# Community-led Integrated Coastal Zone Management: Case Study from Malpeque Bay, Prince Edward Island

By

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# Table of Contents

# Abstract

The *Oceans Act 1996* highlights amongst other principles, Canada's commitment towards Integrated Coastal Zone Management (ICZM). The *Oceans Act* assigns the Department of Fisheries and Oceans the role of developing and implementing ICZM programs to manage activities affecting the marine environment in collaboration with stakeholder. Consequently, the purpose of this paper is to provide guidelines for the development and implementation of a community-led Integrated Coastal Zone Management (ICZM) program. The paper accomplishes this by first outlining the theoretical approach to the process of program development and implementation then utilizes the Malpeque Bay, Prince Edward Island as the case study for practical application of the theoretical approach. The fact that there were various user conflict that can be directly attributed to sector-base management of the four major sectors (fishing, aquaculture, aquaculture and tourism) utilizing the limited space in the bay coupled with expressed interest of the island's First Nations to develop and implement a community-led ICZM initiative made the Malpeque Bay an ideal case study. The paper outlines the stages of developing and implementing an ICZM program; the organisational structure of the management body; methods for achieving stakeholder participation; and various decision support methodologies.



**Keywords:** integrated coastal zone management, Malpeque Bay, stakeholder participation, co-management, user conflict, conflict resolution, community-led.

# List of Figures

# List of Acronyms

| | |
|---|---|
| CB | Convening Body |
| CDB | Convention on Biological Diversity |
| DFO | Department of Fisheries and Oceans |
| EDR | Environmental Dispute Resolution |
| ERA | Ecological Risk Assessment |
| ICZM | Integrated Coastal Zone Management |
| MBMW | Malpeque Bay Mega Watershed |
| MCA | Multiple Criteria Analysis |
| MCPEI | Mi'kmaq Confederacy of Prince Edward Island |
| MNF | Mediated Negotiation Framework |
| NGOs | Non-Governmental Organizations |
| NRCAN | Natural Resources Canada |
| PEI | Prince Edward Island |
| TEK | Traditional Ecological Knowledge |
| UNCLOS | United Nations Convention on the Laws of the Sea |
| WGs | Working Groups |

# Dedication

To my brother Jamie; your memory is the driving force behind everything I do.

# Acknowledgement

I would like to thank:

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The Lennox Island and Abegweit First Nations for unforgettable cultural experience. The staff of MCPEI especially Mr. Randy Angus and Ms. Lori Richard my internship supervisors, there support and advices was invaluable in the development of this paper and Kim Guimond for all her assistance with office logistics.

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# Introduction

Integrated Coastal Zone Management (ICZM) is a collaborative process of decentralized governance that utilizes a suite of management tools such as marine protected areas, land-use planning, marine zoning and conflict resolution to harmonize current and future uses of the coastal zone via the creation of a unified long-term vision (Christie, 2005; Tobey and Volk, 2002). Inefficiencies within the sector-based management system including policy overlap and fragmentation that plague traditional coastal management regimes has set the stage for the development of ICZM over the last two decades as an alternative to the sector-based management (Sorenson, 1997). ICZM allows for the creation of harmonized and integrated legislative and policy framework, implemented through a coordination mechanism of cross-sectoral management, with clear and consistent guidelines (Tobey and Volk, 2002). ICZM came to the forefront of coastal resources management after its inclusion in Chapter 17 of Agenda 21 which calls for the "*protection of oceans ... enclosed and semi-enclosed seas, coastal areas ... through new approaches to marine and coastal management that are fully integrated and precautionary*" (Harvey et al., 1999: 51).

In keeping with the evolution of sustainable environmental management occurring within the international arena (i.e. UNCLOS, CBD, Agenda 21), Canada enacted the Oceans Act (Meltzer, 1998). The Oceans Act which came into effect in 1996 highlights Canada's commitment towards the concepts of sustainable development, integrated management and the precautionary approach (Meltzer, 1998). The *Oceans Act* (1996) tasked the Department of Fisheries and Ocean with creating Canada's "*Ocean Management Strat*egy" which included amongst its mandate (Meltzer, 1998):

1. The integration of the fisheries sector within a broader ICZM framework.
2. The introduction of measures to reduce, remediate and control land-based sources of marine pollution within the broader ICZM framework.

3. The establishment of a network of community-based and regional ICZM initiatives to effectively manage and protect the coastal zone.

The *Oceans Act* 1996 effectively provides the enabling legislation for ICZM, within the Canadian context. Despite this fact, the *Oceans Act* does not outline a framework for accomplishing this objective; it is left up the various regional offices to establish a framework that fits within Canada's national "*Ocean Management Strategy*" (Meltzer, 1998).

A series of court rulings (Sparrow 1990 and Marshall 1999) with regard to resources use between the Canadian Crown and members of Aboriginal groups has led to the Canadian Supreme Court re-affirming First Nations 1760 treaty rights with regard to natural resource utilization (Notzke, 1995; CBC, 2004). In 1990 the Canadian Supreme Court ruled in the "Sparrow Decision" that First Nations had a treaty right to fish for food, social and ceremonial purposes (Asch and Macklem, 1991). The Canadian Supreme Court in 1999 in what is referred to as "The Marshall Decision" ruled that aboriginal peoples had a treaty right to "trade fish and wildlife resources for a 'moderate' livelihood" (CBC, 2004). Confusion over the application of this decision led to a clarification of this ruling by the Supreme Court known as "Marshall 2" (CBC, 2004) "Marshall 2" noted that although natives had the right to fish for a "moderate livelihood," the government retains the power to regulate native fisheries for conservation purposes (CBC, 2004).

Following the re-affirmation of treaty rights to participate in wildlife resource extraction for food, social, ceremonial and livelihood (economic) purposes, First Nations throughout Canada have taken a proactive role in natural resource management. Aboriginal self government and the corresponding rights and interests in coastal/marine resources introduce another jurisdictional layer and element of complexity in coastal management within the Canadian context. Consequently, the strategies, approaches and decisions of Aboriginal peoples in the management and preservation of coastal and marine resources must be incorporated into regional ICZM programs.

The local economy of Malpeque Bay, Prince Edward Island (PEI) is very dependent on the success of the agriculture, aquaculture, fisheries, tourism and processing sectors. Currently, the management of these sectors follows the conventional "sector-based" model, where each sector has its own management plan that is developed and implemented in relative isolation from the other sectors by the federal or provincial government department responsible for each sector. The fact that five economically significant sectors within Malpeque Bay are managed utilizing the conventional sector-based management systems makes it a perfect candidate for ICZM.

Prince Edward Island is the only province in the maritime where the federal government (DFO) maintains the regulatory and management mandate over aquaculture leasing (DFO, 2006). In what may be considered a direct contradiction of the mandate for integrated natural resource management as set forth by the *Oceans Act* 1996, in January 2008, the DFO initiated a process for the creation of an Aquaculture Management Plan for the Malpeque Bay utilizing the sector-based management model. The Mi'kmaq Confederacy of Prince Edward Island, through their Integrated Management program, has taken this oversight by the government as an opportunity for creating a placed-based community-led ICZM initiative for Malpeque Bay, thereby exercising First Nation commitment to sustainable resources management. The goal of the proposed ICZM initiative would be to combine knowledge of native and non-native stakeholders; policy-makers; social and natural scientists to anticipate, monitor and sustainably manage the coastal zone of Malpeque Bay.

In accordance with the expressed goal of the MCPEI, the objective of this paper is to conduct a comprehensive literature review along with a preliminary stakeholder analysis in order develop a suite of best practices that could be used in the development and implementation of an effective ICZM that matches the physical and socioeconomic circumstances of Malpeque Bay. The paper is organized into six sections. Section one presents the research methodology used in creating this document. Section two provides background information on Malpeque Bay. Section three is a review of the body of scholarly literature with regard to ICZM, Stakeholder Involvement and Conflict management. Section four presents the perspectives of the various sectors as highlighted

by representatives of the respective sectors. Section five is an analysis of the different perspectives in a manner that maps the interactions and concerns of the various sectors. Section six synthesizes the best practices highlighted within the literature review and the stakeholder analysis to create an ICZM model that the best fits the management requirement of Malpeque Bay.

# Research Methodology

This study was divided into three stages; literature review; stakeholder identification and interviews; and stakeholder analysis and ICZM strategy development.

***Stage 1: Literature Review***

The literature review entailed library and internet searches through both peer-reviewed journal articles and grey literature related to the themes of conflict theory, ICZM and stakeholder involvement. The conflict theory aspect of the literature review is aimed at identifying and classifying the user conflicts within the Bay (i.e. are the conflicts real or perceived and identify the source of the conflicts). The ICZM component of the literature review focused on identifying best practices for reducing user conflict and maintaining ecosystem functionality. The literature on stakeholder involvement is intended to form the basis for ensuring that as many stakeholders are included in the creation of an ICZM plan as possible

***Stage 2: Stakeholder identification and Interviews***

This stage of the project began with generating a list of resources within the defined area. Following the generation of the resource list, another list was compiled this time identifying the various organizations that might have an interest in the resources that were identified (see Appendix 4 for a comprehensive list of stakeholders). The next activity was to obtain insight into the perceptions of the different sectors within Malpeque Bay

watershed. To accomplish this, a series of semi-structured telephone interviews were conducted (see Appendix 3 for a complete list of questions). Time constraints necessitated that respondents be limited to only key informants from each of the major sectors (fisheries, aquaculture, agriculture, tourism) and NGOs within the bay. The primary investigator took comprehensive notes of each interview paying particular attention to the interactions between the different sectors, conflicts identified and the willingness of sectors to participate in ICZM within the Bay. The open-ended questions presented to the interviewees may be categorized into three themes:

1. Sector interactions or relationships
2. The awareness of the Malpeque Bay ICZM initiative.
3. The willingness of the sector to participate in ICZM

***Stage 3: Stakeholder Analysis and ICZM Strategy Development***

The objective of this stage of the project is the synthesis of the information gathered from the stakeholder interviews and best practices in ICZM emerging from the literature into an effective approach to developing and implementing ICZM in Malpeque Bay. This entailed conducting a preliminary "Social Network Analysis" aimed at categorizing and documenting stakeholder interactions with regard to communication, trust and influence. The approach to social network analysis utilized here was borrowed from Reed et al. (2009). There are two justifications for the use of social network analysis within the context of the project. Firstly, it allows for the evaluation of the level of influence of the sectors; mapping the relationship between the different sectors; and their willingness to develop alliances. Secondly, it provides a mechanism for the removal of investigator bias pertaining to the interactions that exist between the different sectors (Reed et al., 2009).

According to this model, there are four objectives of stakeholder analysis:

1. Defining the aspects of a social and natural phenomena affected by a decision or action.

2. Identifying individuals, groups and organisations that are affected by or can affect those parts of the phenomena that can be affected.

3. Prioritizing identified individuals and organization for inclusion in the decision-making process.

4. Development of strategies and processes that more effectively represent and involve stakeholders in environmental decision-making processes.

In order to create interaction matrices of the coastal activities that highlights high conflict or areas of concern, and consequently requiring special attention the following questions were answered using the information collected during the interview process.

- Who are the parties that are interested in participating in ICZM?
- Who has the power to influence what happens?
- How do these parties interact?
- How might these parties be able to work more effectively together?

## Background

### *Site Description*

Malpeque Bay (46°32' N., 63°48' W) is a 24, 400 ha estuary located on the northern Coast of Prince Edward Island, 10 km North of the town of Summerside (see Appendix 1 for a map of the study area) (Environment Canada, 2003). The name Malpeque Bay is a French rendition of the Mi'kmaq word '*makpaak'*, meaning "large bay" (Encyclopaedia Britannica, 2009). The Bay is protected from the Gulf of St. Lawrence by a 25 km-long coastal sandspit and dune formation (Environment Canada, 2003). A 1 km-wide channel at the eastern tip of the sandspit is the primary source of tidal exchange between the bay and the Gulf of St. Lawrence (Environment Canada, 2003). Twenty three small rivers

and creeks empty into Malpeque Bay (Environment Canada, 2003). Malpeque Bay is characterized by; 700 ha of salt marsh, 7,600 ha of shallow estuarine water and flats, 80 ha of saline ponds, 640 ha of sand dunes, 260 ha of sand beach, 2,200 ha of islands and 12,960 ha of open water (Environment Canada, 2003). There are nine islands within the Bay, five of which are wooded while grass and shrubs form the primary vegetation on the other four (Environment Canada, 2003). The land surrounding Malpeque Bay is predominantly privately owned with the exception of the sandspit which is crown land (most of which is owned by the Lennox Island First Nation); Bunbury Island (97 ha); 60 ha of salt marsh on the eastern side of the bay; Green Park (87 ha) and Cabot Park (58 ha) (Environment Canada, 2003). On April 28, 1988, Malpeque Bay was designated a wetland of international importance under the guidelines set forth by the Ramsar Convention (Environment Canada, 2003).

