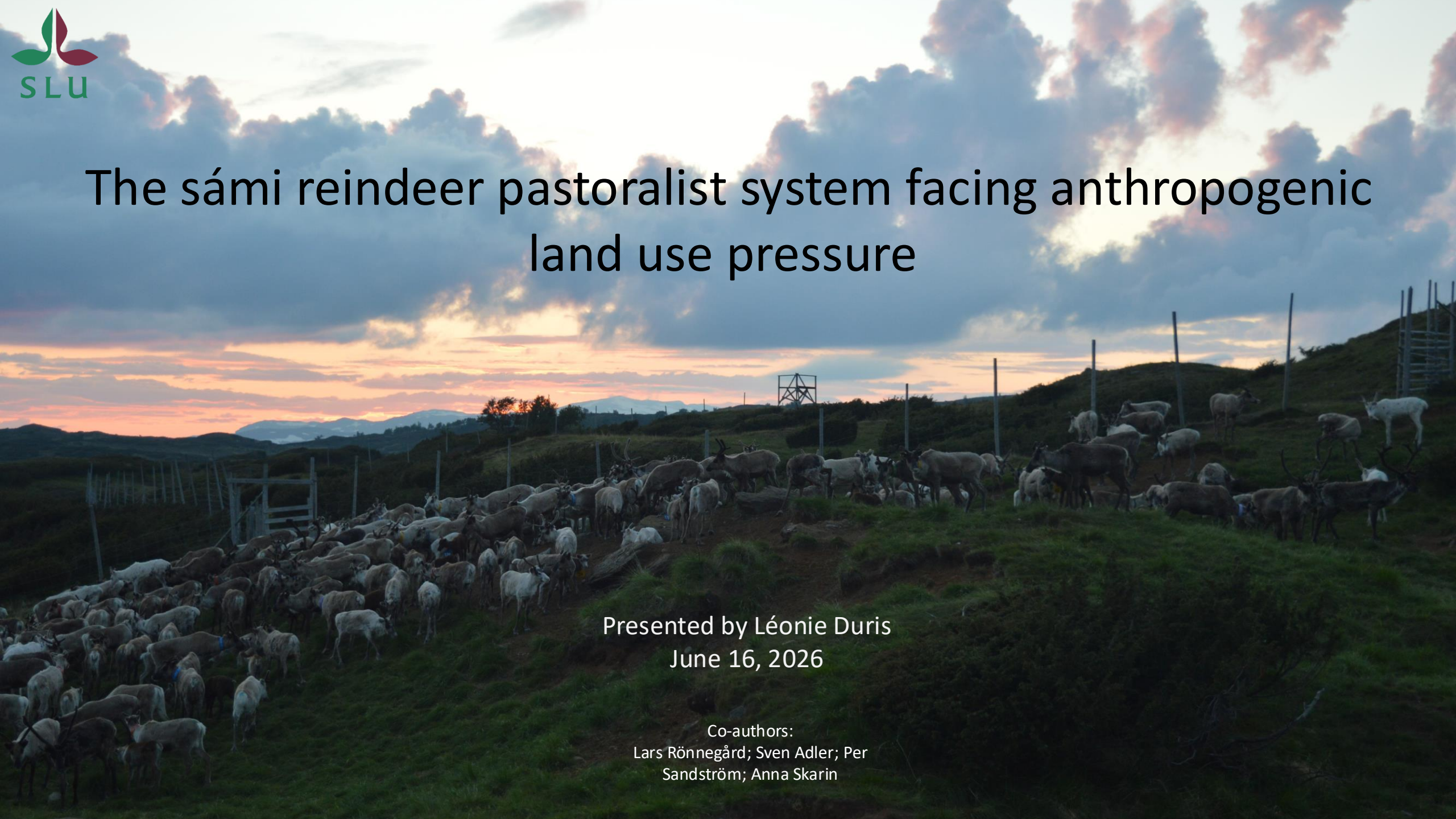

SLU
SCIENCE AND EDUCATION FOR SUSTAINABLE LIFE

The sámi reindeer pastoralist system facing anthropogenic land use pressure



Presented by Léonie Duris
June 16, 2026

Co-authors:
Lars Rönnegård; Sven Adler; Per Sandström; Anna Skarin

Context

Supplementary feeding

Migration

Free ranging

Slaughter

Marking

Context: Ecology of the semi-domesticated reindeer

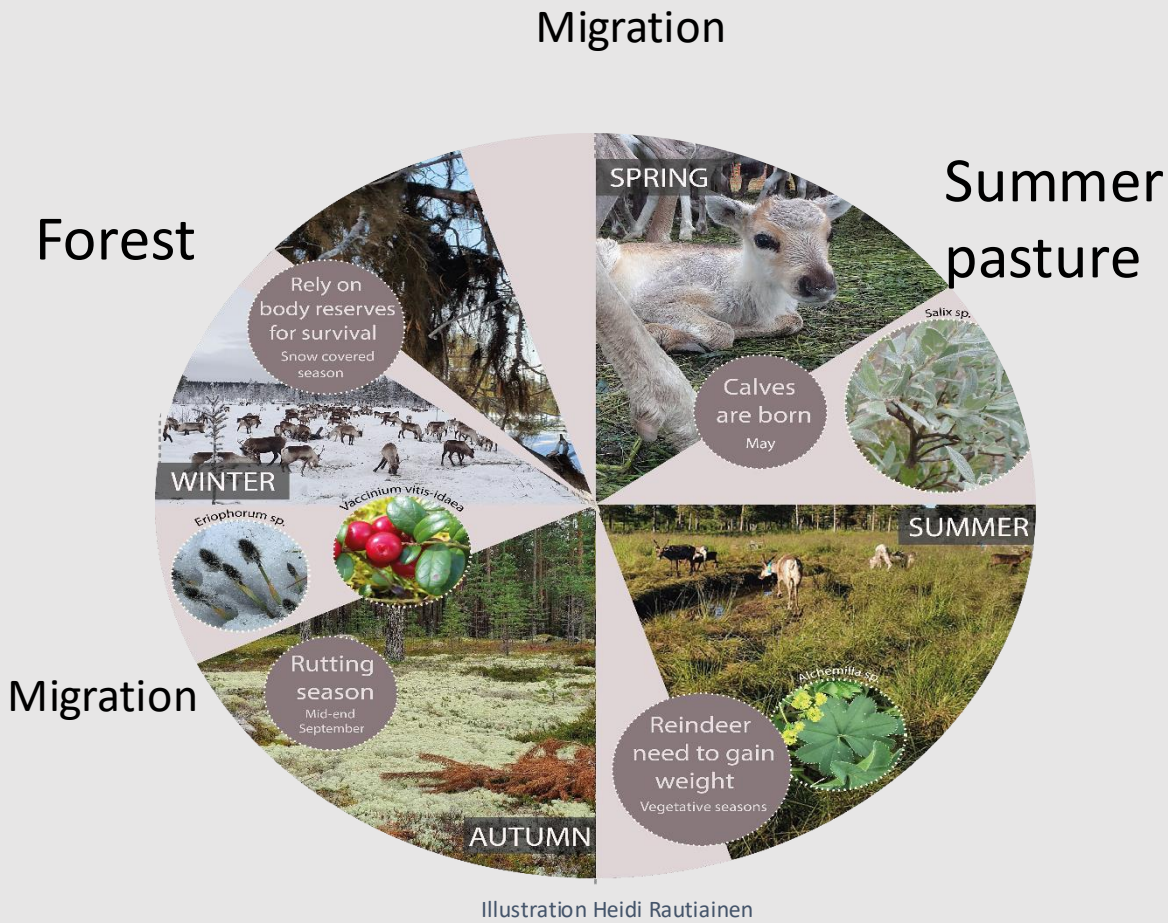
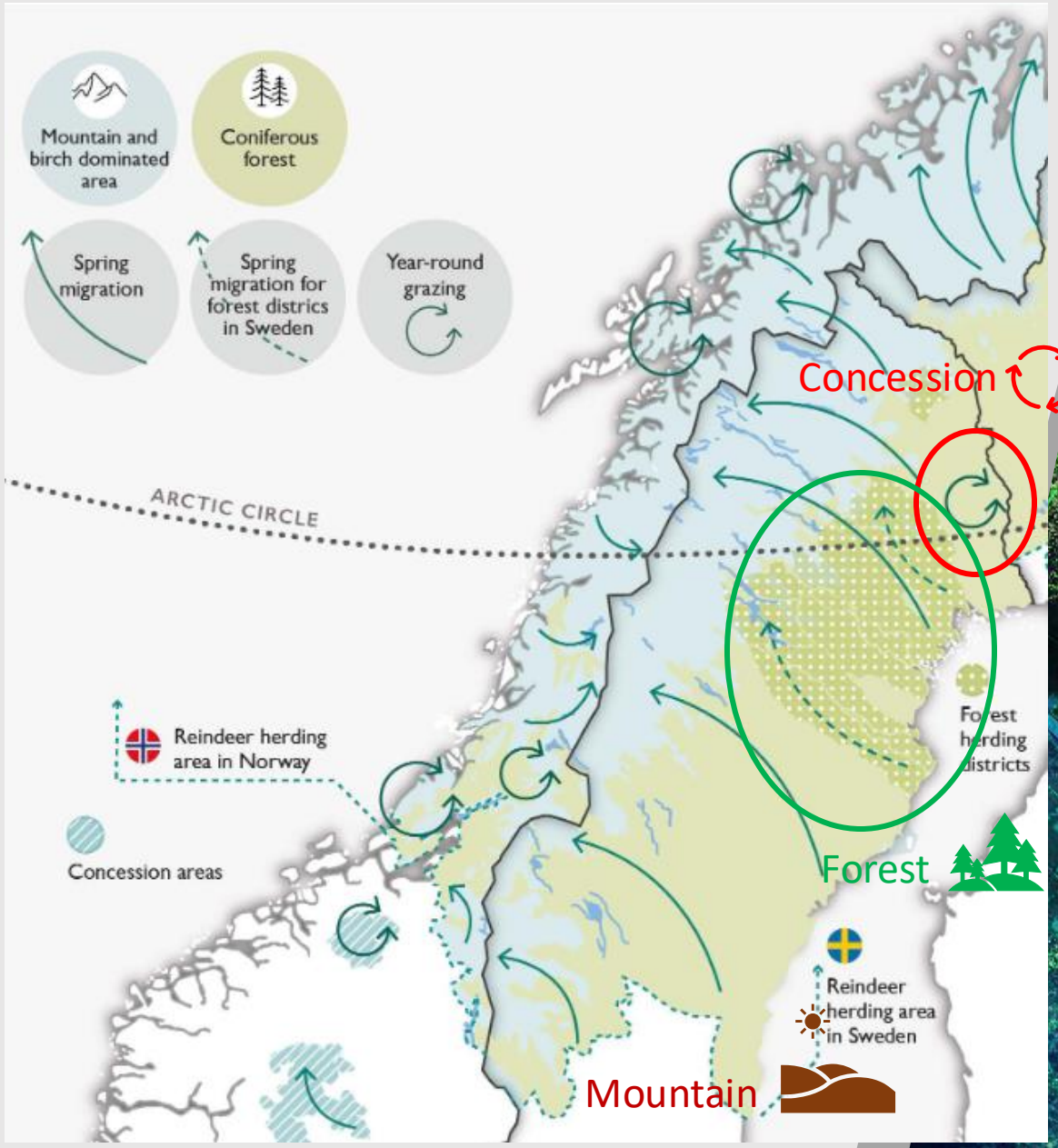


