Paludiculture Newsletter

With this newsletter the Greifswald Mire Centre (GMC) aims to keep a growing community informed on peatlands and paludiculture. You will find news from research, practice, politics, as well as announcements of conferences and other events and recommended publications. Sign up per e-mail to communication@greifswaldmoor.de for upcoming issues! The newsletter is currently provided by the BOnaMoor project coordinated by the Greifswald Mire Centre and financed by the German Federal Ministry of Food and Agriculture through the Agency for Renewable Resources (FNR).

Content

1. General information and news on peatlands and paludiculture

1.1. Peatlands at COP25 - Summary: Topic set, huge need for action

At 13th December the UNFCCC Conference in Madrid came to an end after tough negotiations. The summary of the peatland and climate team of the Greifswald Mire Centre on site: Unsatisfactory to sobering. The topics of peatland and climate protection, restoration and sustainable use were more present than ever before in the conference's supporting programme. On the opening day, the GMC had organized a side event "Mapping, Monitoring and Climate-Friendly Management of Peatlands" together with the Food and Agriculture Organization of the United Nations (FAO), the Japanese Agency for International Cooperation (JICA) and the Global Environmental Centre (GEC) from Malaysia. On 4th December, a theme day in the Indonesian country pavilion focused on climate-friendly peatland management, especially in tropical latitudes. On 5th December, the Global Peatlands Initiative, of which the GMC is a founding member, presented itself in the German national pavilion. Internationally, politicians as well as representatives of NGOs see wet and rewetted peatlands as an efficient nature-based solution for climate protection and adaptation to climate change.

Peatland panel at COP25 (Photo: J. Peters)

1.2. Talks on peatland farming in the EU Parliament

The Common Agricultural Policy (CAP) is decisive for the agricultural use of peatlands in Europe. Although peatlands account for only 4% of agricultural land in the EU average, emissions from agricultural peatlands contribute 25% of total greenhouse gas emissions from agriculture. With the current reform of agricultural policy, there is a great opportunity to initiate a change in peatland management in Europe, to promote the management of rewetted peatlands and to phase out support on drained peatlands (see also recent GMC policy brief). Dr Franziska Tanneberger (GMC), together with colleagues from Wetlands International European Association and Interreg Care-Peat project, spoke about peatland distribution and climate relevance in Europe to 13 members of the European Parliament, among them Vice President Mairead McGuinness (Ireland) and agricultural policy expert Peter Jahr (Germany).

GMC director Franziska Tanneberger (2nd from right) with Members of European parliament & NGO/research colleagues

1.3. Sphagnum Species of the World - New book by GMC's peat moss expert

Book cover

The comprehensive volume Sphagnum Species of the World by Sphagnum expert Dr Dierk Michaelis has just been released in English. Peat mosses are of key ecological and economic importance among the mosses and populate almost all continents. In the book 292 Sphagnum species are described in detail and presents keys for their identification, supplemented by data on habitats, geographical distribution and lists of synonyms. 435 pages strong, the volume issued by Schweizerbart Science Publishers represents the updated, supplemented English language version of the author's original peat moss flora of 2011 (in German), the first overall presentation of Sphagnum since Carl Warnstorf's "Sphagnologia Universalis" of 1911.

2. A paludiculture project presented: LIFE Org Balt

Tackling climate change adaptation and mitigation challenges in peatlands still demands basic research, upon which adapted strategies for large scale wise management of degraded peatlands have to be developed and implemented. The four-year project LIFE OrgBalt: "Demonstration of climate change mitigation potential of nutrients rich organic soils in Baltic States and Finland", started in August 2019, faces this gap. It aims at improving greenhouse gas (GHG) inventories, developing innovative climate change mitigation measures and their implementation in demonstration pilots on nutrient-rich organic soils (fens) in the Baltic States and Finland. The German Succow Foundation is partner in an international project consortium of eight partners from different Baltic states and Finland led by Latvian State Forest Research Institute "Silava". The Succow Foundation, partner in the Greifswald Mire Centre, contributes expertise of paludiculture as an innovative and climate smart peatland management approach. The foundation is also responsible for implementing climate change mitigation measures in selected demonstration sites.

