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Bringing “Place” In – Exploring the Role of the Federal Government in Place-Based Approaches

Canada’s size, its landscape, and population diversity define who we are as Canadians. But within our vast geography, differences in the aspirations of inhabitants from one place to another, unique local challenges, and ecologically defined spaces are growing in importance. New perimeters that eschew traditional political boundaries create a challenge for governments. This diversity of “places” becomes a formidable challenge to the operation of a national government.

Across the country, place-based governance initiatives have been emerging at an accelerating pace at the community, municipal, and landscape or watershed level. These “place-based” approaches develop out of the need to address what are often referred to as “wicked” problems: persistent socio-economic and environmental policy issues requiring a high level of collaboration among governments and with other players. We are rediscovering that economic competitiveness, social well-being, and ecosystem resilience depend, in large part, on collective behaviour in specific “places.”

While the federal government is part of a general movement bringing “place” back into policy, it has not yet developed a systematic approach for addressing issues with place as a focus. But, why is “place” hard to include in policy?

From regulating to facilitating, from leading to capacity building, or just being one of many partners, Canadians increasingly want to know how the federal government can help them in their “place.” It is not easy to reconcile all the potential roles the federal government can fulfil in a variety of places; to play the federal role effectively, we need to answer the following questions:

- When do federal organizations need to be at the table? What criteria would guide these decisions?
- How should federal departments coordinate efforts across diverse and potentially conflicting mandates within the same “place”?
- What accountability mechanisms for partnerships cut across jurisdictions and organizations?
- What are the appropriate instruments for the federal government to use in place-based approaches?
 - What does it take for the federal government to be an effective convenor on issues of place?
 - What are its opportunities and responsibilities as a generator and provider of data that inform place-based policy?
 - What particular provisions should be made when place has an aboriginal dimension?
- What tools and processes will help ensure place-based approaches better address complex issues and promote sustainable development?

Canada is not alone in either the intensification of the place-based approach or in asking important questions about how best to do it. The United States, Europe, Australia, and other countries are developing frameworks to guide place-based initiatives. These approaches are often led by community organizations in neighbourhoods or by stewardship groups in watersheds and by citizens who want to be engaged in the

places that matter to them and in finding solutions that seem appropriate. Place-based initiatives are often led by the private sector as well as by all levels of government.

In the past few years, provincial governments in Canada have created formal frameworks that specify the respective roles and governance structures of these new partnerships, particularly for land-use and watershed planning. These frameworks usually do not identify a role for the federal government, even though its responsibilities might impact or be affected by decisions taken. There have been significant examples of federal leadership in developing place-based initiatives. But, there is a growing understanding that greater integration and collaboration across departments, with other levels of governments and other partners, are necessary policy features to provide greater economic, social, and environmental returns.

Obviously, the federal government cannot physically be present in all places. But its presence can be made significant in various other ways. The federal government should examine the range of policy tools or instruments at its disposal to foster change, whether tax provisions or regulation, possibilities offered by new technologies, including the provision of essential infrastructure for building a

knowledge commons, for sharing best practices, and convening and facilitating partnerships.

This issue of *Horizons* originates from a sense that it is worth taking a strategic look at the federal role in place-based initiatives. As the authors who follow suggest, there is an increasing recognition that the complexity of today’s policy problems requires more collaborative and integrated approaches, that policy decisions are interconnected, and that looking at place may help make sense of these connections. “Place” is where the impacts of decisions are felt, whether they are made in other countries, in Ottawa, or elsewhere in Canada. Citizens increasingly want to be part of the way solutions are defined,

We are rediscovering that economic competitiveness, social well-being, and ecosystem resilience depend, in large part, on collec- tive behaviour in specific “places”.

and they are asking their governments for support. The context set by the relationships developed in the urban and rural communities in which they live and the ecosystems they are part of may determine how best to approach social, environmental, and economic problems and their interconnectedness.

Technological change also supports that trend. Data limitation has been one of the biggest constraints in creating policy at the “place” level. The combination of remote sensing, geospatial data availability, and Web 2.0 creates unprecedented potential in developing and sharing data and, more

generally, knowledge. Such changes blur the lines between government and non-governmental organizations; these changes also transform the way knowledge can be created and shared, uncovering the potential offered by better collaboration. Moreover, the development of software supporting data visualization and scenario building may change the way policy analysis is done, making policy integration simpler, within and across jurisdictions.

History shows the importance of federal leadership in building some of the needed pieces to solve the place puzzle. From the creation of the land capability survey capacity of the Prairie Farm Rehabilitation Administration in the 1930s to the more recent Canadian Remote Sensing Program, the federal government continues to be a world leader in technological innovation supporting social and environmental problem solving.

The articles in this issue of *Horizons* examine some of the questions raised above and offer possible answers and tools to help apply sustainable development principles at the level of place. A companion document on the PRI's web site shares examples of existing place-based interventions with a predominant focus on federal initiatives. This work will inform ongoing efforts to keep the national government's role vibrant in a more dynamic and complex policy world. ●

Two Countries, One Forest

Two Countries, One Forest (2C1Forest) is a Canadian-US non-profit organization created by scientists, conservationists, and funding agencies who responded to a need to protect the Northern Appalachian/Acadian ecoregion. The participants shared a science-based understanding of the threats to the region's natural resources and a commitment to landscape scale conservation. This approach values conservation science and landscape ecology alongside economic and sociological considerations in town or regional planning. *Two Countries, One Forest*'s goal is to connect the ecoregion through a system of core protected areas linked by wildlife corridors critical to the ecoregion's long-term health, while maintaining economically and culturally vibrant local communities.

By working collaboratively, the organization facilitates the conservation work of partners at the local level while increasing the awareness and cooperation at the ecoregional level. Amidst a growing understanding of the cross-border responsibility to protect the ecoregion, *Two Countries, One Forest* works to address the jurisdictional and cultural challenges to landscape scale conservation planning across borders. A Science Working Group was established to form a scientific basis for their five key priority landscape linkages. The Working Group also produced an on-line interactive mapping tool containing over 30 new environmental datasets and base layers to assist land managers and conservation practitioners with conservation and land-use planning in the ecoregion.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

Integrated Place-Based Approaches for Sustainable Development

Introduction

Place-based approaches to planning, policy design or program delivery are a collaborative means to address complex socio-economic issues through interventions defined at a specific geographical scale. Such approaches range from the management of large ocean areas, watersheds and other ecosystems, to programs addressing poverty, public health, immigration or homelessness. They have been part of the toolkit of several federal and provincial departments in Canada and in other countries for quite some time. The scales at which they are developed vary, depending on the issues being addressed. Place-based approaches have been initiated either by governments, citizen-led organizations

principles.¹ By focusing attention on policy issues as they play out in concrete geographic and community settings, place-based approaches provide a means to grasp complex and sometimes unexpected connections. They also provide a means to address challenges and opportunities where the impacts are directly felt. Watershed-based approaches to water policy, for example, can promote: the consideration of the needs of multiple users (in agriculture, industry and cities) and the multiple consequences of these uses; an understanding of the connections between health, transportation, Aboriginal and environmental issues; a scientific understanding of water issues combining the social and biophysical perspectives; and, collaboration between governments and civil society.

This issue of *Horizons* provides a sense of the diversity of place-based approaches as they are applied in different policy areas, and identifies some of the lessons learned from an SD perspective. It also highlights emerging tools and processes available to support an integrated SD perspective on place-based approaches. One of the main lessons for Canada thus far is that integration, in the SD sense, is happening in an ad hoc manner, rather than systematically. While some place-based approaches have been designed to address SD challenges, it is still too soon to assess whether they are achieving the desired results. In general place-based approaches have been initiated to address issues from specific policy areas without much deliberate

or the private sector. Some are based on formal governance processes and decision-making arrangements, while others are more loosely organized.

Place-based approaches address social, environmental or economic issues and thus offer the promise of operationalizing Sustainable Development (SD)

1 By Sustainable Development principles, we refer to the integrated consideration in decision-making of economic, social and environmental issues in a long-term perspective. For a more detailed explanation of the meaning of SD, see Meadowcroft and Bregha (2009).

consideration or integration of others. It is well known that integration of environmental considerations in other policy areas has been a challenge in most countries, but it is also the case that integration of social and economic considerations in environmental policy is limited. Place-based approaches have, however, brought a number of benefits. For example, they have increased local capacity to address complex policy challenges, provided incentives to develop new tools and processes through which socio-economic issues can be analyzed at meaningful spatial scales, and increased understanding of places and ecosystems (see Layzer on p.59).

Place-based approaches are getting increasing attention in many regions of the world, including the European Union and the United States, where they are providing an impetus for increased learning about existing and past experiences in different areas and circumstances. Other drivers such as technology, including the tools like GIS, networking and increasing accessibility of data enable greater differentiation in both understanding and responding to current and future issues on a variety of geographic scales. In August 2009, the US White House issued a memorandum “Developing Effective Place-Based Policies for the FY 2011 Budget” that looks at change drivers like population growth, urban expansion, and food security and aims

to design a “proactive strategy to promote economic and environmental sustainability.”²

One of the main lessons for Canada thus far is that integration, in the SD sense, is happening in an ad hoc manner, rather than systematically.

Based on the articles presented in this issue of *Horizons*, what follows here is a review of some of the common features of place-based approaches, exploring the challenges they face, the benefits they can bring and opportunities for the federal government. We also present a conceptual framework to identify the building blocks or basic requirements of such approaches. We suggest that recurring challenges to place-based approaches can be overcome, so they can become a vehicle to develop and implement plans, policies and programs that foster sustainability across economic, social and environmental objectives. Examples of a number of place-based initiatives are provided throughout the articles, with a predominant focus on federal initiatives with more information available in a companion document to this issue, on the PRI website.

Background

A number of parallel movements have been emerging in a variety of policy areas. Attempting to tackle environmental issues, the 1987 Brundtland Report, which popularized the concept of SD, established the need to consider simultaneously, or in an integrated fashion, important values such as the promotion of human welfare, the

preservation of ecosystems, inter- and intra-generational equity, and public participation in decision making.

The management of natural resources has also been going through a paradigmatic shift, focusing increasingly on the need to understand the multiple effects (positive and negative) of resource use on communities and on the biophysical properties of ecosystems. There have been calls for better alignment of planning and policy approaches at the scale appropriate to the problems in order to better account for these inter-relations and to bring together relevant actors, many of whom have a vested interest in the sustainable use of the resources on which they depend.

In social policy and infrastructure planning, there is an increasing focus on “place”, often the community (see Cook, this issue p. 35, see also Bradford, 2009), sometimes the municipality (see Harcourt on p. 50). As Cook suggests (this issue p. 35), “...patterns of disadvantage are increasingly spatially concentrated in a mutually reinforcing pattern...”. A better focus on these places can thus offer a means to better address a web of inter-related issues. From public health to immigration to fighting poverty, a number of policy challenges can be more effectively addressed by looking at them together at the relevant spatial scale. More generally, as Crane and Manville (July 2008: p.3) argue: “... a second broad category of community development challenges is characterized by spatial market failures, where specific places experience underinvestment and inadequate provision of spatial public

2 See White House memorandum on developing effective place-based policies for the FY 2011 budget, August 11, 2009

goods, including safety, education, transit, community identity, political networks, and the spatial externalities of geographically linked housing and labour markets.”

Bachtler in this issue (p.54) also highlights the theoretical underpinning of the renewed importance of place in economic analysis, or the new economic geography, “... notably the relationship between transport/trade costs and spatial agglomeration; endogenous growth theories, especially on the sources and territorial dimension of innovation; and institutional theories seeking to explain the capacities of economies to adapt and innovate.”³

Given the variety of issues that can potentially be addressed through place-based interventions, the scale at which they should occur is difficult to define *a priori*, as they are often issue driven. Nevertheless, new formal governance arrangements are emerging, particularly at the provincial government level in Canada, around water, resource use (forestry, fisheries), land-use and municipal planning, which can frame the spatial context in which the integration of economic, social and environmental considerations could occur.⁴ In addition, citizen-based organizations developing out of community or regionally-felt needs are increasingly involved in trying to find solutions to their problems. A recent report found that thousands of such stewardship

groups have emerged to address environmental and resource use issues throughout Canada (Neave, 2009).

Benefits of Place-Based Approaches

There is relatively limited empirical evidence of the outcomes and benefits of place-based approaches in Canada and elsewhere, and on the conditions that would make them work better. In most cases, the focus is on process, with an emphasis on the quality of democratic life, with less attention paid to evaluating the actual results of the approaches (see for example Leach, 2006 or Layzer (this issue p.59) for the environmental policy perspective.

Practitioners of place-based approaches in the federal government argue that some of the benefits that can be brought in integrating activities further in place-based approaches include⁵:

- Bringing increased relevance to government intervention given today's diffuse power realities and evolving notions of place;
- Achieving both specific departmental mandates and a collective sustainable development mandate as defined by the new *Federal Sustainable Development Act*;
- Improving service delivery and planning, reducing duplication and increasing efficiency;

- Connecting the federal government to what is happening on the ground;
- Avoiding potential conflict in areas of shared jurisdiction by clarifying roles and responsibilities, generating buy-in at all levels, and fostering motivation throughout federal government;
- Providing greater coherence between legislative frameworks. A focus on place could allow taking into consideration the cumulative effects of different regulatory frameworks, avoiding both duplication and incoherence; and
- Tailoring national approaches to appropriate contexts.

Although place-based approaches are believed to improve integration, and by extension Sustainable Development, there are many challenges to their maturation, ranging from a culture of specialization to the difficulty in collaborating between policy areas and sectors of society and therefore accountability. Governments and stakeholders are often seen as partners in such place-based arrangements, sharing responsibility and therefore accountability to addressing jurisdictional issues. We review some of these challenges in the next section.

³ See also World Bank, 2009, for a recent analysis of the importance of place in a development context. Berdegué et al, this issue p.69, examines a specific case study.

⁴ Robins (2007) has identified close to a hundred formal governance structures developed by the provinces to manage water. This number does not include arrangements created for water by the federal government, alone or in cooperation with provinces or the United States, nor those that have emerged in other policy areas. See Oborne, this issue p.42, to get a sense of the range of existing provincial frameworks.

⁵ This workshop organized by the PRI brought together practitioners of place-based approaches in a variety of federal departments to better understand their challenges and the opportunities they offer.

Challenges to Developing and Implementing Integrated Place-Based Approaches

A number of federal departments have been directly engaged in place-based approaches for many years. With the notable exception of integrated oceans management, which is mandated by legislation, these endeavours are not necessarily meant to be in existence for a prolonged period of time. And they are usually promoted to address single policy issues. The available evidence, both from federally-led initiatives and from other jurisdictions suggests a number of key challenges.

Vocabulary

The notions of “integration”, and of ‘place’, can have different meanings in different contexts. Place can be understood as the neighbourhood, the community, the municipality, a forest or a watershed, to name a few. The meaning of place varies depending on the issues being examined, and the challenge is to recognize that the linkages between those different scales are important to consider. For example, the people living and working in communities depend on and impact the watersheds they live by.

Integration can refer to the need to better coordinate the activities of the different functions of an organization – e.g. in the federal government finances, policy-making, program planning, etc. In the context of place-based approaches to planning, reference is made simultaneously to a number of needs, adding to the potential confusion: the need to better coordinate between different governmental agencies in different jurisdictions or within a jurisdiction;

between disciplines; between sources and types of information; between interests/sectors; or between perceptions, attitudes and values (Slocombe and Hanna, 2007). While all these forms of integration are inter-related, the specific challenges of each form can lead to the development of different approaches. For example, solutions devised to address the need to integrate between different governmental agencies may not be the same as those solutions required to determine trade-offs between values. This said, there is general agreement that more collaborative approaches are needed to address integration challenges.

The notion of integration in resources management is often linked to concepts such as Integrated Landscape Management, Integrated Water Resources Management, ecosystem-based management or others. We refer here to place-based approaches to try to convey the message that there is a common focus on delimiting the inter-relations (often biophysical) of the resource management issues being looked at. In social or economic policy, however, the notion of place-based generally relates to specific socio-economic systems (such as communities or municipalities). The set of challenges faced by place-based approaches, however place is defined, are very similar.

Diverse Problems, Players and Landscapes

The flexibility to tailor solutions to the problems being addressed is often seen as one of the main benefits place-based initiatives can offer. In many cases, this flexibility can also be challenging as each region or community may require

a tailored and unique arrangement, the success of which can be heavily dependent on the dynamic created amongst the key stakeholders and the scope of the issues that need to be resolved. In other words, there is no clear solution or approach; it needs to be crafted by those involved and often this means aligning and integrating a plethora of administratively disconnected organizations to form alliances of government departments across all levels, user groups, industry, citizens, academics and other stakeholders. Such a broad diversity of interests, sometimes in conflict, requires finding some common denominator for constructive processes. But a locally based coalition of interests may need to be challenged in order to foster truly beneficial public outcomes (see for example Berdegué et al., and Layzer, this issue p. 69/p. 59).

Jurisdictional Issues and Regulatory Coherence

Landscapes, watersheds or ocean shores, or even municipal areas considered in a broad sense (e.g. the National Capital Region) rarely align neatly with jurisdictional boundaries, making place-based integrated strategies particularly challenging to develop and implement. Where the issues at hand reach across provincial and international boundaries there is increased complexity due to the different regulatory frameworks and data/monitoring regimes from each jurisdiction as well as the dynamic that each governmental organisation has created with a range of stakeholders.

Beyond geography, the provinces and territories have the authority to make many of the resource management or

social policy decisions. In many cases, however, federal departments have strong mandates and responsibilities linked to some aspects of resource management, such as in the protection of fish habitat or pollution control, the management of international aspects of resource management, or for socio-economic policy decisions which are felt most directly at a place level (for example immigration, housing, infrastructure investments, homelessness or employment training). The issue may be one of identifying and defining complementary interventions from different jurisdictions.

Different policies and regulations are developed over time and may have conflicting goals, within or between jurisdictions. Apart from those frameworks that support place-based approaches, which may not converge in intent (see Oborne, this issue p. 42), it is also possible to see in places more general contradictions led by the historical superposition of policy directions. Water policy and regulations in many countries provide a well known example of contradictions where the support provided to some sectors may increase water use while other policies may be at the same time aiming at water conservation, in the same place.

Finally, experience in many policy domains is indicating that the results of place-based planning, when such processes have been set up, do not necessarily inform decisions. This is perhaps the biggest challenge for place-based approaches ensuring that the

information developed through them is made available and is useful to decision-makers.

Knowledge and Capacity for Place-Based Initiatives

Lack of information is often one of the limiting factors to sound decisions. Throughout Canada, there are often serious gaps in knowledge available at the desired scale, impeding effective analysis (see Cook, in this issue p. 35). Furthermore, specialized policy areas tend to address issues through their own assumptions and perceptions of knowledge needs, making integration across policy domains difficult. Practitioners are learning to cope with such limitations and are developing tools and approaches, such as scenario-building and visioning, to support planning and decision-making (see Bizikova and Waldick, this issue p. 81). There is however much to do build the necessary capacity to address complex, horizontal issues.

Fora or mechanisms for sharing best practices are also generally lacking (see Waldick, this issue p. 73). Information regarding place-based approaches that have led to successful (and unsuccessful) outcomes can be a valuable resource to other similar initiatives –

especially considering that such practices are still relatively new. Lessons learned from the more mature initiatives could provide up-and-coming ones with the much needed guidance and momentum to construct their own approach.

Looking forward there is a need to seriously examine how new methods of knowledge creation, involving technological advances such as geo-referenced information and Web 2.0, as well as collaborative modes of enquiry and policy-making, can support place-based approaches to policy in the long-term.

Place-based interventions are not necessarily planned for the long-term. Because they often rely on the participation of non-state actors, many of whom are non-governmental organisations, changes in the policy directions and levels of funding can have serious effects on the ability of place-based organisations to maintain an adequate level of activity (see for example Robins, this issue p. 64).

Looking forward there is a need to seriously examine how new methods of knowledge creation, involving technological advances such as geo-referenced information and Web 2.0, as well as collaborative modes of enquiry and policy-making, can support place-based approaches to policy in the long-term.

Mandates, Culture and Accountability

Underlying most place-based challenges is the need for a range of actors, in particular within governments, to collaborate more effectively. There are a

number of difficult barriers to overcome in large, mandate driven organisations such as the federal government departments.

A recent event led by the Public Policy Forum and the Policy Research Initiative examined some of the barriers to collaboration. Among the obstacles, experts identified the culture of the public service as too often risk-averse, stifling innovative, flexible policy-making and delivery. It was also felt that the federal government is often a top-down manager of its partners, which is antithetical to the non-hierarchical spirit of collaboration.

"There was also concern expressed that Canada's Westminster institutions, in which authority and accountability are arranged vertically, are poorly-suited to horizontal collaboration. Moreover, increasing scrutiny of the public purse by the media and public and the rigid accountability regime that is emerging are real obstacles to greater collaboration" (Gravelle et al., 2008: 5, see also Federal Family, 2009). The concept and practice of shared accountability needs to be more developed.

Partnerships and Decentralization

Place-based approaches are sometimes seen as a means to decentralize decision-making and to promote more inclusive / deliberative forms of democracy. This can create ambiguity in the design of place-based approaches in that citizens involved in such processes may expect

changes in the ways in which decisions are made, especially if those expectations are not acted upon. Place-based approaches can promote a more informed approach to decision-making for sustainable development, irrespective of the ways in which decisions are made. But tensions between local and more centralized forms of governance and decision-making will probably remain an integral aspect of place-based approaches.

The Building Blocks of Place-Based Approaches

While there is still a lot to learn about place-based approaches and the outcomes they bring, there is already rich

material to build from. The similarities of place-based approaches between policy domains are probably more important than their differences, allowing us to establish a set of core functions and mechanisms that can support them, thus making learning and policy development easier, and hopefully allowing the type of integration

required for SD. We have identified the following building blocks:

- *Criteria to address issues through place.* A place-based approach may not be needed to address all policy issues. Some criteria might be useful to guide policy design and planning to get a better sense of when it might be more appropriate to address issues through place-based approaches. For example, family

benefits can be directed to all families irrespective of their location, whereas programs targeting poor families might want to take into account the place in which they reside in.

- *Linking Scales.* A related challenge is to be aware of, and deal with, inter-relationships across scales. As Charles et al. argue (this issue p. 26) Oceans management, which occurs at very large scales, can build on community involvement, when those communities' livelihoods depend on marine resources.
- *Knowledge production, tools and information-support systems to allow integrated analysis at any given spatial scale, as well as tools that help envision the future.* This includes in particular geo-referenced information, analysis and decision-support systems. As Thie indicates (this issue p. 16), Canada is a leader in this area, and technology exists to allow the widespread application of such tools in a number of policy areas. Better sharing of spatially-based databases that are often developed for specific policy purposes would go a long way to support integrated decision-making at various spatial scales.

Methodologies developed through trans-disciplinary research may provide a means to support the co-creation of knowledge, not only from different disciplines but also from different spheres of activities (e.g. government, NGO and academia), supporting data availability and accessibility at the appropriate scale. Waldick (this issue p. 73)

offers a number of suggestions on how to strengthen our capacities to do this.

- *Planning processes*, as Bizikova and Waldick, Sadler, and Noble show in this issue (p. 81/p. 95/p. 106) (e.g. Regional Strategic Environmental Assessments), can be specifically designed to foster the integration of economic, social and economic dimensions in policy design and planning. There is sufficient experience available to allow implementation of such approaches and technology can help to improve and develop capacity in this regard.
- *Mechanisms to foster collaboration between government departments and agencies*. As Bourgault suggests (this issue p. 88) there are a vast number of horizontal initiatives to learn from (see also Federal Family, 2009). The challenge is to select those that are appropriate to place, keeping in mind the need to ensure coherence at different levels of decision-making, from policy design to implementation. Several Public Service renewal reports have also made the point that the public service of the future will need to build on a culture of collaboration, which requires providing more incentives for such collaboration (see Federal Family, 2009).
- *Mechanisms to support inter-governmental collaboration*. Existing experience shows that such collaboration between bureaucracies is increasing and that there are a number of means to achieve such collaboration (see for example Johns et al., 2006). Different places and issues may

require different modes of collaboration, since leadership – when it is necessary for government to lead – may be taken by different government levels depending on constitutional mandates or other considerations. In water policy, for example, provinces may lead in watershed planning whereas the federal government may need to provide frameworks for international or inter-jurisdictional planning, play a regulatory role or that of facilitator, enabler, or science provider. More generally, all governments may play a number of different roles and functions depending on the type of issues involved.

- *Partnering with other social actors, including the private sector and other non-governmental organizations*. There is considerable experience across Canada at all levels of government in partnering using a wide variety of practices and methods. Sharing these experiences and capturing lessons learned about how to share responsibility and maintain accountability will support more systematic use of these arrangements.
- *Regulatory frameworks*. Places provide a unique lens to examine the intersection of policy and regulatory frameworks and the impacts they have on the people who live there and in the surrounding ecosystems.
 - As Layzer indicates (this issue p. 59), regulation, and environmental regulation more particularly, can provide an important leverage to ensure that collaborative place-based endeavors attain the objectives for which they were

established, rather than maintaining an unsustainable status quo;

- Place-based planning approaches can also reduce regulatory burdens in some circumstances by allowing ex ante consideration of potential risks brought by development proposals, such as those to populations or critical ecosystems. The early identification of such risks may reduce social conflicts at a later stage, such as those that can be experienced with the current application of Environmental Assessment regulations (See Noble, this issue p. 106, for a description of Regional Strategic Environmental Assessment).
- *Governance systems designed to tackle a diversity of tasks and support learning*. Governance, in the sense of clarifying roles, responsibilities and accountabilities, applies to all of the building blocks previously mentioned. As should have become clear by now, place-based approaches take many forms of collaboration from loose or temporary coalitions of interests working on an issue to sophisticated frameworks.
 - Flexible and adaptive approaches to governance is needed - allowing different actors to take on the roles they are best suited to deliver, given the objectives being sought, without compromising the ability of decision-makers to make the decisions that may be required. For example, the federal government might provide frameworks for information management and planning, without

necessarily needing to be involved in all the decisions that may result from the use of this information.

- There is limited experience to guide multiple departments in identifying objectives across mandates or policy sectors for the purposes of sustainable development.
- A lesson from Marine Spatial Planning (MSP) is that place-based approaches do not replace sectoral analysis, but provide a means to better integrate those approaches to allow a more holistic perspective, which is needed to operationalize SD principles. As Ehler and Douvere suggest (2009, p.22): MSP "...aims to provide guidance for a range of decision-makers responsible for particular sectors, activities or concerns so that they will have the means to make decisions confidently in a more comprehensive, integrated, and complementary way". The new *Federal Sustainable Development Act* may also provide a key driver for improved integration.
- Governance systems should be adaptive. They should be flexible enough to allow the integration of new knowledge and experience, (see Batchler and Layzer, this issue). To support learning a special emphasis needs to be put in measuring outcomes.

Conclusion - Considerations for the Federal Government

At the most fundamental level, place-based approaches may provide opportunities to explore how a diversity of federal interventions can be guided by SD principles, be tailored to specific circumstances, ensuring linkages at appropriate scales. The recent *Federal Sustainable Development Act* could provide an impetus for exploring this opportunity.

Increased attention to integrated place-based approaches could help accelerate the development of knowledge and methods to better analyze policy results and therefore development and the ability to evaluate cumulative impacts overtime, at different scales. As Thie suggests (this issue p. 16), Canada could build on its past experience and provide world leadership in facilitating the development of new knowledge infrastructures, shared by all users and supported by flexible governance arrangements.

More pragmatically, place-based approaches can help ensure Federal interventions are not duplicating or contradicting those of other actors, be they from other jurisdictions or civil society. This is not to say that contradictions or appearance of incoherence is necessarily a bad thing in a system where federal-provincial tensions express the democratic necessity in a federal system of providing checks-and-balances. The flip side of this is that place-based approach could allow, when desired, healthy debates over objectives such as SD goals or regulatory coherence.

Place-based approaches may allow the federal government to better align policy or program directions, often developed centrally, and regional staff experience in dealing directly with citizens or local/regional organizations. They can foster the development of a culture of collaboration, which is increasingly needed in a world where information and computer technology not only makes it easy, but necessary, and where values are changing. They may also help to understand and address issues such as climate change and global population growth, whose greatest impacts will be felt at a local scale. (Layzer, this issue p. 59)

In parallel, place-based approaches may offer governments the capacity to better adapt to the increasing involvement of citizen organizations, which has been developing across the world in the last decades, and may help better identify where intervention is needed. Increasing citizen involvement in stewardship activities, in community development, or in other activities that have traditionally been seen as the role of government, will probably continue. This is of course complexifying the relationships between governments and citizens, blurring the division between those that govern and the governed, increasing the complexity of policy-making or program delivery, and changing expectations of citizens. This opens up new and yet unknown possibilities however, adding to the capacity to generate knowledge, for example, to develop new policy instruments, place-based approaches could help ensure government interventions are better coordinated, increasing the efficient use of

public resources, making them as effective as possible, and better understood, at the local and regional levels. ●

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Integrated Management under the *Oceans Act*

In 1997, Canada established the *Oceans Act* to manage all activities in or affecting estuaries, marine and coastal waters through the principles of sustainable development, integrated management and the precautionary approach. A pilot project designating large ocean management areas (LOMAs) serves as a planning basis for implementing Integrated Management (IM). Typically thousands of square kilometers in size, the LOMAs are characterized by the presence of living and non-living marine resources, a high biological diversity and productivity, and significant competing interests for ocean space and resources. To date, five LOMAs have been estab-

lished, with boundaries determined by ecological and administrative considerations. An IM plan defines social, economic, environmental and cultural goals as well as strategies and actions for the sustainable management of resources within a LOMA. Each LOMA is governed by a decision-making committee of Federal/Provincial/Territorial departments with the support of a coordinating secretariat, stakeholder advisory committees and expert working groups. This work is aided by new tools to understand the interaction of activities and cumulative effects, such as the Integrated Oceans Risk Analysis Framework and Pathways of Effects models.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

Jean Thie

President

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Canada- Striking the Balance Between Opportunity and Limitation

Canada is a land of extremes and contradictions that have set the stage for a series of unique initiatives and world-leading innovations in the science, technology, practice, and policy associated with ecosystem surveys. The second largest country in the world, with the longest shoreline and the largest wetland (Hudson Bay Lowlands), Canada actually has a very small land resource base suitable for agriculture; its climate and physiography severely restrict the capacity of its land for agriculture and forestry. Only five percent of the almost 10 million km² of land area in Canada is suitable for crop

Widespread conflicts over the sustainability of land and resource use sparked the federal and provincial governments to initiate the first wave of major programs and acts that used what we now call integrated ecosystem-based approaches. This paper provides thumbnail sketches of some of *past and present* “horizontal” policy and program initiatives and their impact, and explores future opportunities. All these initiatives use horizontal integration approaches enabled through a combination of:

- interdisciplinary ecosystem science;
- location-based integrated monitoring, assessment, and information systems;
- integrated policy and program management focused on national issues and results; and
- cross-sectoral and multi-stakeholder involvement.

Our core competencies and leadership in these key areas, combined with online knowledge management and social participation tools enable the next wave of innovation including broad-based societal initiatives like an integrated landscape management-based Sustainable Development Knowledge Commons.

The First Climate Crisis Adaptation and Mitigation

Most settlement in Canada has taken place in the last 120 years. Accessibility by water and railway was the dominant factor in selecting land for use, and if settlement occurred on good agricultural land it was more often by

Issue-Driven Integrated Landscape Management and Innovation in Canada

production (CLI, 1976) and only 25 percent is covered by commercially viable forests.

Land, water, and climate-based issues have driven Canada's evolution from sectoral to integrated resource management and sustainable development, and made it a leader in geographic information, monitoring, and decision support systems.

Figure 1
Principle Zones of Soil Limitations for Agriculture in Canada



Source: "...for land's sake" by David M. Welch, Lands Directorate, Environment Canada, Supply and Services Canada. 1980, Catalogue No. En 72-6/1980E: ISBN 0-660-10544-6. Page 12

accident than design (Coombs and Thie, 1979). The drought of the 1930s and the associated wind erosion converted much of the short grass prairie, which had been placed in cereal production during settlement, into a vast dust bowl. This "climate" crisis during the Great Depression, and related farm abandonment resulted in the *Prairie Farm Rehabilitation Act* (PFRA) of 1935. A land capability survey formed part of the PFRA program to provide the first ecological knowledge base for the conversion of cultivated semi-arid lands to ecologically more sustainable grasslands and community pastures. This initiative ensured more sustainable use by adapting land use practices to inherent climate and soil capabilities.

Non-Sustainable Land Use, Rural Poverty, and Farm Abandonment

Rural areas continued to pay a high price for the settlement of marginal lands. The 1940s, '50s, and '60s were characterized by the use of science-based technologies, increased mechanization, and changes in market patterns that made only larger farms on good soils sustainable. A new round of farm abandonment started (in the 1960s at a rate of 10,000 per year), and poverty conditions emerged in rural Canada. In 1957, the Senate Committee on Land Use argued for an inventory of land classified with regards to its suitability for particular uses. Further impetus was provided by

the Resources for Tomorrow Conference of 1961, which focused on regional approaches to economic development and stressed the interdependence of the use, development, and conservation of renewable resources (Rees, 1977), and recommended that a comprehensive land capability survey was a necessary prerequisite for the sound future management of Canada's land resources and the evolution of policy for economic and social development in all regions of Canada. The federal government responded with the *Agricultural Rehabilitation and Development Act* (ARDA) of June 1961 that provided the framework for federal-provincial agreements to co-operate in rural resource management and research projects to facilitate land use adaptation to improve social and economic conditions. While the title of the ARDA shows a continued agricultural land use bias, the programs and projects implemented under the Act reflect a systematic strategy toward integrated landscape planning, multiple use, and sustainable development.

The Canada Land Inventory: Accelerating Integrated Landscape Management for Rural Development

In 1963, the federal government in consultation with the Canada Council of Resource Ministers approved the undertaking of the Canada Land Inventory (CLI). The CLI challenge was formidable.

It was to provide a comprehensive survey of land capability and use designed to provide a basis for integrated resource and land use planning, within

Horizontal issues and solutions need compatible, horizontally integrated knowledge bases.

5 years, for the settled portion of Canada, approximately 2.5 million km². It included cross sector assessment of land capability for agriculture, forestry, recreation, wildlife (waterfowl and ungulates), present land use, sport fish as well as pilot integrated land use planning projects in each province.

Guidelines for biophysical land classification

were developed (Lacate, 1969) to provide the ecological framework and basis for the capability classification of the landscape. In addition, present land use was mapped as a baseline for regional planning and to measure land use change over time. This knowledge base would be summarized in over 30,000 land capability maps at scales varying from 1:1,000,000, (for strategic analysis and policy applications) to 1:250,000 (to support regional planning and analysis) and 1:50,000 (to support integrated land use planning and zoning).

