



Sebangau National Park, Central Kalimantan, Indonesia. Photo: Hans Joosten.

IMCG Bulletin: December 2018/January 2019



Contents of this Bulletin

IMCG issues

Word from the Secretary-General.....	02
IMCG excursion Mongolia 2 to 16 August 2019.....	02
The IMCG resolution on submerged drainage and what happened next.....	06
Further impressions from the Field Symposium.....	10
Mires and Peat.....	11

Peatland news

Global.....	12
UNFCCC Katowice peatland side events.....	12
What did UNFCCC Katowice achieve?.....	18
Germany supports Global Peatlands Initiative with 2 million euros.....	20
Peatland resolution on United Nations Environment Assembly?.....	21
Asia.....	24
Indonesia.....	24
Europe.....	31
European Union.....	31
Germany, Lithuania, Poland, Belarus.....	32
Germany.....	33
Ireland.....	35
Netherlands.....	39
Russian Federation.....	42
United Kingdom.....	47
North-America.....	53
United States of America.....	53
New peatland conservation relevant papers.....	56

IMCG issues

Word from the Secretary-General

Dear mire friends

A double issue covering December 2018 and January 2019. With news about the IMCG excursion to Mongolia. Please express your interest as soon as possible to Tatiana (tatiana.minayeva@care-for-ecosystems.net), so that she can proceed with the organization.

Also news from the Netherlands, where our resolution and associated discussions have been heavily stirring up the public debate on the future of the drained peatland meadows, famous for their cheese.

This Bulletin covers the events and side events of the December 2018 Katowice UNFCCC meeting and all that happened since on the peatland conservation front.

Keep sending news, photographs, papers and other contributions for the next Bulletin **by March 10, 2019** to Hans Joosten at joosten@uni-greifswald.de.



Orkhon valley, Mongolia. Photo: Hans Joosten.

IMCG excursion Mongolia 2 to 16 August 2019

Tatiana Minayeva (tatiana.minayeva@care-for-ecosystems.net)

In 2019 we plan to organise an intermediate IMCG Field Symposium (excursion) to the peatlands of Mongolia. We hope that the presence of IMCG in Mongolia will help us to spread the key messages and findings on the threats and tendencies with respect to the degradation of the Mongolian peatlands, about their role for water security and livelihoods and for ecosystem and society resistance to climate change. We expect that the excursion will help to initiate more scientific and conservation projects in Mongolia. The excursion will focus on Central Mongolia and will comprise forest-steppe, high altitude taiga and tundra. To cover a more or less representative part of Mongolian geography and mire types we have to travel almost 1500 km in two weeks. The excursion is scheduled from 2 to 16 August. We will use “ger-camps” where some washing etc. facilities are available (marked below as “lodging”) and we will camp in tents (marked below as “camping”). The steppe is the “toilet”. The relatively high price for this field symposium (but much lower than touristic trips) is caused by

the special means of transportation required. Because of the bad “roads” in Mongolia, we cannot use a normal tourist bus, but need several small cars (with 5-6 passengers each) and one extra car for emergency purposes. The gasoline and car rents form the largest part of the price. The full price without flight is 1500 EUR, which includes all costs underway and one night hotel accommodation in Ulaanbaatar from 15 to 16 August. No other expenses than your private issues are involved. The cheapest and most reliable flights from Europe are with MIAT (from Berlin and Frankfurt). MIAT flies twice a week, please check the schedule.



Mongolian roads. Photo: Hans Joosten.

Next to the excursion we plan volunteer camps in the areas where we have peatland restoration projects. As the camps do not include a lot of travel, the volunteer camps are significantly cheaper: the camp in Khashaat (25 July - 1 August) 300 EUR and the camp in Gatchuurt (16 - 20 August) 140 EUR.

The overview schedule is below. A full description of the sites will follow in the next bulletin.

Dates (activity day and overnight)	zone	area	activity
25 July – 1 August	Forest-steppe	Khashaat	IMCG Field Symposium (Excursion)
2 – 3 August		Khashaat	
3 - 5 August		Orkhon valley western part, Kharkharin/ lodging	
5 - 6 August	Highland taiga	Tuvshrulikh (Burd)/ camping	
6 – 8 August	Highland tundra	Sayah Davaa/ camping	
8 - 9 august	Highland taiga	Bayanhongor/ lodging Ulaantsutgalan	
9 - 10 August	Highland taiga	Ulaantsutgalan/ lodging	
10 - 11 August	Forest-steppe	Orkhon valley Eastern part, Ogijnuur/ lodging	
11 – 12 August		Bajanuur, mining/ camping	
12 -15 August	Highland taiga	Gatchuurt, Terelj/ lodging	
15 – 16 August	City	Ulaanbaatar/hotel	
16- 20 August	Forest-steppe	Gatchuurt	



Degraded peatland in Mongolia. Photo: Hans Joosten

The forest steppe area is characterised by mainly degraded peatlands. We will see valley peatlands, which were formerly waterlogged and are currently in different stages of degradation due to overgrazing. No drainage was undertaken, but overgrazing is really heavy. Husbandry is one of the pillars of Mongolian economy.

The excursion will start in the Khashaat area, 5 hours travel from Ulaanbaatar. Here the peatland restoration site is situated, where the volunteer camp from the 25th of July will carry out monitoring and restoration activities. After that we will proceed to Orkhon valley (Orkhon is a tributary of Selenga river, which flows into Lake Baikal). The area is a National Park and partly a Ramsar site, but this has not prevented peatlands to become degraded by overgrazing and climate change. We will visit the eastern part of the valley. Keep in mind that Mongolia is a highland country where even valleys are situated higher than 1000 m above sea level, in case of Orkhon 1300m.

The highland taiga and tundra mires we will study in the Khangai Mountains, where the Orkhon River rises. The highest point Sayah Davaa with highland tundra is almost 3000 m above sea level. The higher the altitude of the site, the better the condition of the mires, because of less overgrazing and more precipitation. In some places, however, mining has been taking place. In case we are lucky with the weather we can cross directly to the famous Red Waterfall and spend more time in the mires in its surroundings. In case of rain we will need to make a detour via Bayanhongor, a small town in the piedmonts.

After the mountains we go back to the steppe to look at the mire Lun in the western part of Orkhon river, where there is a Ramsar information centre, and then go further eastwards to look at mires along the Tuul river valley. Here we will see examples of extensive and destructive mining of minerals, the second major factor affecting peatlands and the second pillar of Mongolian economy. Mitigation of its impacts and restoration of the damaged peatlands is an urgent issue to be negotiated with the mining business.

From there we will proceed to Terelj National Park, 60 km northwest of Ulaanbaatar. If somebody wants to end the excursion here (August 12), there is a possibility to get to Ulaanbaatar as we will pass by the city via the ring road. In Terelj National Park we will look at highland mires at the piedmonts of the Khangay mountain ridge, which is connecting the forest steppe with the real taiga on the Russian side. We will be based at the Gatchuurt forest station of the Forest Association NGO and the Academy of Sciences of Mongolia, where peatland restoration experiments and long term monitoring is being set up. The sketch of the route in google map is below.



An almost intact spring fen at the source of Gatchuurt river. Photo: Tatiana Minayeva

In order to promote and strengthen IMCG support for peatland conservation we will have number of meetings and talks with local authorities and herders (in Khashat, Kharharin, Ogij Nuur, Gatchuurt). On top we will hold a half day seminar in Terelj National Park “Peatlands in the protected areas” to address the questions “How to plan better mire protection? Do they need special management? How to develop incentives to protect peatlands and mires?” On August 15th we will have a press conference in Ulaanbaatar.

Please express your interest to participate in the excursion and/or volunteer camps until February 28, so that we can make a decision whether or not to proceed with the organisation. Send your requests to Tatiana Minayeva tatiana.minayeva@care-for-ecosystems.net

To learn more about the peatlands of Mongolia, please request from Tatiana the article from the Wetlands Book https://link.springer.com/referenceworkentry/10.1007/978-94-007-6173-5_108-1.



Monitoring works in Orkhon. Photo: Bureenbatar G.



Excursion points during the field symposium in Mongolia.

Follow-up of IMCG General Assembly resolutions 2018

The IMCG resolution on submerged drainage and what happened next

Ab Grootjans (a.p.grootjans@rug.nl)

During the General Assembly in Utrecht on Friday 31 August 2018, the IMCG adopted a resolution on drained peatlands with special reference to The Netherlands. In this resolution we expressed our concerns about the plans of the Dutch government to upscale so-called submerged drainage to ca. 80,000 ha of agricultural peatland areas (costs: 250 million Euro). We pointed out that the proposed measures were too easily presented as an ultimate solution for reducing greenhouse gas (GHG) emissions in agricultural peat areas and that the claims of its proponents (Wageningen University & Research WUR, several water boards and the federation of Dutch farmers LTO) were not substantiated by research of generally accepted scientific standards. We referred to an in-depth meta-analysis of the WUR research by the Greifswald Mire Centre (GMC) (IMCG Bulletin June-July 2018, pp. 9-21: http://www.imcg.net/modules/download_gallery). In our opinion the proposed measures are no long-term solution and (at best) only retard the degeneration process and would not solve the subsidence problem.

On 11 September 2018 we sent the resolution to the Minister of Agriculture and asked her to stop subsidising farmers for installing underwater drainage until science-based research on how to reduce GHG emissions from drained peatlands becomes available. The next day we sent a press-release to about 80 contacts. The response was initially very modest. In the following month about 4 or 5 articles appeared in national and local newspapers and specialized journals; most of them were rather critical about the idea of submerged drainage. Lars Hein, a professor of Wageningen University was particularly critical on the cost that Dutch society had to pay for solutions that were yet unproven.

From 11 – 13 September the International Peatland Society IPS had its 50-year jubilee conference (“Wise use of Peatlands, Past and Future”) in Rotterdam, The Netherlands. The first page of the conference web page announced that the Netherlands aimed to reduce CO₂ emissions by 49% by 2030, and that “it is foreseen that peat meadow soils will contribute an emission reduction of 1 Mton CO₂ per year in 2030”. This is the upper limit of estimates that had been surfacing during the previous months and actually triggered the drafting of the

IMCG resolution. Like during the previous conference of IPS (in Malaysia), the IPS leadership proved unable to prevent that local organisers used the conference platform to express politically inspired and scientifically unsubstantiated messages at its scientific conference. During one of the smaller sessions of the IPS conference I held a presentation in which I questioned the claims of WUR scientists that submerged drains could reduce GHG emissions from agricultural peat soils by 50-75%. The WUR scientist that had organised the session was not amused, but no discussion followed afterwards.

On 26 September WUR posted a reaction to the GMC meta-analysis on its own website (<https://www.wur.nl/nl/nieuws/Discussie-over-onderwaterdrains.htm>). This reaction was later published in more detail (see below).

On 12 October the national branch organisation of Dutch farmers (LTO) wrote a letter to the Minister of Agriculture. Apparently, they were quite upset about the IMCG letter to the minister. LTO, together with the water board “De Stichtse Rijnlanden” had asked the WUR researchers to address the conclusions of the GMC meta-analysis; or, in other words, to critically “test” their own research. This “test” resulted in a report (in Dutch) titled “Submerged drains are effective” (<http://edepot.wur.nl/466227>), which was published at the beginning of December. Unfortunately, the report is hardly constructive and hardly moves the debate forward. It merely repeats the WUR position. WUR shows a reluctance to seriously look at its own data. There are uncertainties that WUR does not address and questions that WUR does not ask. GMC arguments are misconstrued or misrepresented. In their letter LTO stressed that it was more important to learn from practise and not to wait until the scientific debate was settled.

The minister of Agriculture responded to the LTO on 22 November 2018. She is still committed to pilot projects that try to reduce CO₂ emissions from drained peatlands, and she is worried about the disagreements in the scientific discussions. She also says that she will not exclusively focus on techniques aimed at maintaining current agricultural practises, but particularly also on new ways to generate a good income from the Dutch peat meadow areas.



The famous Dutch peat meadows under heavy discussion about their future. Photo: Hans Joosten.

Also on 22 November 2018, solutions to stop soil subsidence in urban areas were discussed in a large national meeting on soil subsidence. There were over 350 participants, mainly civil servants, administrators, business people and applied scientists. The estimated damage of soil subsidence to infrastructure of cities amounts to ca 700 million euros per year. In a plenary session the vast majority of participants voted for drastic measures to stop soil subsidence in peat areas. This outcome came as a big surprise to some politicians, who had expected

that people would go for technical adaptations, keeping the landscape as it has been for centuries, etc. Even an administrator of a large water board voted for drastic governmental decisions. In one of the sub-sessions a coordinator of submergent drainage was asked to comment on the “German” criticisms on his projects. He had prepared for this question and had decided to ridicule the GMC scientists, by showing us “an experiment” with two dry sponges that were made wet to illustrate that no effect of submerged drainage can be measured when you have wet years; that this is what the “Germans” fail to see. And that was his only, childish response to the meta-analysis of GMC.

On 17 December 2018 WUR published a short article on the H₂O website of the Royal Dutch water network (KNW). It was suggested that the GMC analysis was politically motivated: “They [GMC] are working a lot on ‘wet agriculture’, or paludiculture. They try to promote this also in the Netherlands, but here a lot of subsidy goes to submerged drainage. I think they are angry about that and wanted to put the cat among the pigeons and cause a stir”, said Jan van den Akker of WUR. A very clear case of framing scientists who disagree one’s own conclusions.

On 12 January 2019 GMC and the IMCG have jointly issued a statement in reaction to the H₂O article (<https://www.h2owaternetwerk.nl/h2o-actueel/onderwaterdrains-wel-effectief-in-veenweidegebied>). We made it clear that peer-review is an important mechanism of scientific fact-finding and that we expect that the WUR researchers take critical remarks seriously. We regret that our key criticism has not been dealt with. One of the key points is that the relationship between the mean lowest summer water table and the rate of soil subsidence that is used by WUR is tentative at best (see IMCG Bulletin June-July 2018, pp. 9-21). It is applied, moreover, to new hydrological regimes that were never studied during establishment of the relationship. Effects are claimed that lie outside of the boundaries of the original data, which is scientifically improper. Application can produce hypotheses at best. These hypotheses have to be tested against direct measurements of GHG fluxes.

We repeat that the claim of a 50-75% reduction of CO₂ emissions from agricultural peat soils is misleading and not based on credible scientific research. WUR has until now not proven that these claims follow as a general rule from its own research. In the meantime, everyone discussing the effect of submergence drainage agrees that such techniques will never be a sustainable solution to soil subsidence. So, the question is whether we are buying time or wasting time by investing in submerged drains in Dutch peat meadows.

Many more meetings on the fate of Dutch peat meadows are planned in the next months. The Dutch Green Party (Groen Links) is preparing an integrated plan to stop the CO₂ emissions from Dutch peat soils (see further in this Bulletin). LTO is doing the same with the aim to continue cattle husbandry on peat soils, in which farmers themselves would be responsible for monitoring the effects of drainage. In the Netherlands even science must be democratic apparently.

We will keep you informed on the ongoing discussions!

Rumble in the margins

The way in which we now often view peat meadows can be compared to the way the automobile industry used to look against hybrid and later fully electric cars: the majority continued to focus on reducing fuel consumption by only a tenth of a percentage point. In fact nothing more than some rumble in the margin, a kind of rearguard action. As a result, it is precisely those car manufacturers who have had the greatest difficulty in catching up in recent years and have to incur significant costs to be able to get rid of the accumulated backlog. When it comes to our climate, you see that it is now already difficult to comply with the commitment to halve our CO₂ emissions by 2030 compared to 1990. This will not become easier when we are approaching 2050 (when the emissions have to be at least 95 percent less than in 1990). The low-hanging fruits are already difficult to find and will certainly not be available anymore.

The contribution to the climate agreement made by the agriculture and land use sector focuses "on measures that ensure that the climate target is met by 2030, namely a 1 mton reduction in emissions from peat meadows." One bets on subsurface and pressure drainage, but that solution might not be more than wishful thinking. The International Mire Conservation Group (IMCG), an international network of peat specialists, said last September that it is not certain that underwater drainage prevents soil subsidence and CO₂ emissions. These experts doubt the analysis of the available data and noticed that little consideration was given to the results of the Dutch pilots.

The question is therefore whether it is sensible and future-oriented to start messing around in the margins, and subsequently come to the conclusion that there is actually only one future model for the peat meadow areas: rewetting. Therefore it would certainly be useful to act more forward-looking and to check whether multiple targets can be achieved simultaneously in peat meadow areas.

Next to climate such targets could, for example, be nature development (most provinces do still have a big task in that area). But also an increasingly wide dissemination of livestock reduction could start in peat meadow areas. By offering farmers a variety of choices as quickly as possible, ranging from staying but then with some form of paludiculture (wet cultivation), via relocation of the farm to another (non-peat) location that has become available through a stopped colleague (both with financial and other support from the government), to completely being bought out by the same government.

This would provide opportunities for developing peat-forming nature in the peat meadow areas that even can sequester CO₂. The latter (from substantial emissions to CO₂ capture) could well become more attractive and necessary than we currently think, especially to prevent the consequences of further soil subsidence and associated costs.

And the question then is whether you can afford yourself to tempt farmers to make now the switch to a different, somewhat less climate-unfriendly business model, if its expiry date can turn out to be quite disappointing.

Rene van Druenen is associated with the Agrobosbouw.nl cooperative.

Translated from: <https://www.dvhn.nl/Meningen/Opinie/Opinie-Geen-halve-maatregelen-in-veenweidegebieden-24158287.html>

A selection of journal headings about the future of the Dutch peat meadows

Noordhollands Dagblad

Premium

Doen we koelen of waterbuffels?

Will we do cows or water buffalos?

<https://www.dvhn.nl/Meningen/Opinie/Opinie-Geen-halve-maatregelen-in-veenweidegebieden-24158287.html>

DAGBLAD NOORDEN 4 weken van

Opinie: Geen halve maatregelen in veenweidegebieden

Gisteren om 6:03 • Rene van Druenen • **Opinie**

No half measures in the peat meadow areas

I am

De zeespiegelstijging is een groter probleem dan we denken. En Nederland heeft geen plan B

Sea level rise is a larger problem than we think and the Netherlands does not have a plan B

WUR ontzenuwt twijfel aan onderwaterdrainage

UTRECHT KOEN VAN VLIJK 20 DEC 2018 OM 10:48UUR

WUR dispels doubt about underwater drainage

Trouw INLOGGEN

Moet de koe nu echt weg uit de veenweide?

GROEN
Emiel Hakkenes - 10:06, 4 februari 2019

Does the cow now really have to leave the peat meadow?

Trouw

HOME RELIGIE EN FILOSOFIE GROEN DEMOCRATIE SAMENLEVING CULTUUR **OPINIE**

D66 en GroenLinks: grondwaterpeil in veengebieden moet omhoog

OPINIE
Redactie - 12:23, 11 februari 2019

Water level in peat meadows must be raised

de Volkskrant

Columns & Opinie Video Wetenschap Mensen De Gids Cultuur

NIEUWS GRONDWATERPEIL

Oproep D66 en GroenLinks: verhoog grondwaterpeil, schroef veeteelt terug in veenweiden

Call of political parties: raise water level and reduce cattle husbandry in peat meadows

Further impressions from the Field Symposium

Young and old

It was my first IMCG Field Symposium and I was in the organisation immediately. A passionate, very international group of young and old that shared its knowledge and experience about mires, and enjoyed their beauty during 12 days. In the evening, experiences were exchanged and time was taken for a beer, sports and games. The last night was unforgettable. It was a great pleasure. It will certainly not be my last IMCG Field Symposium. Everyone thanks a lot and I hope to see you once more.

André Jansen (ajmjansen@yahoo.com)



*Ab Grootjans (c) explains Weier Lu (China, l) and Tsogt Erdnen Gansukh (Mongolia, r) the importance of the half-parasites *Rhinanthus angustifolius* (right hand) and *Pedicularis palustris* (left hand) in the increase in species diversity of former farmland in the valley of the Reest. Photo: André Jansen.*

Dieu créa le monde, mais les hollandais créèrent la Hollande

Being three times to The Netherlands before, I was mostly meeting friends and visiting natural sites. Without expert's field explanation, it was often hard for me to understand nature and water management properly, even more in an artificial country as The Netherlands. The IMCG field Symposium made me understand a lot of what I had seen before and more. I noticed all those works between scientists and local partners (managers, associations, public authorities, especially through the OBN. The link between field and scientific knowledge takes a big part in the achievements. Indeed, various specialities are linked to find the right solution for mire restoration: chemistry, geomorphology, pedology, botany, history, sociology.... A lack I feel in my actual job / country. The main things that struck me were:

- the artificiality of every landscape for a long time,
- the extreme land 'specialization' where nature is nature and farming is farming,
- the effect of subsidence and how it is perceived in society,
- the identified solutions sometimes too hard to face for our inflexible society through the example of Texel (Thanks Ab, for your explanation of how all those thinkings were achieved and sometimes not really published, I love your stories!)
- the fact that you can be on a valuable wetland and looking down at cows grazing,

- the solutions identified for every problem, no matter the aims (biodiversity, farming...) leading to more artificiality but also to more understanding and better knowledge in a wide range of fields.

In my work, I have often said to partners 'water always goes downstream', now I add: 'except in The Netherlands'. Also, I understand better the sentence of René Descartes "Dieu créa le monde, mais les hollandais créèrent la Hollande." and feel that there is something true behind it. I would like to thank Ab and Francis for bringing me in the IMCG; André, Ab and Jos for the organization (huge work) and their big knowledge shared with enthusiasm; without forgetting all local managers and scientists taking time for us and sharing their experience. I always felt sharing knowledge is a key driver to success and this excursion made me learn a lot, including (and maybe mostly) meeting people I would like to see again.

