

Title

The potential for technology to increase adaptive capacity and resilience in rural Alaska and Arctic communities.

Abstract

The data is based on semi-structured household interviews conducted in Noatak (n = 12), Noorvik (n = 11), and Brevig Mission (n = 12) in the March of 2017. Information gathered consists of individuals use of technology, perceptions about how technology has helped or hindered their ability to do subsistence and address the changing climate, and the role of technology in the community. Demographic information includes gender, race, education, household size, and employment status. Individuals who were particularly knowledgeable and amendable participated in a q-sort exercise to assess values and beliefs regarding technology in their community. Individual records are confidential and protected under the University of Alaska Institutional Review Board (# 780494).

Keywords: Subsistence, technology, climate change, Alaska, adaptive capacity

Methods

Step 1

Review the literature and develop an interview guide (see interview guide) and q-sort statements (see q-sort statements below).

Step 2

Contract with a local resident to recruit people who are actively engaged in subsistence activities in the previous 5 years.

Step 3

Conduct interviews which ranged from 30 to 90 minutes.

Step

Interviews were transcribed and quantitative data was entered into excel.

Study extent

Residents of Noatak, Noorvik, and Brevig Mission Alaska.

Description

Quantitative and qualitative data on the use of technology, perceptions about how technology has helped or hindered the ability to do subsistence and address the changing climate, and the role of technology in the community. Individual records are confidential and protected under the University of Alaska Institutional Review Board (# 780494).

Interview guide:

We are interviewing you because you hunted, fished or gathered subsistence foods in 2016. The goal of this interview is to:

- Understand how you use technology such as GPS, snowmachines, phone apps to do subsistence activities.
- Learn about how your use of technology has changed in the last 10 years for subsistence and the influence of fuel prices.
- Whether technology can help with issues you or your community face such as climate change, especial while doing subsistence activities.
- Document ownership and sharing of technology
- Get a broader picture of the impact of technology for the broader community
 - Community issues and the role technology plays
 - Positive and negative influence of technology on the community

- 1) I am going to go through some technologies and ask you if you own any and use them for subsistence. If you do own, did you lend it out and if you do not own, did you borrow? Finally what year did you start using the technology.

<i>Technology</i>	How many own (#)	Used for subsistence?	Did you lend to someone outside your HH (# of times)?	Did you borrow for subsistence (# of times)?	What year did you start using the tech.?
Jet boat		Y N	Y N #___	Y N #___	
Prop boat		Y N	Y N #___	Y N #___	
Snowmachine		Y N	Y N #___	Y N #___	
ATV		Y N	Y N #___	Y N #___	
Car or Truck		Y N	Y N #___	Y N #___	
Airplane		Y N	Y N #___	Y N #___	
Dogsled		Y N	Y N #___	Y N #___	
GPS		Y N	Y N #___	Y N #___	
Cell phone		Y N	Y N #___	Y N #___	
Computer (prog./internet)		Y N	Y N #___	Y N #___	
Electronic range finder		Y N	Y N #___	Y N #___	
Chainsaw		Y N	Y N #___	Y N #___	
Ice auger		Y N	Y N #___	Y N #___	
Electric smoker		Y N	Y N #___	Y N #___	
Generator(s) in camp		Y N	Y N #___	Y N #___	
Satellite phone		Y N	Y N #___	Y N #___	
SPOT (Personal Locator)		Y N	Y N #___	Y N #___	
inReach		Y N	Y N #___	Y N #___	

<i>Technology</i>	How many own (#)	Used for subsistence?	Did you lend to someone outside your HH (# of times)?	Did you borrow for subsistence (# of times)?	What year did you start using the tech.?
iPad/tablet		Y N	Y N #___	Y N #___	
Solar chargers		Y N	Y N #___	Y N #___	
Spotting scope		Y N	Y N #___	Y N #___	
VHF		Y N	Y N #___	Y N #___	
Game cameras		Y N	Y N #___	Y N #___	
Depth finders		Y N	Y N #___	Y N #___	
Other?					

2) Are there any other technologies you use for subsistence I have not mentioned such as websites such as Facebook, phone apps like NOAA weather, google maps, backcountry navigator, etc.?

3) Are there any technologies that you don't have now, but would like to own that would help you get subsistence resources?

4) Do you typically have cell service in the areas you hunt or fish? Yes No

If yes, what kind (circle all that apply) 4G 3G LTE Most common? _____

5) Does cell coverage influence where you travel or go hunting, fishing, or camping? Yes No Why?

6) In the last 10 years have you attempted to harvest....?

<i>Resource</i>	Attempt	Harvest
Moose	Y N	Y N
Caribou	Y N	Y N
Seal	Y N	Y N
Whale	Y N	Y N
Non-salmon (i.e. Whitefish, Burbot, Sheefish)	Y N	Y N
Salmon	Y N	Y N
Furbearers	Y N	Y N
Waterfowl	Y N	Y N
Bears	Y N	Y N
Wolves	Y N	Y N
	Y N	Y N

7) In the last 10 years, how has technology changed the way you hunt the resources listed above?

8) Is there a species in particular that technology has really helped to improve your ability to harvest? For example, Facebook helps us know when to go out and get caribou.

9) In the last 10 years have you made any switches among technologies to get subsistence foods rather than upgrades to hunt? For example, running ATVs along rivers to hunt moose instead of boats to save gas or switching from a liquid cooled snowmachine to fan cooled.

