What to eat in a warming world:

Can altering forage preferences buffer climate stress?

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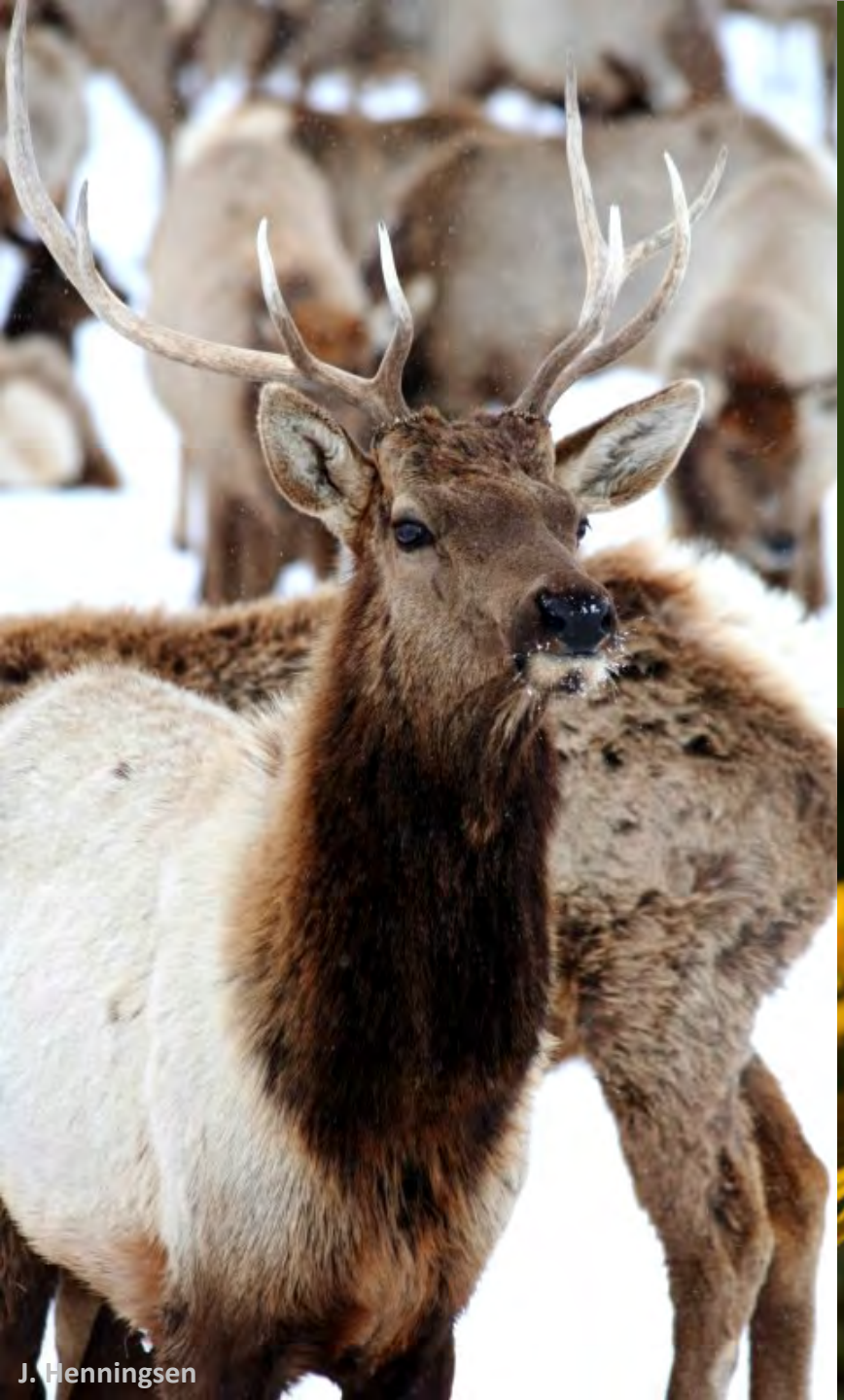

