

Research based on bird monitoring and census data

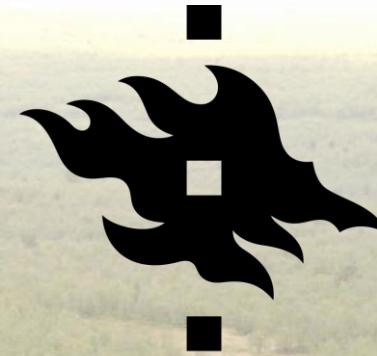
Finnish bird communities in a changing environment

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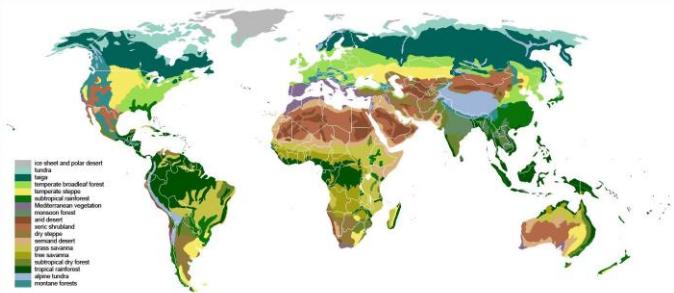
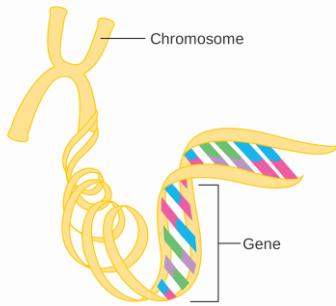


The Helsinki Lab of Ornithology



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The broad footprint of climate change



Climate change and distribution changes

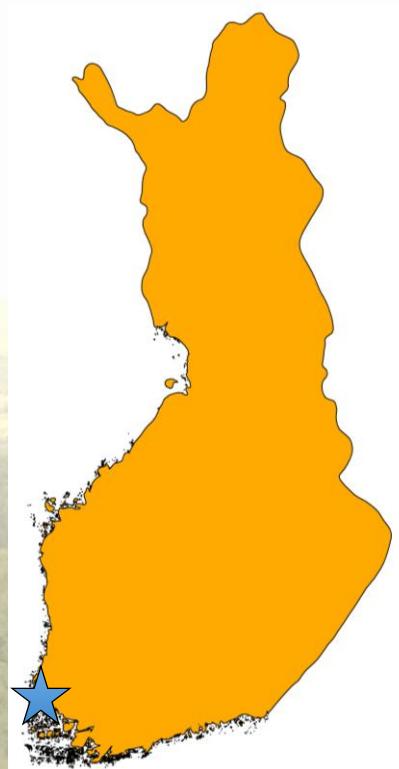


Climate change shifts
distribution areas towards
poles and mountain tops



Change in the central gravity of breeding landbirds (\approx 16 km NNE / decade)