10) Have you made any upgrades in the last 10 years to the technology you use to do subsistence? If so for what resource and why? What year did you make the upgrade?

11) Are there any downside to using technology to do subsistence? For example does it make you more vulnerable to getting lost or I have to carry more batteries/weight?

Yes No Why or why not?

12) In the last 10 years, to what extent have fuel prices changed the distances you travel to hunt or fish?

	Not at all	Decrease	Increase
	If decreased or increased, do you go...		
25% more/less further	50% more/less further	75% more/less further	
Twice as far			

13) In the last 10 years, what extent have fuel prices changed how often you hunt or fish?

	Not at all	Decrease	Increase	
	If decreased or increased, do you go...			
25% more/less often	50% more/less often	75% more/less often		Twice as much

14) Are you using technology to help deal with the following environmental changes....

<i>Issues</i>		
Dangerous ice	Y	N
Poor river/lake navigability	Y	N
Erosion	Y	N

Interview Community

Interview Number

Extreme weather (i.e. storms)	Y	N
Less snow	Y	N
More shrubs	Y	N

Please explain how you are using technology to overcome these issues.

15) Do you think technology can help you overcome problems raised by climate change during hunting and fishing?

Yes

No

Don't know

ACCESS/DISTRIBUTION/ABUNDANCE/SAFETY

16) I will go through a list of statements and please answer yes or no. Has technology

<i>Issues</i>	<i>circle</i>
Allowed you to harvest animals, fish, or marine mammals even though the numbers were scarce	Y N
Allowed you to harvest animals, fish, or marine mammals even when their timing was off (Ex. Salmon to late, waterfowl show up early, etc.)	Y N
Allowed you to harvest animals, fish, or marine mammals when they were in new places	Y N
Allowed you to do multi-purpose trips so you go after multiple subsistence resources at one time	Y N
Allowed you to access areas where the water was previously too shallow	Y N
Allowed you to harvest animals, fish, or marine mammals that before were too far from the community	Y N
Allowed you to communicate more with your hunting/fishing partner(s)	Y N
Helped you overcome management restrictions such as short harvest season, bulls only	Y N
Helped you locate animals or fish more easily BEFORE you head out on the land/water	Y N
Helped you locate animals or fish more easily AFTER you head out on the land/water	Y N
Allowed you to travel over terrain or water that before was not navigable	Y N
Created crowding issues among hunters/fisherman (i.e. increased competition)	Y N
Others?	

SUBSISTENCE and CULTURE

17) I will go through another list of statements and please answer yes or no. Has technology

SUBSISTENCE CULTURE	ID
<i>Issue</i>	<i>circle</i>
Allowed me to try new subsistence activities	Y N
Allowed me to take more risks while out on the land/water	Y N
Allowed me to to out more often	Y N
Allowed me to make more overnight trips	Y N
Allowed me to squeeze subsistence trips in between work or other commitments	Y N
Allowed me to take children or youth out more often to do subsistence	Y N
Allowed me to hunt or fish more often by myself (i.e. alone)?	Y N
Allowed me to to be more successful in general	Y N
Cause me to share costs more often with friends or relatives	Y N
Allowed me to share more subsistence foods	Y N
Decreased the chance I will be stranded	Y N
Increased my ability to make it back to the community safely	Y N
Rely less on what elders have taught me	Y N

18) Has technology changed what you need to know from elders? For example, it may no longer be important to read stars. Yes No Explain

IF THERE IS TIME:

21) Is there any specific changes in the climate or environment, like low snow, lack of river ice, lower river levels that technology has really helped you overcome?

22) During subsistence do you think technology engages people more with each other? How about the land? How about local knowledge?

23) What are the 3 most important issues for the community right now?

24) Is technology being used to address these issues? Yes No

Please explain why or why not?

25) Overall has technology positively or negatively influenced the community? How?

Circle Positive Negative

26) Are there any technologies your community needs to help meet future challenges? Please list the challenges and how technology can help.

Q-Sort Statements for 2017 Belmont Research (25 cards)

Goal is to look at how technology is influencing subsistence and the community.

1. Technology helps increase communication among people in the community.
2. People of this community use technology to have more of a say in resource management.
3. The economy is a bigger issue for our community than climate change.
4. The community has kept up with changes in technology.
5. Technology will be not be important in solving future challenges the community may face.
6. The need for technology makes it hard for youth to get started doing subsistence.
7. Technology can be used to address social issues like alcohol or drug use, poor education, low employment.
8. Our community is more isolated from other communities because of technology.
9. Without subsistence rights this community would not survive.
10. Technology will be able to help us deal with climate change.
11. Technology has helped our children get a better education.
12. Jobs keeps this community alive.
13. Technology has had a positive experience in our community.
14. Our youth are very active in subsistence practices.
15. Climate change is not a threat to our community.
16. People depend on technology too much when doing subsistence.
17. The changing climate is negatively affecting subsistence resources.
18. Limited access to money is a big reason why people do not do subsistence.
19. Contaminants are the biggest concern in our subsistence resources and need to be tested.
20. The children in our community are learning enough about subsistence.
21. Technology has helped the community get more subsistence foods.
22. Children need to know less from elders because of technology.
23. People in the community do more subsistence now because of technology.
24. Technology gives people from outside of our community more of an advantage to get subsistence foods.
25. The benefits from technology outweigh the negatives like needing to pay for gas, maintain equipment, etc.