10 December 2019

# Peatlands International

issue 4.2019

International Peatland Society


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European Peatland Strategies: International Workshop in Bonn
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# Editorial

## Emergency:

## *Our house is on fire!*

Commission Chairs Bernd Hofer (right) and Marie Kofod-Hansen in Qingdao in September. Photo: Susann Warnecke

The European Parliament has declared a global "climate and environmental emergency". It also urged all EU countries to commit to net zero greenhouse gas emissions by 2050.

The vote came as scientists warned that the world may have already crossed a series of climate tipping points, resulting in "a state of planetary emergency" (The Guardian, Thursday, 28 November 2019).

It seems that this is the temporary peak of an escalation that reflects not only the dramatic developments in species extinction or $CO_2$ concentration in the atmosphere, but also an example of an increasingly hysterical symbol politics.

Of course, drastic measures are necessary to at least slow down or even reverse the steady loss of biodiversity and rising greenhouse gas emissions. But what we are witnessing are conferences, political protests, demands and lip service - but no measures. The facts are still moving in the opposite direction and, despite all the hectic activity at the end of each year, the result can be measured by the increasing $CO_2$ concentration.

Perhaps there is also a need for drastic symbols to "encourage" policymakers, who otherwise tend to focus more on the short-term interests of their voters, to act sustainably. Journalism, politics and, as a result, administrations are increasingly lacking rationality in these times of escalating superlatives. Solutions that take years or decades

Peatlands International is the global magazine of the International Peatland Society (IPS). It provides the more than 1,400 individual, institute and corporate members of the Society with up-to-date information on peat and peatland matters, reports and photos of conferences and workshops, background reports and publication reviews.

To serve all of our members, we provide always a good balance between economic, social and environmental points of view. To receive Peatlands International in your email every three months, visit www.peatlands.org/join-us and sign up as a member or subscribe for € 60/year.

**Impressum**

Peatlands International
ISSN: 1455-8491

Publisher: International Peatland Society
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phone: +358 40 418 4075
email: info@peatlands.org

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Cover: *Sphagnum* growth by Sabine Jordan

www.peatlands.org/publications

are no longer acceptable and have become taboo. For example, Germany's coal phase-out plan foresees the end of the use of coal for energy purposes in 2038.

As soon as the plan was announced as a consensus negotiated between representatives of all areas of society, it was immediately criticized as insufficient and an immediate shutdown was demanded. During a demonstration calling for the immediate phasing-out of coal at the end of November in Lusatia, banners appeared carrying the inscription "Make Capitalism History! We Need Climate Justice".

Against this background, the IPS should continue to work on the development of "Peat Concept 2050" - fact-based and balanced as usual, but at a different speed than we are used to. In any case, a concept for the land use sector of peat extraction and growing media production will be required for Germany in the first few months of next year. However, no solution is yet in sight for the much more important agricultural use of peat soils.

In this sense, we have an exciting 2020 ahead of us for which I wish you all the best!

Bernd Hofer

Chair of Commission Peatlands and Environment
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# European Peatland Strategies

## International Workshop, Bonn , Germany, 28 - 20 October 2019

This international workshop, which was kindly organized by the German Federal Agency for Nature Conservation (BfN), Ramsar, Succow Stiftung and the Greifswald Mire Centre, brought together some 30 peatland experts and stakeholders from the public sector and civil society across EU and other European countries.

The aim was to review and exchange knowledge and experiences concerning existing and planned national peatland strategies, and to identify core elements of national peatland strategies which foster best practice in peatland management including conservation, restoration and sustainable use.

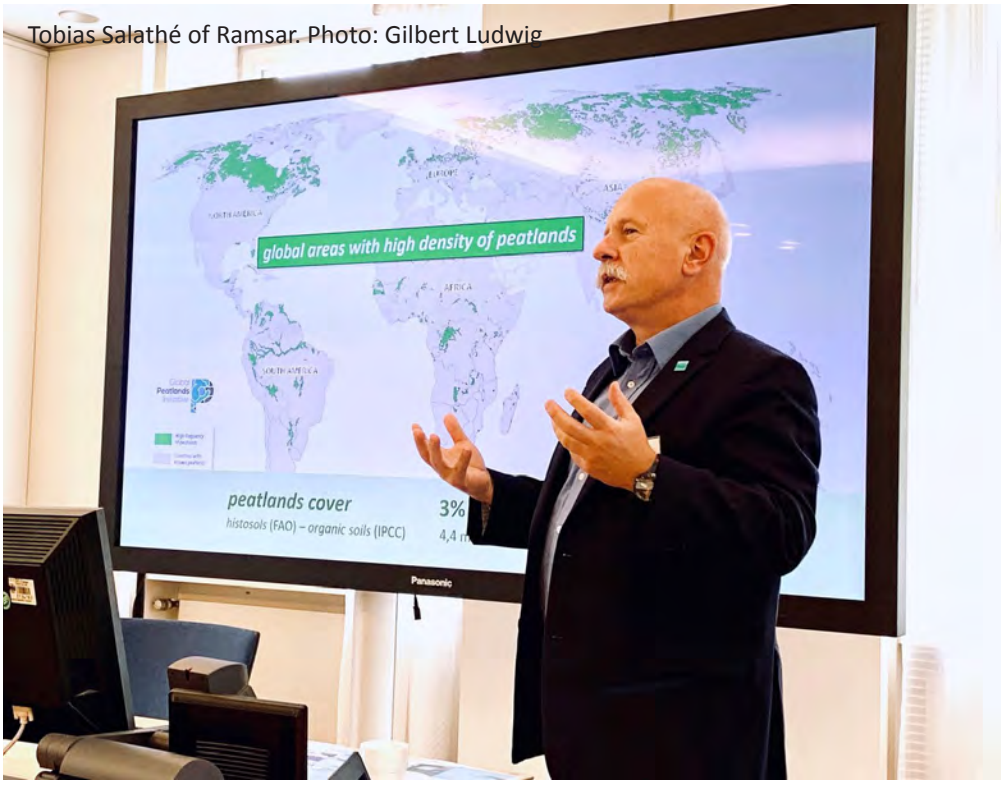
A second objective was to explore the possible need to integrate strategic peatland conservation at the European level and to discuss current practices and existing regulations. The workshop was opened by Mechthild Caspers from the German Ministry of Environment and Bettina Hedden-Dunkhorst on behalf of the organizers (BfN).

## Setting the Scene

Tobias Salathé from the Secretariat of the Ramsar Convention gave an introduction on peatlands in general, and European peatlands in particular. Agriculture and forestry are seen as the major cause of peatland-related greenhouse gas emissions, and Mr Salathé underlined the crucial role of peatlands in mitigating climate change, as well as their biodiversity, historical and archives value. One priority set by the Ramsar Wetland Convention is to ensure that no pristine mires in Europe will be drained in the future.

Attendees of the workshop. Photo: Gilbert Ludwig

Nationally determined contributions, such as national strategies, are also considered of high importance for the implementation of the recently re-launched GAP (Guidelines for Global Action on Peatlands).



Tobias Salathé of Ramsar. Photo: Gilbert Ludwig

Sophie Hirschelmann of the Michael Succow Foundation then gave a summary of the information provided by a precirculated questionnaire about the current state of national strategies, or development/planning thereof. One of the main messages was the expectation of strategies to focus on conservational values.

In a next step, an interactive panel discussion with Arthur Neher (Wetlands International) and Gilbert Ludwig (International Peatland Society) on "Why do we need national strategies and what are important preconditions?" was held. There was a clear consensus between the panellists and the audience about the need for national strategies, as a single European wide strategy would be very much challenged by the heterogeneity in terms of background, context and interest and, above all, the amount of peat and peatlands between different countries.

National strategies give peatlands the attention they need and deserve, but development and implementation imply clear goals and a solid scientific basis, such as the "Wise Use" concept[1] and the SRPM (Strategy for Responsible Peatland Management[2]).

The panellists, however, also pointed out that national strategies and a European peatland "umbrella" strategy need not be mutually exclusive; it would raise attention on peatland-related issues further and highlight the fact that peatlands and peatland-related issues go beyond political boundaries, as does the increasing share of international stakeholders and their businesses.

# Sharing Experiences

In the second part, speakers from different countries presented on the national strategy, or strategies for the doing or planning, of their respective country. The speakers were Francis Muller/France, Emma Goodyer/UK, Kristine Gaga/Latvia, Karin Ullrich/Germany and Mika Nieminen/Finland.

The Finnish strategy was the first national peatland strategy in Europe and largely founded on Wise Use and the SRPM. The Finnish strategy and later the Irish strategy, as well as the Latvian strategy (in planning), are also based on the concept of ecosystem services (as is the SRPM), including provisioning services (to which belongs the extraction of natural resources, such as peat), which sets them apart from other planned strategies that are largely conservation-based.

[1]Joosten, H. & Clarke, D. 2002: Wise Use of Mires and Peatlands. International Mire Conservation Group & International Peat Society, 304 p.

