Proceedings and Report on
The Association of Canada Lands Surveyors
(ACLS) Offshore Issues Consultation Workshop

prepared for

The Association of Canada Lands Surveyors

by

Sue Nichols
Michael Sutherland
Sam Ng'ang'a
David Monahan

MARCH 8, 2001
PRINCE GEORGE HOTEL, HALIFAX, NOVA SCOTIA

Acknowledgements

The editorial team for this report would like to acknowledge the efforts and contributions of the following in making the workshop possible and supporting the completion of this report:

1. The Association of Canada Lands Surveyors (ACLS)
2. The Legal Surveys Division (LSD), Natural Resources Canada
3. The Canadian Hydrographic Service, Department of Fisheries and Oceans

The Team would like to note in particular the assistance and support of Jean Gagnon (LSD), Jean-Claude Tétreault (ACLS), Ian Edwards (ACLS), Neil Anderson (CCMC), Ken Paul (CHS), and Loretta Melnychuk (ExxonMobil Canada). Other participants have provided information and advice and this is greatly appreciated. It all made our task easier.

Executive Summary

In March 2001, the Offshore Issues Committee of the Association of Canada Lands Surveyors (ACLS) organized a special one-day workshop in conjunction with the ACLS Annual General Meeting in Halifax. The Committee had invited nearly 200 stakeholders in the Canadian offshore – from oil and gas development companies to provincial coastal land administration agencies. Nearly 60 attended the workshop coming from as far away as Texas and Western Canada. All of the invitees had something in common – a concern for how property rights and structures are surveyed, charted, and recorded in Canada's offshore.

This report is designed to:

- summarize the presentations to the workshop;
- report the findings and recommendations of the workshop roundtable discussions;
- provide an analysis and recommendations by the editorial team.

There were many issues discussed and many of the issues were not new. However, the workshop was timely because:

- The ACLS, under new legislation has an opportunity to take on greater responsibility for leadership in marine boundary and related issues;

- There is a growing awareness of the need for ocean management and co-management strategies;

- There is a common understanding and goal among stakeholders of improved information management and the fact that we may have the information technologies but we still lack the institutional structures in the offshore;

- There is a critical need to develop Canada's international leadership role in the offshore, especially with the economic opportunities abroad and the fact that the United Nations Convention on the Law of the Sea is coming into force.

Major conclusions of the workshop are summarized in the recommendations in Section 5 (from the participants) and Section 6 (from the editorial team in a broader ocean governance perspective). These recommendations represent what priority issues were (or were not) addressed and gives the ACLS and other stakeholders some direction for the future.

1. Survey Issues

There was consensus throughout the workshop that there is a need to improve many areas surrounding the survey and registration of property rights offshore and their associated structures. This is an area where the ACLS and Legal Surveys Division (NRCan) can collaborate with industry and other government departments to ensure that standards best meet the concerns of all stakeholders. This could include updating the 1982 3rd edition of *Surveying Offshore Canada Lands for Mineral Resource Development* made available through ACLS. It was generally accepted that offshore surveys be referenced to NAD83 CSRS and that consistent transformations be used.

There were serious concerns about the inclusion of directional drilling information on survey plans. This was in part because it is the responsibility of the Regulatory Boards to ensure that activities take place within the lease boundaries and in part because Canada Lands Surveyors do not always have the special education required to do such hydrographic surveys. In fact it was suggested that a "team approach" to offshore surveys be adopted where a CLS would work with a hydrographic surveyor.

There was agreement that non-proprietary information that would indicate any hazards to navigation (e.g., structure on the seabed but not those below) should be included on survey plans. Seismic data should not be shown on survey plans. However, there was agreement that structures such as pipelines and cables should have a survey plan and an easement similar to onshore property regimes.

2. Data Sharing/Public Registry

There was strong consensus that more information about property rights and structures should be publicly available (e.g., public register of plans), but less consensus on how this data could be managed and by whom. Suggestions were made that programs such as GeoConnections, working with Legal Surveys Division and the Canadian Hydrographic Service, could provide a model for bringing together the stakeholders in the provincial, federal, and private sectors. Together they would look at what information is framework data, and also at policy issues such as data pricing, cost-recovery, copyright and liability. It was recognized that a major component of data sharing is the set of metadata that would be required and it was recommended that international standards be used.

3. Jurisdiction and Property Rights Infrastructure

The workshop participants generally agreed that there was a need to improve the property rights regime offshore. There are still many unknowns, the largest being perhaps the emerging role of First Nations and the multiple layers of administrative boundaries marking federal, provincial and sometimes municipal responsibilities. The ACLS has an opportunity to use its expertise to define the issues, meet with stakeholders and demonstrate the importance of co-leading and co-management in such a complex arena.

To date, Canada has not ratified the United Nations Convention on Law of the Sea, in large part due to the need to resolve issues on straddling stocks. This is another area where ACLS and others can promote the establishment of a clearer offshore regime and a draft letter to appropriate Ministers is included in Section 6.5.

There is also growing recognition of the coastal problems and the need for many policy issues to be addressed across the land/sea interface. This is especially true of the datasets that are now collected by several levels of government. The participants argued that there needs to be education within government and industry to help understand the mosaic of public and private rights offshore. There are also issues such as pipelines and cables that need to be addressed from both property rights and navigational perspectives.

4. Marine Cadastre and Geospatial Data Infrastructure

Many of the issues discussed during the workshop focused on the need for better information management. These include items such as:

- updated data standards
- national public registries for all offshore survey plans
- improved data sharing and exchange
- appropriate pricing and liability strategies
- better ocean mapping information coverage

The participants agreed that there was a need to take on these issues in a more systematic and inclusive fashion. This is also the purpose of the Marine Geospatial Data Infrastructure (MGDI) as part of the national data highways being put in place with through GeoConnections (NRCan). This initiative involves governments at all levels, the private sector, and academia. It is a conclusion of the editorial team that there needs to be more emphasis in the national geospatial data infrastructure on Canada's vast ocean resources and spaces.

What became clear at the workshop was that property, administrative, and jurisdictional boundaries are fundamental elements in any geospatial data infrastructure, and especially in the offshore where these boundaries still have many technical and legal uncertainties. It is for this reason that the editorial team strongly recommends that the concept of a 3-D Marine Cadastre be promoted by the ACLS. With support of Legal Surveys Division, the Canadian Hydrographic Service, and GeoConnections a pilot project could demonstrate some of the problems and solutions. There will also be a need for strong participation by industry and First Nations if the concept is to effectively realize the interests in Canada's offshore.

Congratulations to the ACLS for making this workshop a first step towards a modern property rights infrastructure for marine areas.

TABLE OF CONTENTS

Workshop Attendees

	Participants	Department or Company Name
1	Badru Mukhida	Aliant Telcom Inc.
2	Jean-Claude Tétreault	Association of Canada Lands Surveyors
3	Hal Stanley	Canada-Newfoundland Offshore Petroleum Board
4	Ken Paul	Canadian Hydrographic Service
5	Blaine Carr	Canadian Seabed Research Ltd.
6	Derrick Peyton	CARIS
7	Bernie Hoganson	Department of Environment and Local Governments
8	Andrew Breau	Department of Natural Resources and Energy
9	Derek A. Salvage	Exxon Mobil Upstream Technical Computing
10	Jackie Portsmouth	ExxonMobil Canada
11	Loretta Melnychuk	ExxonMobil Canada
12	Andrew Layzack	Fisheries and Oceans Canada
13	Bob Rutherford	Fisheries and Oceans Canada
14	David H. Gray	Fisheries and Oceans Canada
15	J.R. MacDougall	Fisheries and Oceans Canada
16	Julian Goodyear	Fisheries and Oceans Canada
17	Michael Earle	Fisheries and Oceans Canada
18	Peter Hale	Fisheries and Oceans Canada
19	Andy Power	Fugro Jacques GeoSurveys Inc.
20	Barry Ryan	Fugro Jacques GeoSurveys Inc.
21	Pat Byrne	Fugro Jacques GeoSurveys Inc.
22	Bruce Calderbank	Hydrographic Survey Consultants Intl. Ltd
23	Jim Banks	Locus Surveys
24	Neil Anderson	Marine Institute of Memorial University of Newfoundland
25	John Stewart	McGregor GeoScience Ltd.
26	Boris de Jonge	McInnes Cooper
27	Doug Culham	Natural Resources Canada
28	Andrew Brebner	Natural Resources Canada
29	Don Junkins	Natural Resources Canada
30	Felix Kwamena	Natural Resources Canada
31	Gord Isaacs	Natural Resources Canada
32	Jacob Verhoef	Natural Resources Canada
33	Jean Gagnon	Natural Resources Canada
34	Richard A. Pickrill	Natural Resources Canada
35	Richard Haworth	Natural Resources Canada
36	Ron MacNab	Natural Resources Canada
37	William Clark	Natural Resources Canada
38	Douglas Morgan	New Brunswick Land Surveyors Association
39	Christine Fagan	Newfoundland Ocean Industries
40	Patrick Ringwood	Patrick Ringwood Corp.
41	Steve Thomas	Petro-Canada
42	Ron Pitcher	Pro-Dive Marine Services

43	Tim Lawrence	Racal Surveys Canada Limited
44	Réjean Castonguay	Service New Brunswick
45	Roger Gaudet	Service New Brunswick
46	Glen Belbeck	Shell Canada Limited
47	Serge Bernard	Transportation and Public Works
48	Carl Friesen	Underhill Geomatics
49	Dave Monahan	University of New Brunswick
50	Michael Sutherland	University of New Brunswick
51	Sam Ng'ang'a	University of New Brunswick
52	Susan Nichols	University of New Brunswick
53	Dale Scrivens	Association of Canada Lands Surveyors
54	Gordon McCallum	Retired Legal Counsel
55	Ross Lee	
56	Susan Christie	

1. Introduction to Proceedings and Report

In March 2001, the Offshore Issues Committee of the Association of Canada Lands Surveyors (ACLS) organized a special one-day workshop in conjunction with the ACLS Annual General Meeting in Halifax. The Committee had invited nearly 200 stakeholders in the Canadian offshore -- from oil and gas development companies to provincial coastal land administration agencies. Nearly 60 participants attended the workshop, coming from as far away as Texas and Western Canada. All of the participants had something in common – a concern for how property rights and structures are surveyed, charted, and recorded in Canada's offshore.

