

Community Vulnerability In the Western Arctic: A Regional Perspective for the Inuvialuit Settlement Region

F. Duerden and E. Beasley
Ryerson University

1) CONTEXT

There is little doubt that the environment in the western Arctic is changing, and while there is much speculation about the way in which communities will respond as infrastructure, natural resources and economies are variously affected, it is generally accepted that their vulnerability will be a function of historic exposure to stress and adaptive capacity. Based on field work conducted in 2005 and a comprehensive review of secondary sources, this poster explores historic responses of communities to stress, motives for contemporary shifts in land-use and population, and the need for a regional perspective in addressing issues arising from environmental change.

There are six communities in the **Inuvialuit Settlement Region (ISR)** with varying population sizes (Sachs Harbour: 120, Holman: 420, Paulatuk: 312, Aklavik: 631, Tuktoyaktuk: 1,010, Inuvik: 3,586). Individual communities have peculiar geographies reflective of location, history and economy, but they are also united through political context, commonality of experience, exposure to similar stimuli and through patterns of interaction. Consequently, any prognosis about the manner in which places may be impacted by environmental change must consider local and regional contexts, exposure and response to stress in community memory and ambient stresses in the regional settlement system.

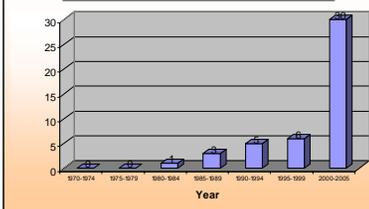
2) HISTORICAL and CONTEMPORARY STRESS

Archeological remnants suggest that settlement patterns in the ISR have evolved and changed as a response to stress in the region. Figure 1 illustrates the rise and abandonment of community sites as well as the settlement pattern which currently exist today (Hargrove in Wonders, 2003). The six communities which remain are relatively young, dating back some seventy years, and can be viewed as the most recent stage in a process of settlement evolution conditioned by opportunity, stress, external stimuli and local conditions over the past 150 years.

As of the late nineteenth century, the Inuvialuit population shifted from being semi-nomadic to sedentary as whaling stations and trading posts became nodal points that eventually became permanent settlements. Subsequently, populations were exposed to a litany of events that shaped both settlement and attitudes towards change. These included the growth and collapse of whaling (and with it, ecological modifications), the periodic growth and collapse of fur trading, disease (slaying up to fifty percent of a community's population in a single year), government settlement rationalizations, mega-projects, toxins in the environment, and now a changing climate. These events occurred within inter-generational recall, which is significant in a society that relies on oral tradition to convey environmental information and prescribe solutions to problems.

Clearly, the Inuvialuit are no strangers to stress and are becoming increasingly aware of the issues pertaining to climate change. A literature scan reveals that formal concern about human impacts of climate change in the western Arctic are very recent (Fig. 2 indicates relevant works cited in the ASTIS database). The pictures to the right outline real and anticipated environmental stresses that have been identified for the individual communities. These can be categorized as events that will impact on infrastructure and events that will modify food webs or affect access to traditional foods.

Fig. 2: ASTIS Database Citations



These stresses vary from location to location as a function of site, situation and community form. In Aklavik, for example, erosion as river discharges increase is an expected outcome of climate change, while in Tuktoyaktuk coastal erosion is the primary concern. In Holman, concerns are less focused on infrastructure, and are instead geared towards changing access to marine food resources as sea ice conditions change. Similar problems have also been identified in the community of Sachs Harbour, along with other local ecosystem shifts.

