Region V Research Overview – Board of Game
January 2020
Lincoln Parrett – RV Research Coordinator

Davalos 2019

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Research Staff

- Adam Craig – Biometrician – Anchorage

- Alex Hansen – WAH Caribou Biologist – Kotzebue

- Christie Osburn – Regional Biologist – Kotzebue

- Warren Hansen – Predator-Prey Research – Nome

- Brynn Parr – Muskox Research – Nome

- Shawna Karpovich – Caribou Research – Fairbanks

Davalos 2019

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Research Locations

- Teshekpuk Caribou
- WAH Caribou
- Lower Kobuk Moose
- Seward Peninsula Moose
- Seward Peninsula Muskox
- Yukon Moose
- Nunivak Muskox

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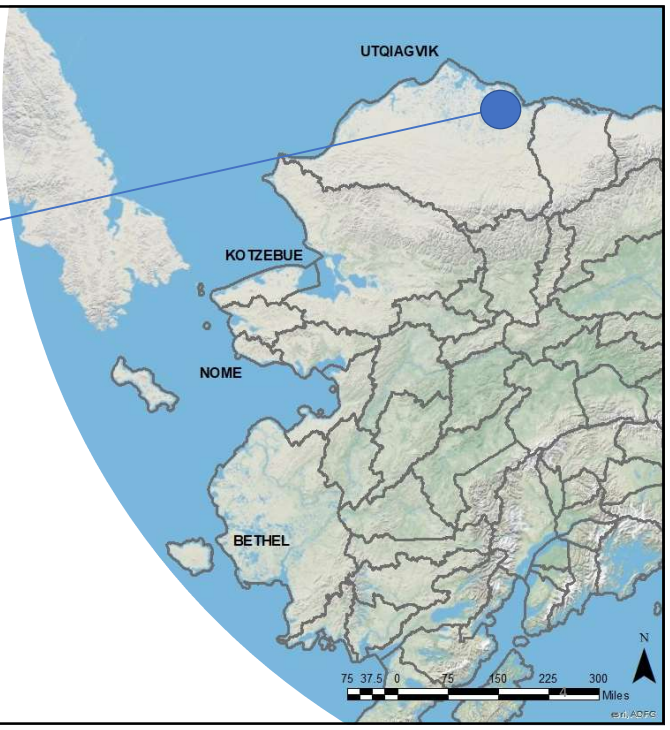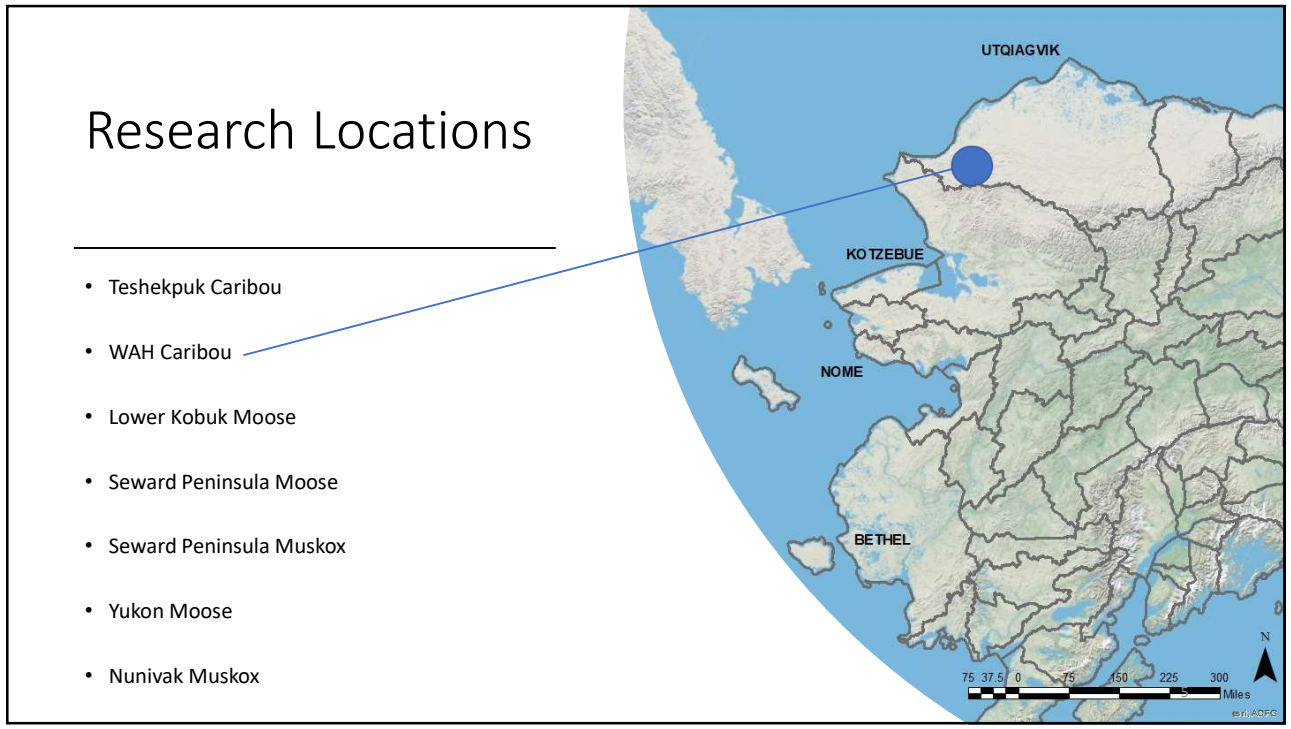
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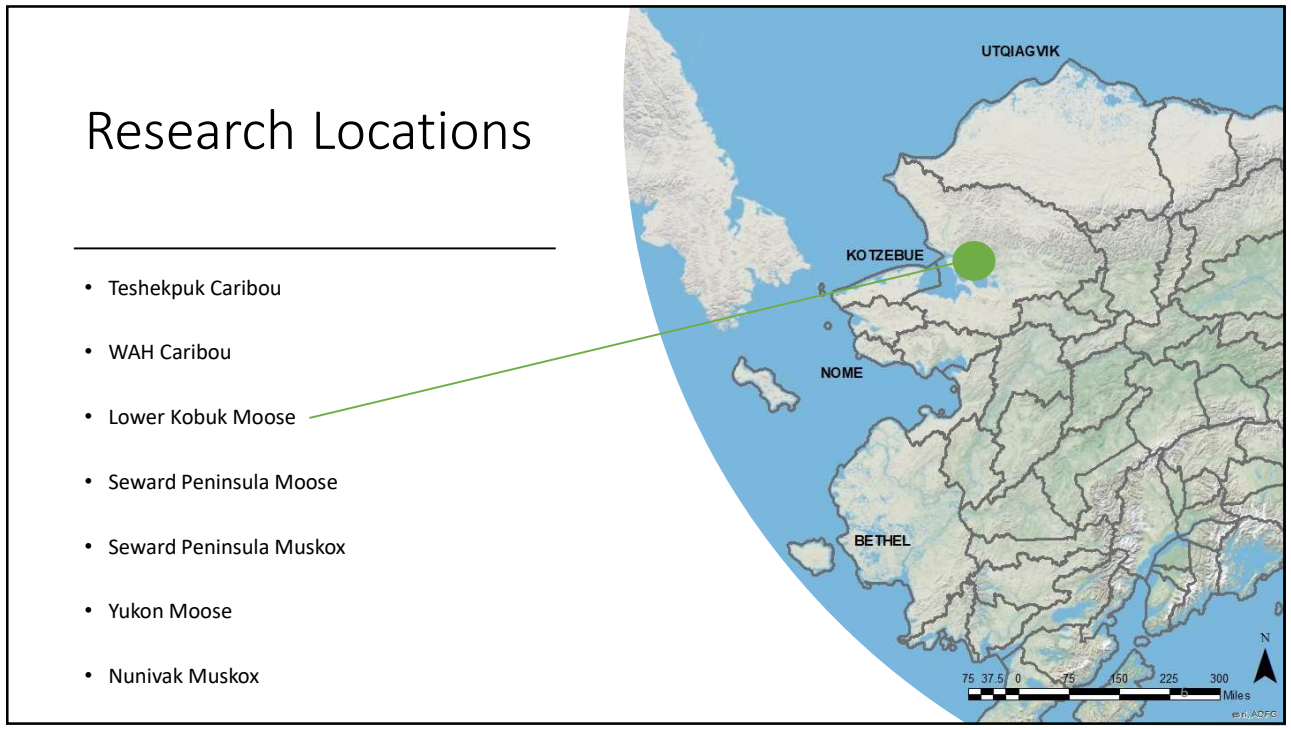- Yukon Moose
- Nunivak Muskox

