UNCLOS Article 76 - Implementation by Smaller Developing States Entitlement, Evidence, Expertise and Expense

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Abstract
The stringent requirements for scientific evidence to substantiate Extended Continental Shelf (ECS) entitlement place developing states at a severe disadvantage. Most lack means and expertise to collect, interpret and present the necessary data sets unaided. States Parties to the UN Convention on the Law of the Sea (SPLOS) have recognised the continuing difficulties faced by the smaller developing States in complying with the ECS submissions deadline. Relaxation of submission timing will mitigate but not resolve these difficulties. This could require a radical review of the implementation of UNCLOS Art.76 and related articles

1. Introduction

> *… the complexity of the issues to be investigated and costs involved in compiling a credible submission are enormous. Implementation of article 76 of the Convention requires collection, assembly, and analysis of a body of relevant hydrographic, geological and geophysical data in accordance with the provisions outlined in the Scientific and Technical Guidelines. The complexity, scale and the cost involved in such programme, though varying from state to state according to the different geographical and geophysical circumstances require enormous amounts of resources.*
>
> Statement to 18th Meeting SPLOS June 2008
> by Kenyan Delegation

> *Despite the fact that SIDS have large ocean areas rich in resources (fisheries, oil and gas, minerals, renewable energy), many island States are unable to benefit from the existence of these resources within their EEZ as a result of inadequate technical and management capacity.*
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> Reports from the Third Global Conference on Oceans, Coasts and Islands
> January 23-28, 2006, UNESCO, Paris[1]

> *… furthermore, sea level is rising almost by a factor of two, faster than it did during the half century prior to 1990. Low lying areas, coastal mega-cities, and several small islands, are subject to increased erosion and loss of coastal protection …*
>
> *In certain island States people are already evacuating due to the rising sea and increases in storm frequency and intensity. … Other island nations such as Tuvalu and Kiribati are currently preparing plans for eventual resettlement of their populations in other countries.*
>
> Conference Overview and Outcomes
> From the 4th Global Conference on Oceans, Coasts, and Islands
> April 7-11, 2008, Hanoi, Vietnam[2]

[1] Small Island Developing States and the Mauritius Strategy - Summary prepared by LaVerne Walker, St. Lucia at http://www.globaloceans.org/globalconferences/2006/pdf/WSSD-MDGAssessmentSIDS.pdf accessed June 2008

[2] Advancing Ecosystem Management and Integrated Coastal and Ocean Management in the Context of Climate Change at http://www.globaloceans.org/globalconferences/2008/pdf/Conference-Overview-and-Outcomes.pdf

The above excerpts illustrate the difficulties facing governments of Small Island Developing States (SIDS) and Least Developed Countries (LDC), some with low lying coasts, that have continental shelves extending beyond 200M. Delineation of the outer limit of the continental shelf, where this requires ship borne investigations to complement pre-existing archive data, can be prohibitively expensive. In a complex case the subsequent data processing and the preparation, presentation and defence of a submission might even be comparable with that of data acquisition. Both these activities require a significant input from international experts.

We review legal, scientific and technical capabilities and discuss the national research facilities needed to undertake the delineation task. The extent and adequacy of external affordable advice and assistance that smaller states could call upon is assessed. The possible impact of non-settlement of EEZ boundaries with neighbouring States on the willingness of smaller coastal States to proceed with CLCS submissions is considered.

The difficulties faced by smaller and more disadvantaged coastal states in acquiring and analyzing the data sets for ECS delineation are presented. These include obtaining full compliance by Institutions from developed countries with the UNCLOS provisions relating to Marine Scientific Research. We question whether seeking to meet the requirements of continental margin delimitation distorts priorities for other more pressing societal concerns or relevant marine scientific endeavours. Costs involved in mobilizing hydrographic and seismic operations will be appraised in the context of prevailing economic conditions.

Some actions by States Parties and others to resolve the issues raised in the following discussion are suggested.

A matrix has been prepared summarising the potential ECS extent and resources of smaller developing coastal States, the status of their submissions to the Commission on the Limits of the Continental Shelf (CLCS) and relevant training. This data, compiled for West and East Africa, the Western Indian Ocean, South Pacific and Caribbean, is provided at **Appendix 1**.

2. Entitlement

> *Small island developing states (SIDS) are characterized as large ocean States due to establishment of the 200 mile Exclusive Economic Zones (EEZs), resulting in these small islands being custodians of much of the world's ocean space.*
>
> (Global Oceans and Islands Forum, 2006)

A report from a recent South Pacific Applied Geoscience Commission (SOPAC) art.76 training event (Islands Business, 2008) stated that the potential ECS entitlement of the eight participating SIDS "*would extend their jurisdiction over a combined area of 1.5 million square kilometres of seabed and subsoil* ". This represents 10% increased in the area of their combined EEZ which is consistent with the SOPAC Oceans and Islands programme manager's assessment that "*some of the nations with potential could realise in the region of a 10 – 15% increase in seabed territorial jurisdiction"*.

Assessment

There are in existence various detailed assessments of the number of coastal states that could be entitled to an extended continental shelf (ECS) under the provisions of UNCLOS art.76; but these are held on proprietary data bases and consequently were not readily accessible to the authors. The information on entitlement provided here is therefore probably incomplete. It derives principally from (Murton *et al* 2001) and (Monahan *et al*, 2005) augmented from SOPAC and CARICOM sources and from submission intentions advised to CLCS (SPLOS, 2008a).

Of some 81 States identified as having a potential entitlement to an ECS, 4 have yet to ratify UNCLOS and one has advised its present intention not to make a submission, while reserving its right to do so. To date (end June 2008) CLCS has received 12 submissions, one of them joint from France, Ireland, Spain and UK. With few exceptions these are partial submissions or reserve a position on a further submission. Australia has lodged a dormant submission for its Antarctic Territories. Barbados and Indonesia are the only SIDS or developing coastal state (DCS) to have made submissions so far and both were in 2008.

There are 49 developing countries yet to make their submissions, 26 of which are categorised by the UN as Least Developed (United Nations, 2008). Some of these countries are also listed as SIDS. The figure for pending submissions includes 12 other SIDS**.** Thus at the time of the SPLOS meeting in June 2008 there were some 40 nation states with specifically identified economic and environmental disadvantages and vulnerabilities having a potential entitlement to an ECS. **Table 1** provides a breakdown of broad margin coastal States by development category and summarises actual and hoped for progress with CLCS submissions. It illustrates both the daunting review task facing the Commission and the preponderance of disadvantaged States whose submissions are pending

Submission status/Intention Category	*Full*	*Partial*	*By May 2009*	*By May 2010*	*Intention advised or indicated*	*Intention not yet advised*	**Not ratified**
Developed	1	7	7		1	1	1
Transition	1	1	1		0	3	2
DCS		1	9	1	0	4	
SIDS	1		6		5	1	
LDC/SIDS			6		8	11	1
TOTAL	3	9	29	1	14	20	4

Table 1*: Summary status of CLCS Submissions (June 2008)*

Delimitation constraints

At the 2008 Global Forum on Oceans, Coasts, and Islands it was noted that although the majority of SIDS have ratified UNCLOS; by 2006 not one of them had or deposited the appropriate instruments delimiting their EEZ with the UN Division of Ocean Affairs and Law of the Sea (DOALOS). This is would facilitate identifying any extension to the continental shelf beyond 200M and areas of overlap with neighbours. .

