Task SES1: Building and evaluating partnerships between LTER scientists and rural communities to increase two-way communication, develop metrics to assess impact, and ultimately expand utility of LTER research to local stakeholders.

Krista Heeringa, Todd Brinkman, Terry Chapin, Orville Huntington, Ben Stevens, Brooke Woods, Tessa Hasbrouck, Ed Sarten, Don Honea, Arnold Demoski, Nathan Elswick, Barret Ristroph, Robin Reid, Caroline Brown, Casey Brow, Lindsey Parkinson, Joe Metesi, Rich Hum, Malinda Chase, Debra Lynne, Marilyn Jones

UAF, Tanana Chiefs Conference, Nulato Tribal Council, Koyukuk Tribal Council, Ruby Tribal Council, Anvik Tribal Council, City of Tanana, Native Village of Ventie Tribal Governments, Alaska Department of Fish & Game, Colorado State University
Task SES1: Building partnerships

Develop collaborative research that support community vision for self-reliance and food security.

Document current challenges and changes affecting traditional harvest practices.

Explore factors that strengthen the ability of individuals and communities to adapt to these changes.
Task SES1: Building Partnerships

Ruby Tribal Council
*Ruby Food Security Assessment*

Nulato Tribal Council
*Affects of climate change on moose harvest success*

Koyukuk Tribal Council - *Local/ non-local moose hunting competition*

MTNT, LTD.
*Community fish-wheel monitoring project*

City of Tanana
*Energy, Wood Harvest, Subsistence and the Biomass Program in Tanana*

Anvik Tribal Council
*Deg Hit’an Dingan’ Place Name Map*

Native Village of Venetie Tribal Gov’t.
*Land use mapping*
Starting Point

CPS In-reach Model

Relationship

Reciprocity

Relevance

Respect

Responsibility

Relevant research that advances knowledge and connects to community’s long-term vision of self-reliance and sustainability.

Creating space for different ways of knowing and respecting cultural protocols and norms.

A collaborative environment where shared community and academic learning and benefit can occur.

Working together to develop research agendas that align with community priorities as well as university programs.

Shared responsibility between community representatives and researchers in following through with agreements and work.
SES1: Framework for assessing impacts to traditional harvest practices

A way of life

- Values
  - Wellbeing maintained through sharing
  - Happy strong families
  - Full bellies

- Tradition knowledge practices
  - Natural grub box
  - Access
  - Cash economy

- Western governance
  - Decision making power

- Indigenous governance

- Formal education system

- Environmental conditions
  - River eddies and hunting trails
SES1: Framework for assessing impacts to traditional harvest practices

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- Environmental conditions
- River eddies and hunting trails

Indigenous governance
- Decision making power

Western governance

Formal education system
SES1: Next steps

Evaluation components:
• Partnership process including communication and organizational structure
• Capacity building among participants and the communities, institutions, or organizations they represent.
• How information from partnerships was shared or used in decision making.

Accepted

Planned Publications
• Evaluation of partnerships
• Impacts to traditional harvest practices.
SES2: Advance the practice of community-based ecological monitoring through development of methods for documenting local observations

Helen Cold, Todd Brinkman, Teresa Hollingsworth, Caroline Brown, Krista Heeringa, David Verbyla, Dana Nossov Brown, Scott Rupp (SNAP Crew)
Thank you to everyone that contributed to this research!
Photo documentation of environmental conditions

NASA Mapping Project
Documenting conditions related to travel & access to wild resources

Name: ___________________________ Date: ___________________________

Photo ID: ___________________________

What is pictured?

________________________________________________________________________

How do these conditions influence travel or access to resources?

________________________________________________________________________

Trip purpose?

- Hunting
- Fishing
- Trapping
- Gathering (wood, berries)
- Village travel
- Camp
- Other: ___________________________

How frequently have you observed this travel condition?

- Observed weekly
- Observed monthly
- Observed seasonally
- Observed yearly
- Observed every few years
- Observed every few decades
- Never observed before
- Not applicable

What year did you first notice this change?

________________________________________________________________________

To what extent does this condition affect travel safety?

- Strong affect
- Moderate affect
- Weak affect
- No affect

How common is this condition occurring in other places around your community?

