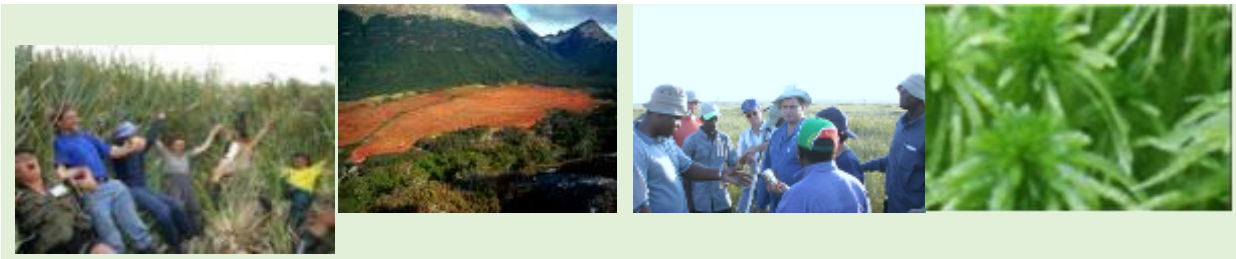


IMCG Bulletin: October /November 2017

INTERNATIONAL MIRE CONSERVATION GROUP

www.imcg.net

Word from the Secretary-General

Dear mire friends

Things are busy on the peatland conservation front and IMCG members are more occupied with making than with writing history, so the reporting is somewhat delayed. Here again a new Bulletin full of information covering the months October and November 2017, which enabled us to cover the climate change negotiations events in Bonn, where peatlands featured as never before.

In this Bulletin also the first information on the next **2018 IMCG Field Symposium and Congress in the Netherlands**, a country with a long and intense history of peatland use and destruction, but also with innovative and pro-active peatland conservation and impressive science-based restoration.

At the end of the Bulletin, as always, a list with relevant recent peatland literature.

Keep sharing your ideas and experiences by sending news, photographs, papers and other contributions for December Bulletin by January 6, 2018 to Hans Joosten at joosten@uni-greifswald.de.

I wish all of you the best for 2018: a new year with new challenges for peatland conservation. Be prepared!

2018 IMCG Field Symposium/General Assembly

Safe the dates: Arrival: Monday August 20, Amsterdam, Departure: Saturday, September 1, Amsterdam.

The first days (August 20-23) we will spend on the Wadden island of Texel, where also the IMCG Congress and General Assembly is planned to be held.

Next basis will be Havelte from where we will make excursions in Drenthe and NW Overijsel (August 23-26). From August 26-29, we will stay in Zwartemeer and vist from their the Bargerveen and East Twenthe. Finally from August 29-31 we will base in Utrecht and visit from there the fens of Utrecht and paludiculture demonstration sites

More information on costs and registration will follow in the next Bulletin and will also be provided on the IMCG website www.imcg.net .

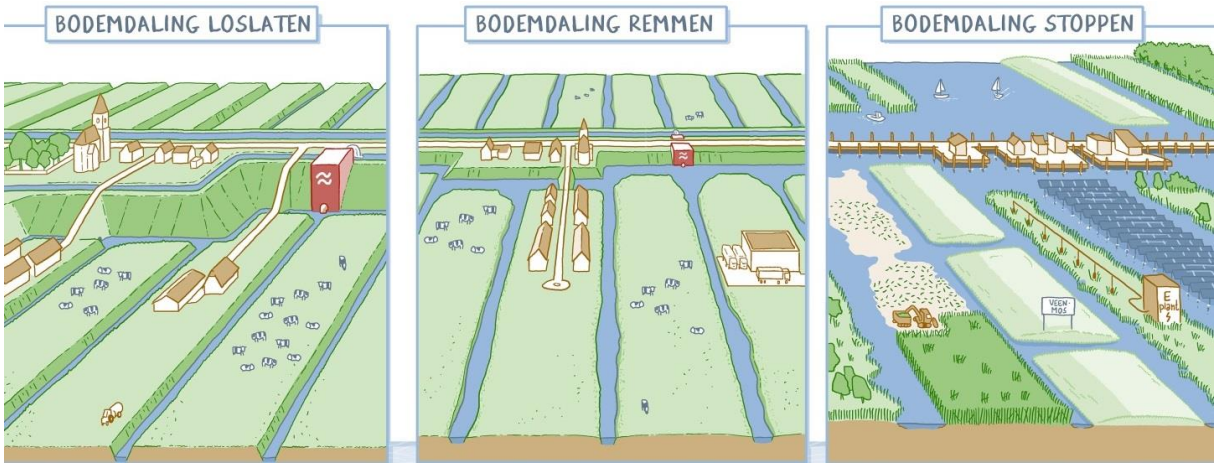
Orchid rich meadow in restored river valley peatland Drentse Aa (Netherlands). Photo: Hans Joosten.

Typically Dutch peat polder landscape with the water higher than the land. Photo: Hans Joosten.

The Dutch challenge

In the Netherlands intensive discussions are taking place about the future of the peatland landscape, see graphics below. Currently large peatland areas are subject to drainage-induced subsidence ("bodemdaling") leading to ever increasing height differences between deeply drained and pumped, intensively used agricultural lands on the one hand (left picture foreground) and low intensity agriculture, settlement and nature conservation sites with much higher water levels on the other hand (left background).

It is clear that continued pumping and subsidence ("loslaten", left picture) is impossible, but what are the alternatives: continuing conventional land use but raise the water levels somewhat to slow down subsidence ("remmen", central picture), or stopping subsidence completely by raising the water level to at or over the surface and changing land use towards wet livelihoods, including paludicultures, floating solar energy, and wet tourism (right picture).



https://www.provincie-utrecht.nl/onderwerpen/alle-onderwerpen/bodemdaling/

Mires and Peat

Our scientific journal Mires and Peat is flourishing with an increasing number of high-quality papers! Find the journal online at http://mires-and-peat.net/. New papers published in October-November 2017 included

- Assessment of the humification degree of peat soil under sago (*Metroxylon sagu*) cultivation based on Fourier Transform Infrared (FTIR) and Ultraviolet-Visible (UV-Vis) spectroscopic characteristics. [S.F. Sim, M.E. Wasli, C.M.R. Yong, P.S. Howell, C. Jumin, N.A. Safie & B. Samling] Volume 19: Article 24. http://mires-and-peat.net/media/map19/map_19_24.pdf
- Refining pedotransfer functions for estimating peat bulk density. [S.J. Chapman, J. Farmer, A. Main & J. Smith] Volume 19: Article 23. http://mires-and-peat.net/media/map19/map_19_23.pdf
- The peatland map of Europe. [F. Tanneberger, C. Tegetmeyer, S. Busse, A. Barthelmes and 55 others] Volume 19: Article 22. http://mires-and-peat.net/media/map19/map_19_22.pdf
- Iberian acid peatlands: types, origin and general trends of development. [X. Pontevedra-Pombal, D. Castro, R. Carballeira, M. Souto, J.A. López-Sáez, S. Pérez-Díaz, M.I. Fraga, M. Valcárcel & E. García-Rodeja] Volume 19: Article 21. http://mires-and-peat.net/media/map19/map_19_21.pdf
- Carbon dioxide and methane fluxes in grazed and undisturbed mountain peatlands in the Ecuadorian Andes. [M.E. Sánchez, R.A. Chimner, J.A. Hribljan, E.A. Lilleskov & E. Suárez. Volume 19: Article 20. http://mires-and-peat.net/media/map19/map_19_20.pdf
- Performance of extensive cattle stocking on a reclaimed minerotrophic wet grassland. [L. Breitsameter, M. Kayser, J. Strodthoff, J. Müller & J. Isselstein] Volume 19: Article 19. http://mires-and-peat.net/media/map19/map_19_19.pdf
- Influence of pore structure on solute transport in degraded and undegraded fen peat soils. [C. Kleimeier, F. Rezanezhad, P. Van Cappellen & B. Lennartz]. Volume 19: Article 18. http://mires-and-peat.net/media/map19/map_19_18.pdf
- Sphagnum growth in floating cultures: Effect of planting design. [Y. Hoshi] Volume 20: Article 8. http://mires-and-peat.net/media/map20/map_20_08.pdf
- Sphagnum moss as a growing media constituent: some effects of harvesting, processing and storage. [S. Kumar] Volume 20: Article 07. http://mires-and-peat.net/media/map20/map_20_07.pdf

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

Asbjørn Moen at the IMCG Polar Urals excursion, Russia, 2017. Photo: Hans Joosten

Asbjørn Moen awarded the Bonnevie Prize

"I am surprised and proud. This is a price I perceive as an honour and recognition for us who have worked in this field for decades," said Asbjørn Moen at NTNU Science Museum, when he received the prestigious Bonnevie Prize from the Norwegian Association of Biologists on 03 November 2017. According to the association, the price "... goes to a person, an organization, an information channel or a special initiative which has highlighted the biology subject in Norwegian public or in Norwegian schools in a particularly advantageous way." Asbjørn Moen has previously been appointed as knight of the Royal Norwegian St. Olav's order, the highest civilian honour conferred by Norway, for his efforts in ecology, conservation and biology.
http://www.universitetsavisa.no/forskning/2017/11/03/Har-forsket-p%C3%A5-myr-i-50-%C3%A5r-n%C3%A5-f%C3%A5r-han-Bonnevieprisen-70248.ece

Global

'No Paris without peatlands': Discussions abound on peat in global climate talks, amid calls for action

In the meeting rooms of the UNFCCC global climate conference in Bonn, 6-17 November 2017, peatlands were never far away. This is true as Germany has expanses of peatlands, most of them drained for agriculture and now emitting huge amounts of carbon into the atmosphere. And it is true as a host of panels, side dialogues and workshops were directing their discussions to these marvellous ecosystems. In this Bulletin a selection of events that paid attention to peatlands. Check the links for more and additional information.

- https://forestsnews.cifor.org/52610/cop23-special-no-paris-without-peatlands?fnl=en
- http://www.en.netralnews.com/news/currentnews/read/14928/environment.minister.speaking.at.unfccc.global.peatland.governance.is.very.important
- https://lifespaceconnect.com/blog/2017/11/13/indonesia-shows-off-progress-in-peatland-restoration-at-un-climate-change-summit/
- http://indonesiaunfccc.com/collective-actions-for-peatlands-restoration-in-indonesia/

Nazir Foead, the Head of the Indonesian Peatland Restoration Agency at the 9 November side event 'Collective Actions for Peatlands Restoration in Indonesia'.

Peatrus project awarded with UNFCCC Lighthouse Award

At the Climate Convention 2017, the Peatrus project was elected as one of the worldwide 19 Lighthouse projects with respect to climate change. The project was initiated to help the Russian government reduce the risk of fire on the drained peatlands. The peat fires around Moscow in 2010 were devastating because they were so difficult to put out. Peat fires continued to burn underground, even in winter under a thick layer of snow. The thick smoke from the fire with its irritant effect seriously affected Moscow and made life in the city hardly bearable. The project focuses on rewetting some 50,000 ha of drained peatland, so that fires are prevented, greenhouse gas emissions strongly reduced and biodiversity can regenerate.