Jean Rousselot (jean.rousselot@hotmail.fr)



IMCG in the Nieuwkoopse Plassen. Photo: Jean Rousselot.

Mires and Peat

In December 2018 the following papers were published in Mires and Peat:

- Plant diversity and structure of the Caimpugan peat swamp forest on Mindanao Island, Philippines. [L.G. Aribal & E.S. Fernando] Volume 22: Article 7 http://mires-and-peat.net/modules/download_gallery/dlc.php?file=292
- Greenhouse gas emissions from two rewetted peatlands previously managed for forestry. [C. Rigney, D. Wilson, F. Renou-Wilson, C. Müller, G. Moser & K.A. Byrne] Volume 21: Article 24 <http://mires-and-peat.net/pages/volumes/map21/map2124.php>
- Physical and hydrological properties of peat as proxies for degradation of South African peatlands: Implications for conservation and restoration. [M. Gabriel, C. Toader, F. Faul, N. Roßkopf, P. Grundling, C. van Huyssteen, A.T. Grundling & J. Zeitz] Volume 21: Article 23 <http://mires-and-peat.net/pages/volumes/map21/map2123.php>
- Community-identified key research questions for the future of UK afforested peatlands. [R.J. Payne & W. Jessop] Volume 21: Article 22 <http://mires-and-peat.net/pages/volumes/map21/map2122.php>

Find the journal online at <http://mires-and-peat.net/> Electronic submission is required using our dedicated electronic submission system. If you experience any problems please contact the Editor-in-Chief Olivia Bragg (o.m.bragg@dundee.ac.uk) who can offer alternative routes for electronic submission.

Peatland news

Global



Peatland side-events at UNFCCC Katowice

Dianna Kopansky, GPI Coordinator (dianna.kopansky@un.org)

The Global Peatlands Initiative led by UN Environment with its 28 partner organizations had a strong presence at the UNFCCC COP24 with peatlands a noted topic across more than 7 side events and discussion forums.

Coordinated by UN Environment and the Greifswald Mire Centre and co-hosted by the German Government, "The trace of haze: Peat fires as local and global challenges" side event held 6 December, 15.30-17.00 at the German Pavilion saw contributions from experts from the Greifswald Mire Centre, Germany; the Institute of Forest Science Russian Academy of Sciences, Russian Federation; Warsaw University, Poland; Ministry of Environment and Forestry, Indonesia; Newcastle University, UK; and UN Environment. The event highlighted the relevance and urgency of action to avoid and stop peat fires as a concrete effort in the fight against climate change. Peat fires cause huge emissions of greenhouse gases – some 1,800 t CO₂ per hectare - and pollute the atmosphere with health damaging carbon monoxide, fine particulate matter and (semi-)volatile organic compounds. Experts shared their experience of peatland rewetting for climate change mitigation and adaptation, human health and biodiversity with special attention to preventing, detecting and fighting peat fires.

Europe must learn from Indonesia!

[Natalie Bennett](#)

Europe must learn from Indonesia's restoration of its peatlands if we are to cut agricultural carbon emissions. Fires on peatlands in distant Indonesia and Malaysia turned the already noxious Bangkok air into a filthy brown soup each year. I lived in Bangkok two decades ago when these fires were an annual feature. Now this looks like one of the early signs that we have trashed this planet.

I remember heading one day down Surawong Road into a viciously crimson sun in a sea of faeces-brown air, thinking that this was what the apocalypse looks like. So I was particularly pleased last week to hear a German expert commenting on Indonesia's policies today, at a wide-ranging session on peatlands at the climate talks in Katowice. Professor Hans Joosten from the [Greifswald Mire Centre](#) said that Indonesia's plans to "rewet" two million hectares of peatland were a beacon of good practice: "Germany and the rest of the EU could learn from them." Diana Kopansky from UN Environment added that Indonesia had not only passed strong legislation defending peatlands that remained in pristine condition, but that it's environment minister ([Siti Nurbaya Bakar](#)) was vigorously using that legislation to defend them. Also on the panel, Ruandha Agung Sugardiman, director general of Climate Change Control in Indonesia, looked rightly pleased.

It was a rare piece of good news in a session that set out the climate change impacts of human destruction of organic soils, and also the extreme depletion of nature on fragile lands that were once so rich in animals and plants. We heard from Professor Mark Reed from Newcastle University of how the UK has lost 94 percent of its lowland raised bogs, while Dr Wiktor Kotowski from Warsaw University outlined how Poland had seen 84 percent of its mires drained, a vast area of 1.5 million hectares once similarly rich. Even the richest of what's left in Poland - such as the [Rospuda Fen](#) - has had to be defended by extraordinary efforts from environmentalists, while frantic efforts are being made to save threatened species like the beautiful [aquatic warbler](#), whose stronghold is the Biebrza marshes in Poland's east.

These lands emit more than 20 tonnes of carbon per hectare per year, as the soils dry out and degrade. Across the EU, 30 percent of agricultural emissions come from peatland, with the Union the world's second-largest source of peatland emissions after Indonesia.

Yet these are soils that are often productive for a few years, before turning sour fast. Often then they are abandoned as wasteland, continuing to emit carbon even when no longer used for farming. Professor Joosten

said: “As the soil dries out nutrients are released from the organic matter, but then you lose the potassium, then the phosphorus, you get drought problems. For the long term it doesn’t make sense to drain peatlands”.

He added that not all of that land can be returned to pristine natural mire. What’s needed is a transformation of agriculture: “We only have dry farming because the technologies we still rely on were developed in the Middle East millennia ago. We have to learn to farm wet land.”

Despite the damage this is causing, only half of national offers of National Determined Contributions (NDCs – what each country proposed at Paris for cutting its carbon emissions) include measures to save and restore peatlands, the session heard. Important contributors to that include Indonesia, Iceland and the EU, but the list also includes Afghanistan, not, as one speaker noted drily, particularly known for its peatlands.

Then there’s the nightmare that made everyone in the room turn pale when it was mentioned: the recently discovered [massive peatlands in Congo](#), which lock in 30 billion tonnes of carbon. Lose a significant slice of them, and it is game over for the climate.

On that kind of scale, the UK’s issues look small, but they’re certainly not in terms of our share of carbon emissions. Dr Reed pointed out that the [Saddleworth Moor Fire](#) near Manchester this year had been calculated to have released 273,000 tonnes of CO₂ into the atmosphere, the equivalent of 1.2 million flights from London to Katowice. That was a reminder that arable farming isn’t the only land use that is deeply problematic, indeed I’d say utterly indefensible. None of our few remaining pristine upland bogs in the UK should be managed for the so-called “sport” of driven grouse shooting (not to mention the downstream flooding impacts, and the mass animal slaughter also [associated with it](#)). The Saddleworth Fire corresponded very closely with [such management](#).

Indeed, when you look at what damage has been done around the world, and how little is left of these wonderful environments, it’s hard not to draw the conclusion that what we need is a global ban on any further destruction of peatlands that remain in anything like a natural condition.

As Professor Joosten pointed out, drying out these lands is incredibly wasteful of our planet’s resources. It also risks so many species already struggling to survive on this human-wracked planet, and adds significantly to carbon emissions just as the IPCC tells us we have absolutely no alternative but to slash them.

Natalie Bennett is a member of Sheffield Green Party and former Green Party leader.

- <https://theecologist.org/2018/dec/11/damaged-peatlands-contribute-carbon-emissions>



Hans Joosten (Greifswald Mire Centre, left), Ruandha Agung Sugardiman (Director General of Climate Change Control, Indonesia, centre) and Andrey Sirin (Russian Academy of Sciences, right) speak on the panel.



(From left) Dr. Barron Joseph Orr, Lead Scientist, UNCCD; Francisco Rilla, Director of Science and Policy, Ramsar Convention; Veronica Lo, UNCBD; and Dianna Kopansky, UN Environment.

Coordinated by UN Environment, UN Convention for Biological Diversity and Wetlands International and hosted by the Global Environment Facility in their Rio Conventions Pavilion, the “**Towards a joint peatland declaration: Synergies of MEAs to reverse the trend on peatland degradation**” side event held 7 December, 9.30-11.00 saw contributions from experts from the Ramsar Convention; UNCCD; UNCBD; UN Environment; Wetlands International; International Mire Conservation Group; Indonesia, Mongolia and Russia. This event advanced discussions on whether it could be beneficial and how to develop a peatland joint declaration or work programme across the relevant Multilateral Environmental Agreements (MEAs). The aim of the collaboration is to further accelerate action for peatlands protection, restoration and sustainable use by identifying synergies for joint implementation of the relevant conventions. Convention Secretariats, leading International Organizations and contracting parties all expressed their desire to work jointly on peatlands issues as an urgent and important priority. Further work will be carried out amongst the Global Peatlands Initiative partners on developing the synergies and possible work programme or declaration in collaboration with contracting parties.



(From left) Dr. Damdin Davgadorj, Managing Director, Climate Change and Development Academy of Mongolia; Dr. Myrna Asnawati Safitri, Peatland Restoration Agency (BRG), Indonesia; Prof. Andrey Sirin, Russian Academy of Science; and Prof. Hans Joosten, International Mire Conservation Group.

Coordinated by Wetlands International and hosted by the German Government (GIZ and BMU), a discussion forum "**Getting to the point – the relevance of wetland ecosystems for advancing NDC ambition**" was held 7 December 14.10-14.45, German Pavilion. Experts from Uganda; The Nature Conservancy; Ramsar Convention; Wetlands International; Alliance for Global Water Adaptation; and the German Federal Ministry for Economic Cooperation and Development (BMZ) highlighted the relevance of wetland ecosystems for both climate change adaptation and mitigation, while addressing their importance for increasing NDC ambitions. Arthur Neher from Wetlands International presented an analysis of peatlands through the NDCs of peat-rich countries and put forward our recommendations for strengthening national climate policies.



Reza Lubis, Wetlands International, presenting at the "Peatland Restoration Monitoring" discussion forum.

Coordinated by Wetlands International and hosted by the Indonesian Government, a "**Peatland restoration monitoring**" discussion forum held 10 December 16.10-17.30, Indonesian Pavilion highlighted the restoration work ongoing in Indonesia. Experts from Wetlands International Indonesia shared their experience in monitoring of peatland restoration work across several tropical peatland sites in Indonesia. The session focused on the paludiculture (wet agriculture) approach, emphasizing that it is the only adaptive solution for growing food on peatlands.

Coordinated by Greifswald Mire Centre, Wetland Conservation Centre and Wetlands International and hosted by Greenpeace, the discussion forum "**Food - Peatlands - Climate. Understand the connection, help saving peatlands. Peat-carbon-free lunch**" held 11 December, 12:00-14:00 at the Climate Action Hub highlighted food choices. This side event saw contributions from experts from the University of Greifswald, Germany; Wetlands International; University of Warsaw; UN Environment; and the Global Environment Centre.



Organiser Wiktor Kotowski with climate activist Greta Thunberg after the side event.

The forum was an opportunity to share peatlands expert knowledge and engage with the public on the values, threats, conservation and restoration of peatlands for climate and nature highlighting the connection between food, peatlands and the climate. Considerable degradation of peatlands is because of their drainage for agricultural use and expansion, which turns them into hotspots for CO₂ emissions rather than carbon stores. We spoke about palm oil in South East Asia, dairy or beef, and some vegetable crops in Europe. The take-home message was that we do not need to drain peatlands to produce food.



Tatiana Minayena, Wetlands International (left) speaks on the panel of the importance of peatlands in NDCs.

Coordinated by IUCN, Wetlands International, Wildlife Conservation Society, The Nature Conservancy (all Global Peatlands Initiative partners), plus Rare, the side event **“Raise the bar on nature based-solutions in NDCs”** held 12 December, 15:00-16:30 in the Bug Room showcased ecosystem-based mitigation and adaptation measures. With a diverse panel of contributors, experts shared their experience by taking stock of ecosystem-based mitigation and adaptation measures within current NDCs and presented recommendations to help strengthen these nature-based solutions further in the next round of NDCs. Notably, Tatiana Minayeva of Wetlands International shared the opportunity for countries to include actions such as peatlands rewetting, restoration and protection as an important ecosystem-based solution in future NDCs.



Panelists from the side event “Corrective Actions on Peat Ecosystem Management in Indonesia.”

Coordinated and hosted by the Indonesian Government in their Pavilion, the side event “**Corrective Actions on Peat Ecosystem Management in Indonesia**” held 13 December, 11:40-13:00, saw contributions from experts from the Pollution and Environmental Degradation Control Unit; the Geospatial Information Agency; the Peat Degradation Control section from the Ministry of Environment and Forestry, Indonesia; and representatives from concession holders and international organizations working in Indonesia on peat issues. Notably, Faizal Parish of Global Environment Centre, a Global Peatlands Initiative partner, presented his experience of rehabilitation of peatland ecosystems through integrated management using nature to restore peatlands through the reestablishment of hydrology and natural vegetation. The session also highlighted the soft launching of the International Tropical Peatlands Center (ITPC) as an opportunity to advance collaboration on research and protection of peatlands globally contributing to the implementation of the Brazzaville Declaration on Peatlands and advancing the aim of the Global Peatlands Initiative.

Due to the full schedule of Ministers, the proposed side event “**High-level South South Cooperation in Action: Protecting Tropical Peatlands Together**” planned for the Indonesian Pavilion was not held. However, Siti Nurbaya Bakar, Minister of Environment and Forestry, Indonesia, met with both Arlette Soudan-Nonault, Minister of Environment and Tourism, Republic of Congo and Fabiola Munoz Dodero, Minister of Environment, Peru at COP24 and she spoke to them about the ongoing and further strengthening of collaboration and south south exchange through the Global Peatlands Initiative. Dianna Kopansky also spoke to Fabiola Munoz Dodero, Minister of Environment, Peru during the UN-REDD event and she expressed her interest and appreciation to continue working together toward the 4th meeting of the Global Peatlands Initiative partners – planned for late 2019 in Peru. In addition, during her high-level ministerial address to the UNFCCC COP24, Arlette Soudan-Nonault, Minister of Environment and Tourism, Republic of Congo emphasized the importance of the Cuvette Centrale Congo Basin peatlands and the contributions of UN Environment and the Global Peatlands Initiative to support their implementation of the Brazzaville Declaration on Peatlands.



Siti Nurbaya Bakar, Minister of Environment and Forestry, Indonesia (left) meets with Fabiola Munoz Dodero, Minister of Environment, Peru (right) during bilateral meetings at COP24.

What did UNFCCC Katowice achieve?

The 24th session of the Conference of the Parties to the UNFCCC (COP) convened at the beginning of December 2018 in Katowice, a city in the heart of Poland's coal region. COP24 marked a deadline to produce a rulebook on how to implement the provisions of the Paris Agreement (PA) that will apply from 2020 onwards. With some considerable hiccups at the start of the two-week conference, including a heated political discussion on whether to 'welcome' or simply 'note' the IPCC Special Report on Global Warming of 1.5°C, the Polish Presidency managed to deliver an almost complete Paris Rulebook. While some agenda items saw more success than others, three underlying themes shaped the negotiations and are evident throughout the discussions: the question of differentiation between developed and developing countries; the increase of finance and support for developing countries; and the need to ramp up ambition.

Coined the 'Katowice Climate Package', the **Paris Rulebook** provides a framework for tracking and reporting greenhouse gas (GHG) emissions and aims to incentivize Parties to implement and periodically update their climate goals. It also delivers assurance for financial support to help weaker developing countries to implement mitigation and adaptation measures. The overarching concern of the Paris Rulebook is to provide appropriate rules that enable Parties to collect information and compare efforts towards achieving the global climate goals of the PA. Many of the guidelines and rules agreed to in Katowice provide for the harmonization of communication and reporting to the UNFCCC, including on information that is needed to back up Nationally Determined Contributions (NDCs), reporting on implementation and the achievement of national contributions as well as on finance and support. Such harmonization is essential for the periodic **Global Stocktake** (mandated in Article 14 of the PA) to become a useful tool to verify progress and enable an increase in ambition regarding mitigation and adaptation efforts. In Katowice, Parties agreed that the Global Stocktake will consist of information collected by Parties that will be fed into technical assessments. These assessments will allow Parties to evaluate the progress of national and collective action and inform a review and revision of their NDCs. The first stocktake is scheduled for 2023.

Parties also agreed on guidance for the information that must be included in their second and subsequent **NDCs** to enable clarity, transparency and understanding. Such information includes the reference point for emissions targets, time frames of implementation, and scope and coverage of targets.

With respect to **accounting**, guidance requires Parties to explain the underlying assumptions and methodologies applied to the accounting of emissions and removals and, in light of their national circumstances, make the case of how their NDC is fair and ambitious. In accounting for their emissions and removals, Parties should be comprehensive in coverage and include all relevant sources of emissions, avoiding slipping back by excluding previously included sources. They should also, to the extent possible, apply IPCC methodologies and maintain consistency in scope and coverage, definitions, data sources, metrics, assumptions and methodological approaches. Although Katowice produced valuable guidance to ensure clarity and comparability among NDCs, it did not yet deliver a common time frame for implementing these national contributions. Parties only agreed to continue negotiations so as to define a uniform time frame to be valid from 2031 onwards.

Whether or not to include flexible or differentiated **reporting obligations** for countries under the transparency framework (Art. 13 of the PA) remained one of the fault lines between Parties negotiating the Rulebook. Many developed countries pushed for harmonized rules from the start, but developing countries emphasized the risk of overburdening developing countries with reporting requirements for which no capacities yet exist, and which could potentially halt their implementation efforts. The final Paris Rulebook does not distinguish between reporting requirements for different country groups. All Parties have to submit 'Biennial Transparency Reports' from 2024 onwards, applying common reporting formats. At the same time, countries may self-determine whether they are able to meet all reporting requirements and adjust their reporting accordingly. To ensure progress in reporting over time, countries using this flexibility should indicate which requirements they cannot meet, and how they will improve their reporting capacities in the future. As a mechanism to ensure the quality of Party reporting, the Rulebook furthermore sets out a technical expert review process. The process is intended to review the consistency of information submitted by Parties in their national inventory reports and when reporting on their NDC progress. The review process is organized by the UNFCCC secretariat and does not put an additional reporting burden on the Parties, however, Parties are required to cooperate with the review team and provide inputs. The review process is concluded with a 'technical expert review report' which sets out recommendations for improvement and may identify capacity-building needs to improve future reporting efforts.

Some major stumbling blocks persisted and could not be resolved in Katowice, including the role of carbon markets and international voluntary cooperation.

Developing countries continue to express concern over developed countries placing priority on mitigation- and relegating the urgent **adaptation** needs of developing countries. The PA has taken vital steps to enhance the role of adaptation in international cooperation, but in the view of many developing countries the status quo remains deeply unsatisfactory. Parties agreed to report their adaptation efforts via their adaptation communication, which Parties are encouraged to submit as part of their NDCs. Moreover, the Rulebook notes the intrinsic linkage between adaptation and sustainable development and the eradication of poverty.

Land use has a reputation for complexity, and has in the past impeded as well as catalysed international climate negotiations. The Rulebook integrates the accounting for forests and land use into its overall accounting framework, abandoning the practice of the Kyoto Protocol to separate the accounting of “green” aspects of greenhouse gas accounting from the accounting for the “brown” sectors. The Rulebook relies on existing decisions when it calls for the use of IPCC guidelines, harmonized definitions, and an increase in scope for all sources of emissions. Specific rules for forests in the Rulebook include the need to detail accounting for natural disturbances, harvested wood products and explanations on how to address age-class structures in forests and its consistency with IPCC guidance.



Agriculturally used peatlands in Uganda. Photo: Hans Joosten.

Negotiators held the first in-session workshop on the Koronivia Joint Work on **Agriculture** (KJWA) at COP24. The role of agriculture received elevated attention following the adoption of KJWA at COP23. The session emphasized the need for additional input and research on the role of agriculture in climate mitigation. The World Bank announced at COP24 that it will provide USD 200 billion over the next five years for agriculture climate change. However, this amount is likely to be a mere drop in the bucket of what is needed to make the sector ‘climate proof’.

In conclusion: COP24 did what it set out to do: deliver the Paris Rulebook and provide consensus on the operationalization of the Paris Agreement starting in 2020. While this calls for celebration, the work of Parties is far from complete. Differentiation between developed and developing countries, the need for more finance as well as raising ambition were key themes that ran throughout the negotiations and shaped the discussions for the Paris Rulebook. The agreed transparency reporting in the Paris Rulebook aims to build trust among

Parties and raise ambition, as it requires countries to explain how their NDCs are conceptualized and whether it is fair. But, as much as this can place pressure on Parties to provide bolder individual targets, COP24 did not stipulate clear common commitments to improve climate action and explicitly enhance NDC targets. According to the Climate Action Tracker (<https://climateactiontracker.org/global/cat-emissions-gaps/>), there still remains a significant gap between emission levels in 2025 and 2030 outlined in Parties' NDCs and the levels that would be consistent with the Paris global temperature goal of below 1.5°C.

- <https://climatefocus.us3.list-manage.com/track/click?u=4ed86d4a95558b756d83d4815&id=1008c6e623&e=cdcea84007>

Germany supports Global Peatlands Initiative with 2 million euros

Peatlands play an important role in combatting global climate change. On 6 December 2018, Germany announced that it will support the Global Peatlands Initiative with 2 million euros.

Federal Environment Minister Svenja Schulze commented: "Peatland soils are enormous carbon sinks. Whenever they are drained, greenhouse gas emissions are released. Peatland conservation is an essential and basic component of climate action in many parts of the world. At the same time, it is important to re-wet peatlands in a way that prevents the release of emissions while still allowing agricultural uses. We are currently working on a national peatland conservation strategy that will help us tap the climate action potential of peatlands in Germany. In addition, we want to help disseminate knowledge of peatlands around the world to allow different countries to learn from each other."