Figure 1 Evolving Settlement Pattern of the ISR

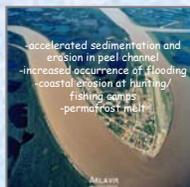
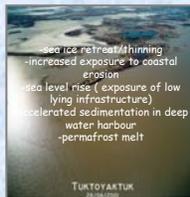
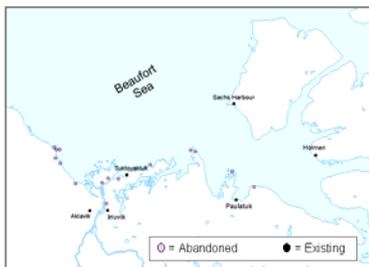


Photo source: GNWT, MACA

3) CONTEMPORARY LAND-USE and POPULATION TRENDS

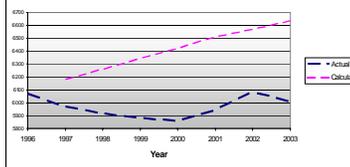
At the regional scale, there are transformations in land-use patterns and shifts in population which may appear to be associated with a changing physical environment, but are largely the outcome of other events.

As documented by Freeman (1982) and Usher (2002) the spatial extent of marine and wildlife harvest areas has declined over the past forty years, and recently this decline has been accompanied by a shift from marine based to terrestrial harvesting. Terrestrial environments are more predictable and therefore safer if weather is less predictable or sea ice conditions are changing. However, associating these changes with a changing environment is somewhat spurious. Wage employment, greater dependency on "day" or short-term harvesting using snowmobile or ATV, the decline of dog-teams which depended on food from the land, and decline in the intergenerational transmission of traditional knowledge are the main determinants for these changes.

Community populations are declining and, although some communities appear to have "steady state" populations, analysis of annual vital statistics data indicates that the populations of all communities in the ISR have been in relative decline over recent years (Figure 3). It can be inferred from vital statistics data and analysis of employment profiles that the population in greatest decline is aboriginal, rather than non-aboriginal. The latter group tends to "rotate" through a community, holding down professional employment for short periods of time and being replaced when they leave.

It has long been recognized that residential relocation is generally symptomatic of perceived stress relative to other locations (Brown and Moore, 1976). In the ISR population mobility tells a tale of isolation, lack of employment opportunities and narrow community infrastructures rather than environmental stress. The most dramatic decline is seen Aklavik, with people often relocating in Inuvik and other larger centers.

Fig. 3: Actual and Calculated Populations of the ISR (1996-2004)



Given the community's flood hazard record, vulnerability to flooding may be seen as a possible "push factor". However, there has been no recent significant flooding in Aklavik, and movement is largely associated with employment opportunities in Inuvik and anticipated benefits of the proposed Mackenzie Valley pipeline.

4) IMPLICATIONS

Because populations in the ISR are no strangers to stress, the message received (largely from the outside) that "climate change is coming and you must be prepared for it!" may seem particularly ironic, especially when seen in the context of a broadly changing world. Virtually within generational recall, populations have become sedentary, traditional land-based activities have declined, industrialization and consumerism have been introduced, the ethno-demographic makeup of society has shifted, and food sources have been tainted by global contaminants.

While there is scientific evidence that the environment in the study area is changing, and anecdotal evidence of environmental change in Inuvialuit communities, recent shifts in population and land-use are largely attributable to socio-economic rather than physical factors.

Within generational and inter-generational recall, populations in the ISR have experienced a range of significant stresses, and climate change is just the latest of these. Historically response to stress was relocation, but in the past there was far more flexibility to respond in this manner—populations were more mobile and without social safety nets, there was little choice but to move. While to some extent relocation is a contemporary response to stress, populations are far more sedentary than they used to be, a reflection of government investment, various transfer payments, easy communication with the outside world, and relatively sophisticated community infrastructures.

If population trends continue then four ISR communities (Aklavik, Sachs Harbour, Paulatuk, and Holman) will at best maintain their current population levels. The implications of this for community capacity are debatable. If physical changes in the environment are extreme, then places with populations that are not growing may experience less stress than those who are. Circumstantial evidence suggests that it is the younger segments that leave, making communities more vulnerable due to the breakdown of intergenerational transmission of knowledge and the loss of this significant human resource.

This poster was prepared for the 2005 ArcticNet Conference, Banff, AB, as part of section 4.2: Human Vulnerability. Supported through ArcticNet and Ryerson U. Track 2 Funding.