J. Henningsen


Christopher Furlong

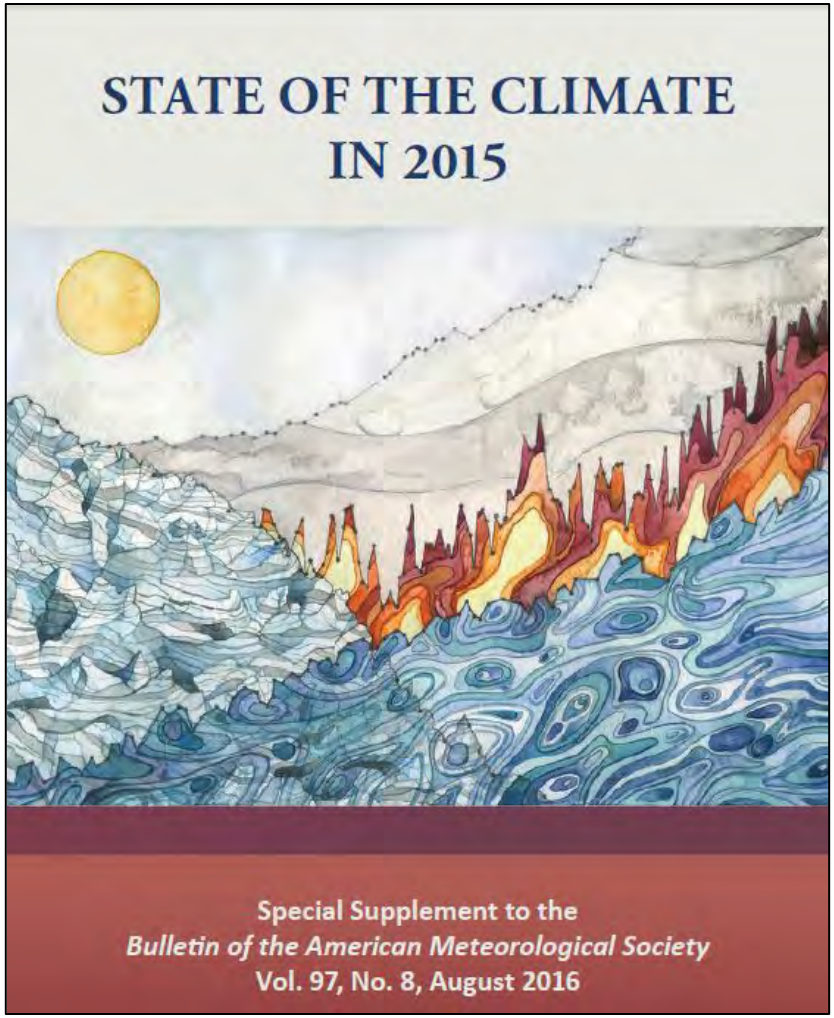

Mark Gocke

Earth's annual physical

2015: **Warmest** year on record

14 of **15** warmest years occurred since 2000

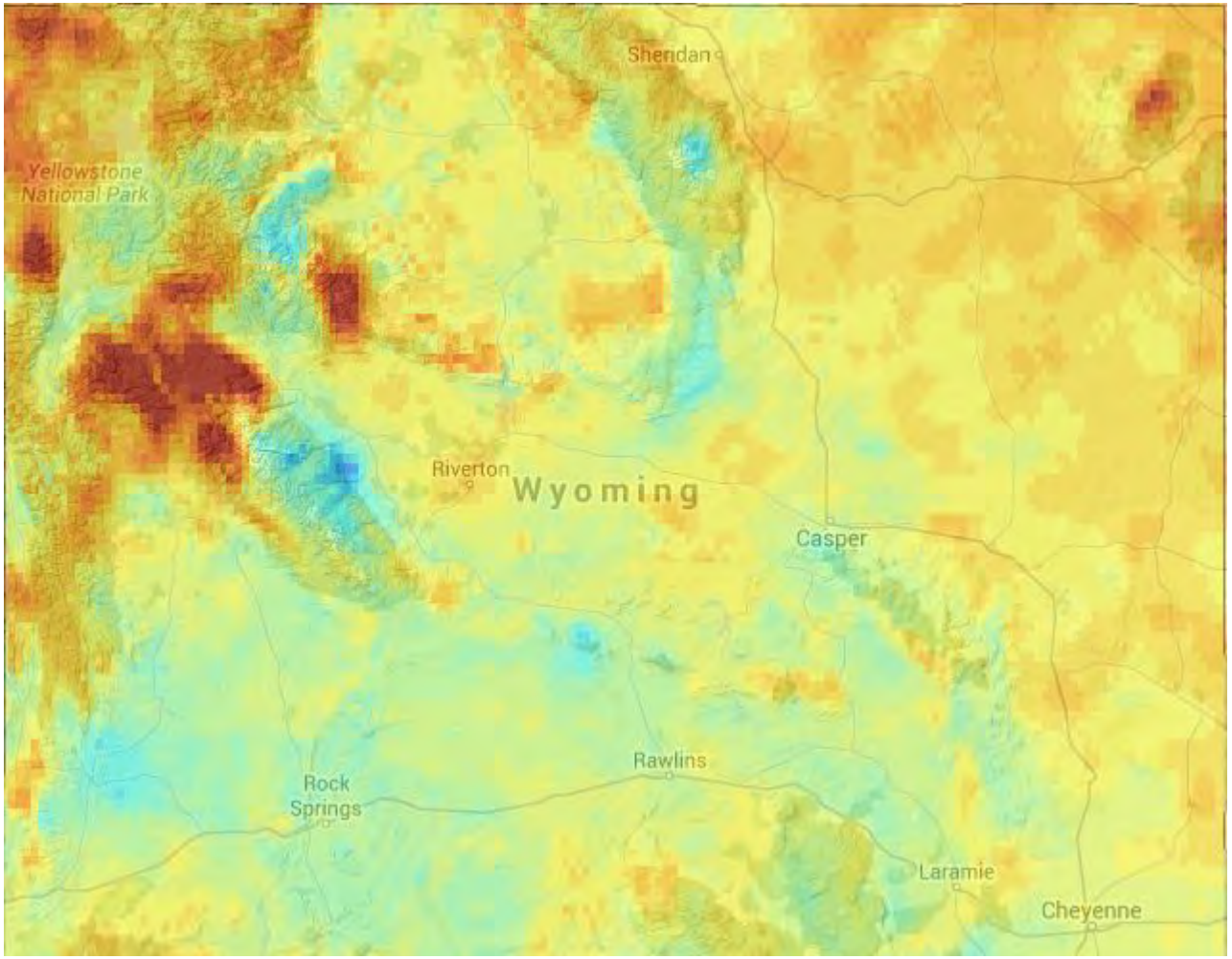
36th consecutive year of alpine-glacier retreat

