

Food Security on the Kenai Peninsula, Alaska

A Report on Local Seafood Use, Consumer Preferences, and Community Needs

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Food Security on the Kenai Peninsula, Alaska

A Report on Local Seafood, Consumer Preferences, and Community Needs

WERC-HD Occasional Report No. 01

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About the Human Dimensions Laboratory

Faculty and students at the Human Dimensions Lab study coastal and environmental issues such as water and food security, marine resource policy and governance, environmental quality, and the engineered environment through a social and cultural frame. The HD Lab is a collaboration of faculty at the Institute of Northern Engineering and the Center for Cross-Cultural Studies at UAF.



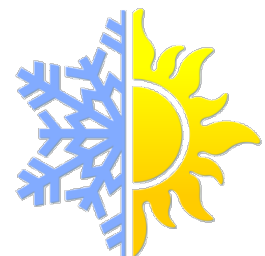
About the Center for Cross-Cultural Studies

The Center for Cross-Cultural Studies addresses research, development and instructional issues associated with educational policies, programs and practices in culturally diverse contexts, with an emphasis on Alaska Native, rural and distance education. The research agenda for the center is established in cooperation with Native organizations, school districts and state/federal agencies, with a focus on applied research that will benefit the people of Alaska. The Center also houses the Alaska Native Knowledge Network, which serves as a resource for compiling and exchanging information related to Alaska Native knowledge systems and ways of knowing.



About the Alaska Center for Climate Assessment and Policy

The Alaska Center for Climate Assessment and Policy is was established in 2006 with core funding from the Climate Program Office of the National Oceanic and Atmospheric Administration (NOAA). ACCAP is one of a group of Regional Integrated Sciences and Assessments (RISA) programs nation-wide. The RISA program supports research that addresses sensitive and complex climate issues of concern to decision-makers and policy planners at a regional level.



Executive Summary

This document reports on a research project undertaken by faculty and students at the University of Alaska Fairbanks in the fall of 2011. We distributed a survey to 1500 randomly selected residents in the Kenai Peninsula region of Alaska, to determine the prevalence of food security, and to elicit the role of locally-caught seafood in household food security. We queried residents on a variety of details related to whether and how they participate in local fisheries, how they procure locally-caught seafood, and whether they are currently coping with some level of food stress or shortage. In addition, we obtained a number of demographic and socioeconomic details at the household level, so that we could explore in detail the relationships between income, fishing activities, access to local seafood, and food security.

In the sections that follow, we provide extensive details on the results of this survey. In summary, we found that access to locally-caught seafood plays a significant role in providing for household food security, especially for the lowest-income households. A great majority of households report fishing, but nearly a quarter report that sharing is in fact the primary way that they obtain local seafood. Thus, both income and access to seafood play primary roles in determining household food security outcomes. These households notwithstanding, many households in the Kenai Peninsula continue to face some degree of food insecurity, with about five percent of respondents facing moderate to severe food shortages.

These data serve to underscore the importance of local seafood to Alaskans, an essential step in understanding if and how communities are vulnerable to changes in those fisheries. But, we also highlight a gap in the equitable access to locally caught seafood. We conclude by discussing the need to improve access, perhaps through innovative new marketing approaches that aim to keep more Alaska seafood in the freezers and on the supper tables of Alaskans.



Hannah Harrison in Seward, AK. Photo by Philip Loring

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Introduction

This report explores the issue of food security in Alaska, focusing on the details of the Kenai Peninsula (Figure 1) and the results of a survey distributed to this region in October 2011 to 1500 randomly selected households. **Food security is an issue of growing concern across Alaska.** With a dearth of local agricultural production, Alaska exists on the borderlands of a global industrial food system that excels at producing high volumes of food commodities but that fails to provide diverse and distributed populations with affordable, high-quality, and culturally relevant foods. Historically, foodways in Alaska have been linked through subsistence activities to wild fish and game, and also to small-scale “outpost-style” agricultural production, which has been an important yet often understated component of people’s food portfolios in the state since the 1800s at least. More recently, however, the state’s changing economy and lifestyles have created greater dependence on imported foods, and as a result, Alaska’s people and communities are more vulnerable than ever to the vagaries of climate, weather, and global markets and geopolitics.

A great deal of literature is already available that examines the economic, ecological, and sociocultural dimensions of these food system transitions, addressing such questions as how dietary changes relate to nutritional outcomes, how high-latitude biogeography circumscribes agricultural production, and how small-scale farmers and fishers can compete effectively in economic markets that are both constructed and dominated by large-scale interests (see the Bibliography for some representative citations). Unaddressed, however, are recently observed state-wide increases in the prevalence of food insecurity and in diet-related negative health outcomes such as type-2 diabetes, coronary heart disease, and colorectal cancer. These trends raise important questions regarding the drivers and determinants of dietary change, food insecurity, as well as how people are coping with these challenges. These trends and questions are what the research detailed in this report aims to address.

Food security means having reliable access to affordable, safe, high quality and culturally relevant foods.

Food security and insecurity are admittedly complex terms with shifting definitions that can and should vary depending on the place, scale, or societal level of interest. For the purposes of this report, food security is defined only generally, as when people have **reliable access** to affordable, safe, and high quality foods that are culturally relevant and that meet nutritional needs, and without having to resort to activities such as stealing or scavenging. By comparison, food *insecurity* can describe a variety of circumstances, including whether people are coping with some degree of food shortage, perhaps by skipping meals or reducing meal size. It can also describe scenarios where people *do* have relatively regular access to sufficient foods, but from sources that are vulnerable to disruption. This is arguably the case for much of Alaska. Thus, food security as used here also **implies a degree of control over the quality and reliability of one’s food sources.** As already noted, there is an important cultural dimension here with respect to how control and self-sufficiency are defined, and as such there are practical limits on the extent to which one can measure indicators of food security/insecurity in a generalizable and comparative way. This issue will be discussed in more detail in the section on methods.



Figure 1. Map of the Kenai Peninsula region of Alaska. Major communities are noted.

Despite the terminological and methodological challenges to defining and measuring food security, even the most basic measures show that food insecurity is on the rise across Alaska. The statewide rate of food insecurity in Alaskan households in 2010 was 14.5% according to the US Department of Agriculture’s “Household Food Insecurity in the United States” report, a report that they have been releasing biennially since 2001. This rate is less than a national average reported by the same study (roughly 16%), but a “meal gap” model created by the non-profit organization Feeding America (www.feedingamerica.org) shows that rates of food insecurity in many rural and predominately-Alaska Native communities may be as high as 30%. What’s more, these same models suggest that the highest values of food insecurity are likely among children in these regions.

Rural communities are undergoing a dramatic social and economic restructuring, or “dying” in the words of some Alaska Natives, as many residents move out of the ‘bush’ and into Alaska’s urban centers for jobs, cheaper food and fuel, and healthcare. Everything costs more in rural Alaska (Figure 2); generally speaking, we know that food and fuel prices are related, but for the most remote and rural communities in the state, these costs are exacerbated, and as a result communities can be especially vulnerable to the vagaries of the global geopolitics and economics.

Add these socioeconomic challenges to the negative health trends noted earlier, Alaskans face a veritable “axis of vulnerability” across social, economic, and ecological issues. In order for communities to understand, plan for, and manage these challenges, it is necessary that research identify and strive to understand the many pathways through which fundamental changes to food systems can undermine physical and mental health, as well as community social and cultural and ecological health outcomes.

Opportunities and Challenges

Alaskans are, of course aware of these challenges. Likewise, they are active in the search for innovative and effective solutions. In many parts of the state, people in communities as diverse as Nikolski in the Aleutian Islands and Fairbanks in the Alaskan Interior are trying to rebuild and revitalize local food systems with community gardens, farmers’ markets, oyster mariculture, community supported agriculture and fisheries, and cooperative purchasing, to name just a few examples. Even in the most remote areas of the state, including communities on the Aleutian Islands and many north of the Arctic Circle, people are trying to revitalize a tradition of “outpost-style” gardening with season-extending hoop houses, greenhouses powered by renewable energy, and regional community-shared and supported agriculture programs. There are a plethora of good ideas for improving food security and diet-related health outcomes in Alaska, and no shortage of motivated individuals for putting these ideas to action.

Nevertheless, many of these initiatives are challenged or stalled. Funding can be an issue, as can infrastructure and social policy. The most immediate challenges include a lack of physical/built infrastructure to meet production, processing and storage requirements. Other challenges include a lack of social services for these professionals, and stringent state and federal policies regarding food safety, quality and marketing that are designed for industrial food production and prove to be overly cumbersome and too expensive for the small-scale producer. Environmental and climatic change have also been a difficult challenge for many local food entrepreneurs. Whether hunter, fisher, or farmer, many Alaskans are finding themselves constrained by changes to weather, the timing of the seasons, and to the distribution, abundance, and migration patterns of fish and game. The food system is

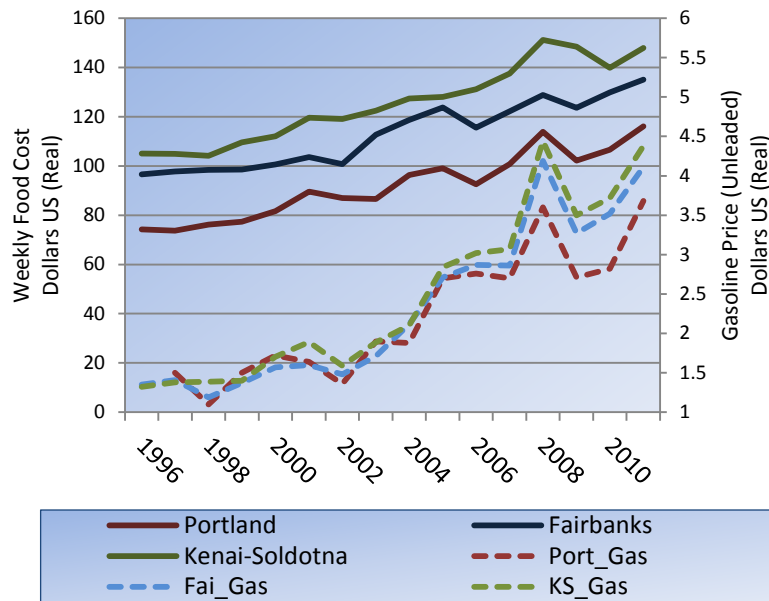


Figure 2. Weekly food costs for a family of four and gasoline prices for Fairbanks, AK, Kenai-Soldotna, AK, and Portland, OR. Data are from the UAF Cooperative Extension Service.

effectively split in Alaska—among those with the time, skill, financial resources and opportunities to fish, farm, or harvest local foods for themselves and their families—and those who, whether out of preference, expedience or both, patronize conventional “box store” markets.

