

Assessing Community vulnerability and adapting infrastructure development to a changing Northern Environment: the Example of Tuktoyaktuk NT

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The hamlet of Tuktoyaktuk is located on the shores of the Beaufort Sea at the mouth of the Mackenzie River, and is one of six communities in the Inuvialuit Settlement Region, Northwest Territories. The community is currently the focus of a number of infrastructure projects anticipated in the near term including: wind energy generation, landfill abandonment and restoration, residential and commercial development, road construction, airport improvements, oil and gas exploration and exploitation, harbour expansion and shoreline protection.

Effective planning and management strategies for these activities will require an adaptive approach, both to address the vulnerabilities associated with bio-physical responses to changing climate patterns, and respond to the pressures associated with socio-economic development. Several current initiatives of the Inuvialuit Land Administration (ILA) in the management of these activities illustrate the importance of innovation and adaptation in response to emerging opportunities and constraints in a changing landscape .

Changes to permafrost thickness and extent pose geotechnical challenges for the proposed Mackenzie Gas Project and for construction of the proposed Inuvik to Tuktoyaktuk all- weather highway, a strategic link in the national highway system and the first highway in Canada that reaches the Arctic Ocean. The ILA is collaborating with the proponents and regulatory agencies to develop adaptive approaches to the management of these projects. The objective is to incorporate adaptive construction strategies which would anticipate changes in the permafrost substrate and identify appropriate construction practices.

Increased shoreline erosion along the Arctic coast is associated with rising sea levels, increased storm frequency, longer open water seasons and permafrost degradation. These changes pose significant challenges for shoreline protection, to the extent that significant portions of the community may be moved from shoreline areas. The ILA is collaborating with the Hamlet and the Federal government to develop more effective shoreline monitoring strategies, to identify areas of high vulnerability to shoreline erosion and to develop management strategies for continued community development.

Thirdly, other socio-economic initiatives will drive a wide range of community development processes in the community. A range of strategies are currently under review as part of a community planning initiative. The ILA is working with a wide range of proponents, agencies and municipalities to develop adaptive community planning initiatives which will recognise long term planning requirements for community growth.