PEATLANDS

International 2/2012

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PEATLANDS
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In this issue

IPS Insights

Congress, symposia and other events

From and for the industry

Research reports

Book reviews

International Peat Society | IMTG MTG

Even on a bog there was not enough room to take a group picture of all 602 participants. Here are just a few of them. Thanks for having been with us in Stockholm!

At the Post-Congress tour. Photo: Tuula Larmola

14th International Peat Congress
Stockholm, Sweden 3 - 6 June 2012

Editorial

Jaakko Silpola

The International Peat Congress in Stockholm was a success!

The 14th international Peat Congress in Stockholm 2012 “Peatlands in Balance” treated themes ranging from basic science and ecology to the economic and social implications of human use of peatlands. In addition, the Congress also had one overriding objective – to focus on the practical management of peatlands.

I am proud to report that the Congress was one of the largest throughout the IPS history. It brought 602 participants from 33 countries and in total 58 sponsors, of which 24 were exhibitors, to Stockholm. The scientific program consisted of 409 approved oral presentations and posters. Because of a fairly large number of late cancellations, exactly 337 of these were presented in Stockholm.

At a glimpse, the three most attractive sessions with approved abstracts were:

- Carbon balance & GHG fluxes in disturbed and cut-over peatlands (Chair: Eeva-Stiina Tuittila), altogether 39 abstracts
- Restoration, rehabilitation and after-use of disturbed peatlands (Chair: Catherine Farrell), altogether 28 abstracts
- Chemical, physical and biological characteristics of peat (Chair: Jürgen Schoenherr), altogether 26 abstracts

The total number of different scientific themes dealt with at the Congress was 28! This great variety of topics shows how widely the International Peat Congress, as well as the IPS as its hosting organization, covers all aspects of peat and peatlands.

All available short abstracts were published in the printed Book of Abstracts. Most of them had advanced into extended abstracts and were consequently published in the ”Proceedings of the 14th International Peat Congress, Stockholm, 2012”. These were given to all registered participants in the form of memory sticks. Unfortunately we had some technical problems with the content of the sticks but - thanks to the Internet - by now all these should be solved. Six months after the Congress, in January 2013, the Proceedings will be available for the public at the member database of the IPS website.

Thanking the outgoing Executive Board of the IPS: Secretary General Jaakko Silpola, EB members Björn Hånell and Paul Short, Communications Manager Susann Warnecke, President Donal Clarke, EB members Jutta Zeitz, Erki Niitlaan, Lech Szajdak and Valerijs Kozlovs. Photo: Stockholm City Congress Center

The panel debate "SRPM, Strategy for Responsible Peatland Management" on the last Congress day started with two presentations about how the Strategy has been received and implemented in different countries. The questions discussed during the panel debate were formulated by Tord Magnusson and Paul Short. Nine panel participants presented their views during the lively discussion.

Very positive and constructive feedback

Three weeks after the Congress, the IPS Secretariat launched a participant survey on the Internet. Altogether 139 participants (23% of all delegates) responded to the lengthy questionnaire. Out of them 47% were researchers; 29% worked for a company, 14% were students, and about 10% involved in other affairs. To our great pleasure, the great majority, some 87% of the replying participants, said that they were satisfied with the Congress in general! This is a very good result. Only a quite small share of those who replied, 5%, were dissatisfied.

Interestingly enough, in the open-ended questions many issues were at the same time either thanked for or criticized e.g. "Too much about the peat industry" stood against "Not enough about the peat industry". To put these answers into perspective, we should remember that e.g. only 28 presentations out of 337 abstracts and posters dealt with horticultural and energy peat production and use.

However, what we clearly need to develop is the structure and timetable of the scientific program. How to enable visitors to get information on as many as possible things at the same time? We also need to pay more attention to the content and function of the USB sticks providing the Congress Proceedings. Maybe there is even a new and better technology available in 2016?

The organizers and session Chairs reported on their huge work load for the Proceedings - we should not blame them. We simply have to have some more time when preparing the Proceedings in order to avoid mistakes.

Based on the feedback, it is also evident that future Congresses of the IPS, as well as other symposia and seminars, must have a more interactive program with more workshops and well-prepared panel discussions. Out of each session also conclusions or a common synthesis should be prepared. Examples for this can be found in this magazine.

There is also one matter we would like to pay attention to: It is a little surprising that only 28% of the students participated in the Congress for networking. I would hereby like to encourage all students and young people to bravely participate in discussions and social events in order to meet new people and make new connections. This might be essential for your future work.

To give you better insights, we have summarised the Congress survey results in a special article that can be studied in this issue of Peatlands International.

Thank you all!

As a conclusion, implementing the Congress required considerable resources in terms of finances, work and dedication, but was also a lot of fun. The whole peat family of the IPS would like to thank the organizers as well as sponsors, session Chairs, key note speakers, session speakers and poster holders and finally all volunteers. You made great contributions in supporting and organizing this splendid event with a high level scientific program, 14 field trips as well as two pre and post Congress tours.

And finally, in addition to the Congress organizers, I would like to thank all participants for the marvellous social program and atmosphere as well as the warm feeling of friendship during all Congress days!

See you soon again at one of the IPS events,

Jaakko Silpola

Secretary General of the IPS
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From the President's Desk

Björn Hånell

A new term – options and priorities

Time flies! Our 14th International Peat Congress is already several months behind us. Over 600 peat family members from 33 countries came to the Swedish capital. More than 400 oral and poster presentations were submitted and the proceedings represent a treasure of the most recent research results in our field! The Congress marks the end of a 4-year work period, but it also fully opens the doors for a new challenging term. What did we accomplish between Tullamore 2008 and Stockholm 2012 - and what are our priorities now?

IPS' new President Björn Hånell (light grey suit) with the newly elected Executive Board in Stockholm on 8 June. Left to right: Paul Short, Canada; Samu Valpola, Finland; Jack Rieley, United Kingdom (2nd Vice President); Björn Hånell, Sweden (President); Guus van Berckel (1st Vice President), the Netherlands; Lech Szajdak, Poland; Valerijs Kozlovs, Latvia; Erki Niitlaan, Estonia; Donal Clarke, Ireland and Secretary General Jaakko Silpola, Finland. Photo: Susann Warnecke

A new Executive Board (EB) of the IPS was formed in Stockholm and the EB itself immediately served us a priority – on balance. Gender balance. I am very pleased with and proud of each and every one of my fellow members in the new Board – but it has no woman representation. As such a situation cannot be accepted, we shall work for an EB gender balance worth mentioning.

Although priorities have changed, the basic long-term task of the IPS remains the same – to work for a science-based management of all the world's peatlands for environmental, economic and social benefits. The most important accomplishment in this effort during the previous term was definitely the finalizing and publishing of the document "Strategy for Responsible Peatland Management" (SRPM). The major step along the road of putting the principles of the book "Wise Use of Mires and Peatlands" into practice has been taken! This means a priority transit for us – now we shall assist with guidelines for the practical implementation of the SRPM.

Survey of peatlands

Striving for a management strategy that targets the world's peatlands goes hand in hand with a wish to, as accurate as possible, assess the extension and status of all peat-covered land. The new information that now is available, since Eino Lappalainen finished his compilation of the Global Peat Resources, published by the IPS about 15 years ago, will soon be further expanded. For example, a national level project to survey the peatlands in China will start in 2013. An update of the data on the world's peatlands is highly desired, certainly not only by the IPS, but we should initiate the project and find the resources (funding and partners) to realize it.

For our members

Our aim to strengthen the role of the IPS on the international scene remains as well. Members give strength. Increasing membership is a prioritized issue, and we also want to take better care of the members we already have. The new IPS webpage at www.peatsociety.org is a recent accomplishment that serves both these aspirations. On this very

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Forestry and Agriculture

Speaking of our members: It is a core characteristic of the IPS to respect and have members among all peatland stakeholders, such as e.g. private landowners, practitioners, scientists, conservationists, and industry. We do have industry members, but only from the peat industry. It is truly discouraging that we do not yet have industry representation from agriculture and forestry. Area wise these two branches are by far the greatest peatland users. The responsible management of peatlands, advocated in our strategy document (SRPM), does not only refer to peat production but to all forms of use, certainly including agriculture and forestry. The strategy means acting locally after thinking globally. So, are agriculture and forest industries against responsible peatland management? Or disapprove to thinking globally when acting locally? I do not think so. I rather believe we in the IPS have an information and dissemination task we should give priority to.

Internal challenges

Another priority, underlined in the Resolution from the Stockholm Congress, is to critically review and perhaps change our internal structure so that it, better than the present, favours initiatives for activities. A more activity-friendly structure, as already developed in some of our Commissions, will offer interested persons better possibilities for participating and take initiatives in the IPS work. The Commission Chair should feel the joy and strength by having a core team to share the tasks with. I am sure that this will lead to a greater number of IPS sponsored meetings. Such a structure, visible on our webpage of course, can make an attractive space for the young ones to find us, and work with us. We need them – we must let the young ones in!

Professor Hånell welcoming all participants of the International Peat Congress in Stockholm. Photo: Susann Warnecke

Huan Ying, China!

Among our aims is also to have the largest and most important peatland countries in the world as our members, each with its own National Committee of our Society. Since the establishment of new National Committee requires more than webpage services, I and the IPS Secretary General visited Beijing and Changchun last September for assisting with and facilitating a Chinese membership. The determination shown by our Chinese hosts to realize the membership is impressive and I would like to take this opportunity to thank them once again for their friendliness and great hospitality.

Climate change

For several reasons it is crucial that our work on climate change, carbon emissions and carbon stores continues. The carbon content in all peatlands is more than two times greater than the carbon stored in all the worlds forests. Instead of establishing a new (10th) IPS Commission on climate change we decided to work with a Cross-Commission Standing Committee on this topic, since it appears on practically all Commission agendas. The priorities of the Climate Change Committee will mirror the strategies and work plans we soon shall meet and decide on.

Moving on

These are only a few matters on the priority list that will be important pieces in the build-up of our near-future strategy. We have regarded the strategy for this new term more important than to deal with at regular EB meetings only. During 25-27 January 2013 we shall therefore have a 2-day meeting in Amsterdam for a going-through and thorough discussions of the most important issues that will be deciding on what we shall do, and how. In the best of worlds, the meeting will lead us to a platform from where we can send clearer and more targeted messages for a better understanding of our work. Such ammunition is needed to fulfil the above-mentioned information and dissemination task.

With combined efforts I am convinced we shall get a good start of the work period in front of us. Before we really get on to it I would like to wish all of you in the peat family a good start of the new year.

Björn Hånell
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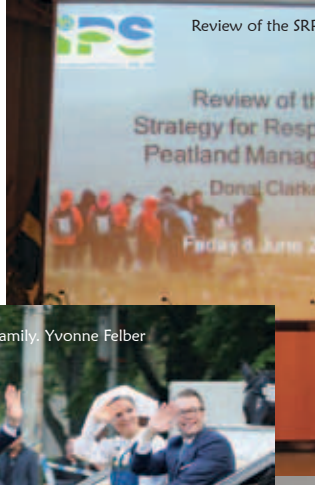
This was the International Peat Congress 2012!

Text: Susann Warnecke




Some saw even the Royal Family. Yvonne Felber

Probably most IPS members are involved in the preparations for the quadrennial International Peat Congresses - more or less, in their own countries or internationally, with an own presentation or organizing one of the exciting jigsaw pieces of the event in the background. All of us were excited and finally it was **3 - 8 June** and time to head to Sweden.

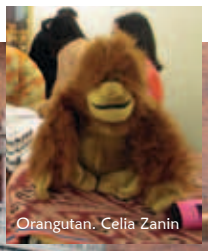
Excursion day and the Congress Center. Yvonne Felber

By plane, car, train or boat - the excellent location of the Swedish capital made it very attractive to some **600 peat experts** from Europe, Southeast Asia and North America. Even although some found the place quite expensive, after all most were impressed by the level of service, safety, cleanliness and sunshine we enjoyed during the Congress week.


Field research. Yvonne Felber


The most important organisers: Gunilla Öberg and Marie Kofod-Hansen. Nick van de Griendt

Naturally days went by at rocket speed. Starting with a welcome reception and registration on Monday, participants found themselves very quickly in one of the keynote sessions and following special interest presentations on **all possible topics related to peat and peatlands**, from biodiversity to growing media, from peat energy to its use in medicine and much more. Tropical peatlands, carbon emissions and climate-related studies remained the hot topics of the peat science world also in Stockholm.


Orangutan. Celia Zanin


Congress audience. Susann Warnecke

At the "Nobel hall". Hannu Salo

Between sessions, the participants spent their time at the **company exhibition** - a big thanks to all committed sponsors - dropping by at the poster or art room, having coffee or simply greeting one old colleague after another - it seems indeed that being a peat researcher or user is a lifelong task and "one knows each other". The open atmosphere made it also possible to get to know new acquaintances, but active networking possibilities can of course always be widened for future conferences.


PM. Susann Warnecke

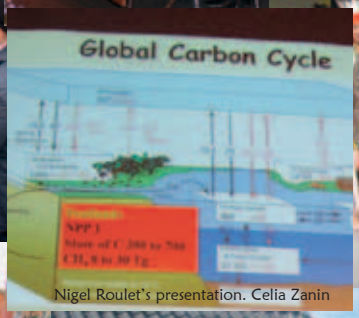

Energy peat field trip. Hannu Salo


Panel discussion. Hannu Salo


Commission II meeting. Susann Warnecke


IPS staff ready to go! Celia Zanin


Inviting the IPS to Malaysia in 2016. Celia Zanin



Nigel Roulet's presentation. Celia Zanin


IPS Honours. Susann Warnecke


Archipelago excursion. Nick van de Griendt


IPS Poster. Susann Warnecke


Music everywhere. Yvonne Felber

Luckily because of the relatively small location, moving from one session to another was relatively easy and brought even some physical exercise as there were plenty of stairs to master. However, the splendid lunches filled up all hungry stomachs - and brought another opportunity to get in touch with potential cooperation partners.

Wednesday was excursion day. Our Swedish colleagues had prepared the incredible variety of **14 field trips** - indeed difficult to choose from and all with a very interesting program. As for the sessions, one could not be at more than one place at a time! Afterwards we heard about beautiful archipelago mires, advanced machines, restored production sites, tame cows and even peat beer.

Thursday became a highlight for many. After the scientific sessions the IPS **National Representatives** met for their preparation meeting for the Annual Assembly where also the candidates for the Executive Board introduced themselves. And then most guests got ready for the official Congress Dinner.

We were invited to the Solliden restaurant at **Skansen** up above beautiful Stockholm. Music and delicious snacks greeted us, and we discovered one more time the hidden singing and dancing abilities of the organising team. What a nice dinner with new and old colleagues! As highlights of the evening, IPS honours were granted to the winner of the 2012 **Award of Excellence**, Professor Piotr Ilnicki, and three Honorary members, Jean-Yves Daigle, Tom Malterer and Juhani Päivänen.

The final Congress morning, on Friday, included the important panel discussion on the review of the **Strategy for Responsible Peatland Management** and the Annual and General Assemblies of the IPS. Finally it was time to hand over the Congress hat to Malaysia for 2016.

Thanks to everybody for having been with us and we hope to meet you again during the numerous activities of the IPS, also in non-Congress years.

Susann Warnecke
IPS Communications Manager
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Themes and sessions - what was discussed and what have we learnt from each other?

Texts: Session Chairs

Session I and subtheme I.2: Inventory, stratigraphy and conservation of mires and peatlands

In the general theme I session addressing common items for Inventory, Stratigraphy and Conservation of Mires and Peatlands there were six oral presentations and twelve posters, and for the sub-theme on Mire Hydrology and Hydrochemistry there were eleven oral presentations and nine posters. In the general session, quite some expectations were directed to an announced presentation on mires of karst hydrology in Iran but unfortunately no presenter showed up. However, karst related mires were presented in a poster from Poland. Instead we got a presentation on a large scale experiment for heating soil and plants. Huge chambers covering also the tree layer are put up and so far only being installed on site and within a year or two starting warming experiments to study the influences on across multiple spatial scales including: microbial communities, bryophyte populations, various higher plant types, and some faunal groups. This comprehensive project is, of course, carried out in US.

Other presentations in this session were related to historical accumulation of peat and its relations to humidity. In Karelia, Eastern Finland, stratigraphical studies showed increments being up to 0.8 mm/yr in the deepest mires while in the aapamires and eccentric bogs of flat terrain it was between 0.2 and 0.5 mm/yr as a mean. However, in the surface layer of 30-50 cm the increment appears to be much higher, but it must be pointed out that this layer is not yet peat but decomposing phytomass. Variations in humidity over time have consequences on peat development.

This was investigated with high temporal resolution and precision based on dendroclimatic analysis of subfossil Scots pine (*Pinus sylvestris*) from raised bogs in southern Sweden in combination with peat stratigraghy. Remarkably strong cross-correlations between ring-width records from Sweden and Germany, separated by 500-700 km, demonstrate that large-scale climate dynamics had particularly significant impacts on peatland pine growth.

Further presentations were directed on inventory and databases for Finnish peatland resources and also peat chemistry in Russia was shown. Poster presentations included classification, geochemistry and vegetation in spring-fed fens. Also a number of posters addressed peat resources, especially for Ireland and Finland. The inventory in Finland partly used photo methods and a new triangle method. From Canada carbon accumulation was shown.

In the session on hydrology and hydrochemistry, interactions were presented between hydrological conditions and surrounding land with effects on on-site vegetation for mires. Drainage in agriculture fields outside a restoration bog in Ireland influenced the hydrostatical pressure with consequences for water levels in the bog. Rewetting

Tord Magnusson and Mats B. Nilsson taking samples from a peatland near Umeå in Northern Sweden. Photo: Susann Warnecke

of industrial cut-over peatlands could alter the runoff regime with decreased low surface water flow in downstream watercourses.

Hydrochemistry and origin of water showed effects on the established vegetation where special conditions occurred in the lagg zone. In peatland carbon turnover, dissolved organic carbon (DOC) losses play an important role and from agriculture grassland in Germany, the importance of farming activities influenced losses, where higher intensity gave large effects. To understand the DOC dynamics, other factors such as the soil water dynamics and the peat quality should also be taken into account. These grassland peatlands also contribute to large losses of nitrogen where nitrate is dominating but organic nitrogen (DON) could also contribute with up to 15% of total nitrogen. Nitrogen and nitrate studies in peat columns were also presented in a poster.

The role of peatlands for water purification was claimed to be without controversy but it could possibly be disputed. However, in certain environments, anaerobic transformation processes, both less matter loads and high retention times, may increase self-purification. Therefore, active implementation of peatlands for water treatment may conserve and restore ecosystem services with respect to the surface water system.

From Japan, water flows through peat were presented and mainly lateral flow occurred with the exception of spring fens where vertical flow was found. Only the shallow groundwater supports high moor vegetation. It was concluded that to save the oligotrophic groundwater in the high moor, it is important to maintain groundwater in the thin surface layer which can easily flow to low moor through the surface peat soil or peat moss layer.

There were topics for everyone at the Congress. Here part of the audience shortly before the opening of the event. Photo: Susann Warnecke

Water quality in the coast of three habitats in Benghazi was investigated showing differences in conditions and pollution situations.

In poster presentations could be found studies on hydrology of natural and managed peatlands. Hydrological modelling based on meteorological data was included. In peat harvesting areas in Finland, influence of ditching showed small or no permanent influence on mire lake water level and quality. Also systems for continuous monitoring studying harvesting, peatland forestry and natural peatlands have been installed for the TASO project in Finland. Pre-conditions to wetland restoration in Scotland where ditch blocking is planned, will be a followed up after measure. Climate change related research had been conducted in perma-frost sites in a sub-arctic peatland showing that it is critical to link the significance of change from the physical through to the biogeochemical conditions.

In two young Swedish peatlands, formation of inorganic (DIC) and organic (DOC) carbon were investigated related to a nuclear waste repository. DIC concentrations where related to the age and the depth of the mires, with the lowest concentrations in the oldest mire and in the shallow samples. DIC concentrations were also positively related to the conductivity of the pore water within and between the mires, reflecting the influence of groundwater rich in calcium cations. DOC concentrations varied to a less extent, but were highest in the oldest mire.

Palaeo-ecological investigations used sterol and n-alkane biomarker composition of modern fen plants showed that the chemical fingerprints of fen plants, is not as straightforward as for bog plants. Also storage and turnover of heavy metals were presented in a poster comparing concentrations in various layers where input of water in autumn had changed concentrations. The highest increase was measured for Ca, Mg, Zn, Cd, Ba and Tl, much lower increase was found for Fe, As and Pb.

All in all, a wide range of subjects were presented and these two themes were only a small part of all the IPC 2012 content.

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Peat harvesting machinery was presented, among others, during the energy peat field trip. Photo: Hannu Salo

Session II and subthemes II.1 and V.2: Peat for Horticulture, Energy and Other Uses

For the last two decades or so there has been a strong trend to substitute or even phase out peat in a number of countries. With these ambitious developments, any achievements and drawbacks are most interesting to follow and – as at earlier International Peat Congresses – where most interesting to follow!

As Sphagnum Farming is of common interest to industry and after-use stakeholders, a joint sub-session (V.2) was arranged by Commissions II and V. Working on new ways of farming Sphagnum experts from the University of Greifswald, Germany, reported on their newest findings growing Sphagnum on bog grassland, establishing Sphagnum propagules from spores and, storing propagules at low temperatures. Such newer methods might be more promising, since donor peat moss is practically not available in central Europe. Another possibly even more promising, is a way of obtaining Sphagnum by in vitro cultivation. Other paper and poster presentations reflected the latest Sphagnum Farming achievements in Germany, Finland and Ireland. In discussions industry pointed out that Sphagnum can be well used in horticulture, but that it cannot be foreseen when this growing media constituent will ever be available in reasonably large enough quantities to make its mark as a peat substitute.