There is understandable hesitancy in concluding boundary agreements especially in areas well endowed with natural resources. The need to provide legal certainty for exploration and exploitation licensees should provide an incentive to seeking a settlement. However, "*several Pacific nations either have already signed or are entertaining signing exploration licences for deep sea mineral exploration yet none of these have ratified (sic) EEZ nor have they submitted ECS claims" (Webb, 2008).*

Historically boundary negotiations have been protracted, costly and occasionally acrimonious. The stand off between Barbados and Trinidad and Tobago over historic traditional fishing rights pre-dating independence was fractious and ill-natured. The long running dispute between Guyana and Suriname nearly led to war. Both boundaries had implications for the delineation of the continental shelf beyond 200M. The finalisation of these two boundaries by awards of arbitral tribunals, in April 2006 and September 2007 respectively, cleared the way for the States concerned to concentrate on their respective continental shelf claims in the area; although a boundary dispute between Guyana and Venezuela remains to be resolved.

Some bilateral negotiations entered into prior to 1982, when UNCLOS was opened for signature, were suspended during the ratification process and only latterly resumed. Negotiations between Nigeria and Benin started in 1968 and a Protocol based on the 1958 Geneva Convention on the Continental Shelf was agreed, but never ratified. In 2000 Nigeria indicated the need to take account of UNCLOS 1982, the latest technology for maritime boundary delimitation and the economic interests of the two countries. Discussions resumed in 2003 and were amicably concluded in 2006. This was a considerable achievement given the disparity in size and financial muscle between the parties and the fact that the median line runs through one of the most hydrocarbon-rich areas in the Gulf of Guinea (Akohou, 2008). As with the earlier examples both parties have now been willing to state their intention to prepare CLCS submissions. In Benin's case this will be in the form of a joint submission with neighbouring coastal States in the Gulf of Guinea (SPLOS, 2008b).

It becomes apparent from the foregoing that in areas of overlapping maritime zones the progress towards ECS delineation will be painfully slow as the outstanding number of submissions for West Africa, Western Indian Ocean and Pacific testify. **Figure 1** well illustrates the point for the latter region, where in 2006 there were some forty-five (45) shared maritime boundaries between Forum Island states with only sixteen (16) formally negotiated and three (3) ratified. Twenty-six (26) are yet to be negotiated (SOPAC Annual Report, 2006). However, there is a possibility for countries to agree on the outer limits of their respective extended continental shelves (including the outer limits of the overlapping areas), even in the absence of an agreement on boundary delimitation amongst themselves. The Norwegian submission is a case in point.

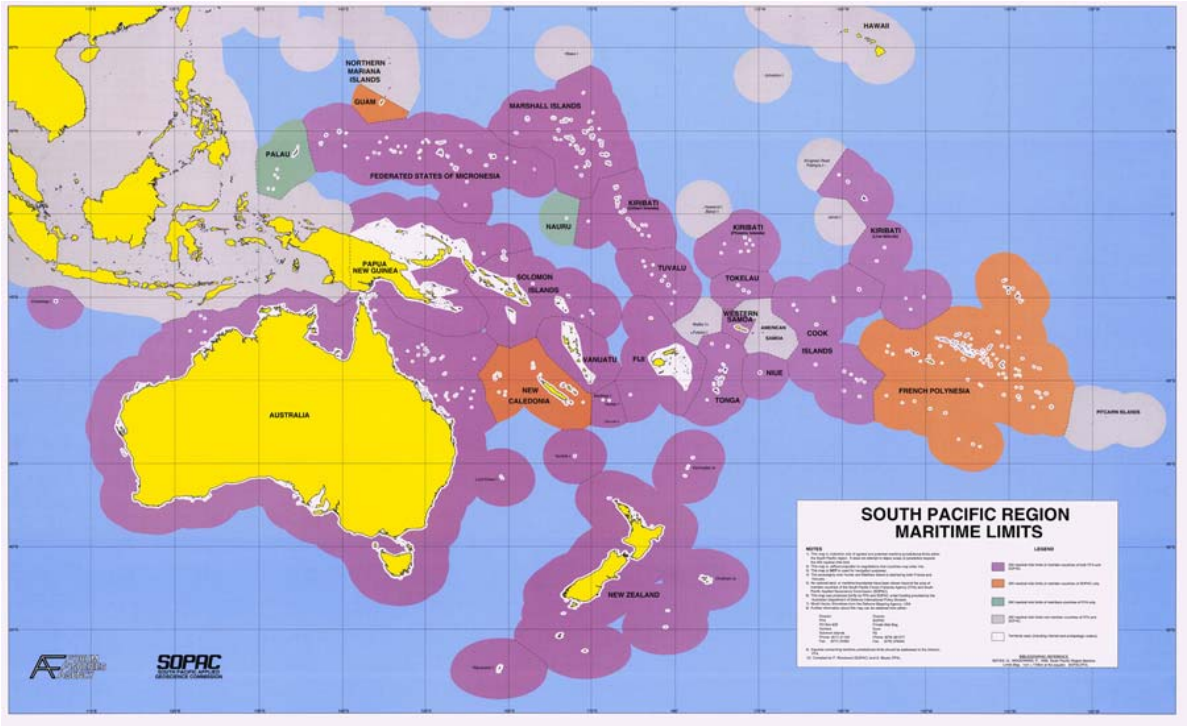

Figure 1 (See International Hydrographic Review Vol9 No 2)

The situation in the Eastern Caribbean is also a complex one; given the mixed colonial inheritance and the continuing interests of maritime metropolitan powers with dependent territories in the region. The small independent Island States feel disadvantaged in negotiations with experienced, well resourced and technically proficient delegations from these countries. A total of approximately 39 potential maritime boundaries remain to be delimited (CARICOM *c.*2004/5).

3. Evidence

Use Availability and Acceptance of public data

Given the high market demand for survey vessels, compounded by escalating fuel costs, developing States and particularly SIDS and LDC will be seriously disadvantaged if the full development of their CLCS submission requires the acquisition of new data to augment that in the public domain. Mobilisation to locations remote from areas of current commercial or scientific interest and where as little as 5-7 days data acquisition is required (ComSec, 2004), may not be commercially viable. It is questionable whether the expenditure on dedicated new delineation surveys can be justified when results may perhaps only marginally strengthen a case developed from public data.

It will therefore be important for disadvantaged states to be allowed to maximise their use of public data. In future this might be supplemented by generalised sea floor depictions derived from remote sensing and sediment thickness models; extrapolated from those regional settings where ground truthing exists. The latest decision of SPLOS relaxing the criteria for satisfying the CLCS submission deadline (SPLOS, 2008c) will allow time for data to be collected and validated from improved instrumentation in the next generation of satellites with dedicated geophysical sensor pay loads. This may then become admissible as evidence for e.g. Foot of Slope (FOS) and the 2,500m contour.

Improvements in accessibility of publicly available scientific and technical data relevant to the preparation of CLCS submissions may now be anticipated following the SPLOS request to CLCS to research this area and publicise its findings (SPLOS, 2008d). The "OneGeology" initiative[3], officially launched at the 33rd International Geological Congress in Oslo in August 2008, is seeking to expand its coverage into the marine domain. For states not now under pressure to complete their full submissions by a prescriptive deadline, this may become an important and readily accessible data archive. However, it is proving difficult for the project to establish contact with those who might hold or know the whereabouts of relevant data (Jackson, 2008). Presumably CLCS will face the same problem.

