The Max Planck Institute for Biogeochemistry (MPI-BGC) in Jena is dedicated to interdisciplinary fundamental research in the field of Earth system sciences with a focus on climate and ecosystems. The internationally renowned institute, which currently employs around 230 people, will celebrate its 25th anniversary in 2022. Jena is known for high-tech industry, internationally renowned research institutions and a modern university, but it also has a beautiful natural setting in the green Saale valley with steep limestone slopes. The city of Jena has an active student scene and a diverse cultural life. For the department of Biogeochemical Signals we are looking for a

Postdoctoral scientist (m/f/d) on atmospheric inverse modeling to constrain high-latitude CH$_4$ budgets
(full time, 3 years limited)

Background and position description:
High latitude ecosystems play a pivotal role in the global carbon cycle. Future climate change threatens to destabilize enormous carbon reservoirs stored currently in northern permafrost soils, with the potential to trigger strong feedback processes between climate and carbon cycle that further amplify climate change. Still, large knowledge gaps remain regarding environmental conditions, and mechanisms, that control the carbon budgets of high latitude ecosystems. This is particularly the case for methane emissions, which contribute an important fraction of the global warming potential resulting from carbon emissions to the atmosphere from many Arctic regions. A key uncertainty in this context is the role of landscape disturbances and non-linear change processes, triggered e.g. by thawing of ground ice and subsequent surface degradation, which also influences the hydrologic regime in permafrost regions, and therefore the fraction of carbon emitted as CH$_4$.

We are seeking a postdoctoral scientist (m/f/d) with experience in atmospheric inverse modeling to constrain exchange fluxes of carbon between the land surface and the atmosphere. The successful candidate will join a multi-disciplinary research project funded by the German Ministry for Research and Education, aiming at investigating CH$_4$ processes with observational programs across spatio-temporal scales, and integrating these new datasets into biogeochemical process modeling and atmospheric simulations. The position will be embedded within an interdisciplinary research team at MPI-BGC that is conducting experimental, observational and modelling studies focusing on Arctic carbon cycle processes under global climate change.

Your tasks:
• Maintain and upgrade an existing scheme for global scale atmospheric inverse modeling, CarboScope (https://www.bgc-jena.mpg.de/CarboScope/) for state-of-the-art simulations of CH$_4$ fluxes in support of top-down CH$_4$ budgets synthesized by the Global Carbon Project
• Exploit multi-disciplinary data sources to inform regional scale inversions over selected boreal and Arctic domains, including e.g. surface-based and airborne observations from recent monitoring campaigns in NW Canada, isotopic datasets, or satellite retrievals
• Link short- and mid-term trends in high-latitude atmospheric CH$_4$ mixing ratios to dynamic land surface processes, with a particular focus on explaining enhanced growth rates in regional atmospheric CH$_4$ in recent years
• Conduct atmospheric inversions to evaluate the performance of upgraded biosphere process models for CH$_4$ fluxes in high northern latitude regions, provided by project partners. The interpretation of process model results will be conducted jointly with project team colleagues contributing modeling results and in situ measurements.
Your profile:

- higher education degree (PhD) in atmospheric or natural sciences (e.g. meteorology, geo-ecology or other geo-science, or environmental physics)
- Experience in constraining surface-atmosphere exchange processes with atmospheric approaches is a prerequisite
- Experiences in atmospheric transport modeling, observation and interpretation of time series of greenhouse gas mixing ratios, and inverse optimization techniques, are essential
- Solid experience in scientific programming is a strong plus
- Demonstrated insights into Arctic ecology or carbon cycle science are considered beneficial.
- We seek a flexible and proactive person (m/f/d) who is able to work both independently as well as in a larger team
- Very good written and spoken English is essential

Our offer:

This is a full-time post-doctoral position to be filled from November 01, 2022, but starting not later than April 01, 2023. The position is available for a duration of 36 months, pending final approval of the funding. Part-time work is generally possible. The position will be evaluated and graded following the collective agreement according to TVöD Bund; in addition, we will provide a pension plan based on the public service (VBL). The Max Planck Society (MPS) strives for gender equality and diversity. The MPS aims to increase the proportion of women in areas where they are underrepresented. Women are therefore explicitly encouraged to apply. We welcome applications from all fields. The Max Planck Society has set itself the goal of employing more severely disabled people. Applications from severely disabled persons are expressly encouraged.

Your application:

For more information about this position, please contact Dr. Mathias Göckede (mgoeck@bgc-jena.mpg.de). Are you interested? Please send us your application with cover letter, curriculum vitae as well as names and contact information of two references summarised in a PDF file (max. 10 MB) by June 30, 2022, quoting the reference number 21/2022 by e-mail to bewerbung@bgc-jena.mpg.de or to the

Max-Planck-Institut für Biogeochemie
Personalbüro: Kennwort “Wissenschaftlicher Mitarbeiter/PostDoc”
Hans-Knöll-Straße 10
07745 Jena

We ask that you do not use application folders, but only submit copies, as your documents will be destroyed in accordance with data protection regulations after the application process has been completed.

We look forward to receiving your application!