

Peatlands

International

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International Peatland Congress 16.0

Tallinn, Estonia

14 - 20 June 2020

www.ipc2020.com

Mark the dates!



Tallinn in winter. Photo: Kaupo Kaida, visit tallinn.ee

Editorial

New forces for the IPS

This edition of Peatlands International comes at an important moment in the calendar of the International Peatland Society. We have just finished a three-day meeting of the Executive Board in Tallinn, Estonia at which we appointed **Dr Gilbert Ludwig** as the new Secretary General.

This is the first time that the IPS will have a full-time Secretary General and it is our hope and belief that this extra resource will make it possible for us to progress strategic objectives which we have had to “park”. See more on page 6!

Among the other items we considered was the second **Tropical Peatland Round Table** which took place in Batam, Sumatra. The initiative to hold Round Tables was taken by the IPS following the 15th International Peat Congress in Kuching. The first Round Table took place in Jakarta in November 2017. A fresh report by Professor Jack Rieley and the official “Batam Statement” can be found on page 32.

In the last two years the scientific work of the IPS has been strengthened by the rationalisation



of ten Commissions into three, and the establishment of a range of Expert Groups under each of the three Commissions. Each Expert Group is led by a coordinator. The Commission Chairs and Expert Group coordinators met in Amsterdam in early February 2018 for the first time.

This meeting was judged to be so beneficial to the work of the IPS that the EB has convened a second international **Expert Meeting** to be held in Tallinn in mid February 2019.

One of the outcomes of the Amsterdam meeting was a mechanism to facilitate the revision of the **Strategy for Responsible Management (SRPM)**. The Executive Board was briefed on plans to have

Peatlands International is the global magazine of the International Peatland Society (IPS). It provides the almost 1,500 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.

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Are you interested?
Contact ips@peatlands.org.

Cover: Traditional Indonesian dance formation at the opening of the 2nd Round Table on Tropical Peatlands in Batam. Photo: Gerald Schmilewski

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the draft revised SRPM ready by February 2019.

As you know, in September 2018 an IPS "Summit" was held in Rotterdam at which senior representatives of International Conventions and Organisations briefed members on the discussions in, and resolutions of, these bodies relevant to peatlands.

The information provided was illuminating but made uncomfortable listening for some in the audience. The Executive Board confirmed its decision to continue following the debates in these bodies, and to attend as many relevant meetings as resources allow.

January 2019 will represent a new start for the IPS - and Gilbert Ludwig and Susann Warnecke have our best wishes for this new era.

Donal Clarke

Member of the IPS Executive Board
donalcla@eircom.net



13 - 16 MAY 2019
BREMEN, GERMANY

 MORE INFO COMING SOON

YOU'RE INVITED TO THE
IPS ANNUAL CONVENTION

Hosted by the German Peat Society (DGMT) and IPS

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Gilbert Ludwig

New Full-Time Secretary General of the IPS

Dr. **Gilbert Xavier Ludwig** has been appointed as the new Secretary General of the International Peatland Society (IPS) as of **1 January 2019**. He will be based at the IPS Secretariat in Jyväskylä, Finland.

Dr. Ludwig holds a PhD and MSc in Ecology and Environmental Management from the University of Jyväskylä. He also completed a Diploma

in Economics and Business Administration at École Supérieure de Commerce in Neuchâtel, Switzerland. As a Swiss national his mother tongues are German and French, and he is fluent in English.

Dr. Ludwig has been living in Finland for 24 years and is also a proficient writer, communicator and negotiator in Finnish.

Ready for his challenging task:
Dr. Gilbert Ludwig (right) and Gerald Schmilewski (left), who has, together with 2nd Vice President Dr. Samu Valpola, fulfilled SG responsibilities for two years in addition to his tasks as IPS President.



Photo: Susann Warnecke

In recent years, Dr. Ludwig has been working as a specialist and project manager for Jyväskylä University of Applied Sciences in the area of IT, entrepreneurship and sustainable bio-economy as well as R&D, project management and stakeholder collaboration. He also gained experience of R&D at Bitcomp Oy and of project management at the Finnish Wildlife Agency.

For the IPS he will be providing leadership and help in implementing its Strategy 2016-2020. His appointment will further strengthen

- internal and external communication,
- monitoring implementation of actions taken by the Executive Board,
- planning events and projects in co-operation with the Scientific Advisory Board and Expert Groups,
- taking financial and budget responsibility, and
- working with the business and science communities.

Dr. Ludwig was born in 1969 and is married, with two adult children. He can be reached at gilbert.ludwig@peatlands.org, further contact details will be made available at www.peatlands.org/about-us/secretariat in January.



Susann Warnecke

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Tere tulemast: 16th International Peatland Congress

The Estonian Peat Association would hereby like to introduce the 16th International Peatland Congress, taking place in Tallinn from 14 - 20 June 2020.

A Peat(land) Congress has been organized every four years since the second Congress in 1968. The first event of that kind took place in 1954, and their name was changed in autumn 2016 to broaden perspectives.

The main aim of the Congresses has been to bring together leading scientists researching peat and peatlands to discuss and present their latest findings.

Over time, industry has become less interested in the Congress programmes because they are funding fewer scientific and technical research projects and are less interested in academic presentations. However, many peatland restoration techniques that are now used widely by companies have been developed by peatland practitioners and scientists over a long period of time with information gained by the presentation and exchange of information at these congresses.

With this context in mind, the topic for Tallinn2020 will be “Ecosystem services” so that the discussion can be taken further and to the next level with regard to traditional restoration and peatland



Tallinn Old Town. Photo: Kaupo Kalda, visittallinn.ee

management topics. So what do we want to achieve?

1. To view peatlands as a whole, as important providers of ecosystem services

One thing that the industry and the scientists definitely have in common is the fact that whatever we do, we have to address the issue of climate change. We also know that abandoned, disturbed and mismanaged peatlands are huge sources of greenhouse gas emissions. Now the discussion goes in two directions when asked whether to restore or use those areas.

The realistic view is that even if all government funding were directed to restoration projects, it is questionable as to whether this would be enough, let alone the amount of time it would take to restore all of the disturbed peatlands. Therefore, from the industry point of view, in some cases, it would be economically and environmentally more efficient to use the resources that are already available and then restore the area. This is something that the scientists and industry have to do together.

2. Facilitate dialogue between industry and scientists

There is a very strong misperception that the industry is the bad wolf and environmental scientists are the ones fighting to save nature. As much as this conflict is not fundamentally written in the relationship between the two, there should be a constructive dialogue in place, as there would not be industry without environmentalists and vice versa.

The problem, however, is more rhetorical than practical which is why one of the main goals of the congress is to show as many practical examples as possible of where cooperation between industry

and environmentalists has led to very successful win-win outcomes for both.

To address this a special industry programme is planned, in which more practical presentations are selected, allowing discussion beyond dry measurement statistics and micro analysis to be started.

3. Address the wider public

Environmental programmes have done a very good job at introducing the pristine beauty of nature. What the congress wants to add is a broader and general understanding of its functions. The wider public surely knows that peatlands are a home to unique flora and fauna, but not much yet has reached popular science of peatlands as carbon sinks or providers of other ecological services - this being an important part of the debate on climate change.

For this reason, we have planned public lectures, a movie programme and photo contest that will explain the usage and functioning of peatlands through the eyes of the average person on the street.

Margit Pulk

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Jump into Viru Bog. Photo: Katri Palm, visittallinn.ee

A Peatland World Heritage Site in Scotland?

The Flow Country in the running to be the UK's next World Heritage Site

The Flow Country enjoys a very positive reputation among peatland enthusiasts around the world. Yet it flies very much under the radar for most Scottish residents and visitors. This could all change, however, if the Flow Country was to be enjoy wider attention as a result of World Heritage Site status.

The Flow Country has been sitting on the UK's tentative list for World Heritage Site inscription since 2012, in recognition of its potential to join world-renowned natural sites such as the Grand Canyon, the Great Barrier Reef and the Serengeti. The Flow Country's position on this list was first encouraged by the Nature Conservancy Council in 1988 and has more recently been strengthened by a comparative study commissioned by the Greifswald Mire Centre, which concluded that the Flow Country exhibits the best habitat of its type in the world.

The location and scale of the proposed World Heritage Site

The proposed Flow Country World Heritage Site is located in the historic counties of Caithness and Sutherland in the north of Scotland, at the

heart of one of the largest areas of blanket bog in the world. The term 'Flow Country' derives from the Scot's word "flow" or "flowe", meaning a wet landscape, and is often taken to refer to all of the peatlands in the two counties. These peatlands extend to approximately 4,000 km² and, while it is unlikely that a World Heritage Site would include every square kilometre of peatland in Caithness and Sutherland, it would likely dwarf existing UK World Heritage Sites. To give an idea of scale, the Lake District World Heritage Site could fit almost twice into the Flow Country, as it stands at just 2,300 km².

How might the Flow Country become a World Heritage Site?

The process of bringing a site to World Heritage inscription is neither short nor simple. A technical evaluation, outlining the property's suitability as a World Heritage Site, first needs to be submitted to the Department for Digital, Culture, Media and Sport (DCMS), which will then decide whether or not the Flow Country can proceed with a full application to UNESCO. Two such evaluations, submitted in 2013 and 2015, were put forward by the Peatlands Partnership and subsequently

returned with encouragement for reapplication. In early 2018, the Peatlands Partnership established the World Heritage Site Working Group with the sole purpose of submitting a successful technical evaluation as an essential step in realising the Flow Country as a World Heritage Site.

UNESCO accepts new properties on the basis of their “outstanding universal value” (OUV), of which there are 10 criteria. A property only needs to prove OUV in one criterion to be accepted as a World Heritage Site, so an application is not necessarily strengthened by arguing for multiple criteria. The Flow Country stakes its claim to two criteria, in recognition of the quality and extent of its blanket bog habitat and of its unique breeding bird assemblages.

In proving that the Flow Country has OUV, it must be argued that this property is vital, not only to the two counties in which it sits (Caithness and Sutherland), nor Scotland or the UK as a whole, but to the whole world. If the World Heritage Site bid were to be successful, it would be the responsibility of the Scottish Government,



“Flow Country” (dark grey area on the map) covers approximately 4000 km² in the north of Scotland.