[2]Clarke, D. & Rieley, J. (eds.) 2019: Strategy for Responsible Peatland Management, 6th edition. International Peatland Society, 35 p.

Germany is also a special case as several "Bundesländer" already have a strategy with varying objectives in place. A federal peatland strategy, which is in the making, will push for the complete protection of all German peatlands, organic soils and mire ecosystems, and includes the integration of a (voluntary) peat reduction strategy. The elaboration of the new federal peatland strategy is expected by spring 2020.

Dianna Kopansky on GPI. Photo: Gilbert Ludwig

The remainder of the first day was used for interactive discussions in parallel groups on important steps and aspects of peatland strategies, including political and legal contexts and relevant sectoral strategies, economic aspects and sustainable use, stakeholder interest groups and their participation, implementation mechanisms and funding programmes, as well as the climate relevance of peatlands.

## Towards Strong National Strategies

On the second day, Dianna Kopansky from the UNEP/Global Peatlands Initiative gave a presentation on the global perspective of peatlands, highlighting the UN Environment Assembly (UNEA) Peatland resolution and its relevance for the development of national peatland strategies.

This was followed by a plenary discussion where core elements, challenges, success factors and formal requirement for strategy development were identified.


Workshop networking. Photo: Gilbert Ludwig

## Peatland Strategies and European Policies

How can peatland strategies be linked to European regulatory frameworks? Jan Peters gave an overview of peatlands in the EU regulatory frame.

Rene Colditz, from the European Commission (DG CLIMA), gave an eye-opening, albeit highly technical, presentation on the complex implications of the LULUCF regulation (EU 2018/841) for peatlands in member states.

Among many interesting aspects he presented possible pathways for achieving a climate-neutral EU, which he considered challenging, but feasible

Kaie Kriiska on IPC 2020. Photo: Gilbert Ludwig

from technological, economic, environmental and social perspectives. In addition to adaptation and mitigation response options proposed by the IPCC SRCCL (Special Report on Climate Change and Land), he highlighted two examples.

Firstly, response options with immediate impact include the conservation of high-carbon ecosystems such as peatlands, wetlands, rangelands, mangroves and forests. Secondly, he pointed out that land-based carbon sequestration options in soil or vegetation, such as afforestation, reforestation, agroforestry, soil carbon management of mineral soils or carbon storage in harvested woods products, do not continue to sequester carbon forever. Peatlands, however, can continue to sequester carbon for centuries.

The final part of the workshop was dedicated to working group discussions on how peatland strategies can be linked to the respective European frameworks, especially regarding agriculture, climate protection, nature conservation, natural resources/energy production and water quality.

At the end, Bettina-Hedden Dunkhorst wrapped up the workshop and reflected on its outcomes, further coordination and next steps. We are very thankful to the hosts for a well-organized, interesting and dynamic workshop!

*Gilbert Ludwig*

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# Tallinn calling! Allan Robertson Grants 2020

The Allan Robertson Grants 2020 will be dedicated to **participants in the 2020 International Peatland Congress** in Tallinn.

As in the past, students and young professionals (typically under the age of 30) can apply. We will cover travelling costs and/or registration fees to the Congress - note that there will also be a special pre-Congress excursion for students. The grants traditionally amount to €250-500 each.

An application form will soon be available at peatlands.org/about-us/honoursgrants.

The application period will last until **31 January** 2020 and winners will be informed in early April.


Photo: Ali Yahya

# Identifying and Overcoming the Many Challenges Facing Peatland Conservation in Indonesia

Tropical peatlands are important for wildlife conservation, reducing dangerous climate change, and the health and livelihoods of local people. Among other benefits, they are home to many thousands of flowering plant species and critically endangered wildlife such as orangutans, store vast amounts of carbon in their soil and vegetation, provide clean water, and support fish populations for local consumption.

This is particularly true in Indonesia, where large peatland areas naturally covered with tropical forests occur on the islands of Borneo (Kalimantan), Sumatra and Papua.

Unfortunately, Indonesia's peatlands are experiencing rapid loss and degradation, placing these many benefits at risk. This is due to a variety of human activities, including agricultural expansion, especially for oil palm and pulp wood plantations, and logging trees for timber.

These disturbances are associated with peat drainage, which leads to fire during dry periods, causing forest loss, massive carbon emissions, and public health problems as people inhale the fires' toxic haze. As a consequence, only 4,260 $km^2$ of the total 57,817 $km^2$ of peatland in Kalimantan (7.4%) were considered to remain in a "pristine" condition in 2015.

Peat-swamp forest in Central Kalimantan burning during the severe 2015 fire season. Photo: Bernat Ripoll Capilla, Borneo Nature Foundation

Roundtable discussion session at the University of Exeter, involving Indonesian and international experts. Photo: Susan Cheyne, Borneo Nature Foundation

After the major Indonesian fire crisis of 2015, the dry seasons of 2016-18 experienced relatively few fires, perhaps indicating positive impact of new government initiatives. This period was, however, also characterised by relatively high dry season rainfall. As El Niño conditions and drier weather returned to the region in 2019, so did widespread peatland fires, with the Indonesian Ministry of Environment and Forestry estimating that 2,273 $km^2$ of peatlands in the country were burned by the end of September.

UNICEF estimate that the toxic haze pollution from this year's fires placed 10 million children at health risk and Indonesia's Ministry of Health reported that from May to September 2019, in the Central Kalimantan city of Palangka Raya alone, 11,758 people were treated for upper respiratory tract infection. Long-term peat-swamp forest research sites, such as Sebangau and Tuanan in Kalimantan, were also threatened.

To help address the dramatic loss of, and problem of fires in, Indonesia's peatlands, we convened a round-table, dual-language (English and Bahasa Indonesia) workshop to identify key challenges, and provide potential solutions and future directions to meet forest and peatland conservation and restoration goals in Indonesia (see PI, issue 4.2017, pp. 24-27).

The results of this workshop and subsequent literature review, which included contributions from an expert team of 31 scientists and local conservation managers, are published in a recent issue of the journal *People and Nature*. Here, the team compiled a (non-exhaustive!) list of 59 political, economic, legal, social, logistical and research challenges.

These challenges relate to the 3Rs (Rewetting, Revegetation and Revitalisation) adopted by the Indonesian Peat Restoration Agency, plus a fourth R that the team considered to be essential to peatland conservation planning: Reducing Fires.

Five key factors underlying these challenges were identified:

1. Disparity and resultant conflict between (long-term) ecological and (short-term) social-economic-political timeframes;
2. Balancing conflicting and evolving needs and desires of different actors to agree mutually acceptable, and socio-politically and ecologically feasible, conservation and restoration targets;
3. Acquiring (long-term) project financing and tackling financial disincentives;
4. Frequent lack of clarity regarding legal status and responsibility for different areas

and activities, conflicting/unclear laws and ineffective law enforcement; and
5. Currently limited scientific knowledge across multiple areas and in relation to all 4Rs.

Analysis of these challenges suggests that narrowly-focused conservation solutions are likely to carry high risk of failure, and that peatland Rewetting and Reducing Fire are particulary important at this stage, as is acquiring local government and community support. Further, each conservation/restoration project will face unique challenges and have differing goals, towards which project activities must always be individually tailored.

To aid in identifying and overcoming the specific challenges that individual projects may face, the team propose an eight-step adaptive management framework (Box 1), which it is anticipated will help governments, NGOs, industry and communities in both Indonesia and other tropical areas to better achieve their forest and peatland conservation and restoration goals.

Full details are provided in the *People and Nature* paper, which includes an abstract in Bahasa Indonesia and is available under open access here: https://besjournals.onlinelibrary.wiley.com/doi/full/10.1002/pan3.10060.


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**Box 1: A step-by-step adaptive management framework for identifying project challenges, planning and regularly evaluating project interventions.**

This process should incorporate multiple stakeholders, including scientists, local officials, local communities, project partners and (potential) funders.

1. Define project conservation/restoration goals and associated targets in relation to the 4Rs (Rewetting, Revegetation, Revitalisation and Reducing Fire), and incorporate SMART objectives (Specific, Measurable, Achievable, Relevant, Timely).
2. Review and identify the potential challenges that the project may face in achieving its goal and targets in relation to all relevant Rs, and gauge the level of risk that each challenge is likely to present towards achieving each target.
3. Particularly if many challenges are identified, group challenges together and identify potential underlying factors spanning across these. Targeting these underlying factors may be more efficient than targeting each individual challenge independently.
4. Consider the interventions required to address the challenges identified, if necessary prioritising those anticipated to address multiple challenges and/or those with highest associated risk level, and that are most feasible given the project situation.
5. Review whether any of the interventions identified are likely to have unintended negative repercussions and revise if necessary.
6. Develop a scientifically rigorous project monitoring plan, including indicators relating to both implementation of project interventions and progress towards its specific goals and targets.
7. Discuss and review plans with all relevant stakeholders before finalising, and obtain any relevant financial and other support needed.
8. In dialogue with project stakeholders, regularly review and where necessary adapt project targets, associated interventions and monitoring protocols.