There is a possibility that military ocean survey data, particularly bathymetry, might eventually become accessible. In 1995 the report of the MEDEA Special Task Force (comprising senior academics and government administrators, among others) concluded that the US Navy's bathymetric holdings warranted declassification (Hawker, 1995); but no action resulted. The UK Hydrographic Office and the Russian Navy are known to have significant classified survey data archives.

There is a precedent from Papua New Guinea (Nidung, 2008a) that a submission can be developed using public data alone. The GRID-Arendal UNEP Shelf Programme (Fabres, 2008a) has identified other states that may be able to do the same. However, such claims have yet to be tested by exposure to detailed scrutiny by a CLCS sub-commission.

Data collection Issues

Developing States do not always appear to be fully aware of their rights and obligations under the UNCLOS provisions on the conduct of Marine Scientific Research (MSR). The failure by developed nations to routinely share the results of research has been highlighted by ABLOS (2005) and elsewhere. There is a need, particularly for SIDS and LDC, to be alert to the activities of research vessels and commercial survey ships which may be in transit through their EEZ and/or over their putative ECS in order to make opportunistic use of their capabilities where possible. In the case of EEZ, survey transit rights could be conditional on

[3] OneGeology is an international initiative of the geological surveys of the world and a flagship project of the 'International Year of Planet Earth'. Its aim is to create dynamic geological map data of the world available via the web. www.onegeology.org last accessed 30 June 2008

data sharing and track line configuration; but as a correspondent (Nidung, 2008b) has pointed out,

> *For some countries, asking researchers to deviate and run some lines as part of MSR consent to access national waters was not a viable choice because of costs involved and time. Sharing of data … is important under UNCLOS and whilst cooperation is possible in reality this does not happen too often between developed and developing countries …*

The gathering and processing of the necessary data for ECS entitlement and MSR cannot be entirely contracted out. Survey and data compilation activities must be seen and used as capacity building exercises. Personal communications support this view[4].

Expertise – Requisite Skill Sets and Infrastructures

The Generic Case

In most cases, the delimitation of an ECS is a complex process that requires a range of abilities and resources that cannot be provided by individuals and singular institutions. Typically, this need is met by the establishment of several working groups that specialize in different tasks according to discipline. Such groups may be constituted formally or informally and their compositions will vary from country to country, but for the most part they consist of teams that assume various – and distinct – responsibilities: legal and diplomatic oversight; bathymetric mapping and interpretation; geo-scientific mapping and interpretation; documentation and data management; administrative and support functions; etc. Several correspondents have testified to the problems faced in assembling such capabilities.[5]

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[4] If Benin did have specialists in the fields of geology, geophysics, petroleum and mining engineering, and oceanography, they would have to be re-deployed or otherwise charged with the implementation of this undertaking, which requires substantial human and technological resources.
Dossou Rodrigue AKOHOU
Jurist to the Legal Affairs Directorate of the Ministry of Foreign Affairs of Benin
(*Literal translation from original French*)

… important that Kiribati for instance is fully involved in the process, to have its own officials learn from every step undertaken towards the submission to the CLCS as these skills will be valuable in future, especially if it stays with the country.
(Willie, 2008)

[5] Lack of capacity and technical know how have immensely contributed to the inability of developing countries to utilize marine resources found within their national jurisdictions.
(Kenyan Delegation, 2008)

Benin as one of the world's Least Developed Countries is tremendously handicapped by a lack of qualified personnel, of technical means, and of the technology needed to collect the necessary data. Given such limitations, there is a high risk that developing states will not be able to participate fully in this process.
(Akohou, 2008)

Many of the small island countries do not have geologists/geoscience personnel or mining departments in their countries. It's the fisheries officials for example who are driving the Article 76 work in FSM. From the beginning Article 76 is not understood because the legal aspects and technical aspects of a continental shelf are different and many cannot visualize what is being proposed by the Article.
Masio Nidung
Coordinator, PNG maritime Boundary Project

Table 2 lists the primary skill sets that must be called into play during the implementation of almost any Article 76 programme. Many of these skill sets are complementary and as a rule, some individuals can be identified who are capable of serving in more than one of the listed capacities. Other skills may be the province of specialists who alone can provide expertise in their specialized fields. From a human resource perspective, a significant aspect of managing an ECS project is the orchestration of a variety of team members who can bring their respective skills and energies to bear on tasks as and when required. To complicate matters, the mix of skill sets and designated operatives will in all likelihood evolve through the life of the project as it advances through its successive stages, and as staff turnover or altered circumstances require adjustments in team sizes and composition.

Some of the skill sets listed in **Table 2** are acquired through formal education, while others may be developed through on-the-job experience that has been accumulated during previous task assignments. Regardless of their provenance, the list implies the existence of a cadre of experts who are qualified, available, and prepared to devote themselves to a project that could be expected to last several years.

Skill sets for Art. 76 implementation	***Coastal State***	***International Technical Assistance (TA) or Contract***	***Remarks***
Project planners and managers	•		International TA project definition
Financial controllers and managers	•		
Contract managers (tendering, awarding, and monitoring)	•	•	Joint activity
Team leaders and managers	•		
Database experts (construction and management)	•	•	Technology transfer through counterparts
GIS (Geographical Information Systems) experts	•	•	Technology transfer through counterparts
Cartographers	•		
Data interpreters (bathymetry, geology, and geophysics)	•	•	Technology transfer through counterparts
Survey managers (planning, design, and execution)		•	Survey contractor
Documentation experts (legal and technical)	•		
Presentation	Political	Technical	Joint activity
Negotiation	Political	Technical	Joint activity
UNCLOS legal expertise	•		May need International TA

Table 2*: Human resource requirements*

Table 3 identifies in general terms the administrative and organizational arrangements that need to be implemented for the orderly and efficient development of the ECS submission. These include but are not limited to:-

- policy and planning decisions
- funding arrangements
- institutional commitments
- infrastructure development
- qualified agencies and organizations and
- advanced technical facilities.

Administrative and organizational arrangements	***Requirement for success***	***Remarks***
National commitment to the initiative	Cabinet level ownership	
Designated leadership for the overall undertaking	Ministerial if not Vice President level	
Clear management and communication framework	Authority to command resources and co-operation across government	
Cost-benefit analysis to assess the prospective economic return of a CSE		Desk top Study (DTS) with International TA
Multiyear budget plan for the duration of the project	Early identification of external funding sources and application criteria	Provision for local funding component
Appropriate legal and diplomatic infrastructures (national government and/or academia)	Motivation of requisite skilled personnel to give time to project	
Agencies appropriately staffed and equipped to collect, manage, and analyze data	Project dedicated staff at working levels	Not a part time activity
Adequate facilities for data management, processing, and visualization	Licences for proprietary software & purchase of work station	Budget issues
Access to high-speed communications for information and data exchange, etc.	Hardware and capacity upgrades	
Training and succession plans for developing staff skills and maintaining staff levels		Motivation and incentive issues

Table 3*: Infrastructure and institutional requirements*

SIDS and LDC

> *… we face same challenges as the other Pacific neighbours … many of our senior officials initially … did not understand the significance of the whole ECS issue and the fact that we had to plan and budget to progress this issue in our respective countries.*
>
> (Nidung, 2008c)

> *… little awareness (at this high level) of what actual resources are to be utilised, what activities had to be undertaken and thus as a result, little commitment has been made for the approval or immediate release of local funds to this exercise.*
>
> (Willie, 2008)

Numerous communications from individuals operating within SIDS and LDC in widely-separated parts of the world, and who are familiar with their national Article 76 programmes, indicate a persistent pattern of administrative unreadiness, indeterminate policies, conflicting national priorities, inadequate funding, insufficient manpower, and scarce technical resources. In short, they paint an unsettling picture of conditions which are not conducive to the timely and effective implementation of their national Article 76 programmes. Most articulate the requirement for externally funded provision of International Technical Assistance. Few if any can contemplate meeting the full cost of procuring survey services should their need be identified by a DTS.