A number of the issues discussed during the workshop, by both invited speakers and by participants in the roundtables, are not new. Many issues (e.g., datum transformations, federal-provincial jurisdiction, continental shelf delimitation, and interagency co-operation) have been debated in forums for decades. Their complexity, scope, and impacts are appreciated by industry and government, if not always well understood. ***One resounding conclusion from the workshop was that it is time to take action on the issues, even if the action is only to determine what agency or body should take a lead role in developing a strategy.***

1.1 Why the Workshop was Timely

If these issues are not exactly new, then why was this ACLS Workshop welcomed by many in the federal and provincial governments, and even more so, by the private sector? Why was one result of the workshop a call for more workshops/forums to continue the dialogue and get the issues resolved? The editorial team of the proceedings reported here suggest the following reasons:

1. **The Evolving Role of the ACLS:** The interested parties need a champion to organize discussion and seek ways of resolving the problems. The ACLS, newly established as a self-regulating profession in 1999, has taken on this challenge with support from the Legal Surveys Division (LSD) of Natural Resources Canada. The ACLS represents government and industry and has members with federal and provincial affiliations. Its mandate is the regulation of the Canada Lands Surveyors' profession. ***The Association has a window of opportunity to rally support, to clarify the issues, and to help develop strategies for change.***

2. **The Growing Awareness of the Need for Ocean Management and Co-Management Strategies:** In the last two decades the oceans have been the subject of several controversies that focused attention not only on the ocean's economic potential and its environmental fragility, but also on the need to include diverse interest groups at all levels in the decision-making processes. Government and academic science is finally being augmented by community knowledge and input.

Petroleum and fishing industries are increasingly being asked to be more environmentally responsible and to develop ways in which the resources can be shared among the many coastal stakeholders. Aboriginal rights, depletion of the cod fishery, the Atlantic Accords, and the recent Newfoundland-Nova Scotia boundary dispute in so-called "Canada Lands" all point to a slowly changing concept that any ocean management in Canada will be co-management. ***Co-management means information sharing; to co-manage there is a need to involve the stakeholders.*** The new federal *Oceans Act* provides one framework for action but there is much work to be done.

3. **The Common Goal of Improved Information Management:** Many of the problems have an underlying theme: how little we know about Canada's ocean space. That does not necessarily mean that the information does not exist. From technical issues such as *"which set of co-ordinates should define the limit of an oil lease?"* to the much harder questions such as *"how can private and public sector agencies be encouraged to share data"*, there is a consistent thread of creating an environment in which information can be pooled accurately and efficiently to support management and co-management strategies. ***We have the information technologies, but we lack the institutional structures to effectively manage this information in the offshore.***

4. **The Need to Develop Canada's Offshore Leadership Role, Nationally and Internationally:** The Canadian offshore is being surveyed and charted by other nations in search of resources. In turn, because of policies such as cost-recovery, Canadian ships are surveying the extended jurisdictions of other nations (e.g., Ireland) in lieu of our own coast. Canadian industry, government, and academia have developed leading edge technologies and techniques that are in demand internationally but underutilized in surveying Canada's offshore. Canada is also one of the few signature nations that has not yet ratified the 1982 *United Nations Law of the Sea Convention* (UNCLOS), although Canada supports most of the principles. And despite the fact that Canada has the world's largest coastline, provincial and regional coastal zone management efforts have been sporadic at best. Other nations are using our offshore research to participate in international markets. ***Canada still has an opportunity to provide leadership internationally in coastal and offshore issues, but the window is slowly closing.***

Participants at this workshop understood that there is a need to act now and to act together. No single level of government or single agency can deal with all of the issues. However, within the context of the workshop, participants made it clear that there is a need to focus attention on the offshore property rights piece of the puzzle and to improve how information about these rights is managed for Canada's offshore. ***Among other recommendations, the participants called for the development of a marine cadastre – a record of legal interests and associated structures offshore that can be used by all public and private sector stakeholders.*** Creating and completing such a cadastre would be an essential effort in the development of a Marine Geospatial Data Infrastructure (MGDI) and would once again affirm Canada's leadership in the offshore.

1.2 Structure of the Report

This report provides a summary of the workshop and workshop findings. The editorial team was also asked to provide its analysis based on the issues raised at the workshop. The report is presented as follows:

- a summary of the invited presentations made to the workshop (Section 2);
- a summary of the questions for, and findings of, the roundtable sessions of the workshop sessions in table format (Section 3);
- a summary of the issues raised during the presentations and roundtable (Section 4);
- the conclusions and recommendations of the workshop participants (Section 5);
- an analysis by the editorial team of the issues raised, and not raised, during the workshop, including recommendations of the team to the ACLS (Section 6).

1.2.1 Special Symbols Used in this Report

The workshop consisted of speeches by invited speakers, open discussion periods, and roundtable discussions focused on debating certain predetermined questions of relevance. Although there was a formal structure to the workshop, spontaneous interaction was encouraged. For example, audience members periodically interrupted speakers with appropriate questions. This report attempts to capture that air of interaction by the use of certain symbols as follows:

Symbol	Interpretation
◘	Main point
•	Sub-point (second level)
–	Sub-point (third level)
@	An unidentified person's comments/questions
&	Speaker's response to comments/questions
☛	Notes by the editorial team (*in italics*)

1.2.2 Disclaimer/Warning

Some comments and opinions expressed at the workshop may not be included in this report due to:

- Speakers being inaudible because of not speaking directly into a microphone
- Comments missed by the workshop recorders
- Roundtable discussions not being entirely reported

2. Invited Presentations to the Workshop

2.1 James Banks, President of ACLS: Opening Remarks
Speaking on *"The ACLS and its involvement in the offshore"*

- ACLS statistics, mandate and history:
  - Membership consists of more than 500 geomatics professionals.
  - The association is officially bilingual.
  - Canada Lands are its exclusive jurisdiction, where Canada Lands are generally described as being under the administration of the Federal Government, including aboriginal lands, national parks, territorial lands, and the Canadian offshore.
  - The ACLS grew out of the Dominion Land Surveyors Association, established in 1882.
  - The predecessor and the "namesake" of the modern association was "born" in 1985.
  - Around 1991 the ACLS took over "certain responsibilities" from the Minister of Energy, Mines and Resources.
  - The ACLS became a self-regulating body in March 1999.
  - "Given the geographically scattered nature of Canada Lands" the association has the distinction of being the only federally enacted association with the mandate to provide services in all provinces and territories.
  - Services provided by members of the ACLS include:
    - The determination and location of boundaries.
    - The determination of the limits of any type of interest in any identifiable parcel.
    - The collection of any type of geo-spatial data, plus the processing, interpretation and management of "same data."
  - There are 12 established committees covering important areas of responsibilities and interests for the ACLS ***(At this point the speaker recognized the efforts of the Offshore Issues Committee, which is responsible for the content and development of the workshop. Bruce Calderbank, Pat Byrne, Tim Lawrence, Jean Gagnon, Julian Goodyear [absent], Ian Edwards [absent], and Harold Jones [absent] were all recognized)***
- Government policymakers and major stakeholders were invited to the workshop to discuss issues of common concern.
- The primary goals of the workshop are to:
  - Heighten awareness of the responsibilities and concerns of the stakeholders in Canada Lands.
  - Define a common strategy to move "this industry sector" forward for the betterment of all.
- Canada Lands in the offshore represents lands greater than the "Canadian landmass."
- In some respect, offshore lands are in the "forefront stage of development." Rules and work procedures are being developed and revised to meet the needs of the petroleum and telecommunications industries.
- Reliable precision and with equal positioning can be offered by the latest surveying techniques.

- A viable offshore survey industry is required to ensure that the development goals are reached future projects.
- ACLS members working in the offshore face certain challenges:
  - The extent and exclusive nature of "our jurisdiction."
  - Water datums for geo-spatial referencing.

2.2 Doug Culham, Deputy Surveyor General (East): Opening Remarks Speaking on *"The need for coordination"*

- "We are here to talk about property rights in the offshore and the infrastructure required to support the various property systems."
- Discussions should involve all stakeholders and a "general understanding of the common denominators":
  - Overlapping jurisdictions
  - Administrative agreements
  - Survey practices
- Canada's coastal state borders on 3 oceans. Canada has the world's longest coastline. Canada has one of the largest continental shelf areas.
- Complexities of property rights affect efficient use of ocean space and make it increasingly difficult to coordinate activities and ensure that policies and property rights systems are "cohesive." The complexities of rights [are related to] aquaculture, commercial fishing, tourism, recreation …
- Some stakeholders are increasingly concerned about the large number of government organizations with ocean mandates and regulatory regimes. [This situation] unnecessarily complicates opportunities for the development of offshore resources.
- Re: the concept of integrated management:
  - Based on the concept of integrated management, the *Oceans Act* came into force on January 31, 1997 as a result of a National Advisory board report in 1994 to the Prime Minister to develop a strong ocean strategy and policy.
  - Geomatics Canada -- NRCan is the scientific and economic department that promotes sustainable development (re: oil, gas and minerals on Canada Lands). NRCan has 3 divisions: energy sector, metals sector and science sector.
  - The difficulty is that there is little coordination among the various organizations.
- The existence of [offshore] property rights leads to inter-jurisdictional issues, which directly affect proper management of offshore resources. Some of the issues relate to provincial [boundary] extension offshore vs. Canada Lands offshore.