# New Paper Out: "Pushing the Limits"

## *Experiences of Women in Tropical Peatland Research*

For the Marine and Freshwater Science Special Edition on Women in Freshwater Science, we brought together the experiences of 12 women in our paper entitled *"Pushing the limits": experiences of women in tropical peatland research*.

The authors of this paper importantly come from a variety of different countries: the UK, Finland, Indonesia and Malaysia.

While our experiences as women in this field of study are understandably diverse, the paper focuses on certain key themes which emerged from our responses to various questions surrounding our experiences as women in tropical peatland research, the importance of role models, and what we would suggest to women looking to move into this field. In this article, I highlight a few of the

What a tropical peatland scientist looks like. Images contributed by authors.

issues that we discuss in the full paper:
We explore, in the paper, our shared love for our research, and how the tropical peat-swamps are where many of us have found our resilience through the challenges that we face as not only field researchers, but also as women. In many ways, the tropical peat-swamp has turned into a symbol of resistance against traditional societal expectations, as two authors expressed (all quotes are anonymized):

*"I am drawn to the challenge, and when faced with the reality that field research is still often male-dominated, with the perception that women are perhaps not as tough or strong, I think a part of me wanted to work in the toughest forest I could find! And that was a peat-swamp forest."* (Thornton et al., 2019, 4)

*"Questions like 'can you even walk in the field?' or 'can you really carry your backpack?' can always be expected. Frankly, it is a great feeling to prove them wrong and to see their expression seeing me doing things they thought I couldn't."* (Thornton et al., 2019, 4)

We also stress the importance of senior female role models and mentors because of their support of junior women in various ways, including publishing, which in turn allows them to establish themselves as researchers. Salerno et al. (2019) recently showed that, in contrast, male principle investigators (indicated as last author ) almost do not publish with women in the fields of zoology and ecology. These are worrying findings which illustrate that there is still a lot of work to do in fighting sexism in academia and research in general.

Just as in most other domains of work and life, women in tropical peatland research can also face hugely damaging situations of sexual harassment and toxic power dynamics with men, both in the field and in academia. We join the worldwide call that significant changes are still needed to make our workspaces not only safe for us to occupy, but also places for us to thrive.

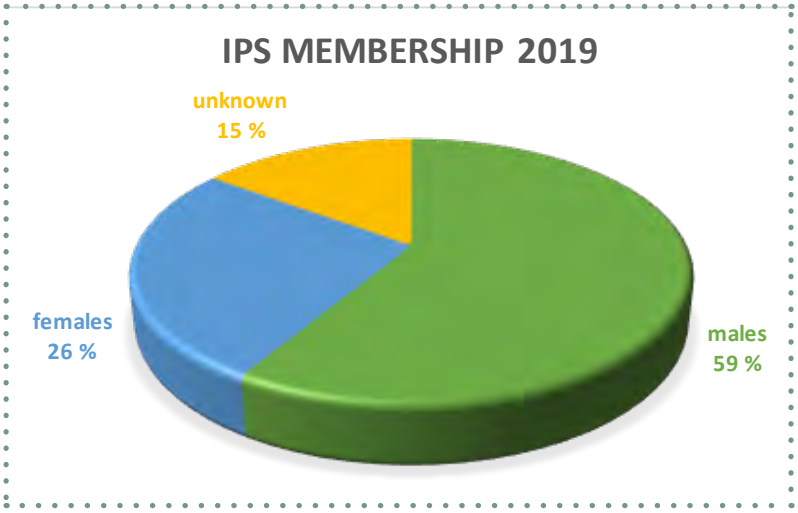
When it comes to issues of harassment in the workplace, organizations need to work *with* women to find solutions that work for them. From the very beginning, everyone (men, women, non-binary) should be made aware of clear procedures that provide sufficient support to those reporting harassment and inappropriate behaviour.

Our paper also stresses that cultural change which supports women in tropical peatland science is needed. Gender stereotypes are still prevalent, from harmful perceptions of women in the field to unequally shared responsibilities of childcare. Authors also brought up the issue of the 'bravado' surrounding fieldwork, which is expected to be found in other fields and warrants further research attention. Challenging this culture would likely benefit everyone, so that, together, we can courageously move towards more compassionate and therefore healthier research environments.

What is clear is that, following on from what we have heard from so many other STEM fields (science, technology, engineering and mathematics), a more balanced gender representation in tropical peatland research is needed, which would ultimately benefit the field.


Photo: Jonas Denil

Based on first names, the IPS membership comprised in early December 2019 about 871 men and 392 women. The gender is unknown for 222 members. Estimation and graph added by IPS Secretariat.




This is a call for everyone (men, women, non-binary) to come together to deal with the persistent issues we outline in this paper: it is unacceptable for invited women speakers to be outnumbered 14 to one at conferences (as has happened in past peatland conferences!).

## It should always be considered best practice to ensure the widest variety of voices are heard, taking into account gender, nationalities, race etc.

Only then can we build a science that is just, progressive and as world-changing as we all hope our science to be. This also involves broadening our conversations and awareness about marginalization to include other identities beyond the male/female binary positions.

We urge scholars and policymakers to continue efforts to make STEM fields more family-friendly (for men, women and non-binary) and reduce the baby penalty that women with children still pay. Otherwise, the increased recruitment of women will not result in increased retention.

It is also clear from our reflections how important mentoring and peer support networks are. They are vital in not only inspiring women in science, but also helping to retain them in research and academia. This was a shared experience on the part of all authors and provides hope for other women in and entering the field of tropical peatland research.

We also stress that formal or informal mentoring schemes in wetland science, and in this case tropical peatland research, have the potential to provide a powerful opportunity to tackle the underrepresentation of women. Setting up and then running these schemes require further effort. There are currently no mentoring schemes for women in peatland research that we know of (and only one for women in wetland research, organized by the Society of Wetland Scientists based in the US).

Our experiences as women in research are certainly similar to those in other research fields involving significant portions of fieldwork. We hope that this paper can support others in exploring and discussing their own experiences, while also continuing the efforts to make academia and research a place for everyone.

Full article citation: Thornton, S.A., Cook, S., Astiani, D., Hapsari, K.A., Varkkey, H., Cole, L.E.S., Dargie, G.C., Sjogersten, S., Zawawi, N.Z. & Page, S.E. (2019) "Pushing the limits": experiences of women in tropical peatland research. Marine and Freshwater Research, Special Issue on Women in Freshwater Research (online early): https://doi.org/10.1071/MF19132

Please feel free to contact me for a copy!

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# Sustainable Potting Soils

The European Competence Center for Peatlands and Climate (Europäisches Fachzentrum Moor und Klima, EFMK) in Wagenfeld in the Federal State of Lower Saxony, Germany is gaining reputation.

Recently, on 23 October 2019, an event presenting the final results of the Sustainable Potting Soils (*Nachhaltige Erden*) Project was organized at the EFMK. The two-year project started in October 2017. It is funded by the North-west Metropolitan Region. The applicant was the County of Diepholz.

A network of municipal waste management facilities and producers of growing media, supported by the regional Chamber of Agriculture, counties and environmental NGOs, sparked the idea of developing a peat-free potting and planting soil in the region and for the region.

## What Were the Objectives Behind the Project?

The aims of the project were:

- To protect peatland and the climate
- Interlink sustainability, $CO_2$ mitigation and profitability in the region
- Public relations to support awareness for sustainability criteria when buying potting soil
- To start a pilot project and continue networking
- To conduct plant growth experiments and storage trials

The European Competence Center for Peatlands and Climate in Wagenfeld. Photo: EFMK

Panel discussion at the final event of the project. From the left: Detlef Tänzer (County of Diepholz), Imke Schweneker (BUND Diepholzer Moorniederung), Michael Emmel (Chamber of Agriculture, Lower Saxony), Andreas Nieweler (AWG), Cord Bockhop (District Administrator Diepholz), Jörg Bensberg (First Chairman of the North-west Metropolitan Region), Christopher Straeter (Lower Saxony Ministry of Food, Agriculture and Consumer Protection), Josef Gramann (Gramoflor GmbH & Co. KG). Photo: County of Diepholz

During the course of the project, and on the basis of regionally available green compost (three sources), composted bark and wood fibre, a number of potting soil recipes was formulated, with different volume percentages for each of the constituents. Coconut coir pith - the overall second-best growing medium constituent besides peat - was not included in the trials because it is not regional.

During the storage trials of up to six months, a strong decrease in the nitrogen content was evident, as explained during the event.

This reduction in nitrogen during storage or plant cultivation is known as N-immobilization or N-fixation, caused by microbes in the growing medium. This is a well-known microbial/nitrogen interaction and occurs in every organic constituent used to manufacture growing media, but much less so in peat.