Federal Minister Svenja Schulze (Germany) rewets (...) a (very small...) peatland. More to come! Photo: BMU.

Germany is supporting the International Peatlands Initiative with just under two million euros of funding from the Federal Environment Ministry's International Climate Initiative. The aim of the peatlands initiative is to save peatlands as the world's largest terrestrial carbon sink and thus prevent releases of CO₂ into the atmosphere. Leading coordinator of the Global Peatlands Initiative is the United Nations Environment Programme (UN Environment). The initiative is organising a South-South knowledge exchange and promotes technology transfer of tried and tested peatland management procedures and methods which help in adapting to climate change and are part of mitigation efforts.

In Germany, more than 90 per cent of peatlands are drained. Drainage was carried out in particular in the 1960s and 1970s for peat extraction and to gain additional land for agricultural and forestry use. As a result, the peat decomposes and greenhouse gases are released. This process can only be stopped by raising the water

level on the affected areas. In order to use the soils for agricultural purposes sustainable soil management is required.

Globally, peatlands hold more carbon than forests, even though peatlands only make up three per cent of the global surface area. Peatland soils store approximately 500 gigatonnes of carbon in the form of peat. Current greenhouse gas emissions from drained or burning peatlands are estimated to amount to five per cent of all anthropogenic emissions. This corresponds to approximately two billion tonnes of CO₂ per year. Peatlands are also crucial for biodiversity conservation and for ensuring a secure hydrological cycle.

- <https://www.bmu.de/en/pressrelease/weltbodentag-moorbodenschutz-ist-wichtig-fuer-den-klimaschutz/>
- <https://www.gouvernementeuropea.eu/germany-supports-peatland-protection/92148/>
- <https://www.unenvironment.org/news-and-stories/press-release/germany-announces-support-peatlands-natural-solution-climate-action>

Peatland resolution on United Nations Environment Assembly?

The United Nations Environment Assembly, the world's highest-level decision-making body on the environment, will meet in Nairobi, 11-16 March 2019. Indonesia has submitted a draft proposal (Draft Resolution UNEA-4) "Sustainable Peatland Management for Tackling Climate Change through Establishment of International Tropical Peatland Center". The resolution requests the Executive Director of the United Nations Environment Programme

- to acknowledge the importance of establishing an organization responsible for:
 - supporting countries with sustainable management of tropical peatlands in a sustainable way;
 - building the capacity of human resources in managing peatlands;
 - promoting multi-stakeholders cooperation on tropical peatland management including with peatland-based industries; and
 - developing interdisciplinary and integrated research-for-development focused on advancing sustainable management of peatlands;
- to work together on establishing an International Tropical Peatland Center (ITPC) within a time frame of one year, and agree to give mandate to Indonesia as a country with experience in peatlands restoration to establish an interim secretariat to be hosted by Indonesia;
- to invite other countries (particularly with peatlands), international organizations, private sectors, and research institutions to contribute and join the works;
- to report to the United Nations Environment Assembly at its fourth session on progress in the implementation of the resolution.

Indonesia, as the sponsor of the resolution, has called out to other member states for support and asks them for inputs and comments so that the resolution will reflect the global aspects and importance of peatlands.

- https://papersmart.unon.org/resolution/uploads/indonesia.draftresolution.sustainable_peatland_management_for_tackling_climate_change_through_establishment_of_international_tropical_peatland_center_1.pdf

Tropical forest and peatland in 2018 and 2019

For an extensive, illustrative and detailed overview of tropical forest and peatland destruction and conservation in 2018 see:

- <https://news.mongabay.com/2018/12/the-biggest-rainforest-news-stories-in-2018/>

Special information on the development on palm oil you find under:

- <https://news.mongabay.com/2018/12/an-expanding-frontier-top-10-global-palm-oil-stories-of-2018/>

whereas an outlook for 2019 I presented under

- <https://news.mongabay.com/2019/01/rainforests-storylines-to-watch-in-2019/>



Brunei harbours the last untouched peatswamp complexes of Borneo. Photo: Hans Joosten.

Palm oil giant increases supplier monitoring to stop deforestation

The world's largest trader in palm oil has unveiled plans to increase its supplier monitoring in a "potential breakthrough" in stopping rainforest destruction. Wilmar International, which supplies around 40% of the world's palm oil, including for popular consumer goods brands, has set out an action plan to prevent forests and peatland being destroyed for palm oil plantations. Under the plans to implement its "no deforestation, no peat, no exploitation" (NDPE) policy, Wilmar is supporting sustainability consultancy Aidenvironment to draw up a comprehensive mapping database of suppliers. The database will allow satellite monitoring to spot any deforestation or development on peat, with the company pledging to immediately suspend the suppliers involved, while also engaging with them to improve their operations. Kiki Taufik, global head of Indonesian forests campaign, Greenpeace Southeast Asia, said: "Wilmar supplies palm oil to most of the world's major food and cosmetics brands. So today's announcement is a potential breakthrough. "If Wilmar keeps its word, by the end of 2019 it will be using satellites to monitor all of its palm oil suppliers, making it almost impossible for them to get away with forest destruction."

Announcing the move, Wilmar's chief sustainability officer Jeremy Goon said: "We remain steadfast in our commitment to our NDPE policy and this new enhanced plan is part of our sustainability strategy as we strive towards a supply chain free of deforestation and conflict." Wilmar called on environmental groups and other industry players to step up the pressure on non-compliant suppliers to commit to and implement policies to stop rainforests and peatland being destroyed and exploitation occurring.

- <https://www.expressandstar.com/news/uk-news/2018/12/10/palm-oil-giant-steps-up-supplier-monitoring-to-stop-deforestation/>
- <https://www.independent.co.uk/environment/palm-oil-wilmar-international-environment-satellite-monitoring-deforestation-greenpeace-a8676971.html>
- <https://news.mongabay.com/2018/12/palm-oil-giant-wilmar-promises-to-take-a-harder-line-with-errant-suppliers/>
- <https://www.energylivenews.com/2018/12/12/worlds-biggest-palm-oil-trader-announces-plans-to-prevent-deforestation/>

FAO Peatlands Internships: apply by 1 March!



To bolster FAO's efforts and technical capacity on peatlands as well as afforestation-deforestation, FAO opens new internship positions for 2019 and 2020 for the main headquarter in Rome, Italy, well as to the FAO country offices with ongoing peatland projects: Indonesia, Peru, the Republic of Congo and the Democratic Republic of Congo.

Responsibilities may include

1. Contributing to technical work related to mapping, management, restoration and/or monitoring peatlands and/or mangroves, or to afforestation/reforestation
2. Supporting collaboration with partners,
3. Supporting preparation of and contribution to project activities, including with the country focal points,
4. Contributing to communication, outreach activities in various languages, and any other related activities.

Internships are for 4 to 11 months; deadline for application: 1 March 2019. The internship is full-time and paid at a basic internship rate (depending of the location, in Rome e.g. USD 700 per month). The application needs to be submitted to either an internship program for headquarters (HQ) and/or country office of interest:

- [Call For Expression Of Interest – HQ Internship Programme à Rome, Italy](#)
- [Call For Expression Of Interest – RAP Internship Programme à Jakarta, Indonesia](#)
- [Call For Expression Of Interest – RAF Internship Programme à Kinshasa and Brazzaville](#)
- [Call For Expression Of Interest – RLC Internship Programme à Peru.](#)

Please ensure you fill all important details in your Taleo profile and submit all applications through this platform: [here](#). Also forward application documents: (CV; cover letter and the downloadable Taleo profile) to kai.milliken@fao.org. Only candidates selected for the interviews will be notified. Interviews will be organized as online calls via skype.

Required competencies include: working level of English, excellent IT skills, Bachelor's degree, knowledge of and higher education related to natural resource management, climate policy, environmental studies or a related field of knowledge (i.e. ecology). Preferred are knowledge and education on peatlands and climate change, knowledge of international frameworks on climate, biodiversity and sustainability, Master's degree related to natural resource management, environmental policies, forestry or similar, at least 0.5 year of previous work experience, independence to work under minimum guidance following a work plan, strong skills in communication and coordination, proficiency with the Microsoft package, in particular Excel, and intermediate knowledge of either French, Spanish, Indonesian language (Bahasa), or Russian. More information: <http://www.fao.org/employment/collaborate-with-us/internship-programm>



Peat swamp forest remnants in Brunei. Photo: Hans Joosten.

Asia

Indonesia

Indonesia to get first payment from Norway under \$1b REDD+ scheme

It's taken nearly a decade, but Indonesia is finally set to receive the first part of a \$1 billion payment pledged by the Norwegian government for preserving some of the Southeast Asian country's vast tropical rainforests and peatlands. Indonesia's environment minister, Siti Nurbaya Bakar, and her Norwegian counterpart, Ola Elvestuen, made the announcement in Jakarta on Feb. 16. The payment, whose amount is yet to be determined, is for Indonesia preventing the emission of 4.8 million tons of carbon dioxide equivalent (CO₂e) through reducing its rate of deforestation in 2017. "Indonesia has embarked on bold regulatory reforms, and it is showing results," Elvestuen said. "It may be too early to see a clear trend, but if deforestation continues to drop we stand ready to increase our annual payments to reward Indonesia's results and support its efforts."

"This is fantastic news for the climate, for the world's animal and plant species, and for the millions of people who depend on these forests," said Øyvind Eggen, director of the Rainforest Foundation Norway, an NGO. Now that Indonesia's MRV protocol is in place, it has to convince Norway about the integrity of the system in verifying that reductions in CO₂ emissions really are being achieved. "We've been discussing this MRV protocol [with Norway] since last year because it will affect the calculation of carbon emissions that we've reduced," said Ruandha Agung Suhardiman, the Indonesian environment ministry's head of climate change.

Norway's acknowledgement of Indonesia's MRV system marks an important development in Indonesia's forest management, says Arief Wijaya, a senior manager for climate and forests at the World Resources Institute (WRI) Indonesia. Indonesia has for years courted controversy over the definition of [what counts as deforestation](#). The term is almost universally understood to mean the conversion of natural forest cover to other land-use categories. The Indonesian government doesn't take that view. It counts human-made plantations, including industrial pulpwood plantations, as forested areas. But Norway's acceptance of Indonesia's MRV system indicates that Jakarta has abandoned its own definition, at least for the purposes of the deal with Norway, according to Arief.

Arief said Indonesia could stand to learn from Brazil's experience in its REDD+ deal with Norway, including the importance of being consistent in efforts to reduce deforestation. In 2017, he said, Norway's rainforest payment to Brazil was [dropped to 350 million krone](#) (\$41 million) as a result of increased deforestation in the Amazon the previous year.

The 2015 fires razed 26,000 square kilometers of land across Indonesia, but since then the problem largely abated. In 2017, the area burned was just 6 percent of the 2015 total, allowing Indonesia to claim an emissions reduction of 24.4 percent from the business-as-usual scenario. In 2018, however, there was a significant uptick of forest fires, with 5,100 square kilometers of land scorched — three times the size of area burned in 2017 — due to a more intense dry season than in the previous two years. Fires in peat forests alone in 2016 emitted 96.7 million tons of CO₂, according to government figures. The final figure for 2018, not yet published, is expected to far exceed that, given that peat fire emissions in the first eight months of the year already hit 76 million tons. Crucially, emission reductions from peat degradation and peat fires aren't included in Indonesia's REDD+ deal with Norway. But they are expected to be included in the accounting mechanism as estimates improve. "The 2018 fires were quite bad and so our emissions reduction will decrease again," Ruandha said. "But we still have until 2030" to meet a target of cutting emissions by 29 percent from business-as-usual projections. "The point is that if we can prevent fires from breaking out, and manage our peat forests well, then our climate target will be met."

- <https://news.mongabay.com/2019/02/indonesia-to-get-first-payment-from-norway-under-1b-redd-scheme>

Nazir Foad: Haze in 2019 unlikely despite developing El Nino

South-east Asia will likely be spared the scourge of haze in 2019, despite predictions of a developing El Nino that could bring drier-than-usual conditions to the region next year, said Nazir Foad, chief of Indonesia's Peatland Restoration Agency on the sidelines of the United Nations climate talks in Katowice, Poland. "We are very convinced...that we can handle this." "We cannot say that there will not be fires, but there will be fewer incidents, and they will be put out much quicker," Foad said. An El Nino event is associated with unusually hot and dry weather in countries in the western Pacific, such as Indonesia. During the 2015 El Nino year, which was

exceptionally severe, forest fires in Indonesia raged harder and for longer, resulting in an intense haze that shrouded the region from September to October. According to forecasts made by the United States' National Oceanic and Atmospheric Administration, there is an 80 per cent chance that an El Nino could develop in the first three months of 2019.

- <https://www.straitstimes.com/world/europe/haze-unlikely-in-2019-despite-developing-el-nino-indonesian-official>



Collecting smallholder oil palm harvest in Riau, Indonesia. Photo: Hans Joosten.

Palm oil: Smallholder expansion into peatlands on the rise

The popular narrative about palm oil in Borneo is a David-and-Goliath story. Deforestation and peatland conversion is largely driven by big business growing oil palm in industrial plantations and exporting to overseas markets, the story goes – while smallholders generally convert tiny patches of existing cropland and produce comparatively few negative environmental impacts. Media articles and activist campaigns reinforce these messages – and at the same time, oil palm research disproportionately focuses on industrial plantations, says CIFOR Senior Scientist George Schoneveld. “Smallholders are pretty much invisible,” he says.

In the last couple of years, Schoneveld says, the big companies have been under increasing pressure from financiers, certification bodies, and their customers to clean up their supply chains – while oil palm smallholders go largely unmonitored. They’re also the fastest-growing producer group in Indonesia: the total area cultivated with oil palm by smallholders is [expected](#) to grow from approximately 40 percent of the total national acreage in 2016 to over 60 percent by 2030. So Schoneveld and colleagues from the [Center for International Forestry Research \(CIFOR\)](#) devised a [way](#) to find out who these smallholders were, and how they were impacting the environment – and the [results](#) upended a number of popular assumptions.

When they crunched the [data](#), Schoneveld’s team found that the kinds of land converted to oil palm changed over time. The study covered plantations established between 2002 and 2016, and over those years, the researchers found an increase in the conversion of peat soils. Their projections point to peat conversion rates rising for the foreseeable future, with the majority of smallholder oil palm expansion happening on peat soils by 2030. “The agricultural land that people are prepared to convert to palm oil has already been converted – and a lot of the existing farmland is becoming exhausted, so farmers are venturing further away and going into more marginal areas,” Schoneveld says.

A common perception in Indonesia is that migrants from other islands are responsible for the worst environmental effects of palm oil. But the study revealed that migrant farmers were in fact least likely to

convert forests and peatlands – while indigenous farmers were most likely to convert these ecologically sensitive landscapes.

Another finding points to the prevalence of comparatively inexperienced farmers cultivating oil palm on peat soils, says Schoneveld. Many of these plots were owned by civil servants, he says. “People who are not really farmers are recognising that hey, oil palm can be quite profitable – they tend to have a more entrepreneurial perspective, and are thinking, where can we get land cheaply?” That cheap land tends to be forested or have peat soils. “From the perspective of greenhouse gas emissions - this type of conversion is especially disastrous” Converted peatlands are also prone to fire, and the risks are amplified by social dynamics the researchers identified. “You have inexperienced farmers converting peat, and peat is one of the most complex soils to farm responsibly and effectively. Our results showed that about a third of the farmers on peat soils have experienced fire problems, which is largely the result of mismanagement.”

In the former peat forest plots, many of the farmers were also not compliant with ISPO – a certification regime designed to improve sustainability practices. “So you have incompliant people adopting poor practices and then experiencing fire hazards. Partly you can attribute that to cultivating peat in general, which is just more difficult, but the role of inexperience also plays its part.”

Indonesia’s national government is very committed to tackling the problem of forest fires, Schoneveld says – but that commitment is yet to trickle down to the district level, which is where decisions about land use and enforcement are made. “If district governments invest in mapping out their peatlands properly, in providing technical support to those inexperienced farmers to manage the peat soils better, conduct better land use planning, and perhaps restrict those sorts of farmers from going onto difficult peat land in the future – that would go a long way towards curbing this expansion and its impact.” To make this happen, though, districts will probably need external support, Schoneveld says. “In a lot of these places, local government capacity is very low, and Indonesia’s decentralisation means they are also not sufficiently incentivised to follow national policies. And if you have so much money going around in oil palm, that can both enrich the district and benefit individuals also investing in oil palm, you have a recipe for inaction. “The fact that so many local elites are going into palm oil in these marginal areas means that some people in district government may have a vested interest in not doing anything about it – because they are also benefitting.”

Ultimately though, better planning will help both smallholders and the environment, Schoneveld says. Under ISPO, oil palm farmers will increasingly be required to demonstrate that their land has been legally obtained, and is designated for palm oil. “If they can’t demonstrate that, those farmers may lose access to markets – and therefore rely on localised, highly unsustainable supply chains which could lead to low prices and exploitative behaviour.”

- <https://forestsnews.cifor.org/59794/palm-oil-smallholders-intensify-deforestation-in-indonesian-borneo?fnl=en>

Hazy figures cloud Indonesia’s peat restoration as fire season looms

Indonesia has restored degraded peatlands the size of a million football fields in the three years since President Joko Widodo launched an ambitious program aimed at preventing a repeat of some of the worst forest fires in the country’s history. But that success may have had more to do with luck than anything else, activists say, as anticipated tinderbox conditions mirroring the 2015 dry season that led to those earlier fires loom over the next few months. The 2015 fires raged across 26,100 square kilometers of land, much of it peat forest that had been drained for agriculture and rendered highly combustible. The resultant haze sickened hundreds of thousands of people, shut down airports, and spread to neighboring countries, inflaming long-running diplomatic spats. The dry conditions that year were exacerbated by an El Niño weather system, which is [likely to make an appearance again](#) in the next few months, according to the U.S. National Oceanic and Atmospheric Administration (NOAA).

The impact from El Niño “started in November, but the trend is increasing, and it’s going to peak in February or March,” said Ruanda Agung Sugardiman, who oversees climate change policies at the Indonesian environment ministry. NOAA has predicted up to an 80 percent chance of a full-fledged El Niño by February, with a 60 percent chance of it continuing into April. In anticipation of the coming dry season, the government is taking extra measures, Ruanda said, including allocating more funding to local governments for fire prevention. “Before this, most of the budget [for forest fires] was earmarked for the central government, but now we’re allocating 75 percent of our climate change budget to local governments,” he said.

The environment minister, Siti Nurbaya Bakar, said the slate of policies rolled out since 2015 had resulted in a significant decline in the number and extent of fires, from 26,100 square kilometers that year to 1,950 square

kilometers in 2018. The number of fire hotspots also dropped during the same period, from nearly 71,000 to just 9,200.

But that apparent success may have had less to do with the peat-restoration and fire-prevention measures than with the milder weather conditions in the intervening years, activists say: there hasn't been a full-on El Niño since 2016. "We attribute the decrease in the intensity of forest fires not to an improvement in [peat and forest] management, but to natural factors," Khalisah Khalid, a spokeswoman for the Indonesian Forum for the Environment (Walhi), the country's biggest green NGO, told Mongabay. Activists from Pantau Gambut, a coalition of 23 NGOs that acts as a watchdog for peat protection and restoration efforts, have also questioned the effectiveness of the government's policies. The coalition's own spatial analysis shows most of the hotspots detected during the peak of the dry season in August 2018 were inside areas that were either prioritized for peat restoration or supposed to be protected under a moratorium on developing peatland. If those measures were truly effective, there should have been a steep reduction or complete elimination of fires in those particular areas, Pantau Gambut said. "These findings indicate that we need to question [the government's] claim and the effectiveness of its restoration work," said Muhammad Teguh Surya, the coalition's national coordinator.



Raising the water level in an Asian Pulp and Paper (acacia plantation in Jambi, Sumatra. Photo: Hans Joosten.

In the wake of the 2015 fires and haze, President Widodo established the Peatland Restoration Agency (BRG) and charged it with leading nationwide efforts to restore 24,000 square kilometers of peat areas by the end of 2020. The rationale was that by restoring degraded peatland, including through blocking drainage canals and rewetting the dried-out peat layers, it would be harder for fires to spread out of control and make it easier for officials to contain them. In 2017, the BRG rewetted just over 2,000 square kilometers. In 2018, it restored another 4,600 square kilometers, for a total of 6,650 square kilometers, or the size of a million football fields. In addition to the restoration policy, in 2016 President Widodo also announced a moratorium on the clearing of carbon-rich peat forests across the country.

The BRG chief, Nazir Foad, said he believed that peat fires on the scale of the 2015 disaster would not happen in 2019, citing lessons learned from past mistakes. "We are very convinced ... that we can handle this," Nazir said as quoted by [The Straits Times](#). "We cannot say that there will not be fires, but there will be fewer incidents, and they will be put out much quicker." Environment minister Siti was similarly upbeat, saying at a year-end gathering at her office that "our transboundary haze [policies] have shown results."

But field investigations by Pantau Gambut throw those claims into question. The coalition found that peat-rewetting and firefighting equipment in some areas weren't functioning properly. One village in Jambi province on the island of Sumatra was found to have fire hoses that were too large for the available water pressure, and too short to reach fire-prone areas. In another village in Jambi, a water pump installed there wasn't powerful enough to provide sufficient water to put out fires. BRG secretary Hartono Prawiraatmadja said those particular facilities had been built by third parties in 2016, before standardized specifications for the equipment needed had been drawn up. He also said the BRG had earmarked at least 20 percent of its funding for the maintenance of equipment. "Last year, we didn't allocate any budget for maintenance," Hartono said. "There's a concern that if there's no maintenance, then the facilities won't work properly during fires. That's why, starting in 2019, we've allocated funding for maintenance."