Moderator Comments in Relation to the Opening Remarks: Neil Anderson

- There are a number of issues in the coastal zone where, for example, oil and gas pipelines intersect with property rights and therefore there is the need to define exactly where those rights are, and also their spatial extent.
- There is a whole range of community issues from aquaculture and fisheries:
  - What are the boundaries?
  - What are the responsibilities around that?

- Aboriginal and community rights need to be addressed.

- "Who is a stakeholder, or not?"
  - Federal/provincial government, university, policy, oil and gas, first nations, communities, telecommunications, marine transportation, navy….?
  - Often the strongest stakeholders are the ones who are investing.
  - We have a wide range of stakeholders and not all stakeholders are present.
  - [I see that the] oil and gas [industries] are well represented.

  @Comment from the audience: *A lot of "these people" were invited!*
  - There are a lot of complex issues to address, for example "Who manages the area around Hibernia?"
  - We hope that all stakeholders join in the discussions and pursue their objectives.
- In managing the commons we have a lot of stakeholders
- Based on the proceedings of this workshop a white paper (a picture of the status quo) from the Surveyor General's office will be prepared for presentation to the Minister. This [white paper] could grow into a substantial new "look" at the issues at hand.

✒ **Editors' Note*: Based on further research by the editorial team it has been ascertained that what the Surveyor General will actually prepare is a position paper to the Minister regarding the role of government in a property rights infrastructure in the offshore.***

- Integration, cooperation, collaboration and coordination are complex issues:
  - Many departments are cooperating, but not integrated.
  - Many departments are horizontally integrated but not vertically integrated.
  - There are problems of data sharing (integrated data, and data-sharing systems).
  - There is the paradox of infrastructure (i.e. as one increases the simplicity of access to a wider range of people, the complexity of the infrastructure increases, "probably exponentially").
  - Regarding integrated management: any decision making is based on good information
  - Bureaucracies are in the way
  - It is legitimate to make specific recommendations to the Oceans Division of DFO in the context of the implementation of the Canada Oceans Act.
  - It is appropriate to make specific recommendations on some of the legal issues of how we are positioning and classifying pipelines.

2.3 Pat Byrne (Fugro Jaques Geosurveys): Speaking on *"Survey Issues"*

- Survey datums are a problem (NAD27 & 83, wgs84, NAD83 CSRS, ITRF)
  - Based on a reference ellipsoid
  - Datum confusion
  - Conversion issues: survey done in one datum but publication required in another.
  - When will NAD27 be retired in favor of ITRF in the offshore?

- Why not register CLS plans in ITRF?

- Offshore survey specifications
  - Existing specs based on distance offshore (9m), which is invalid with DGPS.
  - Need to update accuracy requirements.
- Directional drilling
  - CLS require the well seabed position only.
  - Most reservoirs located by directional drilling only.
  - "How do we deal with [that]? It should be something to consider registering on CLS plan."
- What is not covered on CLS plan
  - Need to increase the number/scope of items covered by CLS plans. "My information tells me that we need to cover any structure on the seabed."
  - "There are a number of cables that do not have to be surveyed to proper standards."
  - "Only sub-sea templates have to be registered with CLS."
  - A complete record of offshore does not exist.
- Data storage and sharing
  - A complete record of offshore interests does not exist.
- Registration of CLS Plan
  - It takes a long time for Legal Surveys Divisions (LSD) to process plans.
  - LSD need to speed up processing.

Moderator Comments on the Speaker's Presentation: Neil Anderson

- "Are there any of the issues/problems which cannot be resolved?"
- Suggests that recorders take each point made by the speaker and report on the body responsible (responsibility center) for that particular problem

<u>OPEN DISCUSSION PERIOD</u>

(@ Unidentified person's comments/questions)
(& Speaker response to comments/questions)

- **Queries/comments on ITRF**
  - **@** I see data storage is the biggest problem!
  - **@** Is it correct that ITRF is a bit of a moving target?
  - **&** "Yes! …Its moving … but it actually corrects itself each and every year …"
  - **@** However, from a data handling point of view, knowing absolute errors at any point in time is useful information
  - **@** Money for conversion is a big factor
  - **@** Do you think that ITRF is the best system? & "Yes!"

- **Queries/comments on what should be on a CLS plan**
  - **@** Why does the Federal government need to know so much detail for a federal reporting procedure?
  - **&** Client information requirements….
  - **@** If, however, it is related to the extent of the rights, are we (CLS) capable of reporting such detail and what kind of partnerships are needed?

@ [With regard to directional drilling] what we need to show is anything that defines the rights or extent of the rights. CLS plan is there to show the extent of the rights [and] do not need directional drilling to show that it is within the extent of the rights! I don't think it should go on a CLS plan!

- **Queries/comments on data storage**
  @ Data storage is a big (expensive) problem. We need standards.
  @ We should also consider the costs of not providing the data
  @ Who pays, and when?

2.4 Jean Gagnon:
Speaking on *"Survey Issues"*

- Objective/duties of the ACLS:
  - To establish and maintain standards of qualifications for Canada Lands Surveyors.
  - To regulate Canada Lands Surveyors.
  - To establish and maintain standards of conduct, knowledge and skill among members of the Association and permit holders.
  - To govern the activities of members of the Association and permit holders.
  - To cooperate with other organizations for the advancement of the surveying.
  - To perform the duties and exercise the powers that are imposed or conferred on the Association by the Act.

- What is cadastral surveying?

  "The identification, establishment, documentation or description of a boundary or the position of anything relative to a boundary."

  or

  "The generation, manipulation, adjustment, custody, storage, retrieval or display of spatial information that defines a boundary."

- Key Legal Survey Issues
  - ***Well surveys and directional drilling***
    - Why survey the well at surface structure only? The importance of directional drilling!
    - Is every well registered? Not all wells are registered!
    - Should we register every well with the Surveyor General? No!
    - Should we survey every well to LSD specifications? Yes!

  - ***Cables and pipelines (the seabed is increasingly being used)***
    - Conflicts arise when pipelines intersect with property rights
    - 65% telecommunication traffic: $1Trillion
    - No transparent regulatory process
    - Where do land surveyors come in, or do we have a role? Delineation of route/ rights-of-way? Disputes?

Important Issues
******* *security (virtual and physical)*
******* *cable owner to prove negligence (under private property law)*
******* *no domestic legislation regulating cables and pipeline*

- ***Conversion of existing rights to NAD83***
  - Protection of existing rights (option to convert to NAD83).
  - Theoretical grid system used to define the rights (option to convert to NAD83).
  - Do we adopt grid areas defined by:
    a. Meridians and chords to parallels?
    b. Meridians and parallels?
    c. UTM grid coordinates?
  - Special cases: fixed grids (section 16 - approved survey) is not in the new regulations and not used since 1982.

OPEN DISCUSSION PERIOD
(@ Unidentified person's comments/questions)
(& Speaker response to comments/questions)

@ Are all offshore leases rectangles?
@ [With regard to the definition of cadastral surveying] "those are definitely the duties of a Canada Lands Surveyor!"
@ [In terms of data storage] that's a "whopping responsibility!"
Question by Réjean Castonguay: "In terms of datum conversion, does anyone know what was done with the 1:50,000 NTS?"
& I've seen some with NAD83 and some with NAD27

2.4 Gordon McCallum:
Speaking on *"The Law of the Sea"*

The speaker referred to a handout given to the audience. Below are some of the main points of his speech.

- There was a 1958 Law of the Sea convention but now we have a United Nations Law of the Sea Convention (1982).
- Canada has not ratified "it" yet.
- At the time of 1982 it had immediate acceptance. It was a unique project.
- International law has two components: customary and treaty. It is roughly analogous to domestic law … the common law and legislative law.
- [With] something as huge as the ocean, it's a little hard to imagine the detail necessary drawing up (?) the customary law.
- So the Convention is really very unique. People realized the pressing needs and it happened in a hurry. The treaty-making process is very unique, [and by] consensus you have to accept the entire package.

- ***"I'm going to touch a few topics in the handout...so that you don't have to take notes…":***
  - In history, after the first Law of the Sea conference in 1958, the oceans were look at as common to mankind. If there was going to be any exploitation, it was going to be shared by all nations.
  - The goal of the conference was to produce a comprehensive, cohesive package.
  - The agreement was going to be by consensus.
  - 1981 was the [year of the] draft convention, and by the end of 1982 the convention was opened for signature.
  - The first day [an unprecedented] 117 signatures. Canada was one of the signatories. [that was only the first part as each country had to enact local implementation, e.g. Canada's *Oceans Act*].
  - Even though Canada has not ratified the convention, it is difficult [for Canada] to not adhere to the rules regarding, for e.g. the continental shelf]. It has become "kind of" customary international law for those "people" who haven't ratified.
  - [The Law of the Sea zones (*Territorial sea*, contiguous zone, exclusive economic zone, and the continental shelf] are from the baselines, and CHS has worked very hard to define the baselines. (*note: some examples of nations responsibilities in each zone were outlined. See workshop handout).*
  - Re: the continental shelf itself, Canada has the right to the resources in the sub-soil. In relation to fish, "we" [Canada] are limited to sedentary species, i.e. fish in contact with the surface. So then if [a nation] was trawling for fish within Canada's continental shelf, then they would be obliged to seek permission to take fish from the surface of the ocean bed.
  - Much work remains on the marine zones, one "of course is the baselines which is ongoing" along with the boundaries with the U.S. [because the boundaries with the other countries are settled].
  - There is also the problem of drawing closing lines across bays as internal waters, e.g. the Bay of Fundy. "I'm not sure if this is a fact but" the provinces could legislate out to the center line, but somebody from Maine may not have to obey that because it is not recognized internationally.
  - With regard to the *Territorial sea* and [sometimes] out to the 200nm limit:
    - Coastal provinces will/may have to obey international law since they have certain rights to areas of the seabed.
    - The Oceans Act defines the Maritimes zones and what we can do in them, e.g. marine protected areas.
    - Within the Oceans Act there are all kinds of specialized topics that impact upon Canada (offshore) lands.
    - There are also many other Acts that impact upon Canada (offshore) lands e.g. the application of the criminal code, the Shipping Act, Fisheries Act, Coastal Protection and Fisheries Act etc. They are examples of 'assertion' on Canada Lands for the purpose of those Acts. All of these are domestic implementation of international law.