The Federal Role in, and Impact of, the Canada Land Inventory

The rapid program implementation required significant innovation in federal-provincial program co-operation, organization, and horizontal program integration strategies to allow for a “scale down” from national to provincial and regional perspectives. The federal government role (in addition to financing) focused on four goals.

- Develop a horizontally compatible and ecologically based classification and national survey standards.

The CLI can be acclaimed as the single most significant federal influence on rural land use.

Impact: The CLI capability classes 1 (best) to 7 (poorest) have become part of the land resource planning vocabulary.

- Facilitate and correlate national communities of practice in land capability classification and land use planning. Impact: The over 1,500 professional and technical staff

involved in the CLI moved on after its completion to influential roles in regional planning, environment, and research, and facilitated its application in policy, programs, and projects.

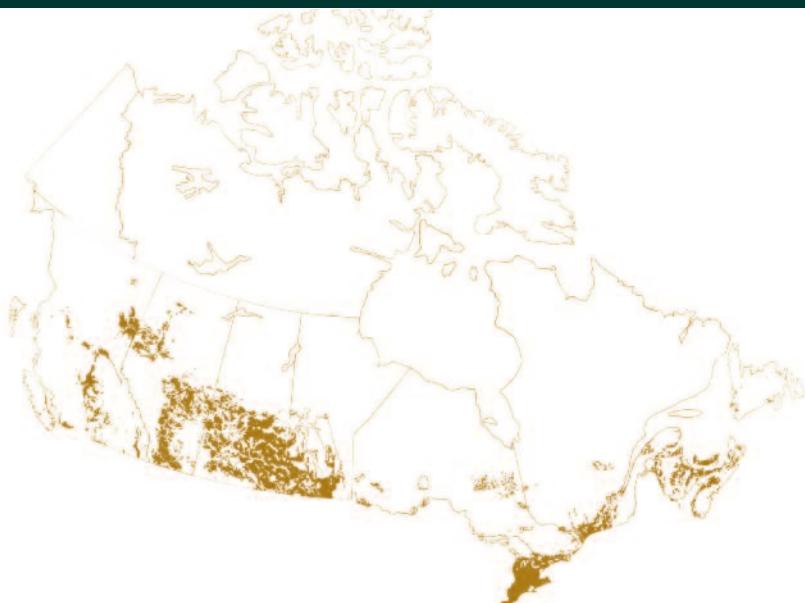
- Provide national co-ordination of the survey and pilot land use planning projects. Impact: This

accelerated the development of provincial institutions and programs for integrated resource planning.

- Publish maps and reports, and create a national digital land resource database and system. Impact: The Canadian Geographic Information System (CGIS) designed for the CLI became the world's first GIS. Its digital maps are still accessible through the GeoGratis component of the Canadian Geospatial Data Infrastructure.

The provinces were responsible for implementation; they established the survey and land use planning teams and, ultimately, integrated the results in forward-looking, land resource management strategies, policies, and programs. Some provinces, such as Manitoba, established integrated teams

Figure 2
Canada's Cropland CLI Class 1,2,3



Canada Land Inventory, Report No. 10, 1976. *Land Capability for Agriculture*. Page 7. Lands Directorate, Fisheries and Environment Canada, Ottawa

of agrologists, ecologists, biologists, economists, foresters, recreation specialists, land use experts, and planners to carry out the survey. British Columbia established the Land Use Committee and Secretariat to guide implementation. In all cases, these provincial solutions ensured the effective completion of the program and an unusually rapid integration of the results in policy, legislation, and planning.

The Canada Council on Land Use summarized progress:

The CLI can be acclaimed as the single most significant federal influence on rural land use. In sum, it would seem that “information” as a federal activity is more appropriate than “development” in contributions to joint Federal/Provincial efforts. The role of information has not been given the weight it should be. It is neutral, value-free as much as anything can be, and is available to all.¹

By that time, CLI ratings of land capability had become common. The protection of Canada’s prime lands became the focus of the federal policy on land use, and of provincial policies and legislation. The scarcity of prime agricultural lands influenced protective policies, legislation, and zoning in British Columbia, Ontario, Quebec, Prince Edward Island, and Newfoundland and Labrador. In these cases, the CLI helped set the agenda for the

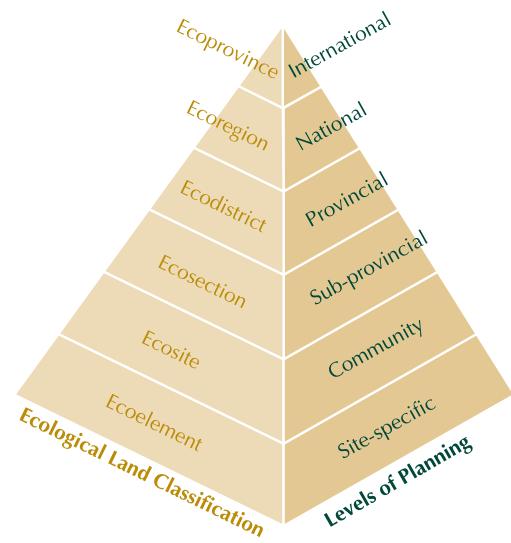
policy and legislative initiatives, but it also provided the implementation framework.

As a complement to the CLI, the Northern Land Use Information Series (NLUIS) was developed in 1971 by the Lands Directorate and Indian and Northern Affairs as a rapid environmental and social reconnaissance mapping program for Yukon and the Northwest Territories. The map series included integrated information on wildlife, fish resources, Native land use, ecological land classification, and socio-economic and cultural data. The maps assist with identifying potential land use conflicts, processing land use permit applications, and preliminary screening of the environmental and social dimensions of exploration programs and northern development.

Ecoregions and Integrated Land Management - An Ecological Framework for Canada

The CLI did not cover two thirds of Canada. In 1976, to fill the gap, federal and provincial governments established the Canada Committee on Ecological Land Classification (CCEL) to continue development and use of a uniform ecological (biophysical) approach to land classification for resource planning, management, and environmental impact assessment. Over 600 specialists representing various governments, academia, the private sector, and non-governmental organizations contributed to its working groups and special products including the following:

Figure 3
Ecological Classification Linked to Levels of Planning



Thie, J., E.B.Wiken, and C.D.A. Rubec. 1986. *Ecological land Survey as Basis for Land resource Planning and Management in Canada*. In *Land and its Uses – Actual and potential*. NATO Conference Series 1: Ecology Volume 10. Pages 437-452 Plenum Press. New York and London.

1. <<http://geogratis.cgdi.gc.ca/CLI/council.html>>, Council on Rural Development Canada 1979.

Figure 4
Ecoclimatic Regions of Canada



Ecoregions Working Group, Canada Committee on Ecological Land Classification (CCELC) 1989 S.C. Zoltai, Chair. *Ecoclimatic Regions of Canada*. Ecological Land Classification Series No. 23. Canadian Wildlife Service, Environment Canada.

Figure 5
North American Ecoregions



Commission on Environmental Cooperation (CEC) 1997. Ecological Regions of North America. Secretariat CEC, Montreal, Canada. ISBN 2-922305-18-X, Page 9
http://www.cec.org/files/pdf/BIODIVERSITY/eco-eng_EN.pdf

- The Canadian Ecological Land Classification System and Survey was established to map and describe ecologically significant parts of the landscape and organize this in a format suitable for planning and management scaled from global to local levels.
 - In 1989, the Ecoclimatic Regions of Canada project mapped broad areas of the Earth's surface characterized by distinctive ecological responses to climate, as expressed by vegetation and reflected in soils, wildlife, biodiversity, and water. This map is one of the most powerful tools available to develop ecosystem-based climate change adaptation strategies and scenarios for Canada.
 - The Wetland Classification System and National Map provided the basis for monitoring wetland loss and the formulation of the federal policy on Wetland Conservation in 1991.
 - Ecoregion and ecodistrict mapping for most of Canada was started, but terminated in 1988 when the Lands Directorate was reorganized into a sustainable development and a state of the environment reporting branch.
- The Ecological Land Survey approach was applied in most of Canada's national parks, in major environmental assessments, and in developments, such as the James Bay hydro-electric project. In the mid-1980s, acid rain sensitivity in Eastern Canada was assessed using terrestrial ecoregions and districts.

In 1991, in support of the Green Plan and state of the environment reporting, the federal-provincial Ecological Stratification Working Group was formed to develop a national ecological framework for Canada, which was published in 1996. It is now widely used nationally and internationally as a strategy framework for policy, research, monitoring, assessment, and reporting.

Managing Declining Migratory Bird Populations

The North American Waterfowl Management Plan (NAWMP) shows how integrated landscape management can be applied to continental issues and implemented locally, if supported by a credible knowledge base for multi-stakeholder partnership negotiations, setting strategic objectives, and developing implementation plans. The decline in migratory bird populations in the 1980s was linked to the loss of habitat (wetlands) in the critical flight ways in Western and Eastern Canada. In 1986, Canada and the United States signed the NAWMP agreement; Mexico joined in 1988. The Plan provides a policy framework for analyzing North American waterfowl issues and sets out a number of objectives relating to waterfowl habitat and populations. Joint ventures and financing from national and provincial/state governments, and substantial financial flows (almost \$300 million) from non-government and not-for-profit organizations in Canada and the United States were directed to wetland preservation and habitat improvement. This included financial support to farmers to

maintain critical prairie pothole habitat as part of the Prairie Habitat/Pothole Joint Venture.

Sustainable Development and the Green Plan: Integrated Science Monitoring and Assessment, and Action Plans

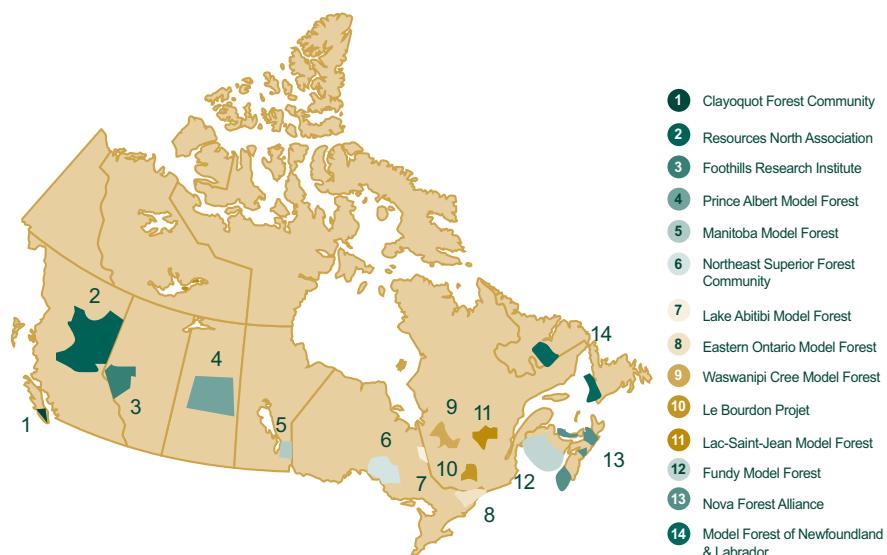
In response to interest in the environment and sustainable development created by the Brundtland Commission Report, Our Common Future, the late 1980s and early '90s saw the development of significant integrated initiatives, some of which were reinforced by the 1990 Green Plan.

- **Integrated science and monitoring.** The Ecological Monitoring and Assessment Network (EMAN) was

part of a comprehensive strategy to integrate terrestrial, aquatic, and atmospheric monitoring networks, sites, and research across Canada. The goal was to provide a national perspective on how Canadian ecosystems are affected by the many environmental stressors, give scientifically defensible rationales for pollution control and resource management policies, evaluate and report to Canadians on the effectiveness of resource management policies, and identify new environmental issues at the earliest possible stage.

- **Sustainable landscape and forest management.** The Canadian Model Forest Network (CMFN) includes 14 model forest sites across Canada.

Figure 6
Model Forest Network



Source : <http://www.modelforest.net/cmfnet/en/forests/>

Each site involves numerous partners working toward sustainable forest and landscape management. Partners include forest companies, Aboriginal communities, private citizens, parks, environmental groups, governments, and universities. Model forests can be seen as test beds for interdisciplinary ecosystem science and participatory planning at the forefront of sustainable forest management. They provide a standard and window on sustainable forest management (SFM) practices in Canada and together with criteria and indicators of SFM provide public and international credibility to the Canadian forest management certification process. This effective Canadian initiative has been expanded globally in the International Model Forest Network involving over 20 countries and covering most continents.

- **Drainage basin action plans** like those for the Fraser River, Great Lakes, and St. Lawrence River provide effective mechanisms for horizontal integration of federal and provincial programs through co-operative and integrated management objectives and methods based on principles of sustainability. The concentration of significant financial flows, with a focus on clear results, have made these integrated action plans very effective.

Integrated Land Management and Location-Based Information

The **Canada Geographic Information System (CGIS)**. The CLI generated over 30,000 maps! Traditional manual analysis, overlays, and presentation would significantly limit use of the data. Roger Tomlinson, universally considered the “father of GIS” worked with Spartan Air Services in Ottawa and explored with IBM in the early 1960s the link between maps, location-based information, and computers. A chance airplane encounter with Lee Pratt, the first Chief of the CLI led to a feasibility study for a geo-information system for the CLI.

- In 1963, the design work started for the Canada Geographic Information System.
- In 1965, the CGIS delivered the world’s first optical scanner capable of reading 1:30,000 maps into a digital form (now in the Museum of Science and Technology, Ottawa).
- In 1971, the CGIS became the world’s first fully operational GIS. It has a unique ability to overlay all CLI maps, integrate socio-economic layers, build continent-wide databases, and provide analysis at the national, provincial, regional, and local levels.

- In 1975, the CGIS became the first GIS to offer nationally remote access to interactive graphic analysis of its integrated databases.

Typical applications and use of the CGIS, combining CLI and many other data sets included (Thie et al., 1982)

federal land use and wetland policy development; the North American Waterfowl Management Plan, supporting Canada-US negotiations; biophysical/ecological databases for national parks planning and management; land use monitoring (e.g., loss of high capability agriculture and wetlands around urban areas); mapping terrestrial sensitivity to acid rain; and spruce budworm damage monitoring and assessment.

Land, water, and climate-based issues have driven Canada’s evolution from sectoral to integrated resource management and sustainable development, and made it a leader in geographic information, monitoring, and decision support systems.

The Canadian Remote Sensing Program.

Parallel in time to the development in early GIS in Canada, the new field of airborne and satellite remote sensing emerged. In 1970, the Interdepartmental Planning Office on Remote Sensing obtained approval to modify the satellite receiving station in Prince Albert, Saskatchewan, to receive data from NASA’s Earth Resources Technology Satellite (ERTS). Exploration and increased environmental awareness moved the federal government to fund this initiative and ensure that Canadians would have equal or better access than their neighbours to this new

source of information about Canada's land and water, and forest and mineral resources. The first objective was to produce the remotely sensed data and information needed for natural resource and environmental management quickly and efficiently, and support research and development on the collection, processing, and interpretation of data.

The intelligent use of Canada's private-sector capabilities (including Computing Devices of Ottawa and MacDonald-Dettwiler and Associates Ltd.) enabled Canada to receive and process the first ERTS satellite images a week before NASA was able to do so. This achievement provided the foundation for MacDonald-Dettwiler and Associates to corner the global market in ERTS/ LANDSAT and SEASAT receiving stations. Through the Canadian Advisory Committee on Remote Sensing (CACRS), a loosely integrated federal-provincial program was developed that resulted in the establishment of provincial remote sensing interpretation centres, and centres of excellence at Canadian universities.

The early successes of Canadian technology at home and globally provided the basis for the successful development of the RADARSAT program and launch of Canada's all-weather radar satellites 1 and 2. Again, the first steps to a radar satellite were taken through an interdepartmental planning office. The Canadian geomatics industry received another boost in its competitiveness in global markets, exemplified by the global leadership position of MacDonald-Dettwiler and Associates

Figure 7
Leaf Area Index from SPOT Satellite – Indicator of Carbon Absorption



< http://ess.nrcan.gc.ca/ercc-rrcc/proj3/theme6/images/index_11.jpg >
< http://ess.nrcan.gc.ca/ercc-rrcc/proj3/theme6/index_e.php >

in building on its success in the convergence of remote sensing systems, GIS, and resource management.

Canadian Geospatial Data Infrastructure (CGDI). The federal Interagency Committee on Geomatics (IACG) has worked for many years to improve the collection, management, and integration of location-based information to enable improved decision and policy making. However, the Internet drastically changed the dimensions of what was possible. Canada was an early adapter with innovative initiatives like SchoolNet and Community Access. In 1994, the National Atlas Information Service (Geomatics Canada) launched the world's first GIS capability on the Internet, providing wide public interac-

tive access to national thematic, issue, and policy maps, and making maps from national databases, such as the National Pollutant Release Inventory, dynamic.

The launch of the GeoConnections Program in 1999 increased the accessibility and use of new technologies, like global positioning systems and web-based mapping. The CGDI was created to improve sharing, access, integration, and use of geographic information. The initial investment of \$60 million (1999-2005) leveraged an additional \$110 million to achieve these objectives. The second phase of the GeoConnections Program (2005-2011) has made integrated land management (ILM) one of its priority areas and

supported **IMAGINE Canada** (Integrated Management and Geospatial Information Network for the Environment) in facilitating the convergence of ILM knowledge bases, geospatial technologies, and decision support systems for national and regional applications. The **GEOIDE Network** (GEOmatics for Informed Decisions) funded by the Networks of Centres of Excellence Program (NCE) complements these initiatives by supporting innovative research and networking in geomatics across Canada. Its major thrusts include sustainable management of land and marine resources, natural hazards, and the environment.

The Future: A Sustainable Development Commons

The last 20 years have set the stage and built the technologies for the next wave of innovation in ILM. The next two decades will see a paradigm shift when converging strategic technologies, societal issues, and a knowledge-based economy accelerate the development of an ILM-based sustainable development knowledge commons (SDKC).

Like ILM, an SDKC would be based on integrating the best interdisciplinary ecosystem science with socio-economic knowledge, best practices (in planning and adaptive management), and best policy development in a transparent multi-stakeholder participation process. The potential of the Internet for sharing data, knowledge, and online analysis, and promoting participatory systems provides a unique opportunity for society to develop

common solutions and renew interest in the old “commons” concept. The creative commons movement, and the **conservation commons** of the IUCN – The World Conservation Union – have set the stage for an ILM-based knowledge commons and infrastructure. IMAGINE Canada is a small strategic step in this direction.

The key components of the SDKC include a shared knowledge base, empowerment tools and best practices, and governance support tools and systems facilitating stakeholder participation and measuring performance.

The federal government should view the SDKC as a strategic opportunity to shift its role from traditional infrastructure to facilitating the new knowledge infrastructure critical for the new economy, sustainable development, and adapting to climate change. It should develop the strategic framework (perhaps through an interdepartmental planning office, which has been an effective vehicle for Canada’s remote sensing programs) to set the stage for a national leadership role. Leadership in the age of the Internet is a series of small, smart investments, and a business model, which enables all stakeholders to participate, share, contribute, and benefit. Many federal programs and policy initiatives could directly benefit from the horizontal integration and multi-stakeholder knowledge provided by an SDKC. Many programs like GeoConnections or GEOIDE could make significant contributions in shifting the orientation from data (a concept of the 1990s) to knowledge infrastructure.

Just imagine Canada when the power of social networking tools transforms knowledge networking and the visualization power of video “gaming” built on geospatial modelling and decision support systems, which can then be used to visualize future policies or landscape adaptation scenarios. ●

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The GeoConnections Program and Place-Based Approaches to Landscape Management

GeoConnections is a national project currently being led by Natural Resources Canada that aims to help decision-makers tackle some of Canada's most pressing challenges through the use of geomatics. "Geomatics" refers to gathering, storing, processing, and delivering geographic information in sophisticated and interactive mapping systems. MapQuest™ and Google Earth™ are great examples of geomatics at work. GeoConnections advances the use of geomatics by supporting and expanding the Canadian Geospatial Data Infrastructure (CGDI), the system responsible for formalizing the structure and process for organizing, using and sharing geospatial data and services in Canada. To date GeoConnections has assisted decision makers with issues ranging from public safety and health, to the environment and sustainable development.

Governments at all levels are implementing comprehensive approaches to managing landscapes, ecosystems, watersheds, coastal zones, oceans, etc. Integrated landscape management (ILM) is often used to capture these holistic approaches. ILM is inherently a "place-based" approach that lends itself well to the use of geospatial data and geomatics technologies, especially when used in conjunction with forecasting and modeling

programs. Integrating the use of geomatics when dealing with place-based issues has contributed to better environmental assessment and land-use planning. For example the Nova Scotia Department of Environment has developed an online geomatics project-planning and decision-making tool to improve provincial environmental assessments (EAs). Similarly, Indian and Northern Affairs Canada in collaboration with the Government of the Northwest Territories have created the Mackenzie Gas Project (MGP) and the Mackenzie Gas Portal, making diverse government place-based data available to support decision-making associated with the pipeline development.

Geomatics technologies and geospatial data are key pillars to the successful delivery of place-based integrated management. As the use of place-based approaches increases there will be a corresponding increase in expectation of accuracy, currency and reliability of geospatial data from authoritative sources. There will also be a demand that geospatial data be easily integrated and analyzed without specialized expertise making projects like GeoConnections and IMAGINE Canada all the more important.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

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Integrated Management: A Coastal Community Perspective

Introduction

The Rio Declaration (1992, UN Conference on Environment and Development) flagged integrated management (IM) as vital to sustainable development, whether focused on coasts, oceans, watersheds, forests, or upland areas. However, the concept has evolved to encompass many more meanings. For example, it has been defined as a multi-disciplinary approach to reconcile sustainability of the biophysical environment with economic growth and prosperity (Olsen, 2003), and as a collaborative planning approach that addresses social, economic, institutional, environmental, and legal interests of multiple stakeholders and of the resources being managed (Christie et al., 2005). Com-

International guidelines for IM emphasize the principle of participatory governance, in addition to those of sustainable development and environmental protection (e.g., UNEP). Research around the globe has demonstrated that wide public participation is the key to success (Tobey and Volk, 2002: 290), but participatory governance remains one of the most neglected areas of IM (Kearney et al., 2007).

This paper, which focuses on ocean and coastal areas, explores the challenge of public participation by discussing the role of communities in IM. It draws on a decade of collaboration between academics and community partners to outline the community perspective on both the limiting factors and the opportunities, and a state-of-the-art survey of community involvement in IM, particularly in the Canadian Maritimes. The paper highlights the importance of linking communities and governments, and the need to overcome the growing disconnect between the two. It also illustrates the varied experiences of local coastal communities with IM through three concrete examples. These practical examples lead to two specific outputs: a set of fundamental IM values and attributes from a community perspective, and a four-step process for facilitating and enabling community-focused IM. The conclusion summarizes key outcomes in terms of inclusivity and active involvement of communities.

ponents that require “integration” include political and legal jurisdictions, ecosystem parameters, conflicting uses, social, cultural, and economic needs, different knowledge systems, and controls on anthropogenic impacts.

The Challenge of Implementing Integrated Management

It is not surprising that governments, including those of Canada, have been slow to develop policy that fully reflects the aspirations of the Rio Declaration, particularly with regard to participatory governance. Several difficult hurdles must be overcome. First, single ecosystems usually fall under the jurisdiction of multiple authorities, and “the purposes for which authorities are statutorily permitted to act and their legal ability to cooperate with each other are sometimes restricted in ways that impede.”¹ Second, major equity issues arise when the profits and benefits of large-scale activities accrue to limited segments of society while costs are imposed on local communities and the environment. Third, there is no generally accepted framework for IM monitoring and evaluation; few IM initiatives identify results-based indicators. Fourth, IM initiatives are often large scale and focused on the space rather than the people (e.g., on large ocean management areas in the marine environment), which can disregard or be incompatible with the needs and aspirations of people living in those areas.

Communities want long-range planning for alleviation of poverty, priority for local needs, and recognition of their rights to access local resources. This implies close attention to “ecosystem/ food-web” connections that exist between vital components of the ecosystem and community livelihoods.

Box 1 Comparing Definitions of Integrated Management

“a comprehensive way of planning and managing human activities so that they do not conflict with one another” and “so all factors are considered for the conservation and sustainable use of marine resources and shared use of ocean spaces...”

DFO, 2005: 11 and 19

“a continuous and dynamic process that unites government and the community, science and management, sectoral and public interests in preparing and implementing an integrated plan for the protection and development of coastal ecosystems and resources”

GESAMP, 1996, in Bastien-Daigle et al., 2008: 97.

From the government perspective, IM has tended to be defined more narrowly (as in the left hand side of Box 1), perhaps without highlighting the participatory collaboration and opportunities for co-learning that we argue will be key to overcoming IM barriers (compare with the right hand side of Box 1).

These challenges are daunting. To build institutions that can accomplish multiple levels of integration in natural resource planning will require linking existing government agencies both vertically and horizontally. However, government linkages alone cannot accomplish effective IM. Keen and Mahanty (2006) suggested that

IM must also involve open discussion of the values and objectives promoted in planning exercises for any given geographic area, as well as open sharing of relevant information, thereby providing the opportunity for wider knowledge and skill base sets to be used in decision making. We turn next to the pressing need to build these institutions in the Canadian coastal zone.

Integrated Management and Canadian Coasts

Globally, coastal zones are under increasing pressure. A growing proportion of the world’s human population lives on the coast, together with a majority share of human infrastructure and activity in industry, transportation and trade, energy processing, communications and services, and a disproportionate share of global consumption and waste production (Tobey and Volk, 2002: 287). But as coasts and oceans are also generators of vital ecological services, and home to much of the world’s fish stocks, rapid coastal development

1 Gibson (2003: 128). For further references, see Kearney et al. (2007); Klinger (2004); Weiss Reid (2004); and Wiber and Kearney (2009).

Box 2

Multiple Levels of Integration in Coastal and Ocean IM

- Inter-sectoral integration that brings together agencies and groups from different sectors, such as fisheries, tourism, oil and gas etc.
- Inter-governmental integration that brings together the several levels of government (national, provincial, and local).
- Spatial integration that connects the land (including watersheds and river basins) with the ocean.
- Science-management integration that includes both natural and social sciences (and we would add traditional ecological knowledge).
- International integration that links local, provincial, and national regulations with international conventions and emerging standards (Cicin-Sain and Knecht, 1998).

and climate change threaten environmental quality and human welfare. Development also squeezes out long-time users of coastal areas, which leads to competition and conflict. These concerns are common to much of the world, and Canada is no exception.

International conventions and declarations guide management of coasts. This includes the United Nations Convention on the Law of the Sea (1982), the Convention on Biological Diversity (1992), and the Rio Declaration (Cicin-Sain and Belfiore, 2005). These conventions have highlighted the various forms of integration indicated in Box 2.

Canada responded with guidelines for coastal and ocean IM under the *Oceans Act* (Canada, 1996, Chapter 31), which authorizes the Department of Fisheries and Oceans (DFO) to work

“in collaboration” with other persons and bodies, including local stakeholders. But, as Canada’s Auditor General, the Senate Committee on Fisheries and Oceans, and various academic researchers have pointed out, this collaboration has not developed. Instead, IM approaches implemented without community support and buy-in have led to local opposition. This can be avoided, particularly through the adoption of a community-based perspective, as this paper illustrates.

Community Perspectives on Integrated Management

For the past several years, a unique alliance of First Nations communities, fishermen’s associations, universities, and coastal resource centres has examined processes of integrated management on the coast, and building

local capacity for engaging in these processes. This has been supported by the Coastal Community University Research Alliance (CURA) project, which studies and shares lessons learned across the three Maritime provinces (Coastal CURA). The authors gratefully acknowledge the support of the Social Sciences and Humanities Research Council of Canada.²

The diverse initiatives in which our community partners are involved include ecosystem-based management plans (Malpeque Bay, PEI), watershed remediation (Bear River, NS), shellfish habitat restoration and restocking (Annapolis Basin, NS), harbour management (Saint John Harbour, NB), groundfish management (Fundy Fixed Gear Council, NS), aquaculture site planning (Southwest New Brunswick), and larger area management plans (SWNB Marine Resources Planning Initiative). The Coastal CURA has examined these real-world community experiences with IM, of which three illustrative examples are described here – one each from Nova Scotia, New Brunswick, and Prince Edward Island. In each, a problem is described, along with the relevant regulatory powers, the local institutions, community actions, and resulting lessons. We discuss the challenges arising from interactions between community and government, and the grass-roots success stories that highlight the different ways communities work toward a common goal of achieving IM.

² Publications include Charles (2008); Kearney et al. (2007); Wiber and Bull (2009); Wiber and Kearney (1996); and Wiber et al. (2003, 2009).

Harbour Management, Saint John Harbour and the Fundy North Fishermen's Association, New Brunswick

Problem: Environmental challenges for the international port of Saint John are numerous (agricultural and forestry run-off, pulp and paper mills, oil refineries, freighter and cruise ship terminals, harbour dredging and dredge dumping, and raw municipal sewage outflows). Rapidly expanding petrochemical developments and post 9/11 security measures also impact local users of the port, especially the inshore fishery.

Regulatory Powers: Numerous federal (DFO, Transport Canada, Environment Canada), regional (Saint John Port Authority), and provincial and municipal agencies have regulatory powers.

Local IM Institutions: Fundy North Fishermen's Association has prompted the formation of a number of ad hoc committees to address specific management harbour issues, including the impact of dredge dumping on migrating lobster, post 9/11 wharf restrictions, liquefied natural gas terminal development, and expanding harbour traffic causing gear loss. The committees include Dredging Dumping (led by Environment Canada), Saint John Wharfs (led by Small Craft Harbours/DFO), Liquefied Natural Gas Community Liaison (led by Canaport LNG), Harbour Traffic (led by Transport Canada/Port Authority).

Fundy North has been involved in planning and research, including environmental impact assessment, developing monitoring protocols, and evaluating tugboat and shipping damage to fishing gear and subsequently to lobster stocks. Overall, Fundy North found the existing consultation process frustrating, as there are no clear channels of responsibility and authority. Mitigating environmental impacts and juggling the multiple uses of the harbour requires more effective integrated management institutions.

Community Actions: A film was produced that captures community suggestions about how different stakeholders can work together in and around Saint John Harbour, including voluntary traffic separation schemes. The film has had wide distribution and media coverage, and has been a tool for dialogue.

Lessons: One government agency should take the lead in establishing an integrated planning board to facilitate harbour planning and operations. New management institutions and policy initiatives can be guided both by the local specificities in Saint John harbour and by best practices from elsewhere (see Wiber and Recchia, 2009).

St. Mary's Bay, Nova Scotia: Shellfish Sanitation, the Annapolis Watershed Resource Committee and Beach Privatization

Problem: Land-based pollution and seasonal water quality problems led to toxins in shellfish and to the closure of productive beaches; habitat destruction and over-fishing have led to declining stocks.

Regulatory Powers: Environment Canada tests water quality and classifies shellfish growing areas; DFO controls harvesting, transportation, and cleaning of shellfish, and the opening and closing of shellfish growing areas. The Canadian Food Inspection Agency (CFIA) regulates handling, processing, marketing, and the import and export of shellfish, including depurated shellfish from closed beaches. The Canadian Shellfish Sanitation Program (CSSP) is jointly administered by Environment Canada,

DFO, and the CFIA. The provincial departments of Natural Resources, and of Fisheries and Aquaculture as well as municipal authorities also have regulatory powers.

Local IM Institution: The Annapolis Watershed Resource Committee (AWRC) was a multi-stakeholder management board facilitated by a local non-governmental organization, the Clean Annapolis River Project (CARP). Other members included the Bay of Fundy Marine Resource Centre (MRC), local clam harvester associations, Bear River First Nation, clam processors, and all levels of government. The AWRC collaborated with clam harvesters on habitat restoration and clam reseeding experiments and co-ordinated with municipal sewage and tidal

power authorities. However, the AWRC found that their efforts were challenged by beach privatization. Since 1997, one company has held an aquaculture lease for 1,682 ha of beach in St. Mary's Bay. So far, the company has only harvested wild stock and operates the only depuration plant for shellfish harvested from closed beaches in the area. As their primary source of clams is from closed beaches, the company has no incentive to improve beach habitat. Beach closures are also increasing. In 2008, most of the Annapolis Basin's beaches were closed to clamming because of changes to protocols surrounding wastewater treatment plant failure, further limiting local harvester access to clams.

Community Actions: Several initiatives have built local capacity, including a clam harvester project in 2005 that proved that reseeding clams was viable; some closed beaches were re-opened using collaborative information sources on water quality from CARP, Environment Canada, CFIA, DFO, and the clam harvesters; the AWRC was re-established; and the MRC played a role as facilitator.

Lessons: If public consultation processes established under provincial regulation had been followed in granting the aquaculture leases, this might have alleviated much of the local frustration and led to different outcomes. Local communities can and do develop effective and timely IM processes but require support from government to address the issues adequately.

Mi'kmaq Confederacy of PEI, Malpeque Bay Integrated Management Plan

Problem: Malpeque Bay has been crucial to food harvesting, transportation, and recreation for PEI First Nations for thousands of years. More recently, the increased and varied use of Malpeque Bay has resulted in conflicts between tourism operators, aquaculturists, fishers, and others who rely on the Bay for their livelihoods or for economic development. While the region's oyster fishery depends on Malpeque Bay for most of the production of spat (juvenile oysters), environmental problems are increasing. Calls for expanded aquaculture in the bay will impact First Nations food and ceremonial fishing rights, and may be untenable given environmental problems.

Regulatory Powers: the federal DFO, Environment Canada, and Transport Canada, Indian and Northern Affairs Canada, and the CFIA; provincial Department of Aquaculture, Fisheries and Rural Development, and Department of Environment.

Local IM Institutions: The MCPEI is a not-for-profit tribal council and provincial territorial organization (PTO) for Lennox Island and Abegweit First Nations. The MCPEI board of directors created the Integrated Resource Management Directorate (IRM), one task of which will be to direct progress on the development of an IM plan for

Malpeque Bay. This includes identifying resources and stakeholders in the Bay, and collecting resource use data in the surrounding area.

Community Actions: The MCPEI undertook a survey of the historical resource use of the Mi'kmaq of PEI, including interviews and mapping of traditional Mi'kmaq resource sites. This began the process of defining a common vision for the Bay, which includes all community members, both First Nations and other stakeholders. A film is being produced to capture this vision and bring it to a larger audience.