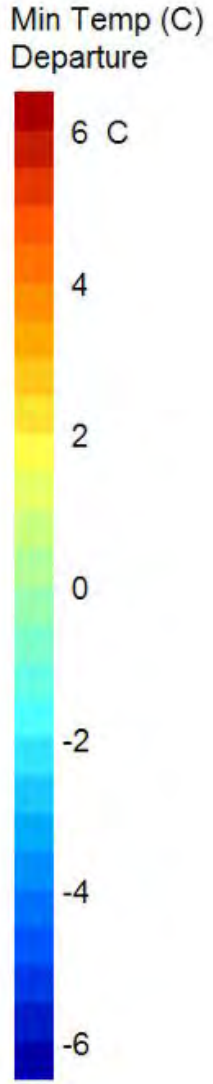


Bulletin of the American Meteorological Society

Average January minimum temperature departure

(1951-2014)





Data Source: PRISM Group, Oregon State University. Girvetz et al. (2009) Applied Climate-Change Analysis: The Climate Wizard Tool. PLoS ONE 4(12): e8320.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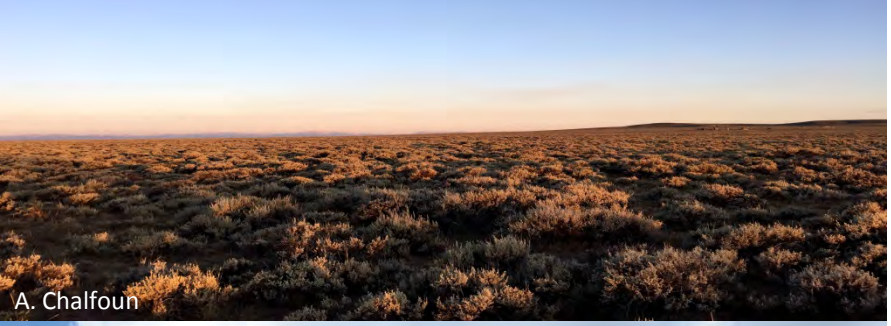
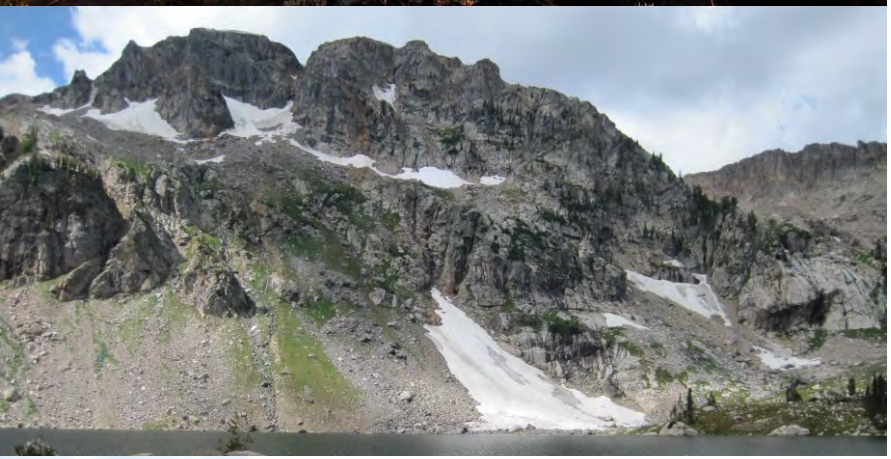