Peatrus key persons with the UNFCCC lighthouse award: From left to right: Jozef Bednar (Wetlands International WI), Frank Moerschel (KfW), Andrey Sirin (Institute of Forestry RAS), Jan Peters (Succow Foundation), Tatiana Minayeva (WI/Care for Ecosystems), Jane Madgwick (WI), Hans Joosten (Greifswald University), Jürgen Keinhorst (International Climate Initiative), Irina Kamennova (WI), Lifeng Li (WI)

Due to the pressing need for action after the fires in 2010, the Russian government quickly started undertaking more traditional fire-fighting measures. These included the construction of roads to allow fire trucks more quickly access or the construction of retention basins and pumps to ensure that enough water is available in the event of a fire. However, these measures are much more expensive than the ecologic rewetting pursued by the project. The project wants to show that rewetting can be a low-cost and environmentally compatible by blocking the drainage canals, so that ground- and rainwater remains in the peatland. Ecological rewetting of peatlands has mainly been put into practice in Germany, the Netherlands and England in the last 20 years – but on rather small areas. In 2010, the Russians looked for ways to efficiently solve the fire risk problem, and the German Chancellor Merkel offered help to the president at the time, Medvedev. The project is part of the International Climate Initiative (IKI). Implementing partners are Wetlands International in cooperation with the Institute of Forest Science of the Russian Academy of Sciences, the University of Greifswald, the Michael Succow Foundation and the Russian authorities. KfW is financing the project on behalf of the Ministry of the Environment with EUR 6.5 million. These funds are used to rewet areas in various Russian provinces including Moscow, Tver, Vladimir and Nizhny Novgorod. A monitoring system will also be set up and Russian partners trained to be able to carry out ecological rewetting independently in the future.

- https://www.kfw.de/stories/environment/climate-change/moore-russland/
- https://www.kfw-entwicklungsbank.de/Internationale-Finanzierung/KfW-Entwicklungsbank/News/News-Details_443008.html
- Film under https://www.youtube.com/watch?v=mY6ZHaSolRg

The need for local action to sustain peatlands globally

This event convened on 10 November 2017, in Bonn, Germany, on the sidelines of the UN Framework Convention on Climate Change. The event was organized by Wetlands International and the Greifswald Mire Centre (GMC) and explored the need for local action to sustain peatlands globally. Jan Peters (GMC) moderated the event. Tim Christophersen, UN Environment, stressed the role of peatlands in global carbon storage, as well as in providing livelihoods for local communities. He said peatland ecosystems deserve a differentiated treatment in the international system, and emphasized that one of the aims of the Global Peatlands Initiative (http://www.globalpeatlands.org) is to help developing countries access peatland technical expertise in a coordinated way. Hans Joosten, University of Greifswald, emphasized the need to maintain and restore wet peatlands to avoid emissions. He stressed that peatlands can be found around the world and can look very different, and noted peatlands have been traditionally under-addressed in fora, such as the Ramsar Convention and the Convention on Biological Diversity. He highlighted that peatlands are the most effective carbon stocks of all terrestrial ecosystems, holding twice as much carbon as all forested areas, and illustrated the economic uses of wet peatlands, including paludiculture crops such as reeds. Alberto Paniagua, Executive Director, Profonanpe, Peru, highlighted a Green Climate Fund project involving seven indigenous peoples groups to protect peatlands. Paniagua highlighted land-use change and agriculture as key threats to peatlands in Peru, and identified sustainable uses of peatland products as a solution. Ruben Rashidi Bukanga, Ministry of Environment, Democratic Republic of the Congo (DRC), outlined his country's activities on climate change and peatlands, emphasizing that it is a pioneer country in REDD+ activities. He showed a video of a research expedition in cooperation with Greenpeace to identify carbon sequestration potentials from peatlands in the DRC. He said a peatland management unit had just been created by the government, noting that it required support to, inter alia, conduct peatland cartography and develop a peatland strategy. Victorine Che Thöner, Greenpeace Africa, presented "wishes" from people from the people of the Congo Basin, compiled in a photo book, to the Ministry of Environment and UN Environment. She said that the wishes, collected during the trip of the Esperanza boat to the Congo Basin, could be summarized as "the people asking authorities to protect their forest." Bas Tinhout, Wetlands International, highlighted his organization's roadmap to accelerate action for peatland restoration. He outlined scientific research to quantify greenhouse gas emissions, subsidence, flooding and peatland inventories. Tinhout stressed the impact of peatland fires in Indonesia, including 100,000 premature deaths during the 2015 fire season. He identified communities as key for sustainable agriculture in the region, stressing the role of paludicultures and land tenure rights. During the ensuing discussion, participants addressed, inter alia: the interaction between large commercial monocultures and small-scale farmers; data collection and peatland inventories; and restoration rates of peatlands.

- http://enb.iisd.org/download/pdf/sd/enbplus148num7e.pdf
- http://enb.iisd.org/climate/cop23/un-redd/html/enbplus148num7e.html

Ruben Rashidi Bukanga (Ministry of Environment, DRC), Victorine Che Thöner (Greenpeace Africa) and Tim Christophersen (UN Environment) at the presentation of the "wishes" book from people of the Congo Basin. Photo: Hans Joosten.

GPI report 'Smoke-on-water' launched

At a high-level side event *Good Peatland Governance to Strengthen Economic, Social and Ecosystem Resilience* at the UNFCCC COP23 in Bonn, Germany, 15 November 2017, the Global Peatlands Initiative under the leadership of UN Environment released its rapid response assessment *Smoke on Water – countering global threats from peatland loss and degradation*. Erik Solheim, Head of UN Environment, Amy Ambatobe Nyongolo, Minister of Environment and Sustainable Development, Democratic Republic of Congo, Arlette Soudan-Nonault, Minister of Tourism and Environment, Republic of Congo and Dr. Siti Nurbaya Bakar, Minister of Environment and Forestry, Indonesia attended the launch. The report aims to close the knowledge gap and enable action on protecting one of the most crucial and the probably least appreciated ecosystems: peatlands.

Peatlands, which can be found in more than 180 countries, are, in addition to supporting a wide range of biodiversity as well as the livelihoods of millions of people, a giant carbon store. But when drained or burning, peatlands release greenhouse gas emissions that account for five percent of the global carbon budget. "Last year, scientists discovered the world's biggest tropical peatland in the Congo Basin, estimated to contain over 30 gigatons of carbon, about the same as what the United States emits in 15 years," said Erik Solheim, Head of UN Environment. "The amount of carbon held in a single hectare of wet peatland is equivalent to the annual emissions of 1,400 passenger cars. So it's absolutely crucial that these areas are protected and we keep that carbon locked up safely in the ground."

Across the globe, in both the tropics and the temperate north, peatlands are under threat from drainage and burning for agricultural, forestry and other development uses. Fifteen percent of known reserves are already either destroyed or degraded. In this state, peatlands release the carbon locked within the layers of decomposed organic matter. While historically Europe has seen the greatest drainage, half the world's peatland emissions come now from Southeast Asia where high rates of clearing and drainage for agricultural expansion speed up decomposition of the drained peat. When used for traditional agriculture the originally organically rich and highly productive peat soil exhausts quickly due to its low level of nutrients. Drying out the surface of peatlands to maximize their agricultural use leaves them vulnerable to fire, which significantly increases greenhouse gas emissions. Peat fires can burn for a long time and the smoke carries particulate matter into the atmosphere that adversely affects the health of communities.

Immediate action to locate, manage and safeguard the remaining global peatlands is therefore an urgent issue that requires increased research to better understand their extent and status. The rapid response assessment *Smoke on Water*, the first joint report by the Global Peatlands Initiative, an international partnership of 24 members formed in 2016 to preserve peatlands, is an initial leap in that direction.

- https://www.unenvironment.org/news-and-stories/press-release/smoke-water-countering-global-threats-peatland-loss-and-degradation
- https://unfccc.cloud.streamworld.de/webcast/smoke-on-water
- http://enb.iisd.org/videos/climate/unfccc-cop23-side-events/good-peatland-governance-to-strengthen-economic-social-and-ecosystem-resilience/?autoplay
- http://enb.iisd.org/climate/cop23/un-redd/15nov.html
- http://enb.iisd.org/climate/cop23/un-redd/html/enbplus236num1e.html

L-R: Amy Ambatobe Nyongolo, Minister of Environment and Sustainable Development, DRC; Siti Nurbaya Bakar, Minister of Environment and Forestry, Indonesia; and Arlette Soudan-Nonault, Minister of Tourism and the Environment, Republic of the Congo, launching the Smoke-on-water report. Photo: IISD Reporting Services.

Smoke on Water – Countering global threats from peatland loss and degradation

The report "Smoke on Water – Countering global threats from peatland loss and degradation" is a call to action and it urges all countries to make informed decisions to improve the conservation, restoration and sustainable management of peatlands. The main messages of the report are:

- **Peatlands are important** to people around the world.
- **Immediate action is required** to prevent further peatland degradation and the serious environmental, economic and social repercussions it entails.
- **A landscape approach is vital** and good practices in peatland management and restoration must be shared and implemented across all peatland landscapes and the catchment areas.
- **Local communities should receive support** to sustainably manage their peatlands by preserving traditional non-destructive uses and introducing innovative management and viable livelihood alternatives.
- **A comprehensive mapping of peatlands worldwide is essential** to better understanding their extent and status, and to enable us to work together to safeguard them.

The report presents the following recommendations:

1. Policy must send a clear message to protect and conserve peatlands for the multiple ecosystem services that they provide and must link delivery of climate change, biodiversity, water, heritage and development objectives.

2. Act now to conserve intact peatlands, keep carbon in the ground and achieve "quick wins" in the areas of protection, sustainable use and restoration by:

- Safeguarding and preserving natural peatlands from degradation.
- Rewetting and restoring where peatlands are degraded to conserve biodiversity, reduce greenhouse gas emissions and replenish freshwater resources.
- Managing peatlands where economic activities are taking place in a sustainable and climate smart, i.e. wet, way.
- Following adaptive management practices where rewetting is not possible.
- Addressing social issues, such as local communities' right to use natural resources and their traditional uses.
- Strategic planning to protect peatlands from damaging activities,
- Removing "perverse incentives" that lead to damage, and
- Making coordination and cooperation across government sectors a priority to secure ecosystem benefits, rather than maximizing the delivery of individual services.

Greenhouse gas measurement in degraded peatland in Mongolia. Photo: Hans Joosten.