Lessons: Developing an integrated plan for Malpeque Bay has proven challenging, as each group (government, non-governmental organizations, communities, non-Native fishers, and tourists) has specific ideas of what constitutes proper and sustainable use of Malpeque Bay. Government departments use their mandates to compartmentalize management effectively. An integrated approach to coastal management requires a leadership partner to encourage participation by all stakeholders, and to engage in positive steps toward successful attainment of the goal of IM.

Analysis: Community Engagement in Integrated Management

The case studies described above reflect a range of experiences and of unique grass-roots perspectives of people who work to build community-centred IM institutions. We have documented a growing sense of urgency in communities, as declines in vital resource stocks and increasing environmental degradation affect livelihoods. Integrated management institutions and responses must develop more quickly and be built on a foundation of community support, if IM is to make a real difference to sustainability.

We see many instances of communities that recognize the value of IM processes and seek to initiate them. However, it is difficult for communities to take on such a leadership role, or for community-initiated processes to result in formal IM institutions. For example, in the case of the Saint John Harbour, fishers sought to have proper IM mechanisms put in place, but despite some progress on specific issues, through ad hoc committees, integrating this into a formal IM process has yet to occur. It needs to be recognized that good leadership, no matter where it comes from, is vital to a successful and sustained IM process, and that sometimes that leadership is to be found in local communities. Indeed, while institutional progress is often slow, there are local success stories. As noted in the case studies above, we have seen a diverse range of community-driven responses to local problems.

The experiences of our coastal community partners with IM demonstrate the linkages, or lack thereof, between efforts to address local problems by civil society, on the one hand, and policy development and implementation within governments, on the other. These experiences also highlight the need for better linkages between communities and governments with respect to the IM ingredients and processes that are valued, and the outcomes expected from IM (Wilson and Wiber, *in press*). This implies that if the potential of Canada's *Oceans Act* and similar legislation is to be realized, and implemented in a way that furthers the sustainable and equitable use of Canada's coastal and ocean resources, the disconnect between policy and public expectations must be addressed.

Our research on coastal experiences in the Maritimes has led us to a set of four major insights from a community perspective to rectify shortfalls in how IM is implemented.

A Focus on Community Participation as an Essential Element of IM

A participatory approach to IM clearly requires careful consideration of who should be involved, how they should be involved, and how to support involvement. It is desirable to begin with broad community participation. At the same time, governments need to recognize the difference between types of stakeholders; indeed, the term "stakeholder" is not well received from a community perspective. Planning must

begin with those most directly affected, so "community" and "First Nation" become the important participants for most planning purposes.

Incorporating Community Values into IM

Communities want long-range planning for alleviation of poverty, priority for local needs, and recognition of their rights to access local resources. This implies close attention to "ecosystem/food-web" connections that exist between vital components of the ecosystem and community livelihoods. Further, within communities, the total life cycle should be considered in protecting livelihoods, so people old and young have options in terms of phasing in or out of the process.

Providing the Legal Space and Local Necessities for Effective IM Institutions

As a fundamental prerequisite, legal space must be made for integrated management. Sometimes, this will require changing existing legislation; other times it will require enabling legislation. The IM planning institutions should accomplish the following:

- Create space for deliberative debate in planning, to help overcome community "push back" that arises when planning is imposed from above without considering local needs and values.
- Take a long-range perspective on inclusivity (e.g., the recognition and authorization of local and First Nation rights), and focus on creating

a level playing field for participants so economic or political clout does not have a disproportionate voice.

- Aim for healthy linkages between community and ecosystems, and include a mechanism to have someone who speaks for the ecosystem; identify potential risks and risk elements, carrying capacity issues, and cumulative effects.
- Develop effective mechanisms for incorporating place-based knowledge into the planning process and for sharing information to facilitate “co-learning” (e.g., through public meta-databases and forms of university-community collaboration).

Reflecting Multiple Scales in IM Governance

It is important to consider multiple spatial scales in IM. While there may be a tendency to take on large areas (such as large ocean management areas), these may seem too large and lacking in focus when viewed from a local scale. Focusing instead (or in addition) on specific localities and specific problems can improve the efficiency of IM initiatives. Examples include dealing with land-based pollution that affects streams and beaches in the Annapolis Basin, or better planning for Saint John harbour. The “scaling up” of smaller, more focused initiatives, and IM institutions, to the regional and national level should be encouraged, potentially through suitable councils or other deliberative bodies. The resulting cross-scale linkages need to work effectively, since communities are keen to see the resolution of jurisdictional quagmires.

Community-Focused Ingredients for Effective IM

Several key issues have emerged among the Coastal CURA partners as crucial to moving IM forward. First, it became obvious that reducing conflict and ensuring environmental sustainability could not come at the expense of local level benefits or the loss of social equity among users of public resources (Cicin-Sain and Knecht, 1998: 129). Second, community partners feel that to avoid inequitable outcomes, IM must be a collaborative process where actors negotiate public policies based on multiple criteria and participatory decision making for a given coastal or marine ecological area (Turner, 2000). Increasingly, the Coastal CURA team saw this process as involving the Canadian public in discussions of value systems and objectives that any planning exercises would then promote (Keen and Mahanty, 2006: 502).

Community-Focused Values and Attributes of IM

The Coastal CURA sought to address key questions in relation to what is meant by IM: What does IM look like in practice? What are the desired outcomes? How do you measure IM progress? As one exercise, we focused on those elements that best describe key values that should drive IM as well as key process attributes. These elements are listed below, expressed in the powerful language of our community partners, who both articulated these attributes and grouped them under themes of values, governance, management decision making, and outcomes.

- **Values:** Intergenerational respect; building consensus; deeply informed by Indigenous perspective; place-based; community as advocates not clients; inclusive; respect for human rights; consideration for all stakeholders’ values; food security.
- **Governance:** Reclaiming local authority; driven by community values; community-level dialogue; learning centred; co-operative; self-governance; deep democracy.
- **Management Decision Making:** Relying on open communication with users; co-ordination; conflict resolution; keeping in mind “who benefits”; adaptive; protects what is good; includes resistance and political work; works with alternatives.
- **Outcomes:** Healthy and safe ecosystems and communities/people; less conflict; ecological sustainability; regional resilience and complexity/diversity; economies for the people; transformative change.

Community-Focused Vision of IM

Given the above, the Coastal CURA developed a view of IM as a four-step process that allows for initiatives by both community and government.

- 1) Identify important values to be protected in the management process (e.g., local benefits, food security, regional economic and ecosystem health, consideration for all stakeholder’s values).

- 2) Empower debate at the local level, through a deeply democratic process, and including the voices of all stakeholders (not just the powerful).
- 3) Generate decisions and plans that are mindful of disruptive or cumulative impacts, address conflict (rather than sweeping it under the rug), and rely on open communication.
- 4) Result in resilient, ecologically viable, sustainable human and ecological communities in a way that is transformative and supportive of healthy local communities (e.g., by improving well-being, ecosystem health, diversity, and resilience).

Conclusions

While the Canadian government has made global and national commitments to IM, implementation to date has not produced the desired results. The Coastal CURA team has identified several barriers or limiting factors to community participation in IM, as described in this paper (see also Kearney et al., 2007). Among the underlying issues is the fact that government and community seem to operate on different temporal scales (government IM is slow while community needs are immediate), often on different geographic scales (large, administrative space versus local place based), and with different purposes (co-ordinating intra/governmental processes and managing conflict versus addressing local ecological and social inequity and ensuring access to resources). Other challenges include lack of brokers

between community-level and government-level processes; in other words, troubles in “scaling up” to government and “scaling down” to community. Finally, the concept of community itself is an issue. If community is seen (wrongly) as something outdated and inefficient, it can be an uneasy fit with modern planning initiatives.

Integrated management is inherently value driven. Since values are not universal, any values underlying IM should first be made explicit, then articulated and debated. This is the core argument of deliberative democracy. We need to build (or support) the institutional settings for IM where this deliberation and debate can happen. To ensure that communities are at the centre of this renewal and implementation of IM, we propose that IM initiatives recognize the ingredients we have outlined in this document, notably support for a community-focused vision together with community-focused values and indicators of success. Particularly important is adoption of the four-step IM process outlined above, which needs to incorporate the four key insights needed to support community involvement in integrated management:

- a focus on community participation as an essential element of IM;
- incorporating community values into IM;
- providing the legal space and local necessities for effective IM institutions; and
- reflecting multiple scales in IM governance.

These considerations all support the key message of this paper: a call to achieve the broad potential of the IM concept, particularly the potential for inclusivity and the active involvement of communities. It is clear from our research that feasible IM mechanisms can involve communities that have their own valid conceptions of IM and undertake successful IM-oriented projects at a local scale. The Coastal CURA, in continuing its work to support community involvement in IM, will be undertaking participatory research, capacity building and knowledge transfer, film-making, community participation techniques, community geographic information systems, comparative case studies, and the development of an appropriate set of indicators of success in IM. In the course of this work, we look forward to engaging, as individuals and as a team, with government departments and others, across agencies and communities, and across horizontal and vertical boundaries. ●

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Cities experience the effects of globalization most acutely. Accompanying the shift to a post-industrial economy are issues of rising income inequality and entrenched patterns of poverty. Meanwhile, a growing demand for labour coupled with greater international mobility leads to rising immigration and ethno-cultural diversity in Canadian cities. Of particular concern is the degree to which poverty is now concentrated among minority populations and how, increasingly, these patterns of disadvantage are spatially concentrated in a mutually reinforcing pattern that poses challenges to social cohesion in Canada's largest cities.

government structures are not well-suited for addressing the complex nature of contemporary urban issues. Governments tend to be vertically organized with policies developed at senior levels and implemented through centralized branches with little co-ordination. However, issues such as income inequality, poverty, or diversity, for example, intersect with immigration policy, the labour market, social welfare, and income redistribution activities, each the purview of different stakeholders. Such issues are what Bradford (2005: 4) referred to as "wicked problems," defined as ones that "cross departmental boundaries and resist the solutions that are readily available through the action of one agency." The horizontal complexity of many issues thus seems to be at odds with the vertical organization of government.

Donec Prohibiti, Procidite: Building a Knowledge Infrastructure to Support Place-Based Policy

While these emergent issues seem to require new social policies and programs, governments face challenges in mounting effective responses as existing

Moreover, government interventions in the social policy arena have typically been population-based where, in the interests of equity, services are delivered uniformly to target populations, irrespective of place. Although early globalization theorists suggested that the global economy was eroding the uniqueness of place, it is becoming recognized that the characteristics of many issues are place-specific; while the new economy functions at a global scale, the specific way it impacts localities is influenced by the local socio-political culture (EACCC, 2006; Tsukamoto and Vogel, 2004). Effective social policy requires that policy makers pay

attention to the specific contexts of place in a way that a-spatial, population-based approaches cannot.

Place-Based Responses to Complex Urban Social Issues

In response to this new urban reality, a “place-based” approach has emerged to develop strategies that respond to the unique characteristics of places as opposed to populations. Place-based strategies are unique to a specific locale, involving a range of stakeholders to achieve a specific objective. Torjman (2009: 1) defined it as “a range of efforts that seek to achieve a desired objective through interventions in the neighbourhoods and communities where people live.” The concept of subsidiarity underpins such approaches; it asserts that “governments” roles and resource bases should move to the most local levels at which they can operate effectively. Decisions are best made as close to service consumers and taxpayers as possible” (EACCC, 2006: viii-ix). Thus, place-based strategies not only need to consider the local context, but they need to be activated locally with the participation of local decision makers as a matter of both efficacy and principle.

In this paradigm, places are not only unique, they have considerable capacity, but the exercise of that capacity requires increased flexibility in policy and decision-making processes to tailor them to local contexts in a way that facilitates horizontal action. It is only at

the local level that partnerships required for such action can be forged as higher orders of government are too far removed, lacking the requisite local knowledge. The role of government in this approach shifts from director to convener, establishing collaborative relationships among a variety of actors to address common challenges. Stein (2006) argued that federal systems are well suited to this form of governing as federal and provincial spheres necessarily overlap requiring collaboration that creates space for local decision making. What is absent from this federal system, however, is the formal recognition of municipalities as meaningful partners.

The Need for a New Knowledge Infrastructure

Although communities (municipal governments and non-governmental organizations) are central to place-based approaches, their capacity for meaningful engagement has been hindered. Federal and provincial policy changes during the 1990s compromised municipal capacity as fiscal retrenchment led to downloading responsibilities without additional fiscal or policy capacity (EACCC, 2006). Similarly, the non-governmental sector was increasingly relied upon to deliver services within a funding regime that failed to build its capacity to do so adequately (Phillips, 2009; Scott, 2003). Meanwhile, both sectors were required to demonstrate greater accountability along with requirements for decisions

to be “evidence-based.” Communities, however, typically lacked the data required to facilitate effective planning or satisfy these demands for accountability. Like the fiscal imbalance, a data imbalance existed where communities lacked information precisely when they most required it to meet their new responsibilities. In this context, four important data issues emerged; relevant geography, data access, institutional capacity, and local relevance.

While important for consistency, Statistics Canada’s Administrative and Statistical Geographic Units sometimes have little local relevance. The Census Metropolitan Area (CMA), typically the unit of analysis for cities, does not correspond with municipal jurisdictions. Similarly, small-area urban geography is collected and disseminated by census tracts, which have little resonance with local stakeholders who understand their communities in terms of neighbourhoods. Not only does this render data difficult for local actors to understand and use, it hinders their ability to collaborate with other orders of government and impairs the ability of senior orders of government to gain the local knowledge that effective place-based approaches require. There are however initiatives that are attempting to address such issues.¹

Further, while communities faced growing fiscal pressures, an increasing cost-recovery focus by Statistics Canada impacted their ability to access data due to cost. Not only did many lack

1 Statistics Canada and Infrastructure Canada, with funding from the Policy Research Data Group, are developing a methodology to identify human settlement patterns using the most disaggregated geographical unit of the census (the census block). This initiative creates a new series (2006 Census-based maps) of spatial datasets that track, with improved precision, all settled areas in Canada; new, comprehensive indicators will enable analysts to characterize and measure the key dimensions and trends of growth patterns of all built-up areas in Canada, using the most recent geographic information system (GIS) technology.

access, they also lacked the capacity to use data effectively along with the ability to build such capacity due to reduced funding. There was little local input into how data were collected, analyzed, or disseminated; important data from a local perspective may not be a priority for the federal or provincial governments, and either not reported on or even collected. Thus, while increasing analytical precision was required to understand the conditions of specific sub-populations in specific areas, such data tended to be unavailable at relevant geographies, requiring custom orders which were cost-prohibitive.

Building a Pan-Canadian Knowledge Infrastructure: Two Case Studies

To address this knowledge gap, two overlapping projects emerged: the Community Social Data Strategy and the Quality of Life Reporting System (QOLRS). Recently, these two overlapping networks jointly developed The Municipal and Community Data Access Initiative. Through these initiatives, communities work collaboratively with Statistics Canada to increase access to information and more effectively engage with senior orders of government.

The Community Social Data Strategy

The CSDS is an initiative of the Canadian Council on Social Development (CCSD) that makes a wide range of statistical data available to communities at reduced cost. Communities participate by forming a data consortium consisting of a lead organization (typically the municipality) in partnership with local non-governmental organizations.

The initiative arose following the 1991 Census, which revealed growing levels of poverty, leading the CCSD to produce a report on urban poverty in Canada. In producing this report, CCSD worked closely with communities and found that most did not have access to local data.

In light of this, the CCSD looked for a way to increase data access that would enable communities to develop effective responses. Meanwhile, Statistics Canada was seeking creative strategies to increase data access, given the constraints of a stringent cost-recovery policy, and to build community capacity to use data effectively. This led to the negotiation of an access agreement between the CCSD and Statistics Canada, and the establishment of a network of data consortia known as the Community Social Data Strategy (CSDS). The objectives of the CSDS were to:

- purchase data and facilitate access;
- train people and build capacity to use data; and
- communicate and disseminate the resulting research.

The CSDS now represents a pan-Canadian network of 22 local consortia with 258 organizational members representing a broad cross-section of municipal governments and non-governmental organizations. Through the CSDS, members have access to an array of

Statistics Canada data including custom tabulations and geographies that correspond to locally relevant city and neighbourhood boundaries, along with training and support in accessing and using data.

Data from the CSDS are being extensively used to better understand the conditions of specific local sub-populations as well as the spatial distribution of issues at small areas of urban geography in order to plan and evaluate programs

and services effectively. In Ottawa, data were used to project areas of high need for food bank services and identify under-serviced areas. In Montréal, an on-line atlas was produced providing a more understandable way to interpret social data. In the region of Waterloo, CSDS data informed the report, *A Commu-*

nity Fit for Children: A Focus on Young Children in Waterloo Region, profiling the health and well-being of local children and families. In Vancouver, CSDS data informed the Housing Data Book, which assists municipalities in responding to local housing needs.

The partnerships facilitated by CSDS membership have also sparked new forms of collaboration. In Calgary, the local consortium co-ordinated efforts to establish a regional population health observatory, and the development of standardized geographical service areas that facilitated more effective joint planning between the partners.

Nationally, members increasingly use the CSDS network as a vehicle for sharing best practices in social development.

In addition to service planning, the CSDS also informs policy. At a local level, CSDS data were used extensively to support the development of a living wage policy in Calgary. In Victoria, CSDS data informed the report, *Poverty and Inequality in the Capital Region of British Columbia*, which reviewed the effectiveness of poverty reduction strategies to stimulate action in the community. The degree to which it has influenced policy at higher orders of government is unclear. John Anderson (2009), former CCSD vice-president of strategic partnerships, suggested that the improved understanding of poverty resulting from the CSDS contributed to the development of provincial poverty reduction strategies. While the impact on federal policy is even less clear, he posited that the availability of local data has supported a more nuanced policy analysis, and the increased interest in place-based approaches may be partly due to more local data being used effectively by communities.

The Quality of Life Reporting System

The Quality of Life Reporting System (QOLRS) is an initiative of the Federation of Canadian Municipalities (FCM), which uses local data to moni-

tor changes in quality of life. The project is driven by a network of member municipalities that collaborate to develop and report on a range of indicators. The system relies on the collective purchase of census data, supplemented by unique data collected through a

municipal survey. Currently, 23 municipalities participate in the QOLRS across Canada.

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determined that the FCM required an evidence base with which to formulate and articulate relevant policy positions effectively. The first quality of life report was published in 1999 with stated objectives to:

- identify and raise awareness of issues affecting quality of life in Canadian communities;
- better target policies and resources aimed at improving quality of life; and
- establish municipal governments as a strong and legitimate partner in public policy debate in Canada (FCM, 1999).

A second report was issued in 2003, along with several theme reports on various issues including immigration

and affordable housing. As Canada enters a new era of possible fiscal retrenchment, the FCM is relying on the QOLRS to demonstrate the effects of previous cutbacks on municipalities and highlight the potential impacts of any new round of downloading.

Although originating as a policy tool, the QOLRS has also become an important data source. Burrett (2007: 163) noted: "Disaggregation using municipal boundaries is one of the unique features of the QOLRS. Most analyses of 'local' issues outside the QOLRS system are done at the level of Census Subdivisions and Census Metropolitan Areas, and hence do not necessarily reflect the issues that a given municipality faces." The ability of the QOLRS to acquire data relevant to local needs and at relevant geographies makes it an increasingly important repository of information for local planners and decision makers.

The ability of the system to connect sectors within and between communities has also become an emergent objective. The municipal survey requires municipalities to engage various stakeholders in collecting data and thereby facilitates horizontal local linkages between municipal departments, as well as other sectors and stakeholders. At a national level, the QOLRS has produced a functioning pan-Canadian network of planners and policy makers who share practices and build collective knowledge.

The Municipal and Community Data Access Initiative

Given the challenges in accessing relevant local data, the CSDS and QOLRS are collaborating on the Municipal and Community Data Access Initiative to enhance data access and improve communication between data providers and community data users. A working group with representatives from the FCM, CCSD, and Statistics Canada produced a strategic plan with specific objectives around the broad goals of supporting effective communication, providing enhanced data access and broadening data supply. This initiative supports and formalizes the growing interaction between Statistics Canada and the overlapping QOLRS and CSDS networks. At its inception, the informal motto of this initiative was *Donec prohibiti, procidite* (proceed until apprehended) reflecting its position outside formal decision-making processes but tenaciously asserting a right to be included.

Key Lessons and Implications for Policy

Based on this review of these initiatives, five key points can be drawn for the development of successful place-based strategies.

1. Place-based approaches require a supporting knowledge infrastructure.

In a global economy, where knowledge is the driver of economic activity, the existence of a strong knowledge infrastructure is critical for policy and planning at both the local and national levels. For communities to address the complex issues now confronting them,

they require timely access to data that are contextually and spatially relevant. Anderson (2009) noted: "If we want a place-based policy approach, we need access to the data. If we develop policies in the absence of data, it almost guarantees failure. While access to the data doesn't guarantee success, it's a key tool for increasing the odds of success." Recent initiatives by Statistics Canada improve access through the provision of on-line data at the census sub-division and census tract levels. Acquiring consistent data at levels of geography relevant to communities, however, remains a challenge that will require ongoing collaboration between Statistics Canada and local data users.

2. Capacity-building investments are needed.

Through the CSDS and QOLRS, communities have proved to be increasingly adept at using data to tell their own stories, becoming much more articulate, and better able to understand their situations. However, continued efforts to build local capacity to use data are needed. Michel Frojmovic (2009), lead consultant to both projects, noted that, while data has become more accessible, "the amount of data available is overwhelming, and this can be intimidating. One principal barrier to using the data is just knowing what you can do with data and how it can support your work." In the case of the CSDS, Doug Norris (2009), former Statistics Canada Director General of Demographic and Social Analysis, commented: "The data were not provided in a user-friendly format, so a lot of communities received the data but had little idea of how to use it. Even if

all data were available free, most people still didn't have the capacity to use it." Ongoing support to further build the capacity of communities to use data effectively will enhance this emerging local asset base.

3. Networks require leadership that must be resourced.

While globalization and the organizational and fiscal challenges of government have created barriers to collaborative action, the CSDS and QOLRS networks demonstrate the capacity for such collaboration by harnessing local leadership to mobilize resources and garner local support. For the CSDS, Scott (2009) noted: "One of the key success factors was the existence of a local lead organization that was interested in assuming a leadership role. This depended to a great extent on the presence of individuals who saw the benefits of the program and wanted to move it forward." For the QOLRS, this assessment was echoed by FCM Director of Policy and Research, Michael Buda (2009), who stated that "the success of the project has largely come from the fact that it is community-based, with people engaged at the local level." Most members, he noted "are doing this 'off the side of their desk' without a lot of institutional capacity and support. What keeps it going is the commitment of individual people in the project." While local leadership is critical, both initiatives also required strong national organizations to spearhead the projects and provide overall leadership. The success of these initiatives hinges on the strength of each of the partners and weakness in any one would jeopardize

the project; strengthening these networks requires both financial and organizational investments.

4. Relationships matter.

The ability of a lead organization to harness its pre-existing relationships with a pan-Canadian network of member organizations facilitated the establishment of the CSDS and QOLRS. The lead organizations were also well-positioned to play a bridging role with Statistics Canada due to their prior relationships with the statistical agency. In the case of the CSDS, an access agreement was possible due in part to the CCSD's ongoing relationship with Statistics Canada and its credibility in producing sound research using Statistics Canada data.

Success also hinged on the ability to expand the sphere of collaboration and establish new relationships. In the case of the CSDS, the consortium model was an explicit strategy to encourage collaboration between organizations. Scott (2009) stated that this was based on a belief that "partnerships need to be built around something. This was something concrete (data), so people could immediately see the value in the partnership. People came for the data, but used that as a nexus around which to organize." In both cases, the instrumental activities of data collection and access required horizontal collaboration that led to more strategic action as partners gained experience working together and were able to identify mutual interests.

5. Integrating the knowledge of networks into decision-making processes of hierarchical structures remains challenging.

Despite their success in generating collaboration and informing policy positions, challenges remain in integrating the knowledge of these networks into formal policy processes. The data imbalance that has existed for the past two decades impedes the ability of communities to plan effectively and impairs the understanding of place by higher orders of government. In articulating the limits of hierarchical organizations, Stein (2006: 40-41) discussed the power of networks as an integrative function within vertically organized societies. Networks "enable communication and collaboration among members who may be dispersed in different organizations, in space and in time. Networks multiply the channels through which information and exchange flow, and are, therefore, much less subject to blockage and gridlock." As a tool for enhancing the capacity of Canada's federal system to respond to the complex challenges of globalization, Stein (2006: 50) argued for a form of "networked federalism" where "governments connect with those who have important information, good policy ideas, or strategic assets in policy implementation." The CSDS and QOLRS provide a model for such networked federalism by freeing the flow of information to communities and harnessing the collective knowledge that communities generate from it.

Conclusion

As Canada confronts increasingly complex issues requiring creative responses among various actors, the importance of pan-Canadian networks capable of mobilizing local knowledge is vital. Scott (2009) noted: "The answers to a community's issues are never located

exclusively in the community, particularly in an era of globalization. However, the way people engage around issues is invariably local." The power to address the issues facing communities can no longer be dissociated from the knowledge available in and to communities. Anderson (2009) concluded: "Knowledge is power. If knowledge is concentrated in Ottawa, the power to address issues also remains concentrated in Ottawa." To enhance the effectiveness of place-based strategies, access to knowledge and data by local stakeholders is essential if they are to play a meaningful role in collaborative policy development activities with the federal government. Our collective success in charting a new course may hinge, in part, on the willingness of these emerging knowledge networks to "proceed until apprehended" and continue to assert the value they add to national policy debates. ●

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Lake Winnipeg Basin Initiative

Covering 24,000 square kilometres, Lake Winnipeg is the tenth largest freshwater lake in the world with a water basin extending over four provinces and four American states. In 2008 the federal government responded to the deteriorating water quality in Lake Winnipeg by making a commitment of \$17.7 million over four years to establish the Lake Winnipeg Basin Initiative. The Initiative was established partly in response to the Manitoba government's request for federal leadership to facilitate integration and co-ordination of stakeholder efforts across borders and to address scientific needs. Led by Environment Canada's Water Science and Technology Directorate, the initiative also includes other federal departments (particularly Fisheries and Oceans Canada and Agriculture and Agri-Food Canada), provincial agencies, non-government organisations, First Nations and other stakeholders.

As part of this initiative, Environment Canada is implementing an integrated science plan to inform policy and programs and to support decision making related to the nutrient management issues of the lake. A Lake Winnipeg Basin Stewardship Fund supports projects that will reduce nutrient loading. A number of federal and provincial agencies are involved in a technical advisory committee that reviews the project proposals.

Environment Canada has also established a Lake Management Office in Winnipeg and is developing a single-window information portal to promote data-sharing amongst partners. The department is working with the Province of Manitoba to develop a Federal-Provincial agreement or MOU to establish a long-term collaborative approach to ensure the sustainability of the basin.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

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The number of integrated landscape management (ILM) practitioners and a growing body of application experience is evolving at the community, provincial, regional, and national levels in Canada – among governments, within the non-governmental organization sector, and within the private sector. Understanding ILM evolution, recent developments, and future trends in Canada will assist in determining the most appropriate ILM roles for the federal government.

Given that most land use and resource management and planning responsibilities fall under provincial jurisdiction, the Policy Research Initiative (PRI) initiated a detailed review of ILM at the provincial level in the spring of 2009.¹

aquatic, and marine areas. Integrated landscape management assumes the use of place-based, rather than activity-based, approaches to sustainable land and resource-use planning. This conceptualization is founded on a multi-partner, interdisciplinary, and whole system approach to guide policy and decision making. It includes all aspects of ILM strategy development, implementation, evaluation, and adaptation.

At the core of ILM is the recognition that innovative planning approaches are now required to facilitate the movement of human society toward a path of sustainable environmental, economic, and social development. Planning and management are elements of governance and, ultimately, decision-making tools. As such, the guiding concepts and challenges facing effective ILM mirror the governance challenges of human communities attempting to shift toward sustainability.

Range and Types of Provincial Initiatives

Most provinces have strong environmental impact assessment (EIA) processes, which are increasingly integrated in their review of impacts of particular developments. These assessments, however, are not ILM planning initiatives, which should be in place before significant land use change is contemplated through development.

An extensive review of each province's ILM experience was conducted, with representative examples used to highlight innovations, approaches, and progress in each jurisdiction. All

Exploring Integrated Landscape Management in Canada

A Planning Tool for Sustainable Development

While no universal definition yet exists, ILM has been described as bringing together science, geography, and socio-economic information to manage environmental objectives, cumulative effects, and any conflict in terrestrial,

1. This paper summarizes the results of a study commissioned by the PRI available at: <www.pri-prp.gc.ca>

provinces demonstrate varying degrees of integrated planning, management, decision making, and conceptual thinking around ILM and sustainable development. The examples explored in the project are by no means exhaustive, but they do represent the Canadian ILM experience as it exists today. This information is presented in a detailed project report to be available via the PRI web site. A summary is provided below.

An incredible variety of ILM-related initiatives occur within the provinces. Table 1 outlines the initiatives and provides a relevant provincial example. Each example demonstrates one or more important elements of ILM as discussed in the literature, while serving to illustrate the current range and scope of ILM activity at the provincial level. They may be grouped into three general types: planning, strategies, and other initiatives.

In most provinces, clear Crown land use planning/policies are in place; in some cases, there is a high degree of co-ordination among multiple provincial departments. As well, most provinces have strong municipal planning processes and policies, which may also include very clear provincial planning directives to local governments, and/or provincial co-ordination of regional municipal planning efforts. Each province has also developed various sectoral planning or strategic initiatives that contain elements of ILM. These range from being highly focused on a particular resource or industrial sector (i.e., water protection, forest

management, fisheries, energy, agriculture) to nascent ILM efforts at multi-departmental co-operation around all aspects of land and resource use and comprehensive province-wide sustainable development frameworks.

Several other types of ILM-related initiatives have also been documented at the provincial level including regional co-operation and issues among multiple provinces and jurisdictions; empowerment of communities in planning and co-management of land and resources; and significant independent initiatives.

It is fair to say that “comprehensive” ILM is not yet widely occurring, nor has it been demonstrated fully and effectively in any province. However, Alberta has initiated its ambitious Land Use Framework to guide all land use and development activities in the province. This initiative has the potential to lead the country with a comprehensive ILM approach, but it is just beginning to take shape and cannot be meaningfully assessed as yet. The New Brunswick Environment Strategic Plan also demonstrates a very high level of internal departmental co-ordination, with plans to co-operate with two additional departments in the development of a new provincial planning policy. Quebec's sustainable

development strategy represents a level of government-wide planning and co-ordination that is rare in Canada.

Regardless, many examples exist of particular aspects of ILM in operation across Canada from which lessons can be learned. Highlights from the research, with several observations and innovations follow.

Observations and Innovations

Land use conflict and the perception of crisis is a key factor in catalyzing meaningful ILM responses. Water quality

contamination, industrial development, depleted fisheries, and forest management concerns figure prominently in the evolution of ILM-based responses in Canada's provinces. However, in very rare cases, a vision for the future or opportunity to avoid future conflicts has driven an ILM planning process or strategy. There are opportunities to learn from both approaches.

At the core of ILM is the recognition that innovative planning approaches are now required to facilitate the movement of human society toward a path of sustainable environmental, economic, and social development.

Serious issues can generate rapid ILM-based responses. These are typically characterized by very high levels of political support, formalized interdepartmental co-ordination and co-operation, as well as very adaptive or innovative responses. Energy development (especially related to oil and gas) appears to represent the industrial

Table 1
Types of ILM and Sample Provincial Initiatives

Type of ILM-Related Initiative	Examples Located									
Planning										
a) Crown land use planning by provincial government Example: Co-ordination of Crown land planning under British Columbia's <i>Forest and Range Practices Act</i> , by the Integrated Land Management Bureau, working with (and on behalf of) seven provincial ministries.	BC		SK		ON					
b) Planning directives to local government by provinces Example: Application of the New Brunswick Coastal Areas Protection Policy through the provincial EIA process and its future adoption as a regulation applicable to all lands under the <i>Clean Environment Act</i> .					ON		NB	NS		
c) Provincial co-ordination of local/ regional-level planning Example: Ontario's Growth Plan for the Greater Golden Horseshoe, to address long-term regional infrastructure needs under the <i>Places to Grow Act</i> , in association with existing municipal planning legislation and policy.	AB	SK	MB	ON		NB				
Strategies										
a) Focused sectoral strategy led by province or appointed body Example: The Focusing Our Energy strategy for Newfoundland and Labrador, a comprehensive initiative designed to maximize the long-term benefits of energy resource development on behalf of all provincial residents.	BC	AB	SK	MB	ON	QC	NB	NS	NL	PEI
b) Nascent ILM (beyond Crown) strategy to be led by province Example: Development of regional land use plans approved by Cabinet under the Alberta Land Use Framework, with legislative support under the <i>Alberta Land Stewardship Act</i> and interdepartmental secretariat co-ordination.		AB					NB			
c) Comprehensive sustainable development strategy led by province, with legislative support Example: The Nova Scotia Sustainable Prosperity Initiative and application of the Nova Scotia <i>Environmental Goals and Sustainability Act</i> , with commitments to achieving goals (with targets and dates) enshrined in the legislation.				MB		QC		NS		
Other Initiatives										
a) Regional co-operation initiatives involving multiple provinces Example: Co-ordinated implementation of the Acid Rain Action Plan developed by The Conference of New England Governors and Eastern Canadian Premiers, without any formal enabling legislation.						QC	NB	NS	NL	PEI
b) Empowerment of local/regional communities and/or co-management Example: Manitoba's support of Aboriginal communities under the Wabanong Makaygum Okimawin – East Side of the Lake (Winnipeg) Governance initiative, covering 82,000 km ² of boreal forest.	BC	AB		MB	ON	QC			NL	PEI
c) Significant independent ILM-related initiatives (others known to exist) Example: Manitoba's Tobacco Creek Model Watershed project is based on integrated goals focused on farm income/landscape diversity, watershed management, participation/ monitoring, drainage/fish habitat.				MB						PEI

sector where the highest degree of political support and interdepartmental co-ordination around ILM exists. Alberta, Newfoundland and Labrador, and Quebec each have very comprehensive energy strategies, with a major focus on oil and gas development, and its substantial social and environmental impacts.

The industrial sector is a major stakeholder in all provinces, and in some other cases (e.g., the Alberta Chamber of Resources, British Columbia's Water and Wastewater Association, and the Atlantic Canadian Organic Regional Network), industrial organizations have been actively involved in the advancement of ILM-related initiatives. Leadership from industry is important, but there may be some cause for concern, that strong influence from these interests may be inappropriate in establishing provincial priorities and implementing government policy and planning decisions. In some cases, leadership from non-governmental organizations has also played an important role in shaping ILM efforts at the provincial level (e.g., the Atlantic Canadian Conservation Data Centre and the Prince Edward Island Nature Trust).