# Trial Results

As reported during the seminar, (salt-) sensitive crops, i.e., *Calibrachoa*, are likely to show chlorosis symptoms and retarded growth.

The study shows that less-sensitive greenhouse crops, i.e., *Pelargonium* are more tolerant of the chosen final potting mix and grow just as good as in peat-based media.


Final event of the Sustainable Potting Soils Project. Photo: County of Diepholz


Peat-free "regional potting soil" developed on the Sustainable Potting Soils Project. 45-l bags of potting soil are sold at regional recycling depots. Source: Mockup Diers+Hemmje

Additional N-fertigation or the addition of slow-release fertilizers to the mix can overcome this problem.

But are these project results new or innovative? Not really, maybe due to the regional background described above. Such results have been reported hundreds of times, representing basic knowledge for growing media producers.

However, such networks and projects deserve acknowledgement.

More information is available (in German) from: www.nachhaltige-erden.de

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Plant cultivation test series at the Chamber of Agriculture of Lower Saxony. Photo: Luise Reiher, Project Manager, Sustainable Potting Soils Project

# Sphagnum Farming in Focus

Industrial large-scale *Sphagnum* farming on rewetted extracted peatlands could reduce greenhouse gas emissions, secure access to substrate for growing media and help to achieve several environmental goals. These conclusions were reached during a seminar at the Swedish University of Agricultural Sciences (SLU) in Uppsala, Sweden, hosted by Sabine Jordan and the Department of Soil and Environment.

The seminar aimed at creating a forum for the dialogue on the future after-use of peatlands, with participants from science, the peat industry and the competent authorities in Germany, Sweden, Finland, and Norway. The focus was on the contribution of drained peatlands to the worldwide emissions of greenhouse gases and on *Sphagnum* farming as one of the solutions, where more carbon could be captured in the form of peat than is being released into the atmosphere.

## Promising German Results

In Germany, knowledge about *Sphagnum* farming has existed for 20 years, according to Matthias Krebs from the University of Greifswald and Silke Kumar from the Torfwerk Moorkultur Ramsloh. Several small-scale field trials have been accomplished, and now they have a study

In the greenhouse, basil and marigold grow well in Sphagnum mosses as substrate. Sabine Jordan (in the middle) describes the growth experiment. Photo: Monica Kling

Experiences from three countries were reported on by Matthias Krebs, Silke Kumar, Sabine Jordan, Hannu Salo, Madelene Carlsson and Sofia Ekmark (left to right). Photo: Monica Kling

site covering 14 ha where good results have been recorded. In this field, there was a fast lawn establishment after 1.5 years, and a high biomass productivity of about 8.7 tons of dry mass per hectare, per year. The first harvest was possible after only three years.

For Silke Kumar, *Sphagnum* farming is a way to secure the continuance of the family peat company, as the German authorities are not issuing any new permits for peat extraction. There is an evident interest among the growers in the *Sphagnum* product, which also has been tested by collaborative partners in professional cultivation.

The field experiments have shown that controlling the field water level is crucial to ensuring the successful establishment and growth of *Sphagnum* mosses. This has also been concluded by Finnish scientists from field trials at the Nature Research Institute Finland, as informed by Hannu Salo from the Bioenergy Association of Finland.

## Swedish Field Experiment Started

In Sweden, the first *Sphagnum* farming experiment was started on 2 ha in 2018. The peat company Hasselfors Garden runs the project in cooperation with SLU, Rölunda Produkter and TorvForsk. The establishment and growth of *Sphagnum* mosses as well as climate and environmental aspects have been studied by Sabine Jordan and her colleges at the SLU. The expected results should underline the potential for a climate-efficient and productive after-use of extracted peatlands under Scandinavian conditions.

Sofia Ekmark and Madelene Carlsson from Hasselfors Garden explained the experimental design and Sabine Jordan presented some of the results from her previous studies on rewetted extracted peatlands with spontaneously established *Sphagnum* mosses.

*Sphagnum* species may differ in quality aspects of importance to cultivation. Matthias Krebs demonstrates some specimens. Photo: Monica Kling

There she investigated greenhouse gases, peat and water

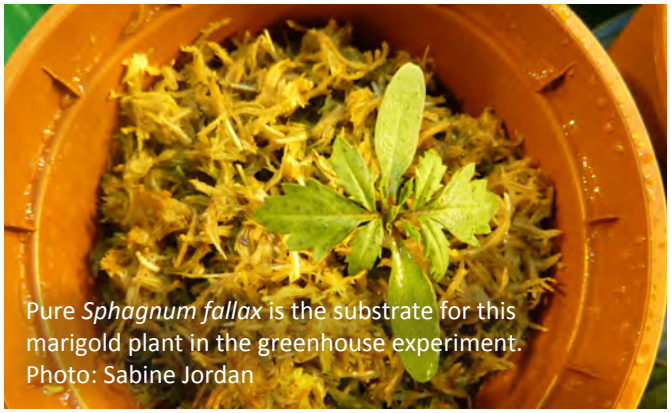
Lots of questions and views were brought up during the seminar. Here, Silke Kumar, Matthias Krebs and Hannu Salo discuss with participants from Neova, the Swedish EPA, and others. Photo: Monica Kling

chemistry and hydrology. These studies revealed, among other things, that *Sphagnum* mosses emitted some methane, but the size of the $CO_2$ uptake made them a sink.

Growth potential and growing media quality could however differ among *Sphagnum* species. This was discussed at the point where the opportunity was given to closely study some *Sphagnum* species.

In one of the SLU's greenhouses, we could also see that *Sphagnum* seems to work out well in plant cultivation. Here, Sabine Jordan presented the university's first growth experiment with *Sphagnum* as growing media substrate.

In the seminar, discussions about the very good prerequisite for *Sphagnum* farming in Sweden were emphasized, as extracted peatlands provide favourable conditions for moss establishment. Furthermore, *Sphagnum* mosses for start-up cultures can be found at nearby sites and there is a water regulation system already in place.



Pure *Sphagnum fallax* is the substrate for this marigold plant in the greenhouse experiment. Photo: Sabine Jordan

*Sphagnum* farming is a politically established concept which is practised in several countries. In Sweden, we are not there yet.

# Acknowledgements

For constructive and valuable discussions, we thank all the speakers and participants from different enterprises and agencies including Econova AB, the Geological Survey of Finland, Hasselfors Garden AB, the Swedish Environmental Protection Agency, Neova AB, Nittedal Torvindustri A.S, Rölunda Produkter, the SLU, Svensk Torv and TorvForsk.

For financial and material support for the project, which the seminar is part of, special thanks go to Stiftelsen Lantbruksforskning (SLF), the SLU, the Royal Swedish Academy of Agriculture and Forestry (KSLA), TorvForsk and Rölunda Produkter.

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# Sphagnum Farming as a New Tool for Peatland Restoration in Lithuania

On 13-14 September 2019, 2 ha of bare peat in a post-milled extraction field on the Aukštumala peatland site (Lithuania) were covered by diaspores of *Sphagnum* mosses. It is one of the largest *Sphagnum* growing sites in the Baltics, where the Canadian 'moss layer transfer technique' and German experiences in *Sphagnum* farming were applied, aiming at the restoration of raised bog ecosystems.

The work was undertaken on the initiative of the Lithuanian Fund for Nature, an NGO, within the framework of the LIFE Peat Restore Project and in close cooperation with JSC Klasmann-Deilmann Šilutė.

Preparatory work for *Sphagnum* planting took more than three years. It included thorough analyses of the ecological conditions at the site (peat and irrigation water properties, water hydrological regime) and possibilities to ensure proper water levels in *Sphagnum* growing fields.

Contributions were made by experts from the Greifswald Mire Centre while visiting German sites where *Sphagnum* farming is implemented (Hankhausen Moor), and by scientists from the Nature Research Centre (Lithuania) who completed the first *Sphagnum* cultivation experiments in the Aukštumala peatbog a few years ago.

The Project LIFE Peat Restore team is grateful to the volunteers and employees of JSC Klasmann-Deilmann Šilutė, who participated in *Sphagnum* planting actions. Photo: Žydrūnas Sinkevičius

Collecting donor material (*Sphagnum* mosses) in the peatland. Poto: Laima Šveistytė

Spreading of *Sphagnum* mosses was performed manually... Photo: Jūratė Sendžikaitė

collected by hand from old peat excavation pits, regrown by *Sphagnum*, and damaged fields, where peat extraction will take place. The spreading of mosses was performed during the second day, both manually and by using a slightly modified one-disc fertilizer spreader.

Attached to a mini-tractor and serviced by two people, it spreads mosses corresponding to the spreading speed of five to six people. Due to high winds during spreading, it was impossible to mulch *Sphagnum* by straw immediately in all areas.

