Myself: I am a researcher who has spent the last couple of years looking through the results from the interviews and here is my attempt to summarize them, provide my personal observations, and share information that is useful and interesting. I apologize in advance if any of my comments or approach taken in this report rubs people the wrong way, after all I am from Fairbanks and we are a little different. There are a lot of positive results from communities that made me proud while living in Norway. Thank you!

Please look for me at the tribal or city council office, school. You can also call me at 907-750-3750 to meet. I will be in Noorvik (2/2-2/5), Noatak (2/6-2/11), Brevig Mission (2/23-2/20), and Atqasuk (3/23-3/26).

Introduction
The goal of the TUNDRA project was to determine how environmental governance and socio-economic conditions influence ecosystems and the services they provided to local people. We also want to better understand the effectiveness of management approaches under different economic conditions and different types of government among four Arctic countries. This project involves 28 communities in tundra regions of Alaska, Canada, Norway, and Russia. For this project I lived in Norway on and off since 2010 and met with the people who conducted the interviews in the other countries. This project started in 2009, and I interviewed people in Alaska during January through March in 2012. Funding was from the Norwegian Research Council. We interviewed 16 people in each community, with the same numbers of Elders/Youth, employees of the government/non-government, and men/women.

These communities were chosen because they are in areas with tundra vegetation, and a large portion of their harvest is typically from the land. In Alaska we wanted to compare different boroughs/census areas, Native organizations, and access to wage income. During the interviews we asked about several topics including harvest and land use, community dynamics, conservation and mining opinions, wildlife management, and information about interactions and trust with various agencies. There was so much information asked that not all the results can be presented here. However, if you would like to see other results or more detailed results, please feel free to contact me.

Overall what is presented here are main themes and things I learned from talking to residents in Alaska and other regions of the arctic. The suggestions below are based on my personal experiences and impressions and may or may not work for your community. I welcome any comment and suggestions and take full responsibility for interpreting this information. Please feel free to disagree and voice your opinions. More detailed information is provided at the end of the report to understand how and why I arrived to these conclusions. I encourage you to read through the report or at least glance at the figures.

How can information sharing be increased?

Many participants expressed a desire for more information, especially from representatives to boards. The councils are very good at informing the residents, and several residents mentioned that the councils are important because they help people, share information, and interact with outside agencies. I use quotation marks (“ “), when I present the exact words that someone used in an interview.

- “If they don’t know information that are going to affect use, that is not good. They should be the front line people and relay it.” Noatak
- “They are the ones that have the meetings. If EPA or Fish and Game is coming around it is always with the city or IRA.” Noorvik
- “Tribal government deals with Feds and city deals with State.” Brevig Mission
- “Because they are the only active governments we have.” Atqasuk

Communication is important for good decision making, and efforts made to share information by individuals who participate in various meetings, conferences, trips, etc. are welcomed by residents. Would communities be interested in having individuals who travel to meetings make formal presentations to their communities? How can agencies support this process?

Can agencies tap into the excellent equipment for video calls and teleconferences that is often in schools and have virtual face-to-face meetings with residents of the community to allow residents to become informed?
Several of the older women who said that, after their husbands died, they felt out of touch because they no longer knew what was going on, which they said increased their feeling of isolation and disconnection. Perhaps extra effort can be made to include these Elders, or perhaps younger women might attend meetings independently or with their husbands, so they are used to going to meetings regardless of their spouse’s position.

An issue facing some northern communities was the importance of attracting educated youth back to the community after graduation. People said they value youth who are educated and active in the community, and that these are very important in community dynamics. Those communities that have attracted their college graduates back after graduation often have strong leaders such as in Noatak and in some Canadian communities. As a cautionary note, a Nunavut resident said that a lot of pressure is placed on these young, future leaders, so finding the balance between not overwhelming those who return, and using their strengths is important. In order to make this happen communities, especially parents, need to stress the importance of attending school and find creative ways to show how an education will be useful since this could be hard to see in an isolated village. If children don’t see the importance of getting a university education and are not receiving support from home to attend school, a child is more likely to stay home. Even if the topics being taught in high school may not seem relevant, the discipline and time management skills which are needed to attend school are important for many issues and jobs a person faces in life. Learning to show up on time and maintain a schedule are a powerful lessons to learn. A study indicated that just finishing high school was a good predictor of how well a person would perform at the Red Dog mine. At the same time, having a good relationship between the school and community is important, which may be hard with the high turnover rates of teachers. Encouraging youth to return as teachers in the community would benefit everyone and could help with attendance. Lastly, more and more work is being done from people’s homes or at a distance. Right now the slower internet speeds in rural Alaska likely prohibit this type of work situation but pushing for faster speeds and capabilities could help people remain in the village and work in businesses or agencies in Anchorage and Fairbanks. In general, getting a formal education doesn’t mean you can’t live in rural Alaska.