The characteristic pool systems or “dubh lochans” can be seen from the top of the Flow’s Lookout observation tower, situated on RSPB’s Forsinard Flows NNR, in the heart of the Flow Country. Photo: RSPB

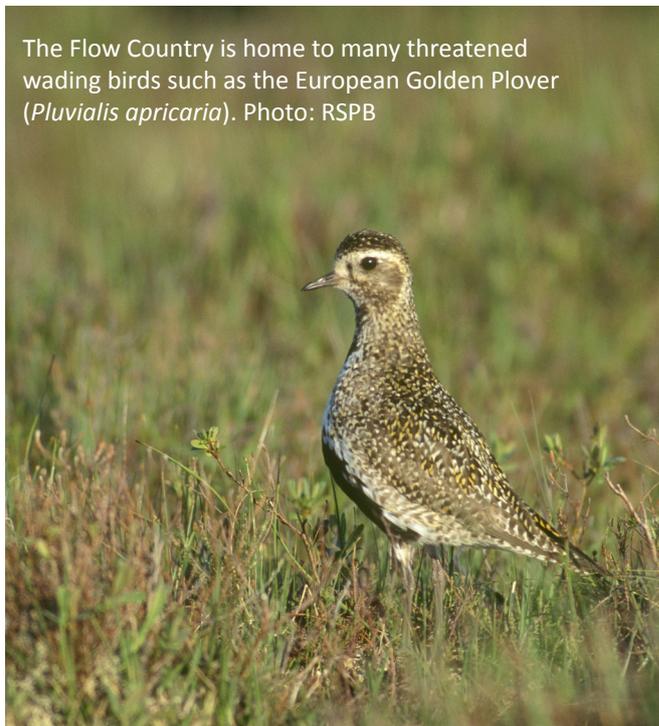
through local planning and existing environmental designations, to ensure that the Flow Country retains its OUV for future generations.

Involving communities in the process

The process of writing the current technical evaluation will be completed by the end of summer 2019, when it will be sent to the DCMS in London. Running alongside this process will be a community consultation, which will give those living and working in and around the Flow Country the opportunity to give their thoughts and opinions on the project and express their ambitions for the future of this remarkable region. Furthermore, this consultation will facilitate an important discussion on the opportunities offered by World Heritage Site status and how these might be best taken advantage of by local communities and businesses.

First and foremost, any Flow Country World Heritage Site will belong to these communities, while its future status as a world-class habitat will be dependent on their continued relationship

The Flow Country is home to many threatened wading birds such as the European Golden Plover (*Pluvialis apricaria*). Photo: RSPB



with the land. The Flow Country has experienced human influence for thousands of years and this landscape will continue to be affected by those fortunate enough to call it their home. World Heritage Site status would be a tremendous accolade for local communities, which will be able to look out on an environment that has been granted the “Michelin star” of heritage awards.



The Flow Country shimmers in a golden hue under the low-lying winter sun. Photo: RSPB

What could a World Heritage Site bring to Caithness and Sutherland?

The opportunities that come with World Heritage Site status are not uniform; indeed, the benefits of each property worldwide are unique and largely shaped by the decisions and attitudes of the surrounding communities. With this in mind, it is impossible to say exactly what World Heritage Site status would bring to Caithness and Sutherland, but many similar properties around the world have taken advantage of the branding, marketing and international recognition that comes with such an inscription.

Taking the Dorset and East Devon Coast (Jurassic Coast) World Heritage site as a case study, the majority of holiday accommodation prominently advertises its proximity to the World Heritage Site on their websites, while a local ice cream producer has brought out a “Jurassic Range” in partnership with the Jurassic Coast Trust.

In 2019, there will be a number of community engagement events across Caithness and Sutherland, as well as a wealth of information online and on social media. We welcome questions and feedback from any source and are delighted to be part of this exciting project, which we hope will raise the profile of the Flow Country to a level more appropriate to its outstanding universal value.

How can the International Peatland Society help the Flow Country gain World Heritage Status?

Although gaining support from the local community is the primary focus of the upcoming events, we believe that endorsement from



international peatland experts will certainly add credibility to the case. Therefore, we would strongly encourage members of the International Peatland Society (IPS) to consider providing individual letters of support.

Further, we even invite the IPS Executive Board to consider providing a coordinated statement with signatories, all of which could be integrated in the bid. For further information, please feel free to contact the authors.

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Two New Research Programs in Partnership with the Canadian Horticultural Peat Industry

Since 1992, the Canadian peat industry has invested significant financial and human resources in improving the knowledge base on peatlands and their responsible management through partnerships with the scientific community.

From 2013 to 2018, research was mostly conducted under the NSERC Industrial Research

Chair on Peatland Management (3rd term) and the related Collaborative Research and Development Grant (CRD) - Farm, restore and model: responsible management of peatlands for a sustainable Canadian horticultural peat industry.

The research program was led by Dr. Line Rochefort (Université Laval, Québec), with collaboration from numerous universities and



Vegetation monitoring and biomass sample collection at a restored peatland in New Brunswick. Photo: Sandrine Hogue-Hugron, PERG.

research institutes across Canada.

For the 2018 to 2023 period, the Canadian peat industry is supporting two distinct research programs.

The first program, led by Dr. Rochefort, continues to explore topics related to peatland management, mostly from the perspective of peatland restoration. The second program is led by Dr. Nigel Roulet (McGill University, Montréal) and aims at developing specific greenhouse gas (GHG) emission factors from peat extraction, use and end use.

Management and Ecological Restoration of Peatlands for a Sustainable Canadian Horticultural Peat Industry

Lead researcher:

Dr. Line Rochefort, Université Laval, Québec

Co-researchers (from Eastern to Western Provinces):

- Dr. Marion Tétégan Simon, Université de Moncton and Valorès, New Brunswick
- Dr. Stéphane Godbout, Université Laval and IRDA, Québec
- Dr. Jonathan Price, University of Waterloo, Ontario
- Dr. Maria Strack, University of Waterloo, Ontario
- Dr. Peter Whittington, Brandon University, Manitoba
- Dr. Kevin Devito, University of Alberta, Alberta
- Dr. William Shotyk, University of Alberta, Alberta

This CRD program is divided into four main topics.

Topic 1 - Managing for biodiversity assesses the effectiveness of ecological restoration and management actions at the landscape level for the reestablishment or improvement of biodiversity,



McGill undergraduate honours students Laura Clark and Naomi Weinberg taking carbon measurement (chamber method) in a peatland under extraction. Photo: Ian Strachan

as well as improving the restoration methods for different types of Canadian landforms. One key objective is to develop criteria to evaluate the success of the restoration actions.

Topic 2 - Managing for water regulation and water quality focuses on fen restoration methods by rewetting and specific water management techniques. It also evaluates the effects of landscape-scale peat extraction and restoration activities on the quality of runoff water.

Topic 3 - Managing for carbon sequestration explores the development of plant-based indicators to evaluate the carbon (C) sequestration capacity of peatlands and test different management options for enhancing this capacity.

Topic 4 - Managing for *Sphagnum* biomass looks at how to improve and scale up the cultivation of *Sphagnum* mosses, for the renewable production of non-decomposed *Sphagnum* fibre biomass on a cyclic basis.

The proposed research program is pan-Canadian and is guided by a perspective of responsible use of the peat resource. The total funding is can\$3,393,900 over the next five years, of which

can\$1,914,417 comes from the Canadian peat industry (including cash and in-kind contributions) and the remaining can\$1,343,483 from NSERC.

Greenhouse gas emission factors from peat extraction, use and end use

Lead researcher:

Dr. Nigel Roulet, McGill University, Quebec

Co-researchers:

- Dr. Ian Strachan, McGill University, Quebec
- Dr. Tim Moore, McGill University, Quebec
- Dr. Maria Strack, University of Waterloo, Ontario
- Dr. David Olefeldt, University of Alberta, Alberta

The Canadian peat industry has been very proactive in supporting research on developing techniques for the ecological restoration of peatlands. Recent research has shown that biological restoration leads to the return of peatland C functioning within a decade or two.

However, due to a lack of empirical observations and parameters for the models used, it is not known what the greenhouse gas (GHG) emissions are during the 10 to 30-year peat extraction period, or how much of the extracted peat is lost back to the atmosphere as CO₂ during and after the peat is used.

About NSERC

The Natural Sciences and Engineering Research Council of Canada (NSERC) supports university researchers and students in fundamental discovery-based research, and in fostering innovation by encouraging Canadian companies to participate and invest in university-led research projects. For more info visit www.nserc-crsng.gc.ca.



Eddy covariance tower for assessing the carbon dynamic of a restored peatland. Photo: Kelly Nugent

The objectives over the next five years are:

- to conduct multi-year GHG emission measurements on peatlands under extraction and to measure emission at the peat use and end-use stages;
- to develop GHG emission factors (EFs) for the extractive, in use, and end-use stages of the peat industry cycle; and
- to parameterize models to simulate the net change in emissions for peatlands that result from peat extraction.

The total funding is can\$1,710,218 over the next five years, of which can\$855,109 comes from the peat industry (including cash and in-kind contributions) and can\$855,109 from NSERC.

This work will enable the Canadian peat industry to delineate its GHG footprint and results will be relevant to provincial and federal agencies responsible for reporting national inventories. Downstream emissions are becoming more important in post UNFCC Paris Accord 2015 discussions and to GHG reporting as part of future certification schemes.

For more information contact Dr. Line Rochefort, Université Laval, gret@fsaa.ulaval.ca or Dr. Nigel Roulet, McGill University, nigel.roulet@mcgill.ca

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The Peat Replacement Forum of Lower Saxony, Germany

Germany is the largest producer of horticultural growing media worldwide. Most of the estimated 8.5 million m³ of growing media manufactured annually are from the Federal State of Niedersachsen (Lower Saxony). Peat is the main constituent of growing media because of its unique chemical, physical and biological properties.

Against the background of climate change, the need to reduce greenhouse gas (GHG) emissions and the limited availability of peat in the future in Lower Saxony, the Federal Government sees an urgent need for action to reduce the use of peat both in amateur gardening and commercial horticulture.

Reduction is to be achieved by developing alternative constituents - a huge challenge for the commercial sector in particular, as the government of Lower Saxony admits. The government also recognizes that emissions from peatlands used for agriculture and forestry are much larger than from peat extraction and use.

Objectives

In March 2015, to support the peat replacement process, the Lower Saxony Ministry of Agriculture, Food and Consumer Protection

created the interdisciplinary forum 'Sustainable Peat Replacement with Renewable Resources' (German translation: 'Nachhaltiger Torfersatz aus nachwachsenden Rohstoffen', or 'Torfersatzforum' for short).

