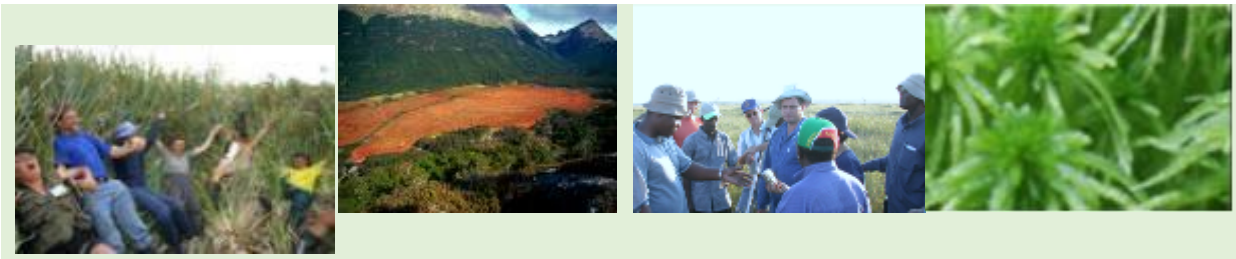


IMCG Bulletin: September 2017

Word from the Secretary-General

INTERNATIONAL MIRE CONSERVATION GROUP

www.imcg.net

Dear mire friends

Again a new Bulletin full of information from the peatland conservation front. This time also with a longer article about the possible development of global peatland emissions until 2030. And just before closing of the issue the news came in that the PeatRus project has been selected a 2017 UNFCCC Momentum for Change Lighthouse Activity. By this selection, peatland rewetting receives the international recognition it deserves in its role in addressing climate change. At the end of the Bulletin, as always, a list with relevant recent peatland literature. Keep sharing your ideas and experiences by sending news, photographs, papers and other contributions for the October Bulletin by November, 10, 2017 to Hans Joosten at joosten@uni-greifswald.de.

Mires and Peat

Find the journal online at http://mires-and-peat.net/. New papers published in September 2017 included

- Sphagnum moss as a growing media constituent: some effects of harvesting, processing and storage. [S. Kumar] Volume 20: Article 07. http://mires-and-peat.net/media/map20/map_20_07.pdf
- Disappearance rate of a peatland in Dublany near Lviv (Ukraine) drained in 19th century. [K. Lipka, E. Zając, V. Hlotov & Z. Siejka] Volume 19: Article 17). http://mires-and-peat.net/media/map19/map_19_17.pdf
- A video simulating the growth of a raised bog. [R.S. Clymo] Volume 19: Article 16. http://mires-and-peat.net/media/map19/map_19_16.pdf
- Effect of repeated mowing to reduce graminoid plant cover on the moss carpet at a Sphagnum farm in North America. [M. Guêné-Nanchen, R. Pouliot, S. Hugron § L. Rochefort. Volume 20: Article 06. http://mires-and-peat.net/media/map20/map_20_06.pdf

Send your new manuscripts to Editor-in-Chief Olivia Bragg: o.m.bragg@dundee.ac.uk

Global

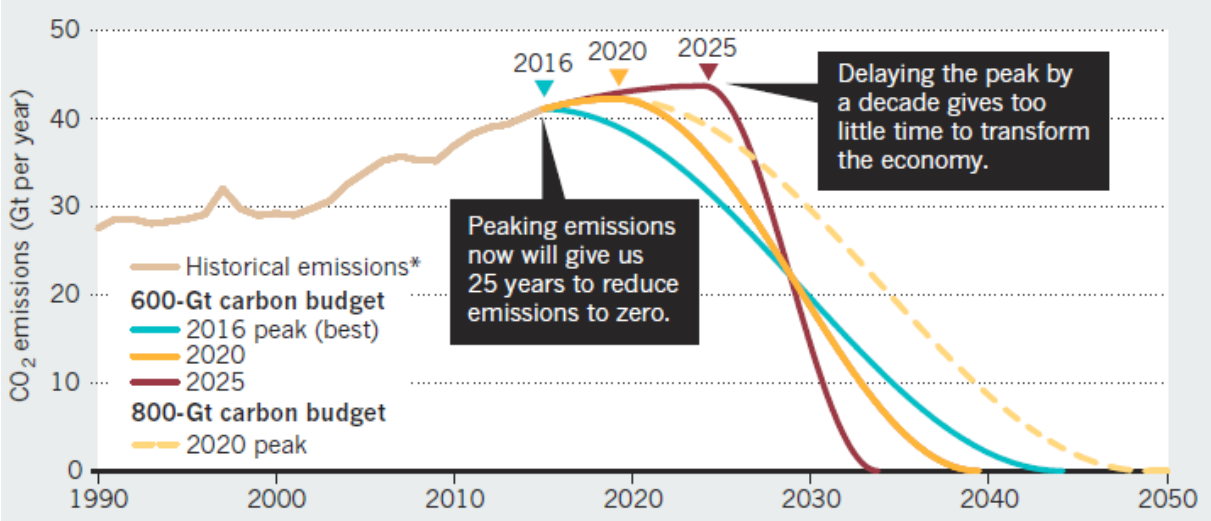
Request for new data on peatland distribution and status

Alexandra Barthelmes has started with the biannual global update of the IMCG Global Peatland Database (see e.g. https://greifswaldmoor.de/files/dokumente/15_12_01_Wetlands%20International%20(2015)%20Save%20Peat%20for%20Less%20Heat.pdf If you have new data for your country/region, please contact Alexandra: alex.barthelmes@greifswaldmoor.de

Paris Agreement and SDGs require fundamental change in peatland use worldwide

Hans Joosten (joosten@uni-greifswald.de)

With the worldwide acceptance of the Paris Agreement and the Sustainable Development Goals, the world has become a lot easier: we have a clear and common goal to limit global temperature increase to below 2° C. If the goal is agreed, direction and timing of activities becomes a lot easier: it is no longer a matter of choice but a matter of fact. According to the latest studies, the temperature goals set in Paris become almost unattainable, should emissions continue to rise beyond 2020, or even remain level. The UN Sustainable Development Goals that were agreed in 2015 would also be at grave risk. So things are clear: back to zero net emissions in 2050 and starting the decrease within the coming few years. In the Nature paper “Three years to safeguard our climate”, Christiana Figueres, the former UNFCCC secretary-general, and leading climate scientists set out a plan for turning the tide of the world’s carbon dioxide by 2020.



There is a mean budget of around 600 gigatonnes (Gt) of carbon dioxide left to emit before the planet warms dangerously, by more than 1.5–2 °C. Stretching the budget to 800 Gt buys another 10 years, but at a greater risk of exceeding the temperature limit. Sources: Stefan Rahmstorf/Global Carbon Project; http://GO.NATURE.COM/2RCPCRU

If the world has to reach zero emissions by 2050, everybody - individually and collectively - has to reach that level. Making an exception for yourself only means that you shift the burden to others, who will have similar difficulties and similar excuses. So: let's take the challenge: phase out the use of drained peatland by rewetting and developing paludicultures, phase out the use of fossil peat and develop climate neutral alternatives. We can take the turn in the next few years already if we continue on the way we are heading (see the 2030 emissions estimates below). We must and can start soon, but we have 30 years to do the full job. Let's go for it!
https://www.nature.com/polopoly_fs/1.22201!/menu/main/topColumns/topLeftColumn/pdf/546593a.pdf

The course has been set for peat and peatland use: zero emissions by 2050, i.e. phase out the use of peat and of drained peatland! Photo: Hans Joosten.

The Global Land Outlook (GLO)

The first edition of the United Nations Convention to Combat Desertification's (UNCCD) Global Land Outlook (GLO) was published in September 2017. The GLO is a strategic communications platform and publication that demonstrates the central importance of land quality to human well-being, assesses current trends in land conversion, degradation and loss, identifies the driving factors and analyzes the impacts, provides scenarios for future challenges and opportunities, and presents a new and transformative vision for land management policy, planning and practice at global and national scales. Bringing together a diverse group of international experts and partners, the GLO addresses the future challenges and opportunities for the management and restoration of land resources in the context of sustainable development, food, water and energy security, climate change and biodiversity conservation, urban, peri-urban and infrastructure development, land tenure, governance and gender; and migration, conflict and human security. The Outlook pays much attention to peatlands. Visit www.unccd.int/glo to download the full report and working papers.

From the Global Land Outlook 2017: "The drainage of peatlands is linked to various forms of land degradation. In parts of Central Asia and China it has led to the desertification of former peatland dominated landscapes, major soil erosion from overgrazing, and subsequent loss of productivity. Peatland drainage inevitably causes soil compaction and peat carbon oxidation, resulting in soil subsidence posing significant risks in lowland regions. As the base of the peat layer often lies at or below sea or river level, soil subsidence over time will result in enhanced flood risks. In many countries, this has been mitigated by the construction of dikes and pumping systems, however, given the inevitable continuation of subsidence of drained peat soils, entire landscapes may eventually lie below sea level. For example, half of the Netherlands lies below sea level as a result of centuries of peatland drainage, causing significant risks in terms of water security and salt water intrusion as well as high costs in terms of maintenance of infrastructure (projected at 25 billion Euro between 2010 and 2050 for the remaining 200,000 ha of Dutch peatlands). Whereas the Netherlands has long since reached a point of no return, in southeast Asia the drainage of lowland peatlands started only in the 1970s. In the tropics, peatland drainage results in high CO_2 emissions, causing subsidence of 3 to 6 cm per year. However, the high levels and seasonal pattern of precipitation may exclude options for mitigation by dike and pumping systems. Continued drainage can lead to devastating consequences, including massive flooding risks and the loss of productive land."

Rapid desertification because of peatland overgrazing in Mongolia. Photo: Hans Joosten.

The development of peatland emissions until 2030: a reconnaissance

Hans Joosten (joosten@uni-greifswald.de)

With respect to the development of emissions, we have to consider three individual tendencies:

1. A continuously increasing area of drained peatland leading to a continuous increase in peatland emissions.
2. A continuously decreasing area of already drained peatland. This decrease has two causes:
   a. A decreasing area of peatland, because progressing oxidation – in case the area remains drained - will over time lead to the complete disappearance of the peat layer. The former peat soils then change to more or less humus-rich mineral soils with much less emissions. How fast the peat and therewith the area of peatland will disappear is a function of land use (incl. drainage depth, intensity, and type of land use), climatic conditions, and peat type. The rate is furthermore determined by peat depth (distribution), deep peatland (parts) taking more time to disappear than shallow ones. For the Global Peatland CO2 Picture (Joosten 2009) I have used a worldwide default value of 0.5% decrease per year, based on
      i. data from areas where systematic remapping of peatland distribution has taken place (e.g. various German federal states, Belarus),
      ii. data on depth distribution of peatlands (e.g. available for Russia, Finland, Indonesia), and
      iii. data on the long-term rate of subsidence of drained peatlands (e.g. available for Florida, Malaysia/Indonesia, California, English Fenlands, Bavaria).

      The default value of 0.5% is a very rough value and probably (?) an underestimate worldwide.

This area in Ukrainian Polesia was still a peatland in 1950. All peat has disappeared as a result of intensive drainage and arable agriculture, leaving not even a trace of the former peatland. Photo: Hans Joosten.

   b. A decreasing drainage depth of the peatland, because of subsidence and consequent decreasing drainability. In many parts of the world, e.g. SE Asia, peatlands are concentrated close to the coast and close to sea level and poldering and pumping will be technically and economically impossible. As a result, relative water levels in the peatlands will rise again following subsidence (the water does not come up, but the land goes down), eventually flooding the peatlands. This process has been modelled impressively by Hooijer et al. (2015a, b) for the Rajang Delta, Sarawak, Malaysia and the Kampar Peninsula, Riau, Indonesia. Where flooding takes place by freshwater impounding, emissions will strongly decrease. But if flooding (partially) takes place with seawater, substantial CO_2 emissions may continue, because the sulphate in the seawater is under anoxic conditions a very effective oxidiser.