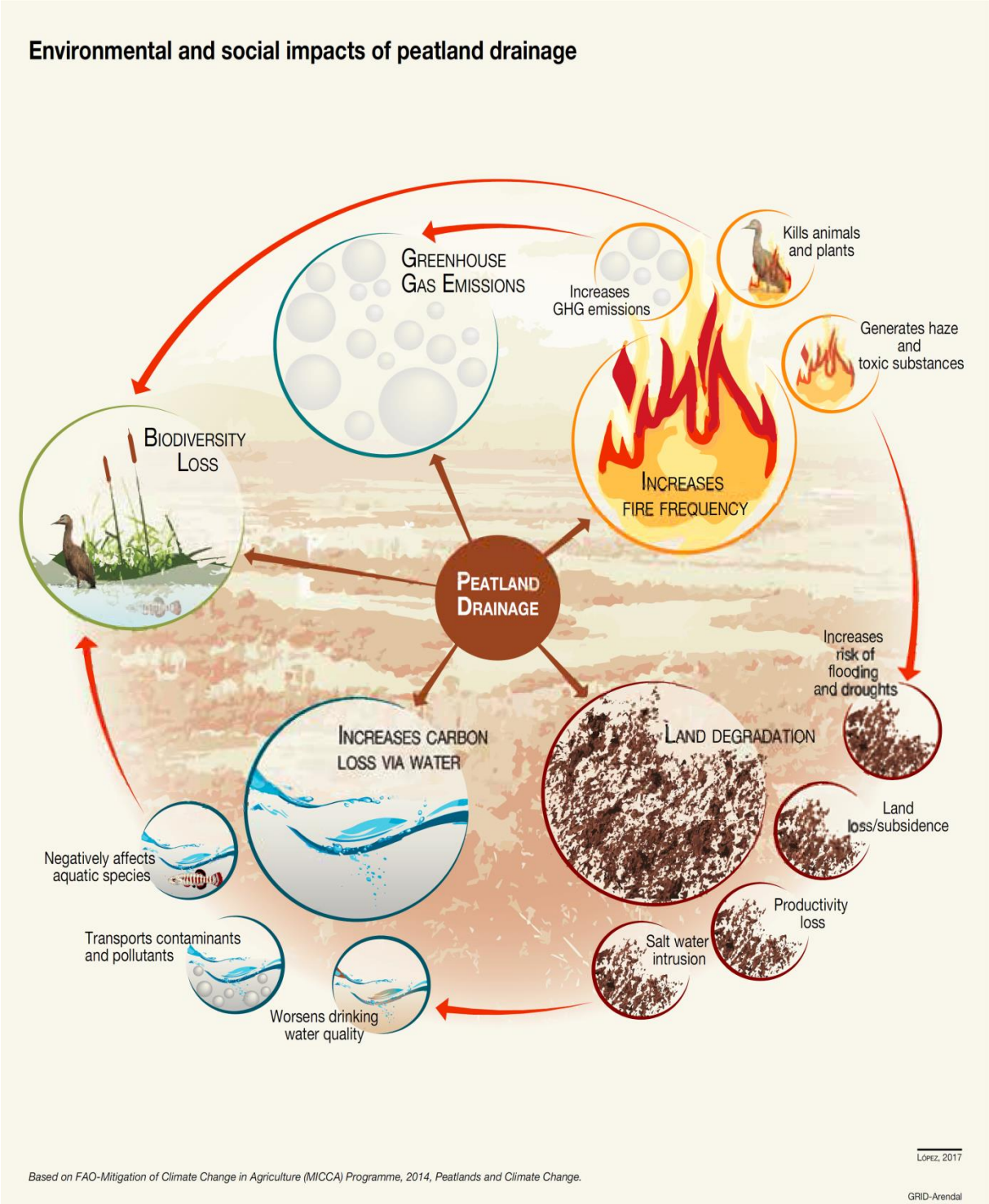
3. The necessary fiscal arrangements must be put in place to support new research and fund conservation and management activity, discourage damaging activities and ensure the restoration and good management of peatlands into the future. These arrangements must assist governments that are unable to pay for extensive research, restoration or other activities. In these cases, private sector involvement is required.
4. Channel funding for responsible peatlands policy development and management through international mechanisms such as the Nationally Determined Contribution framework, REDD+ and Nationally Appropriate Mitigation Actions (NAMAs) under the UN Framework Convention on Climate Change. Accounting for carbon stocks within forested peatlands under REDD+ could foster long-term protection.
5. Create an institutional framework built around coordinated action to ensure good practices across the globe in peatland management. As part of this, ensure involvement of local communities in the development and implementation of sustainable management plans.
6. Improved management and protection requires that the research and knowledge gaps identified in this report be addressed, especially the following requirements:

- Develop a better understanding of the state and extent of global peatlands to inform better peatland management for climate change mitigation and provision of ecosystem services,
- Improve understanding of the contribution of peatlands to greenhouse gas fluxes.
- Increase understanding of the costs and benefits of restoration of peatland ecosystem services, and the opportunity costs of a 'do-nothing' or 'business-as-usual' approach.
- Monitor and research appropriate restoration techniques suited to different peatland types and locations, with knowledge exchange playing an important part.
- Use consistent methodologies in peatland research to enable better evaluation and comparison of published studies.
- Provide a platform for communities, companies and government for exchange of lessons learned on sustainable alternatives for rewetted peatlands across the globe.

7. Governments, industry and other stakeholders must invest in raising awareness about the importance of peatlands at a global, national and regional level when planning new land use policies and management ideas.
8. Ensure there is open dialogue, fair negotiation and social legitimacy from the local to the national level to implement any climate-responsible strategies. Millions of people rely on peatlands or land that has been converted from peatlands for their food and livelihoods. Support is needed to assist communities using

peatlands to manage them sustainably and develop livelihood alternatives to halt and cease destructive practices.

- http://www.grida.no/publications/355
- https://gridarendal-website.s3.amazonaws.com/production/documents/:s_document/373/original/peatposter_lores.pdf



An illustration of the environmental and social effects of peatland drainage. From: Smoke-on-water.

Online survey on economic incentives for wet peatlands

The development of incentives that account for social and environmental costs and benefits of peatland use has been identified as a major action for achieving large-scale paludiculture (FAO 2016). We compile information on existing examples that acknowledge peatland or wetland ecosystem services. Good practice examples can be an inspiration for incentives that may initiate and reward the shift to sustainable agriculture

on peatlands and increase the economic viability and competiveness of paludiculture. This survey is part of the project "CINDERELLA - Comparative analysis, integration and exemplary implementation of climate smart land use practices on organic soils: Progressing paludicultures after centuries of peatland destruction and neglect". Some existing examples are:

- Peatland rewetting for climate benefits (Credits for voluntary carbon market in Germany (MoorFutures) and UK (Peatland Code))
- (Re-)Establishment and maintenance of wetlands for nutrient retention (EU co-funded Agri-environmental measure in Denmark and Sweden, focus on action)
- Maintenance of peatland biodiversity (EU co-funded Agri-environmental measure in Poland, focus on results since payments for habitat management are only provided if certain plant or bird species are found on the site)

Thank you for sharing your experience: http://survey.paludiculture.com or contact Sabine Wichmann (wichmann@uni-greifswald.de) for further information.

New HCV-HCSA Assessment Manual

The HCV Resource Network and the HCS Approach Steering Group have published the new HCV-HCSA Assessment Manual. This manual is designed to help protect High Carbon Stock forests, High Conservation Value areas and peatlands and to respect the Free and Prior Informaed Consent (FPIC) of local people. The manual can be used for integrated assessments in any commodity context, but is primarily targeted at contexts where there is one large land owner or organisation with rights to develop the land and produce commodity agriculture or forest products in fragmented (< 80% forest cover) tropical forests. It is not adapted to a smallholder context, nor to a high forest cover landscape context. Under the HCS approach, peat soils (of any depth) cannot be developed. Therefore, they must be identified, so that they can be conserved, and this means that a peat mapping study must be conducted by qualified soil surveyors.
https://gallery.mailchimp.com/f1a534b5effb0e147ff6f939a/files/667f85cf-896e-44e7-a6f3-b83a65ff34ec/HCV_HCS_Manual_Final.01.pdf

Taking RSPO to the next level

The Roundtable on Sustainable Palm Oil (RSPO) has unveiled a new scheme to endorse palm oil producers whose sustainability efforts go beyond the basic requirements for environmentally and socially responsible practices. The RSPO Next label, which was first mooted earlier this year, verifies that companies which have committed to no deforestation, no peat planting, and human rights protection, are delivering on them. It will be a premium label for companies which have gone the extra mile to ensure their products are sustainable. The finalised criteria for the label were announced at the industry association's roundtable conference in Kuala Lumpur, Malaysia held at the end of November. However, green groups have criticised these existing standards for failing to protect ecologically valuable forest land, limit the greenhouse gas emissions caused by plantation development, and prevent its members from clearing and draining peatland.

Several companies in the past few years have published commitments that go beyond RSPO standards, including pledges on "No Deforestation, No Peatland, and No Exploitation". Singapore-based Golden Agri Resources, Wilmar International, and Cargill are a few examples.

The full RSPO Next documentation with implementation details will be published on January 31 2018.

- http://poig.org/2017/11/
- https://www.rspo.org/news-and-events/news/rspo-next-taking-the-principles-and-criteria-to-the-next-level
- https://www.devex.com/news/opinion-a-make-or-break-moment-for-the-roundtable-on-sustainable-palm-oil-91430

Workshop in Bali on Peatland BMPs

In November 2017, Global Environment Centre (GEC) was appointed by the Roundtable for Sustainable Palm Oil (RSPO) to facilitate the revision and updates of the two RSPO Best Management Practice (BMP) manuals for peatland management. As part of the reviewing process, a consultation workshop was organized in conjunction with the 15th RSPO Roundtable on Sustainable Palm Oil (RT15) in Bali on 27th November 2017. The workshop was followed by two parallel sessions; a) Technical briefing on drainability assessment and b) Smallholder linking & learning session on peatlands. Based on the presentations and discussions, a number of gaps and areas for enhancement of the BMP manuals were identified and will be considered in the revision process.

An online survey has been posted to gather feedback from the various stakeholders on the current BMP manuals [Click on images to download]. RSPO Secretariat and GEC encourage readers to complete a survey by clicking on the following link Feedback Form for RSPO BMPs Manuals on Peat (by 12 Jan 2018) so that we can collate your views and suggestions to make the revised manual better.

Participants of the RSPO BMP consultation workshop in Bali.

Groundwater and tundra fires may work together to thaw permafrost.

Groundwater may play an unrecognized role in thawing Arctic permafrost following wildfires, according to new research. After wildfire burns off a portion of organic rich soil that normally insulates permafrost, summer warmth penetrates deeper into the frozen soils, allowing groundwater to flow downgradient and potentially contributing to greater release of greenhouse gases.

According to the study's lead author, Samuel Zipper from McGill University and the University of Victoria (Canada), researchers tend to estimate permafrost thaw by vertically measuring thawed soil depth at single locations, offering a one-dimensional perspective of the aftereffects of fire on the Arctic landscape. "What's interesting to me," says Zipper, "is if you burn one location, how do other parts of the landscape respond to that fire? Can groundwater flow transmit the impacts of burning from one spot to another by moving water and heat through the subsurface?" To explore the question, Zipper and his colleagues ran over 20,000 simulations of the largest Tundra fire in recorded history: Alaska's Anaktuvuk River Fire, which scorched over 400 square miles. They ran simulations both with and without groundwater flow to tease out its contribution to permafrost thaw following fires. They found that, indeed, wildfire does lead to deeper permafrost thaw, which is enhanced by groundwater flow. But, surprisingly, more water evaporated following fire, so there was less overall groundwater flow reaching the stream. Additionally, the results suggest that wildfire may trigger a positive feedback loop of permafrost thaw. When permafrost thaws simply from the Sun's warmth, groundwater flows from the thawed soil into more permafrost, melting it, which releases more groundwater to thaw more permafrost. "Our findings show that you can't really understand how permafrost is going to respond to disturbances like fire without understanding what's happening in the groundwater system," says Zipper. "Groundwater is a component of the Arctic's water cycle that's been under appreciated just for lack of data. It's kind of the next frontier for figuring out what's going to happen in the Arctic's future."

http://iop.msgfocus.com/c/11rg8XPiJgNGbFTcR1osw2ZjjI

The interference of permafrost and water: palsa (foreground) and pingo formation (background) in the NE Siberian Arctic (Kolyma delta). Photo: Hans Joosten.