Based on the ideas of the Ministry, the main objectives as defined in 2015 are:

- Screening and assessment of raw materials from agriculture, forestry, horticulture, landscape management, waste management
 - ✓ Biomass crops
 - ✓ Residues and by-products
- Optimization of biomass production
 - ✓ Breeding
 - ✓ Identification and selection of suitable plant species
 - ✓ Cultivation systems
 - ✓ Paludicultures
- Logistics
 - ✓ Harvesting
 - ✓ Storage
 - ✓ Supply and transportation of raw materials
- Biological-technical processes
 - ✓ Nutrient contents of materials
 - ✓ Technology of raw material processing
- Qualification and training of staff
- Suitability for growing media
 - ✓ Plant growth trials

- Consultation and information
- Public relations and marketing

Experts from relevant sectors (horticulture, agriculture, forestry, academia and growing media production), together with representatives of authorities, associations and NGOs, have joined this platform to exchange science-based facts and views from practice. The target of the forum is to make purposeful progress in developing peat alternatives. Three specific working groups have been set up:

1. Growing media (for commercial horticulture and amateur gardening)
2. Horticulture
3. Communication and Marketing.

The working groups meet twice a year and report to a supervisory plenum. The forum foresees its existence for at least another ten years. It was

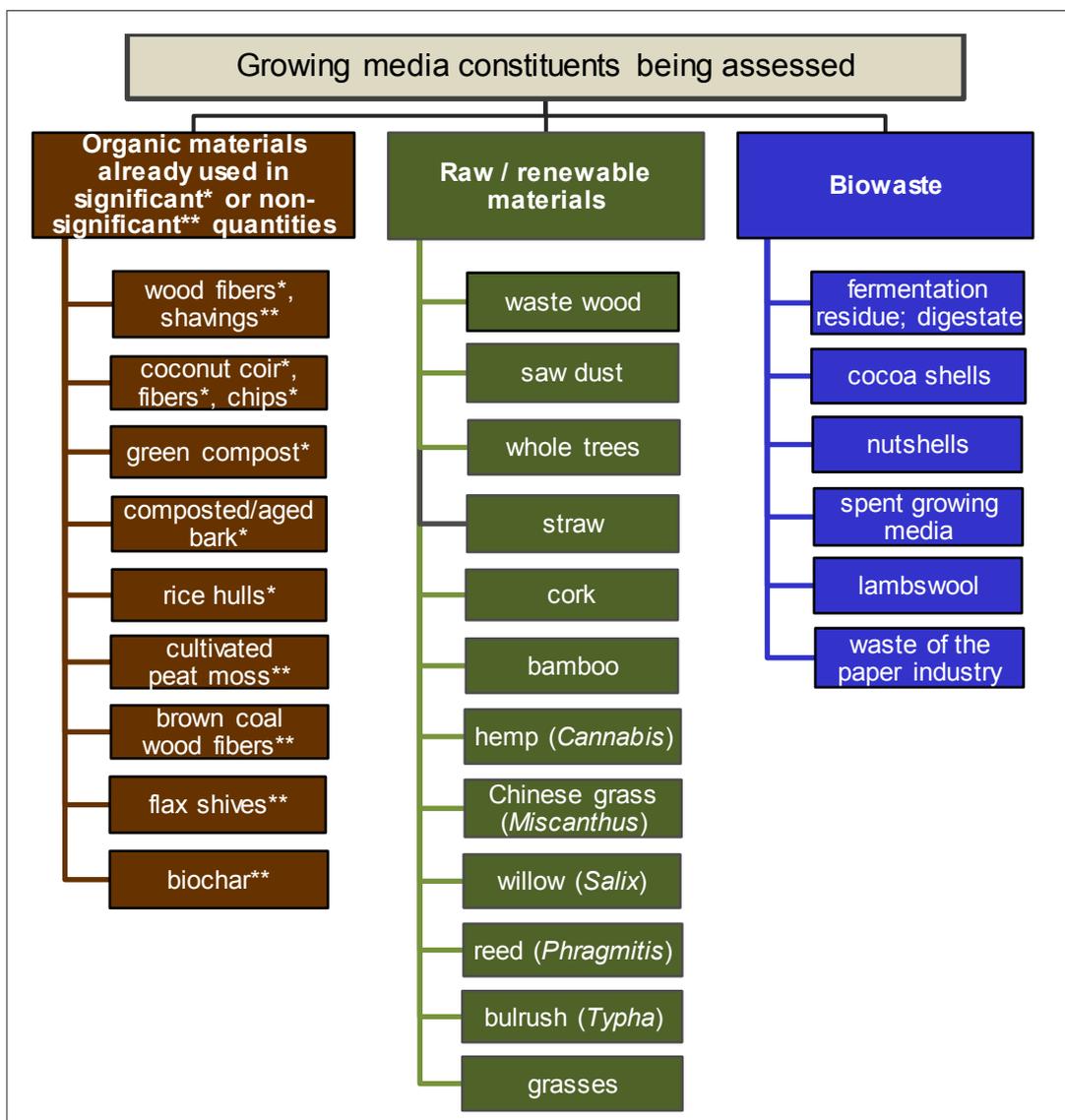
noted at the last plenary session in August 2018 that politicians from all over Germany are closely watching the activities of the Peat Replacement Forum, which - as the Lower Saxony Ministry of Agriculture, Food and Consumer Protection put it - has achieved a pioneering role with regard to peat replacement.

Peat Replacement and the German Climate Protection Strategy

Dr. Thomas Schmidt, representing the Federal Ministry of Food and Agriculture, was invited to speak at the recent plenary session of the forum. He referred to the Federal Government’s coalition contract of spring 2018, which states that the Federal Government shall strengthen horticultural

Figure 1: Constituents other than peat already being used for the manufacture of growing media and other organic materials that are to be assessed by the Peat Replacement Forum.

Note: this figure has been prepared without any claim to completeness and does not include mineral constituents that are already being used for growing-media production i.e., exfoliated perlite, exfoliated vermiculite, clay, expanded clay, pumice, lava, sand and mineral wool, as they are not part of the assessment plan of the Peat Replacement Forum.



businesses and work out a peat conservation strategy. The strategy will have the goal of making more climate-friendly peat substitutes available to reduce peat use. Furthermore, he referred to the German Climate Protection Strategy 2050.

The 2050 Strategy states that from the perspective of climate protection, the reduction of peat use for the manufacture of growing media bears GHG emissions reduction potentials. For this reason, the use of peat in growing media needs to be curbed considerably, says the Federal Government. In particular, the application of peat in amateur gardening, as well as garden and landscape construction, can be reduced considerably via consultation and information activities.

To this end, the Federal Government will set targets regarding the use of peat in public procurement allocation directives for landscaping. To reduce peat extraction, the Federal Government will initiate consultation and information measures for the use of peat alternatives in horticulture. The Federal Government will launch a research program on peat substitutes.

Although discussed at various meetings of the three working groups, Dr. Schmidt asked the plenum 1) how successful peat replacement

actually is and how it can be measured; 2) whether life cycle assessments and CO₂ footprints would help in the long-term process of peat replacement; 3) how much alternative material is/will be available; and 4) what problems we face.

Schmidt refers to the Peat Replacement Forum as having an important, national role to play. It serves as a knowledge platform and information network, a 'council of the wise' and a hub to different groups and a motivation motor.

The TeiGa Project

TeiGa stands for 'peat substitutes in horticulture' (German translation: 'Torfersatzstoffe im Gartenbau'). The project is financed by the Lower Saxony Ministry of Agriculture, Food and Consumer Protection and will run from 1 March 2016 to 28 February 2019.

The objectives of the TeiGa project are to assess the potential of materials other than peat in the different sectors of horticulture. In particular, the following aspects are being assessed:

- Risks for cultivated crops
- Cause-and-effect relationships
- Realistic solutions approaches
- Diagnostic methods
- Evaluation of materials in a practice-oriented trial phase in the third project year
- Shelf-life evaluation.

Institutions involved in the TeiGa project are the University of Hannover (vegetable growing department), the Teaching and Experimental Institute Bad Zwischenahn (tree nursery department) and the Teaching and Experimental Institute Hanover-Ahlem (floriculture department).

Outcome of the Forum so far

Throughout previous decades, much research has been carried out in search of peat substitutes. In particular, scientists and researchers in the community of the International Society for Horticultural Science (ISHS) have analyzed and tested numerous organic materials. Research



Dr. Schmidt speaking at the plenary session of the Peat Replacement Forum on 28 August 2018 in Hanover-Ahlem. Photo: Gerald Schmilewski



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institutes and the research departments of many growing-media manufacturers have also conducted (and continue to undertake) research on materials other than peat.

As stated in many publications, all materials - including peat - have negative environmental impacts and these do not only include GHG emissions (Altmann 2012). If put into practice, even the often highly praised paludicultures, i.e., farmed Sphagnum, will have an environmental impact, for example, due to energy use in various production and processing stages. Other harvested paludiculture crops will have to be composted before being used in growing media to reduce their nitrogen immobilization factor and improve their quality consistency.

Did you know that, of the nine growing-media constituents evaluated in the Life Cycle Assessment study (reported by Altmann in 2012), composted green waste had the strongest impact on human health? Coconut coir, although the best peat substitute in many applications, has an environmental impact due to long transportation distances and has been rejected by environmental NGOs like the German BUND.

The Peat Replacement Forum has begun to consider the mass of aspects that need to be covered when assessing peat substitutes and has realized that alternative materials cannot be used without hesitation. Quality and availability are at the forefront of their evaluation. Weeds and plant propagules, pesticide residues, human pathogens, susceptibility to saprophytic fungi, N-immobilization, crop growth, water and energy use are just some of the physical, chemical and biological properties to be considered.

Of course, availability is also key. For these reasons, the Peat Replacement Forum has concluded that some of the materials listed in Figure 1, including waste wood, cork, bamboo, digestate, nutshells, cacao shells and waste from the paper industry, are no longer under consideration. Others, i.e., straw, reed, hemp and grasses, are viewed with skepticism but will still be considered. Woody materials seem to have the greatest potential of all materials being evaluated. But are these findings new? Not really (Schmilewski 2008).

Where will the Forum take us? No one knows. My decades-long experience in growing-media R&D leads me to conclude that, despite its specific environmental impact (all other materials also have specific environmental impacts), peat will remain the main growing-media constituent for decades. Yes, the use of other materials will increase, especially in the hobby market, but peat is most often the vehicle that enables their use by diluting their unfavorable properties.

Much research on aquaponics and other closed cultivation systems has been going on for years. Should such systems be successful on a large scale worldwide, then the overall need for growing media as we know them and the need for peat, coir, Sphagnum, etc., will diminish. Considering the growth of the world population, I cannot foresee an end to the need for 'traditional' growing media after the year 2050; rather, traditional and closed systems will complement each other.

If you can read German, please be invited to read the book 'Kultursubstrate und Blumenerden - Eigenschaften, Ausgangsstoffe, Verwendung' (Schmilewski 2018) published online at www.ivg.org/de/substratbuch/sub-startseite.

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Gerald Schmilewski

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IPS Extraordinary Assembly of National Representatives

28 - 31 January 2019 by email
Change of Auditor 2018 (company takeover)
Invitations were sent by email on 18 December.