## *Historic Use of Malpeque Bay*

Archaeological records indicates that human have inhabited the coastal region of Malpeque Bay as early as the Holocene Period (11, 000 to 10,000 years ago) which accounts for at least five hundred Aboriginal generations (Simpson and Bisaillon, 2000). The period of European settlement beginning in the early 1920's saw the transformation of Malpeque Bay form a heavily forested landscape to one dominated by mixed farm communities (Sobey, 2006). The lands surrounding the Malpeque Bay was utilized during the period of European settlement for intense livestock grazing and cultivation of crop which favoured the natural drainage of the bay including grain, hay and turnip (Simpson and Bisaillon, 2000).

Pre-world war II (1939-1945) the population would engage in both farming and fishing at different times of the year resulting in diversification of the economy and livelihoods. However, following WWII a movement for specialization effectively ended the era of diversified livelihoods where the majority of the workforce would rotate between farming and fishing activities (Simpson and Bisaillon, 2000). Having a single source of income led to the intensification of both fishing and farming since these activities was no longer rotated throughout the year; rather these activities were executed continuously by families

that now specialized in these activities (Simpson and Bisaillon, 2000). Specialization effectively reduced the ability of the soil and coastal marine environment to recover or replenish themselves due to continuous use, ultimately resulting in the degradation of soil quality and reduction in shell and fin fish biomass within the Malpeque Bay watershed (Simpson and Bisaillon, 2000).

The economy of Prince Edward Island has always depended on natural resource as it primary means of revenue generation; this is highlighted in the fact that the economy has transitioned from shipbuilding in the 19th century; to Silver fox farming at the turn of the 20th century; and finally to the industries that currently dominate (fisheries, agriculture and aquaculture) (Simpson and Bisaillon, 2000).

The shipbuilding industry provided the bulk of the economic revenue during the 19th Century until the collapse of the old growth forest in the 1880's due primarily to clear-cutting for human settlement (Minegoo Group, 2000). The shipbuilding industry of the early 19th century was replaced by the highly lucrative silver fox pelt industry, with the first farm being established in 1894 (Simpson and Bisaillon, 2000). During the early decades of the 20th century, eighty-five percent of the silver foxes in captivity were located on PEI, with furs fetching as much as 2000 English pounds in London (Simpson and Bisaillon, 2000). By the 1940's saturation within the fur market spelt the end of the highly lucrative industry and ushered in the current era in the economy of PEI (Simpson and Bisaillon, 2000).

The end of the fox pelt industry saw the population returning to fishing and agriculture as their primary livelihoods and revenue generating activities. Currently, the lobster fishery is the major fishery that is executed within the confines of Malpeque Bay with limited contributions from the finfish fishery. Although, lobster canning dates back to the 1880s, it was not until oyster farming commenced in the 1930's did seafood processing became fully entrenched in the economy of the island (Simpson and Bisaillon, 2000).

# Literature Review

## *The New ICZM Paradigm*

Sorensen (1997) defines ICZM as the integrated planning and management of coastal resources and environments in a manner that is based on the physical, socioeconomic, and political interconnections both within and among the dynamic coastal systems, which when aggregated together define a coastal zone. Within the ICZM context there are two dimensions to integration; vertical and horizontal integration (Tobey and Volk, 2002). Vertical integration allows for harmonization of policies between all levels of government, NGOs, indigenous peoples, communities and private sector; while horizontal integration requires the creation of intersectoral linkages between the different sectors (fishing, aquaculture, agriculture etc.) with jurisdiction in the coastal zone (Meltzer, 1998; Tobey and Volk, 2002). Sorensen (1997) notes that there are six distinct types of coastal areas: coastal waters; coastline; coastlands; coastal waters and coastline; coastline and coastlands; or coastal waters, coastline, and coastlands. He also argues that to be considered ICZM a program must include all three geographic components: coastal waters, coastline, and coastlands.

ICZM finds its theoretical underpinning in the understanding of the natural phenomena present in the physical environment (Rodriquez et al., 2009). Nunneri and Hofmann (2005) argue that there are three primary components to ICZM; impacts, socioeconomic drivers and response. More specifically, they defined impacts as the perceived environmental problems within a particular geographical location. Socioeconomic drivers were defined as the conflicting land-uses and interests for the limited resources and response as the proposed mitigation measures and policies enacted to combat these issues.

Buanes et al (2005) elegantly sums up the intricacy of ICZM when the noted that; "*The natural, cultural and socio-economic conditions of coastal communities are diverse, complex and dynamic. Consequently, coastal issues are usually multi-faceted, with each facet being of particular concern to a specific stakeholder group*."

The successful resolution of environmental problems necessitates flexible and transparent decision-making that is able to adapt to the dynamic nature of the prevailing issues (Reed, 2008). In order to achieve the requisite level of transparency, stakeholder participation in decision-making is one of the most critical steps; because, stakeholder participation improves transparency. Stakeholder participation in decision-making improves transparency by effectively opening the doors to the decision-making chamber; thereby, demystifying the decision making process. By improving the inclusivity of the decision-making process, stakeholder participation reduces the likelihood that those on the periphery of the decision-making process will be marginalized; thus, becoming a hindrance to the implementation process (Reed, 2008). Reed (2008) also contends that the inclusion of stakeholders in the decision-making process increases the likelihood that the interventions and technologies devised are better adapted to the socio-cultural and environmental conditions of the location where they are going to be implemented.

Stakeholder participation involves "*processes where individuals, groups and organizations choose to take an active role in making decisions that affect them*" (Reed 2008: 2419).

The evolution of the stakeholder participation paradigm has led to the development of various typologies for describing and distinguishing the different degrees to which stakeholders are engaged in the decision-making process. Arnstein's (1969) "ladder of citizen participation" which we would return to later on in this paper, highlights the fact that stakeholder involvement occurs along a continuum and is one of the most cited typology within the stakeholder participation literature.

Within the ICZM literature, stakeholder involvement or participation is often cited as possessing the potential for fostering "social learning" (Reed, 2008). Reed (2008) defines

"social learning" as a process by which members of the wider community learns to appreciate the legitimacy of each other's views ultimately transforming adversarial relationships. The success of an ICZM programs depends heavily of social learning as the primary mechanism for the transformation of adversarial relationships; thereby, allowing stakeholders to work together effectively to resolve the environmental issues affecting their resources base.

Stakeholder participation theorists are striving towards a paradigm shift from the "tool-kit" approach to participation, where a pre-established set of principles or mechanisms are applied to blindly to environmental issue without alteration to fit the intricacies that exist at that particular location. The stakeholder participation scholarship are advocating what is termed a "service contract" approach which emphasises the development of mitigation measures that possesses the flexibility in adapting to different and changing natural and socioeconomic circumstances (Reed, 2008). In other words, the "tool-kit" model of environmental management that dominates current ICZM initiatives globally, has traditionally attempted to resolve resources management issues by picking and choosing from a one size fits all suite of principles or approach. Conversely, the new "service contract" model or paradigm attempts to devise a place-based management system, where the mitigation measures are tailored to match the circumstances and dynamics of the environment where it is employed.

There are a number of requisite conditions for an effective stakeholder participation exercise, the first of which is empowerment (Reed, 2008). There are two components to empowerment with regard to ICZM; the genuine devolution of power amongst stakeholders and providing stakeholders with the requisite technical capacity to participate in decision-making.

Reed et al., (2009:1942) noted that stakeholder literature does not provide a strong explanation of "influence" while offering the following description borrowed from the social psychology literature, "[influence is a] *process of affecting the thoughts, behaviour, and feelings of another.*'' They also argued that "*the capacity to influence is dependent on power*."

According to Mitchell et al., (1997) and Buanes et al., (2004), there are three core attributes that converts an actor into a stakeholder and determine their level of influence

1. Urgency: is determined by the degree to which the claims of a particular stakeholder elicit immediate attention. The stakeholder's interests and concerns must be addressed in the short term and cannot be postponed. There are two components of urgency; time sensitivity and criticality. The time sensitivity deals with the degree to which attending to a stakeholder is unacceptable; while criticality focuses on the importance of a relationship of claim.

2. Power: describes the relationship among social actors, where one (or more) actor possesses the ability or the resources to persuade another actor to yield or do something that they would not have otherwise done. There are three sub-categories of power; coercive, utilitarian and normative.

3. Legitimacy: the perception that the concerns and views of stakeholders are particularly appropriate, justifiable, desirable and valuable to the objective of ICZM and therefore should form its basis.

Wu (2008) defines power as "*one party's capability to gain access to coercive, utilitarian or normative means to impose its will in the relations*." Wu (2008) definition highlights the fact that there are three typologies of power; coercive, utilitarian and normative (Wu, 2008; Reed et al., 2009; Mitchell et al., 1997). According to Mitchell et al. (1997) coercive power gains influence through emotional financial and physical threat and punishment. Utilitarian power gains influence via symbolic, financial and material rewards, such as salaries or gifts (Mitchell et al., 1997). Normative power gains influence through manipulation of belief such as cultural norms, education and advertising (Mitchell et al., 1997). Reed et al. (2009) is very careful to note however, that sources of power are transitory and does not in itself equate to influence, because various stakeholders may choose not to use their power.

## *ICZM Process*

McCreary et al. (2001) has proposed dividing the process of developing an ICZM program into three distinct stages, each of which are further subdivided into variable number of steps (see Figure 1).

**Stage 1 (Project Inception)**

Step 1 (Convening)

The convening step is geared towards identifying a critical mass of participants termed the convening body. The convening body would form the core unit for the project inception stage.

Step 2 (Establishing participation)

During this stage the convening body work towards the identification and engagement of all relevant stakeholders. Once all stakeholders are identified and invited to participate in the CZM initiative, a stakeholder assessment should be conducted to assess the views, interests, aspirations and the willingness to participate and commit to the process.

Step 3 (Agenda Framing)

This step focuses on creating a mission statement that reflects the collective views and objectives of the management body along with establishing ground rules for participation. The creation of the mission statement is one of the major tasks of the convening body and is based on the stakeholder analysis conducted in the previous step.

**Stage 2 (Option Development)**

Step 1 (Fact Finding)

This step is dedicated towards analysing and debating the competing and/or conflicting interests of the various stakeholder groups involved in the ICZM program. The fact finding process would entail nonpartisan experts with a variety of views, interests and expertise answering critical questions with the ultimately goal of establishing scientific consensus within the management body. The adversary science approach establishes what

scientific and technical information will be utilized as a legitimate foundation for deliberation.

Step 2 (Management Options)

The development of management option, utilizes the scientific consensus achieved during the "fact finding" step as the primary source of information required to develop and analyse a suite of mitigation measures. The primary objective of this step is to engage the participants most of whom possess different mental modes entering the process to acceptance their differences in opinion and develop a mosaic mental mode that is superior to all of the individual models that they entered the process with. It is important for then participant to note that this step is for the creation and development of as many management options as possible, not deciding on any particular one. Having multiple options for each issue at stake enables mutual gain bargaining via stakeholder trade-off that ultimately leads to a pareto-optimal solution to be reached.

Step 3 (Preliminary Documentation)

This stage entails the creation of a preliminary document that highlights the management options that have been created and developed to cope with the identified environmental issue(s). It also highlights the areas of common ground and the areas of competing or conflicting interests. This document is intended to inform the next stage of the process and for reporting back to the stakeholder groups as to the progress of negotiations so that stakeholder groups may re-strategize.

**Stage 3 (Decision-making)**

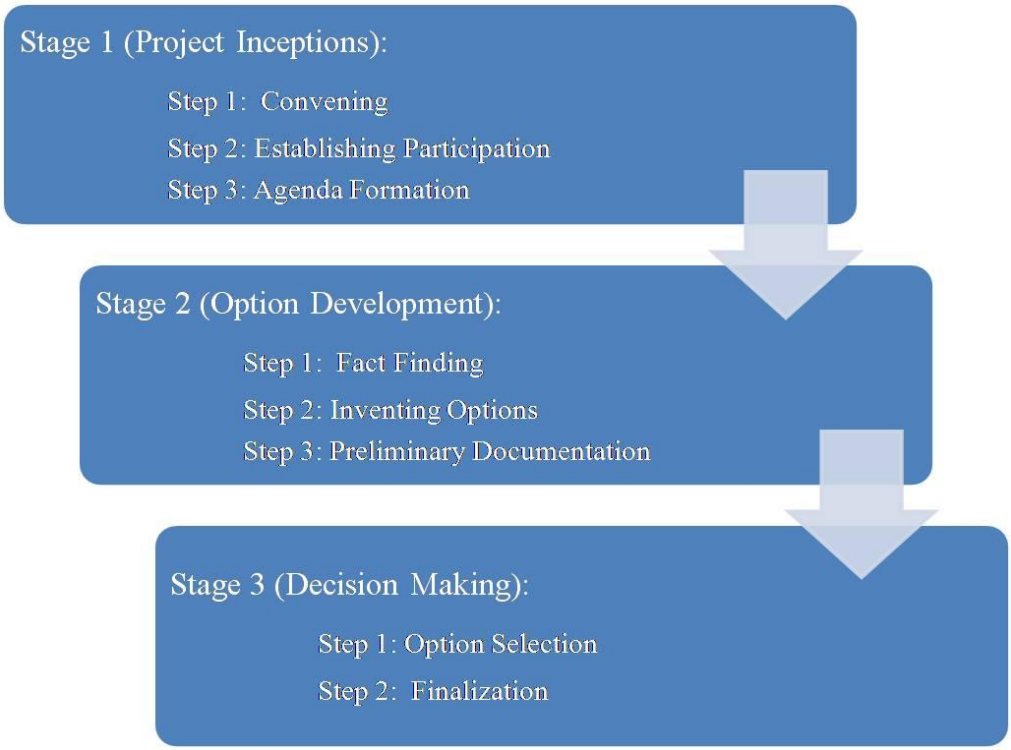
Step 1 (Option Selection)

This step is selects the management option that would be implemented via the process of mutual bargaining and stakeholder trade-off noted above. This step is also driven toward securing the commitment of all participants for the implementation of the selected options.