2.6 Gordon McCallum: Speaking on *"Federal-Provincial Jurisdiction"*

The speaker referred to a handout given to the audience. Below are some of the main points of his speech.

- On land Canada only has jurisdiction when it owns the lands. These are lands within the provinces, so Canada really doesn't have land unless it purchases land or has had it since confederation (e.g. government offices, military bases etc.). Indian lands are administered in trust for the First Nations. Territories have certain rights but not as much as those as provinces.
- Re: Canada Lands [seaward]: Provincial lands "may" end "perhaps" at [the] low tide mark "and then Canada takes over "outwards" from there (from the tidal waters of the internal sea).
  - There are some known and unknown exceptions to the above generalizations, for example:
    - Princess Charlotte Sound
    - Bay of Chaleur
    - Historic bays of Newfoundland
    - The 3 mile belt around Newfoundland (before Confederation)
- Domestic acceptance of historic waters may not be accepted internationally as enclosed waters.
- Issues between provincial and Federal authorities can either be taken to the Supreme Courts or dealt with as cooperative federalism (e.g. products can be registered in a provincial system AND still maintain usefulness to the Surveyor General)
- Re: dividing lines between East Coast provinces:
  - Oil and gas has an important impact (especially between Nova Scotia & Newfoundland).
  - Equidistance principle seems a more likely solution (the principle in the *Oceans Act*). Baselines then needs to be precisely defined.
- Re: Federal-Provincial Jurisdiction:
  - Within provincial boundaries, that is normally the limit of provincial jurisdiction.
  - The *Oceans Act* can extend provincial jurisdiction into federal territory without impacting upon federal jurisdiction.
  - Outside the provinces (in the offshore beyond provincial boundaries) it is full federal jurisdiction, but then its subject to international law.
- There is a further extension of [federal] jurisdiction, e.g. federal law can apply on the high seas (Canadian ship at sea, or a Canadian airplane travelling over the oceans etc.).

<u>OPEN DISCUSSION PERIOD</u>

(@ Unidentified person's comments/questions)
(& Speaker response to comments/questions)

@ Is there any reason why Canada has not ratified UNCLOS?
& Canada is waiting on international fisheries law to be ratified first (not speaker)
& We obey everything except straddling stock issues.

@ How many offshore surveyors are there who could do the kind of "work" needed?
& I'm not sure. Maybe one could use two persons with complementary skills to do the job.

Moderator Comments: Neil Anderson

- I would like to see the report speak to the international expertise we have in terms of international development
- The world is now beginning to think spatially (cell phone link to location information)
- Of course there is also the down side to "tracking."

3. Roundtable Report to Plenary

Attendees were grouped by numbered tables, with each table discussing either survey issues, or boundaries and rights issues. The discussed questions are numbered and outlined at the beginning of each sub-section. Each table's responses to the questions are then outlined in table form with numbers corresponding to the question being addressed.

Some comments and opinions expressed at the workshop may not be included in this report due to:

- Tapes being inaudible because participants did not speak directly into a microphone
- Comments missed by the workshop recorders
- Roundtable discussions not being entirely reported

3.1 Survey Issues: Questions Regarding Cooperation

1. Should all non-proprietary offshore survey data be available to the general public?
2. What is the most appropriate way to ensure that the locations of platforms, pipelines, sub-sea structures, telecommunications cables etc are shared and distributed?
3. Should an organization be assigned the responsibility to maintain a public registry for all positional data?
4. Should locations of platforms, pipelines, flow lines, sub-sea structures, telecommunication cables etc be surveyed by Canada Lands Surveyors?
5. What can this workshop suggest that would be a good method of data sharing amongst offshore users?

Table 2	Table 3	Table 5
1. Yes, if the offshore survey data is verified and validated (concept of user fee-cost recovery). 2. Share and distribute from geo-referenced database with public access – pipeline, cable and sub-sea installations with a common reference system 3. Yes. • Collaboration with public /private sector partnership. • DFO presently has the mandate to take the lead and to coordinate a marine advisory committee. Could be an offshore system parallel to Geoconnections. • MGDI set up as a distributed database network • open standards –technology standards – architecture	1. Public offshore data – in theory yes, not necessarily free, define proprietary or not companies do it now to a degree – the benefit – while fishing you can avoid structures 2. Locations of structures – should use CHS charts and make them more efficient- internet. Information for non- navigational uses should be incorporated 3. CHS has existing system mainly for coordinates rather than manager navigation) should be in one registry with many portals and many contributors. Napster for geomatics data not physically in one place 4. Canada lands surveyors – existing situation hydrographic and industry people (non CLS) can survey locations of structures	1. Yes to compile databases. Only items caught by a net(no well logs or Seismic data). Not sub sea bed-stability of policy- legal issues 2. Yes to surface data but No to wells. CNOPB/ CNSOPB- enforce safety side and push the oil companies 3. One agency for Canada Lands with branch offices 4. yes to survey; no to CLS (present) 5. public registry * internet * channel monies toward the actual process of data sharing

• funding should be provided for data holders so that they can get on board – public/private sector partnership 4. Yes- by collaboration between Hydrographic CLS and Cadastral CLS 5. Data sharing by a web-based database architecture		

3.2 Survey Issues: Questions Regarding Data Sharing

1. How can copyright in data and plans being distributed be protected?
2. How can liabilities associated with others using data be controlled?
3. What data standards need to be in place for sharing data?

Table 2	Table 3	Table 5
1. Existing mechanisms can still be used -licensing agreements(with royalties if necessary) – with a honor system or prosecute abusers licensing agreement. 2. Disclaimers of liability – if no liability is to be assumed . 3. Still a need for metadata to clarify nature and quality of data .	1. Look at data but cannot get it – bottom line is that we really cant protect it – good will and cooperation – ownership and copyright give up in the public domain 2. cant transfer liabilities to public domain – keep copyright and liabilities – insurance companies may not let it be shared 3. CLSR should be to international standards – rate existing data against a scale. Autocad and similar formats. Marine field already has standards used by many bodies internationally (IHO, IMO, IOC, UNS7)	1. Use a legal process with correct wording dealing with copyright and liability issues 2. Same as above 3. Standards should be set by an industry group e.g. East coast industry group (ECOIA) @ Such a group can develop standards. @ Industry group may not work in the interest of the public. @ There are a lot of checks and balances in place. @ Standards are good but not that too much standard is good standard.

3.3 Survey Issues: Questions Regarding Datum Usage

1. What datum is appropriate to use in offshore Nova Scotia and Newfoundland?
2. Should offshore eastern Canada switch from CSRS to ITRF?
3. What are the impacts of using different datums offshore?(see paper by LSD summer 2000)
4. How are boundaries affected by using different datums?
5. What is the best method for converting NAD 27 to NAD 83?
6. Should boundaries be defined by plan or by coordinates?
7. What can this workshop suggest to achieve the most appropriate datum usage?
8. What can this workshop suggest as the best method to proceed to NAD 83?

Table 2	Table 3	Table 5
1. NAD83 (CSRS realization). 2. No! • No- should be consistent with landmass. NAD 83 agreed upon by cooperative policy with USA and provinces. • Any realisation of ITRF is not a problem if the parameters are known. May cause confusion and lead to errors. White paper can address this – about 50 to 900 wells will change Should be consistent with landmass: NAD83 agreed upon by US and Provinces. 3. Rights will not change but descriptions will. 4. Best method: re-survey! Rights not protected – 5. Use NTV2-defacto standard-works		1. NAD83 (CSRS realization) continue to convert offshore data. 2. No! 3. Vary (financial / legal). 4. Boundaries fixed, coordinates move. 5. NTV2 – phase out NAD27boundaries fixed coordinates move. 6. Boundaries by coordinates. 7. Retire NAD27. 8. Government action - intervention.

on SDA's(Hibernian and Sable) but not on large areas offshore. 6. Define by coordinates and plan-bearings and distances-coordinates needed for database. 7. Legislate and provide a standard for conversion-Legislate NAD 83 just like the metric system. 8. Education-Provide standards.		

3.4 Survey Issues: Questions Regarding Technical and Administrative

1. Does existing CLS procedures and specified accuracies meet those achievable today?
2. Does the removal of selective availability effect survey operations offshore?
3. Why does it take so long to register a CLS plan?
4. How can registration process be simplified and streamlined while still maintaining the regulatory needs?
5. Will offshore seismic surveys be registered in the CLS survey system?
6. What can this workshop suggest to improve technical and administrative aspects of offshore surveys?

Table 2	Table 3	Table 5
	1. Industry standards and GPS have accuracy higher than CLS specifies today (IHO better than CLS). 2. Removal of selective availability was not a big impact but the full effect not seen yet. 3. Long CLS process for plans should be made more accepting of work (plans) for CLS professionals-ACLS practice review may accelerate. 4. Not enough expertise in offshore surveying. 5. Why would you register seismic surveys – not an issue – no value. 6. All aspects of offshore surveys can be improved by using international systems and standards (these also address datums).	1. No-white paper because IHO standards are better @ some done by CHS; there are also publications. @ CHS need to do better. 2. No! 3. Don't know 4. Shorten or eliminate the review process of CLS plan @ also have only one set of reporting procedure. 5. No! 6. Joint Government-private technical committee. This will be an economic driver.

3.5 Survey Issues: Wrap Up Question

What can this workshop suggest to ensure that an effective property rights infrastructure is in place to promote the good governance and sustainable development of Canada's natural resources?

Table 2	Table 3	Table 5
	• Need a marine cadastre. • Information should be 3D since reality is also in (at least) 3D. • Cooperation is the most important tool to resolve existing situation. • Support Sue Nichols idea of a Marine cadastre. • Referencing system needs to be three dimensional for water column and seabed resources.	