Gaps in understanding

Extent to which individuals can cope with warming conditions

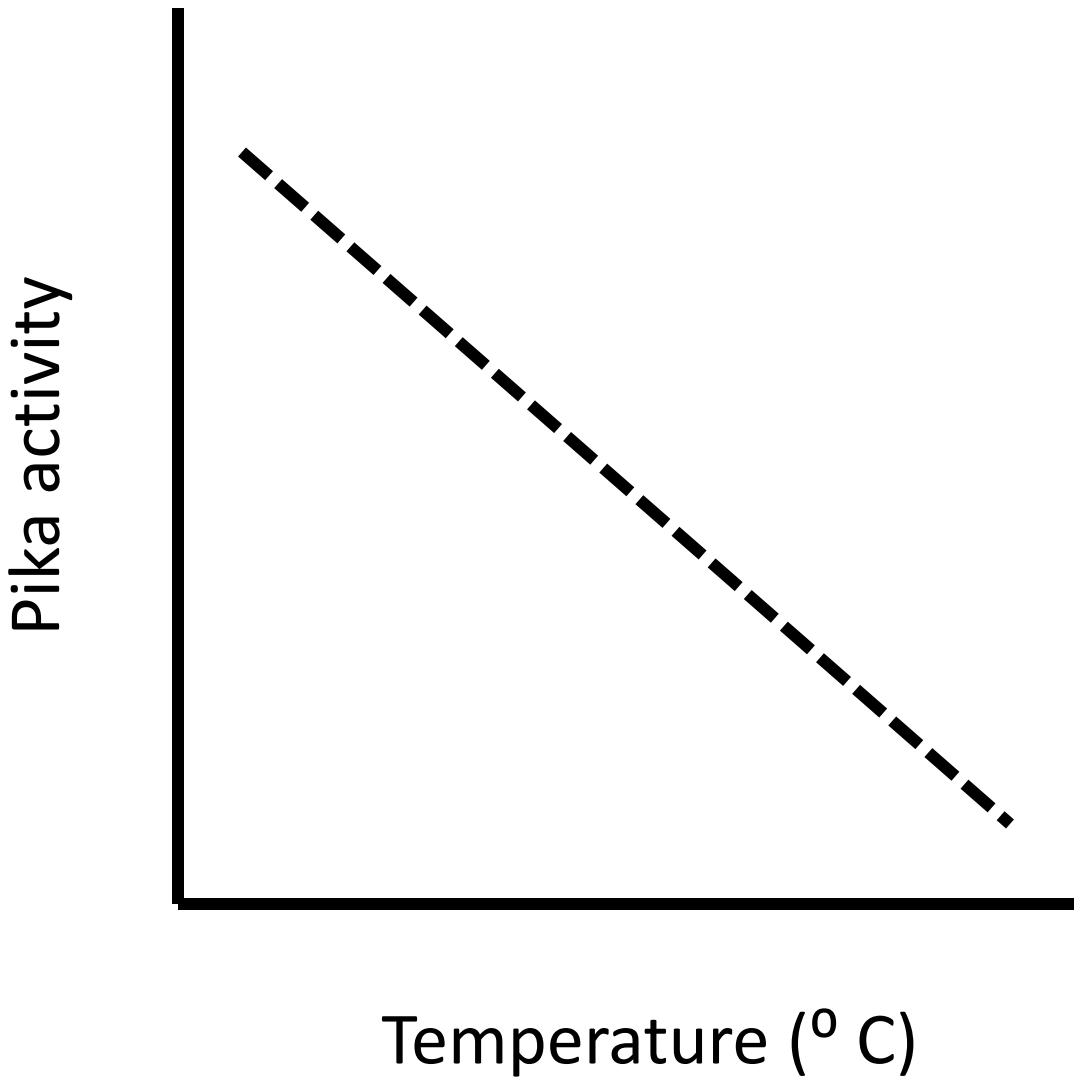
Ability to change resource preferences

Research question

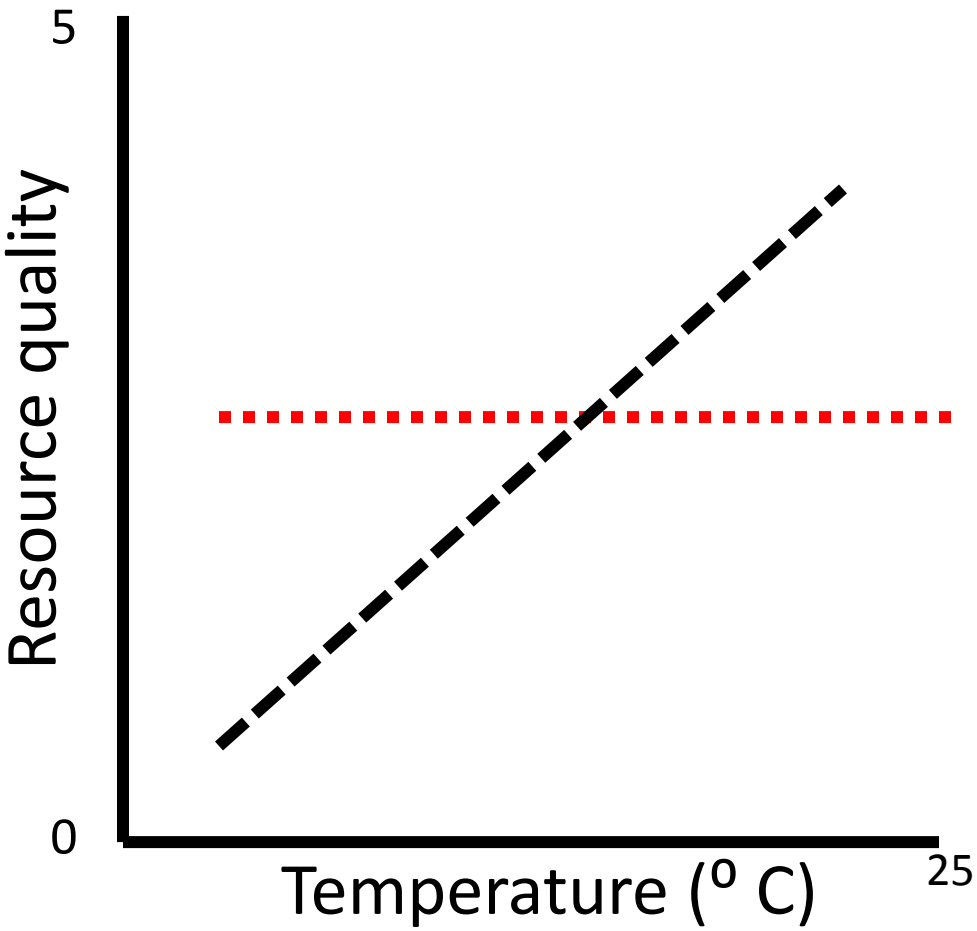
To what extent can individuals compensate for climate-related reductions in foraging opportunities by shifting forage preferences?