SIDS and LDC can usually identify individuals who possess a collective accumulation of the skill sets listed in **Table 2**; but most of these tend to be stretched to the limits of their capacity and are in demand in other key economic sectors. Compiling a CLCS submission and possible downstream oversight of offshore development may not be seen as a career move by some. It is unrealistic to expect the majority of SIDS and LDC to attain the full range of skills listed in **Table 2**. Nor are they likely to put in place in the foreseeable future the necessary dedicated infrastructure and institutional arrangements outlined in **Table 3** in their entirety.

Training

With the support of key UN agencies such as United Nations Environmental Programme (UNEP) Shelf Programme and others, many developing countries are now in the process of finalizing the delimitation of their EEZ. The Commonwealth Secretariat (ComSec), which has many SIDS and LDC as well as other developing countries in its membership, has provided assistance in UNCLOS matters and co-sponsored training courses in the implementation of UNCLOS art.76 with the UN Division for Ocean Affairs and the Law of the Sea (DOALOS). International academic and scientific institutions have also played their part as have independent consultants. A UNEP/DOALOS workshop is planned for West Africa later in 2008 to complement an earlier DOALOS/ComSec training session in the region.

In the Pacific region SOPAC, in collaboration with Geoscience Australia and the UNEP Shelf Programme, has been delivering an extensive and sustained schedule of work shops to help member states develop their CLCS submissions. The most recent took place in Fiji in May 2008. SOPAC has designed and developed a working database “Pacific Islands Regional Maritime Boundaries Information System” enables users to delimit their maritime zones as prescribed by UNCLOS and provided training to member countries to complete their maritime limits (Webb, 2008). This is the end product from an Australian aid funded project (Artak and Lal, 2006) to design, develop and implement a Regional, Maritime Boundaries initiative. This project commenced in 2002 was a successor to an earlier Maritime Boundaries Delimitation Project (1991-2001).

Despite all the above efforts progress overall is uneven. In parts of Latin America, East African states and Angola, where the UNEP programme has been in dialogue with the decision makers, submission preparations are well advanced. There has been no direct access to decision makers in the Pacific and in *some cases the progress of work is hindered by the lack of human resources and the instability of the teams. Cases of technical committees being formed to disaggregate or be disaggregated some months later have occurred recently* (Fabres, 2008).

4. Expense

> *Finally, technical assistance should consist not only of advice rendered by CLCS experts, but should include financial support for the collection and use of bathymetric, geological, and geophysical observations. These factors are*

particularly problematic because under present circumstances, Benin possesses only limited data sets, and to all intents and purposes it is incapable of meeting the very high cost of chartering a seismic vessel with its associated techhnology.

(Akohou, 2008)

Capacity Issues

The proceedings of high level international conferences and meetings, the authors' personal experience and responses to enquiries of those engaged in the development of their national CLCS submissions reveal that there is a need for an integrated approach to ocean use and management. The research has also identified that many developing states, especially the smaller ones, face chronic difficulties in addressing their maritime problems. The need for capacity-building to offset the lack of financial, technical, and human resources to deal with these problems is recognised and it is evident that efforts are being directed to this end.

By forcing coastal States to focus exclusively on delimitation issues, the provisions of UNCLOS art.76 could be said to inhibit what should be an holistic approach to the exploration and management of marine resources. UNCLOS art.76 survey methodology does provide evidence for non-living resources; and the presence of genetic resources might be inferred from the geological setting. Water column measurements, essential for bathymetry, also aid marine biological research as would the bathymetry itself. Unfortunately the often random and restricted scope of geophysical data collection for delimitation purposes is no substitute for the systematic seabed exploration and resource mapping essential to subsequent exploitation.

For many administrations the task of delimitation is sufficiently demanding of scarce resources that they may not even be able to contemplate the essential and even more costly exploration phase. Yet the two activities are entirely complementary.

It could be argued that SIDS with extensive EEZ, rather than commissioning surveys to meet specific Art.76 criteria, should devote their limited financial and marine science resources to Ocean and Coastal Zone Management issues and fisheries research. These are recurrent themes demanding action by international fora convened to implement the principles of the 1992 Rio Declaration incorporated in Agenda 21 (United Nations, 1992). The full implementation of Agenda 21, the Programme for Further Implementation of Agenda 21 and the Commitments to the Rio principles were strongly reaffirmed at the World Summit on Sustainable Development (WSSD) held in Johannesburg, South Africa in 2002. The Mauritius International Meeting, convened to review the progress of implementation, identified the need for EEZ mapping (Mauritius Strategy, 2005) in support of integrated use of the marine estate.

As usual it is a question of priorities and conflicting demands on limited financial resources. Specific challenges to SIDS include, *inter alia*, environmental degradation, natural disasters, food security, water scarcity, HIV/AIDS, narco-trafficking, small arms trafficking and the impact of terrorism on the economic sectors and tourism in particular. Difficulties in dealing with these problems are exacerbated by a 50% reduction in Official Development Aid (ODA) to SIDS in the period 1994-2004 (Chowdhury, 2004). A situation that is unlikely to improve in the current global financial climate.

ECS delineation and EEZ exploration conflicting priorities

The earlier cited excerpts on the impact of sea level rise, encapsulate the dilemma confronting many developing countries looking to delimit their marine estate and to subsequently explore and exploit its resources. Pressures on the land can perhaps be relieved by the realisation of offshore potential; but in what time scale and at what cost? In extreme cases in the Pacific and Indian Oceans will some SIDS still exist at this point? On the other hand accelerating the process of mapping and evaluating marine resources may yield some means of mitigation.

States contemplating ECS delineation surveys might be advised to expand the scope of work to include an element of reconnaissance level resource exploration; on the principle of "measure once use twice". Cost Benefit analysis is an essential prerequisite for any decision on developing an ECS submission. It is debateable whether undue emphasis on complying with demands of the Technical and Scientific Guidelines (CLCS/11) is skewing what should be an holistic approach to seabed exploration and subsequent sustainable exploitation.

Survey Costs

Estimating the cost of operating a commercial survey vessel is subject to many uncertainties that are linked to global market conditions, the circumstances of specific operations and the nature of the data to be acquired. The latter will dictate the type of vessel and instruments to be provided. In some circumstances it is not unusual for bathymetry and seismic data acquisition to be carried out by separate contractors. Although for short duration surveys in remote locations this is clearly impractical. The costs outlined here are general estimates only, and should not to be taken as exact figures. They are however, indicative of the order magnitude of the expense that could be incurred in delineating the outer limit of the continental margin in accordance with CLCS Guidelines.

