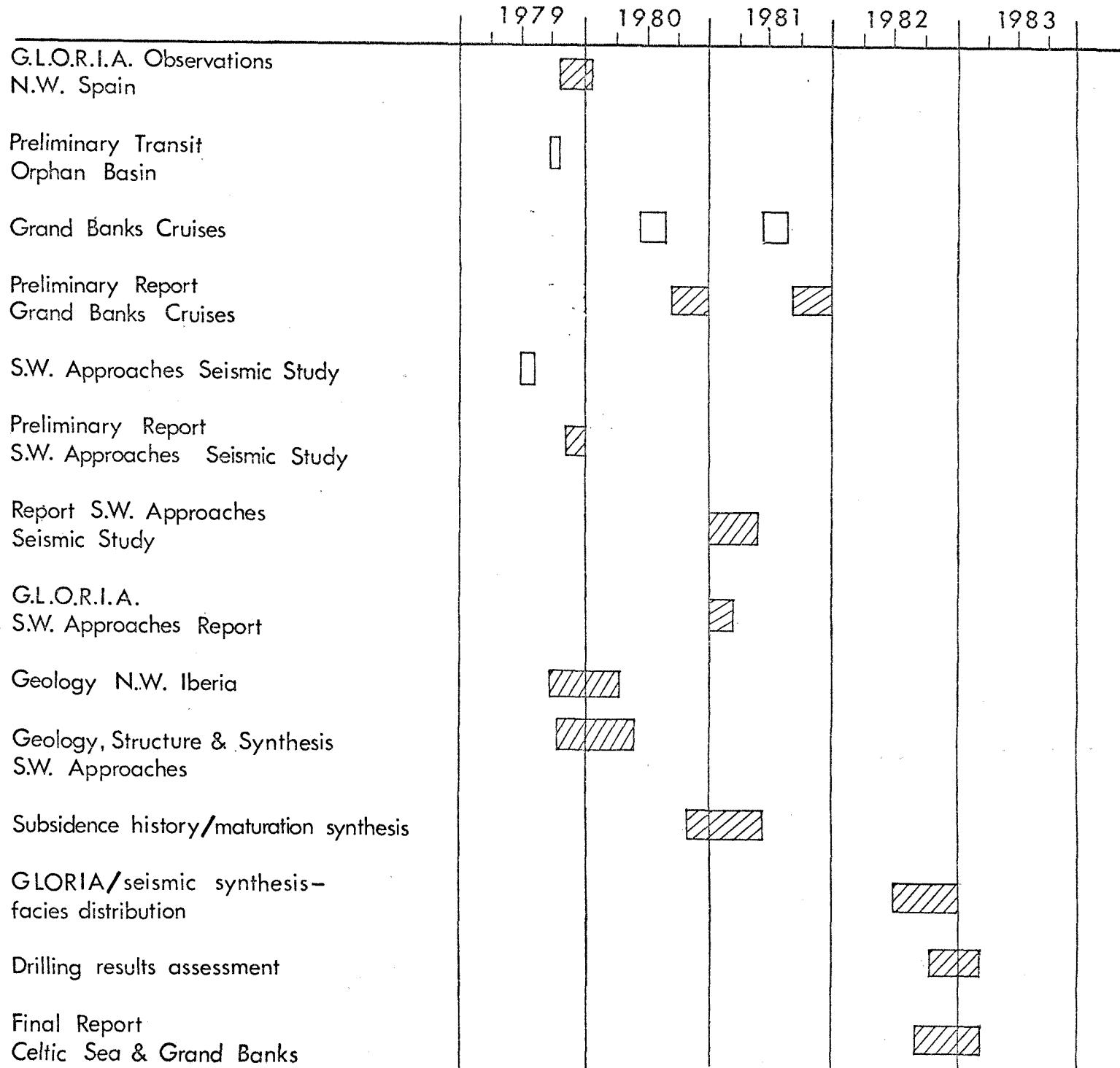
1981-82

- 2.8 Report on Grand Banks cruises
- 2.9 Facies distribution on passive margins - synthesis of
GLORIA and seismic observations - b) the Southwest margin

1982-83

- 2.10 Assessment of drilling (IPOD) results - b) the Southwest
margin
- 2.11 Final report "Palaeogeography of the outer Celtic Sea
and Grand Banks"

PROJECT 2: N. ATLANTIC MARGINS: BISCAY/S.W. APPROACHES - GRAND BANKS



NATURAL ENVIRONMENT RESEARCH COUNCIL
INSTITUTE OF OCEANOGRAPHIC SCIENCES

Geological and geophysical studies of continental margins

Project title 3. Work in connexion with the IPOD programme in the NE Atlantic.

Synopsis IOS will take part in the International Phase of Ocean Drilling (IPOD) of the Deep Sea Drilling Project by representing UK as members of committees and working groups, by assisting in the geological analysis preparatory to drilling, including site surveys where appropriate, and by participation in the drilling activities aboard GLOMAR CHALLENGER. Work in the immediate future will concentrate on preparations for the drilling programme at present proposed for the NE Atlantic in 1981. It may be desirable to commission commercial seismic profiles to link proposed drilling sites to areas of known structure.