Many of the same challenges are seen in the local seafood sector, and any discussion of food security in Alaska is incomplete without at least some attention to both the current and potential future role of fisheries. For thousands of years, coastal and living marine resources have provided a keystone for the cultural, economic, and environmental health and wellbeing of Alaska’s people and communities. Today, Alaska’s commercial fishing industry is widely hailed as sustainable, creates over \$5.8 billion in direct and indirect economic outputs, and provides over 50 percent of the United States’ wild landings. Fishing and fishing-related industries also employ more workers in Alaska than any other sector, and rank third for total economic value behind North Slope oil and the federal government. Likewise, noncommercial fishing activities continue to be of utmost importance to rural and urban communities across the state:

The food system is effectively split in Alaska—among those with the time, skill, financial resources and opportunities to fish, farm, or harvest local foods for themselves and their families—and those who do not.

“bush” communities in Alaska’s coastal zone and inland rely on salmon and other fish for much of their yearly food supply, and many urban households in the greater Fairbanks and Anchorage areas share a valued tradition of dip-netting for salmon on the Copper and Kenai rivers.

However, not all of the successes and benefits of Alaska’s commercial fisheries are enjoyed by Alaskans, and very

little of the fish caught commercially in these fisheries is marketed in state. Even grocery stores in such iconic fishing communities as Homer, the purported “halibut fishing capital of the world,” do not have fresh seafood counters. Some individuals are experimenting with innovative ways to market locally caught seafood, with schemes for direct marketing and community supported fishing. But here too, these initiatives repeatedly come up against challenges that relate to policy, infrastructure, and human resources. Commercial fishing involves long and hard days; many fishermen simply do not have the time to prioritize the local marketing of their daily catch, as opposed to selling everything at once to a major fish processor. Likewise, in lieu of any sort of cooperative buying group, local demand for fish is often considered too small or inconsistent by many fishermen to make a serious business commitment to developing the local market. Some local fishermen and processors also cite cumbersome and expensive food safety policies and protocols that limit their ability to innovate on a small-scale. In Alaska, it seems that if you do not fish for yourself, or do not know someone who fishes, you are out of luck, and limited to the industrially-processed and packaged alternatives to locally caught seafood.

Impetus, Aims, Scope

This research study was designed to dig deeper into food security in Alaska and more specifically into the role of locally caught seafood in food security, particularly in the Kenai Peninsula region of the state. A premise of contemporary local/alternative food movements is that people and communities are more food secure, and hence more sustainable, when more of their food is produced, processed, and marketed locally. Embedded in this premise are a number of assumptions, however, related to best

practices and outcomes in respect to both social and environmental systems. For example many of the following claims are likely familiar to the reader:

- *“Local food is healthier.”*
- *“Local and small-scale agriculture provide better working conditions and living wages.”*
- *“Local food systems are safer because they are more transparent, and you know your farmer and fisher.”*
- *“Local food systems are more sustainable because they more closely connect people with their environments.”*

While these sentiments make for good marketing and for a vision for the future that is both valid and appreciable, none of these outcomes or premises should be considered certain. While burgeoning, local/alternative food movements across the US and elsewhere in the world are still struggling with many of the same issues we have come to blame on the industrial agricultural food complex. This does not mean that local/alternative food systems are a dead end, but rather that these persistent problems, such as inequity in access to the high quality foods that local food systems can provide, are not simply agricultural or ecological problems to begin with, but are rooted in unaddressed societal, cultural, educational, and economic issues that are part and parcel to developing and maintaining more sustainable food systems.

Alaska is rich with natural resources and also with the potential for developing secure and self-reliant communities around sustainable and locally-oriented food systems. Successes and failures, opportunities and dead ends, benefits and tradeoffs are all important issues to be evaluated and assessed. This research attempts a minor portion of that assessment. How are people in one of the most productive salmon fisheries of the world benefitting from that resource? How equitable is access to that resource and how are the benefits distributed? What is the status of current harvest regimes, and are they sustainable in both biological and societal terms? These are the questions that we have attempted to address through this work, and as we describe in the remainder of this report, these are questions that we have only begun to answer.

It should be noted that the primary impetus for this research was demonstrated community interest and need. Exploratory interviews were held with representatives from multiple community stakeholder groups in the region, including:

- MAPP of Southern Kenai Peninsula <http://mappofskp.net/>
- Kachemak Bay Research Reserve <http://www.adfg.alaska.gov/index.cfm?adfg=kbr.home>
- Sustainable Homer <http://www.sustainablehomer.org/>
- Kenai Peninsula Food Bank <http://kpfoodbank.org/>

Through these interactions we learned of a variety of concerns among local residents related to issues of food security, climate change, community health, and the sustainability of local fisheries. The following research protocol describes a study design with extensive local input to address these concerns.

Study Area and Methods

Cook Inlet (Figure 1) is well known among Alaskans for its highly valued and heavily contested fisheries. The Inlet includes a stretch of ocean that reaches 180 miles north from the Gulf of Alaska, along the west coast of the Kenai Peninsula, to the city of Anchorage. The associated estuaries and watershed covers approximately 100,000 square kilometers of the South-central portion of the state and is home to over 400,000 Alaskans—more than half of the total population of the state. Scattered throughout the region are a few large and several smaller communities; Anchorage is the major city, with the bulk of the population living in the city or surrounding areas; about 50,000 people live on the Kenai Peninsula, a land mass about the size of Maine.

We selected the Kenai Peninsula as our strategic case study location to explore whether the region can serve as an accurate microcosm for exploring statewide food security issues. In planning this research we encountered a common perception that the communities of the Kenai Peninsula are demographic and socioeconomic exceptions rather than the norm for Alaska, and indeed there are differences between in vital statistics for the region and the state (see the table below). Still, we argue that many of the sociocultural, economic, ecological, and geopolitical circumstances and challenges found here are nevertheless representative of those found statewide, if only at a more subtle level. The region is home to renewable resource industries such as fishing and tourism as well as contentious debates over non-renewable extractive resource industries such as coal and offshore oil development.

Communities on the Peninsula include the iconic fishing ports of Homer and Seward, which are regularly among the top twenty US fishing ports when ranked by dollar value of wild landings. Other large communities include Kenai and Soldotna, which rely extensively on commercial fisheries and tourism. Smaller, predominately Alaska

Native or Russian communities include Seldovia, Port Graham, and Nanwalek, which are not on the road system. In isolated communities, subsistence hunting and fishing play an especially important role in household livelihoods and community well-being. The Cook Inlet watershed and the Kenai River in particular host all five species of Pacific salmon, with salmon runs numbering in the millions. Finally, more than 70 percent of the land on the Kenai Peninsula is federally managed, which approximately parallels land jurisdiction for the state at large.

With respect to food security, data from the Feeding America show that the Kenai Peninsula Borough has rates that approximate the state average. Other relevant socioeconomic data that put the borough in a statewide and national context are shown in Table 1.

Vital Statistics ¹	Kenai Peninsula	Alaska
Population	56,293	722,718
Demography		
Caucasian	85.0%	67.9%
African American	0.6%	3.6%
AKN/AI	7.5%	14.9%
Asian	1.2%	5.6%
Native Hawaiian	0.3%	1.1%
2+ Races	5.4%	7.0%
Unemployment ²	9.3%	7.6%
Food Insecurity ³		
Children	20.4%	19.9%
Per Capita Income	\$29,127	\$30,726
Below Poverty Level	9.5%	9.5%

Table 1. Comparative details for the Kenai Peninsula.

Methods

In order to better understand the state of household food security in the region, including the role of locally caught seafood, we distributed a survey via the US Postal Service to 1500 households randomly selected from a list of residential addresses for all of the zip codes on the Kenai Peninsula. Surveys were designed and distributed following a modified version of the “Tailored Design Method” crafted by Don Dillman and colleagues. To raise awareness, we arranged interviews on local public radio to discuss the research. To maximize response rates, we sent post-cards notifying recipients that their address had been randomly selected and that they should expect a survey soon. With the survey we included a token incentive—a one dollar bill. We also followed the survey with a reminder post-card thanking people for their participation. As we discuss in the results section below, our high response rates confirm the efficacy of this survey distribution methodology.

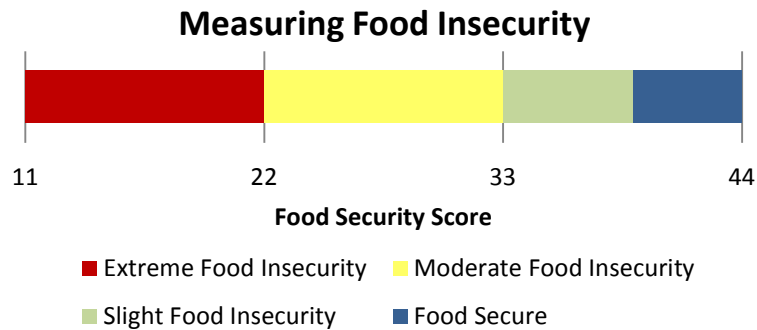


Figure 3. The method used to measure food security in this research provides a unit-less “score” for each household between 11 and 44. The scale does not begin at zero because the method is not designed to capture the most extreme kinds of hunger that some people experience.

