Food Security in the Canadian Arctic
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Abstract
Food security in the Canadian Arctic is an important issue; rates of food insecurity in the north are much higher than the national average. The Arctic is also undergoing major ecological changes and socio-cultural changes that might affect food security. I systematically reviewed the literature on Arctic food security and its potential response to these rapid changes. My results emphasize the important but diminishing role traditional foods play in terms of nutrition, health, and cultural values in the North. This declining trend is likely to continue given ecological change, increased industrial activities, and changing social preferences, which is a cause for concern. However, these changes also present new possibilities to address the issue of food security in the North.

Methods
I conducted a systematic review of the literature on climatic, socio-economic, and cultural change and their effects on food security in the Arctic, to obtain a list of factors important to food security in the Arctic. I then categorize these factors in a modified Drivers-Pressures-State-Impacts-Responses (DPSIR) framework, to understand how a changing Arctic might affect food security.

Ecosystem Services as Link between Changing Ecosystems and Food Provisioning
People’s use of local traditional foods is directly linked to the ecosystems that provide them. As such, through a systems diagram, I draw on the concept of ecosystem services (the benefits that humans derive from nature) to draw links between food security and the shifting dynamics of use of traditional food in the Arctic today.

Background

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Food security: “the situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious foods that meet their dietary needs and food preferences for an active and healthy life” (FAO 1996).

Nutrition Transition Leading to Double Burden of Food Insecurity
The consumption of traditional foods such as caribou, marine mammals, and fish has many health benefits, providing a range of healthy omega-3 fatty acids as well as high amounts of vitamins, antioxidants, micronutrients, and protein (Kuhnlein et al. 2002).

However, people in the Canadian Arctic are increasingly turning to store-bought foods. Fresh fruits and vegetables can be prohibitively expensive, so people consume non-nutrient dense foods (NNDF) instead, leading to increased diabetes, cardiovascular disease, and obesity in Inuit communities (Fillion et al. 2014). This shift is indicative of the double burden of food insecurity, whereby the food people consume is both lacking in quantity, as well as in nutritional value.

Literature Cited

Results & Discussion
The literature on food security (total number of studies included n = 90) in the Arctic fits into three general categories: (1) measurements and determinants of health and food security indicators; (2) assessments of vulnerabilities; (3) changes in key food species dynamics.

Study types (1) and (2) focus strongly on the role of traditional food, with solutions focused narrowly on increasing traditional food consumption. My results show that while these foods are very important in terms of nutrition and cultural values, such an approach ignores key ecological and economic drivers that are accelerating the nutrition transition and reducing the accessibility and availability of traditional foods. As such, policies to address food insecurity in the Artic will be more successful if they take a broader approach, recognizing the larger social and ecological changes that are exacerbating the state of food insecurity in the Arctic.

Conclusion
A systems approach to food security issues in the Arctic shows that exogenous drivers are causing changes in the Arctic that accelerate and exacerbate food insecurity. Traditional food, while incredibly valuable, is progressively becoming less available and accessible, and so can not be viewed as a panacea towards food insecurity. Instead, solutions and policies need to focus on alternatives that include making healthy foods more readily available.