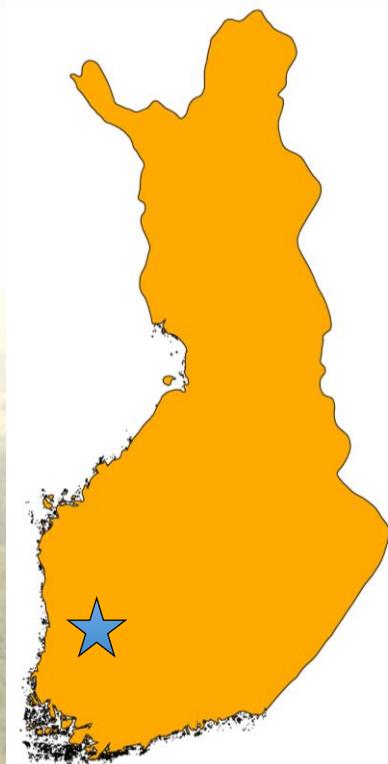
Blackbird



1970-1989 → 2000-2012

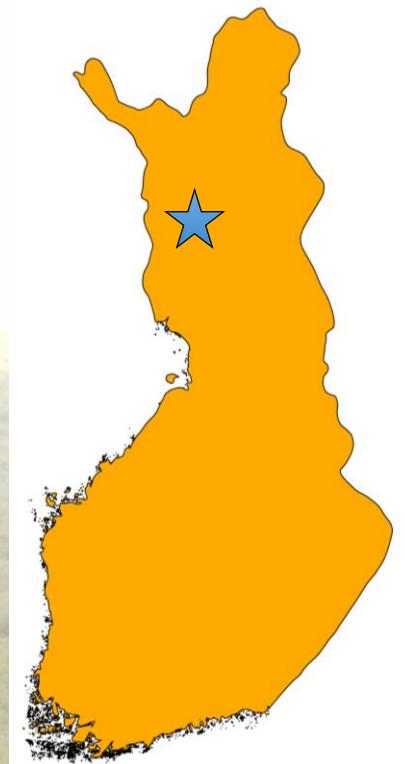
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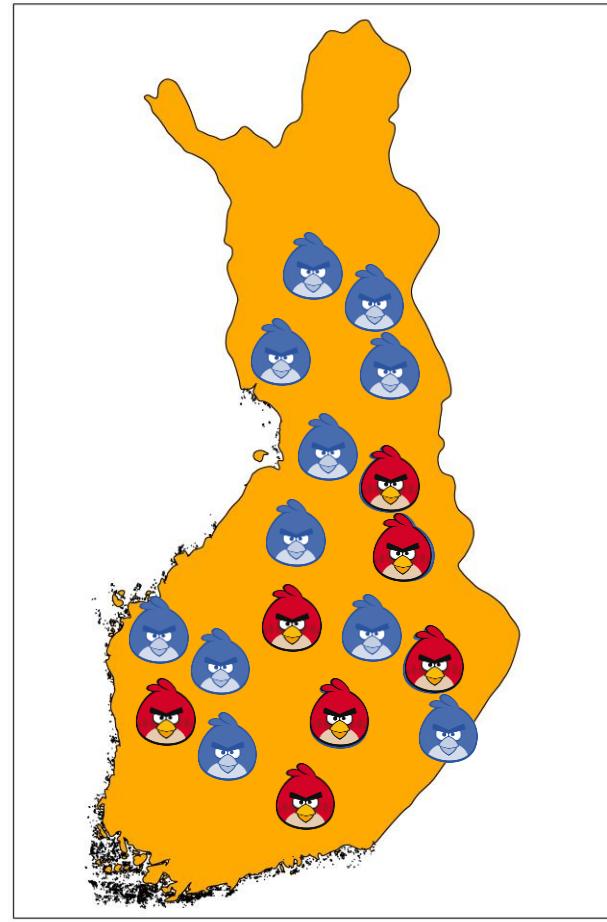
1970-1989 → 2000-2012