Further reads and views:

- https://www.popsci.com/just-some-cool-new-pictures-time-greenland-was-on-fire
- https://thetopofthetree.uk/2017/11/06/the-carbon-farmer/

Africa

Democratic Republic of Congo

Congo basin's peat swamps are new front in climate change battle

Leeds University forest ecologists Simon Lewis and Greta Dargie cheer. The peat bed below the tangle of trees and water in the Democratic Republic of the Congo (DRC) in the geographical heart of Africa is much deeper than they expected. Lewis and Dargie surprised the world earlier this year when they showed that the peatlands on either side of the Congo river contained one third of all the world's tropical peat and were five times more extensive than anyone had thought, stretching over 145,500 km^2, an area larger than England. Since 2012, the two researchers have spent months wading through bogs and sleeping on makeshift platforms built above the crocodile-infested swamp forests in the Cuvette centrale region of the neighbouring Republic of the Congo. But their new exploratory research, conducted with the Congolese botanist Corneille Ewango, 50km from Mbandaka in DRC, suggests that central Africa's inaccessible forest swamps could be even more important as a global carbon storehouse than they thought, and could need a global initiative to research and protect them. "While the extent of the peat is known, its depth is not. There is just no data. We are a long way from really knowing how much is there and need to do more research," said Dargie. "Maintaining these large stores of carbon must be a global priority. Only with strong scientific data on the peatland, and how it behaves or might react to future changes, can governments establish baselines and protections in international agreements to ensure it is preserved," said Greenpeace forest campaigner Matt Daggett. There is growing understanding that the fate of carbon sinks like the Congo basin peatlands will determine future climate change. If left alone, they are vital collectors of CO_2; but if the forests above them are felled and the land is converted to farming, as has been widely practised for the past 30 years in south-east Asia, then the drained peat emits vast quantities of CO_2 and intensifies climate change. Tropical peatland stores around 2,000 tonnes

of carbon per hectare but this has been barely recognised by governments which have continued to promote intensive farming on peatlands.

The discovery has also excited the DRC government. Under constant pressure from environmental groups like Greenpeace and the Rainforest Foundation in Britain to better protect the second-largest rainforest in the world, after the Amazon, the revelation that some of its remotest lands are vital to the global effort to avoid climate change is a source of national pride and gives the country added leverage in ongoing climate change negotiations. A proposal to protect a much smaller area of Peruvian Amazon peatland has already attracted attention from the UN's Green Climate Fund. However, a DRC government official told Mongabay that a transboundary application by the DRC and ROC to protect and sustainably develop their more extensive peatlands could attract much more money from conservation groups, governments and the UN. As a measure of the peatland's importance to the DRC, President Joseph Kabila sent Joseph Katenga, his forests adviser, to Lokolama with Greenpeace campaigners and the scientists. Within days, Environment Minister Amy Ambatobe proposed setting up an official unit to oversee future management of the peatland. "The management of the peatland will become very important. It will determine how [it] will be managed and who would be involved," Ambatobe said. "This work is to be done with technical partners and donors, civil society and local community."

Greta Dargie, Simon Lewis and Congolese colleagues coring DRC peatland. Photo: Kevin McElvaney/ Greenpeace

The Congo basin forest, the second largest in the world after the Amazon, has been relatively protected by its inaccessibility, but environmentalists say it is highly vulnerable and its peat could easily be destroyed. Pressure is building, they say, from logging companies and European governments to lift a 15-year-old moratorium on the allocation of new industrial logging concessions. Logging on swamplands is prohibited in the DRC but, says the Rainforest Foundation UK (RFUK), Congolese legislation does not precisely define what constitutes a swamp. Its analysis suggests 3.4bn tonnes of carbon could be emitted if the concessions become active. According to Greenpeace, nearly half of the DRC's current logging concessions are in breach of the law because their permissions have run out and they do not have approved management plans. These concessions overlap around 10,000 km^2 of peat swampland. "If this forest is cut, there will be decomposition of the peat and vast quantities of CO_2 will be released into the atmosphere, said Dagett. The Congolese government, which has welcomed the scientists, is cautious about further protection. "There must be a balance between the forests and development. It comes down to money," said Joseph Katenga, forest adviser to Amy Ambatobe, the

minister for the environment and sustainable development. But communities living close to the carbon-rich swamps near Lokolama have welcomed the discovery of peat, hoping it would attract money to better protect their forests which they traditionally use for fishing and hunting. “As indigenous people, peatlands are part of our heritage and their discovery for the world to see represents a great hope for future generations,” said Valentin Egobo, who speaks for the Lokolama community. “We hope our government will support us in our role as guardians of this ancient forest and provide us with the needed support to safeguard peatlands for our children and for the world. “We did not know the peat was there. This is very important for us but we also need development. Our schools are dilapidated. We are marginalised and impoverished,” Egobo added. The future of the DRC rainforest may be determined in the next months when the Norwegian government is expected to decide whether to fund a French Development Agency plan to expand “sustainable” industrial logging in the region. This would allow local communities to benefit from their resources, according to the agency. But Greenpeace, RFUK and a petition signed by 135,000 people in Norway and the UK have condemned the plan. “Norway risks putting globally significant stores of carbon at risk through misguided support for so-called sustainable forest management in DRC. Instead of expanding large-scale timber-felling, Norway should work with the Congolese government to shut down the half of the country’s logging areas which the law requires to be closed and returned to the state,”, said Simon Counsell, the director of the RFUK.

- https://www.theguardian.com/environment/2017/nov/12/congo-basin-swamps-peatlands-carbon-climate-change
- https://africanbrains.net/2017/11/01/scientists-confirm-presence-peatlands-democratic-republic-congo/
- https://news.mongabay.com/2017/11/much-deeper-than-we-expected-huge-peatland-offers-up-more-surprises
- https://news.mongabay.com/2017/11/at-cop23-leaders-vie-for-protection-of-incredibly-important-african-peatland/
- http://www.africanmedias.com/could-the-peatlands-of-congo-be-a-carbon-bomb/?lang=en
- https://phys.org/news/2017-11-peatlands-congo-carbon.html
- https://news.mongabay.com/2017/07/is-norwegian-money-funding-congo-deforestation/
- See also IMCG Bulletin July 2017: http://www.imcg.net/media/2017/imcg_bulletin_1707.pdf

The peatlands of Lac Télé-Lac Tumba are important for global climate regulation

The peatlands of Lac Télé - Lac Tumba region in the district of Epéna (Republic of Congo RC) and in Mbandaka (Democratic Republic of Congo) play an essential role in global climate regulation, according the final declaration of a regional workshop held at the end of September, in preparation of the Climate Convention meeting. The participants of this workshop were informed that the Governments of DRC and RC have set up a transboundary conservation project in this area. The project aims to protect biodiversity, ensure the sustainable use of resources and maintain the functioning of carbon sinks in the Congo Basin rainforest and the peatlands around Lac Télé and Lac Tumba. Biodiversity and natural landscape resources are increasingly threatened by habitat destruction resulting from logging, unsustainable livelihood activities, and commercial hunting and fishing. Threats to the endogenous wealth and biodiversity of the area, which hosts one of the continent's largest Ramsar sites (Lac Télé site and its tributaries) have captured the attention of the authorities from both countries. The interest in preserving this ecological heritage justifies the Ramsar designation of Lac Tumba, which juxtaposes Lac Télé, and a network of protected areas has been created, to be managed effectively, adaptively and collaboratively through partnerships involving governmental and non-governmental actors, as well as local communities.

According to the United Nations Development Program (UNDP-RC), Lac Télé- Lac Tumba is the largest rainforest and second-largest wetland in the world. It covers 126,440 km², straddling the Republic of Congo (RC, 54,001 km²) and the DRC, 72,439 km². About 70% of the area is wet forest and grassland, seasonally flooded, the remainder being dry land and savannah. This landscape also plays a vital role in the hydrology of the Congo Basin. It is home to large densities of the three great primates of Africa (gorillas, chimpanzees and bonobos). Other species present in this landscape are forest elephants, hippopotamus, 16 species of diurnal monkeys and seven species of duiker. More than 350 bird species have been observed, including significant populations of waterfowl. There are also Nile crocodiles, armored crocodiles and broad-browed crocodiles, but herpetological knowledge is incomplete. The fish diversity is impressive with over 80 species listed in the DRC and 50 in the RC. Fish wildlife diversity is not only an indicator of biodiversity, but the livelihood base of most communities.

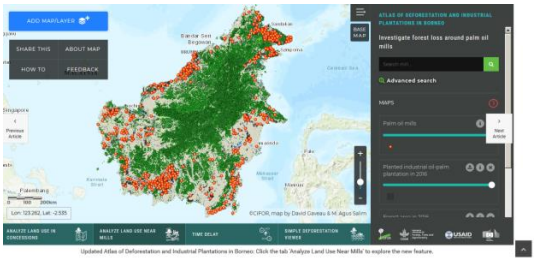
http://acpcongo.com/acp/tourbieres-paysage-lac-tele-lac-tumba-important-ecosysteme-regulation-climat-global/#lZOtKRxIE3JMabWi.99

Asia

New version of Borneo Palm Oil Atlas launched

The latest version (version 4) of the Borneo Atlas has been launched on November 23. It allows users to verify the location and ownership of 467 palm-oil mills in Borneo. The dataset was developed by reviewing online documentation on company dashboards, NGO websites, certification agencies (RSPO and ISPO), mapping websites and social media. A link to the mills' location on high-resolution imagery from Google Maps and ArcGIS World Imagery is also provided for each search, to prove that the mill exists. See tutorial video embedded in blog for full capabilities.

Future developments will include linking mills to supplier plantations, to ports and refineries, and incorporating time-lapses to reveal how industrial oil palm has expanded. The atlas aim to equip governments, NGOS and companies with the capacity to see the full impact of industrial agriculture on forests, and to act accordingly to bring the rate of forest loss in their supply chains down to zero.



https://forestsnews.cifor.org/52817/new-map-helps-track-palm-oil-supply-chains-in-borneo?fnl=en

Palm-oil mill in Sabah, Malaysia, Borneo. Photo: Hans Joosten.

Unit to study wildfires in ASEAN

The first dedicated research unit for studying wildfires in the Mekong region was established within Thailand's Kasetsart University in October 2017. The unit aims to fill a significant gap in the region's knowledge and research on wildfires, forest fires and their impacts on the environment and human society and health in Cambodia, Thailand, Vietnam, Laos and Myanmar. The unit, dubbed the Upper ASEAN Wildland Fire Special Research Unit (WFSRU), is hoped to provide invaluable research data to help governments address the issue. Currently there is no existing focus or direct research centre or special research unit that deals directly with wildland fires, smoke and haze under vegetation types, geographic conditions, weather patterns and related human behaviours of mainland Southeast Asia. The unit's activities fall under the Global Wildland Fire Network, which was mandated in 2004 by the UN International Strategy for Disaster Reduction. The centre will be the

focal point to provide information regarding fire, smoke and haze management. This will help governments to address wildfire problems. NASA satellite imagery from the past decade shows Cambodia has one of the region's highest observed numbers of "hotspots". The 2015-2016 fire season burned some 2,000 square kilometres, including large areas of flooded forests. http://www.phnompenhpost.com/national/unit-study-wildfires-asean

Burned peat swamp forest in Central Kalimantan, Indonesia. Photo: Hans Joosten.