At this point, Quebec appears to be the most innovative and forward-thinking province focusing on ILM, with several internally co-ordinated initiatives occurring under the auspices of a provincial sustainable development strategy. Initiatives, such as the Quebec water policy, a move toward localized/regionized natural resources decision making, and the application of strategic environmental assessment under the Quebec energy policy represent a

planning paradigm that is more focused on achieving future visions than on responding to crises or conflicts. This policy foundation is legislatively supported by a comprehensive provincial sustainable development act.

The Nova Scotia *Environmental Goals and Sustainability Act* supports that province's Sustainable Prosperity Initiative and represents another impressive government-wide ILM-related effort. It includes other sectoral strategies, such as a social improvement initiative (*Weaving the Threads: Framework for Social Prosperity*), which seeks to address the well-being of Nova Scotia residents.

Meaningful stakeholder involvement and participation represent a fundamental element of any effective ILM-related initiative. British Columbia's New Direction for Strategic Land Use Planning is co-ordinated by the province's Integrated Land Management Bureau. This effort focuses on building strong land use relationships with First Nations in the province; Manitoba and Quebec have also made similar (if less formalized) progress. Very impressive levels of stakeholder participation have also been experienced through Ontario's Living Legacy, the province's current Crown land use strategy through which some 15,000 people participated across three regions. The Quebec energy strategy involved 12,000 people in its consultation process.

A perceived lack of adequate, open, or honest communication can easily eliminate stakeholder unity and throw major ILM planning initiatives into disarray, as appears to be the case with Manitoba's East Side Planning Initiative covering Canada's largest contiguous region of boreal forest landscape, part of which has been nominated for UNESCO World Heritage Site designation.

All provinces demonstrate varying degrees of integrated planning, management, decision making, and conceptual thinking around ILM and sustainable development.

There appears to be great value in regional (including cross-border) strategic co-operation around ILM, especially where smaller governments with fewer resources work together. The Acid Rain Action Plan prepared by The Conference of New England Governors and Eastern Canadian Premiers represents an impressive level of co-ordination among mul-

tiple jurisdictions on a complex issue, through which detailed data are collected, translated, and shared among the member provinces and states. It would seem logical that increased regional, interprovincial, and international co-operation would benefit several other areas of Canada, particularly the Prairies. Ontario has several regional ILM-related initiatives in the Greater Golden Horseshoe (GGH) region around Toronto, namely the Greenbelt Plan, Oak Ridges Moraine Conservation Plan, Niagara Escarpment Plan, Parkway West Belt Plan, and the Rouge North Management Plan. Several watershed-based *conservation authorities* also exist within the GGH. The new

Growth Plan for the Greater Golden Horseshoe is an attempt by the Ontario Ministry of Energy and Infrastructure to integrate many of these existing initiatives under the *Places to Grow Act*. However, this strategy and legislation override clear and consistent provincial planning direction under the province's *Planning Act* and Provincial Policy Statement on municipal land use planning, raising planning integration and certainty concerns, and creating opportunities for new land use conflicts related to growth and sustainability (vs. addressing them) in Canada's most intensely developed and growing region.

Regardless of its current shortcomings in the GGH, legislated planning direction appears to be clearest in Ontario – through a provincial policy statement on municipal land use planning, which fundamentally recognizes the critical land use planning and decision-making roles played at the local government level. Through the statement, a performance-monitoring framework is now in development to evaluate progress and support the achievement of consistent provincial goals.

Presented most poignantly in the GGH, but also existing elsewhere in Canada where provinces appear to have multiple related initiatives, each attempting to "co-ordinate" various sec-

The primary requirements for effective ILM-related initiatives appear to centre on high-level political commitment, interdepartmental co-ordination and co-operation, and building stakeholder unity through effective consultation and open communication.

tors or regions, the fact that so many ILM-related plans exist (with new plans either replacing or overriding existing plans) suggests an actual lack of co-ordination and integration (and the inefficient use of human, technical, and financial resources). It is apparent that power struggles exist among "competing" departments within individual provinces as they claim authority for ILM. There is an urgent need for vastly improved interdepartmental planning co-ordination in most of the provinces.

However, it should be noted that some individual departments do have very impressive internally co-ordinated ILM-based plans. This is particularly the case with New Brunswick Environment. Governed by principles focused on integrity, respect, impartiality, and competence,

the New Brunswick Environment Strategic Plan appears to embody much of what an ILM approach should look like. The ministry has stated priorities to support integrated planning, place decision making at appropriate levels, and promote a culture of continuous improvement and adaptive management – hallmark concepts at the core of ILM. New Brunswick Environment is currently working to implement the New Brunswick Coastal Areas Protection Policy (CAPP), an ILM planning and decision-making tool

designed to improve the management of coastal areas. Similar ILM-related innovations are noted within Common Vision – Common Future, the New Brunswick fisheries renewal strategy. The next challenge is to carry this department-level co-ordination across all ILM-related decision-making processes of government, and among all relevant departments.

Watersheds (often embodied within an integrated water resources management or IWRM framework) continually appear as a logical unit for ILM planning in most provinces. Ontario and Manitoba have led the way in this regard, with rapid progress by others. The formation of 33 regional watershed organizations under the Quebec water policy is likely the most comprehensive initiative. Coastal zone planning is equally important and logical in marine areas (using an integrated coastal zone management (ICZM) framework). Drinking water protection and other types of water strategies exist in most provinces and typically represent the first co-ordinated planning experiences in watersheds. Saskatchewan has demonstrated the greatest provincial leadership in this area through its Safe Drinking Water Strategy (SDWS). The SDWS is legislatively defined as a key cross-government strategy with mandated reporting to the legislature and clear interdepartmental planning guidelines. Science-based indicators rate watershed health and determine priority watersheds for action and support. Strategy implementation has occurred through a deputy minister level interdepartmental committee chaired by Saskatchewan Environment.

Community-level watershed-based planning and management occurs through the Saskatchewan Watershed Authority (SWA), which also reports to Saskatchewan Environment. The SWA supports the self-organizing capacity of local communities to develop their own watershed-based initiatives, like those embodied by the Lower Souris Watershed Committee. Prince Edward Island has recently responded to its watershed-based challenges by swiftly and strongly responding positively to recommendations made by the independent PEI Environmental Advisory Council, to address critical needs for the province's 30 local watershed stewardship organizations and their efforts to improve the sustainability of the province's dominant land use – agriculture.

Varying degrees of legislative commitment to ILM exist across Canada, but much can and has been accomplished without formal legislative support, as informal interdepartmental co-operation and co-ordination among well-meaning individuals can be as important as formal efforts. The primary requirements for effective ILM-related initiatives appear to centre on high-level political commitment, interdepartmental co-ordination and co-operation, and building stakeholder unity through effective consultation and open communication (i.e., The Conference of New England Governors and Eastern Canadian Premiers). While formalized commitment, co-operation, and co-ordination should guarantee better, more consistent results, this is not always the case, as some formal bodies can be (and rou-

tinely are) ignored or not used if there is a lack of political support for them and their processes.

Preliminary Assessment of Progress

If ILM is to contribute to improved planning, management and, ultimately, sustainable development, continued improvement in decision making will be required. Based on the research conducted for this project, what appear to be the single most innovative provincial examples of various elements are now discussed, focusing on initiatives that exist today and could readily be explored further.

Governance

Effective governance and strong political leadership from the highest levels of responsibility over land and resource management are required for ILM to proceed. Today, Quebec must be recognized as the most innovative province in Canada where effective governance in support of ILM appears to exist. Quebec's approach starts at the very broadest levels through its sustainable development strategy, which commits all departments to developing and reporting annual sustainable development plans. Integration is a key feature of the strategy, and this occurs at the highest levels – at three Cabinet committees, most importantly the « Comité ministeriel de la prospérité économique et du développement durable », which directly links sustainability to economic development. A series of progress indicators are now in development, and overall progress will be reported annually to the auditor general by the com-

missioner of sustainable development. It is likely due to this leadership and strong recognition of the value of integrated decision making that additional innovations have occurred related to the integration/regionalization of natural resources management, implementation of watershed-based planning through the Quebec water policy, and the application of strategic environmental assessment processes in the Gulf of St. Lawrence.

Commitment

Prince Edward Island may be the leader for this key ILM element, where recognition and support of the actors closest to implementing solutions are so critical. This province appears to understand that a provincial jurisdiction can do little beyond strategic policy, appropriate funding, and clear regulations and/or incentives to effect actual solutions at the landscape level; it is the cumulative impact of many individual decisions that ultimately determines whether sustainability trends move upward or downward. In response to growing water quality concerns related to agriculture (a key driver of the provincial economy), Prince Edward Island commissioned its independent Environmental Advisory Council to investigate the matter. The prime recommendation was for the province to provide substantially greater levels of financial and technical support to 30 existing and largely volunteer watershed stewardship organizations (WSOs) in the province. Immediately on release of the Council's report, the province announced its Watershed Planning Initiative, with dramatic

increases in WSO funding and technical support to these local groups, most of which focus on the provision of agriculture-friendly water quality solutions.

Science

Scientific information is more likely to be used effectively by decision makers if it contributes to the resolution of sustainability challenges around which there is broad public support. This does not discount the need for pure research. It only suggests that some aspects of the ongoing frustrations between science and decision making might be channeled in support of improved ILM decision making, which some may see as “applied,” although this is not necessarily the case. Saskatchewan leads the country in this area through its use of science-based indicators to support its Safe Drinking Water Strategy and local watershed planning initiatives co-ordinated by the Saskatchewan Watershed Authority (SWA). A suite of 30 indicators have been developed through rigorous research, and are now used to rate each watershed in the province in terms of health and sustainability. The indicators provide a useful tool for decision makers in determining priority watersheds for action, and in tracking long-term progress and trends. They will also be useful for local decision makers and stakeholders to see progress in their planning efforts (and adapt as required).

Capacity

Establishing the capacity to implement ILM-related initiatives and, ideally, comprehensive sustainable development solutions, is best portrayed in British Columbia, through the opera-

tions of the Columbia Basin Trust (CBT). While its origins through the Columbia Basin Treaty reflect dramatic examples of poor planning and a lack of integration, the CBT today maintains a generous financial endowment in recognition of past planning mistakes. Through this ongoing funding, the CBT defines integration and comprehensiveness in all its operations, most of which focus on sustainability, quality of life, and investing in the watershed community. The CBT will likely play a major role in shaping the environmental, economic, and social future of this region.

Co-ordination

Given its strong leadership, it should not be surprising that Quebec also leads in terms of co-ordination. It is logical that a government that understands the need for integrated environmental, economic, and social solutions will also find a way to provide the structures to support its leadership efforts. Beyond its three interdepartmental Cabinet committees, Quebec's sustainable development strategy is supported by a special unit, the “Bureau de coordination du développement durable”, led by an assistant deputy minister. This office also supports the staff level “Comité Interministerial du développement durable”. These critical functions are provided by the “Ministère du Développement durable, de l'Environnement et des Parcs” (MDDEP), a department with sustainable development in its name. Finally, there is very strong leadership from the premier on the sustainable development strategy.

Opportunities for Federal Consideration

While this research focused on ILM-related initiatives at the provincial level, there are needs and opportunities for increased federal attention and participation in ILM initiatives across Canada.

Canada has constitutional responsibilities directly related to ILM in the areas of navigable waterways, fisheries, and First Nations. Also, the federal government is jointly responsible for agriculture, together with the provinces. Transportation is another major area of federal jurisdiction, and Canada has traditionally funded vast amounts of infrastructure development across the country. Each of these areas has very strong connections to land use planning and management, in addition to social and environmental impacts.

Federal departments currently lead several ILM initiatives relating to agriculture, fisheries, and forestry/natural resources. These need to be explored to understand more clearly how the federal government participates and initiates ILM. The federal government also plays a key role in supporting land use planning and management efforts in the territories; ILM efforts undertaken in the Northwest Territories, Nunavut, and Yukon need to be similarly explored. These federal departmental and territorial explorations would support the evolution and consistent application of a suite of national ILM standards – working in co-operation with the provinces (which are primarily responsible for land use planning and management in Canada). There is a

need for greater (and more effective) co-operation with the provinces, and their ILM efforts, particularly around areas of clear federal jurisdiction (or other areas of useful federal participation, such as science-based indicators and performance measurement).

The federal government could also play a key role in facilitating greater inter-provincial co-operation at the provincial boundaries, where political barriers often thwart effective land use planning and management across logical, landscape-based regions, such as ecozones and watersheds. With federal technical,

and financial support, community-level, watershed-based ILM plans occurring within larger regional-level ecosystems or ecozones may be the most appropriate land use planning and management framework for the federal government to encourage. ●

Hosting the Olympics – An Exercise in Multi-sector, Multi-disciplinary and Multi-jurisdictional Planning and Coordination

Canada will host the XXI Winter Olympic Games and the X Winter Paralympic Games in February and March 2010. In executing this global undertaking, the Vancouver Organizing Committee for the 2010 Olympic and Paralympic Winter Games (VANOC) is working in close cooperation with the governments of Canada and British Columbia, the City of Vancouver, the Resort Municipality of Whistler, the Canadian Olympic Committee and the Canadian Paralympic Committee. To facilitate the work of this core decision-making body, a multi-party agreement – the first in the history of the Games – was established, which clearly defines each party's roles and responsibilities and acts as an essential planning tool. Other parties, including community organizations, are also engaged in the process.

To coordinate the horizontal and vertical participation of federal bodies, the Federal Coordination Framework was created. This governance mechanism includes a Coordination Committee of deputy ministers and heads of organizations, which provide executive leadership and ensure collective actions reflect federal priorities. In addition, contribution agreements have been signed by VANOC and most provinces and territories regarding their cooperation in Games organization, with the aim

of securing mutual, long-term benefits in terms of arts and culture, the economy and tourism, and participation in sports, among other areas

The Games represent a unique opportunity to develop new infrastructure, stimulate the economy, tourism, volunteerism and employment, and promote sports. Partners have committed to promoting the inclusion of federal priorities such as the diligent and transparent use of public funds, requirements related to official languages, protection of the environment, active and inclusive participation of Aboriginal communities, and promotion of Canadian cultural diversity.

Sustainable development is a critical element in terms of the Games' general organization. Significant environmental efforts are being made in relation to biodiversity and animal habitat, energy and climate change, air quality, water quality and preservation, and waste management. The promotion of social inclusion through Canada's diverse linguistic community, Aboriginal cultures, and vibrant multicultural dimensions is being fostered. And economic development opportunities are being generated for Canadian businesses and communities, especially in procurement, tourism, trade, investment, technology and innovation.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

Mike Harcourt

Former Premier of British Columbia
and former Mayor of Vancouver

In February 2004, Prime Minister Paul Martin established the External Advisory Committee on Cities and Communities (EACCC). The diverse members came from all regions of the country – from big, medium, and small communities, and from wide sectors of the economy and society. I was appointed chair. Our purpose was “to rethink the way Canada and its communities are shaped, and to help make sure that Canada will be a world leader in developing vibrant, creative, inclusive, prosperous and sustainable communities.” (EACCC 2006: iv)

to focus on different sizes of communities, and on four dimensions of sustainability: a prosperous economy, a healthy environment, social inclusion, and a culture rich in creativity, and its practical application, innovation.

In September 2005, we convened a roundtable, Planning for Sustainable Canadian Communities, attended by over 100 government politicians, officials, and experts on community sustainability. From this event, we formulated a planning approach we awkwardly named “Integrated Community Sustainability Planning”. We also tested the initial findings and recommendations. Broad agreement was reached. Further work by the committee, from October 2005 to June 2006, refined our three key findings and recommendations. We were ably assisted by staff at Infrastructure Canada’s Cities and Communities Branch. On June 15, 2006, our final report, “From Restless Communities to Resilient Places: Building a Stronger Future for all Canadians,” was transmitted to Prime Minister Harper. The 70-page report, with a wealth of research, and other material, summarized the findings under three themes.

- **Place matters:** Canadians have a strong sense of place. These places – big, medium, small, rural, or remote – were so varied that a cookie cutter, one way suits all, Ottawa-driven approach, wouldn’t work.
- **Double devolution:** Ineffectual government arrangements damage the global competitiveness of Canada’s nine big cities, 100 medium-sized cities, and thousands of small, rural, remote communities.

From Restless Communities to Resilient Places: The Role of the National Government and The Importance of Integrated Community Sustainability Plans

Over the next 27 months we convened meetings, workshops with hundreds of local leaders, community agencies, stakeholders, and subject matter experts. We formed two subcommittees

- **Sustainable cities and communities strategies:** For double devolution to work, local communities need to collaborate with federal and provincial/territorial governments, and citizens to develop a vision for their place.

These findings lead to three basic recommendations.

1) **All governments in Canada need to adopt a place-based approach to policy making.** The leadership role of the federal government would be “one of facilitation and partnership with other orders of government and civil society, to deliver locally appropriate solutions to issues of national consequences playing out at a local level” (EACCC, 2006: 18).

2) **A double devolution should occur** from the national government to provincial and territorial governments, and then shift responsibilities and resources to the local level. In the interim, while cities and communities take on new responsibilities or develop their own taxation systems, the municipal infrastructure deficit of aging sewer, water, waste management, roads and bridges, libraries, and recreation centers, needs to be addressed by increased federal, provincial/territorial investments.

3) All governments should work together to assist communities in developing integrated sustainability strategies and plans.

Present Situation

While our EACCC report was being researched, and experts and communities became involved, many intergovernmental initiatives were well under

way to reduce the \$100 billion plus municipal infrastructure deficit; start to shift more revenue from federal and provincial governments to municipalities; and start the process of intergovernmental co-operation and planning for more sustainable communities.

Prime Minister Chrétien’s government restarted a municipal infrastructure program, in 1994. Prime Ministers Martin and Harper have maintained the \$1.2 billion per year funding, over the last 15 years totalling \$18 billion federal funding, which with provincial and municipal investments totalled around \$45 billion. As well, Prime Minister Martin implemented the Federation of Canadian Municipalities request for sharing the equivalent of five cents of the gas tax which, by 2009, amounted to \$2 billion per year. As well he eliminated the GST on municipal purchases, keeping \$700 million per year in municipal coffers. Prime Minister Harper and Finance Minister Flaherty made the gas tax revenues a permanent source of revenue transfer to the provinces to pass through to municipalities.

The 2004-2006 so-called “gas tax agreements” between the federal, provincial, and municipal governments also provided funding for “Integrated Community Sustainability Plans” (ICSPs), which are community-based, participatory planning frameworks designed to help communities define and achieve their long-term, sustainable development vision. These plans support the integration of a community’s environmental, social, cultural, and economic objectives, and can act as a tool to better align community-level policies across all levels of government.

As well, \$130 million was transferred from Infrastructure Canada to Indian and Northern Affairs Canada for infrastructure on reserves. Funds were also made available for comprehensive community plans (CCPs). Over 80 First Nations communities in British Columbia have received CCP funding. Additionally, new federal funding was made available to academics and organizations throughout the country to support research on horizontal infrastructure-related issues, including research on sustainable community planning that supports ICSP implementation by documenting best practices and sharing key lessons.

Future Implications

Over the last 15 years, federal, provincial/territorial, and municipal governments have, in an ad hoc rather than cohesive way, started to move toward addressing the municipal infrastructure deficit, in a more place-based way.

A form of double devolution through the gas tax agreements and permanent gas tax transfers is starting to evolve. For example, Manitoba transfers income tax revenues to municipalities. British Columbia gives municipalities access to hotel taxes and vehicle offence revenues and, through Metro Vancouver’s transportation agency Translink, use of a range of revenue sources, such as the gas tax, hydro surcharges, and parking and vehicle levees.

Sustainability planning approaches and funding are taking place in many provinces and municipalities. Examples of provinces and territories playing an active “linchpin” role include British Columbia’s *Growth Strategies Act* and Smart Planning Program, as well as

Ontario's Places to Grow initiative and Yukon's ICSP toolkit. At the municipal level, examples include new planning tools, such as the Alberta Urban Municipalities Association's Municipal Sustainability Planning on-line toolkit. Across Canada, several regional and metropolitan bodies, large and small cities, and towns have engaged in long-term, integrated, and participatory planning processes.

However, much more needs to be done. Research generally shows that implementation of community sustainability planning principles and objectives, and their integration into day-to-day decision making and community development processes, remain a significant challenge in many places, no matter the size of the community. Recent Canadian case studies¹ show that strong community-based leadership that can engage broad support for sustainability planning goals, to develop consensus and to promote participation is an essential ingredient of successful ICSPs. The studies also show that the possibility for cities to learn from each other's experience, through participation in "peer-to-peer" information activities, is highly valued by municipal officials and represents another key enabling factor for advancing and implementing sustainable development agendas at the community level. Still, we need to continue to improve and share our understanding of the barriers

and the key factors that can lead to or impede successful implementation of ICSPs in various contexts.

Another potential avenue for governments to support sustainable community development is the development of new data and tools that can lead to a better "on-the-ground" evaluation and ongoing monitoring of multi-level sustainability policies. Our final EACCC report emphasized the need to "catch-up with other countries on research and policy reviews of cities and their effects on competitiveness, inclusion and sustainability" (EACCC, 2006: 15-16), as other Canadian stakeholder reports have pointed to poor data quality and quantity as an obstacle to better policies on cities.²

Currently, governments, academics, and private stakeholders in Canada are engaged in a variety of promising research initiatives and data-development projects that share the common, overarching goal of advancing community sustainability in Canada. Ongoing projects either focus on developing Canadian knowledge and capacity on urban integrated energy systems (e.g. QUEST), improving our capacity to assess the state of Canada's public infrastructure (e.g. NRTSI and NRC, 2009) or on new national data that can better track the evolution of urban form (e.g. Infrastructure Canada and Statistics Canada). More innovative and collaborative research initiatives of this type are needed.

We are in the urban century, internationally and nationally. More people live in cities than the countryside for the first time in human history. At the time of Confederation, only 20 percent of Canada's citizens lived in cities; soon, 90 percent plus will live in urban areas. Even though our small, rural, and remote natural resource-based communities are very important, 95 percent of our 33 million citizens live in our nine big and 110 medium-sized cities, or their suburban rural communities, close by. Climate change mitigation and adaptation, global competitiveness, and the quality of life will probably accelerate intergovernmental co-operation, and it is hoped this will happen more by public policy design, than chance. A great public policy opportunity exists to study, research, and facilitate new 21st century intergovernmental approaches that are place-based, with double devolution, and lead to sustainability-focused cities and communities. ●

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1 For example, see research and case studies from Simon Fraser University Centre for Sustainable Community Development and from the International Centre for Sustainable Cities Simon Fraser University Centre for Sustainable Community Development <www.sfu.ca/cscd/strategic_sustainability/index.html> and the International Centre for Sustainable Cities <<http://sustainablecities.net/plusnetwork>>.

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Comprehensive Community Planning (CCP)

Comprehensive Community Planning (CCP) is a strategic planning process supported by Indian and Northern Affairs Canada (INAC). This planning process enables First Nations, Inuit and Northern communities to take a holistic approach to managing natural resources, while incorporating and addressing the social, economic and governance aspects of a community.

Based on a process whereby all community members are engaged in identifying and prioritizing their needs and wants and developing clear goals and a vision for the future, CCP provides a framework for the integrated management of land, natural resources and the environment that touches on all aspects of community life.

Plans may vary from community to community, but they all have the key principles of participation, sustainability, clear goals, enforceability and flexibility.

INAC has assisted and/or supported 138 communities interested in CCP in a variety of ways. For example, in British Columbia more than 10 tools to assist communities in the CCP process have been developed and a tracking/ evaluation system and a Funding Service Officer Training program have been implemented. Monitoring and feedback advice is an important part of supporting communities, and the region has a designated Monitoring Officer for this purpose.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

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The past two decades have seen a shift in the paradigm of regional policy in Europe. This article reviews the trends in regional policy design and delivery at national and European Union scales, and considers the degree to which the principles of place-based policy operate in practice, highlighting the issues and challenges that have arisen.

A Place-Based Policy Approach

The concept of place-based policy is not new. As far back as the 1960s, Louis Winnick (1966) posed the dichotomy of “place prosperity” vs. “people prosperity” in considering the redistribution of economic activity. The question of whether government intervention in areas, such as poverty and social inclusion, should focus on people or places has been a perennial source of debate in regional, urban, and other policies (Armstrong and Taylor, 2000). Over the past two decades, the concept acquired a new resonance in several policy fields, particularly in North America and Australia. Facilitated by the OECD, it has also become more familiar to Euro-

pean under-utilization of potential and reducing persistent social exclusion in specific places through external interventions and multi-level governance; promoting the supply of integrated goods and services tailored to contexts; and triggering institutional changes (Barca, 2009).

The impetus for this policy approach has come from a greater recognition of the importance of place in modern growth theories and, especially, the spatially contingent economic and institutional factors that contribute to economic agglomeration. Policy thinking about economic and social development has been reshaped by three advances in theory and empirical research (Farole et al., 2009): the “new economic geography,” notably the relationship between transport/trade costs and spatial agglomeration; endogenous growth theories, especially on the sources and territorial distribution of innovation; and institutional theories seeking to explain the capacities of economies to adapt and innovate. Michael Storper (1997: 3) encapsulated the shift.

Something funny happened in the early 1980s. The region, long considered an interesting topic to historians and geographers, but not considered to have any interest for mainstream sector social science, was rediscovered by a group of political economists, sociologists, political scientists, and geographers... it was asserted that the region might be a fundamental basis of economic and social life “after mass production.”

Place-Based Policy and Regional Development in Europe

pean policy makers, where the preferred spatial term has tended to be “region” rather than “place.” The concept has been used to describe not just a spatial focus within policy making but a strategic and integrated approach to governance with different institutional relationships. In a recent formulation for the European Union, a place-based policy approach was defined as a long-term strategy aimed at tackling persist-

The influence of such thinking on European regional development policies has been significant. It sparked a radical transformation of regional policy design and implementation, to the extent of constituting a new paradigm of regional development (Bachtler, 2001; Halkier, 2006; OECD, 2005). This paradigm shift is evident both in the regional policies of national governments in Europe as well as in the cohesion policy of the European Union. However, without detracting from the extent of change, the degree to which contemporary regional policies constitute a place-based policy approach varies, and several important questions remain unresolved.

Regional Development Policies in Europe

In assessing whether and how the place-based policy approach is incorporated within European regional policies, several important features of the approach need to be considered: the existence of a strategic, integrated framework; the objectives of policy; the spatial focus of interventions; the state of multi-level governance; and the approach to accountability and learning (Bachtler and Yuill, 2001, 2007; Yuill et al., 2008).

A first requirement is a strategic framework to ensure that individual policies with territorial impacts are incorporated into a national strategy that covers actions taken at different levels and by different territories and actors, to ensure the consistency and coherence of policy. A feature of European regional policies over the past 10 to 15 years is a move away from individual regional aid and infrastructure instruments to a

broader set of interventions, which inevitably has involved trying to influence the territorial dimensions of sectoral policies. This is exemplified in the Nordic area, where both Finland and Sweden require sectoral policy makers to take account of the regional dimensions of their policies, as well as in France (via co-ordination by the national development agency known as DIACT – the inter-ministry delegation to the installation and competitiveness of the territories) and Italy (under the new unitary regional policy).

However, a national framework was entirely absent until recently in most European countries. Among the exceptions are Germany, which has published an annual framework plan since 1969, and the Netherlands, which produces a white paper every four years setting out spatial development priorities. Since the early 2000s, Denmark and Finland have also produced national strategic statements of regional development priorities. A more strategic approach has been stimulated by the need for EU member states to produce a national strategic reference framework as part of the funding allocation system for the EU's cohesion policy. Introduced in 2006, this has led to individual countries developing their

own national regional development strategies – often for the first time – and it has strengthened strategic co-ordination (e.g., in Austria, France, and Sweden). This approach to regional policy making has had mixed results. While undoubtedly stimulating more strategic planning and deliberation on core priorities, the implementation of strategic frameworks has often been problematic. In particular, it has proved difficult to break down the barriers between sectoral departments and policies, certainly at a national level.

In assessing whether and how the place-based policy approach is incorporated within European regional policies, several important features of the approach need to be considered: **the existence of a strategic, integrated framework; the objectives of policy; the spatial focus of interventions; the state of multi-level governance; and the approach to accountability and learning.**

A further important change in approach has been the shift in policy objectives that have progressively moved away from the traditional goal of reducing inter-regional disparities through redistributive measures. The focus is increasingly on the promotion of economic growth and making regions more competitive through factors, such as innovation, productivity, entrepreneurship, and skills. This has been strengthened by policy priorities at the EU level, notably the so-called Lisbon agenda, promoting EU-wide action on knowledge and innovation, the business environment, and labour markets, for which EU cohesion policy is a key instrument. Interestingly, many regional policies seek to retain some

aspect of traditional policy goals of promoting equity or convergence, notably in Germany or Spain where there are constitutional requirements to reduce disparities, or where there is long-standing underperformance/under-development justifying higher budget allocations or special measures for certain regions (France, the Nordic countries, United Kingdom).

The conceptual thinking underlying the place-based policy approach is also reflected in a different spatial focus of policy. The emphasis on developing regional strengths and potential has brought a greater focus on urban centres or city regions (United Kingdom), as well as spatial economic networks between urban centres and urban-rural links (Sweden). Examples of the application of policy at different spatial scales are sub-regions (Germany), multi-region initiatives (as in the case of the “Northern Way” in the United Kingdom or inter-cantonal agreements in Switzerland), or inter-municipality co-operation (as in the Netherlands, or the rural concept of pays in France). In many cases, though, the geography of national regional policies has not (yet) been substantially challenged; new spaces for regional development are often small-scale or experimental, and established regional administrative boundaries continue to provide the spatial parameters for interventions. More significant are the efforts of the EU to promote territorial co-operation, which over a 15-year period has created a Europe-wide geography of transboundary areas for intervention promoting cross-border, inter-regional and trans-national co-operation.

An integral part of these developments is a move to multi-level governance. The traditional model of regional policy governance, dominated largely or exclusively by central government, has been partly superseded by a governance system with sub-national bodies, on the one hand, and the European Union, on the other hand, playing an important part in the design and implementation of policy. The changes encompass a more complex set of vertical and horizontal relationships between and across different territorial levels and involving both government and non-government actors. The “Europeanization” of regional policy is evident in the influence of EU competition policy on policy instruments, modifying the scope for government to provide subsidies for enterprises or engage in grant-bidding wars for foreign investment. It is also apparent in the rising influence of EU cohesion policy since 1988, which has influenced both the content and governance of national regional policies.

The regionalization trend has seen a mix of devolution and deconcentration of decision making and implementation responsibilities to regions and localities – of particular note in Finland, France, Italy, Poland, Sweden, and the United Kingdom. This is a key element of the place-based approach: mobilizing local awareness and preferences with appropriate institutions so the place specificity of economic development challenges can be addressed “bottom up” with tailored, integrated, and strategic responses at the regional or local level. Devolution has led to new regional governments or councils being

created. New agencies or other delivery bodies have also emerged, enabling many regions to develop or administer their own regional strategies.

However, the scope for multi-level governance is determined by the very different constitutional arrangements and institutional structures of European countries. At one extreme is Belgium, where virtually all economic development responsibilities devolved to the regions. Other federal countries, like Austria, Germany, and Switzerland, also have high levels of regional autonomy for regional development. By contrast, many central and eastern European governments lack any significant sub-national involvement in regional development policy. Elsewhere, regionalization involves central government retaining a strong influence through regional offices or agencies (France, Finland, United Kingdom), and there are even some examples of the decentralization trend being curtailed in recent years (Ireland, the Netherlands).

The growing breadth (across policy areas) and depth (between policy levels) of regional policy means a much greater range of actors is now involved. This requires enhanced co-ordination across and between different administrative tiers. Horizontal co-ordination at the regional level has become easier over time as regional programs (developed collectively by regional actors) have become more common, in part driven by the partnership principle of the EU cohesion policy. In contrast, national-level co-ordination has been more difficult, with national sectoral departments often unwilling to “buy in”

to regional development priorities. The growth in regionalization has demanded national-regional coordination, through informal mechanisms of dialogue (Austria, Germany, Sweden), national co-funding of programs and projects (Denmark, France), the requirement for national priorities to be included in regionally designed interventions (Finland, the Netherlands), or contractual agreements (such as the public service agreements in the United Kingdom). Again, one of the most advanced examples of coordination between levels of government is under EU cohesion policy, which involves negotiated program agreements (including conditionalities and incentives) between the European Commission and individual national or regional governments.

Finally, the place-based policy approach demands accountability and learning. In part, this involves subjecting the design and outcomes of policy to greater political and public scrutiny during the phase of policy design (to ensure transparency in the decisions made on priorities and resource allocation) as well as during and after implementation. Given the uncertainties of complex packages of interventions involving different partners, it also requires a commitment from actors to effective policy learning. In this respect, a notable European trend over the past 15 years has been the growth in evaluation. From being largely restricted to a few northwestern European countries (e.g., the Netherlands, Sweden, and the United Kingdom), evaluation has increasingly been viewed as a core policy process, conducted at *ex ante*,

interim, and *ex post* stages of implementation. This has been driven by the need to demonstrate value for money but also by a need for reliable information to guide the management of development programs. Again, EU cohesion policy has been a driver of change.

Issues and Challenges

There has clearly been substantial reform of regional policies across Europe over the past two decades. However, from a place-based policy perspective, several issues have proved problematic.

First, there is often fuzziness in the formulation of policy objectives. As Barca (2009) noted, the conceptualization of policies and the purpose of interventions often fail to distinguish explicitly between the goals of efficiency (increasing income and growth) and equity (reducing inequalities), which has implications for their verifiability. Popular terms, such as competitiveness, productivity, innovation, and entrepreneurship, are not always adequately defined or related to specific targets.

Second, although substantial progress has been made in achieving an integrated and strategic approach to development (mainly at the regional level), the progress often involves regional economic strategies. In many cases, the social and (especially) environmental dimensions tended to be managed

through separate policy channels, or subordinated to economic goals. A more coherent approach to sustainable development has begun to emerge in recent years (the EU has had a sustainable development strategy since 2001, renewed in 2006), although this is frequently interpreted as environmental sustainability. Examples of integrated, sustainable development strategies remain relatively rare.

From a place-based policy perspective, a fundamental challenge is how to promote institutional capacity building at the local and regional levels and to develop social capital.

Third, multi-level governance is now an established feature of regional development in Europe, but the degree to which regions and localities have development responsibilities and powers varies enormously from country to country. In some cases, the regionalization of economic development is not embedded (e.g., the regional development agencies in England could be abolished with a change in government), and there are examples of central government re-centralizing aspects of development policy (as in the Netherlands). From a place-based policy perspective, a fundamental challenge is how to promote institutional capacity building at the local and regional levels and to develop social capital. There are very different views and experiences of how best to mobilize local awareness and engagement, challenge vested interests, develop networks, and capture local knowledge as a basis for designing interventions.