There's another key point where the BRG and NGOs differ. Under the peat-restoration initiative, companies whose concessions include peatlands are responsible for restoring those areas, which amount to 14,000 square kilometers of the total 24,000 square kilometers. The concessions in question include areas of deep peat that contain high biodiversity. Under the president's signature [anti-haze regulation](#), these areas must be zoned for conservation and rewetted to prevent fires. As of August 2018, 127 pulpwood and plantation companies had submitted their restoration plans to the environment ministry. Three months earlier, the ministry [reported](#) that the companies had restored a combined 10,000 square kilometers of degraded peatland since 2015, mostly by blocking the canals initially dug to drain the peat in preparation for planting.

That figure has since been updated to 14,000 square kilometers, which, if accurate, means the companies have fulfilled their peat-restoration obligations, the BRG's Hartono said. He added that this claim on the part of the companies had yet to be verified through on-the-ground inspections. But Pantau Gambut says the government has failed to disclose detailed information on the implementation of the companies' restoration plans. There also hasn't been any transparent follow-up to the companies' submitted plans, despite the fact that the restoration is required to be carried out immediately upon approval of the plans. Ultimately, Teguh said, there's no independent confirmation that the peatland restoration has been carried out as reported by the companies. "Unfortunately, after they've revised their plans, it remains unclear whether the restoration work has been carried out or not," he said. "The public has never been involved in the process. Without a transparent [process to disclose the] information, the public is left in the dark."

For its part, the government is preparing a regulation to serve as a guideline for the BRG and civil society groups to monitor the companies' restoration activities, Hartono said. To verify their claim to have restored 14,000 square kilometers of peatland, the BRG needs to have the regulation in place, currently being drafted by the environment ministry. "If the BRG enters [the companies' concessions] without a clear regulation [permitting it to do so], the companies are worried that it might disrupt [their operations]," Hartono said. "We haven't been able to confirm yet that what the companies are doing matches or expectations," he added. "So we will supervise the companies, both in terms of what they've done and what they're planning to do." If the companies' claims are confirmed, then that leaves the BRG with less than 4,000 square kilometers of degraded peat areas to restore before the end of 2020. "We're optimistic [we can meet that target] if that's the case," Hartono said.

Teguh cautioned that while this might seem a small number compared to the agency's achievements in the past two years, the BRG should be diligent about ensuring it met its target in an open and accountable manner. "Considering how there's only two years left, the BRG has several big tasks pending," he said. "That includes making its peat restoration agenda more inclusive and accountable, sharing its data and restoration progress in more detail, accepting criticism and recommendations for improvement, and not basing its work only on projects."

- <https://news.mongabay.com/2019/01/hazy-figures-cloud-indonesias-peat-restoration-as-fire-season-looms/>
- <https://www.thejakartapost.com/news/2018/12/29/brg-boosts-peatland-restoration-2018.html>

Peatlands: An appetite to re-wet?

At the December 2018 [Global Landscapes Forum](#) in Bonn, Germany, delegates exchanged [management strategies for tropical peatlands](#), highlighting the potential offered by new [south-south cooperation](#) through the International Tropical Peatland Centre (IPTC) launched in November. Headquartered on the outskirts of Jakarta in Bogor, Indonesia at the Center for International Forestry Research (CIFOR), the IPTC alliance includes Indonesia, Peru, Republic of Congo and Democratic Republic of Congo (DRC).

In 2009, Indonesia [made a promise to reduce](#) national greenhouse gas emissions by at least 26 percent by 2020. In its 2015 Intended Nationally Determined Contribution, [Indonesia increased](#) its voluntarily promise to reduce greenhouse gas emissions to 29 percent on its own and up to 41 percent with international support by 2030, against a business as usual scenario.

Tim Christophersen, head of the water, land and climate branch of UN Environment, which helped establishing the ITPC, said that Indonesia is now on its way to correcting past mistakes made in peatland management. “Siti Nurbaya (the Indonesian minister of Environment and Forestry) is a champion for this cause,” Christophersen said. Through sharing lessons with other tropical countries, peatland management will improve, offering potential livelihood benefits in addition to environmental advantages, he said.



South-South-dialogue: Minister Siti Nurbaya (Indonesia) addressing Minister Amy Ambatobe Nyongolo (Democratic Republic of Congo) in Brazzaville (Republic of Congo). Photo: Hans Joosten.

Peatland drainage leads to land subsidence, and makes them more vulnerable to fires, which can rapidly burn for years underground in optimal conditions. In 2015, in Indonesia, fires burned uncontrollably for lengthy periods due to dry conditions. Peat fires and haze in Indonesia that same year killed 100,000 people, put half a million people in hospital, and caused up to \$40 billion in damage, said Hans Joosten, a world leader in peatlands management with the [International Mire Conservation Group](#) and Germany’s [University of Greifswald](#). “We must appreciate very much that Indonesia has taken the lead in turning this back – it’s leading the list of global top emitters from peatlands, even without the enormous peatland fires,” Joosten said. “But the European Union is a good second — the European Union likes to blame Indonesia for peatland emissions, but should also look at their own.” Developed countries must share in the responsibility, Joosten said. “If we look at land use, peatlands produce 30 percent of all emissions from all agriculture.”

Land subsidence caused by draining poses a challenge, he said. Much of the Netherlands is now at risk of flooding because it is below sea level — in some areas the land has sunk 8 meters. “We’ve calculated that peatlands subsidence will, in this century, lead to uncontrolled flooding of 10 to 20 million hectares of productive land worldwide, and that is frightening because we are losing land now that we need it most; for more people, for less poverty, and for replacing fossil resources as we have agreed in the Paris Agreement,” Joosten said.

Paludiculture, the cultivation of agriculture and plants in damp conditions, is a viable option to land drainage because it produces biomass from wet or rewetted peatlands. We must keep wet peatlands wet, Joosten said.

“Make drained peatlands wet again — and if you use them, use them wet. There will be no Paris (Agreement) without peatlands; peatlands must be wet. For the climate. For the land. For the people. Forever.”

Paludiculture is definitely viable, but strategic planning is vital to avoid such increased risks as malaria, said Francisco Rilla, director of science and policy for the Ramsar Convention, which oversees international wetlands management and conservation initiatives. We have to retain variability and bio-diversity in these landscapes, Rilla said. For conservation, adding water is right, but it is not enough, we need time, and we must be careful.

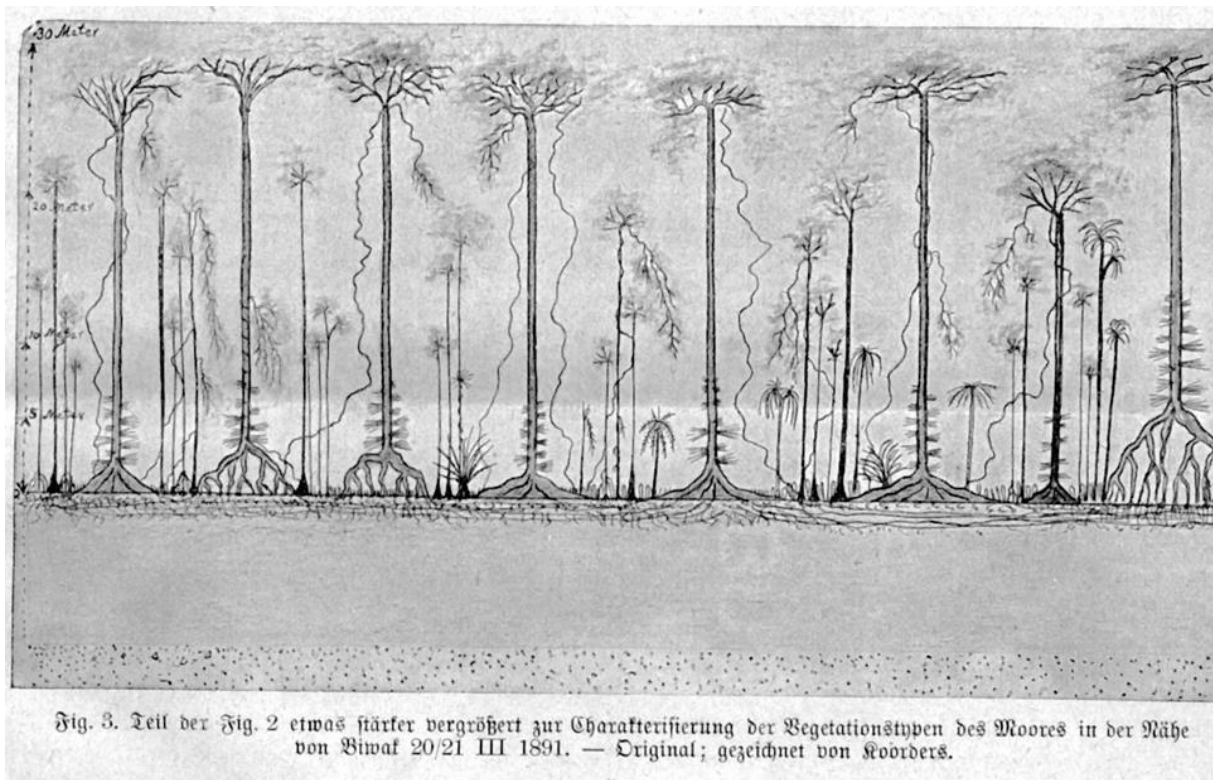
Indonesia’s new interactive Peatland Restoration Information and Monitoring System (PRIMS) was designed to support transparency and complex restoration initiatives to [complement the recently introduced moratorium on oil palm plantations](#), said Budi Wardhana, who leads the project at the country’s National Peatland Restoration Agency. “The purpose of the development of PRIMS is to communicate results and outcomes and also to encourage positive momentum, to inspire and allow for transferable resolve, to guide and support implementation of restorations and provide feedback including continuous and collective learning for adaptive management,” Wardhana said.

- <https://forestsnews.cifor.org/59084/peatlands-an-appetite-to-re-wet?fnl=en>

What does it take to save one of Indonesia’s last peatland forests?

Located in Indonesia’s Riau province, the Kampar Peninsula is a vast peatland forest that originally stretched 700,000 hectares along the eastern Sumatran coastline. Over the past two decades, selective logging has degraded Kampar. In a podcast, Eco-Business spoke to Tony Sebastian, who currently advises Restorasi Ekosistem Riau (RER), a project that aims to protect, restore and manage 150,000 hectares of degraded peatland forest on the Kampar Peninsula and Padang Island. RER was founded five years ago by Singapore-based pulp and paper company Asia Pacific Resources International Holdings Limited (APRIL), and is run in partnership with international conservation organisation Fauna & Flora International (FFI) and Indonesian non-profit organisation BIDARA. Tune in to find out from Sebastian what it takes to restore a peat forest:

- <https://www.eco-business.com/podcasts/what-does-it-take-to-save-one-of-indonesias-last-peatland-forests/>
- <https://soundcloud.com/user-101945751/how-to-restore-a-forest>



The first picture of Kampar and of a tropical peat swamp forest at all (by Sijfert Koorders 1891)

Europe

European Union

Renewable Energy Directive and Indirect Land Use Change

The EU's [draft Delegated Act](#) for the Renewable Energy Directive (RED) was released early February accompanied by an announcement of a four-week consultation period, allowing individuals, industry, NGOs and governments the opportunity to provide feedback.

The Delegated Act implies a freeze until 2023 and then a reduction to zero “by 2030 at the latest” on biofuels considered as having a ‘high risk’ of indirect land use change (ILUC). Most importantly, it sets out the parameters of which fuels will be considered as having ‘high risk’ of ILUC. This is based on the expansion of production area of crops since 2008, and whether the bulk of this has been in ‘high carbon stock’ (HCS) areas. According to the Delegated Act’s Annex, for palm oil, it says 45 per cent of this expansion has been in forested areas, and around 18 per cent of this area has been in wetlands. It also sets a draft threshold of 10 per cent for the expansion of any crops into HCS areas. Finally,. However, under mounting pressure, including trade war threats, from the governments of Malaysia and Indonesia, the Commission has made an exemption for palm oil produced in independent small plantations (‘smallholders’ less than five hectares) or produced on ‘unused’ land.

[European environmental groups already see this as a loophole](#) for palm oil exports to make it into the RED. This is because around 40 per cent of the world’s palm production area is held by smallholders, and around 35 per cent of global production comes from smallholders.

On the other hand, the practicality of the ILUC concept is contested as indirect land-use change is a phenomenon that is impossible to directly observe or measure. Both Indonesia and Malaysia have stated publicly that they will challenge the regulation at the World Trade Organisation, and have also put the EU-ASEAN relationship on ice because of the regulation.

- https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2019-762855_en
- https://ec.europa.eu/info/law/better-regulation/initiatives/ares-2019-762855_en
- https://biofuels-news.com/display_news/14367/epure_responds_to_eu_draft_regarding_use_of_palm_oil/
- <https://www.transportenvironment.org/press/eu-classifies-palm-oil-diesel-unsustainable-fails-cut-its-subsidised-use-and-associated>

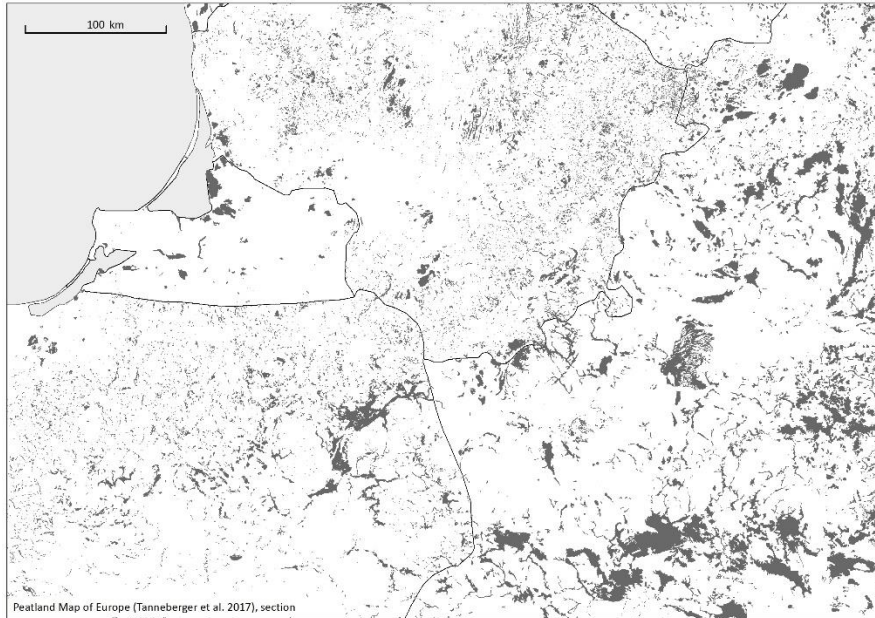
Germany, Lithuania, Poland, Belarus

Restoration and paludiculture in the Neman river catchment

The Interreg project DESIRE (DEvelopment of Sustainable (adaptive) peatland management by REstoration and paludiculture for nutrient retention and other ecosystem services in the Neman river catchment) started in January 2019 with the aims to implement efficient management of natural resources, to support transnational cooperation, to enhance capacity of public authorities and practitioners to ensure better environmental status of the Baltic Sea Region waters, and to strengthen resource-efficient growth. It will help in developing integrated approaches to reducing nutrient loads and decreasing discharges of hazardous substances to the Baltic Sea and the regional inland waters. The DESIRE project is directly linked with the Action Plan of the EU Strategy for the Baltic Sea Region and in line with the EU Water Framework Directive, the Flood Directive, the Nitrate Directive, and the 2030 Climate and Energy Framework.

DESIRE focuses on numerous disturbed peatlands in the Neman catchment (picture 1) and will exemplarily restore some of them to act as wetland buffer zones (WBZ). Rewetting stops, inter alia, further soil degradation, decreases uncontrolled water run-off, strongly reduces nutrient- and GHG emissions and is good for biodiversity. Within DESIRE, the ability of rewetted peatlands to catch nutrients will be enhanced with innovative land use practices (paludiculture), i.e. harvesting of nutrient-rich biomass from rewetted peatlands (especially phosphorus). The few ongoing activities on paludiculture in the focal countries will be supplemented by pilot sites, optimised for nutrient retention. These will be used for awareness raising and communication towards the target group of policy makers. Policy instruments like river basin management plans and agri-environmental schemes will be analysed and adapted or newly developed within the project to provide instruments and incentives for stakeholders to implement measures following the project's pilot examples. Economic evaluation of the pilot projects and paludiculture implementation will showcase cost-effectiveness of

the proposed ecosystem-based measures in comparison to other, more technical installations for nutrient filtering and retention. Water quality in the Neman basin will benefit by (1) reduction of nutrient loads from diffuse sources in the catchment area (mainly arable lands) and (2) preventing peatlands to act as nutrient sources and internal-external eutrophication hot spots. The project is led by Greifswald University supported by Succow Foundation (Greifswald), cooperating with partners in Poland (Warsow University of Life Sciences, Polish society for the protection of birds/OTOP, Bialystok Technical University), Lithuania (Aleksandras Stulginskis University, Lithuanian Fund for Nature), and Russia/Kaliningrad oblast (Ministry for Natural Resources and Ecology of Kaliningrad Region, Natural Heritage NGO). Further institutions in Lithuania, Poland, Kaliningrad and Belarus will act as associated organisations. More information: Wendelin.Wichtmann@uni-greifswald.de and Marina.Abramchuk@succow-stiftung.de



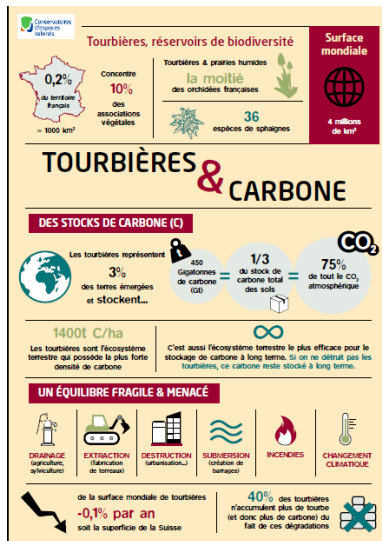
Distribution of peatlands in the project area (the Neman river catchment) (Tanneberger et al. 2017)

Denmark

8th International Symposium on Wetland Pollutant Dynamics and Control

WETPOL is an international conference bringing together wetland scientists, engineers and practitioners working on wetland ecosystem services, including water quality improvement, climate regulation and flood control. In 2019, the 14th annual SWS Europe Chapter Meeting will be organized in association with the WETPOL conference in Aarhus, Denmark. The conference will create a framework for wetland scientists and practitioners to exchange knowledge and advance the overall understanding of these complex ecosystems. The goal is to improve our understanding of the role wetlands perform in processing nutrients and contaminants, and to discuss and demonstrate how restored and constructed wetlands in the future, via their associated ecosystem services, can contribute to ensure sustainable water management and resource recovery while at the same time regulating and mitigating impacts of global climate change. The conference will include one day of field trips to explore unique natural wetlands and peatlands in the region as well as examples of constructed and restored wetlands. More information: <http://wetpol.com/>

France



Peatlands and carbon

As part of World Wetlands Day 2019, with the theme "Wetlands and Climate Change", the French peatland coordination centre Pôle-relais tourbières is highlighting the close relationship between peatlands, their carbon stocks and climate change.

A computer graphics is now available for download to explain in a simple and illustrated way the challenges of preserving peatlands in a context where the importance of carbon storage is no longer to be demonstrated. A slide show to complete this information will be published very soon! Downloadable under: <http://reseau-cen-doc.org/dyn/portal/index.seam?aloid=19738&page=alo&cid=40>

Germany

WETSCAPES CONFERENCE

Understanding the ecology of restored fen peatlands for protection and sustainable use

[WETSCAPES Conference](#), September 10-13, 2019 in Rostock, Germany. We have some great keynote speakers who you can meet in a familiar atmosphere (see below). Together we want to discuss not only research for sustainable use and protection of rewetted fens but also learn from your knowledge in pristine mires.

Keynote speakers	Conference topics
<ul style="list-style-type: none"> • Dr. Rebekka Artz, The James Hutton Institute, Scotland UK • Prof. Dr. Philippe van Cappellen, University of Waterloo, Canada • Prof. Dr. Chris Evans, Centre for Ecology and Hydrology, Bangor, UK • Prof. Dr. Steve Frothingham, University of New Hampshire, USA • Prof. Dr. Dr. h.c. Reinhard Hüttl, German Research Centre for Geosciences (GFZ), Germany • Prof. Dr. Klaus-Holger Knorr, University of Munster, Germany • Prof. Dr. Susanne Liebner, German Research Centre for Geosciences (GFZ), Germany • Dr. Sunitha Pangala, Lancaster University, UK • Dr. Fereidoun Rezanezhad, University of Waterloo, Canada • Marcel Silvius, Global Green Growth Institute, Indonesia • Dr. Maria Strack, University of Waterloo, Canada 	<ul style="list-style-type: none"> • Greenhouse gas exchange in space and time • Element cycling and export • Peatland bio-hydrology • Plant growth and decomposition • Microbial pathways • Paleoecological methods in restored peatlands • Legacy of degradation in biotic communities • Mapping with GIS and remote sensing

The presentations of the conference „Niedersächsische Moorlandschaften - Projekte zum Klimaschutz durch Moorentwicklung“ (Peat landscapes in Lower Saxony: climate change mitigation by peatland action“ are now downloadable under: <http://www.lbeg.niedersachsen.de/aktuelles/veranstaltungen/tagung-niedersaechsische-moorlandschaften-169696.html>

Landtag compensates flights with MoorFutures from peatland rewetting

From 2019 on, the Brandenburg 'Landtag' will pay climate levies for all official flights of members of parliament and parliamentary employees. This was decided by the parliamentarians with the budget for the years 2019/2020. The Brandenburg state parliament - including the Berlin House of Representatives - is one of the first parliaments in Germany to pay this climate tax. Commenting on Parliament's decision, Landtag President Britta Stark said: "The Landtag is starting the new year with a bit more climate awareness. I am particularly pleased that the CO₂ levy with the 'MoorFutures' is going to a project in Brandenburg".