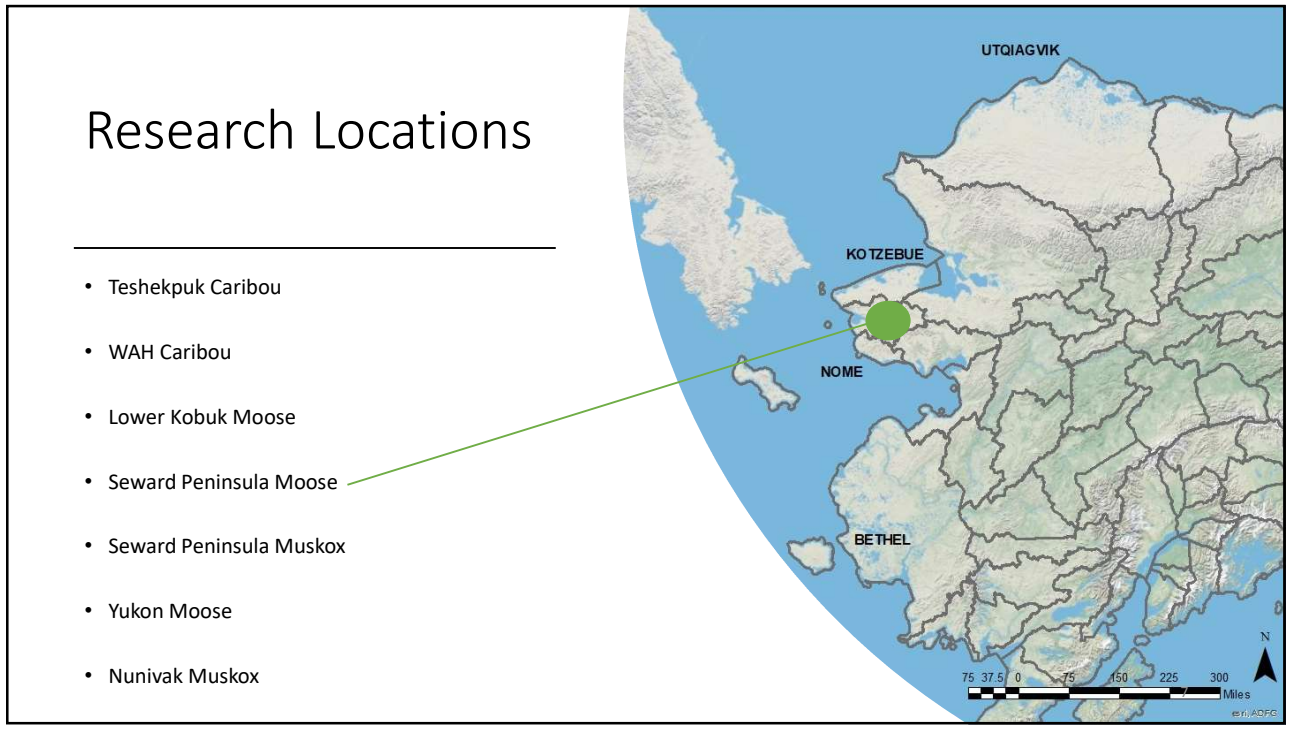6

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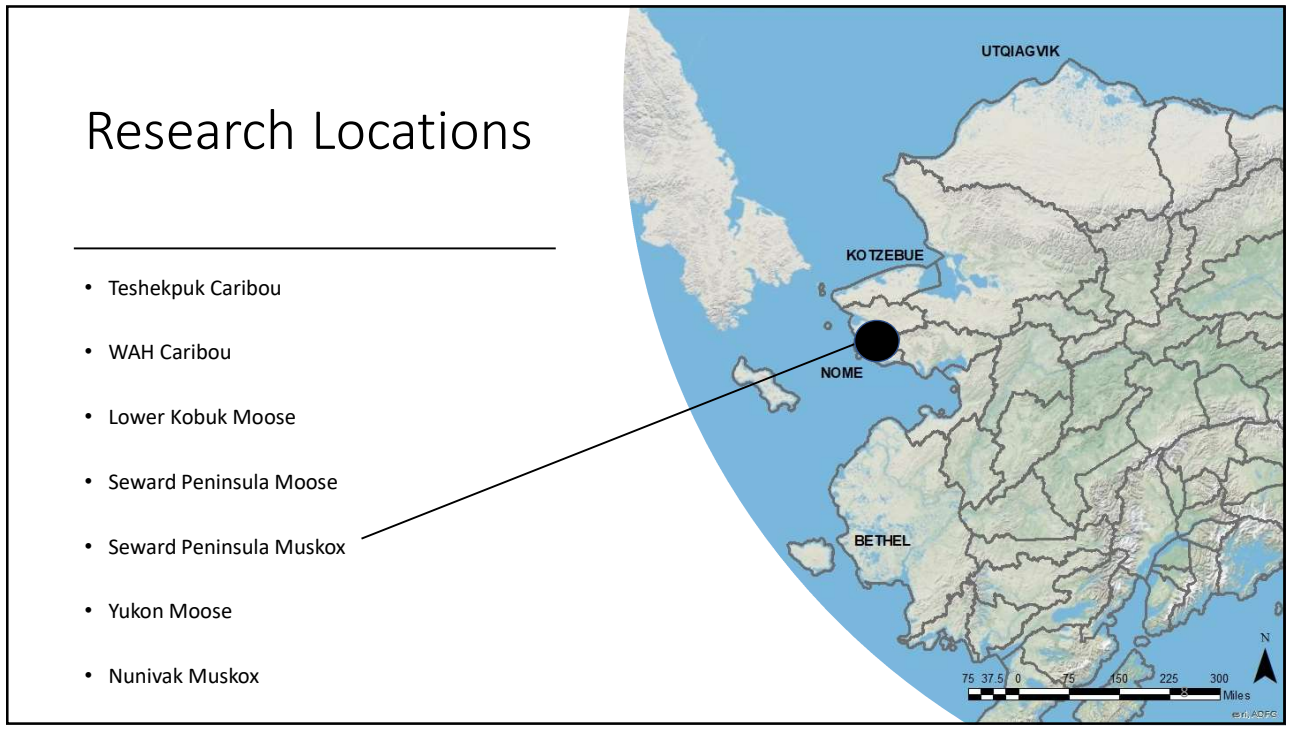