Kick-off meeting of LIFE OrgBalt in Oct. 2019 in Riga (Photo: LIFE OrgBalt)

The project's objectives and partners in short:

Objectives:

- Improvement of GHG inventory methods and activity data for nutrient-rich organic soils
- Identifying and demonstration of cost-effective Innovative Climate Change Mitigation (CCM) measures applicable in nutrient-rich organic soils
- Elaboration of tools and guidance for implementation of CCM measures

Partner organisations:

Latvia: Latvian State Forest Research Institute "Silava", Latvian University of Life Sciences and Technologies (LLU), Ministry of Agriculture of the Republic of Latvia (MA), Association Baltic Coasts (BaltCoasts)
Lithuania: Lithuanian Research Centre for Agriculture and Forestry (LAMMC)
Estonia: University of Tartu (UT)

Finland: Natural Resources Institute Finland (LUKE)
Germany: Michael Succow Foundation (MSF)

Funder:
The project is entirely funded by the LIFE programme, the EU's funding instrument for the environment and climate action.

More information: https://www.orgbalt.eu/

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3. News from other paludiculture projects

This section compiles news from current projects and initiatives on paludiculture from various regions and countries.

3.1. Projects internationally

3.1.1. Indonesia: PALUDIFOR and paludiculture projects

Indonesia has learnt that the degraded peatlands have to be restored, while protecting the remaining pristine peat swamp forests. The Government of Indonesia along with various stakeholders are committed to do corrective actions on sustainable and responsible peatland management. Paludiculture is recently recognized as a method for sustainable peatland ecosystem management through the cultivation of mire-typical plants without applying peatland drainage. Paludiculture may restore degraded peatland, avoid subsidence, reduce peat fires and GHG emission. At the same time, paludiculture provides economic benefit through tangible and intangible values of wet and rewetted peat ecosystem.

The Paludiculture Forum, or so called PALUDIFOR, was initiated on 8th August 2018 in Bogor, by Forest Research and Development Center and Yayasan Lahan Basah Indonesia (previously named as Wetlands International Indonesia, WII). After several meetings, the Forum was officially launched on 30th July 2019, and it has a legal status as an association from the Ministry of Law and Human Rights of Indonesia. Mr. Agustinus Tampubolon was elected as the Leader of the Forum.

PALUDIFOR was officially launched on July 30th, 2019, in Bogor, Indonesia (Photo: WII)

PALUDIFOR is a multi-stakeholder forum of tropical paludiculture, which is connecting practitioners, scientists, and business sectors, and has four principles, e.g. open, participative, accommodative, and synergy in order to achieve target of sustainable peatlands of Indonesia. PALUDIFOR was established in a mission to provide solutions and recommendations of significant needs in Indonesia of a sustainable peat management system. PALUDIFOR is expected to become a platform for information

exchange in the context of developing paludiculture best practices that can answer many root causes of problems, specifically peat forest and land fires.

Just recently in December 12th, 2019, PALUDIFOR organized a seminar on "Strategy on Sustainable Development and Business Investment of Peatland Commodities and Paludiculture", which aimed to identify potential paludiculture commodities, potential markets, processing and value added products, (micro)financing and supporting regulations. The Forum also discussed about firm definition of paludiculture, principles and scopes of the approach in the context of tropical peat ecosystem.

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3.1.2. Lithuania: First steps of paludiculture - Sphagnum cultivation experiments on cutover part of Aukštumala peatland

"Paludiculture" as a branch of agriculture and/or forestry on rewetted peatlands is quite a new term, which still needs to be recognised by politicians and scientists and local society as well. The Lithuanian word "pelkininkystė" has been accepted by the State Commission of the Lithuanian Language (http://www.vlkk.lt/) in 2018 and is recognized as suitable translation for the English term "paludiculture" and the German term "Paludikultur". The term "Pelkininkystė" is officially included in the "Term Bank of the Republic of Lithuania" (http://terminai.vlkk.lt/paieska?search=pelkininkyst%C4%97).