Current high demand and supply for the Oil & Gas sector has led to some very high 2D and 3D seismic acquisition rates. Similarly, the current rapid resurgence of growth in telecommunication market sector has led to huge increase in demand for deep water multibeam vessels. Such vessels are in short supply; resulting in higher market rates. Costs for data acquisition and submission development have effectively doubled since 2004. Indicative day rates (vessel, personnel and survey systems only) provided in 2006 were; Bathymetry with Geophysical survey capability $US 15-25k and for deep seismic survey $US 35-50k.

There are four primary categories of costs associated with vessel operation: mobilization, survey execution, standby, and administrative. Of these the biggest variable is that of the mobilization of the survey vessel to location. This cannot be quantified until the specifics of each case are considered by the contractor. The daily rate for survey execution will depend on the *modus operandi* of data acquisition. This could vary from simply Multi-Beam Echo Sounder or even Single Beam Echo Sounder to define a few critical FOS points, to the execution of a full seismic survey, including the full suite of geophysical sensors and bathymetric systems. The range of survey costs, with the addition of seismic data post-processing are shown in **Table 4**.

Activity	Minimum	Maximum	Poss. Example	Remarks
Mobilization	Zero if vessel in transit through location	$2-3 M	$850,000	Lump Sum
Survey execution	$50,000	$400,000	$150,000	Day rate
Post-processing	$ 2,500	$ 5,000	$ 4,000	*Per* acquisition day
QC			$ 1,500	Day rate with costs
Standby	65%	90%	75%	% of daily rate
Administration			15%	% of daily rate *per* day

Table 4**:** *Indicative costs ($US) of data acquisition for ECS delineation obtained from industry contacts with experience of ECS delineation survey and the full CLCS submission process.*

From the example in the table, acquisition costs for a 7 day deployment with port call and one down weather day would be in the order of $US 2.0M. It will be seen that in other circumstances this amount might not even get a vessel to location. The indicative cost of a

similar exercise in 2004 was $0.85M. Data acquisition, be it from public data sources or newly acquired, usually a combination of the two, is only a portion of the total foreign exchange cost associated with the delineation and submission process.

Submission Costs

For a developing state, with limited scientific, administrative and legal resources a significant input of international Technical Assistance (TA) should be provided for. This could be as much as 30% of the cost of acquisition. Matching costs for the local component of the project might be 15% of the foreign component. There would be an additional foreign exchange element, even for nationals, when required to attend CLCS sessions in New York or preparatory and continuation training overseas. Thus in the example the total cost of a submission with a contingency of 5% would be approximately $US 3.0M. It must be appreciated that for comparative purposes with the only historic data obtainable, the survey duration has been assessed at an absolute minimum.

Use of Consultants and National Experts

As indicated earlier the use of consultants is likely to be a significant cost item. If international consultants are to be engaged this should be for the total project duration. Examples have been cited of international TA being restricted to the development of a case for submission; but without adequate transfer of the skills and knowledge to prosecute a successful claim.

In addition there should be a maximum involvement of national experts throughout the project, as success will depend on continuity between the principal phases of the project namely; DTS, Data acquisition and processing, the preparation of the submission, its presentation to the CLCS and its defence in the face of any CLCS objections. It is possible and perhaps practicable that different consultants will be engaged for each phase. Consistency in the national team is therefore all the more important and appointments to the team should take this into account.

Career civil servants and political appointees may only serve for a limited period; but the core technical and legal personnel should be permanent appointees and dedicated to the project. The benefit of this approach would extend beyond a successful submission. The technical and analytical capabilities developed and international contacts fostered would be readily adaptable to other initiatives. This could include the management of the newly acquired marine estate and the effective oversight of exploration and exploitation activities.

Options to reduce costs

Joint commissioning of survey work on a regional basis is an option. This would be particularly relevant for SIDS in the Pacific and the Caribbean and some African coastal States. There is anecdotal evidence[6] that for a variety of reasons this option has not been exploited to date by some larger coastal states despite the potential cost savings on offer; but there are examples of co-operative surveys which include Australia-New Zealand, Canada-Denmark (Greenland) and Canada-USA. Should any States be in a position to make a joint submission then the sharing of survey costs, human resources and data becomes feasible. This possibility exists for the Ontong Java Plateau, the Gulf of Guinea and perhaps in the Caribbean.

5. Concluding Discussion

CLCS Submission in perspective

[6] *pers com* Managing Director of company performing ECS surveys May 2008

The process of ECS delimitation and proving entitlement is a minor component of the total development cycle. Consequently it merits a proportionate investment of national resources. This is particularly pertinent when the required skill sets and/or human resources are more urgently needed elsewhere and over a much longer term. Administrations therefore need to adopt a strategy which will deliver a positive CLCS recommendation without distorting long term development goals. Joint submissions or mutually agreed boundaries with neighbours and regional co-operation with survey programmes should all be considered.

The submission process should be used to develop a cadre of experts, with transferable skills, able to negotiate and manage future offshore exploration and exploitation contracts. Meeting CLCS guidelines for delineation of an ECS is only a first step in a protracted sequence to realise the potential benefits from an ECS. The subsequent developmental phases are unlikely to warrant investment in an independent offshore infrastructure given the finite nature of the resource and the unpredictability of global demand.

Commercial service providers

The DTS is a vital stage in which investment in international TA can be very cost effective. Ideally it could yield access to sufficient public data for submission development without recourse to acquisition of new data. It would optimally identify the minimum data requirement and present the cost benefit case for delineation options.

Should surveys need to be commissioned then the first choice would be to identify government research vessels programmed to transit or work in the region. Depending on the scope of work, it is more likely that commercial survey services will need to be contracted. In either case funding will need to be procured.

Profit sharing option

Economically viable exploitation of seabed resources in the deeper waters of the continental margin is not an immediate prospect. Consequently there is a requirement to establish a win-win risk sharing and reward *modus operandi* among interested parties, to meet immediate, medium and long-term goals of the coastal State. In financial terms this will inevitably mean that the coastal State will need to mortgage some of the future revenues from its seabed assets. This will require skilful negotiation with the exploration and exploitation contractors and the probable involvement of the International Seabed Authority (ISA). The option of involving the ISA in this way might/would require an amendment of the Convention, which may be difficult to achieve. Consideration may therefore need to be given to the involvement of other international institutions in funding delimitation and exploration activity by SIDS and LDC.

For combined exploration and delineation surveys, the additional financial burden could be offset by survey contractors being awarded exploitation benefits from any resources located. Alternatively States Parties, through the ISA, might consider a long-term funding mechanism to enable developing states to delineate their ECS, with repayment from revenues derived from subsequent exploitation activity. The early removal of any ambiguity in jurisdiction, by the *de facto* landward delimitation of the Area, should be mutually beneficial.

SPLOS role

In addition to representing the interests of coastal States with the ISA, States Parties might also consider instructing the CLCS to issue discussion papers (or alternatively to expand its Guidelines) with a view to explaining the rationales behind key scientific and technical interpretations that have been taken so far in dealing with coastal state submissions. For some this may alleviate the burden of retaining expensive legal and other advisory services.