Baltic Peat Producers Met in Tartu, Estonia

The 17th Baltic Peat Producers Forum took place from 10 - 12 October 2018 in Tartu, Estonia, and was focused on new applications of peat and peatlands. Over 300 participants from all over Europe and as far as from China had the opportunity to hear presentations from leading experts on peatland restoration, peat production and new technologies used across the peat industry.

The ice-breaking party kicked off with discussions on Industry 4.0 and Bioeconomy. The second conference day was divided into four main slots: trends in the field of peat, new applications of peat, developments of peatland management and future technologies.

On the third day, participants went to see one of the biggest greenhouses in Estonia, a nursery, a power plant that uses energy peat and a leading plastic packaging manufacturer in the Baltic.

The next Baltic Peat Producers Forum will be organised in Lithuania in autumn 2019. Welcome!

Presentations: <https://balticpeatproducersforum.eu/bppf/bppf-2018>

Photo gallery: <https://balticpeatproducersforum.eu/bppf/bppf-2018/bppf2018-photo-gallery>

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Erki Niitlaan and Marc Peray.



Audience of BPPF 2018. Photos: Helle Ly Tomberg

Fuel preparedness is needed in Sweden

The coming winter's fuel situation is likely to be as difficult as the previous winter's, and possibly even worse. One cause is Britain's decreasing export of RT chips (recycled waste wood or recovered wood fuel). New suppliers and better-quality RT must be sourced to ensure energy companies won't go without fuel.

The Swedish Energy Bioenergy Association (Svebio) estimates that, during the winter of 2018/2019, Sweden will continue to experience strain within the biofuel market. Since 2011, Sweden has seen a downward trend in biofuels with the forestry industry having successfully delivered large quantities of by-products, while, at the same time, electricity prices have fallen. This has contributed

to decreased volumes of top cuttings and branches - known by their Swedish acronym, GROT - and poorer profitability.

"We needed GROT right now, and it takes time to rebuild production. We're also seeing decreasing quantities of recycled wood from the UK. We'll see if we can get recycled wood from any other market", says Gustav Melin, CEO of Svebio.

Last summer's forest fires will eventually give rise to larger quantities of wood fuel, but probably not until next winter. "Some of the thinner stems can be used for fuel, but forest owners haven't yet had time to fully manage everything in fire-ravaged areas. Currently the conversation is around not

Peat can act as a contingency fuel during hard winters. By using peat from already drained peat fields, greenhouse gas emissions can be reduced. Photo: Svensk Torv



having things cleared and delivered until March 2019.”

The need for preparedness for biofuels became apparent during the winter of 2017/18 when several combined heat and power (CHP) plants were permitted to use coal and oil to ensure district heating supplies throughout the winter, which was colder than normal. In several places in northern and central Sweden, peat was used as an alternative to oil and coal to secure electricity and heat production.

Local fuel from already drained areas

“Peat is a good energy alternative”, says Ingrid Kyllerstedt, CEO of the Swedish Peat Producers Association. “It’s far better that we use our domestic peat than using oil and coal that we need to import.”

According to the peat industry, peat also contributes to the security of Sweden’s energy supply, plus peat can be stored in stacks close to CHP plants. However, the peat industry is now facing major challenges that threaten its survival. Although there was a temporary rise



Ingrid Kyllerstedt, CEO of the Swedish Peat Producers Association. Photo: Svensk Torv

in demand for peat due to the winter’s biofuel shortage, general demand for peat is on the decline. This is due to several factors, specifically, the new legislation and provisions within the EU’s emissions trading system, which makes it even more difficult to obtain peat permits, as well as generally negative public opinion that considers peat as an unwise climate alternative.

“I understand that the public are not full acquainted with everything surrounding peat use. Peat should be eligible for electricity certificates and treated in the same way as wind, solar and other renewable fuels. The UN Climate Panel has also classified peat as an intermediate between renewable and fossil fuels, but what complicates the situation is that the energy consumer is also licensed with emission allowances. We are working hard to change the fact that it’s only the incineration of peat that is taken into account by the EU. Peat from drained land has major climate benefits, which the EU must also take into account”, says Ingrid Kyllerstedt.

Fewer CHP plants use peat. Municipal councils have decided to use only 100 per cent renewable fuels, which often doesn’t include peat, which Ingrid Kyllerstedt believes is unfortunate because it only takes into account emissions trading and not peat’s life cycle.

“Peat has many technical advantages. It reduces the internal coating in boilers and increases efficiency. Instead of peat, sulphur granules



Gustav Melin, CEO of Svebio.

are used, which have a negative impact on the environment. Many electricity companies would like to use peat, but its connection to emissions trading is difficult to explain to customers, and the climate benefits are therefore not visible.”

Gustav Melin at Svebio believes that peat can play an important role in the energy mix, particularly over and above coal use. “There are many arguments for peat use. In my opinion, there are now slightly more positive winds blowing for peat use in Sweden, with many realizing that drained peat fields are already oxidizing, so that it’s preferable if they do it in a CHP.”

Many peatlands were ditched in the early 1900s to expand Sweden’s soil and woodland. This means that over a quarter of Sweden’s peat areas have been drained. “New research shows that drained forestry land releases greenhouse gases equivalent to 2.5 million cars driving a lap around the world - every year. We think we should harvest the peat and treat it as a practical alternative. In this way, we’d stop greenhouse gases leaking from drained peat fields”, says Ingrid Kyllerstedt.

What does the future look like for peat?

“If nothing changes positively for peat use, we may have no industry left in five years. We need to see political initiatives quickly. We have seen initiatives for hydroelectric power, but not for peat. We need to raise awareness of the benefits of peat for consumers. The use of peat is needed in the biofuel mix and it’s lack will certainly be felt this winter, if not before.”

Translated from the Swedish article, originally published in Tidningen Energi.

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Energy peat was also a hot issue during the International Peat Congress in Stockholm, Sweden in 2012. Photo: IPS

Restoration of Terminated Peat Cuttings by Rewetting

A project on the *Restoration of Terminated Peat Cuttings by Rewetting*, extending over more than 20 years, was carried out in Sweden between 1997 and 2018. The original aim of the project was to investigate the effects of rewetting on soil, hydrology, water chemical conditions and vegetation, and the development of these conditions over time.

After some years, the effects of greenhouse gas fluxes and carbon balances attracted increasing interest, and studies into the effects on greenhouse gas fluxes of common ecotopes/microsites started about 10 years after rewetting. Financial contributions to the project were made by the Swedish Energy Agency and the Swedish Peat Research Foundation, while the Swedish University of Agricultural Sciences hosted it.

The peat company Neova AB provided field preparations. Three peat-extraction areas, Porla, Toftmossen and Västkärr, located in central south Sweden, were studied. After rewetting, the sites were turned into shallow wetlands, forming a nutrient gradient from the poor Porla site, over the intermediate Toftmossen site to the fairly rich Västkärr site (Fig. 1). The Toftmossen site was mainly used in the greenhouse gas (GHG) studies.

Starting conditions

By finishing peat extraction, a bare peat surface existed. Such cut-over areas should be put in after-use. There are a number of alternatives for finished extracted peatlands and in Sweden the common use is often either forest or wetland.

A wetland case can start as a shallow bird lake, which in time will become terrestrialized towards mire conditions. In this project, investigations initially focused on lake/wetland conditions. Vegetation development over time will alter the initial physical and chemical conditions.

Soil material - peat

Remaining soil peat, once extraction was finished, formed prerequisites for wetland substrates and peat surface structures. In the Västkärr area, a levelled, fen peat surface, with a thickness of 0.2 to 0.4 m above postglacial clay, formed a stable lake bottom. Discharging groundwater through the clay provided nutrients to the lake water.

At the Porla site, there was a till mineral soil underlying the *Carex* and *Sphagnum* peat. The till had a broken topography furnishing both thin and thick peat cover, ranging from almost zero up to two meters of peat. In the case of thick peat layers, the top c. 0.7 m was *Sphagnum* peat with fen peat below. After rewetting, the top *Sphagnum* peat became swollen and partly floating (Lundin *et al.*, 2016). This formed floating peat rafts with low buoyancy, further increasing the risk of peat transportation to downslope surface stream water. This risk was low, however, in the Porla lake, which was blocked by dams, but in other cases, more open flow paths of surface water could conduct such floating peat.

The chemical composition of peat at both the Västkärr and Porla sites, turning into a bottom substrate, did not change considerably after



Figure 1. The three wetlands, Porla (a), Toftmossen (b) and Västkärr (c), after a 7-10 years of rewetting. Photos: Lars Lundin



rewetting. Carbon and phosphorus content, as well as pH, were fairly stable. Nitrogen content increased somewhat with a higher share of ammonium. C/N became somewhat lower at the Porla site (Lundin *et al.*, 2016).

Hydrology

Obviously, hydrology changed from drained conditions in the extraction phase to shallow, open lake conditions with water depths of about one meter on average. Runoff decreased after rewetting, and both low and high discharges lessened. There were also longer periods with no water flow and cessation of discharge (Lundin *et al.*, 2016). This could have deteriorating effects on the living environment in downstream water courses.



Water chemistry

Water chemical conditions differed between the three wetlands with poor conditions in Porla lake (whose pH level was just above 5, while Toftmossen water showed a pH around 6 and Västkärr, being richest, had a pH of 6 to 7). Also, nutrients such as base cations, phosphorus and inorganic nitrogen compounds, showed similar pH patterns.

After rewetting, the pH level at Porla lake was almost unaltered, whereas the Västkärr pH decreased at first, but after a number of years

Table 1. Average chemical composition before and years after rewetting at the Porla and Västkärr sites.

Variable	Västkärr lake		Porla lake	
	Before	After 13-15 years	Before	After 12-14 years
pH	6.1	6.7	5.4	5.0
NO ₃ -N, mg/L	0.63	0.18	0.09	0.06
NH ₄ -N, mg/L	0.64	0.36	0.64	0.17
Org-N, mg/L	1.31	1.70	0.86	0.84
Total-N, mg/L	2.58	2.24	1.58	1.07
PO ₄ -P, µg/L	31	16	3	4
Total-P, µg/L	34	76	16	20

increased, reaching values higher than before rewetting. Most ions and elements showed lower concentrations after rewetting at both the Porla and Västkärr sites. In contrast to this, phosphorus concentrations increased (Table 1). Element transportation out of the wetlands mostly decreased (Lundin *et al.*, 2016).

Dissolved oxygen content was often at an acceptable level, probably due to the rather shallow water depths being mixed by wind. However, during stagnation periods in late winter and late summer, dissolved oxygen was depleted and short periods of anoxic conditions occurred (Lundin *et al.*, 2016) with effects on bottom fauna life.