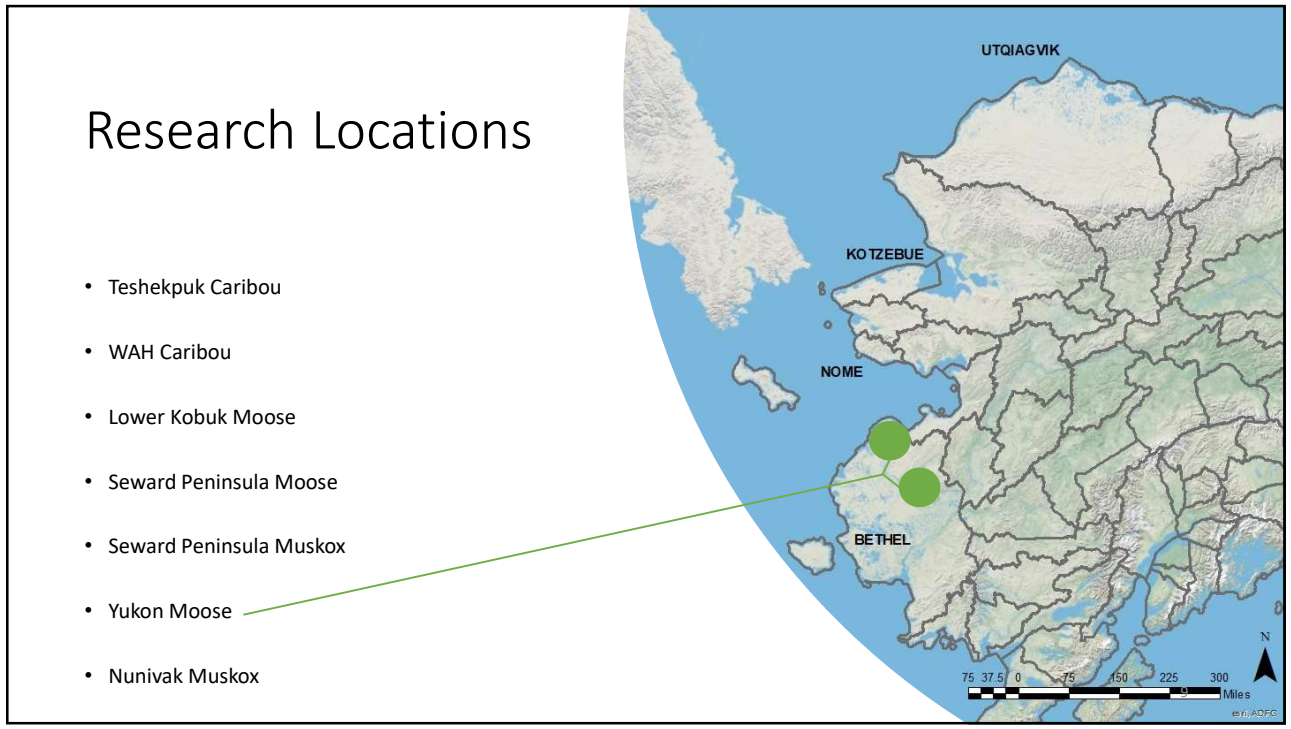- Yukon Moose
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Research Locations