American pika
Narrow thermal niche
Limited motility
Cache food
J. Jacobson

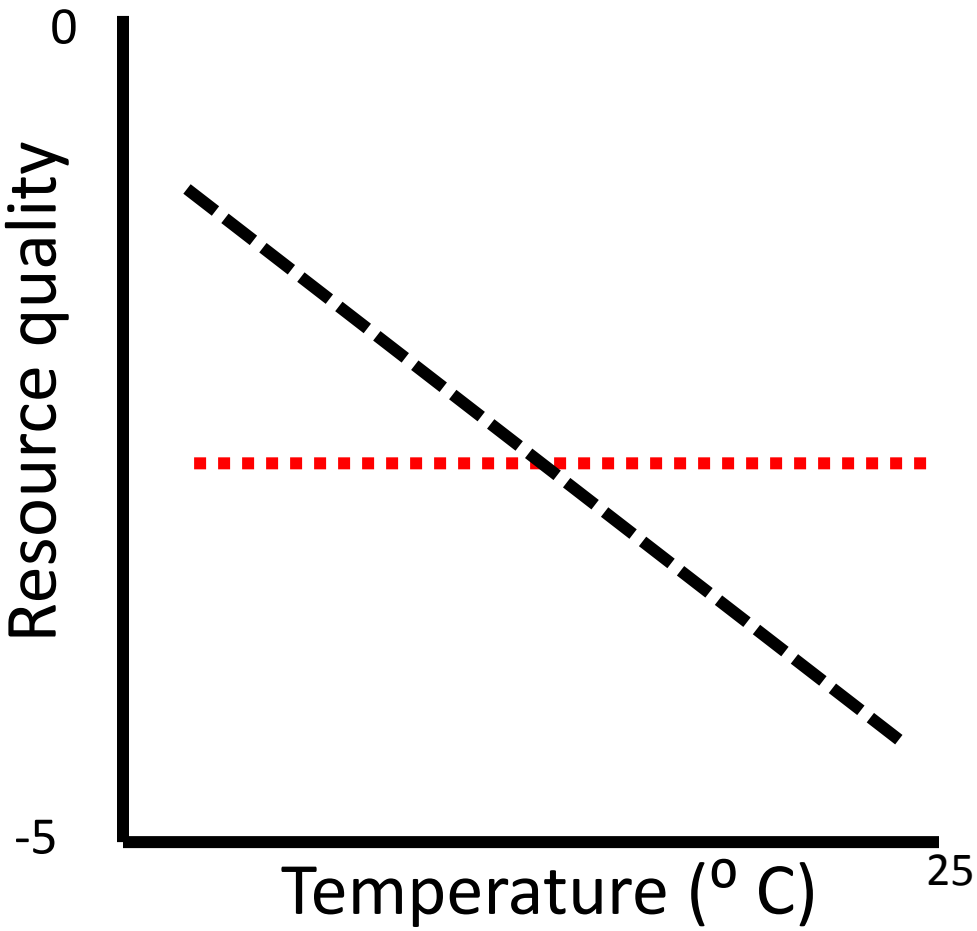
Temperature constraints



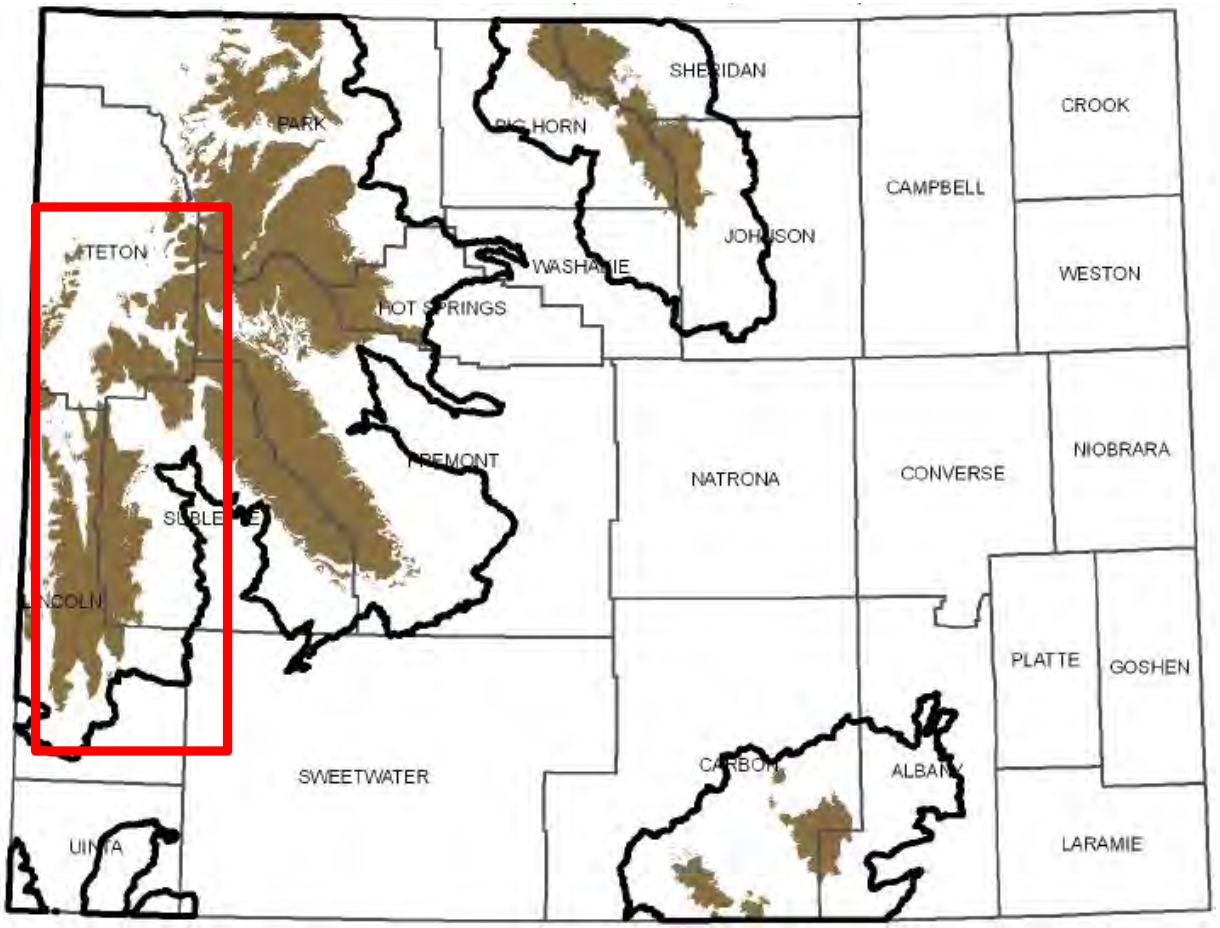
Temperature & resource choice



Temperature & resource choice



Study area & surveys



WGFD 2010. SWAP American pika

5 sites

42 individuals

2 vegetation-quality metrics

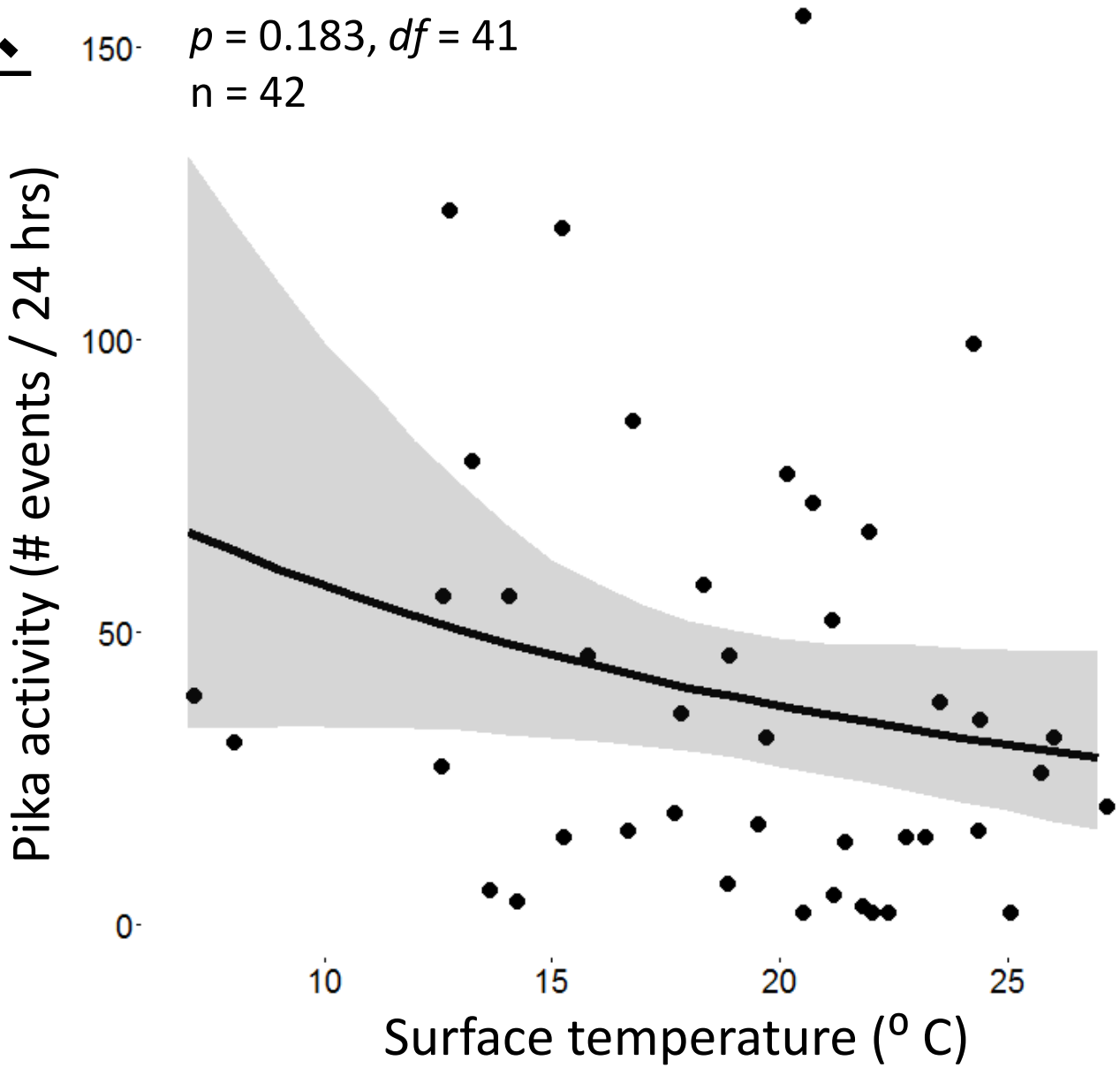
