Is tomorrow's wetter nature top of class or a sinner in terms of climate?

Associate Professor Jesper Riis Christiansen with the Department of Geosciences and Natural Resource Management (IGN), University of Copenhagen, was granted DKK 321,735 from COWIfonden to develop a calculation tool for determining the climate impact of the recreation of natural hydrology.

Recreation of natural hydrology is an unknown factor in Danish greenhouse gas accounts
Recreation of the natural hydrology in woodland and open country in Denmark is done to increase biodiversity in the Danish nature and constitutes a significant change to the landscape. It has the potential to become an important, yet so far overlooked factor in Denmark's greenhouse gas accounts, due to the increasing emission of the strong greenhouse gases methane and nitrous oxide. The purpose of the project is to improve the existing knowledge basis on how recreation of hydrology in Danish woodland affects the emission of greenhouse gases from wetter land. This knowledge will be used for developing a calculation tool that determines the total climate impact resulting from the recreation of natural hydrology.

The project will initiate a unique field test to study greenhouse gases
In the next two years, the project will monitor emission and absorption of greenhouse gases in a hydrologically recreated area containing environments characterised by increasing water saturation, ranging from dry land to lakes. It is important to distinguish between the different environments since the balance between greenhouse gases changes according to the water saturation of the system. A new automatic system for monitoring greenhouse gases, SkyLine2D, allows for this distinction while measuring the seasonal fluctuation in greenhouse gases. Combined with analyses of soil hydrology and nutrients, these unique data will form the basis for developing the tool for calculating the climate impact resulting from the recreation of natural hydrology.

Cooperation with the Danish Nature Agency in Gribskov, northern Zealand
The project will be carried out in cooperation with the Danish Nature Agency. The project will be carried out in Gribskov, which is home to many natural wetland areas, but most of these were drained to increase the production of timber. In these years, the Danish Nature Agency is recreating hydrology in many areas of Gribskov, making this location ideal for the project.

The project adds new perspectives for nature management from a climate perspective
This project contributes a so far unknown climate component in nature management. Denmark is obligated to annually report its national greenhouse gas budget to the Kyoto Protocol, which must include the impact of the recreation of natural hydrology. With this in mind, the knowledge and the calculation tool developed as a result of the project are relevant

from a societal perspective. The results can be used to guide the design and improve the management of recreated wetland from a climate perspective, in Denmark and internationally.