3. A decreasing area of drained peatland, because of peatland rewetting. Here again two situations must be distinguished:
   a. Rewetting as a result of aimed rewetting activities. Worldwide we have 527.783 km² of drained peatland (Global Peatland Database 2015 data), most of it (c. 300,000 km²) in Europe. Of the drained peatland in Europe, less than 2,000 km² (i.e. <1%) has been rewetted over the past decades, mainly in Belarus, the Russian Federation, Germany, and the UK (Tanneberger et al. 2017). Elsewhere the situation is even worse. We must first and for all see what will happen in Indonesia, where the government aims at rewetting 28,000 km of drained peatland by 2020. In the light of the rewetting efforts in the world until now, this 2020 aim is extremely ambitious. On the other hand, in spite of diverse resistance, Indonesia is persisting and recent achievements are impressive. However, the current focus of the Indonesian Peatland Restoration Agency BRG is on preventing fire and haze, indeed the most urgent issue, but not the only important one (see table below). Preventing fire/haze requires much less rising of the water level than stopping emission from microbial oxidation. Reducing microbial emissions to zero requires average water levels to be raised to around or above the surface. Stopping fires requires raising the level to -40cm (and better management) and this will "only" halve the emissions from microbial oxidation.

Effect of drainage	Damage	Where?	Solution
fire + haze	health, welfare, economy and political relationships	local, national, regional	raising water table to >40 cm + better management
emissions	climate	global	raising water table: the higher the better
subsidence	land availability, food security	local, national, global	raising water table to in average at or over the peat surface

   Furthermore, the main cultivated crops on drained peat in Indonesia (oil palm, acacia, eucalyptus, pineapple) cannot grow under water level conditions high enough to stop microbial oxidation so that a substantial rise in water levels will interfere with the current production function. The choice is then to abandon these lands or to change to cultivating crops that accept high water levels. With respect to the first strategy: The Indonesian government has just prepared over 9,000 km^2 of land beyond the peatland area for a land-swap plan. Many of these lands are, however, located on other islands than where current peatland activities are taking place and miss the economic infrastructure to make swapping attractive for firms. Moreover, a substantial part of the drained peatlands is managed by smallholders for whom no swapping deals are (yet) available.
   With respect to the second strategy: paludicultures, i.e. wet agriculture and forestry that combine environmental and economic interests (cf. Wichtmann et al. 2016), are indeed being piloted, but still in such a pioneer phase that I do not expect very large scale implementation in the coming decade (cf. Dommain et al. 2016).
   b. Rewetting as a result of neglect of drainage infrastructure. This has especially happened c.q. is happening in Russia, where a substantial part (order of magnitude 10,000 km²) of the formerly forestry-drained peatland has been and is still "spontaneously" rewetting as a result of failing ditch maintenance.

Let's take a look what the effects of the developments mentioned above could mean for global peatland emissions:

Ad. 1: A continuously increasing area of drained peatland: Between 1990 and 2008 emissions from drained peat soils have increased with 23% (i.e., with 1.3% per year; Joosten 2009; mind this concerns CO_2-emissions. In the following I assume that the trends of CH_4, N_2O and DOC follow the same trend).
I have no indications to assume that this trend has changed since 2008. This means that emissions from drained peatlands (without fires) will have annually increased by 1.3% compared to 1990 and would in 2015 have been 132% of 1990 values. As in 2015 the total global emission from drained peatlands (excl. fires) was 1600 Mt Mt CO_2e (ltest Global Peatland Database data), equivalent emissions in 1990 will have been 76% (100/132) of 2015 values, i.e. 1216 Mt CO_2e.
What would developments be until 2030? Let's first look at SE Asia (Indonesia and Malaysia; other SE Asian countries do have peatlands but their extent is – except for Papua New Guinea - minor compared to those in

Indonesia and Malaysia). In SE Asia awareness has strongly risen, strong political pressure and willpower exist to stop peatland fires, and a large part of the oil palm and pulp industry has meanwhile adopted a "no deforestation, no peat, no exploitation" policy. The internationally operating palm oil firms also to some extent control the small-holders that supply the firms' mills, which also will limit new peatland drainage by smallholders. The peatland drainage frontier in SE Asia is currently, however, in the Indonesian province of Papua, i.e. an area with less international irritation caused by peat fire and less political pressure to observe and implement a strict "no peat" policy.
But peatland drainage is also taking place in other parts of the world and for other purposes, incl. for subsistence agriculture. The latter is a hardly observed issue in east and southern Africa and driven by rapid population growth and poverty. Furthermore, next to failing awareness of peatland emissions, most countries are not even aware of the extent or even the mere presence of peatlands in their country. This concerns major peatland countries like Papua New Guinea and countries in East Africa, the Congo basin, Western Amazonia…

Extensive but hardly explored peatlands exist in Papua New Guinea. Here: Enjoyment after finding abundant peat during coring expeditions in July-August 2017. Photo: Felix Beer, Greifswald Mire Centre.

The awareness of peatland issues has rapidly grown in Indonesia and Malaysia, especially because of the very "visible" peatland fires and haze. Emissions from microbial oxidation, however, are not visible and awareness of their importance is currently virtually absent. This is illustrated by the fact that from a climate point of view much more attention is being paid in press and politics to peatland fires than to microbial peat oxidation in drained peatlands, although the latter have globally three times larger annual emissions than peat fires.
Taking these aspects into account, I think we can be very satisfied, if we can halve the rate of new peatland drainage (compared to 1990) over the coming decade. This rate would in 2030 result in an extra climate burden of c. **+120 Mt CO_2e** (15yrs * 0.65% * 1216 Mt) compared to 2015.

Ad 2a: A continuously decreasing area of already drained peatland because of a decreasing area of peatland: Let's keep that at -0.5% (see above), which would result in a climate alleviation of c. **-80 Mt CO_2e**.

Ad 2b: A decreasing area of drained peatland, because of subsidence and decreasing drainability: I have really no idea (but we are working on it), so let's leave it a ***p.m.***

Ad 3a: A decreasing area of drained peatland as a result of aimed rewetting activities.
Most aimed rewetting has hitherto been taking place in Europe (see above), but still concerns less than 1% of the total drained peatland area. This rewetting has mainly taken place in temperate Europe, where site selection has largely focused on those peatlands (forestry drained peatlands, peat extraction sites, shallow drained grasslands), where emissions reductions from rewetting are comparatively modest (0-8 t CO_2 ha^{-1} yr^{-1}, see Wilson et al. 2016). Total emissions reduction from past rewetting in Europe has therefore only been in the order of magnitude of 1 Mt CO_2e. Rewetting of sites where rewetting would result in more substantial emission reduction (cropland and deeply drained grassland) is still hardly done because of the high opportunity costs and the resistance of land users and politics.
Whereas peatland rewetting is politically widely supported in Europe, strategies that aimfully address the core of drained peatland emissions (i.e. those from arable land and high-intensity grassland) are not yet developed. There are currently no incentives for such rewetting; on the contrary: rewetting is still frustrated by perverse incentives for drainage-based peatland agriculture and the absence of EU direct payments for promising paludiculture alternatives (Wichtmann et al. 2016). Unless a substantial change in agricultural policy (cf. EU-CAP) takes place, I do not expect emission reduction from European peatlands in 2030 to exceed **-10 Mt CO_2e**.

With respect to strong political aims of Indonesia to rewet 28,000 km of drained peatland by 2020, the following constraints must be noted:

- A full and total rewetting of all drained peatland is not possible because peat oxidation, fires, and subsidence have altered the formerly smooth relief of the peatlands to the extent that major areas have become technically non-rewettable up to the surface. In addition, there is an area where rewetting would frustrate current "unmovable" land use (e.g. villages, cities and infrastructure on peat). I guess that this area will be at least 20% of the total drained area.
- The major political driver for rewetting is stopping fire and haze (i.e. not emission reduction), an aim which – in combination with better management –may be achieved by raising the average water level to 40 cm below surface.
- Current land use with important cash crops prohibits raising the average water level much higher than 40 cm below surface. Alternative paludiculture crops and management techniques have not yet sufficiently been developed and will until 2030 not replace the current drainage based crops on a large scale.

Both latter causes will limit reduction to 50% of the maximum achievable emission reduction over the relevant area (rise in water level from -80 to -40 cm, assuming a linear relationship between water level and emissions, cf. Couwenberg et al. 2010).
Taking these aspects into account I expect that a "successful" Indonesian peatland rewetting program concerning 28,000 km^2 until 2030 may achieve a reduction of microbial oxidation of 40% by 2030, i.e. of **-60 Mt CO_2e** annually.

Ad 3b: Whereas the area is substantial, emission reductions by rewetting of the (low productive) boreal peatlands are limited, default reduction values being only 1.2 t. CO_2e /ha/yr (Wilson et al. 2016), which would result in only **1-2 Mt of CO_2e** annually.

With respect to peat fires:
Peat fire emissions have for Peninsular Malaysia, Sumatra and Borneo over the period 1997-2015 been 232 MtCO_2e per year, which I guess to be more than half of all global peat fire emissions. I expect that peat fires in Indonesia and Malaysia – with continuing political attention and sufficient financing – by 2030 could be reduced by 75% (50% is politically unacceptable, 100 % is an illusion cf. 2017 fires), which would lead to an emission reduction of **175 Mt CO_2e**.
Although the total area of drained peatland would grow (cf. ad 1 and ad 2a), change in peat fire emissions outside Indonesia would largely be a function of rewetting and improved management, i.e. will depend on awareness and political attention (and sufficient financing). The political attention for peat fires is strongly determined by the nuisance of haze (cf. SE Asia, Russia). If no major cities are near, peat fires get much less attention and priority for rewetting (cf. peat fires outside Moscow Oblast, peat fires in Ukraine). Therefore I think that peat fire emissions outside Indonesia will be reduced less and in 2030 will see a reduction of less than **100 Mt CO_2e per year** (long-term average).
Mind: these "calculations" are based on the assumption that the peat is only oxidized to CO_2. In reality peat fires emit also gases with a stronger GWP (incl. CO and CH_4 and species that are not accounted in the IPCC/UNFCCC reporting), so that emission reduction from decreased fire incidence will be larger than these figures suggest.

Conclusions:

- Provided that planned policies are effectively implemented and awareness continues to rise, global annual emissions from drained peatlands in 2030 are expected to be some 300 Mt CO_2e lower than in 2015. This amount results from
  - an increase of 40 Mt CO_2e (without fire) from the net increase of drained peatland area, resulting from (compared to 1990 – 2015 rates) halving the rate of new peatland drainage (+120 Mt CO_2e) and the continuing trend of drainage-inherent disappearance of long-term drained peatland (-80 Mt CO_2e),
  - a decrease of 70 Mt CO_2e from peatland rewetting and reduced microbial oxidation, with the majority (60 Mt CO_2e) stemming from Indonesia and<10 Mt CO_2e from Europe,
  - a decrease of 275 Mt CO_2e from reduced peat fires as a result of peatland rewetting and improved management within SE Asia (175 Mt CO_2e) and outside (100 Mt CO_2e).
- It thus seems possible to decrease total peatland emissions from 2200 Mt CO_2e in 2015 to 1900 Mt in 2030, which is a 15% reduction compared to 2015. However, compared to the estimated 1200 Mt (microbial oxidation) + 300Mt (peat fire) in 1990, this is still an increase of 25%.

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Harvesting peatmoss from pristine peatlands is bad for the climate

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The cultivation of Sphagnum biomass on rewetted peatlands is a promising, climate friendly option to provide a high quality alternative for fossil peat in horticultural growing media (Wichmann et al. 2014, Gaudig et al. 2017, Günther et al. 2017). Since various countries, including the United Kingdom, Switzerland and Germany, have decided to restrict or phase out the use of peat (Joosten et al. 2015, BMUB 2016), the global demand for fresh Sphagnum biomass as a renewable substitute for peat is expected to grow.