Step 2 (Finalization)

Once the final management options are decided on, it is time to begin implementation. This step is focused on assignment of roles and responsibilities for the implementation of various components of the management options selected.

**Figure 1 Schematic representation of the ICZM process proposed by McCreary et al., 2001**




## *ICZM initiating Conflict Typologies*

A global review of ICZM literature undertaken by McCreary et al (2001) has highlighted three primary conflict typologies that motivates ICZM; resources use; inter-jurisdictional and competing or overlapping mandates.

The resources use conflict typology as it names suggests characterized by inter- and/or intra- sectoral competition for the limited space and resources that are available with the coastal area (McCreary et al., 2001). According to McCreary et al (2001) this is the most frequently cited conflict typology within the integrated coastal zone management literature.

The Inter-jurisdictional conflict typology is characterized the inability of coastal zone management agencies to effectively manage the coastal zone because, the geographical scope of the critical natural phenomena traverses national or international jurisdictional boundaries (McCreary et al., 2001). In other words, the coastal zone management bodies are unable to effectively manage the environmental issues because, the causes or effects of the environmental issues in question occurs outside their jurisdictional boundary; thereby, preventing the establishment of effective geographical boundaries for their ICZM plan.

The competing or overlapping agency mandate conflict typology is characterized by inconsistency within the different governmental agencies/departments (e.g. fisheries, transportation, defence etc.) that manages the activities that occurs within the coastal zone (McCreary et al., 2001). For example, the mandate of the fisheries department may be to create a marine reserve in the coastal water around an outlying island. Conversely, the department of defence due to lack of coordination between the two departments may designate the island a bomb testing sight. Consequently, the lack of harmonization departmental mandates with regard to this island effectively creates a conflict of competing mandates which highlight the need for ICZM.

***Boundary Establishment***

The single most important factor in determining who has a stake in the system and ultimately who may be termed a "stakeholder," is determining the social and ecological boundaries of that system (Balaguer et al., 2008). Setting boundaries with regard to stakeholder identification poses an ethical issue because, the parties that are included has an opportunity to ensure that potential interventions are in their best interest while excluded parties are effectively excluded from the decision-making process. Despite the inherent difficulty in defining system boundaries it is critical that boundary designation is accomplished very early in the planning process (Balaguer et al., 2008). The success of an ICZM initiative depends on defining the appropriate geographical boundaries that encompasses both the causes and effects of the problem being addressed (Balaguer et al., 2008). In other words, when establishing the geographical boundaries of an ICZM initiative, it is vital that the area selected is large enough to capture the affected areas

along with all the natural and socioeconomic components on that are underlying the problem. It is also important that the boundaries that are established are small enough to be effectively managed. Given this concept, the established boundaries of an ICZM initiative should be based on the geo-environmental, socioeconomic and jurisdictional characteristics of the management area (Balaguer et al., 2009). Although, the optimal boundaries would encompass all the causes and effects of environmental issues, in some cases this is often very challenging, because environmental issues often traverse national or international jurisdictional boundaries. Balaguer et al. (2008) has proposed a suite of parameters that may be used to further refine the spatial boundaries of an ICZM initiative namely; territorial jurisdiction, socioeconomic sectors, habitats and legislation. Balaguer et al. (2008) also suggests using these parameters to develop a GIS layer that would aid in deliberative decision-making.

## *Empowerment within ICZM*

For the purposes of this paper, "empowerment" refers to the capacity-building process by which stakeholders of a community acquire the necessary skill set for autonomy and effective participation in an ICZM initiative (Jentoft, 2005). In order for an effective community-led ICZM initiative to occur, empowerment needs to occur within both government and stakeholder institutions (Jentoft, 2005). Simultaneous, empowerment of the government and stakeholder is a necessary component of the process since neither party has entered into such an arrangement that require the devolution of power to a stakeholder coalition.

There are four dimensions to psychological empowerment that are of particular importance to effective participation in integrated coastal zone management namely; personality, cognitive, motivational and contextual (Zimmerman and Rappaport, 1988; Jentoft, 2005). Personality empowerment is the development of one's self-confident; which fosters a sense of control and responsibility over one's actions. Cognitive empowerment provides the assurance that one possesses the necessary skill-set required to effect change or makes a difference in the decision-making process. The motivational dimension focuses on one's willingness and resolve in becoming part of the decision-making process. The contextual dimension of empowerment deals with one's awareness

of the prevailing environmental situation along with the ability to define problems, opportunities and influence change.

Rivera (1997) highlights the fact that stakeholder empowerment through participation in environmental management programs is a by-product of dialogue, which can only be achieved when resources users perceive their contributions as making a positive difference in the management of their resource base. Consequently, stakeholder empowerment is a critical component of a community-led ICZM program.

We now return to Arnstein's (1969) ladder of citizen participation for the discussion of empowerment within the ICZM context because, it provides a perfect metaphor for illustrating the dynamic nature of the governance continuum. The ladder of citizen participation divides the governance continuum in eight rungs on a metaphorical ladder which Arnstein (1969) separates into three categories corresponding to the level of participation exhibited. In ascending order, Manipulation and Therapy are the first two rungs on the ladder of participation and characterizes the "nonparticipation" category (Arnstein, 1969). Informing, Consultation and Placation are the next three rungs and forms the 'tokenism" category (Arnstein, 1969). Partnership, Delegated Power and Citizen Control are the final three rungs and are categorized as "citizen power" (Arnstein, 1969).

"Nonparticipation" according to Arnstein (1969) does not constitutes genuine participation since the main objective of this level of participation is to educate stakeholder rather than having them participate in planning or conducting programs. "Tokenism," allows for the views and concerns of the population to be heard; however, does not provide any mechanism or power for stakeholder to insure that their views and concerns are heeded (Arnstein, 1969). "Citizen Power" is characterized by an arrangement where, stakeholders possess the majority of the decision-making or managerial power (Arnstein, 1969).

As Arnstein (1969) elegantly points out, although her ladder of citizen participation only depicts eight rungs, in reality there are an infinite number of rungs on the metaphorical ladder; however, what is critically important is that the three categories of stakeholder

participation (i.e. nonparticipation, tokenism and citizen power) remains valid regardless of the number of rungs inputted.

## *Co-management in ICZM*

Integrated Coastal Zone Management initiatives are typically implemented by coastal zone management units administrated and staffed almost exclusively by government employees (Burbridge, 1997). Under these arrangements, the community or stakeholders are consulted for their opinion on a suite of management option that has been developed without stakeholder participation (Burbridge, 1997). The opinion of the stakeholders in the best case scenario is considered when making a final decision on which course of action to pursue (Burbridge, 1997). Conventional ICZM initiatives as highlighted above, generally offer no sense of transparency (Buanes et al., 2004). In other words, final decisions are made behind closed door with only the final decision publicized. Stakeholders are effectively excluded from participation in and understanding the decision-making process that is utilized. This type of arrangements would be classified as "tokenism" utilizing the participation typology established by Arnstein. The fact that stakeholder views and perspectives are actively sort means that the ICZM initiative has progressed pass the nonparticipation category; however, by not given stakeholders the power to ensure that the views and concerns that they express are heeded puts these arrangements firmly within the "tokenism" category (Arnstein, 1969). According to Sen and Raakjaer-Nelson (1996) the majority of ICZM initiatives that currently exists does so within the "tokenism" sub-categories.

The new paradigm in ICZM is making strides towards what would be categorized as "citizen power" by including stakeholders groups into the decision-making process through various Co-management initiatives (Jentoft, 2005). Collaborative or co-management is a power sharing arrangement that is characterized by the distribution of management responsibilities for a particular "common pool resources" between a state and a coalition of resources users (Carlsson and Berkes, 2004). Co-management is the part of the governance continuum that exists between the dichotomy of the conventional

"command and control" government administrated system and the exclusively community ran governance system (Carlsson and Berkes, 2004). It is important to note however, that co-management does not have to be a static arrangement. As Carlsson and Berkes (2004) noted, co-management can be a dynamic process that traverses the governance continuum, where the government and user groups continuously evaluate and re-adjusts themselves along the governance continuum.

Rivera (1997) noted that the level at which co-management occurs is a function of the legal environment; capacity and aspirations of the resources users and the political will of the government to devolve genuine power. Zimmerman and Rappaport (1988) were able to show that there is a positively correlation between participation in community activities and organizations and psychological empowerment through "social learning." The social learning theory highlights the notion that co-management effectively creating a self-reinforcing loop of stakeholder empowerment, since participation in co-management provide resources users with the capacity and empowerment necessary to climb the metaphorical ladder of stakeholder participation.

Consequently, the ultimate goal of co-management arrangement in ICZM is to provide a medium for greater participation of resource users in management thereby improving the efficiency and responsiveness of the decision-making process (Pomeroy and Berkes, 1997; Bradshaw, 2003).

The capacity of the stakeholders groups within this co-management arrangement is a major determinant in the ability of a co-management arrangement to realizing the expectations of improved efficiency and responsiveness (Bradshaw, 2003). Simply put, the success of a co-management initiative hinges on the capacity of the stakeholder groups to fulfill or accomplish their assigned roles and responsibilities.

## *Knowledge*

Scientific enquiry does not directly deliver policy; rather it informs policy and the range of potential policy options increases with scientific uncertainty or the use of a precautionary approach (Fletcher, 2007). The long periods of time needed to develop a

comprehensive metal model of natural phenomenon, results in gaps in the scientific knowledge regarding the coastal zone that are available to coastal zone managers. Consequently, Fletcher (2007) argues that "science" should be viewed as an input of the decision-making process that should be tempered using social and ethical criteria developed by the people affected by the resulting policy.

Science attempts to understand the underlying principle and theory behind an observable phenomena via the "know-why" method; while, traditional ecological knowledge is accrued by generations of informal collective "know-how". The difference between the two methods of knowledge development complements each other perfectly; therefore, the combination of local and scientific knowledge allows for the formulation of a more complete picture of complex and dynamic natural systems that underlay coastal management issues. This new hybridized form of knowledge would facilitate the production of more relevant and effective environmental policies and practices. Stakeholder participation in decision-making is the perfect catalysis for these two distinct bodies of knowledge that have traditionally been isolated from each other to work together to improve the rationality and legitimacy of the ICZM process (Buanes et al., 2004).

## *Stakeholder Involvement in ICZM Programs*

Stakeholders have typically been included in environmental management projects at the implementation stage; however, this often results in the needs and priorities of stakeholders differing from the objective of the project (Reed, 2008). This highlights the fact that stakeholder need to be involved early in the project unless the design of a management project is flexible enough to allow for changes to be made to the objectives at a later stage once stakeholders are consulted. The coastal managers need to include stakeholders during the project identification and preparation stages so that the objective of the ICZM program reflects their needs and priorities (Reed, 2008). The participatory process needs to be iterative such that decisions that are made are monitored and shortcoming or unanticipated outcomes ameliorated or new approached developed (Reed, 2008).

The biggest criticism of participatory policy-making process such as ICZM is that stakeholders possess insufficient capacity to meaningfully contribute to policy. The lack of understanding of the complexity of the issues involved or the implication of policy choices are often cited as the primary capacity deficit, especially when the evidence base for policy is scientific (Fletcher, 2007a). However, as Arnstein's ladder of citizen participation highlight, stakeholder participation can and should occur at the level at which the capacity of the stakeholders facilitate.

Stakeholder engagement is non-adversarial process directed at increase legitimacy of decisions through the participation of the affected groups (Holzer, 2008). In order to achieve public acceptance of an ICZM program, the initiating body needs to conduct their activities within the standards, etiquette and public perception of the area (Holzer, 2008). According to Fletcher (2007a) there are three fundamental questions pertaining to stakeholder participation in ICZM:

1. Who should be included?
2. At what stage in the policy-making process should participation occur?
3. What form of participation should occur?