Vegetation development

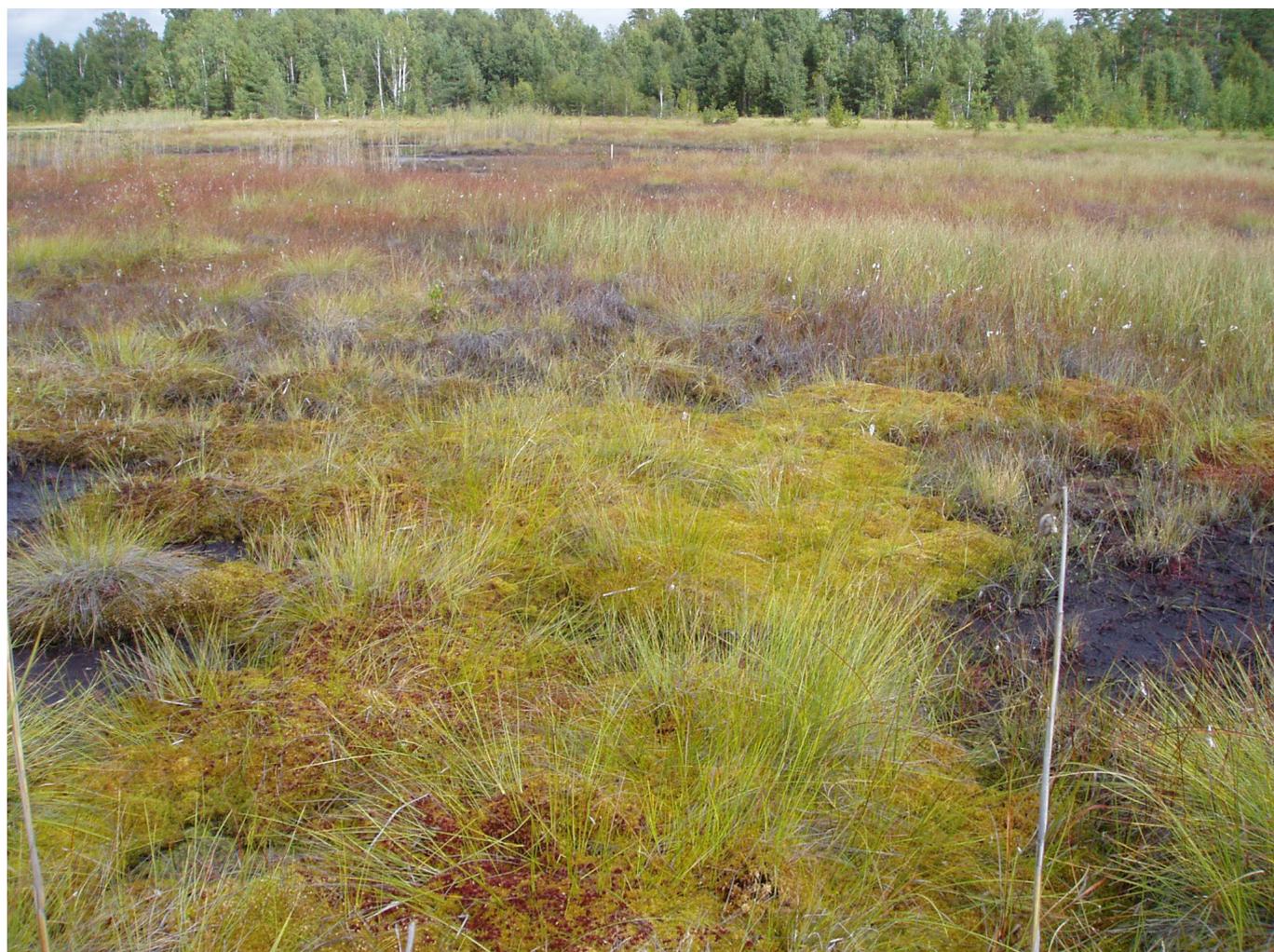
On termination of peat extraction, there were mainly bare peat surfaces in the cut-over areas, with few plants connecting to the remaining ditches. However, colonization started quite rapidly at the Västkärr site after 2-3 years,

with vegetation dominated by grasses such as *Glyceria fluitans*, *Phalaris arundinacea* and *Poa trivialis*. Other species were *Equisetum spp.* and *Potamogeton spp.*

Open water and bare peat made up 20-30% of the coverage and higher in the case of high water levels. In later stages, after almost 20 years of lake conditions, the number of species decreased and the vegetation was dominated by *Carex spp.*, *Phragmites australis*, *Typha latifolia* and *Phalaris arundinacea* (Kozlov *et al.*, 2016).

Especially evident, was the emerging reed *Phragmites australis*, growing out into open water with a bulrush (*Typha spp.*) board in many places. Onshore, deciduous trees such as willow (*Salix spp.*), birch (*Betula spp.*) and alder (*Alnus spp.*) hampered the open water view and had to be cut to keep the range of sight free.

Figure 2. Rewetted peatland where cotton grass (*Eriophorum spp.*) as a pioneer plant is paving the way for *Sphagnum spp.* Photo: Lars Lundin



Vegetation colonization was slower in the Porla area compared with the Västskärr site. Large parts of the soil surface were dominated by bare peat and open water. In a few locations close to old ditches, *Polytrichum spp.* and *Phragmites australis* were found. However, with time, *Eriophorum vaginatum* and *Eriophorum angustifolium* in particular started to colonize, and (after 5-7 years had a coverage of around 20% and almost 30%, respectively. Occurrence of *E. vaginatum* was higher than for *E. angustifolium*.

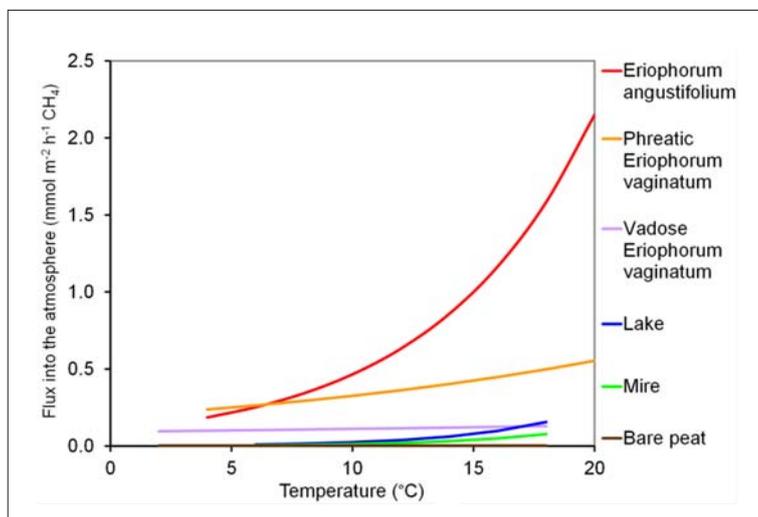


Figure 3. Ecotope CH₄ fluxes (mmol m⁻² h⁻¹) related to soil or water temperature (°C). Fluxes are estimated with a linear mixed-effects model based on measured temperature ranges.

After about seven years, *Sphagnum spp.* started to appear commonly, increasing in a number of places and expanding to cover 20-30% of the studied plots after another 7-10 years. Total plant cover increased from ca. 40% in year seven after rewetting to almost 80% after another ten years, with bare peat and open water making up the rest. *Drosera spp.* occurred frequently in up to 10% of the studied plots (Kozlov *et al.*, 2016).

It could be concluded that *Sphagnum spp.* establishment was largely connected to the occurrence of cotton grass (*E. vaginatum*) (Fig. 2). In the Toftmossen area, the occurrence and coverage of *Sphagnum spp.* was also increasing over the years studied.

in water, *Carex spp.* and other grasses) or from open water bodies. The drained bare peat and bare peat with *Eriophorum vaginatum* tussocks showed the highest ecosystem CO₂ net emissions due to oxidative peat consumption and strong root respiration.

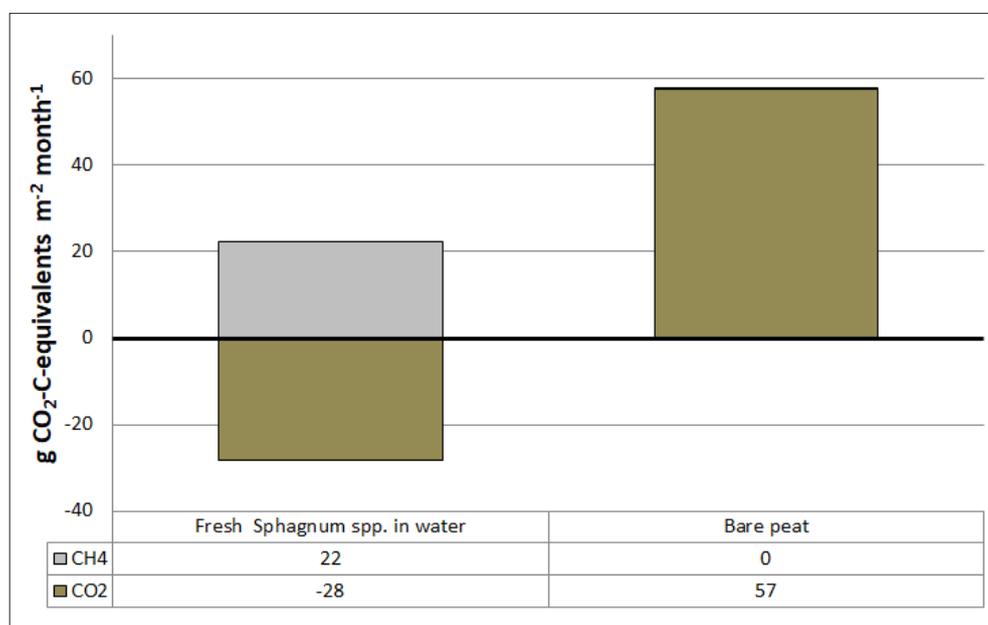
Methane (CH₄), however, mainly showed low emissions from bare peat, mire and lake water, whereas the highest CH₄ emissions were found for wet *Eriophorum spp.* ecotopes (Fig. 3), for *Carex spp.* and other grasses.

Greenhouse gas fluxes

For all sites, CO₂ net emissions were generally low or negative (CO₂ uptake) from ecotopes with wetland/peatland vegetation (*Sphagnum spp.*, *Eriophorum spp.*

Regarding N₂O emissions, these were mainly negligible from the three sites and also from the different ecotopes.

Figure 4. Net emissions (measured with automated transparent chambers) of CO₂ and CH₄ (g-CO₂-C equiv. m⁻² and month) from the *Sphagnum* sites, in comparison to bare peat sites from the rewetted peatland at Porla during the vegetation seasons 2016 and 2017. A minus sign indicates uptake.