Fourth, under a place-based policy approach, the geography of intervention would be determined by development needs. In practice, it has proved difficult to move away from established administrative boundaries toward, for example, functional regions. There are interesting initiatives in several countries, with some new spaces being determined from the top down (e.g., city regions), and others emerging bottom up (e.g., through inter-municipality co-operation), but they are often marginal to mainstream development.

Finally, important foundations have been laid in Europe for improving accountability and policy learning, an integral part of the place-based policy concept. Partly driven by pressure from the EU level, the use of evaluation has grown significantly, as evident in the creation of evaluation units in government departments, the commissioning of evaluation studies as a standard part of policy development and assessment, and the creation of evaluation societies. There is also a much greater use of consultation mechanisms as part of policy design and the formulation of regional and local development strategies. On the other hand, the use of evaluation in Europe is not yet as advanced as in North America. Much

of the focus has been on evaluating process rather than understanding impacts (what works); and evaluation results are not being sufficiently exploited. More generally, a culture of policy learning is still limited. ●

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In the past two decades, the concept of ecosystem-based management (EBM) has come to dominate the theory and practice of natural resources management in the United States and elsewhere.¹ Although definitions vary, most EBM initiatives feature three elements: a landscape-scale focus, collaborative planning that engages all stakeholders, and flexible, adaptive implementation of planning goals (Cortner and Moote, 1999; Grumbine, 1994, 1997; Keiter, 1998). In the United States, such initiatives have yielded a variety of benefits, including a more comprehensive understanding of large-scale ecosystems and better co-ordination among agencies and jurisdictions within those ecosystems. But stakeholder collaboration and flexible

Why Ecosystem-Based Management?

In the United States, EBM has emerged in response to widespread dissatisfaction with the prevailing approach to land-use and natural-resource management practices. Ecologists and conservation biologists complain that the traditional regulatory framework implicitly treats complex, diffuse phenomena as if they are separable into problems that are well bounded, clearly defined, and linear with respect to cause and effect. There is abundant evidence that centralized decision making that generates uniform rules accompanied by penalties for non-compliance has been effective at curbing the harmful practices of huge industries. But most policy analysts believe it is unwieldy for addressing the problems attributable to the habits of individuals and small businesses. Many also draw attention to the political liabilities of the “decide-announce-defend” model, in which decision making is contentious and polarizing, stalemate is common, and the policies that result are poorly implemented and subject to ceaseless challenge.

By contrast with the conventional regulatory approach, EBM is based on the recognition that the boundaries of ecosystems rarely coincide with the lines that delineate political jurisdictions; instead, environmental problems are best addressed at a landscape scale. To that end, it involves co-ordinating the activities of jurisdictions and agencies with disparate missions and integrating management of public resources with stewardship of the surrounding

implementation can undermine EBM's environmental benefits, unless policy makers are willing to articulate an overarching, environmentally protective goal and exert regulatory leverage to ensure that goal is attained.

1 By the late 1990s, the phrase “ecosystem-based management” had largely replaced the original term, “ecosystem management,” as proponents sought to emphasize management of human activities within ecosystems, rather than management of ecosystems themselves.

Ecosystem-Based Management in the United States

matrix of private land. Rooted in a “flux-of-nature” (as opposed to a classical equilibrium) view of ecology, EBM aims to foster experimentation and learning through its reliance on flexible, adaptive implementation. Perhaps most important, by fostering consensus among stakeholders, EBM promises to resolve the apparently intractable controversies that accompany our ubiquitous, sprawling, resource-depleting pattern of development.

Because of EBM’s broad appeal, in the 1990s a host of non-governmental organizations, professional societies, federal agencies, and state officials endorsed the concept (e.g., Beattie, 1996; Christensen et al., 1996; Dombeck, 1996; IEMTF, 1995; NAPA, 1995; PCSD, 1996; SAF, 1992; Thomas, 1996; US EPA, 1994; Western Governors’ Association, 1998). In the 2000s, professionals and advocates began promoting EBM for marine systems as well (McLeod et al., 2005; Pew Oceans Commission, 2003; US Commission on Ocean Policy, 2004).

But EBM proponents had not waited for an expert stamp of approval before embarking on experiments. In 1983, the US Environmental Protection Agency kicked off the Chesapeake Bay Program, which brought together Virginia, Maryland, Pennsylvania, Washington, DC, and in an effort to revive what was once one of the most productive estuaries in the world. In

1991, federal, state, and local planners launched a massive effort to restore the Everglades, South Florida’s badly degraded “river of grass.” Within a few years, a similar initiative was under way in Northern California, where the precipitous decline of the Delta Smelt had signalled the collapse of the California Bay-Delta. Other prominent watershed restoration processes took hold as well, including the Interior Columbia Basin Ecosystem Management Project and the Platte River watershed planning process.

Simultaneously, terrestrial EBM initiatives were springing up around the country, but particularly in the West, spurred by potential *Endangered Species Act* (ESA) listings.² Cities and counties throughout the Southwest began working on a variety of habitat conservation plans (HCPs).³ In 1985, the Fish and Wildlife Service approved the Coachella Valley HCP; in the early 1990s, the City of Austin, and Travis County, Texas, developed the Balcones Canyonlands Conservation Plan (BCCP); and Clark County, Nevada worked with the City of Las Vegas to devise the Clark County HCP. In 1991, California created its Natural Community Conservation Planning program; shortly thereafter, San Diego and other jurisdictions in Southern California established a series of pilot projects to address the rapid loss of coastal sage scrub habitat. Other projects, initiated by stakeholders, emerged as well; for

example, formed in 1993, the Quincy Library Group sought to devise a plan that reconciled logging and biodiversity conservation in a portion of California’s Sierra Nevada.⁴

An Assessment of EBM

Although they hailed the emergence of these EBM initiatives, scholars had little systematic evidence of the efficacy of EBM, partly because few initiatives had existed long enough for evaluators to assess their substantive benefits, but also because of their complexity and heterogeneity. Meanwhile, critics worried that EBM would not work as expected. More specifically, they suspected that development interests would dominate regional processes, while institutional barriers would impede co-operation among agencies and jurisdictions. They feared that stakeholder collaboration would yield watered-down plans that impose substantial risk on natural systems. And they worried that flexible, adaptive implementation would enable managers to resist actions that threaten powerful stakeholders. Some critics charged that EBM would draw limited resources away from or disable the tools, such as administrative appeals, lawsuits, and public relations campaigns that, historically, have been environmentalists’ most effective weapons.

2 The *Endangered Species Act* prohibits actions that would jeopardize the survival of any species listed as endangered.

3 Amendments to the *Endangered Species Act* in 1982 allowed for the creation of habitat conservation plans, in which property owners could “take” some species in return for enhancing the species’ overall viability through habitat conservation.

4 Because of their scale and scope, the vast majority of EBM projects are led by federal, state, or local governments. Stakeholder-driven collaborative processes that aim to address environmental problems in a holistic fashion also proliferated during this period. Political scientist Ed Weber (2003) documented three prominent initiatives of this type.

My own research suggests that although EBM does yield important benefits, some of the concerns of critics are warranted.⁵ An in-depth comparison of four prominent EBM initiatives with three similar cases reveals that landscape-scale planning does indeed prompt planners to adopt more comprehensive approaches to environmental problems and leads to new forms of co-ordination among disparate agencies and jurisdictions. In every case I examined, planners commissioned integrative scientific assessments, which in turn broadened their thinking about the relationships among landscape elements and functions. In many cases, they also experimented with new management tools — often as a result of interaction with colleagues from other agencies or jurisdictions. The beneficial effects of collaborating with stakeholders and of flexible, adaptive implementation are more elusive, however.

In cases where policy makers deferred to stakeholders in setting goals, the policies and practices that emerged appear unlikely to conserve or restore ecological health because, to gain consensus, planners skirted trade-offs and opted instead for solutions that promised something for everyone. The resulting plans typically feature management-intensive approaches with little buffering; as a result, they impose the risk of failure on the natural system. Flexible, adaptive implementation has

not compensated for the failings of these environmentally risky plans and, in fact, has sometimes exacerbated them. In particular, a rhetorical commitment to adaptive management, which entails devising management interventions as experiments that test clearly formulated hypotheses about the behaviour of the system, monitoring the results of those interventions, and modifying management practices in response to information gleaned from monitoring, has not translated into a willingness to alter policies in the face of new information. This is partly because minimalist plans actually provide little room for adjustment, but also because management and monitoring are insufficiently funded. In any case, learning by scientists does not translate automatically into management changes. And managers with missions that are incompatible with ecological restoration tend to resume resource-user-friendly practices when political conditions shift.⁶ This intransigence may reflect the potency of organizational mission and culture which, in turn, influences who thrives in the organization and how rewards are distributed; in some circumstances, it may

be a consequence of shifting priorities among political appointees at the top of the organization.

By contrast, when policy makers — elected officials, administrators, or judges — endorsed an environmentally protective goal and used regulatory leverage to prevent development interests from undermining that objective, the resulting policies and practices were more likely to conserve or restore ecological integrity. A willingness by political leaders to make ecological health the pre-eminent aim changed the balance of power and altered perceptions of what was politically feasible.

One factor that will complicate EBM and other place-based efforts is rapidly changing local and regional climates, and the ecological and human behavioural adjustments that will follow.

When restoring ecological health was articulated as the paramount goal, planners were more likely to approve, and managers to implement, approaches that relied less on energy-intensive manipulation and more on enhancing the ability of natural processes to sustain themselves, even if doing so imposed short-run costs on some stakeholders.

One factor that seems to affect the ability of policy makers to exert such leadership and wield regulatory leverage is the complexity — both physical and

5 I compared four full-fledged EBM initiatives — the Balcones Canyonlands Conservation Plan, the San Diego Multispecies Conservation Program, the Everglades Restoration Plan, and the California Bay-Delta Program — with three landscape-scale initiatives that did not rely on consensus-based planning: the Sonoran Desert Conservation Plan, the Kissimmee River Restoration Plan, and the Mono Basin Restoration. My findings are consistent with some other, less systematic assessments of large-scale, collaborative efforts at environmental management. (Layzer, 2008).

6 For example, in California's Bay-Delta region, the state and federal agencies responsible for distributing water to farms and cities, which had been co-operating with the agencies responsible for environmental conservation, once again began negotiating exclusively with water users as the collaborative CALFED program withered (CALFED is a department within the California Resources Agency that acts as a consortium, co-ordinating activities of the federal government and State of California that are related to water in the Sacramento-San Joaquin River Delta.) (Layzer, 2008).

organizational — of the target ecosystem. In heavily modified ecosystems, where numerous interests have legal and political claims, it is far more difficult to generate the political will necessary to pursue an environmental goal above all else. Under such conditions, proponents must be particularly talented at framing the problem in ways that enable construction of broad pro-environment coalitions.

An Enhanced Federal Role?

Initial assessments suggest that a strong federal role, although not a panacea, can mitigate some of the weaknesses of EBM. First, stringent federal regulations can promote environmentally protective regional initiatives. In the United States, many EBM initiatives have been spurred by the threat of federal regulation, particularly the ESA, but also the *Clean Water Act*. The more stringent the regulation, and the more strictly it is enforced, the more likely it is that EBM will yield environmentally beneficial results. This makes sense. At the local and regional levels, development interests hold disproportionate sway over the decision-making process; it takes a substantial incentive simply to get them to the table. Once there, they are unlikely to make concessions, never mind reconceptualize their interests, in the absence of credible threats to the status quo. Federal officials may be loath to embrace the role of “common

enemy” whose “unreasonable” demands force combatants to devise innovative solutions, but the evidence suggests that doing so can be effective.⁷

Second, the federal government can be a crucial source of financial support. Not surprisingly, funding is always a problem for EBM initiatives. In the United States, EBM projects have relied heavily on federal funding; many would not have gone forward without it, particularly with respect to acquiring environmentally sensitive property. In the United States, the 45-year-old Land and Water Conservation Fund (LWCF) has been a crucial source of funding for local and regional projects that involve land acquisition.⁸ The Department of Interior also provides financial (and technical) assistance to private landowners who are willing to engage in environmental conservation and restoration through its “co-operative conservation” programs. The federal government is well positioned to levy national surcharges, on electricity consumption, for example, for habitat conservation that can be disbursed to worthy projects.

Third, the federal government can serve as a source of information, co-ordination, and education/outreach. Federal agencies, such as the US Geological Survey, and the Fish and Wildlife Service, have furnished essential information that forms the basis for the integrative science that underpins

effective EBM efforts. Moreover, nearly every current EBM initiative lacks adequate resources to monitor the environmental impacts of interventions. As a result, they cannot engage in adaptive management. Federal agencies can (but in most US cases do not) provide funds for monitoring, as well as the technical expertise to aggregate results in ways that facilitate learning, both within and across EBM projects.

A strong federal role is no substitute for pro-environmental local leadership, which in turn is facilitated by effective mobilization and coalition building by local environmentalists. But federal regulation, strictly enforced, is often an essential precursor to genuine shifts in practice and, more important, it can catalyze new ways of thinking about problems.

Conclusions

In short, EBM holds the promise of achieving results that are superior to those attained using conventional approaches to natural resource management. If taken seriously, EBM offers an opportunity to test the assumptions that underpin the sustainability ideal: that social and economic well-being can be reconciled with environmental health. To date, however, most EBM initiatives in the United States are more consistent with “weak sustainability” — superficial greening of conventional practices — than with a genuine

⁷ In California’s Bay-Delta region, officials from the federal Environmental Protection Agency explicitly used the threat of *Clean Water Act* enforcement to force the State of California to act. Similarly, environmental advocates often employ the threat of a lawsuit to provoke action.

⁸ Congress established the LWCF in 1965. The act establishing the fund mandated that a portion of receipts from offshore oil and gas leases be placed in a fund to support national, state, and local conservation efforts. The LWCF is authorized at \$900 million annually, although that level has been met only twice during the program’s 40-year history.

commitment to social and economic transformation. To the extent EBM fails in practice to attain the achievements touted in theory, it is often because of a lack of genuine commitment by local or regional leaders to ecological restoration, and unwillingness to employ stringent regulations.

One factor that will complicate EBM and other place-based efforts is rapidly changing local and regional climates, and the ecological and human behavioural adjustments that will follow. In Florida, for example, scientists recognize that sea-level rise introduces major uncertainties into the Comprehensive Everglades Restoration Plan, and will almost certainly undermine many of the projects that have been undertaken or are currently in the pipeline. The inevitability of climate change suggests that EBM initiatives should be even more environmentally precautionary than they might be otherwise, to ensure the resilience of natural systems in the face of extraordinary stress. ●

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Abstract

This article focuses on Australia's 56 designated regional organizations with devolved responsibilities for managing land and water resources, and the national programs that have underpinned their establishment and development. Australian governments have driven decentralization in the arena of watershed management over the past 20 years. The redistribution of centrally collected taxes through national programs has progressively transferred power from state and territorial governments to the federal level while, at the same time, variously empowering stakeholders at local and regional levels. In doing so, federal governments (and their national programs) have facilitated greater integration across the bio-

Australia's decentralized arrangements for watershed management: the National Landcare Program, Natural Heritage Trust, Natural Heritage Trust Extension, National Action Plan for Salinity and Water Quality, and Caring for our Country. With a new federal government in 2007, the emphasis given to decentralized arrangements diminished. Under Caring for our Country, the federal government has stressed the need to take a business approach to investment and to better target national priorities. In doing so, it has channelled more resources directly to local groups (rather than via regional organizations) and put in place measures to enable non-governmental organizations, regional bodies, and government agencies (local, state/territory, and federal) to compete for a greater proportion of funds. Many regional organizations have had to downsize in response, and their capacities to build local collaborations and pursue integrated approaches to watershed management have been compromised.

National Grants: A Mechanism for Embedding Decentralized Governance Arrangements for Watershed Management

physical, social, and economic dimensions of watershed management. This article outlines a number of national programs of relevance to

The Regional Model

Like Canada, the Australian constitution vests power over the management of land and water resources primarily at the level of the states (or provinces) and territories. Approaches to planning, implementing, and reporting on aspects of watershed management across Australia's six states (New South Wales, Queensland, South Australia, Tasmania, Victoria, and Western Australia) and two territories (Australian Capital Territory and Northern Territory) are therefore inherently diverse and changing.

Unlike Canada, successive federal governments in Australia have encouraged and supported decentralized arrangements. Powell (1993: 51) argued that the regional idea “suggested enough logic and convenience to convert pragmatists and rationalists of various political persuasion in Australia” and that the “ALP (Australian Labor Party) intellectuals applauded it as a special ‘democratising device’, for the articulation of local needs and the efficient delivery of nationally coordinated programs.” Decentralization has been used as a strategy for achieving greater convergence and consistency among jurisdictions, including setting strategic directions and priorities, as well as approaches to implementation and reporting. Large-scale national grant programs (which redistribute centrally collected taxes) have been the primary mechanism through which this alignment has been pursued. Access to program resources is predicated on each state/territorial government signing a bilateral agreement with the federal government, which generally requires matching cash and/or in-kind contributions. While participation is voluntary, those governments that do not align their strategic directions (and resources) with those of the federal government forgo a significant injection of resources.

This article focuses on the emergence of Australia’s formal network of 56 regional organizations with responsibilities for aspects of watershed planning and management (see Figure 1). These entities are the primary vehicle through which major national programs are delivered. Colloquially, they are referred to as natural resource

Figure 1
Australia’s 56 NRM Regions



Source: Robins and Dovers (2007a: 274).

management (NRM) regions and the regional model. Natural resource management, in the Australian context, is used quite loosely and best translates as watershed management in the Canadian setting. Many NRM regions started in response to demand from communities (bottom up) but have been moulded, homogenized, and professionalized to deliver (top down) programs on behalf of state/territory governments and especially the federal government. These responsibilities include further devolution of grants to local groups within the region, and supervising and reporting on that expenditure.

The 56 regional organizations vary in corporate form (statutory authorities, incorporated associations, limited companies, bodies corporate) and staffing levels (5-75 members). Each is governed by a board of management

consisting of representatives of the major stakeholder interests (6-20 members), whose members are generally appointed by the responsible minister at state/ territory level (Robins and Dovers, 2007b).

Regions differ significantly in their historical, cultural, social, political, ecological, and economic contexts and capacities, and their functions often extend beyond delivering state/ territorial and national programs. Their boundaries have been strongly influenced by the philosophy of integrated watershed management, referred to as integrated catchment management (ICM) or total catchment management (TCM) in the Australian setting. However, ecological boundaries, such as ecological vegetation classes (EVCs), rather than watershed boundaries have been a greater determinant in flatter parts of the continent.

While decentralized organizations exist in Australia within the context of a national framework, no such national consistency exists in Canada. Instead, different decentralized governance bodies have developed in response to provincial/territorial needs and concerns (e.g., Alberta's watershed planning and advisory councils, British Columbia's Fraser Basin Council, Manitoba's conservation districts, Ontario's conservation authorities, Quebec's watershed organizations). Robins (2007) identified and discussed 115 decentralized organizations in Canada with responsibilities for watershed management as potential building blocks for nationwide governance arrangements and capacities that could be more purposefully evolved. A comparison of capacity challenges with Australia is made in Robins and de Loë (2009).

The sections that follow outline the national programs of central relevance to the emergence of the decentralized arrangements.

National Landcare Program

The launch of the National Landcare Program (NLP) (and the decade of landcare) by the federal government in 1990 marked a tipping point in the management of land and water resources in Australia. The program sponsored the formation and activities of local landcare groups with an interest in improving land and water management. Campbell (1994) described "landcare" as landholders

working together with government to solve local problems. It marked a paradigm shift from focusing on the individual farmer and that farmer's property to sponsoring local community groups, and building relationships and networks at the local community level. It also marked a shift in emphasis from single- to multiple-issue programs. The NLP followed the successes of state government initiatives in Victoria and Western Australia, and emerged in response to joint lobbying of the federal government by the Australian Conservation Foundation and the National Farmers' Federation.

In only four years, about one third of all farming families across the country were represented on more than 2,000 landcare groups (Campbell, 1994). This social phenomenon came to be referred to as the landcare movement. Today, there are around 4,500 landcare groups involving about 40 percent of farmers (Australia, DAFF, nd). The landcare model has been adopted in other countries, including New Zealand, South Africa, and the Philippines. For an example in Canada, see Land Care Niagara (nd). Landcare is a cornerstone of Australia's approach to land and water management. Its popularity and broad-reaching participation has seen the NLP remain a subset of subsequent national programs, including the current Caring for our Country initiative (A\$189 million over five years from the total budget of around A\$2.25 billion).

Natural Heritage Trust

Just over half way through the decade of landcare, the incumbent federal government lost office. The incoming government had campaigned to increase resources significantly for land and water management subject to the partial sale of Telstra (a wholly owned public telecommunications company). In keeping with this election promise, the Natural Heritage Trust (NHT1) was established to address pressing environmental issues whether at a local, regional, state, or national level. It formed an umbrella for a suite of federal initiatives, including landcare, bushcare, and coastcare programs. It invested A\$1.25 billion over five years (1997-1998 to 2001-2002).

The NHT1 emphasized the need for better integration both across issues (e.g., weeds, salinity, soil erosion) and across scientific disciplines (social, cultural, economic, ecological). It adopted a more businesslike approach than earlier programs, with much greater emphasis on monitoring and evaluation. Funding application and assessment processes were significantly more detailed, and new accountability arrangements necessitated greater data collection, analysis, and reporting. Local-level community groups became disgruntled with high workloads and funding delays, and some groups became inactive. Regional organizations, where established, were often better positioned to meet the growing demands for specifying, justifying, and accounting for projects.

As the end of the NHT1 (and the decade of landcare) neared, the National Land and Water Resources Audit (Australia, LWA, nd) consolidated a significant body of evidence to support the need for much greater action and resources to address the country's natural resource degradation issues. At the same time, it became clear that local actions alone would not achieve the landscape scale change required to address these problems. The local care-based approach was perceived as a success at raising community awareness and engagement, but a failure at achieving co-ordinated, larger-scale change. The policy agenda therefore needed to respond by giving greater emphasis to regional scale planning and approaches.

Natural Heritage Trust Extension and National Action Plan for Salinity and Water Quality

The Natural Heritage Trust Extension (NHT2) invested A\$1.75 billion over six years (2002-2003 to 2007-2008) to help restore and conserve Australia's environment and natural resources through biodiversity conservation, sustainable use of natural resources, and community capacity building and institutional change. At the same time, the National Action Plan for Salinity and Water Quality (NAP) invested A\$1.4 billion over eight years (2000-01 to 2007-08) in 21 priority regions (comprising at least parts of about 30 NRM regions) as an initial step to achieving major systemic improvements in land and water management

in regions highly affected by salinity, or contributing to salinity and water quality problems elsewhere.

Like the NHT1, both the NHT2 and NAP required signed bilateral agreements between the federal and state/territorial governments; the process of which was lengthy and contested in some jurisdictions (NHT2: December 2002 to June 2004; NAP: June 2001 to September 2003). Under these agreements, regional NRM organizations were charged with developing, implementing, and monitoring regional NRM plans and investment strategies. In some parts of the country regional organizations needed to be created to access the available resources.

A regional NRM plan was required to identify the assets for protection (e.g., town water, wetlands, forests) and set and monitor targets (aspirational, achievable resource condition, and management action). The submission of regional plans and investment strategies for accreditation by the federal government was required within 12 months. During this 12-month period, many local groups were left stranded without the resources to support their activities. Following accreditation, the regional organization could allocate resources (e.g., to landcare groups) within the context of the approved plan. However, the shift to a more targeted approach and larger-scale activities meant that some local groups either became ineligible or were deemed a low priority for funding, while those in priority areas received substantial resources.

The NHT2 and NAP have been instrumental in driving the formalization process of NRM regions and their management structures across Australia. They have prompted legislative amendments at the state/territorial level, as well as the restructuring of government agencies and research agendas. However, the approach to program delivery has disenfranchised some individuals and stakeholder groups, including those local groups experiencing greater bureaucracy and less access to resources than in the past. The programs have also alienated state agencies by establishing a network of federally employed facilitators (traditionally employees of state/territorial agencies) at the regional level to report directly to the commonwealth.

Caring for our Country

When a new federal government took office in 2007, Caring for our Country (CfoC) was developed to replace the NHT2 and NAP at their conclusion in June 2008. The program provides A\$2.25 billion from 2008-2009 to 2012-2013. It focuses on six national priorities:

- national reserve system;
- biodiversity and natural icons, including weed and feral animal control, threatened species;
- coastal environments and critical aquatic habitats;
- sustainable farm practices, including landcare;
- natural resource management in remote and northern Australia; and

- community skills, knowledge, and engagement.

The new federal government stressed the need to take a business approach to investment and to better target national priorities. In the transition year (2008–2009), the program guaranteed that regional organizations would receive at least 60 percent of the average annual allocation received from the federal government under the NHT2 and NAP (Australia, CfoC, 2009b). It introduced a more competitive approach to funding by running an open grants process to “provide the opportunity for non-government organisations, regional bodies, Local Government and State, Territory and Australian Government agencies to compete for a greater proportion of funds” (Australia, CfoC, 2009a). Some regional organizations have had to reduce their staff numbers significantly as a result of reduced resources.

The program is characterized by its more narrow scope than the NHT2 and NAP. The centrality of regional NRM plans as the platform for allocating funds has lost ground and, with it, integrated approaches to watershed management. Significantly more funds are being channelled to individual local groups independent of regional priority-setting processes. The pendulum has also swung toward short-term and tangible gains at the expense of tackling complex problems requiring integrated thinking and solutions. ●

Conclusion

This article has focused on the potential for national programs as a mechanism for embedding nationwide

decentralized arrangements for watershed management. While Australia’s regional model is reportedly the preferred approach to NRM delivery (ABARE, 2006), including among indigenous peoples (Keogh et al., 2006), it is also the subject of criticism (e.g., legitimacy, democracy, accountability). Evaluations and audits of past programs have identified ample scope for improving program logic, delivery, and reporting, and highlighted the need to foster synergies and collaborative (rather than competitive) relationships between local and regional levels. The current program, Caring for our Country, has seen a swing in emphasis from the regional level back to local groups, and away from integrated planning and long-term outcomes to a narrower, more tangible, and short-term approach. The challenges of sustainably managing land and water resources are great, and the leadership of the federal government, working collaboratively with state/territorial counterparts, is an important ingredient in building the community capacity needed to realize landscape-scale change. The current federal government has not succeeded (thus far) in delivering a devolved, participatory and integrated agenda for watershed management in Australia. ●

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Issue

The lines between international development and domestic policy are blurring. While the former addresses differences in growth, poverty, and inequality between countries, the latter must address such differences within a country. Throughout the Americas, from Canada to Chile, a new generation of data sets is giving researchers a new perspective on how the opportunities for development vary and why different places benefit (or not) from national-level policy. Identifying where successful development is occurring is the first step toward understanding what drives some rural territories to thrive while other stagnate.

a collective sense of social identity. Rural territories build on the idea of farming systems, or the study of farms that face similar opportunities and constraints in terms of crops, soils, technology, and livelihoods. A rural territory includes the landscape covered by a group of people, their economic activities, and their relationships with the surrounding economy, society, and environment. While some rural territories are based on farming, others rely on fishing, forestry, mining, tourism, manufacturing, or some combination of activities. Examples include a coffee-producing region in Columbia, sugar cane and irrigated agriculture surrounding Petrolina-Juazeiro, Brazil, and mining and agriculture in Michoacán, Mexico. Each of these rural territories encompasses a distinct economy, with a particular set of dynamics that drive development at the local level.

The Latin American Center for Rural Development (RIMISP), a regional organization based in Santiago, Chile, pioneered the study of rural territories. Since 1986, RIMISP has been at the forefront of knowledge on changes affecting rural communities. The Center conducts its own research, trains young professionals, and co-ordinates a research agenda involving numerous partners throughout South and Central America. Center researchers work closely with people living on marginal lands, who tend to be excluded from national development, and seek to ensure these people benefit from the research conducted by RIMISP. The hypothesis behind the current program on rural territories is that development

Balancing Geography: New Insights into Rural Development in Latin America

Approach

Over the past two decades, researchers in Latin America have refined the concept of “rural territories” – spatial areas that combine economic activities with

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outcomes are influenced by changes in local institutions and the structure of the local economy.

New Geography

Worldwide, there is renewed interest in the spatial distribution of development outcomes. Much commentary has focused on the growing economic and political importance of India and China, yet these countries are the tip of the iceberg of new insights within both international and rural development. The 2009 edition of the World Bank (2008) World Development Report examined the interplay of increased population density, reduced distance to economic opportunities, and reduced barriers to the movement of people, goods, and ideas. At the same time, the Internet provides researchers with unprecedented access to data on local administrative divisions below the national level. Such data allow analysts greater freedom to explore more nuanced dynamics at regional, county, municipality, and district levels.

Mapping economic growth, poverty, and inequality within central Chile shows some municipalities have achieved development outcomes that are comparable to Europe, while other areas experience outcomes that more closely resemble conditions found in Africa. In short, comparing regions within a single country reveals greater variation in development outcomes than the differences between countries. Conditions that resemble both the developed and developing world can be found within national borders. An inward look at where development occurs provides a

starting point for understanding the internal dynamics that drive growth, poverty, and inequality.

A New Look at Latin America

With support from Canada's International Development Research Centre (IDRC), RIMISP co-ordinated the compilation of data for close to 10,000 local administrative divisions across 11 countries in Central and South America. National partners were directly involved in the work in each country. The RIMISP team focused on three indicators of development: economic growth in terms of per capita income, the incidence of poverty in terms of the percentage of households below the poverty line, and inequality in terms of the Gini coefficient that measures the distribution of income.

Given the differences in the methods used by statistical authorities to collect data in different countries, the results are not strictly comparable between countries. The research team also intended to include indicators of environmental quality, yet such data proved harder to find and was not as widely available for all locations. The data are nonetheless sufficient for the purpose of the RIMISP team, which was to identify potential success stories: those regions experiencing qualitative improvements in all three indicators over time. The RIMISP team used maps to identify sites for case studies to further identify what was driving development in these locations.

National maps were produced using small area estimates, an econometric technique that combines data from the national census with household surveys (Elbers et al., 2002). The maps compared data from the 1990s and 2000s, to show how development outcomes had changed over the decade. The maps indicated that about one in ten *municipalidades*, equivalent to the county level in Canada, had experienced a triple win of economic growth with reduced poverty and inequality.

Beginning at home, the RIMISP team mapped data for Chile, a country that is widely considered a development success. Two thirds of the *municipalidades* saw reduced poverty or inequality in the absence of economic growth, suggesting that such gains were more due to transfers and social welfare programs than an internal dynamic of development. Meanwhile, national success seems to owe more to the five percent of the regions mapped that exhibited simultaneous improvements in growth, poverty, and inequality.

Throughout the 11 countries studied, the regions that did experience a triple win (growth with reduced poverty and inequality) were home to over 27 million people. This suggests that important dynamics exist that are overlooked by national averages. Probing deeper, regression analysis showed that this pattern of development could not be easily explained by investments in infrastructure, education, or electrification. Something else occurring in these particular regions warranted further study.

Salmon and Jobs on Chiloe Island

One such case study examined the island of Chiloe in southern Chile, a site that had experienced rapid expansion in salmon aquaculture. Chiloe has traditionally been isolated from the urban centres and agricultural opportunities that drove development elsewhere in the country. The arrival of salmon farms thus proved to be a boom for the region. Within a decade, jobs in farming and processing salmon boosted incomes and halved poverty on the island. The local population also began to grow as people moved to the island in search of work, reversing a previous trend of out migration.

This success created a coalition among salmon companies, local people, and government. Aquaculture was initially dominated by Chilean firms, but soon foreign investors from Norway and other European countries took over much of the industry. With the promise of further investment and jobs, people voted for and supported the local government.

Governments adopted numerous policies intended to nurture and grow the industry. First, they allowed the privatization of rights of access of coastal areas. Such rights were intended to provide more certainty and better guarantees for private investment in the farms. Second, the aquaculture industry was

allowed to regulate its own environmental impact. Third, public investment took place; Chile's government built roads and industrial parks to move and process farmed salmon, and supported research and education to provide knowledge and workers for aquaculture.

The result was a stable coalition, or institutional arrangement, that benefited all concerned. Firms thrived under policies that enabled the industry to grow, people enjoyed increased employment, and government held the support of the firms and voters.

Yet this coalition is also an example of institutional myopia, an inability to detect and respond to

potential threats. Despite increasing marine pollution over the decade, little action was taken as it was assumed that the industry would regulate its own impact. At the same time, the increasing number of farms created dense populations of genetically similar Atlantic salmon, a condition that allowed for the rapid transmission of infections.

In 2008, infectious salmon anemia spread throughout the region, decimating the farmed stocks. Within a year, one third of the work force was unemployed and the prospects for continued development were very doubtful.

In short, the apparent success story of Chiloe is a warning. The coalition that formed among industry, people, and

government invested in optimizing aquaculture and assumed the gains could be sustained over time. Yet the triple win of rapid economic growth with reduced poverty and inequality had been generated at the cost of rapid degradation of the local environment to support salmon.

Researchers with RIMISP continue to compile detailed case studies on other locations throughout Central and South America. Once completed, the research team will be in a better position to assess whether such institutional myopia is widespread and can identify where gains in human development also enhance the quality of the local environment.

National policies cannot be one size fits all; instead, they must balance the provision of mean- ingful direction with the ability of local actors to adapt such policies to local opportunities.

Reaching Out to Audiences

Beyond co-ordinating research, RIMISP actively engages policy communities through the Americas and beyond. In particular, RIMISP has formed two networks to reach out to the parties involved so they can learn from and act on the insights provided by this research. The first brings together provincial premiers and state governors throughout the Americas via annual in-person meetings and study tours. The second brings together journalists that cover rural issues to share stories, ideas, and analysis. Each network represents a key audience for RIMISP research and is supported by two Internet sites: the blog of Red Prensa Rural (nd) and Red de Gobiernos (nd). Both networks have members in Canada, for example providing a platform for the province of Quebec to share its experience in developing a rural pact to foster local

innovation. The RIMISP team has also reached out to Canadian researchers, for example working with the University of Saskatchewan to examine how similar maps and coalitions might explain development patterns in Canada's north and the opportunities of Aboriginal communities.

Policy Implications

The experience of using rural territories to map and study local development suggests two sets of implications.