**Are wildlife regulations important? If not, why?**

At first I was surprised that residents seem to be unfamiliar with local wildlife management and regulations. But, now that I have listened to people and visited the communities, it makes sense. For instance, residents here are relatively isolated, and many people said that their stomach is their signal about when it is time to hunt. Three of the four communities depend on caribou as main sustenance, with two of the three on the Western Arctic Herd, which until recently was quite large. Caribou are known to come and go, and the impact of hunting has been thought to be small when compared to predators and climate. In addition, many meetings about wildlife management are held in larger hubs like Kotzebue and Barrow where only one person from the community attends. Unlike Alaska, each Nunavut community has a local conservation officer who works with the hunter and trapper organizations (HTOs), which are made up of locals. In Alaska, the local representatives for the advisory committees and/or regional advisory councils could act as the local conservation office and have a group of individuals (HTOs) he/she meets with to both share information but also bring local concerns to the board. The local representative cannot be seen as an enforcer of wildlife management. Relationships between local people and managers will be better if there is less attention paid to enforcement and more on communication of information about fish and wildlife abundance and distribution.

**What are other communities doing to engage Elders?**
The Elders subsistence program in the Northwest Arctic Borough was very popular and helpful for residents and could be adopted by other areas to support their Elders, for example in Brevig Mission. This program offers gas, ammunition, and oil to younger hunters who then provide the Elder with part or all of their subsistence (see: http://www.maniilaq.org/tribalAdministration.html). Overall, I think Native corporations could do more to help out residents of the communities, but this also requires that community members take the initiative to ask for help. For example, since jobs are scarce in many communities, a program that helps locals sell their handicrafts either online or at stores in larger cities would help provide source of income. Programs like this could be structured to give people the tools and knowledge to eventually become independent, such as free courses on how to make a website or start a business.

- “But [Native corporations] can be improved by providing more opportunities for families and people to be more independent like start small businesses like family, commercial fishing or sled building.” Brevig Mission

As mentioned before, education is important and support for an exchange program with other Inuit communities in the Arctic could be a great way for students to experience life outside of their village or Anchorage and open their eyes to other opportunities they did not know existed. Could this be a program that Native corporations could help establish?

**Below are results requested by one of the Tribal Councils which may be of interest:**

Who tends to feel they are informed by city and tribal government, wildlife management, resource extraction issues, and government? Are there differences among Atqasuk, Brevig Mission, Noatak, and Noorvik?

<table>
<thead>
<tr>
<th>Percent of Interviewees who said they felt informed by the Tribal and City Councils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atqasuk</td>
</tr>
<tr>
<td>Tribal</td>
</tr>
</tbody>
</table>

- People felt slightly more informed by the tribal council than the city government.
- More youth in Atqasuk felt uninformed, with only 25% and 37.5% saying they felt informed by the tribal and city council respectively.
- A majority of the Elders in one community did not feel informed by the city council (57%), but felt more informed by the tribal council (43%).
- Everyone in Noatak felt informed by the tribal council. Sex of the interviewee did not influence how informed a person was.
People involved with government, such as tribal or city council or advisory committees, felt more informed (81%) by the tribal council than non-government interviewees (52%).

Trust was much higher for tribal councils than city councils, 85% versus 68%, respectively.

**Does the price of food influence your subsistence hunting? Why or why not?**

- Most people said that an increase in food prices would affect their subsistence (65%), and most said they would increase subsistence activities (62%).
- People who said no often they mentioned they already do a lot of subsistence while those who said maybe mentioned that the price of gas and ammo would probably go up.

**What if food is not available at the store?**

- The most common response was to order from outside the community (28%).
- The two communities with access to wage employment (Atqasuk and Noatak) had the higher percentage of people who would order from outside the community, 41% and 29%, respectively. However, the most common response in Noatak was to look in the freezer or substitute a different kind of food.

**What are important education goals?**

- All communities, except Noatak, felt that teaching students to respect nature and wild animals was the most important thing to teach in school (43-50%). Interviewees from Noatak felt harvesting traditions were more important (36%).
- People said that the least important item to teach in schools was how to make resource extraction profitable (38-53%). Only Brevig Mission, which has moose, thought that wildlife management laws were least important (23%).