Despite being "fresh" terminology, "Pelkininkystė " has already been included into strategic planning documents of Lithuania, e.g. the National Energy and Climate Plan, spread among Agricultural and Environmental protection sectors as a measure to reduce greenhouse gas emissions. However, still huge work awaits to raise awareness among the society. For this, good practice examples are vitally needed. Therefore, we can be proud announcing that the first Sphagnum cultivation trial in Lithuania has been established in Aukštumala peatland, which is known in the world for the first scientific monograph in peatland science (Weber, 1902).

Prof. Dr Romas Pakalnis, Landscape ecology and mire restoration expert in LIFE Peat Restore, Lithuanian Fund for Nature

Aukštumala peatland from above in 2019 (Photo: Zyndrunas Sinkevicius)

Sphagnum cultivation experiments in Aukštumala peatland

In Lithuania, the first attempt to restore raised bog vegetation on cutover peatland were carried out in Aukštumala peatland in 2011–2012 based on the initiative of Prof. Dr Romas Pakalnis and a group of researchers from the Institute of Botany (Nature Research Centre, Lithuania) and the administration of JSC Klasmann-Deilmann, Šilutė as well. One hundred and thirty donor patches (0.4×0.4 m in size and 5–7 cm thick) of *Sphagnum* sp. (e.g. *S. fuscum*, *S. magellanicum*, *S. capillifolium*) and other plants (e.g. *Eriophorum vaginatum*, *Oxycoccus palustris*, *Andromeda polifolia*, *Drosera rotundifolia*) characteristic of raised bogs were collected from the degraded part of Aukštumala peatland and placed into wet bare peat in the specially prepared experimental field (area: 0.12 ha). Transplantation of donor material was performed in the middle of autumn. First results of *Sphagnum* planting were quite promising: 93% of planted *Sphagnum* patches established successfully. *Sphagnum* mosses took up from 8% to 85% of the plot on each patch and started to spread on bare peat. The most significant changes in the vegetation coverage were ascertained for *V. oxycoccus* (the average coverage increased from 5% to 18%), whereas the mean cover of *Sphagnum* spp. increased only by 4% during the first two years of the experiment.

Unfortunately, unfavourable hydrological conditions at the experimental site due to adjacent peat extraction by Klasmann-Deilmann Šilutė made it impossible to maintain optimal ground water level (GWL) favourable for the development of typical raised bog vegetation without implementation of special GWL regulation and maintenance system. Therefore, during wet periods the surface of the experimental field was flooded (GVL up to +30 cm in autumn and winter) and it dried up (GWL up to -82 cm) during summer drought. Because of such unfavourable hydrological conditions and dry vegetation seasons in 2013–2015, mean coverage of typical ombrotrophic plants decreased from 58% (in 2012) to 14% (in 2015).

Lessons have been learned, therefore, in 2018–2019, *Sphagnum* planting was carried out in a completely different way. Biggest attention was paid to water supply and GWL regulation. The site is located on the edge of the peatland, which is drained from one side because of peat extraction, and public drainage ditches from another side. Preparatory work for a new *Sphagnum* cultivating action took more than two years. It included thorough analyses of site ecological conditions (peat and irrigation water properties, water hydrological regime) and possibilities to ensure proper water level in *Sphagnum* cultivating fields. Finally, a special scheme for installation of *Sphagnum* cultivating field was developed and implemented in the cutover part of Aukštumala peatland. Contributions were made by experts from the Greifswald Mire Centre (GMC) and Klasmann-Deilmann GmbH while visiting German sites (Hankhausen Moor, Provinzialmoor and Drenth), where *Sphagnum* farming is implemented, joined by the researchers from the Nature Research Centre (Lithuania), who completed the first *Sphagnum* cultivation experiments in Aukštumala peatbog a few years ago.

Sphagnum planting volunteers campaign in Aukštumala peatland (Photo: Zyndrunas Laima)

As a result, the 2 ha *Sphagnum* cultivation field is divided into two parts with irrigation ditches installed every 10 m (see a photo). To avoid prolonged flooding, water overflow will be removed by an outflow construction. Two artificial reservoirs for the storage of rain and snow melt water and automatic electric water level support system were installed to ensure optimal year-round watering of the peat and provide favourable conditions for the growth of *Sphagnum* mosses.