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- Seward Peninsula Muskox
- Yukon Moose
- Nunivak Muskox

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Public Support

- Support for research <u>questions</u>

- Support for research <u>activities</u>

UTQIAGVIK

KOTZEBUE

NOME

BETHEL

N

75 37.5 0   75   150   225   300
Miles

esri, ADFG
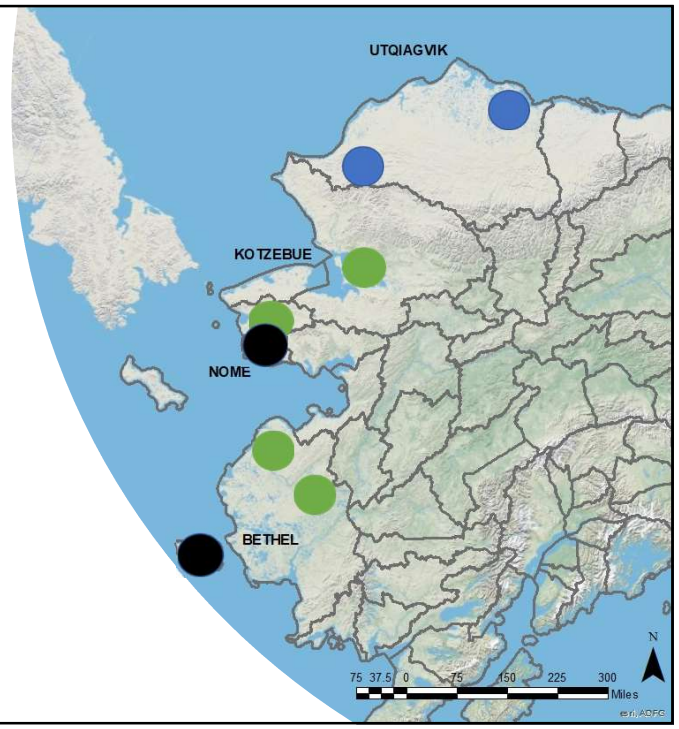
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Biometric Research

Predicting population trajectory
from mortality rates

25%

15%

1993

2012.3

Adult Female Mortality

30%

25%

20%

15%

10%

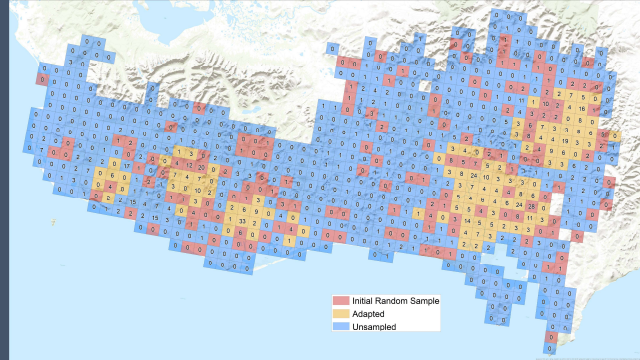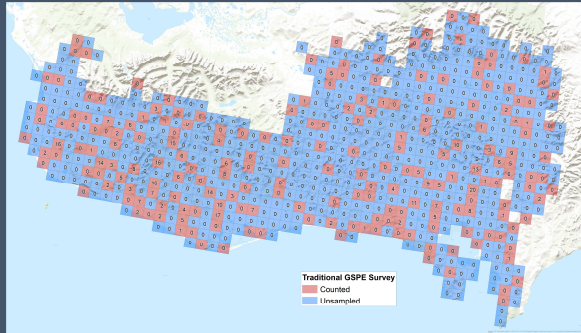1990   2000   2010
Year

