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Introduction
The coastline of Nova Scotia is more than a provincial resource, it is a Canadian resource. The Nova Scotia coastline is extremely diverse and it includes the full range of temperate climate shores from rock cliffs to barrier beaches and extensive salt marshes. Understanding the geological, biological and process complexities of these shores and managing their use by diverse interest groups is a challenging job which requires much greater integrated effort and better financial support.

1. Promotion and safeguarding of provincial coastal resources

All of the coastline of Nova Scotia should fall under regulation for protection against the adverse effects of development. At present DNR expends considerable effort trying to justify designating a piece of shore property as a protected beach. By the time pertinent information is gathered and the beach is designated as protected, it has either been developed or negatively impacted to such an extent that it is almost impossible to save. Instead, if all shores were protected by the province, developers or individuals would have to make their case for building structures, homes or other infrastructure. If this was the case, clear rules and regulations would have to be developed to maintain consistent coastal management policy across the province. Many of the provincial acts pertaining to the coastal zone need updating or redeveloping. There is no overall coastal management policy for the province as raised by the Fournier commission regarding Digby Neck, NS. Present reviews of requests for development in the coastal zone by regional offices are inconsistent because of lack of guidance and support from consistent provincial policy. There is a lack of sound scientific background in many cases to make informed decisions on applications.

Shore types are often closely interrelated. DNR protects (under legislation) beaches. It is ineffective when sediment supplying the beach is from an adjacent cliff or shore which is not protected (legally) from the installation of shore protection structures. Beaches need sediment to adjust to changing environmental conditions so if the adjacent shore is prevented from eroding, the beaches will receive less sediment. Furthermore natural sediment pathways between parts of the coast should be preserved to maintain a natural succession of coastal features and habitats.

Shorelines are subject to different rates of change as a function of their elevation / morphology, composition, exposure to different processes and their stage within geological evolutionary cycles. There is no complete inventory of shore types and their stage of natural development and evolution around the province to enhance our scientific understanding and provincial policies for different shore types.
2. Advising, communicating and providing sound information to the public

The lack of a provincial coastal management policy has resulted in a lack of leadership and guidance for municipalities which has resulted in inconsistent development policies. This has made it difficult for DNR, the front line department in many issues, and led to dissatisfaction with DNR policies regarding protected beaches because present laws do not cover the complexity of issues arising in the coastal zone today. Accordingly, inconsistent decisions are made, eg the bridge to nowhere on Kingsburg Beach—good advice on protecting dunes but conflicting advice on how to address the bigger issue of public safety, and protection of coastal resources. Coastal management policies enforced by DNR must be consistent province-wide and based on scientific principles so that they can be justified and better explained to the public.

The recent growth of large numbers of community groups focusing on coastal issues is systematic of ineffective management of coastal resources by all government departments and increasing distrust by public regarding development along the coast (resource or infrastructure).

The communications climate has changed dramatically in the world, any group can rapidly get provocative messages out to the public and media through U-Tube and other electronic means. This poses a real challenge for scientific and governing groups to ensure that correct information gets out to the public.

There are few follow-up investigations by DNR of the consequences of decisions about coastal development. Time, personnel and financial constraints are no doubt the problem. Learning the consequences of their decisions and making them available to the public would improve DNR transparency and informed decision-making. There has been little long-term investigations of the consequences where permits were issued for various coastal infill, armouring or other alterations to the coast. Regulations can only be effective if their consequences are reviewed and our knowledge improved.

3. Promotion of long term coastal sustainability

Within DNR there is a diverse and dedicated group of scientific and technical experts, which in some cases could benefit from improved collaborative efforts within the department. For example, the Mineral Resource Branch of DNR has recently focused efforts on better understanding the geological framework and geohazards of present shorelines. Parks & Recreation Division who manage parks and protected beaches and reviews applications for development in the coastal zone could take advantage of this expertise. Parks & Recreation Division appear well-equipped in forestry aspects and work closely with biological groups but there is currently a lack of people with expertise in coastal geology or geomorphology. Geological/physical expertise could assist in reviewing development proposals and selecting coastal properties to protect for the future. As an example, present efforts by DNR are focused on acquiring land along the present outer coastline but as sea level rises some of the best beaches in the future will be developing in the estuaries. As the outer shores are broken down and eroded, sediment
will be deposited in the estuaries. Geologic expertise on long term coastal evolution would provide a long-term, broader perspective.

4. Diversifying opportunity and moderating relationships between other provincial groups

There are conflicting users and regulators in the coastal zone of Nova Scotia, in particular the Departments of Transportation, Public Works, Environment, Aquaculture and Fisheries and Natural Resources. There is room for improved collaboration and consultation on remedial actions that are taken along the coast. During emergency situations where for example, roads are damaged during storms, repair would benefit from prior planning on the establishment of transportation alternatives. Broader long-term environmental planning for the future, taking into account issues such as rising sea level and increasing intensity of storms are extremely important when repairing or replacing coastal roads. The jurisdictional aspects are so complex, the Ecology Action Centre produced a pamphlet for the public on how to navigate the maze of jurisdictions in the coastal zone.

5. Clarifying responsibility and stewardship - geoscience information, geohazards etc

The Geological Survey of Canada Atlantic (GSCA) established a program for monitoring physical changes along specific shores in Nova Scotia in the late 1970s because of the elimination of coastal expertise in NS Environment and because of an absence of coastal geology activities at DNR at that time. We have worked closely with the Parks & Recreation Division and the Mineral Resource Branch on many issues but the connections could have been stronger. Our activities may have delayed DNR getting involved in similar aspects but with our shoreline monitoring program being curtailed in 2006, there is a real need for DNR to get involved. DNR has recently initiated susceptibility mapping of shores to coastal hazards in areas not covered by GSCA activities, namely the Antigonish and St. Margarets Bay areas. GSCA investigations concentrated on barrier beaches and till shore cliffs along the Atlantic Coast of Nova Scotia. There is very little information available about rates of change along rock shores of different lithology, eg. in the Sydney (CBRM) area or the Bay of Fundy, or about rates and types of changes within estuaries or more wave protected shores. Some local universities, e.g. St Marys Geography Department have expertise in marshes and other coastal issues and there could be better cooperative activities.

Monitoring changes at select representative shore types within the four coastal environments of Nova Scotia is time consuming but provides staff with a better understanding of their dynamics. New accurate DGPS technology allows extremely accurate and better longshore coverage. The analysis of shoreline change using georectified aerial photography and high-resolution satellite imagery provides better understanding of the interrelationships between adjoining shores and rates of change over larger areas that planners require. New techniques such as aerial Lidar and BathyLidar mapping provide a better quantitative reference base for measuring coastal changes over
larger areas in the future. No one strategy addresses all questions that arise, but a mix of approaches and working closely with other disciplines, departments and academia is the best strategy given limited resources. Developing key questions about coastal stability, geohazards and safety and security issues and addressing them before they reach crisis stage is very important in gaining public trust.

6. Reinforcing the need for adequate funding
With roughly 7600 km of shoreline and a complex mix of issues, (e.g climate change, development pressures, conservation, aquaculture, fisheries, tourism, public access, transportation, cultural heritage, safety and security), and no coastal management plan in place, a more collaborative, concentrated effort will be required to achieve effective planning, guidance and control of coastal zone activities. A more coordinated effort is required by all government departments (provincial and federal) and universities in dealing with the coast. There is a need to move beyond a band-aid approach to solving coastal issues. A substantial increase in financial and personnel support is required if a robust framework for addressing complex coastal issues and an effective coastal management policy are to be achieved in Nova Scotia.