3.6 Boundaries and Rights Issues: Questions Regarding the Extent of Canada Lands

1. Where do Canada Lands start near the coast and what rationalizing is used? How can stakeholders cooperate in finding solutions?
2. Where and when will Canada establish its Continental Shelf limit?
3. How do we promote cooperation between provincial and federal organizations to avoid confusion?
4. How do we promote cooperation between federal departments and offshore interests?
5. How can the ACLS in partnership with the stakeholders contribute in resolving the issues?
6. Are there any issues related to international boundaries? (France, USA, Denmark (Greenland))

Table 7	Table 8	Table 10
1. We must remember that it is a 3D boundary especially since we moved off land. *2.* - *3.* – • Very political issues. • Need to approach it on benefits rather than jurisdiction or dispute in order to promote cooperation. 4. Need all stakeholders including First Nations people 5. • Management of offshore is sector oriented- not horizontal. • Land management is hampering ("big mouse barrier").	*1.* Boundaries are 3 dimensional. Have not done well historically with land based boundaries of jurisdiction. The question should be who has jurisdiction to grant rights. Pull stakeholders together. *2.* - *3.* Pragmatic drivers 4. Better act than react. 30 plus federal government agencies dramatizes the need for cooperation. • recognized and started • struggling but started • could not care less *5.* • The reality is that many issues are situation driven. • Create a web site with a directory of places to go and see in response to offshore	*1.* Refer to water law in Canada and observe its application in Atlantic Canada. Pull stakeholders together into small pilot projects with rural planners (municipalities). Pragmatic drivers – extending jurisdiction by municipalities e.g. rural planning out into provincial offshore. Perhaps to include the inter-tidal zone *2.* *3.* *4.* Better to act than react *5.* Avoid impending problems by going with a civil (Canadian) solution *6.*

6. • Possible solutions –can we expand on the accord principle. • Do we extend accord type solutions to natural resources or also to other jurisdictional issues such as labor and commerce. • Need to include aboriginal people. Unceded territory in eastern Canada. Marshall case- aboriginal title may extend offshore. • Need to try get native leaders in the room for discussion in order to get different perspectives on conservation, ecology and boundaries • ACLS should focus the expertise in the group to clearly identify and state the issues. It should identify the stakeholders and meet with them. Show them what you have to offer. Address the issues to DFO, NRCAN and DFAIT.	issues • Petroleum industry is doing a roadmap for regulatory approval • Remember that offshore is not just an oil and gas world(but there is mining, research, fisheries, eco-tourism) • Co-leading could lead to cooperation • Co-leading exists now • Co-management exists and works	

3.7 Boundaries and Rights Issues: Questions Regarding the Need for a Property Regime

1. What types of property rights are granted in Canada's offshore?
2. What rights are granted under international law?
   - ♦ Pipelines and cables
3. What rights are under national and provincial jurisdiction?
   - ♦ Oil and gas exploration and exploitation
   - ♦ offshore structures
   - ♦ pipelines and cables
   - ♦ seabed mining
   - ♦ aquaculture.
4. What is Canada doing to protect these rights and help meet its legal and social obligations?
   - ♦ Are rights registered?
   - ♦ Should Canada institute new laws to protect the public for the effective management of the offshore?
   - ♦ Should there be a registry of rights?
   - ♦ What are the advantages/disadvantages for reduction of conflict, safety, environmental etc issues?
   - ♦ What is the most appropriate way to ensure that the extent of rights is effectively delineated and protected?
   - ♦ How do we resolve conflicts when they arise?

Table 7	**Table 8**	**Table 10**
1. Can we expand R-O-W/easement concept offshore? 2. Need to address layers. **3.** 4. • • • Federal govt. is to facilitate development of a public registry(marine cadastre – one	1. - 2. - 3. • *Oil and gas exploration and exploitation* - depending where it is- joint jurisdiction. • *Offshore structures*- depending on where it is – joint jurisdiction.	1. There should be some kind of regime and there should kind of marine cadastre. 2. - 3. - 4. - • Coherence between federal / provincial • Coherent land / sea policing • Objective of law should be the same

stop shop) where all the boundaries of interests are recorded. DFO should take the lead. • • Concept of boundaries could be different. They do not have to always be straight lines. Ecosystems based on watersheds. This concept is more in line with fish habitats and First Nations concept. •	• *Pipelines and cables* - joint but more complicated (domestic vs. international). • *Seabed mining*-south of 60 degrees no legislation, north of 60 degrees sand and gravel - Federal. • *Aquaculture*-provincial. 4. - • • Look at the new Privacy Act (effective Jan 1 2001) and the Right to Information Act. • Issues concerning the North Sea and Gulf of Mexico. Ask the question -What would they do if they had it to do over again? The Internet is a major tool that can be used to answer questions regarding a registry of rights.	• Sharing of information is needed • Similar to land use regime.

3.8 Boundaries and Rights Issues: Questions Regarding the Law of the Sea

1. What protection does the Law of the Sea offer to the rights owner?
   - ♦ What are the powers and obligations of the State under article 79?(pipelines and cables)
2. What protection does the Law of the Sea offer to the State?
3. When will Canada adopt the Law of the Sea and define the limit of the Continental shelf as defined in Article 76?

Table 7	Table 8	Table 10
1. 2. 3. • ratification being held up because of straddling stocks • DFO has responsibility to regulate any activities not regulated or managed. • Unequivocal agreement that Minister of DFO should be asked to establish a regulatory regime for cables and pipelines. *Neil Anderson:* *Minister created an advisory committee✒; Ocean Division needs support to tell the minister what he needs to know because "I" don't think he knows.* ✒ **Editors' Note:** *The committee referred to by Neil Anderson is the Minister's National Advisory Board on Fisheries and Oceans.*		*1.* *2.* *3.* • Waiting on agreement on straddling fish stocks. • Push using the team Canada approach - for offshore boundary delimitation • Research the cost of not doing work - the benefits that might have accrued.

3.9 Boundaries and Rights Issues: Questions Regarding Survey Issues - Legal

1. At what stage in the exploitation process is it critical to take into consideration the offset between NAD 27 and NAD 83 to protect oil and gas rights granted on NAD 27?
   - ♦ Exploration licenses?
   - ♦ Significant discoveries?
   - ♦ Production licenses?
2. Existing survey regulations require the location of an offshore well be at a structure surface. Directional drilling may extend a well beyond the limits of the grid unit to which rights have been granted:
   - ♦ How does the existing rights regime take into consideration the difference between the structure surface coordinates and the bottom hole coordinates?
   - ♦ Is it a concern to the rights administrators and regulators that the bottom hole coordinates may be outside the limits of the rights issued?
   - ♦ Are the procedures for the derivation of the track of a directionally drilled hole and bottom hole coordinates consistent within the industry?
   - ♦ Should a Canada lands surveyor be required for the survey of the track of a directionally drilled hole and the derivation of bottom hole coordinates?
3. How can Canada ensure that the offshore survey fabric is developed appropriately to promote an effective property infrastructure and the protection of existing rights?
4. What can this workshop suggest to achieve an improved property rights infrastructure?

Table 7	Table 8	Table 10
1. Always important to protect rights. *2.* Proprietary data and confidentiality must be protected. *3.* Big role for ACLS especially in disputes and making recommendations to regulators. *4.* ACLS could offer services to board to increase the knowledge to the benefit and use of geo-spatial data.	*1.* Please decide on an option and get on with it!!! *2.* - *3.* Co-ordinate with provincial jurisdiction. *4.* -	1. - 2. - *3.* – • Support Marine Geospatial Data Infrastructure • Involve more stakeholders(e.g. scallop fishermen) 4. – • Co- registry is important for simplicity and good governance

• Always important to protect the rights. • Proprietary data and confidentiality must be protected. • Directional drilling much like any other activity in exploring resources. Not defining boundaries but trying to make sure that it is done within the land allocated. • Big role for ACLS especially if disputes arise. • ACLS make recommendations to regulators (CNOPB, CNSOPB, NEB, NOAG). ACLS can provide expertise in analyzing "geo-spatial data." • ACLS could offer services(provide services) to boards so that regulators get better understanding of using the geo-spatial data. • We need to know why published coordinates on web do not match rights. • Why datum origin is important.		• Co-leadership • Co-management. • Support pilot project – a pilot project where we can identify stakeholders, rights that people have and their concerns – can we apply property rights to these pilot projects? • Poor cadastre leads to poor property rights – good data supports good decision-making.

3.10 Boundaries and Rights Issues: Wrap Up Questions

1. What can this workshop suggest to ensure that an effective property infrastructure is in place to promote the good governance and sustainable development of Canada's natural resources?
2. How can Canada ensure appropriate offshore development in property rights context?

Table 7	Table 8	Table 10
	What is a property rights infrastructure? It: • Is a flow chart of rights available within each zone. • Addresses the questions: ✓ are rights transferable ✓ can they be bought and sold • Incorporates customary / traditional rights. • Has Jurisdiction horizontally – across government departments. • Has Jurisdiction vertically – hierarchy of who is in charge. **How can Canada ensure appropriate offshore development in property rights context?** To be effective the infrastructure has to: • Have some form of quality control. • Have regular maintenance(update). • Have preferably real time update and access. • Be readily available / accessible. • Address the question of is it free ? who pays? • Indicate at same site multi-jurisdictional rights. by providing links • Focus on the big picture. • Be a one stop shop. • Provide the functions of a 3 dimensional cadastre addressing: ✓ who owns it ✓ where it is ✓ what can you do • Be on a distributed network.	

4. Issues Arising from the Speeches and Roundtable

Section 4 is divided into two parts, both dealing with issues brought up at the workshop. Section 4.1 deals with issues distilled and summarized from the speeches of the invited speakers. The speeches may not always follow the formal structure of the roundtable discussions, but many points brought up deserve attention. When grouped, the points outlined in relation to the issues mentioned may be conflicting; they represent the various views of the speakers and were not further validated.