This increasing demand has initiated new players to enter the market. The Finnish company EcoMoss Oy collects Sphagnum moss from living bogs and considers 300,000 hectares of Finland's bogs “to be ideal for that purpose”. In 2016, 15,000 cubic metres of moss were collected industrially in Finland. Landowners can earn up to EUR 1,000 per hectare for moss collection and the use of Sphagnum moss for greenhouse cultivation is sparking interest around Europe. "The growth potential of growing media – peatmoss included – is estimated to be EUR 2.5 billion within the EU. The market is reasonably large. Sphagnum moss also meets environmental values such as renewability and recyclability. European consumers appreciate the ecological aspects," according to Teppo Rantanen, Managing Director of Novarbo and Biolan, a company which owns a large share of EcoMoss. Expectations are particularly great in the Netherlands, Germany and the Mediterranean countries.

The collection of Sphagnum is presented as “climate neutral and considerably more ecological than peat extraction”. Researcher Niko Silvan of the Natural Resources Institute Finland (Luke): “Moss production requires no drainage and generates almost no climate emissions, unlike peat collection. This is because the rapid regrowth of bog vegetation in just a few years balances the area's function as a carbon sink".

The story presented is, however, full of false claims. Whereas the Sphagnum plants may regrow and the biomass thus could be called “renewable”, the consequences of the activity are not climate neutral at all. The regrowth does not “balance the area's function as a carbon sink”, but instead 1) stops the area from being an

effective carbon sink in the period between Sphagnum removal and the re-establishment of a full Sphagnum cover, and 2) removes part of the carbon stock that the living vegetation had earlier accumulated.

It seems that the experts involved do not fully grasp the essence of what a mire is. In a mire, a part of the vegetation - and in case of a Sphagnum mire even a substantial part of annual net primary production - is after its death forever stored as peat. Mire vegetation has thus another 'fate' than the vegetation of other ecosystems. The biomass of other ecosystems will, after shorter or longer time, be fully converted into its original constituents: CO_2 and H_20. Using such biomass is thus not changing the eventual fate of the organic substance but only the pathway (e.g. direct combustion versus microbial decomposition) and the speed with which this is happening. In case of harvesting mire vegetation you change the fate (the developmental direction) the organic matter would take: instead of being stored "forever", you oxidize it in short time. Removal of peat forming vegetation is equal to removal of the peat that it otherwise would have been produced: you remove, what you could call, a future fossil resource.

Claiming this removal as being "climate neutral" disregards the fact that living mires and their carbon sequestration are already part of the climate's greenhouse gas balance. To be climatically neutral the new CO_2 source you create by using the Sphagnum biomass should be compensated by a new sink, not by a sink that was already there, before you disturbed it.

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Equipment developed for peatmoss collection from living bogs. The machine scoops moss off the ground, crushes it, squeezes the water out, and finally places the moss in a container. Photo: Heikki Rantanen.
https://www.tekes.fi/en/tekes/results-and-impact/cases1/case-examples-2017/ecomoss-finnish-sphagnum-moss-is-cultivated-into-ecological-products-for-export/

Further reads and views:

- Rainfall patterns determine geomorphology and carbon fluxes in tropical peatlands: https://www.youtube.com/watch?v=Nm2kqFvVr1c

- The Great Bog Walk: Crossing Red Lake Peatland (Minnesota) on foot in 50 hours: https://gearjunkie.com/red-lake-peatland-crossing-minnesota-big-bog-hike
- Video Fire and haze in Indonesia: Laws and regulations - The impact of local laws in breaking the cycle: https://forestsnews.cifor.org/51774/fire-and-haze-laws-and-regulations?fnl=en
- Ice and fire: some cool new pictures of the time Greenland's peatlands were on fire: https://www.popsci.com/just-some-cool-new-pictures-time-greenland-was-on-fire

Asia

Brunei

Brunei's 13 Meeting of Commitee convenes to discuss haze measures in Asean region

The air quality situation of Brunei Darussalam was highlighted by the Permanent Secretary of the Ministry of Development, Haji Muhammad Lutfi bin Abdullah, at the 13th Meeting of the Asean Agreement on Transboundary Haze Pollution (AATHP) in Berakas. Despite the dry weather of previous year, he said, "We were fortunate that the southern Asean region experienced less hotspots, less forest fires, and therefore less problems of transboundary smoke haze. Nevertheless, we should not be too complacent, and therefore should always remain vigilant to enhance our preparedness and response to any likelihood of land and forest fires in the next dry weather period." Items discussed at the meeting were the review and outlook of the weather and haze situation; presentations from Asean member states updating on the fire and haze situation in their respective countries; and progress reports of activities and actions taken at the national level in addressing transboundary haze pollution. The Asean Secretariat also presented a progress update of the Roadmap on Asean Cooperation towards Transboundary Haze Pollution Control with Means of Implementation, which serves as a strategic framework for the implementation of the collaborative actions to control and resolve transboundary haze pollution. Another main agenda item was the update the Asean Programme on Sustainable Management of Peatland Ecosystems (2014-2020). The AATHP aims to prevent and monitor transboundary haze pollution as a result of land or forest fires, which need to be mitigated through coordinated national efforts, along with more intense regional and international cooperation. The agreement was established in 2002 and is managed by the Asean Ministers of Environment and other representatives from Asean member states. http://www.elevenmyanmar.com/asean/11563

Recently burned peat swamp in Brunei. Photo: Hans Joosten.

Indonesia

"Zero-burning policy hurts small farmers – a flexible approach is needed"

To tackle the ongoing disaster of fires and haze that harm human health and the environment, since 2014 the Indonesian government has strictly banned the use of fire to clear peatland areas for agriculture. Smallholder farmers have used controlled burning as a traditional practice and tend a variety of food crops such as rice and corn in non-peat areas. The ban on the use of fire for land clearing has raised the costs to prepare their land for planting and to keep it pest-free. A degree of flexibility is needed to help farmers survive and prevent them from abandoning their lands due to high farming costs, according to a recent study carried out by the Center for International Forestry Research (CIFOR) in collaboration with the Forestry and Environment Research Institute in Palembang and the University of Lancang Kuning in Pekanbaru. The group studied nine villages in three regencies (Pelalawan, Indragiri Hulu and Indragiri Hilir) in Riau Province (Sumatra) and discovered that the farmers found it difficult to follow the government's alternative of preparing land without burning. They have to clear the land manually, using machetes or sickles, and let the grass and tree debris decompose. This takes longer than burning – one to two months as compared to only several days by fire – and costs more for manpower. This method also brings pests and diseases from the pile of decomposing wood, leaves and grass, thus threatening farmers' crops. Farmers from villages in Indragiri Hilir told that coconut beetles attacked their coconut plants since the neighbouring plantation companies were using this technique. The fire ban for land preparation also limits farmers' ability to improve soil fertility. Research has shown that minerals generated by the burning process reduce soil acidity (pH). Without ashes from burning, farmers need to add dolomite to improve soil fertility. This leads to higher production costs as it takes about two tonnes of dolomite per hectare to get good results. A number of land owners had decided to abandon their farms. Their harvest could not compensate for the high production cost of land preparation. The abandoned lands create a higher risk of wild fires during the dry season due to the build-up of biomass from the bush.

The government banned peatland burning because of the difficulty of controlling fire in that ecosystem. Oil palm growers often drain peatlands so they can grow their crops on it. Burning drained peat to prepare the land significantly increases greenhouse gas emissions, as it will continue to smoulder and release haze for a long time. But even though the ban on the use of fire for land clearing was specified for peatland, according to the regulation on peatland ecosystem protection and management and its revision, the enforcement of the zero-burning policy applied not only to peatland but to practically all agricultural land in the region. The government has created the Forest and Land Fire Task Force, or Satuan Kebakaran Hutan dan Lahan (SATKARHUTLA), recruited from various agencies from the central and regional government and the local community, and involved the police and military to patrol the fields to prevent communities from burning their land. They also extinguish forest and land fires and even arrest and prosecute the violators. The policy has made farmers too fearful to burn their lands, even though the use of fire in agricultural land clearing has been a common practice in their farming system. Having seen citizens being arrested for burning farmlands, half of the surveyed households had stopped doing so. But hundreds of other farmers in the surveyed areas were still practising burning for their farming activities. These farmers have long done this and have yet to find better ways to prepare their land. They are mostly doing it in secret. But some do ask for permission from village authorities prior to burning, which creates a dilemma for these authorities.

The zero-burning policy on peatlands, while effective in reducing forest and land fires, may in the long run harm the local agriculture industry. There is a need for flexibility in implementing the policy on the ground. Genuine farmers should be allowed to implement controlled land burning. Traditional community wisdom makes it possible to apply the technique with the guidance of government officials in the field. Patrol activities are still needed to control opportunist groups who chase short-term profits by burning new forest irrespective of environmental safety. It is important that officers understand and are able to distinguish between opportunistic groups and the genuine farmers whose livelihoods really depend on their farming activities.

https://phys.org/news/2017-09-zero-burning-policy-small-farmers-flexible.html#jCp

Palm oil giant FGV will 'endeavour to rehabilitate' peatlands it trashed in West Kalimantan

After a year in which it destroyed over 1,000 hectares of peat swamp forest in violation of its own sustainability policy, palm oil giant Felda Global Ventures said it would "endeavour to rehabilitate" the damaged lands in Indonesian Borneo. In August 2016, FGV promised to stop clearing rainforests and peatlands. But on the

ground, it continued to plow through the carbon-rich environments, creating space for its oil palm plantations. In doing so, FGV violated not only its own green pledge, but also its obligations as a member of the Roundtable on Sustainable Palm Oil (RSPO), which FGV joined last December. “This is the first time a palm oil company has been forced by its customers to restore the forest it cleared,” Greenpeace Southeast Asia forest campaigner Bagus Kusuma said in a statement. FGV, which calls itself the world’s largest palm oil producer, is listed on the Bursa Malaysia, while the Malaysian government holds a one-third stake. FGV’s transgressions had been highlighted by watchdogs Greenpeace and Chain Reaction Research in April and July. Two of FGV’s Indonesian units — PT Temila Agro Abadi (TAA) and, to a far lesser extent, PT Citra Niaga Perkasa (CNP), both in Landak district, West Kalimantan province — had cleared over 1,000 hectares of forest and peatland since August 2016, according to the reports. Following these findings, FGV said in a statement last month that it had “permanently discontinued…the land development work” in both concessions, and amended its previous sustainability policy by promising not to develop peat “irrespective of when the lands are acquired or owned by FGV group.” That means it won’t clear peat in areas it was licensed to develop before it issued the commitment. FGV also said it would “endeavour to rehabilitate” the peatlands it had planted since it issued the commitment in August 2016. It did not note the extent of area it intends to restore, but Eric Wakker, a member of the Chain Reaction Research team, said the company had cleared over 1,000 hectares since then. “In respect of the peat lands which have been developed at PT TAA and PT CNP, FGV will use RSPO’s land rehabilitation guideline as guidance and will consult Indonesia’s Peat Restoration Agency on the course of actions to be taken to implement the rehabilitation program,” the company said. Wakker called it “the most ambitious peat rehabilitation commitment made by any RSPO member so far.” “The company must however realize that this commitment is easier made than fulfilled. With everyone’s eyes on this case, the pressure is on.” Greenpeace called on the companies that buy palm oil from FGV — including refiners Wilmar International and Musim Mas, and consumer goods giant Unilever — to halt their purchases until the Malaysian firm provides “credible proof” that restoration is underway.
https://news.mongabay.com/2017/09/palm-oil-giant-fgv-will-endeavor-to-rehabilitate-peatlands-it-trashed-in-borneo/

Nightly peat fire in Central Kalimantan. Photo: Hans Joosten.