5
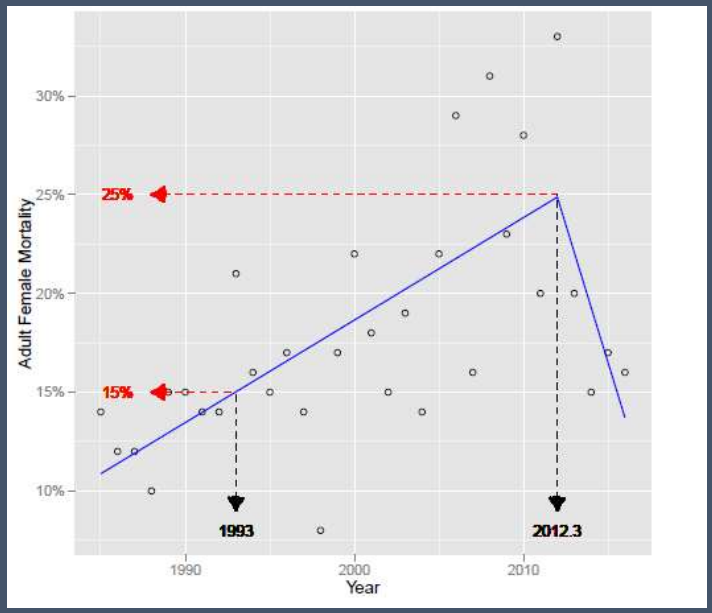
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Biometric Research
Improving Moose Survey Efficiency

Unit 22B/C
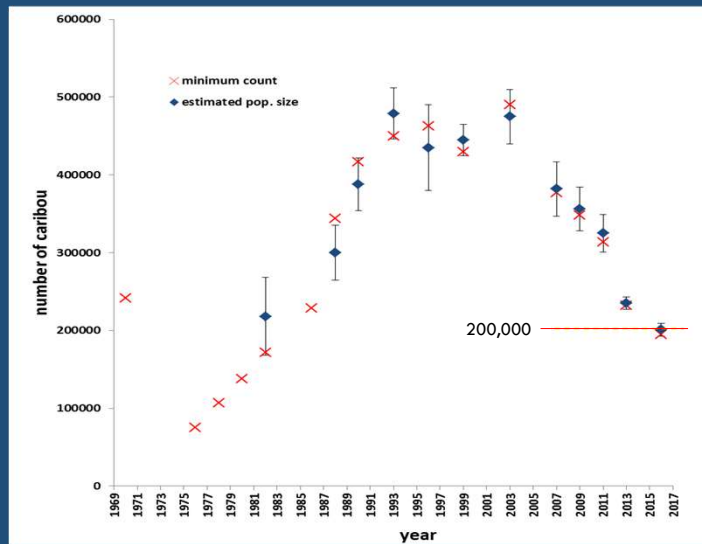**Standard Stratified GSPE Sampling**

Unit 22B/C
Adaptive Cluster Sampling

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WAH CALF MORTALITY RESEARCH

-The WAH declined from nearly 500,000 to 201,000 between 2003 and 2016

-A steady decline in calf recruitment was observed leading up to the decline

- Slightly above Intensive Management objectives

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16

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18

Lower Kobuk Moose Research

Three-year study 2018-2020 (ongoing) PRELIMINARY RESULTS

- **Population appears to be nutritionally healthy (browse, twinning, neonate wt)**

- **Survival patterns are strikingly similar to other populations thought to be LDDE**

- **Grizzly bears predominate cause-specific mortality to date**

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Lower Kobuk Mortality 2018

Grizzly 94%

Drowning 4%
Black Bear 2%

n=48
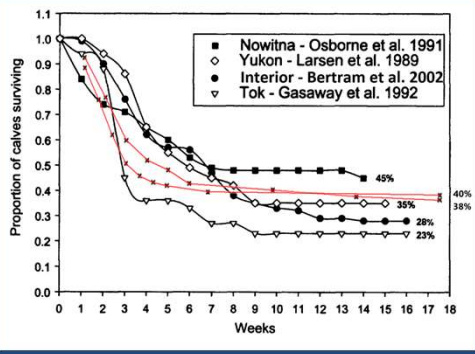
19

Unit 22 Moose Research

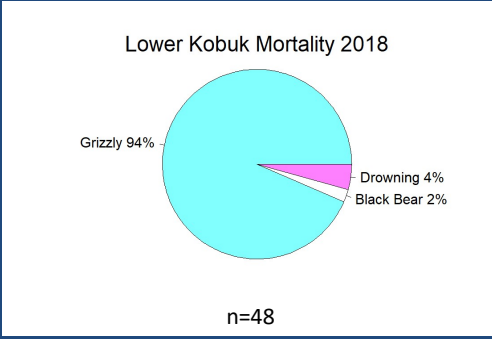- **Moose in Unit 22D have been declining since at least the late 1990's**

- **22D has provided roughly 33% of the GMU's harvest in recent years**

- **Steady reduction in opportunity**

- **Perennially poor spring calf recruitment**

- **Questions about role of nutrition**

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Unit 22 Moose Research

PRIMARY OBJECTIVES

- Evaluate the role of nutrition in limiting the growth of the population.