Section 4.2 summarizes issues specifically dealt with at the roundtable discussions. The points outlined in relation to the issues mentioned may be conflicting as they represent the many views of the workshop participants. They are not validated.

4.1 Issues Arising from the Workshop (Speeches)

4.1.1 Canada Lands in the Forefront of Development

- The fact that Canada Lands in the offshore are in the forefront of development with rules and work procedures being developed and revised to meet the needs of the petroleum and telecommunication industries.

4.1.2 Challenges for ACLS members

- The extent and exclusive nature of their jurisdiction.
- The various "water" datums in use for geo-spatial referencing:
  - The existence of datum confusion.
  - The fact that surveys are done in one datum and CLS requirement that registration be in another.
  - The question of converting existing rights to NAD83? How to define the grid areas?
- The question of how to (and is it necessary for the CLS to) deal with directional drilling information?
- The fact that a complete record of the offshore does not exist.
- The fact that the LSD takes a long time to process plans.
- The problem of data storage.

4.1.3 Cables and Pipelines Issues

- Security (virtual and physical).
- Cable owner to prove negligence (under private property law).
- No domestic legislation regulating cables and pipeline.

4.1.4 Stakeholders Issues

- Who are stakeholders and who are not?
- Not all stakeholders were present at the workshop.
- What are the needs of stakeholders relevant to the ACLS?
- The need to know the spatial extent of community rights in the offshore.
- The complexities of property rights affect the efficient use and management of ocean spaces and "the commons."
- The problem of overlapping jurisdictions, administrative agreements and survey practices.
- The problem of Federal-provincial seaward boundaries and jurisdiction.
- The problem of inter-provincial seaward boundaries.
- Concerns about the large numbers of government departments with oceans mandate and regulatory regimes.
- The problem of conflicts arising from the intersection of oil and gas cables and pipelines with community rights, including:
  - The role of surveyors.
  - The fact that there is no transparent regulatory process.

4.1.5 The Existence of Little Coordination among Various Government Organizations.

- The lack of horizontal or vertical integration (including cooperation, coordination).
- The problems (cost etc.) of data sharing.
- The need for good information to support good decision-making.

4.1.6 UNCLOS Issues

- Definition of baselines.
- U.S. seaward boundary with Canada.
- Closing lines across historic bays and international recognition of the closing lines.
- Harbors as Canada Lands.
- Canada's ratification of UNCLOS.

4.1.7 Miscellaneous Issues

- Which responsibility center is responsible for which problem?
- The ability of surveyors to handle survey requirements offshore.
- The building and international marketing of Canada's expertise in the offshore.

4.2 Issues Arising from the Workshop (Roundtable)

4.2.1 Survey Issues

<u>Cooperation</u>

- Coordination of the collection and access of all offshore data.
- A common reference system for collection of offshore data
- A public registry
- The hydrographic qualifications of CLS and their ability to do Hydro Survey

<u>Data Sharing</u>

- The importance of an organization that facilitates exchange of offshore data
- Access of offshore data and copyright / liability issues
- Data standards for collection and access of offshore data

<u>Datum Usage</u>

- Still need to resolve NAD 27 / 83 issues
- Offshore areas are international and a probable conversion to ITRF is needed
- A standard for NAD 27/ 83 conversion is needed for data sharing purposes
- How do you ensure that stakeholders comply with the conversion standard?

<u>Technical and Administrative</u>

- CLS survey standards need revision
- Registration of plans is a big hurdle – streamline operations
- Define what other types of surveys should be included in a CLS plan e.g. seismic survey

4.2.2 Boundaries and Rights Issues

Extent of Canada Lands

- The definition of Canada Lands is still unresolved especially when taking into consideration aboriginal claim to offshore title
- Cooperation between stakeholders is a big problem especially when you consider federal/provincial, federal/offshore interest groups etc
- The role of the CLS in promoting cooperation and resolving conflicts is still undefined

Property Regime in Offshore Canada Lands

- Lack of good understanding of rights offshore
- Jurisdictional problems still exist especially when you consider that the offshore has a Canadian and international aspect
- An understanding of the extent of rights is still unknown – a record of the rights is still unavailable
- The approach to the resolution of conflicts offshore when they arise is still unknown

Law of the Sea

- The role of the law of the sea still remains unclear especially with the Canada's non-ratification
- Regulatory regime for cables and pipelines

Survey Issues - Legal

- Issues regarding directional drilling were identified as being important
- Issues with the offset that occurs with conversion of leases from NAD 27/ 83 were determined as being important
- An effective property infrastructure that protects existing rights was identified as being important

5. Conclusions and Recommendations Summarized from the Workshop Speeches and Roundtable Discussions

This section outlines the conclusions and recommendations derived from the workshop. The conclusions and recommendations are categorized according to questions posed to the roundtable groups.

Although the conclusions and recommendations are taken mostly from the reports related to the roundtable discussions, any recommendation gleaned from the speeches are also included if they fit into the categorization of the roundtable questions.

The points outlined in relation to the issues mentioned may be conflicting as they represent the many views of the workshop participants. They have not been validated.

5.1 Survey Issues

5.1.1 Cooperation

Coordination of the collection and access of all offshore data

- The offshore data should be collected and made available to the general public after it is validated and verified. Although data is collected and databases compiled, certain information (well logs and seismic data) should not be made public.

Sharing and distribution of offshore data

- Information should be based on a common reference system.

A public registry

- An organization should be in charge. The agency should have branch offices. CHS mandate can be expanded to handle this role. DFO should take the lead as it has the mandate to lead a coordinate and marine advisory committee. A parallel can be drawn to GeoConnections..

The ability of CLS to do Hydrographic Surveys

- CLS not adequately qualified to perform these kinds of surveys. A collaboration structure, where surveys are done by both a CLS with hydrographic specialty and a CLS with cadastral specialty is recommended.

5.1.2 Data Sharing

Copyright issues in distributed offshore data

- Use legal wording that effectively nullifies the copyright uncertainty. Existing mechanisms can be used. Licensing agreements with royalties being paid is one such mechanism. Users are to be allowed to look at the data but not get to it. Producers depend on the goodwill and cooperation of users.

Liability issue

- If the producers are made accountable for the integrity of their data then that accountability might discourage the availability of the data. A disclaimer was identified as the best protection.

Data standards for collection and access of offshore data

- Metadata is deemed as being important for clarifying the nature and quality of data. The data standards should be international. AutoCAD and other similar formats can be used. The marine field already has several international standards.

5.1.3 Datum Usage

Offshore data representation

- NAD 83 CSRS was identified as the best datum for Eastern Canada. NAD 27 should be retired. Offshore data should not be converted from CSRS to ITRF. Conversion from CSRS to ITRF was not a problem if the parameters were known.
- A standard for NAD 27 to NAD 83 conversion is needed for data sharing purposes. The NTV2 conversion should be the appropriate conversion standard. Boundaries should be defined by plan and coordinates.
- To ensure datum usage, Government intervention is suggested. Legislation of NAD 83 was needed. Education probably the best way to accomplish compliance with datum usage recommendations.

5.1.4 Technical and Administrative

CLS offshore survey standards

- Industry standards are better especially with the use of new GPS technology. IHO standards already exist which are also good. Selective availability apparently does not affect survey operations offshore.

CLS plans

- The registration system of a CLS plan is too long. An ACLS practice review may accelerate the whole process. There is a need to shorten and eliminate the review process. No need to register seismic surveys.
- A joint technical committee between the Government and the private industry should be used to improve the technical and administrative aspects of offshore surveys.

5.2 Boundaries and Rights issues

5.2.1 Extent of Canada Lands

Definition of Canada lands

- This issue is still unresolved especially when taking into consideration aboriginal claim to offshore title. Refer to Water Law and its application to Atlantic Canada. There is a need to determine the implications of the Marshall decision. Try extending the Accord principle

How do you promote cooperation?.

- *Between Stakeholders*: Pull stakeholders into small pilot projects.
- *Federal-Provincial:* Promote cooperation from a benefits perspective rather than dealing with it as a jurisdictional issue. Already started.
- *Between Government and stakeholders:* Need to ensure First Nation participation. The *Oceans Act* is a good step forward.

ACLS role in solution of offshore issues

- ACLS should use its expertise to define the issues, meet with stakeholders and show them what expertise it has in solving the identified issues: co-leading and co-management roles.

5.2.2 Property Regime in Offshore Canada Lands

Rights offshore

- Can we extend land-based rights offshore? e.g. rights of way. A good understanding of offshore rights is still not well appreciated. There is a need to address the water column, seafloor, and subsurface rights. There is a need to perform some kind of planning to manage the conflicting use of the 3D offshore rights.

Jurisdiction

- This is a very complex issue especially with the observation that Atlantic Canada lands were not ceded by First Nations. There might be aboriginal title offshore. Federal, provincial, and other jurisdictions need to be identified.

Canada's initiative in solving offshore problems

- A coherent approach between all Government levels is needed, i.e. Federal, Provincial, Municipal. A coherent land/sea policy should be developed.
- There is a lack of good understanding of offshore rights. Federal government should facilitate a public registry of offshore rights. There are implications to offshore rights from legislation such as Privacy Act and Right to Information. These Acts should be reviewed.
- International issues concerning North Sea and Gulf of Mexico need to be addressed.

5.2.3 Law of the Sea

- Ratification being held up because of the United Nations Straddling Stocks Agreement.
- DFO Minister should establish a regulatory regime for cables and pipelines.
- The role of the Law of the Sea still remains unclear especially with Canada's non-ratification of the treaty. A Team-Canada approach is probably the best way to approach offshore boundary delimitation.

5.2.4 Survey Issues - Legal

NAD 27/83 issues

- Issues with the offset that occurs with conversion of leases from NAD 27 to NAD 83 were determined as being important.
- Directional drilling is still an issue. Rights are however granted within the original leases spatial extent.