Although the site was installed in late spring, however, due to surprisingly extended dry vegetation period *Sphagnum* introduction was possible only in the beginning of autumn. During the *Sphagnum* planting volunteer's campaign (on 13th–14th September 2019), 2 ha of bare peat in a post-milled extraction field were covered by vital fragments of *Sphagnum* mosses. On the first day, donor material from *Sphagnum* mosses (about 120 m^3) was collected by hand from old peat excavation pits, regrown by *Sphagnum*, and damaged fields, where peat extraction will take place. Spreading of mosses was performed during the second day both manually and by using slightly modified one-disc fertilizer spreader. Attached to the mini-tractor and serviced by two people, it spreads mosses corresponding to the speed of 5–6 people. Due to high winds during the spreading, it was impossible to mulch *Sphagnum* by straw immediately in all areas. Instead, *Sphagnum* and mulch were pressed into the soil by a wide wheel tractor. Some days later, the whole field was covered by straw for improving favourable microclimate for *Sphagnum*.

These actions would not be possible without the contribution of volunteers and employees of the JSC Klasmann-Deilmann Šilutė and a group of enthusiastic volunteers, who left at home their computers and came to the Nemunas Delta to help restore peatland, who took part in the event despite strong wind and rainy weather. Now it is one of the largest *Sphagnum* growing sites in Baltics, where Canadian 'moss layer transfer technique' and German experience in *Sphagnum* farming were applied aiming to

cultivate *Sphagnum* biomass for harvest, as a material for restoration of damaged raised bog ecosystems in the future showcasing the potential of carbon sequestration.

Sphagnum planting volunteers campaign in Aukštumala peatland (Photo: Jūratė Sendžikaitė)

Prof. Dr Romas Pakalnis, *"What we did on September 13th and 14th will be described in the history of the most famous bog in the world – Aukštumala raised bog. It will enter history, because the Lithuanian Fund for Nature has taken a hard initiative to revive the destroyed bog by planting two hectares of Sphagnum mosses to start the process of recovery of raised bog vegetation in the exploited part of the peatland. We believe that after some years, this brown peat desert will turn again into a green, fragrant and full of life Sphagnum bog. I am convinced that it will be the case, because we worked and believed in the success of the ideas of ecological restoration and climate change mitigation. Of course, it will take much more human efforts to achieve the result of these dreams, but the hardest job – the beginning – has already been done. The strong west wind could become an undervalued force to this project, but it seems that our joint efforts overcame that obstacle, too. Thanks to everyone who dedicated two autumn days to our future! I wish to have more such days in our lives!"*

The action is part of LIFE Climate Mitigation project LIFE Peat Restore LIFE15 CCM/DE/000138 "Reduction of CO_2 Emissions by Restoring Degraded Peatlands in Northern European Lowland" financed by European Commission, project partners and contribution of JSC Klasmann-Deilmann Šilutė.

A short **movie about the *Sphagnum* spreading volunteer's campaign** you can find here: https://www.youtube.com/watch?v=2aWDjVNHWak

More Information: https://life-peat-restore.eu/en

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3.1.3. Sweden: Rewetting of extracted peatlands - Swedish field experiment for *Sphagnum* farming started

In Sweden, the first big scale *Sphagnum* farming experiment was started on 2 ha of Ekeby mossen post-extraction peatand in autumn 2018 and was enlarged by 1 ha in autumn 2019. The experiment is a joint project between Hasselfors Garden, The Swedish University of Agricultural Sciences (SLU), Rölunda Produkter and TorvForsk. In relation to the water table, a variety of local but also Finnish *Sphagnum* mosses (*Sph. fuscum, Sph. fallax, Sph. magellanicum, Sph. squarrosum, Sph. cuspidatum*) were spread in different volumes (pure or mixed with peat) over the remaining bare peat. The goal here was to monitor the growth rate of the species after rewetting. In the future, we intend to farm species suitable for growing media or bedding material.