- Evaluate overwinter mortality, rates and causes
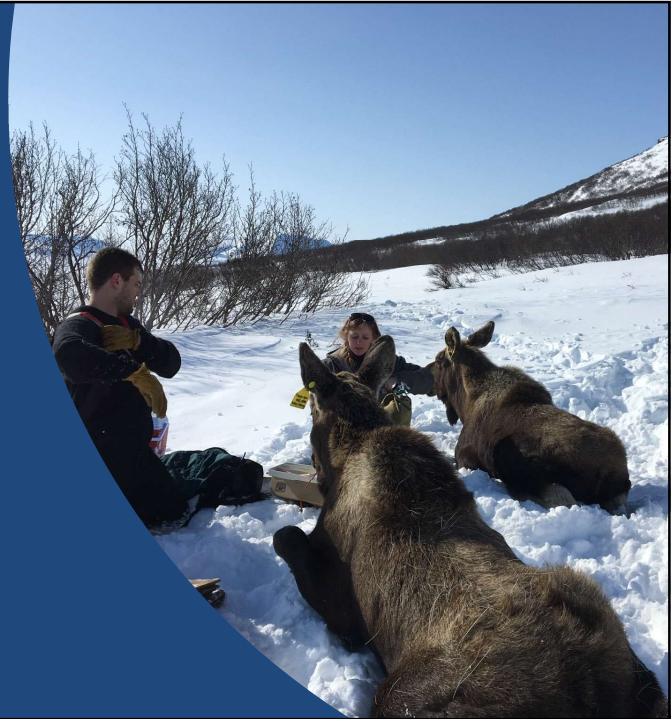
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Unit 22 Moose Research

Three-year study 2017-2020 (ongoing)
PRELIMINARY RESULTS

- Seward Peninsula moose start out relatively heavy but lose a lot of weight over winter

- Overwinter survival is high (>95%)
  - 1 wolf mortality
  - 1 starved
  - Bear mortality picks up in May

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Unit 18 Yukon Moose Research

- **Moose population on the Yukon has grown rapidly**

- **Opportunity to study a population that is presumably approaching carrying capacity**
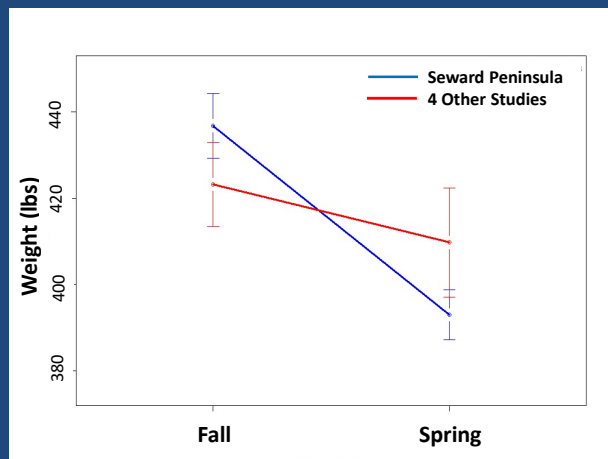
Lowest Yukon

28   65   674   1341   2827   8226

16

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Unit 18 Yukon Moose Research

PRIMARY OBJECTIVES

Evaluate the ability of multiple metrics to foreshadow/parallel changes in abundance

    A. Browse removal rates
    B. Twinning Rates
    C. Short Yearling weights
    D. Short Yearling survival
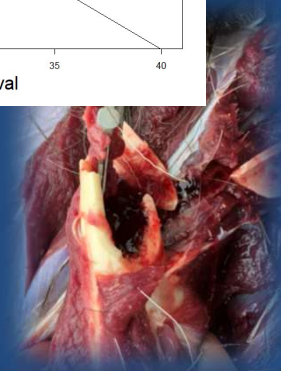   E. Hormonal stress levels
    F. Dispersal

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Unit 18 Yukon Moose Research

Three year study (2019-2021)

PRELIMINARY RESULTS

- **Low weights (<385)**
- **Moderate to high browse removal**
- **Twinning rates declining**
- **Mortality rate is high (starvation and predation)**
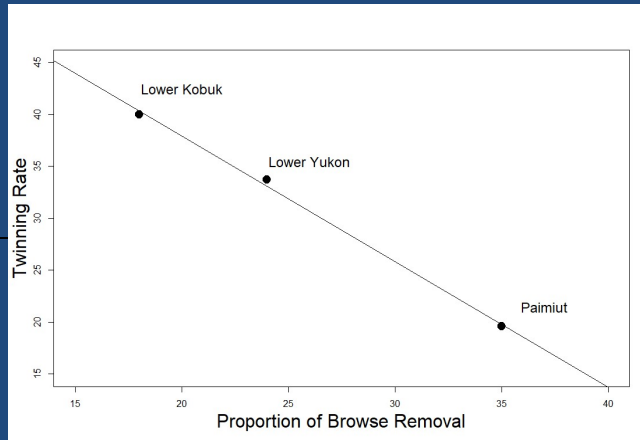
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Unit 22 Muskox Research