Freeman, (1984: 46) defines "stakeholder as "any group or individual who can affect or is affected by the achievement of the organization's objectives."

Freeman's definition leaves the notion of stake unambiguous; that is, the notion of stake can be unidirectional or bidirectional in the sense that a stakeholder can affect or be affected by an action. According to Mitchell et al. (1997) a stake is associated to some form of risk, where something can be gained or lost. Achterkamp and Vos (2008) has taken Freeman's definition of stakeholder a bit further by stating that stakeholder can be classified into two parties; those who holds the "potential for collaboration" or those with the "potential for threatening." By using this dichotomous classification, Achterkamp and Vos attempts to refine freeman's unambiguous notion of stake into an archetype that is readily applicable to environmental management.

There is a distinct difference between an "influencer" and a "stakeholder." An "influencer" possesses power over an organization irrespective of having a valid claim/stake; conversely, a "stakeholder" may have a legitimate claim but lack the power to influence the decision-making body (Mitchell et a., 1997).

**Identifying stakeholders**

The first step in the stakeholder identification process should begin by defining broad stakeholder categories based on the resources and activities that are available in the study areas; these categories are then filled by answering the question of "Which specific stakeholders fit within each category" (Achterkamp and Vos, 2008). The second step is to answer the question, "what are all the parties who can, will or ought to fulfill the various stakeholder roles" (Achterkamp and Vos, 2008). The third step is to answer the question, "what are the relevant knowledge and expertise of the stakeholders identified thus far and are there any other stakeholders with similar knowledge or expertise not yet identified" (Achterkamp and Vos, 2008). Achterkamp and Vos (2008) argue that stakeholder identification needs to employ a normative perspective in order to ensure that the "affected" or parties whose freedom or wellbeing is affected are adequately represented.

According to Ulrich (1983) there are two justifications that a party can use to claim belonging to a system. That is, the party possesses some kind of resources (expertise or financial, etc.) to contribute to the system or they are actually or potentially affected by the outcome of alterations to the system. Ulrich (1983 cited in Achterkamp and Vos, 2006) argues that there are two categories of involvement; those that actively contribute to decision-making process and those that passively contribute to the outcomes of the system. Ulrich goes on to note that the "passively" involved is very difficult to identify; therefore, this category should be included in the decision-making process via self appointed representatives.

According to Buanes et al. (2005) there are three primary channels of formalized stakeholder participation in the ICZM planning process:

1. Working Groups (WG): they afford a higher degree of permanence and commitment through repeated interaction in a multi-party structure.

2. Public Hearings: this allows for stakeholders that was excluded or overlooked in the earlier phases of the project to voice their concerns or support. (prevents collaborative planning)

3. Veto Powers: this power is granted to public agencies responsible for implementation national policy

Similarly, Buanes et al. (2005) highlighted three primary channels of informal stakeholder participation in the ICZM planning process:

1. Public Meeting: allows for less organized stakeholder group to voice their views

2. Media Exposure: stakeholders voice their concerns in the local/regional media.

3. Direct Contact: the concerns of public stakeholders are communicated directly to the decision-making group/institution. (hinders transparency)

Buanes et al. (2005) noted that informal participation channels especially that of direct contact is the dominant mode of stakeholder participation in ICZM, it was also noted that "once engaged in ICZM, stakeholders use the resources available to them for the purpose of continued engagement" (Buanes et al., 2005; 666).

## *Stakeholder Representation in Community-led ICZM Initiatives*

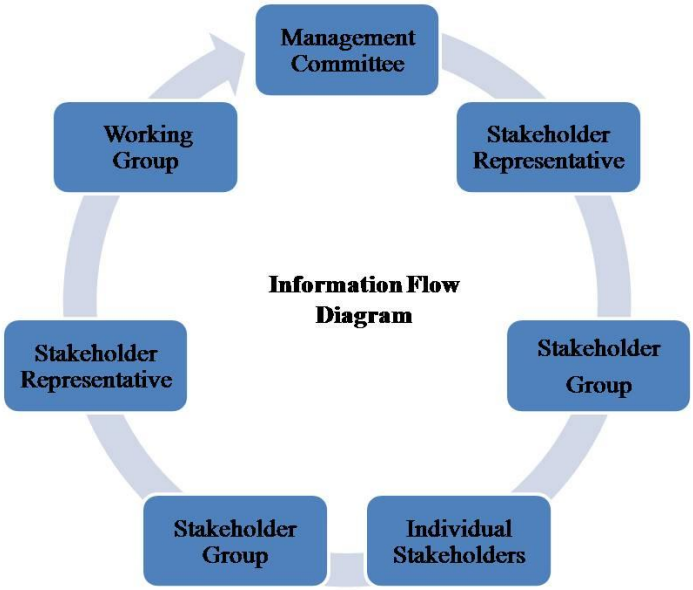
Stakeholder participation within the management structure of community-led ICZM programs is via stakeholder representative using an indirect democracy model. In order to ensure most appropriate candidate is selected to represent each stakeholder group, a formalized and transparent process must be established (Fletcher, 2007b). Although a formalized process for representative selection is necessary, there is no need for the selection process to be uniform between stakeholder groups (Fletcher, 2007b). In other words, the circumstance of each stakeholder groups is different; therefore, the representative selection criteria should match the circumstances of each group which would invariable result in differences in selection methods. Appointing the most appropriate representative is of critical importance since this individual need to be given a

certain level of autonomy or trusteeship that allows them to participate in deliberative decision-making on behalf of their constituents. Representative must be able to articulate the interest of their organization but also have the authority to make binding commitment on behalf of their organization (McCreary et al., 2001).

The single most important component of this indirect democratic process is the flow of information. Within a representative system of IZCM the information flow need to represent a complete circle beginning and ending with the view and concerns of stakeholders (see Figure 2). The flow of information from constituents to the management committee via the stakeholder representative ensures that stakeholders' views and concerns are incorporated in the decision-making process and that they are aware course of actions that are being pursued by the management committee. The effective and efficient flow of information within the management loop aids is social learning, transparency and legitimacy (Fletcher, 2007c).

Fletcher (2007b) notes that there are internal and external factors that influence the level of stakeholder representation with any participatory coastal management program. Within this context, external factors refer to those activities that are influenced by the stakeholder groups outside the control of the decision-making mechanism. Conversely, internal factors are those that are influenced by the inner workings of the decision-making process with no involvement of the various stakeholder groups.

**Figure 2 Diagrammatic representation of the information sharing loop**




The three factors of external representative relationship, accountability and information flow (Fletcher, 2007b). Representative relationship within this context refers to the relationship between the elected stakeholder representative and the constituents of their stakeholder group. This relationship is very critical as it ultimately determines the level of autonomy or trusteeship that is bestowed on the representatives by their constituency (Fletcher, 2007b). The level of autonomy of a representative has huge ramifications for the decision-making process as the level of autonomy is often an indicator of credibility of the representative, both within the constituency and the decision-making circle (Fletcher, 2007b). Accountability here refers to a formalized mechanism that allows for the removal of a stakeholder representative if they are deem to be incapable or ineffective at representing the interests of their constituents (Fletcher, 2007b). In effect, accountability provides a failsafe mechanism that assurances that once elected; a representative represents their constituents in a responsive manner (Fletcher, 2007b). Information flow allows for a bidirectional transfer of information between the decision-making mechanism and constituents of a stakeholder group with the stakeholder representative being the intermediary. According to Fletcher (2007b) information flow influences stakeholder participation in two was; (1) it allows for views and concerns of the constituents on a particular issue to be relayed to the decision-making mechanism, and

(2) it allows the constituents to understand the role and function of the decision-making process. Aside from these two primary functions, effective information flow also provides a means for stakeholder groups to assess the effectiveness of their representative within the decision-making process in making accountability judgements (Fletcher, 2007b).

Conversely, the internal factors influencing stakeholder representation in participatory coastal management are organisational structure; structural representation; extent of deliberation and democratic procedure (Fletcher, 2007b). Organisational structure refers to the legal or political provision that have been set forth for allowing the involvement or participation of stakeholder in the institutional or organisational structure that carryout decision-making activities (Fletcher, 2007b). Simple stated, the component of organisational structure asks or answers the question, are stakeholders legally permitted to make decisions. This is critically important as it determines to what level stakeholders could be legally incorporated into the decision-making process. Structural representation is the management process that determines which stakeholders are admitted to the decision-making mechanism along with who sits on various working groups (Fletcher, 2007b). Structural representation as an exercise is very ethically sensitive as it effective establishes who has a stake and therefore warrant inclusion in the decision-making process. Deliberative decision-making as Fletcher (2007b) points out requires the careful consideration of all points of view and available options before coming to a final decision. In instances where deliberation is constrained, representatives may not have the opportunity to fully express or explain the position of their constituents; this effectively alters the level of participation that occurs (Fletcher, 2007b). The democratic procedures are effectively the role and guidelines for the decision-making process. That is, the democratic procedure outlines the representation process and ensures that all views and concerns of the various stakeholders are treated equally and decisions are unbiased (Fletcher, 2007b). Fletcher (2007b) highlights the fact that having a clear and decisive democratic procedure instills a sense of creditability in the decision-making process.

## *Borrowing from the Forestry Paradigm*

Although, the discourse on environmental management with regard to the coastal zone is relatively recent, the forestry management possesses an extensive body of scientific

literature that chronicles the evolution of environmental management from government dominated "command and control model" to the community initiated "grassroot" initiatives which the ICZM scholarship is striving towards. The extensive forestry literature may be a significant source of insights on best practices in achieving an effective place-based community-led ICZM initiative.

According to Sheppard and Meitner (2005) there are eight (8) criteria for designing an effective stakeholder participation process:

1. Broad Representation: this allows for fairness and credibility.
2. Open Access: allows for a participation of a wide range of stakeholder, including those is less organized groups.
3. Formalized decision-making process: this allows transparency on how the final decision will be reached.
4. Engaging Process: that attracts and encourages stakeholders
5. Accurate and easily understandable; prevent information overload and confusion (i.e. creation of appropriate charts and graphics)
6. Scale sensitive: allows for speedy decision-making (i.e. information needs to be at appropriate educational level).
7. Multi–attribute analysis of sustainability criteria that is explicable to stakeholders and understood/coordinated by managers.
8. Spatially explicit with temporal resonance: able to forecast the social and economic values of the applicable area over a fairly long time period (15 yrs).

Sheppard and Meitner (2005) noted that the ability of a management regime to incorporate these criteria into their management process would ultimately determine the degree of credibility, participant satisfaction and mutual learning experienced by participants involved in the decision-making process.

## *Unanticipated / Negatives Effects of Stakeholder Involvement*

Arguable the single most important component that determines the success or effectiveness of the stakeholder participation or involvement in management or decision-making is the process stakeholder empowerment employed (Reed, 2008). That is, the process used to engage and distribute "power" to the various stakeholder groups could have severe ramification to the outcome of the resulting ICZM program. Empowerment is a very critical and volatile component of stakeholder participation, in that empowerment does not always create the desired or anticipated outcomes. Reed (2008) highlights the fact that, the empowerment of previously marginalized groups may have unexpected and potentially negative effects with regard to existing power structures. Conversely, empowerment may reinforce existing privileges and group dynamics that discourages minority perspectives form be expressed (Reed, 2008).

In areas where you have a small population or in instances where participants in the decision-making process perceive that their involvement is not producing tangible outcomes this might create cases of consultation fatigue (Reed, 2008). In other words, if there are not tangible outcomes form the decision-making process, to illustrate that to the stakeholders that their time and effort is making a difference they are likely to disengage from the process. Although stakeholder participation is necessary for effective ICZM, it is important to note that it can hinder the decision-making process; especially in cases were parties enter into the process with non-negotiable positions or where one party has the power to over-ride decisions made by the coalition (Reed, 2008).

## *Decision Support Processes within ICZM*

### Multiple Criteria Analysis (MCA)

Stakeholder groups are usually heterogeneous (with regard to education, ethnicity and power) therefore efforts needs to be made to level the playing field to allow for all stakeholder to have a "voice" (Reed, 2008). In instances where technical knowledge is required to inform decisions a "citizen jury" may be used; where stakeholder listen to expert witnesses present different arguments on the issue then take a decision (Reed, 2008). This allows stakeholder regardless of their educational background to be included

in all decision-making exercises as the information necessary for facilitating educated decision-making would be presented to the participants in a format that is accessible and appropriate to them.

As highlighted earlier, Stage 2 of the ICZM process is divided into three steps (fact finding, options creation and preliminary documentation); although, different authors used different names for the categories, these steps are consistent throughout the management literature. Environmental management has traditionally used cost-benefit analysis as the primary decision-making tool (Brown et al., 2001). However, multiple criteria analysis (MCA) has emerged as a very effective tool in conducting the trade-off analysis in environmental management where the value of various components to be compared (i.e. ecological good and services) are not readily quantifiable or expressed in economic terms. The use of MCA would effectively nullify the shortcomings of conventional cost-benefit analysis with regard to economic valuation of nature and human relations with the natural environment.