Summary of expected costs £K 1978 September prices	1979-80	80-81	81-82	82-83
IOS staff and other recurrent costs	9	9	18	18
Overheads and rentals	3	3	6	6
Commercial surveys		41	-	-
Totals	12	53	24	24
Direct staff effort m.y.	0.4	0.4	0.8	0.8

Purpose of the work

The objective is to exploit the contribution made directly by the UK to the IPOD programme by making sure that a fair share of IPOD drilling is located so as to yield a maximum contribution to the understanding of sedimentary margins of interest to UK. IPOD holes have provided and will provide evidence crucial to the stratigraphic interpretation of the Rockall and SW Approaches margins: it is essential that they should be located so that they can be properly linked to surveys already made or planned.

Description of the work

IPOD drilling is expected to take place in the NE Atlantic in 1980 or 1981: IOS will work to prepare for it and will participate in the work at sea and the subsequent analysis and interpretation. A substantial part of the institute's effort will be in the Passive Margin Panel of IPOD where the case will be argued for drilling in the Rockall area and off the SW Approaches.

1979-80

Work will concentrate on planning for the 1981 drilling. Work in the Southwestern Approaches cruise (project 2) will include a study of the Continent-ocean Boundary, designated as a drilling target. Preparations for drilling will include reviews of the margin areas under consideration for drilling. Some multi-channel commercial seismic profiles will be required immediately around proposed drill sites.

1980-81

Interpretation of the Continent-ocean Boundary Survey, proposal of candidate drill sites, possible participation in the drilling programme.

1981-82

Possible participation in the drilling programme. Evaluation of the drilling results, interpretation and publication.

Schedule of reports

The following reports are proposed

1980-81

Report on IPOD site surveys

1981-82

Preliminary report on IPOD NE Atlantic drilling

1982-83

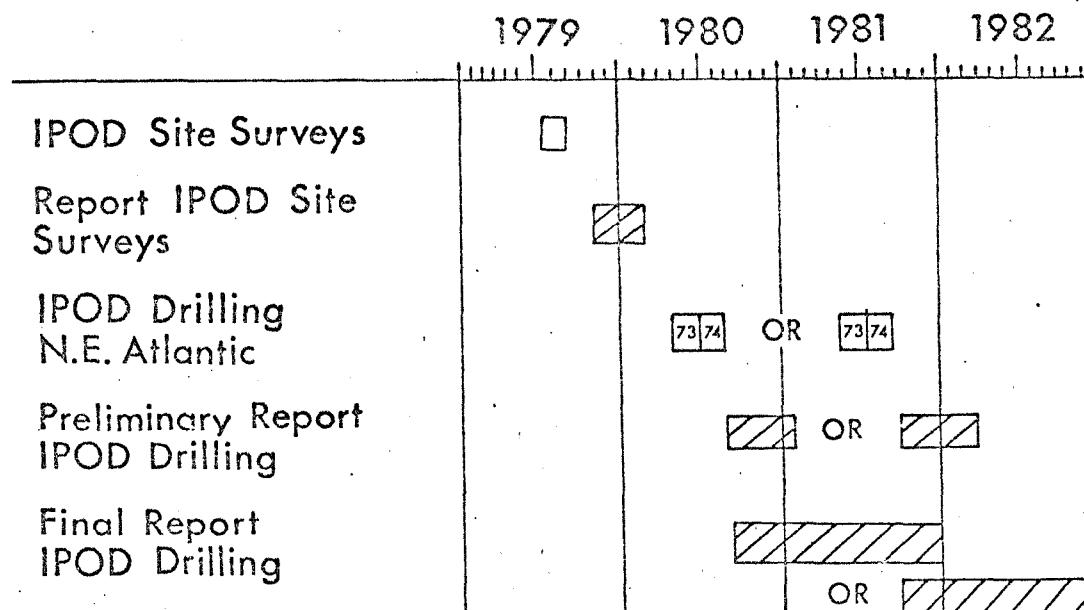
Initial core descriptions of IPOD NE Atlantic drilling

Final reports on IPOD NE Atlantic legs.

Reports of relevant IPOD Committee meetings will be supplied to the Department.

16.7.1979

I.O.S. CONTINENTAL MARGIN PROGRAM
PROJECT 3: IPOD DRILLING PROGRAM



NATURAL ENVIRONMENT RESEARCH COUNCIL

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Geological and Geophysical studies of continental margins

Project Title 4. Legal regime of continental margins

Synopsis IOS will provide advice to the Department of Energy on the geological and therefore possible resource implications of proposals about the legal regime of continental margins under consideration at the United Nations Law of the Sea Conference and elsewhere.

The work will initially be for a two year period and is expected to lead to a series of papers exploring and assessing proposals for boundary definitions and so forth.

Summary of expected costs £K 1978 September prices	1979-80	1980-81
IOS staff and other recurrent cost	5	7
Overheads and rentals	2	3
 Totals	7	10
 Direct staff effort m.y.	0.5	0.8