At session II.1 a Finnish presentation highlighted the possibility of harvesting Sphagnum biomass as a growing media constituent – an interesting alternative to Sphagnum Farming which, of course, requires the abundance of regional mires and legal permits to harvest. Another talk illustrated the difficulties a sphagnicol fungus (*Tephrocybe palustris*) can cause when farming Sphagnum, elucidating one over the quality problems that might occur.

Attempts to phase out peat in horticulture by 2030 in England and the possibilities and actual need/nonsense behind this debate was presented and adversely discussed with much enthusiasm in Stockholm. However, the past and future commitment of industry to further engage in R&D on materials other than peat was emphasized.

Also other papers underlined the importance of peat for growing media production by presenting the results of comparative trials and demonstrating that the color of peat can be used as an indicator of its chemical and physical properties.

In China too, the value of peat for horticulture is evident: for years Chinese experts have been developing and improving a compressed growing medium in tablet form in which plants are seeded. All bogs (16 km²) in China are protected, therefore only fen peat is available for local media production.

Thanks to all who participated and contributed to the lively and interactive discussions during the course of the Commission II sessions, not least to the 50 Commission II members who attended the Commission II meeting on Sunday with valuable contributions to pressing issues i.e. peat certification, peat production, Life Cycle Analyses of growing media constituents, etc.

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Subtheme II.2: Peat for Energy

This sub-session was amongst the first to kick-off on the opening day of proceedings, and was very well attended with standing-room only. In all, nine papers were presented (as well as three posters). The programme overall was indicative of the current state of play in the industry and the issues and trends that are influencing the current and future outlook for the industry. The oral presentations were scheduled into three sub-themes as follows:

- policy and strategy
- environmental aspects
- fuelling options

Under “policy and strategy” Brandel’s paper discussed sustainability and peat, Lindholm dealt with the related debate in Finland and its impact on policy while Reilly’s presentation outlined the likely direction of policy development in Ireland regarding the future use of peat for power.

In the next sub-theme “environmental aspects” papers from Tuukkanen and Marttila

covered erosion and sedimentation due to drainage runoff from peat harvesting sites in Finland; Holmgren dealt with the climate impact of energy peat utilisation from a life cycle perspective.

Finally, the differences in outlook were exemplified by the last three presenters: Nagornov's presentation dealt with peat as a fuel, Burvall treated on co-combustion of reed canary grass and milled peat, with Wichtmann suggesting ways of substituting peatland-produced biomass (paludiculture) as an energy crop to replace peat.

The essential output from the session may be stated as follows: the peat energy industry, in response to increasing "environmentalism", both in the form of environmental controls relating to emission-related impacts as well as from policy development and societal pressure in the area of sustainability, is indicating a progression towards peat displacement by, or co-fuelling with, biomass and that his is more pronounced in Western Europe than in eastern countries.

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Subtheme II.3. Peat harvesting and processing technology

There were only two presentations in the session, because Russian speakers were not able to come to Stockholm.

The first presentation was given by Arvo Leinonen, Senior Scientist from the VTT Technical Research Centre of Finland. The title of the presentation was "The development of new sod peat production technology in Finland". This presentation was very interesting and the room was full of people from different countries. 30 years ago there were a lot of presentations about peat harvesting technology, but this was the only presentation of its kind at the Congress. People especially from Eastern Europe and Baltic countries were very keen to know more about the technology, because there are plans to increase the use of peat fuel in those countries.

The presented Multilayer technology would increase productivity and decrease weather dependence, which are very important for fuel production.

The other presentation was given by Frans Haapaniemi from Helsinki University. He was talking about the potential of agricultural peatlands for peat production in the Seinäjoki region in Finland. In many cases the area of peatland is small and the depth of peat layer shallow, which lowers the peat production potential.

In some cases there has been mineral soil added on the top of the peatland, which decreases the quality of peat for energy due to high ash content. However, there is some potential for peat production. In some other countries, like the Baltics and Germany, agricultural peatlands are a significant reserve for peat production. Also for climatic and biodiversity reasons, agricultural peatlands would be ideal for peat harvesting.

Growing Media presentations and the RHP workshop were followed by many horticultural peat experts. Photo: Susann Warnecke

Thinking of the next IPS Congress in Malaysia 2016, I hope that there would be a lot of presentations about new harvesting technologies. If we want to harvest peat in a responsible way, we need to have new, environmentally friendly production technologies to be taken into use in the near future.

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Session V and subtheme V.II: Restoration, rehabilitation and after-use of disturbed peatlands

It is always interesting following the trends in the development of restoration and rehabilitation techniques and no less than this year as the presentations during Commission V sessions at the 14th International Peat Congress in Stockholm this year has shown.

Beginning with those bogs that have been harvested for industrial peat production, there is a clear distinction between those sites that have only the upper Sphagnum peat layers removed for horticultural peat, as is largely the case for the industrial use Canadian peatlands and those where the peat is taken down to the

Kerstin Berglund showing the subsidence of peat in agriculturally used peatlands, from 1918 to now. Photo: Susann Warnecke

underlying fen layers, as in the case of bogs harvested for energy peat such in countries such as Sweden and Ireland.

The Canadian Sphagnum transfer method has been shown to be successful in returning a growing Sphagnum layer to former bare peat areas. Although the results do vary from site to site, it is continuously being refined and developed to cover all aspects of the peatland – from lagg to pool systems. It was very interesting to see how this method has now been trialled in Poland, Estonia and Ireland. In each case there are varying degrees of success but the trials will continue to be monitored and hopefully the results will reported at coming meetings.

This Sphagnum transfer method and methods for cultivating Sphagnum both in the lab and in the field for commercial purposes was further explored in the sub-session Commission V.I (a joint session with Commission II) on Sphagnum farming. The pioneering work carried out by the students at the University of Greifswald is showing that farming Sphagnum could be a feasible commercial venture and after-use for the millions of hectares of drained agricultural peatlands across Germany. We witnessed novel approaches such as cultivation of Sphagnum on rafts in flooded mining areas and ambitious harvesting methods using tailored catamarans. Innovative techniques from the UK and Germany are showing how propagules can be cultivated in the lab, which would compensate for the lack of available sources of Sphagnum in natural situations in some countries.

A number of presentations outlined the value of rewetting of peatlands, particularly in instances where Sphagnum re-growth is not favoured by alkaline peat layers and hydrology. The value of long term monitoring is clear and we saw great examples of the recovery following rehabilitation of bogs in Poland, Ireland, Sweden, Finland and Latvia. The additional benefits of rewetting were highlighted – such as the value for breeding waders in Ireland (a species otherwise in decline and in need of conservation management) and other ecosystem services such as carbon sequestration.

There were also very useful presentations about how scientists working on restoration and rehabilitation are working at the policy development level and interacting with peat producers and local communities living on the edges of peatland sites. In our discussions it was agreed that in order to deliver successful restoration and rehabilitation projects, interaction with policy makers, practitioners and communities is critical. This can be a challenge for scientists but a range of communication measures were explored. One very interesting presentation showed how peat is being used to cap a former landfill site in the Netherlands. Please look to the Proceedings of the conference for the full text supporting the presentations.

Thanks to all who participated and contributed to the lively and interactive discussions during the course of the Commission V sessions, not least the Commission V members meeting that had further valuable contributions from Sweden, Peru, Finland and Germany. I would like to welcome Dr Roxane Andersen who is currently working in the North of Scotland as the new Vice Chair of Commission V.

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Session VI: Balneological, medical and therapeutical use of peat

The session of the balneological, medical and therapeutical use of peat was held on 5 June. Because of the late cancellation of the presentation of Dr. Mall Orru from Estonia there were only three presentations.

The first talk, held by Mrs Yvonne Felber from Germany, dealt with the UV-B protective effect of humic substances providing the basis for the development of a peat lipstick. Her studies have been collaborated with Monika Guhr, Renate Klöcking, Roland Schubert and Jürgen Schoenherr at University of Applied Sciences Zittau/Görlitz, Germany.

Mrs Felber had sent her abstract under the name Seel but was married after that. The presentation was a very interesting one and it will be published in the Mires and Peat journal later on. In her presentation we were told that *Herpes labialis* is a worldwide spread recurring viral infection caused by the *herpes simplex* virus type 1. A major provocation factor for virus

reactivation is UV-B radiation. Humic acids (HA) known for their antiviral and UV-B protecting effects are considered promising candidates for developing a photo-protective lipstick which should minimize or even prevent the risk of UV-induced recurrences.

Peat bath products were shown also at the company exhibition, by Raselina Ltd. Photo: Susann Warnecke

In the study, UV/VIS spectra of natural humic acids, synthetic humic like acids substances and various basic lipstick components were analyzed to find out the most appropriate UV-absorbing ingredients for the product under development. The selected humic substances were then tested in different concentrations for their UV-B protective effect in human U937 cells.

For this purpose, a special arrangement of two UV-transparent cell coculture plates (one on top of the other) has been used with the cells in the lower and the test substances – acting as UV-filters – on the upper plate. UV-B irradiation was carried out in the microprocessor-controlled UV irradiation system Bio-Sun (Vilber Lourmat). The results show the expected high absorption degree of all humic acids in the UV-B range, but revealed substantial differences in the UV-B absorption of the lipstick proved to be unexpectedly high and should not be neglected. Cell counting results 24, 48 and 72 hours after UV exposition demonstrated significant dose-dependent UV-B protective effects of the tested HA similar to p-aminobenzoic acid (PABA) which was used as positive reference substance.

The second presentation was made by Dr. Leena Larva about the experiences of the Finnish Peat Sauna for athletes. The research has been carried out with soccer players in Valkeakoski town in Southern Finland from February to October in the season 2011. The FC Haka team (18 players) came to the Sportspa Aino directly after their game or training session, 8 times during the season with intervals varying from 17 to 66 days. They had a whole body peat mask in the sauna, rested and enjoyed a supper afterwards. The peat sauna is a variant of the ordinary sauna. In the peat sauna, the whole body is covered by peat and then clients stay 20 minutes in sauna of 50-60 ºC heat and at least 55% humidity.

During this season, a player of the FC Haka team was absent from the game in average 7.6 times. The mean absence per injury was 2.6 days. This is less than a half of the absence/injury, which the FC HJK team (Helsinki) had during the season 2008. Every team member found the peat sauna very relaxing and good for the spirit of the team. The research is continuing in the future. To Doctor Larva's team belong Physiotherapist Erkka Heinä and Senior Scientist Riitta Korhonen.

The third presentation was held by Senior Scientist Riitta Korhonen. She reported about the results of the balneological peat research of some mires and peat types in Estonia, the Republic of Korea and Northern Ireland in 2005 and 2008. Altogether 8 mires were investigated for balneological purposes and 22 peat samples were tested in the laboratory.

In the field, the balneological peat researches concentrated on the mire site types, peat types, degree of the decomposition of peat, thickness of the peat deposits, subsoil types and hydrological conditions. The peat samples were taken by the peat corer method for more detailed analyses. The variation of the pH-value, ash content, sulphur content and water content were typical for the natural peat types. The variation of the amounts of humic acids and fulvic acids were quite large compared with the results of Finnish peat researches.

The results certified that properties of well decomposed peat are quite similar in these countries. The physical and chemical properties of the peat samples were at the same level as in Finnish peat types. The heat retention capacity was very good for all tested peat samples. However, according to the results of these researches there were also some peat deposits not suitable for balneological purposes.

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Session VII, subtheme VII.1: Peatland forestry and surface water quality

Invited speaker Prof. emer. Hannu Mannerkoski of the University of Eastern Finland gave an excellent review on the extent of different peatland forestry activities

Many of the excursions, here field trip II "Peat geological history in the pioneer L. von Post trails", touched also forestry issues. Photo: Laimdota Kalnina

implemented in Finland since early 1900. He described the gradual emergence of measures for reducing the harmful effects on water bodies observed following peatland forest drainage, fertilization, and harvesting. Some 40 years of research has shown significant improvements which have been taken in use in practical forestry. There are still significant challenges related to the mitigation of impacts of peatland forestry to the water courses in order to attain the current standards set for the quality of surface waters.

Restoration of drained peatland sites may also cause significant water quality problems in terms of leaching of nutrients (specifically phosphorus) after water table rise. This issue was addressed in a laboratory study by M.Sc. Annu Kaila et al. in which different types of peat samples from Finland and Ireland were analyzed for nutrient leaching. The results indicated variable levels of leaching in varying conditions after rewetting.

Two of the presentations addressed utilization of natural processes in management to control the nutrient and sediment loads to the water courses. Sakari Sarkkola et al. used water balance measurements data obtained from field experiment to show the significant forest vegetation water use as a basis to substitute part of the ditch network maintenance actions with this so called biological drainage. Zaki-ul-Zaman Asam et al. found promising results in the laboratory when testing the use of native grasses as a method of nutrient retention after harvesting in blanket bogs in Ireland.

Two presentations addressed impacts of forest harvesting on water courses in Irish blanket bogs. Joanne Finnegan et al. showed that use of brash mats of sufficient thickness and quality during clear felling protects the peat from consolidation, minimizes soil disturbance and re-fertilizes the soil with dissolved nutrients. Xiao et al. showed that forest harvesting increased water yields and base flows but had very limited impact on flood risk downstream in forested blanket bogs.

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Session VII.2: Management methods for peatland forestry

We started this session with an overview paper from USA and Canada and finished with specific forest management practices in Sweden and Finland. Invited speaker Prof. Carl Trettin of the US Forest Service, USA depicted the current status of peatland forestry in the United States (mainly on the East coast) with new management prescriptions being scrutinized (shorter rotation, inter-cropping) which pose additional questions in relation to carbon balance and ecosystem services. Sylvain Jutras from Université Laval, Canada also reviewed the status of peatland forestry in Canada with a short history and present situation where both afforestation and harvesting have become not profitable.

The impact of management practices on greenhouse gas emissions was covered in two papers. First Sikstrom et al from the Forestry Research Institute of Sweden, showed that the utilization of wood ash reduced the global warming potential of two drained peatland forests in Sweden. On the other hand, Pearson et al (METLA), presented some surprising results in that the types of soil preparation applied after clear cutting (mounds, scalps or undisturbed) did not show any difference in terms of CO_2 emissions. Huotari et al, also from METLA, confirmed that the utilization of wood and peat-ash in afforested cutaway peatlands has a positive effect on both biomass production and stand density. Saarinen et al had wonderful pictures of vegetation colonizing microsites (scalps and mounds) and concluded that depth to water table affected re colonisation of scalps while mounds made of deeply dug decomposed peat remained vegetation free. Finally the last presentation by Prof. Hannu Hökkä (METLA) as Chair of the Commission, presented alternative

new management practices in the form of cutting of small canopy openings in spruce mire. There was insufficient time (5 years) to see a clear response to the cutting but already signs of the taller trees growing fasters in the mid-sized openings (10 m) is encouraging.

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Session IX and subthemes IX.1, IX.2 and IX.3: Tropical peatlands

In this session on Tropical Peatland there were 50 presentations, 30 of which were oral and 20 poster. The quality of the presentations was high and covered all aspects of tropical peat and peatlands. The main focus was on Southeast Asia but also included papers from Brazil and Republic of Congo.

Sub-Session IX – Tropical Peatlands (general)

There were 4 oral and 10 poster presentations. Topics included peat chemistry, biological activity, remote sensing, moisture content/hydrology and energy flux measurements of both natural and developed peatland.

The sophistication and accuracy of remote sensing technology has improved considerably in recent years, and is contributing greatly to better peatland inventory and improved estimates of the tropical peat carbon store and losses from it as a result of fire and land use change. LIDAR, for example, is likely to become an important monitoring tool in future REDD-related projects (Boehm et al; Segah et al; Ballhorn et al).

There is still considerable interest in ecological and management - related research. Changes to peat bacterial communities and DOC following peatland conversion to oil palm plantation were considered by Maie et al, while the effect of logging on organic matter characteristics of peat in Brunei Darussalam were discussed by Gandois et al. The barriers to seedling regeneration in tropical peatland following fire were highlighted by Jali.

The guests from Asia were very interested in peatland agriculture in Sweden. Photo: Susann Warnecke

Sub-Session IX.1 – Sustainability of Tropical Peatland

There were 6 oral and 4 poster presentations. Problems of sustainable tropical peatland ecosystem management were discussed by Medrilzam et al and sustainable biomass production by Norisada et al.

Three presentations were concerned with restoration/rehabilitation of degraded tropical peatland. Applegate et al considered the impact of drainage and peat degradation on tropical peatland hydrology and proposed a revised approach to rehabilitation focussing on canal blocking rather than construction of large scale dams. Wösten et al described an efficient and widespread methodology for planned hydrological restoration of disturbed tropical peatland in Central Kalimantan, Indonesia to mitigate CO_2 emissions.

Tropical peatland and peat fires were considered in three presentations. Hergoualc'h & Verchot assessed the loss of carbon from tropical peatland as a result of land use change and fire over a 25 year timescale. They considered losses of both above ground biomass and peat and estimated that peat carbon loss from wildfires contributed >63% of total carbon losses, demonstrating the urgent need in terms of global warming to protect tropical peat swamps.

The results of a small and controlled field experiment of peat burning on tropical peat in Central Kalimantan was described by Hamada et al. Bathgate et al added to the debate on the problems of restoration of tropical peatland, relating experiences in Riau, Sumatra where drains had been blocked, water table levels raised and limited vegetation regeneration was taking place.

Sub-Session IX.2 & X – Carbon Balances and Greenhouse Gas Fluxes in Tropical Peatland

There were 9 oral and 4 poster presentations covering many aspects of the topics. This sub-session commenced with a global perspective of tropical peatland by Page et al who reviewed the location, extent and magnitude of their carbon

The Malaysian participants at the Golden Hall of Stockholm City Hall. Photo: Susann Warnecke

stores in various regions of the world but especially in Southeast Asia. Their assessment of current and projected peatland development in this region indicates that ~50 Gigatonnes of peat carbon are at risk of release over the next 20 years. Hirano et al argued that owing to land use change and fire even undrained peat swamp forest was no longer a carbon sink. Presentations dealt mainly with the following:

1. CO_2 and CH_4 emissions
2. N_2O emissions
3. Peat bulk density
4. Water table effects on CO_2 emissions

Hirano et al provided information on CO_2 balance of tropical peatland ecosystems that store about 90 Gt carbon. Unfortunately, these are becoming net carbon sources as a result of land use change and fire. Net CO_2 efflux was confirmed by studies carried out on a tower on peatland in Sarawak by Tang et al. Emissions of CO_2 and CH_4 from Acacia pulp tree plantations in Riau, Sumatra were reported by Suminawata et al while Morrison et al reviewed the literature on peat surface emissions from tropical peatland. The latter suggested a revised uncertainty range for peat CO_2 emissions from oil palm plantations and demonstrated that biofuel carbon debts are likely to be larger than previously assumed for palm oil produced from feedstock grown on tropical peat.

Further data on CO_2 and CH_4 fluxes were presented by Aeries et al for logged over peat swamp forest in Sarawak and Melling et al for an oil palm plantation in Sarawak. The disturbance history and N_2O fluxes as a result of tropical peatland management were described by Vasander et al while the effect of fertilisation on N_2O emission in a laboratory incubation study was the topic presented by Sim et al. In comparison Hashidoko et al reported on a study of active nitrous oxide emissions from reclaimed peatland under agriculture.

Other greenhouse gas-related presentations included:

1. The need for a standard for assessing deforestation of tropical peat swamp forest (Setiadi);
2. Net ecosystem CO_2 exchange (NEE) (Tang et al);
3. Role of water table in CO_2 flux (Melling et al);
4. Above and below ground carbon budgets of degraded peatland using multi-temporal airborne laser altimetry (Sweda et al).

Sub-Session IX.3 – Social and Economic Uses of Tropical Peatlands

11 oral and 2 poster presentations were submitted to this sub-session and although a few presenters did not attend the remaining contributions provided a deep insight to the problems, challenges and opportunities facing tropical peatland, especially in Southeast Asia. The large number of topics ranged from conservation and rehabilitation to sustainable economic development, impact of land use change, especially to plantations. Other contributions dealt with carbon budgets, subsidence and CO_2 emissions.

Marcel Silvius set the scene with a keynote on 'Tropical Peatland Conservation and Rehabilitation as a Sustainable Economic Development Option for Private Sector and Local Communities' in which he explained the consequences of unsustainable developments for biodiversity, greenhouse gas emissions, subsidence, and local peoples livelihoods and health. He outlined alternative options to industrial scale plantations that could be cost effective, provide better livelihoods and reduce GHG emissions.

Chin et al provided an overview of peatland management in Southeast Asia. They stressed that this is at a crossroads and it is important to strategise to conserve peatland forests and reduce GHG emissions and that the principle of wise use and sustainable management is crucial to enhance the socio-economic well-being of local and global communities. This was supported by Ahmad et al in their poster on integrated peatland management. The impact of plantation establishment on tropical peatland following deforestation, drainage and fire formed the subject of several presentations. The presentation by Miettinen et al explained the rapid increase in the area of peatland in Sumatra being converted to industrial plantations of rapidly growing Acacia trees to supply the paper pulp industry. CO_2 emissions associated with these plantations are huge and will increase greatly as plantations expand. Details of carbon budgets and stocks in tropical peatland and the magnitude of CO_2 losses as a result of land use change and fire were emphasised by Jauhiainen et al, Hernowo et al and Rieley & Page.

Marcel Silvius, Wetlands International and Tong Yiew Chee, Global Environment Centre Malaysia at the SRPM Panel Discussion. Photo: Celia Zanin

Jauhiainen et al who reported on a method that separated root respiration from heterotrophic respiration (peat oxidation) showed that net CO_2 emissions were 80 t ha^{-1} y^{-1} and claimed that previous studies have underestimated GHG emissions from plantations on tropical peatland. Hernowo et al explained how Indonesia could reduce significantly the very large CO_2 emissions attributable to unsustainable management of tropical peatland by implementing best practice, peatland rehabilitation and revised land allocation policies. Rieley & Page provided data to show that subsidence caused by plantation on tropical peat will make this land unusable within human timescales as a result of increased flooding, acidity and salinity.