6. Acknowledgements

Profound thanks are due to the many correspondents who have taken time from their very busy schedules to respond to repeated enquiries and requests for clarification. Most are cited as personal communications *(pers com*). Given the sensitivity of the subject some contributors wished to remain anonymous and are included in the following list of countries or regions from which responses were received. These were Benin*, Caribbean, Kenya, Kiribati*, Mozambique, Papua New Guinea*, the South Pacific*, Solomon Islands and a national delegation to the United Nations.

Significant contributions were received from those countries marked with an asterisk and additionally from the Coordinator of the UNEP Shelf programme at GRID-Arendal, Joan Fabres, who provided a global perspective. The regional overview of the South Pacific came from the Manager of the SOPAC Oceans and Islands Programme, Arthur Webb.

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	Coastal State UN-OHRLLL List ***SIDS** ****LDC** *****SIDS/LDC**	**EEZ** *Million km²*	**ECS** *km²*	**Test of Appurtenance**[1] A (passes) B (physically meets criteria)[2]	**Marine research and other submission preparations** Indicative only	**Resources** Hydrocarbons (H); Minerals (M), Gas Hydrates (GH)	**Neighbours** Indicative only	**Remarks** and CLCS Submission information
1	Angola**	0.606	251,304	A	Oil Exploration	M, M, GH Major oil producer	Namibia, Congo	Tentative submission May 09[3]
2	Benin**	0.003	2,759	B	Potential oil producer	H	Togo, Nigeria & Ghana	Joint G. of Guinea submission[4]
3	Cape Verde***	0.790	2,883	Does not meet Test (Monahan)[1]		No proven hydrocarbon reserves	Senegal, Guinea-Bissau, Mauritania	Tentative submission Apr 09[4]
4	Congo	0.025	14,652	B	Significant oil producer	H, M	Angola, Gabon, Dem. Rep. Congo	Not Ratified
5	Dem. Rep. of ** the Congo	0.013	1,029	*As 2*		H, M	Congo, Angola	*Coastline 37 km.* As 6 *Possible claim (Murton)*[5]
6	Equatorial Guinea**	0.283	15,566	*As 2*	Significant oil producer	H	Gabon, Cameroon	Constrained by May 09 submission deadline. *Possible claim (Murton)*[5]
7	Gabon	0.214	136,752	B	Major oil producer	H, M	Equ.Guinea, Congo	As 6
8	The Gambia**	0.020	10,662	B		H, M	Senegal	As 6
9	Ghana	0.218	25,943	B	DTS completed	H	Togo, Cote d'Ivoire	Requested deferral to May 2010[3]
10	Guinea**	0.071	27,897	A		H, M	Guinea-Bissau, Sierra Leone	As 6
11	Guinea-Bissau***	0.038	16,807	A		H, M	Guinea, Senegal	As 6
12	*Mauritania***	*0.154*	*53,312*	*B*	*Exploration not*	*economically viable*[5]	*Senegal, West Sahara*	*As 6*
13	Morocco	0.278	824,562	B		H, M	W. Sahara, Algeria	Ratified 31 May 2007
14	Namibia	0.524	1.1M (?)	A	ECS surveys completed	H, M	S Africa, Angola	Tentative submission Dec 07 not met[3]
15	Nigeria	0.211	103,772	A	ECS surveys completed	H, M Major oil producer	Benin, Equatorial Guinea, S. Tomé et Principe, Benin & Cameroon	Tentative submission May 09[3]
16	Senegal**	0.206	106,650	A		H, M	Gambia, Guinea-Bissau & Mauritania	As 6
17	Sierra Leone**	0.156	51,030	B	ComSec assistance DTS	H, M	Guinea, Liberia	Tentative submission May 09[3]
19	Togo**	0.002	1,232	B	Potential oil producer	H	Benin and Ghana	*Coastline 70 km.* As 9

Appendix 1 Table 1 – West African Coastal States with Potential for Continental Shelf Extension

[1] MONAHAN D. *et al*, 2005. *Applying the Test of Appurtenance Globally*, International Hydrographic Review; Vol.6 No.1 (New Series)
[2] Unresolved maritime boundaries with neighbours may affect any ECS claim
[3] SPLOS/INF/20 16 January 2008
[4] SPLOS/INF/20/Add.1 7 May 2008 www.un.org/Depts/los/meeting_states_parties/eighteenthmeetingstatesparties.htm accessed 17 June 2008
[5] ISA Technical Study: No.1 (2000), Global Non-Living Resources on the Extended Continental Shelf: Prospects at the Year 2000, MURTON B.A. *et al*

NOTES

1. The above States have attended Art.76 training and awareness events as follows

(a) University of Durham UK, International Boundaries Research Unit 1999/2000 (Namibia, Nigeria, Senegal)
(b) GRID-Arendal[6] 2003 (Angola, Guinea-Bissau, Senegal, Cape Verde)
(c) Southampton Oceanography Centre 2001-05 (Senegal (2), Nigeria, Congo, Morocco, Angola, Ghana, Namibia)
(d) DOALOS Accra 2005 (Angola, Benin, Cape Verde, Côte d'Ivoire, the Democratic Republic of the Congo, Gabon, the Gambia, Ghana, Guinea, Guinea-Bissau, Mauritania, Namibia, Nigeria, Senegal, Sierra Leone and Togo)
(e) GRID[6]/BGR[7] Cape Town 2007 (Angola, Namibia).

2. A further Workshop is planned by the UNEP Shelf Programme for West African States in 2008
3. Only Angola and Namibia were represented at the 2003 University of Virginia School of Law, Annual Conference *Legal and Scientific Aspects of Continental Shelf Limits*.
4. For the following States the entry in the entry under "*Continental Shelf Outer Limit Claims*" in the DOALOS Table of claims to maritime jurisdiction 28 May 2008 reads N/A (*No information regarding current legislation is available*), Angola, Congo, Dem. Rep. Congo, Equatorial Guinea, Gabon, Gambia, Guinea, Guinea-Bissau, Togo

[6] UNEP Global Resource Information Database Centre based in Arendal Norway which hosts a facility (UNEP Shelf Programme) to serve UNCLOS Article 76, supporting the needs of developing countries and small island states; acting on their request regarding the delineation of their continental shelf.
[7] Federal Institute for Geosciences and Natural Resources of Germany