Brambling



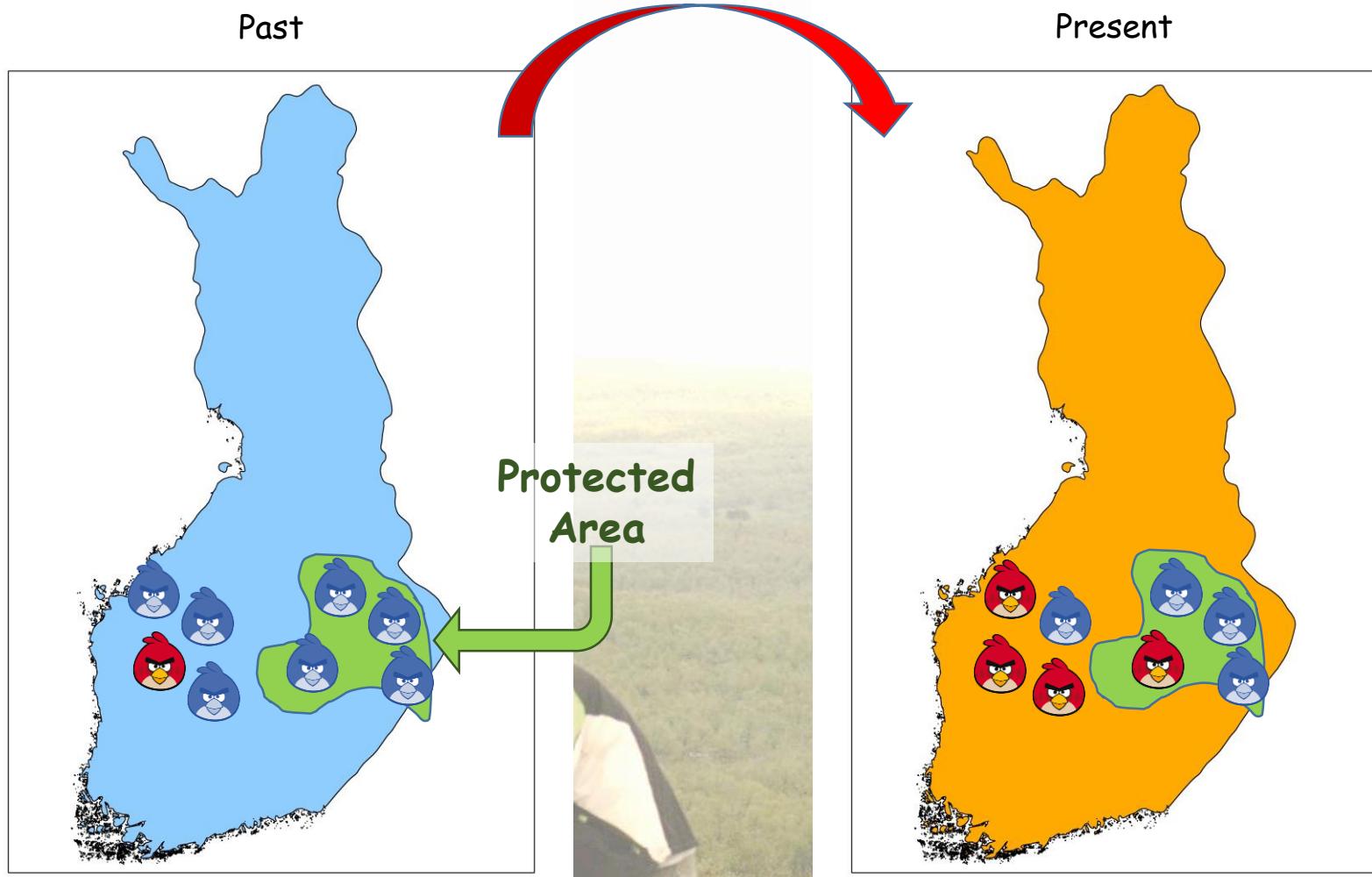
1970-1989 → 2000-2012

Bird communities under climate change?



Bird communities under climate change?

The role of protected areas



Bird communities under climate change?

The effect of season

Breeding



Wintering



Bird communities under climate change?

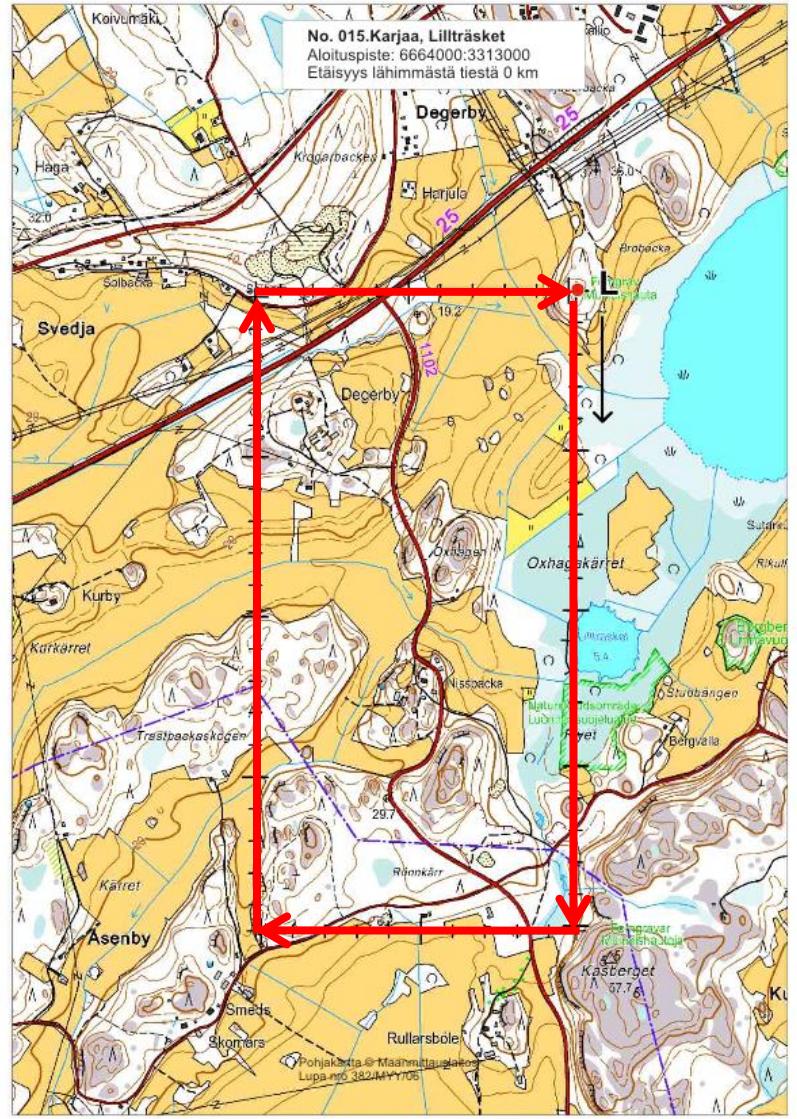
Study aims:

1. Quantify the change in breeding bird communities under climate change
2. Investigate the role of Protected Areas on bird community change
3. Compare change in bird communities between the winter and summer season



Breeding line transects

- Regularly since 1970s
- ~ 200 repeated annually, ~ 80 volunteers
- Counts in June (4 – 9 am)
- 6 km long (1 x 2 km rectangle)
- 50 meter wide main belt + supplementary belt
- All birds are counted



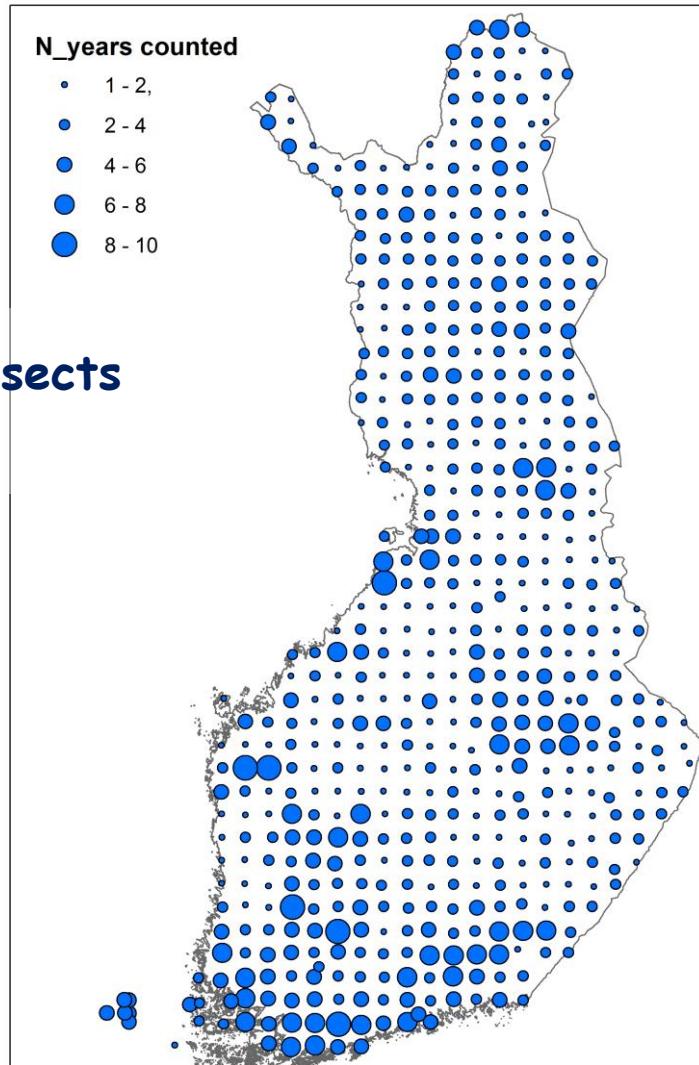
Winter line transects

- Early winter 1.-14.11. (1976=>)
- Mid-winter 25.12.-7.1. (1957=>)
- Late winter 21.2.-6.3. (1966=>)
- 10 km long route
- All birds are counted
- ~ 550 routes / year, ~ 1000 volunteers