MCA typically involves the evaluation of alternative management scenarios across a range of different criteria and indicators, creating a matrix within which the performance of each scenario is assessed (Sheppard and Meitner, 2005). The public MCA approach proposed by Sheppard and Meitner (2005) is a collaborative process that allows stakeholder to weight the management objectives and sustainability criteria developed by multi-disciplinary experts.

Achieving a balance between sustainable livelihoods and maintaining environmental integrity required the development of a decision-making process that is flexible enough to handle the complex information systems needed to produce the most viable economic, social and ecological option for all stakeholders. The traditional MCA paradigm is outcome oriented, which effectively means that it is geared almost exclusively towards resolving environmental conflict (Brown et al., 2001).

**Ecological Risk Assessment**

Ecological Risk Assessment (ERA) is a decision-making support process that functions by comparing and ranking ecological risk along with the development and prioritization

of a risk management options; monitoring of mitigation of the implementation of mitigation measures thereby facilitating further refinement of these measures (Kellett et al., 2007). Risk assessment required establishing time scale starting with the present assuming the continuation of the status quo. This is necessary to provide a baseline against which the outcomes of possible mitigation scenarios can be compared. The ERA process as outlined by Kellett et al. (2007) follows:

Step 1: Problem Identification

The ERA process is initiated by a particular concern or the emergence of an environmental issue, the problem identification step is oriented towards exploring the issue of concern in order to understand the underlying cause or the forces that are giving rise to these issues. Once the problem is completely defined the process could then transition towards developing mitigation measures.

Step 2: The identification of the ecological values,

It is critical that during this step that there is adequate representation from all sectors to ensure that all perspectives are taken into consideration and the values developed accurately represent that of the entire community.

Step 3: Ecological Value Identification

This includes the identification of specific ecological values for specific environments (e.g. the preservation of wetland; spawning and nursery areas). Ecological values represent what matters in the context of the specific decision or problem and what the community places on a region's natural resources thereby, identifying what stakeholders want to see protected.

Step 4: The development of assessment endpoints.

This includes the selection of an ecological value attributed to each ecosystem type (habitat) as a basis for developing an assessment endpoint. Assessment endpoints are developed to provide more specific and measurable attributes of ecosystems and should

be ecologically, socially and politically relevant, sensitive, amenable to measurement, and relevant to the management goal.

Note: Endpoints includes (maintain fish abundance and diversity; number of migratory bird species)

**Mediated Negotiation Framework**

The limited availability of space within the coastal zone inevitably leads to user conflicts; ICZM intrinsically entails components of conflict resolution (McCreary et al., 2001; Van Kouwen et al., 2008). Environmental Dispute Resolution (EDR) has emerged within the natural resources management literature as an effective means of managing user conflicts; thus would make a useful addition to the suite of options available to coastal managers (McCreary et al., 2001).

McCreary et al. (2001: 189) noted that there were "four principles of an effective negotiation-based decision-making process" namely; participation, representation, legitimacy and accountability.

The principle of participation is grounded in the notion that in order to reach decisions that are socially, economically and environmentally sound; all stakeholders need to be included in the deliberation and decision-making process (McCreary et al., 2001).

The principle of representation dictates that once stakeholders are identified and invited to participate in the decision-making process, protocols must be established that ensures ensure that all stakeholders groups are adequately and equally represented, regardless of power imbalances that may exist (McCreary et al., 2001). It also notes that all stakeholders should have reasonable access to technical information as well as resources required to prepare for entering into negotiations McCreary et al., 2001).

The legitimacy principle necessities that the decision-making body develops a structured decision-making process with steps, timelines, rules and procedures that are clear, fair and equitable to all parties involved in the process (McCreary et al., 2001). McCreary et al. (2001) also noted that it is the responsibility of all parties involved in the process to create legitimacy by adhering to the procedures and guideline that have been established.

The accountability principle highlights the fact that a system for monitoring the procedures and outcome of the decision-making process needs to be instituted (McCreary et al., 2001). This should include a system of checks and balances to ensure that stakeholder representatives are effectively reporting back to their constituent especially with regard to conveying interim results of negotiation exercises (McCreary et al., 2001).

# Stakeholder Perspective

## *Fisheries*

Negative Sectoral Interactions

The informants noted that they are negatively affected by the aquaculture sectors daily and to a lesser extent by the agriculture industry. The informants cited direct competition for space and navigational hindrances as the primary sources of concern with the aquaculture sector. One respondent also cited the method of farm treatments as another source of concern to the fisheries sector. When questioned about the severity and duration of these interactions, respondents noted that the issue over space has existed since the inception of the aquaculture industry and has basically been resolved by the 1999 moratorium on issuing of new aquaculture leases. It was noted however, that recent discussion about creating an aquaculture management plan for Malpeque Bay along with the lifting of the lease moratorium has brought the issue back to the surface. All three respondents agreed that the issue over space is relatively minor. With regard to navigational issue, one respondent noted the fact that some members of the fishing fleets due to the presences of aquaculture farms have to alter their navigational route which he argues adds to their operational cost (i.e. fuel) therefore narrowing their profit margins. Regarding the effect of aquaculture treatment methods on the fishing industry, the respondent noted that the effects of these treatments on fish reproduction or growth is unknown; consequently, there is unease amongst fishers about aquaculture farms being near their traditional fishing areas. The respondent also noted that the issue of aquaculture treatment is approximately ten years old (Note: this coincides with the appearance of clubbed tunicate in the bay during 1998). The respondents were in agreement that the aquaculture industry was aware that their activities were having the above expressed

effects on the fisheries industry; however, they noted that nothing was being done to mitigate these interactions. Despite, the lack of mitigation efforts, respondents noted that the DFO (i.e. the federal government) is currently conducting research into new aquaculture treatment methods.

The respondents were noticeably vague as to the interactions that exist between the fisheries and agriculture/agro-processing sectors. However, they all alluded to the contribution of fertilizer and soil into Malpeque Bay from the agriculture sector. Respondents highlighted the fact that some farmers along the coastline do not adhere to the government stipulated riparian buffer zones. It was also highlighted that the scope of the siltation and nutrient loading issue is unknown to them but is a source of concern.

Positive/Neutral Sectoral Interactions

Respondents regard to the tourism and seafood processing sectors, as having positive and neutral effects on the fisheries sector. The respondents noted that through activities such as shellfish festivals (e.g. lobster, oyster) and deep sea fishing, the tourism industry has a positive effect on the fisheries sector. Consequently, the respondents consider the relationship between the fisheries and tourism sectors to be mutually beneficial. Like the relationship with the tourism sector, the respondents view the relationship between the fisheries and seafood processing sector to be mutually beneficial, where the fisheries provides a product that the processing sector uses to create a value-added product. Despite their categorization of the processor-fisher relationship as being mutually beneficial, two of the respondents noted that relationships are volatile. They noted that the relationship between the fisheries sector (specifically lobster) and the processing sector was strained during the last two fishing seasons due to pricing issues.

Willingness to Participate in ICZM

All respondent noted that they have heard about the discussion about creating an ICZM plan for Malpeque Bay but, their respective organization was not invited to participate in the process. They also noted that ICZM or any similar management strategy has never been viewed as a potential solution for resolving the abovementioned sectoral

interactions. Respondents were confident that their organizations would be willing to participate in any environmental management initiative within the bay.

## *Tourism Sector*

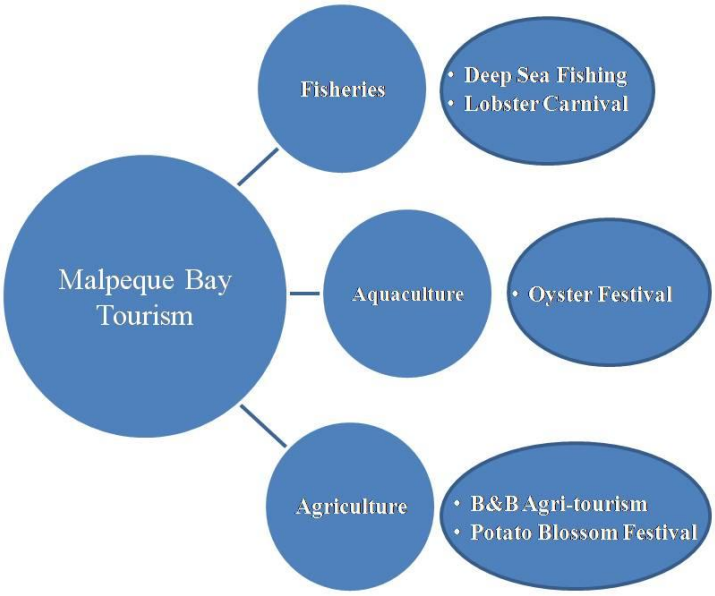
Sectoral Interactions

Respondents noted that the tourism sector currently shares a positive relationship with the other four (fisheries, aquaculture, agriculture and processing) sectors. Figure 3 highlights the various activities that the tourism industry along with the other sectors (fisheries, aquaculture, agriculture and processing) has developed over the years as a means of mutually generating revenue for each of the sectors. Respondents indicated that although the tourism sector may not be directly involved in the planning or execution of some of the festivals (e.g. oyster, shellfish), the tourism sector contributes to the success of these activities by featuring them in their marketing and advertizing campaigns.

Willingness to Participate in ICZM

The respondents noted that they had heard about the proposal of developing an ICZM for Malpeque Bay but have not been involved in any of the inception meetings. One of the respondents stated that his organisation viewed ICZM initiatives as being limited to only the resources sector involved in marine resource extraction (i.e. fisheries and aquaculture). Respondents noted that their lack of participation in the ICZM initiative thus far was primarily due to lack of information regarding who/how they could get involved. Respondents expressed their organization's willingness to participate in the ICZM initiative.

**Figure 3 Tourism activities within the fisheries, aquaculture and agriculture sectors**




## *Agriculture Sector*

Sectoral Interactions

The respondents noted that there had not been formal relationships established between the agriculture and the other sectors (fisheries, aquaculture and tourism) with the exception of the agro-processing sector. The respondents proceeded to notes that in their opinion the activities of the agriculture sector have a neutral effect on the fisheries and aquaculture sectors. Although the respondents categorized the interactions between the agriculture, fisheries and aquaculture sector as being neutral, they both acknowledged the fact that nutrient loading from coastal farms holds the potential for being a source of conflict or negative interactions between the sectors. One respondent noted that currently, the issue of nutrient loading is relatively insignificant and is only being discussed within the aquaculture sector with regard to animal husbandry (particularly cattle) on terrestrial farms adjacent to the marine farms.

Willingness to Participate in ICZM

Informants noted that there organizations had heard that there were discussions about creating an ICZM plan for the Bay but have not attended or participated in any formal

discussions. However, they noted that their organization would be willing to participate in the creation and implementation of an ICZM plan for the Bay.

## *Aquaculture Sector*

Sectoral Interactions

Respondents for the aquaculture sector noted that the relationship between their sector and the tourism and processing sector was positive. The respondents cited the fact that the aquaculture sector is branded (e.g. Malpeque Oysters) and promoted as a unique attraction by the tourism sector and that the processing sector depends on directly on success of the aquaculture sector. The respondents highlighted these mutual dependences as the reasons for the positive relationships between the aquaculture and processing and tourism sectors. The relationship between the aquaculture and fisheries sector was described as being neutral, highlighting the notion that the activities of the aquaculture sector neither impede nor enhance the activities of the fisheries sector. However, the respondents categorized the interactions between the aquaculture and agriculture sector as being negative. The respondents highlight the fact that the aquaculture industry was severely dependent on good water quality for the success of the industry; however, nutrient loading form coastal farms were degrading water quality and in some cases leading to loss of water due to closures due to food security concerns. One respondent noted that the provincial government had made recent changes in the laws regarding the size and maintenance of riparian buffer zones aimed at reducing runoff and nutrient pollution; however, he expressed concern it the effectiveness of this mitigation measure noting that there appears to be very little enforcement of these new laws.

Willingness to Participate in ICZM

The informants noted that they were aware of the discussion over developing an ICZM plan for Malpeque Bay and noted that members of their sector have been involved in the preliminary discussions. The respondents also expressed interest in participating in any ICZM program that would be developed within the bay.

### *First Nation Perspective*

The Lennox Island and Abegweit First Nations participates in fisheries, aquaculture and tourism activities as a band operation; there are member from both bands that participate in these sectors on an individual or private enterprise basis. Marine resources have always played a significant role in the daily life of the Mi'kmaq; however, the Marshal Decision marked the entrance of the First Nations into the commercial fisheries (primarily lobster) within Malpeque Bay. Although, the fisheries have not reached its full potential with regard to revenue generation, it has had a profound positive effect of the PEI First Nation communities. Aquaculture is a new activity for the First Nations; consequently, there is significant room for growth within this sector. With regard to the tourism sector, there has been recent rejuvenation of the tourism industry with proper branding and new infrastructural facilities.