	Coastal State UN-OHRLLL List ***SIDS** ****LDC** *****SIDS/LDC**	**EEZ** *Million km²*	**ECS** *km²*	**Test of Appurtenance** A (passes) B (physically meets criteria	**Marine research and other submission preparations**	**Resources** Hydrocarbons (oil/gas) [H] Seabed minerals [M] Gas Hydrates [GH]	**Neighbours** Indicative only	**Remarks** and CLCS Submission information
1	Comoros***	0.164		Does not meet Test according to Monahan *et al* or Murton	Nothing known		Madagascar, Tanzania, Mozambique, Seychelles, France	Intending to submit ECS claim before 13 May 2009[1]
2	Kenya	0.118	20,782	B	ECS surveys completed 2008 *See notes 3 & 4*	H, M, GH	Somalia, Tanzania	Intending to submit ECS claim before 13 May 2009[4]
3	Madagascar**	1.292	2.09M?	A	*Yes* *See note 3*	H, M, GH	Comoros, France, Seychelles, Mozambique	Submission by 21 Sep 2011 (ratified 22 Aug 2001)
4	Mauritius*	1.181	321,039	B	ComSec assistance maritime boundary negotiation. Seabed surveys (India & UK)	H, M and GH	Seychelles, France UK (Indian Ocean Territory)	Government intends to make an ECS submission[4]
5	Mozambique**	0.562	123,258	A	Oil exploration in progress. Proven reserves of natural gas onshore *See note 4*	H, M, GH	S. Africa, Tanzania, France, Madagascar, Comoros	Constrained by 13 May 2009 submission deadline Maritime boundary concerns in Mozambique Channel.
6	Seychelles*	1.349	321,039	B	DTS completed & other assistance from ComSec in UNCLOS matters & *See note 3*	H, M	Madagascar, France, Tanzania, Kenya, Comoros	Intending to submit ECS claim before 13 May 2009[4]
7	Somalia**	0.782	242,676	A	Nothing known	H, M, GH	Kenya, Yemen	Constrained by 13 May 2009 submission deadline
8	South Africa	1.017	184,863	A	ECS surveys in hand 2008 and prior	H, M and GH	Namibia, Mozambique	Intending to submit 2009[2]
9	Tanzania**	0.223	55,681	B	*See note 3*	H, M, GH	Kenya, Mozambique, Comoros	Intending to submit ECS claim before 13 May 2009[4]
10	Yemen**	0.5		B	DTS in progress	Onshore Oil and Natural gas	Somalia, Oman	Constrained by 13 May 2009 submission deadline

Appendix 1 Table 2 – East African Coastal States with Potential for Continental Shelf Extension

NOTES

[1] SPLOS/INF/20 at www.un.org/Depts/los/meeting_states_parties/eighteenthmeetingstatesparties.htm last accessed 24 March 2008

[2] Statement by national representative on 17 June 2008 at 18th SPLOS Meeting

1. The above States have attended Art.76 training and awareness events as follows
(a) University of Durham UK, International Boundaries Research Unit 1999/2000 (Seychelles, Mauritius)
(b) GRID-Arendal 2003 (Mozambique, Seychelles, Madagascar)
(c) Southampton Oceanography Centre 2001-05 (Mauritius, Seychelles, Mozambique (2), Tanzania)
(d) DOALOS Colombo 2005 (Kenya, Madagascar, Mauritius, Mozambique, Seychelles, S. Africa, Tanzania)
(e) GRID-Arendal/BGR Cape Town 2007 (Comoros, Madagascar, Mauritius, Mozambique, Namibia, Seychelles, South Africa, United Republic of Tanzania)
(f) National Oceanography Centre, Southampton, MSc. module 2008 (Yemen)
2. Mauritius, Seychelles, S. Africa and Tanzania were represented at the 2003 University of Virginia School of Law, Annual Conference *Legal and Scientific Aspects of Continental Shelf Limits*
3. The GRID-Arendal UNEP Shelf programme has been decisively involved in the delineation project in Kenya, Madagascar, Tanzania and Seychelles where national task forces where constituted during the dialogue with the programme or following capacity building workshops.
4. The Commonwealth Secretariat (ComSec) collaborated with DOALOS in the provision of Art.76 training and Desk Top Study (DTS) development for Kenya and Mozambique
5. States listed as LDC by UN-OHRLLS; Comoros, Madagascar, Mozambique, Somalia, United Republic of Tanzania and Yemen
6. States listed as SIDS by UN-OHRLLS (Institutional List); Comoros, Mauritius, Seychelles
7. For the following States the entry in the entry under "*Continental Shelf Outer Limit Claims*" in the DOALOS Table of claims to maritime jurisdiction (as at 28 May 2008) reads N/A (*No information regarding current legislation is available*), Comoros, Kenya, Somalia, Tanzania

	Coastal State UN-OHRLLL List ***SIDS** ****LDC** *****SIDS/LDC**	**EEZ** *Million km²*	**Test of Appurtenance** A (passes) B (physically meets criteria)	**Marine research and other submission preparations** Indicative only	**Resources**	**Neighbours** Indicative only	**Remarks** and CLCS Submission information
1	Cook Is*	1.8	Potential CSE (UNEP Shelf)[1]	Deep-sea mineral prospecting late 70s, JAPAN/SOPAC deep-sea mineral resource programme. Tripartite Cruises [ANZ/USA/SOPAC], confirmed mineral potential of manganese nodules	Major deposits cobalt rich manganese nodules	French Polynesia, Kiribati, American Samoa, Tonga	Linked with other eligible states as having a credible claim to "territory beyond current 200M EEZ"[2]
2	Fiji*	1.28	B	Tri-partite Cruise 1985-7 JAPAN/SOPAC Deep Sea Mineral Resources Programme (DSMRP) from 1985 with its final phase completed in 2002. ComSec assistance DTS	Hydrocarbons M'g'n'se crust Hydro thermal deposits	Tonga, NZ, New Caledonia, Vanuatu,& Solomon Is, Tuvalu, Wallis & Futuna Is.	Discussion with NZ and Tonga Constrained by May 2009 submission deadline
3	F S Micronesia (FSM)*	2.98	B	EEZ explored in 1997 and 1998. JAPAN/SOPAC DSMRP	Cobalt rich crust	Guam, PNG, Palau, Nauru, Solomon Is.	*See 4*
7	Palau*	0.63	Potential CSE (UNEP Shelf)[3]			FSM	Tentative submission May 09[5]
4	Papua New Guinea (PNG)*	3.12	B	Japan/SOPAC programme, cruise in EEZ in 1992. ComSec assistance DTS	Hydro thermal deposits	Solomon Is., Australia & FSM	Joint submission with FSM & Solomon Is. in progress to meet May 2009 deadline[4]
5	Solomon Is.***	1.34	B	CCOP-SOPAC Tripartite Programme (NZ/AUS/US) & EU/SOPAC Maps project 1993	Hydro Thermal deposits Hydrocarbons	Vanuatu, PNG, Fiji, New Caledonia, FSM, Tuvalu	*See 4*
6	Tonga*	0.7	Potential CSE[5] (SOPAC)	ANZUS/CCOP/SOPAC Cruises 1982/84 Swath mapping RV 'Gloria' 1990–1, marine scientific survey 2003 assess potential deep-sea mineral resources,	Hydrocarbons Hydro thermal deposits	W. & American Samoa Fiji, NZ, Niue, Wallis & Futuna Is.	Intends to submit at future unspecified date[6]. Ongoing discussion with NZ & Fiji Licensed exploration in EEZ 2008
8	Vanuatu**	0.71	Potential CSE (SOPAC)	EU/SOPAC Maps project 1993		New Caledonia, Fiji, Solomon Is.	*Submit by 10 Sep 2009*
9	Kiribati**	3.7	Potential CSE (UNEP Shelf)	ComSec assistance DTS	Cobalt rich crust	Tuvalu, Marshall Is, Cook Is., Nauru	*Submit by 26 Mar 2013*
10	Tuvalu**	1.3	Potential CSE (UNEP Shelf)	EU/SOPAC *Map* project 1993 PIRMBS Maritime Boundary delimitation	Cobalt rich crust	Kiribati, Fiji, Wallis & Futuna Is.	*Submit by 08 Jan 2013*