Experimental site before rewetting showing different treatments (pure Sphagnum and Sphagnum:Peat mixtures uncovered or covered with straw) and reservoir surfaces of former drainage ditches. (Photo: Sabine Jordan)

Successful rewetting with establishment of typical wetland vegetation (September 2019). (Photo: Monica Kling)

Sabine Jordan and her colleagues at SLU have studied greenhouse gas emissions from rewetted cutover peatlands for more than 10 years and the impact of rewetting on hydrochemistry for about 20 years. Filling an artificial depression in the landscape with water is rather logical. Thus, rewetting combined with any kind of wet agriculture would be a climate-smart use of post-extraction sites. In the 1990s, hydrological aspects and biodiversity were central points for adapting a rewetting measure, and GHG measurements before rewetting were almost never done. Background data from our long-time experiments before rewetting are mostly missing. Nowadays we have the possibilities to conduct GHG measurements combined with soil and water chemical analyses before rewetting. This fact enables us to better underline the potential for a climate-efficient and productive after-use of extracted peatlands under Scandinavian conditions.

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3.1.3. Poland: Development of a technology for the production of construction material from Common Reed

Decreasing deposits of raw materials and protection of the natural environment against pollution caused by waste from the construction industry make it necessary to invest in the development building products from renewable raw materials. At Bialystok University of Technology (Poland), for 30 years, studies on the properties of lightweight cement composites with organic materials such as wood shavings, sawdust, common reed, and hemp shives have been carried out. Portland cement is used as the binder. Due to the dissolution of compound sugars often found in organic raw materials, which are harmful to the process of cement hydrolysis and hydration, a two-stage technology of

mineralization of organic fillers has been developed. The most favorable results were obtained when aluminum sulfate ($Al_2(SO_4)_3$ and hydrated lime $Ca(OH)_2$ (9% and 18% in proportion to the mass of the organic filler respectively) were used. They give the solution an acid reaction pH 3–5 (after dissolving in water) and neutralize the solution of the aluminum sulfate (after mixing it with water) respectively.

Further research has established that cement composites with organic fillers have the ability to absorb carbon dioxide from the air. The mechanism of increased carbonation in such composites is associated with a high content of cement in the composition and the use of additional calcium hydroxide during mineralization of the organic filler. Calcium hydroxide, the amount of which is determined on the basis of differential thermal analysis (DTA), is approximately 17% on average, reacts with carbon dioxide (CO_2) to form calcium carbonate $CaCO_3$, which is a product of paste carbonation. The content of calcium carbonate in the control samples stored in dry-air conditions was about 33% and increased by almost half, reaching a value of about 45%, when accelerated carbonation was used. This confirms the occurrence in cement composites with organic fillers of a strong process of binding carbon dioxide from the air during carbonation, by converting CO_2 into calcium carbonate.

Our proposal for future cooperation concerns the following issues:

- Further development of the technology for the production of construction products with organic fillers, e.g. with Common Reed, with increased CO_2 sequestration from the air during their life cycle.
- Use in construction products with organic fillers, more environmentally friendly binders, e.g. geopolymer.

We invite you to cooperation!

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3.2. Paludiculture projects from Germany

3.2.1. BONAMOOR

Biomass sampling

In the BonaMoor project (implemented by University of Greifswald & HTW Berlin, Germany), which studies how to optimize biomass production on wet peatlands and its thermal utilization, biomass could be harvested from several permanent study plots during the last quarter of 2019. A very late harvest of sedge and reed-grass biomass was carried out in October 2019 in order to obtain biomass for the combustion tests for the "late harvest" variant.

It can be assumed that here the contents of combustion-critical ingredients, which are to be analysed in spring 2020, are significantly lower than for summer biomass. For this purpose, a 2 ha area was left out in each of the study plots during regular harvesting. The harvest proved to be feasible, but despite of some drying on the ground, the biomass still shows a high water content. Thus, its quality as a fuel is questionable. Information on this will also be available in spring 2020.