Respondents were asked to report if someone in their household fishes and if so, to specify whether this includes fishing commercially, fishing for sport, fishing as a guide/charter, and/or fishing for personal

If faced with the choice, which of the following would you prefer to eat? Please circle one for each pair.

- | | | |
|-------------|------|-------------|
| Pacific Cod | -or- | Black Cod |
| Black Cod | -or- | Halibut |
| Halibut | -or- | Rockfish |
| Pacific Cod | -or- | Rockfish |
| Salmon | -or- | Halibut |
| Rockfish | -or- | Black Cod |
| Salmon | -or- | Black Cod |
| Salmon | -or- | Pacific Cod |
| Halibut | -or- | Pacific Cod |
| Salmon | -or- | Rockfish |

Figure 4. An example of a paired comparison test.

use or subsistence. Next they were asked to report if they consume fish or other seafood; for those with a positive response, several questions followed regarding how and where they obtain the seafood, and their preferences when selecting seafood. To measure food security, the survey included six questions about “coping strategies.” These ask respondents to report how often they take actions such as reducing meal size or skipping meals because there is not enough food and/or so that someone else in their household can eat (Figure 3). Responses to these questions are tallied in such a way as to create a score in the range of 11 to 44, with 11 being extremely food insecure and 44 being completely food secure.

Seafood consumption preferences were also elicited using a series of paired comparisons (Figure 4), with

respondents asked to choose between two kinds of fish, and asked to do so for every permutation of possible comparisons. This method not only allows the identification of consumption preferences both within and among groups, it also reveals the relative strength of those preferences, something we explore in the results section below.

Other questions on the survey addressed household composition and income level, and whether or not respondents presently rely on some form of nutritional assistance such as the Alaska Food Stamp Program or the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC).

The complete survey can be found as an Appendix at the back of this report.

Who Responded?

Of the 1500 surveys mailed, 490 responses were received and 75 were returned as undeliverable, for an adjusted response rate of 34.38 percent and a confidence level greater than 95 percent that the sampled population is representative of the population of the Kenai Peninsula at large. Table 2 provides response rates by ethnicity / culture group.

Socioeconomic details such as household composition and income were comparable to figures for the rest of the state (Figure 5); for example, the median household

Ethnicity/Culture	n	Rate
Caucasian	395	83.0%
African American	1	0.2%
AKN/AI	42	8.8%
Asian	7	1.5%
Native Hawaiian	3	0.6%
Hispanic	6	1.3%
Russian	5	1.0%
Other	17	3.6%
Total	459	100%

Table 2. Response count and rates (among those who answered this question.)

Figure 5. Comparison - Kenai and State Data

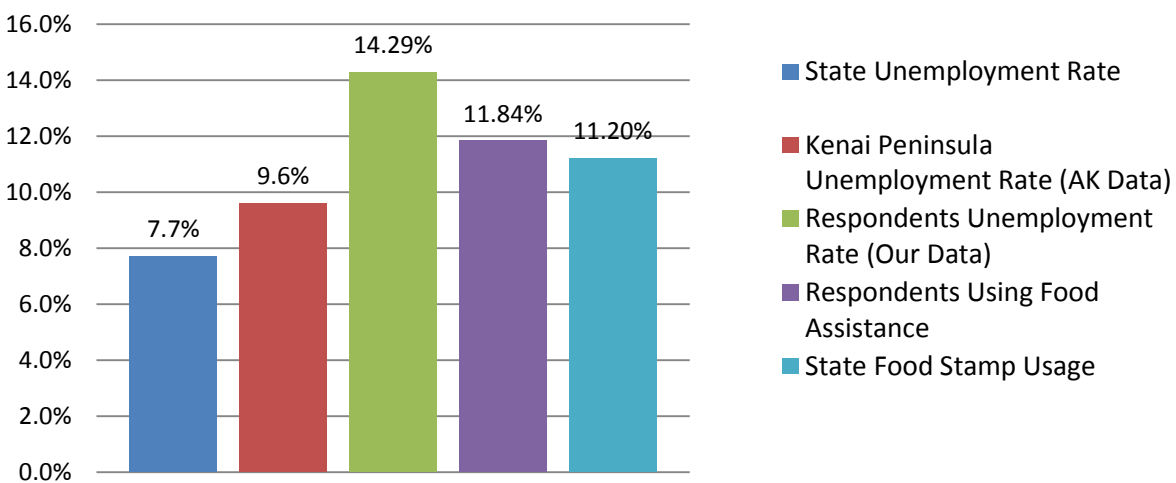


Figure 5. This chart presents socioeconomic data for survey respondents compared against data from state agencies. Note differences between unemployment rates, and similarities regarding the use of food assistance programs.

income in 2010 in the Kenai Peninsula Borough according to the state of Alaska was \$57k, and in our study, the median income was in the \$50-75k range. Interestingly, income in the Peninsula was relatively balanced, with the highest percentage of respondents' households (27.5 percent) falling within the \$25-\$50k income bracket (Figure 6).

Significant variance from the mean was found for the household income reported by among Alaska Native / American Indian (AKN/AI) respondents. Over 30 percent of AKN/AI respondents reported household incomes in the lowest bracket, roughly 10 percent more than in the Caucasian group. Similarly, 7 percent fewer AKN/AI respondents reported incomes at the highest level than Caucasian respondents.

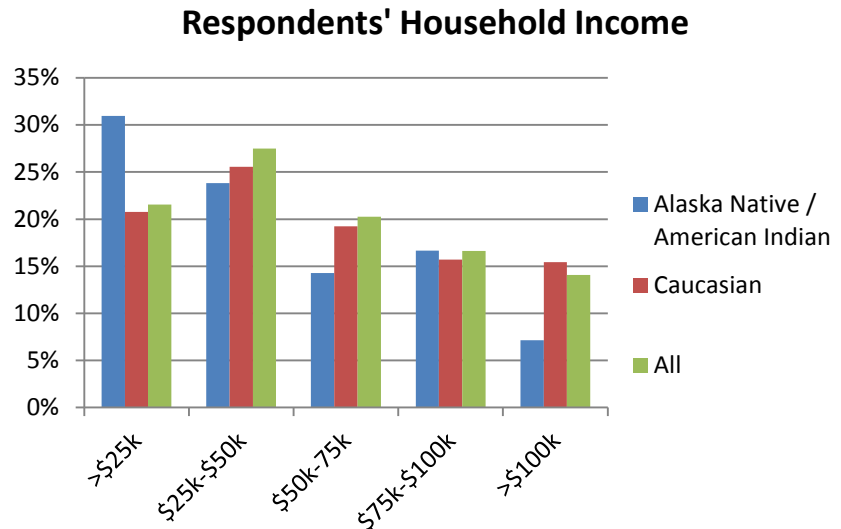


Figure 6. The distribution of household income for the entire population as well as just for Alaska Native and Caucasian households. Other ethnicity/culture groups are not included here because response rates for those groups were too low.

Additional data stand out as noteworthy. For example, over 14 percent of respondents reported that they were unemployed, which is nearly twice the state unemployment rate reported for the State of Alaska, and five points higher than the reported rate for the Kenai Peninsula Borough. It may be the case that our numbers include those who have dropped out of the workforce, but these differences nevertheless warrant additional research.

Fishing & Fish Consumption

Nearly 80 percent of respondents reported that someone in their household fishes, the majority of which (66.5 percent) describe their primary fishing activities as for personal use and subsistence. Sport fishing was the next most common kind of fishing (42 percent), followed by a much smaller group of commercial fishers (7 percent) and guide/charter operators (2 percent).

Fishing is not the only way that Kenai Peninsula residents obtain seafood (Figure 7). While 80 percent of people report fishing, only 62 percent of respondents describe fishing as their primary way of obtaining seafood. 23 percent of respondents instead reported that **sharing** was the most common way they procure fish. Very few people, by comparison, obtained seafood through other means, such as major or local grocers. This aligns with the fact that grocers in the Kenai Peninsula do not carry locally caught seafood, but only an assortment of frozen products that are packaged and distributed from out of state.

How Do You Get Local Seafood?

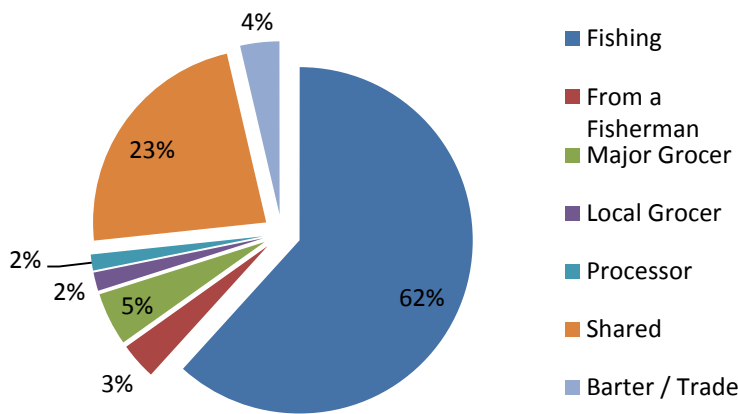


Figure 7. Primary method of procurement for respondents.