Appendix 1 Table 3 – South Pacific Applied Geoscience Commission (SOPAC) member States with Potential for Continental Shelf Extension (CSE)

[1] *Pers com* J.Fabres 1 August 2008
[2] Excerpt from SOPAC site *http://www.sopac.org/tiki-read_article.php?articleId=108* accessed 12 June 2008
[3] UNEP Scanning Assessment Report (UNEP Shelf Programme 2005)
[4] *pers com* A. Webb SOPAC Ocean and Islands Programme Manager 4 June 2008
[5] SOPAC Annual Report 2005
[6] SPLOS/INF/20 16 Jan 2008

NOTES

1. All states have benefited from longstanding SOPAC programme of UNCLOS awareness raising and capacity building
2. SOPAC officers represented member states at the 2003 University of Virginia School of Law, Annual Conference *Legal and Scientific Aspects of Continental Shelf Limits*
3. Following states have attended international Art.76 training events, Fiji (3), PNG (3), Solomon Is (3)., FSM (3), Tonga (2), Vanuatu, Palau
4. In 2005 SOPAC commissioned the UK National Oceanographic Centre (NOC), to undertake desktop assessments (DTS) for Federated States of Micronesia (FSM), Kiribati, Palau, Solomon Is., Tuvalu and Vanuatu to establish their potential CSE[7].
5. Fiji, PNG and Tonga obtained independent advice on their CSE potential[8]
6. Reliable figures for the potential area of CSE for individual SOPAC member states not available but understood from SOPAC that some states might be able to claim between 10 and 15% of the area of their EEZ[9]
7. Fiji along with Cook Islands, Solomon Islands, Kiribati, Palau, the Federated States of Micronesia, Tonga and Papua New Guinea have a credible claim to more than 1.5 million km^2 of additional space beyond their current 200 M Exclusive Economic Zone[10]
8. For the following States the entry under "*Continental Shelf Outer Limit Claims*" in the DOALOS Table of claims to maritime jurisdiction (as at 28 May 2008) reads N/A (*No information regarding current legislation is available*), Kiribati, Palau, Tonga, Tuvalu

[7] SOPAC Annual Report 2005 http://www.sopac.org/data/virlib/AR/AR2005.pdf
[8] SOPAC Annual Report 2006 http://www.sopac.org/data/virlib/AR/AR2006.pdf
[9] *pers com* A Webb SOPAC Ocean and Islands Programme Manager 4 June 2008
[10] Excerpt from SOPAC site *http://www.sopac.org/tiki-read_article.php?articleId=108* accessed 12 June 2008

	Coastal State UN-OHRLLL List ***SIDS** ****LDC** *****SIDS/LDC**	**EEZ** *Million km²*	**ECS** *km²*	**Test of Appurtenance** A (passes) B (physically meets criteria)	**Marine research and other submission preparations** Indicative only	**Resources** Hydrocarbons (oil/gas) [H] Seabed minerals [M]	**Neighbours** Indicative only	**Remarks** and CLCS Submission information
1	Barbados*	0.187		A	EEZ boundary with 6 defined	Not listed Murton Hydrocarbons[2]	T&T, Guyana, Suriname, France	Submitted May 08[1]
2	*Bahamas**	0.655		CARICOM[2] Not by Monahan		*Not listed Murton Hydrocarbons[2]*	*USA, Cuba*	*Ratified 29 Jul 83* *Delineation dispute with USA*
3	Cuba*	0.351		As 2		Not listed Murton Hydrocarbons[2]	Jamaica, USA, Bahamas	Intending to submit by 13 May 09[3]
4	Guyana*	0.13	61,003	A	Proven Oil reserves DTS completed Boundary with 5 defined	H, M	Surname, T&T Venezuela	Intending to submit by 13 May 09[3] Boundary dispute with Venezuela
5	Suriname*	0.101	89,1110	A	Proven Oil reserves Boundary with 4 defined	H, M	Guyana, Fr. Guiana & Barbados	Intending to submit by 13 May 09[3]
6	Trinidad & Tobago* (T&T)			B	Proven Oil reserves EEZ boundary with 1 defined	Not listed Murton	Barbados, Grenada, Guyana, Venezuela	Intending to submit by 13 May 09[3]
7	*Venezuela*	*0.364*	*14,431*	*B*	*Proven Oil reserves*	*H. M*	*Guyana, T&T*	*Not ratified* *Boundary disputes with neighbours*
8	*Costa Rica*	*0.574*		*B*		*Not listed Murton*	*Panama, Nicaragua*	*Ratified 21 Sep 92*

Appendix 1 Table 4 – Caribbean Coastal States with Potential for Continental Shelf Extension

NOTES

1. The above States have attended Art.76 training as follows;
(a) Southampton Oceanography Centre 2001-05 (Barbados, Guyana, Suriname)
(b) DOALOS Argentina 2006 (Bahamas, Barbados, Costa Rica, Cuba, Guyana, Suriname, Trinidad and Tobago)
(c) GRID/BGR Port of Spain 2008 (Bahamas, Barbados, Costa Rica, Cuba, Guyana, Suriname and Trinidad and Tobago)
2. Guyana only state represented at 2003 University of Virginia School of Law, Annual Conference *Legal and Scientific Aspects of Continental Shelf Limits*
3. States 1-6 above are listed as SIDS by UN-OHRLLS (Institutional List); but 4 & 5 are omitted from the Economic List
4. For the following States the entry under "*Continental Shelf Outer Limit Claims*" in the DOALOS Table of claims to maritime jurisdiction (as at 28 May 2008) reads N/A (*No information regarding current legislation is available*), Bahamas, Barbados, Costa Rica and Suriname

[1] SPLOS/INF/20/Add.2, 6 June 2008
[2] http://www.caricom-fisheries.com/website_content/publications/documents/Delimitation_of_Maritime_Boundaries_within_CARICOM.pdf accessed 03 July 08
[3] SPLOS/INF/20, 16 January 2008

Biographies

Ian Russell is a Chartered Hydrographic Surveyor and former Charge Surveyor in the Hydrographic Service of the British Royal Navy. He designed and delivered undergraduate and post graduate courses in Hydrography and Marine Resource Management for Southampton Institute (now Southampton Solent University). He is the Sole Principal of Seaconsult UK.

His interest in UNCLOS and the Continental Shelf dates from 1996. He co-authored a paper, given at the Second Conference on the Geodetic Aspects of the Law of the Sea (GALOS), on cost effective survey methods for the delineation of the Outer Limits of the Continental Shelf. His first UNCLOS consultancy assignment was a review of Maritime Boundaries for a SIDS. He has subsequently advised clients on UNCLOS issues and been retained by developing coastal States evaluating their ECS entitlements and preparing submissions to CLCS.
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Ron Macnab is a retired marine geophysicist who wrote his first paper on UNCLOS and continental shelf extensions in 1987. Among other affiliations, he is a member of the American Geophysical Union (AGU) and of the International Law Association (ILA), where he participates in the deliberations of the Committee on the Legal Issues of the Continental Shelf (CLICS). He is past chairman of the IAG/IHO/IOC Advisory Board on the Legal and Technical Issues of the Law of the Sea (ABLOS).