More detailed aspects of peat subsidence were considered by Darmawan et al and Hooijer et al. The results of the former, carried out over only one year, were confusing and conclusions appeared to contradict the findings of most other peer reviewed publications and should be assessed further. In contrast, Hooijer et al presented data from more than 800 locations monitored over a period of 3 years that confirmed subsidence rates in an around oil palm plantations in Jambi, Indonesia to be around 5 cm y^{-1}) and a net carbon loss from plantations amounting to 75 t CO_2 ha^{-1} y^{-1}. They showed that monitoring of over short periods cannot yield accurate measurements of either peat subsidence or carbon loss. In another presentation Hooijer et al discussed the implications of peat subsidence for peatland drainability and sustainability. They suggested that serious drainability problems will start in a few decades after the onset of drainage and may lead to the end of agricultural production on between 30% and 69% of the coastal peatlands within 50 years. Eventually, most drained peatlands will inevitably be rendered unproductive.

Bathgate & Iqbal explained the development context of peatland in coastal areas of Riau, Sumatra in terms of the jobs being created and increases in standard of living achieved. This was complemented by Sawal's presentation on the regulatory framework used to control development in peat areas of Sarawak. He highlighted the various initiatives and programmes undertaken by the Malaysian Government and State Government of Sarawak to regulate development and mitigate environmental issues associated with conversion of peatlands.

Overview Tropical Peatlands

This was in total the largest number of presentations of all of the sessions in this Congress and indeed at any International Peat Congress so far and represents a significant increase over the Tullamore Congress in 2008. They showed that research on a large range of aspects of tropical peatland was extremely buoyant and topical. Advances were being made in satellite and airborne methods of land cover detection and land use change monitoring. The important contribution of tropical peatlands to global biodiversity and carbon store were emphasised as was the reduction in both following land use change through deforestation, drainage, fire and conversion to other uses, especially plantations and infrastructure. It is evident that developed tropical peatland makes a large contribution to climate change processes, something of grave concern that needs to be monitored constantly and must be addressed immediately.

There are obviously conflicting opinions on the uses of tropical peatland and the consequent impacts. On the one hand there is a global obligation to preserve and enhance biodiversity and the habitats required for species survival; on the other hand developing countries need to increase their sources of income to benefit the livelihoods of their people. It is without doubt that any land use of tropical peatland, apart from natural ecosystem maintenance, leads to habitat loss and release of large amounts of carbon much of which is transferred to the atmosphere as CO_2 thereby influencing climate change processes. Oil palm and Acacia plantations on peatlands in South-east Asia will, as a result of land subsidence, lead in the medium term to major water management problems and costs and in the longer term to major land loss when the subsidence reaches levels where gravity drainage is no longer possible. Socio-economic development will therefore need to look into sustainable use options, i.e. land use that does not require drainage.

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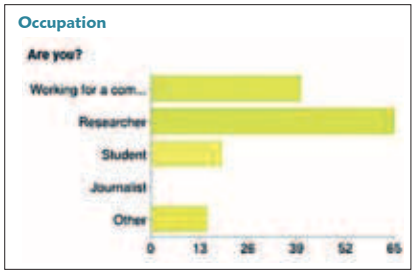
Feedback from the Congress - did you like it, too?

Survey: Celia Zanin
Text: Susann Warnecke



In summer 2012 the IPS Secretariat was in the lucky situation to have a very competent intern available, Ms Celia Zanin from France, who had studied Intercultural Communications at the University of Jyväskylä. She helped us a lot during the International Peat Congress and readily took the task to carry out the Congress participant survey.

The survey was implemented partly during the conference via questionnaires, but the majority of feedback reached us 3-9 weeks after the Congress via our internet survey. All 602 participants were asked by email to give us their opinions and impressions from the Congress on Survey Monkey. An amazing number of 139 attendees took this opportunity to help us improving future scientific events by answering to some 20 multiple choice questions and commenting their preferences.

In general, it can be said that the great majority of participants (87%) have enjoyed the atmosphere, the organisation, the activities offered and the scientific content of the Congress. However, there are some 5% of unhappy attendants and a few points that should be analyzed in detail:

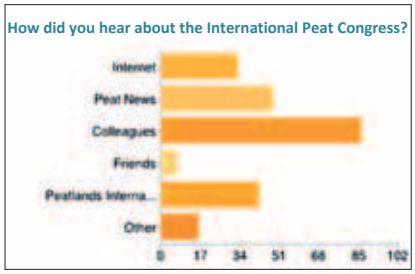
To begin with, some 84% of the responders were satisfied with the registration process. As heard also before the event from our members, some felt uncomfortable that VAT had unexpectedly to be added to the registration prices, and group registration should have been easier. Also the price level of the official accommodation offers that came together with the online registration form was criticised.

With regard to the Congress itself, people praised the diversity on country representation, subjects and disciplines. At the same time, some felt unhappy with the "dominance" of either the peat industry or the other scientific topics. This is a typical challenge for broad organisations such as the IPS, but improvements could be made by e.g. better scheduling keynote speeches and rethinking exhibition space.

The participants were very satisfied with the quality of the presentations, only some felt that the scientific level could have been higher. Much praise was given to the horticultural peat workshop, the social events and field trips. Overlapping was critized in many cases, for parallel sessions, excursions and with other conferences. In that connection, it would surely have been also beneficial for networking and exchange of ideas, if different disciplines would have had more opportunities to interact.

There were mixed opinions about the conference venue, the City Congress Centre. For many it was ideally located in the city centre, spacey, light and lunch was great; but others saw it just as outdated, too complicated and pricey for this kind of conferences. Especially the location of the poster exhibition could have been better.

Local support worked well, timing was good and the technical equipment usually worked fine. Also the Book of Abstracts was very welcome, the opening ceremony



pretty and the peat art exhibitions exciting. Serious problems occured with the USB sticks due to technical failure - replacement files were offered by email after the conference. We hope that this has solved the situation for most of you.

For a smooth running of future Congresses, the following important recommendations were given:

- chronological programme
- detailed information at the entrance and room doors
- country of speakers to programme
- indicate the level of each presentation
- list of participants as excel file
- registration on first floor
- state of art opening, conclusion and panel discussion for each commission/session
- more information on IPS administrative meetings and voting
- posters at passing places
- detailed presentation/pptx instructions
- video sessions online

Also interaction could be improved. Instead of frontal presentations, participants asked for more time for discussion, round tables and other platforms to deal with controversial views and to deepen knowledge. Many suggestions were given for additional topics for sessions, workshops and practical application of knowledge. We hope to see some of them in Malaysia in 2016 as soon as the call for papers is being prepared!

The field trips on Wednesday were attended by 3/4 of those anwering, of which almost 70% liked the experience. Most praise came for the archipelago, the peatlands and factory visited, the guided tours and the peat beer (!). For future tours, more information could be given on their schedule, equipment needed, weather and local conditions. It would also be reasonable to fill all excursions and cancel less popular ones for networking and also cost reasons. To allow people to get to know each other, name badges should be worn by all at all times and participant lists distributed before or after the trip.

The price of the conference was discussed in length at the survey. Even 46% felt it was too high, although they understood well how the level of service, the location and price were related. To save costs and thereby increase participation from poorer countries and NGOs, e.g. lunches and bags could have been simpler. Most dissatisfied here were the researchers; least students (lower fees) and company representatives. Altogether, of those responding, almost half (47%) were researchers. Some 29% came from companies, 14% were students and 11% in other occupations.

Interestingly enough, most participants had heard about the Congress from colleagues (62%) and friends (7%), 35% from Peat News, 30% via Peatlands International and 24% on the Internet (multiple choices possible). This shows that all communication channels are important - also for the local IPS conferences organised by your National Committees. And it proves that it is worth talking about joint endeavours!

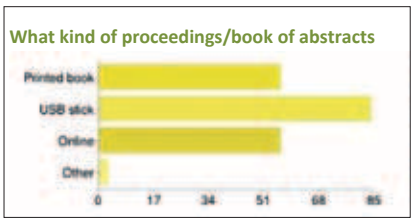
The main reason for attending the Congress was scientific interest (82%), networking (49%), promotion of their company/organisation (17%) and doing business (14%). About half of the company attendants were also interested in the scientific content. This underlies the importance of research within the IPS. Surprisingly, only 28% of the students came for networking. This possibility should surely be used much more - but we might also have to question traditional conference arrangements to allow more real get-togethers.

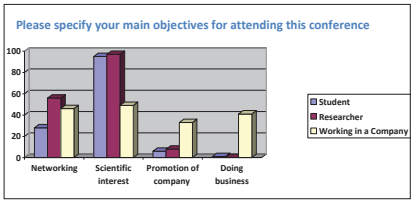
It was also interesting to see that about half of the participants were “old experts” and the other half attended their first International Peat Congress. Is this due to project work and location or are there other reasons for returning or not returning to IPS events? For Malaysia in 2016, 21% are ready to pack their bags, some 56% are not sure yet and 24% will not attend. Can we convince them to fly with us to Asia and how?

Finally a few words on the proceedings. This has always involved much work and headache for Congress organisers, mainly with regard to the tight timeframe, the varying quality of submissions and not always standardised review processes. In 2004 two heavy books had been printed, whereas in 2008 and 2012 all participants received the extended papers and abstracts on a USB memory stick, first in book format and now as separate files

For 63% a USB stick is a fine solution, 41% would prefer a printed book and the same 41% would go for online proceedings (multiple answers possible). It seems that this is a questions of culture and habit, but of course costs have to be considered too. Obviously a range of choices would be the best solution, possibly already at registration, which should be technically feasible. And one could think about further sharing: of power point files, photos, contact data and so on. After all, this could also be an important way of keeping costs at a reasonable level.

Detailed instructions must be given and followed at future conferences concerning the format of IPS proceedings, organisation of files, page numbering, the way of citing, sharing and printing. The Scientific and Executive Boards of the IPS will work on a solution - and technique is of course improving all the time. In any case, we have to check twice or thrice to avoid technical mistakes as





with this year’s USBs, some of which included wrong characters or did not open at all!

Despite some criticism, the IPS is thankful that we received that many comments and ideas for our work. We are especially glad that 84% of the respondants would recommend the International Peat Congress to others. This corresponds well with the source of information that people had before they signed up.

At the end a few words about the perception of the IPS as umbrella organiser of the Congresses. 61% of respondants were IPS members, 30% not and amazing 7% were not sure. Can all of us help to improve this, and attract more members to the IPS? After the Congress, 88% knew IPS and the majority found its work either good (53%) or very good (28%). For this, detailed comments were given, which will be considered in the strategy work of the Society.

The new IPS website was liked by 77% of respondants, but some 28% did e.g. not know that they can buy peat and peatland publications online from us. Additional free Congress comments included the range of topics, the conference bag, the proceedings, the ability to understand and choice of speakers as well as possible locations of further IPS events. Clear messages, more networking and interaction, easy-to-use proceedings and more information are needed in future - let’s head for that challenge!

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Award of Excellence 2012 of the International Peat Society to Professor Piotr Ilnicki

The IPS Award of Excellence is conferred annually for outstanding achievement in the area of peat and peatlands. During the International Peat Congress Dinner in Stockholm on 7 June 2012, the Award went to Professor Piotr Ilnicki from Poland.

Professor Piotr Ilnicki was born in Wrocław in 1935. In 1953 he enrolled at Wrocław University of Life Sciences to study Agriculture. In 1957, he earned his M.S. in Agriculture. In 1966, he gained his PhD in Agriculture at Szczecin Agricultural University. In 1999, he defended his habilitation dissertation at that University. In 1999, the President of Poland granted him the title of Professor of Agronomy.

From 1957 to 1960 he has been employee of Administrative District Authorities in Kalisz, Poland. Prof Ilnicki has been co-operator with the Engineer Consulting Office for Land Reclamation in Poznań, Poland from 1960 to 1989. Since 1989, he has been working at the Agricultural University of Poznań in the Department of Environmental Protection and Management. From 1994 to 2005 he was head of the Department. His scientific interest is focused on the following aspects:

- wetlands ecology,
- peatlands in Poland and other countries,
- physical properties of peat,
- peatlands reclamation and subsidence,
- organic soils,
- agricultural use of fens,
- soil science,
- grassland management,
- carbon sequestrating in peatland,
- eutrophication of rivers, landscape ecology,
- hydromorphological evaluation of rivers,
- change in the water circulation in Poland over a long time.

Professor Piotr Ilnicki. Photo: Galica

Above these issues, he achieved during scientific international programs to be leader, main performer or/and executor at e.g. (i) Volkswagen Stiftung Hannover, Zentrum für Agrarlandschafts- und Landnutzungsforschung (ZALF) Müncheberg, Germany, "Odra Basin – Baltic Sea Interactions (OBBSI)" 1997-1998; (ii) Global Peat Initiative, Wetland International, IUCN, IMCG, IPS, Alterra Netherland "Restoration and carbon sequestrating, capacity and biodiversity in abandoned grassland on peatland in Poland" I. Phase 2001-2002.

Professor Piotr Ilnicki was the supervisor of 5 completed PhD-theses and 76 M.S. theses. In 1976 and 1980, he was granted a scholarship from the Alexander von Humboldt Stiftung fellowship, and worked in the Bodentechnologisches Institut Bremen, Germany for 18 months. In 1990, he spent 3 weeks at German universities and scientific institutes (Braunschweig, Hannover, Bonn, Hamburg, München, Stuttgart, Essen) by the Robert Bosch Stiftung. Moreover, he attended the International Training Course on Environmental Assessment and Management at the University of Aberdeen (UK) 1992 for 8 weeks.

Professor Piotr Ilnicki has published more than 321 scientific and technical papers, including 50 published abroad in Finland, France, Germany, Hungary, the Netherlands, Soviet Union, Slovakia, Sweden, United Kingdom and the USA.

Moreover, he was also an editor of 13 scientific books. In 2002, he received the award of the Polish Ministry of

Education for publishing the book "Peatlands and Peats". In 2003 the working group "Histosoils", (unit of Commission III on "Utilization of Peat and Peatlands in Agriculture" of IPS), prepared the book on "Organic soils and peat material for sustainable agriculture". The book was edited by L.E. Parent and P. Ilnicki and published by CRC Press-USA.

Professor Piotr Ilnicki has played an active role in the work of numerous international scientific organizations. From 1965 to 1970, he was a member of the Internationale Gesellschaft für Moorforschung Liechtenstein. Since 1968 he has been a member of the International Peat Society and since 1984 a member of Commission III "Agricultural Use of Peat and Peatland". From 1995 to 2000 he was Chairperson of that Commission.

In Stockholm, the Award of Excellence scroll was handed over by the President and Secretary General to EB member Lech Szajdak (middle) from Poland, who promised to safely take it with him for Prof. Ilnicki. Photo: Hannu Salo

In addition, from 1995 to 2000 he was involved in the organization of the IPS conferences in 1997 Saint Malo, France and 1999 in Jokioinen, Finland. Moreover from 1988 to 1996 he has been a member of the IPS Executive Board. Furthermore, and from 1996 to 2000 he was elected 2nd Vice President of the International Peat Society. In 2004, the IPS granted him the title of Honorary Member.

Besides his work in the International Peat Society, since 1967 he has played an active role on the Polish National Committee of the IPS. From 1993 to 1998, he has been President, 1983-1992 Vice President, and for 1983-1992 the Chair of the Polish Commission III on "Utilization of Peat and Peatlands in Agriculture".

In addition, Prof. Ilnicki has been a member of the following international scientific organizations: since 2000 International Mire Conservation Group (IMCG); since 1990 Societas Humboldtiana Polonorum (SHP); since 1993 Polish Association of Landscape Ecology (PAEK); since 1993 International Association for Landscape Ecology (IALE); since 1978 Polish Soil Science Society; since 1986 International Soil Science Society, from 1980 to 1998 Polish Academy of Sciences, member of the Committee for Land Reclamation, and from 1990 to 2000 Ministry of Environmental Protection, Commission for Environmental Impact Assessment.

Professor Piotr Ilnicki has been a member of editorial boards in a number of journals including; from 1991 to 2000 Zeitschrift für Kulturtechnik und Landentwicklung (former Zeitschrift für Kulturtechnik und Flurbereinigung (Associate Editor); 2001-2003 Landnutzung und Landentwicklung; 1998-2000 International Peat Journal; 2007-2011 Woda-Środowisko-Obszary Wiejskie.

Professor Piotr Ilnicki attended many scientific seminars, conferences and congresses organized by the IGM (Internationale Gesellschaft für Moorforschung) and IPS, such as in Budapest 1964, Helsinki-Otaniemi 1972, Poznań 1976, Leningrad 1988, Uppsala 1992, Bremen 1996, Saint Malo-France 1997, Jokioinen 1999, Quebec 2000 and Tullamore 2008.

Besides that he has been organizer or convener of sessions concerning organic soils in Poland, Germany, GDR, the Netherlands, Estonia, France, Finland, United Kingdom, Hungary, Belarus, USA and Norway. Please accept our warmest congratulations!

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About the IPS Award of Excellence

The IPS Award of Excellence was launched in 2005 and is annually conferred for a distinguished contribution by a single person, group or project in any sector of peatland activities. The Award comprises a framed scroll and a cash prize of total € 1,000.

Submissions can be made by 31 January of each year by a written letter, email or online at the IPS website. The decision on the Award winner is made by the IPS Executive Board and the Award is presented annually at the Annual Assembly of the IPS.

For more information and to submit your nomination, please visit www.peatsociety.org/award-excellence.

The IPS becoming active in China

Text and photos:
Jaakko Silpola and Björn Hånell

The IPS is on its way to strengthen its relations with Chinese peat and peatland experts. IPS President Björn Hånell and Secretary General Jaakko Silpola visited both Beijing and Changchun in September 2012. The journey was hosted by Professor Meng Xianmin from Northeast Normal University.

In Beijing, meetings were arranged, among others, with the China Coal Industry Association, which is in charge of peat and peatland affairs, the Centre of Wetland Management in the Ministry of National Forestry, and the Department of Deposit Resource Use in the Ministry of Land and Resource.

After a very interesting, one thousand kilometre train trip from Beijing, the visit continued in Changchun where the Northeast Normal University is located. The University is the centre of various activities related to peat and peatlands.

The appointment at the institute, started by meeting Executive President Zhang Shaojie of Northeast Normal University. After that, a round table meeting was held, in which the welcoming speech was given by the Director of the City and Environmental School Wu Zhengfang. In addition to professors, teachers and students of the University, several peat company representatives from all over China participated in the meeting.

IPS President Hånell introduced the history and mission of IPS as well as recent activities of the Society. This was followed by a presentation of the current status of peat research and industry in western countries given by Secretary General Silpola. Professor Wang introduced the peat research of Northeast Normal

IPS President Professor Hånell introducing the IPS to Chinese peat and peatland stakeholders. Professor Meng is translating.

University during the past 50 years. And finally, Professor Meng presented the status, opportunities and challenges of the Chinese peat industry.

After the presentations, a true round table discussion took place. During the talks, several topics dealing with peat resources, peatland investigations, the hydrology of peatlands, peatland conservation and utilization as well as their rehabilitation were covered. The Chinese peat and peatland stakeholders were also interested in general IPS activities, the Society's structure and members, as well as how to organize a well-functioning IPS National Committee.

As a special extra, a field trip was offered, including the investigation of a valley fen peatland close to Changchun. Following that, the group visited the production site for seedling substrate of Beijing Juno Science Agricultural Technology Co., Ltd. The company produces various seedling pots with lime and fertilizers ready to use for greenhouses and nurseries. The biggest pots can be used e.g. for growing oil palm plants.

After the IPS tour to China, Professor Meng informed the IPS Secretariat that Chinese peat and peatland stakeholders had suggested and supported Northeast Normal University to become "the home" of the Chinese National Committee of the IPS. This could happen by calling peat and peatland stakeholders to join the already existing Jilin Province Peat Society and upgrade that to become a whole China Peat Society - by permission from the China National Science and Technology Association. This would mean that the Society could achieve official status and the legal position to organize relevant activities all over China, and to apply for the status of a National Committee of the IPS.

Interestingly enough, Professor Meng also reported that Chinese have already set up a peat industry union on growing media in Northeast China and Inner Mongolia. All members of the union could become members of the China Peat Society.

In addition to that, according to Professor Meng, there is an idea that the China Peat Society would like to sponsor an international symposium on wise use of fen peat in Kunming City, Yunnan province, China in the fourth quarter of 2013.

Professor Meng Xianmin has developed seedling pots which are now manufactured by Beijing Juno Science Agricultural Technology Co., Ltd. Company Chairman of the Board, Mrs Lihui Liu, and IPS President, Professor Björn Hånell, listen to his introduction.

IPS President Hånell and Secretary General Silpola would like to warmly thank the representatives of the Chinese Government offices, the Chinese peat and peatland related associations and companies and of course Northeast Normal University for their hospitality and interest. We would also like to send our kind thanks to all peat related company representatives, as well as all students involved for their intensive interested towards the IPS.

Finally we would like to thank Professor Meng from Northeast Normal University as well as Counsellor Zhang from the Embassy of China in Stockholm for putting together and hosting the excellent program.

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A warm welcome surprised the two travellers from Europe.

English Growing Media Task Force issues its final report

A personal view by Jack Rieley, Secretary of the UK Peat Society

Background

The UK Government Natural Environment White Paper (June 2011) set out plans for reducing the horticultural use of peat in England to zero by 2030 according to the following milestones:

- Progressive phase-out for government and public sector on direct procurement of peat in new contracts for plants by 2015;
- Voluntary phase-out for amateur gardeners by 2020; and
- Voluntary phase-out for professional growers of fruit, vegetables and plants by 2030.

In order to address these goals a 'Task Force' was established with representatives of 35 organisations from across the supply chain and environmental NGOs to identify and overcome the barriers to phasing out the use of peat in English horticulture. Dr Alan Knight OBE was appointed Chairman.