The state parliament acquires climate certificates, the so-called MoorFutures (www.moorfutures.de), with which peatlands in the state are rewetted and the emission of greenhouse gases is thus considerably reduced. Whether this model can be extended to the entire state government will be shown by the experiences of the state parliament.

- https://www.landtag.brandenburg.de/de/meldungenlandtagspilot_fliegt_auf_moorfutures:_stark_begrueszt_klimaabgabe_ab_2019/891845



Degraded peatland meadow in Lower Saxony, Germany. Photo: Hans Joosten.

Ireland

Irish Peatland Conservation Council winners of National Heritage Award 2018

The dedication of individuals and community groups across Ireland to the preservation and promotion of Ireland's heritage was recognised at the National Heritage Awards 2018 and closing ceremony for the European Year of Cultural Heritage 2018. The new Le Cheile san Eoraip Award recognises event organisers who explore Ireland's heritage connections with other places in Europe. One of the three prizes was awarded to 'Peat Crossing Borderlines' of the Irish Peatland Conservation Council. The Irish Peatland Conservation Council's event shared the Dutch-Irish Save the Bog Story and built awareness of the importance of Ireland's peatlands at a European level. They strengthened the connection between Ireland and the Netherlands and the countries shared passion for conserving Irish peatlands. Participants from Poland, Russia, Holland, Northern Ireland and Ireland shared their personal experiences of bogs. Prof Matthijs Schouten- the father of peatland conservation was invited to speak as was His Excellency Mr Peter Kok the Netherlands Ambassador to Ireland. The Dutch-Irish Save the Bogs Story is an excellent example of European countries working together for the purpose of conserving our natural heritage.

- <https://www.heritagecouncil.ie/news/news-features/national-heritage-awards-2018-winners>

Conservation policy to protect peatlands a 'colossal failure'

Conservation measures to protect Ireland's unique peatlands over the past three decades have been a "colossal failure", an Oireachtas (Parliament) committee heard February 6th, 2019. The stark warning from Pdraig Fogarty of the Irish Wildlife Trust came during a hearing of the heritage committee on the preservation of biodiversity of peatlands. Today, two-thirds of Ireland's peatland has been converted to other uses in agriculture, forestry, and active peat extraction that alone affects 84 per cent of Ireland's raised bogs. While

accepting that turf cutting has a “long cultural heritage” in Ireland, Mr Fogarty said that the ramping up of industrial-scale extraction has had “calamitous consequences for our peatlands”. It is no exaggeration to say that the raised bogs of the Midlands are “practically extinct”, he said, while the “vast blanket bogs” of the West and upland areas have “fared little better”. Nine out of 11 peat habitats listed for special protection under the EU directives are in ‘bad’ condition, one is ‘inadequate’ and only one is ‘good’, according to the National Parks and Wildlife Service. Mr Fogarty said that conservation measures – “limited in extent and late in coming” – have been a “colossal failure” over the past 30 years. A lack of strict conservation measures, he said, has allowed for over-grazing by sheep, unregulated turf-cutting and the covering of bogs “underneath a carpet of plantation conifers”. “It is a tragic loss of heritage that today we cannot show our children what a healthy bog looks like. It is a legacy that few will thank us for,” Mr Fogarty said.



Almost all peatlands in Ireland are damaged, even the best ones, here Clara Bog. Photo: Hans Joosten.

The National Peatlands Strategy was published in 2015 to map a path towards the management of peatlands and to regulate turf-cutting on all non-designated areas. Mr Fogarty said, however, that there has been no progress towards setting lasting conservation objectives for blanket bogs and that “promised management plans have not materialised”. Dr Catherine O’Connell of the Irish Peatland Conservation Council echoed these findings, telling the committee that the current conservation scheme is “not working”. She said that this is reflected in the fact that just 23 per cent – 275,000 hectares (ha) – of the original area of peatlands in Ireland is in good enough condition as to be conservation-worthy. She said that “inadequate regulation” is making the situation worse, such as allowing for bog drainage during the bird nesting season and for wind farms in upland blanket bogs. Wind farms are a risk for birds and bats and fragment the integrity of the blanket bog habitat as they require road infrastructure, she said. Without urgent changes in how we manage our bogs, Dr O’Connell warned that a sod of turf may soon become a “peculiar item on a museum shelf”. She said that additional staff and finance for the National Parks and Wildlife Service (NPWS) is critical to allow it to work effectively with stakeholders, communities and the public to preserve peatland ecosystems.

Brian Lucas of the NPWS highlighted the restoration efforts of the Living Bog Project at 12 of Ireland’s raised bog in protected nature areas as well as the publication of a management plan for our raised bogs last year.

Dr Catherine Farrell of Bord na Mona said that the company is now focused on decarbonisation and ceasing peat extraction for energy production. The Bord na Mona ecology team, she said, is working on the restoration of up to 15,000ha of cutaway bog of its total 80,000ha holdings. The semi-state, she said, has machines out full time working to restore 2,000ha of raised bog under Bord na Mona control, with a further 2,000ha in the early

stages of restoration. She pointed to the Lough Boora Parklands in Co. Offaly as an example of how large-scale ecological restoration can be both technically feasible and popular with local communities. Dr Farrell said that Bord na Mona is currently undertaking biomass trials to try and establish local willow to replace peat at Edenderry power station and the two ESB stations in the Midlands. Bord na Mona will continue to extract peat for the horticultural sector and for animal bedding, she said.

- <https://iwt.ie/wp-content/uploads/2019/02/Committee-presentation-Irish-Wildlife-Trust.pdf>
- <https://iwt.ie/a-lament-for-our-peatlands/>
- <https://greennews.ie/conservation-policy-protect-peatlands-colossal-failure/>
- <https://www.thetimes.co.uk/article/bogs-are-sunk-conservation-is-colossal-failure-dd38gd6gg>

As Ireland goes green, rural workers feel punished

Bord na Móna's decision to close its peat extraction sites has raised concerns among the rural stakeholders:

- <https://www.kyma.com/news/national-world/as-ireland-goes-green-rural-workers-feel-punished/1005829064>
- <https://edition.cnn.com/2019/02/08/europe/ireland-bog-climate-change-intl/index.html>

Removal of peat planning requirement a 'free pass' for unauthorized extraction

The Government's decision to remove large-scale peat extraction from the planning system offers a "free pass" for peat companies to continue unauthorised extraction across the country, environmentalists have warned. On 25 January, the Minister for Planning Eoghan Murphy TD [published new regulations](#) to exempt peat extraction of 30 hectares (ha) or more from any requirement to obtain planning permission. The need for planning permission for large-scale peat extraction has been a controversial topic for decades, with An Bord Pleanála only ruling in 2013 that permission was in fact required. The board's decision was [challenged by several large peat harvesting companies](#), with the High Court refusing several companies permission to appeal the decision last December.

The decision to again bring peat companies outside of planning [coincided with the introduction of another set of regulations](#) by the Minister for Climate Action Richard Bruton TD to make the extraction of 30ha or more exclusively subject to licensing by the Environmental Protection Agency (EPA). The environmental watchdog regulates peat extraction through the Integrated Pollution Control (IPC) system, with the new regulations bringing the threshold level down from 50ha to 30ha.

The Department for Planning told *The Green News* that the combined intent of the new regulations is to put a new regime in place that will get rid of the current "twin-track approach" and provide a more "streamlined regulatory approach" building on the EPA's expertise in this area. The new system will bring in stronger protections, the department said, as it is mandatory to carry out an environmental impact assessment under EPA licensing and further assessment is required where any proposed extraction site may impact on a protected nature area.



Harte Peat site on 28 July 2018. Photo: Friends of the Irish Environment

Friends of the Irish Environment, which has a long history of monitoring and challenging unlicensed peat extraction, said that it has “deep concerns” about the legal change. In 2010, a satellite survey commissioned by FIE and carried out by University College Cork, identified over 150 sites that are above the 30ha threshold, a third of which the Government determined in 2013 required planning permission. The environmental group argues that removing large-scale extraction from the planning scheme effectively offers a “free pass to unauthorised operators to continue extracting peat”. FIE also questioned the bite of the watchdog to bring companies in line, with the EPA slow to respond to its 2009 warnings of unlicensed activity by Harte Peat at sites in Co Westmeath above the [then 50ha threshold](#). While the EPA is currently embroiled in a legal challenge with the company, [an injunction brought last November](#) to halt extraction up to five metres deep at a Harte Peat site [was adjourned](#). Mr Justice Charles Meehan found that the agency was aware of extraction for at least five years and as such could have acted sooner. He directed an early hearing of the ongoing case for March 2019.

FIE’s Director Tony Lowes said that the group is also concerned that the regulations were brought “behind closed doors” without public consultation or Oireachtas debate. The decision to remove the peat industry from the planning system will also limit the ability of individuals and concerned bodies to challenge large-scale peat projects, FIE argues. The Irish planning regime currently allows for concerned parties to make an appeal to An Bord Pleanála for a small fee where it disagrees with a local authority’s grant of planning permission. The planning authority is then tasked with examining the planning decision afresh and making a decision to refuse planning permission or to allow it, often with certain conditions. Under the new regime, however, appeals against EPA decisions for IPC licences may only be challenged by way of judicial review in the High Court, an often costly and time-consuming process. Speaking at a [legal conference last summer](#), the Chief Justice, Mr Justice Frank Clarke, said that prohibitive legal cost is a key challenge in bringing environmental cases in Ireland. Speaking at the same event, the European Commission’s Liam Cashman said that Ireland “stands out as really exceptional” within the EU due to the “cost risks” associated with taking environmental cases to the courts. “I think it’s difficult to be surprised if you don’t see your mainstream environmental organisations staying out of the courts. You may then wonder are we really getting the kind of environmental litigation that would serve the public interest,” he added. The Department for Planning told *The Green News* that environmental NGOs can take advantage of “special legal costs arrangements” if they wish to take proceedings against any EPA decisions.

The move, Mr Lowes said, also runs contrary to the “lofty promises” from Mr Bruton to address Ireland’s rising emissions since taking over the climate and environment brief last October. According to the EPA, around 23 Mt of soil carbon was lost between 1990 and 2000 through industrial peat extraction. Today, 84 per cent of raised bogs have been affected by peat extraction. A recent University College Dublin-led study found that it will be impossible to rewet all degraded peatland sites from an economic point of view. A targeted approach, the study found, may be required to pick sites with the most potential for biodiversity regeneration and carbon storage. Following this “prioritizing approach”, the authors accept, could mean that some industrial extraction sites will remain drained even after extraction has ceased. The decision to remove large-scale extraction from the planning system will do little to help, according to the study’s lead author, Dr Florence Renou-Wilson. The UCD peatlands scientist told *The Green New* that the move is also “at odds” with our international obligations to both protect our bogs and lessen the environmental impacts from extraction. Various EU Directives, Dr Renou-Wilson said, recognise the need to protect peatlands and restore ecosystem services to “help combat climate change, biodiversity loss, flooding and water pollution”. “Peat extraction activities, which include draining wetlands, increase CO₂ emissions and exacerbate climate change, pollute our waterways and the air we breathe, increase risks of flooding and destroy biodiversity and our last wilderness,” she said.

A DCCAE spokesperson said that the Government remains committed to making Ireland a climate leader and transitioning away from peat to low carbon fuel sources is crucial to achieving that ambition. “The publication of these regulations do not alter Bord na Móna’s plans to wind down the production of peat over the next decade in line with their recently launched ‘Brown to Green’ strategy,” the spokesperson said. The semi-state, however, will [continue to extract peat](#) for horticulture and peat bedding for livestock, along with many private peat harvesting companies. Demand for peat as animal bedding peaked last summer during the fodder crisis with the carbon-rich resource recommended by Teagasc as a “viable alternative” to straw.

In an affidavit for the EPA’s injunction proceedings against Harte Peat last November, the founder of Monaghan Mushroom Group (MMG) Ronald Wilson said that the industry [“relies entirely” on peat for](#)

[mushroom casings](#). An injunction order, Mr Wilson said, would “devastate the mushroom industry within days” and would cause “huge financial loss” to his company that has an annual turnover of over €160 million.

- <https://greennews.ie/removal-peat-planning-free-pass-unauthorised-extraction/>
- <https://www.irishtimes.com/news/environment/new-peat-cutting-rules-mean-bog-destruction-will-continue-says-action-group-1.3781929>

Netherlands

LTO focuses fully on peatland drainage

The federation of Dutch farmers LTO North West believes that the pace of the roll-out of underwater drainage is far too slow and wants more large projects to start soon. This commitment is part of the Veenweidenoffensief (Peat Meadow Offensive), a broad approach that the organisation started from 1 January. As part of the offensive, LTO North Region West has appointed a quartermaster to boost the roll-out of underwater drainage in the western peat meadows, preferably with projects in which entire polders participate at the same time. The aim is to slow down subsidence in peatlands by 50 percent.

The aim of the offensive is to find a promising future for the agricultural sector in the peat meadow areas. A recent members' consultation shows that farmers are particularly positive about underwater drainage and level-controlled drainage as measures against subsidence. Of the respondents, 72 percent said they had confidence in the technology. Almost 60 percent of the members want to start working with underwater drainage in the long term. 40 percent want to do so within five years.

In addition to underwater drainage, it is also about available freshwater, opportunities for farmers to determine water levels, a sound business case for wet crops, a good earnings model for nature-inclusive agriculture and further reduction of greenhouse gas emissions.

- <https://www.nieuweoogst.nu/nieuws/2018/12/11/lto-zet-vol-in-op-drainage-veen>



Experimental pressure drainage in a peat meadow in the Netherlands. Photo: Hans Joosten.

GreenLeft comes with delta plan for subsiding peatlands

The GroenLinks (GreenLeft) Group in the Lower House of Parliament launches a Delta Plan for the peat meadow area. A peat commissioner, a water level fixation and a financial reward for farmers must save the sagging peat. Member of the Lower House Laura Bromet packs the proposals in an initiative note that was submitted at the beginning of February. Government coalition party D66 joined. On January 25 Bromet held a symposium on the concept in Broek in Waterland. In recent weeks Bromet has been talking to farmers,

scientists and interest groups. Also Frisian, where the problem is most manifest. Subsiding peat meadow areas cause an enormous CO₂ emission of 30 tons per hectare per year. In Friesland, this even amounts to 40 tonnes per hectare.

In political The Hague there was not much attention for this problem until now. This changed with the recent 'Climate Proposals' in which a few paragraphs are devoted to the peat meadow problem. Bromet wants to make progress. She used to be alderman in Waterland, a peatland area north of Amsterdam. There she noticed that peat soil subsidence is mainly addressed locally and at most provincially. And that has to change. What is missing is: overview.

Everyone knows that subsidence and CO₂ emissions decrease when the water level rises. This is also good for biodiversity and the status of meadow birds. The farmers are reluctant. They want to continue using their land. It seems like a vicious circle.

The initiative memorandum 'The hidden polluter' advocates long-term research. It takes 500,000 euros to draw up a Delta Plan Peat. A Peat Commissioner can then streamline plans. It is important to find financial compensation for the agricultural sector. In the draft memorandum, Bromet refers to a subsidy for maintaining peat pasture areas.

In Friesland, in some places the peat meadow area has been drained to a depth of more than 90 centimetres. Because the peat oxidises, 7 megaton of CO₂ is released annually in the Netherlands. That is equivalent to the emissions of two million cars, according to the note. In the total climate challenge of 48.7 megaton in 2030, this is more than 14 percent of the emissions that must be reduced.

GroenLinks wants to look for alternatives. The Hague should use part of the climate funds to raise the water level. The party thinks it is worth investigating whether areas can be used for the storage of CO₂. That seems cheaper than at sea.

In some places, experiments are being conducted with underwater drainage. In this way, the level can be raised and the farmer can continue to farm. Bromet is careful. "It could be one of the choices, but we are not sure yet whether it works. Digging trenches releases a lot of CO₂. If the ground settles, it can sink. That is a waste of public money." Construction of underwater drainage costs between 2000 and 2500 euros per hectare. It is many times cheaper to rewet. But then research is also needed into alternative agricultural use, such as the cultivation of cranberries, cattail or wild rice. Or keeping water buffaloes, which can easily cope with swampy land. European structural or agricultural funds can help.

The consultation sessions were not always easy. GroenLinks advocates a total ban on retaining tillage, such as ploughing for maize cultivation, by 2020. Because: "You have to leave the soil alone". In the province of Utrecht, turning tillage is already prohibited, in Noord-Holland also, although it is not maintained there.

The initiative memorandum was presented to Minister of Agriculture Carola Schouten in February. The cabinet will respond to it, after which the Lower House will have its say.

- <https://www.lc.nl/friesland/GroenLinks-komt-met-deltaplan-voor-het-zakkende-veen-24114354.html>
- <https://app.nieuweoogst.nu/nieuws/2018/12/17/groenlinks-wil-hoger-waterpeil-veengebied>
- <https://demonitor.kro-ncrv.nl/artikelen/waarom-miljoenen-nederlanders-zich-zorgen-moeten-maken-over-veenweiden>

D66 and GroenLinks call on the government to raise the groundwater level in the peat meadow area and to significantly reduce livestock farming there. Because the groundwater level is now kept artificially low for the benefit of farmers and cattle farmers, there is major damage to the foundations of houses and buildings in the surrounding area. In addition, dry falling peat causes huge CO₂ emissions and deterioration of the habitat for meadow birds.

The question is whether the parties will get their way in the short term. The government has also recognised the problem for some time, but within the government coalition, D66 will encounter reservations, particularly from the Christen Democrats and the Christian Union, parties that have traditionally held the interests of the agricultural sector dear. The agricultural organisation LTO Nederland is also in favour of measures, but emphasises that the agricultural function 'must not be compromised'. If in some areas it is too problematic to combine agriculture with a higher water level, compensation should be paid to farmers. If the level or function of an area changes, the farmers concerned must be compensated.

- <https://www.volkskrant.nl/nieuws-achtergrond/oproep-d66-en-groenlinks-verhoog-grondwaterpeil-schroef-veeteelt-terug-in-veenweiden~bdc73d23/>



The IMCG Field Symposium 2018 studying a cattail cultivation field in the Netherlands. Photo: Hans Joosten.

Norway

Norway bans biofuel from palm oil to fight deforestation

In December 2018, the [Norwegian parliament voted for a ban on palm-oil based biofuels](#). Starting from 2020, the government is expected to impose taxes and policies to exclude biofuels linked to deforestation risk. While the Norwegian market accounts for less than 1% of the total palm oil exports, it sets an example towards market-based deforestation combatting policies. The EU has also decided to ban the use of palm oil in motor fuels [starting from 2021](#).

Malaysia pledged to implement policies to ensure the sustainability of palm oil production and supply chain, however measures should also be taken to stop further expansion of palm plantations.

- <https://www.greenoptimistic.com/norway-bans-biofuel-from-palm-oil-to-fight-deforestation-20190101/>

Poland

Alkaline fens conservation

Take a look at the new “guidebook on good practices of alkaline fen conservation”! Downloadable under: http://alkfens.kp.org.pl/wp-content/uploads/2018/11/GUIDEBOOK_EN.pdf . Also available in Polish (see Literature on p. 56).

Rumania

Congress “Fen peatlands across ecological gradients” 5-8 June 2019 in Danube Delta, Tulcea, Romania.

Among wetland types, peatlands are characterized by permanently waterlogged soils, which determine biogeochemistry, vegetation composition, microbiological processes and slow decomposition rates, and make them to effective carbon sinks and stores. Fens, i. e. ground- and surface water- fed peatlands, occur from the Arctic to the Tropics and from the high mountains to the sea. They exhibit a large ecological diversity, from oligotrophic to highly eutrophic and from slightly acidic to strongly calcareous and often have a high and special species richness. However, because of increased nutrient availability, they are also often strongly degraded by drainage and agricultural use. We invite you to a meeting at the southernmost limit of continuous fen distribution in Europe, the Danube Delta with its highly productive reed fens, to discuss fen ecology and

diversity and to increase knowledge to facilitate their more effective restoration as fully-functional peat-forming systems.

June 5, 2019 (WE): field trip to REPEAT case study site floating fens in Enisala (number of participants limited)

June 6, (TH): REPEAT plenary sessions and poster session.

June 7, 2019 (FR): Deltas & Wetlands 2019 symposium

June 8, 2019 (SA): Boat trip in the Danube Delta

For more information: <http://repeatconference.ddni.ro/>

The REPEAT project (Restoration and prognosis of PEAT formation in fens linking diversity in plant functional traits to soil biological and biogeochemical processes) aims to clarify how environmental factors and human management interact with soil biodiversity in determining rates of peat accumulation in undrained and rewetted fens. The project is funded by ERANET Cofunds BiodivERSA3. www.repeat-project.com

Russian Federation

Russia moving towards carbon market

Tatiana Minayeva (tatiana.minayeva@care-for-ecosystems.net)

The absence of the legislative background for carbon markets in Russia is the clear obstacle for the development of the economic incentives for peatland restoration projects including paludiculture. At the end of 2018 a step was undertaken towards resolving this problem, when the advisor on Climate Policy Ruslan Eldegeriev directed a proposal on the development of carbon market in Russia to the Prime Minister of the Russian Federation Dmitry Medvedev.