Illustration Heidi Rautiainen



Context: Wind power development and mine

Roads

Rail roads

Power lines

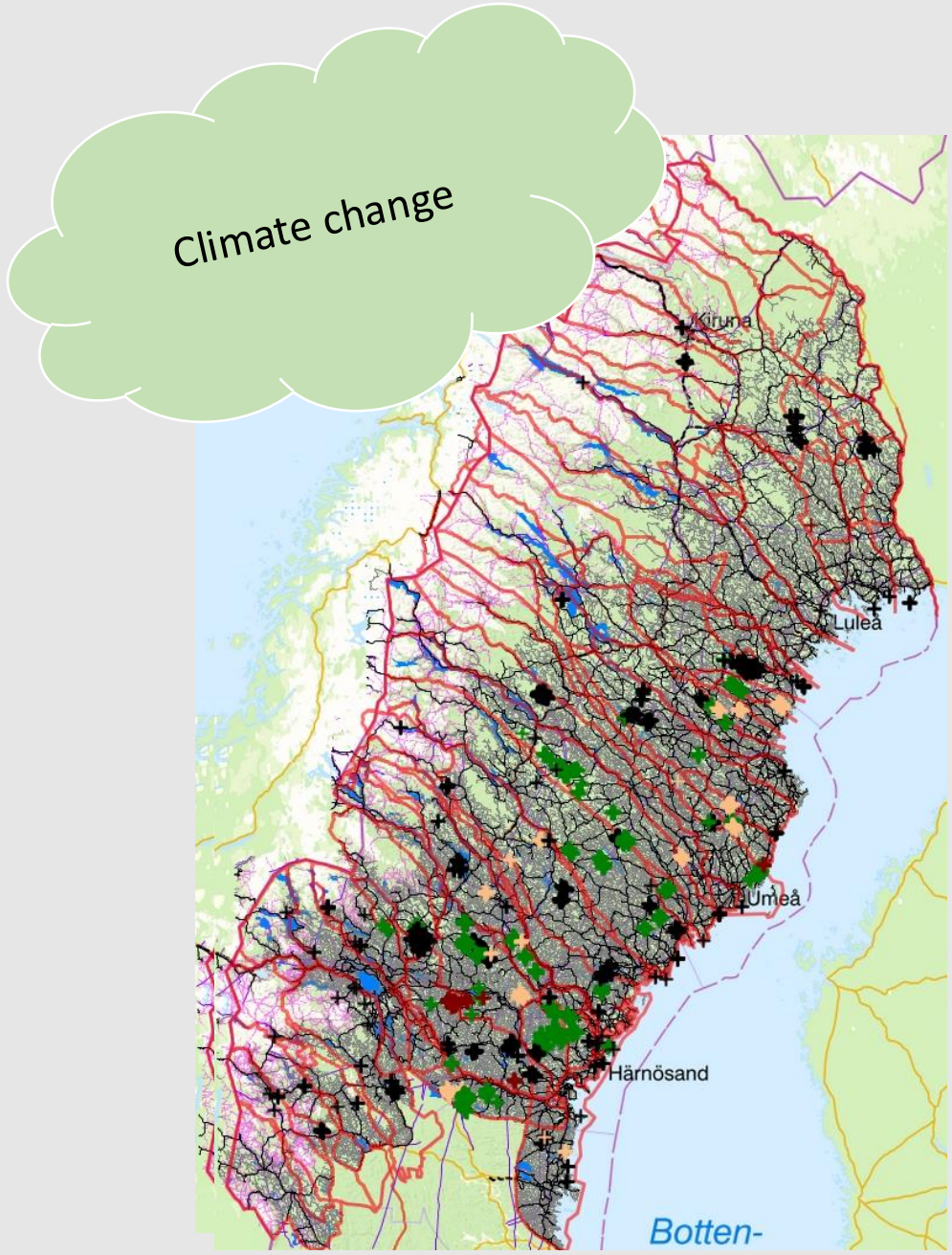
Hiking trails

Hydro power

Mining

Wind power

Forestry



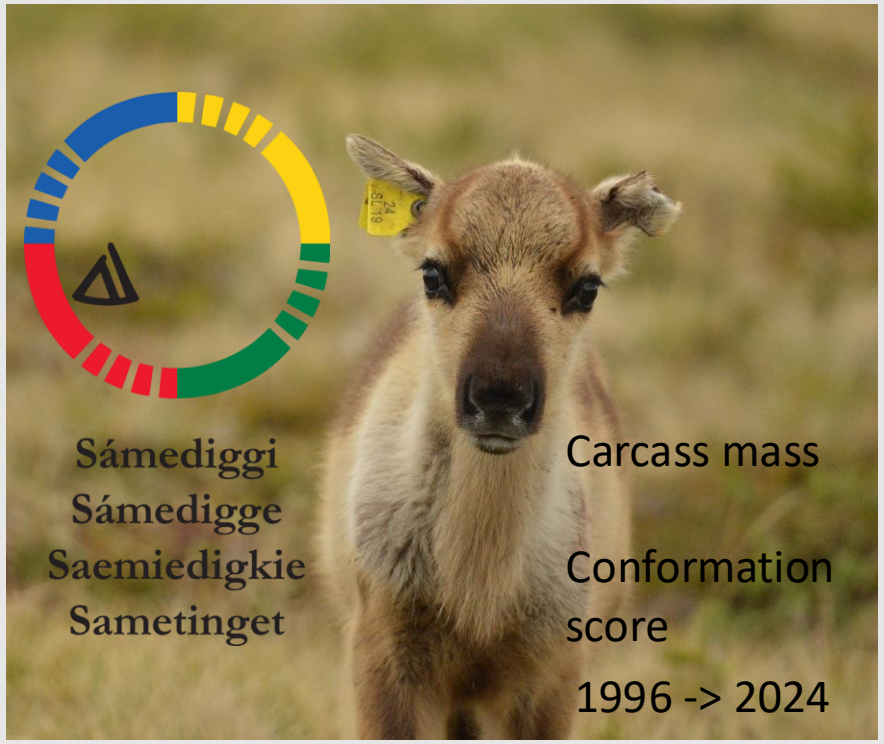
Aim:

What characterizes the reindeer herding communities where wind power development and mine affects:

Calves' carcass mass and conformation score

SUMMER PASTURE

Method:



Linear models:

Wind turbines density + Mines in activity

SUMMER

Maximum temperature

Insect Activity

Herd density

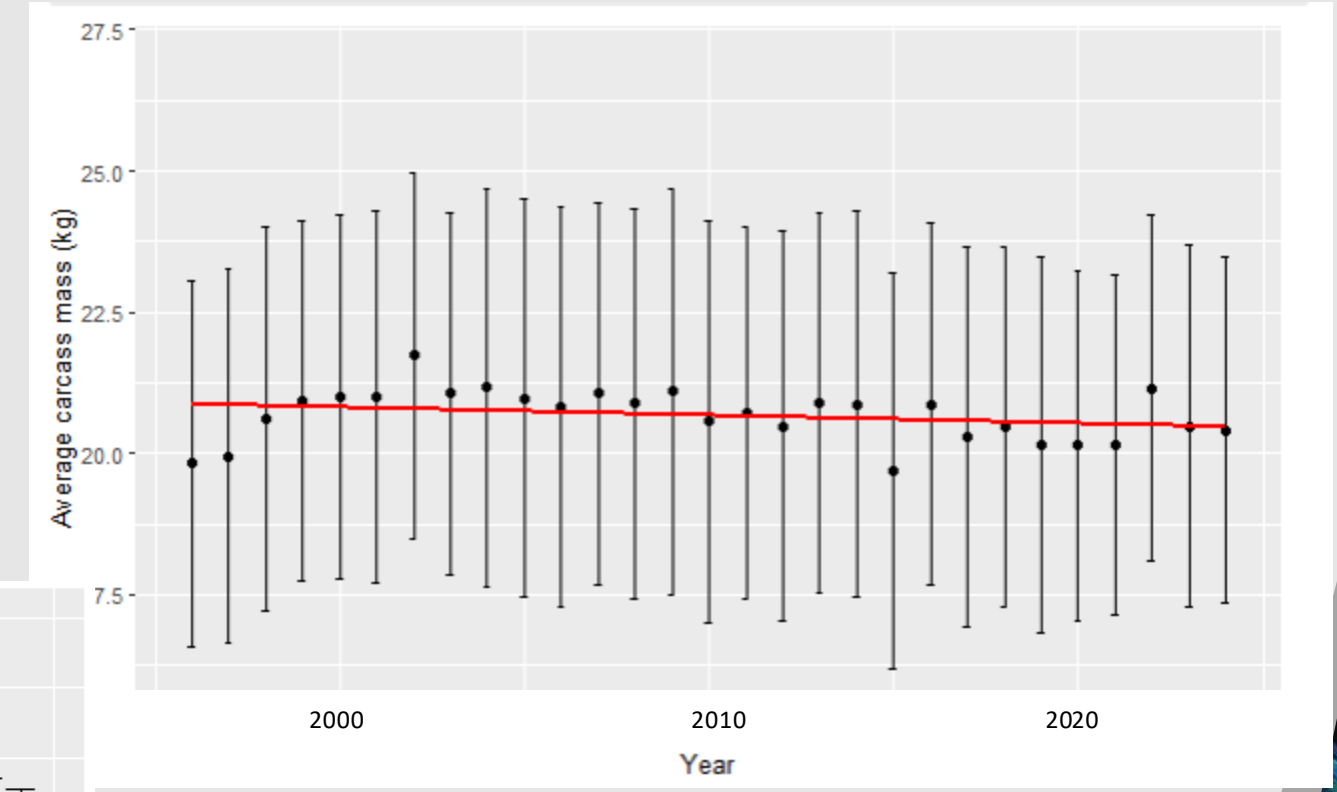
PREVIOUS WINTER

Number of days with Ice crust probability

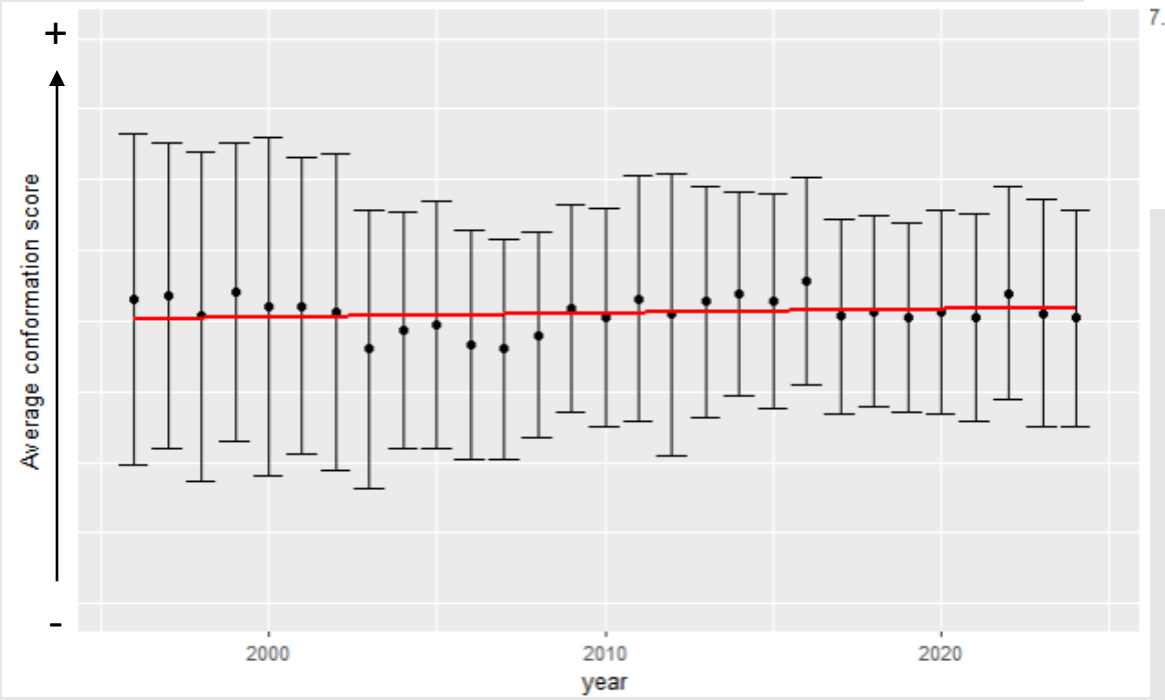
Forestry -> Clearcuts density

Response variables:

Carcass mass

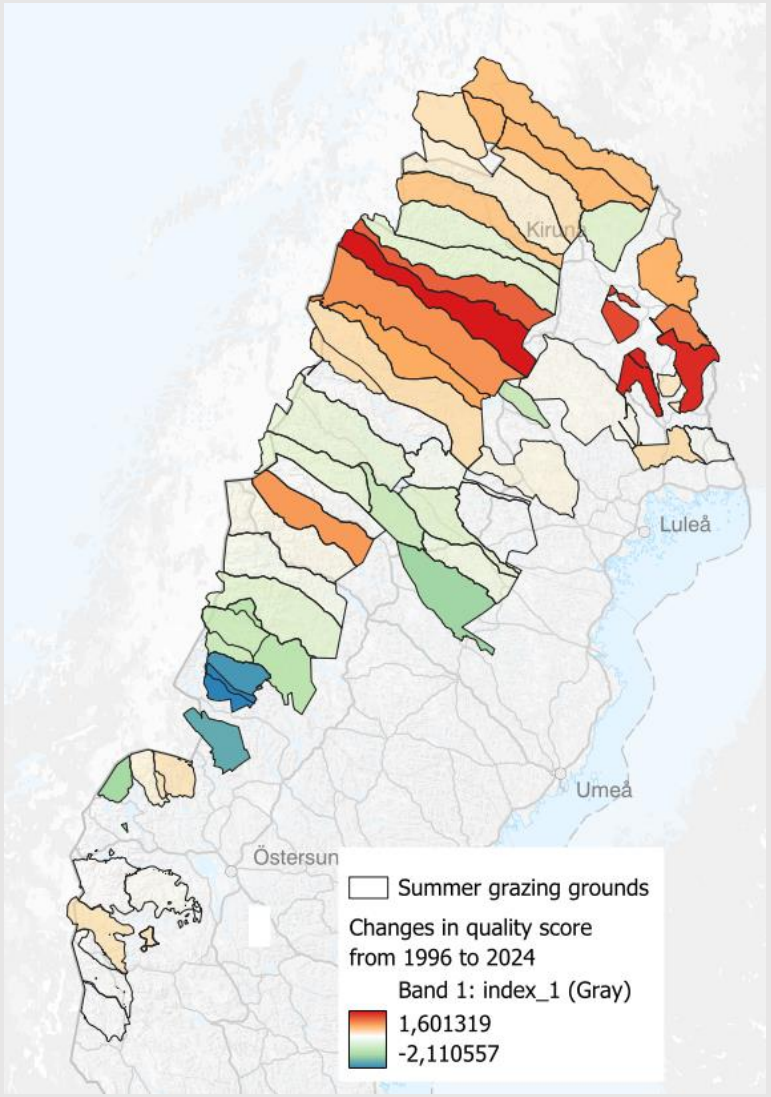


Conformation score

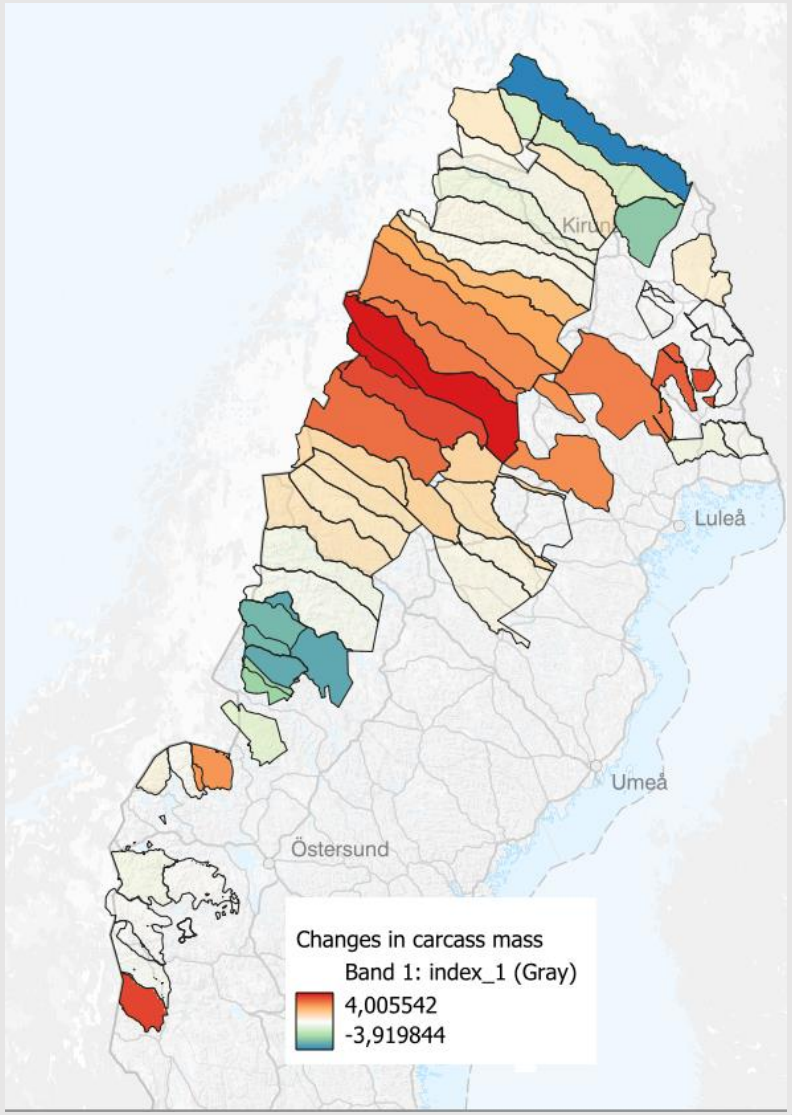


Response variables: Overall changes from 1996 to 2024

Conformation score

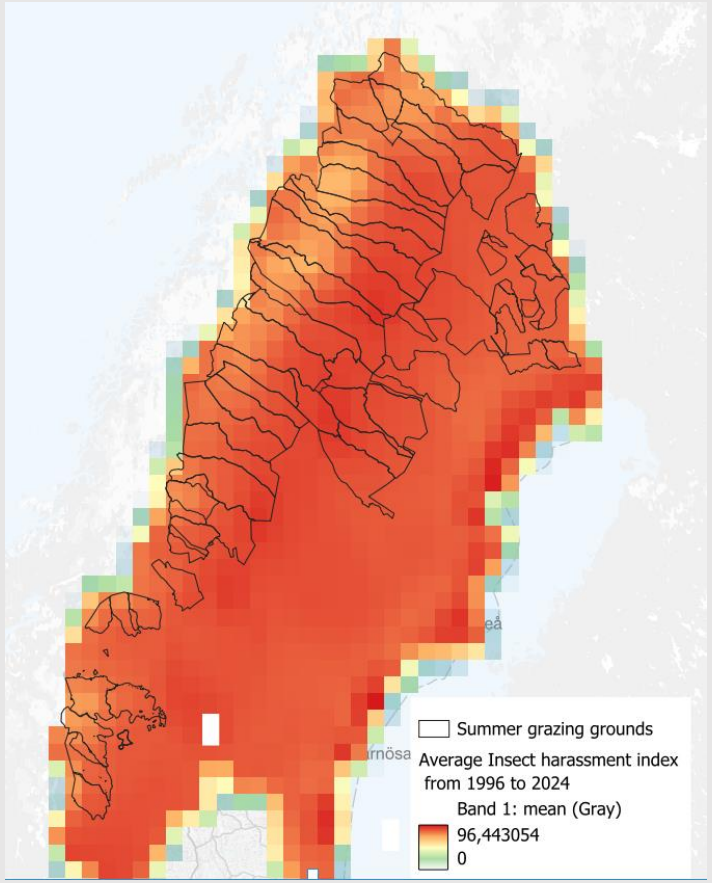


Carcass mass

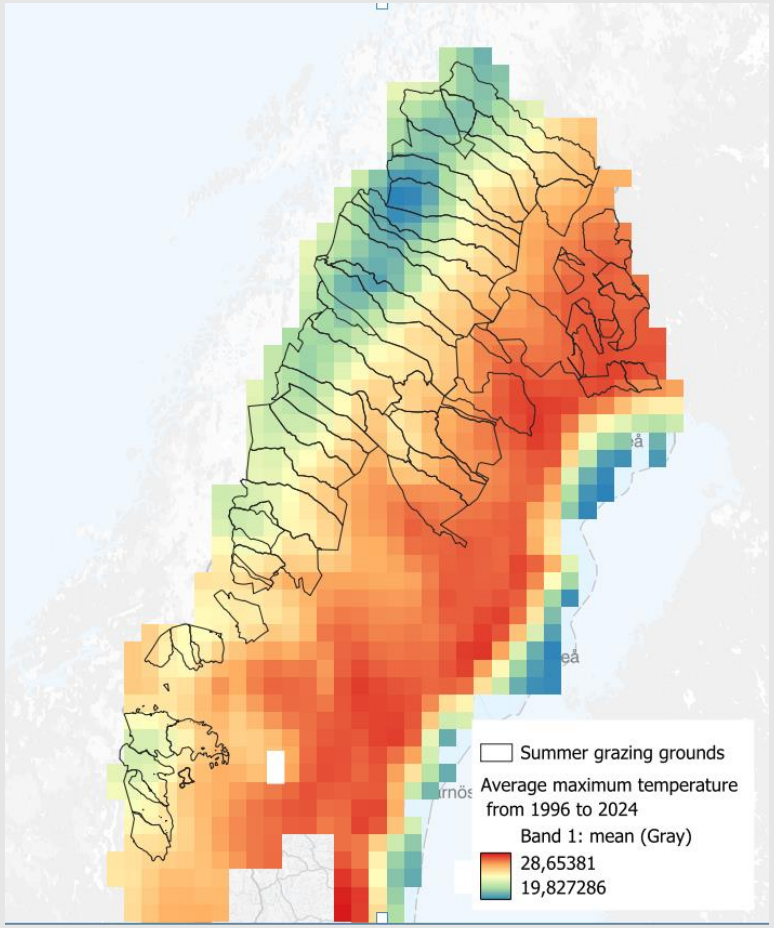


Environmental variables:

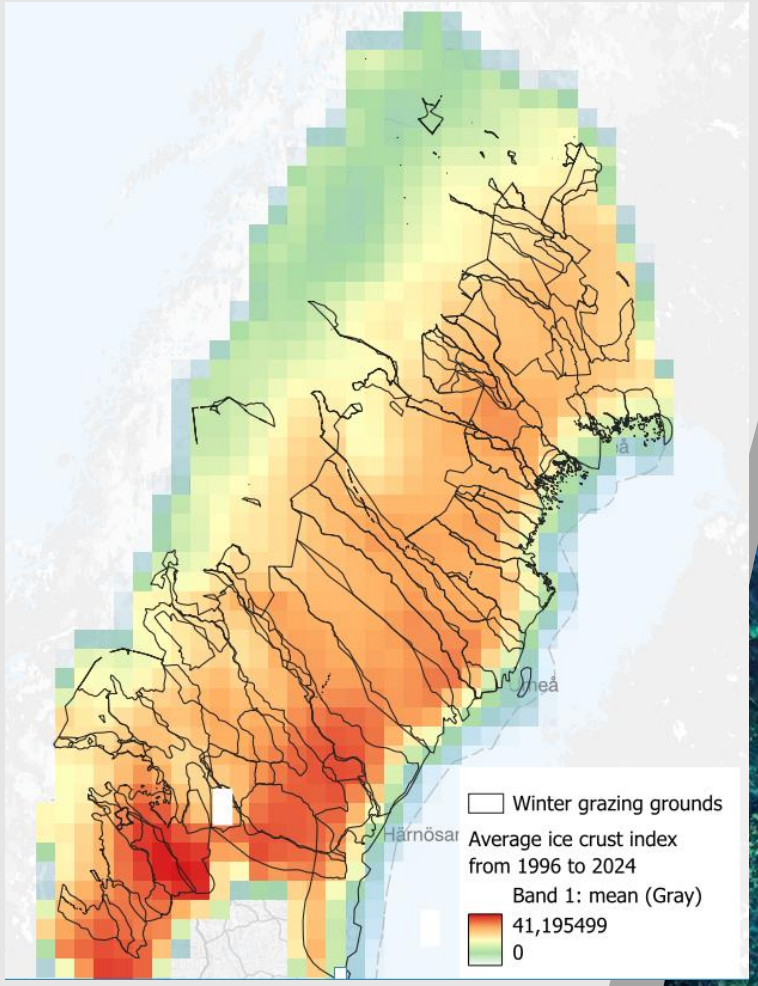
Average insect activity from 1996 to 2024