Task Force programme of work

The Task Force drew up a work programme consisting of 12 individual projects in the following four groups.

1. Sustainable growing media – how to define and measure sustainability of growing media;
2. Role of public policy – the role of public policy in developing solutions;
3. Growing media performance, use and price – performance standards and requirements of growing media;
4. Consumer communications – communication of messages to consumers and users of growing media.

Task Force Interim Report

This report[1] was published in March 2012 and consists of an introductory personal perspective from Alan Knight followed by a 'factual' account of the progress made to date on the various projects set out in the programme of work. The chairman attempted to bring together and integrate the conflicting arguments and interests in the phasing out of peat in horticulture debate and put much emphasis on achieving 'sustainable' growing media. In spite of frequent requests, the NGOs involved in the Task Force had not re-stated the 'problem' of peat use in horticulture to update this information from its origins some 30 years ago. Alan Knight stressed the need to develop standards for 'responsible growing media', the momentum for which must come from industry.

It was evident that some projects had made more progress than others and there was little consensus agreement amongst members of the Task Force of the way forward. The carbon driver of the policy was disproved and biodiversity had vanished from the process leaving little to justify the phasing out of peat in English horticulture.

Brassica in peat blocks. Photo: James Bean

Task Force Final Report

The Final Report shows that little has changed since publication of the Interim Report except that the 12 projects are not mentioned at all and no indication is given of progress made. It is mostly the 'Chairman's take' on the process and not the consensus view of the Task Force. It is confusing, repetitive and highly anecdotal. Gone are the systematic approaches to identifying and overcoming barriers to achieving 'sustainable' growing media and instead there is 'significant progress', 'consensus', 'emerging messages' and 'observations'. The report is short, devoting 5 pages to the Chairman's observations while the main report is a mere 11 pages, followed by 5 pages of roadmap.

Pelargonium. Photo: Malcolm McPherson

Part 1: Personal observations from the Chairman

These comments and 4-point summary give the impression that the Task Force was united in finding suitable alternatives to peat while continuing to use peat in the meantime. Detailed reading of the main body of the report, however, does not support this and it is clear that the policy to phase out the use of peat in horticulture in England has not changed although the underlying rationale is highly flawed. The interpretation and use of 'sustainable' and 'sustainability' is confusing and inconsistent and detracts from the main issue of use of peat in growing media in the future of English horticulture.

Four Point Summary of Final Report Conclusions

1. The horticulture industry over relies on peat. The more it argues the economic case for peat, the more it exposes the inherent risk in having an industry that is too reliant on peat to compete. It is in the economic interests of the industry to develop more choices and alternatives in the raw materials for growing media.

2. All growing media regardless of origin must be competitive, perform to agreed standards and have proven sustainability credentials. Consensus is needed amongst the key stakeholders on what those credentials are and the degree of third party auditing required to verify compliance.

3. The environmental movement needs to restate its rationale for zero peat use in horticulture and be consistent in the delivery of that message, not just across the UK but also across the EU and beyond. It also needs to balance its narrative on peat in horticulture with other uses of peat.

4. (The UK) Government should continue to show bold leadership on this issue, but should seek ways to, and be seen to, support a prosperous UK horticulture industry that not only uses sustainable growing media but creates a sector that supports Government's wider sustainability and economic ambitions.

Part 2: Distillation of the Task Force Discussions and Programme of Work

The full report can be obtained on the Internet[2] and only a brief commentary on the major points is given here.

All Growing media must be fit for purpose
Growing media ingredients should be 'sustainable' (i.e. renewable) and conform to standards (yet to be formulated) that are third party audited. The aim should be to ensure that the majority of multi-purpose compost sold in England should meet performance standards.

Current preference for peat is based on performance and price and not ideology
The use of peat is not based on ideology but NGO commitment to stop its use is. In theory peat is not required to grow plants but the horticulture industry knows it is needed to grow plants safely, reliably and profitably and if appropriate non-peat products were available they would be used instead.

The transition to sustainable growing media needs to be economically viable
Growing media manufacturers and growers have made significant progress in reducing the peat content at their own expense but most

Bedding plants. Photo: Malcolm McPherson

peat alternatives are too expensive, unreliable and their carbon footprints can be as high as peat. There are competing demands for alternatives (e.g. for energy)

All growing media should be made from raw materials that are environmentally and socially responsible sourced and manufactured

Task Force members are developing a set of criteria for assessing if raw materials are environmentally and socially responsibly sourced and manufactured. The 3 pillars of sustainability - economic, social and environmental have been assessed in the recently published EPAGMA Growing Media Life Cycle Report[3] that shows peat replacements are no better than peat when all three indicators are taken into account.

The horticulture sector in 2030 will have undergone other transformations as will society

The focus of attention is moving from peat to water (water holding and releasing capacity of peat is much better than all other growing media ingredients) and the Report states that the horticulture industry needs to improve its water use efficiency as this is also a barrier to developing peat-free growing media.

Removal of all peat from commercial horticulture will be very challenging and targeted action is required

Peat is used because it is cheap, available and reliable and its removal from horticulture will be very challenging but will proceed. Already elements of the horticulture industry have moved away from peat but growers will only move away completely if it is in their commercial interests to do so (or forced by law!).

Transformation should be encouraged through choice editing

The majority of task force members believe that consumers cannot be expected to drive change but should retailers force it on them through choice editing? It is strange that the horticulture industry changes are to be solved by partnerships and consensus but gardeners are to have matters forced upon them.

No peat should be sourced from pristine or high quality peat habitats

None of the peat extracted in England, or the rest of the UK, is from pristine of high conservation value peatlands. Stopping peat extraction in England will drive up imports over which there will be no control and so this peat could be from high quality peatlands.

Peat is an important carbon store and active bogs sequester carbon

On the one hand, UK peatlands are said to be capable of accumulating 0.5-1mm of peat a year but only 'active' bogs are capable of doing this and the CO_2 'gain' is extremely small and very much less than the 10 million tonnes of CO_2 a year leaking from the 95% of UK's 2.3 million hectares of peatland that are degraded (not peat forming any more). Peat extraction in the UK is responsible for only 0.06% of total UK emissions!

There will never be a consensus on the case against peat, but extraction of peat will remain controversial

The argument that biodiversity is a driver for stopping peat extraction in England is no longer valid because pristine and HCV (high conservation value) bogs are not being used. No biodiversity action plan species occur on peatlands in England with planning permission for extraction. The final report refocuses on habitats and ecosystem services but the same flaw in the argument holds.

Extraction of peat for horticulture is only one of the pressures facing

Cucumber in grobags. Photo: Julian Davies

peatlands in England
The Task Force should not have decoupled peatland conservation and restoration following peat extraction from the use of peat in horticulture. They are both part of responsible peatland management and should be integrated. The new National Planning Policy Framework guidance to prevent new licenses or extensions to existing ones, being granted for peat extraction in England is a mistake that has closed the door to major opportunities for new approaches to peatland conservation and restoration.

Labelling should help the consumer make a choice and not confuse them
It would seem obvious that better information on content and source of growing media ingredients should be given to consumers. Peat-free growing media need to be checked that they really are; there is evidence to suggest that some peat-free products contain peat!

Improving confidence in the use of green waste requires improved collection, segregation and sourcing of green waste
There is an assumption in the report that peat will be replaced largely by composted green waste that is the worst growing medium ingredient as far as most of the horticulture industry is concerned. It has been rejected because of its high risk in terms of quality, reliability, safety and price.

Garden plants grown on peat compost at Stockbridge Technology Centre, UK. Photo: Julian Davies

The waste regime is currently a barrier to the sourcing of materials
The report contends that the current waste regime is a barrier to the sourcing of materials for growing media and apart from the risk factors mentioned above, stopping peat use in horticulture will require an additional 3 million cu m of peat-free growing media to supply the market

A voluntary approach will only work if people choose to take part
The horticulture industry favours a voluntary approach but NGOs and some companies favour legislation to force the change. The voluntary approach is dependent on goodwill and a desire to make things work. However, the UK Government is set on implementing its peat-free policy regardless so there is no room to manoeuvre.

Monitoring of progress needs to consider more than only changes in volumes of materials used, and this should be reflected in the 2015 policy review
Implementation is to be based on a 'roadmap' prepared in one Task Force meeting that has not been consulted or commented upon. Progress will be monitored to determine if the voluntary approach set out in this Final Report is delivering the desired result.

Part 3: Roadmap

This shows how the UK Government will stop the use of peat in English horticulture with involvement of the horticulture industry. Since this Roadmap was 'created through individual conversations and a single Task Force meeting' it is unlikely to be well thought out and has errors and inconsistencies.

Performance Standard
Growing media are to be 'fit for

Footnotes

1. www.defra.gov.uk/peat-taskforce/2012/04/02/interim-report-published/
2. www.defra.gov.uk/peat-taskforce/
3. www.epagma.eu/default/home/responsible-use.aspx
4. www.peatsociety.org/peatlands-and-peat/strategy-responsible-peatland-management

Celery in small pots.
Photo: James Bean

purpose' but who is going to carry out the testing? Who is going to carry out the subsequent product monitoring and how? What other performance standards are needed?

Responsible Sourcing and Manufacturing Standard
All growing media should be made from raw materials that are environmentally and socially responsibly sourced and manufactured. It is suggested that the Growing Media Association and the Growing Media Initiative be the bodies responsible implementing a certification scheme but they are not independent and the process would not be transparent.

Commercial Horticulture
The aim is to use only responsibly sourced and manufactured growing media but this is referred to as sustainable growing media. These are not the same! What is really concerning is that the first environmental criterion is renewability, which is nothing to do with sustainability or responsible sourcing.

Choice Editing
This is a euphemism for taking freedom of choice away from customers.

Improving Confidence in Green Waste
A major objective of the Task Force process seems to be to promote composted green waste to replace peat in order to meet other Government targets. All of the steps outlined are fine but what if green waste cannot be improved and how could it ever replace the volume of peat used?

Voluntary Approach
The aim is to achieve sustainable growing media that according to definition has to be renewable and therefore peat free. The majority of the growing media supply chain has to commit to specific actions within one year from June 2012. Gardeners are dismissed because they can be choice edited out of the story. Growers are more problematic but their demise is in a continuum that represents a series of stages in the phasing out of peat in English horticulture.

Conclusion

It is clear that the UK Government policy to phase out the use of peat in horticulture in England has not changed. In fact it has not even been modified or varied and, if anything, its resolve has been strengthened by the work of the Task Force and involvement of the horticulture industry in it. Alan Knight has thrown out a challenge to the horticulture industry that he accuses of being fossilised in the past and unable to prepare itself for the future. Is it capable of rising to this challenge?

As a better alternative to phasing out the use of peat in English horticulture it would be more responsible and sustainable to support the initiatives currently underway elsewhere in the EU to develop certification and standards for peatland management and peat use in growing media linked to the widely accepted concept of 'wise use' that is embodied in the 'Strategy for Responsible Peatland Management'[4]. It is currently the best consensus of opinion on how to manage this global resource in ways that will not give cause to future generation to attribute blame for its mismanagement.

A final thought. We are in this situation of conflict over peatlands in the UK largely because there is no overall view of peatlands at either the country or UK level. Contentious issues could be resolved more rationally if it were known what the true extent of the peatland resource and its carbon store really are together with the actual condition of all peatlands (bearing in mind that 95-99% are degraded and emitting CO_2) and the needs of industry now and in future. UK Biodiversity Plan monitoring shows that most UK peatlands have deteriorated since monitoring began and this has nothing to do with peat extraction.

A step in the right direction would be preparation of 'National Peatland Plans' for each country within the UK so that all information on conservation, utilisation and restoration can be brought together, integrated and assessed. Unfortunately, opposing interests are poles apart and while they continue to maintain their confrontational stances Britain's peatlands continue to leak CO_2 and degrade.

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Humic lakes of Wigry National Park, Northeast Poland – development and expectations for the future

Text: Danuta Drzymulska, Mirosława Kupryjanowicz

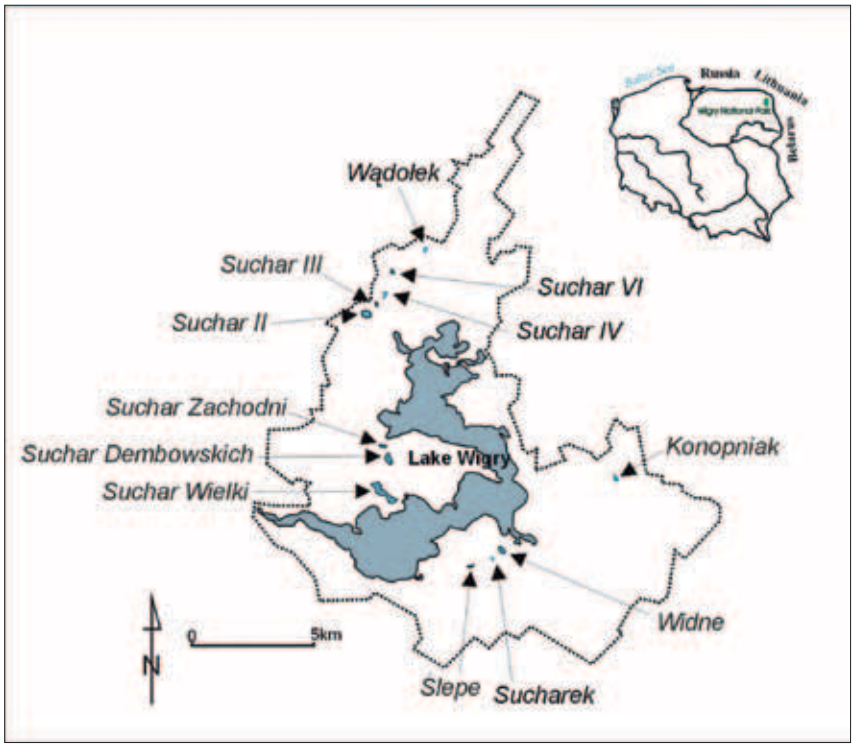

Fig. 1. Map of Poland. Humic lakes of Wigry National Park.

Introduction

Humic lakes are protected in the European Union and registered in Appendix I of the Habitat Directive as "Natural dystrophic lakes and ponds" (Anonymous, 2007). These water bodies are typical of the boreal zone (Ojala & Salonen, 2001). In northeastern Poland they occur in Wigry National Park (WNP), in the vicinity of the Wigry Lake (Fig. 1), one of the biggest and deepest lakes in Poland (area 21.63 km^2, max. depth 74.2 m), where climate and vegetation cover are similar to the conditions of Scandinavia.

These small brown-water lakes (0,5 - 3 ha) are closed systems, lacking inflows and outflows, and are surrounded by forests (Fig. 2). Some of the specific features of humic lakes include peat-covered catchment areas overgrown with coniferous forests, peat moss in the vicinity of water bodies, spreading floating mats on water surfaces, low water and sediment calcium content, high water HS content, dy sediments, low pH (4,0-6,0), small algal biomass, poor taxonomic biodiversity, and higher respiration than primary production (Wetzel, 1983; Brönmark & Hansson, 2005).

Floating mats formed by the roots and rhizomes of vascular plants (*Scheuchzeria palustris, Menyanthes trifoliata, Cyperaceae, Ericaceae*) and Sphagnum mosses are a characteristic feature of these lakes (Figs 3-4). Humic lakes have been studied in detail using hydrobiological methods (Górniak et al., 1999). Less attention, however, has been focused on their past.

Development of foreshores

The material for the study (peat and dy) was collected in the foreshore of twelve humic lakes (Fig. 1) using a Russian sampler (50 cm long and 8 cm in diameter). Single cores were drilled in the zone of the firm (non-quaking) mire. The entire sediment sequence was used for analysis of plant macrofossils. Radiocarbon dating was conducted for selected sediment samples.

The oldest foreshore sediments were accumulated in the Alleröd - by Lake Suchar VI (13075 - 12700 cal BP; GdA-2379). Lakesides of other

Fig. 2. Lake Suchar Dembowskich. Photo: Danuta Drzymulska

with poor fen (Lake Suchar VI), moderately rich fen (Lake Widne), or moderately poor fen (Lake Sucharek). Bog stage was completely absent during the development of foreshore mires of these three lakes. In others, bog developed from the initial stage (Lake Suchar II) or it occurred after the fen stage.

Formation of lake basins

Two sediment cores were collected from three selected lakes (Lake Suchar II, Lake Ślepe and Lake Suchar Wielki); the first from the basin and the second from the marginal zone covered by floating vegetation mats. The cores from marginal zones were collected with a Russian corer (50 cm long and 8 cm in diameter). Cores from the water basins were collected during winter from the ice surface with a Więckowski probe (Fig. 5). The pollen analysis of sediments was used to recognize the age of sediment. Thus the analyzed profiles were age assessed by comparing pollen diagrams with the ^{14}C dated

Top: Fig. 3. Lake Suchar VI – floating mat with *Menyanthes trifoliata*, *Thelypteris palustris* and peat mosses. Photo: Danuta Drzymulska

Below: Fig. 4. Lake Suchar III – floating mat. Photo: Danuta Drzymulska

lakes began to develop already in the Holocene. Wherein the youngest bottom sediments of the foreshore were recognized by Konopniak Lake (1717 - 1881 cal AD; Poz-38251).

Succession of subfossil vegetation, in 9 from 12 objects, followed towards bog. Different sequences were recognized only in the lakeside of Lake Suchar VI, Lake Widne and Lake Sucharek. The youngest subfossil communities were there connected

Fig. 5. Drilling by the Wieckowski probe from the ice surface. Photo: Marta Szal

diagram from nearby Lake Wigry (Kupryjanowicz, 2007).

The oldest sediments accumulated in the Alleröd (foreshore and basin of Lake Suchar Wielki and foreshore of Lake Suchar II). Sediments of Lake Ślepe started to accumulate in the beginning of the Holocene – in the Preboreal period. Each of these three lakes was a humic water body probably during the early Holocene, what is confirmed by presence of dy sediment, which age was assessed as Preboreal. Possible way of Lake Suchar II formation is presented in Fig. 6.

What about future?

Our expectations regarding the futures of humic lakes are ambiguous. On the one hand, it can be assumed that these water bodies will transform into eutrophic-like lakes. Climate change observed in the late twentieth century in northeastern Poland, including winter warming and the predominance of dry springs, can cause changes in habitats that are less favorable for dystrophy. Humic lakes are strongly linked with a cool, humid climate (Kankaala et al., 2006).

Simultaneously, over the past few decades phenomena that are advantageous for the formation of humic lakes have been observed; namely, the intense export of organic matter to surface waters (Freeman et al., 2001).

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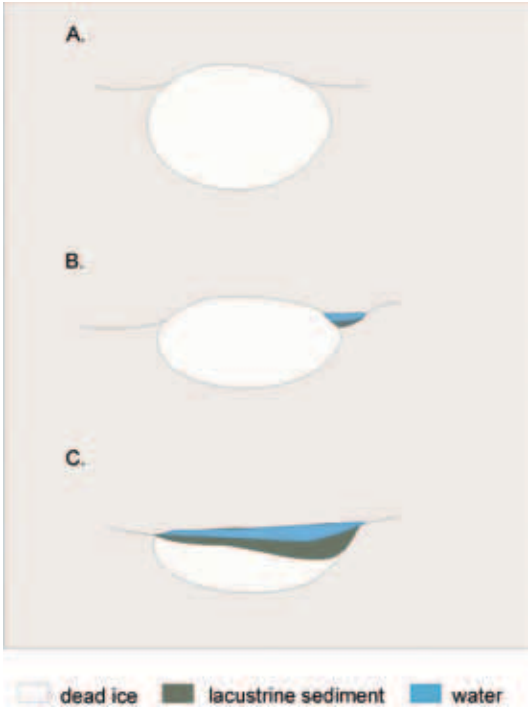

Fig. 6. Development stages of Lake Suchar II. A. Dead ice occurred in this place throughout the Late Glacial period. B. The lacustrine sediments (lacustrine chalk and calcareous gyttja) formed only in the marginal parts of this small water body as a consequence of ice melting during the Alleröd. C. The mid section of the dead ice melted over a long period of time; hence, the accumulation of sediments was there only possible in the Preboreal period after it had melted either significantly or entirely.

Notes from a German peatland symposium

Text and photos: Raimo Sopo

The International Congress "GeoHannover 2012" was held at the Leibniz University Hannover in Germany during 1-3 October 2012. The majority of the about 600 participants came from Germany. The Congress under the headline "Georesources for the 21st Century" included a one-day symposium "Peatlands and their importance as raw material in Germany".

Peatlands have played an important role in land-use especially in Lower Saxony where a major part of the German peat resources is concentrated. In accordance with population growth during the past centuries, interest in peatlands and their use in agriculture and house heating gradually grew to such extent that only very few mires are nowadays left in natural condition.

Today in Germany, as in many other countries with relatively large peat resources, a continuous discussion between nature conservation bodies and stakeholders representing agriculture, horticulture and silviculture is going on about wise use of peat and peatlands. This topic was also a core content of the peatland symposium organized by the German Peat Society (Deutsche Gesellschaft für Moor- und Torfkunde, DGMT).

The use of peat as an energy source ceased in Germany in the 1960s and today peat is produced in the country only for horticultural and in minor amounts also for balneological purposes. Albeit peat production in Germany is gradually going downwards, in 2011 some 7 million cubic meters of horticultural peat was produced, the total production area constituting more than 11,000 hectares.

The annual use of peat raw material in growing media production is about 8 - 9 million m^3, an amount of which is partly covered by import from the Baltic States, Finland and Sweden. The number of growing media producers depending on good quality substrates consists of some 60,000 enterprises and the number of employees in those enterprises is some 400,000 persons. These figures prove that the peat dependent growing media industry is for Germany economically extremely important, Mr. Johannes Welsch, Director of the German Garden Industry Association (IVG) stated in his presentation.