Property rights infrastructure.

- There is a need for a Marine Geo-spatial data infrastructure. Co-registry, co-leadership, and co-management is the best approach. A pilot project should be used.
- An effective property infrastructure that protects existing rights was identified as being important. ACLS has an important coordination / education role.

6. Analysis and Recommendations from the Editorial Team to the ACLS and Stakeholders

In this Section, the editorial team presents its analysis of:

- the issues raised by the workshop, from a broader ocean governance perspective;
- priority issues and recommendations on these issues.

These issues and recommendations may not reflect the priorities of individual stakeholders at the workshop or the interests of any governmental, academic or private sector organization. They are the opinions of the editorial team based on the workshop and on other research and experience. They are presented here in order to take the process of resolving the issues further than is perhaps possible in proceedings of a one-day workshop.

6.1 Identifying and Getting Participation of ALL Stakeholders:

One of the most revealing questions raised at the workshop was that which the moderator, Neil Anderson, asked at the outset: "who do you represent and who is ***not*** at the table?" While there was generally good representation from federal government organizations, there were relatively few provincial representatives. There was a good showing from the oil and gas industry, the petroleum administrative boards, and their surveying partners, but no representation of other private and public interests (e.g., fishing, aquaculture, environment, ports and harbors, coast guard, tourism and recreation). There were surveyors and ocean mappers and representatives of geological science, but only one legal expert. There was one representative of aboriginal interests.

Some of the missing stakeholders had been invited. Why did those approximately 140 people who did not respond to the invitation think that they did not need to be at the table? Their absence may be due to their lack of recognition that property and boundary issues offshore affect their activities and interests. It may also have been the use of the word "offshore" which conveys (on a day-to-day level) a different meaning than "coastal" which may have attracted some of the missing groups. In fact, in this workshop ACLS intended to address the oil and gas lease issue in particular. However, it was clear from the proceedings, that despite any jurisdictional limits that might exist, there is a need to take a greater look not just at the far offshore, but also the near offshore. As Ken Paul later wrote to the moderator, to try to open doors for First Nation consultation: in such workshops, in his own opinion:

> *It is extremely important that First Nations leaders are kept aware of these workshops…..It will be far more costly in the long run to make agreements of offshore and near-shore jurisdictions (for example the Laurentian sub-Basin) without involvement of First Nations* [and he adds] *not as a stakeholder, but as a Nation.*

The need to include aboriginal stakeholders should not be underestimated. Since the *Marshall* decision, the Atlantic coastal region has been in turmoil. An appreciation of the breadth of the issues and their potential impact on marine resource rights, is slowly (and in some cases such as Burnt Church, belatedly) growing. Any attempt to delimit a marine resource rights regime without taking potential aboriginal interests into account is likely to be challenged.

R6.1.1 ***It is recommended that the ACLS and other organizations make an even greater attempt in any future efforts to attract a broader range of stakeholders. This will have to include communication with a variety of sectors to demonstrate why property and boundary issues offshore affect their interests.***

R6.1.2 ***In particular, the ACLS should increase participation by aboriginal, fisheries, and provincial stakeholders, including provincial surveying associations in future discussions.***

R6.1.3 Further workshops should be held in other areas across Canada to ensure a broad range of input. Development of a discussion document would possibly generate more interest among potential participants and create a focus for the workshops. One goal of the workshops should be the evaluation of the need for information on offshore property rights, and also on structures offshore that may pose a hazard to fishing and navigation.

6.2 Promoting Co-operation, Data Sharing, and Improved Data Access

During the roundtable sessions, there was much discussion about how various private and public agencies could share data in a more standardized fashion. Related questions that arose included:

- what information is proprietary and what can be considered public?
- what information actually needs to be shared?
- what information is already available (although perhaps not readily available) from the various Petroleum Boards or government agencies?
- how will users know the quality of information?
- how can the impediments of government cost-recovery policies be overcome?
- should there be a central data depository?
- if so, how will it operate when data spans several levels of government and various industries?
- what incentives can be given to industry to provide information to a central repository if there are costs involved?
- if a legislative solution is taken, how long will it take to implement?

Both industry and provincial authorities had some concerns about setting up a "federal property data repository." Yet nearly all stakeholders agreed that some sets of data should be more readily available. These included:

- data sets about rights to the water column and sea bottom;
- data sets about any structures that might create a hazard to navigation, fishing, or the environment.

Certain sets of information, such as the location of pipelines and communications cables, were thought by participants to be currently excluded from public access. Yet after the workshop, the

editorial team found that some of this data is now available through CEONet (see, for example, Oceans Program Activity Tracking - OPAT). CEONet and GeoConnections may also be vehicles for facilitating data sharing among the various levels of government and public/private organizations.

The Legal Surveys Division (NRCan), in conjunction with the ACLS, should take the lead in beginning to examine in more detail the information questions raised above and to evaluate alternative solutions. Issues that will have to be addressed in any strategy include: confidentiality; liability, and cost vs. benefits (including who bears the costs and benefits);

R6.2.1 It is recommended that the Legal Surveys Division and ACLS investigate what information concerning property rights infrastructure and related structures is a) currently available and b) required.

R6.2.2 It is also recommended that GeoConnections with or through DFO, NRCan, INAC and industry conduct a strategic level information requirements study that includes an evaluation of the options and associated economic, legal, and institutional issues for data accessibility.

6.3 Standards

If there was any great consensus during the workshop on where to proceed, it was the need for improved standards for surveys and data access. Participants representing the oil and gas industry also gave extensive commentary after the workshop to ensure that the issues discussed at individual roundtables were adequately addressed. There was perhaps insufficient effort during the final discussions of the workshop to prioritize the findings, especially when complex technical issues were involved. In this section, therefore, we attempt to address the findings and the controversies that were not necessarily reflected in the actual notes and tapes coming from the workshop.

The following short discussion attempts to capture some of the issues that were considered critical by participants from industry.

- what information should be shown on plans to indicate the well hole and the limits of leases?
- who should be responsible for ensuring that directional drilling was conducted within the lease area?
- what other property rights offshore should require a legal survey?
- what datum(s) should be used in the offshore?

There was consensus that any structural information that "could be caught in a net" for example, and was therefore a hazard to navigation, should be shown on the survey plan or be made

available after structures were in place. This information should not include the location of the wells and structures below sea bottom.

The issue of directional drilling and wellbore inclinometry measurements appeared to be one of the most controversial issues, and as one participant later claimed - there needs to be a better understanding of what is actually taken place. Participants believed that the workshop had had some agreement on the fact that the Regulatory Boards were responsible for ensuring that drilling was within lease boundaries and that this was not a legal issue to be addressed through survey standards.

The oil and gas industry also noted strongly that seismic surveys should not involve a legal survey of property rights. Pipelines and communication cable s are structures that should require an easement or right-of-way, and therefore a survey plan to indicate potential hazards to navigation. One difficulty here is whether these plans structures should be produced to show "as built" locations rather than an easement that may be geometrically pleasing (e.g., defined by a series of straight lines but not really indicating the actual structural location).

With respect to appropriate datum standards there appeared to be consensus at the workshop that there be consistent datum transformation to NAD 83 CSRS. There was a strong call for national standards and this datum has been agreed upon by the provinces and the United States on land. Offshore use of spatial reference systems should be consistent with those on land. Issues regarding lease boundary definition (or redefintion) with a datum transformation still need to be addressed by Legal Surveys Division with industry and the Regulatory Boards. Discussions have been on-going and this workshop added more input but did not focus on this one issue.

The editorial team has abstracted the conclusions and recommendations from the notes and tapes in Section 5. If they do not fully represent the workshop participants' views then perhaps this best indicates a need for further documentation of the standards issues. The following are recommendations from the editorial team based on workshop discussions.

R6.3.1 NAD 83 CSRS should be adopted as the standard reference datum with a set of standard transformation s to convert data using other datums.

R6.3.2 LSD, in conjunction with the ACLS and other stakeholders should develop up-to-date standards for how and what offshore survey data is collected, depicted, stored, and accessed in order to promote goals such as improving the completeness of the information, its ease of use, and data access. This may, for example involve developing standards for pipeline and cable easements and for disclaimers or other means to reduce liability for disseminating certain data.

R6.3.3 In particular, it is recommended that ACLS and LSD, in conjunction with CHS, the International Hydrographic Organization, and others as appropriate, update the 3rd edition of Surveying Offshore Canada Lands for Mineral Resource Development [1982]. ***Coastal surveys and pipeline/cable easements should be included. Canada should create and enforce world class standards***

for data acquisition, data management, chart production and information dissemination, as well as appropriate quality control.

R6.3.4 The private sector should acquire the technology and develop the applications for collecting the data that meets the stated standards. Sectors and industries that would be involved include fishing and associated processing, oil and gas, tourism and recreation, aquaculture, shipping, and research and development institutions.

R6.3.5 It is also recommended that ACLS take a lead role in reviewing and revising if necessary education standards for coastal and offshore surveys. These standards should also reflect the need to build a national skill base to support the developing offshore survey and ocean mapping international markets.

R6.3.6 ACLS should strike a committee with hydrographic surveyors and production (down-hole) surveyors to find ways in which understanding can be improved on the complicated issues involved with, for example, directional drilling. This committee should also investigate ways in which production surveyors could become Canada Lands Surveyors (e.g., through special minimum requirements) to better insure the protection of the public interest offshore.

6.4 Ocean Mapping

Ocean mapping no longer refers only to modeling seafloor bathymetry. Today ocean mapping is the acquisition, analysis, visualization and management of spatial information concerning all marine features, processes, and properties in four dimensions (space and time), including the sea surface, contents of the water column, and the sediments and crust beneath the seafloor.