**How much do people trust local, State, and Federal agencies? Does this differ with age, sex, or community residence? In general do people trust Native organizations more? How do levels of trust compare with tundra communities in Canada (Nunavut), Norway, and Russia?**

- Overall sex, age, and holding a position with the government did not influence trust. What was more important was where the person lived.
- Alaskans are very, very trusting people, even more so than Norwegians.
- In general Alaskans are more trusting of local and indigenous organizations, those without enforcement power, and the only characteristic of a person that influenced trust was their education level. Trust seemed to increase with increased education. Churchill in Manitoba was the one community in North
America that had very low trust and this was due to controversies regarding a railroad and port, both of which are tied to jobs and availability of resources.

What is the community’s view on mining/oil/gas development? Will mining influence animals, is mining more important than the environment, and is money from mining more important than protecting the environment? How does your communities view compare with other tundra communities in Alaska, Canada (Nunavut), Norway, and Russia?

Table 1. Percent of interviewees who said yes to the following questions: A) Mining will create problems for people’s use of the land, B) The income generated from mining will offset the negative consequences from mining

<table>
<thead>
<tr>
<th></th>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>60.9</td>
<td>15.6</td>
</tr>
<tr>
<td>Nunavut</td>
<td>56.0</td>
<td>18.5</td>
</tr>
<tr>
<td>Manitoba</td>
<td>47.1</td>
<td>29.4</td>
</tr>
<tr>
<td>Norway</td>
<td>38.2</td>
<td>37.0</td>
</tr>
<tr>
<td>Murmansk</td>
<td>52.9</td>
<td>40.5</td>
</tr>
<tr>
<td>Taimyr</td>
<td>79.6</td>
<td>30.1</td>
</tr>
<tr>
<td>Yamal</td>
<td>82.7</td>
<td>19.1</td>
</tr>
</tbody>
</table>

- Most people agreed that protecting nature was more important than natural resource development and that money earned would not be worth the potential cost.
- Most people feel that the environmental impact assessment process is helpful (53%), but many said they don’t know if their comments are incorporated (48%) or said that their opinions were not included (33%).
- Trust of the industry was low (32%), much lower than trust of non-industrial agencies. Only Norway had more trust in industry probably because it is tightly controlled and regulated by the government.

Again I want to thank everyone who helped make this possible including the tribal and city councils, local hires, interviewees, University of Alaska Fairbanks, and University of Tromsø.

To give your comments or find out more information about the TUNDRA project please contact:

Jennifer I. Schmidt, University of Alaska and University of Tromsø, Cell: 907-750-3750, jischmidt0@gmail.com
Information about the communities which was influential in the results:

Alaska (Atqasuk, Noatak, Noorvik, and Brevig Mission)

The communities in Alaska are located in very remote places, small (< 700 residents), and predominately Inuit Alaska Natives. They are located in three different governmental districts with two of the three being boroughs that are typically formed when there can be revenue made from natural resources. We wanted to compare communities that are affected by resource extraction industries either through employment opportunities and/or financial trickle down effects versus those that are less affected. Atqasuk and Noatak are more influenced by resource extraction than Noorvik and Brevig Mission. Atqasuk is located in the North Slope borough and is the smallest community. It was chosen because it is one of the few communities on the North Slope that is inland and has subsistence activities that are primarily land-based. Due to the oil and natural gas resource extraction activities and borough policies, residents of this community receive large dividends and have access to much cheaper gas and heating fuel than the other communities. Meanwhile, Noatak is near Red Dog mine (40 miles), and residents can travel to the mine and obtain cheaper fuel. Also, Red Dog mine is working to establish a transport system to haul and store large amounts of the reduced-cost fuel for the village. Some residents of this community are employed at Red Dog mine. Meanwhile, Noorvik is further south within the Northwest Arctic borough and less influenced by Red Dog mine. This is the largest community (n = 668) and in 2010 had the lowest percent of the population employed. However, the median household income is the second highest due to a few households with high incomes. Lastly, Brevig Mission is the only community located on the coast, has more moose harvest than caribou, and can barter with reindeer herders. This community has the lowest median household income and is the only community to have an increase in the percent of adults without a high school diploma between 2000 and 2010.