That 23 percent of people in the Kenai Peninsula rely on sharing for their seafood is also an important finding because it indicates that a considerable number of people rely on local seafood even though they do not harvest it themselves. As such, we also explored the demographics of who relies on shared fish, and found a compelling, if not terribly surprising pattern (Figure 8). The contribution of

fishing and sharing as the primary

source of fish are found to correlate negatively with one another, with a positive relationship between fishing and household income, and a negative relationship between sharing and household income. In other words, more low income households rely on sharing as their primary source of locally-caught seafood than do households at higher income levels; more high-income households rely on fishing as their primary source of locally caught seafood than do lower-income households; and changes in one are made up for by changes in the other as income varies.

One additional finding relates only to the lowest household income category: barter and trade of fish, which is different from sharing in that it describes and explicit component of fair exchange of goods and services, are the primary methods of procuring locally-caught seafood for 10 percent of respondents at the lowest household income level. For all other income levels, the contribution of barter and trade were 3 percent or less. This is significant because it represents an important

Primary Method of Procurement, By Income

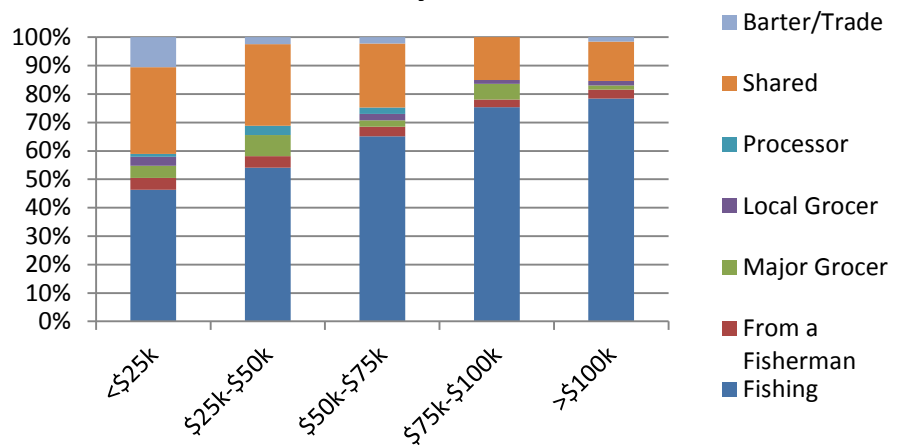


Figure 8. Respondents' primary method of procurement was found to vary significantly with income level. As you can see above, lower-income households share more and fish less than higher income households. Also noteworthy is a significant percentage of households relying on barter and trade at the lowest income level.

pattern of local exchange, and raises the question of what goods and services people in this income bracket are providing in return. Also, it is significant because barter and trade of fish caught under the auspices of personal use and/or sport fishing is, with some exceptions, illegal in the State of Alaska.

Consumption Rates & Preferences

While fishing and fish consumption are ubiquitous across the Peninsula, we thought it important to explore how often people consume fish, which types they prefer, and whether preference and consumption patterns vary among respondents, whether by demographic or socioeconomic group (Figure 9).

Many residents report regularly consuming seafood regularly, with between 45 and 50 percent of all respondents reporting that they eat it multiple times per week. Salmon was easily the most emphasized species, with 93 percent reporting an emphasis on salmon. Halibut and

clams round out the top three consumed resources. When asked to describe the role of salmon in their household, 67 percent reported that it is an important part of their diet, 24 percent responded that it is an important part of their financial security, and 55 percent reported that salmon are important to their community and/or culture

Interestingly, household income did not prove to influence how frequently people eat seafood (Figure 10). Indeed, all households had the same pattern, split roughly 50-50 between eating salmon “sometimes,” which describes as 2-5 times per week, and “rarely,” which describes once of fewer times per week (but not never).

Consumption patterns are not necessarily predictors of preference, and both are important components of food security (described later in more detail.) **How, if at all, do preferences regarding seafood vary among our respondents?** As described in the methods section we queried respondents on their preferences regarding salmon, halibut, rockfish, black cod, and pacific cod, comparing two options at a time for each permutation, with a method that allows us to infer both order and strength of preference within a group (Figure 11). While the overall pattern of preference seen in these data are not surprising, halibut being the most popular, followed by salmon, rockfish, black cod, and pacific cod, we also found an interesting effect of income on reported fish preference. At the lowest income levels, the strength of overall preferences was much reduced. That does not mean that low-income respondents do not have

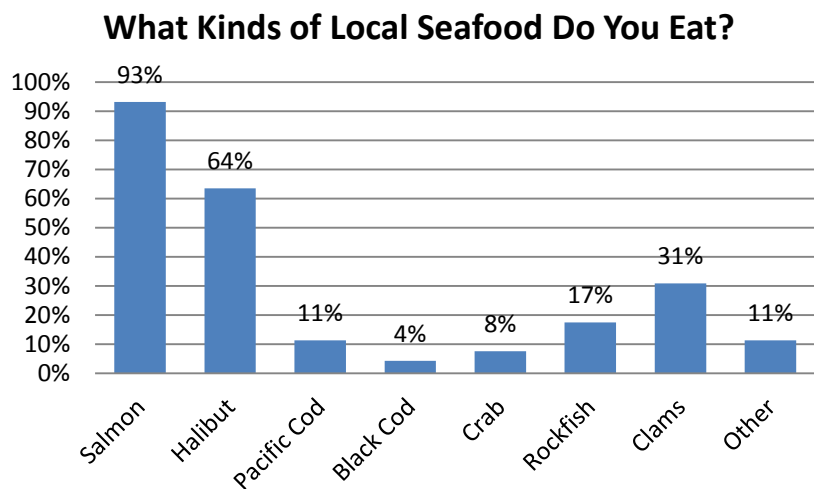


Figure 9. Residents of the Kenai Peninsula rely on a wide variety of seafood resources. Salmon, halibut, and clams round out the top three emphasized items.

strong preferences, but as a group, that these demand as a result of these preferences is less stratified. In other words, the different fish species are more equally interchangeable, most noticeably the case for salmon and halibut.

Conversely for the highest income level, fish preferences were extraordinarily strong, with halibut and salmon being preferred more exclusively, and Pacific cod coming in a dead last.

We can only speculate about what these data tell us about the interactions between food cost, availability, household socioeconomic status, and consumer preferences. In one sense, the data seem to contradict the hypothesis that lower-income households will covet more strongly those food items that society deems luxurious than high-income households. In other words, among Americans in general, Alaska halibut and salmon have a reputation as expensive, gourmet foods. It stands to reason that the lowest income household will report stronger preferences for these foods because they consider them to be exclusive or associate them with a higher quality of life. One possible explanation for the patterns seen in Figure 11 is that strong preferences are more likely develop among those households that are less economically constrained.

How Often Do You Eat Seafood?

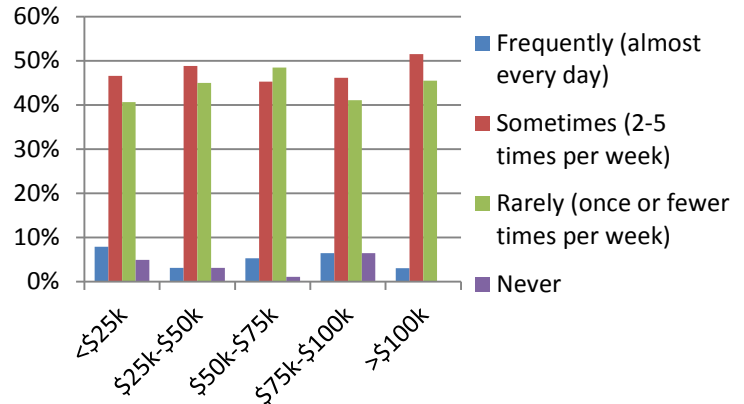


Figure 10. The frequency at which people consume seafood is an important parameter for understanding its role in household and community food security, and also provides insight into dietary patterns and regional health status.

Seafood Preferences By Income

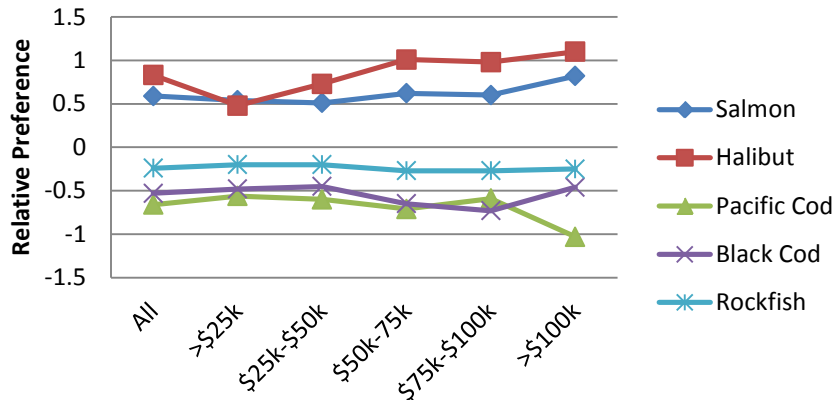


Figure 11. Relative preference among income groups for the five major kinds of fish included in our survey. The y axis indicates a normalized, unit-less scale for preferences. The data can be interpreted both for the order of preference and by the distance between points, which indicates strength of preference.

Food Security: Availability, Access, Utilization

Food security is a process. People are constantly navigating changes and uncertainty, whether with respect to food prices or salmon returns, and when people are able to make dietary and lifestyle decisions that support health in its various biophysical, social, and ecological dimensions, we can think of them as experiencing food security. Within this process, we can think about three general issues that drive a household or community's food security: availability of food, access to food, and utilization.

Food availability involves the amount, type and quality of food a person or community has at its disposal; this can be analyzed in terms of availability from local production, the efficiency of distribution channels for moving food where it needs to be, and the vulnerability of those distribution channels to supply and disruption.