The document states the need to develop an economy with low GHG emissions "in order to raise a competitiveness of Russian goods in face of growing carbon protectionism". The document quite detailed explains the principles of and differences between carbon markets and carbon taxes. The document mentions that a draft law "On state regulation of GHG and particular changes to a number of legislative acts" has been submitted to the Duma. Mr.Eldegeriev mentioned to the Prime Minister, that there is a need for developing economic mechanisms and for a special statement on the regulation of stating, distribution, transfer and purchase of permitted volumes of emissions, as well as criteria for designating the volumes. A decision is requested to determine a fee for GHGs as a basic instrument.

In the description of the experiences of other countries, carbon credits from the LULUCF sector are not mentioned. Significant action is needed to make sure that this sector is also considered.

Rewetting Gorokhovetskiye bogs

From 22 to 28 October, Greenpeace volunteers, foresters and employees of the management of specially protected natural areas (SPNTs) of the administration of Vladimir region were engaged in rewetting Artemov bog, a part of the Gorokhovetskiye peatlands, being a natural monument of regional importance. Such measures are necessary to protect both forest and local residents from the tragic consequences of peat fires, which periodically occur in the region. In August 2018, a major peat fire in the forests of the Ministry of Defense near Petushki, burned more than 1.5 thousand hectares of forest, whereas the peat smoke covered the cities of Petushki, Sergiev Posad (in Moscow Region) and even reached Vladimir.

The Gorokhovetsky complex consists of 5 bogs and is one of the specially protected areas with disturbed ecosystem as a result of drainage, which was carried out in the 1960s-1970s. At that time, a large drainage canal and many small canals connecting each other were dug across the wetlands." The peatland was included in the list of specially protected natural areas in the 1970s. The peatland has burned several times.

"After the fire in Petushinsky district, we inspected all peatlands in the protected areas and found that in Gorokhovetsky district in September the water level in the canals was zero. We were very alarmed by this. We contacted Greenpeace to help us with rewetting activities. We are working to restore this wetland system so that it can be regenerate itself, even after 100 or 200 years," said Olga Kanishcheva, Head of the Department of Protected Areas of Vladimir Region.

The technology of peatland rewetting is quite simple: in order to retain water at a certain level, specialists install a kind of "dam" across the main drainage canals. There are two types of cofferdams: ones made of logs, boards and bags of sand and peat, or special plastic sheet piles, which form a solid waterproof wall when

attached to each other and do not decompose over time. Handmade technology has many drawbacks. The dams need to be installed in dry canals so that logs, planks and bags are tightly connected to each other. This technology is laborious and time consuming. In addition, water still passes through peat sacks, which, by the way, can simply float to the surface if there is a large amount of water.



In autumn, when the icy water in the swamp has risen by almost a meter, hammering plastic tongue and groove into the peat is a much more convenient, safe and fast technology. However, in order to hammer tongue and groove into the peat, it is necessary to manually dig a deep and long groove. Greenpeace volunteers use shovels and hoes for this purpose, and if you need to cope with roots and snags, a chainsaw. From the outside, the process looks rather unusual - like cultivating a swamp and sawing the ground.

"The main purpose of the work is to reduce fire hazard. In September, there was almost no water in the canals, now the water level has risen slightly. The summer was dry, and if the swamp caught fire somewhere, it wouldn't be possible to extinguish it. We are installing a water retaining lintel made of Larsen's plastic sheet pile. It is installed quite quickly - 15 meters of such a dam is installed in a day. The tongue and groove itself does not decompose over time. This year we are building one dam, but later on we plan to build a cascade of dams to ensure that the water difference between the dams does not exceed 20 centimetres," said Greenpeace employee Ivan Semyonov, who manages the volunteers.

The effect of the construction of the "dam" will be seen in spring 2019, when the water level will rise after snowmelt. However, the first results were already visible a week after the installation of the partition wall, when the water had risen by 15 centimeters.

In addition to the rewetting works, Greenpeace volunteers took part in a special seminar under the guidance of the German hydrologist, geo-ecologist and peatland specialist Frank Edom. The wetland scientist clearly demonstrated how to properly study the peat, what conclusions can be drawn depending on the appearance of the deposit, as well as how to conduct rewetting of the bog.

The rewetting project is financed by Greenpeace: the organization brought volunteers and equipment, and purchased the necessary Larsen sheet piles. The administration of Vladimir region ensured the development of the rewetting project and provided additional manpower: foresters and staff of the protected area.

- <https://zebra-tv.ru/novosti/jizn/obvodnenie-gorokhovetskich-bolot/>
- https://www.youtube.com/watch?time_continue=2&v=r1RQSH2qzAA



The German peatland hydrologist Frank Edom explaining the ins and outs of peatland rewetting. Photo: Greenpeace.

Peatlands in the Russian Internet 2018: West and East, South and North

Tatiana Minayeva (tatiana.minayeva@care-for-ecosystems.net)

- 1) News feeds from Kaliningrad informed about the launch of a peatland restoration programme and a training workshop on peatlands in the framework of collaboration between the Government and the project "Restoring peatlands in Russia" in 2018: http://vishtynec.gov39.ru/news/detail.php?ELEMENT_ID=187
- 2) The XIXth Galkina Readings took place in February 2018 in St. Petersburg. It is a traditional meeting of mire scientists from all over the country timed to coincide with World Wetlands Day (2 February) and dedicated to the memory of mire scientist E.A. Galkina who made a great contribution to the nation and the city during the Great Patriotic war: <https://www.binran.ru/science/konferentsii-i-shkoly/ix-galkinskiie-chteniya/>
- 3) In spite of the fact that the Ramsar Convention had dedicated World Wetlands Day and the entire year 2018 to urban wetlands and their positive role especially in mitigating heat waves and purifying water, the authorities of St. Petersburg keep actively developing the city's peatlands:
 Kanavnoye Mire to be transformed into a zoo: https://spbvedomosti.ru/news/gorod/boloto_ne_dlya_begemota/
 Pargolovo Mire in Suzdalsky Avenue to be transformed into a square: <http://kanoner.com/2018/02/16/158700/>
- 4) Developments on wetlands went on in Leningrad Oblast as well: at the end of August, Nord Stream (a company under Swiss law) launched the construction work of the North Stream II pipeline on the territory of Kurgalsky Nature Reserve (zakaznik), which is also a wetland of international importance (Ramsar Site):
<https://korrespondent.net/business/companies/4005934-v-rossyy-startuet-stroytelstvo-severnoho-potoka-2>
https://www.dp.ru/a/2018/10/31/Vihod_k_morju_cherez_les
 Nature conservation organizations and experts in Russia that had expressed their concerns about changes in the hydrology of the protected Kadar Mire in the Nature Reserve, said good-bye to the Reserve.
https://pikabu.ru/story/proshchay_kurgalskiy_zakaznik_6129645
<https://dront.ru/news/2018/08/04/severnyi-potok-2-razdavit-krasnoknizhnye-rasteniya/>
<https://pasm.ru/archive/215298/>
 According to our information, a Ramsar mission will in early summer 2019 assess losses and propose a compensation plan.
- 5) In 2018, Rustam Sagitov passed from among us. He devoted his entire life to nature conservation in Leningrad Oblast and was a stalwart defender of Kurgalsky Nature Reserve. In cherished memory of him:
http://bfm.org.ru/wkdir/team/farewell_rustam/
<https://www.iucn.org/ru/news/secretariat/201808/rustam-abdullaevich-sagitov-odin-vedushchih-rossijskih-ekologov>

- 6) On June 15, Novay Gazeta informed about a peatland fire in Leningrad Oblast that was aggravated by an ammunition explosion hazard: <https://www.novayagazeta.ru/news/2018/06/15/142496-pod-peterburgom-gorit-torfyanoe-boloto-s-beopripasami-est-ugroza-vzryvov>
The Greenpeace Firefighting project was engaged at the site: <https://www.youtube.com/watch?v=XFjivseKU88>
- 7) Status monitoring of peatlands using drone aircrafts was started in summer 2018 in Vologda Oblast where peatland rewetting activities were carried out: <https://vologda.mk.ru/social/2018/07/12/sostoyanie-torfyanikh-bolot-na-vologdachine-ezhenedelno-kontroliruet-mchs.html>
- 8) In the adjacent Novgorod Oblast, N. Zavyalov, vice director of Rdeysky Nature Reserve (zapovednik), aired his grievances just before the 25th anniversary of the Reserve. He complained how difficult it was to study and conserve vast protected areas of peatlands without funds, with the peatland massive being a classical study object of Russian mire science and the largest near-natural raised bog in Europe. Director V. Krolikov hoped to establish a visitor center by anniversary day. <https://novvedomosti.ru/articles/region/48726/>
- 9) Encouraging news came from Bashkiria, where it was decided to establish 15 local protected areas for peatlands covering a total area of 2500 ha: <http://ufatime.ru/news/2018/09/25/v-bashkirii-15-torfyanyh-bolot-stanut-pamyatnikami-prirody/>
- 10) In Siberia, peatland news was apparently positive: Vasyugansky Nature Reserve was established by a Governmental Decree of the Russian Federation Nr 1563 as of 17 December 2017
<http://static.government.ru/media/files/Uq7ooOAzmr2PzaZ7p9L7dIPufDBCMBR.pdf>
We have tried to find out how the Decree has been fulfilled: whether the demarcation is done, whether the site is listed in the land cadaster, and whether the administration is established (which was to have a seat in Tomsk where major research centers with staff trained in mire science are located). We only learned that the newly established reserve was placed under management of Kuznetsky Alatau State Nature Reserve (zapovednik): <https://tass.ru/sibir-news/5300632>
Let's hope that Kuznetsky Alatau Nature Reserve (in Kemerovo oblast) will succeed in solving the massive task of the cadastral work and the management of the 614803 ha large area Tomskaya and Novosibirskaya oblasts....
Remember that the area is on the waiting list to be designated a World Natural Heritage site.
<http://whc.unesco.org/en/tentativelists/5114>
<http://www.greenpeace.org/russia/ru/campaigns/world-heritage/great-vasyugan-mire/>
- 11) Joint projects with NABU and Warsaw University under trilateral agreement can make a positive contribution to nature conservation practice in Siberia. A workshop and visit to the Vasyuganskoeye Peatland took place in September 2018. <http://www.sibniit.tomsknet.ru/index.php/mainmenu-88/mainmenu-87/ainmenu-103/918-17-oktyabrya-2018-goda>
- 12) In the Russian Far East, World Wetlands Day was not disregarded in 2018. On February 3, the "Wings over Peatlands" environmental awareness-raising festival was announced on the legendary Russky Island. However, the entry fee seemed to highlight the dignity of the occasion, ranging from 450 to 1000 rubles. We are unaware of any enthusiasts who joined the event, also because the island seems to be hardly accessible for ordinary citizens, especially those with kids.
<https://www.vl.ru/afisha/vladivostok/event/87850>
- 13) In central Russia, peatlands were also in fashion as of summer 2018: Tver tour operators changed their focus and offered tours to local mires instead of Turkey and Crimea.
<https://tver.mk.ru/social/2018/07/11/a-nu-v-boloto-zhurnalisty-nashli-zateryanny-mir-v-tverskoy-oblasti.html>
As the number of such tourists is expected to grow, it would be sensible to think how to mitigate negative impacts of the tours and, at the same time, raise awareness of the natural values of peatlands (other than being a source of cranberries). Moreover, the tour included Orshinsky Mokh peatland where researchers and practical experts from Tver have been working. Their activities are described below.
- 14) On 17–19 September 2018, the last operating peat research and education centre in Tver, Tver State Technical University, held an international workshop on "Sustainable Development of the Peat Industry in Russia: problems and perspectives". More than 100 participants discussed reorganization of peat industry in Russia to promote effectiveness, sustainability, and environmental responsibility.
<http://vesti-tver.ru/dailynews/razvitie-torfyanogo-dela-v-rossii-obsudili-na-konferentsii-v-tvgtu/>
<https://vk.com/@tverstu-mezhdunarodnaya-konferenciya-problemy-i-perspektivy-ustoichi>
<https://russia.wetlands.org/ru>
<https://ethnoexpert.com/ru/problemy-perspektivy-ustojchivogo-razvitiya-torfyanogo-dela-v-rossii-etnoekspert-vnosit-svoj-vklad/>
- 15) Colleagues from Tver made an educational video in support of peat industry development and published it on a business development website in March 2018. The material includes extensive recommendations on how to establish a peat business. <http://coolbusinessideas.info/kak-sozdat-biznes-na-torfe/>

The website contains a 20-minute video about numerous peat uses. Oleg Misnikov tasted peat, perforated tree stumps with an INSTORF peat borer, and did his best to explain how many great products can be produced from peat. https://www.youtube.com/watch?v=SZV6QA5h_o



Peatland rewetting in Orshinsky Mokh. Photo: Hans Joosten.

- 16) A peat fire was registered near the town of Petushki in Vladimir Oblast in August 2018. Interestingly, the information was communicated by Greenpeace, not by the Ministry of Civil Defence, Emergencies and Disaster Relief. <http://www.forestforum.ru/viewtopic.php?t=22667>
- 17) In October 2018, Greenpeace volunteers built an earth dam to block the main channel in a peatland of the Gorokhovets Mire Group, Vladimir Oblast. Greenpeace published a contribution about the initiative titled "A taste of peat, or how to make a peatland wet: why damming peatlands and who can teach us that". Frank Edom, a German mire hydrologist, introduced the Greenpeace volunteers and experts to peat layer structure and explained them how to use this knowledge when planning peatland rewetting. Frank gave a master class on water regime restoration planning and building dikes in peatlands. <https://greenpeace.ru/blogs/2018/10/30/vkus-torfa-ili-kak-sdelat-boloto-mokrym/>
Zebra TV commented on the event as well. <https://zebra-tv.ru/novosti/iizn/obvodnenie-gorokhovetskich-bolot/>
- 18) Rewetting of the Bolshoye Ursovo Peatland in Kameshkovo Rayon, Vladimir Oblast, by the project "Restoring peatlands in Russia" in summer 2018 was only reported by the project itself: <https://russia.wetlands.org/ru/%D0%9F%D1%80%D0%BE%D0%B5%D0%BA%D1%82%D1%8B/rewetting-bolshoye-ursovo-degraded-peatland/>
- 19) At the same time, mass media of the Vladimir Oblast would give recommendations on how to collect cranberries on peatlands, which undoubtedly promotes a positive image of mires: <http://prizyv.tv/2018/10/vladimirtsy-podalis-na-bolota-za-tsarskoj-yagodoj/>
There was also positive news from Central Russia:
- 20) A new mire reserve (zakaznik), Danilovskoye Peatland, was established in September 2018 in Moscow Oblast: <https://ria.ru/20180921/1529075210.html>
- 21) In September 2018, the EcoElektrichka Project returned to the Craneland Nature Reserve. The project unites a group of people that are enthusiastic about nature, history, and architecture in Moscow Oblast. They basically take a train and visit interesting places. It is awesome that the project participants find peatlands so exciting. https://www.usadboved.ru/eco_talodom
We have more peatland lovers thanks to Olga Grinchenko and her Craneland team!
- 22) Ryazan Oblast joined the Russian-German project "Restoring peatlands in Russia" in February 2018. <https://62info.ru/news/okruzhayushchaya-sreda/28956-nemtsy-torfyanye-bolota-ryazanskoy-oblasti/>

<https://www.rzn.info/news/2018/2/2/ryazanskaya-oblast-prisoedinitnya-k-proektu-vostranovleniya-torfyanih-bolot.html>
<http://ryazan.bezformata.com/listnews/vostranovleniem-torfyanih-bolot-v-ryazanskoj/64565964/>
http://www.mnr.gov.ru/press/news/minprirody_rossii_bank_kfw_i_posolstvo_germanii_v_rossii_podpisali_plan_meropriyatiy_po_vosstanovleniu/?sphrase_id=83758

- 23) A delegation of the Embassy of Germany in Russia arrived in Ryazan Oblast in August 1918 and visited Oka Nature Reserve (zapovednik): <http://news.zapoved.ru/2018/08/22/okskij-zapovednik-posetili-uchastniki-proekta-vostranovlenie-bolot-rossii/>
- 24) Some news about Ryazan peat producers selling peat to India came in November 2018. They have already managed to supply their peat products to this distant country, despite all calculations showing that transportation of peat over more than 200 km is not economically feasible. India must be in a dire need of peat! <https://rg.ru/2018/11/20/reg-cfo/riazanskij-torf-nachali-postavliat-v-indiiu.html>
- 25) The Greenpeace Forest Forum kept us updated about peatland fires throughout the country, for which we are very grateful: <http://www.forestforum.ru/viewtopic.php?t=22396>
- 26) The website of volunteer firefighters informed us about peatland fires, and we are grateful to them as well: http://firevolonter.ru/peat_fires

Peatlands are becoming a focus of federal information resources:

- 27) Russia's Ministry of Natural Resources and Ecology informed about World Wetlands Day, a memorandum with Wetlands International, and some activities under the Russian-German project "Restoring peatlands in Russia". Peatlands were a subject of some news communicated by federal Protected Areas.
http://www.mnr.gov.ru/press/news/2_fevralya_otmechaetsya_vsemirnyy_den_vodno_bolotnykh_ugodiy_/?sphrase_id=83758
http://www.mnr.gov.ru/press/news/minprirody_rossii_planiruet_sozdat_v_chelyabinskoy_oblasti_natsionalnyy_park_zigalga/?sphrase_id=83758
http://www.mnr.gov.ru/press/news/5_letniy_yubiley_prazdnuet_natsionalnyy_park_onezhskoe_pomorie_arkhangel'skaya_oblast_/?sphrase_id=83758
http://www.mnr.gov.ru/press/news/glava_minprirody_rossii_servey_donskov_pozdravil_zapovedniki_komandorskiy_kamchatskiy_kray_i_kerzhen/?sphrase_id=83758
http://www.mnr.gov.ru/press/news/v_zapovednike_bryanskiy_les_bryanskaya_oblast_vyavleno_20_novykh_vidov_lishaynikov_i_blizkikh_k_nim/?sphrase_id=83758 and others.
- 28) Aleksander Khaburgayev, a popular Russian television host in nature programming, delighted us in November 2018 by having said that he was curious about mires. Although his text was riddled with factual errors and his understanding of mire nature sounded odd, we enjoyed the very fact.
https://www.moya-planeta.ru/travel/view/ne_dumaj_o_bolote_svysoka_43314/
- 29) In January, a peatland-related question was given in the Field of Wonders – a television quest that is popular in Russia <https://sprintotvet.ru/dlya-chego-v-drevnosti-nekotorye-narodyi-ispolzovali-moh-sfagnum.html>
- 30) In May, the FOBOS meteorological website published a piece about peatlands and their role in climate regulation:
<https://www.meteo-vesti.ru/news/63658701580-sohranenie-torfyanih-bolot-pomozhet-borotsya-globalnym-potepleniem>
- 31) In January the Energy Project website published materials praising peat as a fuel resource
<http://energy-project.ru/istoriya-ispolzovaniya-torfa-v-kachestve-topliva/>

Online mass media in Russia's regions occasionally published materials dedicated to peatlands:

- 32) A web paper in Ulyanovsk wrote about peatlands in the Ushakov Forest. In fact, they were described as "rotten", but we are used to that. <http://ulgrad.ru/?p=170503>
- 33) An excellent web resource, the Ecological Map of Lipetsk Oblast (<http://lounb.ru/lipparks/>) has been launched in that region of Russia. They have published information about some peatlands, for instance the Popovo Peatland: <http://lounb.ru/lipparks/oopt/boloto-popovo>
- 34) Penza Oblast celebrated World Wetlands Day by informing the public about volumes of peat resources for 382 local peatlands. <http://russia58.tv/news/165819/>

United Kingdom

Farmer's union calls for net zero agriculture emissions in the UK by 2040

The Oxford Farming Conference, held early January, brought people from the UK agricultural industry together to discuss future farming, innovation and the world beyond Brexit. Agriculture is a major contributor to climate change and is responsible for around 10 per cent of the UK's greenhouse gas emissions. To combat this, National Farmers' Union (NFU) President Minette Batters said that emissions must reach net zero by 2040, she said: "I believe we can match and beat their lead – our aim must be ambitious, to get our industry to net zero across all greenhouse gas inventories by 2040 or before."

The NFU also addressed their fears over a no-Brexit deal and what effect this would have on the farming industry. Michael Gove, Environment Secretary, spoke at the conference about the benefits of Brexit, he said: "It allows us largely to diverge from EU regulation after the transition, to leave the Common Agricultural Policy and end all mandatory payments to the EU".

During the conference, Green MP, Caroline Lucas called for a tax on meat to slash emissions. She said: "Better manure management and careful selection of feed can both help reduce greenhouse gas emissions, but – at the risk of incurring the wrath of the energy secretary, who said recently that encouraging people to eat less meat would be the worst sort of nanny state ever – we need serious consideration of measures like a meat tax." This news follows the NFU calling for a [united approach](#) to tackle climate change, by asking the Government to set an appropriate emissions target.

- <http://www.climateaction.org/news/farmers-union-calls-for-net-zero-agriculture-emissions-in-the-uk-by-2040>

Dredging to restore reedswamp in the Broads

The official channel of the Broads Authority, the body responsible for looking after the Broads Park in Norfolk and Suffolk, UK, has released an amazing video about the dredging and reed bed restoration operations at Hickling Broad. In the video, sediment is being dredged from the channel at Hickling Broad in the Broads Park, than pumped into an area known as 'Chara Bay', set to be used to fill large geotextile bags which will prevent the an area of restored reedswamp from being swept away by the wind and waves from the broad.