Canada

Nunavut (Baker Lake, Whale Cove, and Chesterfield Inlet)

In general residents of communities in Nunavut are similar to those in Alaska in that they are remote, primarily Inuit, young population (median age 24.7) and depend heavily on subsistence harvests. Unlike Alaska, indigenous residents of Nunavut can sell subsistence harvests that are typically sold to their local cooperative or processing plants. Also the land claims settlement occurred in 1993, after Alaska’s lands claim settlement, and indigenous residents have retained more power and involvement in government and management. This has even expanded to selling caribou on Facebook. This has resulted in the doubling of subsistence harvest which is a cause of concern by wildlife managers (http://www.cbc.ca/news/canada/north/selling-caribou-meat-online-may-hasten-herds-decline-biologist-1.1311871). Each community has hunter and trapper associations which are strong forces in the communities. Baker Lake is the largest community (n = 1,870), has 3 lodges, known for its arts and crafts, and is located near the Meadowbank Mine (45 miles). Some residents of Baker Lake are employed by the mine, and research has indicated that there have been some negative social consequences from mining, especially for women. The other communities in Nunavut are less influenced by resource extraction, located on the coast, and
are smaller in size \((n < 450)\). Chesterfield is preparing for increases in tourism which includes sport hunting. Lastly, Whale Cove is the smallest community settled by inland and coastal Inuit during the 1950s and marine mammals are key subsistence foods.

**Manitoba (Churchill)**

Churchill is also known as the polar bear capital of the world. It is a community that is connected with a railroad and a port which provides diverse job opportunities. The indigenous population there is the minority and is a mix of Metis, Cree, and Inuit. There currently is controversy regarding the future of the port and railroad, which has people talking. Overall this community is more like an urban community with a hospital, public library, cinema, etc. than any other of the North American communities used in this study.

**Norway**

All the communities in Norway are connected by a road network. Also this population is much older than other regions due to a lower birth rate and long life expectancies. Most of these communities are similar to smaller communities that would be found in the lower 48 with paved roads, access to various shopping and cultural facilities, cafes and restaurants, either locally or within driving distance. Access to jobs typically was not an issue compared to other regions in the Arctic, and, if employment is not available, the country has a very generous unemployment package. The costs of living in Northern Norway are similar to Southern Norway partly due to country politics and subsidies. There are 75,207 residents in Finnmark, and 13\% are registered as indigenous people. Only 2,370 are registered as reindeer herders. Some of these herders move their reindeer from summer to winter pastures, and the industry is subsidized. Many people harvest subsistence foods to either sell or supplement food purchased at the store. Fisheries are the most important enterprise in the coastal communities.

**Russia (Murmansk, Yamal, and Taimyr)**

Overall, there has been a large amount of outmigration from northern Russia and some communities have been completely vacated. In Russia the sale of subsistence-harvested animals, fish, and plants is allowed. Also people can be employed or make a living as professional hunters and fishers. This is most prevalent in Taimyr (Table 1).

Table 1. Percent of interviewees who worked as professional harvesters of subsistence resources. People can be self-employed or join cooperative, which are a group of people working together to benefit economically from harvest.

<table>
<thead>
<tr>
<th>Title</th>
<th>Murmansk</th>
<th>Yamal</th>
<th>Taimyr</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professional resource user</td>
<td>2.0%</td>
<td>6.1%</td>
<td>24.5%</td>
</tr>
<tr>
<td>Professional hunter</td>
<td>0.0%</td>
<td>0.0%</td>
<td>14.3%</td>
</tr>
<tr>
<td>Professional fisher</td>
<td>2.0%</td>
<td>6.1%</td>
<td>22.4%</td>
</tr>
<tr>
<td>Professional reindeer herder</td>
<td>0.0%</td>
<td>1.0%</td>
<td>4.1%</td>
</tr>
</tbody>
</table>

**Murmansk**

Murmansk shares a boarder with Scandinavia and is viewed as slightly apart from the rest of Russia because of this proximity. It is biogeographically similar to northern Scandinavia and shares the landscape and climate conditions of this region. Indigenous residents in this region are mostly Sami, and some of them are herding
reindeer. Employment opportunities are scarce in two of our three communities, but, like Norway, all were accessible via a road.

**Yamal**

Yamal is known for its oil and gas development and one of our communities actually had gas in its name, Gaz-Sale. A total of six communities were used for this study ranging between 1,000 to 2,900 residents. The indigenous residents of this region are mostly Nenets, and reindeer herding was present in four of the six communities but also there was access to other employment opportunities. Gaz-Sale and Zapoljarnyi are communities similar to Prudhoe Bay in that they are primarily made up of gas/oil field workers. However, like the North Slope most of the communities in Yamal are influenced by resource development.

**Taimyr**

All of the communities in Taimyr were not accessible by road. Novaya is the smallest community (313) interviewed in Russia and is inhabited almost exclusively by indigenous people (Dolgan and Nganasan). The indigenous people in this region are mostly Dolgan in eastern Taimyr and mostly Nenets in western Taimyr. In eastern Taimyr hunting and fishing are the main traditional activities. Nosok is very close to Yamal, and reindeer herding is an important activity like in Yamal. Of the three Russian regions Taimyr was the most isolated.
Land use:

Residents of Canada use the largest amount of area followed by Alaska while Norway and Russia use smaller areas but their use is more diverse. One person in Canada reported using an area 70,273 km² largely to hunt for wolves. However, land use would have been even higher if marine mammals had been included.