In Germany peatland utilization is strictly regulated by mire conservation programs, approved in 1981 and in 1986. Originally the main target of the programs was to protect the still existing mires, especially

Left: The GeoHannover 2012 Congress was arranged at the Leibniz University of Hanover. The capital of Lower Saxony is known of a concentration of many organizations dealing with soil science, peatlands included.

valuable from a nature conservation point of view. Environmental legislation has had a positive influence on the restoration of cut-over peatlands. During the past 20-30 years some 12,000 hectares of cut-over peatlands have been rewetted and the development of new mires has gradually been started in those areas.

Today more and more emphasis is put on the role of mires and peatlands in climate change, which has brought with it new approaches regarding the use of peat soils for industrial and agricultural purposes. An interesting detail was introduced at the seminar concerning "competition" between the peat and the biomass producing industries, which are both interested in acquiring old agricultural fields for their own needs.

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The peat symposium, arranged on 3 October, was attended by many well known German peat and mire experts. In the foreground Dr. Joachim Blankenburg from Bremen and Dipl. Ing. Jürgen Günther from Oldenburg.

A view on the main hall of the University where the poster stands of the Congress where erected.

Report on the German seminar "Rewetting of raised bogs - a model of success?"

Text and photos: Gerfried Caspers
Translation: Katharina Neff, AAQ

The seminar was held on 27 and 28 June 2012 in the Camp Reinsehlen hotel near Schneverdingen, jointly organised by the Alfred Toepfer Academy for Nature Conservation (NNA) and the German Peat Society (DGMT). It was designed to be a continuation of last year's seminar on the rewetting of raised bogs, in which not all interested were able to participate due to high demand. On the first seminar day, the rewetting of raised bogs and the necessary conditions were set out in several lectures. The second day was a full-day excursion to different bogs in the Rotenburg/Wümme district.

The seminar was opened by Berndhard Salomon (NNA), who gave a quick overview of last year's main points, which focussed both on the general conditions for rewetting and on specific problem cases. During the presentation, reference was made to some of last year's main lectures, but also, and most importantly, recommendations for actions were discussed. For next year, Salomon announced the continuation of the series with a seminar to be held on the future of mire protection in the Lower Saxony region.

Rainer Rahlfs from the nature conservation authority explaining the geology and historical development before entering the Großes und Weißes Moor.

Dr Joachim Blankenburg was the DGMT organiser of the seminar and welcomed the 50 participants at the beginning of his introductory presentation. He gave an overview on important national and international publications dealing with bog restoration. In particular the hydrological peat properties are worth being taken into account. They change depending on the different types of use and often decide on success or failure of rewetting.

The preparation of peat production areas was explained based on the Geofakten 14 (geo facts 14). By building peat embankments, the water is gathered in polders on the remaining, previously levelled, peat surface. The water levels are regulated with plastic tube spillways. Showing a general schema on seepage loss, Blankenburg explained to the participants which conditions have to be fulfilled for successful rewetting of fens and raised bogs.

The Staatliche Moorverwaltung (Lower Saxony peatland authority) is in charge of approx. 11,000 ha of peatlands in the Lower Saxony region, Dr Eberhard Masch, head of the authority, stated in his presentation. Half of this area, 5,500 ha, is currently being rewetted. Long-term experience has shown that the embankments fully fulfil their function only for a limited period of time. They lose height considerably by compaction and microbial peat decomposition and often have to be reworked after more than 10 years. Due to this, it is necessary to build embankments that are large enough in order to be able to drive on them afterwards. There is no other access for machines to the rewetted areas later on.

Also the birch trees growing on the peat embankments have to be kept short and, in the end, this is only possible with machines. For the avifauna, this is a necessary long-term maintenance measure. Masch pointed out that especially these long-term works are not carried out after the initial preparation works for previous peat production areas. This also includes the water level regulation, which is often not continued. Persistence, however, leads to success, Masch was able to demonstrate when presenting the Stapeler Moor: Now, after 20 years, hummock forming peat mosses are spreading again.

Peter Germer, representing the BUND Diepholzer Moorniederung (a project of Friends of the Earth Germany), set out the effects of large-area rewetting focussing mainly on the avifauna, but also on the vegetation. Data of the Rehdener Geestmoor, the Neustädter Moor and the Renzeler Moor show how the *limocolae* benefit first from rewetting. Later on, the occurrence of individual species such as the lapwing tends to slightly decrease. Shoveler and teal populations on rewetted peatlands increase with some delay. In the Neustädter Moor, meadow pipit and skylark have remarkable populations. This is probably also due to the fact that bogs that are no longer used serve as habitat for these species.

The success of rewetting for the spread of the crane can especially be seen in the Diepholzer Moorniederung. The crane does not only use the bogs for breeding but also as a resting place with tens of thousands of birds when migrating to their winter quarters and back. However, much of the success for the avifauna could only be achieved by maintenance measures, especially by keeping the bogs open by sheep grazing. Hence, the central aim in the Diepholzer Moorniederung remains to improve the hydrological situation of the bogs with further measures for rewetting and for keeping them open.

Angelika Bretschneider from the Schleswig-Holstein State Agency for Agriculture, Environment and Rural Areas gave a report on the renaturalisation efforts, which were first made for raised bogs, reaching back to the eighties. Severely adversely affected by manual and industrial peat extraction as well as agriculture, the drained raised bogs were rewetted by blocking ditches and removing the trees and shrubs. Any intervention into the existing, often only rudimentary bog vegetation left, had to be kept as little as possible, as was the case throughout Germany during those years.

Only after several years of experience with building peat embankments using construction machines, the situation improved considerably in many areas. With the introduction of a fen protection programme in 2002, also fens came within the scope for rewetting. In 2011, the programme was extended to cover all bogs in Schleswig-Holstein so that recently

Former peat production area at Hatzter Moor two years after rewetting.

rewetting projects are again carried out more and more also for raised bogs. The on-site inspections and data collection for detailed analysis of the bogs' soil and hydrological properties are issued for tender. Later on, also the supervision of the construction works is contracted. For Bretschneider, the challenges today in bog protection are not missing financial resources but a lack of human resources. The calls for tenders have to be prepared in a professional way, the submitted tenders have to be evaluated, and the projects need to be managed and monitored. In discussions, the situation was considered to be similar in the Lower Saxony region.

Dr Ludger Meyer from the engineering company Heidt & Peters highlighted the possible impacts of rewetting on stakeholders in areas nearby. For illustrating the problems, he presented the Hannoversche Moorgeest, a large-scale protection project, controversially discussed in the last few years. The water level increase has to be planned such that there are no adverse effects for land use in nearby areas. All stakeholders should be involved very early so that the technical measures planned can be communicated and thus misunderstandings are prevented. Meyer emphasised the major importance of collecting convincing water management evidence, starting already several years before implementing the rewetting measures and monitoring the situation later on.

Jan de Vries from the Staatsbosbeheer (State authority for nature conservation and forestry), Netherlands, is in charge of the rewetting measures in the raised bog reserve Bargerveen at the German-Dutch border and explained the concept. Efforts for preserving the Bargerveen reach back to 1968, when the Staatsbosbeheer bought its first 68 ha area. The protection area with 2,500 ha today is a fragment of the former Bourtanger Moor – which was much larger – and partly lies several meters above the surrounding cut-away area. The enormous hydraulic pressure resulting from this led to a serious failure of a peat embankment some years ago. The adjacent agricultural areas were largely flooded, several houses were threatened. As a consequence, a dam with a 45 m large base was constructed, consisting of a sand core and covered with boulder clay. Since then, the water levels in the raised bog could be increased. However, it has been observed that the rising water levels also increase seepage and considerable water loss occurs. For this reason, further buffer zones around the current protection area are planned for the future in order to increase the groundwater level.

As the last speaker, Eckhard Schmatzler presented alternatives for areas where optimal rewetting is not possible. The Lower Saxony mire protection programme states that such areas should be developed as heathland or dry areas. They are not to be used but to be grouped together with wettable areas. Unexpected sandbanks are only a small-area phenomenon though due to today's requirement of a 100 m x 100 m boring distance for peat harvesting applications. Larger structures in the mineral subsoil are known and usually the polder arrangement in the restoration plans is such that these areas go into rewetting. Another challenge is the rewetting of manually harvested bogs

with their strongly varying surface in small areas. Keeping the water on slightly decomposed younger peat where lateral water loss can be significant is also a difficult issue. The presentation was concluded with an overview of the Lower Saxony mire protection programme.

In the final discussion after the lectures of this seminar, the role of peatlands in climate change was raised, as had been already done in comments during the lectures. Different aspects were discussed but, in general, peatland protection and climate protection need both to be taken into account and to be weighed against each other. The aim should be to have appropriate water levels serving both purposes. As an example, the growing of typical bog vegetation on previous extraction fields with a remaining layer of strongly decomposed peat requires winter flooding, even though this causes methane emissions to increase. The climate aspect has to be incorporated into existing mire protection programmes such as foreseen in the Lower Saxony region.

Despite the various concepts for the improvement of the hydrological balance in mires taking into account both nature conservation and climate protection aspects, it has to be kept in mind that most of the peatland areas are used for agricultural purposes and hence are not readily available. Even when raising water levels in these areas, pedogenetic changes as well as the increase in nutrient content in the topsoil lead to difficult problems for the development of near-natural ecosystems. It was also critically noted that rewetting can only be carried out with the consent of all landowners. This often means that the scattered property has to be purchased, which takes a long period of time. Due to the high demand for land, mainly caused by energy crop farming, peatlands are barely sold anymore or have become very expensive. In the meantime, meaning often over decades, the peatland degradation continues.

On the excursion day, 28 June 2012, the Großes und Weißes Moor north of Kirchwalsede was visited. Rainer Rahlfs from the Untere Naturschutzbehörde (nature conservation authority) of the Rotenburg district introduced the participants to the bog's geology and the history of use and nature conservation with well-prepared information material. The bog was never used for industrial extraction. There was only some manual extraction at the edges of the area. Nevertheless, a ditch system can already be seen on the map of the Preußische Landesaufnahme of 1898 (Prussian map), which also drained the centre of the bog.

During the following walking-tour through the bog, the improvement of an old peat embankment and the visitor management in the area were presented and further possibilities for raising the water levels were discussed. In the centre of the bog, several natural bog lakes were visited, the formation of which had already been analysed in detail by Schneekloth (1963). These analyses were compared with today's situation, also by taking a sample core at the edge of a bog lake. Even though the bog was never used, its hydrology is still strongly disturbed due to the more than 110-year-old ditches. The water levels in the bog lakes have fallen at least 0.5 m as compared to the natural situation, causing the edge areas to be dry today with only some typical raised bog vegetation left. The greater the distance from the bog lakes, the more the results of ditch blocking and other measures for raising the water level can be seen. Peat mosses and other raised bog plants have spread here under a not too dense shield of pine and birch trees.

In the afternoon, previous peat production areas in the Hatzter Moor were visited, which originally were planned to be transformed to agricultural after-use. However, since the areas are low-lying, the after-use plans were changed, even though extraction had only left peat crumbs in large parts. The Rotenburg district assigned the Stiftung Naturschutz (nature conservation trust) with the bog's nature conservation management. The area has been rewetted during the last two years by building peat embankments. The project was financed by selling 'Ecopoints' for compensation measures, which became necessary at other locations in the district. Pursuant to the environmental impact provision of the Federal Nature Protection Act, standardised evaluation procedures are used to determine the number of 'Ecopoints' for biotopes or use types. Today, the centre of the low-lying area is under water. In the drier areas at the edges, more and more birch trees are growing. In the centre, extensive soft rush populations have developed, between which *Sphagnum cuspidatum* is spreading abundantly. Ms Heike Vullmer from the nature conservation trust of the Rotenburg (Wümme) district is in charge of the management of the areas. She explained the measures implemented in the Hatzter Moor together with Ms Sigrid Vogt from the Rotenburg district.

Special thanks for the excellently organised excursion go to the Untere Naturschutzbehörde (nature conservation authority) of the Rotenburg district, to the authority's head Jürgen Cassier and his staff, in particular to Rainer Rahlfs. Not only a tasty warm meal for lunch on site with tables and benches was organised, but also clearance cutting had been made for the walk through the Großes und Weißes Moor, which deserves special mention, whilst clearly highlighting the careful preparation of the excursion. For the very successful organisation of the whole seminar as well as for the moderation during the lecture day, the author of this report would like to thank Bernhard Salomon and Dr Joachim Blankenburg.

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Managing the Western Peatlands

Irish Peat Society Annual Meeting, Study Tour and Seminar

Text: Donal Clarke

The group walking into the Ballycroy National Park, Co. Mayo. Photo: Katherine Duff

The Irish Peat Society held its annual meetings and excursion in County Mayo on 16 - 17 October 2012. The two days were devoted to issues relating to western blanket bogs. The area visited, and discussed during the seminar, was famously described by Robert Lloyd Praeger in 1937 as "the very loneliest place in this country, for the hills themselves are encircled by this vast area of trackless bog, I confess I find such a place not lonely or depressing but inspiriting. You are thrown at the same time back upon yourself and forward against the mystery and majesty of nature."

The first visit was to Ballycroy National Park, 11,000 hectares of Atlantic blanket bog and mountainous terrain, covering a vast uninhabited and unspoilt wilderness. The National Park is within the Owenduff/Nephin Special Area of Conservation (SAC) and Special Protection Area (SPA), part of the European Natura 2000 network. Denis Strong, Deputy Regional Manager of the National Parks and Wildlife Service (NPWS), outlined the long negotiations with local landowners which led to significant reductions in over-grazing and other negative practices, resulting in the recovery of large areas of blanket bog.

A bog walk on Srahduggan followed where the differences between raised and blanket bogs were outlined including those in plant species and methods of peat formation.

This was followed by a visit to the Srahmore bog outside of the town of Bangor-Erris where Bord na Móna is taking wet peat from the site of the future natural gas facility at Bellanaboy 8 km north of the Srahmore site, and spreading the peat on the surface of industrial cutaway.

Areas where the spreading was completed by 2007 display successful re-vegetation by soft rush. These areas are now showing considerable growth of Sphagnum between the rushes.

The next visit was to view the rehabilitation of 6,500 hectares of former industrial cutaway at Bord na Móna's Oweninny bogs. Following the cessation of peat production in 2003, extensive blocking of drains was undertaken, ridges were established and settlement areas – ponds and small lakes – were formed. By the time of this year's visit, the area was almost completely covered in vegetation with some areas of strong Sphagnum regeneration. Dr David Wilson outlined studies being undertaken on the changing carbon balance in the area. Whereas the whole complex had been a large source of carbon, now areas where the water table has risen close to the surface are becoming either carbon neutral or carbon sinks.

The final visit was to an area where NPWS and the forestry company Coillte are establishing a large wilderness area. It will involve combining 5,000 hectares of Coillte land with 3,000 hectares from the Ballycroy National Park.

The group that attended the Irish Peat Society meeting. Photo: Bord na Mona

The future wilderness area includes land currently covered with commercial forestry combined with extensive tracts of blanket bog. Research indicates that the area has probably never been inhabited or farmed. Bill Murphy of Coillte outlined the plans to extensively thin the forests, remove the forest roads, and leave the area to develop whatever way nature takes it.

Routes and trails will be laid out and a few overnight campsites will be designated to include lean-to shelters. The full wilderness experience will last several days.

The seminar the following day continued with related themes. It began with a brief introduction by Jack Rieley, IPS Second Vice President, followed by a report by Conor Skehan of the National Peatlands Council on progress in developing a national peatlands strategy. The seminar also ended with a round table discussion on the development of the peatlands strategy.

Andrew Coupar of Scottish Natural Heritage spoke on managing Scotland's blanket bogs and of the challenges from hydro, open-cast mining, quarrying and other projects. Bill Murphy gave a more detailed outline of the plans for the Mayo wilderness area, which will take fifteen years to complete.

Michael Hughes of Inland Fisheries outlined the damage caused to rivers where run-off from blanket bog originally caused by forestry and excessive grazing led to large sections of the bog falling into the river, destroying salmon spawning areas. He described modern methods of restoring the spawning potential of the river.

Finally, Antoinette Kearney described new methods of mapping peatlands in Northern Ireland using airborne radiometric data to estimate carbon stocks.

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Denis Strong, Deputy Western Regional Manager NPWS, informing the group about management challenges relating to blanket bogs in the west of Ireland. Photo: Katherine Duff

Inefficiency banished, peat plant increases capacity

Peltracom case history

Text: Janet Cass

Any company that wants to sustain its average growth rate of 30 percent per year cannot afford inefficiency. "We had to change [our] baler to improve the quality of packaging and become more efficient," recalls Mr. Renārs Skudra, Chairman of the Board at AS Misas Kudra's peat-processing facility in Latvia. Equipped with a new baler and processing line from Premier Tech Chronos, the plant's capacity has more than doubled.

Increasing demand

The plant is a subsidiary of Belgium-based horticultural supplier Peltracom, which supplies more than 1,000 different horticultural products for the retail and professional markets in addition to peat moss, which the company harvests from its own sustainably managed peatlands. The company's exports to southern Europe, Asia and the Middle East have soared in recent years; its market share is increasing in Italy, Portugal, Malaysia, the United Arab Emirates and Turkey; and Peltracom products were recently launched in China, Taiwan and Greece.

Robust expansion is welcome news for any manufacturer—but only if the manufacturer can keep pace with demand for its products. Peat, in addition to Peltracom's other products, is in high demand for its capacity to conserve moisture and nutrients in plant substrates and for its ability to support the growth requirements of such economically important crops as strawberries, blueberries, mushrooms and lettuce.

Mr. Renars Skudra, Chairman of the Board (right), and Factory Manager Mr. Viesturs Šlosbergs (left), in front of the EA-450-E vertical FFS baler and a 1-L bale of peat moss.

Material & site challenges

Peat conserves moisture, in part, because it is dried after being harvested, becoming capable of absorbing many times its own weight in water. However, once dried, peat has the potential for creating a dusty handling environment and an accompanying risk of explosion. "We ordered a baler with options which remove dust from the system," Board Chairman Mr. Skudra explains, so fugitive dust and cleaning expense are now significantly minimized.

Peat is additionally hard to handle because its fibrous character makes it prone to bridging. Fortunately, the baler supplied by Premier Tech Chronos is equipped with a volumetric belt feeder that has a leveling device and variable frequency drive (VFD) feeding speed, which minimize the risk of bridging during feeding by moving material easily and consistently through the compression tube. In addition to minimizing bridging, this equipment promotes accurate packing because the leveler ensures that a consistent height of material is fed into the compression tube. Production is optimized too, because the height of the leveler adjusts to accommodate different bale sizes.

In addition to material-handling constraints, "the biggest challenge on that project was space constraints: to find a way to install all the equipment into a very [limited] space, have it integrated with existing equipment, and optimize functionality of the plant for current and future equipment," recalls Premier Tech Chronos Project Manager Mr. Simon Houle.

Finding the solution

Peltracom's challenges continued once the peat was baled, because the bales of semi-compressed material were too soft and too small to be successfully ejected from the four-station carrousel VP-400SE-E baler (the initial choice of Misas Kudra) en route to being conveyed and flipped prior to palletization. Premier Tech Chronos found the solution.

Because the relatively small, 100-liter bale size "was critical to the application, to better understand Peltracom's expectations about the 100-L bales, before starting the project we visited the customer in Latvia," says Mr. Houle. "After that visit, we concluded that the EA-450 baler was appropriate due to the fact that the bales are ejected [from the baler] on the wider face of the bale. No conveying on gusset face and no bale flipper are required. Using the EA-450 baler required a complete review of the layout."

This vertical form, fill, seal (FFS) baler with electronic sealer packages peat and other compressible materials at a densification ratio of up to 2.5 :1, and has a small footprint that fits in tight spaces such as the Peltracom plant. The plant's constrained space was also accommodated by Premier Tech Chronos' AP-415-E high-level palletizer, whose modular design makes it easily integrated into multiple layout configurations.

Fast installation and training

The EA-450 baler is part of a complete line installed by Premier Tech Chronos that includes an infeed system consisting of a receiving hopper and feeding conveyors; the EA-450-E vertical FFS baler plus bag conveyors; an AP-415-E high-level palletizer; a Chronos- Stretch™ Rainbow 120-B stretch hooder; and a pallet conveying and accumulation system.

"Premier Tech was flexible and organized fast support during start up, so we were able to do production almost from the very beginning …" notes Mr. Skudra. "The complete installation and commissioning was done from the second week of January 2012 to the end of February 2012," adds Mr. Houle. "After that period, we did some additional visits for fine tuning, adjustment and additional training."

Peat bales are ejected from the EA-450-E vertical FFS baler (right) onto feeding conveyors over the AP-415-E palletizer (middle), en route to the Chronos-Stretch™ Rainbow 120-B stretch hooder (left).

Training, reports Peltracom's plant manager, was accomplished so quickly that the peat-plant technicians who were the first employees to be trained were able to subsequently instruct equipment operators without direct support from Premier Tech Chronos. The line was operating at full capacity by mid-March 2012

Improved efficiency

Premier Tech Chronos' solution to Peltracom's need for improved packaging and increased efficiency "… improves all efficiency numbers," reports Mr. Skudra, including the cost of packing material and labor. The baler, for example, makes its own bags from a roll of flat film so there's no need to order pre-made bags.

The universally applicable stretch hooder's ability to wrap 40-120 pallets/hour and its capacity for precise ultrasonic height measurement ensure that the stretch hooder quickly creates correctly sized covers. This prevents material waste, reduces downtime and increases productivity. The palletizer reduces downtime and injury, too. And, due to the palletizer's modular design, it can be integrated easily into various layout configurations.

"Choice of Premier Tech was due to its experience in balers in peat industry. Premier Tech was best in supplying complete line," concludes Mr. Skudra. For more information, please visit www.premiertech.com.

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The feeding hopper on the right sends peat to the EA-450-E vertical FFS baler, in the middle of the photo, which ejects bales onto the feeding conveyor that leads to the AP-415-E palletizer, seen at left.