Government, local administrations not unified in protecting peatlands

According to Greenpeace the government and local administrations of Indonesia take different measures in protecting peatlands. The environmental activists said a lack of concrete action may hinder the success of agreements made by the governor’s Climate and Forest Task Force (GFC) and that the central government and

local administration are not speaking with one voice on the protection of peatlands. “Even a governor from one of the GFC member provinces has questioned the benefit of Government Regulation [PP] No.57/2016 on the protection and management of peat land ecosystems to President Joko ‘Jokowi’ Widodo,” conservation group Greenpeace Indonesia’s global forest campaign head Kiki Taufik, said in Balikpapan, East Kalimantan, on September 27th. In a letter sent to Jokowi in April, West Kalimantan governor Cornelis said the implementation of PP No.57 and Environment and Forestry Minister Regulation No.P.17/2017 would affect the sustainability of investments from 43 companies that employ 20,000 people in the province. “In fact, the forest and peat land fire level in West Kalimantan is quite high,” said Kiki. Last month, National Disaster Mitigation Agency (BNPB) spokesperson Sutopo Purwo Nugroho said satellite monitoring had detected 150 hot spots in areas across West Kalimantan. The widespread hot spots have forced five regencies in West Kalimantan (Bengkayang, Ketapang, Kubu Raya, Melawi and Sekadau) to declare an alert for land and forest fires. Kiki said the central government and local administrations must uphold their commitment to tackle deforestation.

- http://annx.asianews.network/content/government-local-administrations-not-unified-protecting-peatlands-greenpeace-57389
- http://www.thejakartapost.com/news/2017/09/27/central-local-govts-not-unified-in-protecting-peatlands-greenpeace.html

Fighting fire and haze in Indonesia

More than 300 representatives from various sectors came together to discuss ways to strengthen local laws and learn from ground-level experience at a national policy dialogue in Pekanbaru last month, hosted by the Center for International Forestry Research (CIFOR) in collaboration with the University of Riau. The dialogue on ‘Laws and Best Practices for Reducing Fire and Haze’ invited participants to share both their challenges and their success stories in breaking the dangerous annual cycle.

The president’s decree on peatlands set the tone nationally for a change in land management practices. But research has found that local laws – issued at the provincial, regency or city level – can have even greater impact in reducing the risk of disaster. Yulwiriawati Moesa, Head of the Riau Forestry and Environment Agency, reminded participants in the dialogue of a provincial regulation issued last year on the protection and management of peatlands, and said work was ongoing to fully implement it on the ground. Nonetheless, she praised efforts that have so far prevented another major disaster. “The province of Riau has managed to overcome the threat of a fire and haze disaster these past two years, after 18 years in shackles,” she said in her opening remarks.

CIFOR scientist Herry Purnomo recommended that any new legislation in the province or elsewhere should be based on scientific evidence and support community-level action for fire prevention and land restoration.

Effective work is being carried out at the ground level by local people, including farmers, landowners and volunteer fire fighters. Rozi, head of the Fire Awareness Community (MPA) in Dompas village, Bengkalis regency, leads regular patrols to catch fires before they burn out of control, and works together with his community to re-green and re-wet degraded peatlands, including by blocking canals to allow water to return to the land. He regularly catches small fires started by cigarette butts or mosquito coils, particularly in the dry season. “When we go on patrol, we don’t get paid,” he said on the sidelines of the dialogue. “But in villages where there are no patrols, there’s sure to be fire.” “It’s hard to convince others to join the patrols because it means they can’t take on other work that day, they don’t get paid, and then they can’t feed their families. Economic issues are our main obstacles,” he added. Ongoing work in collaboration with CIFOR scientists is bringing water back to dry peatlands by blocking canals that were dug to drain them in the first place. The practice of draining and burning peatlands to clear land for agriculture is a major cause of deforestation, land degradation and fires in Riau.

Bambang Setiadi from Indonesia’s National Research Council said the damaging practice of peatland burning started in Kalimantan in the 1990s, and was transferred to other parts of the country like Riau and Palembang. But as a peatland expert himself, Bambang warns that there is no sound scientific basis for draining and burning peatlands, and that the “bad science” of the 1990s must be stopped. “Drying out peatlands is the first mistake, since about 95% of peat is water,” he said in an interview at the dialogue. “You can see the effects of this in places like Banjarmasin and Pontianak, which never had floods in the past, but now when it rains these cities are inundated.” He said that businesses still using burning as a method to clear land must be held accountable to government regulations. “These businesses say, ‘But I pay tax, I employ people’. These kinds of battles go on. But I say to them, ‘If you were conducting your business in the proper way, we wouldn’t have seen the kinds of fires we had in 2015’.”

Tiur Rumondang, Director of Indonesia Operations for the Roundtable on Sustainable Palm Oil (RSPO), said that burning is absolutely banned for companies aiming to comply with its standards and criteria. “It’s what we call ‘major non-compliance’. If a company did this, we would consider it a major violation,” she said. Iman Santoso from the Indonesian Forestry Business Association (APHI) said the responsibility of stopping fires extends from companies and smallholders to all stakeholders involved in and affected by forestry and land-use decisions.
“Forestry cannot be regarded as an issue for foresters alone. Just as security cannot be considered solely the responsibility of the army, but as a task for the entire nation,” he said. “That’s why the Indonesian Forestry Business Association is happy to be finally implementing a landscape approach to optimize land use in landscapes that have multiple uses – not just for pulp and paper, not just for palm oil, but for all local crops that already exist there. As a consequence, we need to involve multiple actors, multiple disciplines and multiple sectors in finding solutions.”
For more information on this topic, contact Herry Purnomo at h.purnomo@cgiar.org.
https://forestsnews.cifor.org/51756/fighting-fire-and-haze-in-indonesia?fnl=en

Malaysia

Freshly cleaned ditch in oil palm plantation on peat in Sabah, Malaysia. Photo: Hans Joosten.

Poor sustainability of Malaysian and Singapore palm oil use

The majority of Malaysia and Singapore’s most popular brands have failed to push for the use of sustainable palm oil in their products, with some refusing to disclose who they buy from, according to a new survey by the World Wide Fund for Nature WWF (Palm Oil Buyers’ Scorecard). Earlier this year, WWF surveyed 47 locally based food and restaurant-chains, with 27 from Singapore and the rest from Malaysia. Of the 47 companies that were contacted, only 16 disclosed information on their palm oil usage. And half of those had taken no action to support the use of sustainable palm oil. “Even though 100% certified palm oil is available today, most businesses in Malaysia and Singapore are still not sourcing it,” the report of the survey read.
Palm oil is one of Southeast Asia’s biggest industries, with Malaysia and Indonesia responsible for most of the world’s production. These countries are also home to many manufacturers that use palm oil. For its part, Singapore serves as a base for the regional operations of major growers and refiners in the industry, as well as a financial hub by supplying loans and investments to these companies. As the industry expands across the world, calls for more sustainable practices have intensified as well on the back of environmental concerns.

Many oil palm companies take community lands without their consent, backed by government officials in some of the most corrupt nations on earth. The industry's expansion has also driven the destruction of forests and biodiversity, especially in Indonesia, a leading greenhouse gas emitter because of the clearance of its forests and peatlands. "Unsustainable practices in the palm oil industry are at the root of the transboundary haze and deforestation," Elaine Tan, CEO of WWF-Singapore, said in a statement.

Since 2009, the WWF has published the four scorecards to track the palm oil and sustainability commitments of global brands. This is the first time the NGO has published a scorecard looking at Malaysian and Singaporean brands specifically. The WWF defines "sustainable" palm oil as that which is certified by the Roundtable on Sustainable Palm Oil, the world's largest association for ethical production of the commodity. Companies that join the RSPO are forbidden from using palm oil linked to the destruction of virgin forests and peatlands, which is not necessarily illegal in Indonesia and Malaysia. At the same time, some companies have gone further than the RSPO, pledging to eliminate the destruction of any kind of forest from their supply chains. This year's scorecard found that non-disclosure and lack of action was higher among brands in Singapore and Malaysia than in other countries. Global brands had an 80 percent response rate, and over 60 percent have sustainable sourcing commitments for palm oil. In comparison, 30 percent of regional brands responded to the WWF and only three have public commitments on palm oil use, despite Southeast Asia's position as the world's leading palm oil producer. "Singapore is at the heart of a region that supplies 85% of the world's palm oil. Our local brands need to show leadership by being accountable for their palm oil use and take real action to source sustainably," Tan said. The report identified a lack of internal capacity among companies as a key obstacle in adopting sustainability commitments. "One of the things we realized is that most don't have a sustainability person, let alone a team," Denise Westerhout from WWF-Malaysia told Al Jazeera. Meanwhile, companies cited the cost of sourcing sustainable palm oil and a lack of consumer awareness and demand for certified sustainable products among the reasons for not buying certified sustainable palm oil.

https://news.mongabay.com/2017/09/poor-grade-for-malaysia-singapore-brands-in-palm-oil-sustainability-wwf/

Collecting oil palm bunches in a model plantation on Carey Island, Peninsular Malaysia. Photo: Hans Joosten.

Europe

Draining of peatlands is reducing bird diversity

The populations of peatland birds in Finland, Sweden, Norway, Estonia and Latvia have decreased by a third during the past three decades, a recent international study indicates. The situation in Finland is the most dire, and the species in most trouble is the Finnish ruff, as the population has fallen to approximately 3 percent of what it was at the beginning of the study period. "The populations of many common peatland birds, such as the wood sandpiper, the meadow pipit, the yellow wagtail and the common reed bunting have gone down in Finland by a third or more since 1981," states Academy Research Fellow Aleksi Lehikoinen from Luomus, the Finnish Museum of Natural History, part of the University of Helsinki. The only peatland bird to become more common in all of the countries mentioned is the crane, which has tripled its populations over the three decades. This is probably due to the reduced hunting of the species in areas where it winters and along its migration route.

The poor situation of peatland birds can be attributed particularly to the diminishing natural peatlands resulting from decades of wetland draining and peat extraction. "In general, peatland birds are much more plentiful on high, open fens and undrained swamps," explains Andreas Lindén, senior researcher from Novia University of Applied Sciences. In many areas, there have been efforts to transform mires into forests through draining. Finland has the most drained wetlands in all of northern Europe. Only 14% of Finnish peatlands are protected, most comprehensively in northern Lapland. In contrast approximately 75% of Estonian mires are now protected, and the study suggests that the country's populations of peatland birds are on the rise.

According to the researchers, the status of the peatland bird populations can be improved by protecting the existing mires and by rehabilitating previously drained peatlands. "Because it has the largest area of wetlands, Finland has the greatest responsibility for maintaining the populations of peatland birds in the European Union. Consequently, we should place more effort on protecting and rehabilitating our peatwetlands," states Lehikoinen. https://www.sciencedaily.com/releases/2017/09/170926105445.htm

European Union

Common Agricultural Policy and ecosystem services

BiodivERsA has launched a new policy brief 'The Common Agricultural Policy can strengthen biodiversity and ecosystem services by diversifying agricultural landscapes' based on the combined results of the FARMLAND, APPEAL, CONNECT, EC21C and ECODEAL projects. This 4-page brief presents key recommendations on how the Common Agricultural Policy can significantly contribute to diversifying agricultural landscapes in support of nature and people, for a more sustainable agriculture. The brief was drafted by the Institute for European Environmental Policy (IEEP), in collaboration with BiodivERsA partners and project scientists. In case of any questions, contact Frederic Lemaître, BiodivERsA science-policy interfacing officer (frederic.lemaitre@fondationbiodiversite.fr).