Figure 1. Areas used by interviewees in Russia (Yamal (6), Taimyr (3), Murmansk (3)), Norway (6), Alaska (4), and Canada (4) in 2011 and 2012.

Most of the land use by North American communities is for harvest purposes such as hunting, fishing, and harvesting. However, in Norway about 40% of the area used is for non-harvesting purposes such as skiing, hiking, and other recreation. Spiritual use of the land was the greatest in Russia and minimal in all other Arctic regions (Figure 3a-3f).
Figure 3a. Land use in Alaska.

Figure 3b. Land use in Canada.
Figure 3c. Land use in Norway.

Figure 3d. Land use in Murmansk, Russia.
Figure 3e. Land use in Yamal, Russia.

Figure 3f. Land use in Taimyr, Russia.
In Alaska and Canada interviewees were reluctant to identify areas that are the most important for their use, but in Norway and Russia cabins and berries/mushroom places were often identified as most important (Figure 5).

The intensity of land use intensity was much greater for harvest purposes than non-harvest purposes in Alaska and Canada (Figure 6). In Norway the number of people using the same area was not as great, likely
because of the smaller use areas, diverse use, and increased access to a wide number of areas. Unlike North America, similar intensity levels occurred for harvest and non-harvest activities (Figure 6).

Figure 6. Land use intensity by interviewees in four Alaska communities in 2012.

Harvest:

The highest harvest levels occurred in Russia, particularly Taimyr due to the ability to commercially sell harvests (Figure 8.). In Russia, it is legal to sell harvested resources and also be employed as a professional harvester. In Yamal and Taimyr there is reindeer herding but we tried to not include that activity in our numbers. In Alaska we failed to ask about harvest of fish and berries so the harvest levels in Alaska are grossly under-reported. Areas with marine mammal harvest are also under-represented. Murmansk harvested a large quantity of berries, which is similar to Norway. In Norway, the harvest of salmonberries is popular and special to many people. Like Russia, people can sell their harvests in Norway and it is not uncommon to see moose and whale meat and reindeer hides in the stores. Sale of harvest is also legal in Nunavut but to a limited extent. People reported selling caribou and fish to cooperatives and fish plants. However, some have expressed concern that selling subsistence harvest conflicts with Inuit values (Gombay 2009).
When we exclude people who do not harvest anything average harvest per person was greatest in Taimyr (1,473±264 lbs) followed by Yamal (464±93), Manitoba (529±114), Nunavut (319±82), Alaska (201±36), Murmansk (187±26), Norway (127±23). When we looked at the difference between when all individuals were included and only those who harvest there was a large difference in Alaska and Nunavut. This indicates that people who harvest typically harvest a lot and a number of individuals harvest very little (Figure 8). Other than Taimyr, where some people were professional hunters and fishers, harvest was more similar among people. This supports the “super-household” or “harvester” theory which has been used to describe subsistence harvest patterns in rural Alaska.

Overall harvest estimates are likely low in Alaska and Canada because marine mammals were not included, especially in Brevig Mission and Chesterfield Inlet (Figure 9). Also in Alaska we did not ask harvest amounts for fish and berries/plants. However subsistence household surveys indicate that lbs/household was much greater in Brevig Mission (2,472; 1989), in Noatak (1,609; 2007), and Noorvik (2,612, 2012). Per capital estimates, which are more comparable to our data because include those who don’t harvest, is smaller at 579 lbs (1989) in Brevig Mission, 602 (2007) in Noatak, and in 364 (2012) Noorvik. Overall with household-level numbers Alaska harvest are more comparable to Russia but likely still lower. The ability to sell harvests increases what people harvest.
I = primarily indigenous communities, H = herding community
*Fish and berries/plants were not asked in Alaska.

Figure 9. Average harvest in 2012 from interviews conducted in Alaska, Canada, Norway, and Russia.