Depending on temperature, soil moisture, height of the water table and light, ecotopes with peatland vegetation (e.g., *Sphagnum spp.*) can be sinks or sources of greenhouse gases, whereas bare peat sites are carbon sources (Fig. 4).

CH₄ fluxes to the atmosphere from vascular plants directly after rewetting can be considerable. However, if the shallow lakes develop into bogs or poor fens with *Sphagnum spp.* as the main vegetation form, a greenhouse gas balance close to zero can be obtained, since the relatively small emissions of CH₄ from *Sphagnum spp.* lawns can be balanced by CO₂ uptake.

Conclusion

To sum up, it could be stated that rewetting of terminated, peat cut-over areas is beneficial for landscape diversity and biodiversity. The main effects on hydrology were lower discharges, of special concern in low discharge situations. Most concentrations of chemical compounds became lower but total phosphorus increased.

The significance of this from a GHG perspective could be more complex and needs further investigation to determine the consequences. Over time, carbon is sequestered in the newly formed peat, which would have significance for GHG balance reclamation of the mire landscape.

As long as large areas of bare peat exist, ecosystem respiration may govern the GHG fluxes from rewetted peatlands. Creating a carbon source by drainage is a fast process, but creating a C sink by rewetting may take decades.

Related literature

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Second Tropical Peatland Round Table in Batam and Meranti Island

The 2nd Tropical Peatland Round Table was held in Batam, Sumatra on 12-13 November 2018, followed by a field excursion to Meranti Island to view peatland restoration projects.

The meeting was sponsored by Indonesian Peatland Restoration Agency (BRG), Republic of Indonesia, Indonesian Ministry of Environment and Forestry (MoEF), the International Peatland Society (IPS), Japan Peatland Society (JPS), Indonesian Peatland Society (HGI), and the Research Institute Humanity and Nature.

Around 100 participants attended from peatland science and technology, restoration, industry, government, NGO and international Agencies. The meeting was funded by Peatland Restoration Agency (BRG), Norway Budget that managed by United Nations Office for Project Services (UNOPS), and RIHN.

“Batam Statement” on Responsible Management of Tropical Peatland

This Statement was issued at the end of the 2nd Tropical Peatland Round Table on 13 November



Mitsuru Osaki and Jack Rieley attended also the 55th Anniversary Conference of the University of Palangka Raya on 21-22 November 2018. Photo provided by Mitsuru Osaki



Bambang Setiadi, Hidenori Takahashi and Gerald Schmilewski. Photo: Mitsuru Osaki



Ir. Nazir Foead, Head of BRG and Dr. Haris Gunawan, Deputy of R&D at BRG. Photo: Gerald Schmilewski

2018. After 2 days of thorough discussion of the issues the following conclusions and recommendations were made:

NOTING the outputs of the 1st Tropical Peatland Round Table (TPRT) held in Jakarta on 1-2 November 2017, especially the 5 Pillars of action:

- Establish a “Tropical Peatland Centre”
- Organise an “International Committee for Technical Consultation”
- Develop and “Integrated Monitoring System”
- Conduct a “Model Project” for responsible management of tropical peatland
- Achieve “Capacity Building”

NOTING that the Ministry of Environment and Forestry (MoEF) of the Republic of Indonesia has soft-launched an International Tropical Peatland Centre (ITPC) within the MoEF Forest Research, Development and Innovation Agency (FEORDIA), located in Bogor

NOTING also that the other 4 Pillars of Action were discussed thoroughly,



Traditional Indonesian dance formation at the opening of the 2nd Round Table. Photo: Gerald Schmilewski

The 2nd Round Table participants:

WELCOMED the establishment of the International Tropical Peatland Centre,

PROPOSED a “Tropical Peatland Network” (TPN) to share information and activities,

RECOMMENDED, once the TPN has been established, appropriate persons are identified to populate an “International Committee for Technical Consultation” (ICTC) to advise, as appropriate, the ITPC, research projects and other activities on tropical peatland,

NOTED the status of and recent developments in monitoring technologies for detecting fire and land use change and assisting restoration of tropical peatland,

PROPOSED a “Model Project” for responsible management of tropical peatland globally using a multi-partner approach,

AGREED that “Capacity Building” is a priority action necessary to raise scientific, public and institutional awareness of the importance of tropical peatland and to train future practitioners and managers of this important resource, and

PROPOSED to write a multi-authored book on “Responsible Management of Tropical Peatland”.

Jack Rieley

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Factors Affecting Carbon Cycling in Kippure Blanket Peatland:

A Case Study from Ireland

Fluvial carbon cycling in Irish upland blanket peatlands is dependent on a variety of factors such as spatial setting and weather trends. Therefore, peatland morphology and the temporal variability of climatic patterns are significant factors influencing carbon dynamics in these types of environments.

In blanket peatlands, drainage systems such as macropores and peat soil pipes (Photo 1) are

well connected with pools and hummocks and this connectivity leads to significant variations in outflows of carbon from these microtopographic units depending on precipitation trends.

Critical transport pathways and the fluvial concentration of dissolved CO₂ are poorly understood in these peatland systems. The source of CO₂ in them, could originate from peatland soils where it is derived from the microbial respiration



Photo 1: PhD researcher Mariya Radomski establishing the diameter of a peatland pipe at Kippure Bog, Wicklow Mountains National Park, Ireland. Photo: Alan Gilmer

Photo 2: Surveying the blanket pool, Kippure Bog. Photo: Alan Gilmer



and the decomposition of peat organic matter. The transport of dissolved CO_2 out of the peatland soil into pools and freshwater reservoirs is mediated via two major pathways: surface run-off from the acrotelm layer of the peatland soil and subsurface flow through macropores from the catotelm layer of the peatland body. The flow of dissolved CO_2 into the peatland pools of Kippure bog (Photo 2) is a factor adding to supersaturation.

Peatland pools are typically supersaturated in CO_2 compared to the atmosphere. This supersaturation is dependent on factors such as negative net ecosystem production, photochemical degradation of dissolved organic carbon (DOC) or high inflow of dissolved inorganic carbon (DIC) from the acrotelm. Disequilibrium between pool water and the atmospheric concentrations of CO_2 promotes and accelerates loss of gas into the air. Destabilization of highly supersaturated conditions in pools could be the result of changes in hydrochemical conditions and the effects of extreme climatic events.

Freshwater mediated CO_2 evasion represents an important pathway for carbon losses to the atmosphere in this bog. This study sought to explore the dynamics of blanket peatland

hydrology and carbon transformation in the Kippure blanket peatlands of Ireland.

The current project - 'Peat-Hydro' investigates the role of spatial (based on microtopography) and seasonal (temperature, atmospheric pressure and the precipitation) influences on carbon production, transport and fluxing. Most importantly the project aim is to understand the carbon speciation in this locality and to evaluate the importance and significance of these species. The research is a mixture of a longitudinal field study and modelling.

Three monitoring stations were established and field experimentation involved the use of NDIR (non-dispersive infra-red absorption) sensors (Figure 1).

The sensors were used to monitor dissolved carbon dioxide in-situ- continuously capturing variability due to seasonality, diurnal patterns, variations in precipitation trends and spatial differences. NDIR probes were placed in peatland soils and pools (Figure 2).

Additionally, to trend the potential relationship between all the variables, parameters such as barometric pressure, temperatures (water,

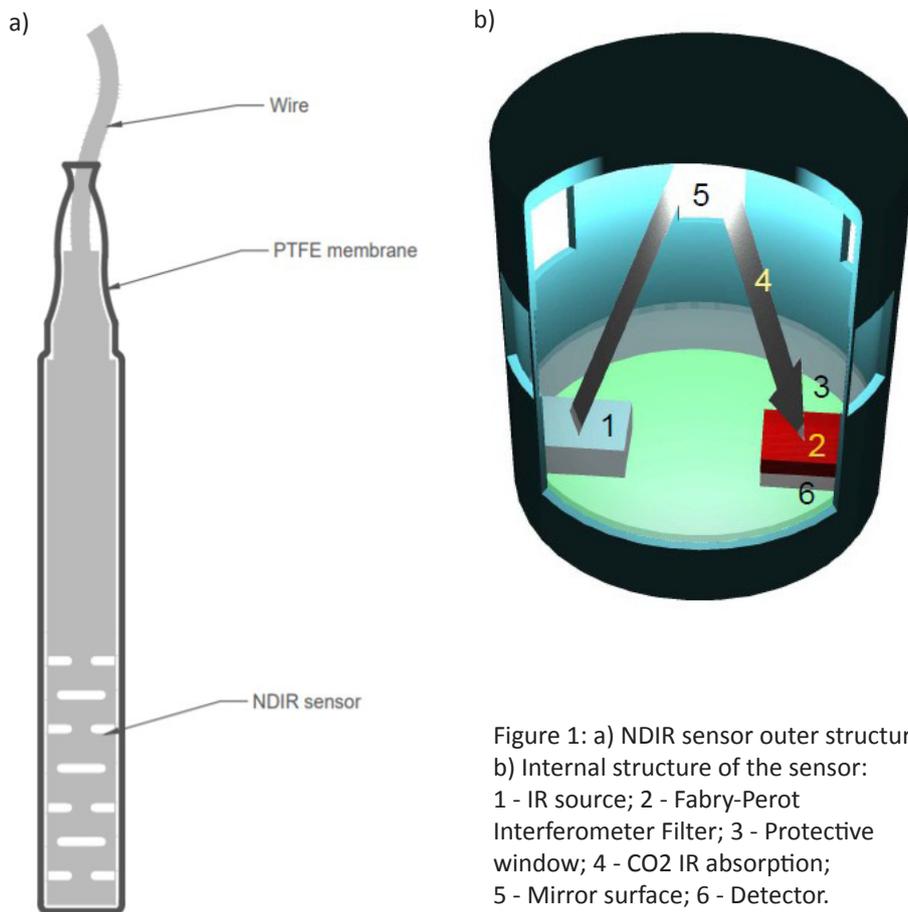


Figure 1: a) NDIR sensor outer structure; b) Internal structure of the sensor: 1 - IR source; 2 - Fabry-Perot Interferometer Filter; 3 - Protective window; 4 - CO₂ IR absorption; 5 - Mirror surface; 6 - Detector.

peat characterisation study and a routine relevé survey were performed to map vegetation communities in the study area. The modelling part of the study involved an estimation of carbon dioxide fluxes based on a 'thin boundary layer' approach.

The first monitoring cycle of the study involved investigation of the winter level of dissolved CO₂ effluxing from a designated pool and peat soil (Figure 3) adjacent to it in a blanket peatland.