Food access involves the ability of each person to procure the foods that are available, including physical and logistic access to the locations where foods can be procured, affordability of foods, as well as how food allocation mechanisms such as subsidies, trade agreements, and other government policies work. Limits to access also involve any policy barriers, such as hunting and fishing regulations, that impede a consumer's ability to acquire foods that meet their sociocultural and biophysical food needs and preferences.

When people are able to make dietary and lifestyle decisions that support health in its various biophysical, social, and ecological dimensions, we can think of them as experiencing food security.

This latter issue of sociocultural and biophysical needs also relates to the third aspect of food security—**food utilization**—which refers to people's ability to derive all potential and needed benefits from the foods they do have access to. Utilization includes factors such as food safety nutritional quality, and food consumption patterns and preferences.

In the sections that follow, we describe the patterns that emerged specifically for our measurement of household food security scores, using the unit-less index of 11-44 described in the Methods section. This index does not give us any specific information about availability, access, or utilization, just a crude measure of whether or not people are coping with some degree of food insecurity. More robust inferences can be made, however, when exploring how reported food security scores vary among different households, perhaps by income level or by relative access to locally caught seafood. We do not claim to have identified *causal* relationships in this analysis, but do believe we have uncovered **compelling empirical patterns that match a number of common hypotheses about food security and the role of local food systems.**

Local Seafood and Food Security in the Kenai Peninsula

Overall food insecurity in the Kenai Peninsula was found to be more extensive than suggested by Feeding America's data for the region, which, as noted in Table 1, is a rate of 14.7 percent. We found

that 27 percent of respondents report some degree of food insecurity, and only 39 percent of respondents achieved a perfect score of 44, indicating that a very significant number of people are making some accommodations in their diet (Figure 12)!

It is also possible to compare average food security scores by community in the region (Figure 13). While the survey was distributed to a random selection of addresses in the Peninsula, some smaller communities did not have high enough response rates (e.g., 1 or 2) to be included in our analysis. The average food score for the peninsula is 41, which if you refer back to the methods section qualifies as relatively food secure.

However, there is pretty dramatic variation among communities. The community of Nikiski in particular, scores statistically significantly lower on average than the rest of the peninsula; likewise, Ninilchik scores higher than other communities, though a low sample size (17) for Ninilchik may mean that this is not statistically significant.

Another, more revealing way to look at the distribution of food security in the Peninsula is to look at how scores vary by income and/or other demographic details. Figure 14a shows how food security scores vary by income bracket. We found a weak ($r=0.500$) but significant correlation in the overall

Food Security in the Peninsula

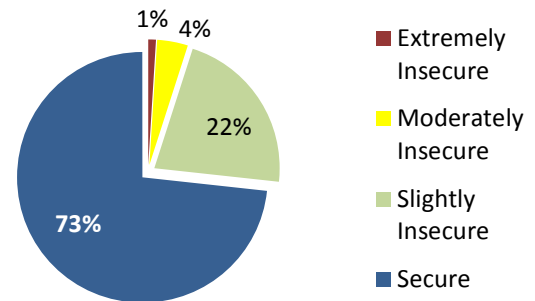


Figure 12. Distribution of food security scores as categorized in Figure 3.

population between food security score and income. However, we also want to explore **the role of access to local seafood in producing household food security.** To do so, we first used a statistical tool called a two-tailed Students T-test (Table 3), with which we found a **statistically significant increase in the mean food security score for those with access to locally caught fish for the lowest income bracket.** We interpret this as supporting a hypothesis that access to local seafood does improve food security for low-income households.

Food Security by Community

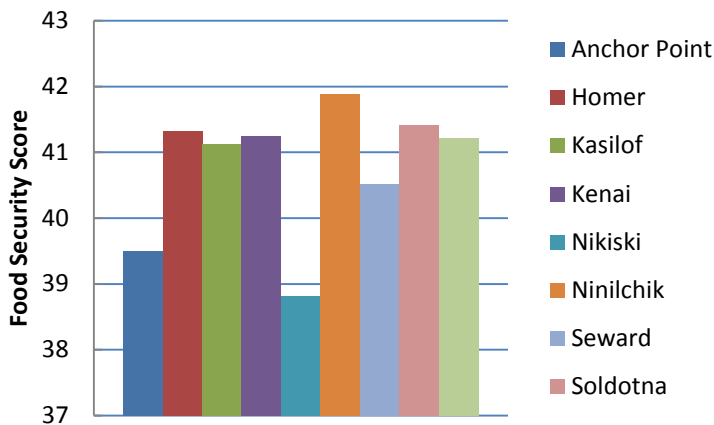
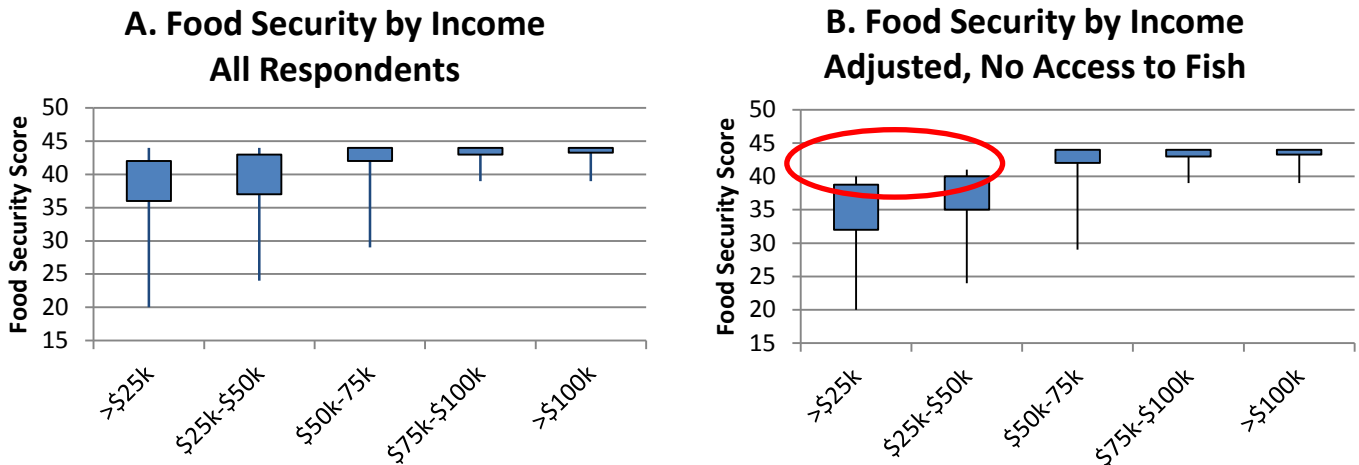


Figure 13. Food security score by community. Overall average score for the region is 41. Nikiski and Ninilchik are the only two communities with average food security scores that are statistically significantly different from average.



Figures 14a and 14b. These box plots show how food security scores are distributed within and among income brackets. The blue regions represent the food security scores for the middle two quartiles, while the ‘whiskers’ illustrate the total range from minimum to maximum reported score. Box plot B shows how the distribution of food security scores changes when low-income households with access to locally caught seafood are removed from the sample. Recall that the index range is 11-44.

To look at this finding another way, we temporarily removed from the sample population low-income households who have access to local fish. Our rationale for doing so was that the correlation between household income and food security score should not change when these households are removed from the population. Confirming our hypothesis, we found that the correlation coefficient between household income and food security score improves from a weak correlation ($r=0.500$) to a much stronger correlation ($r=0.709$) when low income households with access to fish are removed from the sample.

These are extremely significant findings as they relate to the claims made in support of local food systems discussed in the Introduction. Specifically, these data support the premise that **local food systems can support better social outcomes, i.e., food security**. Indeed, we know of no other study in

Household Income	Food Security Score, With Fish	Food Security Score, Without Fish	Difference	p
>\$25k	39.19	36.32	2.87*	0.003666577
\$25k-\$50k	39.42	38.23	1.19	0.164935747
\$50k-75k	42.15	42.93	-0.78	0.262101295
\$75k-\$100k	43.32	43.42	-0.10	0.775600889
>\$100k	43.53	42.75	0.78	0.376032664
All	41.30	39.31	1.99	
ANOVA	F=25.9	F=16.02		

Table 3. Comparison of Food Security Scores among households with and without access to locally caught seafood.

Alaska or elsewhere that provides empirical data in support of this premise. Also of interest is that so many Kenai Peninsula residents obtain their fish through sharing and barter and trade. This suggests that the Kenai Peninsula has a relatively robust local food system, albeit “informal” or “alternative” in the sense that it is not oriented around a mainstream market-based distribution system for moving food from production to consumption. However, we cannot forget the many households in the region that do experience moderate to severe food insecurity, many of which report not having access to local seafood. These people’s experiences highlight the need to better understand the drivers and determinants that limit local marketing of locally caught seafood, such that these households might also enjoy the security that Alaskan seafood already provide for so many others.

We hypothesized that access to locally caught fish helps buffer the lowest-income households against food insecurity. Our data support this hypothesis.

There are a few final details related to socioeconomics and food security in the Kenai Peninsula that bear reporting. First, we explored whether food security varies with ethnicity/culture group. While we did find a significant difference in income among different ethnic/culture groups (Figure 6), we did not find that ethnic/culture group influences average food security score. This finding is likely related to the findings discussed above that access to local fish among these households improves their food security. Respondents were also asked to identify whether anyone in their household was unemployed, disabled, or retired. Based on these responses, we found that households with members who are disabled or unemployed both have statistically significantly lower food security scores than average (Fig. 15).