Instead, *Sphagnum* and mulch were pressed by a wide-wheel tractor. Some days later, the whole of the *Sphagnum* farming field was covered by straw in order to create a more favourable microclimate (higher relative humidity, more stable temperatures) for *Sphagnum* growing.

The total volume of *Sphagnum* donor material was around 120 $m^3$.

As a result, the 2-ha site on Aukštumala peatland is divided into two parts, irrigated by ditches installed every 10 m. Water supply is ensured by two artificial water reservoirs for storing rain and snow melt water.

Automatic electric pumps provide water from the reservoirs to the *Sphagnum* fields to ensure constant water levels, which should be close to the peat surface. Water overflow is removed by a special outflow construction.

The *Sphagnum* planting campaign lasted two days. During the first day, donor material from *Sphagnum* mosses was

... and by using a slightly modified one-disc fertilizer spreader. Photo: Jūratė Sendžikaitė

Last steps of Sphagnum planting: rewetted site covered by straw mulch.
Photo: Valerija Daukantienė & JSC Klasmann-Deilmann Šilutė

These actions would not be possible without the contribution of volunteers and employees of the JSC Klasmann-Deilmann Šilutė, who took part in the event, despite strong wind and rainy weather.

The action is part of the 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 the European Commission, project partners and JSC Klasmann-Deilmann Šilutė.

"We, as the peat extraction company, feel responsible for our business activities, and support such activities as much as we can. We hope that such actions will provide new experiences on the most effective restoration methods and good examples of restoration of cut-over peatlands in our country", said the General Director of JSC Klasmann-Deilmann Šilutė, Kazimieras Kaminskas.

A short film about the Sphagnum spreading volunteer campaign can be found via this link: www.youtube.com/watch?v=2aWDjVNHWak

Donors waiting for transfer. Photo: Laima Šveistytė


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# Sphagnum Cultivation Provides Opportunities for Climate and Nature Conservation

## Introduction

A current pilot project has demonstrated that the cultivation of *Sphagnum* mosses is possible, even under the difficult hydrological conditions associated with highly humified black peat. Cultivated peat moss biomass can be used as a sustainable substitute for peat in horticulture. Compared to conventional agricultural use, the wet management of sites reduces greenhouse gas (GHG) emissions and creates new habitats for endangered animal and plant species typical of raised bogs.

*Sphagnum* cultivation ("*Sphagnum* farming") aims to grow peat moss for the harvest of non-decomposed *Sphagnum* fibres (Gaudig et al. 2018; Pouliot et al. 2015). This new type of peatland agriculture is an example of "paludiculture", which is defined as the sustainable productive use of peatlands under rewetted and therefore peat-preserving conditions (Wichtmann et al. 2016).

*Sphagnum* cultivation is initiated by spreading *Sphagnum* fragments on the bare peat. Due to their high regenerative capacity, the mosses grow out of the fragments. With a constant and sufficient water supply, they form closed lawns that can be harvested.

*Sphagnum* cultivation site '*Drenth*'. Photo: Klasmann-Deilmann GmbH

Several horticultural trials have shown that such Sphagnum biomass could successfully substitute peat in growing media, because it has similar physical and chemical properties to white peat (Emmel 2008).

The cultivation of *Sphagnum* was tested and scientifically monitored from 2015 to 2019 on two cut-over bog sites with shallow residual layers of highly

humified black peat and different hydrological starting conditions in north-west Germany. With a total area of 5 ha each, one site was established directly after peat extraction (‘*Drenth*’) with ongoing peat extraction in the surroundings, while the other site (‘*Provinzialmoor*’) has been rewetted for seven years (since 2008) prior to its installation.


*Sphagnum* cultivation site ‘*Provinzialmoor*’. Photo: Lotta Zoch

A project consortium has gathered together for the implementation and scientific monitoring of the experimental sites. The Institute of Environmental Planning at Leibniz University Hannover assessed and evaluated *Sphagnum* growth and the suitability of the cultivation sites as habitats for characteristic plant and animal species of raised bogs. The greenhouse gas balance of the “peatland-based” peat moss production was evaluated by the Thünen Institute of Climate-Smart Agriculture in Braunschweig.

The GHG balance includes the quantification of the influence of the peat moss harvest on the carbon sequestration of the donor sites. The substrate producer Klasmann-Deilmann GmbH provided and installed the fields and was responsible for the site management.

They examined the economic profitability of *Sphagnum* cultivation and the suitability of peat moss fibres as constituent for growing media.

The study was financed by the Lower Saxony Ministry for Nutrition, Agriculture and Consumer Protection and the German Federal Environmental Foundation (DBU).

# Sphagnum Growth

While the *Sphagnum* mosses established successfully at both cultivation sites, there was however a significant difference in cover, lawn thickness and biomass accumulation of *Sphagnum* between the two sites. Overall, *Sphagnum* growth was better at the site which had been previously rewetted and remained with a thicker residual peat layer ('*Provinzialmoor*').

A sufficient water supply and peat layer thickness proved to be essential factors for successful establishment and growth. Especially on sites with difficult hydrological and soil conditions, a


Beginning peat moss growth at the cultivation sites. Photo: Lotta Zoch

*Sphagnum* lawn at the cultivation site '*Provinzialmoor*'. Photo: Lotta Zoch

After only two years, the cultivated areas were able to provide a (partial) habitat for some species of fauna. It was possible to identify typical raised bog species from almost all species groups.

In the case of birds, the areas seem to offer favourable microclimate provided by vascular plants and rewetted surroundings can promote the successful establishment of *Sphagnum*.

# Biodiversity

In addition to the cultivation sites, the biodiversity of the flora and fauna was also evaluated as a reference at two near-natural donor sites and two conventionally rewetted sites.

A high number of plant species established at the cultivation sites. Many species were transferred with the introduced *Sphagnum* fragments from all of the four different donor sites. Some species additionally migrated from the surroundings of the sites or were introduced with the irrigation water. The high number of typical bog species and endangered species at the cultivation sites was comparable to that at the near-natural sites.

The frequency of plant species that were untypical for raised bogs was low at the cultivation sites. An overall low number of species was found at the conventionally rewetted sites. The transfer of *Sphagnum* material to the cultivation sites led to a high number of typical bog plant species, which was much higher than the floristic diversity of conventionally rewetted sites without the introduction of *Sphagnum* fragments.

favourable conditions, especially for ground-nesting birds. The suitability of the cultivation sites as habitats for amphibian and dragonfly fauna mainly depends on the presence of ditches and therefore on the type of irrigation. To date, dragonfly and amphibian larvae have only been discovered in irrigation ditches. Among the epigaeic invertebrates, spiders (*Aranae*), true bugs (*Hemiptera*) and beetles (*Coleoptera*) were among the dominant orders. The height of the *Sphagnum* lawn and vascular plants had a significant positive influence on the abundance of the epigaeic fauna.

*Sphagnum* cultivation creates habitats for the endangered plant and animal species of raised bogs. However, the species composition of a cultivation site depends strongly on the donor

Moor frogs find new habitats on *Sphagnum* cultivation sites. Photo: Lotta Zoch

The highly endangered keeled skimmer (*Orthetrum coerulescens*) at '*Drenth*'. Photo: Lotta Zoch

material, the age of the site, its maintenance and the landscape context.

# Greenhouse Gas Balance

The exchange of the greenhouse gases carbon dioxide ($CO_2$), methane ($CH_4$) and nitrous oxide ($N_2O$) was measured over a period of two years. Including the GHG emissions of the cultivation area, irrigation polders, dams and a still estimated amount of harvested biomass, the sites constituted relatively weak sources of around 5 to 10 t $CO_2$-eq. $ha^{-1}$ $a^{-1}$ during the initial phase (two to three years after installation). These results reflect the challenging hydrological conditions of the highly humified black peat as well as the extraordinarily warm and dry summer of 2018. The greenhouse gas exchange of the *Sphagnum* cultivation areas was strongly influenced by water availability and the composition and development of the vegetation.

The donor site showed a reduction in $CO_2$ uptake in the first year after the harvest only. Higher $CH_4$ emissions were measured in areas with a high proportion of vascular plants, even at low groundwater tables. Individual areas with fluctuating water levels and sparse vegetation occasionally showed high $N_2O$ fluxes. The $CH_4$ emissions of the irrigation polder were lower than those of the near-natural reference area, which showed $CH_4$ emissions in the upper range of natural and rewetted nutrient-poor peatlands (IPCC 2014). In comparison to raised bog sites under intensive agriculture, GHG savings between 10 and 30 t $CO_2$-eq. $ha^{-1}$ $a^{-1}$ could probably be achieved, depending on site characteristics and assumptions about agricultural use.

# Site Management

Maintaining an optimal water table proved to be a challenge on thin layers of highly humified black peat. The irrigation effort must be increased to compensate for additional water loss and low hydraulic conductivity. Especially in the initial phase, when *Sphagnum* fragments are at their most vulnerable, a constant and sufficient water supply is crucial.