- **Muskox recruitment in mainland populations tends to be low**

- **Reductions in recruitment were linked to declines in the abundance of mature bulls**

- **Currently managed very conservatively**

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Unit 22 Muskox Research

PRIMARY QUESTIONS

1. What are the primary limitations to calf recruitment?
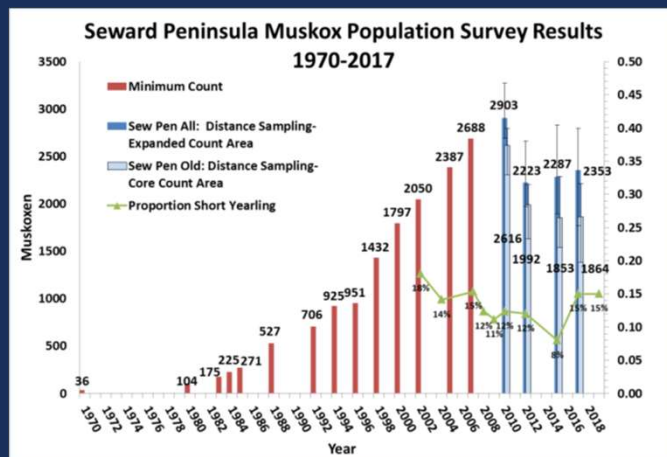
2. Do mature bulls play a biological role in the recruitment of calves beyond breeding?

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Unit 22 Muskox Research

On track to be a ~4-year study (2018-2021)
PRELIMINARY RESULTS

- We are developing promising techniques for capturing young muskox (birth and 6 months)

- Young muskox die at high rates from an array of causes
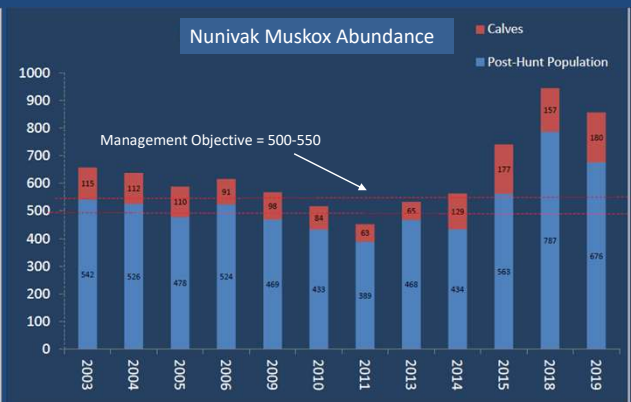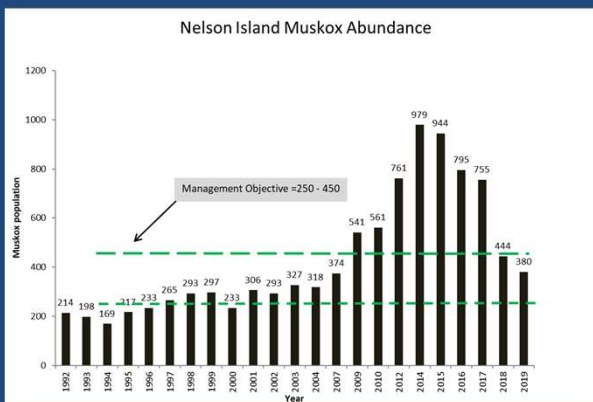
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Unit 18 Muskox Research

- There is no clear gradient across which to evaluate nutritional limitation in muskox

- The island populations in Unit 18 provide an opportunity to begin to investigate the utility of various metrics

- Both populations were above management thresholds

- Density of muskox on Nelson Island are 10-20 times that of Nunivak

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Unit 18 Muskox Research

Nelson Island Muskox Abundance

Management Objective =250 - 450

214, 198, 169, 217, 233, 265, 293, 297, 233, 306, 293, 327, 318, 374, 541, 561, 761, 979, 944, 795, 755, 444, 380

Nunivak Muskox Abundance

Calves / Post-Hunt Population
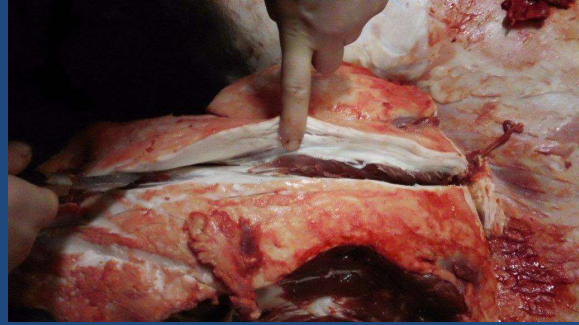
Management Objective = 500-550

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Unit 18 Muskox Research

PRIMARY OBJECTIVE

1. Develop nutritional indices that are sensitive to large differences in density and nutritional stress
   A. Age-specific pregnancy rates
   B. Rump fat
   C. Trace mineral concentrations
   D. Stress hormone levels
   E. Dietary contents

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Unit 18 Muskox Research

3 year study (2018-2020)

PRELIMINARY RESULTS

1. Developing hunter-biologist relationships

2. First set of samples (2019) being analyzed

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Stress and Nutrition: Non-invasive indices