Even more interesting, is that the greatest differential is not at the lowest income bracket, <\$25k/year. Rather, **food security scores are lowest among households in the \$25k-\$50k bracket that report one or more members unemployed.** There are multiple possible meanings of these data that need to be explored through additional research in more detail. One is that some households in this income bracket do not qualify for food assistance programs that they would otherwise benefit from (the “meal gap” hypothesized by the group Feeding America). Note that in Fig. 15, the two highest income brackets are omitted because too few respondents fell into this category for comparisons to be statistically significant.

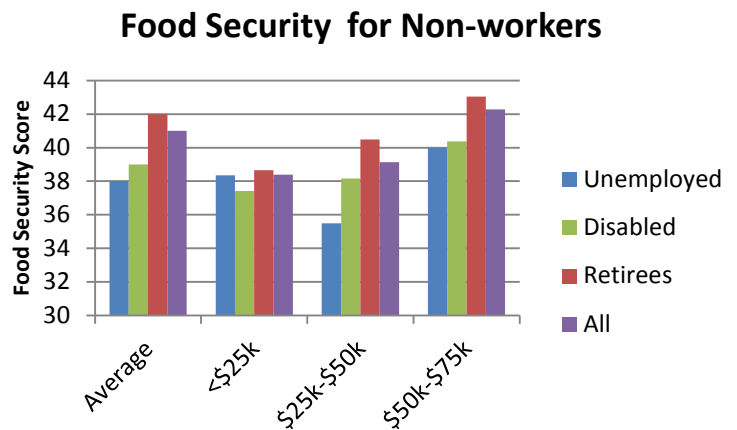


Figure 15. Average food security scores are reported for the first three income groups, for households with members who are not in the work force, i.e., unemployed, disabled, retired. A statistically significant decrease from mean is observed for households with one or more members who are unemployed, but only in the \$25k-\$50 income bracket.

Discussion

Food security is an issue of growing concern among residents of the Kenai Peninsula as well as the State of Alaska as a whole. Recent and record declines and shortfalls in the returns of king salmon to the Kenai River, and related closures in 2012 of some commercial and sport fisheries as a result, highlight the immense importance of salmon and other fisheries to the region. The data on which we report here increase our understanding of both the ubiquity of local seafood use in the Kenai Peninsula, and its importance to household food security. It is encouraging to know that so many Alaskans benefit from these fisheries, and even more encouraging knowing that many low-income households are able to

A premise of small-scale alternative food movements is that developing local food production systems for local consumption will strengthen community sustainability and security. Our data show this to be the case for the Kenai Peninsula. But, there is still work to be done.

make ends meet because of the access they enjoy to locally caught seafood. It is clear that the stakes are high for managing these resources sustainably.

Some attention must be turned, however, to those food insecure households in the region who report not having access to locally caught seafood. While many obviously do enjoy the benefits of local seafood, whether because they harvest it themselves or because they can obtain it via sharing or barter and trade, our data suggest that many local residents do not enjoy these benefits. Perhaps this is because these families do not have the time,

supplies, or resources to fish for themselves, or that they lack the requisite social relationships with people who have fish to spare. Research is needed to better understand this vulnerable group, and to identify existing and new venues for expanding the distribution and marketing of locally caught seafood so that they may benefit from local resources as much as their neighbors.

There is no doubt that Alaska's fisheries provide much to the state by way of income, employment, and cultural value. However, the colorful images of rugged-yet-thriving people and communities that adorn many of the marketing materials for Alaska's commercial fisheries (Figure 16) might unintentionally obscure the more complicated reality that is presently on display in places like the Kenai Peninsula and the many more remote rural regions of the state: high and growing rates of food insecurity, rural economic decline, and domination of the commercial fishing industry by international corporations and export markets. It is hard not to find contradictions when contrasting the gains of a \$5.8 billion food industry with rural food insecurity rates that range between 15 and 30 percent of the population.

A question remains as to what role Alaska fisheries can and should play in improving the food security of Alaskans. Much is made lately of the need to improve the sustainability and self-reliance of Alaska communities through improvements to local food systems. A premise of these small-scale alternative food system movements is that developing local food production for local consumption will strengthen the system's sustainability and security. Our data show this to be the case for the Kenai Peninsula. But, there is still work to be done.



Figure 16. An exhibit featuring the Alaska seafood industry at the Alaska SeaLife Center (Seward, AK). This exhibit was constructed with support from the Alaska Seafood Marketing Institute (ASMI). Photo used with permission.

Clearly, Alaskans do not currently have equitable access to Alaska’s seafood resources. It seems counterintuitive that one is hard-pressed to purchase fresh, locally caught seafood in Alaska. Even in such iconic fishing communities as Homer, the self-described halibut capital of the world, grocery stores do not have a seafood counter. The commercial fishing industry has developed around national and global rather than local markets, but reform is possible. There are several exciting and ongoing projects that aim to improve the presence of locally caught and grown foods in the Alaska marketplace. These include farm-to-school and fish-to-school programs that focus on making our schoolchildren, a group that is currently among the most food insecure in the state, the first beneficiaries of food systems innovation (Appendix II). Taking a cue from the extremely successful business model of community supported agriculture, some fishermen are also experimenting with community supported fishing (CS-Fish or CSF). These programs are creating new spaces for insinuating food systems reform at the state and community level, and also for developing the beginnings of the civic apparatus necessary for ensuring food security for all Alaskans.

A Note on Climate Change

It is important when discussing the future of food security and seafood in Alaska to raise the issue of climate change, specifically with respect to how the observed and projected impacts of a changing climate might impact salmon, other coastal and marine living resources, and coastal communities.

Whether or not driven by anthropogenic forcing, we already know that ecosystems and fisheries in Alaska waters are changing rapidly in response to changes in air temperature, sea temperature, and sea-ice conditions. In the Kenai Peninsula and Cook Inlet regions, the effects of climate change have been pronounced, including events such as spruce bark beetle outbreaks, three 50-100 year flood events since 2002, seasonal (summer) drying trends observed for area wetlands, and significant warming trends observed for salmon streams across the Cook Inlet watershed. The latter three can have direct impacts on salmon, and have spurred concern among many area residents. Writer and Homer resident Nancy Lord, for example, in her recent book *Early Warming*, writes,

Salmon are adaptive; we know this. The five Alaska species have managed to survive in this part of the world for six million years, through periods of warmth and cold. ... [However], the challenge this time looks to come from climate change that modifies both freshwater and marine conditions on a large scale, and rapidly. Despite all of Alaska's bragging about our sustainable salmon management, we may find ourselves up the proverbial creek. This time, the degree and speed of change may be more than salmon, as a species, can adapt to (p. 29)

There is clear evidence that river and stream temperatures are rising across the state, and in particular for the Cook Inlet watershed (Figure 17). Of 41 salmon streams that are monitored by the regional non-profit Cook InletKeeper, 35% as of 2009 already showed temperatures above 20°C along adult salmon migration corridors. The temperature threshold for adult Chinook salmon is thought to be between 20° and 21°C. Just how local salmon populations will be impacted by these changes is unclear. It is true, as Lord writes, that salmon have proven over millennia to be extremely adaptive. However, that process of adaptation could lead to changes as minimal as a change in the timing of salmon runs, or as significant as northward migration and complete regional die-offs of salmon within the next 50 to 100 years. Too, it is important to recognize that salmon today have to contend with a human footprint that is much more extensive than found in Alaska even a few decades ago (i.e., because of the development of roads, bridges, and culverts, fishing pressure, and off-shore energy development). As such, past patterns of adaptability for salmon are not necessarily effective predictors of future salmon behavior. To paraphrase Sue Mauger, area biologist from the local environment non-profit Cook Inlet Keeper who is quoted extensively in Lord's book, salmon today are being stressed from several directions at once.

Part and parcel of anticipating the possible future impacts of climate change is developing an understanding of which communities, sectors, and demographics will be most vulnerable to likely changes. From the perspective of food security, the uncertain future status of Cook Inlet salmon represents a worrisome vulnerability for all communities in the Kenai, particularly because so many local households rely on locally caught salmon. A poignant but as-yet unanswered question is how families will respond if salmon runs do indeed decline, especially those families at the lowest income levels.