The availability of sufficient water with suitable quality (preferably rainwater) needs to be carefully considered when planning a cultivation site. Water reservoirs that are filled with surplus rainwater in winter months can account for times with low precipitation. Water should not be stored on the cultivation field, because flooding reduces *Sphagnum* growth. Intense mechanization of the irrigation system proved to be necessary in order to keep personnel costs low and to be able to guarantee an optimal and constant water supply.

Regular mowing is recommended to keep the vascular plant cover at a low level and thus to decrease competition and achieve high-quality *Sphagnum* yields. However, vascular plants improve the microclimate and enhance the survival and growth of *Sphagnum*, especially if the abiotic conditions are suboptimal.

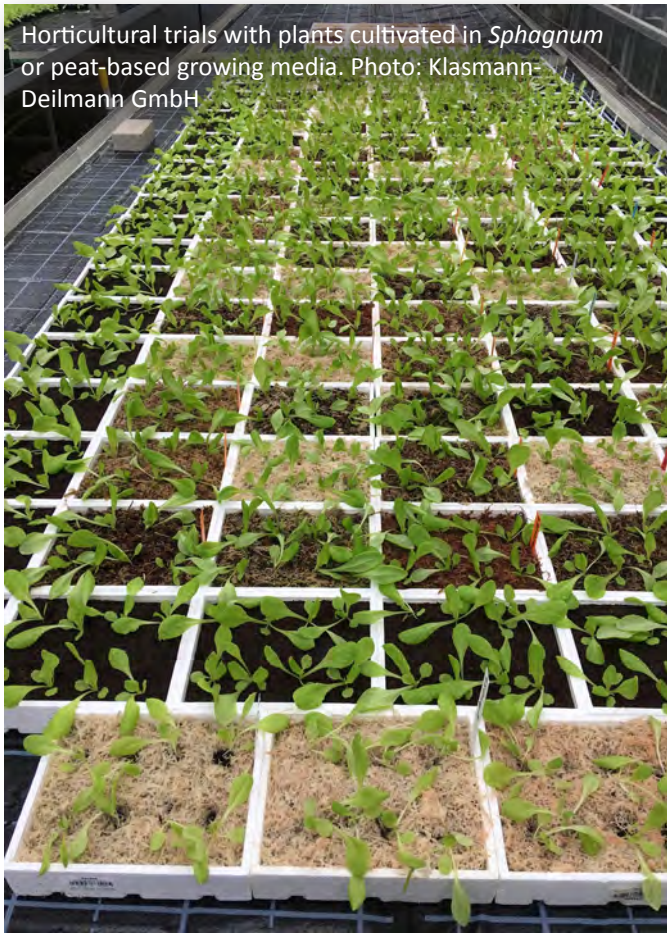
# Growing Media Suitability

The horticultural trials on this project had promising results. Peat moss, even in high quantities (mixed with or without peat), is a high-quality growing media constituent. Plants cultivated in *Sphagnum*-based growing media showed the same or even higher production rates compared to plants grown in peat-based media. The results also showed that the preparation and hygienization of *Sphagnum* fibres are possible with existing substrate production technology.

# Conclusions

The project has demonstrated that the cultivation of *Sphagnum* is possible under the difficult hydrological conditions of highly humified black peat. The chances of success are higher on sites with peat layer thickness (>1 m) in wet surroundings. Sufficient water quantity and quality are prerequisites for successful *Sphagnum* cultivation. The cultivated *Sphagnum* fibres can be used as a sustainable substitute for peat in horticulture.

*Sphagnum* biomass grown on sites with highly humified black peat in Germany is not yet able to compete with fossil peat as a growing media constituent, as current support schemes cannot compensate for the high costs of site installation and maintenance. The reduction of greenhouse gas emissions through the wet management of *Sphagnum* cultivation sites and the positive effects on biodiversity are not yet rewarded. With regard to bog restoration, the introduction of *Sphagnum* fragments has proven to be an interesting option to speed up the regeneration of rewetted peat extraction sites.



Horticultural trials with plants cultivated in *Sphagnum* or peat-based growing media. Photo: Klasmann-Deilmann GmbH

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# Wetscapes Conference in Rostock, Germany

## 10-13 September 2019

WETSCAPES - "Understanding the ecology of restored fen peatlands for protection and sustainable use" - was held at the University of Rostock, Germany, under the auspices of the the Ministry of Education, Science and Culture of Mecklenburg-Western Pomerania.

This conference brought together researchers and practitioners that work on any type of bog and fen peatland or on coastal non-peatland wetlands - pristine, artificially drained and rewetted. Experiences of agricultural scientists, soil scientists, ecologists, and practitioners from agriculture, forestry, nature conservation,


160 participants from 20 countries at the WETSCAPES Conference in Rostock, Germany. Photo: Thomas Rahr, University of Rostock

landscape planning, water engineering and other fields related to peatland management were exchanged.

Gerald Jurasinski, one of the organizers, summarized the results of the conference. Photo: Franziska Schmacka, University of Rostock

Around 160 participants listened to and discussed 73 presentations, including 12 keynotes. There was also a wide selection of posters representing a broad area of research on bogs and fens globally.

The session topics were:

- Peatland rewetting and water quality
- Peatland rewetting, land management and policy
- Mapping peatlands and peatland ecohydrology
- Peatland management and element cycling and export
- Peatland rewetting, proxies and modelling
- Peatland rewetting and microbiota
- Greenhouse gas emissions and its drivers
- Plant growth and decomposition
- Peatland rewetting and vegetation
- Peatland rewetting and greenhouse gas emissions

A poster session and get together was held on the first evening, excursions were organised on day 2 and the conference dinner was held on the evening of day 3 on a ship in Warnemünde harbour.

# Background

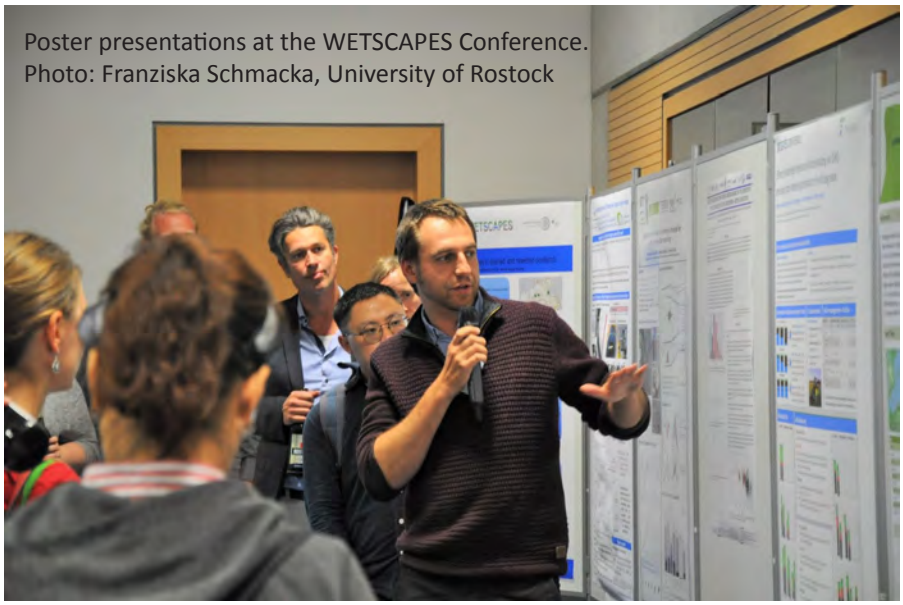
Peatlands cover less than 3% of the global land surface but contain 480-610 gigatonnes of carbon. This is more than the carbon stock in the entire forest biomass of the world meaning that peatlands are the largest terrestrial carbon store on the planet.

Many peatlands have been drained for agriculture and forestry, while a small area has been used for peat extraction. Drainage leads to peat decomposition and subsidence, a process that can continue for decades. Initially, drained peatlands may provide favourable conditions for agriculture, but these deteriorate, and eventually degrade to become unsuitable for agriculture.

Despite their relatively small global area drained peatlands release much $CO_2$ and are responsible for nearly 5% of the world's anthropogenic greenhouse gas emissions (estimated to be at least 2 gigatonnes C per year).

Wetlands also function as buffers for water and compound fluxes and enable landscapes to be


Anke Günther, a young scientist of the WETSCAPES consortium, presented her results that show that carbon dioxide emissions pose the greatest threat for reaching the Paris goals. Photo: Franziska Schmacka, University of Rostock



Poster presentations at the WETSCAPES Conference. Photo: Franziska Schmacka, University of Rostock

landscape, thereby facilitating carbon storage, nutrient retention, climate regulation, and habitat function.

A better understanding of peatland ecosystem functioning, and the underlying processes is the basis for implementing responsible use of wet landscapes.

Many of the problems relating to the wiser use of bogs and fens were highlighted at this WETSCAPES Conference.

resilient against extreme weather conditions and chemical fertiliser application.