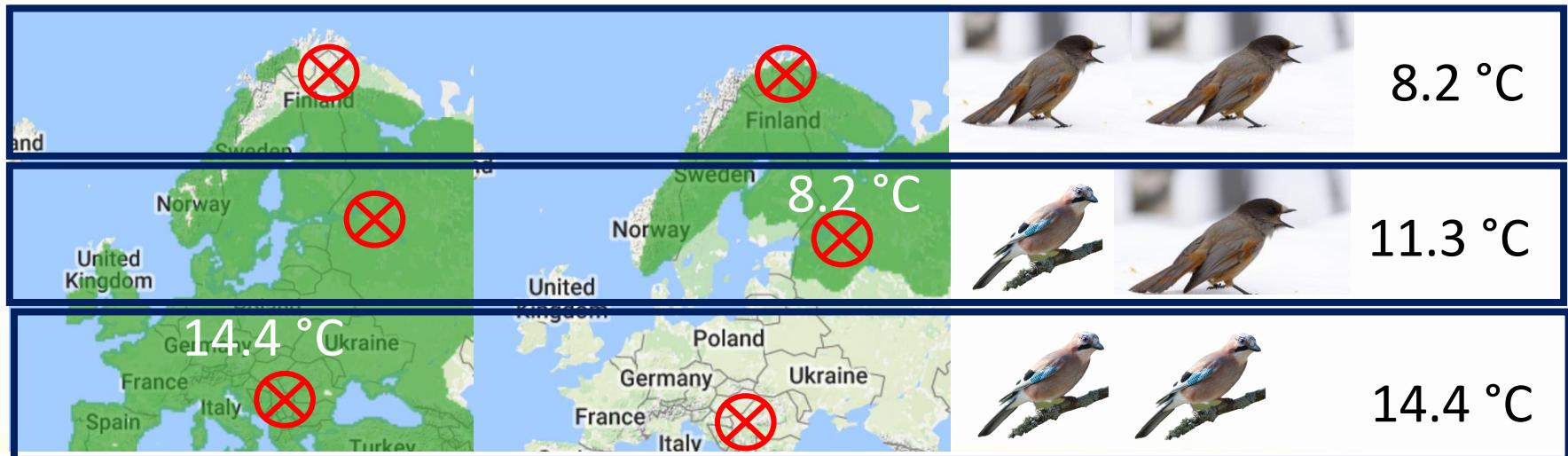


Massive citizen science effort

Breeding line transects
2006 ->



Change in communities - A simple index



Community Temperature Index (CTI):

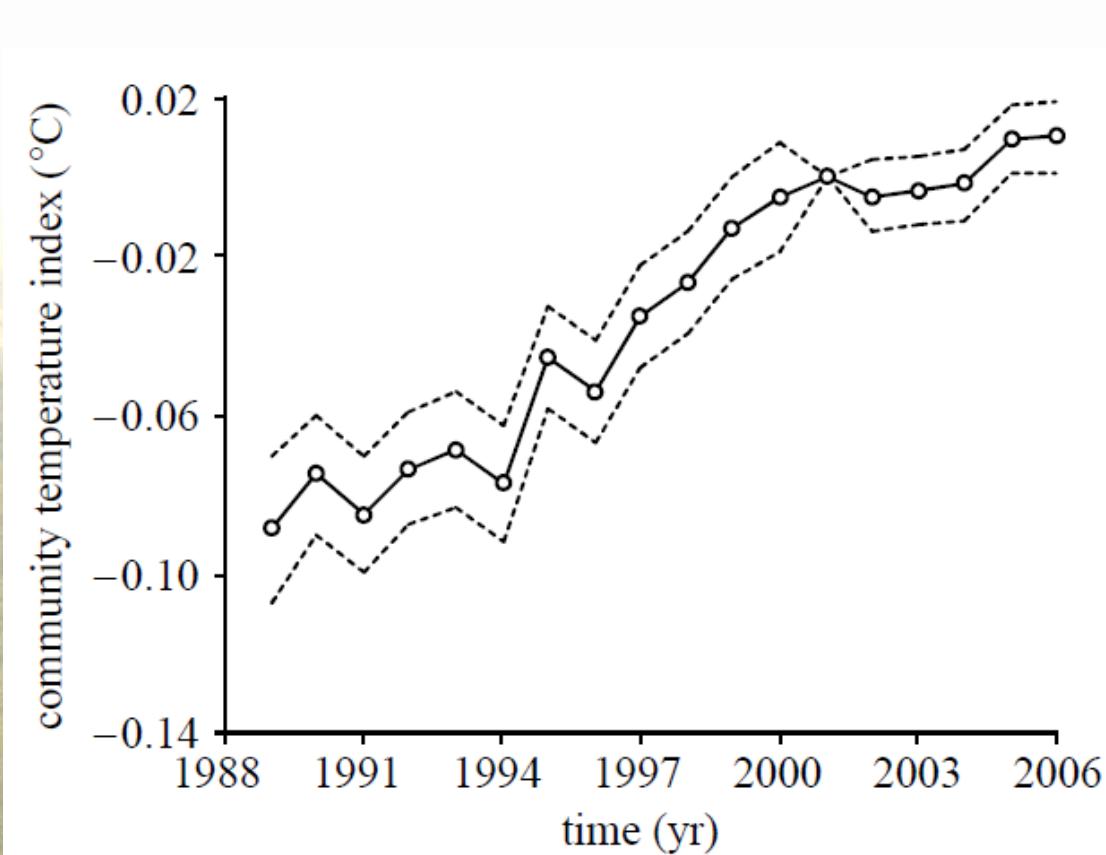
Average of each Species Temperature Index weighed by species abundance