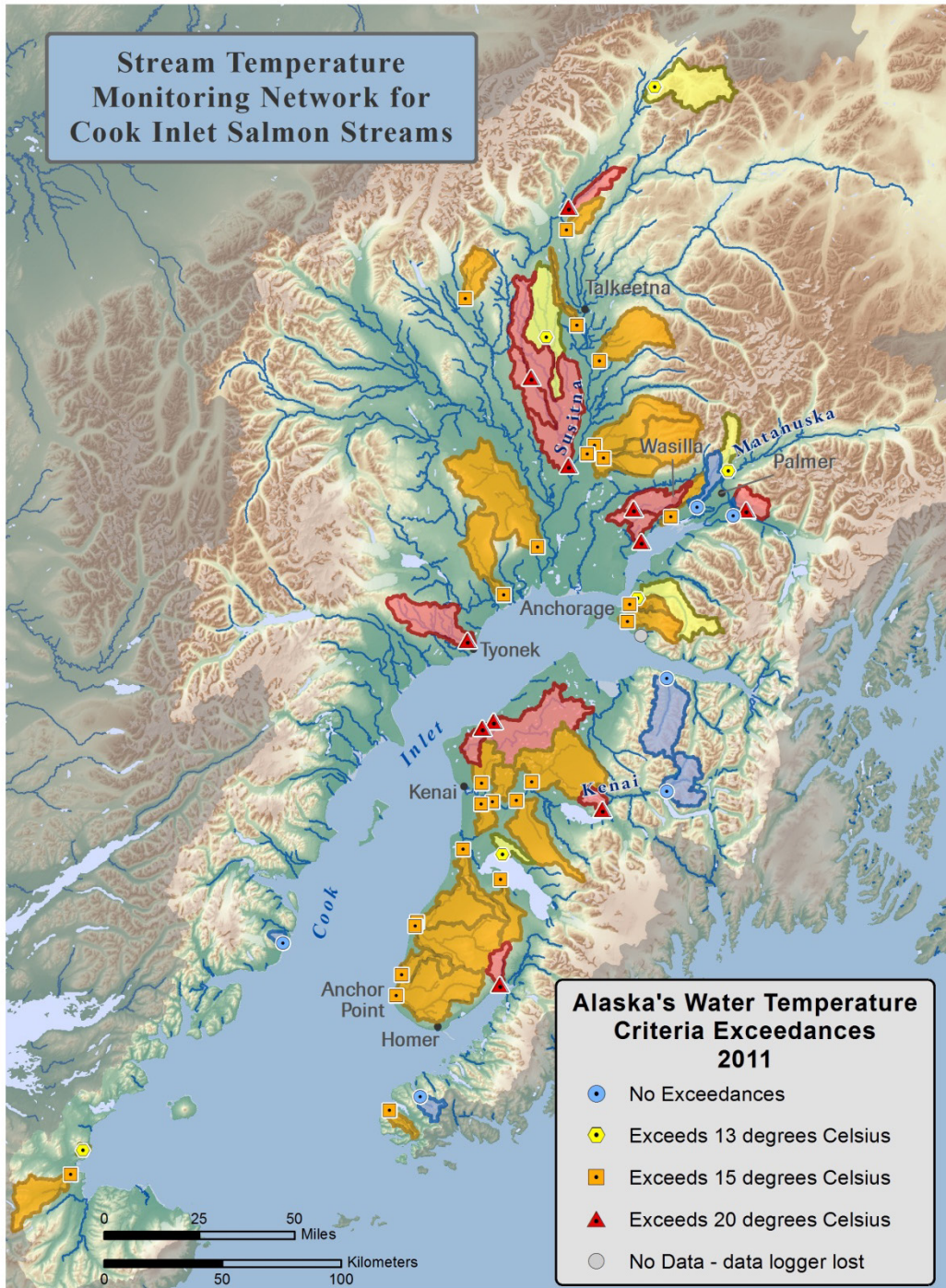


Figure 17. In 2011, summer stream temperatures exceeded Alaska’s Water Temperature Criteria of 13oC at 42 sites, 15oC at 36 sites, and 20oC at 11 sites. Temperature logger sites and their contributing watersheds are color-coded by the highest exceedance value. Cook Inletkeeper is also using projections for climate change to model possible future water temperatures, and these data should be available in 2013. Map by Cook Inletkeeper and the Nature Conservancy.

Conclusion

As noted earlier we can only draw inferences from the data we discuss in this report. In-depth, household-level ethnographic research is necessary to better understand the patterns we have identified. However, given that many of our findings track with the general principles and premises of local food systems being researched elsewhere in the world, we believe that our analysis is on the right track. **The opportunity is real for Alaska to be a leader in the ongoing global pattern of food system reform.** Alaska fisheries have undergone multiple complex ecological and sociopolitical transitions in the last few hundred years, and some of those transitions are continuing. While the managers of these fisheries can claim many successes, there remains room for improvement. It is our firm belief that it is possible to build community food security through the proactive local marketing of locally-caught seafood in Alaska in a way that enriches our peoples and strengthens our communities, without sacrificing responsible management or important commercial activities.

Alaska has a globally recognized track record for setting the standard for effective and sustainable fisheries management, and as such is particularly well situated to once again lead the world in developing fisheries and food system governance that ensures outcomes of food security and environmental justice for all stakeholders.

Acknowledgements

We wish to express our sincerest thanks to everyone who took the time to fill out our survey, and all of those individuals who went out of their way to make this project possible (listed in no particular order): Megan Murphy, Neil and Kyra Wagner, Linda Swarner, Sharon Whytal, Brian Harrison and Suzanne Haines, Nancy Hillstrand, Catie Bursch, Shana Loshbaugh, Kevin and Donna Maltz, Sue Mauger, Anna Brawley, Amy Pettit, and anyone else that we may have unintentionally omitted. This research is yours, and we hope that it contributes in some small way to your lives and livelihoods.

This research was supported by a NOAA Regionally Integrated Science and Assessments (RISA) cooperative agreement (grant #NA11OAR4310141), the Alaska Center for Climate Assessment and Policy (ACCAP), by the Institute of Northern Engineering at the University of Alaska Fairbanks. The views presented here are of the authors, and do not necessarily represent the views of the funding agencies.



Hannah Harrison at Kachemak Bay. Photo by Philip Loring.

Appendix I. The Survey



You've Been Selected—We Need Your Help!

10/31/11

Dear Kenai Peninsula Resident,

I am writing to ask for your help in understanding the quality of life in the Kenai Peninsula region of Alaska. In particular, my research team is trying to better understand how many Peninsula residents do not have consistent and reliable access to healthy foods, for themselves and for their families. The best way we have of learning about this kind of issue is by asking all different kinds of people who live in your area to share their thoughts, experiences, and opinions. **Your address is one of only a small number that have been randomly selected to help in this study.**

To make sure we hear from all different types of people who live in the area, we ask that an adult (age 18 or over) in your household complete this questionnaire, preferably one who is responsible for paying bills or purchasing groceries on a regular basis.

The enclosed questionnaire should only take about 20 minutes to complete. **Your responses are voluntary and will be kept anonymous.** Your names are not on our mailing list, and your answers will never be associated with your mailing address.

If you have any questions about this survey, please contact me, Dr. Philip Loring, the study director, by telephone at 907-474-7163 or by email at ploring@alaska.edu. This study has been reviewed and approved by the University of Alaska's Office of Research Integrity. If you have any questions about your rights as a participant in this study, you may contact them by telephone at 907-474-7800 (Fairbanks area) or 1-866-876-7800 (outside the Fairbanks area) or fyrb@uaf.edu.

By taking a few minutes to share your thoughts about life in the Kenai Peninsula, you will not only be helping us a great deal, you will be helping to raise awareness about living conditions and economic concerns in your community.

I hope that you enjoy completing the questionnaire and look forward to receiving your responses. Please accept the enclosed dollar as a token of thanks for your time. If you prefer taking this survey online, please go to the following URL: <http://www.surveymonkey.com/s/KenaiFoodSecurity>

Many Thanks,

Dr. Philip A Loring
University of Alaska Fairbanks

Alaska Center for Climate Assessment & Policy
University of Alaska Fairbanks
PO Box 755910, Fairbanks AK 99775



Kenai Peninsula Food Security Survey

Thank you for taking the time to complete our survey! Your thoughtful answers will help us to better understand the economic challenges facing Alaskans, and the special role that wild, local seafood plays in the livelihoods of Alaska families.

Section 1 – Seafood

1. Do you or does someone in your household fish for salmon, halibut, or any other kind of local wild seafood?

- Yes
 No

2. If you said yes to Question 1, how would you describe these fishing activities? *Select all that apply.*

- For commercial purposes
 For sport
 For tourism (I am a guide or charter)
 For subsistence or personal use

3. If you said yes to Question 1, what kinds of wild seafood did you harvest this year (2011)? *Select all that apply.*

- Salmon
 Halibut
 Pacific Cod
 Black cod (sablefish)
 Crab (any)
 Rockfish
 Clams
 Other _____

4. How frequently do you and your family eat seafood? *Please select only one.*

- Frequently (almost every day)
 Sometimes (2-5 times per week)
 Rarely (once or fewer times per week)
 Never

4b. Why not? Please use this space to elaborate, and then skip to Section 3 on page 6.

Kenai Peninsula Food Security Survey

5. How often do you eat each of the following kinds of seafood?

	Frequently (More than once a week)	Regularly (three to four times a month)	Rarely (one or fewer times a month)	Never
Salmon	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Halibut	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pacific Cod	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Black Cod (Sablefish)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rockfish	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crab (any)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Clams	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6. If faced with the choice, which of the following would you prefer to eat? Please circle one for each pair.

Example: If you prefer salmon to halibut, circle salmon.

Halibut -or- Salmon

Pacific Cod	-or-	Black Cod
Black Cod	-or-	Halibut
Halibut	-or-	Rockfish
Pacific Cod	-or-	Rockfish
Salmon	-or-	Halibut
Rockfish	-or-	Black Cod
Salmon	-or-	Black Cod
Salmon	-or-	Pacific Cod
Halibut	-or-	Pacific Cod
Salmon	-or-	Rockfish

Kenai Peninsula Food Security Survey

7. Other than fishing, how do you get seafood? *Select all that apply.*

- I buy from a fisherman (dockside, farmers' market, fish share, personal arrangement)
- From a major grocery store (Safeway, Fred Meyer, Walmart)
- From a less common grocery store (Save-u-more, Three Bears, etc.)
- Fish processor (Ed's Kasilof, Coal Point, etc.)
- Someone shares their fish with me for free
- Barter or trade (e.g., swapping goods, favors, or services for fish)
- Other _____

8. What is the most common way you get seafood? *Select only one.*

- Fishing
- From a fisherman (dockside, farmers' market, fish share, other arrangement)
- From a major grocery store (Safeway, Fred Meyer, etc.)
- From a less common grocery store (Save-u-more, Three Bears, etc.)
- From a fish processor (Ed's Kasilof, Coal Point, etc.)
- Someone shares their fish with me for free
- Barter or trade (e.g., swapping goods, favors, or services for fish)
- Other _____

9. Roughly how much of the seafood that you eat do you purchase? *Select only one.*

- Little to none
- some, but less than half
- half
- more than half
- nearly all
- all

Continue to the Next Page, Please.

