From practitioners' knowledge to climate modelling and back: – Using climate model projections to provide relevant climate information to Arctic reindeer herding communities Heidrun Matthes, Sirpa Rasmus, Roza Laptander, Teresa Komu, Kirll Istomin, J. Otto Habeck, Tim Horstkotte, Bruce C. Forbes, Jussi T. Eronen and Hans A. Tømmervik

Motivation



- practical work in environment-dependent livelihoods is constant adaptation to external conditions
- provide relevant and relatable climate change information to practitioners of environment dependent livelihoods
- spark thinking about adaptation of adaptation strategies

3-step process

- 1. Understanding the operational environment
- 2. Calculating information on critical conditions
- 3. Present results in relatable and understandable ways

example: reindeer herders (mostly in Finland)

Understanding the operational environment



workshops with practitioners: mapping of the operational framework of the livelihood

identification of critical climate conditions that impact the livelihood's success



spring (calving) early summer (calf marking, migration) • snow free patches ice crusts high water levels in rivers early spring river and lake ice snow storms strong currents snow melt rain on snow summer ice crusts insect harassment (insect numbers) insect harassment (insect winter attacks) rain on snow hot summers mild temperatures wet/dry summers $(from -5^{\circ}C to +3^{\circ}C)$ permafrost degradation shifts in occurrence of early winter (migration) predators/plants rain on snow snow bed degradation hoarfrost; frozen water on late autumn (rutting , round ups) early autumn plants/lichen • wet/dry soil at the moment mushroom growth ice crust on bare ground of first snow warm conditions during rutting (ground ice or frost) frozen/unfrozen soil at the wet conditions during rutting moment of first snow

Laptander et al., 2024, https://doi.org/10.1016/j.polar.2023.101016

workshop tools & instructions can be found here: https://doi.org/10.5281/zenodo.8334153

13/12/2024

3

Calculating information on critical conditions



translating these conditions into climate indices identifying data sources: gaps in understanding, data availability and data quality calculating indices from appropriate data sources











6

are affected.



How can else can we communicate climate change? \square situation room game



- How do you realize this is happening?
 - What do you need to know about it?
- Can you get that information? How and from whom?
- What would you do?
- What would you need others (who?) to do?

action tokens (one colour per player)



practitioner level action (What would you do?)

stakeholder level action (What would you need others to do?)



Ylläs workshop, August 2024

H. Matthes et al. - AGU 2024, From practitioners' knowledge to climate modelling and back, GC51E-04



PolarRES CHARTER

How can we visualize climate change differently? \Box In 2050, what will your backyard look like?



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How can we visualize climate change differently? StoryMaps by Philip In 2050, what will my backyard look like? Û ... lida Melamies Jari Temonen. 3: Kate Utsi Rákkoniárga Niemelä reindeer. Reindeer herder Commercial. 0 Murmans Lake Imandr Rovanier

https://storymaps.arcgis.com/stories/95207a47d7bf4d5bb674a66da6a3db79

13/12/2024

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9

Conclusions



Communication is everything!

- Who is your audience?
- What is their background?
- Why might they want your information?
- How is information presented?
- Who has access to your presentation?
- Who provides context? Who is the translator?



