



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 869471

CHARTER is a research project that is funded by the European Union Horizon 2020 Programme. CHARTER grew out of a desire to better understand the processes that have been driving rapid climate and land use changes in the Arctic.

The name comes from the project title: **Drivers and Feedbacks of Changes in Arctic Terrestrial Biodiversity**. The project started in August 2020 and will run for 4 years. CHARTER involves 21 research institutions across 9 countries (see the full list *here*). CHARTER is coordinated by the Arctic Centre, University of Lapland and the project leader is Research Professor Bruce Forbes.

CHARTER works mainly in northern Europe and Northwest Russia. Changes in climate and land use affect Arctic biodiversity, as well as snow cover, sea ice and permafrost. Changes in these, in turn, have other consequences and feedbacks to Arctic regional climate.

These changes are not merely of academic interest. They are especially felt by those working on the land, such as reindeer herders. This is perhaps best demonstrated by the 2013/4 severe icing event on the world's most productive reindeer herding region of Yamal, Northwest Russia, where it is estimated that Nenets reindeer herders lost at least 61,000 reindeer, perhaps as many as one fifth of all reindeer in that region. Some herding families lost all their reindeer and have reverted to fishing in order to remain in the tundra while they attempt to rebuild their herds before another such catastrophe may strike. Poor winter grazing conditions in winter 2019/20 led to the death of as many as 15,000 reindeer in Finland, which had large financial consequences for herders along with a substantially increased workload.



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Reindeer are obviously an important species for herders and cultures that depend on them. Reindeer are also a key species in the Arctic; they have strong effect on the functioning of the ecosystems. By managing the grazing, reindeer herding as a livelihood has the potential to affect even permafrost region temperatures and, through effects of grazing on vegetation, regional climate.

CHARTER wants to co-develop tools with Arctic communities to better adapt to climatic and biodiversity changes. The project will do this for example through joint data collection, analysis and modeling. CHARTER will look backwards to build a short, medium and long range look at biodiversity, meteorological and snow and ice data. This will build out a picture of change throughout the Holocene period (the last 11,000 years). CHARTER will take a more detailed look at these same changes and drivers over the last 40 years.

CHARTER will also co-produce knowledge with local herders and other practitioners and co-develop optional future pathways for the region. The aim is to develop climate modelling tools so that they better consider also the climate impacts of local livelihoods and related land cover changes. When climate scenarios up to 2050 take into account also relevant Arctic livelihoods, the strategies for adaptation are easier to co-develop. The ambition is that Arctic decision making would better consider the actions by local communities and livelihoods. This would support gearing Arctic land management towards climate change mitigation and sustainable development.



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CHARTER is made up of 7 'Work Packages', led by researchers from across Europe. The project is supported by an advisory group made up of selected experts representing reindeer herders, administrators, relevant ministries and science communication professionals.

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