Finland

New mire conservation areas in Finland

On Thursday September 14, 2017, the Finnish government agreed to adopt two statutes to establish a total of 62 nature conservation areas in eastern Lapland and northern Ostrobothnia. The total designated conservation area in eastern Lapland is over 197,000 hectares, while areas to be protected in northern Ostrobothnia amount to nearly 22,000 hectares. For the most part, the protected areas include part of the EU's Natura 2000 network as well as other territory under state protection. The region to be protected in eastern Lapland comprises forested and swampy areas. The largest single area to be added to the list of conservation sites is a 50,000-hectare expanse in Koitelainen. The area also includes springs and other small waterways, fells and rocky outcroppings, floodplains and woodlands. Additionally, the site features traditional biotopes under active care and use. Eastern Lapland's largest wetlands including the Kemihaara, Luiro, Pomokaira and Koitelainen mires, are some of the most valued territory in Lapland and the country as a whole.

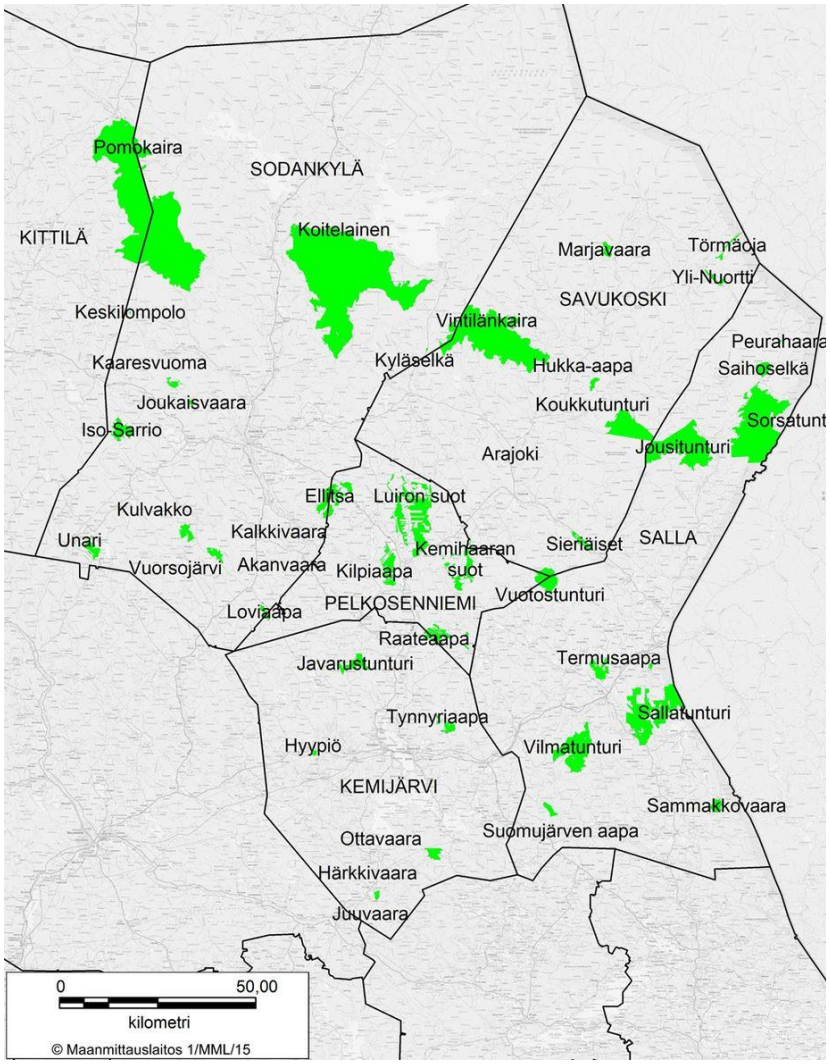


Image: Ympäristöministeriö

The conservation sites to be established in northern Ostrobothnia include forested lands as well as wetlands and avian waters. Nearly 80 percent of the swamp and peatlands in the southern part of northern Ostrobothnia have been drained. The new wetlands will be a major addition to the region's protected swamps. Several such sites are important bird nesting and resting areas. Among the areas to fall be designated official conservation areas are eight significant water bird areas that are also part of the global network of protected wetlands, the Ramsar network Some of the forested areas earmarked for conservation are already protected under a programme for mature forests, while others have sought protection under the government-led voluntary forestry protection programme METSO..

The new government regulation would safeguard them as part of the Natura 2000 area in the southern part of northern Ostrobothnia, where protection is based on conservation legislation.

All of the new conservation areas will fall under the remit of the state forest agency, Metsähallitus. The areas to be protected in eastern Lapland belong to the network of free hunting areas and locals' right to hunt in the area will not be restricted. Most of the new conservation areas in northern Ostrobothnia are not covered by free hunting rights, but the activity is allowed in exceptional circumstances. According to ministry officials, changes to existing hunting practices should only change when there are special grounds.

However some form of hunting is possible in about 90 percent of the conservation area to be established in northern Ostrobothnia. For example, locals will still be allowed to hunt moose in nearly all of the earmarked regions, either in part or in the entire site.

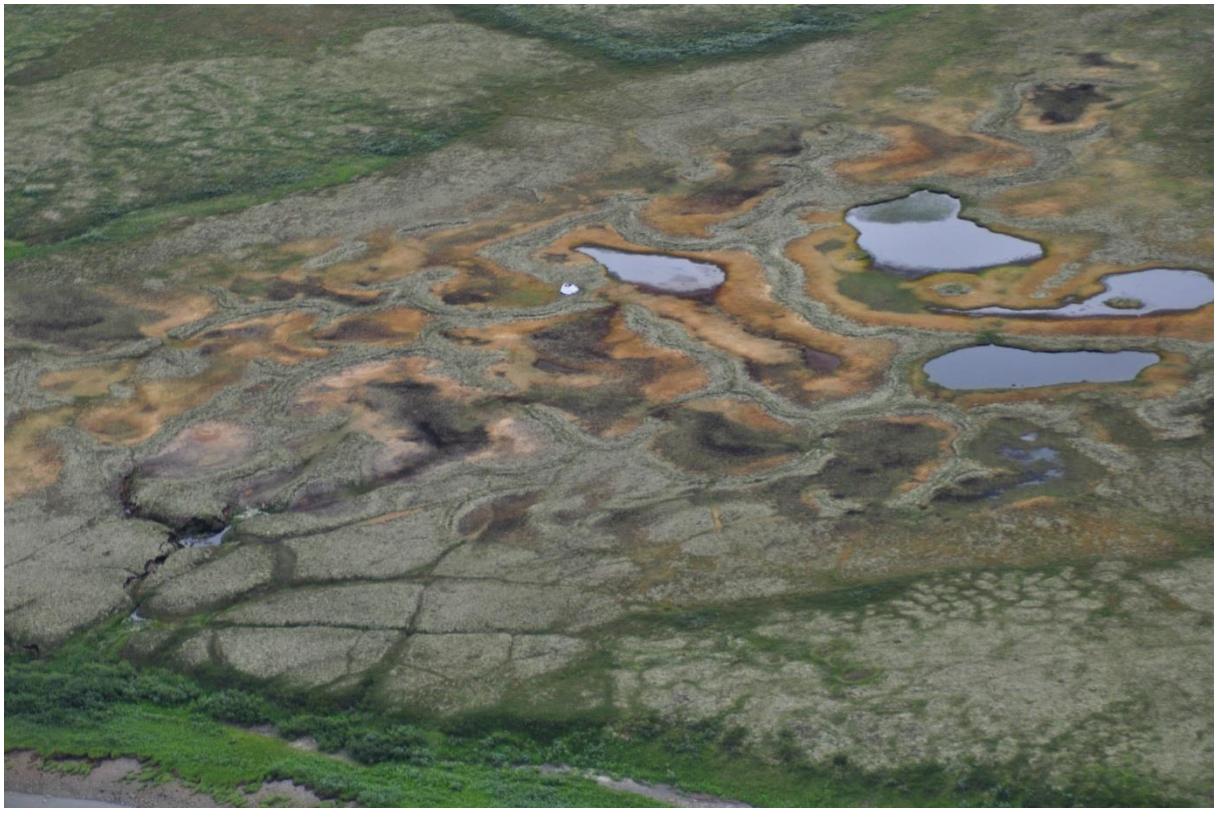
https://yle.fi/uutiset/osasto/news/government_green-lights_new_nature_conservation_areas_in_northern_western_finland/9833379

France

Permafrost peatlands in a changing climate

Session #14 at the upcoming 5th European Conference on Permafrost (EUCOP) 2018 in Chamonix, France, 23 June – 1 July will have the theme "Permafrost peatlands in a changing climate – past, present and uncertain future". Peatlands cover vast areas in the permafrost region and are important soil organic carbon reservoirs. Because of the characteristic thermal and hydraulic properties of peat, permafrost peatlands respond differently to ongoing and future climatic changes compared to mineral soils. Complicated feedbacks between energy, water and carbon cycles constitute a significant challenge for modelling approaches, making future projections on the fate of permafrost peatlands highly uncertain. This session aims to provide an

interdisciplinary platform showcasing state-of-the-art research on permaforst peatlands. We welcome presentations on a wide range of aspects and disciplines, such as landscape development and permafrost history, thermokarst features, monitoring activities, cryostratigraphy, carbon storage and cycling, numerical modelling and representation in Earth System Models. The deadline for abstract submission is 15 November 2017! Please submit your extended abstract at: https://eucop2018.sciencesconf.org/resource/page/id/12



Highly diverse permafrost peatland complex at Cape Bolvansky, Nenets Autonomous Okrug, Russian Federation. Photo: Hans Joosten

Germany

Peatlands in the spotlight at the IUFRO Congress in Germany

In September the International Union of Forest Research Organizations, IUFRO, held its 125th Anniversary Congress in Freiburg, Germany. IUFRO is a global network that promotes international cooperation among more than 15,000 scientists from more than 110 countries. During the five-day event, technical sessions highlighted innovative research under the theme "Interconnecting Forests, Science and People." Scientists from the Sustainable Wetlands Adaptation and Mitigation Program, SWAMP, which includes the USDA Forest Service, Oregon State University and, the Center for International Forestry Research CIFOR presented a culmination of five years of research into peatlands and mangroves. In addition, the journal 'Mitigation and Adaptation for Global Change' is soon publishing a series of 10 papers on peatlands in Southeast Asia, Latin America and Central Africa. The special issue will be titled 'Tropical peatlands under siege: the need for evidence-based policies and strategies'.
https://forestsnews.cifor.org/51615/making-peat-a-priority?fnl=en

A full week of paludiculture

Greta Gaudig (greta.gaudig@greifswaldmoor.de)

The last week of September 2017 was devoted to 'paludiculture' – at least in Greifswald, Germany. From 25.-30.09.2017 a national and an international conference, a day of excursions and a Sphagnum farming workshop were organised by the Greifswald Mire Centre. Almost 200 scientists, land owners, land users and environmentalists from 27 countries assembled at the 2nd International Paludiculture Conference RRR2017 - Renewable resources from wet and rewetted peatlands (27.-29.09.) to discuss how to tap the potential of

peatlands for climate protection, alternative agriculture and saving great socio-economic costs, and to promote paludiculture – the productive utilization of wet and rewetted peatlands. The participants adopted the joint concluding statement "Peatlands must be wet: for the climate, for the people, for the future – Implementing paludiculture for sustainable peatland utilisation" (see below). Conference proceedings can (soon) be downloaded at www.rrr2017.com and are available as hardcopy via communication@greifswaldmoor.de.
Besides the extensive scientific program a wide range of interesting related events was offered: A show of machinery and technical equipment for wet peatland agriculture at the market square in the heart of Greifswald, an exhibition of potential paludiculture plants ('paludarium') at the Botanical Garden of Greifswald University, an art exhibition "RUMOOREN – art meets mires" as well as the conference dinner with classical mire-associated songs and poems, and a networking evening for lively exchange.