Indonesia

Peat fires and toxic haze: The power of perception

According to a new study, perceptions of peatland fires in Indonesia vary considerably among different actors, offering an explanation of behaviour, action and environmental outcomes on the ground. A study led by Rachel Carmenta, then at CIFOR, mapped out the perceptions of different stakeholders, from international policymakers to local farmers and absentee landlords, all of whom have a role to play in the use, management and future of peatlands. Using Q methodology — more commonly used in psychology to identify stakeholder subjectivity on a particular issue of interest — the research team gained insights into how various groups perceive the benefits and the burdens of peat fires and the resulting toxic smoke, or 'haze', as well as how they perceive the effectiveness of potential solutions. "We focused our efforts on Riau because it is a contemporary peatland frontier, with lots of new actors, from international business interests, to town-based investors, to small-scale farmers migrating from other parts of Sumatra, radically transforming the landscape in a process that directly or indirectly involves fire," Carmenta explains. Fire is pervasive in Riau both from intentional use and conditions that enable fire to spread accidentally. For example, reasons for intentional burning can include land preparation, or disputes over land and resources. Indirect drivers of fire include peatland drainage, necessary for many of the plantation crops grown on peat, which results in increasingly flammable conditions. "Accidental fire (that is, fires spreading beyond intended limits) is influenced by the drained condition of the peat, which itself is a fuel for fire spread, and contested tenure, which means incentives for fire management are not ideal," Carmenta says. The research shows significant distinctions among groups of perceptions, clear areas of agreement and controversy, and discusses the implications for future fire management intervention (FMI) design and the governance challenges of global environmental change. Public health and biodiversity impacts of fires are areas of concern that unite otherwise diverse groups. FMIs ranked overall as the most effective, but also generated the greatest controversy between groups. These interventions include increasing

use of shallow canals to ensure access to water, provide fire breaks, and maintain higher water tables; forbidding new agricultural expansion on peatland; and increasing enforcement measures against companies that have fire within their land. The study suggests that a mix of targeted policy measures and dialogue between diverse groups will be essential in designing and implementing a sound, high-performing, FMI approach to overcome the existing policy-practice gap.
https://forestsnews.cifor.org/51983/peat-fires-and-toxic-haze-the-power-of-perception

The Eighth Great Ape: New orangutan species discovered in Sumatra

Scientists have described a third species of orangutan. The Tapanuli or Batang Toru orangutan (*Pongo tapanuliensis*) is found in the Tapanuli region of Indonesia's North Sumatra province. A study indicates what was once assumed to be an isolated population of the Sumatran orangutan is in fact a distinct species. The Batang Toru orangutan differs from the Sumatran orangutan in morphology, behaviour and genetics. Genomic analysis suggests it diverged from other orangutan species 3.4 million years ago. There are fewer than 800 Batang Toru orangutans in existence, making it the rarest of all the great apes. The species is already considered at risk of extinction. It is highly threatened by habitat loss. The study says a hydropower plant planned for the area could affect 8 percent of the species' remaining forest habitat. The Indonesian government will come up with a strategy to protect the orangutan, including the establishment of protected forest areas and wildlife sanctuaries. The government will also review a plan to build the hydroelectric plant.

- https://mongabay.us14.list-manage.com/track/click?u=80161fe385606408293ae0e51&id=4ceaf70bcd&e=268d1757f8
- https://www.webwire.com/ViewPressRel.asp?aId=216130

Pulpwood plantation on peatland in Jambi, Sumatra, Indonesia. Photo: Hans Joosten

Indonesian Supreme Court strikes down regulation on peat protection

Indonesia's Supreme Court has quashed a ministerial regulation obliging forestry companies to relinquish and protect carbon-rich concessions in protected peat areas. The regulation was part of a package of new rules meant to prevent a recurrence of the annual fires that burn across Indonesia's vast peat swamp zones. Businesses, labour unions and politicians had expressed concern over the regulation, saying that it would result in loss of productivity and massive layoffs. The government says the court ruling will not hamper the nation's efforts to protect its peatlands.

The ruling was handed down on Oct. 2 by the Supreme Court in response to a challenge filed in June by a labor union in Sumatra's Riau province, one of the regions particularly hard hit by the fires and choking haze they

generate. The regulation was issued in February by the Ministry of Environment and Forestry as part of a package of new rules meant to prevent a recurrence of the annual fires that burn across Indonesia's vast peat swamp zones, much of which have been drained for agricultural use, rendering them highly flammable. Opposition to the regulation came from businesses, labor unions and politicians, who argued that a requirement to retire plantation lands on deep peat would hurt the pulp and paper industry, especially in Riau province, home to 14,000 km^2 of industrial timber plantations. In its ruling, the court said the regulation purported to create a new type of forest zone, in violation of the 1999 Forestry Law. Under that law, Indonesia's "forest estate" — over which the Ministry of Environment and Forestry exercises jurisdiction and which accounts for two-thirds of Indonesia's land mass — are zoned for either conservation, protection or production. In the court's eyes, the regulation illegally sought to create a fourth category, for "peatland ecosystems." "The content of the ministerial regulation stipulates something that is not [within] its authority and something that is not ordered by the forestry law," the court ruling reads. "The authority to add peat ecosystem to the core functions of forests completely lies within the forestry law to regulate and decide." The court thus ruled that the ministerial regulation would create legal uncertainty and give rise to further problems in its implementation.

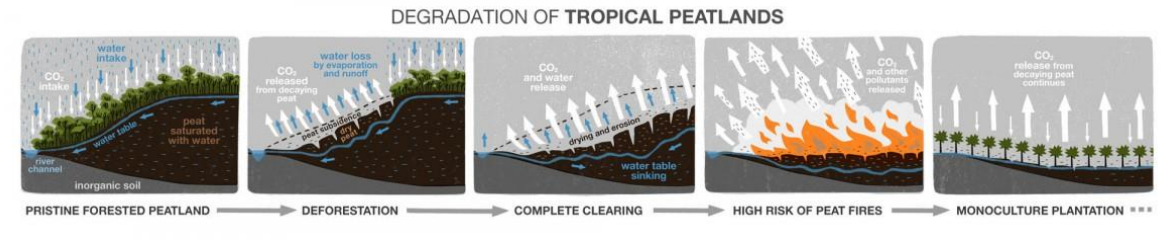
The regulation required companies to overlay their peat maps with the government's peatland hydrological area map, which divides the country's peatland areas into two categories: conservation and production. The map was issued by the Ministry of Environment and Forestry earlier this year and distributed to plantation companies so they could start overlaying their maps. If any concessions overlap with conservation areas in the peatland hydrological area map, then companies have to give up those areas to be converted into protected areas. The companies are still obliged to manage these protected areas by restoring them to their original function through rewetting and revegetation. Only those companies whose concessions comprise at least 40 percent protected peat area under the government's definition are eligible for compensation in the form of land elsewhere. The ministry gave companies 30 days to revise their work plans and resubmit them following receipt of the government's peat map. The labor union that mounted the legal challenge against the regulation argued that these requirements would harm local livelihoods. Up to 125,000 people depend on the industrial timber sector in Riau, according to Nursal Tanjung, the head of the Riau chapter of the All-Indonesian Labor Union. "What will their future would be like? The [promise of a] land swap is false. There's no more [vacant] land in Riau," he said.

The ministry defended the regulation as necessary to protect Indonesia's peatlands and prevent another disastrous bout of peat fires. "There will be a disruption to the climate balance and water management, loss of carbon stock, loss of biodiversity, loss of oxygen sources, triggering global warming not only in Indonesia but also other countries," the ministry argued in court filings. Quashing the new rule, the ministry added, would also create confusion among concession holders, most of whom have already submitted their revised work plans. The environment minister, Siti Nurbaya Bakar, told reporters in Jakarta that she would study the verdict before making any decision. However, she said there was still another regulation, the 2014 ministerial regulation on industrial timber plantations' work plans, that required companies to revise their work plans. Bambang Hendroyono, the ministry's secretary-general, said the 2014 regulation required companies to revise their work plans whenever there was a change in policy or whenever there was a change in the function of their concessions. He added that the 2017 peat regulation was only one of a series of ministerial regulations that were drafted to enforce a 2016 presidential regulation issued in the wake of the disastrous 2015 fires. The 2016 regulation was President Joko Widodo's signature piece of anti-haze legislation. The core of peat protection in the country, such as the stipulation that at least 30 percent of all peat domes — landscapes where the peat is so deep that the center is topographically higher than the edges — should be converted into protected areas, is already included in the 2016 regulation. This stipulation was further fleshed out in the 2017 regulation, with the focus being timber plantations. "So for industrial forest plantations, the technical guideline for them is regulated by the 2017 regulation," Hendroyono told reporters at the ministry's office in Jakarta. "So [the 2017 regulation] is very technical. But when we look at it, [the court ruling] doesn't reduce companies' responsibilities in peat ecosystems. They still have to prioritize [peat] recovery." Andri Gunawan Wibisana, an environmental law expert from the University of Indonesia (UI), said that, if anything, quashing the 2017 regulation actually stripped companies of the right to receive land in compensation, given that the 2016 presidential regulation does not require the government to give new land to companies that lose their concessions. "There's a chance that [parts of their concessions] are still designated as protected areas because

the 2016 regulation is still in effect, but the ministry no longer has an obligation to give land substitute," Wibisana said in an interview
https://news.mongabay.com/2017/11/indonesian-supreme-court-strikes-down-regulation-on-peat-protection/

How unhealthy is the haze from Indonesia's annual peat fires?

Indonesia's vast peat swamps have been widely drained and dried for agriculture, rendering them highly flammable, and they often burn on a massive scale, blanketing the country and its neighbors in smoke. A recent survey on perceptions of the fires showed that while different groups have varying levels of concern about forest loss or carbon emissions, everyone agrees that protecting public health is a top priority. However, the first step to solving a problem is to agree on how critical the issue is. Loren Bell, in a recent contribution to Mongabay, provides a valuable overview of the relevant knowledge.



Art by Prabha Mallya for Mongabay

Two independent studies have estimated that the 2015 Southeast Asian haze crisis caused somewhere between 11,880 and 100,300 premature deaths. However, because these estimates were based on remote sensing and models – and not "hard data" – they were roundly rejected by the governments of Indonesia and Malaysia. There, officials maintain, only 24 Indonesian and zero Malaysian deaths can directly be attributed to the 2015 haze. The rest of the health issues, they have claimed, were just temporary respiratory irritations that cleared up when the haze lifted. Nailing down how severely the fires affect health has been notoriously difficult. Accurate numbers for hospital admissions and mortality are not freely available, or in many cases are nonexistent. In addition, academic research has tended to focus on environmental conservation and carbon emissions rather than public health, leaving a data gap in our understanding. As a result, different models based on solid, but varying, assumptions can provide different conclusions, which can lead people to cherrypick results based on their agenda – or reject them all outright. However, while some study results may contradict one another, the body of science as a whole is less hazy on the conclusions: smoke from uncontrolled fires is a deadly threat to Southeast Asia whose victims number in the thousands, not dozens.