Kenai Peninsula Food Security Survey

Section 2 – Salmon

In this section we ask **only about salmon unless otherwise indicated**. We understand that halibut, cod, and other seafood are also important! By focusing on salmon, we keep the survey short while still getting valuable information for you.

10. How would you describe the role of salmon in your household?

Select all that apply.

- Salmon is an important part of our diet
- Salmon is important to our financial security
- Salmon is important to our culture or identity
- Salmon is important to our community
- Salmon is important for other reasons (explain): _____
- We neither regularly consume nor fish for salmon in our household

10b. Why not? Please use this space to elaborate, and then skip to **Section 3 on page 6**.

11. During the local salmon fishing season (roughly, late May through September) how frequently does your family eat salmon? Please select only one.

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

12. When local salmon are not in season (roughly, October through May), how many times a week does your family eat salmon? Please select only one.

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

Kenai Peninsula Food Security Survey

13. Do you use any preservation/storage methods to keep salmon for consumption when it is not in season? Select all that apply.

- Freeze
- Smoke
- Dry
- Can / jar
- Salt
- Other (please specify): _____

- We do not preserve or otherwise store salmon

13b. Why not? Please use this space to elaborate, and then skip to Section 3 on page 6.

14. If your answer to Question 13 is that you freeze or otherwise preserve salmon, do you ever find yourself with left over salmon when the fishing season opens the next year?

- Yes, usually
- Yes, sometimes
- No, never

15b. If yes, what do you do with the left over salmon? Please select all that apply.

- Sell it
- Trade or barter it
- Give it away
- Donate it
- Throw it away
- Dog food
- Compost it
- Other _____

15. Do you believe that Cook Inlet salmon are being fished and managed sustainably?

- Yes
- No
- Not sure

17b. Please share any additional comments about sustainability here!

Kenai Peninsula Food Security Survey

Section 3 – Food Security

Food security means having access at all times to affordable, safe, nutritious, and culturally preferred foods.

The next few questions ask you to think about the foods you eat, and how much you adjust or economize your family's diet to make ends meet. Remember, all of your answers are **strictly anonymous**.

16. In the last month, how often have you and your household eaten foods that are less preferred but are more affordable, in order to make sure that everyone in the household could eat? Please select only one.

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

17. In the last month, how often has someone in your household had to limit their portion size in order to make sure everyone in the household could eat? Please select only one.

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

18. In the last month, how often have you had to borrow food, or borrow money to buy food, so that everyone in the household could eat? Please select only one.

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

19. In the last month, how often have you or another adult in your household limited their portion size specifically so that a child could eat? Please select only one.

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

Kenai Peninsula Food Security Survey

20. In the last month, how often have you or anyone else in your household had to skip a meal because there was not enough food? *Please select only one.*

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

21. In the last month, how often have you or anyone else in your household gone an entire day without eating because there was not enough food? *Please select only one.*

- Frequently (almost every day)
- Sometimes (2-5 times per week)
- Rarely (once or fewer times per week)
- Never

22. In the last month, have you used of the following food assistance programs? *Please select all that apply.*

- Food Stamps / Quest
- WIC - Women, Infant, and Children
- Food Bank
- Soup kitchen
- Free or reduced school lunch program
- Other _____

Section 4 – Demographic Data

Almost done! The next few questions give us some background information so that we can better understand your community. Remember that all of your answers are kept **entirely anonymous**.

23. What is your zip code? _____

24. How many people regularly eat in your home? (At least one meal per day, at least once per week). *Please provide the number of adults (age 18 and older) and the number of children.*

Adults _____ Children _____

25. How many of the people you listed in your answer to Question 24 are not immediate family members? *Please provide the number of adults (age 18 and older) and the number of children.*

Adults _____ Children _____

Kenai Peninsula Food Security Survey

26. What is your annual household income? *Please select only one.*

- < \$25,000
- \$25,001 - \$50,000
- \$50,001 - \$75,000
- \$75,001 - \$100,000
- More than \$100,000

27. Does anyone in your household fall into any of the following categories? *Please select all that apply.*

- Unemployed – *they do not have a job, have actively looked for work in the prior 4 weeks, and are currently available for work*
- Retired – *not actively employed and not seeking employment, but not because of disability*
- Disabled – *has a physical or mental impairment that substantially limits their employment*

28. What is your ethnic/racial background?

- African American
- Alaska Native / American Indian
- Asian
- Caucasian
- Hawaiian / Pacific Islander
- Hispanic / Latino
- Russian
- Other _____

THANK YOU! Please return this survey to us in the provided, postage-paid envelope.

On behalf of the project team, I want you to know that your participation in this survey is **greatly appreciated**, and will help us to identify, in partnership with community organizations and local government, possible **solutions** for **strengthening** food systems in the Kenai Peninsula. When the results of this survey are tabulated, this information will be made available to you through a variety of venues. Best Wishes!

Signed,



Dr. Philip A Loring, Lead Investigator

Appendix II. Additional Programs and Resources

Listed here are just a sampling of the various local food-related programs and resources that we are aware of at the time of writing.

- **The Alaska Food Policy Council**

<http://alaskafoodpolicy.blogspot.com/>

<http://dhss.alaska.gov/dph/Chronic/Pages/Obesity/nutrition/default.aspx>

The Alaska Food Policy Council is an open-membership organization that works to strengthen Alaska's food systems to spur local economic development, increase food security, and improve nutrition and health. It serves as a resource for information on local and state food systems, and works to identify and propose policy and environmental changes that can improve the production, processing, distribution, health, security and safety of our food.

- **The Alaska Grown Resource Book**

http://dnr.alaska.gov/ag/ag_AKGrownResourceBook.htm

- **Alaskans Own Seafood**

<http://alaskansown.com/index.php>

"Alaskans Own" is a Community Supported Fishery (CSF) program, a seafood subscription that offers longline and troll-caught fish harvested from Southeast waters. Modeled after Community Supported Agriculture (CSA) subscriptions that deliver fresh produce from local farmers, their CSF program provides wild Alaskan seafood to subscribers.

- **Catch of the Season**

<http://www.akmarine.org/our-work/catch-of-the-season>

A project of the Alaska Marine Conservation Council (AMCC), the Catch of the Season Project is a yearly Community Supported Fishery that provides the opportunity to purchase shares of Kodiak Tanner crab. The program provides direct support to both ocean conservation and independent fishermen whose sustainable harvesting practices set a vital standard.

- **Cook Inletkeeper**

<http://www.inletkeeper.org>

- **Farm to School (Alaska)**

http://dnr.alaska.gov/ag/ag_FTS.htm

The Farm to School (FTS) program is designed to offer expertise and support to all areas of the state to pursue farm to school activities and interests. The prevailing program goal is having product produced and/or harvested in Alaska available in the school food environment. We hope that through a variety of outreach efforts, we will increase the procurement and use of food grown in the state by public schools.

- **Kenai Peninsula Food Bank**

<http://kpfoodbank.org/>

The Food Bank is a non-profit organization founded in 1988, which provides food to over 67 non-profit agencies for their feeding programs throughout the Kenai Peninsula.

- **Kenai Resilience**
<http://www.kenairesilience.org/>
 The mission of Kenai Resilience is to “gather and celebrate local skills, knowledge and resources toward cultivating a more sustainable community.” Among other activities, the group offers a local food directory and hosts regular community potlucks, where members discuss issues related to local food and food security, screen documentary films to help raise awareness.
- **MAPP of Southern Kenai Peninsula**
<http://mappofskp.net/>
 The goal of MAPP SKP is to develop and sustain healthy communities via “participation from many diverse organizations and individuals who live, work and play” in the Southern Kenai Peninsula. Started in November of 2008, MAPP SKP conducted the first collaborative, area-wide health needs assessment in Alaska, to identify opportunities for health improvement and to serve as a catalyst for community action.
- **People Promoting Wellness**
<http://kpmapp.org/>
 People Promoting Wellness is a community-driven (Kenai, Soldotna, Kasilof, Nikiski, Funny River and Sterling area) initiative that is using the Mobilizing Action through Planning and Partnerships (MAPP) strategic visioning process to address community health issues. Currently, PPW is facilitated by public health leadership and exists to help communities identify and prioritize issues related to health and community and then formulate goals and strategies for positively addressing them.
- **Sitka Local Foods Network**
<http://sitkalocalfoodsnetwork.org/>
 The Sitka Local Foods Network is a 501(c)3 non-profit group dedicated to promoting the growing, harvesting and eating of local foods in Sitka, Alaska. Initiatives include the Sitka Farmers Market, the Sitka Community Greenhouse and Education Center, expanding local community and family gardens, promoting the responsible and sustainable use of traditional foods, and providing educational opportunities, technical expertise and encouragement to Sitkans wishing to grow their own food.
- **Sitka Fish to Schools**
<http://sitkawild.org/issues/community/environmental-education/fish-to-schools/>
 The Sitka Conservation Society (SCS) is a founding partner and coordinator of the Sitka “Fish to Schools” program. Their mission is to deepen youth understanding of local seafood resources by integrating locally-caught seafood into the school lunch program, introducing stream to plate curricula, and fostering a connection to the local fishing culture.
- **Sustainable Homer**
http://www.sustainablehomer.org/local_food.htm
 Sustainable Homer is dedicated to being the resource for information and available programs that can help people make a difference. Sustainable Homer has hosted speakers on a variety of topics from peak oil to permaculture and collaborated on forums concerning energy and conservation to promoting local foods.

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Endnotes

¹ Data presented here are for 2011 from the US Census Bureau's QuickFacts website unless otherwise noted, accessed 09/12/2012

² Unemployment data from the State of Alaska Department of Labor and Workforce Development Research and Analysis website, accessed 09/12/2012

³ Food insecurity rates are from Feeding America's Map the Meal Gap model, accessed 07/12/2011

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