"Peatlands must be wet: for the climate, for the people, for the future"
"Implementing paludiculture for sustainable land use"
- Concluding statement of the RRR2017 conference -

Drained peatlands hamper the achievement of the Paris Agreement and the Sustainable Development Goals. Drained peatlands/organic soils cause enormous economic and environmental losses through greenhouse gas emissions (5% of global emissions), peat fires, loss of biodiversity, water pollution, soil degradation and desertification, and subsidence (1-5 m per century) followed by an eventual loss of productive land. Almost half of the peatlands in Europe have been drained for agriculture and forestry. In Southeast-Asia, Africa, and America drainage of peatlands is increasing.
It is critical to stop further drainage of intact peatlands to maintain their highly valuable ecosystem services and biodiversity. Rewetting (i.e. raising the water level back to around the surface) solves most problems associated with drained peatlands, but stops conventional drainage-based land use. Paludiculture (i.e. productive use of wet and rewetted peatlands) presents the necessary paradigm shift towards sustainable regional economies with global climate benefits. Instead of draining them, peatlands are kept productive under permanently wet, peat-conserving conditions. Paludiculture is always preferable to drainage-based peatland use: It mitigates climate change and helps adapt to a changing climate in which challenges of sea level rise, droughts, and floods have to be faced.

The second international conference "Renewable resources from wet and rewetted peatlands" (RRR, 26-28 September 2017, Greifswald, Germany) brought together nearly 200 experts from all over the world. Over three days they exchanged experiences and ideas, identified research demands, and built networks. The conference showed the impressive progress made since the first conference in 2013. However, several issues still obstruct large-scale effective implementation of paludiculture.

The participants insist that the concept of paludiculture should at the very least entail the preservation of the peat carbon stock (no peat loss) and the minimization of net greenhouse gas emissions. Whether these aims are reached is not determined by the selection of specific crops but by the conditions under which these crops are grown and managed (permanently wet and without damaging the peat soil). Paludiculture may also enhance additional ecosystem services such as water storage, flood control, biodiversity conservation, and nutrient retention.

Whereas partly raising the water level reduces net emissions and subsidence, reaching the goals and implications of the Paris Agreement and the Sustainable Development Goals (zero-emissions by 2050, no loss of productive land) requires peatland water tables to be maintained close to the surface over the entire year.
Until now, most peatlands have been rewetted for nature conservation purposes. To comply with the Paris Agreement, a much stronger emphasis must be placed on rewetting deeply drained peatlands/organic soils currently under high intensity land use. These lands have the highest potential for climate change mitigation, but rewetting these lands implies a transition to new production goals, techniques, and management. Implementing paludicultures will strongly reduce the opportunity costs of the required Climate Action on organic soils. The transition will need to be supported by strong public incentives and investments.

Large scale implementation of paludiculture requires

- Further awareness of direct and indirect stakeholders on all levels and stimulation of inter- and multi-sectoral cooperative action;
- Adjustment of legal frameworks, including stopping incentives which maintain or stimulate peatland drainage, and ensuring accounting for emissions from organic soils under the Paris Agreement;
- Provision of planning security, financial incentives from the public sector (e.g. for rewetting and investments, payments for ecosystem services), and improved access to finance;
- Stimulation and support of innovation along the entire paludiculture value chain, including breeding, cultivation, harvesting, transport and processing technologies, logistics, economy, and markets;
- Encouragement of private sector and multinational corporations to participate in this transformation through investment and Corporate Social Responsibility;
- Bottom-up solutions by engagement of stakeholders/land users, establishment of pilot and best practice demonstration sites, and knowledge transfer, with special attention to decentralised solutions to address the large variety of environmental and socio-economic conditions;
- Further research into paludiculture crops, water levels, and management options to optimize climate and other environmental effects and economic consequences;
- Improvement of the knowledge base of peatland distribution and status worldwide;
- Institutionalisation of paludiculture research and worldwide cooperation

Paludiculture is new and challenging, but with ongoing and increased cooperation between stakeholders (incl. authorities, private sector, farmers, knowledge institutes, conservation organisations), we are confident that sustainable paludiculture solutions can be developed that are beneficial to all parties and the planet.

Harvesting reed near Rozwarowo, Poland. Photo: Philipp Schroeder, lensescape.org

Annex: Drained peatlands and organic soils in the World

Peatlands and organic soils occur in almost all countries of the World, but with a distinct uneven distribution. Most of them are found in the boreal and arctic zones with about 70 % of global organic soils concentrated in Asian Russia (Siberia) and northern North America (Alaska and Canada, Table 1). These lands are largely undrained. Also, 75% of the undrained organic soils of Europe are located in the northern part (European Russia, Sweden, Norway and Finland).

Many organic soils in Europe are, however, drained, especially in the temperate zone (Table 2). In Asia 64% of the drained organic soils are found in Indonesia, which also constitutes the largest single source of emissions from drained organic soils globally. The area of drained organic soil has considerably increased in the Tropics over the last years, especially in SE Asia. Most uncertain are the area data for South America and these will likely change considerably with increased awareness and research.

Globally, annual greenhouse emissions from drained organic soils (without peat fires) are 1,600 Mt CO_{2e} (Table 1), i.e. double the amount of CO_2 emissions from aviation. Peat fires from drained peatlands add - in long-term average - another 600 Mt CO_{2e} per year.

Table 1: Total and drained organic soils in the World (Global Peatland Database 2015).

	organic soils			
	total	drained		emissions
continent	**km²**	**km²**	**%**	**Mt CO_{2e} yr^{-1}**
Asia	1,500,000	195,000	13.0	916.4
Europe	594,000	285,000	48.0	506.8
Australasia	84,000	15,000	17.9	58.4
Nord-America	1,900,000	23,000	1.2	57.9
Africa	118,000	12,000	10.2	51.7
South America	157,000	6,300	4.0	31.2
global	**4,353,000**	**536,300**	**14.0**	**1622.4**

Table 2: Proportion of organic soils drained in selected European countries (Global Peatland Database 2015).

country	% drained	country	% drained	country	% drained
Germany	98	Ireland	83	Belarus	66
Netherlands	95	Romania	81	Latvia	66
Denmark	93	France	73	Iceland	63
Austria	85	Lithuania	72	Ukraine	58
Poland	84	UK	67	Finland*	54

* Finland also constitutes the largest single source of emissions from drained organic soils in the European Union.

The last two days of the paludiculture conference week (29./30.09.) focused on bog paludiculture, i.c. Sphagnum farming. After 2005 in Germany and 2011 in Canada, the 3rd International Sphagnum farming workshop 2017 took again place in Germany. The workshop was organized by the Greifswald Mire Centre and Leibniz University Hanover, and supported by IMCG and IPS. The number of participants was limited to 33 invited experts from 9 countries from all over the world to ensure an intensive and effective working atmosphere. During field trips participants got to know two large-scale Sphagnum farming projects (each over 10 ha) and the associated research on Sphagnum growth, biodiversity, hydrology and greenhouse gas emissions: one from Greifswald University, peat company Torfwerk Moorkultur Ramsloh and other partners on former bog grassland in the Hankhauser Moor, and the other from Hanover University , Klasmann-Deilmann and other partners on cut-over bog in the Provinzialmoor and Drenth. At the workshop the experts exchanged and discussed results and experiences on the key Sphagnum farming topics ‘Sphagnum productivity’, ‘water’,

Sphagnum farming excursion, Lower Saxony, Germany, September 30, 2017. Photo: Hans Joosten.

'techniques', 'diaspores', and 'substrates'. Results of the workshop are planned to be published in Mires & Peat. Because of increasing interest in and research on 'Sphagnum farming' it will probably not take again six years until the next exchange will be organized.

The paludiculture conference week was financially supported by the German Federal Ministry of Environment, Nature Conservation, Building and Nuclear Safety (BMUB), the German Research Foundation (DFG), and the German Federal Ministry of Education and Research (BMBF).

Harvesting peatmoss biomass on a Sphagnum farm near Hankhausen, Germany. Photo: Philipp Schroeder, lensescape.org

Ireland

New project to restore Ireland's bogland

A new initiative, the Living Bog Project, to restore 12 raised bog special areas of conservation (SAC) was launched on September 15th 2017. Ireland currently has 53 raised bog SACs. Raised bogs once formed extensive wetland over much of the central lowlands of Ireland, covering an estimated 310,000 hectares of land. The most recent surveys show that the area of active raised bog within Ireland's 53 SACs was 1,940ha in 1994. This decreased to 1,210ha in 2014, a loss of 730ha. Minister for Culture, Heritage and the Gaeltacht

Heather Humphreys launched the €5.4 million project in Clara, Offaly. "I hope this project will go towards the creation of a 'peat district' for Ireland, an area of raised bogs which will give visitors a chance to discover 10,000 years of history," Humphreys said. The Living Bog restoration work plans to re-create over 750ha of active raised bog and improve a total of 2,649ha of raised bog habitat.

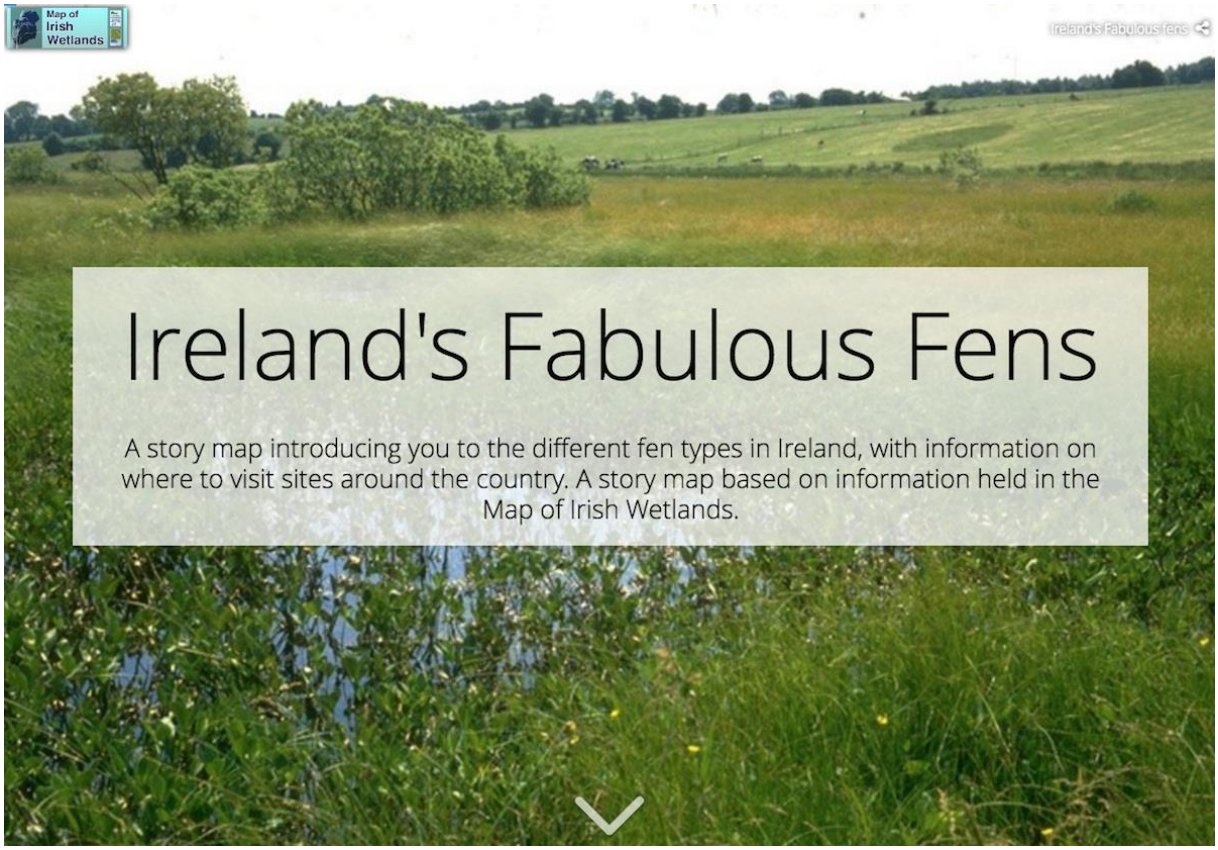
The 12 sites the project will be working on. Source: Department of Culture, Heritage and the Gaeltacht