Community Dynamics:

Alaska residents were very trusting, almost as trusting as Norwegians (Figure 10). We did not have interviewees define trust but simply asked them how much they agreed with the statement that “most people in your community can be trusted”. Churchill in Manitoba has the lowest amount of community trust which is likely due to issues surround development (railroad and port). This community is less homogenous than other North American communities with a lower percentage of indigenous peoples and a mix of different wage income options. Murmansk is a region in Russia that shares a border with Norway and many people from this region have left for southern Russia or even Norway. Their relationship with the rest of Russia is a bit strained because of is nearness to Scandinavia. These circumstances may be reasons for lower trust in Murmansk. In Alaska, Brevig Mission had the lower trust (3.1±0.2) while Noatak had the highest (4.5±0.2). This result is similar to the overall cohesion results (see below).
Norway is known for its high social cohesion but Alaska actually tied with Norway (4.0 of 5 with 5 indicating a high amount of social cohesion). Lowest was in Manitoba (Canada), Yamal (Russia), and Taimyr (Russia) at 3.3 out of 5. There was a high amount of social cohesion (togetherness) among Alaska communities with the highest in Noatak and slightly lower in Atqasuk and Brevig Mission (Figure 11).
Figure 11. Community averages for questions about social cohesion with 5 indicating high cohesion and 1 is low cohesion.

Some of the potential reasons for the lower overall trust and social cohesion in some communities could be tied to two observations. First, some Elders during the interviews felt a bit isolated and left out. There were some comments about not having children stop by or bring subsistence foods like in the past. What could be done to help improve community connection with Elders? Secondly, schools are a main centerpiece in Brevig Mission the relationship between the school and community was strained. This may be why this was the only place with an increase in youth with no high school education from 2000 to 2010 (Figure 12). However, since my visit this community has a new principle and hopefully this relationship has improved.

![Change in Education Achievement among 25 year olds and older between 2000 and 2010](image)

Figure 12. Change in the percent of adults (>24 years old) with various levels of education attainment.

**Trust**

Previously we presented trust within the community while here we look at trust of agencies and organizations. Overall trust was greatest in Alaska and Nunavut (Table 2) which are dominated by rural, isolated, Inuit communities. Even though, trust may seem low people were much more trusting in Alaska than Norway and Russia. **Why do people in Alaska trust their agencies? Are agencies doing something right?**

Table 2. Trust of various agencies or organizations by Arctic communities.

<table>
<thead>
<tr>
<th>Country</th>
<th>Region</th>
<th>Yes (%)</th>
<th>Partly (%)</th>
<th>No (%)</th>
<th>NA (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska</td>
<td>Alaska</td>
<td>46.1</td>
<td>12.2</td>
<td>7.3</td>
<td>34.4</td>
</tr>
<tr>
<td>Canada</td>
<td>Nunavut</td>
<td>46.1</td>
<td>13.5</td>
<td>19.7</td>
<td>20.5</td>
</tr>
<tr>
<td>Norway</td>
<td>Norway</td>
<td>36.7</td>
<td>16.8</td>
<td>20.8</td>
<td>25.7</td>
</tr>
<tr>
<td>Russia</td>
<td>Murmansk</td>
<td>13.5</td>
<td>6.8</td>
<td>18.8</td>
<td>60.9</td>
</tr>
<tr>
<td></td>
<td>Yamal</td>
<td>20.1</td>
<td>8.3</td>
<td>26.7</td>
<td>44.8</td>
</tr>
<tr>
<td></td>
<td>Taimyr</td>
<td>8.8</td>
<td>1.6</td>
<td>18.0</td>
<td>71.7</td>
</tr>
</tbody>
</table>

However, many responses in Russia were “don’t know” or “no response”. Trust was in general higher for local agencies and lowest among agencies or institutions associated with industrial development (Figure 13).
Within Alaska communities trust for local government and industry was greatest in Noatak. Also in Noatak and Noorvik support for national agencies was greatest with much lower “do not know” responses which are likely due to recent interactions with the Alaska Division of Subsistence on subsistence household surveys and the Western Arctic Caribou Working Group (Figure 14).

Within North America trust was also higher for agencies that are comprised of largely indigenous employees or focused on indigenous issues (Table 3).

Table 3. Trust levels among the people who provided an answer for agencies that are primarily indigenous either based on employees or agenda.
In Alaska we asked about 13 different agencies and even though both city and tribal council are local governments trust was much greater for the tribal council. Noatak had high trust for its tribal council and since it did not have a city council the higher trust found in Noatak did not influence city council results. Support for the State fish and wildlife advisory committee was much greater than the federal committee (RAC) largely because people were more familiar with the State committee and two of our communities had a very popular wildlife biologist who works for the state.

![Graph of agency trust in Alaska](image)

Figure 15. Trust of agencies as expressed by interviewees from Atqasuk, Noatak, Noorvik, and Brevig Mission in Alaska.

In North America education appeared to increase trust (Figure 16). Unlike Alaska, there were several interviewees in Nunavut that had no formal education.

![Graph of agency trust by education level](image)

Figure 16. Trust in agencies based on different education levels.
Mining

In general there was agreement that mining will cause problems for caribou and peoples’ use of the land and that the economic benefits from mining are not worth the potential environmental costs (Figure 17a and b).