First is the need to understand what drives development at the local level. National trends can hide important dynamics of where and why development occurs. General policy prescriptions for rural development can miss the mark if they are not adapted to local conditions. Analysts should identify who benefits from development, the coalitions of actors involved, and understand how they favour particular economic opportunities. This requires understanding the political dynamic

among different actors and institutions that influence the distribution of assets and resources. The nuanced story of Chiloe further suggests the risk of institutional myopia and the possibility that existing coalitions may fail to detect and respond to changes in the local environment.

Second, higher-level authorities (whether federal governments or development agencies) must consider how their policies play out in different places. National policies cannot be one size fits all; instead, they must balance the provision of meaningful direction with the ability of local actors to adapt such policies to local opportunities. Federal and provincial/state governments can play a dual role, fostering innovation while challenging local coalitions to avoid the myopia of short-term gains at a cost to the local environment.

As the world nears the deadline for the United Nations Millennium Development Goals, future gains increasingly

rely on addressing "hotspots" of poverty and inequity below the national level to know what drives development in particular locations. Place-based approaches show how different policies and practices interact. For example, changing environmental conditions influence economic and social opportunities. In short, there is a need to go beyond national averages. Mapping and studying rural territories offers one such approach. ●

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Setting the Context: The Need for Managing Complexity

Individual choices made by decision makers will always have secondary impacts, both positive and negative. Many of these secondary effects may impact sectors or jurisdictions beyond that of the decision-making authority in question. Since impacts are non-linear - in the sense that they are multiplied or compounded - and sometimes offset the effects of other activities taking place within a region. Understanding the extent and nature of such cumulative, interactive, and compound effects of ongoing decisions is essential to manage competing and conflicting demands and priorities, and ensure the

no single source or cause that can be pointed to, or managed to mitigate these trends. Moreover, they may not only be the result of many interacting events and activities taking place in an area, but the result of activities undertaken in the past, or in regions far removed.

It is difficult to find ways to explore this complexity from a knowledge and information perspective. Yet, this is not the only difficulty with which managers and decision makers who are interested in tackling complex regional issues must contend. There is also the significant problem of how existing sectorally divisive governance structures limit (and complicate) efforts to address issues of regional importance from a trans-sectoral and trans-jurisdictional perspective. There is little precedent in doing so; the problem of boundary in the context of integrated management (IM) is a major barrier to whole system approaches to managing complexity and risk (e.g., Balaguer et al., 2008; Folke et al., 2005; Mitchell, 2005; Pollard and du Toit, 2005). Legislation has tended to arise in response to specific problems, such as the loss of species or the release of contaminants, often specific ones, which means that most policy and management tools were set up to address very specific and narrowly defined, sectoral objectives. Few tools are available to address trans-sectoral complexities.¹ Implementation of existing acts might benefit from IM.

It is often the case that many of the historic issues or problems continue to persist today, which means that the day-to-day efforts and attention of

The Role of Institutions in Integrated Management

sustainability of our natural systems, communities, and overall socio-cultural well-being.

Increasingly, the implications of our issue-by-issue and sector-by-sector approaches to planning, regulation setting, and management create situations in which we see evidence of scarcity, realized and emerging, in our natural resources, including renewable ones (like water). In nearly all cases, there is

¹ CESD (2008).

decision-making communities remains focused on reactively managing existing problems, rather than addressing new emerging ones (Meadowcroft and Bregha, 2009). The ability to respond to complex emerging problems depends on the ability of governments to co-ordinate their activities and knowledge quickly and effectively. In fact, there is much precedent in this regard. There are many examples of governments overcoming large-scale, complex, or long-running problems, such as the national scale response to avian influenza. In such cases, complex, far-reaching problems, and risk, are managed through the use of large-scale, co-ordinated trans-governmental responses, which are organized rapidly and led by a mix of disciplinary experts. This responsive governance mobilizes effective information exchange and targets the most “appropriate scale,” bypassing jurisdictional limitations to institute changes at the scale and scope necessary.

The ability to assess information, develop plans, and identify appropriate scales over which issues are considered and acted upon is critical to managing

Numerous place-based planning and decision-making communities of practice exist across Canada... Although they differ in focus, all are systematic, participatory, scientific, and information-based approaches to risk and planning under conditions of imperfect information.

highly complex problems (EEA, 2001). Since the most effective communication and knowledge sharing systems have a disciplinary basis along professional societies or associations, the bottleneck for knowledge and information transfer is in discovering ways to integrate socio-economic and environmental information across existing sectoral, jurisdictional, and disciplinary boundaries. Even if, or when this is achieved, and available information and data are accessible, the reality is that information will always be imperfect. In other words, the other key challenge, both now and in the future, is how we should consider uncertainty.²

Given the realities of managing under existing governance structures, managing complexity requires bringing together the various holders of data and information with the various managers, policy makers, and other implementers of change; and ensuring that relevant policy, legislation, cultural, socio-economic, and environmental considerations within a region are viewed collectively and appropriate management actions are orchestrated and linked to implementable actions.

Real Life Examples

Whole system assessments, while appearing daunting and time consuming, are capable of quickly establishing highly effective responses over short time frames. Such responses need not revolve around catastrophic events. Meadowcroft and Bregha (2009) provided some examples. For instance, in the Netherlands, a federal adaptive management framework is being adopted to establish pathways and interdepartmental co-ordination and initiate consultation with stakeholders, facilitate the use of analytical tools to explore scenarios, conduct visioning exercises, and set objectives – again, all recognized features of IM (Bizikova and Waldick, this issue p. 81).

Another example of a government recognizing the need for new governance tools is the regulatory Land-use Framework in Alberta (Alberta, SRD, nd). The Framework was established to enable the management of cumulative effects. Its supporting tool, the *Alberta Land Stewardship Act*, serves as a basis for co-ordination among the multiple stakeholder and interest groups responsible for management and planning, to ensure that cumulative effects of all activities in a region are considered early and on an ongoing basis. In this way, The Act serves as the mechanism to manage the problem of how to set environmental standards that take into account both the combined and interactive effects of growth and development in an area.³ This is not the only

2 This is variously done through the use of a computer-based scenario or projective models (PRI, 2005a), and by subject matter (disciplinary) experts in multi-stakeholder processes (Meadowcroft and Bregha, 2009).

3 In other words, whereas every sector may operate individually according to established and required environmental standards and practice, their collective impacts exceed what the natural system is capable of sustaining. Water supplies have and are being dramatically reduced in some areas to an extent that conflict is emerging among users (e.g., farmers, ranchers, industry, the public).

Canadian example. Integrated management and planning frameworks and approaches have been appearing increasingly in provincial and territorial contexts over the past five to ten years (Oborne, this issue p. 42).

A nuance worth mentioning here is that while integrating governance models, such as the one in Alberta, use a legislative basis to facilitate planning and management along biophysical boundaries, which represent the true units of impact. Their existence need not change the responsible authority. In Ontario, conservation authorities were set up to allow watersheds to be managed in a co-ordinated fashion. This was achieved through the creation of a forum through which mandated authorities could orchestrate adaptive responses (through integrative and collaborative dialogue) using natural watershed boundaries. Both the Ontario and Alberta acts are examples of how formalized and systematic strategies may be set up to co-ordinate dialogue, planning, and implementation in an ongoing manner. By creating more structured systems, these strategies also address the need for information and data exchange across information boundaries, knowledge sharing, and information management – all essential elements of IM.⁴

Box 1 Challenges Identified for IM

- Address management and impacts over protracted time frames.
- Address issues over space (i.e., established jurisdictional boundaries) to deal with issues (regional and global).
- Move from established functional and academic specialization to integrative forms (i.e., sectoral basis of government ministries, disciplinary research paradigms).
- Establish strategies and science-based approaches (tools) to better understand uncertainty and unknowns (risk).
- Get support to change established approaches, revisiting desired goals, and the need for change (e.g., move to renewable energies).
- Adopt flexible (adaptive) decision-making approaches.

Note:

Integrated management is increasingly emerging in discussions of how to address complex sustainability objectives. Meadowcroft and Bregha (2009) provided a comprehensive discussion on the linkages between IM and sustainable development.

Source: Meadowcroft and Bregha (2009).

The State of IM in Canada

Numerous place-based planning and decision-making communities of practice exist across Canada. Our initial scan has identified over 80 IM type applications. Although they differ in focus, all are systematic, participatory, scientific, and information-based approaches to risk and planning under conditions of imperfect information. At their core, they consider the impacts of uncertainty and missing information on regional objectives through the use of integrated analytical tools,

including interactions between management or policy activities and cumulative effects. They also establish transjurisdictional management objectives (e.g., policies, regulations); engage and sustain participation by multi-stakeholder collaborators; and make use of scientific, geographic, and socio-economic information from various disciplinary areas (PRI, 2005a,b; see also Box 1).

In a detailed review of 20 Canadian IM communities, it was evident that they are also constrained by the same

4 (Bizikova and Waldick, this issue p. 81; Liu et al., 2009). As in the Alberta example, capacity demands are substantial to sustain these multi-stakeholder initiatives, and government support in some form is essential to their effectiveness and survival. At present, 36 authorities exist, representing 90 percent of the population of Ontario. Governance is through municipal appointment (most of whom would be elected councillors in the region), and each serves to connect otherwise disparate jurisdictions to integrate and co-ordinate science-based advice, services, and planning. Funding is self-generated, as well as from municipal levies, projects and grants, and federal grants and contracts. The annual budget for program and service delivery is over \$250 million Canadian. For more information, see Conservation Ontario, (nd).

Box 2 **Practical Applications of IM**

1. Environmental assessment (EA) (improved integration, streamlining, development of regional EA processes, strategic environmental assessment).
2. Knowledge co-production (and sharing)
 - system-level exploration of uncertainty and risk (greater temporal and spatial scope and overall complexity of issues considered); and
 - trade-off and cost-benefit analysis expanded in analysis of management and policy options (multiple sectoral socio-economic and environmental/human health information).
3. Land-use planning (including watershed, resource, etc.).
4. Decision support
 - goal (threshold) setting (regional, integrated scope); and
 - policy evaluation (cross-governmental and sectoral).
5. Cumulative effects management.

challenges identified at a practitioner workshop held in 2005 (PRI, 2005b; see also Box 2). The overarching feature of all of these challenges is intimately linked to the “trans” nature of IM, in other words, working across existing information, expert, disciplinary, sectoral, and jurisdictional boundaries. This creates a catch-22 in which, the need to better manage complexity and cumulative effects through integrated planning can be obstructed by the inability of managers to justify activities that extend beyond their individual scope or mandate. The suite of challenges for any IM community, therefore, demands the time and attention to overcome fragmented governance and management systems (including, those behind unco-

ordinated policies, data, and information management) and trying to maintain ongoing engagement and collaboration by all relevant stakeholders (PRI, 2005a,b; Waldick et al., 2006).

Tackling the Challenges: Federal Roles

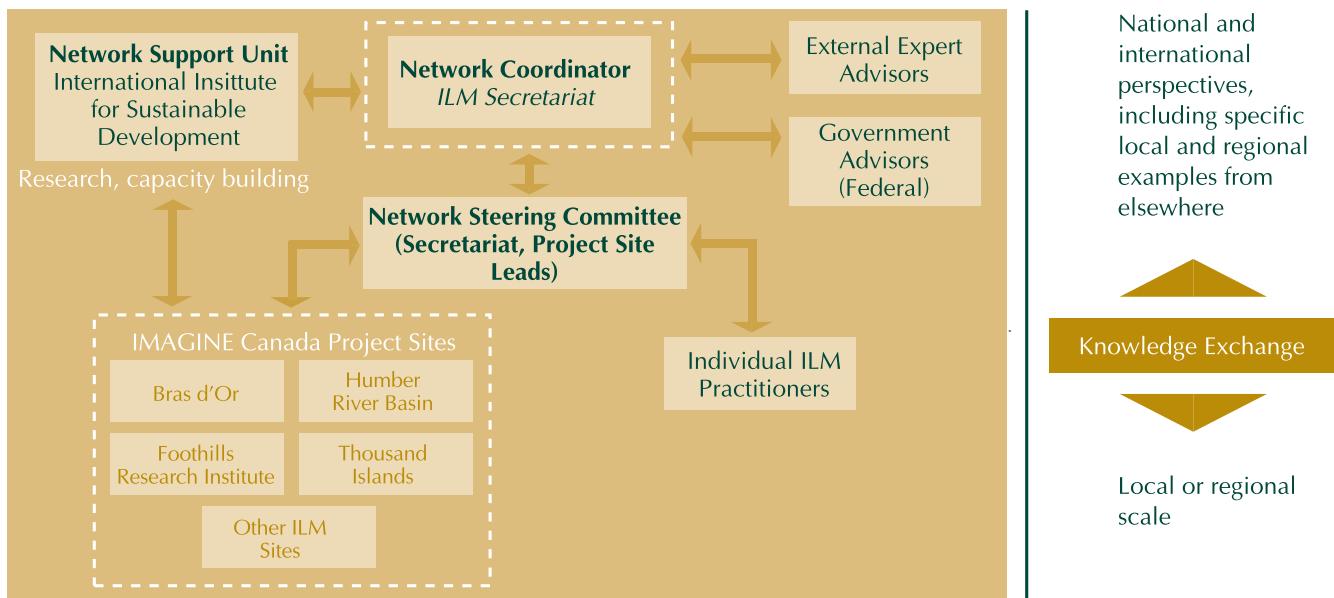
We asked a mixed Canadian and international group of IM practitioners how best to address the fundamental challenge of integration (PRI, 2005b). The result was a descriptive map of a centrally co-ordinated national network, which served to simplify and facilitate all the necessary exchanges, training, and integration requirements of regional practitioner communities (including facilitating peer-to-peer exchange among expert communities).

There was consensus on the need for some form of a central facilitation (co-ordination) entity, with active involvement by appropriately mandated authorities that are able to work across boundaries, with a longer term, big picture perspective of what is going on across Canada. Explicit reference was directed at this being a role for the federal government, since the scope and magnitude of the necessary information exchange, knowledge co-production, and capacity requirements is beyond the authority and ability of provincial governments, the private sector, or non-governmental organizations to facilitate or manage.

However, boundaries were not the only concern. Other pressing needs included security issues, information and data access (and management), and science and technology training and transfer, among others. The federal role in such a centralized network was defined in three ways.

- **Co-ordinate interactions across boundaries.** Facilitate necessary transjurisdictional and cross-sectoral interactions/ forums at relevant scales, clarify roles, responsibilities, and objectives to orchestrate management responses and reduce conflict in policy objectives.
- **Foster knowledge co-production.** Enable exchanges of information, data (including sensitive information or data), and expertise (including trans-disciplinary) and supportive forums in which management needs

Figure 1
Governance Structure of IMAGINE Canada



and risk and planning may be logically addressed (i.e., anticipatory approach to managing uncertainty).

- **Provide a big picture context.** Increase the impact and relevance of policy by identifying synergies or conflicting mandates or objectives to better meet the mandates of all (e.g., local, national, and international objectives). This would also help streamline resource demands (e.g., strategic/environmental assessments) by developing linkages between different policy areas.

To understand the potential of this network vision, and identify potential synergies with the mandates, roles, and responsibility of the Government of Canada, Environment Canada and GeoConnections Canada undertook a test application of the national network idea proposed in 2005 – Integrated Management And Geospatial Information Network for the Environment (PRI, 2009) (Figure 1).

Since the launch of IMAGINE Canada in 2008, the Secretariat, housed in Environment Canada's Science and

Technology Division, has focused on developing capacity, providing training and professional advice, supporting science, data, information, and knowledge acquisition (this includes policy and program information). The Secretariat has also worked with the International Institute for Sustainable Development (IISD), the Policy Research Initiative (PRI), and the Steering Committee to establish a suite of focused, supportive activities and research to address capacity and knowledge co-production priorities.⁵

5 All the planning and implementing is orchestrated by the Secretariat, with ongoing support from the advisory committees, which provides program and research or technical support (and peer review or validation), the IISD, which serves to deliver capacity to network members, and the PRI. The Secretariat function in the network is central to all activities, from synthesizing, identifying, and co-ordinating the necessary supportive activities, to outreach and training at the national and international levels.

Table 1
Types of Supportive Activities Contributed to Network Members by Role and Organization

	Secretariat	Government Advisors	Policy Research Initiative	GeoConnections Canada	IISD	External Experts	Steering Committee	IM Project Teams ^{a)}
Capacity Development								
Peer-to-peer training	■							■
Data and information support	■	■	■	■	■	■	■	■
Directed training (<i>delivery in specific fields of applied work e.g., consensus building, scenario planning</i>)	■	■			■	■		
Networking/outreach/partnerships (e.g., program synergies)	■	■	■	■	■			■
Research support (<i>lessons learned and other targeted technical or process information</i>)	■		■	■	■	■		■
Funding		■		■				■
Knowledge Co-production (integrating and transboundary activities)								
Mechanisms for information dissemination/sharing/exchange	■		■	■	■			■
Expert outreach (<i>and networking</i>)	■	■	■	■	■	■	■	■
Forums for knowledge co-production (<i>integrating science, data, policy, etc.</i>)	■	■	■	■	■	■		■
Integration across levels of government	■	■	■	■	■	■	■	■
Credibility and validation		■				■	■	■
Policy advice and context setting (e.g., <i>legal and regulatory context</i>)		■	■	■				■
Co-ordinating interactions, planning, and orchestrating engagement and activities of network members	■							■
Monitoring and assessment	b)		■					■

Notes:

These activities have been variously achieved through in-person training and workshop events among all network members, as well as on-line (web-based) training and information exchanges. As the project continues, we will continue in this vein, delivering additional peer-to-peer and other expert training events (on-line), targeted research (technical, governance, and practical science and technology), and lessons learned documentation and publication.

- a) Activities occurring regionally, conducted by and for regional network members. These regional activities receive further support from IMAGINE Canada, most of which is complementary or in addition to ongoing regional transboundary activities.

- b) Monitoring and assessment occurs within the Secretariat with regard to meeting the needs, priorities, and objectives of the network as a whole,

including delivery of specific elements to regional teams to enable them to address complexity and uncertainty (e.g., integrated planning and cumulative effects assessment). This is in contrast to the monitoring and assessment by specific government departments and agencies, and other authoritative bodies in the regions and centrally, which will be linked to specific mandates, program activities, etc.

The use of a centralized network provides a wide range of supportive activities to regional practitioners in a timely manner because it brings together expert professional communities capable of providing input, advice, and support on an as needed basis (i.e., addresses networking, engagement, and capacity requirements across boundaries) and provides a broader context for integrative work and research that expands opportunities and leverages ongoing program and research work (also reducing duplicative efforts), and facilitates knowledge transfer across Canada, and internationally.

Moving Forward – Next Steps

It is apparent that some challenges exist to whole system management (i.e., IM, ecosystem-based management, integrated water resource management, etc.) that are intimately connected to existing governance structures and approaches to managing issues. Given that many of these have to do with working across boundaries, cumulative effects and risk management, and big picture issues, many of which are international in their scope, one objective of IMAGINE Canada is to examine these in the context of synergies and linkages among existing federal priorities and

There was consensus on the need for some form of a central facilitation (co-ordination) entity, with active involvement by appropriately mandated authorities that are able to work across boundaries, with a longer term, big picture perspective of what is going on across Canada.

program activities. In other words, look at the full range of complementary roles, priorities, and activities and examine how integration would advance them collectively. Potential linkages would include the use of IM for more strategic and efficient information transfer and risk assessment to increase the efficacy of environmental assessments (regional EAs), improve the ability to address sustainable development and cumulative effects management, as well as coordinate plans to meet international objectives (e.g., biodiversity, climate change).

Over the next eight months, the Secretariat, IISD, PRI, and GeoConnections will publish a series of research and lessons learned insights based on experiential as well as experimental information from this work. Specific assessments dedicated to the roles, benefits, and opportunities for the federal government will be addressed. These include how the centralized framework could advance co-ordination and transfers across boundaries to better (and more rapidly) support planning and environmental assessment priorities, which would include consideration of science, innovation, and risk assessment, as well as geospatial data, data standards, etc., and the federal government's role in improved (better co-ordinated and

orchestrated) management and decision making through expedient use of best available data for knowledge co-production. In this context, it is also important to understand the existing capacity (both federal and non-federal) and capacity needs to support whole system approaches in Canada. ●

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First Nations Communities in Crisis Initiative (FNCICI)

In order to support the health and resilience of First Nations in acute situations, Health Canada established the First Nations Communities in Crisis Initiative (FNCICI) in 2007. FNCICI's approach recognizes that a community health program must be community-based and holistic in order to succeed. It also recognizes that in order to improve the overall health and well-being of community members, programs must systematically improve the social determinants of health, which often fall outside of Health Canada's mandate. In order to do this, the barriers incurred by different accountability regimes, reporting requirements and funding mechanisms used by different departments and agencies must be removed.

Health Canada is collecting evidence on Indigenous health issues by sponsoring literature reviews and analytical studies and by looking to past examples of situations where First Nations had experienced crisis.

FNCICI is also working with the regional offices of Health Canada and INAC and the Ontario Ministries of Aboriginal Affairs and Children and Youth Services to establish up to five pilot projects in First Nations communities in Northern Ontario. The pilot projects will identify community strengths and needs and translate them into comprehensive community plans that address key social determinants of health in culturally appropriate ways.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

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Introduction

Many of today's social and environmental problems will not be solved without a fundamental review of how we explore the interactions between humans and nature (Tippet et al., 2007). However, we not only need to investigate and better understand these interactions, but also to translate them into policy-relevant outcomes to guide resource management. This is not a simple task. The cost of failing to consider how individual local decisions interact across sectors and across spatial and temporal scales may be significant. In some cases, such costs may continue long after corrective policy actions have been taken (e.g., asbestos, ozone depleting halocarbons) (EEA, 2001).

can challenge confronting decision makers at all scales and across all sectors is in finding ways to ensure that relevant scientific knowledge is available (in real time and appropriate scales); and such knowledge and information can be appropriately considered within the context of complex regional planning processes, which must consider multiple disciplines, stakeholder groups, and objectives.²

Integrated management (IM) approaches, like the *Alberta Land Stewardship Act*, have emerged as promising ways to address trade-offs, explore risk, and consider best options within the context of socio-economic and environmental priorities over time and space, and across jurisdictions. Integrated management can be thought of as one or a series of approaches to managing diverse human activities at regional or larger scales that have developed in the last 50 years or more. It follows in a tradition that includes approaches, such as integrated resource management, integrated watershed management, comprehensive regional land use planning, and ecosystem-based management, among others (Hanna and Slocombe, 2007). While IM applications initially tended to focus on describing ecological and biophysical systems through the use of biological models, they quickly evolved into integrated "whole system" models that frequently used spatially explicit

Informing the Policy Process through Integrated Management

The substantial investments governments make in supporting science and technology reflects the importance of knowledge and research.¹ One signifi-

1 In the United Kingdom, the government set a target of 2.5 percent of gross domestic product (GDP) for research and development (UK, 2004). In Canada, the government committed \$5.1 billion dollars for science and technology initiatives in 2009 (NCE, 2009).

2 An example of such an approach is the recently enacted *Alberta Land Stewardship Act*, 2008, which emphasizes integration of policy and planning processes as well as the use of monitoring and research information across scales.

Box 1

The ten IM Projects and Methods

The selection and the evaluation of the case studies research was based on a variety of data sources and analysis techniques, including practitioner and academic literature reviews and interviews with key team members from the analyzed projects.

1. Participatory Integrated Assessment of Water Management and Climate Change in the Okanagan Basin (PIA – Okanagan)
2. Georgia Basin Futures Project (GBFP)
3. From the Corn Belt to the Gulf: Societal and Environmental Implications of Alternative Agricultural Futures (Corn Belt)
4. Willamette Valley–Puget Trough–Georgia Basin–Ecoregional Assessment (EvoLand)
5. Coast Information Team (CIT) program, British Columbia
6. Integrated Grid-Based Ecological and Economic (INGRID) landscape model
7. Sustainability Impact Assessment: Tools for Environmental, Social and Economic Effects of Multifunctional Land Use in European Regions (SENSOR)
8. Lake Balaton Integrated Vulnerability Assessment and Adaptation Strategies (Balaton)
9. Advanced Terrestrial Ecosystem Analysis and Modelling (ATEAM)
10. Pathway – A Vision for Tahoe’s Future (PATHWAYS)

models to explore uncertainty and cause-and-effect responses in the late 1980s and 1990s (Stevens et al., 2007). Although most IM projects tend to be set up to deal with specific local or regional issues, such as forest management, erosion, impacts of climate change, conservation planning, etc., they nevertheless share common features. In fact, the general framework for IM always includes the following steps:

- Assess past and current conditions and trends of the local and regional systems by collecting data, identifying indicators, and creating integrated models, which may be qualitative (descriptive) and/or quantitative.
- Build future scenarios and pathways of change using either existing or new integrated models (i.e., computer-based systems models) or

descriptive models, which assist in the envisioning of medium- and long-term conditions for the region of interest.

- Establish plans and objectives to attain these envisioned conditions.

At each step, IM project teams need to reach across different disciplinary, theoretical, and methodological boundaries through interactions between natural and social researchers, policy makers, managers, and other stakeholders. This means bringing together issues and all necessary stakeholders as part of the research process thereby allowing exploration of the linkages across disciplines. This continued integration is essential in developing insights into complex processes that often operate across more than one scale. Integration also requires adjusting research processes and outcomes so they provide the necessary support for decision makers (Parker et al., 2002). This would include, for example, a shift from more traditional question-based research approaches to more exploratory approaches focused on uncertainty and risk associated with diverse processes and potential policy choices.

Because IM projects are place based and problem driven, much of the progress in integration with policy making has been made in the particular context of individual projects, which has meant that the transfer of lessons learned is limited. In this paper, we compare and contrast the experiences and lessons learned from ten individual IM projects from across Canada, the

United States, and Europe (see Box 1) with a specific focus on two key challenges to integration.

- Integration across diverse knowledge domains (scientific, traditional, and local knowledge) is necessary to address the differences among scientists in various disciplines and between scientists and stakeholders, including decision makers and the community.
- Integration across diverse purposes (producing high-level scientific outcomes and being relevant for policy making and management) is needed to address the differences between objectives and outcomes required by scientists and their institutions, and outcomes relevant for resource managers and policy makers.

We provide examples of approaches used by the reviewed IM projects to illustrate how the integration of disciplines, stakeholders, and outcomes in the context of policy making was achieved.

Integration across Diverse Knowledge Domains and Stakeholders

By integration of this type we mean that different disciplines and knowledge communities are bridged and their knowledge fused together to address a research question (Tress et al., 2007), to contribute to a better understanding of landscapes and solve problems related to planning and policy development. This requires bringing together researchers from

Box 2 Examples of IM Stakeholder Groups: Inclusivity under the Alberta Land Stewardship Act

- All provincial government departments and decision-making boards and agencies
- Municipalities and local government authorities
- Industry, including companies with mineral rights leases and forestry management agreements as well as agricultural operations
- All Albertans

different academic disciplines with non-academic participants, including government officials, land managers, and the general public to address relevant questions effectively. With this approach, the IM project reflects the particular context of the landscape and societal actions including potential policy responses.³

Integration across different knowledge cultures including natural sciences, social sciences, and humanities is often challenged by a lack of common terminology and by separation of those using quantitative versus qualitative approaches. Rather, the process of integration of different disciplines should be conducted according to what is thought to be appropriate to the problem and issues at the particular landscape level. The goal is not to end up with an integrated model describing current systems, trends, and future scenarios as a finished product, but to adapt the model or IM process so it becomes a vehicle of problem exploration and a tool for communicating among diverse researcher and stakeholder groups (Parker et al., 2002).

Experience from the projects reviewed shows that the effective integration of data and models representing environmental, economic, and social domains at the landscape level would require attention in the early stages of project development. Most of the models were created by an interdisciplinary team of researchers involving stakeholders for consultations on issues such as the relevance of the results and recommendations. To enhance this process, it would be beneficial to review the accessible inputs, desirable outputs and products, and the planned model or process structure when the actual framework is being developed. Furthermore, it would be useful to review current data sets and monitored indicators to assess their suitability to reflect on changing socio-economic and environmental conditions, their usefulness in envisioning and monitoring future scenarios and policies, and their suitability in policy and regulatory planning. As suggested by the reviewed studies, this could be achieved by establishing an independent board to design and manage the information, assessment, and

³ This type of research is often referred as transdisciplinarity.

modelling, or assessment parts of the IM project. The board should consist of respected members of the various knowledge communities — science, humanities, technical/practitioner, and local — aspiring to a balance among them and within each community (CIT Review, 2005).

Finally, engaging with diverse stakeholder groups including local and regional resources, managers, and policy makers, in IM projects lets users participate in a debate about desired management alternatives while continually refining their understanding of what their priorities are, what could be considered as feasible outcomes and how they see sustainability at the particular landscape level and beyond. In this sense, an understanding of what sustainability means — and what it might entail — emerges from interactive engagement among researchers and involved stakeholders (Robinson, 2008). However, from among the analyzed projects, only a limited number considered an explicit investigation about what long-term sustainability means for the different stakeholders and reflected this in their methodological approach. Creating space for stakeholders and decision makers to express their views on sustainability at the landscape level and then considering them in the research process is an important step to increase

the sense of co-production and ownership stakeholders feel of the project's outcomes and their usability.

Needs for Integration across Diverse Purposes, Objectives, and Outcomes

In general, science and policy serve different purposes, and scientists and decision makers use a different suite of approaches and often have different values and perspectives. More important, perhaps, is that they tend to lack a mutual understanding of each other's knowledge systems. While scientists

often complain that their voices have been ignored by policy makers, the latter have also expressed dissatisfaction that critical information required for decision making is often not readily available, accessible or presented in a usable form (Sarewitz and Pielke, 2007). Integration is often rather weak in practice across diverse purposes, including cross-disciplinary research and the producing of high-level, scientific outcomes, as well as

the defining of research work according to relevant policy-making objectives (or outcomes); in other words, research that leads to information capable of supporting different management decisions and planning process needs.

In practice, the IM projects reviewed could be considered as analytical processes by which guides were

produced to provide insightful information on locally or regionally pressing issues without direct linkages to policy objectives. Still, each project did set out to provide this information to decision-making authorities within their region of study. In fact, most of the analyzed projects considered it important to contribute to increasing awareness among regional managers, planners, political leaders, and media. They used the developed integrated models and scenarios to identify policies and their impacts that could improve local and regional resource management. In some IM projects, the developed models also provided additional flexibility in the way patterns and practices could be explored, since scenarios could be changed or recombined to better explore ways to achieve targeted policy aims (e.g., Nassauer et al., 2007). While the projects may not have specifically targeted policy outcomes, they did create policy-relevant outcomes in four areas (also see Table 1).

- Capacity building for policy makers mostly focused on helping them learn how to use the developed model, how to create and interpret future scenarios, and how to deal with uncertainties involved in the model.
- Assistance in local policy development mostly centred on providing inputs for land-use planning, local management plans, and zoning.
- Planning processes helped policy makers understand linkages between the environment and human decision making within the integrated model.

- General recommendations for policy making were made based on the developed scenarios and models. However, such comments tended to be presented from the research perspective; this is included in all reviewed IM projects.

In general, the involved policy makers welcomed initiatives that develop greater links between scientists and the policy process. In the reviewed IM projects, the additional approaches applied to make the project outputs accessible for policy makers centred largely on highlighting the main results of the overall study (in visual as well as

text-based ways); making general recommendations for policy makers; and presenting follow-up questions raised by the research of relevance to the decision makers. Because these projects lacked direct links to explicit policy objectives or authoritative agencies, we were unable to track direct policy or management changes influenced by the outcomes of the IM projects. Consequently, we have very limited information about any actual policy changes or direct local actions that were taken to address recommendations or findings from these studies. We suspect that many of the projects' impacts, includ-

ing those in the policy arena, occurred after the completion of the projects and often without the knowledge of team members, who were not actively engaged in actual planning processes.

Finally, promoting policy relevance in the IM projects is not only challenged by the different needs of the diverse group involved, but also by the difficulty in imposing rigid scientific norms on interdisciplinary teams. There is a need for these teams to establish their own standards of excellence that value integration and co-production of outcomes with stakeholders (Parker et al., 2002).

Table 1
Tools Applied in the ten IM Projects to Assess the Current System

	PIA – Okanagan	GBFP	Corn Belt	Evoland	CIT	INGRID	SENSOR	Balaton	ATEAM	Pathways
Supporting implementation of the outcomes										
Capacity building	■	■		■		■	■	■	■	
Local policy development					■	■				■
Improving the planning process	■	■			■					■
Recommendations to policy makers*	■	■	■	■	■	■	■	■	■	■
Monitoring and assessing progress										
Regular data collection					■			■		
Recommendations for future policies and targets	■			■						■
Review of implemented actions					■					
Meetings with key stakeholders	■	■	■	■	■	■	■	■	■	

Note: * Recommendations to regional, provincial, and national policy makers.

The Way Forward

Academics, decision makers, and society at large have an interest in the success of landscape-level IM projects, because such approaches maximize the use of available knowledge and research within a region, much of which is distributed across these various stakeholder communities. Moreover, those with “stakes” in a region, either due to their research interests, family, or employment responsibilities, or simply because that is where they live, have a vested interest in contributing to any process that can improve local socio-economic and environmental conditions by capturing the complex interactions and interdependencies between humans and nature. Integrated management approaches assist in increasing the understanding within local communities of such interactions, conflicting priorities, and the necessary trade-offs by enabling stakeholders to envision pathways and scenarios in a policy-relevant manner.

Integrated management approaches are not, in themselves, the solution to land planning and risk management. Their role as learning and communication tools, while important, will have limited influence on policy or planning unless they are formally linked to explicit needs among decision-making communities. However, planning for effective integration needs to be done at all stages of the IM process, from formulating the project proposal until execution and evaluation of the project, not just at the conclusion of a study or project.

So, where, exactly, should IM modeling and scenario approaches fit into decision-making processes? We believe there is no single answer to this question but that, in fact, IM approaches should be included as a tool in planning processes to advance and facilitate a better overall understanding of environmental and socio-economic complexities within a region, including what their impacts might be in the future or within the context of things that are likely to happen outside a region. Integrated management could simply be viewed as an adaptive management and planning tool that serves to engage decision makers and other knowledge and research communities in a systematic way within a region.

We also see a value in looking to integrate the different knowledge domains and priorities held within research, management, and policy communities, so available knowledge may be used to advance our ability to identify, understand, and mitigate unacceptable short- and long-term costs that arise when decisions are made without fully considering uncertainty and risk. Scientific methods focus on verifying hypotheses, whereas policy analysis generally involves assessing conditions that are impossible to verify. Yet, even in the sciences, the goal is not to be “true,” as there are no truths, but to give the best explanation among competing models or hypotheses (Morgan and Henrion, 1990). This, in effect, is the unifying construct between science and policy objectives – to understand those things that we do not, or cannot know.