## Stakeholder Analysis

### *Stakeholder Perspective*

The stakeholder interviews highlight the fact that the sectors within Malpeque Bay hold divergent perceptions of the interactions between their sector and the other four sectors (see table 1). As presented in table 1 the fisheries sector view their interactions with the tourism and processing sector to be positive while there interactions with the agriculture and aquaculture sector are perceived as being negative. The aquaculture sector perceive their interactions with the processing and tourism sectors as being positive while their interactions with the agriculture and fisheries sectors are perceived as being negative and neutral respectively. The agriculture sector, perceived their interactions with the processing and tourism sectors as being positive and their interactions with the aquaculture and fisheries sectors as being neutral. The tourism and processing sectors perceive their interactions with the other four sectors as being positive.

**Table 1** summarizes the perception of the sectors listed along the rows with regard to their interactions with the other four sectors (listed along the columns).

| Sectors | Processing | Tourism | Agriculture | Aquaculture | Fisheries |
|---|---|---|---|---|---|
| Fisheries | + | + | - | - | N/A |
| Aquaculture | + | + | - | N/A | o |
| Agriculture | + | + | N/A | o | o |
| Tourism | + | N/A | + | + | + |
| Processing | N/A | + | + | + | + |

It is important to note that with regard to the processing and tourism sectors, they perceived the interactions between their sector and the other sectors as being positive, which is consistent with the perception held by the other four sectors. However, there is a major divergence of views between the fisheries, agriculture and aquaculture industries regarding the interactions that exist between them. The fisheries sector perceives the interactions with the aquaculture sector as being negative, while the aquaculture sector perceives this interaction as being neutral. Similarly, the fisheries sector perceives the interactions with the agriculture sector as being negative while the agriculture sector perceives it as being neutral. The aquaculture sector like the fisheries sector perceives the interactions with the agriculture sector as being negative while the agriculture sector perceives this interaction as being neutral. It is apparent form this mismatch in perception highlights the fact that the agriculture sector is view by the fisheries and aquaculture sector as negatively affecting the water quality by being the largest contributor to non-point sources on nutrient pollution. The agriculture sector contends; however, that there is no proof the levels of nutrients that enter the Malpeque Bay marine environment is sufficient to negatively affect the fishing and aquaculture sectors via its effect on water quality.

Although, there are no comprehensive studies conducted within the bay on the effects of nutrient pollution on the fisheries and aquaculture sectors and the effect of the treatment method utilized with the aquaculture sector on the fisheries sector, the precautionary approach adopted by *the Oceans Act*, puts the burden of proof on the agriculture and

aquaculture sectors. The burden of proof concept presented by the precautionary approach, which states that in instances where scientific consensus is absent with regard to the harm of a particular activity, it is the responsibility of the body wishing to pursue that activity to proof that it is benign (Ricci et al., 2003). Consequently, one can conclude that the perception of the fisheries and aquaculture sector that there is a negative interaction between their sector and the agriculture sector as being justified.

## *Current Status*

Employing the conflict typologies presented by McCreary et al. (2001), the Malpeque Bay ICZM initiative aims to manage resources user conflicts. In other words, the proposed ICZM initiative is a proactive attempt to prevent significant user conflict over space and resources while simultaneously maintaining the ecological integrity of the Bay.

The proposed place-based community-led Integrated Coastal Zone Management (ICZM) initiative for Malpeque Bay of Prince Edward Island is effectively a co-management arrangement between the government and stakeholders that would exist at the delegated power level of Arnstein's metaphorical ladder. A co-management initiative executed at this level of stakeholder participation is characterized by stakeholders constituting the majority of the decision-making powers (Arnstein, 1969). Within this arrangement, the primary role of the government agencies would be as a legitimizing agent and to provide scientific and technical support (Arnstein, 1969). In other words, the primary role of the government department on the decision-making team is to create enabling legislation for the implementation of the ICZM plan once decisions are made. In order for this initiative to proceed there needs to be genuine devolution of power and the establishment of ICZM enabling legislation; however jurisdictional within the Canadian context with regard to ICZM add another level of complexity to these activities. Within the context of Canada, the *Oceans Act* 1996 assigns DFO the mandate for accomplishing ICZM; however, jurisdictional issues restrict the ability of DFO to influence land-based activities (Meltzer, 1998). This means that in order for the Malpeque Bay program to proceed, a memorandum of understanding would have to be developed amongst all three levels of government or new enabling legislation enacted before an ICZM initiative could be implemented.

## *Issues of Concern*

Throughout the course of this study three areas of concerns (issues) have been raised with regard to the Malpeque Bay ecosystem, namely; nutrient loading (eutrophication), invasive species and potential expansion of the aquaculture industry (particularly mussels).

Nutrient loading represents the single largest threat to the biodiversity and ecosystem functions of Malpeque Bay. Nutrient loading or eutrophication is the significant increase in chemical nutrients (typically nitrates and phosphates) in an ecosystem, which then increases primary productivity, leading to drastic reduction in water quality and in extreme cases anoxia (absence of oxygen) (Nybakken and Bertness, 2008). Eutrophication is typically the result of nutrient pollution from run-off carrying fertilizers or sewage (Nybakken and Bertness, 2008).

Eutrophication could produce severe negative impact on the aquaculture, fisheries and tourism sector effectively crippling the economy of the bay. Shellfish are very sensitive to water quality issues; therefore, degradation of the water quality due to eutrophication could have significant ramifications for the aquaculture industry in any of two ways; (1) if the area becomes anoxic all the shell fish would die, (2) poor water quality could lead to *Nitzchia* outbreaks effectively making shellfish unsafe for consumption. Under condition two listed above where the shellfish is deemed unsafe, it may be possible to depurate and still consume the shellfish; however, this may constitute a significant increase in cost. With regard to the fishing industry eutrophication holds the potential to be even more devastating, unlike the second scenario with the shellfish noted above, poor water quality would result in the complete disappearance of motile species either due to death or migration to cleaner water and in the case of sessile species such as oysters, these would just die. The destruction of the aquaculture and fisheries sector ultimately leads to the collapse in the seafood processing sector and there begins the downward spiral for the economy of the island.

There are two categories of pollutants with regard to nutrient emissions; point source or non-point (diffused) source. Within the context of Malpeque Bay, processing plants (e.g.

McCain and Cavendish) are the primary sources of point sources pollution, while agriculture is the primary diffused source. The fact that the coastal areas of the Bay are dominated by farms makes it a prime candidate for eutrophication related problems, also given that the average depth of the bay is 4 m (maximum 13m) makes it also very susceptible to siltation issues due to excessive soil erosion due to rain and wind (Environment Canada, 2003).

There are three potato process plants around the Malpeque Bay watershed, two owned by Cavendish Farms Ltd and one owned by "Small Fry Inc." Prior to 1993, the two processing plants operated by Cavendish Farms in New Annan, released untreated effluent directly into the Barbara Weit River Estuary (NRCAN, 2006). In 1993 an environmental assessment exercise conducted between the provincial and federal governments determined that the assimilative capacity of the Barbara Weit Estuary was stressed. Consequently, Cavendish Farms constructed a biological nutrient removal plant to treat its effluent before disposal into the Barbara Weit River (NRCAN, 2006). The potato processing plant operated by "Small Fry" located within the Slemon Park Industrial Park located near the decommissioned Canadian Forces Military Base in Summerside; conversely treats its effluent through the park's wastewater facilities then discharges it into a tributary of Bentick Cove (NRCAN, 2006). The provincial government conducts periodic checks of the effluent discharge from the plant to ensure that they are within acceptable ranges, as a result of these measures, the point sources of pollution within Malpeque Bay has been effectively managed (NRCAN, 2006). However, non-point sources of nutrient pollution, primarily through run-off and wind erosion of fertilized soil from de-cropped farmland remains a problem within the watershed and warrants further attention. Given the potential for harm due to nutrient pollution, one of the primary objectives of the proposed ICZM initiative should be focused on decision-making to mitigate impact of nutrient enrichment on water quality along with its socioeconomic consequences.

As noted earlier, over the past ten years there have been a number of pilot projects that have been established to test the potential for expansion of the aquaculture industry from predominantly mussels and oysters into clams, scallops and finfish (e.g. soft shell clams

and Arctic char) (DFO, 2006). Members of the fisheries sector have voiced concerns about the expansion of existing aquaculture farms and the introduction of new farm species (DFO, 2006; Vision Quest, 2008). Most of the concerns are focused on the lack of data illustrating that aquaculture is not having a negative effect on fish habitat and important spawning and nursery areas (Vision Quest, 2008). There is also concern regarding the benthic chemistry as a result of the treatment methods employed by the aquaculture industry to combat tunicate and sea stars (Vision Quest, 2008).

Finally, there is growing concern about invasive species especially within the aquaculture sector. The aquaculture industry documented the presence of clubbed tunicate in 1998 and subsequently developed measures for coping with them including use of hydrated lime which coincidentally is one of the factors cited by the fisheries sector as a concern with the expansion of the industry. However, the appearance of three other species of tunicates namely the golden star in 2001; the violet and vase species in 2004 compounded by the migration of the European Green crab has brought the aquaculture industry to a new unknown.

All of the concerns highlighted above could theoretically be solved in isolation using the conventional sector-based approach; however, given the interaction between the fisheries and aquaculture sectors with regard to the treatment of invasive species (tunicates), a single-sector approach means that the likelihood that externalities of particular mitigation measures would be overlooked increase exponentially. Consequently, the most effective approach to solving the myriad of coastal zone issues within the Malpeque Bay watershed, without increasing user conflict, is the development of an ICZM program that includes all the major sectors with their respective stakeholder groups.

## Application of ICZM in Malpeque Bay

This section of the paper focuses its attention on utilizing the best practices that have emerged from the literature to develop a theoretically robust framework for the development of a community-led ICZM program within the Malpeque Bay watershed. This section of the paper is divided into three sub-components that are of critical

importance to the proposed ICZM framework; the ICZM approach; the organisational structure and the decision-making process.

## *Proposed Approach to ICZM for Malpeque Bay*

The ICZM program for Malpeque Bay should follow the three stages process proposed by McCreary et al. (2001) which was outlined in the literature review section. Since there has never been an attempt to implement ICZM within Malpeque bay, the proposed program needs to begin at step one of the "project inception" stage. In other words, Malpeque Bay needs to begin by establishing an initiation body of participants. According to McCreary et al. (2001) the primary objective of establishing an initiation body is to establish a decision-making structure as well as assessing the resources base that is needed to operationalize the ICZM process.

Considering the fact that Malpeque Bay has a relatively long history of formalized user organizations (i.e. fisher, agriculture, aquaculture associations) that possess the robust institutional structures necessary for negotiating based on the interests of their membership and given the level of willingness that were expressed by the key informants for their organizations to participate in ICZM, establishing a critical mass of participants should begin with these organisations.

Step 1 (Project Initiation)

The led agency (i.e. MCPEI) should initiate the "convening" process by distributing formal letters of invitation to all existing user organizations; NGOs and relevant government departments. This is critical as several of the organisations interviewed attributed the lack of participation of their organization in the preliminary ICZM consultations conducted by the government to the fact that their organisation was not formally invited to participate in the process. The distribution of invitations should include some mechanism that allows the various organisations to identify times that are appropriate for them to attend meetings. It is critical that these meetings are held at a location(s) that is/are neutral and mutually convenient (e.g. community centres or town halls). These meeting serves a dual function in that it allows for the establishment of a

convening body (CB) while providing an opportunity for organizations that may have never worked together to establish working relationships (McCreary et al., 2001).

Step 2 (Establishing Participation)

The next step in the process is "Establishing Participation" of all relevant stakeholders. As highlighted by Balaguer et al., (2008) the inclusion of stakeholders in any processes invariably require the establishment of program boundaries. This typically means that one of the first decisions of the newly formed ICZM convening body is the establishment of project boundaries. However, within the context of Malpeque Bay, the geophysical nature of the bay makes it a relatively closed system, the geographical scope of the proposed project is the Malpeque Bay Mega Watershed System which consists of 25 smaller individual watersheds (see Appendix 2). Using the Malpeque Bay Mega Watershed System as the geographical boundaries of the project, the stakeholder participation process could begin, with the criteria for inclusion in the ICZM process being that an organization is physically located or the primary activities of that organization are conducted within the Malpeque Bay watershed (MBW).

The newly formed Malpeque Bay ICZM convening body should employ the approach to stakeholder identification and inclusion developed by Achterkamp and Vos highlighted above (2008). In other words, the CB needs to develop a comprehensive list of resources (e.g. forestry, fisheries and agriculture) that are available with the MBW along with the activities that are currently executed there. By creating a broad list of stakeholder categories and filling them by answering the questions highlighted by Achterkamp and Vos (2008) the CB should be able to identify most of the major stakeholder groups. The relative small geographic scope of the project along with the social cohesiveness of PEI communities; suggests that social structure of Malpeque Bay should lend itself perfectly to this exercise.