Average maximum temperature from 1996 to 2024

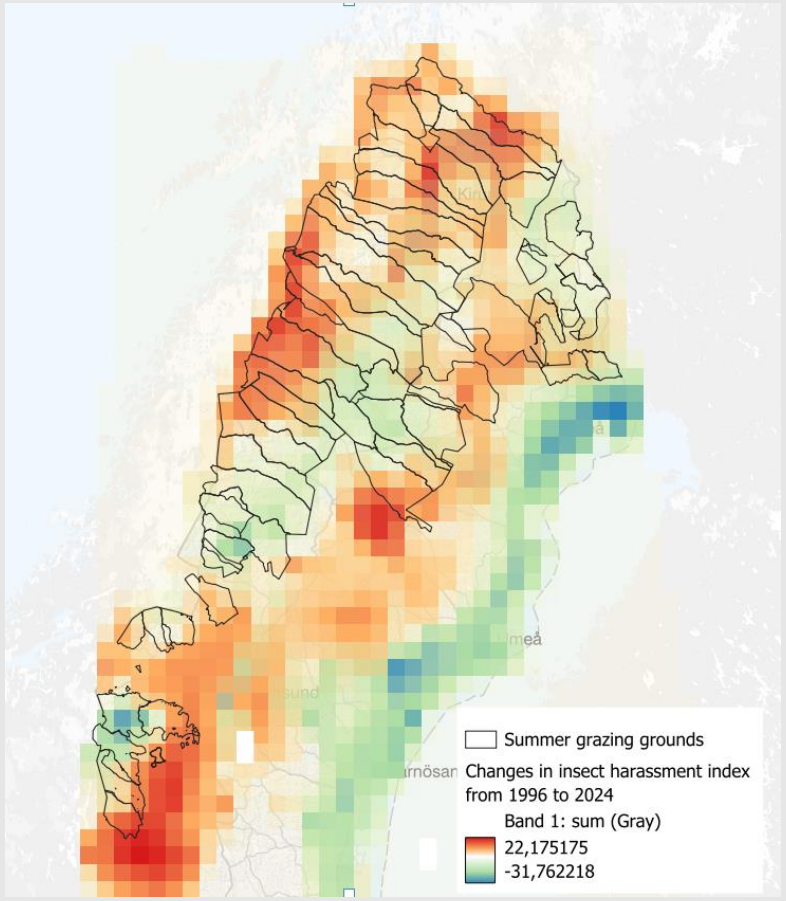


Average ice crust probability from 1996 to 2024

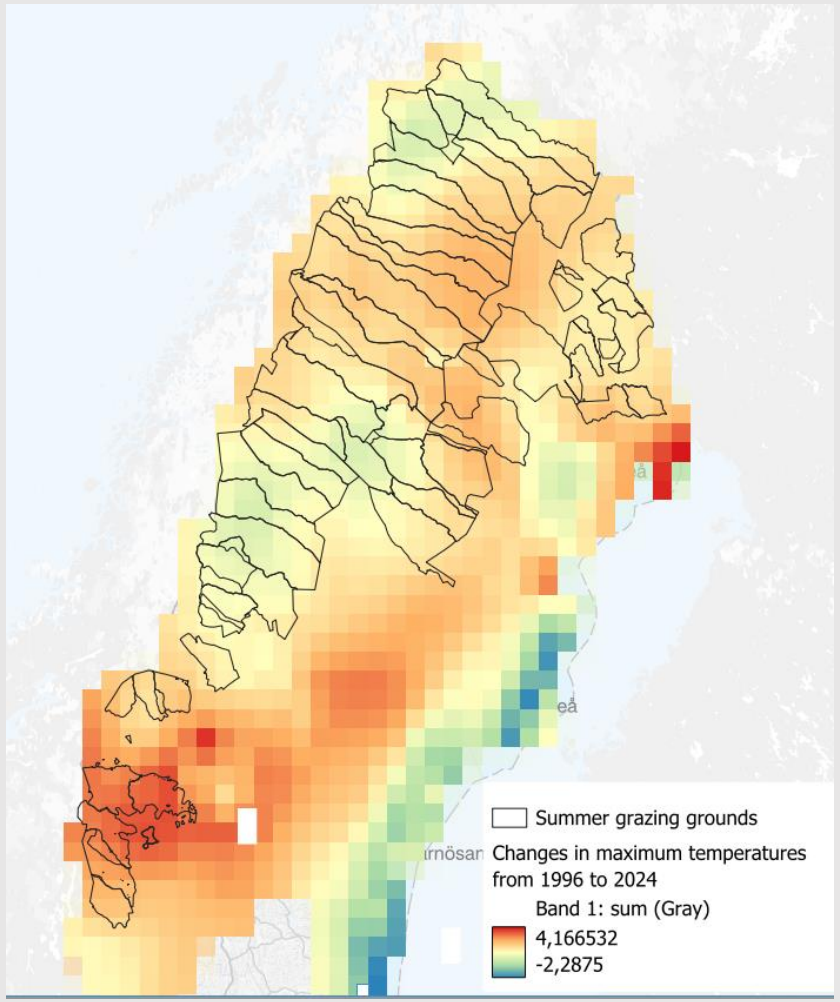


Environmental variables:

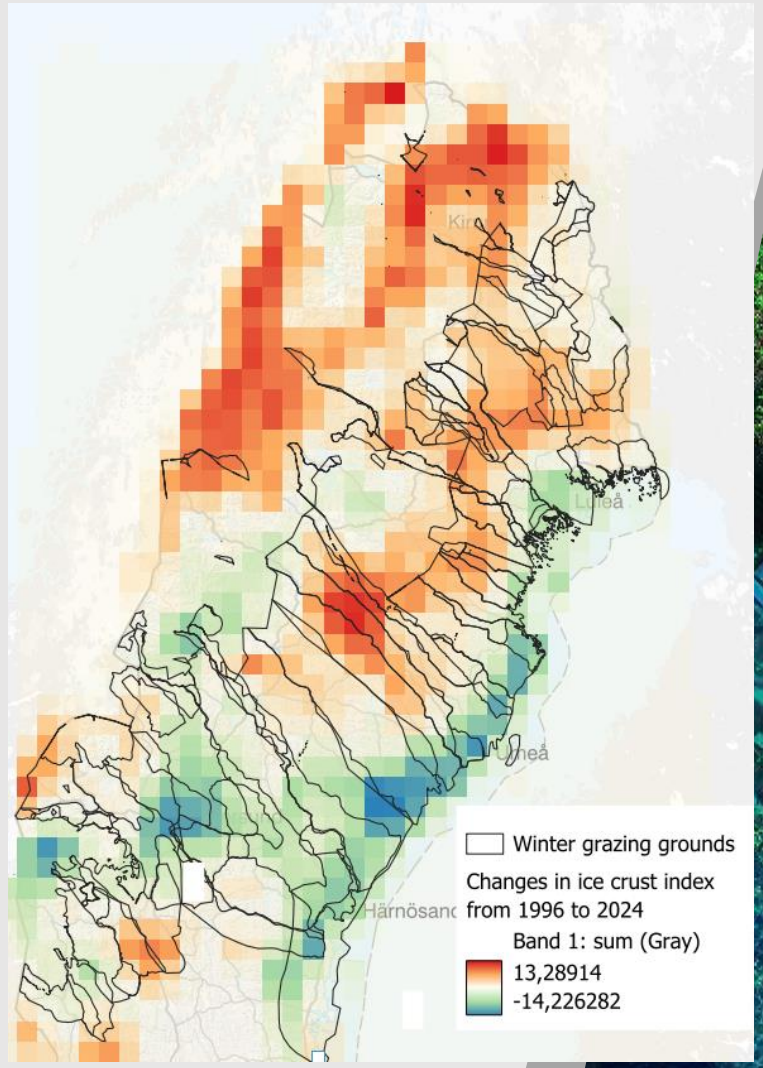
Overall changes in insect activity from 1996 to 2024



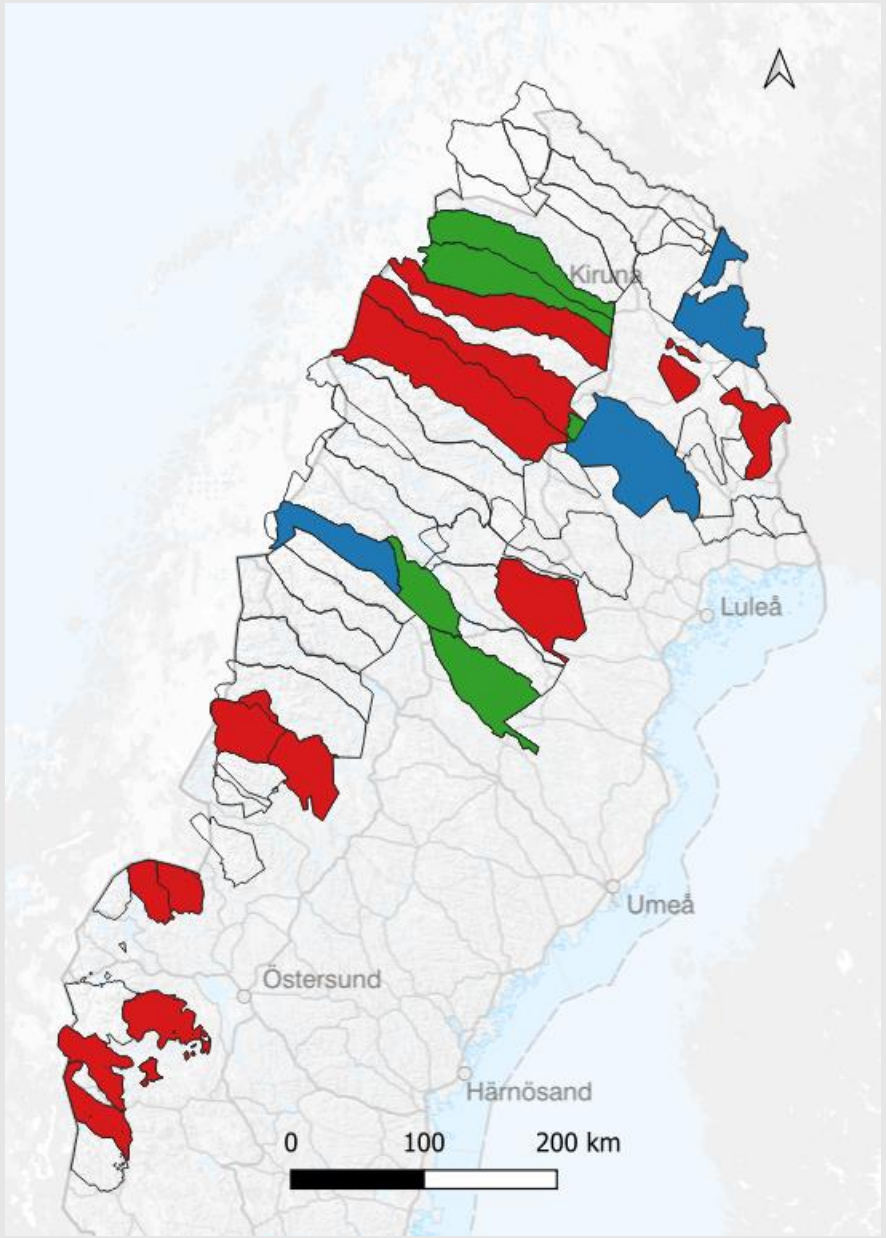
Overall changes in maximum temperature from 1996 to 2024



Overall changes in ice crust probability from 1996 to 2024



Infrastructures:



Communities with at least one mine
Communities with wind turbines within 2.5 km
Communities with wind turbines and mines
Summer area