The investigation took place during December 2016 when light levels were at their lowest and photosynthetic activity and respiration levels were

minimal. The concentration of dissolved CO₂ in the pool was recorded over a period of three weeks and outputs indicate that CO₂ concentrations ranged from approximately 710 μmol mol⁻¹ to a peak of 1560 μmol mol⁻¹ (Figure 3).

soil, air) and precipitation were continuously monitored. To understand the carbon speciation, the water was routinely sampled with the purpose of quantifying dissolved organic carbon. As well as physical parameters such as pH and conductivity,



Photo 3: One of the monitoring stations.
Photo: Mariya Radomski

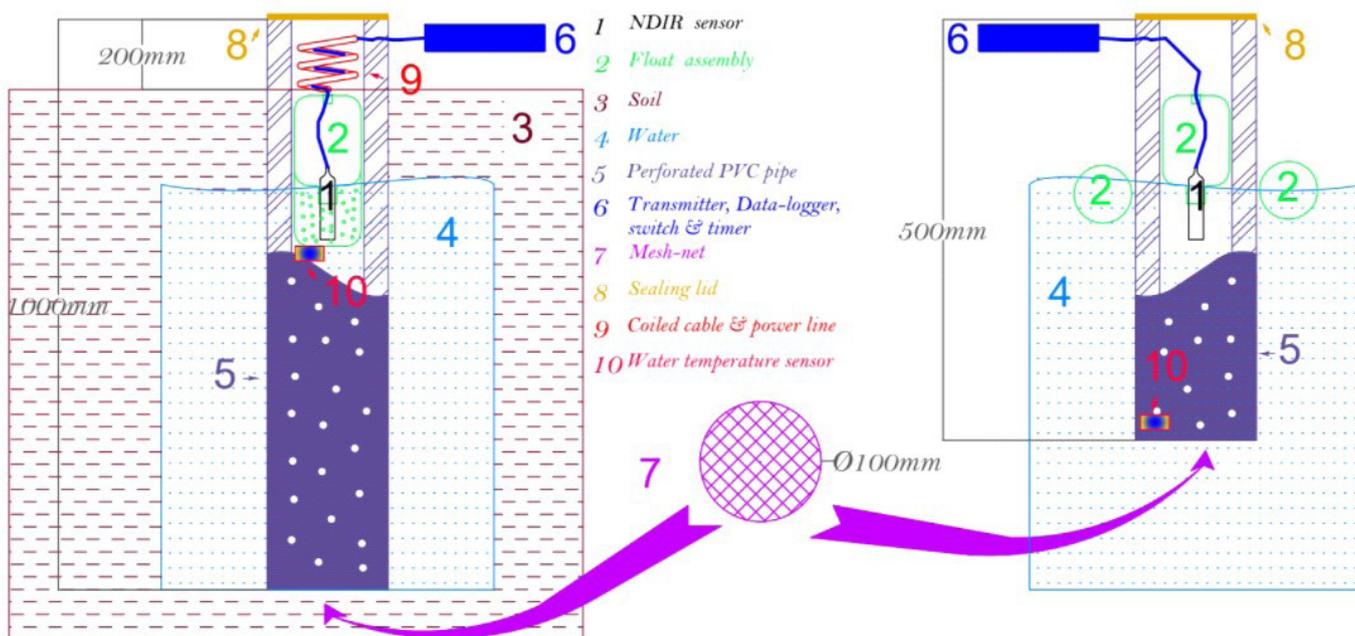


Figure 2: Internal structure of the housing for the carbon dioxide sensors: left-hand side - peat soil based and right-hand side - pool based.

The average dissolved CO₂ concentration for the pool was 1046 $\mu\text{mol mol}^{-1}$. Water is the solvent in which CO₂ dissolves and is also the medium through which temperature values affect its ability to dissolve - consequently the temperature of water is the most significant thermal component in modifying recorded dissolved CO₂ values.

Temperature is also regarded as a significant control on microbial CO₂ emissions. Consequently,

temperature is also shown (Figure 3) as an indication of the possible influence this abiotic parameter may have on the CO₂ values measured.

It is also interesting to note that the correlation coefficient of the water temperature and the reported CO₂ values over the measurement period show a weak positive coefficient of 0.248. This is somewhat expected given the length of the study or time frame involved and the fact that water

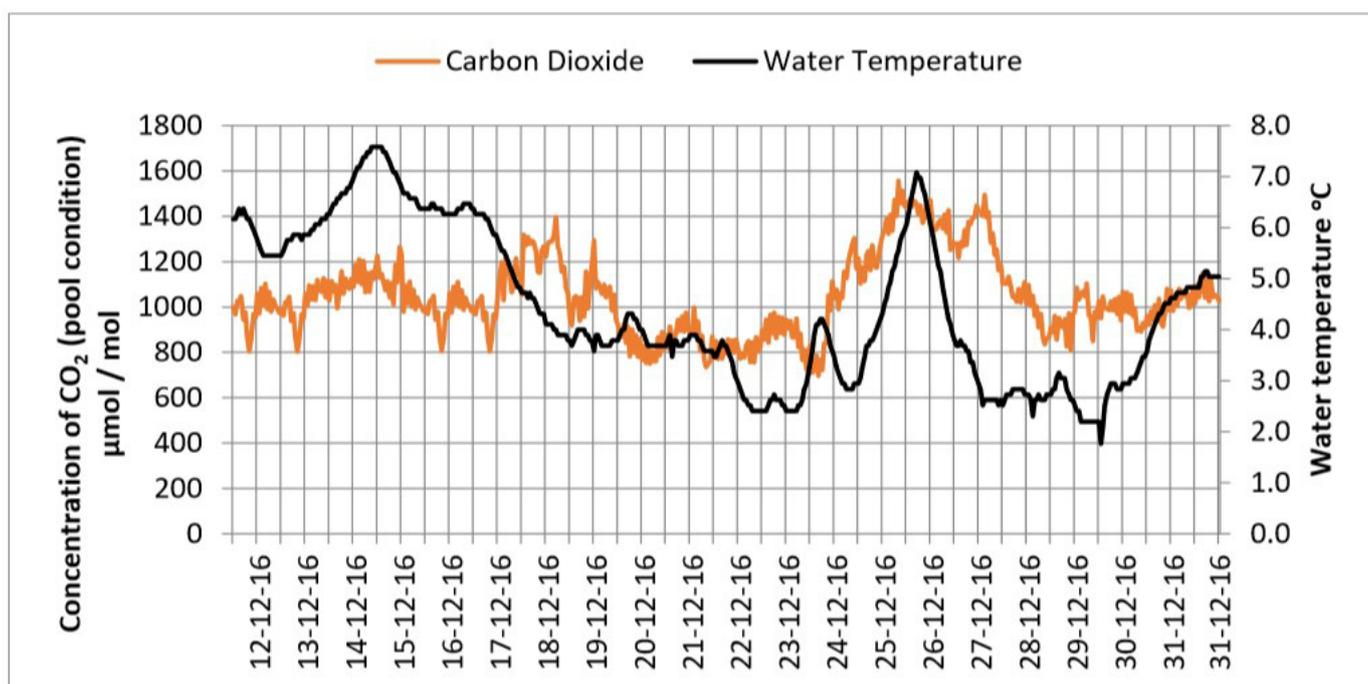


Figure 3: Corrected CO₂ concentrations (pool condition) $\mu\text{mol mol}^{-1}$.

has a higher specific heat capacity than air, which produces a thermal lag with respect to changing air temperatures.

It is also worth noting that some of the CO₂ response with respect to temperature may simply not reveal itself, as the temperature range is simply too small. Added to this is the fact that the average temperature value is quite low, averaging 4.4°C and that this diminishes the thermal element in controlling the CO₂ concentrations experienced.

It may well be that at higher temperatures the correlation could be stronger. Nonetheless the results of this study suggest that other factors in the peatland ecosystem are probably more dominant in controlling CO₂ values or that the thermal component in the system is significantly affected by other biotic and even abiotic elements, underscoring the need to view these systems as complex and adaptive.

Conclusions

This research project provides an insight into fluvial carbon cycling in Kippure blanket peatland. The outcomes of this longitudinal study include:

1. a thorough understanding of carbon speciation, concentration and fluxes;
2. identification of the role of carbon in the water quality of the Wicklow Mountain headwaters such as Liffey, Dargle and Cloghoge;
3. establishment of a reliable method to study carbon dynamics in-situ and finally
4. the production of a carbon database to support future research.

*Mariya Radomski
& Alan Gilmer*

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ALLAN ROBERTSON GRANTS 2019: APPLY BY 31 JANUARY.

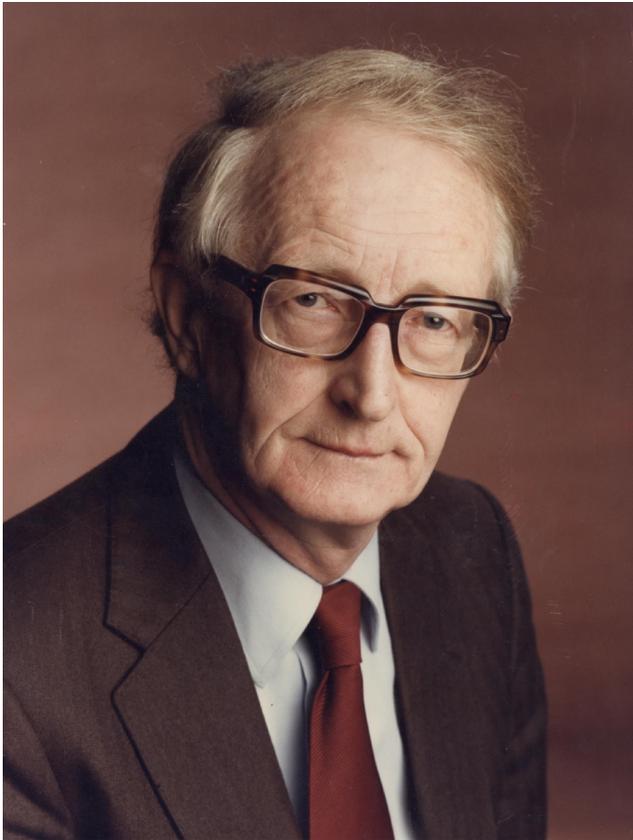


 **III INTERNATIONAL SYMPOSIUM ON
GROWING MEDIA, COMPOSTING AND
SUBSTRATE ANALYSIS**
MILAN, JUNE 24-28, 2019

abstract deadline 18 January!

In Memoriam: Patrick (Paddy) MacEvilly (1928 - 2018)

Text: Donal Clarke
Photos: BnM



After graduating in mechanical engineering from University College Dublin MacEvilly joined the Department of Posts and Telegraphs. In 1952 he was appointed junior mechanical engineer in the Timahoe Works of Bord na Móna.