Once a stakeholder group/organisation is identified, an assessment of the views, interests, aspirations and willingness of that organisation to participate in the ICZM project must be conducted. This is where the expertise of the various convening parties becomes vital, for example the various government departments (i.e. agriculture or fisheries dept.) or the

MCPEI which have established mechanisms (i.e. protocols and trained staff) for data collection and analysis may take the lead in stakeholder assessment exercises.

Step 3 (Agenda Forming)

The "agenda forming" step is a direct continuation of the previous step since the information emerging from the stakeholder assessments are reviewed by the CB and synthesized into a vision or mission statement that reflects the collective views and objectives of the various stakeholder groups. As Sheppard and Meitner (2005) points out, the vision statement should exhibit "temporal resonance" with regard to long term (15 yrs) ecological and socioeconomic sustainability. In other words, the ICZM initiative should not only consider the current circumstances of Malpeque Bay but, consider long term changes that may occur within the bay.

The second component of the "agenda forming" step is the establishment of the democratic procedures for participation. As Fletcher (2007b) highlighted, the democratic procedure should represent a representation process that is equitable and impartial. In this regard the CB needs to employ a normative approach to establishing their democratic procedure. In other words, regardless of the procedures the CB ultimately decides to establish, these guidelines of rules must fit the socio-cultural norms of Malpeque Bay. Within the context of Malpeque Bay this is particularly important as this initiative would include both native and non-native stakeholder groups that are very socio-culturally distinct; therefore a normative approach to the democratic procedure ensures that no stakeholder group is excluded or marginalized. A mechanism should be developed so that the various stakeholder groups have an opportunity to decide what should be included to the agenda of each scheduled meeting; this ensures that issues are dealt with in a timely manner.

Stage 2 (Option Development)

Step 1 (Fact Finding)

The fact finding component of any ICZM initiative is very important because it provides a mechanism for acquiring a scientifically robust understanding of the driving forces

behind observed coastal phenomena (i.e. the physical, chemical and biological interactions), along with the effects of anthropogenic inputs on these processes (Fabbri, 1998; Power et al., 2000). The typical approach to fact finding within the government machinery is to establish a consultancy and use whatever is presented in the consultant's report to direct decision-making. Within the context of the Malpeque Bay ICZM process, fact finding should employ nonpartisan experts with a variety of views, interests and expertises would provide the information used to reach a scientific consensus. Employing an adversarial science approach would invariably provide a more holistic view on the issue being discussed; thereby fostering "social learning".

Step 2 (Inventing Options)

This step in the process is where different approaches are developed to mitigate or resolve issues of conflict or environmental concerns utilizing the scientific consensus regarding the origin of the relevant issues. Based on the information provided by the key informants and the ICZM initiating typologies presented by McCreary et al. (2001), it can be concluded that the MBW falls within the so-called resources user conflict typology. This means that the majority of conflict that exists is over access to sea space or the effects of particular activities from one sector having a negative effect on another sector(s). In addressing such issues, it is important for stakeholder representatives to indicate any non-negotiable positions that have been given to them by their constituents. This ensures that options that are developed pay particular attention to these issues.

Step 3 (Preliminary Documentation)

As outlined earlier the preliminary documentation step would entail the generation of a document chronicling the scientific consensus achieved during the fact finding step and how this information was utilized in the creation and development of management options. This preliminary document should be written in a manner that would facilitate lay understanding as it would serve the dual function of informing management committee decisions and of being the primary source of information used in conducting public hearings.

Stage 3 (Decision Making)

Step 1: (Option Selection)

The Malpeque Bay ICZM management committee should utilize deliberative decision-making via membership consensus as the primary method of deciding on the management measure that would be implemented to resolve the issues within the bay. In other words, the various members of the working group that was involved in the development of the management option would be given an opportunity to present the views of their respective stakeholder groups on the management options available. Once all parties have a chance to express their views on the options, the management committee could then begin their trade-off analysis. The exact mechanism for achieving deliberative decision-making within Malpeque Bay will be discussed in detail in the section on decision-making to follow.

Step 2: (Finalization)

This step sees the designation of roles for the implementation of various components of the management options that are selected by the management committee. Within the context of Malpeque Bay, the various government departments as noted earlier would serve the role of legitimizing agencies by enacting the legislation that are required to ensure compliance with the management actions taken. They may also be the most appropriate bodies for monitoring and enforcement of these measures. With regard to restoration of habitats (e.g. rivers and wetlands) these should be collaborative projects between the various stakeholder groups, where the organisations with the most experience in these activities would take on the role of project leaders.

## *Proposed Organizational Structure*

The proposed organizational structure of the Malpeque Bay ICZM initiative is modeled after the Coastal Partnerships used for participatory coastal management in the United Kingdom (Fletcher, 2007c). The organizational structure is relatively simple, consisting of a management committee; working groups; stakeholder representatives; stakeholder groups and individual stakeholders (see figure 4).

Considering the fact that McCreary et al. (2001) highlighted that the efficiency of a decision-making process begins to decrease precipitously as the number of participants exceeds 14, the management committee, which is the highest level within the organization structure should effectively be the convening body. However, provisions could be established within the democratic procedure discussed earlier, for the inclusion of other organizations into the management committee as is deemed necessary. The management committee is responsible for accomplishing stage 3 of the ICZM process. Specifically, the management committee is responsible for conducting the option selection process which entails making all final decisions with regard to the management options that would pursued. Secondly, the committee also undertakes the project finalization exercise, which includes, assigning the roles and responsibility to the various stakeholders groups for the implementation of the different components of the management plan. Another critical task of the management committee that is noticeably lacking in the McCreary et al., (2001) model is the need for the establishment of an implementation timeline, which would also fall under the portfolio of the management committee.

**`Figure 4 Diagrammatic representation of the organisational structure proposed for Malpeque Bay, PEI**


At the second level of the organizational structure are the Working Groups. Within the context of Malpeque Bay, there should be five (5) working groups, one for each of the major sectors (fisheries, tourism, agriculture, aquaculture and processing). As Figure 5 highlights, the membership of the various working groups should include representatives from all the stakeholder groups that are directly involved in the sector under consideration; one elected representative from each of the other sectors and a panel of scientific experts from that field. Each working group with the aid of their scientific experts would accomplish stage 2 of the ICZM process discussed above. That is, working groups are expected to conduct fact finding process where the scientific panel provides the most current scientific knowledge or understandings on issues being discussed along with the respective scientific uncertainty. They would then transition to the options development, where they create a suite of management options to mitigate or solve the issues highlighted during the fact finding process. The final task of the working groups would be the preparation of the preliminary document, outlining the management options that they have identified. This document would be presented to the management committee which would then select the most appropriate course of action.

The stakeholder groups are effectively the lowest organizational level within the direct management mechanism. Each stakeholder group is responsible for electing a stakeholder representative that would represent their interests within the various working groups. Again here the reason for having only one representative from each of the stakeholder groups is to reduce the number of participants in the decision-making process without altering the user profile or excluding stakeholders groups (Fletcher, 2007c). The process of establishing a stakeholder representative should follow the principle highlighted by Fletcher (2007b). In particular, stakeholder representatives need to have autonomy in articulating the concerns and interests of their constituents in order for the indirect democratic process to work efficiently.

Within the organisational structure that is proposed for the development and implementation of an ICZM program for Malpeque Bay. There are individual stakeholders as well as stakeholder groups. Within the context of this paper, individual stakeholders are persons that have a stake within Malpeque Bay but are not a member of any formal stakeholder organisation. In other words, these individuals wish to participate in the ICZM process but, for any number of reasons, are lacking the institutional arrangements necessary for the conventional stakeholder representation process. Achterkamp and Vos (2008) note, these persons are almost impossible to identify via conventional stakeholder identification methods; therefore, it should be left up to these person to self identify. Individual stakeholders are not directly involved in the decision-making process; however, public hearing would form the primary mechanism through which individual stakeholders would present their views and concerns. Before a decision is made by the management committee, a series of public hearings discussing the management options that have been developed by the various working groups would be conducted, this would be the primary means for individual stakeholders to provide input on these management options. Public hearings conducted in this manner serves the dual function of allowing individual stakeholders to add input into the decision-making process that follows while also providing an opportunity for stakeholder groups to evaluate the accountability of their respective representatives.

## *Proposed Decision-making Process*

Decision making within the Malpeque Bay ICZM program should adopt a "shared adversity approach," that acknowledges the fact that trade-offs are essential to achieve socioeconomic and ecological sustainability (Steinman et al., 2002). More specifically, the "shared adversity approach" is a deliberative decision-making process that focuses on communication and argument facilitated by the exploration of the diversity of positions and assumptions held by the participants involved in the process. Building on this notion, Multiple Criteria Analysis MCA) and Ecological Risk Assessment (ERA) could be established as decision-making support processes utilized in the Malpeque Bay ICZM initiative. More specifically, ERA could be utilized as a decision support tool within the working groups and MCA utilized by the management committee. Figure 5 outlines the different node of influence with regard to decision making.

### Working Groups

The ERA methodology presented earlier would be an appropriate decision support process within the working group setting since the working groups would be responsible for the development of the suite of management options. As discussed earlier, ERA provides a mechanism for comparing and ranking ecological risk and ultimately, the development and prioritization of risk management options. With the context of Malpeque Bay ERA was selected as being a more appropriate method of decision-making than Mediated Negotiation Framework (MNF) because the features of the ERA process matches perfectly with the mandate of the various working groups. More specifically, the working groups are responsible for assessing the risks associated with a particular activity and developing mitigation measure to nullify the identified risks. However, MNF does not provide a mechanism for assessing the risk associated with particular activities; instead it is focused primarily on resolving user conflict via tradeoffs. For example, the agriculture working group could conduct an ERA focusing on point and non-point sources of pollution, in particular irrigation tail water as a hazard to wetland ecosystems and its links to habitat protection; and a buffer zone that protects Malpeque Bay from sediment, nutrients and other contaminants. An ERA conducted in this situation would

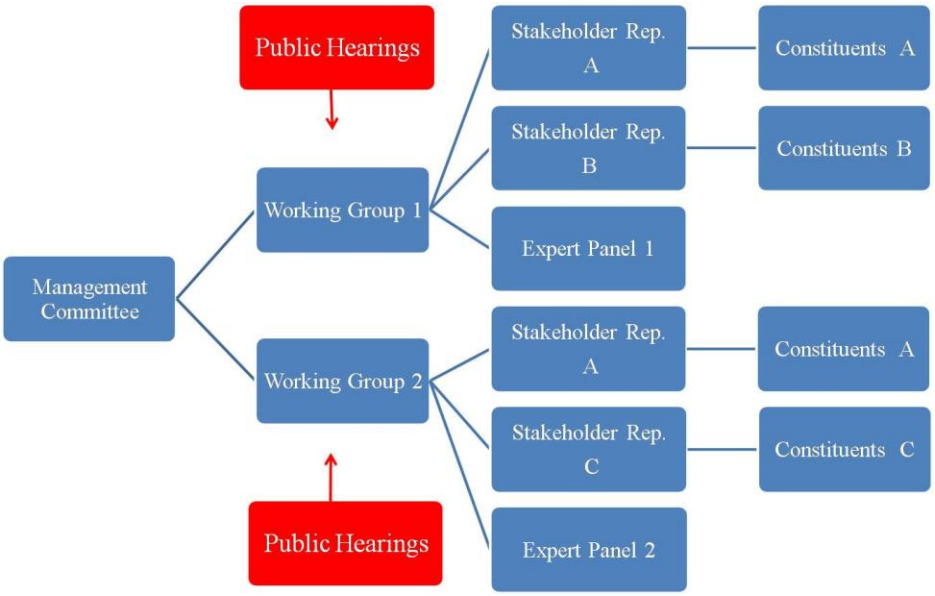
highlight the risk associated with trail water pollution along with mitigation measures that would combat or minimize the risks identified.

**Management Committee**

With regard to the management committee, both MCA and MNF could be utilized for accomplishing the decision-making process. However, within the context of Malpeque Bay, MCA would be an appropriate deliberative decision support process for the management committee. Within the management committee decision-making sphere, MCA provides the necessary mechanism for effective stakeholder trade-off and mutual gain bargaining for the aggregation of the different views and objectives of each identified stakeholder groups into a management plan that would be socioeconomically and ecologically sustainable. The public MCA approach proposed here would provide an effective means of bridging the gap between the general participatory processes and complex decision-making processes of ICZM.