Most of the IM projects we have reviewed to date were initiated and driven by researchers within governments or at academic institutions, which are motivated by disciplinary or sectoral priorities (such as publishing papers in the case of academics, or meeting sectorally based mandates, in the case of governments). Managing, or even understanding complexities beyond these traditional lines of inquiry requires brainstorming, insightful research and knowledge sharing, and new analytical approaches that are capable of managing large, complex, and scale-dependent (time and space) information. Integrated management approaches that combine spatial data sets, projective analytical tools, and opportunities for mixed stakeholders to express their views on short- and long-term sustainability objectives represent a practical learning and communication tool to accomplish exactly this. By strengthening the science basis of models supporting IM approaches, they would also be able to provide quantitative assessments of specific long-term policy and management options.

To pass beyond the state of useful capacity and learning tools, IM projects will need to find ways to engage directly with, and therefore, support, the needs of mandated regional authorities. Several examples in various stages of development across Canada could be examined to:

- Explore how IM approaches can increase or support regional capacity to manage local and regional issues, such as cumulative effects as an

outcome of a number of uncoordinated human actions, risk, and regionally based environmental assessment. As well, look at how IM approaches streamline and increase the transparency of regional assessment, planning, and regulatory processes by creating a systematic and common platform for structured dialogue, knowledge exchange and sharing, and evaluation, using future scenarios and collaborative, interdisciplinary, and multi-stakeholder processes.

- Assess the value of IM projects in medium- and long-term planning and environmental assessment, by using them to explore potential development and management pathways, and contribute to trade-off analysis.
- Examine how IM has contributed to policy and monitoring directions, and policy choices, including the use of past and current trend data, as well as policy and cumulative impacts on both societal, economic, and biophysical elements.

- Identify opportunities for sharing lessons learned and experiences among policy makers, researchers, and other stakeholders who have been actively involved in IM projects. ●

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Although it is highly urgent and essential, intervention in sustainable development often appears to be a Sisyphean task, given the numerous obstacles, such as the rejection of scientific evidence and the fear of short-term economic impacts. There is also a need to get businesses, pressure groups, the public and various tiers of government to work together. Awareness of the gravity of the situation is proportional to stakeholders' willingness to get involved.²

Already, the definition of sustainable development includes ambitions that go beyond simply combating climate change, as this mission alone runs into a multitude of coordination problems

between the tiers of government in a single country, as is the case in Canada (Harrison, 1996: 10).

The question is posed with great acuity in the case of interventions that focus on one section of the territory: the citizens who live in or use the territory, groups pursuing a variety of aims, businesses operating there, and all of the tiers of government (from one to five) that are interested due to their national policies or territorial responsibility. It may be a matter of controlling use of land for storing waste, sites for encouraging wind power or hydro power production, flow of water in the rivers or integrity of the water, jeopardized by agricultural activities or tourism. How then, through the multiplicity of interested parties, can we preserve the rivers, wildlife and flora, air quality, soil use? How can we organize economic and social activity when many decision makers have the means to facilitate or hinder initiatives?

Air, soil and water are essential to humanity's survival yet are fundamentally indifferent to whoever makes—or fails to make—timely decisions: ultimately, they only respond to the laws of physics and chemistry. Yet people act based on laws governing power relationships in a territory, which are sometimes chaotic, conflictual and counter-productive. To organize the most optimal response to the challenges of sustainable development, we need to better organize the integration of human inter-

Utopia within Reach: Horizontal Collaboration on Place-Based Projects from a Sustainable Development Perspective

- 1 The author would like to thank Stefanie Bowles and Bernard Cantin of the Policy Research Initiative (PRI) for their ideas and advice, as well as for their support while the study was being produced.
- 2 This paper summarizes the results of a study commissioned by the PRI available at: <www.pri-prp.gc.ca>

vention; a horizontal management approach has already enabled some progress in terms of such optimization.

This article sets out the specifics for mechanisms for working together from an optic of implementing place-base integrated management approaches. It investigates the highly important challenges such collaboration must take on with respect to place-specific projects in comparison with collaboration in other contexts. It inventories existing mechanisms that are particularly appropriate to a place-based approach. To do so, it describes the actors and issues and sets out horizontal territorial initiatives. What many might characterize as utopian has already been achieved in a number of places around the world, where actors have deemed the issue to be important enough to justify sufficient investment in collaboration. Here, Thomas Moore's Utopia corresponds to the intimation of a situation that is both perfect and unattainable.

Elements to Consider

This section deals with the dimensions of place, sustainable development and horizontal management.

Place

By definition, any place-based project refers to a space that is simultaneously governed by a municipality, region, province, central government and sometimes even a binational or multinational treaty, or else an agreement among the peoples who share a single space, as is the case with the non-aboriginal and aboriginal peoples in Canada.

Collaboration on place policy or projects that deal with a specific place involves very specific challenges. For local populations and governments, such projects are more mobilizing than major national or international policies, as the impacts of such projects seem more immediate.

Place-based issues attest to governments' legal capacity to act. Concretely, they embody the physical identification of the tiers of government. No one wishes to waive their constitutional responsibilities and the associated jurisdictional sovereignty. In a federal system like Canada's, everyone claims to justify their relevance through the quality of their involvement. Place-based interventions are an opportunity to justify some relevance as a government body in the eyes of the public. As Harrison wrote (1996: 4-14), a number of other factors stimulate—positively or negatively—a given government's inclination to take action, such as constitutional jurisdiction, awareness of the issue's importance, the financial costs to be borne, sense of the ability to succeed, openness to potential conflict, perception of what the public wants, proximity of elections, etc.

Place-based projects involve particular issues because they have a direct effect on the lives of those who live in the territory or use it for recreation. These living spaces affect people's daily lives. They have a strong potential to mobilize, therefore. Moreover, places also offer potential for people to identify

with them: we're from this region or that sub-region. Developing or protecting a given watershed means addressing the various places the resident identify with. These issues exacerbate local populations' political sensitivities.

To organize the most optimal response to the challenges of sustainable development, we need to better organize the integration of human intervention.

Moreover, some factors negatively impact mobilization when it comes to place-based projects: the size of the territory, occupancy and the indirect nature of the expected impacts. There is more mobilization for a small, inhabited valley than there is for a remote and less known space.

Sustainable Development

As knowledge expands, it becomes clear that environmental issues involve a multitude of phenomena that affect the living practices of people in society. Interactions between these practices impact the quality of the environment. The population awoke to environmental issues due to remedial actions: damage had been done and it was necessary to attempt to return a site to its original state. Over time, the notion that it was important to take preventive action to avoid damaging environments gained currency.

This is what happened with the fight against climate change that is keeping environments from deteriorating. The factors that affect climate change are being targeted, and educational and enforcement measures are being taken to decrease CO₂ emissions, for example.

It then emerged that the preventive approach had to involve all human activity, as all actions have a direct or indirect impact. The notion of *sustainable development* emerged as a more holistic approach to fostering environmental protection: it is no longer a matter of simply directly protecting a site; now, for example, we must avoid pointless consumption to prevent pointless production that pointlessly consumes resources and puts excess pressure on environments. The more an approach refers to sustainable development, the more it involves all human action and thus calls on more actors from more tiers of government and demands more from all individuals.

Place-based projects deal with both the dimensions of remediating and preventing damage. They only partially address sustainable development.

Horizontal Management

Fifty years ago, it was taken for granted that every government body had its responsibilities and handled them as well as it could. As scientific knowledge evolved, we understood that the phenomena of human activity in one sector affected another. We also realized that physical, economic and social phenomena have a range of types of causes and involve various kinds of impacts. Governments strove to enrich how these files were handled by developing mechanisms for coordinating within tiers of government, consulting with groups and the public, and allowing the different tiers of government to work together.

These mechanisms includes:

- Interdepartmental negotiation
- Inter-government negotiation
- Coordination by hierarchy (authorization)
- Coordination by money (subsidies)
- Coordination by authority (aggregation)

The limitations of such mechanisms quickly emerge when they are used. It became important to find out how to foster a more “committed” and intense collaboration. The intensity of the actors’ collaboration had to be increased. Better integration of actions that stemmed from diverse hierarchies was sought.

The will to integrate manifests through various dimensions of horizontal management, from complete operational integration to collaborative governance, to active and more or less formal partnerships (Bourgault, 2002). Horizontal management fosters more adequate, economical, efficient and fast responses to problems that call for cooperation among a range of stakeholders. In doing so, it increases the legitimacy of government action. Horizontal management also has its drawbacks: among others, it takes time, a new culture of cooperation, and makes vertical accountability harder to establish.

The Actors

Place-based development projects and ecological issues put a wide variety of actors and interests into play. These actors have very diverse attitudes and behaviours.

Government actors tend to fight to assert their jurisdictional capacity (exclusivity), expertise and usefulness to citizens. Occasionally they collide on these terrains and projects are underdeveloped if they go forward! (Ross and Dovers, 2008: 255).

Non-profit organizations (NPOs) form around local or regional “causes”, to protect watersheds, rivers and natural environments. Such organizations are also present nationally for broader causes, and occasionally have a voice in a more local situation. Groups do not always push in the same direction: their interests do not always overlap perfectly, or they may have diverging strategies depending on whether the organization is local or national.

Citizens may feel directly implicated by place-based projects, or by the need to develop them to remedy a situation. Citizens do not always form a single, united and predictable block: factions collide over economic, political and social issues or over old quarrels.

The Challenges of Place-Based Projects

Place-based projects can generate conflicts in perspectives: nationally, something may be desired due to a national policy or internal politics (avoid creating a precedent, expressing the power relationships in a department or between two departments), whereas at the local level another solution may be desired which better matches peoples’ interests or the existing power relationships.

There is abundant documentation of inter-government conflicts in place-based projects: the policies of one tier of

government conflict with another tier's (natural resources, agriculture, land use, transportation, environment, etc.). One tier may want to demonstrate that it has more expertise, is more legitimate, more useful, more attuned to the public, etc. (Heller, 2001: 132-133-136).

Perspectival conflicts also occur in the context of local conflicts of which they are a recent episode: the project may feed conflicts between a region's entrepreneurs or may fan local political squabbles, etc.

Horizontal Initiatives

Methods of horizontal management, also called transversal management, materialize with needs and do not follow a single model. A single project may be an opportunity to generate a number of horizontal arrangements simultaneously. For example, a project may draw governments and groups from civil society as well as the public into a single horizontal management arrangement. In this case, citizens' groups may have reason to organize how they are participating in a project. It is also likely that each tier of government will coordinate its own approach and that arrangement between two or more organizations will arise. First, let us look at the array of cooperation mechanisms.

Reviews of the Literature Show that a Number of Horizontal Arrangements are Possible

Operational integration means secondment and pooling of financial and human resources around certain specific operational aims for a specific

period. For example, Ottawa's Integrated Threat Assessment Agency unites 13 government agencies and departments (including two from the provincial level) to produce assessments on an ongoing basis (Bourgault et al., 2008).

Corporate management unites the corporate plan, perspective, resources and coordination around a joint plan. Led from the top, it breaks down into agendas and includes bolstering and educational actions to have authority give way to a shared culture. This practice is appropriate to initiatives within a single tier of government (Bourgault, 2007).

A variant of the corporate management approach, the **Joined Up Government** (JUG) approach takes the form of directives from Cabinet (and mandate letters from the Prime Minister) to build a shared perspective and foster joint work (6, P, 2004; Ling, 2002: 623).

Integrated policy development is related to corporate management, but on a smaller scale: it only affects two or three sectors. It is also different in that pooling is neither imposed nor coordinated from the top, but comes from the participating organizations. Here, as it is primarily consensual, it is more fragile (Aoki, 1986; Ross et Dovers, 2008).

Action-centred forums make it possible to seek collaboration beyond the initiating government or community. This approach strives to produce and share information in order to influence public decision makers and get them to engage in a perspective and project (Lahey et al., 2002: 21).

Bridging takes the form of ad hoc agreements among tiers of government or citizen groups based on an existing project or an initiative that is already underway, in order to increase the initiative's impact while meeting the goals of the government body that is associated with it. This synergy makes it possible to keep parallel, competing and potentially antagonistic initiatives from developing, along with the efficiency losses that arise in such situations (6, 2004: 131).

The **open method of coordination** strives to have organizational actors adopt common goals and urge them to achieve these goals through influence and public dissemination of the results. It does not necessarily involve organizational cooperation <http://europa.eu/scadplus/glossary/open_method_coordination_en.htm>.

Collaborative governance involves consultation of citizens, local groups and local political bodies, to the point of jointly creating projects and monitoring their execution (Hirst, 2000: 146-148).

For place-based projects, it seems that a number of approaches can be combined: for example, collaborative governance to involve groups and citizens, bridging to tie the project into local initiatives, corporate management to properly coordinate each tier's action, operational integration to foster maximum effectiveness and efficiency in running projects (Ansell et al., 2008: 543-571).

Some Geographically Defined Achievements

A number of horizontal initiatives have done well when they bear the stamp of geography, such as the St. Lawrence Action Plan, the Québec maritime project, the model forest initiative in Gaspésie, the Saguenay-St. Lawrence Marine Park, the Federal Action Strategy for Greater Montreal, regional civil servant development centres and other support services that are pooled locally, the Estrie council of federal bodies, etc. Of these projects, some are exclusively federal at the local level, while others involve a number of tiers of the federal government and still others involve other governments, business and the public (Bourgault et al., 2002).

A number of these projects involved an openly independent provincial government. Clearly, the utopian vision of collaboration is within reach when promoters believe it is necessary enough.

Environmental Achievements at the Territory Level: From the National Level to Integrated Landscape Management (territorial integration)

A very partial review of the literature documents a large number of highly varied initiatives in this area. The examples below are simply to illustrate some of the successes. The literature reviewed does not provide a strict definition of the notion of success. However, our understanding of the texts has led us to consider “success” as the fulfilment of two conditions: an adequate achievement of ecological goals, through the contribution of a horizontal governance mechanism that functioned reasonably

well, according to the stakeholders. Here, a relativistic judgement of these situations is opportune: not all projects predefine their goals in a quantified way; aspects of new goals emerge during projects. Projects that meet 100% of all of their objectives are scarce; moreover, an infinite number of actors cannot be fully satisfied (Koontz and Thomas, 2006: 111-121). An exhaustive list of these “successes” would be impossible to put together.

Sweden's long tradition of environmental cooperation allowed the Persson government (1996) to announce an *environmentally sustainable society*. How? By focusing on responsible growth and management of resources, and combining ecology, the economy and employment. Following the “welfare state”, it proposed the “green welfare state” (cf. in particular *Delegation for Ecologically Sustainable Development, made up of the ministers of the environment, agriculture, taxation, elementary education, and the junior labour minister; the Sustainability Investment Program which includes the Local Investment Programs run by the Ministry Unit for Ecological Transformation and Development*) (Lundqvist, 2001: 319-337).

In the Netherlands, the management model (Rotmans-Kemp model) strives to incorporate sustainable development into the government's policies. The challenge is to show how the transition toward SD can be handled. Participation by actors from civil society and the private sector is considered very important. The goal is to privilege systemic innovations as the approach to developing public policy (Kemp et al., 2005: 12-30).

Integrated Landscape Management Projects generally refer to businesses that develop, protect and manage ecosystems. They focus on defined geographic zones (watersheds, etc.) within a given jurisdiction (Bizikova, 2009). A number of North American examples of such integrated territorial initiatives have been recorded: they involve US states, Canadian provinces or groups of both. This was the case in August 2001 with the Climate Change Action Plan (Bramley, 2002: 16-24). The World Commission on Dams (WCD) is another example of resolving conflict and drafting global public policy in the framework of a partnership process, in which parity and respect for organizational identities are critical to success (Brinkerhoof, 2000: 324-336).

Watershed organizations are an eloquent example of success in the area of reconciling the environment, the economy and society: cases have been documented in Brazil, Australia, Europe, Africa, the United States and Canada, in short on almost every continent, and with every type of political regime and societal tradition.

In Brazil, the government instituted a participatory watershed management system and created a user commission, a watershed management committee that fosters collaboration with the government and representatives from civil society (ability of the network and actors to disseminate the debate when perspectives diverge). Power related to water management shifts from the federal and state level to the level of local organizations and watersheds (Lemos et al, 2004: 2121-37).

In British Columbia, *Participatory Integrated Assessment of Water Management and Climate Change in the Okanagan Basin* (PIA) is based on collaboration and an interdisciplinary effort that unites universities, government agencies and local partners (Brizikova 2009).

To meet the water needs of the public, industry and other sectors, Washington State's Department of Ecology instituted an integrated management approach for the Yakima watershed (State of Washington, 2008).

Québec's National Water Policy created 33 watershed organizations on priority rivers. Subsidies help them with their efforts to collaborate on specific local objectives. The federation also receives support. An inter-departmental work group on the National Water Policy, coordinated by the « Ministère du Développement durable, de l'Environnement et des Parcs » (MDDEP) brings together 12 departments and agencies (Government of Québec, 2007).

For the Canadian government, many institutions are based on a strong combination of horizontal environmental policy integration and vertical environmental policy integration (HEPI and VEPI). Among its horizontal type measures, among others, Canada created the position of Commissioner of the Environment and Sustainable Development (CESD/CEDD) and the National Round Table on the Environment and the Economy (NRTEE/TRNEE), which also involves civil society and is deemed one of the coun-

try's most important horizontal measures (Cohen, 2007: 18-19). Various departments have formal arrangements for collaborating with communities, the provinces and each other (see, for example, the Bakvis and Juillet report released in 2004). Multi-department initiatives have been around for a long time, such as the St. Lawrence Action Plan (see Bourgault, 2002, the chapter by Gilles Corriveau, pp. 79-100).

The same goes for various councils governing conservation of sites and protected areas, etc. Also note the case of Australia, which adopted a regional approach to natural resource management (NRM) by changing how programs were managed and financed ("Natural Heritage Trust," "National Landcare Program" and "National Action Plan for Salinity and Water Quality") (Paton et al, 2004: 259-267; Dover, 2001).

For place-based projects, it seems that a number of approaches can be combined: for example, collaborative governance to involve groups and citizens, bridging to tie the project into local initiatives, corporate management to properly coordinate each tier's action, operational integration to foster maximum effectiveness and efficiency in running projects.

Conclusion: Utopia?

A number of eloquent examples attest to successful collaboration for achieving priority environmental objectives. When the primary participants have

decided to make sustainable development a sufficiently important priority, collaboration among the actors will get the required tools. A number of them have already been tested in the field.

Collaboration in places features some especially tough challenges. Developing and managing place-based projects may seem difficult, as they are generally close to citizens' real lives and easily become subject to various types of controversy. However, the literature is packed with examples of success in these areas.

Developing and managing place-based projects also features advantages that are uniquely concrete and mobilizing: most of the actors live near the sites being considered and are looking for satisfactory solutions, so they are not indifferent to the pace of the work or its results.

These projects need time to reach maturity before their fate can be decided: it is completely normal for a project to see adjustment difficulties at the outset.

The question of cooperation among human beings always arises in every type of organization and field: the

difficulties in cooperation are not always resolved. Success comes when all of the potential collaborators are convinced of the issue's importance.

Today, new knowledge about the environment, the dramatic nature of sustainable development issues, mobility of investment and speed at which information circulates are placing the problem of territorial development on a new scale: action must be more anticipatory and concerted, taken from the perspective of broad interest and the scope of the challenge must put it beyond short-term interests. Human beings have already achieved this. We have achieved many "utopias" ... when we put enough into it. ●

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Introduction¹

The challenge of integrating economic, environmental, and social considerations at all levels of decision making lies at the heart of developing practical approaches to advance the federal agenda for sustainable development. It is the subject of a large and diverse literature including frameworks, measures, and tools for undertaking integrated, sustainability-focused analyses across a broad range of issues from global risks to the impact of specific proposals. Much still remains to be done to refine and apply these approaches as an integral part of Canadian public policy development. Within the federal government, many arrangements and means for taking an integrated approach are in place, but

ization (Meadowcraft and Bregha, 2009). These fundamentals are resistant to reform and likely to persist for the near and medium term.²

In the interim, further progress can be made by mobilizing, sharpening, or making better use of existing or readily available frameworks, concepts, and tools as vectors for incremental and instrumental change, carrying more strategic, integrative approaches into the mainstream of federal policy making. Existing policy instruments that have a mandate for integration and support the delivery of sustainable development include environmental assessment, land use and resource planning, and departmental sustainable development strategies. For example, the Policy Research Initiative (PRI) has identified integrated land and water management as a “new paradigm” for optimizing economic, social, and environmental outcomes at a regional or landscape level, and is exploring how the federal government can use its tools and processes in policy development. Recently, the PRI, in collaboration with several federal agencies, organized a workshop on concepts and elements of spatial approaches to integrated management (SAIM) and their potential application within the federal government

This paper briefly describes certain aspects and examples of international experience with SAIM as part of a

remain unused or underused, at odds with a traditional culture of policy making and structure of governance based on sector and functional special-

1 An initial version of this paper was prepared as a background information note for the PRI Workshop, Ottawa, March 31, 2009.

2 To declare my colours, the premise and perspective advanced here is that of someone who is outside the federal government, but has some experience of its operations via secondment and consultancy. On this admittedly limited basis, I conclude that the degree of change necessary to come to grips with pressing sustainability issues and considerations is remote for institutional as much as political constraints in Canada, irrespective of the political stripe of the governing party. In that regard, of course, the Government of Canada is hardly alone.

Box 1 Concepts and Terms

Sustainable development is a process of positive socio-economic and biophysical change or wealth (capital) creation that meets the needs of all people and can be continued indefinitely without undermining the natural systems on which it depends or foreclosing the range of opportunities available to future generations. This process is one of continuous adaptation to evolving economic, environmental, and social realities. In policy-making terms, it involves planning or muddling toward a path to course transition in the state of systems that are always in flux.

Sustainability is a quality or condition of a course or process of development that can be continued indefinitely along the lines described above. It can only be analyzed subjectively against some set of normative values or accepted framework of principles or criteria of sustainable development.

Sustainability appraisal is the process or act of evaluating the effect of a development trend, proposal, or activity against the type of framework described above. As a policy test, it can be undertaken *ex post* or *ex ante* and all such determinations will be highly approximate, for example, framed as progress toward (or away) from specified aims or criteria.

Integrated approaches are widely considered to be indispensable when undertaking any process of sustainability appraisal. They encompass substantive and procedural characteristics, that is, an integrated analysis of the economic, environmental, and social effects and sustainability implications of actions and options and the co-ordination of procedures, methods, and tools for synthesizing information in support of decision making.

Spatial approaches are a distinctive group of planning tools and processes for land and water management of a defined geographic area or region. They are particularly useful to give effect to place-based sustainability appraisal at the landscape level and within an ecosystem framework that brings together multiple uses and divided responsibilities for their spatial and environmental integration with the potentials and constraints of the resource base.

larger convergence of trends and developments toward more integrated, sustainability-focused strategic planning and policy appraisal.³ There are three key objectives.

- Consider the role and scope of SAIM within a broader classification of strategic approaches to assess and evaluate the sustainability of development proposals and actions.

- Identify a number of SAIM-type processes, undertaken in Canada and internationally, where experience has been promising and may have wider application.
- Explore the opportunities and challenges for moving forward with the SAIM process design and development with some concluding observations (undoubtedly naive) on the prospects for their federal uptake.

Background Perspectives

The concept and principles of sustainable development are now firmly embedded in international law and policy, and widely referenced in Canadian statutes and strategies. Yet their practical implementation continues to present major challenges, including how to assess and evaluate the impact of development trends, actions, and options from a sustainability perspective – or sustainability appraisal for short. As used here, sustainability appraisal is a generic process that can be undertaken formally or informally under policy, planning, regulatory, or assessment frameworks. Ideally, a plural, “whole of government” approach is needed to inform all the choices and actions federal agencies take that might affect the delivery of sustainable development. From that perspective, the potential of SAIM is discussed in terms of its potential as an *ex ante* instrument for sustainability appraisal.

On Terms and Concepts

Although the terms “sustainable development” and “sustainability” are commonplace in policy discourse, there is

³ This material, *inter alia*, draws on work undertaken jointly with Barry Dalal-Clayton at the International Institute for Environment and Development. Other sources include Czech Republic (2005) and Sadler (2009).

remarkably little agreement on what they mean in terms of day to day decision making. For present purposes, these and other key terms and concepts are defined in Box 1. In brief, sustainable development refers to a direction and process of ongoing change, and sustainability refers to a condition or state of change at a particular time or place. Sustainability appraisal is any process of estimating progress toward or away from a reference benchmark that has two essential components: an integrated analysis of the economic, environmental, and social effects of development proposals or actions; and an evaluation of their significance against stated policy aims or criteria for sustainable development. In this context, an integrated approach will have the following dimensions: substantive integration of the different types of impact; procedural integration of analytical and consultative measures at key stages of the process; and policy integration of findings in decision making and implementation. Spatial or place-based approaches comprise a distinctive body of analytical and planning tools for integrated, sustainable land and resource management of a defined geographic area or ecosystem.

Frame of Reference

Sustainability appraisal covers a broad tent of thinking and practice, and draws from a menu of concepts, methods, and diagnostic tools to address development effects, issues, and linkages that are complex, multi-scale, lie at the interface of socio-economic and biophysical systems, and connect local,

Table 1
Spatial Dimensions of Types of Approach to Sustainability Appraisal

Paradigm/Stage	Relative Level of Use and Examples of SAIM Tools
Impact assessment of specific proposals	<ul style="list-style-type: none"> Moderate; SEA, cumulative effects assessment
Strategic planning/land- and resource-based applications	<ul style="list-style-type: none"> High; regional and local area plans, integrated watershed, coastal zone or oceans management strategies, some aspects of national sustainability strategies
Accounting systems	<ul style="list-style-type: none"> Low-moderate; certain systems and tools have spatial dimensions, e.g., well-being assessment and ecological footprint analysis
short-term decisions with global, long-term consequences. Broadly stated, a large range of integrated approaches and processes are used, or are potentially available, for this purpose, including SAIM tools. In abbreviated form, three main types of approach to sustainability appraisal can be identified, corresponding to the micro, meso, and macro levels of policy making. These consist of:	<p>As indicated in Table 1, SAIM-type frameworks and tools are applicable at each level. They find their most visible expression as large-scale land use planning and resource management processes that provide a means of spatial and environmental integration of competing options and activities and facilitate cross-sector reconciliation and adjustment of different interests through stakeholder engagement and interaction. In this context, PRI (2004, 2005a) has called attention to the potential of geographic information system (GIS)-based analytical models that have a number of integrative applications, such as identifying the interactions and cumulative effects of land use and resource development alternatives, evaluating their economic, environmental, and social trade-offs, and exploring different policy and management outcomes. This methodology (termed integrated landscape manage-</p> <ul style="list-style-type: none"> impact assessment and related forms of appraisal that address effects and consequences of specific development options and proposed actions; strategic planning and integrated management that set directions and allocate resources within a given sector or spatial framework; and accounting systems that evaluate progress toward or away from sustainability at the level of society, countries, or sectors of activity.

ment modelling or ILMM) is also promoted as a means to establish a more consistent, rigorous, and scientifically defensible process of strategic environmental assessment (SEA) of proposed policies, plans, and programs. It is also applicable to assessments of large-scale projects that are likely to have significant cumulative effects. Despite its acknowledged potential in these areas, ILMM is not yet widely used in Canada which reportedly lacks capacity to undertake this approach (PRI, 2005b).

Challenges to SAIM

Integrated landscape management modelling and other SAIM in Canada are still evolving as planning tools for sustainable development. Their role as a process of sustainability appraisal as delineated above is open to speculation but, *prima facie*, SAIM are broadly correspondent, particularly as a means of analyzing large-scale interactions and interdependencies among economic, environmental, and social aims and considerations. More arguable is the extent to which integrative analysis is undertaken within or against a sustainability framework, that is, to test the significance of identified effects. In principle, despite gaps and inadequacies, federal policies related to sustainable development should provide a “sufficient enough” framework against which a sustainability appraisal could be undertaken along the lines described. In practice, a robust approach will depend on the existence of a number of enabling conditions being in place including clear priority setting, implementation of the commitments made

in departmental sustainable development strategies, and mechanisms for their government-wide co-ordination.

Despite some progress on these matters, the Parliamentary Commissioner for Environment and Sustainable Development (CESD 2005, 2008) has identified significant weaknesses that have persisted for more than a decade. In 2005, the Commissioner noted, *inter alia*, that the quality of the third round of departmental strategies varied widely; implementation of commitments was unsatisfactory; and overall direction on priorities and co-ordination of strategies was lacking (CESD, 2005). These problems also continued, largely unaddressed in the latest departmental strategies or in the generalized guidance on their preparation. As a result, most strategies are not substantive plans for sustainable development nor do they reflect rigorous assessment of the impact of departmental policies and programs on sustainable development (CESD, 2008). In short, the patchwork of federal sustainable development strategies provides a less than coherent or consistent policy framework for integrated analysis and decision making.

The policy and institutional challenge of integration is also intergovernmental (and trans-border) with respect to spatially explicit approaches, which typically cut across policy mandates and jurisdictional boundaries, and involve a large and diverse cast of stakeholders. As a federal state, Canada has a complex regime of divided powers and overlapping responsibilities for land and resource management. Despite provin-

cial title to crown lands within their boundaries, the federal interest and reach in this area is considerable. It is exercised directly in the case of authority over offshore waters, national parks, or northern areas, co-operatively under formal or *ad hoc* inter-jurisdictional and trans-boundary arrangements, and indirectly through legal and policy provisions related to agriculture, environment, fisheries, First Nations, transport, and water matters. From a governance perspective, integrated land and water management becomes progressively more complex (though no less necessary) when moving from direct to indirect control, from the politics of intragovernmental to intergovernmental co-operation.

From a methodological perspective, the challenge is how to undertake a sustainability appraisal as part of SAIM; which procedural and analytical tools will work in this planning context? Broadly stated, there are three main entry points.

- Use an institutionalized procedure, such as SEA, grafting economic and social analysis onto this assessment mainframe as in the UK regime.
- Conduct parallel streams of assessment, linking findings at key stages following rules for integration as in the Australian process.
- Apply an integrative methodology such as multi-criteria analysis or a landscape cumulative effects simulator ALCES), as in the Alberta system.

The above modular approaches overlap; they are not mutually exclusive and could be variously combined, perhaps

in a phased manner moving along the continuum from partial to full integration. Depending on the spatial and policy context, the capacity for sustainability analysis may be built incrementally, relying on tested procedures or tools that are commonly used to assess economic, environmental, and social impacts, or experimentally, using new, integrative and interdisciplinary methodologies, such as ILMM. As an initial platform, there is considerable experience already with integrating social and, to a lesser extent, economic analyses into SEA and environmental impact assessment (EIA) using a suite of analytical and participatory methods. This more integrated form of assessment can either incorporate or feed into modelling applications.

A tool kit is needed for this purpose. No individual procedure or method, however versatile, will be sufficient to encompass the multi-dimensional scope of sustainability appraisal. In that regard particular attention needs to be given to critical thresholds and criteria for evaluating the significance of the impact of planning options. Table 2 lists examples of the types of tools from simple, rapid assessment techniques to computer-based methodologies that can be used at each generic stage of a SAIM process to impart sustainability assurance to planning and decision making. New packages and web books of tools and methods are coming on stream all the time, particularly in the European Union, which has commissioned several projects to advance the science and methodology for integrated

Table 2
Matching Tools to Tasks in Integrated Sustainability Assessment

Key Activities	Examples of Tools that are or Can be Used
Clarify need, scope and context of analysis	<ul style="list-style-type: none"> • Policy scanning and mapping • Vulnerability mapping • Baseline and trend analysis • Stakeholder identification and engagement
Determine issues and impacts	<ul style="list-style-type: none"> • EIA/SEA • Social impact assessment (SIA) and health impact assessment (HIA) • Economic analysis • Participatory methods
Development and comparison of alternatives	<ul style="list-style-type: none"> • Multi-criteria analysis • Cost benefit analysis • Comparative risk assessment • Modelling and scenarios
Evaluation of significance and identification of best practicable sustainability option	<ul style="list-style-type: none"> • Mitigation and adaptation • Threshold tests • Trade-off matrices • Policy compatibility analysis
Monitoring effects and evaluating outcomes	<ul style="list-style-type: none"> • Issues tracking • Trend monitoring • Value for money and results auditing • Policy evaluation

Source: Adapted and modified from Bonvoisin et al. (2006).

sustainability analysis (van Herwijnen and de Ridder, 2007; Weaver et al., 2007).

Profile of Canadian and International Experience with SAIM

As outlined above, the policy, governance, and methodological challenges to the application of SAIM for sustainable development are considerable but by no means insurmountable. Canadian and international experience has

much to offer in that regard. Particularly instructive are examples of the use of an integrated approach to tackle complex land use and resource conflicts or address cumulative effects or systematically apply sustainability appraisal as an integral part of plan making and approval. In this section, four such applications are profiled; they highlight possibilities and lessons that may be of wider interest to SAIM practitioners.

Box 1

Regional Forest Agreement (RFA) Process, Central Highlands, Victoria, Australia

Regional forest agreements cover most of the major production areas of native forest in Australia. They are based on CAR (comprehensiveness, adequacy, and representativeness) criteria for core forest reserves that were the product of much bargaining. As finally agreed, the criteria were applied to set aside a reserve system in RFA areas as follows: 15 percent of the pre-1750 distribution of each forest type; 60 percent of the existing old-growth forest, more if rare or depleted; 90 percent or more of high-quality wilderness forests; and all remaining areas of rare and endangered forest ecosystems.

With some individual variation as to detail, a similar RFA process was followed in each area comprising scoping, assessment, integration, and agreement. The RFA process can be illustrated for the Victorian Central Highlands region, an area of some 1.1 million hectares (56 percent of which is public land). A Comprehensive Regional Assessment (CRA) was conducted of environmental, cultural, economic, and social issues in the region. It included assessments relating to biodiversity, old-growth forest, wilderness, national estate, world heritage, and Ecologically Sustainable Forest Management (ESFM). The CRA report (released for public consultation in July 1997) may be compared in scope and scale to an impact statement in a conventional EIA process and was supported by a range of technical reports.

Under the Agreement, the conservation reserve system for the region has increased by 116,000 ha (64 percent) and nearly half the public land in the region is now in national parks or other reserves. The CAR reserve system meets the nationally agreed criteria for biodiversity, old growth, and wilderness. Benefits for industry include greater resource security in terms of certainty of access to forest resources and financial incentive for industry development. Social benefits include prospects for job creation in the order of 300 jobs.

Source: Ashe (2002).