Permanent study plot „Knick_Rechts“ at 26th Nov 2019. Biomass still standing upright despite high water tables. (Photo: Max Wenzel)

Permanent study plot „Fangstand“ 26th Nov 2019. The biomass lies highly compressed on the ground. (Photo: Max Wenzel)

Measurements of combustion

Further measurement campaigns for the thermal utilization of peatland biomass ran in November and December 2019 in the heating plant of Agrotherm GmbH Malchin. Bales of sedge and reed canary grass were combusted as well as straw as a reference biomass. Pellets from fen biomass as a fuel had already been tested in January 2019. To determine the emission values and the optimal combustion of the biomass from fen peatlands, the new measuring technology for exhaust gas analysis (SM 6000 from Pronova) acquired especially for BonaMoor was used for the first time. It enables an exact and continuous recording of the pollutants carbon monoxide (CO), nitrogen monoxide (NO), sulphur dioxide (SO_2) and oxygen (O_2). The test aims to optimally adapt the operation of the heating plant to the emission limits specified by German law (TA Luft). After each test series ash samples were taken from the combustion chamber, and analysed for their elemental composition.

Bales of sedge lying on the conveyor in front of the round bale disintegration unit (Photo: Guy Kabengele)

Combustion chamber at the heating plant Malchin (Photo: Guy Kabengele)

Practice test and time study

A practical trial on the late harvest of sedge and reed canary grass dominance crops with adapted grassland technology on wide tyres was carried out in October 2019 on three areas (c. 1.75 ha each) on the western shore of Lake Kummerow. The mowing took place on 15th October, the pressing on 26th October. The biomass was turned three times between mowing and pressing. The water content of the biomass could be reduced from 49% to 27.5% or 30.5% in the case of reed canary grass. There was no precipitation in the days before pressing, an average of 3.5 hours of sunshine per day. The average temperature was 13 ° C and humidity ranged from 77% to 98%. The

average wind speed was 18 km/h. During the week after harvest, the good weather conditions would probably have enabled better drying, but this was not foreseeable at the time of pressing. The yield was around 3.8 t DM per hectare for the reed canary grass and 2.2 t DM for the sedges. There was a relatively high loss of biomass of 30%. Besides increased crumbling losses due to already died-off biomass and frequent turning, this was primarily due to the close-knit running over of the swath. A working time study was carried out on these areas during the harvest, too. Productivity and water content of the biomass were determined via random squares in the area and random samples from the swath before pressing. The time was also recorded using GPS and logs.

Practice test at Lake Kummerower (Photo: Tobias Dahms)

Authors: Guy Kabengele, Max Wenzel, Tobias Dahms (Greifswald Mire Centre)

3.2.2. The OptiMoor field trial – Optimizing management for peat bog restoration after intensive agricultural use

Bogs are among the most threatened biotopes in Germany. In Lower Saxony alone, 99% of the bogs are drained. Bogs which are drained for agricultural use (65%) emit ca. 3.4 Mt CO2-equ. a-1. In 2016-2021, the “OptiMoor” project explores strategies for peatland restoration after intensive grassland use. The aim of the project is the development of guidelines for optimal restoration of typical bog vegetation and fauna and to mitigate greenhouse gas emissions. To achieve this, a 1 ha field trial has been set up in the ‘Hankhauser Moor’ in Lower Saxony, Germany. Here, different combinations of rewetting, topsoil removal and *Sphagnum* spreading are tested at stable water tables. The field trial installation, maintenance, and water management are done by Europäisches Fachzentrum Moor und

Klima Wagenfeld GmbH. The accompanying scientific research is led by the Landscape Ecology Group at the University of Rostock.

Optimoor field trial (Photo: Anke Günther)

Participants of Optimoor field day in August 2019 (Photo: Anke Günther)