The management options that are pursued within ICZM programs are rarely beneficial to all parties involved in the process owing to the fact that it is a practical compromises achieved by trade-off and negotiation. Consequently, it is impossible for every party to be fully satisfied with the final decision or outcomes. It becomes imperative for the parties that are unsatisfied with the course of action that is decided by the management committee to be satisfied with the decision-making process that ultimately led to the course of action that is being pursued (Buanes et al., 2004). In others words, although a particular stakeholder group is dissatisfied with the management option selected by the management committee, they are satisfied with the fact that they were able to explain their situation; express their concerns and that the decision-making process considered their point of views and the effect of the outcome/decision on their sector or stakeholder group. These stakeholders understand that although the course of action pursued negatively affects their sector or stakeholder organisation, that a reasonable process was used to select the chosen option from amongst the options currently available.

**Figure 5 Schematic representation of the proposed chain of influence of the Malpeque ICZM program**




# Conclusion

As noted earlier, the objective of this paper is to provide a theoretical framework that could be utilized by any community that is interested in developing and implementing a community-led ICZM program. The theoretical framework is intended to be used for overlaying the particular characteristics (i.e. biophysical, socioeconomic, cultural and political structure) of that location. The Malpeque Bay case study within this regard is utilised here to illustrate who the overlaying of socioeconomic, cultural, biophysical and political circumstances of a particular area may be accomplished. By identifying and overlaying the particular characteristic of that location the shift from the "tool-kit" model of management to the "service contract" model that is rooted in developing place-based management measures.

One of the most significant component of the proposed framework is the addresses the issue of capacity. That is, the framework provides a mechanism for stakeholder representation in decision-making regardless of their educational background or capacity. A community-led ICZM initiative utilizing the approach presented earlier would provide an excellent opportunity for mutual empowerment and social learning. Within the

Malpeque Bay watershed, social learning could be facilitated through the sharing of traditional ecological knowledge (TEK) that have been acquired over generation of resources utilization; while the government agencies, could contribute conventional scientific knowledge fostering a mutual exchanged of knowledge via continuous dialogue.

Creating a community-led ICZM program requires the dedication of the community as well as the political will of the various levels of government. The government agencies would have to be willing to devolve decision-making powers to stakeholders. The devolution of power is in itself a very complex proposition that in most cases required enacting new legislation or establishing memorandum of understandings. As highlighted with the Malpeque Bay case study, the complexity of existing jurisdictional boundaries with regard to sectors and space (marine or terrestrial) may pose a significant huddle to the development of ICZM initiatives; however, the establishment of memorandum of understandings holds the potential for resolving most if not all jurisdictional issues. Another area of critical importance with regard to the success and sustainability of a community-led ICZM initiative but was beyond the scope of this discussion is the issue of funding and financial self-reliance.

This project has also indicated that the stakeholders of Malpeque Bay are ready and willing to commit their time and resources in the development and implementation of a community-led ICZM program. In this regard, the MCPEI or some other organisation within bay need to take the leading role in facilitating the development of a community-led ICZM program that would help to reduce user conflict; nullify inaccurate stakeholder perceptions and sustainably manage the natural resources within the bay

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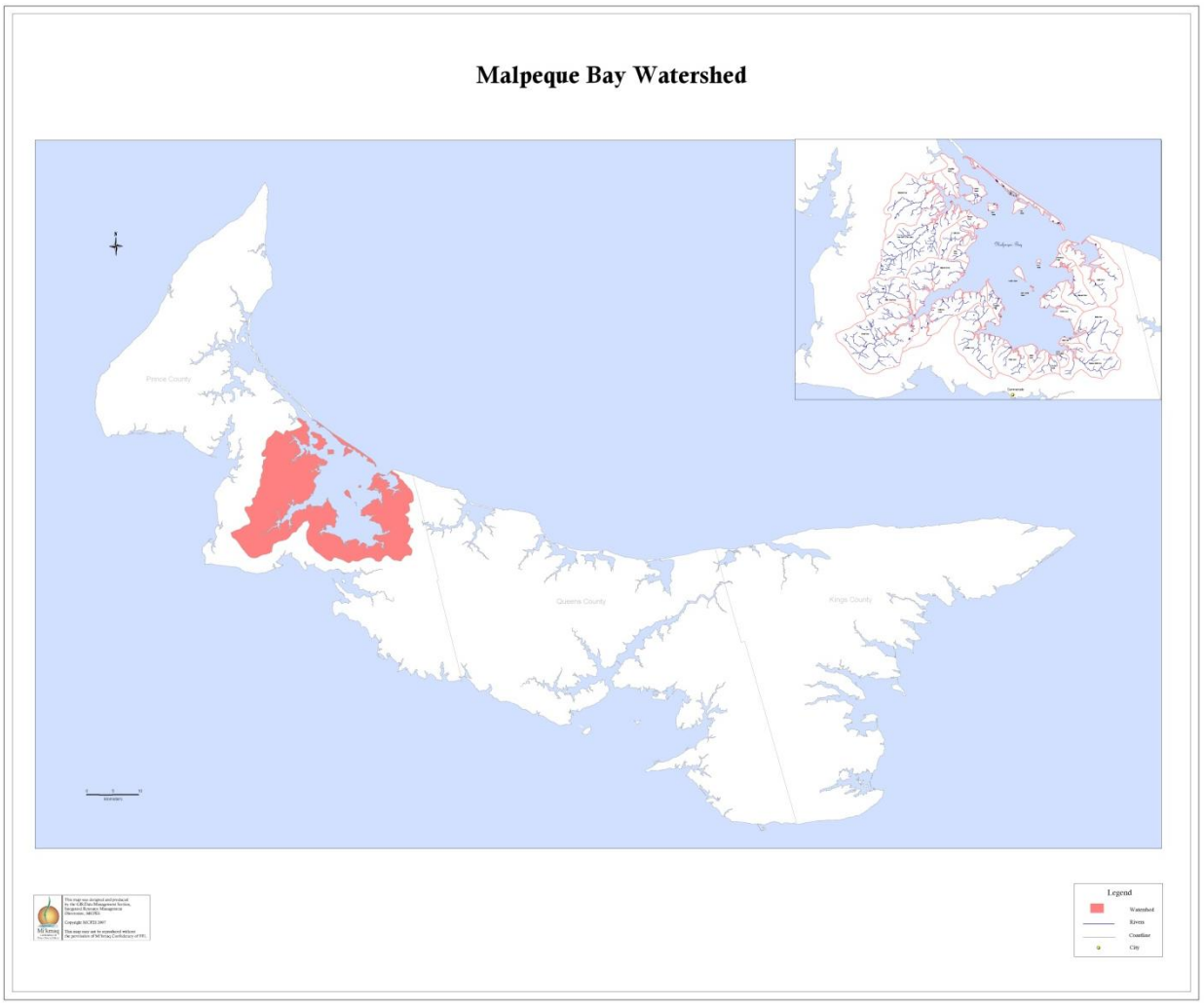
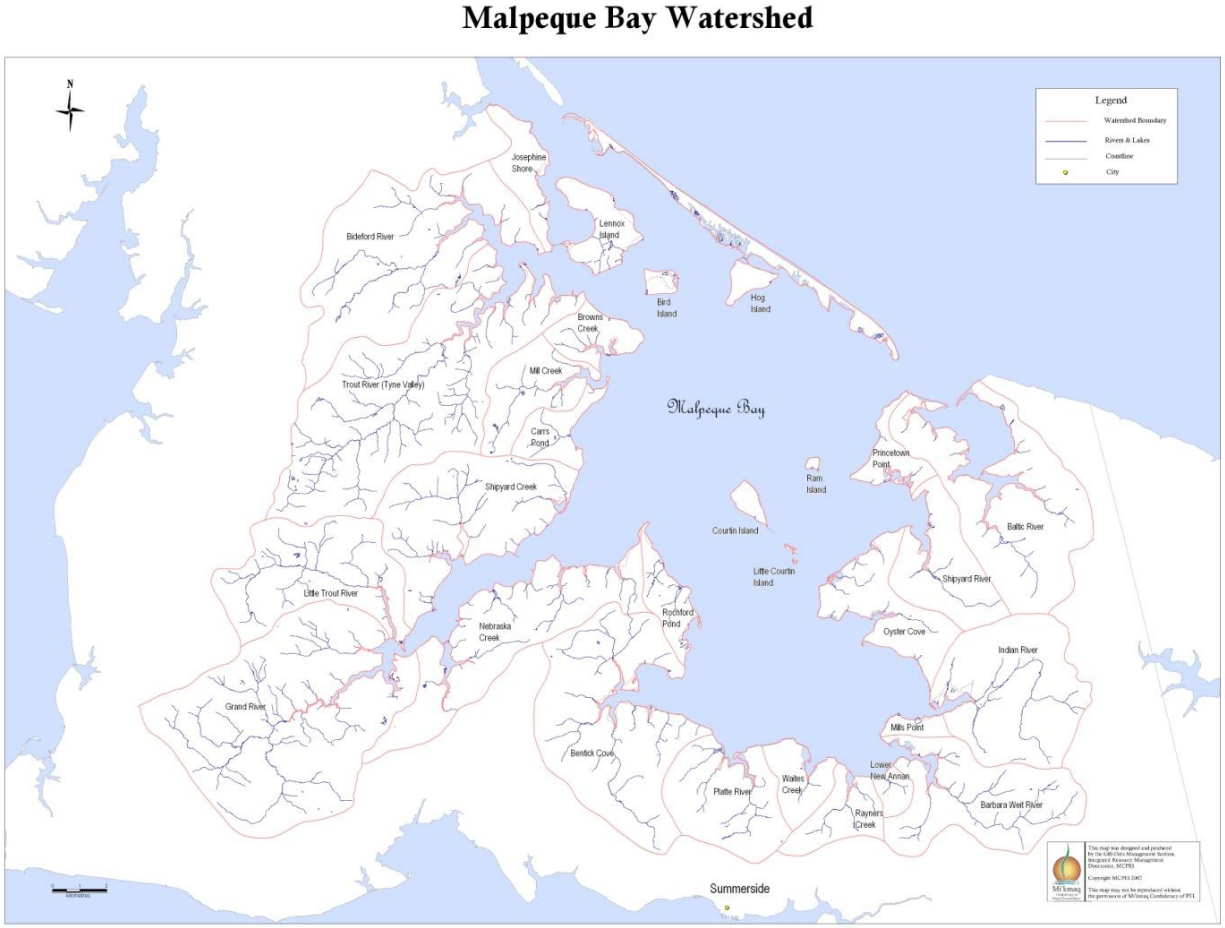
# Appendix 1




Map of PEI with the Malpeque Bay Watershed highlighted in red.

(Source: MCPEI GIS Data Management Center)

# Appendix 2




Map the Malpeque Bay Mega Watershed with the other 25 smaller watersheds outlined in red.

(Source: MCPEI GIS Data Management Center)

# Appendix 3

## List of Interview Questions

**Interactions:**

1. Which of the other sectors interacts with your sector?
2. What activities or interactions of those sectors (identified earlier) affect your sector positively or negatively?
3. How do these activities affect your sector?
4. How significant are these interactions?
5. How long have these activities or interactions existed?
6. Do these activities or interactions persist year round or at particular times of the year?
7. Are these activities conducted throughout the entire bay or at specific locations within the bay?
8. Where are these activities or interactions most prevalent or abundant?
9. To your knowledge is the sector that is conducting these activities aware of its effect on your sector?
10. Is anything being done to mitigate these activities or interactions?
11. Who is responsible for these mitigation activities?
12. Are these mitigation efforts working, why or why not?

**Willingness to Participate in ICZM:**

1. Is the user group you are representing a formal group with elected officers that meets regularly or do you meet only when an issue arises?
2. Is your sector aware of the ICZM process that is being initiated by the MCPEI?
3. Has your sector attended any of the previous ICZM meetings?
4. If no, why have your sector not attended previous meetings?
5. Is your sector willing to participate in an ICZM initiative within the Malpeque Bay?

# Appendix 4

## Stakeholder List

### Environmental and Conservation Organizations:

- Bedeque bay Environmental management Association (BBEMA)
- O'Leary Wildlife Federation
- Malpeque Community Improvement Committee
- Malpeque Bay Historical Society

### Academics institutions:

- Atlantic Veterinary College Lobster Science Center (UPEI)
- Canadian Aquaculture Institute (UPEI)
- Institute of Island Studies (UPEI)

### Resources organizations:

- PEI Shellfish Association
- Ellerslie Shellfish museum
- Western Gulf Fishermen's Association
- Cabot Fishermen's Cooperative Association
- Prince County Shellfish Association
- Prince County Flyfishers Association
- PEI Aquaculture Alliance
- PEI Fishermen's Association

### Harbour Authorities:

- Alberton
- Darnley
- Malpeque
- Milligan's Wharf

### Towns and communities:

- Town of Alberton
- Town of Kensington
- Community of Lot 11 and area

- Community of Malpeque Bay
- Community of Miminegash
- Community of Miscouche
- Community of Northport
- Community of Sherbrooke
- Community of Tyne Valley

## Socioeconomic Development Organizations:

- O'Leary Area Development Corporation
- West Prince Tourism Association
- Tyne Valley and Area development Corporation
- Miminegash and Area development Corporation
- Kensington and Area Tourist Association