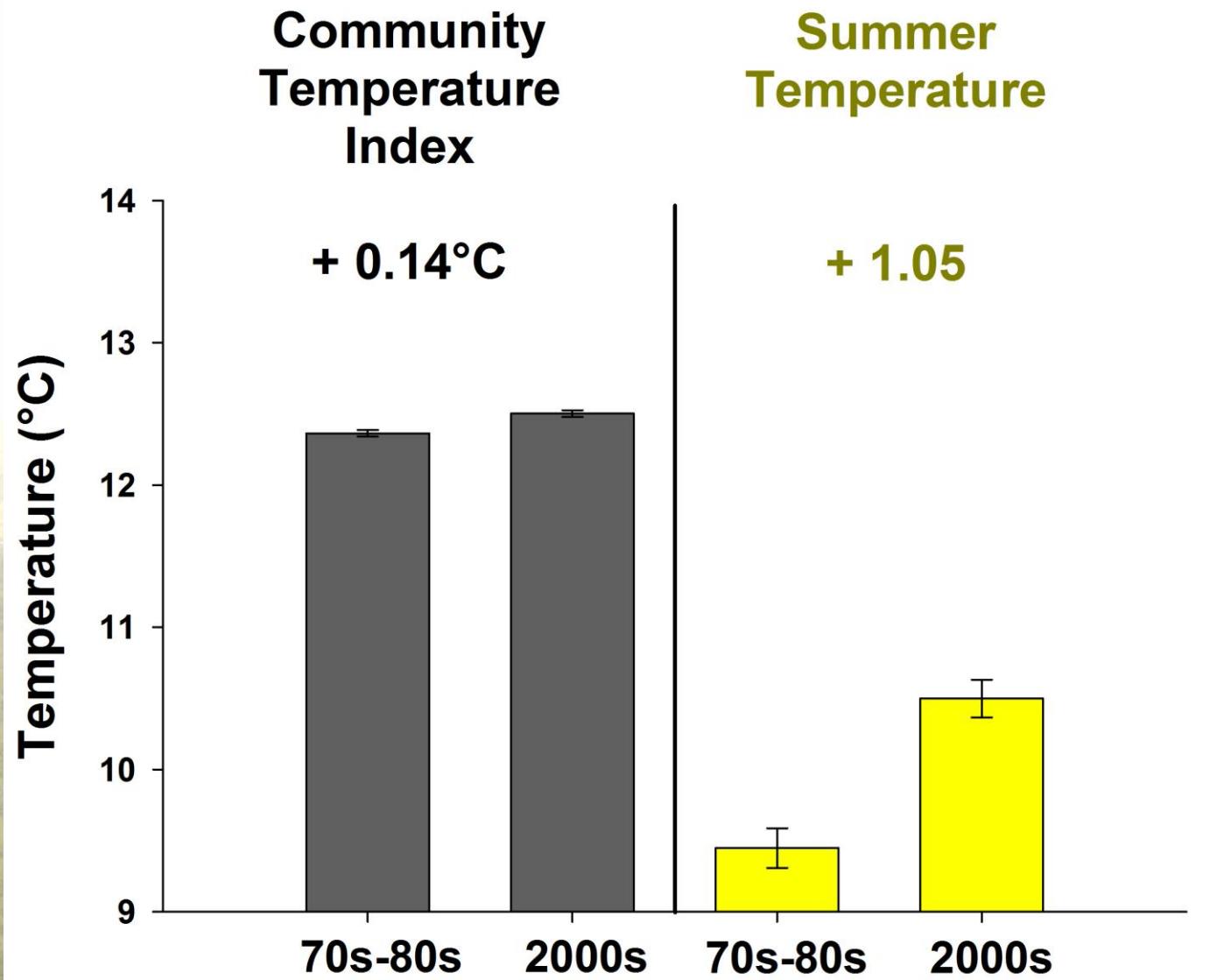
Average temperature across the breeding range
Species Temperature Index (STI)