	SAC name	County (nearest town)	Total SAC area
1	Kllyconny Bog	Cavan/ Meath (Virginia, Kells)	191.22
2	Clara Bog	Offaly (Clara)	836.54
3	Ferbane Bog	Offaly (Shannonbridge)	153.08
4	Mongan Bog	Offaly (Athlone)	207.83
5	Moyclare Bog	Offaly (Ferbane)	129.86
6	Raheenmore Bog	Offaly (Daingean)	210.01
7	Sharavogue Bog	Offaly (Birr)	223.43
8	Carrowbehy/Caher Bog	Roscommon (Ballyhaunis)	343.83
9	Derrinea Bog	Roscommon (Ballyhaunis)	86.18
10	Garriskill Bog	Westmeath (Rathowen)	324.81
11	Carrownaggapul Bog	Galway (Mount Bellew)	487.43
12	Ardagullion Bog	Longford (Edgeworthstown)	117.33
	Total		**3,311.55**

New boardwalk in Clara Bog. Photo: Hans Joosten

Ireland's National Peatlands Strategy emphasizes the role of peatlands in storing carbon and makes recommendations on continuing research of how peatland management might be used reduce greenhouse gas emissions. The project is set to develop new methods of monitoring carbon emissions to contribute information to this area. "This is the biggest single raised bog restoration project in the history of the state. The project, in consultation with landowners and local communities, will use active restoration measures to establish suitable conditions for peat to once again form on the bogs," Humphreys said. The project will also support community-led amenities at the bogs, with new walking trails and boardwalks being developed as the bogs become educational and environmental amenities. http://www.thejournal.ie/the-living-bog-project-3599651-Sep2017/

SAC Clara Bog with freshly cut faces of "traditional" peat extraction. Photo: Hans Joosten 2008.



Wetland Surveys Ireland and Foss Environmental Consulting have been surveying, studying and researching fen habitats throughout Ireland for over twenty years. They have recently developed a story map to share some of their fascination with these wonderful Irish wetlands. The map is a compilation of stunning images taken from Irish fens giving you an insight into this lesser known and rarely seen part of the Irish landscape. Fens are a unique type of peatland that form an important part of the Irish landscape. They help regulate and clean our water supply, support a rich variety of wild plants and animals, and can even tell us about our past history. With so much in their favour, it is surprising that fens are one of the least studied and lesser known Irish habitats. The story map brings you on an informative tour focusing on four main themes: Background to fen habitats where you can learn of their origin, development, and ecology; Biodiversity value of fens and the various plant and animal species they support; The importance of conserving Irish Fens; Fen sites to visit in your locality many of which are open to the public with various facilities. Ireland's Fabulous Fens story map was created by Dr Peter Foss as part of the Map of Irish Wetlands project. To learn more about Irish fens and see the spectacular images: http://bit.ly/IrishFens. Links to Map of Irish Wetlands: http://www.wetlandsurveysireland.com/ or http://www.fossenvironmentalconsulting.com/

Bord na Móna makes the move to bioenergy

Bord na Móna has launched its new Bioenergy business marking a critical step away from its traditional peat business towards renewable energy generation and supply. The announcement was made with the Minister for Communications, Climate Action and Environment Denis Naughten TD at the National Ploughing Championships. Head of Bord na Móna Bioenergy Patrick Madigan said 'In simple terms you will see the company move away from bogs and peat and towards bioenergy as the central focus of operations. After eighty years of bog operations, this is a massive step change. Bord na Móna Bioenergy will be sourcing sustainable biomass here and abroad providing green energy and green jobs to replace traditional operations and employment. Two years ago we made the commitment to exit peat for energy generation by 2030. Today we are making good on that promise and pointing the way towards biomass as a new green energy source for Ireland.' This move is a huge logistical challenge but we are confident that we have now put in place the supply chain that will meet the projected demand. In the next few years we will be supplying 1.5million tonnes of sustainable biomass material per annum to customers including other power generators and large energy consumers. We are actively looking to develop indigenous supplies from private forestry and are also encouraging Irish farmers to consider energy crops as a secure income source. Government has been and will be critically important to underpinning development of this domestic supply.'

Biomass materials will allow the company to replace peat and provide a 100% renewable, reliable and secure energy supply. The company is already using biomass to co-fire its power station at Edenderry, Co Offaly. This has already resulted in a substantial drop in greenhouse emissions with further decreases expected as biomass is increasingly deployed as an energy source. The use of renewable, greenhouse gas neutral biomass is especially attractive as it allows electricity generators to dispatch power on demand and not be wholly dependent on wind and sun strength. The company sees this feature as an important compliment to wind and solar provision that would support further development of other carbon zero energy sources.
https://www.irishbuildingmagazine.ie/2017/09/20/bord-na-mona-makes-the-move-to-bioenergy/

The devastated peat landscape around the decommissioned (and 2007 demolished) peat-fired power station Bellacorick (Mayo, Ireland). Photo: Hans Joosten.

Netherlands

Heel Holland Zakt – Entire Holland subsides

On November 9th 2017, the second national congres on peat soil subsidence will be held in Rotterdam. After the plenary programme three subsessions will deal with governance, financial instruments, the realtion beween subsidence and CO_2-emissions, the use of satellite data and spatial adaptation. For more information: http://www.slappebodem.nl/Nationaal-congres-veenbodemdaling

Russian Federation

UNFCCC declares Peatrus project lighthouse in climate change battle

The project 'Restoring peatlands in Russia – for fire prevention and climate change mitigation', shortly called PeatRus, has been selected as one of 2017 Momentum for Change Lighthouse Activities. The United Nations 'Momentum for Change' Climate Solutions Award will be presented to the project at UNFCCC COP23, 6-17 November 2017 in Bonn, Germany. Momentum for Change is spearheaded by the UN Climate Change secretariat as part of wider efforts to mobilize action and ambition, as national governments work toward implementing the Paris Climate Change Agreement and the Sustainable Development Goals. By selecting the Peatrus project as 'Lighthouse Activity' from 460 applications, peatland rewetting receives the international recognition it deserves in its role addressing climate change and environmental sustainability.

Peatrus is a major peatland restoration project, implemented in response to the extensive peat fires in the summer of 2010 in the Moscow region by Wetlands International, the Institute of Forest Science of the Russian Academy of Sciences and the Michael Succow Foundation. The project was initiated within the framework of co-operation between the Russian Federation and the Federal Republic of Germany and represents one of the largest peatland ecosystem restoration projects in the world. To date, over 35,000 hectares of drained peatlands have been restored using ecological methods with another 10,000 hectares currently underway. Another 42,000 hectares have been optimally restored in relation to peat fire prevention in the Moscow region by using complex hydro-technical facilities. Paludiculture (wet agriculture on restored peatlands) has been initiated at several sites. http://unfccc.int/secretariat/momentum_for_change/items/10457.php

One of the many dams constructed in the Peatrus project to rewet drained peatlands.

Sweden

Climate Smart Agriculture on Organic Soils

International Conference on Climate Smart Agriculture on Organic Soils, 23-24 November 2017, Uppsala, Sweden. Peatlands store a major share of the world's soil organic carbon. Many European peatlands have been drained and cultivated in the past centuries. This fosters land surface subsidence and peat mineralization. Therefore, drained organic soils are a large source of greenhouse gases (GHG) emissions and, at the same time, at a high risk of being degraded and lost. At this conference, we want to discuss options for maintaining production on organic soils while reducing GHG emissions and buffering climate change.
http://www.slu.se/CAOSconference

Ukraine

Peat fires continue

In the Cherkassk area fire figthers have extinguished a fire on the 44 hectares of peatland, but 7 hectares are still smoldering, the speaker of the Main Department of State service for emergency situations (SSES) in the Cherkassk area Konstantin Protsenko said to the TV channel "112 Ukraine". On September 17 dry grass catch

fire near the village Irdyn, which later spread into the peat bogs. An emergency situation was declared. “As of 10.00 am on 8 October we managed to liquidate a fire on an area of 44 ha but pockets of peat continue to burn in the area of 7 hectares. The main problem is major drought and lack of water in drainage channels. Therefore, the main objective is to restore water supply in these channels. To date, we managed to restore the water level, which immediately affected the situation. In two or three days we’ll be able to report on elimination of a fire.” http://world.24-my.info/in-gschs-declared-that-in-the-cherkassk-area-rescuers-liquidated-a-fire-on-the-44-hectares-of-peatland/

United Kingdom

Festival celebrated Peak District moors

This September, nearly 300 international experts in peatlands came together to learn, share and celebrate the wonder of bogs at BogFest, a conference delivered with a festival atmosphere. Peatlands are exceptionally important for our wellbeing, even though for many they are out of sight, out of mind. However, peatlands are under threat globally because they have historically been undervalued, misunderstood and misused. Indeed more than one academic characterised peatlands as having Cinderella syndrome – meaning that they are not recognised or appreciated. But things are changing – in the words of Rob Stoneman, Chair of the IUCN UK Peatland Programme, ‘Cinderella is yet to make the ball, but her fairy godmothers have been found and she is on her way.’ Across the Peak District and South Pennines, Cinderella syndrome manifests itself as huge areas of blanket bog that were denuded of life and dried out due to years of atmospheric pollution, wildfire and overgrazing. Moors for the Future Partnership, co-organiser of BogFest, works on a landscape scale in the Peak District and South Pennines to rewet and reintroduce bog-forming vegetation to upland blanket bogs, in an effort to improve carbon capture and water quality, reduce the chance of flooding in the valleys, improve habitats for wildlife and reduce the risk of wildfire. The Partnership’s work covers vast areas of iconic scenery like Kinder Scout, Bleaklow and Black Hill, experienced by thousands when walking the Pennine Way.

Walking the Pennine Way with blanket bog erosion and restoration. Photo: Hans Joosten.

Holding BogFest in Edale meant that there was ample opportunity for conference delegates to witness practical peatland restoration work up close and personal and see for themselves the terrific difference it is making.
The conference focussed on many aspects of peatland restoration and research, with 46 sessions and 85 speakers covering peatland science, practical management and restoration, the future of financing vital work,

government policy and how better to communicate the value of our peatlands. Popular sessions included a workshop demonstrating the use of unmanned aerial vehicles (also known as drones) to build an accurate picture of the type and mixture of plants on blanket bogs and a Question Time style panel on Peatland Policy: Supporting Nature's Vital Services in the Uplands. As part of the panel, Angela Smith MP expressed her views on why we should invest in improving the condition of upland blanket bogs: "Improving the condition of blanket bog is an investment in our future, in a healthier environment, water that is actually cheaper to put in the taps because it's cleaner when it comes off the hills. When Sheffield flooded in 2007, I made it clear that part of the solution was to invest in moorland restoration, and my constituents thought that was exactly the right thing to do. "So until we start planning strategically and embedding making space for water and making space for nature in our planning systems, we won't have the resilience that everybody on this panel is looking to secure."

Blanket bog erosion on Black Hill (Pennines). Photo: Hans Joosten.