Carbon Accumulation Shows the Interplay between the Natural Succession of Mires and Climate Change

Text: Markku Mäkilä, Matti Saarnisto and Oleg Kuznetsov

Summary

Holocene carbon accumulation was examined from 41 peat profiles throughout Finland and Russian Karelia, and climate variability was interpreted using records of carbon accumulation rates from three raised bogs in southern Finland and one near the White Sea in Russian Karelia. Natural succession, interacting with local factors and climate, leads to differences in vegetation species composition and thus in the productivity of the resulting vegetation types. In sedge-dominated northern aapa mires, the natural development of mires and changes in the vegetation conditions have contributed more to the decreasing trend in carbon accumulation than climatic factors. The stratigraphy of raised bogs suggests that carbon exchange and accumulation have always been sensitive to the climatic fluctuations that have characterized the entire Holocene. A comparison was also made with a raised bog in the coastal area of the White Sea in Russian Karelia, which revealed a similar trend in carbon accumulation to that in the Finnish data, thus suggesting that climate fluctuations are the driving force and overshadow local factors.

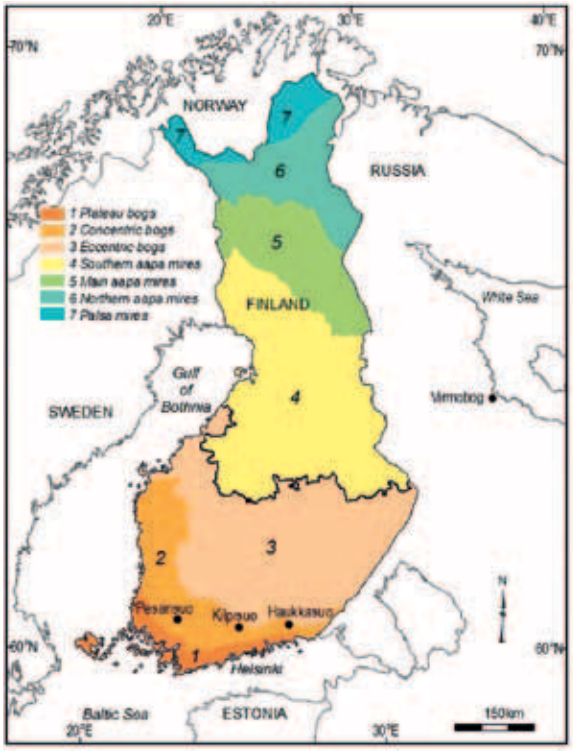


Figure 1. Locations of the study bogs and the regional distribution of the mire complex type regions of Finland according to Ruuhijärvi and Hosiaisluoma (1989). The raised bog region occurs to the south of the black line (regions 1–3) and the aapa mire area to the north (regions 4–7).

Introduction

Holocene carbon accumulation was examined throughout Finland and Russian Karelia in 41 peat profiles from 22 mires. Climate variability was interpreted using records of carbon accumulation rates in five peat profiles from three pristine raised bogs in southern Finland and one near the White Sea in Russian Karelia (Fig. 1). The carbon accumulation was calculated using peat columns of known dry bulk density, carbon content and age.

The homogeneity and age of peat deposits is of primary importance when studying the carbon accumulation dynamics in different periods of the Holocene. Mires provide widespread material for palaeoenvironmental analysis covering the Holocene (van Geel 1978, Barber et al. 2004, Mäkilä and Saarnisto 2008). The purpose of the present article is to illustrate how carbon accumulation shows the interplay between the natural succession of mires and climate change.

Peat deposits are mainly autochthonous and relatively suitable for dating with radiocarbon, especially when mosses dominate the peat. Sphagnum (moss) and Carex (sedge) peat form in different ways (Mäkilä 2011). Sphagnum moss grows from the apical bud, and the lower parts of stems die and form peat (Fig. 2). In Carex peat (and also in the formation of peat due to the

Figure 2. Formation of Sphagnum peat. Picture drawn by Harri Kutvonen.

Figure 3. Formation of Carex peat. Picture drawn by Harri Kutvonen.

decay of other vascular plants), the most important constituents are roots (Fig. 3). A certain proportion of roots dies and regenerates, so besides living roots there are also dead roots of different ages in the same peat unit. All roots eventually die and form peat.

Materials and Methods

Actual rate of carbon accumulation (ARCA)

The high carbon accumulation in the surface layers of mires is temporary and mainly related to the development of the mire. Only sub-surface carbon accumulation rates can indicate any real (delayed) long-term trends in net carbon accumulation rates, which incorporate the effects of autogenetic development of the mire and climatic change on primary production and decomposition in the surface layers of mires. The highest carbon accumulation rates in layers younger than 300 years were measured in ombrotrophic mire site types *Sphagnum fuscum* bog and *Sphagnum fuscum* pine bog (Mäkilä & Goslar 2008), (Fig. 4). Wet oligrotrophic and minerotrophic treeless mire site types came next. The lowest carbon accumulation was recorded in the most transformed, sparcely forested and forested mire site types. These mires have the lowest water table.

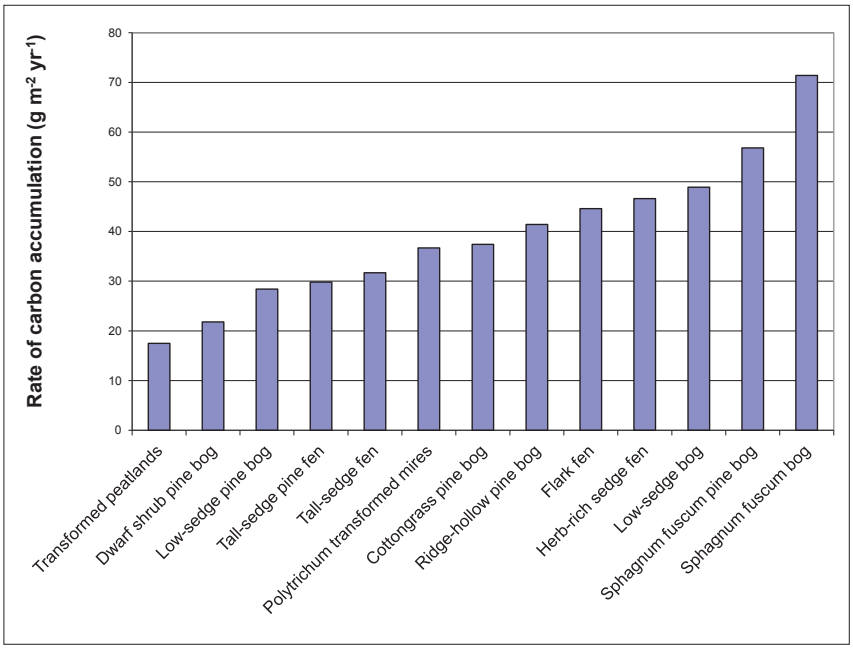


Figure 4. The average carbon accumulation rate in layers younger than 300 years in relation to the mire site type.

Long-term apparent rate of carbon accumulation (LARCA)

The long-term carbon accumulation of mires has always varied due to different climate periods, mire developmental stages, geographical locations and mire fires (Mäkilä 1997, Mäkilä et al. 2001, Heikkilä et al. 2006, Mäkilä and Moisanen 2007, Mäkilä and Saarnisto 2008). Hydrological, topographical and edaphic factors have mainly controlled variations in the carbon accumulation of aapa mires. As long as litter accumulates under anoxic conditions below the water table, peat accumulation rates mostly depend on organic matter production, and thus on the fertility of the mire water (e.g. Damman 1996). After the most productive initial stages of development, net carbon accumulation rates in mires generally decline (Mäkilä et al. 2001, Mäkilä & Moisanen 2007). The carbon accumulation of the sedge peat became slower in the mires (Fig. 5) during the warmest period of the Holocene 9,000-6,000 years ago.

In the future, it appears that carbon accumulation in surface layers will increase most in raised bogs with a dense cover of *Sphagnum fuscum* on hummocks (Fig. 5). There will also be slight increase in accumulation in southern aapa mires after the mires

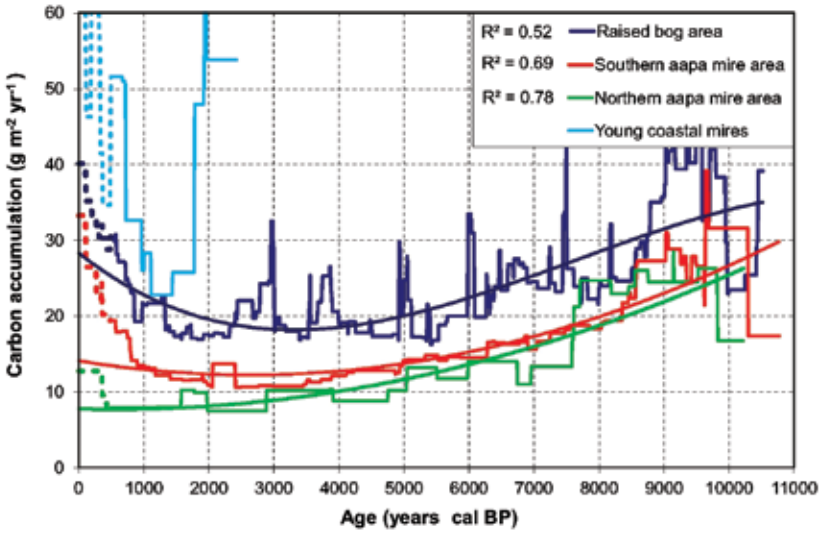


Figure 5. Carbon accumulation rates in raised bog regions, aapa mire regions and coastal mires.

become overgrown with Sphagnum. In sedge-dominated northern aapa mires, the natural mire development and changes in the vegetation conditions have contributed more to the decreasing trend of carbon accumulation than climatic factors. In young coastal bogs, carbon accumulation is gradually decreasing, because they have mainly passed the early stage of their development.

Carbon accumulation versus climate change

High net carbon accumulation rates can be attributed to low decomposition rates and wet-inhabiting species associated with humid periods with a more positive precipitation-evaporation balance. A marked decline in the carbon accumulation rate may indicate a period with a relatively dry and warm climate (e.g. Mäkilä and Saarnisto 2008, Charman et al. 2008, Saarnisto 2009). Dry periods of this kind occurred, for example 6,350-5,950 and 4,900-4,600 years ago.

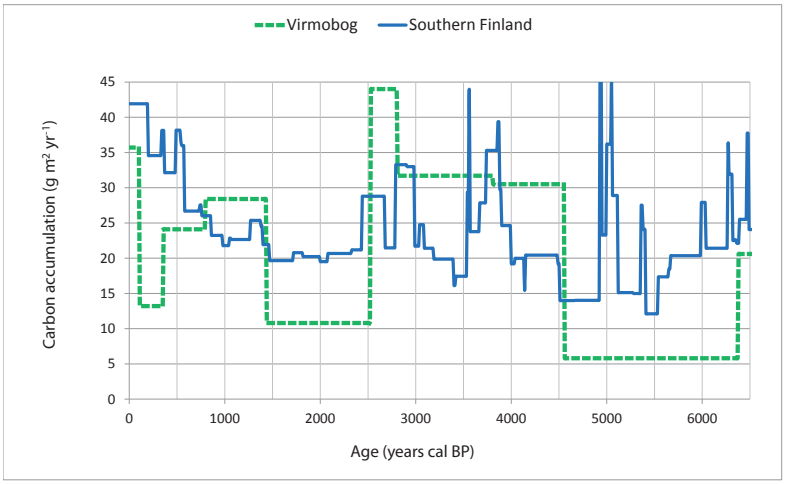
Figure 6. Average rate of long-term carbon accumulation during the last 6 600 years in three raised bogs in southern Finland and Virmobog near the White Sea in Russian Karelia.

Between the dry periods there was a moist period about 5,000 years ago when carbon accumulation greatly increased (Fig. 6). Thereafter, the climate varied considerably with regard to precipitation and became cooler. The leveling-out and subsequent increase in carbon accumulation rates in the raised bog region after 4,500 cal BP indicates the development of *Scheutzeria-Sphagnum* (section *Cuspidata*)-dominated plant associations connected with an increasingly humid climate. It was especially cold and moist 2,600-2,800 years ago, as revealed by the evidence from plant macrofossils of Sphagnum (section *Acutifolia*) and relatively low peat decomposition. Lower carbon accumulation rates between 1400-2400 cal BP may indicate a dry climate shown by more humified peat and charcoal layers in the studied bogs.

Conclusions

Natural succession, interacting with local factors and climate, leads to differences in vegetation species composition and thus in the productivity of the resulting vegetation types. The surface layers of mires are still undergoing a rapid carbon cycle. This means that carbon accumulation rates measured in the uppermost layers cannot be used in estimating long-term carbon sequestration rates. In sedge-dominated aapa mires, the natural development of the mires and changes in the vegetation conditions have contributed more to the decreasing trend in carbon accumulation than climatic factors.

Sphagnum moss is more sensitive to changes in climate than Carex peat, and also more suitable for radiocarbon dating. The stratigraphy of raised bogs suggests that carbon exchange and accumulation have always been sensitive to the climatic fluctuations that have characterized the entire Holocene (Mäkilä and Saarnisto 2008). A comparison with a raised bog in the coastal area of the White Sea in Russian Karelia revealed a similar trend in carbon accumulation to that in the Finnish data, thus suggesting that climate fluctuations are the driving force and overshadow local factors.



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Status of Peatlands and Peat in Finland today

70 Years of Peatland Research at the Geological Survey of Finland

Text: Jaakko Silpola
Photos: Taina Järvinen, GTK

The Geological Survey of Finland (Geologian Tutkimuskeskus, GTK) has organized peat and peatland research for 70 years in the country and abroad. On that occasion, a festive seminar on "Peatlands in Finnish Nature and Economy" was held at the GTK headquarters in Espoo on 28 November 2012.

The seminar was opened by Mr Elias Ekdahl, Director General of the GTK. During the day, several presentations gave a broad update and future prospects for the existence, protection and use of peat and peatlands in Finland.

Topics covered included for instance the current situation of the Finnish Peatland Strategy; needs for additional peatland protection; the use of peat for energy; possibilities to use peat in the chemical industry; a provincial case of land use planning on peatlands; as well as a presentation of the peatland research of the GTK in the past and in future.

In that connection, long term GTK geologist Mr Eino Lappalainen, who has also been a very active IPS member, received the "Silver Signet" Award of Honour of the Geological Survey for his long-time work and commitment from Mr Ekdahl.

Geologist Eino Lappalainen receiving the GTK "Silver Signet" medal from Director General Elias Ekdahl.

The festive speech of the seminar was given by Mr Esa Härmälä, Director General of the Energy Department of the Ministry of Employment and the Economy. He reported that, according to the energy guidelines of the Finnish Government, the use of peat in energy production is supposed to decrease by one third by the mid 2020s. Despite that, fuel peat is going to have its important share in the Finnish energy system, reminded Mr Härmälä.

He also underlined that it makes one worry when many power plants nowadays get prepared to increase the use of coal because of difficulties in peat supplies. The Finnish Government has recently outlined a new principle to classify peatlands into several categories according to their natural status. This is based on the Finnish National Peatland Strategy. Mr Härmälä is afraid that even though high value peatlands will be saved and protected according to the new strategy, fewer decisions will be made which low value peatlands can be utilised for peat production.

In practice, peat production operators may not apply for licences for high value peatlands, as classified by the Government's new peat and

peatland principles. However, at the same time those principles do not necessarily provide means how to obtain production licences faster that before for low value peatlands, mentioned Mr Härmälä. In addition, he stated that a responsible use of peat is legal and fair in the future, too.

According to Mr Härmälä, it must be kept in mind that more than one fourth of the Finnish land area is covered by peat. With this amount of peatlands, Finland actually has the possibility to determine several land use objectives for these areas at the same time. Their ecosystem functions need attention first, he stated – enough peatlands must be protected both in quantity and quality.

In addition to the use of peat for energy production, peat and peatlands are needed also in agriculture and forestry, for production of growing media, for landscaping and animal bedding as well as in environmental applications such as absorbing oil spills, he said.

Director General Esa Härmälä from the Energy Department of the Ministry of Employment and the Economy reminded in his festive speech that fuel peat is going to have an important share in the Finnish energy system also in the future.

Special attention must also be paid to the after-use of peat extraction sites. Mr Härmälä told the audience that he has seen fine wetlands on places that used to be peat production sites before.

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Technical Meeting on an Integrated Management Plan for Peatlands in Southeast Asia

Text: Noor Azura Ahmad

The balance between hydrology, soil and vegetation is crucial to the ability of peatland areas to support biodiversity, regulate water supply and maintain, if not increase, soil carbon stocks in Southeast Asia.

To ensure the sustainable management of peatlands and peat swamp forests, the importance of integrated management of peat swamp forests cannot be stressed enough. These were the thoughts from deliberations of a Technical Meeting on Integrated Management Plans for Peatlands in Southeast Asia held on 9-10 July 2012 in Pahang, Malaysia and attended by 40 participants from Malaysia, Indonesia, Vietnam and the Philippines; involved in the implementation of the ASEAN Peatland Forests Project (APFP), SEApeat Project as well as some regional experts.

To encourage sustainable management of key peatland areas in Southeast Asia, speakers from the region and staff from several Malaysian government agencies involved in peatland management shared their thoughts and experiences. Peatland management in Southeast Asia, over the last 2-3 decades is at a crossroads. Moving forward to resolve these peatland issues and managing it to achieve the objectives of the ASEAN Agreement on Transboundary Haze Pollution (AATHP) and guidance of the ASEAN Peatland Management Strategy (APMS), the meeting focussed on key objectives including:

- Share experience on integrated management of peatlands from the region;
- Identify strengths and weaknesses and gaps for implementation of existing plans;
- Identify good practices and lessons learned; and
- Identify key principles to guide future integrated management measures.

The meeting was successfully held and was made possible by support from IFAD/GEF and the European Union through the APFP and SEApeat projects.

Demonstrating Actions on the Ground by Malaysia

The host country, Malaysia, organized a field visit for the participants, to

Dr Raman Letchumanan, Project Director and Head of ASEAN Environment Division opening the meeting. Photo: Chin Sing Yun

highlight some practical solutions that are being applied particularly to control forest and peatland fires, and through inter-agency cooperation, sustainable timber harvesting and rehabilitation in peatland areas.

In the Penor Forest Reserve, a peat forest surrounded by urban and agricultural zones, a tube well, fire watch tower and check dams have been constructed to help prevent and control the annual incidences of fire in the surrounding land.

This approach is guided by the Ministry of Natural Resources and Environment and involves inter-agency cooperation from the Forestry Department of Peninsular Malaysia (FDPM), Department of Drainage and Irrigation (DID), the Department of Geology and Minerals (DGM), Department of Environment (DOE), Fire and Rescue Department of Malaysia (FRDM) and the Malaysian Volunteer Corps (RELA).

The tube well was commissioned by DID and managed by DGM to supplement water flow in dry seasons and provide a water source for fire fighting. Four check dams have also been built and maintained by DID to regulate the water level in the neighboring canals as part of the fire prevention measures.

The watch tower is managed by the DOE and manned by volunteers from RELA. Powerful binoculars and a compass are utilised in fire detection during the dry months. In the event of fire, the FDPM and FRDM are responsible for providing immediate assistance.

In the Pekan Forest Reserve, Reduced Impact Logging (RIL) is practiced under guidance of the Pahang Forestry Department.

The improvised crane and grabber setup. Photo: Chin Sing Yun

From 520,000 ha of Forest Reserve managed under the Sustainable Forest Management System (SFM) in Pahang, 200,000 ha is peat swamp forest, making up about 60% of protection forests and 40% of production forest in the state. Logged using the Selective Management System (SMS), affected areas are replanted, including the 20 m buffer zone area.

At this site, there was a demonstration of RIL using a modified grabber and crane to extract felled timber. Due to the high cost and strict regulations for sustainable logging in peat swamp areas, the logging activity in the area is lower than the allowed coupe of 500 ha/yr. The group also visited an area which has regenerated well 12 years after logging. Areas logged using RIL have shown better forest recovery compared to areas logged using conventional methods.

Some valuable thoughts from the Region

Eight speakers from Peninsular Malaysia (Pekan FR), Sabah (Klias FR), Sarawak (Loagan Bunut NP), West Kalimantan, Central Kalimantan, Riau provinces, Philippines and Vietnam presented experiences with the integrated management planning in their respective locations. Several

Participants looking at a map of Forest Reserves in Pahang, Malaysia. Photo: Chin Sing Yun

Demonstration of water pumping at the tube well in Penor. Photo: Noor Azura Ahmad

notable points were highlighted and discussed during the meeting.

Dr Khali Hamzah from Forest Research Institute Malaysia (FRIM) stressed the importance of stakeholder consultation and endorsement to ensure that the Management Plan is implemented. He also shared a lesson learnt regarding the importance of financing in effective implementation of the management plan. From the views of West Kalimantan, the suitability of crops for agriculture on peatlands is related to the challenge of addressing economic needs of communities living on peatlands. In Loagan Bunut, Sarawak, the speaker shared his experience with the effect of development outside conservation area boundaries on the quality of protected forests and its hydrology. Dr Le Phat Quoi from Vietnam highlighted the importance of keeping water at optimum levels instead of constant flooding because while flooding helped to control fires, it affected vegetation growth. Some natural fluctuation is also necessary for the growth of seasonal grass beds in the area. The event report and presentations are available on www.aseanpeat.net/index.cfm?&menuid=164&parentid=116.