Community temperature index, CTI

- Originally average temperature of breeding range during breeding season
- Unit degrees ($^{\circ}\text{C}$) - comparable with changes in Temperature

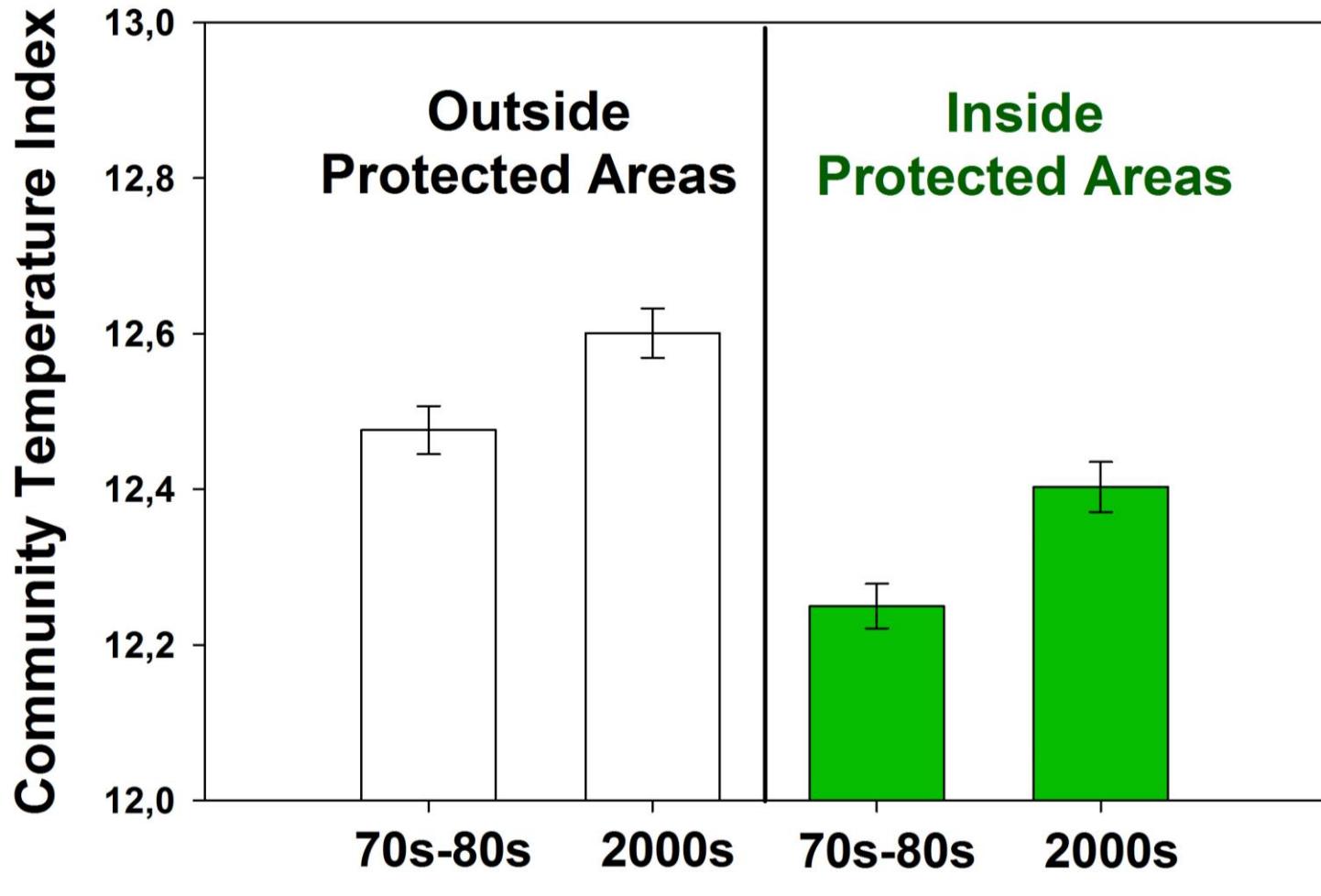


Results - 1. Changes in bird communities



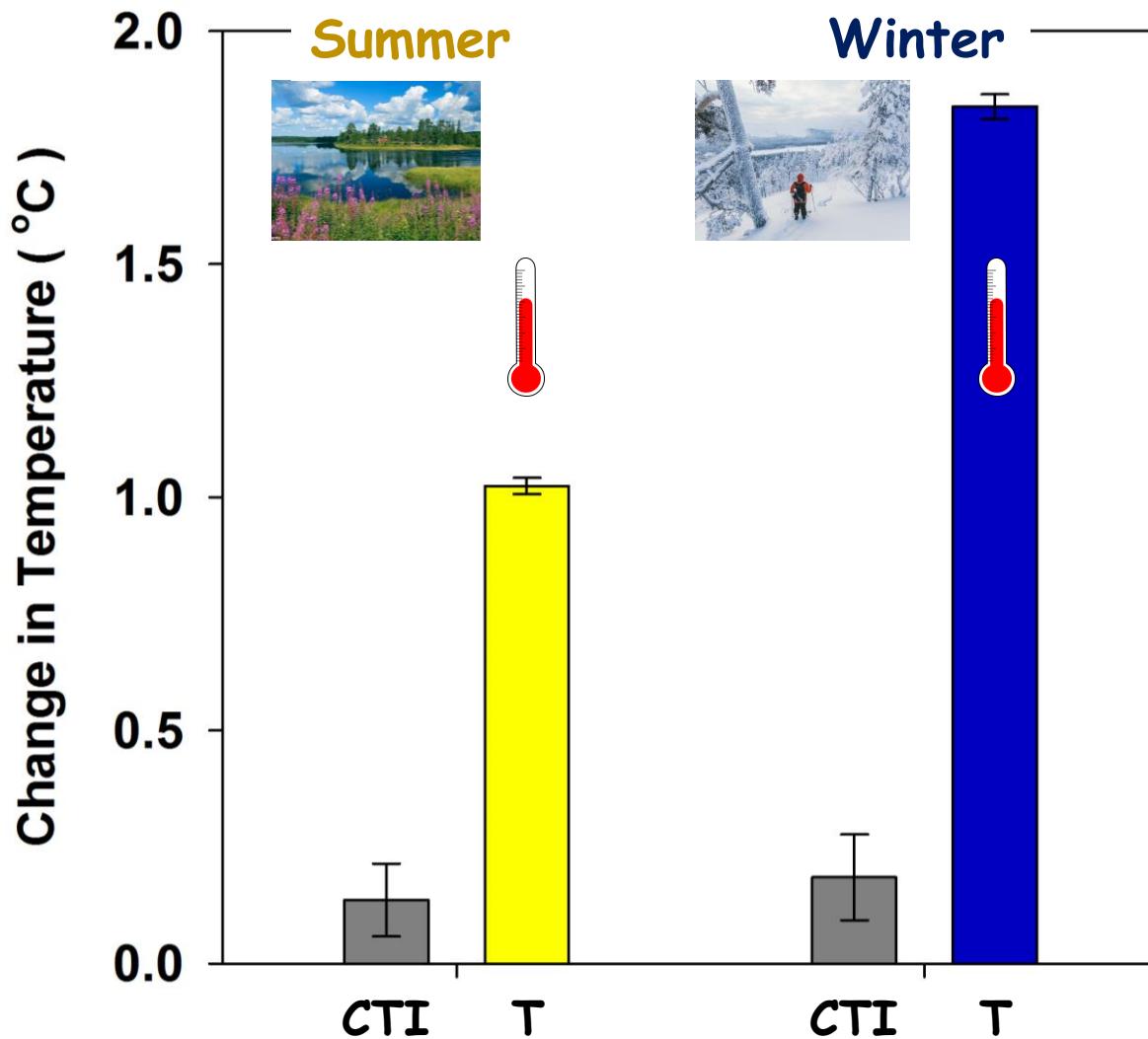
Results - Changes in bird communities

2. The role of Protected Areas



Results - Changes in bird communities

3. The effects of seasons



Take home messages:

- The world is changing, and so are wildlife communities
- Birds are tracking shifts in Temperature, but not fast enough
- The lag is growing - particularly in winter
- Finnish protected areas - still reservoirs of cold-dwelling species...
- But for how long?
- Importance of large-scale & long-term data to understand causes & consequences of change -> mitigation/adaptation measures
- Future direction: expand beyond Finland

Thanks to:

Citizens



A. Lehikoinen

LUOMUS

FINNISH MUSEUM OF NATURAL HISTORY



ACADEMY OF FINLAND

RESEARCH FUNDING AND EXPERTISE