Climatology of Mosquito Activity Within Summer Ranges of North Slope Caribou Herds in Alaska

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INTRODUCTION:

- Insect harassment is spatially and temporally dynamic, both within and between years (Dau, 1986). Our current knowledge is limited to estimates of harassment for certain herds in certain years (White et al 1975, Russell et al 1993), and these estimates have not been localized within the summer range of a herd.
- A comparative estimation of potential effects of mosquitoes on caribou herds is warranted.
 For maximum utility and to make broad inferences such a study should involve the spatial and temporal components of mosquito activity.
- Long-term climatology datasets provide the potential to derive abiotic drivers of mosquito activity.

HYPOTHESES:

The positive trend in spring and summer temperatures and regional differences in temperature reported for Arctic Alaska (Shulski and Wendler, 2008), is hypothesized to affect mosquito activity, through time and space. We tested the hypotheses –

- Intensity and duration of mosquito activity seasons have increased during the period 1979-2009.
- The MAI estimated from NARR data will show regional differences in patterns and magnitude, across Alaska north of the Brooks Range.

DATA & ANALYSIS:

A three-decade period, 1979 to 2009, was abstracted from the long-term climate dataset to study the patterns in conditions conducive for mosquito activity over space and time.

- DATA: North American Regional Reanalysis (NARR) data is a long-term climatology dataset, available at 3hourly temporal resolution, and 0.33° spatial resolution (Mesinger et al 2004).
- Following Russell et al (1993), we quantified "Mosquito Activity Index (MAI)" for each time step (8 times every day) for the duration 1-Jun to 31-Aug, for each year.
- Spatial and temporal trends were generated for the regions within summer ranges of Western Arctic herd (WAH), Teshekpuk lake caribou herd (TCH), Central Arctic herd (CAH), and Porcupine caribou herd (PCH).



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