Recommendations

The meeting concluded that it is necessary to focus on coordinated management of peat domes or hydrological units; and good hydrological management to reduce the rate of subsidence, optimise production of economic products and prevent fires at all times. The meeting also recommended that governments and other stakeholders should work together to address the following:

- Manage peatlands in an integrated manner
- Collate best practice and experience for integrated peatland management and develop guidelines;
- Develop IMPs for all significant/large scale peatland ecosystems and enhance the availability of resources for the implementation of the existing IMPs;
- Strengthen the linkage and coordination between IMP activities with implementation of the national and regional mechanisms;
- Improve the engagement of key stakeholders;
- Enhance regional and national cooperation and exchange among related stakeholders;
- Monitor and report regularly at local, national and regional levels on the status and trends in peatland protection and management and the implementation of IMPs for key areas.
- Strengthen the institutional & regulatory framework for peatland management at national and local levels and assign clear responsibilities for peatland protection and management.
- Link IMPs for peatlands with ongoing work on climate change, REDD, subsidence control and community development.
- Strengthen capacity for integrated peatland management through training and awareness programmes as well as Research and Development (R&D) activities.

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The ASEAN Peatland Forest Project (APFP), funded by the Global Environment Facility (GEF) and the International Fund for Agricultural Development (IFAD); is led by the Association of Southeast Asian Nations (ASEAN) Secretariat and selected ASEAN Member States.

Global Environment Centre (GEC) is the Regional Project Executing Agency the APFP. It aims to demonstrate, implement and scale up the integrated management of peatlands in Southeast Asia. The related SEApeat project, funded by the European Union through GEC seeks to reduce deforestation and GHG emissions caused by the degradation of peatland forests in Southeast Asia.

The combined projects involve all ten ASEAN countries in regional activities and/or pilot site activities for the period 2010-2014. The projects aim to promote and support the implementation of the ASEAN Peatland Management Strategy (2006-2020) especially related to capacity building, fire prevention and sustainable management of peatlands in the region. Further details of these two initiatives can be found at www.aseanpeat.net.

International Peat Society: THE meeting point for all peat and peatland experts. Learn more at www.peatsociety.org

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International Symposium on Wild Fire and Carbon Management in Indonesian peatland forests

Bogor, 13 - 14 September 2012

Text: Jack Rieley

This symposium organised jointly by the Japan International Collaboration Agency (JICA) and Japan Science and Technology Agency (JST) in collaboration with a range of Indonesian Government sponsors and the University of Hokkaido was held in Novotel, Bogor, Indonesia on 13-14 September 2012. It was attended by 264 participants from 10 countries.

Background

In Southeast Asia, peatlands cover more than 26 million hectares (69% of all tropical peatlands), at altitudes from sea level to about 50 m above, mostly near the coasts of East Sumatra, Kalimantan, West Papua, Papua New Guinea, Brunei, Peninsular Malaya, Sabah, Sarawak and Southeast Thailand. There are approximately 6 million hectares of peatland in Kalimantan with a thickness varying from 0.3 m to 20 m.

Natural lowland tropical peatlands are dominated by peat swamp forest and are important reservoirs of biodiversity, carbon and water. Tropical peat swamp forests in their natural state make an important contribution to regional and global biodiversity and provide a vital, but undervalued habitat, for rare and threatened species, especially birds, fish, mammals and reptiles. The increased awareness of emissions from developed tropical peatland has created strong political support for reducing deforestation and peatland degradation (REDD), specifically in Indonesia that is responsible for the bulk of the emissions.

The "Wild Fire and Carbon Management in Peat-Forest in Indonesia" project has been conducted by JST-JICA in Central Kalimantan since 2008 in conjunction with Indonesian authorities in order to develop a fire awareness and carbon management system. This JST-JICA International Symposium on Wild Fire and Carbon Management in Peat-Forest in Indonesia 2012 was held to share updated information, experiences on project activities and other special sessions such as recent forest and climate change activities in Indonesia (REDD+ and MRV system), capacity building, education and networking.

The Objectives of the Symposium:
(1) Synthesize knowledge on past, present and future trends relating to wildfires and the carbon management of peat forest.
(2) Provide information on the possible impacts of climate change, as well as guidance for stakeholders in the area of planning, implementation and scenarios (REDD-plus, MRV system, etc.).
(3) Compile a roadmap that provides a short to long term vision on research needs (capacity building, networks, etc.).

Symposium programme

Professor Jack Rieley of the University of Nottingham, UK and Second Vice President of the

Group photo of the participants of the symposium. Photo: JST-JICA Organising Committee

Prof. Jack Rieley from Nottingham University, IPS Second Vice President. Photo: Hendrik Segah

International Peat Society was invited to be guest keynote speaker on the topic 'Tropical Peatland in Southeast Asia – Burning Issues'.

The symposium was opened by representatives of the Japan International Co-operation Agency (JICA), Embassy of Japan, Indonesia, Indonesian Institute of Sciences and Hokkaido University, Japan. The programme lasted two days and consisted of four cores sessions and four special sessions.

Core sessions

1. Remote sensing, carbon and ecosystem management of tropical peatland
2. Evaluation of carbon storage and carbon flux of tropical peatland
3. Sustainable management of carbon, biodiversity and tropical peatland ecosystems
4. Integrated tropical peatland management

Special sessions

1. National policy and demonstration activities on REDD+ mechanism
2. Policy assessment and evaluation modelling of environment and ecosystem
3. Challenging of REDD+ and forest management activities in Asian countries
4. Capacity building and Kalimantan university consortium

In addition there was a poster presentation session to which 34 posters were submitted on a wide range of research topics allied to the symposium theme. The proceedings of the symposium will be published in due course.

Prof. Mitsuru Osaki from Hokkaido University, Japan. Photo: Hendrik Segah

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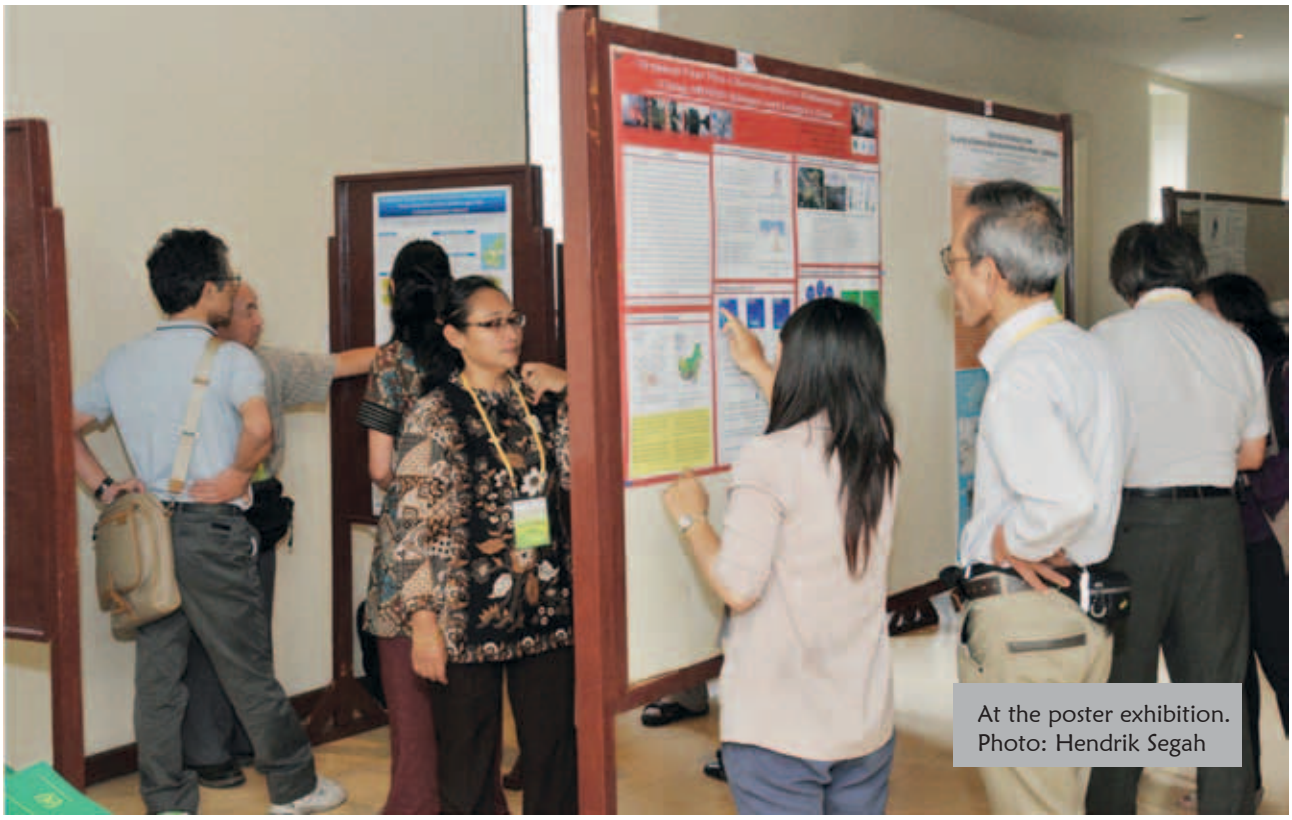

At the poster exhibition. Photo: Hendrik Segah

Steep Increase in Oil Palm Plantations on Peat in Southeast Asia

Text and photos: Jack Rieley

Photo 1: Natural peat swamp forest in Central Kalimantan, Indonesia

Approximately 441,000 km² (11%) of global peatland is located in tropical countries, mostly in Southeast Asia where they contain around 70 gigatonnes of carbon (Table 1[1]).

In their natural condition lowland tropical peatlands consists of peat deposits up to 20 m thick that support a vegetation of rain forest trees up to 50 m in height. Peat swamp forest is waterlogged throughout the year and for most part the water is above the peat surface. It is one of the most biodiverse ecosystems on the planet.

Legal requirements in Europe and USA to increase the proportion of biofuels used for transport is driving the expansion of oil palm plantations on peatland in Indonesia and Malaysia, countries with the largest share of global palm oil production. Between 2005 and 2010, 353,000 hectares of peat swamp forest were deforested, drained and converted to oil palm plantations leading to loss of wildlife habitat and releasing large amounts of carbon dioxide to the atmosphere. A recent study using satellite imagery[2] shows that peat swamp forest in Sarawak was cleared at a rate of 8% per year during this period as a result of which 33.4% of peat swamp forest was converted to oil palm plantations. The study also showed that 44% of all oil palm plantations in Sarawak were on peatland.

Another study[3] demonstrated that the area of oil palm plantations on the peatlands of Indonesia and Malaysia increased over the last 20 years from a very small area in 1990 to at least 2.15 million hectares by 2010. Under present projections this is expected to almost double to 4.1 million hectares by 2020 although it could be larger.

The vast carbon stocks in Southeast Asian peatland[1] are causing concern over how much peatland destruction the increased demand for biodiesel will cause. For optimal growth of oil palm the water table ahould be maintained 60 cm or more below the surface. Lowered water levels create aerobic conditions that favour

Table 1: Area of tropical peatland in different geographical regions (based on Page et al., 2011)

REGION	AREA (best estimate) (km²)	AREA (Range) (km²)
Asia (southeast)	247,778 (56%)	236,647-336,115
South America	107,486 (24%)	95,335-143,936
Africa	55,860 (13%)	29,464-135,043
Central America and Caribbean	23,374 (5%)	20,761-31,210
Asia (mainland)	6,337 (1%)	4,804-10,936
Australia and Pacific Islands	190 (0%)	190
TOTAL	441,025	387,201-657,430

Photo 2: Oil palm fresh fruit bunches being transported from canal to a collection point in Woodman plantation, Sarawak

peat oxidation (decomposition) and increased carbon dioxide emission to the atmosphere. Fire that is used to get rid of forest debris during peatland clearance can release additional large amounts of carbon into the environment[4]. Carbon dioxide emissions from oil palm plantations range from 50 to over 100 tonnes per hectare a year[2].

The palm oil industry disputes the magnitude of GHG emissions from oil palm plantations, the speed at which peat is subsiding and the timescale by when it will become impossible to continue cultivation. According to one account[5] oil palm cultivation on peat in Southeast Asia accounts for 5.3% of CO_2 emission in the tropics or 1.2% of total CO_2 emission from agriculture on peat globally. It is contended that current rates of CO_2 emission on tropical peat are grossly overestimated because there are few studies and lack of knowledge of the characteristics of tropical peat.

The controversy has generated much interest in the press in Southeast Asia. For example, the Borneo Post Online posted a blog by Mahbob Abdullah[6] who praised the planting of oil palm on peat and stated that 'the details and quantity of these emissions (CO_2) were still a subject of impassioned debate.' In support of his arguments he mentions Dr Lulie Melling, Head of the Tropical Peat Research Centre, Kuching and Tan Sri Yusof Basiron, Head of the Malaysian Palm Oil Council. The latter is a strong critic of the scientific evidence that confirms the large amount of CO_2 released in the conversion of peat swamp forest to oil palm plantations.

Responsible peatland management of oil palm plantation?

One of the companies that are developing oil palm plantations in Sarawak, Malaysia is the Woodman Group that is headed by Dato' Sri Law Kiu Kiong. In addition to oil palm plantations and crude palm oil mills Woodman Group has commercial interests in coal mining, shipping, biofertiliser manufacture and golf courses and resorts.

Woodman began the development of its oil palm plantations near Bintulu in 1999 and has since then expanded operations into the Kuala Baram region. Its planted area totals more than 30,000 ha with another 20,000 ha under development. Woodman sees the cultivation of oil palm as a natural extension of land-use, and an opportunity to diversify its activities for the benefit of the local community. In addition, Woodman is also a leader in the use of bio-fertilizer in the region.

Woodman assures that new oil palm planting as well as existing oil palm tree maintenance and harvesting operations are planned and conducted efficiently with minimal damage to the environment. The company practices a Controlled Burning Policy in its new planting developments by burning tree debris in the wet season to minimise fire damage to and CO_2 from the peat. Palm biomass such as pruned fronds, emptied fruit bunches (EFB) and old palm stems are recycled back to the soil as natural fertilizers. Kernel shells and EFB's are also used as a renewable energy source in the Crude Palm Oil Mills (CPO) via steam generation for power.

Woodman currently has two CPO mills in operation in Sarawak, which have a combined capacity of

Footnotes

1. Page et al (2011) Global and regional importance of the tropical peatland carbon pool. Global change Biology, 17: 798-818
2. SarVison (2011) Impact of Oil Palm Plantations on Peatland Conversion in Sarawak 2005-2010. SarVision, Wageningen, The Netherlands
3. Hooijer et al (2011) Historical Analysis and Projection of Oil Palm Plantation Expansion on Peatland in Southeast Asia. International Council on Clean Transportation, White paper No 17, Washington DC, USA
4. Page et al (2002) The amount of carbon released from peat and forest fires in Indonesia during 1997. Nature, 420: 61-65
5. Foong-Kheong et al (2010) Estimation of GHG emissions from peat used for agriculture with special reference to oil palm. Journal of Oil Palm and the Environment, 1: 1-17.
6. Borneo Post Online (August 2012) Oil Palm on Peat in Sarawak.

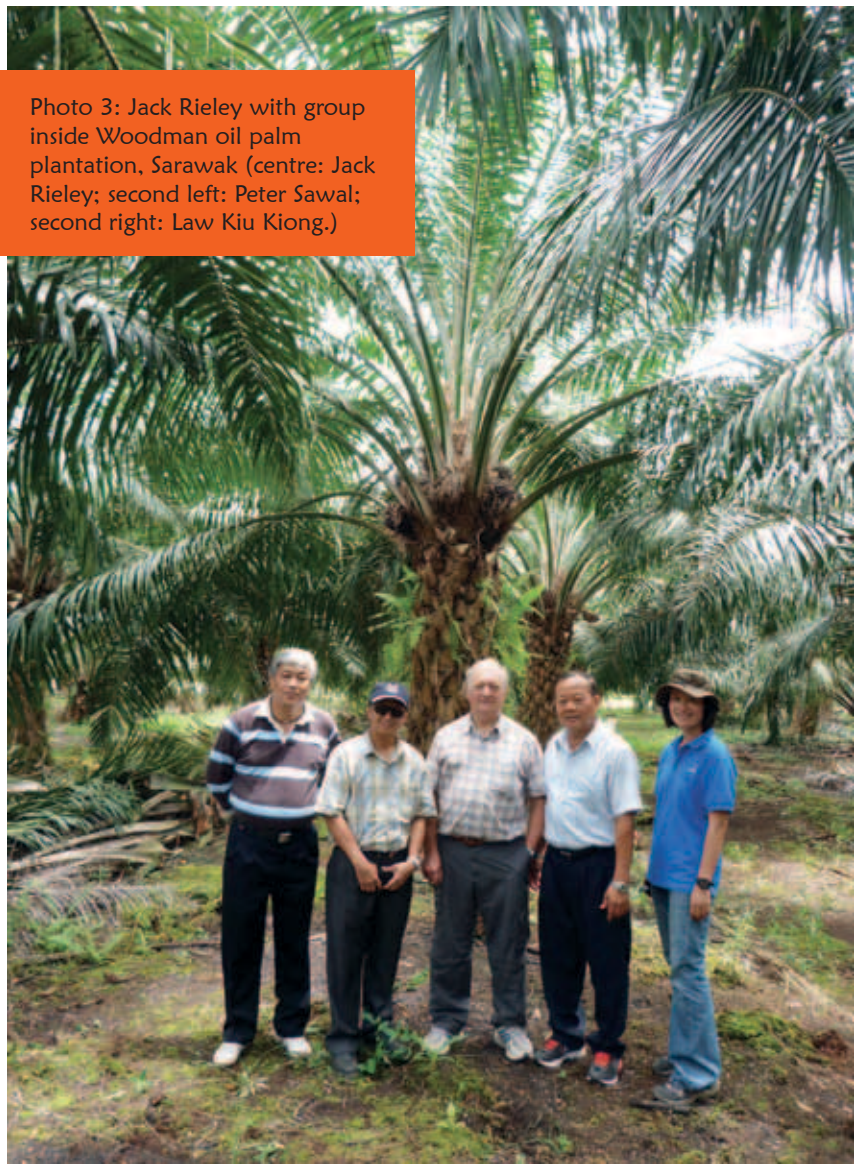

Photo 3: Jack Rieley with group inside Woodman oil palm plantation, Sarawak (centre: Jack Rieley; second left: Peter Sawal; second right: Law Kiu Kiong.)

processing approximately 800,000 Mt of fresh fruit bunches (FFB) per annum. There are plans for a third and fourth mill to be constructed over the next few years that will position Woodman as one of the largest palm oil processing companies in the region.

Woodman seeks to maximize its oil palm fruit yield per hectare through agronomy best practice, science and technology. In 2008, Woodman's average yield was 40% above Sarawak's average yield. By 2010, Woodman aimed to double that of Sarawak's average yield while reducing environmental impact.

More than half of its annual fertilizer budget is spent on organic and bio-fertilizers. Unlike chemical fertilizers, organic and bio-fertilizers are environmentally friendly, restore natural soil fertility and solve the problems of salinity of the soil and chemical run-off from the oil palm fields into the drains and subsequently rivers. The primary advantages of bio-fertilizer are that it enhances the availability of different nutrients in the soil.

Woodman understands the need to strike a balance between economic performance and social and environmental responsibility. In Sarawak, there are many indigenous people who live in the areas of their operations, including the Kenyah, Kelabit, Kayan, Iban, Penan, Punan, Lun Bawang, Saban and many others. Woodman prides its self in being an equal opportunity employer and hires people regardless of their race, religion or cultural background.

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Photo 4: Peatland in Woodman plantation, Sarawak being prepared for oil palm planting by compressing the surface prior to burning the tree remains from the former peat swamp forest.

Welcome to the "peat family"!

New IPS Members

We welcome the following individual persons, institutes, companies, non-government organisations and/or their representatives as new IPS members. Updates in their membership lists are provided by our National Committees as soon as they occur, or at least at the end of each year on request of the IPS Secretariat (status 11 January 2013).

Individual Members

China: Hongyan Zhao, Huang Qinghui, Meng Xianmin, Qui Juan, Shang Delin, Wang Shengzhong, Wang Zhongqiang, Wu Genquan, Zhang Zixue, Zhao Guorong

Falkland Islands: Jo Tanner

Finnish Peatland Society (Suoseura): Jaana Haapala, Pia Kangas, Jouko Karinen, Mari Könönen, Saara Lilja-Rothsten, Anu Lounela, Markku Palén, Marjo Palviainen, Kati Pihlaja, Päivi Rikalainen, Teppo Sainio, Markku Suoknuuti, Minna Väliranta

Irish Peat Society: Alastair Cameron, Joanne Denyer, David Healy, Antoinette Kearney, Jim McAdam, Jennifer McKinley, Bill Murphy, Ger Noonan, Cliona O'Brien, David Perry, Don Quinn, Shane Regan, Jack Rieley

Latvian Peat Producers Association (Latvijas Kūdras ražotāju asociācija): Vilnis Nollendorfs (honorary member)

Malaysian Peat Society: Bettycopa Anak Amit, Mohd Roslan bin Md Noor, Aimi Khairunnisa binti Abdul Kadir, Hasimah binti Mos, Nur Amanina binti Shahabuddin, Nur Maisarah Jantan, Lip Khoon Kho, Ella Michael Dosi, Rina Tommy

Russia: Valeriy Kreshtapov, Vera Kreshtapova

UK Peat Society: Roxane Andersen, Samuel Foster

Student Members

Canadian Society for Peat and Peatlands (CSPP): Sarah Howie

UK Peat Society: Kieran Stanley

Peru: Monica Sofia Maldonado Fonken

Please note that not all National Committees offer student membership yet. However, they often have reasonable membership fees for individual members - just ask.

Corporate Members

Canadian Sphagnum Peat Moss Association (CSPMA): Stephanie Boudreau (Canadian Sphagnum Peat Moss Association); Bob Falconi (Premier Tech Home and Garden), Todd Moore (Scotts Miracle-Gro Company), Gary Zielke (John Deere Limited), Thierry-Michel Racicot (Farm Credit Canada, (FCC)

China: Wang Zhong (Jilin Sunnow Industry Co. Ltd.), Zhang Xueyi (Quingyan Biyuan Peat Development Co. Ltd.