- Temporal record of hormones in feces, hair and keratinized tissues

- Stress and pregnancy are reflected in hormone levels

- Potentially large samples through non-invasive collections, or from harvested animals

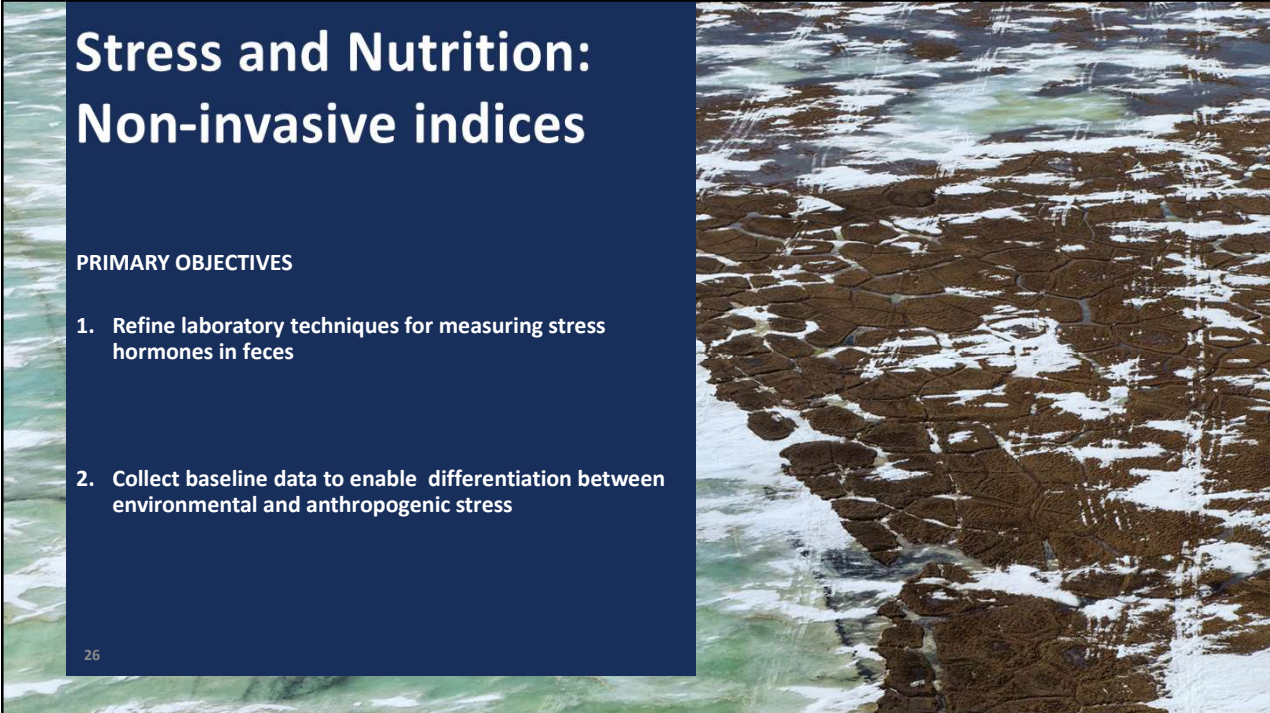- Can be used to understand animal responses to new stressors

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Stress and Nutrition: Non-invasive indices

PRIMARY OBJECTIVES

1. Refine laboratory techniques for measuring stress hormones in feces

2. Collect baseline data to enable differentiation between environmental and anthropogenic stress

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Stress and Nutrition: Non-invasive indices

3-4 year study (2019-2022)

PRELIMINARY RESULTS

1. Initial samples prior to new construction are being analyzed

2. Other tissues being explored (e.g. muskox hair)

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Detecting Calving Using Movement

- GPS collars have been used to detect calving events through movement patterns

- Lack of non-parturient cows has hampered some studies

- Differences in migratory strategies can produce inconsistent results

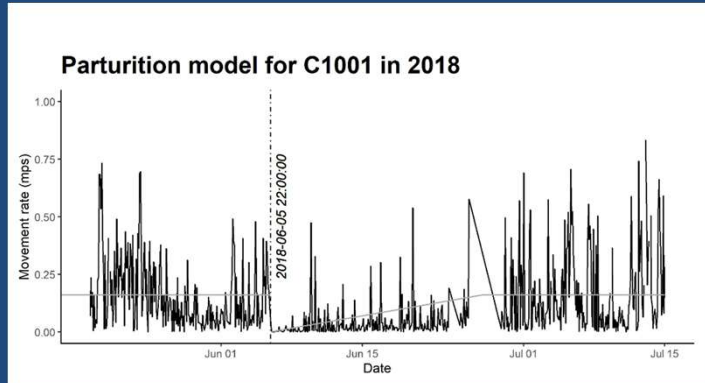- Teshekpuk caribou typically have low parturition and widely varying migratory strategies

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Detecting Calving Using Movement

PRIMARY OBJECTIVE

1. Evaluate the utility of this method in a herd that presents:
    A. an opportunity (large number of non-parturient females)

    B. challenges (non-migrants)

Parturition model for C1001 in 2018

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Detecting Calving Using Movement

2-3 year study (2018-2020)

PRELIMINARY RESULTS

1. Some suggestion of a positive bias; calving is easier to detect than not calving

2. Different movement metrics may need to be explored

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January 2020

Yuyan 2019

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