New guidance was introduced to help build resilience into our uplands: Blanket Bog: Land Management Guidance, which has been produced by the Uplands Management Group (a collaborative working group of land managers and conservationists), and published by Moors for the Future Partnership. This practical guidance will help land managers to improve the condition of their bogs to benefit biodiversity, water quality and natural flood management, carbon capture, red grouse population and grazing. Emma Howard-Boyd, Chair of the Environment Agency, joined the conference to talk about the importance of investing in upland blanket bogs because of their direct effect on human wellbeing, highlighting the essential services they provide, including natural flood-risk management and water quality. Delighted to join in the proceedings, she said of BogFest:
"I really enjoyed visiting Derbyshire and attending BogFest. There were some fascinating talks taking place and it was a great opportunity to meet people and make partnerships between Government, NGOs and businesses. Partnership is essential in environmental management, and the Moors for the Future Partnership has shown that you can make a compelling case for investment to enhance landscapes and catchments through its engagement with water companies." Taking place across the village of Edale in three venues, including a marquee pitched on a campsite, BogFest was a conference with a difference. As well as expert delegates from all areas of peatland interest, an estimated 150 members of the public was got involved and learned more about blanket bogs and the uplands, with an optimistic film High Water Common Ground about how communities can help prevent flooding through natural interventions, a talk about the use of the bog-building

moss sphagnum during the world wars, a fell race that attracted 71 adult and 17 young runners and boggy doodles, an art workshop taking place in the hills. BogFest was hosted and co-organised by Moors for the Future Partnership, based in Edale, alongside the International Union for the Conservation of Nature UK Peatlands Programme and funded Moors for the Future Partnership MoorLIFE 2020 project. For a full report and to take a look at posters and presentations please visit www.iucn-uk-peatlandprogramme.org/resources http://old.moorsforthefuture.org.uk/node/935

Moors for the Future publishes first annual report

Moors for the Future Partnership has published its first annual report. Illustrated with stunning photos, the Year in Review is packed with stories that give a flavour of the work completed by the partnership. For more information: http://www.moorsforthefuture.org.uk/sites/default/files/MFFP_Review_2016-17.pdf

History & Heritage of the Bogs & Peatlands of Cumbria

This event explores the fascinating but under-appreciated history and cultural aspects of peat bogs in and around Cumbria and the surrounding areas. http://www.ukeconet.org/cumbriabogs.html

Lowland Peatland Systems in England and Wales – Evaluating Greenhouse Gas Fluxes and Carbon Balances

The final report of Defra's Lowland Peat project has now been published online. The research project, by a consortium of seven research organisations led by the Centre for Ecology and Hydrology, established a network of 15 measurement sites ranging from conservation-managed fens and raised bogs to drained grassland, arable and peat extraction sites, extending from North Wales to East Anglia. The results confirm that agriculturally drained lowland peats are the UK's largest sources of peatland greenhouse gas emissions, whilst fens under high water table management consistently act as CO_2 sinks. Overall, the study showed a very strong relationship between CO_2 balance and mean water table depth, which was only partly offset by higher methane emissions where water tables were at or above the peat surface. The results suggest that restoring or raising water levels in agriculturally drained lowland peatlands could deliver nationally significant climate mitigation benefits.

http://randd.defra.gov.uk/Default.aspx?Menu=Menu&Module=More&Location=None&ProjectID=17584&FromSearch=Y&Publisher=1&SearchText=sp1210&SortString=ProjectCode&SortOrder=Asc&Paging=10#Description

Welsh peatland to get £1m fund for restoration

Important peatlands across the whole of Wales are to get £1m in funding to help restoration of 70,000 hectares of peatland. The Mawndiroedd Cymru (Wales' Peatlands) project will help train land managers to conserve the delicate environments. Funded by the Welsh Government, the project will now appoint three officers to oversee the work. "Peat restoration is beneficial to all elements of today's society as it reduces carbon emissions, improves water quality and improves river management," said Rhys Owen, the head of agriculture and conservation at the Snowdonia National Park Authority."In addition, it will assist land managers in improving grazing opportunities, it will retain the distinctiveness of our historic landscapes and preserve prehistoric features." The project is being led by the Snowdonia and Brecon Beacons National Parks, with both the National Trust and Natural Resources Wales as partners. On behalf of the partnership, Rhys Owen, Head of Agriculture and Conservation at Snowdonia National Park Authority said: "We are extremely grateful to the Welsh Government for its generosity in contributing towards a scheme which will help to ensure a prosperous future for Welsh peatlands. Peat restoration is beneficial to all elements of today's society as it reduces carbon emissions, improves water quality and improves river management. In addition, it will assist land managers in improving grazing opportunities, it will retain the distinctiveness of our historic landscapes and preserve prehistoric features. Our intention is to establish a hub or an electronic platform that will be the focus point for all data and research relating to Welsh peatlands, provide an accreditation scheme when delivering training to land managers to improve and restore peatlands, then provide packages or bundles of different areas with the intention of attracting a new market to invest in the peatlands through the Payment for Ecosystem Services scheme, The Peatland Code."

- http://www.bbc.com/news/uk-wales-41517438
- http://www.eryri-npa.gov.uk/authority/news-and-media/latest-news/2017/2017-news-items/-1-million-to-restore-wales-important-peatlands

Climate benefits of peatland restoration to be certified by newly appointed independent body

The IUCN UK National Committee has approved a certification body to validate and verify peatland restoration projects under the Peatland Code for their climate benefits. The appointment of OF&G working in partnership with Acoura Certification Ltd will provide unique benefits for the effective development and implementation of the Peatland Code, with the collaboration building on existing work both organisations undertake in the environmental certification space including the Woodland Carbon Code, PAS 100 Compost and PAS 110 Biofertiliser certification. The Peatland Code Executive Board of the IUCN UK National Committee made the important decision to select an independent, third party certification body, so that private investors in peatland restoration projects through the Code would be provided with the utmost assurance that any purchases they make will return verifiable climate benefits over the project(s) duration.

UK peatlands store over three billion tonnes of carbon, but with over 80% damaged much of this is being lost to the atmosphere – around 10 million tonnes of carbon dioxide in the UK alone. Peatland restoration is a tried and tested solution to this climate issue, but investment to fix the problem is urgently needed. The Peatland Code is designed to facilitate the use of private investment in the UK voluntary carbon market motivated by corporate social responsibility, and can be used alongside public funds available through agri-environment schemes and grant-aided projects to increase the amount of restoration taking place in the UK. The Peatland Code is issued by the IUCN UK National Committee and managed by an Executive Board that is facilitated by the IUCN UK Peatland Programme. For more information on the Peatland Code please visit www.iucn-uk-peatlandprogramme.org/peatland-code.

North America

Canada

Good year for peat extraction in Canada

The Canadian Sphagnum Peat Moss Association (CSPMA) surveyed members Aug. 31 regarding the level of harvest for the 2017 season. CSPMA represents 95% of North American peat production. Overall the season has been satisfactory with some but not all peat extraction regions achieving their expected extraction volumes. In New Brunswick, the industry is almost at or slightly above its expected volumes (New Brunswick North 104%, New Brunswick South 98%). Québec's South Shore (90%) is below expectations, because of a cool, moist wetter in spring and parts of the summer. In Québec's North Shore (98%) some extractors achieved and exceeded their extraction expectations. The Prairie provinces have experienced a mixed season: Manitoba reached 110%, whereas Saskatchewan (78%) and Alberta (78%) were lower because of a prolonged spring and cool wet summer months. Minnesota (USA) has reached a similarly lower than expected volume with only 53% of its target levels achieved. https://www.greenhousecanada.com/news/a-good-year-for-peat-moss-harvesting-32149

United States of America

International mountain peatland symposium

David Cooper and Rodney Chimner plan to host an international mountain peatland symposium and a field trip to look at mountain peatlands at the 2018 SWS conference in Denver (May 29th-June 1st). Peatlands are numerous across tropical, temperate and boreal mountains due to higher annual precipitation, cooler temperatures, and higher available water compared to the surrounding lowlands. Mountain peatlands are similar in some ways to low gradient peatlands, but have many properties that make them distinctive including landscape positions, vegetation types, steep slopes, high sediment and chemical inputs, high erosion potential, groundwater dependence, high UV light, high daily temperature variations and short growing seasons in temperate and boreal/austral regions. Mountain ecosystems, including peatlands, are experiencing rapid climate changes in addition to a range of other disturbances. Mountain peatlands experience a range of human land use changes including high livestock grazing pressure, mining for minerals, and recreation. The unique properties of mountain peatlands have made it difficult to transfer knowledge and techniques from general peatland science. This symposium will bring together experts from around the world to communicate recent developments in mountain peatland science. The main goal is to compare and contrast mountain peatland science from many mountain ranges including, Rockies, Sierra Nevada, Andes, Alps and Himalayas and develop

science and management perspectives for all mountain peatland types. This symposium will encourage international collaboration and partnerships among researchers, practitioners, managers, and policy-makers, to improving mountain peatland science. If you are interested in attending, please contact Rodney Chimner: rchimner@mtu.edu.

IMCG in a mountain peatland in the Lesser Caucausus, Georgia, 2009. Photo: Hans Joosten.

DNR of Minnesota gives update on peat mining in Aitkin county (Northern Minnesota)

Department of Natural Resource (DNR) Attorney Vicki Sellner joined the Aitkin County Board of Commissioners meeting Sept 12 to give an update on peat leasing in the county. American Peat Technology of Aitkin is proposing two new leases. The first is to mine 636 acres of DNR and tax-forfeited land in the Rossburg bog, located in Kimberly and Spencer townships. The other is to mine over 10,000 acres in the Seavey bog located in Pliny, Seavey and Idun townships. Aitkin County has over 250,000 acres of peat land. The 10,000-acre Seavey Bog lease exceeds the amount allowed which is 3,000 acres. Land Commissioner Mark Jacobs is expecting the request to get more specific as to area prior to a lease agreement. “Keep in mind that this is very early in this process,” Jacobs said. Last January, the board agreed to enter into a joint powers agreement between the county and DNR, which would allow the DNR to administer lease lands for the county and facilitate the permitting process. “This is the first step in a process,” Sellner said. “You’re not giving them a permit to mine peat. We’re not anticipating extraction right away. You would need to do an environmental assessment and apply for permits.” Sellner predicted peat extraction wouldn’t be permitted and have authorization to go forward with until 2025. The DNR will collect a 20 percent fee of all revenue collected on the lease. The lease term would be for 25 years at most, Sellner said. Commissioner Mark Wedel acknowledged that American Peat Technology is a significant employer in the county. Its payroll was $1.9 million, and has the potential to increase. There has been $580,000 invested in an environmental review. The Seavey Township bog work will employ 50 persons.

http://www.messagemedia.co/aitkin/news/government_meetings/dnr-gives-update-on-peat-mining/article_3cb7494a-a2d8-11e7-95c9-9f9f96f3b975.html

Peatland conservation relevant papers September 2017

Collected by Hans Joosten: joosten@uni-greifswald.de

1. Global wetland contribution to 2000–2012 atmospheric methane growth rate dynamics: http://iopscience.iop.org/article/10.1088/1748-9326/aa8391/meta
2. Long-term environmental change in eastern Tasmania: Vegetation, climate and fire at Stoney Lagoon: http://journals.sagepub.com/doi/full/10.1177/0959683617690591
3. Estimation and uncertainty of recent carbon accumulation and vertical accretion in drained and undrained forested peatlands of the southeastern USA: http://onlinelibrary.wiley.com/doi/10.1002/2017JG003950/abstract
4. Hydrogeological controls on spatial patterns of groundwater discharge in peatlands: https://www.hydrol-earth-syst-sci-discuss.net/hess-2017-282/hess-2017-282.pdf
5. The first permafrost cycle in Færdesmyra, eastern Finnmark, Norway?: http://www.tandfonline.com/doi/abs/10.1080/00291951.2017.1316309
6. Short-term response of testate amoebae to wildfire: http://www.sciencedirect.com/science/article/pii/S092913931730344X
7. Soil drainage facilitates earthworm invasion and subsequent carbon loss from peatland soil: http://onlinelibrary.wiley.com/doi/10.1111/1365-2664.12894/abstract
8. Evapotranspiration across plant types and geomorphological units in polygonal Arctic tundra: http://www.sciencedirect.com/science/article/pii/S0022169417305723
9. A map of global peatland distribution created using machine learning for use in terrestrial ecosystem and earth system models: https://www.geosci-model-dev-discuss.net/gmd-2017-152/gmd-2017-152.pdf
10. Long-term population dynamics – theory and reality in a peatland ecosystem: http://onlinelibrary.wiley.com/doi/10.1111/1365-2745.12865/abstract
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Permafrost peatland in Mongolia. Photo: Hans Joosten.