2019 has seen a lot of activities around the OptiMoor project. First results show very interesting biodiversity and greenhouse gas emission patterns across our restoration approaches. Some of those have been presented at the EGU General Assembly in Vienna, April 2019. We were able to show that removal of degraded upper peat layers can indeed be a viable strategy to mitigate greenhouse gas emissions immediately after rewetting. Together with various experts from all fields of peatland restoration and Sphagnum cultivation, we held our fourth project meeting in June. The goal of this meeting was to gather experiences from other restoration projects across Germany to discuss the general applicability of the patterns of our project on larger scales. This workshop-type meeting also set up the start of developing our guidelines of bog restoration after intensive grassland use. On 13th August, Professor Beate Jessel, president of the Federal Ministry for Nature Conservation, visited the OptiMoor field trial. The visit was inspiring and motivating because it demonstrated increasing recognition for peatland restoration as an effective nature conservation and climate change mitigation measure from German Federal authorities. On 21st November, more than 50 participants of a joint workshop on bog restoration visited the OptiMoor field trial during an excursion. This event marked the end of a year full of discussions around the topics of nature conservation and climate change mitigation through peatland restoration. Beside the encouraging impression that nature-based climate solutions are on the rise we are also impressed of how valuable a field trial can be for all sorts of stakeholders, because it allows us to show how peatland restoration can work in such a clear way. The integration of our results from the more nature conservation focussed project OptiMoor with those of the more paludiculture focussed project MOOSWEIT allows us to foster our understanding of managed peatlands as young ecosystems, which is a prerequisite for successful implementation of paludiculture.

More information:
www.optimoor.de,
www.researchgate.net/project/OptiMoor-How-can-restoration-and-rewetting-of-drained-bog-peatland-under-former-intensive-grassland-use-be-optimized

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3.2.3. The Competence Center Paludiculture Lower Saxony in the 3N Competence Center e.V.

Around 10% of the area of Lower Saxony is covered by organic soils, which is c. 500.000 ha. According to Lower Saxony's Ministry for the Environment, Energy, Building and Climate Protection, most of this area is covered by bogs (c. 200.000 ha) and fens (c. 190.000 ha). If water-saturated, these soils function as sinks and habitats for specialized plants and animals. In Lower Saxony, plants such as sundew, cranberry and orchids and animals such as snipe and moor frog can be found in intact peatlands - an important contribution to biodiversity. In addition, they provide further ecosystem services. Today about 90% of these peatland soils are drained and mainly used as grassland or arable land. Due to increased mineralization of organic material due to drainage, the organic soils used for agriculture – c. 220.000 ha - are likely to emit more than 6 Mt ha-1 a-1 in CO2-equivalents (according to preliminary calculations of 3N Competence Center). This corresponds to over 6% of the total GHG emissions in Lower Saxony.

Today drained peat soils are increasingly rewetted and their functions in the landscape is being restored. Since peat soils cannot be removed from agricultural use in total, alternative climate -smart forms of management reducing or even stopping GHG emissions are being developed in Lower Saxony for securing an income for the agricultural businesses concerned.

In order to promote paludiculture in Lower Saxony while taking advantage of opportu¬nities and avoiding risks, the "Competence Center for Paludiculture" was created in September 2017. The project is sponsored by the Lower Saxony State Agency for Water Management, Coastal Protection and Nature Conservation. It is carried out in cooperation with the 3N Competence Center Lower Saxony Network Renewable Resources and Bioeconomy. The Competence Center for Paludiculture is the information hub for paludiculture in Lower Saxony and intended to eliminate legal and technical obstacles to cultivation and to support marketing of paludiculture products.

Agritechnika 2017 in Hannover. Left: Gisela Wicke (Geschäftsbe-reichsleiterin des GB Regionaler Naturschutz im NLWKN), Colja Beyer (Kompetenzstelle Paludikultur), Marie-Luise Rottmann-Meyer (Geschäftsführerin des 3N Kompetenzzentrum e.V.) (Photo: 3NCC)

The tasks include:

- Initiation and monitoring of pilot projects
- provision of information
- Support in product development
- Development of new utilisation concepts
- Improve economy
- Development of legal and economic recommendations
- Knowledge transfer and networking

The project is funded by the European Regional Development Fund (ERDF) Programme Area Greater Developed Region (SER) and the State of Lower Saxony and by the Lower Saxony Ministry for the Environment, Energy, Building and Climate Protection and contributes to the implementation of the programme "Lower Saxony moorland "

More information: www.3-n.info

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3.2.4. Specifically: 5 measures for CAP - Proposals for peatland and climate protection