He served in a number of posts, specialising in briquette factory management and design, becoming manager of Croghan briquette factory. In October 1975 he was transferred to Bord na Móna Head Office to a position in charge of briquetting at a time when two new briquette factories were being considered.

In 1978 he became General Works Manager and in 1983 was appointed Managing Director of Bord na Móna. That same year, 1983, he was elected Vice-President of the IPS. In 1987 he left Bord na Móna to take up the position of Managing Director of a prominent food-processing company, Odlums. He was made an Honorary Member of the IPS in 1988.



Paddy MacEvilly with the then Deputy Prime Minister Dick Spring T.D. at the time of the 1984 Peat Congress.

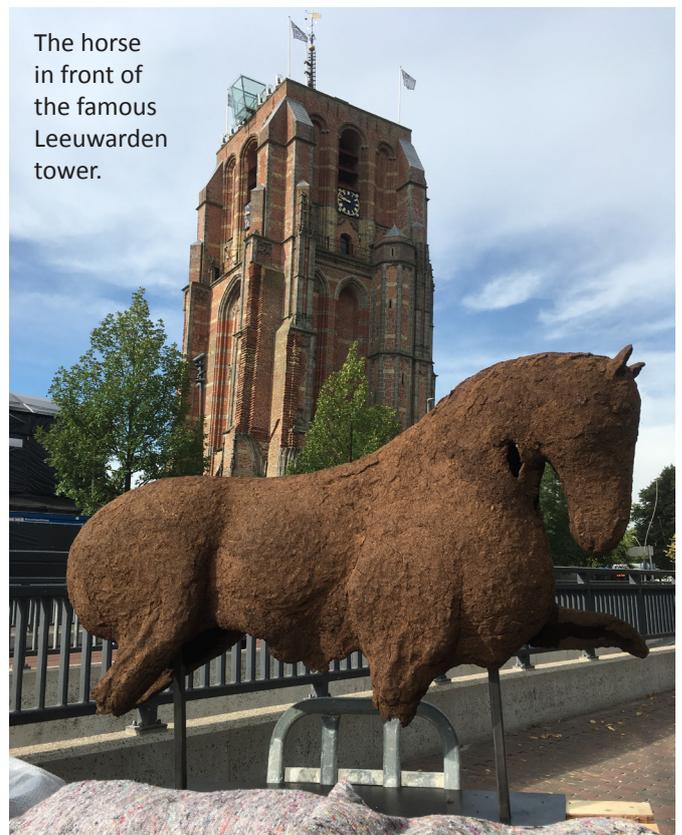
PEATART in the Cultural Capital of Europe 2018

On July 6th the ambassador of Estonia in the Netherlands, Mrs. Kaili Terras, opened the PEATART pop-up gallery in the city center of the Dutch city of Leeuwarden.

During her presence in Leeuwarden, artist Dionien Busschen worked on the sculpture of a Frisian horse made of Estonian peat. In addition to this active part where visitors could watch how she worked, the exhibition “DOWN TO EARTH - the forgotten people of Soosaare” was exhibited. The pop-up gallery was visited by approximately 9,000 people from all over the world during the six weeks it was open.

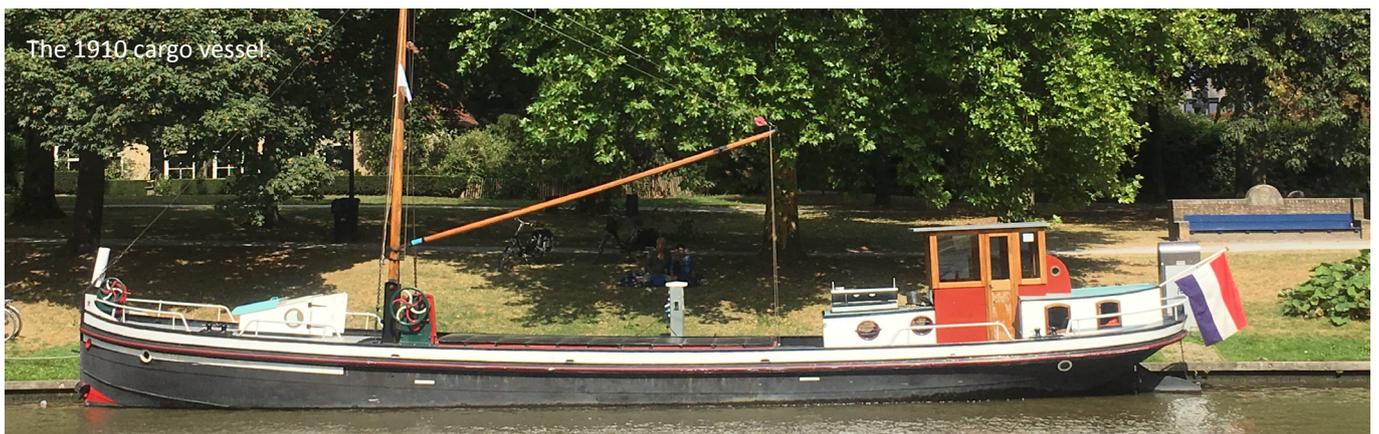
The horse left Leeuwarden by an old cargo ship built in 1910. After a two-day sail it arrived in the city of Gorredijk where it is now part of an exhibition in the Museum Opsterlân about the Frisian horse.

The exhibition “DOWN TO EARTH” can be seen from September in the PEATART gallery at Kerkstraat 76 in Amsterdam, www.peatart.com.



The horse in front of the famous Leeuwarden tower.

Nick van de Griendt
navdgriendt@sphagnum.nl



The 1910 cargo vessel

Rotterdam Convention Participant Survey

The following recommendations of the survey were submitted to the Executive Board, to be taken into consideration for future IPS events:

Well done

- Venue
- Field trips
- City easy to reach
- Mix of people and topics
- Meeting people face-to-face
- High-quality presentations
- Not too much stuff to carry
- Short presentations
- Open Wifi
- On time

*Thanks to all
49 who replied!*

To improve

- Increase transparency & interaction: fewer keynote speeches, earlier (in the week) and more/longer sessions by volunteer speakers
- Much more diversity in gender, ethnic background, age and career stage
- Ensure real balance between industry & science, conservation & use, tropical & temperate on all days (this was mentioned by both sides, as both felt underrepresented)
- Improve organization: early program, early website, organizers being present, clear access
- Active organizing committee, build scientific committee of local and international experts
- Fewer parallel sessions, longer presentation slots, more session days
- Stronger focus on posters: special session, designated time slots
- Ensure easy navigation (map, signs), include breaks between meetings
- Larger rooms for the sessions, preferably close to each other
- Lower prices, low-budget accommodation nearby, lower admin fee
- Quantity of food, buffet works better, special food requirements also on tours
- Evenings: seated gala dinner, closer venues, combi of official and non-official evenings, less bus transport, option to leave earlier
- List of participants (opt-in), brochure + bag
- Attract young scientists and students
- Get newbies involved

New Members of the IPS and invoicing

New members (or new contact persons for corporate and institute members) are approved by our National Committees or, in other countries, 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 13 December)

To join us, simply fill in our online membership form at www.peatlands.org/join-us!

Individual members

Chile: Piero Gecele

Finland, Suoseura: Minna Arola, Olli

Autio, Kersti Haahti, Frans Haapaniemi, Timo Kemilä, Juhani Laamanen, Jaana Leppälampi-Kujansuu, Timo Niura, Niina Onttonen, Mari Pihlatie, Sanna Piilo, Maarit Raivonen, Ulla Tarvainen, Pertti Tuomi, Tuuli Virmiala, Kim Yrjälä

Student members:

Bangladesh: Md. Nayem Hasan Munna

Finland, Suoseura: Oona Allonen, Ronja Hyppölä, Sara Lankinen-Timonen, Karim Md Rezaul

Corporate members:

Belgium: Nele Ameloot (Greenyard Horticulture)

The Secretariat will keep updating its membership list in January. Membership fees are collected by each of our National Committees on their own conditions and timetables. For members in other countries, invoices are sent directly by the IPS Secretariat, mostly by email.

Next year's fees will be collected in June, after the Annual Assembly in Bremen, Germany.

Thank you very much for supporting us. Any network is only as strong as its parts.

Peat and Peatland Events

Extraordinary Assembly of National Representatives (change of auditor)
Email, 28 - 31 January 2019

IPS Commission and Expert Group Meeting
Tallinn, Estonia
11 - 13 February 2019

25th PERG's Symposium
Québec City, Canada
18 - 19 February 2019
www.gret-perg.ulaval.ca

IPS Executive Board Meeting
Stockholm, Sweden (to be confirmed)
20 - 21 March 2019

EGU General Assembly 2019
Vienna, Austria
7 - 12 April 2019
www.egu2019.eu

**German National Committee (DGMT) and IPS Symposium and Annual Assembly
Bremen, Germany
13 - 16 May 2019
www.dgmtev.de**

27th European Biomass Conference EUBCE 2019
Lisbon, Portugal
27 - 30 May 2019
www.eubce.com

Society of Wetland Scientists 2019 Annual Meeting
The Role of Wetlands in Meeting Global Environmental Challenges
Baltimore, Maryland
28 - 31 May 2019
www.swsannualmeeting.org

ISHS-IPS III International Symposium on Growing Media, Composting and Substrate Analysis
Milan, Italy
24 - 28 June 2019
www.susgro2019.com

WETSCAPES Conference - Understanding the ecology of restored fen peatlands for protection and sustainable use
Rostock, Germany
10 - 13 September 2019
www.wetscapes.uni-rostock.de/en

8th World Conference on Ecological Restoration
Cape Town, South Africa
24 - 28 September 2019
www.ser2019.org

IPS Symposium
Use of Peat for Food Production and Quality of Life
Liaocheng, China
16 - 18 October 2019

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

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

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

**16th International Peatland Congress
Tallinn, Estonia
16 - 19 June 2020
www.ipc2020.com
www.facebook.com/events/1162609177193984**

17th International Peatland Congress
Beijing, China
22 - 25 July 2024

Visit the new IPS online store: holvi.com/shop/peatlands



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Next issue(s)...

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Please send your manuscript (max. 1,000 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 or pdf files with the names of the photographers) and advertisements (pdf files, prices according to Media Kit) as soon as possible to the IPS Secretariat, susann.warnecke@peatlands.org.

Submission deadline: PI 1/2019: **4 March 2019**



Your peat and peatland
article 2018/2019?
Mail us!

Strategy for Responsible
Peatland Management
Review & Update 2019



Looking forward to
Bremen 2019 -
Annual Meetings in May