Drained peatlands can be rehabilitated by rewetting but to date implementation is patchy and leads to loss of agricultural land, leading to economic and social conflict.

Paludiculture, a new management approach, that combines peatland with agriculture or forestry, is being tested as an alternative. The vision of the 'WETSCAPES' Project is to keep water in the

# Summary of Programme

**September 10th 2019**

Opening and welcoming speeches were delivered by or on behalf of the Rector of University of Rostock; Ministry of Education, Science and Culture Mecklenburg-Pomerania; Federal Ministry of Environment, Nature Conservation and Nuclear Safety.

One of the excursions took the participants to a rewetted alder carr. Photo: Franziska Schmacka, University of Rostock

At the excursions to a rewetted coastal peatland the participants learned how greenhouse gases were investigated within the project WETSCAPES. Photo: Franziska Schmacka, University of Rostock

The first joint Plenary Session on "Peatland rewetting and water quality" kicked off with a keynote by P. Van Cappellen, University of Waterloo, Canada on "*Understanding soil organic matter decomposition: back to basics*".
This was followed by a joint plenary session "Peatland rewetting, land management, and policy" with the scene set in a keynote by Marcel Silvius, Global Green Growth Institute, Indonesia on "*Jurisdictional landscape-wide approach to tropical peatland restoration*".

After lunch the participants divided into two parallel sessions, one on "Peatland ecohydrology" led by a keynote from F. Rezanezhad, University of Waterloo, Canada on "H*ydrogeochemical reactivity of peatland soils*"; and the other "Mapping peatlands" with a keynote from Rebekka Artz, The James Hutton Institute, UK on "*Mapping peatlands remotely*" given remotely by video link. A poster session was held in the evening together with a 'get together' over beer and pretzels.

**September 11th 2019**

This was a day of field excursions with a choice of four destinations in the vicinity of Rostock.

*Excursion 1 'Hike through an alder carr'*
*Lead: Dr Tobias Scharnweber, University of Greifswald*

This visited the "farmers mire" or "Bauernmoor" a small (about 10 ha) forested peatland near the old estate Wöpkendorf about 30 km east of Rostock. It is groundwater fed and fills a small depression in this young morainic landscape. Its history has been documented since the end of the 17th century when it was sparsely forested and used as a pasture.

It was abandoned towards the end of the 19th century, and an alder-ash forest developed.

Around 1900 the mire was drained and managed as high forest. Poor maintenance of ditches led to an increasing occurrence of waterlogging since the 1990s. In 2003 rewetting was initiated bringing the maximum water level to 1.30 m above the surface causing most of the trees to die. A WETSCAPES

Measurement of green house gases in a rewetted alder carr, one of the monitoring plots of the project WETSCAPES. Photo: Franziska Schmacka, University of Rostock

A further monitoring plot of the project WETSCAPES is located within a rewetted percolation mire. Photo: Franziska Schmacka, University of Rostock

monitoring plot, with detailed instrumentation of above and below ground growth and peat formation/decomposition processes, was installed at the margin. During the excursion participants walked around the surrounding of the rewetted mire.

*Excursion 2 'Coastal mire and Baltic Sea beach'*
*Lead: Dr Gerald Jurasinski, University of Rostock*

The nature reserve "Heiligensee und Hütelmoor", which covers about 540 ha, features a vast peatland complex that consists primarily of fen, with a small bog, beach lake, natural beaches and dunes and ancient forests of oak and beech. These habitats are home to diverse and unique biotic communities. Almost all fen parts of the area were drained in the late 18th century and again in the 1960s. These were rewetted in late 2009 and now are inundated almost year-round and the vegetation has changed again.

In 2008, the Landscape Ecology Group of the University of Rostock started to measure $CO_2$ emissions at the landscape level using an Eddy Covariance Tower; in 2009 closed chamber measurements commenced, focusing on $CH_4$ exchange. In 2011 a $CH_4$ sensor was added to the Eddy setup and the impact of vegetation change from 2011 to 2014 was monitored.

In the year after rewetting the area was a strong greenhouse gas source, mainly because of very high $CH_4$ emissions whereas net ecosystem exchange was almost unaffected. Subsequently $CH_4$ emissions became much lower and stabilised whereas net ecosystem exchange started to vary strongly between years.

*Excursion 3 'Historic and recent land use of river valley fens'*
*Lead: Dr Anke Günther, University of Rostock*

The percolation mire, that was visited at excursion 3, was rewetted 20 years ago and its function as sink of greenhouse gases could be restored. Photo: Franziska Schmacka, University of Rostock

North-eastern Germany was once covered by large areas of growing mires. Today, about 13% of the area is still covered by peat soils. The majority is degraded, while a small part has been rewetted. The area had been used mainly as pastures for centuries.

With the rise of salt production from a local salt spring in the town Bad Sülze, peat was extracted for fuel to heat the salt

pans and the surrounding peatlands were drained following the 13th century. After cessation of salt production, many areas were deeply drained and used as intensive grassland since the 1960s. In 1997, 3,000 ha were rewetted as part of an EU-LIFE project.

The excursion visited river valley fens, coastal peatlands and alder forests that are being studied in the "Wetscapes" project, focussing on typical land use histories and status of river valley fens. Impact of peat extraction, agriculture, and rewetting were observed, and two former percolation mires were visited that formed along the rivers Recknitz and Trebel.

*Excursion 4 'Coastal flood mire and research at the Greifswald Mire Centre'*
*Lead: Dr Franziska Tanneberger, University of Greifswald*

This excursion visited field and mesocosm research in and close to the city of Greifswald, spending the morning at Karrendorfer Wiesen and continuing to the mesocosm compound at Greifswald University and inspecting other research facilities at the Greifswald Mire Centre.

The shore provides a unique habitat with low salinity and without tides. After 6,000 BP, a peatland developed here, over centuries with "anthropozoogenic" peat formation, with the peat surface growing up above the sea level to provide coastal protection.

Following periods of increasingly intensive agricultural use, as pasture, meadow and even arable land, in 1993, the removal of the dike around the Karrendorfer Wiesen polder re-exposed 360 ha of former salt meadows to flooding by the Baltic Sea.

Within a few years, salt meadow species re-occupied the formerly intensively used agricultural lands and soon the salt meadows functioned again as coastal protection.

Now largely owned by the Michael Succow Foundation, partner in the Greifswald Mire Centre, the site is managed by cattle and water buffalo grazing and long-term bird monitoring is carried out. Further restoration works will be implemented in 2019-2021.

**September 12th 2019**

The second day of the Wetscapes Conference began with a joint plenary session "Peatland rewetting, proxies and modelling" with a keynote by Chris Evans, Centre for Environment and Hydrology, Wales, UK on "*Come hell or high*

The location of the WETSCAPES monitoring plot in a rewetted coastel peatland is used as pasture. Photo: Franziska Schmacka, University of Rostock

*water. Mitigation of greenhouse gas emissions from agriculturally drained peatlands*". After refreshments there was a joint session on "Peatland rewetting and microbiota" with a keynote from S. Liebner, German Research Centre for Geosciences, Potsdam, Germany on "*Microbial Response to Peatland Degradation and Rewetting*".

Following lunch there were two parallel sessions, one on "Greenhouse gas emission and its drivers" with a keynote from Maria Strack, University of Waterloo, Canada, on "*Returning carbon sink function*", delivered by video link and the other on "Plant growth and decomposition" that started with a keynote from Wiktor Kotowski, University of Warsaw, Poland on "*Productivity gradients, vegetation processes, and ecosystem functions in fens*".

Later in the afternoon there was another parallel session on "Greenhouse gas emission and its drivers II" and "Plant growth and decomposition II", without keynotes. The Wetscapes Conference dinner was held in the evening aboard a ship cruising around Warnemünde Harbour.

**September 13th 2019**

In the morning there were two plenary sessions. The first "Peatland rewetting and vegetation" commenced with a keynote by S. Pangala, University of Lancaster, UK on "*The role of lateral and tree transport in methane cycling in tropical peatlands*". The second, "Peatland rewetting and greenhouse gas emissions", started with a keynote from A. Günther, University of Rostock, Germany on "*Peatland rewetting: balancing methane emissions against carbon dioxide savings*".

After lunch participants had the choice of two parallel sessions, one on "Peatland Management" and the other "Element cycling and export". J. Guerts, Radboud University, Nijmegen, Netherlands provided the introductory keynote on "*Experiences from paludiculture experiments in the Netherlands: which factors influence carbon fixation and methane emission?*" to the first of these sessions. K.-H. Knorr, University of Münster, Germany led the other session with a keynote on "E*valuating the relevance of redox properties of peat organic matter as a control on anaerobic carbon mineralisation*".

# Closing

After this very intensive and important programme of scientific presentations on peatlands and peat over two days the conference was wrapped up and conclusions drawn in a short debate chaired by Gerald Jurasinski and John Couwenberg, after which participants departed. Further information can be found at www.wetscapes.uni-rostock.de/en.