The works began in 2018 and will take place over three winters to create 1ha of new land into Hickling Broad, using 19,000m³ of dredged sediment. The works are being undertaken by the Broads Authority as part of the INTERREG funded CANAPE project (Creating A New Approach to Peatland Ecosystems).

- <https://www.dredgingtoday.com/2019/02/06/video-restoring-hickling-broad/>



Wind turbines in the Flow Country, Scotland. Photo: Hans Joosten.

Wind-turbine carbon payback times shorter than expected, finds new study

The carbon payback times for wind turbines are much shorter than previously thought, according to international research carried out at the largest community wind farm in the UK. German student, Katharina Lutz, found the turbines at Beinn Ghrideag had a payback time of just 47 days – a drastic reduction on the previous estimate of 2.3 years.

'Carbon payback' refers to the length of time it takes for the negative environmental impact from the construction of a wind farm on peatland to be offset by the positive environmental impact of generating clean energy instead of burning fossil fuel. When peat is disturbed for large concrete foundations to be laid for According to her report 'CO₂ Emissions from Wind Turbines on Peatland: A Practical Calculation' "...the main reason for these [earlier] projected high carbon payback times is the assumption that all displaced peat becomes fully oxidized and that the construction not only causes drainage within the immediate construction area, but that the effect can extend outwards by a distance of up to 400 m. However, existing turbines on a wind farm on the Isle of Lewis, Scotland, on a site which is typical of the region, were found to have a carbon payback time is only 47 days when the actual impact following several years of operation is established."

When concrete foundations are being laid, peat is usually disposed of by being spread thinly over the surrounding area, with the assumption that all the displaced carbon will end up as atmospheric carbon dioxide. However, Lutz found that less drainage takes place than had been thought – and that extensive drainage is not necessary as the hole can be backfilled.

Community wind farm developer Calum MacDonald, who developed Beinn Ghrideag for Point and Sandwick Trust, said: "This is a hugely important piece of research, especially for wind farm projects in the Highlands and Islands. There is mounting evidence that the climatic conditions we have means that peat disturbance is not so great and peat recovery is generally faster in the Highlands and Islands than elsewhere in the UK and Europe. Community-owned projects, of course, will always be more conscientious and environmentally-minded because it's our land and our future that we are working on."

Alasdair MacLeod said: "If you object to the turbines, you can't object to them on the basis of what they do to the peat. Any objection has got to be something else. You may hate them because of the visual intrusion but you can't hate them because they damage the peatland because they don't."

- <https://www.windpowerengineering.com/business-news-projects/wind-turbine-carbon-payback-times-shorter-than-expected-finds-new-study/>

Celebrating peatlands in the Broads

February 12 saw the launch of 'Celebrating Peatlands' a landmark Broads Authority initiative in collaboration with their North Sea Region Partnership, CANAPE (Creating A New Approach to Peatland Ecosystems). This match-funded project has secured more than 500,000 euros from the European Regional Development Fund to research new ways of managing peatland ecosystems for the benefit of the environment. The project looks at finding new uses for wetland material in the form of sustainable soil improvers and charcoal as well as engaging with the public so that everybody from students to landowners understand the fragility and importance of their local Peatland landscapes.

The Broads Authority will be trialling the creation of a different kind of fuel from the Broads, by turning natural waste, wood and reed into charcoal and biochar using a transportable kiln. The kiln, known as a carbon composter, burns biomass in reduced-oxygen conditions. The outcome of this process are charcoal for cooking or heating and fine biochar which can be added to soil to improve its quality. The sustainably produced charcoal will be available for the public to purchase from May 2019.

Working with local farmers and growers, the Broads Authority will also be producing soil improvers from reed that is cut in order to maintain nature reserves. The reed soil improver aims to boost soil organic matter, helping growers hold more water and nutrients in their soils. It is hoped that this could help improve the water quality leaving these fields and improve soil structure.

Alongside the production of the sustainable products, a public engagement programme will be undertaken from July 2019 to highlight the importance of peat and its management. This includes working with students from East Norfolk sixth form and Hobart High School, who will take deep peat cores around the Broads. With these new skills students will help teach their peers and the community all about peat coring at a series of events. There will also be engagement with local reed-cutters to better understand where their reed and sedge beds need to be protected and even expanded. In addition to this the Broads Authority will be working with those farmers and land managers who are custodians of peatland ecosystems to look at the environmental benefits, such as flood management and carbon capture, which result when people manage the landscape in alternative ways.

- <http://www.publicnow.com/view/92EFA43E2F3B27972B629F400106DE9532A56263>

Lindow Moss owner 'can and will' restore peat bog

Croghan Peat insists it 'can and will' deliver the restoration scheme for Lindow Moss successfully. The firm, who submitted the planning application for 14 homes, has previously come in for criticism over its management of the peat bog. Conservationists have questioned whether Croghan Peat could fund Lindow Moss' restoration and suggested the company had ignored conditions on the permission it currently has for peat extraction.

But Ben Malin, representing the company, told the committee that the company had a successful track record of restoring peat bogs. He said: "The owners have got a wealth of experience in peat land restoration. They have restored sites and they will restore this site." Mr Malin added that a legal agreement would secure the link between the 14 houses and the restoration of the peat bog.

- [Cheshire East Council approves plans to build 14 homes so Lindow Moss' restoration can be funded](#)
- [Councillors are divided over plans to build 14 homes for the restoration of Lindow Moss](#)
- <https://www.knutfordguardian.co.uk/news/17318945.lindow-moss-owner-insists-it-can-and-will-restore-peat-bog/>
- <https://www.bbc.co.uk/news/uk-england-manchester-46633242>

Lindow Moss is a raised mire peat bog on the edge of Wilmslow in Cheshire, England. It has been used as common land since the medieval period and is best known for the discovery of the preserved bog body of 'Lindow Man' in 1984 (see Brothwell, D.R. 1986. The bog man and the archaeology of people. British Museum Publications, London, ISBN 0-7141-1384-0).

Manchester Metropolitan University commissioned Ralph Hoyte (www.ralphhoyte.com) to compose a poem on Lindow Man for "The Science and Beauty of Peatlands: Manchester Science Festival" 2016. Read the poem's start on the next page. Listen to the full poem: https://mmutube.mmu.ac.uk/media/Dark+Materials+-+Ralph+Hoyte/1_pjislxw4

Simon Caporn, Manchester Metropolitan University: "A positive outcome after years of arguments about the condition and fate of Lindow Moss near Manchester Airport. It is actually my nearest and dearest bog! Peat cutting will finish and the bog is likely to be restored in some way. A compromise and controversial deal was reached which allows the current users of the land to build houses on some land on the margin of the bog. In exchange they will stop destroying it."



Lindow moss Sphagnum. Photo: Simon Caporn.

DARK MATERIALS*Ralph Hoyte (ralphdhojte@gmail.com)***SPEAK, MEMORY**

Of the resolute hero,

The brave, the strong, the taker of many heads of warriors
 Defender of his people, desired of women ... beloved of the gods.

[I am That One]

BEAR – WITNESS

To his deeds,

The Morrigan, Triple Goddess of the Earth
 Black raven of Death, scalded crow, and Nemai, she of the battle fury

[I am That One]

TO ME, THE SACRIFICIAL ONE OF NO NAME

[I am That One]

The one honoured amongst men - and gods

Why would the Druids choose the lamb, the weakest of the flock?

They chose me: the strongest of the warriors, the most valiant in combat, the most favoured of women.

They chose me. I accepted. I accepted the Triple Death, for if the sacrifice is not willing, the earth will be
 shattered.

[I am That One.]

I am a warrior.

REFRAIN

Of that dank water, of acidity high
 that edge where earth cries out for sky;
 what did his blood-dimmed eyes last see?
 Writhing in death's agonies, down on one knee?

Getting through the bog of water deterioration together

With only 14 per cent of rivers in England classed as healthy, it is a huge challenge to get our waterways fit for purpose, not only for water customers and businesses but also for the wildlife that relies on healthy water to survive. The scale of the environmental problem in our waterways means that no one sector can solve it on its own. That's why 20 environmental NGOs, co-ordinated by Blueprint for Water, and nine water companies have pulled together to create a set of shared ways of working setting out how they will work together to help leave the environment in a better state. The shared principles include: greater collaboration on policy and projects; promoting greater awareness of the links between water management and the natural environment; working together to achieve and build upon Water Framework Directive obligations; sharing key data sets; and joint efforts to enhance and improve the resilience of water-based ecosystems.

One such successful on-the-ground joint project is RSPB's partnership with United Utilities at Dove Stone – an area of open moorland above the Dove Stone reservoir in Greater Manchester, with internationally important blanket bog that supports a host of wildlife. The project involves working with tenant farmers to restore 4,000 hectares of moorland including 2,500 hectares of blanket bog degraded by decades of damage. The joint work started in 2010, continuing the work of United Utilities' Sustainable Catchment Management Programme.

This is a significant restoration project which has been recognised as a model of success with the partnership winning the Natura Award for Conservation in 2016 and the CIEEM Award for Large-scale Conservation in 2018. Peat bogs are a hugely valuable landscape for both wildlife and in regulating environmental pollution. The peat that cloaks our highest land forms a blanket of life that supports characteristic plants and animals, especially the Sphagnum mosses, with 'Blanket Bog' a very rare habitat globally for vulnerable wildlife. Peat bogs, when in good condition, are also a massive carbon 'sink', continually soaking up CO₂ from the atmosphere. Upland soils are the largest carbon store in England with 300 million tonnes of carbon stored in English peatlands, mostly in the uplands, and restoring these habitats is a key way to help tackle climate change.

But these invaluable peat bogs are under attack. Historic atmospheric pollution from the northern industrial towns and cities killed more than 99 per cent of the peat-building Sphagnum moss at Dove Stone. With overgrazing and burning the peat oxidizes and is prone to be washed away in times of heavy rain. Peat-staining in our water is costly to remove and the peat that disappears through chemical oxidation ends up pumping carbon into our atmosphere.



Black Hill, upstream of the Dove Stone reservoir. Photo: Hans Joosten.

RSPB and United Utilities' work on the ground involves planting up the bare areas of peat, blocking eroded gullies and innovative work sowing over 400,000 individual handfuls of peat-forming sphagnum mosses. It's a work in progress, but there have already been dramatic changes in the landscape. As the peat recovers, we are seeing benefits in water quality, water retention and the work is helping to tackle climate change by locking up carbon. There has also been a flurry of wildlife as a result of the project with birds such as dunlins, golden plovers, curlews, peregrine falcons and red grouse, insects and amphibians increasing and vulnerable mammals like water voles starting to flourish.

Jo Harrison, United Utilities: "We are hugely proud of what we've achieved with the RSPB at Dove Stone. Our customers get to benefit from a beautiful area which was previously in great decline, where rare birds, insects and animals are thriving, and better quality water is entering our reservoirs. This sort of project is a win-win-win for customers, the environment and our business. We're looking forward to working even more closely with nature partners in future to help leave our environment in a better condition than we found it."

Nathan Richardson, RSPB: "Dove Stone is a great example of the environmental transformation that can be achieved when water companies and nature experts work hand in hand. It is important that the momentum that we've developed from joint-working on these key projects is built upon so that benefits to nature turn from a trickle into a flood. It's not just through on the ground projects that we can make a difference, by showing the common ground and joint voice that water companies and environmentalists have on difficult issues like agricultural pollution, climate change, drought and flooding we can get these messages heard more clearly, and acted upon, by Government."

"With the UK's waters in a critical state this pooling of resources and expertise is essential to help make them healthy again," says the RSPB's Nathan Richardson, who is vice chair of Blueprint for Water. "Joint projects on

the ground across the country are already achieving success and we look forward to more joint work on policy, targets, campaigns, and initiatives delivering results for the environment.”

Jo Harrison, asset management director at United Utilities, added: “It is essential for wildlife, for our customers and for us as a business, to pool our resources and expertise with that of nature experts. From peat bogs to politics behind the scenes, we are increasingly working with partners to make our business more sustainable, deliver innovative solutions to environmental problems, and benefit our customers through an improved service and improved landscapes for them to enjoy.”

- <https://wwwonline.co.uk/features/getting-through-the-bog-of-water-deterioration-together>

UK peatland experts link with EU

A new group has been launched that will exchange expertise across Europe to help in the fight against climate change and restore some of our most vital habitats. Launched by the [North Pennines Area of Outstanding Natural Beauty](#) (AONB) Partnership in collaboration with environmental network [Eurosites](#), the group will bring together peatland restoration experts to share the science and practice behind the work they do on sites across Europe. As lead partner of the EU funded [Pennine PeatLIFE](#) project, staff from the North Pennines AONB Partnership will chair the new [Peatland Restoration Working Group](#). Setting up the group is one of the objectives of Pennine PeatLIFE, and will allow experts to share scientific research and expertise as well as the practical restoration and monitoring techniques which have been developed across the EU.

[Kristijan Čivić](#), Network Development Manager of Eurosites said: “Our members have been sharing knowledge between similar sites for more than 30 years. We are now looking at a different approach where we work together on a topic of joint interest. “Peatland restoration is a topic that has gained a lot of importance in the light of the climate change discussions and is gaining importance with countries in the North-West Europe, both among Eurosites members and beyond.” [Paul Leadbitter](#) from the North Pennines AONB Partnership, explained: “As part of our European funded Pennine PeatLIFE project we will be working with our European partner Eurosites to bring together past and current peatland restoration projects to learn from what has gone before, share research and practice and coordinate the future efforts of peatland restoration.”

- http://www.stackyard.com/news/2019/02/environment/08_npaonb_eurosites.html

North-America

United States of America

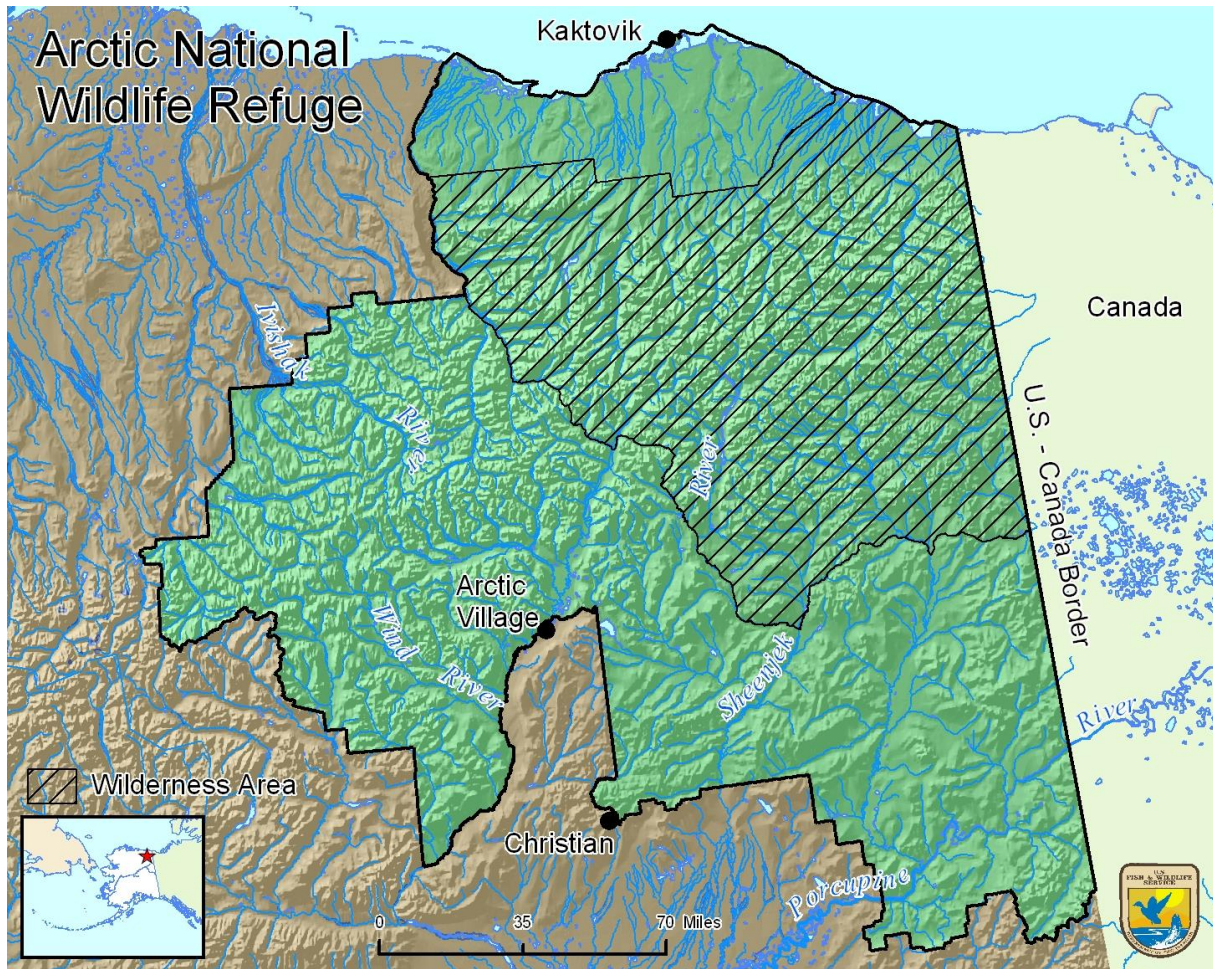
Tests for oil in Arctic Refuge won't happen this winter, officials say

A plan to conduct seismic testing for oil and gas exploration across a large swath of the Arctic National Wildlife Refuge in Alaska, rich in polygon mires, has been shelved for this winter, Interior Department officials have said. The announcement signals at least a temporary victory for environmental groups and scientists who oppose the project, in which large trucks and other heavy equipment would crisscross the refuge's coastal plain along the Arctic Ocean, using acoustic signals to map underground rock formations that may hold oil and gas reserves.

Steve Wackowski, the department's senior adviser for Alaska affairs, made the announcement at a hearing February 5, in Kaktovik, a village within the refuge. Faith Vander Voort, a department spokeswoman, said the seismic proposal was still pending, and that the company behind it, SAExploration, had asked that the start date be moved to next December. The postponement will have no direct impact on the Interior Department's plan to open the coastal plain, 1.5 million acres known as the 1002 Area, to oil and gas development. The department, through the Bureau of Land Management, has said it wants to offer leases for sale this year.

The coastal plain is thought to overlie formations containing billions of barrels of oil, and [the Trump administration has been eager to allow development](#), part of its push for more commercial activities on federal lands. But the decision means that oil companies that bid on the leases will have to do so without the benefit of new data on potential reserves. The only seismic studies in the refuge were done three decades ago, using less-effective technology. An exploratory well, the only one in the refuge, [was drilled around the same time](#), and its results have remained secret.

Opponents of the seismic plan have argued that the work would harm polar bears and other wildlife and leave [indelible scars on the delicate tundra](#) in the refuge, a vast, largely unspoiled wilderness in the northeastern part of the state. But the Bureau of Land Management and SAExploration have said that new seismic technology has little permanent impact on the landscape. The company says it is working with federal wildlife officials on steps to be taken to minimize harm to wildlife.



Democrats have blocked proposals to open the refuge for decades, but in 2017 the Trump administration and Republicans in Congress [approved a plan to allow oil and gas development there](#). A draft environmental impact statement on the leasing plan [was issued in December](#) and is expected to be finalized this year, allowing the sales to proceed.

SAExploration's proposal calls for trucks to roll across the tundra in grid lines roughly 200 yards apart, sending acoustic signals deep into the earth to assess the location of any oil or gas deposits. The trucks have rubber caterpillar treads designed to minimize the impact on the fragile landscape. They would be accompanied by two "man camps" holding up to 160 workers each, along with fuel tanks and other equipment for the work.

Opponents have said that even with the steps taken to minimize damage, the seismic work could have lasting effects on the fragile landscape, compressing the tundra and potentially altering vegetation types and the flow of water. They point out that there are still signs of the seismic work undertaken in the area in the mid-1980s. And [work by a Fairbanks-based digital mapping expert](#) last summer found evidence of damage by seismic trucks that operated just west of the refuge in April.

- <https://www.nytimes.com/2019/02/07/climate/seismic-testing-anwr-alaska.html?partner=rss&emc=rss>

Trump to farmers: Wetlands protections 'one of the most ridiculous' regulations

Monday, January 14, President Donald Trump pointed to farmers as winners from the administration's proposed rollback of federal protections for wetlands and waterways across the country, describing farmers crying in gratitude when he ordered the change. But under longstanding federal law and rules, farmers and farmland already are exempt from most of the regulatory hurdles on behalf of wetlands that the Trump administration is targeting. Because of that, environmental groups long have argued that builders, oil and gas

drillers and other industry owners would be the big winners if the government adopts the pending rollback, making it easier to fill in bogs, creeks and streams for plowing, drilling, mining or building. Government numbers released last month support that argument.

Speaking to the American Farm Bureau Federation in New Orleans, Trump told farmers the federal protections for waterways and wetlands were “one of the most ridiculous” regulations. “It was a total kill on you and other businesses,” Trump said. He claimed farmers and builders alike wept in gratitude when he signed an executive order in 2017, as one of first official acts of his presidency, directing a rewrite of the wetlands protections.

“We’re going to keep federal regulators out of your stock tanks, your drainage ditches, your puddles and your ponds,” Trump told the cheering farmers.

Opponents contend Trump and his administration put farmers front and center as beneficiaries of the proposed rollback because of the strong regard Americans historically hold for farming. “But the building industry, oil and gas and others with lower profiles in the campaign “are going to be some of the big beneficiaries,” said Kenneth Kopocis, the Environmental Protection Agency’s deputy assistant administrator for water under the Obama administration.