One of the points that should have been made clearer at the workshop is that charting and baseline data gathering in Canada is many years behind where it should be. Major government cut-backs ironically came at a time when:

- the spatial and legal jurisdiction vastly increased with the UN Law of the Sea Treaty;
- there is increasing competition on the use of oceans and coastal resources;
- there are new technologies available to expand our knowledge of marine areas;
- there is a growing demand for ocean mapping services internationally.
- academic institutions in Canada have developed internationally recognized programs to support traditional hydrography and new ocean mapping techniques.

The results of these cutbacks include the loss of Canadian expertise as job markets and research facilities in the United States and abroad become more attractive. They also include the fact that while Canadians are mapping the offshore territories of other countries, Canada has a deteriorating information infrastructure offshore and this lack of information affects

jurisdictional claims and enforcement, environmental protection, as well as economic development.

If Canada is not to fall completely behind in international responsibilities and competitiveness, such issues as the following need to be addressed very quickly:

- enhancing job growth in areas such as information technology, electronic chart production, hydrography, geomatics engineering, data acquisition, sensor development
- linking ocean mapping to natural resource development in support of economic and social goals;
- promoting ocean mapping as a necessary step in understanding and protecting the environment;
- enhancing research and development through improved co-operation among government, industry, and academia.

Ocean mapping activities in Canada need better coordination and integration. A sound national ocean mapping policy direction is needed. Such a policy would preserve and enhance Canada's oceans mapping capability, with tremendous economic benefits. A policy fostering development of ocean mapping capabilities should start with a well-focused, goal-oriented program within government inspired by the theme of "ocean transparency". Many specific sampling and data presentation programs are likely to fall within this theme - better fish counting, remote sensing, ocean observatories, etc... Attention to both data acquisition and visual impact of their presentation is required to increase "transparency"

R6.4.1 It is therefore recommended that the federal government establish a multi-disciplinary and multi-departmental working group that includes the private sector, provincial interests, and academia. Among other tasks, the working group should establish a broad policy framework that defines an ocean mapping program and funding levels required to meet the stated objectives. The framework should also identify areas for leveraging data collection along the coasts, as well as identifying key requirements for ocean mapping research.

R6.4.2 It is also recommended that CHS, working in conjunction with ACLS and other stakeholders, develop an information strategy to communicate the need for an expanded ocean mapping program in Canada to politicians, other government departments, other levels of government, and stakeholders in the private sector.

R6.4.3 Governments should encourage, through partnerships, the participation of university and industry researchers in its research goals. Particularly fruitful are adjunct professorships, where government and industry scientists can direct graduate students and bring to the benefits of their energy, skills and experience to academia. Other models are the development of internships for student with government and the private sector.

R6.4.4 It is recommended that particular fundamental research be directed towards acoustic imaging and other technologies leading to "ocean transparency". Government should encourage and provide some funding for initiatives which introduce the public, and especially the young public, to "seeing through" the ocean: to visualize ocean depths and ocean processes. Public support (and overall funding) for ocean mapping will grow with visualization of the ocean by the public.

6.5 UN Convention on the Law of the Sea (UNCLOS)

After Canada ratifies the UNCLOS convention, there will be only a limited time available to accurately map the outer limits of our continental shelves and to submit a proposal to the UN. Canadian capability to map these ocean areas is likely to be a main international market opportunity for Canadian ocean mapping during the next decade.

An important short-term challenge for ocean mapping is the accurate mapping of sea bed in the areas where the foot of continental slope and the 2500 meter isobath are located. Not only is this mapping critically important for the delineation of the extended continental shelf, it would allow Canadian industries to develop and refine expertise at home with which they could aggressively pursue international projects as other countries prepare and submit claims to the UN. Of the approximately 70 Coastal States who are expected to claim a Continental Shelf, it is estimated that 30 - 50 countries will require foreign help to prepare and submit their claim. The potential value of the work is conservatively estimated to be at least $100M (US) worldwide.

An early start in Canadian waters would help position Canadian industry to be a strong player in this market. Canada will also realize benefits through the positive impact that undertaking this work could have on the oil and gas exploration industry. Industry is concerned that as they move into deeper water beyond 200nm, there will not be clear title to exploitation of resources and may therefore spend their exploration funds elsewhere.

R6.5.1 It is recommended that the ACLS send a letter along the following lines to federal ministers of DFO, NRCan, Foreign Affairs, etc.:

> "We the Association of Canada Lands Surveyors (ACLS) respectfully recommend that Canada immediately begin the survey and technical work needed to maximize the area Canada can claim as a Continental Shelf under *United Nations Convention on Law of the Sea* (UNCLOS) and as specified in the *Canada Ocean Act*. UNCLOS gives all Coastal States a 200nm wide EEZ, and allows them to claim a Continental Shelf seawards of that, providing they prepare a case according to UN Guidelines. The technical elements of preparing the case include surveying and collecting data offshore, analyzing and interpreting it, and preparing a submission.

Representing 500 geomatics professionals who have a formal mandate and license to survey Canada Lands, the ACLS believes that such a decision would benefit Canada in a number of ways. First, this would allow our industry and complementary Canadian industries to develop and refine expertise at home with which they could aggressively pursue international projects, such as participating in the preparation and submission of claims as other countries prepare and submit claims to the UN. Of the approximately 70 Coastal States who are expected to claim a Continental Shelf, it is estimated that 30 - 50 countries will require foreign help to prepare and submit their claim. The potential value of the work is conservatively estimated to be at least $100M (US) worldwide. An early start in Canadian waters would help position Canadian industry to be as a strong player in this market.

Canada will also realize benefits through the positive impact that undertaking this work can have on the oil and gas exploration industry. They are concerned that as they move into deeper water beyond 200nm, there will not be clear title to exploitation of resources and may therefore direct their exploration funds outside Canada. Undertaking this work will be a signal that Canada intends to take title and reassure the industry that it can invest in a secure area. The survey work itself will also encourage hydrocarbon exploration since the data for an UNCLOS claim can be collected collaboratively and for multiple purposes supporting both the claim and interpretation of hydrocarbon potential.

We believe that time is of the essence. Under the current rules, some of the Coastal States will have to submit their claim to the UN by 2004, and several developed countries are currently seeking to establish themselves as the supplier of choice. We urge an early commitment to this work that will clearly benefit the surveying and geomatics industry and provide employment for Canadians in regions in which employment levels are the lowest in Canada."

6.6 Intergovernmental Coastal/Offshore Jurisdiction and Administration

Jurisdictional uncertainty is a major factor in the lack of comprehensive approaches to ocean resource problems. The current regime of provincial and federal government rights to ocean resources (water column, seafloor, fish etc.) is a mosaic of overlapping and often conflicting public and private rights and powers. To complicate matters, the administration of coastal and ocean resources does not necessarily coincide with the jurisdiction. At another level, aboriginal and community rights are often not taken into account at all in decision making. Coastal communities are often unable to participate in policy making because they do not have sufficient information to understand the potential implications. One result is that rights to explore, develop, use coastal and offshore resources may be in potential conflict with community rights, aboriginal rights, rights of traditional fishers, rights of riparian landowners.

If such goals as environmental protection, economic development, and participation of all stakeholders in the policy making processes are to be met, then there is a need to better understand and appreciate the complexity of the offshore regime. This is in contrast to approaches where different levels of government are unaware of competing authorities and the importance of existing rights and powers. In addition, these goals probably cannot be met unless there are new approaches put in place to manage marine resources and resource use.

R6.6.1 It would be overly ambitious and perhaps counter-productive to recommend complete clarification of all spatial limits of various jurisdiction, ownership, and administration. However, it is recommended that governments at all levels take a more proactive approach to understanding, communicating, and resolving the issues.

R6.6.2 It is further recommended that the ACLS work closely with federal and provincial counter-parts to increase awareness of jurisdictional and administrative complexity and of the importance of addressing property right regimes in marine areas in any policy, plan, or development.

R6.6.3 The ACLS, together with federal and provincial counterparts should also look at ways of co-managing boundary and property rights information in marine areas as a model for other public information activities.

6.7 Towards a Marine Cadastre and MGDI

All of the above issues and recommendations are essential to developing a comprehensive strategy for marine information management. Of particular interest at this workshop was information regarding rights and restrictions and information about jurisdictional powers and governmental administration. What these data sets have in common is the fact that they have spatial dimensions defined by legal boundaries. Gaining a better understanding of the complexity of these spatial limits was a key success of this workshop. But more work needs to be done.

One of the concepts discussed at the workshop was the development of a marine cadastre. It is expected that the participants had many different ideas of what this might consist and who would be responsible. These ideas need to be explored in future workshops and other forums. Research has been underway to define what a four dimensional marine cadastre might entail, including exploration of the data uncertainty aspects from many perspectives. There is a need to expand this research and to be in putting the first components of a marine cadastre into place. The ACLS and LSD will be key players in this process. However, the jurisdictional complexity and the sheer magnitude of the task require a co-operative strategy among all levels of government, industry, and private interests.

There is an opportunity to take on this task in conjunction with the many recommendations given above and in the workshop proceedings. As a concept, the development of a marine cadastre

provides a framework for addressing all the other issues. As a goal, it will assist those responsible in communicating the needs, priorities, and opportunities.

R6.7.1 It is recommended that such a marine cadastre be promoted as an essential part of the framework data required for the development of the marine geo-spatial data infrastructure required by Canada to meet its ocean obligations and to maximize the opportunities Canada's ocean spaces provide.

R6.7.2 It is recommended that the ACLS in conjunction with other stakeholders discuss the concept of the development of a marine cadastre in future stakeholder workshops and other forum to gain input from the many stakeholders.

R6.7.3 It is also recommended that the Legal Surveys Division, in conjunction with ACLS and federal and provincial counterparts, take a lead role in promoting the marine cadastre concept to politicians, within governments and in the private sector. This will involve developing further some of the ideas and issues raised at this stakeholders' meeting.

R6.7.4 It is further recommended that the Legal Surveys Division develop a project to implement the marine cadastre concept in a trial, so as to better understand and communicate the issues.