Australian: Experience with Particular Reference to the Regional Forest Agreement Process

In the last decade, many legal and policy developments in Australia have been relevant to SAIM for sustainable devel-

opment. For example, the *Environment Protection and Biodiversity Conservation Act 1999* (at section 3A) specifies principles of ecologically sustainable development (ESD) that must be taken into account when deciding whether to approve a development initiative (sec-

tion 136) and undertaking a mandatory strategic assessment of fisheries managed by the Commonwealth (federal) government or exported (section 146). The draft assessment report is part of the information used in preparing a statutory fisheries management plan, which, *inter alia*, must certify that a fishery is ecologically sustainable. Similar requirements on fisheries assessment and management in Canada are urgently needed.

Intergovernmental (commonwealth-state/territory) machinery for resolving long-standing jurisdictional disputes and policy conflicts over land and resource management uses and values may have greater resonance for Canadians. The regional forest agreement (RFA) process represented perhaps the most extensive, large scale resource assessment and planning exercise yet undertaken in Australia. It had its policy basis in the National Forest Policy Statement (NFPS), a co-operative framework that sets out policies and objectives for Australia's public and private forests, means for their integration, particularly to resolve competing conservation and development uses and values, and respective roles and responsibilities of the commonwealth and state governments.

Key principles and elements of approach to apply this policy statement for large-scale, native forest areas included:

- creation of a forest reserve system based on principles of comprehensiveness, adequacy, and representativeness;

- protection of old growth forests and wilderness areas as part of the reserve system;
- commitment to ecologically sustainable forest management (ESFM) in wood production areas;
- comprehensive regional assessment (CRA) of the economic, environmental, and economic issues and impacts of forest plans; and
- preparation of long-term (20-year) plans for heritage conservation and sustainable development of large native forest areas that were the focus of deep-rooted conflicts (see example in Box 1).

Integrated Management for Large Oceans Management Areas

In Canada, functionally comparable to the Australian example, is the process of integrated management of large ocean areas being developed by the federal Department of Fisheries and Oceans (DFO). Although much still remains to be done, the groundwork has been laid for an ecosystems approach to oceans management, based on a hierarchical, spatial framework for planning and decision making (Figure 1). This framework incorporates a risk-based procedure to assess the comparative severity of ecological threats. It may be thought of as the infrastructure for ecosystem-based management (EBM), which aims to ensure that the structure (e.g., biological diversity), function (e.g., productivity), and overall environmental quality (e.g., water and habitat

Figure 1
DFO Process for Integrated Management of Large Ocean Areas



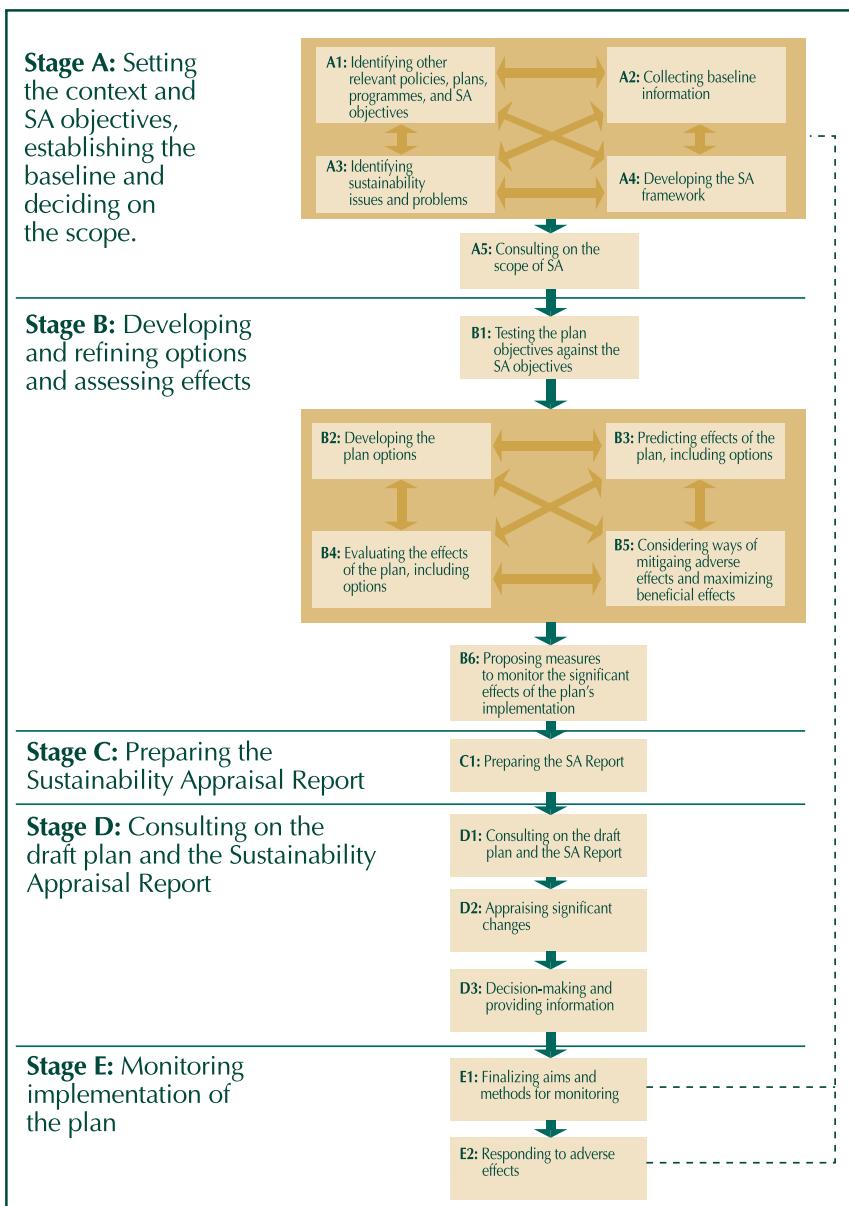
Source: DFO (2005) Ecosystem-Based Management in Canada's Marine Environment, DFO/2005-951. Figure derived from slide presentation of Siron R (2006) Ecosystem-Based Integrated Management and Planning in the Marine Environment: Potential Relationships with the Environmental Assessment Process, National Environmental Assessment Practitioners' Workshop, Whistler (BC), October 24-27, 2006.

quality) of marine systems are maintained at appropriate temporal and spatial scales (see shaded components of Figure 1).

A key to giving effect to this approach is the preparation of an ecosystem overview and assessment report (EOAR) on the state of a large oceans management area (LOMA) including trends and patterns of human activity and their interaction with valued ecosystem components. This process, *prima facie*, fills a major gap in current methodologies for assessing cumulative effects, applying the internationally

recognized driving forces-pressure-states-impacts-response (DPSIR) framework to synthesize information on ecosystem functions and properties, and identifying threats and risks to resource productivity and the quality of the marine environment. It also promises to provide a baseline reference point for SEA or EIA of the impact of specific programs or projects on offshore waters. The EOAR arguably may qualify or substitute for regional studies as designated under the ambiguous wording of section 16.2 of the *Canadian Environmental Assessment Act*.

Figure 2
Schematic of UK Sustainability Appraisal Process and Activities



Source: ODPM, 2005b

Experiences to date with this approach are best described by those who know the system well, although it is probably fair to say that progress has been slower than that hoped for originally. The main points relate to its large-scale geographic coverage, the attempt to integrate ecosystem and socio-economic objectives, the application of the internationally recognized DPSIR framework to synthesize information on ecosystem functions and properties, and to identify threats and risks to resource productivity (although, in my view, it falls short on this track).⁴

Sustainability Assessment of Land Use Plans, UK

The United Kingdom has a multi-level and territorially devolved system of SEA. It encompasses impact assessment of policies and regulations, SEA of sector plans and programs applied in accordance with European Directive 2001/42/EC, and a combined process of SEA and sustainability appraisal of land use and spatial plans mandated under the *Planning and Compulsory Purchase Act* (2004). This Act also meets the requirements of the Directive and represents a fundamental shift toward regional planning, adding a new tier of regional spatial strategies (RSS) to which local planning documents are generally required to conform. Comprehensive guidance on sustainability appraisal emphasizes that this process is to be applied as an

⁴ There is also the possibility that the EOAR may function as an REA-equivalent process under the ambiguous terms of section 16.2 of the *Canadian Environmental Assessment Act*. Section 16.2 opens the door to a discretionary role for “regional studies” to address cumulative effects outside the scope of the Act, but leaves unclear the nature of the relationship to a subsequent environmental assessment of a project conducted under the Act. As written, section 16.2 provides little or no incentive for a responsible authority to undertake a regional study that “may be taken into account” and (as far as I can determine) no supplementary guidance is available on the scope of this approach, how its results might help to meet the requirements of the Act, and which federal processes might qualify as a fit-for-purpose instrument.

integral part of regional and local plan making and embeds SEA concepts, such as baseline and significant effects, which apply to social and economic, as well as environmental considerations (ODPM, 2005). Figure 2 illustrates a schematic of the process.

A first generation of UK land use plans subject to a combined process of SEA and sustainability appraisal is now being rolled out. It is probably too early to make any sweeping judgment about the quality of sustainability appraisals or their contribution to successful plan making. However, emerging experience suggests their scope of application varies markedly, likely reflecting the range of statutory land use plans, from regional spatial strategies to local development frameworks, which are subject to this process. United Kingdom spatial plans typically would be smaller scale and address a more intensive range of rural and urban land use conflicts than would be commonplace in Canada. There are also indications of weaknesses at key stages of the process, such as consideration of alternatives and limited identification of critical environmental thresholds or bottom lines to be avoided (as opposed to objectives to be achieved). Another area of sustainability concern is the short shrift apparently given to analyses of social and economic issues, although an initial worry was that these would dilute the consideration of environmental effects. Despite these concerns (which may reflect difficulties of merging SEA and sustainability appraisal), the methods and procedures used should be of wider interest (see Therivel, 2004).

Regional Strategic Environmental Assessment Process, Alberta

The Alberta government is developing a regional strategic environmental assessment (RSEA) process in support of a cumulative effects management system (CEMS) and land-use planning framework (LUPF) for major regions of the province. It is intended to balance environmental, social, and economic objectives, and represents an attempt to address cumulative effects issues at their source, rather than reactively on a project-by-project basis. The problems and stresses encountered in the Oil Sands, where multiple large-scale developments have occurred in relatively close time sequence and spatial proximity to each other, appear to have been a particular driver in this respect. The Alberta RSEA process and CEMS and LUPF cornerstones are still at an early, prototype stage, but clearly this approach will be under close scrutiny in other parts of the country. The environmental assessment task group of the Canadian Council of Resource and Environmental Ministers is developing comparable principles and methodological guidance for RSEA that may well have wider application in Canada (Noble and Harriman, 2008a,b) (Noble and Gunn, this issue p.106).

In both instances, the case for RSEA is strongly made in relation to the limitations of project-level environmental assessment when addressing cumulative environmental effects. Key elements of the proposed Alberta process include:

- a statement of goals;

- process elaboration in relation to the geographic and temporal context of development;
- identification of valued ecological (and social and economic) components (VECs);
- regional baseline analysis and ecological characterization;
- a visioning exercise through discussion of public preferences and priorities for management;
- alternative development scenarios incorporating preferences and trend and state information;
- a GIS, which will be used to integrate diverse data sets (environmental, social, and economic), and express competing priorities;
- VEC-based assessment analysis of cumulative effects for each alternative; and
- choice of development strategy.

With certain variations, these are steps that form part of SAIM in general.

Concluding Thoughts and Some Ways Forward

Still missing from many SAIM processes is an explicit link to sustainability thresholds and precautionary criteria that are critical to frame uncertainty and risk in an era when environmental and resource limits threaten future economic and social prospects. An enhanced level of risk proofing or environmental sustainability assurance can be gained through impact zoning systems, whereby land uses are allocated and types and intensities of

Box 2 Components for Successful SAIM

- Responds to and anticipates pressing, policy relevant issues
- Identifies uncertainties in information base – what we know, what we don't know, what we need to know and where we need to focus
- Leads to better understanding of ecosystem functions, spatially integrating knowledge across different disciplines
- Encourages co-operation among all stakeholders to take actions to break chains of cumulative effects not just to provide information that helps others to act
- Provides a robust forecast of potential changes and future states including identification of risks and impacts worth worrying about
- Informs strategic decision making whether these take the form of development approvals (e.g., regional plans) or choice of management strategies (e.g., development paths)
- Establishes adaptive, precautionary safeguards for VEC, such as critical habitat, species at risk, resource stocks
- Imparts a level of environmental sustainability assurance (e.g., using a risk framework to relate the level of threat to key thresholds and indicators)

Box 3 Spatial Characteristics Related to DPSIR Methodology

- Multi-activity, area-wide focus [*drivers*, relationships to valued ecosystem components]
- Trend and change orientation [*pressures*, early warning signs of cumulative effects]
- Baseline and effects-based [*state* of the resource within a defined geographical area or ecosystem]
- Synoptic perspective and synthesis [understanding *impacts* on critical ecosystem features and functions]
- Decision linkage [*response* to findings, from development approvals to planning/management strategy]

permitted activity are adjusted to resource potentials and constraints. This will be particularly the case if this approach is undertaken as part of a process that included other proxies of SAIM good practice as generalized in Box 2.

Spatial approaches to integrated management applications could benefit from the use or adaptation of the so-called DPSIR model, which is a widely used and internationally accepted scientific framework. Box 3 outlines the basic components and characteristics of the DPSIR model, particularly as they relate to a spatial approach. For example the conceptual framework for the millennium ecosystem assessment (MEA), which links the functions and conditions of ecosystems to human well-being, is an elaboration of the DPSIR model (Millennium Ecosystem Assessment, 2003). It is considered by many to be a state-of-the-art framework representing one of the outputs of a five-year work process by over a thousand scientists.

Finally, a new architecture of approach is needed to provide a greater measure of sustainability assurance. The United Nation Environment Program proposes a spatiality based Framework for the evaluation. It is based on three cornerstones that are further elaborated in Sadler (1999; 2002) and Dalal-Clayton and Sadler (in press):

- a floor and ceiling “compass” of triple top lines (TTLs) of sustainability aims, principles, and criteria, and triple bottom lines (TBLs) of minimum thresholds and safeguards against which the potential effects of proposals can be evaluated;

Source: Millennium Ecosystem Assessment. 2003. *Ecosystems and Human Well-being: A Framework for Assessment*. Island Press, Washington, DC.

- a systematic procedure for assessment of the economic, environmental, and social effects and linkages of proposed actions; and
- a set of “rules of the game” for integrating and weighing their significance against TTL and TBL criteria to guide policy options and choices in support of sustainable development.

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Introduction

Canada's land resources and waterways are under increasing pressure from the cumulative effects of human development. Part of the challenge in managing these cumulative effects has to do with the way in which we approach decisions about land use and development. The current state of the art can be described as operating in three silos: project proponents operating in the silo of environmental assessment to get approvals for their projects, with governments as gatekeepers; the scientific and academic community operating in the silo of local and regional studies to understand micro- and broader ecosystem

Each silo is valuable in its own right; however, this piecemeal approach is often at odds with the pursuit of sustainable land management. This is not to say that another layer of federally legislated environmental assessment is required in Canada; rather, there is a need to better integrate current planning and assessment systems and to do so at the regional and strategic tiers if any one silo is to be meaningful in facilitating sustainable development.

A renewed interest is emerging in Canada in more integrated, regional, and place-based approaches to resource and environmental planning, impact assessment, and land management. The terminology used to describe this is as diverse as the concept itself. In this article we adopt "integrated land management" (ILM) as an umbrella term to capture the variety of ecosystem and place-based approaches. Central to this is the understanding that a more integrated and regional approach provides a better understanding of the relationships between environment and development, the opportunity to address varied environmental problems in a single coherent framework (Panel on Integrated Land Management, 1997), and for a wider range of roles and stakes to be integrated in planning, impact assessment, and decision-making processes (Cooper and Sheate, 2004; Creasy, 2002; Joao, 2007).

This article does not debate the merits of ILM, as this is the focus of several other important articles and initiatives. Rather, we introduce regional strategic environmental assessment (R-SEA) as a supporting framework to facilitate the development and assessment of ILM

Regional Strategic Environmental Assessment for Integrated Land Management

and landscape functioning, but with limited influence over project decisions; and land-use planners and environmental managers operating at the strategic level, above the project tier, focused on broader environmental planning and management concerns, while incremental stresses at the project scale continue to cumulate (see Duinker and Greig, 2006; Harriman Gunn and Noble, 2008).

strategies and plans. We first introduce the notion of R-SEA, followed by a brief example. We conclude with observations and future directions for R-SEA as an integrative planning and assessment framework.

Regional Strategic Environmental Assessment

In early 2008, the Environmental Assessment Task Group of the Canadian Council of Ministers of the Environment commissioned a study to establish a foundation and methodological guidance for R-SEA (Noble and Harriman Gunn, 2008), a process designed to assess potential environmental effects systematically, including cumulative effects, of alternative strategic initiatives, policies, plans, or programs for a particular region (Noble and Harriman Gunn, 2008). The R-SEA process is not meant to replace existing ILM, impact assessment, or planning processes; rather, R-SEA facilitates and shapes the development of ILM and regional planning, conservation, and development initiatives to ensure that development in a region occurs within the context of planned (rather than the most likely) outcomes.

The overall objective of R-SEA is to inform the preparation of a preferred development strategy and associated environmental management framework for a region (Noble and Harriman Gunn, 2008). It is an integrative, regionally based assessment process, operating above the project tier and ensuring that knowledge and understanding about the cumulative effects of future development possibilities

Table 1
Core Principles of R-SEA

Futures oriented	<ul style="list-style-type: none"> Focuses on identifying possible futures and the means to shape sustainable regional outcomes.
Alternatives-based	<ul style="list-style-type: none"> Identifies and systematically compares the environmental effects of alternative development scenarios to obtain a vivid picture of the likely consequences of different initiatives, management plans, or courses of action.
Integrative	<ul style="list-style-type: none"> An integral part of (and providing overall guidance to) the development of regional strategies and initiatives rather than serving as a framework against which already developed policies, plans, or programs are measured and assessed.
Adaptive	<ul style="list-style-type: none"> Treats strategies, policies, plans, and programs as experiments, expecting to modify and adapt them as new knowledge is gained through implementation, monitoring, and feedback.
Value ecosystem component-centred	<ul style="list-style-type: none"> Valued ecosystem components are the central focus of the impact assessment.
Multi-scaled	<ul style="list-style-type: none"> Takes into account perturbations and processes operating at multiple spatial scales within and outside the region.
Ecosystem-based	<ul style="list-style-type: none"> Scale of application is defined by ecological rather than political or administrative boundaries, with attention to important ecosystem relationships and pathways and processes of change.
Multi-sector	<ul style="list-style-type: none"> Encompasses the activities, policies, and plans of multiple sectors that may exist in a region or may influence regional processes of change and decision making.
Multi-tiered	<ul style="list-style-type: none"> The assessment informs and is informed by existing or proposed policies and plans influencing the region; it is also deliberately tiered toward downstream development assessment and decision-making processes.
Opportunistic	<ul style="list-style-type: none"> Embraces the opportunity to examine regional development through broader stakeholder debate, and to create or modify institutional arrangements in support of sustainability.

Source: Based on Dubé, 2003; Duinker and Greig, 2006; Noble and Harriman Gunn, 2008; Noble and Storey, 2001; and Retief, 2007.

inform the development and implementation of regional planning and conservation initiatives, and also trickle down to improve impact assessment and project-based decision making (Table 1). Emphasis is on ensuring the sustainability of a region and a desired level of environmental and socio-economic quality, rather than solely on mitigating the outcomes of the most likely development futures. In this regard, R-SEA is a means to facilitate the development of better ILM initiatives, enhance the performance of project-based impact assessment by setting targets and desired thresholds of change, and provide an early indication of the level of public interest and primary issues and concerns in a region.

R-SEA Framework

An integrated planning and assessment process, R-SEA provides for an early, overall analysis of the relationships between alternative futures for a region and the potential environmental effects that may emerge from those futures (Noble and Harriman Gunn, 2009). The R-SEA approach is designed to evaluate systematically the cumulative effects of multi-sector land uses and surface disturbances under different future scenarios (Figure 1). Applying R-SEA in support of ILM plan development and assessment involves the following steps:

- 1) A pre-assessment phase focuses on developing a reference framework, scoping the environmental baseline, identifying cumulative baseline change, and delineating key trends and stressors of concern.

2) An impact assessment phase, often technical in nature, identifies and assesses the environmental effects and associated impacts of alternative plan options, leading to identification and selection of a preferred direction.

3) A post-assessment phase focuses on moving forward to plan implementation and monitoring, and following up on performance and effects post-implementation.

The focus is on creating images of the future state of development, natural change, and cumulative change in a region, asking “what if” questions concerning alternative development options. The R-SEA methodology is about informing the development or evaluation of alternative strategic policies, plans, or programs for a region and then comparing those alternatives based on their potential for cumulative environmental change, and in consideration of various socio-economic, environmental, and planning objectives.

The R-SEA Approach: Great Sand Hills, Saskatchewan

There are no applications of formal R-SEA in Canada to date; however, a number of cases depict many of the good-practice characteristics of R-SEA

in an ILM context. One such example is the Great Sand Hills Regional Environmental Study, commissioned in 2004 by the Province of Saskatchewan.

Situated in the southwest portion of Saskatchewan, the Great Sand Hills is about 1,942 km² of native prairie overlaying a more or less continuous surface deposit of unconsolidated sands, with

R-SEA identifies early on the primary issues and concerns in a region, providing the opportunity for public debate of regional policies, goals, objectives, and alternative development options, and potentially minimizing conflict downstream in project-based assessments.

five dune complexes that total 1,500 km². The region is home to several endangered, threatened, and sensitive species, and is considered to be the traditional territory of numerous First Nations groups in Saskatchewan, Alberta, and North Dakota. The region is also characterized both by large-scale and long-term anthropogenic-induced surface disturbance, in particular livestock grazing and natural gas development.

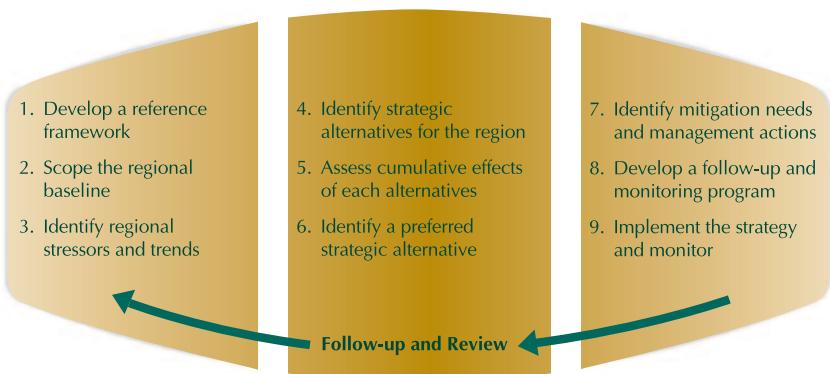
Regional land use planning in the Great Sand Hills started in the early 1990s, with the development of a land use strategy and land use zoning designations. However, such initiatives did little to manage the nature and pace of development in the region, or to provide specific guidance for future development in a way that would ensure that the long-term ecological integrity of the area is maintained while economic benefits are realized (Noble, 2008). In response to mounting environmental pressures and

growing conflict over land uses, a regional study was commissioned to provide a strategic assessment of human activities that cumulatively affect the long-term ecological integrity and sustainability of the region, and to provide recommendations, in the form of an integrated management plan, to guide future land use activities. An independent scientific advisory committee was appointed to oversee the assessment process.

The spatial scale of the R-SEA was multi-tiered, considering biophysical, socio-economic, and cultural boundaries, as well as the reach of existing policies, plans, and existing land uses that have the potential to affect the possible range of future land uses in the region. The assessment consisted of three main phases: a baseline that characterized the current and cumulative conditions of the region; the identification of past trends in land use and associated stress, conceptualized as “surface disturbance”; and the creation, projection, and assessment of alternative future land use scenarios and the recommendation of a preferred scenario and guidelines for implementation and monitoring. The assessment was completed in May 2007.

In the Great Sand Hills, the R-SEA facilitated the development and systematic analysis of alternative sustainable future scenarios and key environmental goals and objectives. Scenarios focused on alternative futures of development and conservation. Emphasis was placed on exploring the consequences associated with alternative spatial and temporal patterns of development, identifying a pre-

Figure 1
Methodological Framework for R-SEA



Source: Based on Noble and Harriman Gunn, 2009; Noble and Storey, 2001.

ferred future based on ecological, social, and economic objectives, and devising the means to achieve it. This process filled a critical gap in the family of planning and assessment tools in the region, providing a higher-tiered forum in which to identify key environmental issues and to discuss and promote a sustainability agenda for the region, while providing standards, thresholds, and efficiencies for downstream project development initiatives. In this regard, the R-SEA approach managed to move forward in the Great Sand Hills where other processes stopped short: identifying desirable futures for protecting the ecological integrity of the region while maintaining a sustainable level of human economic and cultural activity (Noble, 2008).

Moving Forward: Opportunities and Requisites for R-SEA Innovation

The benefits emerging from the application of an R-SEA type framework as a basis for assessment and regional land

use plan development are both procedural and substantive. Drawing on lessons from the Great Sand Hills, other Canadian-based regional planning and assessment initiatives, and international experience (see Noble, 2008; Noble and Harriman Gunn, 2008) we identify a number of benefits to R-SEA in support of ILM plan development and assessment.

- The R-SEA approach is a structured, yet flexible framework for ILM plan development and assessment, allowing for explicit analysis of trade-offs between alternative future land use scenarios, objectives, and targets, thus providing quality assurance that decisions are made based on an explicit set of rules, addressing the “fuzziness” of broad decisions at the regional and strategic levels.
- The R-SEA framework expands the current dialogue and conceptualizations of integration beyond resources, sectors, and the co-ordination of management efforts to also

- direct attention to the potential benefits of integration among related tiers and scales of planning, management, and assessment.
- A strategic approach to ILM plan development ensures that broader environmental and socio-economic objectives can inform the plan development process and options assessment, thereby ensuring that the identified plan of action represents the most sustainable (as opposed to the most likely) way forward.
 - Project-based impact assessments are often lightning rods for regional development issues; however, R-SEA identifies early on the primary issues and concerns in a region, providing the opportunity for public debate of regional policies, goals, objectives, and alternative development options, and potentially minimizing conflict downstream in project-based assessments.
 - The R-SEA approach ensures that cumulative effects are assessed at the most appropriate level, beyond the scope and spatial scale of the individual development project, and that management measures are built in to ILM plans to avoid or minimize, rather than solely mitigate, potentially adverse cumulative environmental change.
 - Sustainability targets, thresholds, and indicators of change identified during the R-SEA process serve as standards and inputs to project-based impact assessment, and establish a benchmark or goal posts against which the environmental performance of development initiatives can be monitored and evaluated.
- In those regions where R-SEA is used, there is opportunity to facilitate data sharing on common indicators, and to maintain a “living baseline” through combined regional and project-based environmental monitoring programs, thereby increasing the efficacy and regional relevance of project-based impact assessments.
- Notwithstanding the potential of R-SEA to advance ILM initiatives, and to integrate the current silos of planning and impact assessment in Canada, a number of constraints must be addressed if R-SEA is to be successful. Aside from the more technical issues, such as data quality and the availability of spatial data, the most pressing challenges to ensuring R-SEA success and the sustainability of ILM initiatives are largely institutional in nature (Noble, 2008, 2009).
- First, many regionally based applications, including R-SEA or ILM initiatives, occur outside the scope of any formal regulatory process. As such, many initiatives are often seen as “one-offs” (Dubé, 2003), with no real mechanism to sustain them as an integral part of regional planning and downstream project impact assessment. With a growing interest in regional assessment frameworks and sustainability planning at all levels of government, there is an opportunity for federal leadership in the formal adoption of R-SEA as a framework to guide the development of federally controlled land and oceans planning initiatives, and in the creation of an arm’s-length institutional arrangement to facilitate the process.
- Second, and closely related to the above, is the limited tiering that exists to ensure that the results of R-SEA and ILM initiatives provide direct input to guidelines, terms of reference, and standards and indicators for downstream project-based environmental assessment practices. Currently, a formal mechanism does not exist to link regional ILM planning or assessment initiatives at the level of policies, plans, or programs to project-based impact assessment requirements. The R-SEA and ILM initiatives are of little use, if there is no mechanism to ensure their influence over project-based development decisions.
- Third, the adaptive nature of R-SEA and related ILM initiatives is a challenge to the often static institutional arrangements in place to manage such processes. Although the initial application of R-SEA is a short-term exercise, implementation of the resulting ILM initiative and monitoring of its performance is not. Institutions must be willing to make long-term commitments to initiatives that emerge from R-SEA, and be willing to accept that the plan or policy implemented may need to be revisited as conditions change. Adaptive management and the capacity to adapt are critical to the long-term success of ILM initiatives.
- Fourth, this long-term commitment requires federal re-investment in basic environmental monitoring. As unattractive as monitoring may seem, it is

central to measuring the success of any strategic, ILM, or other planning initiative. Monitoring of this sort cannot be achieved with development proponents operating independently in their monitoring and reporting efforts. There is a federal opportunity to establish standards and indicators for both coarse- and fine-filtered monitoring programs in those regions where R-SEA is implemented, and to follow up and monitor performance on a long-term basis.

Finally, R-SEA requires leadership from the federal government as well as a partnership with provincial governments. Any ILM initiatives demand inter-agency and inter-governmental collaboration with agencies working in partnership. Ideally, this requires a common vision. At a minimum, it demands commitment and clear delineation of roles and responsibilities for implementation of results and recommendations emerging from R-SEA. Many of these recommendations may be beyond the scope and authority of the government or government agency in charge of the assessment process. Thus, R-SEA requires a degree of government and inter-agency collaboration not typical of traditional project-based environmental assessments. It is here where federal leadership and federal institutional responsibility for R-SEA is central to success.

...there is an opportunity for federal leadership in the formal adoption of R-SEA as a framework to guide the development of federally controlled land and oceans planning initiatives, and in the creation of an arm's-length institutional arrangement to facilitate the process.

Conclusion

The current approach to development decision making in Canada is often to predict and identify ways to mitigate the most likely effects associated with a proposed project or land use activity.

There is much less attention to asking whether the proposed undertaking is the most appropriate form of land use and development, or whether the potential cumulative effects of such actions are in conflict with broader regional or national sustainability goals or desired future conditions (Duinker and Greig, 2006; Harriman Gunn and Noble, 2008). Ensuring the sustainability of Canada's land resources and waterways requires a more proactive and integrative framework than

currently achieved through either conventional project-driven impact assessment or regional studies and planning initiatives. It requires a supporting strategic framework to identify and systematically assess the implications of alternative futures and strategic initiatives within a region, prior to implementing a preferred development plan or predictive framework to evaluate the impacts of proposed development actions. We believe there is considerable promise in R-SEA as a supporting framework for the integrated assessment and development of ILM initia-

tives, but for such a framework to be successful, there is a need for a federal champion and commitment to leadership in place-based, and spatially relevant planning and assessment processes. ●

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Integrated Management: A Public Health Example

The Healthy Alternative Lifestyle Project was established in 2005 to improve the supply and consumption of healthy food to 14 small isolated communities in Quebec, which were experiencing restricted food choices associated with high transportation costs, declining employment options and a lack of social support networks. With its 20 partners the three year project aimed at lowering the costs of supplying a healthy diet, creating awareness of the benefits of healthy eating and testing the Sustainable Communities approach which focuses simultaneous intervention across social, environmental and economic realms. The Coasters Association, a Lower North Shore community group, was the lead and main point of contact for the project. Partners in the federal government included the Public Health Agency of Canada, Indian and Northern Affairs Canada, and Fisheries and Oceans Canada. Other partners

included provincial Ministère des affaires municipales, des régions et de l'occupation du territoire du Québec and municipal governments; local boards and associations; transportation companies; retailers and food suppliers; and financial institutions.

Outcomes included a healthier food supply by improving cooperation with retail, food and transportation service, establishing community gardens and creating awareness of the Food Mail Program (INAC). New social supports included community kitchens, Meals on Wheels for seniors, and nutritional sessions in schools. An economic development project to harvest and process regional wild berries was also established. The final evaluation report, prepared by the Population Health Fund, focussed on the project as a whole rather than the effectiveness of each partner's funding contributions.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

AAFC Geomatics – The National Land and Water Information Service (NLWIS)

In March 2009 Agriculture and Agri-Food Canada launched the exciting new **Agri-Geomatics** website as part of the National Land and Water Information Service (NLWIS) project. This project benefited from the support of provincial governments, some municipal governments, as well as from federal departments and agencies, including Environment Canada, Natural Resources Canada and Statistics Canada. The Agri-Geomatics website provides a one-stop portal for interactive maps, planning tools, expertise, and geospatial data dealing with a wide range of information about agriculture and the environment. The developers of the site have pulled together data from a wide range of sources using Geographic Information System technology, providing interactive maps that help to visualize and explore data,

making the information more accessible. The website provides expert help to apply and interpret the information.

Currently, there are more than a dozen geographic applications available in Canada's two official languages. For instance, the Plant Hardiness Zones of Canada is very popular with Canadian gardeners and the "fence calculator" can map out and project the cost of fencing off an area. The data and tools housed by the Agri-Geomatics site also provide useful information that can be used in planning and decision-making by governments, producers, planners, and land-use managers across Canada, creating a knowledge base that can be shared.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

The Federal Family on Community Collaboration

The Federal Family on Community Collaboration is an informal community of practice which brings together federal officials interested in collaborative action to improve the understanding of "place-based" approaches, their potential to improve well-being at the community level, and related implications for the federal government. The Family's work focuses on learning how social, economic, environmental and cultural issues intertwine and affect local communities. The network strives to improve federal engagement and action by focusing on key concerns such as policy coherence, authenticity, shared accountability, data sharing and trends relating to the federal government's roles and interests in communities.

The Family's core membership consists of about 10 colleagues working across federal departments, including Aboriginal affairs, culture, public health, immigration,

natural resources, public safety, rural development, statistics, and social development. The group is governed by principles of combined strength, sustainable impact, mutual learning and trust. Members meet twice monthly to discuss and advance issues of shared interest, identify potential partnerships, discuss challenges, explore the optimum federal role in communities, and develop new ideas. The Federal Family has contributed to horizontality and collaborative efforts within the federal government through the collective planning of a "Collaborative Community Initiatives Speaker Series" program, drafting and workshopping of a paper on place-based approaches to policy, establishing an interdepartmental working group on community data needs, and fostering a multi-sectoral research network on place-based approaches.

A more detailed description of this initiative can be found on the Policy Research Initiative web site at <www.pri-prp.gc.ca>.