While emissions from burning peatlands are less well-studied than other types, recent research has shown that they contain potent carcinogens and over 90 different gases, some of which are highly toxic. Among those, formaldehyde, acrolein, benzene, carbon monoxide and nitrogen dioxide are the most concerning, given their negative health effects in even relatively small doses. As such, the World Health Organization (WHO) and most other regulatory agencies have established recommendations for safe exposure levels to these chemicals – levels that are regularly exceeded by peat smoke and resultant haze, as shown by a comprehensive 2016 meta-analysis of 375 fire and health studies published between 1970-2014 from different fuel types around the world. Formaldehyde and acrolein are both known carcinogens, while benzene, a potent organic compound, can negatively affect the blood, brain and immune systems. Firefighter exposure to formaldehyde at prescribed burns in the U.S. has been recorded as high as 3,700 percent of the recommended maximum, and measurements of peat fire production of the gas have lead researchers to caution that exposure to the local population will likely exceed recommended levels. Carbon monoxide (CO) is a highly toxic blood poison that binds with hemoglobin, preventing effective oxygen uptake. The amount of CO a fire produces varies widely, and although it readily dissipates in the atmosphere, acute exposure at the source can have deadly consequences. While most studies find exposure levels from forest fires to be below regulatory guidelines, the slow smoldering nature of peat can produce high levels of CO not typically seen from other fires. In 2015, outdoor levels of CO in Kalimantan, the Indonesian part of Borneo, were measured at 3-6 times higher than what the U.S. Environmental Protection Agency (EPA) considers dangerous. Further, CO can linger in the bloodstream for several hours, adding to the level of CO already in the environment from vehicle exhaust and

other pollution. Finally, nitrogen dioxide (NO_2) has been shown to affect lung function and is particularly threatening to individuals who already suffer from asthma or chronic obstructive pulmonary disease (COPD). Although long-term, low-level exposure to NO_2 may be relatively safe, short-term exposure to high concentrations of NO_2 correlates with increased mortality in several studies. Firefighter exposure to NO_2 has been recorded at 2.5 times the acceptable occupational limits.

As noted, these chemicals can all have severe health effects in high doses, but less is known about long-term, repeated exposure. Further, the established guidelines typically do not consider the cumulative effects of multiple carcinogens, irritants and toxins bombarding the body at the same time for an extended period.

Beyond the highly toxic gases listed above, however, a more threatening byproduct of peat fires appears to be fine particulate matter (PM). These airborne particles are classified as either PM10 (between 2.5 and 10 micrometers, roughly the size of dust, pollen or mold) or PM2.5 (less than 2.5 micrometers, only visible with an electron microscope). According to the WHO, both are responsible for acute respiratory issues such as asthma, while PM2.5 is increasingly linked to mortality from heart and lung disease. The ultrafine PM2.5 particles are small enough to penetrate deep into the lungs, coating the tiny air sacs known as alveoli and even crossing into the bloodstream. PM2.5 is produced by vehicle exhaust, wood burning and most other types of combustion, and while all particulates can have negative health effects, different emission sources produce different toxins. A 2013 study of Indonesian peat fire smoke found that the carcinogenic metals cadmium, chromium, nickel and cobalt where being produced at 16, 9, 8, and 13 times the rate of background pollution. The health effects of PM2.5 have been thoroughly researched in laboratory settings as well as in population-based cohort and ecological studies, and even short-term exposure is linked to cardiovascular and pulmonary diseases.

A 2014 meta-analysis of 110 published studies of PM2.5 concluded that although there was some variability among the data, the general consensus was that death rates rise with even short-term exposure to ultrafine particulate matter. Taken as a whole, the literature shows that increasing short-term exposure to PM2.5 by 10 micrograms per cubic-meter ($\mu g/m^3$) will result in a 1.04 percent increase in mortality risk. This is observed across all age groups in all parts of the world, with the rate varying from 0.25-2.08 percent. The highest mortality increases were reported from studies in Chile, Mexico and Brazil. (The analysis included no studies from Southeast Asia.) To put the numbers in perspective, the WHO sets the standard for 24-hour average exposure to PM2.5 at 25 $\mu g/m^3$. During the 2015 haze event 24-hour averages in Singapore regularly topped 100 $\mu g/m^3$, with one station recording a high of 471 $\mu g/m^3$. It is important to note that these acute spikes in particulate matter during haze events occur on top of daily background exposures that already well exceed safe standards. Over 90 percent of the populations of Indonesia and Malaysia and 100 percent of Singapore's population are consistently exposed to PM2.5 levels above WHO recommendations. By contrast, less than 10 percent of the U.S. population ever experiences levels above the WHO guideline. However, even in the U.S. – where advanced healthcare is readily available and background particulate matter is relatively low – the effects from forest fires can still be deadly. A recent analysis by the U.S. EPA and Australian researchers found that short-term exposure to PM2.5 produced by wildfires in the U.S. between 2008-2012 was likely responsible for 1,880 premature deaths per year. Further, they estimate that long-term exposure to fine particulate matter likely caused 10,940-24,600 premature deaths per year for the same period. Although these numbers are lower than the 11,800-100,300 premature deaths predicted for Southeast Asia as a result of the 2015 blaze, one must consider all confounding factors including exposure times and intensity as well as access to medical care and population health before drawing any comparisons between the two.

One issue with using broad population-wide studies – like the majority of those above – is that they are typically unable to tease out which groups might be at a higher risk, or to separate immediate causes from chronic conditions. For example, the effect of PM2.5 exposure on pregnancies, newborns and infants is still poorly understood, but at least one study reached a tragic conclusion. Northwestern University economist Seema Jayachandran analyzed Indonesia's 2000 census data and found that there were over 16,000 children "missing" from the census that models otherwise expected. Further, regional decreases in the number of children correlated significantly with exposure levels during the 1997 haze crisis in different provinces.

Other studies have found that exposure to haze during pregnancy can negatively impact a developing fetus. An analysis of 886,034 births during four years in Southern California found that fetuses who's parents were exposed to wildfire smoke weighed 6.1 grams less than normal at birth. This weight loss may be a result of reduced oxygen in the bloodstream during pregnancy, or even the mother's stress during haze events. Although the effect found in this study is slight, the researchers note that increased frequency of haze

exposure resulted in increased negative effects. Further, they point out, if enough pregnant women are affected, no matter how slight, this could significantly alter birth outcomes for the population – particularly among those populations already at risk for low birth weight. At the other end of the lifeline, a new paper from the Universiti Kebangsaan Malaysia Medical Centre published in November reports that cases of acute lung disease increased during the 2015 haze episode, as did the number of new lung cancer patients. Although the latter is likely due to more undiagnosed cases seeking treatment for breathing difficulty, the centre also reports cancer survival time decreased by 36 percent for those exposed to the haze. Clinic ASRI in Indonesia's West Kalimantan province said via email that during the same period, their respiratory cases increased by 47 percent, and their oxygen use tripled. They did not report any haze-related deaths. And, while the lack of "hard data" could mean the exact toll that fires take on the people may never be known, the growing body of science well-documents the health effects of forest fire smoke on both individuals and populations.
https://news.mongabay.com/2017/11/how-unhealthy-is-the-haze-from-indonesias-annual-peat-fires/

'Jakarta Declaration' on Responsible Management of Tropical Peatlands issued by IPS, BRG and JSP

On 2 November 2017, the International Peatland Society (IPS), the Indonesian Peatland Restoration Agency (BRG), and the Japan Peatland Society (JPS) issued the "Jakarta Declaration on Responsible Management of Tropical Peatland". This was the result of a two-day seminar and workshop in Jakarta on 1-2 November 2017, which was attended by 57 peatland experts from Indonesia, Japan, Malaysia, Singapore, Vietnam, Finland, Germany, the Netherlands, Canada, Mexico and other countries. The event was initiated by the Executive Board of the IPS after the International Peat Congress 2016 in Kuching, Malaysia as a follow-up to a media debate on peatland management in the area, and a letter by 139 peatland experts who were concerned about the contents of some of the keynote speeches of the Congress.

- http://www.peatlands.org/sites/default/files/peatlandsnippets8-2017.pdf
- http://jakartaglobe.id/news/jakarta-declaration-aimed-at-helping-indonesia-save-its-peatlands/

Jakarta Declaration" on Responsible Management of Tropical Peatland

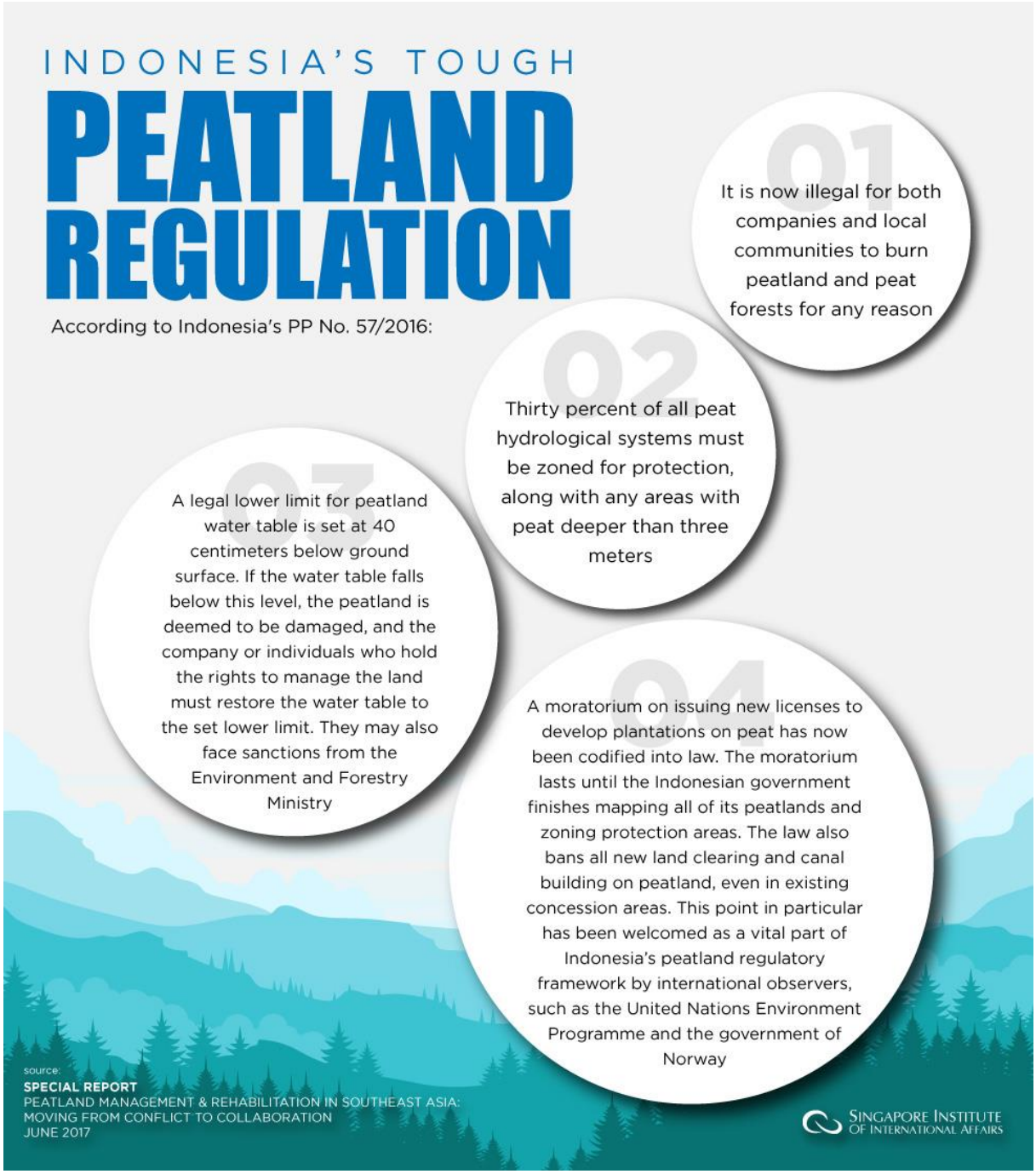
Truly effective Tropical Peatland Restoration in Indonesia will require substantial development of an integrated peatland management system based on scientific and technical knowledge and information. Achieving this requires the establishment of an International Committee for Technical Consultation to facilitate Tropical Peatland Restoration Action.