The more than 300-page financial analysis the administration released last December when it formally proposed the rollback appears to starkly quantify that disparity. Of 248,688 federal permits issued from 2011 to 2015 for work that would deposit dirt or other fill into protected wetlands, streams and shorelines, the federal government on average required home builders and other developers to do some kind of mitigation — pay to restore a wetland elsewhere, generally — an average of 990 times a year, nationwide, according to the government’s analysis. In all, other industries and agriculture obtained an average of 3,163 such wetlands permits with some kind of extra payment or other mitigation strings attached each year. Farmers represented just eight of those on average in a year, according to the administration’s figures.

The administration’s proposal greatly narrows what kind of wetlands and streams fall under federal protection. If it is formally adopts it after a public comment period, it would change how the federal government enforces the landmark 1972 Clean Water Act and scale back a 2015 Obama administration rule on what waterways are protected. Environmental groups say millions of miles of streams and wetlands would lose protection.

Trump signed an order in February 2017 directing the rollback. With farmers as well as homebuilders by his side, Trump called the waterways protections then in force a “massive power grab” targeting “nearly every puddle or every ditch on a farmer’s land.”

- <https://www.pbs.org/newshour/politics/trump-to-farmers-wetlands-protections-one-of-the-most-ridiculous-regulations>

Duke University begins work on 10,000-acre ‘Carbon Farm’ in Eastern North Carolina

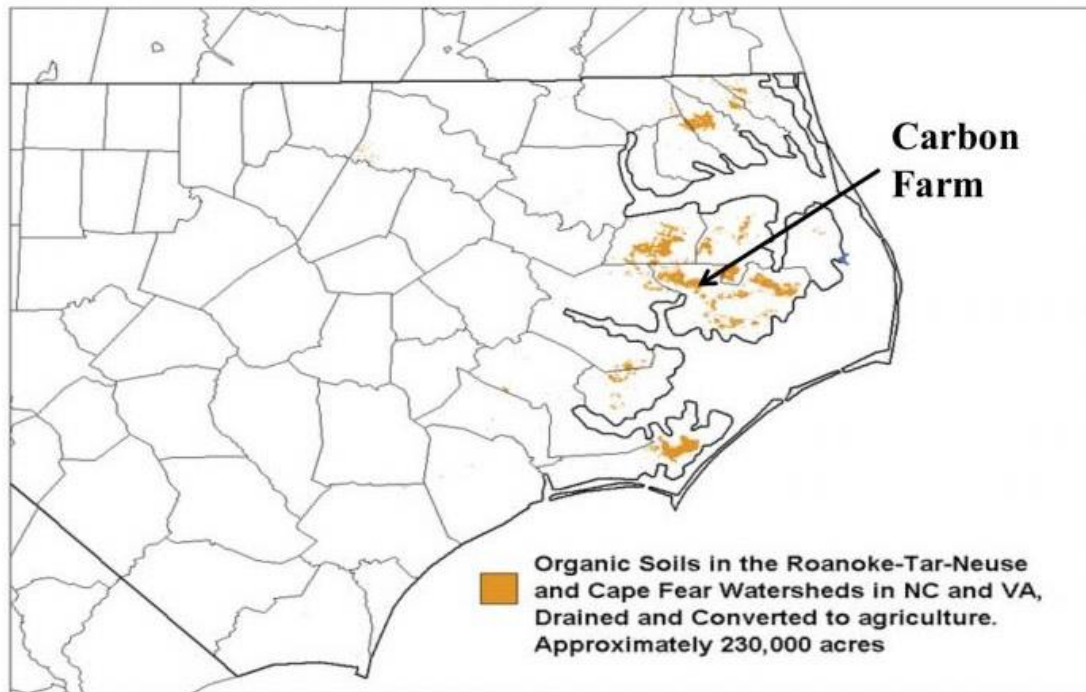
Duke University has acquired rights to create a 10,000-acre ‘carbon farm’ on privately owned land in eastern North Carolina. When fully operational, the farm -- located in Hyde County on a tract of pocosin peatlands formerly drained for agriculture -- could potentially store enough carbon to offset much of the university’s carbon emissions and help Duke meet its goal of achieving carbon neutrality by 2024. Offset credits not used by the university could be sold to others.

Carbon farming is a new approach for fighting global warming that uses enhanced land management and conservation practices to increase the amount of carbon that current or former agricultural lands pull out of the air and lock away in their soil and vegetation.

“By rewetting and reverting these former peatlands to their natural wetland state, we can significantly increase their capacity for long-term carbon storage,” said Curtis J. Richardson, director of the Duke University Wetland Center, who spearheaded efforts to broker the deal with the landowner, Hyde County Partners LLC, and will direct the restoration and management of the 10,000 acres for carbon storage. The freshwater marshland will also protect local groundwater supplies and provide wildlife habitat as side benefits.

“This is a tremendous opportunity for the state of North Carolina, Duke University and the private landowner to create the largest carbon farm in the eastern United States, maybe the entire country,” Richardson said.

Researchers recently began a two-year pilot program on 300 acres of the land to identify the best ways to restore the former farm fields to their original wetland state and measure and verify how much carbon their saturated peat soil can store. If enough carbon credits can be generated at a cost-effective rate, production will then expand to the other 9,700 acres.



Carbon farming programs already under way in Australia, New Zealand, Europe, Canada, California and the Midwest have shown that a 2.5-acre plot of working rangeland or pasture can store more than one metric ton of carbon annually. Recent studies indicate that Southeastern pocosin peatlands, such as those found in Hyde County, have much greater potential. “A five-year study we did at Pocosin Lakes National Wildlife Refuge in nearby Tyrrell County showed that these peatlands have some of the highest net carbon credit values ever recorded,” said Richardson, who holds a faculty appointment as John O. Blackburn Distinguished Professor of Resource Ecology at Duke’s Nicholas School of the Environment. “When restored to their natural state as shrub-dominated bog wetlands, they can potentially store 10 to 15 times more metric tons of carbon per year than drained or unrestored agricultural lands,” he said. “Left undisturbed, carbon in pocosins can remain stored for millennia due to the unique natural antimicrobial compounds that prevent the waterlogged peat from rapidly decaying and releasing the carbon back into the atmosphere,” Richardson said. “The presence of these compounds acts as a protective mechanism or latch -- greatly reducing the release of greenhouse gases, even during periods of drought.”

In 2017, Duke University generated about 258,000 metric tons of carbon emissions. If carbon storage rates at the new 10,000-acre farm are similar to those recorded at Pocosin Lakes, “we could offset much of the university’s carbon footprint in one fell swoop,” Richardson said. “Duke will likely also have thousands of tons of carbon credits to sell.” Richardson said he and his team are already looking for other landowners, industries or businesses that would like to partner or invest in projects at similar sites. He noted that spatial analysis by researchers at the Duke Wetland Center shows there are hundreds of thousands of additional acres of pocosin peatlands across eastern North Carolina and other southern coastal states that have been drained for agriculture or forestry, or abandoned. Restoring these lands so they can be managed as productive carbon farms could provide a new source of revenue for landowners throughout the region and yield long-term environmental benefits above and beyond carbon storage.

“Rewetting these areas and restoring them as freshwater peatland bogs will raise the local water table and help keep salt water from intruding into neighboring agricultural lands, which is a big problem in a low-lying coastal area like this,” Richardson said. “Restoring the lands will also aid wildlife conservation for native or migratory species and create new opportunities for restricted hunting on some lands by creating better habitats for wild turkeys, quails and ducks.

- <https://nicholas.duke.edu/about/news/duke-university-begins-work-10000-acre-%E2%80%98carbon-farm%E2%80%99-eastern-nc>

Peatland conservation relevant papers Dec. 2018 – Jan. 2019

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

1. A guidebook on good practices of alkaline fen conservation: http://alkfens.kp.org.pl/wp-content/uploads/2018/11/GUIDEBOOK_EN.pdf
2. Podręcznik dobrych praktyk w ochronie torfowisk alkalicznych: http://alkfens.kp.org.pl/wp-content/uploads/2018/09/PODRECZNIK_PL_FINAL.pdf
3. Holocene sea level and climate interactions on wet dune slack evolution in SW Portugal: A model for future scenarios?: <https://journals.sagepub.com/doi/abs/10.1177/0959683618804633>
4. Global cost estimates of forest climate mitigation with albedo: a new integrative policy approach: <https://iopscience.iop.org/article/10.1088/1748-9326/aaeaa2>
5. Importance of CO₂ production in subsoil layers of drained tropical peatland under mature oil palm plantation: <https://www.sciencedirect.com/science/article/pii/S0167198718302897>
6. Variation in soil properties regulate greenhouse gas fluxes and global warming potential in three land use types on tropical peat: <https://www.mdpi.com/2073-4433/9/12/465>
7. Autogenic and allogenic factors affecting development of a floating *Sphagnum*-dominated peat mat in a karst pond basin: <https://journals.sagepub.com/doi/abs/10.1177/0959683618804631>
8. Is moss stoichiometry influenced by microtopography in a Boreal peatland of Northeast China?: <https://link.springer.com/article/10.1007/s11769-018-1000-4>
9. Microtopography determines the habitat quality of a threatened peatland butterfly at its southern range margin: <https://link.springer.com/article/10.1007%2Fs10841-018-0095-3>
10. Using Digital Surface Models from UAS imagery of fire damaged *Sphagnum* peatlands for monitoring and hydrological restoration: <https://www.mdpi.com/2504-446X/2/4/45/htm>
11. Ecohydrological gradients and their restoration on the periphery of extracted peatlands: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/rec.12914>
12. Delineating boreal plains bog margin ecotones across hydrogeological settings for wildfire risk management: <https://link.springer.com/article/10.1007/s11273-018-9636-5>
13. The impact of anthropogenically induced degradation on the vegetation and biochemistry of South African palmiet wetlands: <https://link.springer.com/article/10.1007/s11273-018-9638-3>
14. Dragonfly fauna in rewetted mires in Belarus: diverse but different from natural sites: <https://link.springer.com/article/10.1007/s11273-018-9625-8>
15. Interacting effects of elevated atmospheric CO₂ and hydrology on the growth and carbon sequestration of *Sphagnum* moss: <https://link.springer.com/article/10.1007/s11273-018-9607-x>
16. Current state and vegetation history of spring-fed fens in Western Pomerania (Northern Poland): a case study of the Chociel River valley: <https://link.springer.com/article/10.1007/s11273-018-9640-9>
17. Salt-enrichment impact on biomass production in a natural population of peatland dwelling Arcellinida and Euglyphida (Testate Amoebae): <https://link.springer.com/article/10.1007/s00248-018-1296-8>
18. The sustainability of an environmental policy: A review of Indonesia peat restoration program: https://www.e3s-conferences.org/articles/e3sconf/abs/2018/49/e3sconf_icsolca2018_02003/e3sconf_icsolca2018_02003.html
19. Natural iron fertilization of the coastal ocean by “blackwater rivers”: <https://www.sciencedirect.com/science/article/pii/S0048969718347788>
20. Review of emissions from smouldering peat fires and their contribution to regional haze episodes: <https://www.publish.csiro.au/WF/WF17084>
21. Thaw processes in ice-rich permafrost landscapes represented with laterally coupled tiles in a Land Surface Model: <https://www.the-cryosphere-discuss.net/tc-2018-210/>
22. Evaluating tephrochronology in the permafrost peatlands of Northern Sweden: <https://www.sciencedirect.com/science/article/pii/S1871101418300797>
23. Improvements to the Wetland Extent Trends (WET) index as a tool for monitoring natural and human-made wetlands: <https://www.sciencedirect.com/science/article/pii/S1470160X18309671>
24. Insight into indicators related to the humification and distribution of humic substances in *Sphagnum* and peat at different depths in the Qi Zimei Mountains: <https://www.sciencedirect.com/science/article/pii/S1470160X1830894X>
25. Soil carbon and nutrient sequestration linking to soil aggregate in a temperate fen in Northeast China: <https://www.sciencedirect.com/science/article/pii/S1470160X1830918X>
26. Anaerobic methane oxidation in High-Arctic Alaskan peatlands as a significant control on net CH₄ fluxes: <https://www.mdpi.com/2571-8789/3/1/7>

27. A novel approach for high-frequency in-situ quantification of methane oxidation in peatlands: <https://www.mdpi.com/2571-8789/3/1/4>
28. Methane emissions from a grassland-wetland complex in the southern Peruvian Andes: <https://www.mdpi.com/2571-8789/3/1/2>
29. Vegetation and climate changes during the last two glacial-interglacial cycles in the western Mediterranean: A new long pollen record from Padul (southern Iberian Peninsula): <https://www.sciencedirect.com/science/article/abs/pii/S0277379118306668>
30. Salt effects on carbon mineralization in southeastern coastal wetland soils of the United States: <https://www.sciencedirect.com/science/article/pii/S0016706118310176>
31. Digital mapping of soil carbon fractions with machine learning: <https://www.sciencedirect.com/science/article/pii/S001670611732030X>
32. Impacts of land use change on soil organic matter chemistry in the Everglades, Florida - a characterization with pyrolysis-gas chromatography–mass spectrometry: <https://www.sciencedirect.com/science/article/pii/S0016706118317452>
33. Rates and spatial variability of peat subsidence in Acacia plantation and forest landscapes in Sumatra, Indonesia: <https://www.sciencedirect.com/science/article/pii/S0016706118315635>
34. The full carbon balance of a rewetted cropland fen and a conservation-managed fen: <https://www.sciencedirect.com/science/article/pii/S0167880918304018>
35. Restoration of blanket peat moorland delays stormflow from hillslopes and reduces peak discharge: <https://www.sciencedirect.com/science/article/pii/S2589915518300063>
36. Mapping upland peat depth using airborne radiometric and lidar survey data: <https://www.sciencedirect.com/science/article/pii/S0016706118303495>
37. A robust vegetation-based elevation transfer method for reconstructing Arctic polygon mire palaeo-microtopography: <https://www.sciencedirect.com/science/article/pii/S0031018218305212?via%3Dihub>
38. High-risk infrastructure projects pose imminent threats to forests in Indonesian Borneo: <https://www.nature.com/articles/s41598-018-36594-8>
39. Impact of peatlands on carbon dioxide (CO₂) emissions from the Rajang River and Estuary, Malaysia: <https://www.biogeosciences.net/16/17/2019/>
40. Physical dynamics of Lake Victoria over the past 34 years (1984–2018): Is the lake dying?: <https://www.sciencedirect.com/science/article/pii/S0048969718348915>
41. Economic losses of carbon emissions from circum-Arctic permafrost regions under RCP-SSP scenarios: <https://www.sciencedirect.com/science/article/pii/S0048969718351787>
42. Seismic line impacts on proximal boreal forest and wetland environments in Alberta: <https://www.sciencedirect.com/science/article/pii/S0048969718351143>
43. Assessing paleohydrologic controls on the hydrogen isotope compositions of leaf wax n-alkanes in Chinese peat deposits: <https://www.sciencedirect.com/science/article/pii/S0031018218309386>
44. 2nd State of the Carbon Cycle Report (SOCCR2): <https://www.globalchange.gov/content/about-soccr-2>
45. Assessing human and environmental pressures of global land-use change 2000–2010: <https://www.cambridge.org/core/journals/global-sustainability/article/assessing-human-and-environmental-pressures-of-global-landuse-change-20002010/307BC019C33F9C0914C131F888D5EB2E>
46. Impact of warming and reduced precipitation on photosynthetic and remote sensing properties of peatland vegetation: <https://www.sciencedirect.com/science/article/abs/pii/S0098847218316149>
47. Melanin mitigates the accelerated decay of mycorrhizal necromass with peatland warming: <https://onlinelibrary.wiley.com/doi/pdf/10.1111/ele.13209>
48. Transformation of organic phosphorus compounds during 1500 years of organic soil formation in Bavarian Alpine forests – A ³¹P NMR study: <https://www.sciencedirect.com/science/article/pii/S0016706118316793>
49. Modelling and mapping soil organic carbon stocks in Brazil: <https://www.sciencedirect.com/science/article/pii/S0016706117320669>
50. State of the Apes - Infrastructure development and ape conservation: <https://www.stateoftheapes.com/volume-3-infrastructure-development/> (entire book 57Mb!)
51. Role of agricultural activity on land subsidence in the San Joaquin Valley, California: <https://www.sciencedirect.com/science/article/pii/S0022169418309661>
52. Simulated projections of boreal forest peatland ecosystem productivity are sensitive to observed seasonality in leaf physiology: <https://academic.oup.com/treephys/advance-article/doi/10.1093/treephys/tpy140/5298609>
53. Ecosystem carbon response of an Arctic peatland to simulated permafrost thaw: <https://onlinelibrary.wiley.com/doi/abs/10.1111/gcb.14574>
54. Deeper burning increases available Phosphorus, promotes moss growth, and carbon dioxide uptake in a fen peatland one-year post-wildfire in Fort McMurray, AB: <http://hdl.handle.net/10012/14429>

55. Relationship between electrical conductivity and water content of peat and gyttja: implications for electrical surveys of drained peatlands: <https://onlinelibrary.wiley.com/doi/abs/10.1002/nsg.12030>
56. The relative contribution of peat compaction and oxidation to subsidence in built-up areas in the Rhine-Meuse delta, The Netherlands: <https://www.sciencedirect.com/science/article/pii/S0048969718313019>
57. Responses of macroinvertebrate assemblages to environmental variations in the river-oxbow lake system of the Zoige wetland (Bai River, Qinghai-Tibet Plateau): <https://www.sciencedirect.com/science/article/pii/S0048969718351891>
58. Zero to moderate methane emissions in a densely rooted, pristine Patagonian bog – biogeochemical controls as revealed from isotopic evidence: <https://www.biogeosciences.net/16/541/2019/bg-16-541-2019-discussion.html>
59. The potential hidden age of dissolved organic carbon exported by peatland streams: <https://agupubs.onlinelibrary.wiley.com/doi/abs/10.1029/2018JG004650>
60. The potential for modelling peatland habitat condition in Scotland using long-term MODIS data: <https://www.sciencedirect.com/science/article/pii/S0048969718352124>
61. Is deforestation in Borneo slowing down? New maps reveal the truth about plantations: <https://forestsnews.cifor.org/59378/has-borneos-deforestation-slowed-down>
62. Groundwater isotopes in ecohydrological analysis of peatland landscapes: [https://www.rug.nl/research/portal/en/publications/groundwater-isotopes-in-ecohydrological-analysis-of-peatland-landscapes\(f9a77984-24ab-4538-8a88-a4a38333c9b2\).html](https://www.rug.nl/research/portal/en/publications/groundwater-isotopes-in-ecohydrological-analysis-of-peatland-landscapes(f9a77984-24ab-4538-8a88-a4a38333c9b2).html)
63. The impacts of prescribed burning on blanket peatland vegetation: http://etheses.whiterose.ac.uk/22678/2/Noble_AK_PhD_Geography_2018.pdf
64. Are living peatland trees a reliable natural archive for climate reconstruction?: <https://brill.com/view/journals/iawa/aop/article-10.1163-22941932-40190228.xml>
65. Field calibration of TDR to assess the soil moisture of drained peatland surface layers: <https://www.mdpi.com/2073-4441/10/12/1842/htm>
66. Tropical peatlands under siege: the need for evidence-based policies and strategies: <https://www.springerprofessional.de/tropical-peatlands-under-siege-the-need-for-evidence-based-polic/16447860>
67. Native and introduced fish community structure in a freshwater swamp forest: Implications for conservation and management: <https://onlinelibrary.wiley.com/doi/full/10.1002/aqc.3006>
68. Why do we need to document and conserve foundation species in freshwater wetlands?: <https://www.mdpi.com/2073-4441/11/2/265>
69. Assessing nutrient responses and biomass quality for selection of appropriate paludiculture crops: <https://www.sciencedirect.com/science/article/pii/S0048969719302360>
70. Tropical Africa could be a key to solving methane mystery: <https://www.nature.com/articles/d41586-019-00457-7>
71. Permafrost peatlands: Losing ground in a warming world: <https://www.unenvironment.org/resources/frontiers-201819-emerging-issues-environmental-concern>
72. Transforming REDD+ - Lessons and new directions: http://www.cifor.org/publications/pdf_files/Books/BAngelsen1801.pdf
73. A user guide for valuing the benefits of peatland restoration: <https://icasp.org.uk/resources/peat-resources/>
74. Multisensor data to derive peatland vegetation communities using a fixed-wing unmanned aerial vehicle: <https://www.tandfonline.com/doi/full/10.1080/01431161.2019.1580825>
75. The spatial heterogeneity of vegetation, hydrology and water chemistry in a peatland with open-water pools: <https://link.springer.com/article/10.1007/s10021-019-00342-4>
76. What causes deforestation in Indonesia?: <https://iopscience.iop.org/article/10.1088/1748-9326/aaf6db/pdf>
77. Modeling peat- and forestland conversion by oil palm smallholders in Indonesian Borneo: <https://iopscience.iop.org/article/10.1088/1748-9326/aaf044>
78. Evaluating the social and environmental factors behind the 2015 extreme fire event in Sumatra, Indonesia: <https://iopscience.iop.org/article/10.1088/1748-9326/aeee1d>
79. From peat swamp forest to oil palm plantations: The stability of tropical peatland carbon: <https://www.sciencedirect.com/science/article/pii/S0016706118318123>
80. Quantitative analysis of self-organized patterns in ombrotrophic peatlands: <http://www.nature.com/articles/s41598-018-37736-8>
81. Large, climate-sensitive soil carbon stocks mapped with pedology-informed machine learning in the North Pacific coastal temperate rainforest: <https://iopscience.iop.org/article/10.1088/1748-9326/aaed52>
82. Effect of phosphorus and nitrogen on *Sphagnum* regeneration and growth: an experience from Patagonia: <https://link.springer.com/article/10.1007/s11273-019-09657-4>