nitrogen

fiber

Activity & temperature

1,685 video recordings

Temperature constrains activity

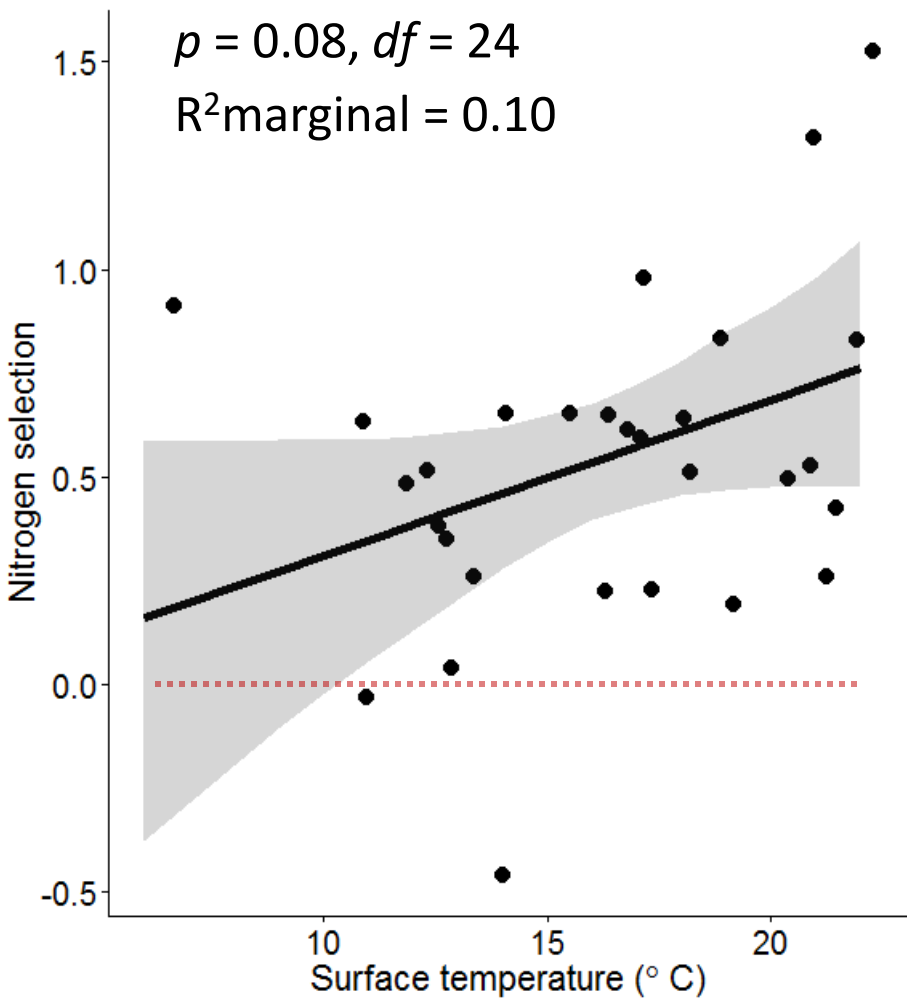


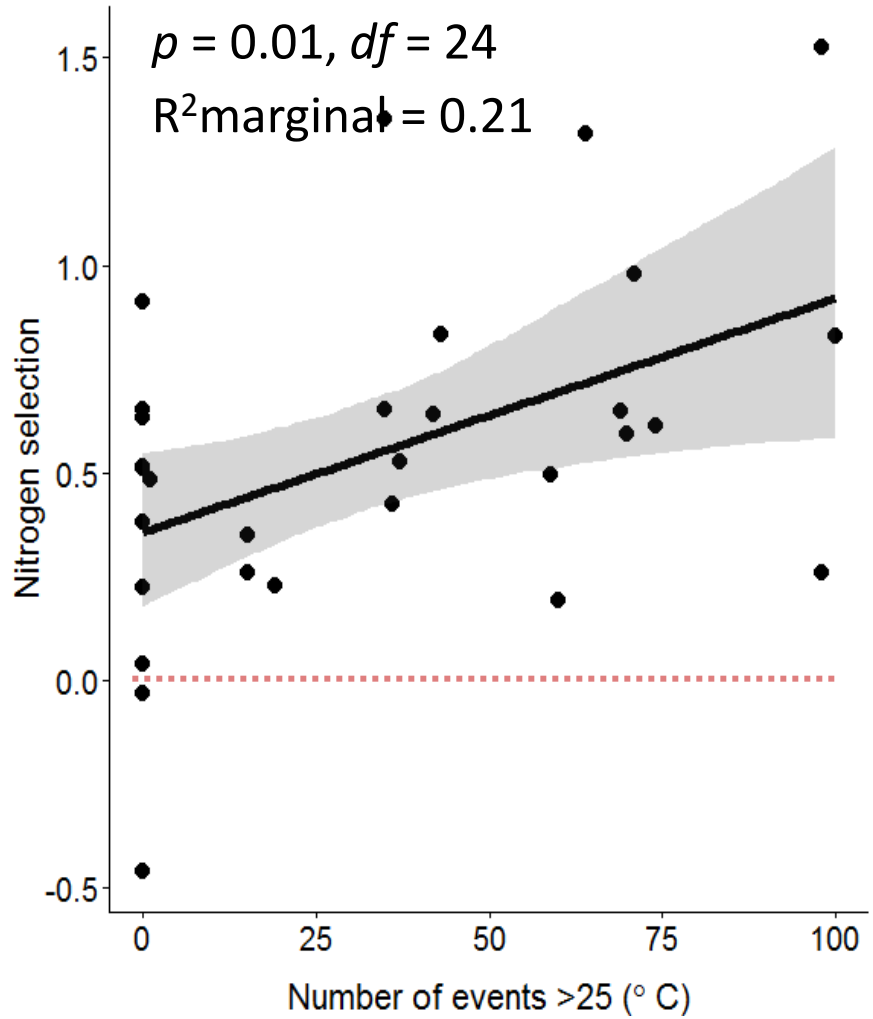
Available vegetation

C. Tappe

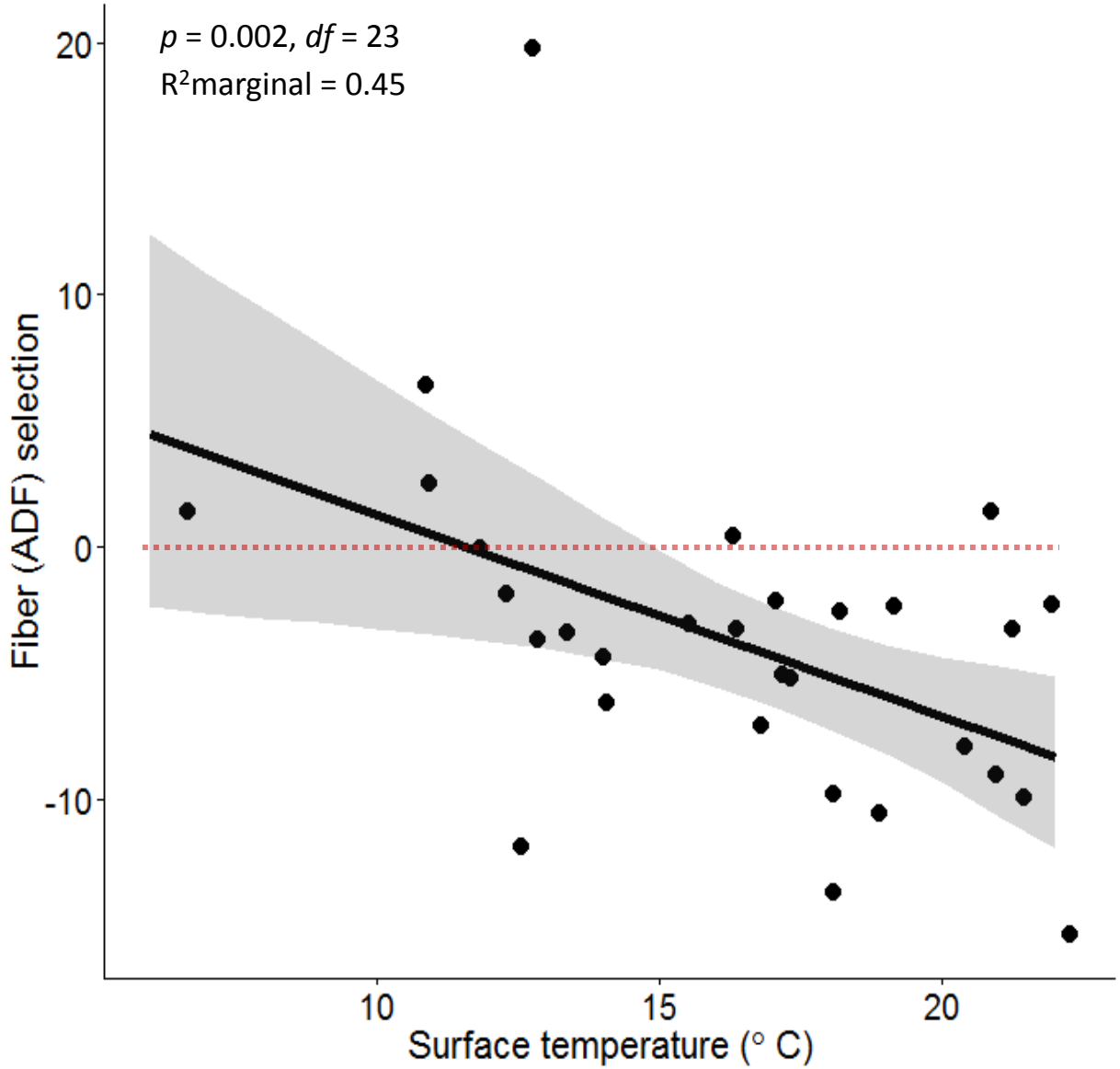
Selected vegetation

Nitrogen selection





Fiber selection



Conclusions

Individuals exposed to higher temperatures altered vegetation selection

Shifting selection may buffer effects of warming

Behavior as a potential conservation tool

Consider resource **availability** and species' **capacity** to modify behavior

Partners and Funding

Collaborators

U.S. Forest Service
U.S. Geological Survey
Wyoming Game & Fish Department

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Funders

Meg & Bert Raynes Wildlife Fund

Research Office


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Flexible foraging strategies

- Behavioral flexibility may allow individuals to adjust to stressful conditions
- Individuals can alter **when**, **how often** and **how much food**
- Recorded behavior using trail cameras
- Simultaneously measured temperature

Haying behavior

Major food source over winter

Late July – Sept

27 trips / hr

10,674 trips / yr