

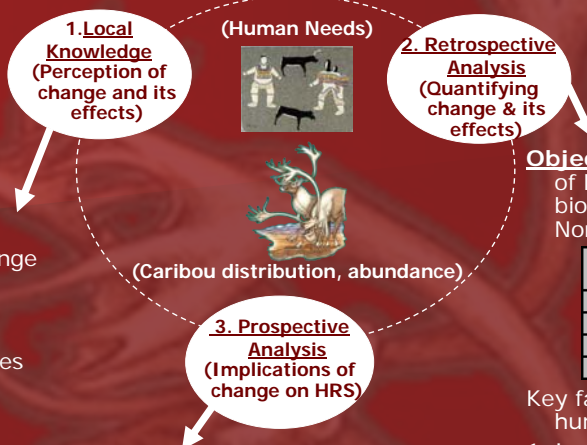
A Conceptual Model For Understanding Change: Climate Change Effects on 4 Alaskan Human-Caribou Systems

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Human-Rangifer Systems

Research Question:
What is the heterogeneity in climate change effects across the 4 North-Slope Alaska herds and their implications for associated Human-Rangifer Systems?



Objective 1: To document people's perspectives (local knowledge) of change and its effects for Human-Rangifer Systems

- Sources of information: Community interviews conducted during the "Voices of the Caribou People" project

Objective 3: To project implications for human-rangifer systems using future climate projections for North Slope

- Use the retrospective analysis to relate projected climate data (month-wise mean temp, precip) with possible future trends for the set of key-factors (Insects, summer forage and winter snow conditions)
- Evaluate implications of these for the harvest systems

Objective 2: Conduct a retrospective analysis of long-term climate data, and available biological and social data to compare the 4 North Slope Alaskan herds

	Insect Harassment	Summer Forage	Winter snow conditions	Harvest
PCH				
CAH				
TCH				
WAH				

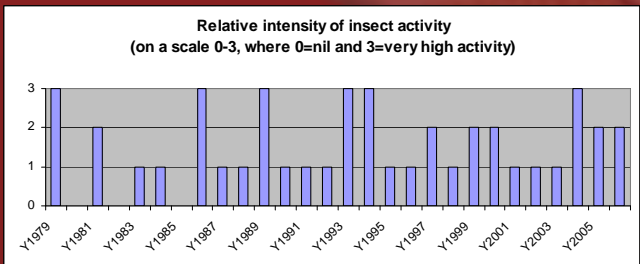
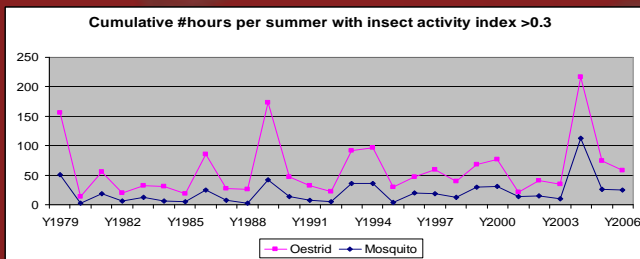
Key factors to be compared across the 4 human-caribou systems:

- Insects harassment (weather effects on abundance and summer activity)
- Summer forage availability (time of green-up, length of growing season)
- Winter conditions (snow depth, snow cover)
- Human harvest

Example: Insect Harassment

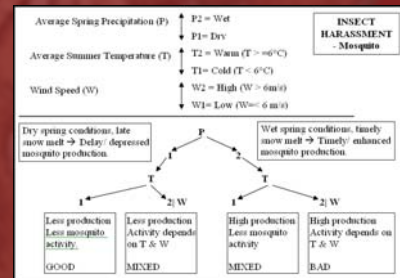
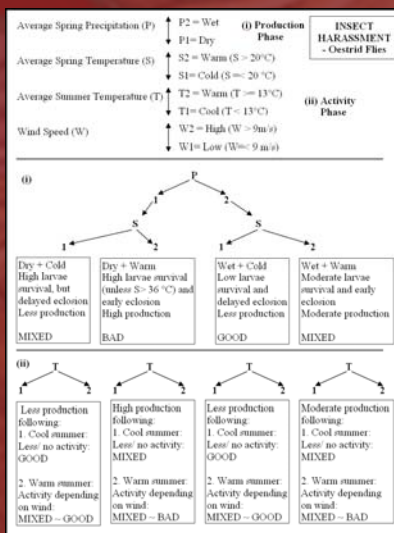
Retrospective analysis:

- To estimate trends in insect harassment in recent years using temp and wind data from weather stations for multiple locations across the summer ranges of 4NS herds and compare patterns across the 4 herds.
- Following 2 graphs are based on Barrow hourly temp and wind observation data.



Prospective analysis:

- Use decision trees to classify future summers as potentially – good, bad, or mixed impact for caribou
- Estimate trends in relative abundance of insects and insect activity in near-future years
- Compare distribution of good, bad and mixed seasons across herds to access relative vulnerability of the 4 herds



Key References for the decision tree:

- Cowell, D.D., Hall, M.J., and Scholl, P.J. (eds). 2006. The Oestrid Flies: biology, host-parasite relationships, impact and management. CABI publishing, Wallingford, UK.
- Russell, D.E., Martell, A.M., and Nixon, A.C. 1993. Range ecology of the Porcupine caribou in Canada. Rangifer S1 No. 8.
- White, R.G., Thompson, B.R. et al. 1975. Ecology of caribou at Prudhoe Bay, Alaska in Ecological investigation of the tundra biome. In the Prudhoe Bay region, Alaska. Biological papers of the University of Alaska special report number 2.

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Acknowledgements: We are thankful for the invaluable guidance and critical feedback from Brad Griffith, Craig Nicholson, Robert White & Don Russell.

