

Simulating the vegetation of the Last Glacial Maximum with an Earth System Model

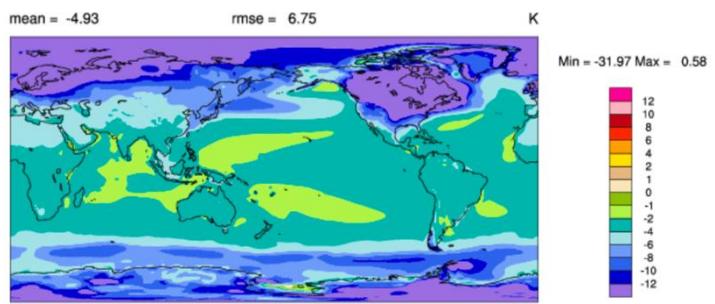
Summary

The Last Glacial Maximum was the most recent period during the Last Glacial Cycle that the ice sheets attained greatest extent. Global temperature and sea level were 5 K and 130 m lower than today, as large areas of North America and Eurasia were covered with ice.

In this project, you will simulate the vegetation during this period as a piece of a larger project simulating the climate and ice sheets of the LGM.

Research questions

How was the vegetation cover during the Last Glacial Maximum? How does this vegetation cover compare with the current vegetation map? How did the climate of the LGM shaped the vegetation distribution and viceversa?



Differences in near-surface temperature between the LGM and pre-industrial climates as simulated by CESM1

Method

You will use an Earth System Model with atmosphere, ocean, sea ice, land and ice sheet components, the Community Earth System Model version 2 (CESM2). You will design, perform and/or analyze simulations. These will be done in supercomputing facilities in USA and/or The Netherlands (surfSARA).

You will also use a vegetation model that uses climate conditions simulated by CESM2 as input. You will implement the output of this model in the land component of CESM2, and test and evaluate this implementation. You will also analyze the processes of vegetation-climate interaction during the LGM.

Background/skills & technical details

You have a background on atmospheric, ocean, fluid mechanics, mathematics, physics, informatics and/or earth science.

Strong programming skills are necessary. Previous knowledge of python, linux environments, and/or FORTRAN is a plus.

The model output format is netCDF.

Supervisor

Dr. Miren Vizcaino
M.Vizcaino@tudelft.nl
Room 2.24, CiTG
☎ 015-278516

Co-Supervisor

Dr. Michele Petrini
CiTG