For this purpose, the IPS (International Peatland Society), BRG (Peatland Restoration Agency, Indonesia) and JPS (Japan Peatland Society) organized the 1st "Tropical Peatland Roundtable" on the 1st and 2nd November 2017 in Jakarta, supported by JICA (Japan International Cooperation Agency), Norwegian Embassy, UNDP (United Nations Development Programme), and BRG.

After two days of thorough discussion, a principal strategy of Responsible Management of Tropical Peatland was agreed. This includes five pillars of action:

• establish a "Tropical Peatland Center"
• organize an "International Committee for Technical Consultation"
• develop an "Integrated Monitoring System"
• conduct a "Model Project" for responsible management
• achieve capacity building

We release this 'Jakarta Declaration' as a milestone for promoting action on 'Responsible Management of Tropical Peatland', also as a basis for bridging Indonesian stakeholders and the international community.
Gerald Schmilewski (The President of the International Peatland Society IPS), Nazir Foead (The Head of Peatland Restoration Agency BRG), Mitsuru Osaki (The President of Japan Peatland Society JPS)



http://jakartaglobe.id/business/tougher-peatland-regulation-mean-pulp-paper-industry/

RAPP addresses retirement of plantation peatland in Sumatra after government pressure

PT Riau Andalan Pulp and Paper (RAPP), a unit of the Asia Pacific Resources International Limited (APRIL) conglomerate, Indonesia's second largest pulp & paper company, has after a severe dispute with the Indonesian government over the development of environmentally sensitive peatlands, decided to revise its business working plan. In May, the ministry had asked RAPP and other companies to revise their work plans so that areas zoned for conservation under the 2016 regulation would be taken out of contention for development and rewetted to prevent future fires. RAPP initially refused to meet the government's deadline for providing information on how it would move its operations off peatland, calling the regulations illegal, but acquiesced after the Ministry of Environment and Forestry invalidated its work plans. Some 60 per cent of land within RAPP's concession areas in Riau, amounting to 388,000 ha, are peatlands. RAPP's concessions overlap with one of Indonesia's deepest peat landscapes, the Kampar Peninsula.

At the heart of the dispute was Ministerial Decree No. 17 of February 2017. The law, aimed at encouraging plantation firms to shift off deep peatlands, said companies with plantations on deep peat cannot replant on their concession lands after the next harvest. Instead, they must work with the ministry to negotiate land

swaps to replant on non-peatlands. The expedited process of shifting plantation firms off deep peat has unsettled some companies because of uncertainty over the availability of new land and the disruption to the five-to seven-year harvest cycles of pulpwood plantations. The government will only offer land swap deals to companies if at least 40 percent of their concession areas is located within a protected peatland area.

Indonesia's Environment and Forestry Ministry ruled on 16 October that RAPP had flouted regulations on peat management. RAPP has been actively engaged in consultations with the ministry to comply with the government's new peatland protection framework detailed in. End October RAPP finally relented and agreed to include peat protection and rehabilitation in its Business Working Plan. The company can now operate normally, but is not allowed to plant acacia or eucalyptus trees on Peatlands Protected Ecosystem Areas of its concession. The business plan will show how vast the peatland areas are that would be eligible for land swap. Meanwhile, for peats recovery, the areas will be planted with adaptive plants to protect the dome.

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Pulpwood plantation in Jambi, Sumatra, Indonesia. Photo: Hans Joosten.

Interview with Aryan Wargadalam, chairman of Indonesian Pulp and Paper Association (AKPI)

The Environment and Forestry Ministry of Indonesia has released a number of regulations to govern cultivation activities in peat. Specifically crucial for industrial forest concession holders is ministerial decree No. 17/2017, which provides a guide for companies to comply with the government's new peatland protection framework. The pulp and paper industry has been blamed for causing environmental disasters — forest fires, destruction of biodiversity — and social problems, such as conflicts over land ownership. However, the industry also claims it has a significant stake in people's welfare and the Indonesian economy. The Jakarta Globe interviewed Aryan

Wargadalam, chairman of Indonesian Pulp and Paper Association (AKPI) — which harbors the largest pulp and paper producers in Indonesia. The following is an excerpt of the full interview:

Q: Do you think ministerial decree No. 17/2017 hampers growth in the pulp and paper industry?

A: In the regulation, there are articles, the implementation of which could have a significant effect on the pulp and paper industry. The articles are: Article 8E, verse 1: "If a cultivation ground has been transformed into peatland conservation area, it can be harvested only once [more] and cannot be sown again" and Article 8G, verse 1, verse 2 and verse 3: "If more than 40 percent of a block of land has been used or marked to become a peatland conservation area, a land swap deal can be proposed." The pulp and paper industry needs a sustainable supply of wood. To provide for this, the government has allocated lands to be used as industrial forests. However, pulp and paper companies stand to lose their industrial forest concessions in the next few years if they sit on protected peatland area, after the Environment and Forestry Ministry issued decree No. 17/2017. As a result of the decree, wood supply is expected to dwindle by 40 percent-50 percent. Implementation of the new peatland regulation will make it harder for companies to sustain their business since they stand to lose their source of raw materials. Possible impacts may include: a. Potential losses in pulp production: 2.4 million tons per year (or $1.32 billion). b. Potential losses in paper production: 3.6 million tons per year (or $3.6 billion).

Q: What regulations does the pulp and paper industry need to lead a sustainable business?

A: Investment in the pulp and paper industry has traditionally been integrated with investment in industrial forest, all of which needs a long-term vision and huge capital. It also requires high technology and a large number of workers. The output is exported to many countries and has contributed $5.4 billion in foreign exchange revenue. The government should consider making pulp and paper industry more sustainable. Industrial forest concession holders, which operate on protected peatland area, should be allowed to implement the latest water management technology on peatlands to minimize carbon emissions and prevent forest fires. The government should also show a willingness to revise articles in the peatland regulation which will reduce supplies of raw materials for pulp and paper companies. The government needs to come up with free lands for the land swap deals. Converting plantations into protected peatlands should not reduce supplies of raw materials.

Q: What do you think of the land swap deal as regulated by ministerial decree No. 17/2017? Will it work?

A: In principle, industrial forest concession holders are ready to relocate if they sit on protected peatland areas, as drawn by the government. But we also need the government to ensure the availability of "clean and clear" land for its land swap deals. The land swap deal needs to be rolled out gradually so it does not disturb production schedules. Unfortunately, the government still has not come up with a clear map of replacement land for concession holders. Concession holders need assurance that the replacement land the government offers has been cleared, and not subject to ownership disputes. The replacement land should also be located close to the company's manufacturing facilities.

Q: How are the facts and figures of the local pulp and paper industry?

A: In 2016, Indonesia exported 3.4 million tons of pulp products worth a total of $1.5 billion. We also shipped 4 million tons of paper products worth $3.4 billion. According to government data on exports of forestry-related products in 2011-2016, pulp ranked third among other forestry-related products. The industry also employed 1 million people directly and another 1.1 million in related industries.

Q: How big is Indonesia's pulp and paper industry in global terms?

A: According to data from [international consulting and engineering company] Pöyry, Indonesia is the world's 10th largest pulp producer with an annual production of 8.1 million tons and the biggest producer among members of the Association of Southeast Asian Nations. Indonesia contributes 3 percent of the total global pulp production. Indonesia is also the sixth biggest paper producer in the world, producing 12.3 million tons of paper every year and contributes around 3 percent of global paper production.

Q: What are our future challenges?

A: Indonesia is entering the digital era. Old paper-based media products, like newspapers and magazines, are being replaced by digital ones. The e-book market has grown rapidly. Despite this, demand for paper products remains steady in the domestic market, especially from the country's print media companies. According to a McKinsey & Company study, the market for papers used for graphics — newspaper, print media and paper for print — has shrunk gradually, but the market for paper used for paper board, wrapping, liquid packaging and tissues continues to expand.

Q: What competitive advantages our pulp and paper industry has over other countries?

A: Indonesia is a pulp and paper producing country with many competitive advantages, one of them being the abundance of raw materials. This is what enables Indonesia to penetrate the international markets. All pulp and paper products from Indonesia are also guaranteed by the timber legality verification system (SVLK) certification. This government-endorsed certification is acknowledged in Europe since November 2016.

Q: Do you think the government has been accommodating enough to help the industry?

A: The government's policy with regard to peatland management actually has accommodated what the industry really needs, especially the plantation and forestry industries. The article 45 in the government regulation No. 57/2016 says "business permits, or activities utilizing peatland ecosystem to remain valid until the permits expire." Without the transitional period, the regulation can cause a dwindling of raw materials for the industry in the longer term. Regulation No. 57/2016 will reduce industrial forest concession areas by as much as 45 percent to just 1.35 million hectares. Around 1.1 million hectares in concession area will simply be lost.

http://jakartaglobe.id/business/tougher-peatland-regulation-mean-pulp-paper-industry/

Pulpwood transport in Riau, Sumatra. Photo: Hans Joosten.