Jack Rieley

IPS Executive Board member
jack.rieley@peatlands.org


At the Bauernmoor. Photo: Jack Rieley

# Get nominated for the EB - deadline *14 February*!

The IPS will hold elections to its Executive Board (EB) next June. There will be **7 vacant** positions: for the President, First and Second Vice President as well as four Ordinary Members. Nominations for these positions must be sent by National Committees by **14 February 2020** to the IPS Secretariat.

This is your chance to get involved in, obtain real insider knowledge, network and influence the future of the IPS! In practice, all National Committees can submit proposals (Sweden, Malaysia, the UK and Germany only for the President and two Vice President roles).

**Contact your National Committee and convince them that you are the best candidate.**

Proposals should include a one-page presentation of the nominated person and a clear statement for which position(s) he/she is being proposed. The following positions will become vacant:

**Presidents until June:**
Gerald Schmilewski, Germany - vacant
Guus van Berckel, Netherlands (1st Vice) - vacant
Samu Valpola, Finland (2nd Vice) - vacant

**Ordinary Members until June:**
Donal Clarke, Ireland - vacant
Paul Short, Canada - vacant
Erki Niitlaan, Estonia - vacant
Zhengping Wang, China - vacant

On the Board remain until 2022 Sabine Jordan, Sweden; Lulie Melling, Malaysia; Jack Rieley, United Kingdom; and Frank Tamminga, Germany.

**Rules for the Executive Board**

"So as to ensure an equitable distribution of national representation, there can be only one Ordinary Member from any one National

Photo: Nicolas J Leclercq

Committee on the Executive Board at any given time. The President and the two Vice Presidents should come from different countries, but can be from the same National Committee as one of the Ordinary Members.

Nominations for any position on the Executive Board must come from National Committees at least **four months** prior to the Annual Assembly and the nominees must be IPS **members residing** in the country in which the National Committee is located.

Separate nominations must be made for each position (President, First Vice President, Second Vice President, Ordinary Member). The same person can be nominated for **more than one** position, but each **nomination must be clearly stated** in the nomination papers.

When proposing candidates for the Executive Board, National Committees shall ensure that nominees' **travel expenses** are covered.
All candidates are asked to prepare a **one-page written presentation** of him/herself including qualification for the candidacy, and to speak for no more than three minutes at the Assembly."

# Peat and Peatland Events

UNFCCC COP 25, CMP 15, CMA 2
Madrid, Spain (new venue!)
2 - 13 December 2019
www.cop25.cl/web/en

Southern Hemisphere Regional Conference on Permafrost of the International Permafrost Association (IPA)
Queenstown, New Zealand
4 - 14 December 2019
https://southcop19.com

3rd Finnish Peatland Day
Helsinki, Finland
31 January 2020
www.suoseura.fi

Ramsar STRP23
Gland, Switzerland
16 - 22 March 2019
www.ramsar.org

6th Flow Country Research Conference
Understanding Dynamics
Thurso, UK
17 - 19 March 2020
www.eventbrite.co.uk/e/flow-country-research-conference-6-understanding-dynamics-registration-83152652823

IPS Executive Board Meeting
Newbridge, Ireland
between 23 March - 5 April 2020
www.peatlands.org/events

Tenth International Symposium on Land Subsidence (TISOLS)
Delft-Gouda, the Netherlands
20 - 24 April 2020
www.tisols2020.org

European Geosciences Union (EGU)
General Assembly 2020
Vienna, Austria
3 - 8 May 2020
www.egu2020.eu

**First World Peatland Day**
**2 June 2020**
**www.peatlands.org/event/world-peatland-day**

IV. ISHS International Symposium on Horticulture in Europe (SHE)
Stuttgart, Germany
2 - 6 June 2020
https://she-ihs-fav2020.de

Québec RE3 Conference 2020
From Reclaiming to Restoring and Rewilding
Quebec City, Canada
7 - 11 June 2020
www.re3-quebec2020.org

IUCN World Conservation Congress
Marseille, France
11 - 19 June 2020
www.iucn.org

**16th International Peatland Congress**
**Tallinn, Estonia**
**14 - 20 June 2020**
**www.ipc2020.com**
**www.facebook.com/peatlandcongress**
**www.facebook.com/events/1162609177193984**

SIWI World Water Week 2020
Stockholm, Sweden
23 - 28 August 2020
www.worldwaterweek.org

AsiaFlux Conference 2020
Kuching, Sarawak, Malaysia
22 - 24 September 2020
www.asiaflux.net



More at: www.peatlands.org/events

## New Members of the IPS

New members (or new contact persons for corporate and institute members) are mainly approved by our National Committees. For all other countries, the approval is made by the Executive Board of the IPS. Each National Committee is asked to compare their membership list to that of the IPS at least once a year (status below as of 10 December 2019) More info: www. peatlands.org/join-us.

**Individual members:**
Canada, CSPP: Scott Davidson, Sylvain Jutras, Chris Newton, Nigel Roulet, Barry Warner
Indonesia: 332 members (names next issue)
Ukraine: Vasylii Fatenko, Volodymyr Hnieushev, Inna Ivashyna, Ivan Kyrychyk, Oksana Lynnyk, Viktor Moshynskyi, Kostiantyn Mykytas, Illia Skliarevskyi, Liliia Stepchenko, Serhii Vashchuk
United Kingdom: Rebekka Artz, Olivia Bragg, Christopher Evans, Paul Gaffney, Peter Sale
USA: Stefan Muehlbauer

**Corporate & institutional members:**
Canada, CSPMA: Ka Yeon Jeong and Yedidia Koschitzky (Sun Gro Horticulture), Nicholas McGougan (Juniper Organics), Geneviève Potvin (Scotts Canada), Kristian Swan (John Deere Limited)
Estonia: Elar Abram (AS Kraver), Eric Beaudet (Florentaise), Pēteris Gredzens (IntelliTech Ltd), Jüri Hiienurm (Invester OÜ), Olar Järvloo (FIE Olar Järvloo), Erlend Kotkas (Skywind OÜ & Matureks AS), Kristjan Kuuse (Rapla Turvas OÜ), Marek Linnutaja (Yara Eesti OÜ), Janek Ojamäe (HansaPeat OÜ), Matti Puuronen (AS Tootsi Turvas), Erik Ratnik (OÜ Vestur), Terje Retter (AS Estiko Plastar)
France/Canada: Jacques Blanchet (Premier Tech Falienor)
Lithuania, LPA: Zivile Bauziene (UAB Patyrio samana), Oksana Strasinskiene (IPS Lithuanian National Committee)
Russia: Evgeny Lysenko (Russian Peat Company)
Ukraine: Dmytro Babakov ("Rivneengoalyans" Limited Liability Company), Oleh Hohenko (Limited Liability Company Research Technical Enterprise Techno), Andrii Ozerchuk (Ukrainian Peatland Association)
United Kingdom: Christopher Greenwood (Turftech International Ltd.)
USA: Dennis Berry (BASF Corp.)

**Student members:**
Finland (Suoseura): Petri Salovaara, Heidi Verkkosaari
United Kingdom: Benjamin Crezee, Benjamin Inglis-Grant, Anna Keightley, Anna Macphie

Membership fees are collected by the National Committees on their own conditions and timetables. For members in other countries, invoices are sent by the IPS Secretariat in June. You can ask for, change or delete your membership information any time by contacting info@peatlands.org.

# Next issue...



## You are welcome to write!

Please send your manuscript (500-2000 words, A4, Arial, no full cap lines, with author contact details, language proofread if possible, e.g. **www.englishproofread.com**), photos and illustrations (separate jpg files with the names of the photographers, you need to have copyrights and persons' consent) and advertisements (pdf files, prices according to Media Kit) to susann.warnecke@peatlands.org.

Submission deadline: PI 1.2020: **1 March!**

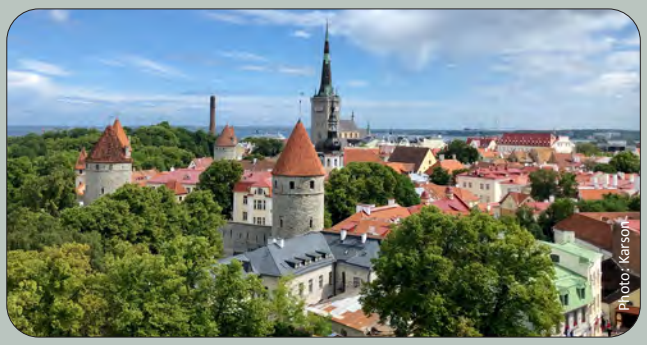


Photo: Karson

Welcome to the 16th International Peatland Congress in Tallinn, Estonia!

Third Finnish Peatland Day Seminar in Helsinki - Reports and Update from 31 January


Photo: Alexandre Croussette


Photo: Andear Ferrario

UNFCCC COP25 in Madrid - What have we learned and what can be done in future?