In Germany, organic soils account for only 7% of the area used for agriculture, but cause 37% of the emissions from agriculture. The EU average is similar. However, the current Common Agricultural Policy (CAP) of the European Union (EU) does not take this into account. In the policy paper Promoting climate protection through peatland protection - Using the opportunities of CAP reform (German only), the Greifswald Mire Centre and Landcare Germany (DVL) made proposals for the reorientation of the CAP in Germany in December 2019. These will hopefully feed into the upcoming reform of the CAP. The partners in the MoKli project suggest, among other things, more pilot areas and support programmes for sustainable peatland use and the recognition of climate protection achievements by ‚carbon farmers'.
Here media response of a German agricultural online platform on the proposals (German only): https://www.topagrar.com/acker/news/klimaschutz-durch-moorschutz-fuenf-konkrete-massnahmen-11924878.html

4. Events on peatlands and paludiculture

20.-24.04.2020	TISOLS 10th International Symposium on Land Subsidence, The Netherlands, www.tisols2020.org
03.-08.05.2020	EGU General Assembly 2020 Wien, https://egu2020.eu Session "Peatland Management" Deadline for abstract submission is 15th January 2020
07.-11.06.2020	RE3 Conference "From Reclaiming to Restoring and Rewilding", joint conference of Canadian Land Reclamation Association (CLRA), the Society for Ecological Restoration (SER) and the Society of Wetland Scientists (SWS), Quebec, Canada, http://www.re3-quebec2020.org/
May 2020	Lower Saxony conference on paludiculture 3N Competence Center Lower Saxony Network Renewable Resources and Bioeconomy, www.3-n.info
14.-20.06.2020	International Peatland Congress 2020, Tallinn, Estonia http://www.turbaliit.ee/international-peatland-congress-2020/ Session on paludiculture Deadline for abstract submission 31st January 2020
16./17.06.2020	Bioenergy Forum Rostock https://www.3-n.info/news-und-termine/veranstaltungen/veranstaltungen-dritter/14-rostocker-bioenergieforum.html
30.06.-02.07.2020	6th IAHR Europe Congress, Warsaw, Poland https://iahr2020.pl/ Deadline for abstract submission is 15th January 2020

14.-18.09.2020	Symposium “Mires of Northern Eurasia: biospheric function, diversity, management”, Petrozavodsk, Russia, mire2020@krc.karelia.ru
18.-23.10.2020	11th INTECOL International Wetlands Conference, Christchurch, New Zealand http://www.intecol.org/node/37

5. Literature

Bołtryk, M., Krupa, A., Pawluczuk. E. (2018): Modification of the properties of the cement composites with the organic filler. Construction and Building Materials 167: 97–105.

Bołtryk, M., Pawluczuk. E. (2014): Properties of a lightweight cement composite with an ecological organic filler. Construction and Building Materials 51: 97–105.

Geurts, J.J.M., van Duinen, G.-JA., van Belle, J., Wichmann, S., Wichtmann, W., Fritz, C. (2019): Recognize the high potential of paludiculture on rewetted peat soils to mitigate climate change. Landbauforsch J Sustainable Organic Agric Syst 69(1): 5-8. DOI:10.3220/LBF1576769203000 https://www.landbauforschung.net/fileadmin/landbauforschung/LBF-69-01-2_PP_Geurts_et_al_121220.pdf

Tata, H. L. (2018): Paludiculture: can it be a trade-off between ecology and economic benefit on peatland restoration? IOP Conference Series: Earth and Environmental Science 394 012061. https://iopscience.iop.org/article/10.1088/1755-1315/394/1/012061

Uda, S. K. (2019): Sustainable peatland management in Indonesia: Towards better understanding of socio-ecological dynamics in tropical peatland management. https://edepot.wur.nl/499309

Svedarsky, D., Grosshans, R., Venema, H., Ellis-Felege, S., Bruggman, J., Ostlund, A. & J. Lewis (2019): Integrated management of invasive cattails (Typha spp.) for wetland habitat and biofuel in the Northern Great Plains of the United States and Canada: A review. Mires and Peat, Article 9, published online: 07.11.2019: http://mires-and-peat.net/pages/volumes/map25/map2509.php

Further new publications on peatlands and mires, restoration and rewetting of peatlands as well as nature conservation can be found in the IMCG bulletins, which are regularly published on the IMCG homepage: http://www.imcg.net/pages/home.php

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