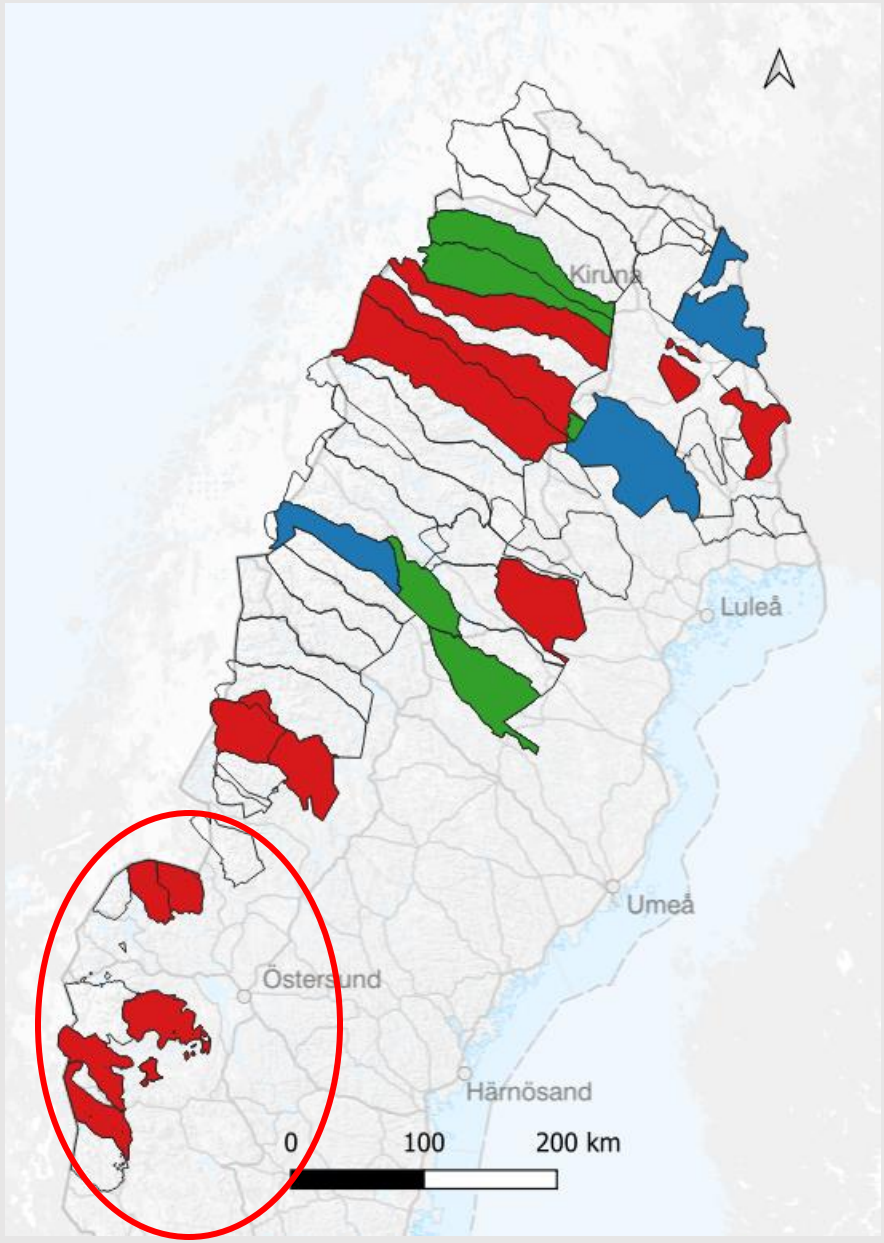
Number of communities with active wind turbines in the summer area

	<2005	2005-2015	2016-2024
Concession	0	1	2
Forest	0	2	2
Mountain	8	12	13

Number of communities with active mines in the summer area

	<2005	2005-2015	2016-2024
Concession	0	1	1
Forest	3	3	3
Mountain	2	2	2

Results:



Carcass mass

Variable	Effect
Insect Activity	(+)
Ice crust probability	+

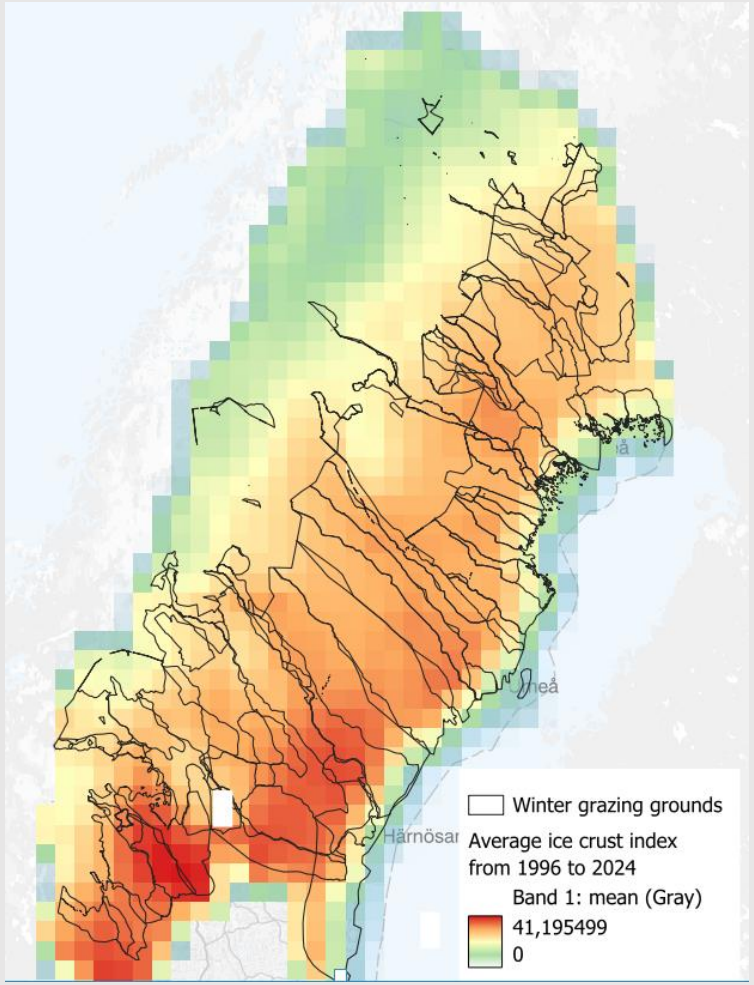
Conformation score

Variable	Effect
Forestry	(-)

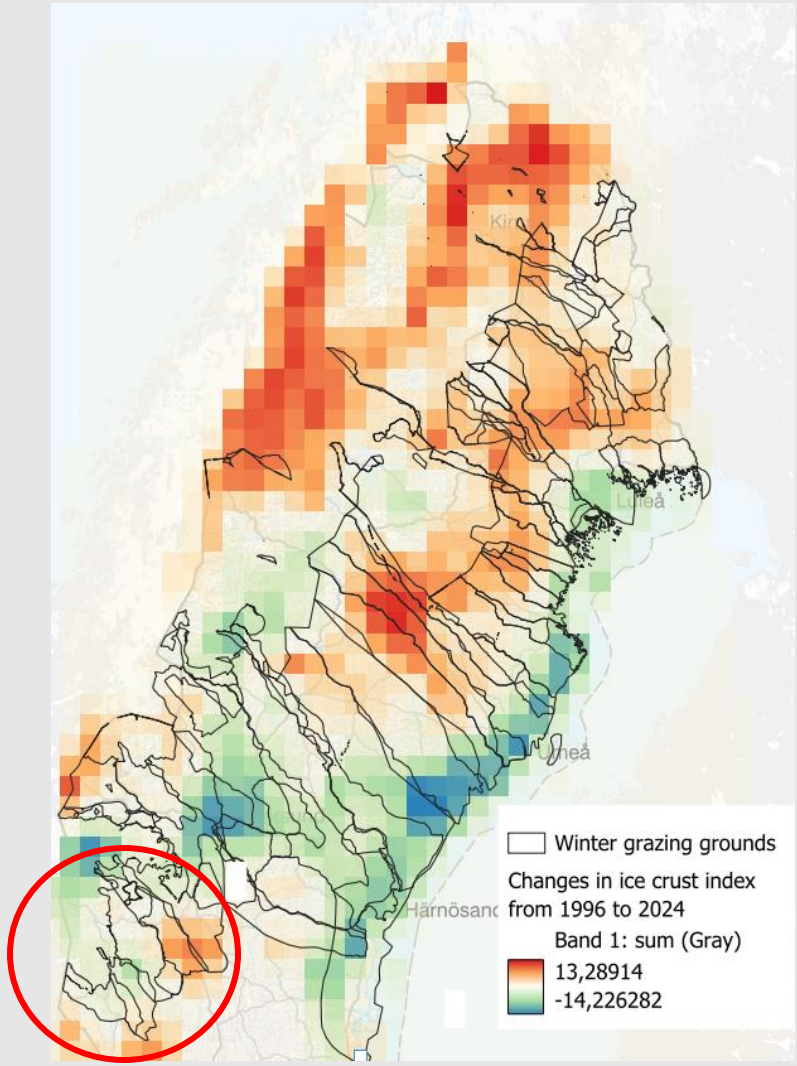
Geographical location:

No strong changes in ice crust probability

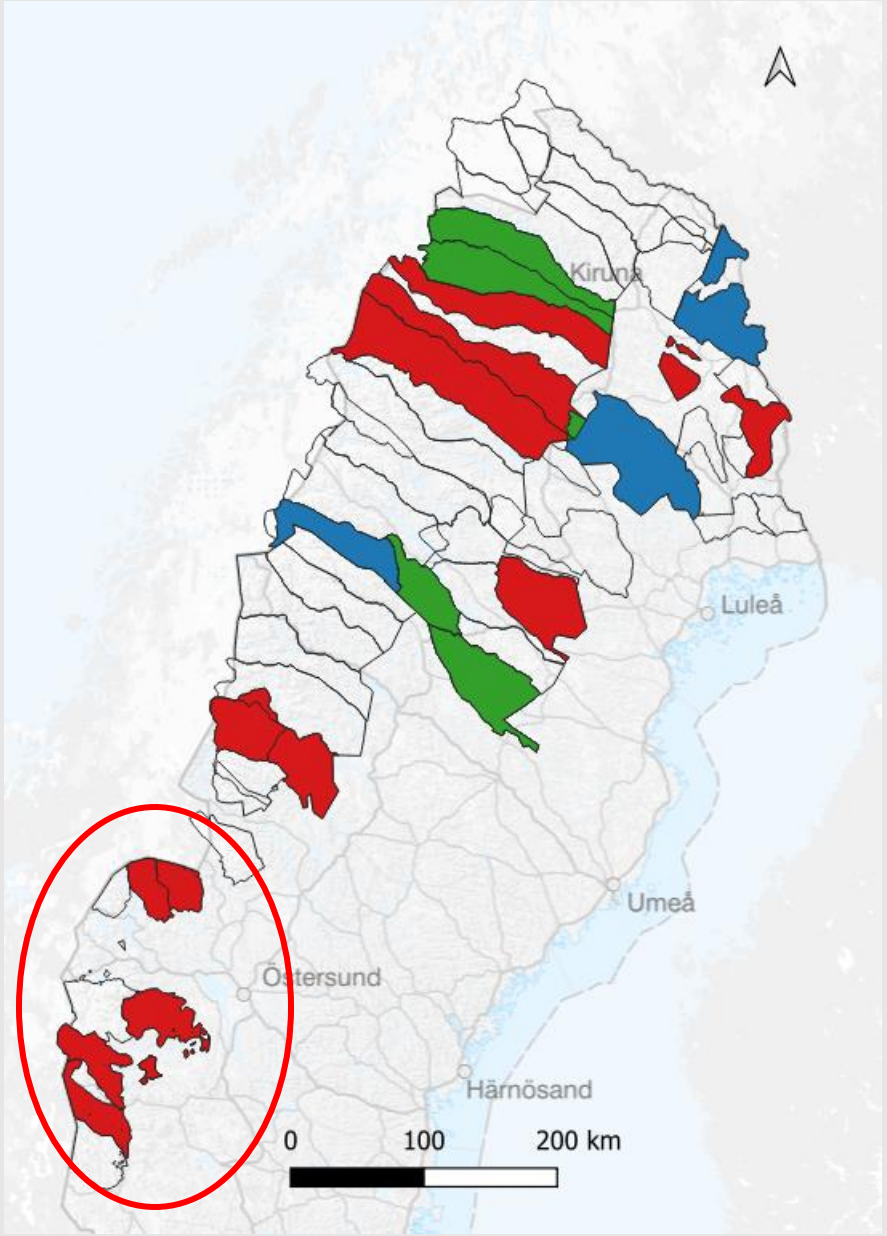
Average ice crust probability from 1996 to 2024



Overall changes in ice crust probability from 1996 to 2024



Results:



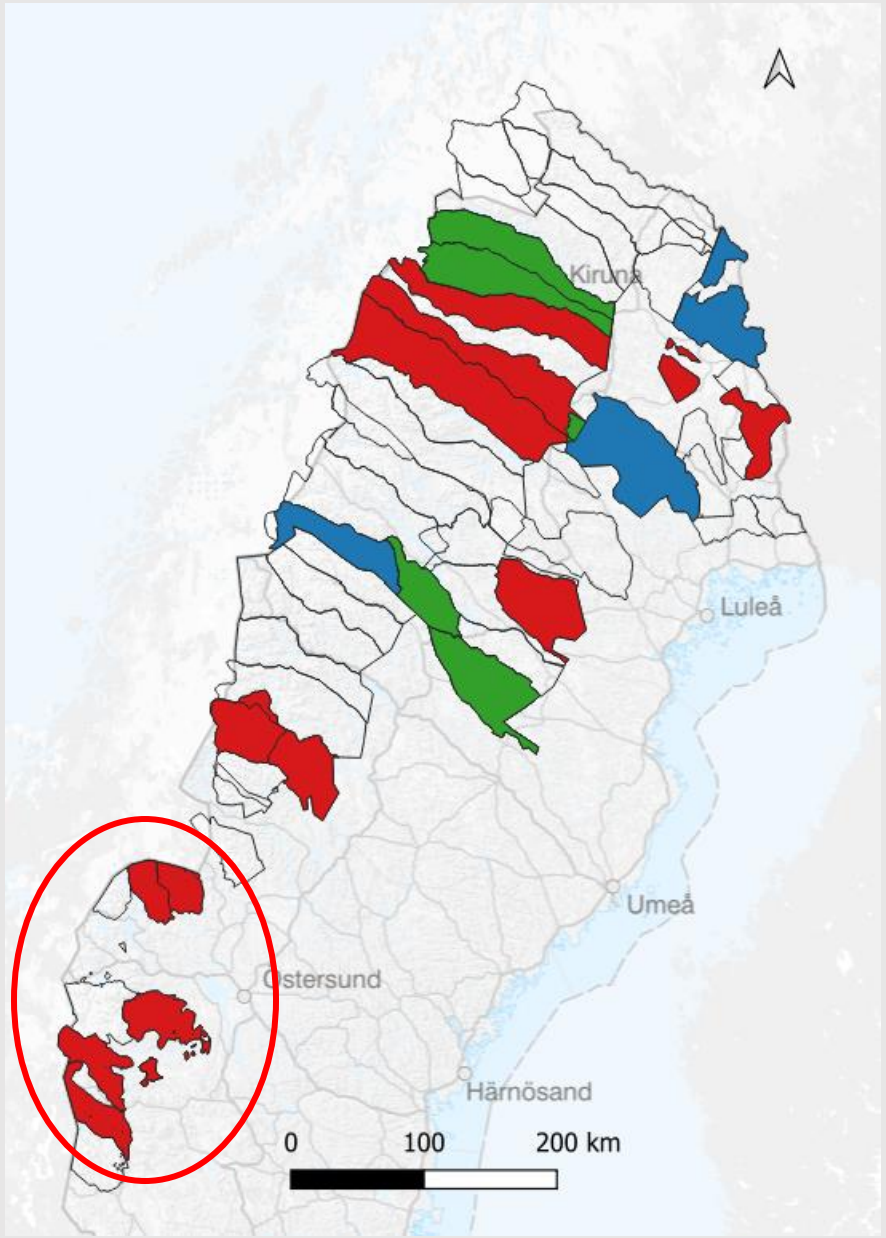
Carcass mass

Variable	Effect
Insect activity	-
Maximum temperature	(-)

Conformation score

Variable	Effect
No significant effects	

Results:



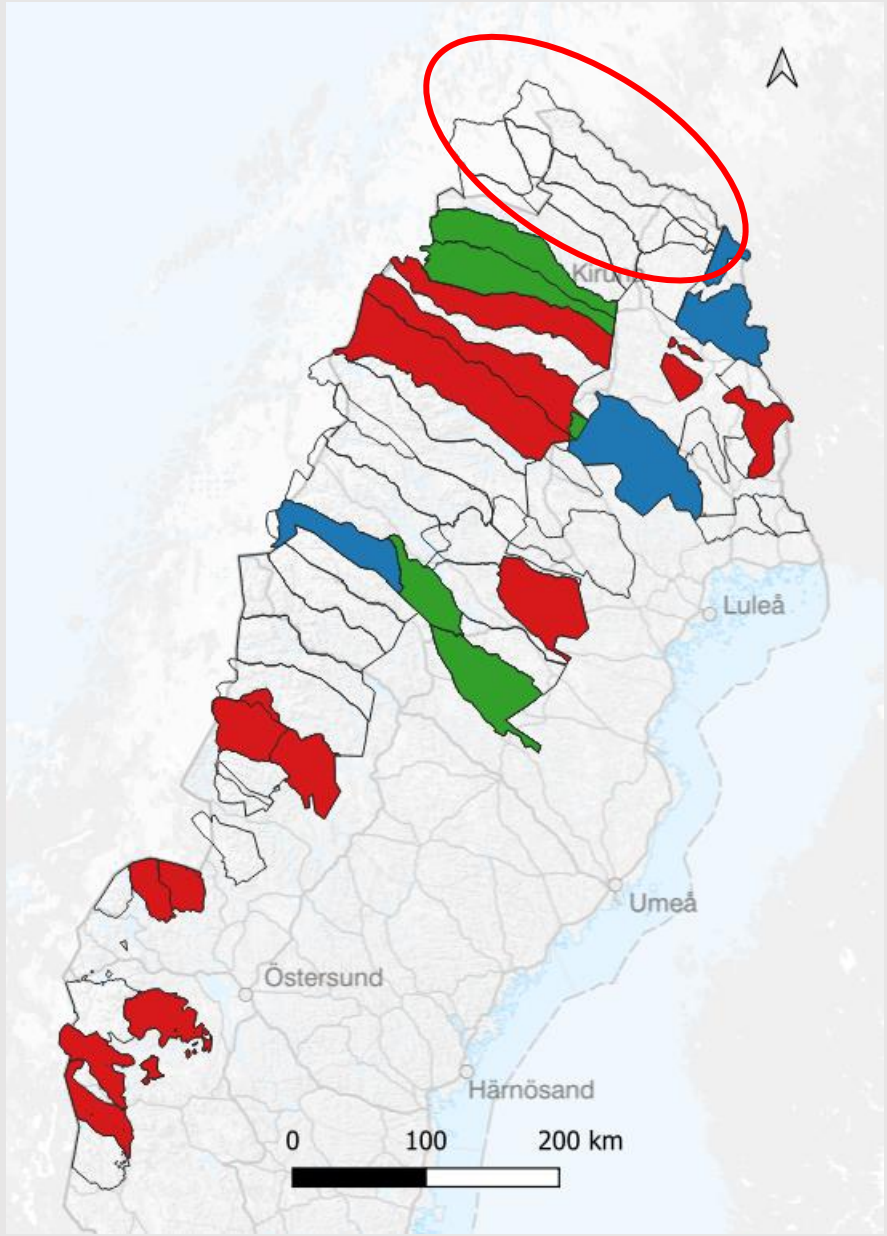
Carcass mass

Variable	Effect
Wind turbine density	-
Maximum temperature	(-)

Conformation score

Variable	Effect
Wind turbine density	(+)
Maximum temperature	(-)

Results:



Carcass mass

Variable	Effect
Herd density	(-)

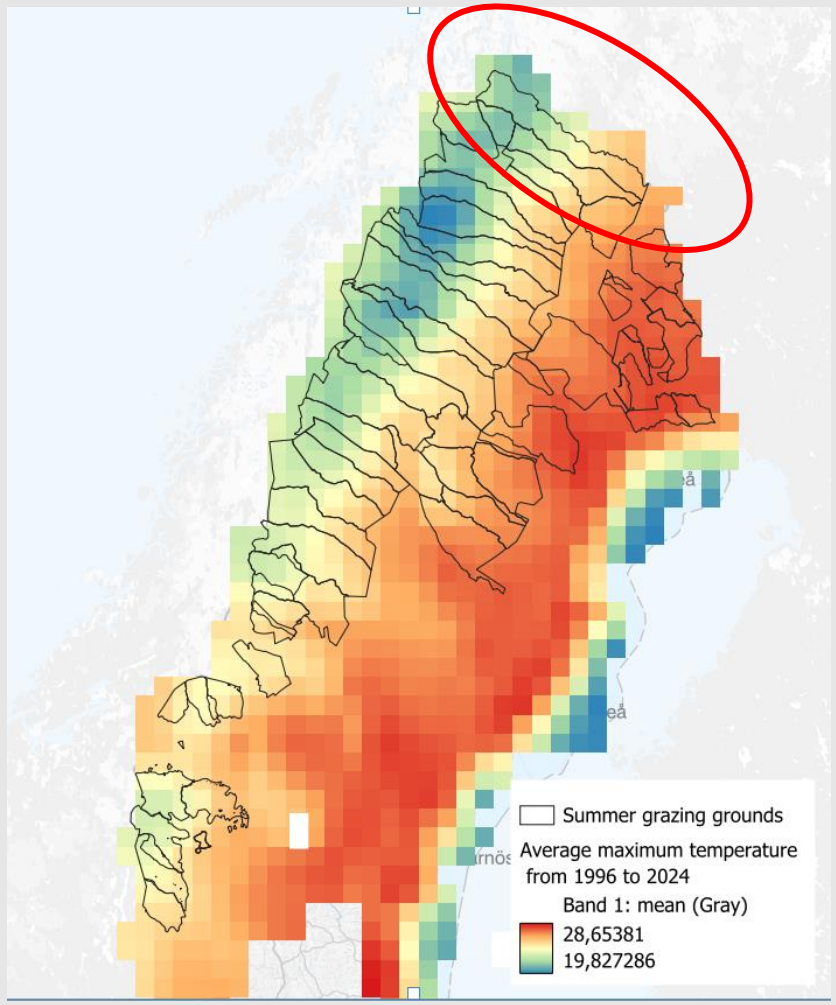
Conformation score

Variable	Effect
Herd density	(-)
Max temperature	(+)

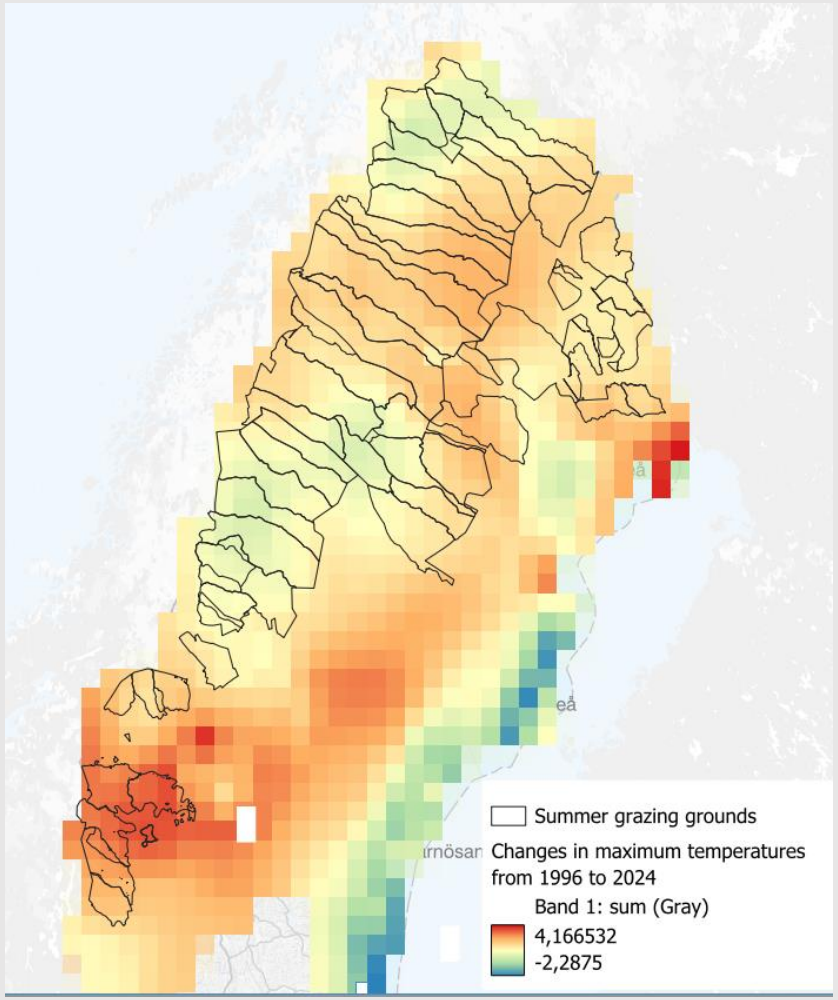
Geographical location:

The temperature is close to 20 degrees

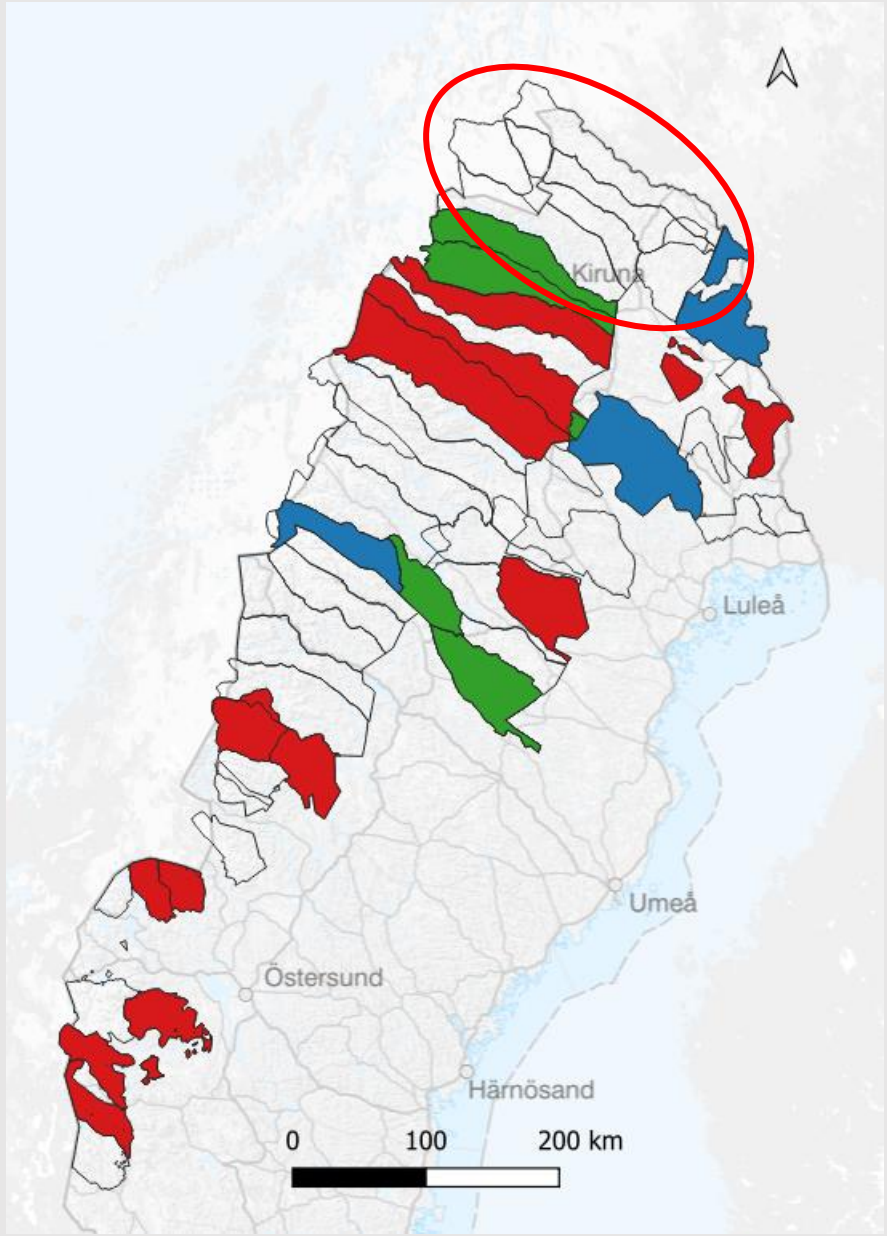
Average maximum temperature from 1996 to 2024



Overall changes in maximum temperature from 1996 to 2024



Results:



Carcass mass

Variable	Effect
Herd density	(+)

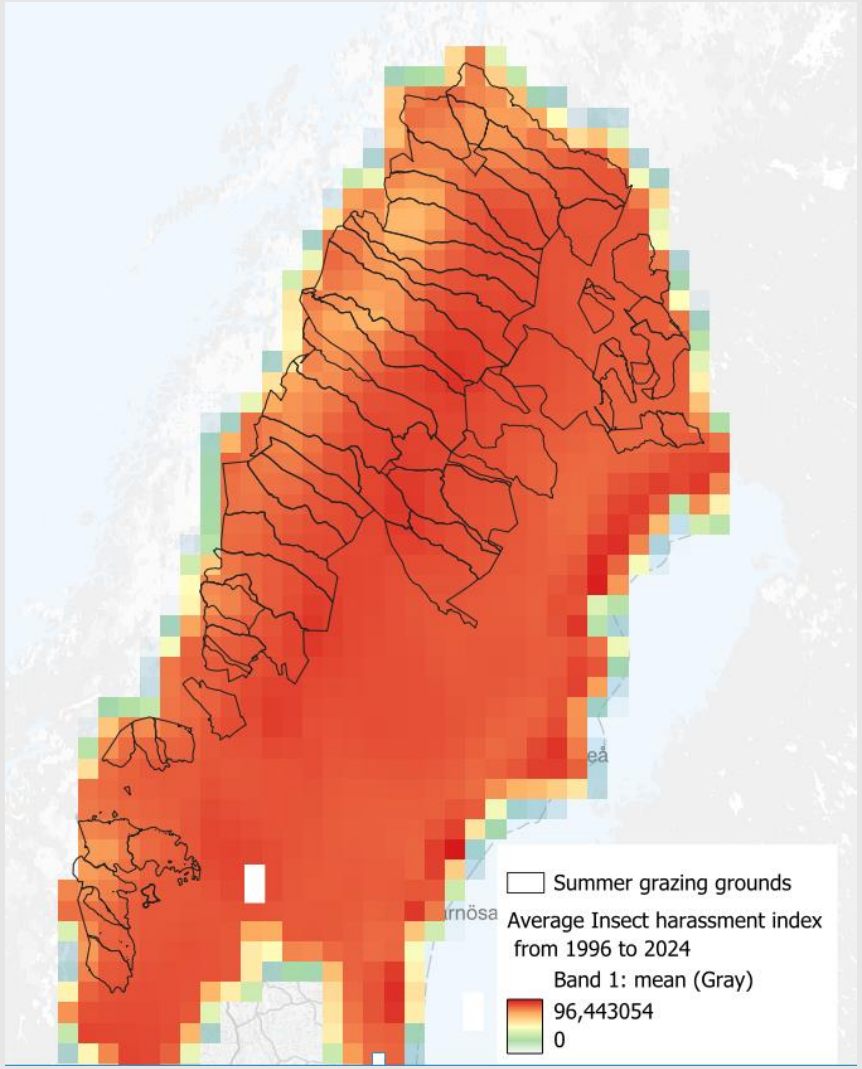
Conformation score

Variable	Effect
Herd density	+
Insect activity	(+)

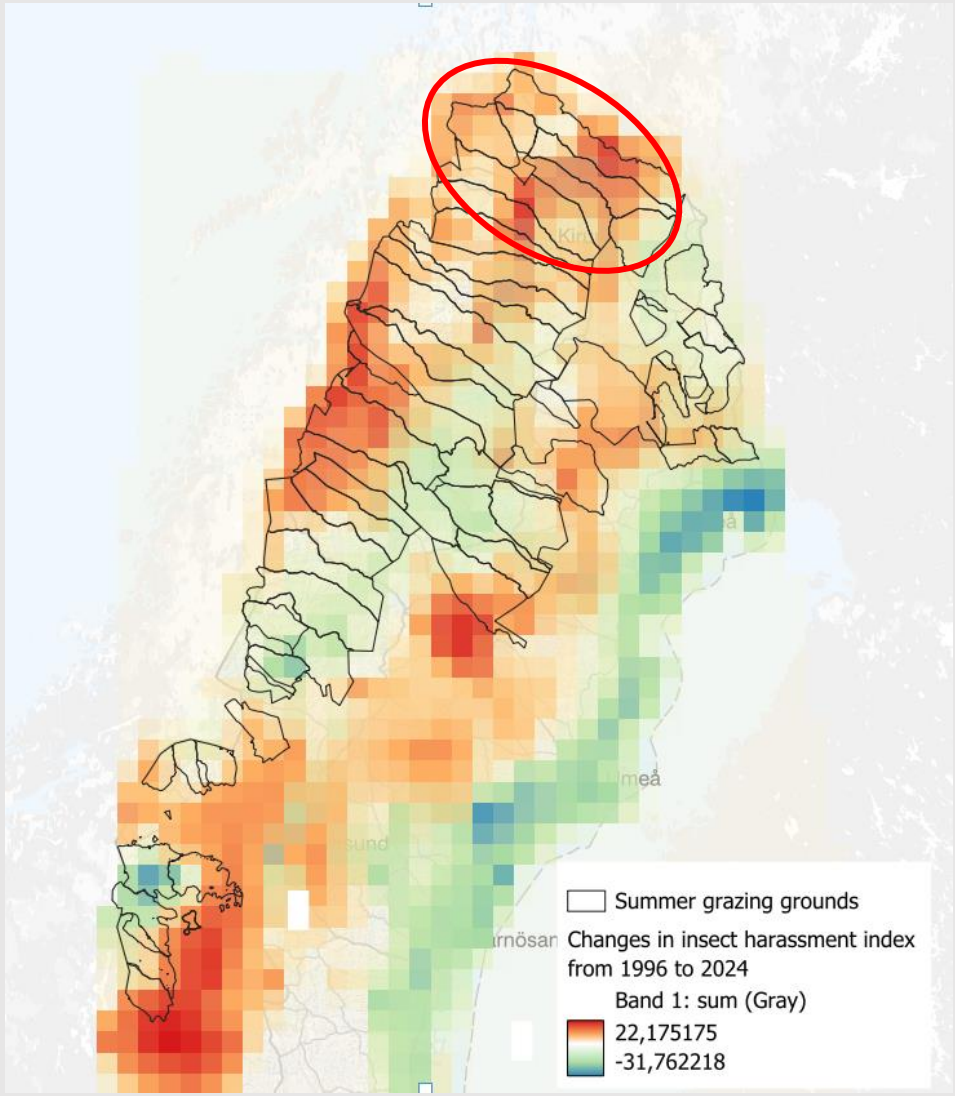
Geographical location:

No strong changes in insect activity

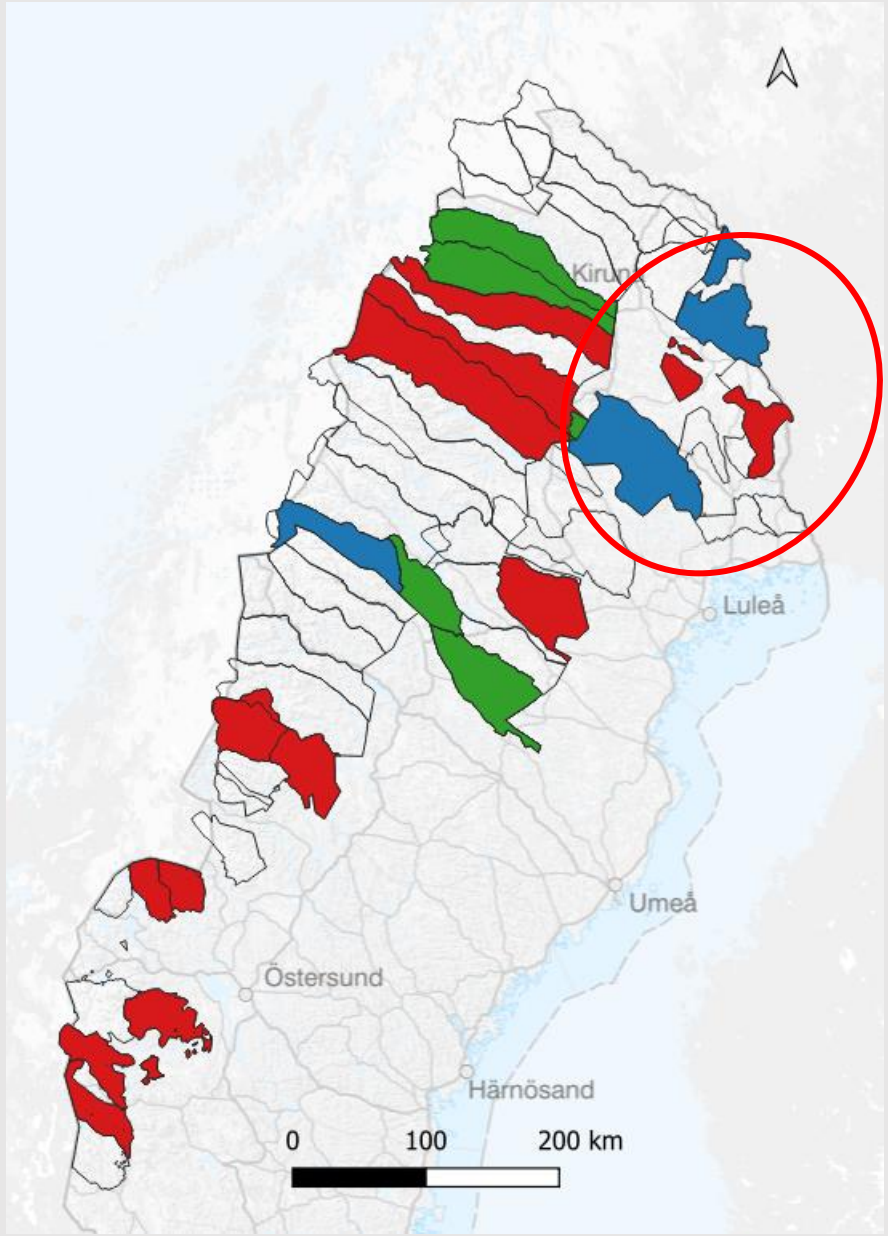
Average insect activity from 1996 to 2024