![Figure 17](image)

**Figure 17.** A) Response by residents in TUNDRA communities in seven Arctic regions regarding mining. B) Percent of interviewees who felt informed by industrial development (oil, gas, & mining).

However, these questions are phrased in very black and white terms and likely questions that are phrased in a more balanced way would produce more mixed results. In Norway, people thought that mining would be the least damaging but also trust for industries was the highest in Norway (Figure 18). In Alaska, most people thought that the environmental impact statement was beneficial largely because it provided community residents with an opportunity to express their opinions. Whether those opinions were heard or not was another story. On average 47% of respondents said they felt informed when decisions are made about industrial activity that might influence their village. This indicates the need for better communication.
Figure 18. Responses by interviewees in Alaska as to whether they think the environmental impact assessment (EIA) process benefits their community.

“We get informed on whatever they are going to do next and how they are going to do it.” Atqasuk

“Really hope so. It is supposed to. Mr. Parnell is not happy about getting back to communities. Water is where our food lives.” Brevig Mission

“They need to do more of them. That is when we get to speak up. They act like they hear us but then nothing will be done.” Noatak

“Because we have to be involved with what's going on. If not involved, create our own problems.” Noorvik

**Conservation & Management**

Questions about conservation indicated that both Alaska and Russia supported maximum harvest of resources (Alaska 67%; Russia 72%) and to a less extent Nunavut (48%). Support for predator removal was greatest in Alaska (47%) followed by Murmansk (35%), Nunavut (34%) and Taimyr (33%). All of these regions depend on harvest of subsistence resources or reindeer herding. In addition Alaska, Yamal, and Taimyr did not support reduction of ATV use in wilderness, but Norway strongly supported this (63%). Management was sometimes difficult to explain and define in Alaska and Nunavut. This response is not without good reason especially in areas with large numbers of wild caribou. Caribou are known to fluctuate widely in population size and roam over several thousand miles.

**Wildlife management (specific to Alaska)**

Overall most people know about the State agencies responsible for management of fish and wildlife (69%) but were less familiar with the Federal government (61%) agencies like the National Park Service (NPS) and the U.S. Fish and Wildlife Service (USFWS) (Figure 19). Atqasuk was the community with the least familiarity with wildlife management agencies and this is likely because it is a small, remote community surrounded by land owned primarily (95%) by Bureau of Land Management (BLM), whereas the other communities have a
mix of land ownerships. Also, the area biologists play a large role in peoples’ perceptions and awareness of wildlife management. In Noatak and Noorvik several people favorably mentioned the local ADF&G biologist and the caribou trails magazine. This area biologist has worked in this area for around 30 years and has built up a good relationship with the people participating in community programs like a kids’ summer camp. Meanwhile in Brevig Mission, people are aware of agencies more for negative reasons. Several comments were made about agencies flying over to watch what people are fishing and also people only coming to town for permit issues, but not really to listen to the people. People in Brevig Mission do harvest moose, which as seen below, typically comes with a single animal bag limit and season restrictions which people are not fond of. However, some of the negativity could be left over from previous workers in the area because the local area biologist has not been in the area as long as the other three communities. Regardless, increased communication and transparency about actions and motives likely would help to improve relations.

**Figure 19 Interviewees familiarity with management agencies and committees which local residents are supposed to use to make their voices heard regarding fish and wildlife management.**

**Most people believe wildlife management should be based on local customs and traditions (78%) and only 2% felt it should be based on western science more than local knowledge.** Almost half of the people interviewed felt the tribal council should have the power to manage wildlife (49%). However, some expressed concern because of the large amount of resources that would be needed. When asked if the tribal council would do better than the State or Federal government people were not sure with 43%(State) and 39% (Federal), saying “Yes” they would and about a quarter of people saying they did not know. In Alaska trust of wildlife managers was for information about animals as moderate (53%) with the most trusted source being elders who still hunt (93%). When asked if residents in the Alaska community had meetings about subsistence issues only 38% of Brevig Mission residents said “No” while the other communities ranged between 56 and 75% saying “Yes”. Atqasuk was the only community where more residents reported meetings about resource extraction than subsistence. When asked about rules or regulations that make it difficult to harvest the most common response
was season limits but most of these comments came from Brevig Mission, which has moose as the target species. Overall most people did not have or mention a problem. The most common reason for declines in caribou or moose varied between communities with Atqasuk mentioning industrial activity and human disturbance, Noatak climate and human disturbance, Noorvik predators and human disturbance, and Brevig Mission predators. We did not ask about disease in the first community, Noorvik, but this was suggested by a few interviewees and was mentioned by 3 people in Noatak.

