We will perform a PhD course in the summer of 2019 with the main elements during an excursion to Svalbard.

The course will be divided in four parts.

1. An introduction will be given in the form of lectures before the course by the course leaders before the excursion on: *Historical aspects of climate change and research at Svalbard*, *Practical evaluation of climate change at the landscape level, including an exercise in generating orthophotos and digital elevation models using drones and threats to the arctic ecosystems: Tourism before, now and tomorrow* In a seminar after the introductory lectures students will develop an own project which they will carry out on Svalbard in small groups (see below) in discussion with the course leaders. All introductory lectures can be attended via Skype as well.

2. During field work in to Svalbard, the course leaders will demonstrate the effects of global change in a high Arctic permafrost environment and how they are evaluated during a number of excursions from Longyearbyen and from the Isfjord radio station, where our department has a research history since 1972. These will include: *Glacial retreat* -- at Trygghamna we will show arctic primary succession on land area which have been cleared for different durations since the local glacial retreat starting at 1936. *Vulnerability of the landscape*: In a number of day excursions we will demonstrate how both climate change but also tourism has changed the landscape. This will build on the long term research of Jonas Åkerman and will include changes in biodiversity (expansions of species ranges), changes in soil formation (depressions due to tractor use), changes in erosion rates changes in the active layer depth, cultural changes: due to the replacement of the mining based economy to a tourism based economy

3. Within a small scale project the participants will record effects of global change in the arctic and evaluate them in small groups (2-3). Here we offer a wide range of opportunities: Evaluating effects of tractor use by evaluating highly resolved 3d models taken in the area using a drone. Evaluating effects on biodiversity Evaluating effects on cultural changes using interviews. Evaluating effects on erosion rates. Evaluating effects on hydrology. Evaluating evidence of tourism impact While we offer this range of projects we are open to other ideas that will fit to the student’s research theme. We are open to all practically feasible small scale projects. The projects have to be developed and the project idea has to be presented in Lund to assure their feasibility in the field.

4. After the trip, the students will continue working on their recorded data and will present their work in an open institute seminar.

The course is limited to 15 students and places will be given on a first come first serve basis, with priority given to CLIMBECCO PhD students and PhD students from the Department of Physical Geography and Ecosystem Science.

Costs: The course is free of charge (excursions etc.). The students have to cover their transport to Svalbard as well as the stay at the hotel at Longyearbyen and Isfjord Radiostation. While a flight ticket to Svalbard (return) costs ca 5000 SEK, the costs for the hotel are 22000 SEK, (13 nights all meals included). A proportion of the hotel costs need to be payed upfront to the hotel.

Last application date: 19.th of April. However, for practical reasons of booking flights and to assure your place please apply ASAP to veiko.lehsten@nateko.lu.se. All questions please contact also Veiko Lehsten.