- This change is common, I see it everywhere.
- I have seen this change in some other areas.
- I haven’t seen this change anywhere else.
482 photo observations of conditions
  o Access database

22 interviews, 294 observations
  o Transcribed (word docs)
  o ATLAS.ti 8
  o Codes developed that coincided with GPS datasheet info
<table>
<thead>
<tr>
<th>Condition</th>
<th>N</th>
<th>Average Sensitivity Value</th>
<th>V score (across)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ice Conditions</td>
<td>0.30</td>
<td>0.79</td>
<td>1.10</td>
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<tr>
<td>Snow Conditions</td>
<td>0.25</td>
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<td>Vegetative Community</td>
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<td>Composition</td>
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<td>0.76</td>
<td>0.98</td>
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<tr>
<td>Sedimentation</td>
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<tr>
<td>Water Levels</td>
<td>0.26</td>
<td>0.73</td>
<td>0.98</td>
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<tr>
<td>Erosion</td>
<td>0.15</td>
<td>0.78</td>
<td>1.00</td>
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<tr>
<td>Weather</td>
<td>0.10</td>
<td>0.72</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Road-connected communities different than off-road network communities
Changes in environmental conditions having negative impact

Communities most vulnerable to effects of changing:

- Ice conditions
- Erosion
- Water levels
- Vegetative community composition
Future Directions

- Continue to monitor and explore
- How are people adapting and how effective are those adaptations
Cross-scale interactions

- Lots of opportunities to overlay these observations with other maps to assess patterns
- Permafrost thaw risk maps
Publication and Communication tools


**Online communication tools**

http://mapventure.org/environmental-impacts-access/index.html
SES3: Evaluate interactions among environmental change, harvest regulations, and hunter access to wildlife

Tessa Hasbrouck, Todd Brinkman, Krista Heeringa, Dana Nossov Brown, Knut Kielland, Glen Stout, Caroline Brown, Teresa Hollingsworth, Dave Verbyla, Erin Trochim, Terry Chapin, Bob Bolton

Questions

◦ What are the biophysical causes and mechanisms causing environmental conditions that are challenging hunter access?
◦ How are these environmental conditions actually affecting harvest?
◦ What is the association between challenging conditions and what other LTER scientists are studying?
**Findings:** Spring and autumn air temperatures impacted timing of breakup (-2.0 days/°C) and freeze-up (+2.0 days/°C).

**Significance:** The duration of river ice cover for safe travel is declining.

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**Changing River Ice Seasonality and Impacts on Interior Alaskan Communities**

**Showing Results for "fell through ice"**

20 results found - Advanced Archive Search

2 dead near Bethel when four-wheelers fall through river ice amid warnings to stay off

Zaz Hollander  
| Alaska News | April 1

Passers-by rescue children who fell through ice in Bethel

Associated Press  
| Rural Alaska | February 18

Volunteer search underway near Big Lake for missing snowmachinners

Madeline McGee  
| Alaska News | December 19, 2018

No sign of man who fell through ice on Western Alaska fishing trip

Zaz Hollander  
| Rural Alaska | November 9, 2018

Body found along Kuskokwim River identified as man who fell through ice 2 years ago

Kyle Hopkins  
| Rural Alaska | May 23, 2018

Father dies, 5 people rescued after family falls through river ice near Bethel

Anna Rose MacArthar, KYUK  
| Rural Alaska | January 2, 2018
**Findings:** Winter river discharge and earlier break-up dates were positively associated with river bank erosion rate.

**Significance:** Climate-related changes to fluvial dynamics impact communities through effects on infrastructure, travel safety, channel navigability, fish and wildlife habitat, and access to subsistence resources.

Explore impacts on moose harvest rates

- Change in temperature
- Change in leaf drop
- Change in water levels
Warm weather meant tough hunting in GMUs 17B and C

By ISABELLE ROSS  •  SEP 20, 2018

Biologists and hunters are theorizing that moose lay low to escape the heat and inadvertently escaped the freezer.

CREDIT ADF&G
## Results, “weekly” univariate statistics

### Local hunter harvest

<table>
<thead>
<tr>
<th></th>
<th>1-5 Sept</th>
<th>6-10 Sept</th>
<th>11-15 Sept</th>
<th>16-20 Sept</th>
<th>21-25 Sept</th>
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<tbody>
<tr>
<td>Temperature</td>
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### Non-local hunter harvest

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<th>16-20 Sept</th>
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<tbody>
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<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
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<tr>
<td>Water level</td>
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<td>P=0.02</td>
<td>P=0.02</td>
<td>P&lt;0.01</td>
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</table>
Future Directions & Cross-Scale Interactions

◦ Continue to explore biophysical causes and mechanisms influencing conditions affecting hunter access

◦ Incredible opportunities to connect LTER science to localized conditions affecting society, especially rural communities with reliance on stable conditions that foster food security sustain cultural practices
Publications

◦ Hasbrouck T, Brinkman TJ, Stout G, Kielland K. Assessing moose harvest patterns to address hunter competition. *Alces (in prep)*