![Figure 19](image)

Figure 19. Reasons that might make harvest of a caribou or moose difficult for people in Atqasuk, Noatak, Noorvik, and Brevig Mission in Alaska. Three communities depended on caribou and one community depended on moose.

Interviewees had different coping mechanisms if they were not able to harvest their caribou or moose (Figure 20). Two common responses were to buy food at the store and use other resources (Figure 20). So if the fall or winter caribou season is poor, fish maybe an even more important resource the following spring and summer. Wildlife managers could take this into consideration when making regulations. In addition, as the price of food increase people said they would depend more on subsistence foods (Figure 21). In both situations residents have found ways to adapt to changing availability of subsistence and store bough food and for some this means a trade-off with less healthy and costly options when subsistence foods are unavailable.

![Figure 20](image)

![Figure 21](image)
If food is limited in the stores, such as the recent fire in Kivalina, most people said they would order from outside the community (28%), but within communities the responses varied. In Atqasuk, Noorvik, and Brevig Mission most people would order from outside the community. The two communities with more access to wage income had a larger percent of the interviewees who reported ordering from the store (Figure 22).
People in the communities get food from a wide variety of people (Figure 22) including relatives (67%), non-relatives (27%) and even people they do not know (6%).

![Bar chart showing the number of people who could get subsistence foods from different relatives.](chart)

Figure 22. The number of people who said they got food from various people in the community.

The elders subsistence program was popular in Noatak and Noorvik with 71% and 63% of elders interviewed in the respective communities using them program. When asked what the elder would do without the program residents stated:

- “It would really affect them getting food. Has been going on for a long time.”
- “Sit and cry. Who is going to give me meat? I have good neighbors.”

Others said it would not make a difference. People also mentioned that the program not only helped them but also helped the other person to get out and do some hunting. So a program like this could help with keeping the youth engaged in subsistence, which other research has shown to be declining.

**Engagement with management and the decision making process:**

People feel more informed by wildlife management than by industrial development. Communication is still an issue. There were 77 comments during the interviews about communication. However, those comments were a mix of positive and negative and several expressed gratitude for the Caribou Trails newsletter.
However, effective communication requires both parties to make efforts, and 60% of the people interviewed in Alaska reported going to meetings (Figure 22). The highest attendance was for meetings regarding community services.

Figure 22. Reasons people gave for not attending meetings about community services (road dust, health care, school, etc.), wildlife, and industrial development (mining, oil, and gas) in the last three years.

Reasons for not going to meetings typically were that the person was not used to getting involved (Figure 23). Several elderly women said that their husbands typically did that and after their husbands died they do not hear about things anymore. Also since a few key people often go to several of the meetings it is important that this person effectively communicate with the residents of the community. In some communities this was an issue raised by residents.

Figure 23. Reasons people gave for not attending meetings about wildlife management and resource extraction.
Involvement and getting one’s voice heard is different in Norway than in other regions. People use organizations to get their voice heard and believe that these organizations represent their opinions.

Figure 24. The ways in which people gave their opinions about either wildlife management or industrial development. Personal input means an individual spoke up at a meeting, wrote a letter, etc. Organizational input means that a person was confident that an organization represented them and expressed their opinion.

Thank you to everyone who helped including the local hires, interviewees, University of Alaska Fairbanks, University of Tromsø, and tribal councils.

I especially want to thank the local hires

- Josh Melton & Merna Sheldon (Noorvik)
- Ward Olanna Sr. (Brevig Mission)
- Hannah Onalik (Noatak)
- Wanda Kippi (Atqasuk)

And Interviewees

- Gilbert Tocktoo, Elmer Seetot Jr., Joyce Tocktoo, Rita Olannna, Daisy Rock, Floyd Olanna, Aurthur Tocktoo, Bessie Olanna, Leonard Adams, Marcus Barr, Carla Kakoona
- Johnny Nayukok, Kate Aiken, Thomas Itta III, Doug Whiteman, Wanda Kippi, Della Shugluk, Della Ivanoff, Martha Kagak, Bert Shugluk, Elizabeth Hollingsworth, Virgina Brower
- Mary Arey, Alvin Ashby, Floyd Wesley Jr., Wendle Booth Sr., Robbie Kirk, Evelyn Shy, Carol Wesley, Allen Downey, Vernon Adams Sr., Helen Ashby, Hannah Onalik, Rebecca Brutche

To give comments or for more information about the TUNDRA project please contact:

Jennifer I. Schmidt, University of Alaska and University of Tromsø, Cell: 907-750-3750, jischmidt0@gmail.com