Overall changes in insect activity from 1996 to 2024



Results:



Carcass mass

Variable	Effect
Mine activity	(-)
Herd density	(-)
Forestry	(+)

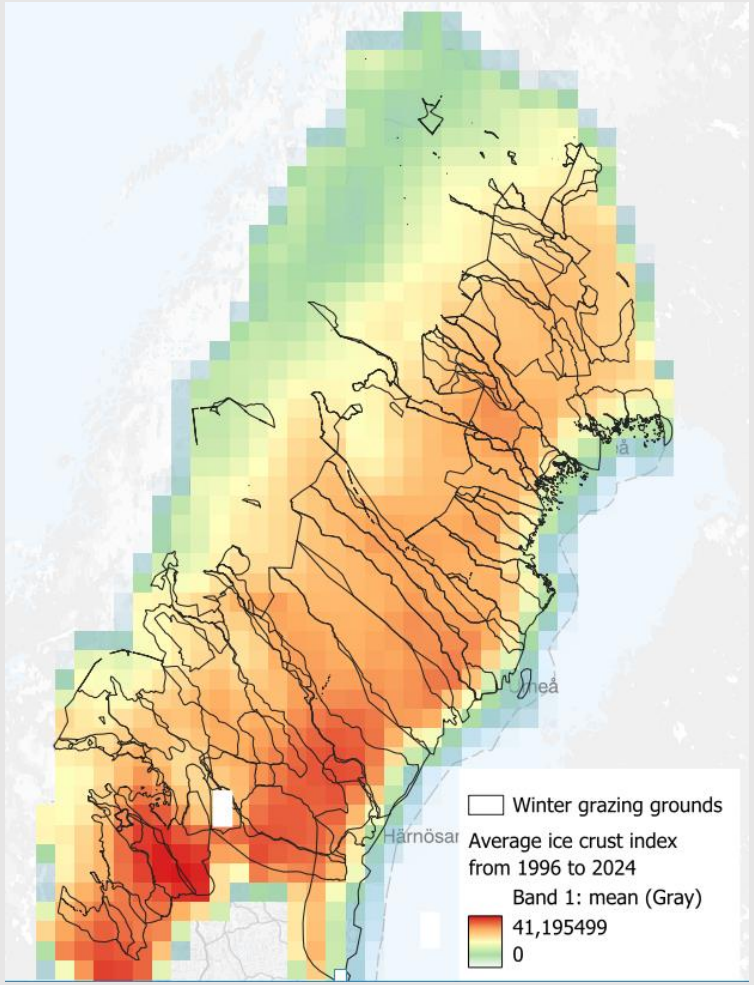
Conformation score

Variable	Effect
Ice crust	(+)

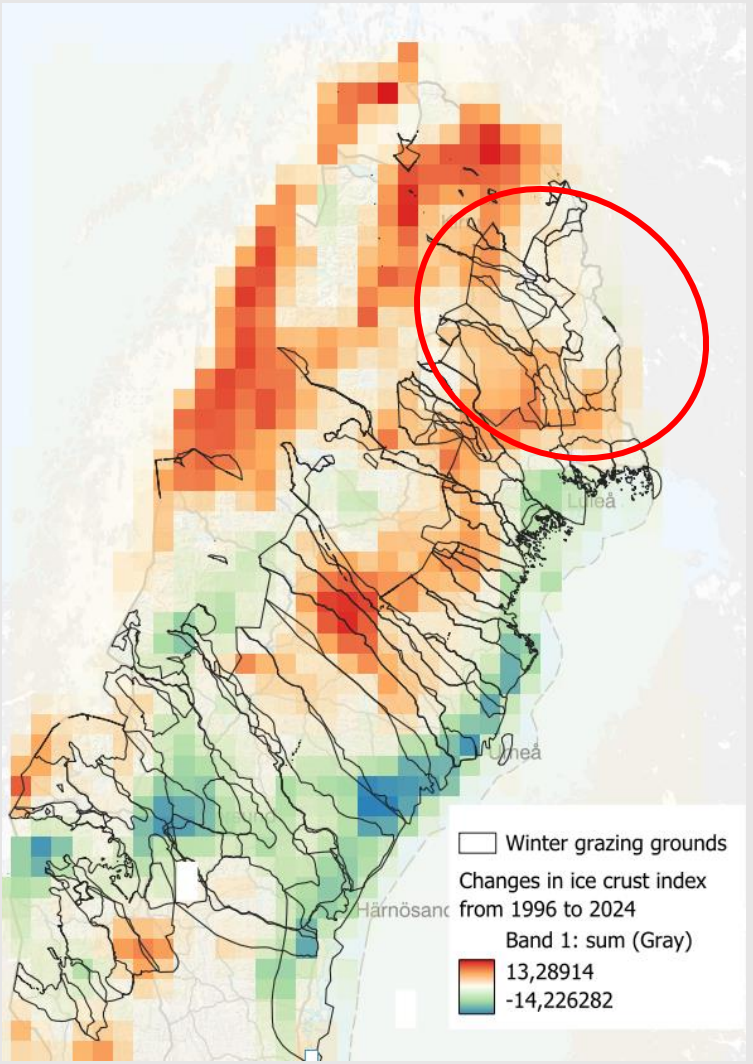
Geographical location:

No strong changes in ice crust probability over time

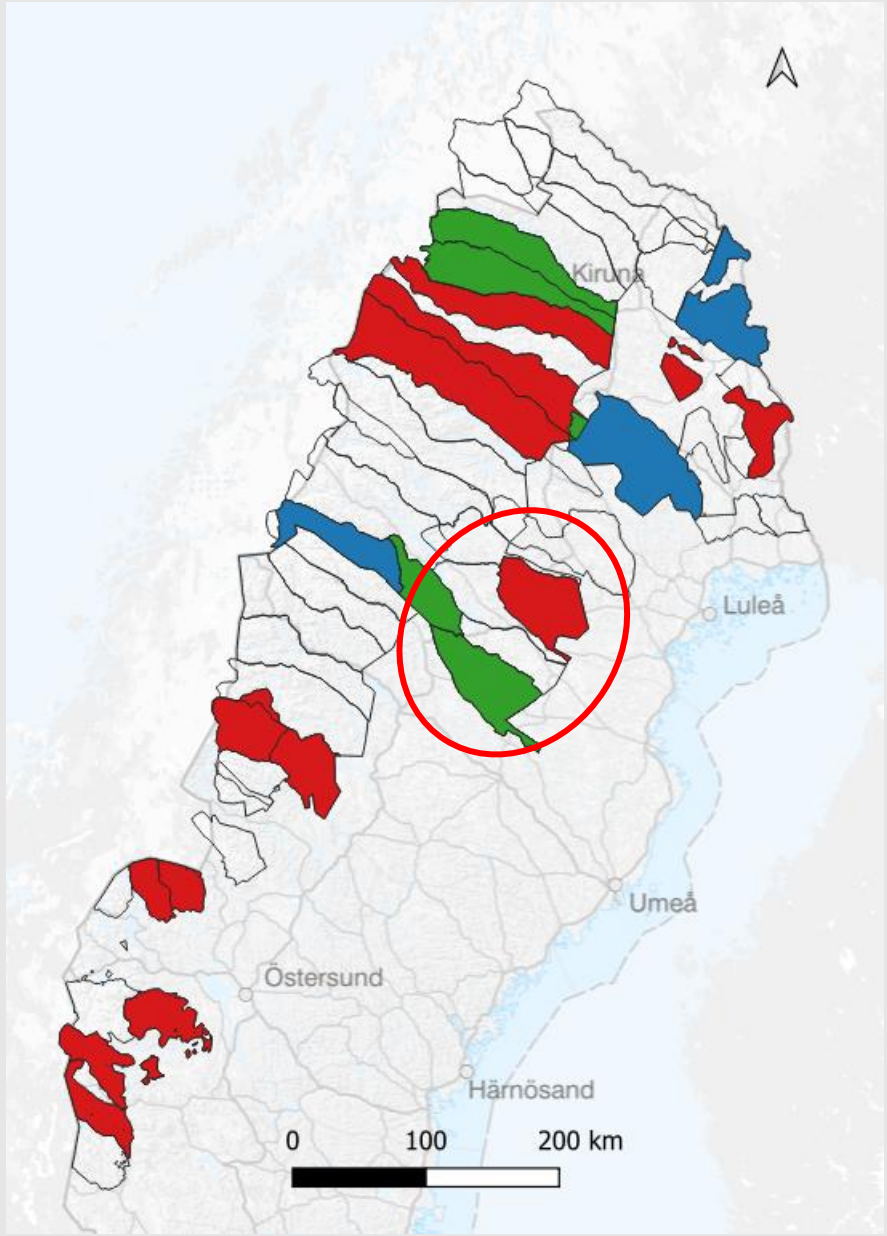
Average ice crust probability from 1996 to 2024



Overall changes in ice crust probability from 1996 to 2024



Results:



Carcass mass

Variable	Effect
Wind turbine density	0
Herd density	+

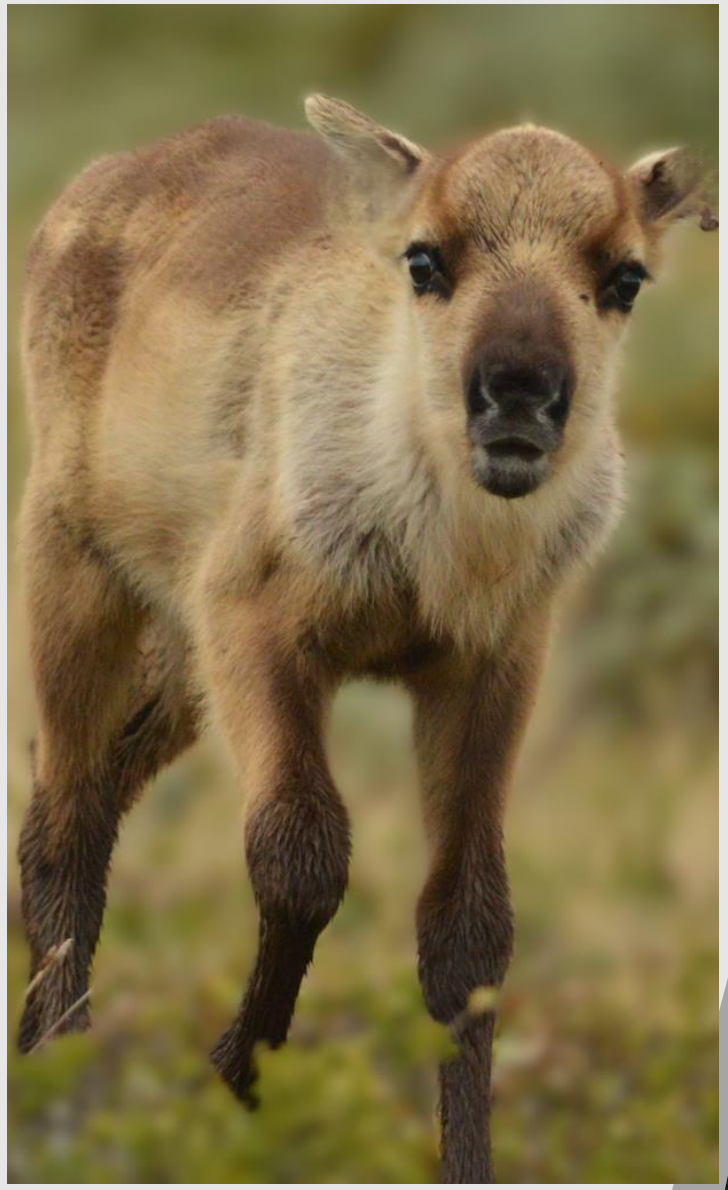
Conformation score

Variable	Effect
Wind turbine density	0
Herd density	+
Forestry	+

Conclusion

- There are variations north/south
- It might also depend on the type of reindeer herding community
- It is important to not only consider carcass mass in the analysis as it might reflect the reindeer herders selection

Next step: Do the same for all reindeer communities and see patterns




Thank you !
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Questions, suggestions?

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