Latvian Peat Producers Association (Latvijas Kūdras ražotāju asociācija): Andrejs Buzajevs (Meliors Krauja Ltd.), Marks Cepelevs (B-Peat Ltd.), Bernd Hofer (Hofer & Pautz GbR), Martins Kevins (Pabazu Kudra Ltd.), Raimonds Petersons (Zibu kudra Ltd.)

Lithuanian Peat Producers Association (Lietuviškos durpės): Darius Karcmarinas (UAB Sulinkiai), Vidmantas Vitkevicius (UAB Rempaka)

Swedish National Committee: Ingrid Kyllerstedt (Swedish Peat Producers Association)

UK Peat Society: Christopher Turner (William Sinclair Horticulture Ltd)

Research institutes

Polish National Committee: Radoslaw Dobrowolski, Justyna Dresler, Irena Agnieszka Pidek, (University of Marie-Curie Sklodowska in Lublin), Marcin Becher, Dorota Kalembasa, Stanislaw Kalembasa (Siedlce University of Natural Science and Humanities), Anna Mikosz, Ewelina Tokarz (University of Life Science in Lublin), Agnieszka Wagner, Edyta Waniek, Stanislaw Zakowicz (Warsaw University of Life Sciences), Romualda Bejger (West Pomeranian University of Technology), Zygmunt Miatkowski (Institute of Technology and Life Sciences Bydgoszcz)

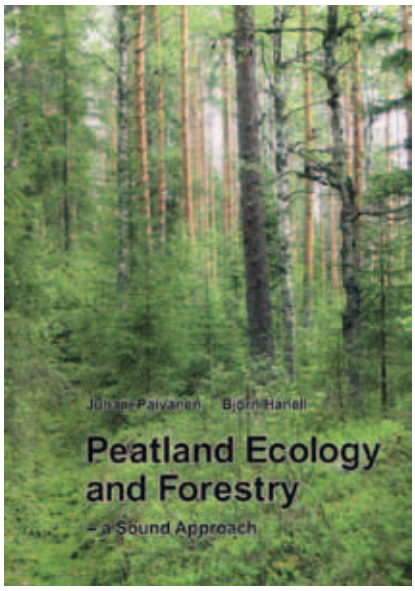
You are very welcome to join us, too! Please visit www.peatsociety.org/join-us, contact the National Committee in your country (addresses at www.peatsociety.org/about-us/national-committees and in the Annual Report) or fill in the membership application form on page 47 in this magazine.

BOOK REVIEW

Soundly about peatland forestry

Päivänen, J. & Hånell, B. 2012. Peatland Ecology and Forestry – a Sound Approach. University of Helsinki Department of Forest Sciences Publications 3, 267 pp. Vammalan kirjapaino Oy Ltd, ISBN: 978-952-10-4531-8.

Review: Sakari Sarkkola



Need for new textbook of peatland forestry

Peatlands are admittedly - whether they are drained or in pristine state- a significant natural resource in boreal zone. Even though, Finland can be regarded as "superpower" of peatland forestry with half a billion cubic meters of wood on peat, also the neighboring countries such as Sweden and Norway have long traditions in the utilization of peatlands for forestry purposes. Furthermore, we cannot forget that locally extensive forestry is also carried out e.g. in the British Isles, Baltic countries, north-western Russia and North America. Overall, we can very well say that the interest of foresters in peatland forestry is appearing in all regions, where ever peatlands occur, and lately, this interest has clearly increased. This has further created a need for scientific and practical knowledge, which, unfortunately, has only limited availability in international languages. The former comprehensive textbook in this field was published in English already sometime ago (Paavilainen & Päivänen 1995). Thus, this new book fills an evident gap in the book market. Both of the authors, Juhani Päivänen from Finland and Björn Hånell from Sweden, have exceptionally long scientific careers and versatile expertise in ecology, drainage and forestry on mires and peatlands.

Peatland forestry soundly

First, the attention of the reader is paid on the title of the book, where the terms, ecology and forestry, are presented equally. Even though the word "ecology" is often too lightly used, in this title, however, it is perfect, because about half of the content of the book is concerning the function and structure of peatland ecosystems. Respectively, the authors have clearly attempted to avoid to use the trendy term "sustainable", which has been replaced by the more objective word "sound". This is reasonable, because the sustainability in forestry on peatlands may create unsustainable mire ecosystems due to man-made drainage.

Although the book shares some of the basic knowledge with the former one, it is an independent new book including perspectives and style of its own. Furthermore, the new huge scientific knowledge accumulated during the latest decades is comprehensively updated in the book. Particularly, the knowledge and practices carried out in the other Nordic countries besides Finland are highlighted in the book. This has been done successfully, although the "Finnish perspective" is dominant, especially in the cases of forest management on drained peatlands. As much as about 60% of the 1000 references presented in the book originate from Finland. However, this cannot be regarded as any defect; since peatland forestry has been heavily studied in Finland, and most of the cubic meters of wood harvested globally on peatlands are coming from this country.

From the mire initiation to wood production

Peatland forestry is not only silviculture, but it is retaining a large range of knowledge and sciences such as ecology, hydrology, soil science and technology. The first chapter provides a short but inclusive view of the mire ecology, starting from the terminology and the initiation mechanisms of peat and peatland ecosystems, continuing to the amounts of peatlands, the physical and chemical characteristics of peat, carbon and nutrient dynamics and hydrology. Finally there are short presentations of the prevailing peatland classification systems both in Finland and in the other Nordic countries. The terminology used is well-explained and includes practically all the important terms related to peat and peatland ecosystems.

Not until the seventh and eighth chapters, is the turn of forestry issues: history of forestry on peatlands, the ecological principles of forestry, and the management practices and restrictions in the operational forestry. Besides conventional management rules, attention has also been paid to alternative approaches in forestry, such as methods of uneven-aged forest management and how to apply these on peatlands. The reader is also provided with profound information, e.g. why and how the millions of hectares of peatlands have been drained in the Nordic countries and how forestry practices differ between them.

The book familiarizes the reader with operational-scale forestry

practice, for example, how to grow the first post-drainage Scots pine generation soundly, and what to do if one wants to maximize the wood yield or net inherent investment rate. Furthermore, the reader finds answers to questions like how to carry out the ditch network maintenance reasonably, how to promote the water protection in forestry and how to prevent forest damage caused by insects and fungi. The versatile offering of the book will climax in the last chapter about other uses/forms of peatlands starting from mire conservation, berry picking and recreation services to agricultural use, energy peat production, and finally, the restoration of mire ecosystems. In fact, the last chapter is out of the title of the book and it would also do very well without this review. However, the chapter aids to understand that forestry is only one of numerous alternatives for mire and peatland utilization. Other alternative methods can be applied if forestry is to be given up on a certain area for one reason or another.

Suitable to many hands

There is a small variation in the style of the text in different parts of the book, but this does not badly distract from the reading. Rather, the book is easy and even enjoyable to read. Although the book is primarily purposed for academic teaching, the text is thoroughly handled and popularized so that using the book, even laical English-speaking forest owners can carry out sound forestry on peatlands. Thus, the book is a significant achievement in the dissemination and popularization of that large amount of scientific and practical knowledge produced mainly in Nordic languages to international readers worldwide.

References

Paavilainen, E. & Päivänen, J. 1995. Peatland forestry - Ecology and principles. Ecological Studies 111: 1-248.

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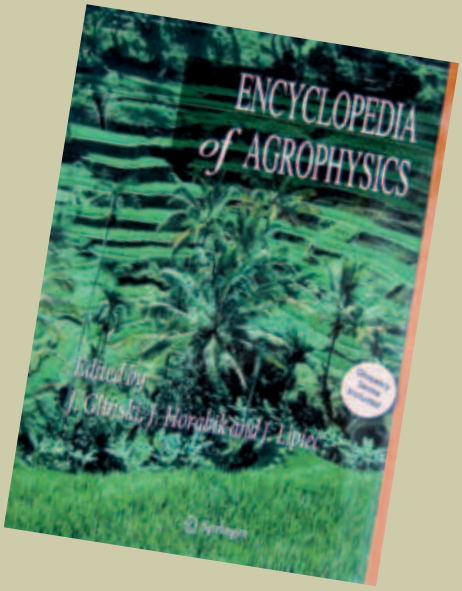
BOOK REVIEW

The Encyclopedia of Agrophysics - some aspects of peat and peatlands

Encyclopedia of Agrophysics – edited by Glinski J., Horabik J. & Lipiec J. Springler Verlag, Heidelberg, Germany, 2011. ISBN 978-90-481-3584-4.

Review: Ryszard Oleszczuk



The Encyclopedia focuses on a very wide range of disciplines related to agricultural activities. The book consists of 1028 pages, 314 authors are involved in this book, giving some information about peat and peatlands. Tadeusz J. Chmilewski (Department of Landscape Ecology and Nature Conservation, University of Live Sciences, Lublin, Poland) and Danuta Urban (Institute of Soil Science and Environmental Formation, University of Live Sciences, Lublin, Poland) present the chapter entitled: “Peatlands: environmental functions” (pages 548-551). They describe definitions and classifications of peatland based on several papers published in the literature.

A large part of the chapter is dealing with ecological functions of peatland areas in the natural environmental: water retention, natural filters of pollutants, reservoir of organic matter and carbon, biological diversity and the areas of many plants, animals and fungi. In the last part of this chapter the main threats and problems of peatland conservation are presented: regulations of rivers and wet areas – drainage of wetlands, artificial afforestation and exploitation of peat deposits for use in agriculture, horticulture, balneology and for fuel. Finally they suggest to protect and prepare active conservation and restoration of these areas.

The next chapter dealing with peat soil titled: “Peats and peatlands, physical properties” (pages 551-555) is prepared by Lech Wojciech Szajdak (Department of Enviromental Chemistry, Institute for Agricultural and Forest Environment, Polish Academy of Sciences, Poznań, Poland), Jan Szatyłowicz (Department of Environmental Improvement, University of Life Sciences (SGGW), Warsaw, Poland) and Raimo Kõlli (Department of Soil Science and Agrochemistry, Institute of Agricultural and Environmental Sciences, Estonian University of Life Sciences, Tartu, Estonia).

The authors describe in the introduction the processes, localization and classification of peat soils in the world. The following physical properties of peat soils are presented: decomposition degree, ash content, peat bulk and particle density, porosity, moisture retention, hydraulic conductivity and peat shrinkage. The authors present two tables including selected basic physical properties for raised bogs and

fen peats related to degree of decomposition (von Post scale). Finally the authors conclude that basic physical and water properties strongly depend on the degree of decomposition, and the presented physical data shown the relativity large variability. The authors of these two chapters present the review of their own research data and other publishers (32 present research papers). The information presented in these chapters is a valuable source of knowledge for students and all other people interested in peat and peatlands. The book is well published, all tables and figures are very clear. I recommend this part of the Encyclopedia for researchers dealing with peat soils, members of the International Peat Society, decision-makers in politics and ecological foundations.

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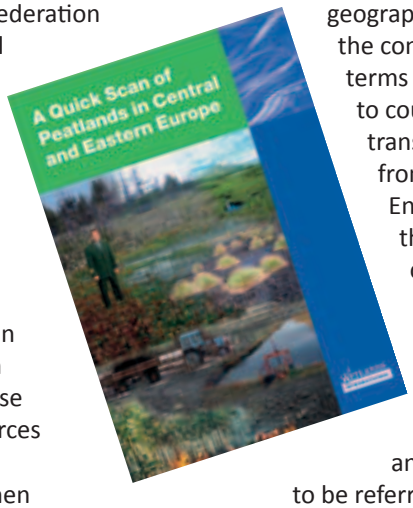
Peat and peatland resources in Central and Eastern Europe

Review: Juhani Päivänen and Björn Hånell

Minayeva, T., Sirin, A. & Bragg, O. (eds.) 2009. A quick scan of peatlands in Central and Eastern Europe. Wetlands International, Wageningen, The Netherlands. 132 p. ISBN/EAN 978-90-5882-044-0.

Knowledge about mires, peatlands and peat resources located in the Russian Federation and in Central and Eastern Europe has been scanty and scattered. This is even more true for information on the utilization degree of these natural resources for different purposes. When compiling our text book (Päivänen & Hånell 2012) we ran across this shortage. We were, however, lucky enough to find much of the information needed from the book reviewed here. In the proper places of our monograph we referred to this publication but unfortunately the correct bibliographic information had dropped out from the final list of references. We regret that!



The reviewed book is a result of a project funded by the Netherlands Ministry of Agriculture and implemented by Wetlands International. The vast and versatile material has been technically worked out by Tatyana Minayeva and Andrey Sirin, whilst Olivia Bragg has been responsible for the language editing.

A detailed account on mires, peatlands and peat in any greater geographical area is demanding: the concepts behind these terms may differ from country to country, and accurate translation of the terms from different languages to English is not easy. Even the survey methods and compilation of statistics are not universally confined. The authors have however done their best to overcome these imperfections and now there are figures to be referred to when information is needed. The person in need has still to consider the certain inaccuracy that remains behind the figures.

The report shows how peatland coverage is heavily concentrated to some of the countries concerned – due to climate, topography and hydrology. In Russia, if deep (>0.3 m) and shallow-peated (<0.3 m) areas are combined, the peat-covered area amounts to 370 million hectares or 20% of the land area. The relative share of the peat-covered area in the other countries that were studied is clearly smaller: Belarus 7.9%, Estonia 7.2%, Latvia 4.9%. For Lithuania, Georgia, Bulgaria and Armenia the share is above 2%. In the countries rich in mires, amelioration of peatlands for agriculture and forestry used to be wide-ranging. Nowadays, a great deal of the sites previously drained especially for forestry have been ineffectively managed and are consequently undergoing secondary paludification. In the future, it remains to be seen whether or not the increasing consumption of bioenergy creates a more positive attitude towards the possibility to increase wood production with peatland drainage.

The main aim of the book is to reveal the richness of peat resources, their location, and how to use them responsibly. The target group for the book is all those needing country-wise information about peat and peatlands in this huge geographical region. It also gives strategic priorities for action on peatland management and advice on how to meet these priorities.

Reference

Päivänen, J. & Hånell, B. 2012. Peatland Ecology and Forestry – a Sound Approach. University of Helsinki Department of Forest Sciences Publication 3. 267 p.

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In memoriam: Leo Schipper (1949-2012)

Leo Schipper passed away on 8 September 2012 and with him we lost a friend and respected colleague.

Leo is well-known in the world of peat. For almost forty years peat in all its guises was his life. From 1991 on as the director of Nevema, a major Dutch firm in the peat business. With its roots dating back as far as 1918, Nevema became a family business, branching into Germany, Estonia and Ireland. With more than one million m^3 of peat products handled and exported to more than twenty countries annually, Leo can be proud to have shaped the firm into what it is today.

With genuine and firm believes, and clear points of view, he had an open mind to other opinions. His character and willingness to share his profound knowledge made Leo welcome in many relevant organisations. He served as president of the RHP norm commission, on the RHP supervisory board, and as organizer of conferences like "Peat in the Stranglehold of Interest Groups".

Photo: private

For 10 years, until 2009, Leo was the chairman of the Dutch IPS National Committee, the Nederlands Veengenootschap, and "our man" in, among others, the IPS's Annual Assemblies.

The Dutch IPS is grateful for his national and international work, building a stable and well reputed Veengenootschap. This was recognized by awarding him honorary membership. In the Dutch peat world we feel a sense of connection, we have lost more than a friend and a colleague.

We wish Barbara and their sons all the strength they need now to go through these difficult times.

The Board of the Dutch IPS National Committee

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Peat and peatland events

International Peat Society | IMTG MTC

Executive Board Strategy Meeting
Amsterdam, 25 - 27 January 2013

German Peat Society (DGMT):
Peat and Peatland Seminars and Excursions
Zeven, Germany, 19 - 20 April 2013
Bad Wurzach, Germany 7 - 8 June 2013
www.dgmtev.de

German Peat Society (DGMT): Prospects for the sustainable use of peatlands in Lower Saxony
Schneverdingen, Germany, 12 - 13 June 2013
www.dgmtev.de

IPS Annual Assembly and ISHS-IPS International Symposium on Growing Media and Soilless Cultivation
17 - 21 June 2013 in Leiden, the Netherlands
www.grosci2013.wur.nl

Lithuanian Peat Association: Baltic Peat Producers' Forum
Vilnius, Lithuania, 4 - 6 September 2013
www.asocdurpes.lt/en

German Peat Society (DGMT): Annual Assembly
Freising, Germany, 25 - 27 September 2013
www.dgmtev.de

German Garden Industry Association (IVG):
48th German Peat Day
Bad Zwischenahn, 24 October 2013
www.ivg.org

Executive Board Meeting
Tallinn, Estonia, 28 - 29 October 2013

International Peat Technology Conference
Riga, Latvia, 26 - 29 August, 2014

15th International Peat Congress "Peatland in Harmony - Agriculture, Industry, Nature"
Kuching, Malaysia, 15 - 19 August 2016

Last minute updates and further events can be seen at our website, www.peatsociety.prg/events and at www.facebook.com/peatsociety.

Related organisations

National Ecological Networks Conference
Edinburgh, UK, 6 - 7 February 2013
https://scottishwildlifetrust.org.uk/shop/nen-conference-2013

Reed as a Renewable Resource (RRR),
Greifswald, Germany, 14 - 16 February 2013.
www.rrr2013.de

International Conference on Climate Change and Local Wisdom: Living in Harmony within Our Built Environment
Makassar, Indonesia, 14 - 15 February 2013
http://genius-loci-conference.com

World Sustainable Energy Days
Wels, Austria, 27 February - 1 March 2013
www.wsed.at

EGU General Assembly 2013
Vienna, Austria, 7 - 12 April 2013
http://meetingorganizer.copernicus.org/EGU2013

Biohydrology Conference 2013. Bio meets Hydrology
Landau/Pfalz, Germany, 21 - 24 May 2013
www.biohydrology2013.de

Society of Wetland Scientists
Annual Meeting 2013
Duluth, Minnesota, 2 - 6 June 2013
www.swsannualmeeting.org

4th AEBIOM Bioenergy Conference
Brussels, Belgium, 17 - 19 June 2013
www.aebiom.org/conference

2nd International Conference - Energy & Meteorology
Weather and Climate for the Energy Industry
25 - 28 June 2013, Toulouse, France
www.icem2013.org

32nd Congress of the
International Society of Limnology (SIL)
Budapest, Hungary, 4 - 9 August 2013
www.sil2013.hu

INTECOL 2013: Into the next 100 years
London, United Kingdom, 18 - 23 August 2013
www.intecol.org

War and Peat - The military heritage of moors, heaths, bogs & fens
Sheffield, UK, September 2013
www.tiny.cc/sfbyqw

A frequently updated list of IPS events and symposia of related organisations is posted at www.peatsociety.org. To inform us about future happenings of interest for IPS members, please contact ips@peatsociety.org.

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Better drainage and higher air porosity

Low volume to store
The blocks are compressed to transport bigger volumes and thereby there is no packaging needed.

Low EC levels
At our Indian sites, we produce washed coir (IMO certified) and buffered quality (RHP certified)

High output per Mton
Due to special sieving and structure

Highest stability
By selected raw materials, treated in our own factories

Reliable deliveries
By big volumes in stock, good agreements with the liners

Growbags, special double layer "Optima"
Custom made for vegetables, flowers and softfruits growing

IMO control

RHP Certified for Horticulture

Call our sales team for more information:
The Netherlands
Phone: 0031 - 492 32 42 91

India
Phone: 0091 - 4222 312 822

contact@dutchplantin.com
www.dutchplantin.com

FIBA-ZORB™

TURFTECH INTERNATIONAL

The Proven Safe and Effective Wetting Agent for all Substrates & Growing Media

FIBA-ZORB Liquid is a leading wetting agent developed by Turftech International that has been used internationally for over 15 years for treating peat based substrates and growing media for both the professional and hobby markets. **FIBA-ZORB** has undergone very extensive research and growing trials to prove its safety and efficacy with respected organisations such as the R.H.P. in Holland and the DEG Green Team in Denmark. It has been proven that the commercial benefits far exceed the cost of incorporating **FIBA-ZORB** into the growing media.

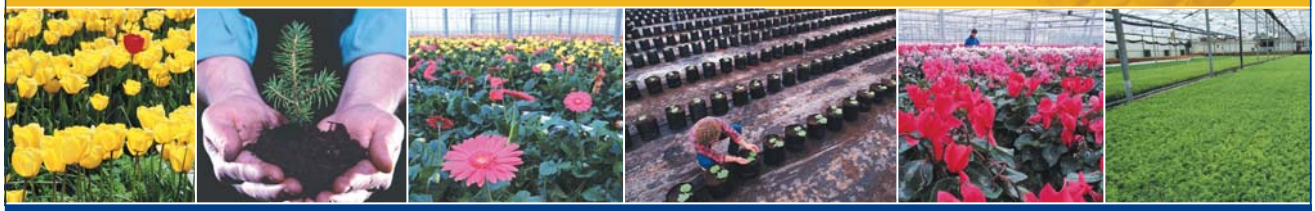
The benefits of **FIBA-ZORB Liquid** include:

- Total crop safety
- Initial and repeated fast wetting-up of substrates
- Improves drainage – highly suitable for capillary action and flooded benches (ebb and flood)
- Maximises the applied fertilisers and nutrients
- Very leach resistant – lasts over 1 year
- Economic in use
- Beneficial for 'Dry Production' techniques

FIBA-ZORB Granular displays all the properties of FIBA-ZORB Liquid **plus**:

- Can be added with fertilisers and trace elements
- Process does not add further water to already moist peat
- Can be added at any temperature and used in sub-zero temperatures
- Can be used in fully automatic production facilities without the investment of cabilbrated spraying equipment
- Safe to handle

APPROVED
FOR USE IN RHP CERTIFIED SUBSTRATES



Revisit our website, now updated and in 6 languages with downloadable content: **www.turftech.co.uk**

For further information contact:

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RAPID DELIVERY
FROM STORAGE IN THE UK, BALTIC, GERMANY & BELGIUM