Peatland restoration project sees return of endangered bird life to Sumatra's Kampar Peninsula

Restorasi Ekosistem Riau (RER), a collaboration of private and public sectors established by APRIL in 2013, has published a new report, *Birds of the Kampar Peninsula: An Annotated Checklist*, which details the presence of 299 rare and endangered birds in its Kampar Peninsula peatland restoration forest area and surrounds. The new checklist compiles the results of several biodiversity assessments conducted since 2010 and indicates a significant increase in the number of bird species identified in the area, including the critically endangered Helmeted Hornbill (*Rhinoplax vigil*), three species that have been classified as Endangered by the IUCN – White Winged Duck (*Asarcornis scutulata*), the Milly Stork (*Mycteria cinerea*) and Storm's Stork (*Ciconia stormi*), as well as a further ten species classified as Threatened. The Kampar Peninsula covers approximately 344,000 hectares and is considered to be the largest remaining contiguous area of lowland peat swamp in Sumatra. This diverse landscape includes 129,357 hectares at the heart of the peninsula as part of the RER project, representing the largest contiguous ecosystem restoration license area in Indonesia. Surrounding this is a mix of landscapes, including riparian, mixed peat swamp and pole areas, as well as industrial plantations for oil palm, rubber and wood fibre, small holder plantations, farmlands and human settlement.

http://www.aprildialog.com/en/2017/11/22/peatland-restoration-project-sees-return-endangered-bird-life-sumatras-kampar-peninsula/

APRIL outed in Paradise Papers

Indonesia's second-largest pulp and paper firm routed billions of dollars through a network of offshore shell companies, likely to minimize its tax burden in the Southeast Asian country, where it has drained vast swaths of carbon-rich peatland in order to establish vast timber estates. The company, APRIL, also sought the removal of an environmental condition from a $600 million loan it received from major banks in 2011. The revelations were published early November by the International Consortium of Investigative Journalists (ICIJ) as part of its reporting on the Paradise Papers, a leak of 13.4 million files that shine new light on how the world's richest individuals and corporations hide their wealth in secrecy jurisdictions. "[APRIL] has shuffled billions of dollars through a web of offshore companies stretching from the Cook Islands in the South Pacific to the British Virgin Islands in the Caribbean. … Experts told ICIJ that such arrangements often shift taxable profits away from jurisdictions that bear the social costs of resource exploitation to others that simply charge lower taxes," the article reads. APRIL is controlled by the billionaire Tanoto family, whose patriarch, Sukanto Tanoto, rose to prominence during the 32-year regime of dictator Suharto. When Suharto held power, Indonesia lost an area of rainforest larger than Thailand, as conglomerates like APRIL ate through its natural wealth with the strongman president's consent. Suharto topped Transparency International's list of the world's most corrupt leaders in 2004. Under consumer pressure, APRIL announced in 2015 that it had stopped deforesting. To feed its mills, it now sources timber grown on huge plantations in Sumatra and Borneo, where it is often mired in conflict with local communities. In a statement, APRIL said it follows all the rules in the jurisdictions where it operates, and cares about the environment and people more than profits. Greenpeace said it wasn't surprised by the news about APRIL's offshore dealings. "April likes to publicly claim in its PR that its 'good for the community', yet here it is depriving the Indonesian Government of tax revenue by siphoning funds offshore. The company's double standards are beyond outrageous," Rusmadya Maharuddin, a forest campaigner with the NGO, said in a statement. "Every dollar locked up in a tax loophole is people's money stolen from protecting Indonesia's rainforests and peatlands."

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Development or destruction? An inside look at APP's mega paper mill

Burning season is in full swing in Indonesia. The annual haze hasn't been as intense as in previous years, and neighbours Singapore and Malaysia haven't complained of smoke drifting across their borders. That the fires haven't reached the Dantean ferocity of two years ago when Southeast Asia experienced its worse bout of haze pollution on record — and burning peatlands produced more carbon dioxide than the European Union emits in a year — is particularly good news for one company. Asia Pulp & Paper (APP), Indonesia's largest pulp and paper firm, was heavily implicated in the devastating forest fires of 2015. The firm was blamed for about a third of the fires that enshrouded Southeast Asia that year, and has since lost millions in revenue after retailers in Singapore removed the company's products from their shelves.

APP's effectiveness at controlling the fires has dramatically improved, thanks to the millions it has spent on fire suppression and prevention, and partly due to favourable weather—this year's dry season has been a lot wetter than usual. But a new pulp mill that APP quietly put into operation nine months ago, PT Ogan Komering Ilir (OKI) in South Sumatra, has caused concern among environmentalists who say the massive facility will inevitably lead to forest fires and haze in the region for decades to come. A coalition of 12 non-government organisations that includes World Wide Fund for Nature (WWF), Wetlands International, Rainforest Action Network, Hutan Kita Institute, Forest Peoples Program and Woods & Wayside International, claims in a report, titled *Will Asia Pulp & Paper default on its 'zero deforestation' commitment?*, that the mill does not have sufficient wood supply from its plantations to sustain itself. This, they argue, will mean an environmental and social disaster in the making for Indonesia and the region. The company in February 2013 launched a Forest Conservation Policy, which was a promise to stop clearing natural forests, developing carbon-rich peatland and seek free, prior and informed consent (FPIC) from local communities before developing on their land. These are all practices that APP has been accused in the process of building a multi-billion dollar business over close to half a century. The new mill—the third that APP has built in Sumatra, and its largest—will make it impossible for the company to fulfil its FCP commitments, environmentalists claim, as at this capacity, there is no way that

the company will be able to feed the mill using only trees harvested from its plantations. Furthermore by June 2018, APP plans to open a new tissue paper facility that will further increase the mill's appetite for wood.
APP makes two arguments to quash concerns about OKI mill's wood supply. The first is that the company will ship in timber from outside Sumatra to feed the mill if supply is running short. The other argument is that the mill does not need to run at full capacity. But Bas Tinhout of Wetlands International suggests that the introduction of the tissue facility in a year's time will make this flexibility less realistic.
The biggest wood supply headache for APP comes from the fact that most of its plantations - 70 per cent that supply OKI mill currently - are grown on peatland, Tinhout points out. Undrained peatland is too wet to support acacia, APP's main crop for producing timber. It must therefore be drained first, a problematic practice because dry peat is extremely flammable. Tinhout is not convinced that APP can meet its current fiber demands, given that OKI mill is slated to be running at 85 per cent capacity by the end of the year. He says that the fires of 2015, the worst of which occurred in the area around OKI, have squeezed an already stretched wood supply.
What exacerbates the situation is that 37 per cent of APP's plantations in South Sumatra were consumed by fire in 2015, and cannot be replanted. And with 60 per cent of APP's concessions on peat, and a government ban in place on peatland exploitation, the company's expansion plans are limited. Tinhout points out that APP's peat-based plantations are not only at high risk from fire, but also threaten the environment near them. The drainage canals that run through the plantations leach water from neighbouring forests and local community land, while the roads leading to the plantations give outsiders easy access to fire-prone areas. He says: "APP has a track record that shows its inability to prevent major fires within their planted and unplanted plantation areas."

2015 burned APP pulpwood plantation in Jambi, Sumatra. Photo: Hans Joosten.

Sceptics of APP's claims that the company is under intense financial pressure to run the facility at full capacity - and keep it there. Most of the US$2.6 billion mill investment comes from a loan provided by China Development Bank and other funders, and the debt is repayable on a 12-year schedule. APP's ability to meet its financial obligations will depend on the profitability of the mill. The report of the NGOs found that the company was well short on wood to feed the mill—even before the destructive forest fires of 2015.
"It doesn't tally with what is really happening on the ground," Rainforest Alliance's Richard Donovan says, pointing to the work that APP has been doing to keep faith with its FCP commitments. One of APP's key strategic ambitions is to re-engage with Forest Stewardship Council (FSC), a forest products certification body

that broke off ties with the company a decade ago because of the company had been found to have defaulted on a pledge to identify and monitor high conservation value forests. The process of re-engagement has begun, and Donovan suggests that APP would not want to jeapardise a potential certification deal that would help the company sell more products by carrying the FSC logo.

Commenting on behalf of Greenpeace is Andy Tait, a well respected activist who has worked for the NGO for 17 years. He says that the group has campaigned against APP around the world for many years, and since the company stopped cutting down rainforests, Greenpeace has "pushed" it to deliver on its zero deforestation commitments and to manage peatland more responsibly. "The company still has a lot of work to do to deliver on these commitments," says Tait. "APP's decision to stick with plans to build a major new mill have rightly led to doubts being raised about how it can both feed the capacity of this mill and stick to its sustainability commitments." "Greenpeace and other NGOs will obviously continue to hold APP and Asia Pacific Resources International Limited (APRIL), the other major pulp company in Indonesia, to account to implement sustainability commitments and to compensate for highly irresponsible past practices."

Aida Greenbury, APP's chief sustainability officer, who abruptly left the company in May, has also caused some critics to wonder what would become of the commitments that the outspoken Indonesian had fought for over a 13-year career. One of Greenbury's biggest achievement was negotiating a US$10 million a year pledge to restore 1 million hectares of Indonesian peatland, which could end up costing APP in the region of US$1 billion to implement, according to a source close to the company. Greenbury's replacement as head of APP's sustainability function, and also the head of its Singapore operations, is Bernard Tan, a former Singapore army general and head of the intelligence services.

With Greenbury gone, will APP now start to unravel its forest protection commitments? Greenbury, who has set up an eponymously named consultancy and has recently joined FSC and Mongabay's Board of Advisors, tells Eco-Business that it would be "commercial suicide" for APP to renege on it pledges. APP has lost millions in lost contracts because of its destructive forestry practices, and would lose millions more if news broke that the company had gone back on its promises.

As things stand, APP says that it is on track with the improvements it is making to its operations, which will ensure that its forest conservation commitments remain intact. They are: increasing yield by better control of disease and pests, trialling strains that can thrive on peat soil, and reducing wood waste. Though its record of fires in its concessions is alarming, the company has put serious money behind measures to suppress and prevent them. The company has invested around US$20 million in tackling fire, from thermal image cameras mounted to super puma helicopters, to rewarding smallholder farmers that refrain from burning land with financial incentives. APP's promise to restore 1 million ha of rainforests is still very much in its infancy, with only a few thousand hectares in its concessions in the process of being restored. But achieving such a big target is feasible for a company with a land bank of 2.6 million hectares—if it focuses on land that is under its full control, says Tinhout of Wetlands International. He points to APP's Tripupa plantation in South Sumatra, which was retired and rewetted before the 2015 fires. It was the only concession in the province that stayed fire-free.

Looking to the future, the biggest problem facing APP is peat, large tracts of which have been drained and developed into plantations. If the peat subsides, as it is prone to after it has been drained, as much as 60 per cent of APP's peat-based land could eventually be rendered unfarmable, as flooding and diseases such as root rot and canker ravage yields. The company is trialling species that thrive on peat - known as paludiculture. But these species are some way off from being commercially viable. Producing a fiber from paludiculture at a cost that is competitive is one problem. Another is that some vegetation must remain in place when the crop is harvested to ensure that the sun does not dry out the peat. This raises costs and lowers productivity. While APP may be serious about developing a peat-friendly crop, some suspect that it is using its research efforts to buy more time for its plantations on drained peat. "The only responsible way forward is for them to drastically reduce their plantations on drained peat," says Brian Orland, senior associate, Woods & Wayside International. "Paludiculture for pulpwood production does not seem like a commercially viable alternative in the short term."

This is a challenge that is not APP's alone. APRIL, Indonesia's second largest pulp and paper company, is around a third the size of APP, but grows an even larger proportion of its crops on peat. The riskiness of peat-based planattions came to prominence for APRIL this November, when the operations plans of subsidiary PR RAPP were declared legally invalid after the company was found to have ignored new regulations on peat management, which prohibit tinkering with water levels or developing new plantations on the carbon-rich soil.

The news was a reminder of the squeeze agribusiness firms operating in the area now find themselves under. Now, the race is on for APP, APRIL and others to find crops that can grow well on peat, or secure land on less vulnerable soil. The fate of Indonesia's pulp and paper firms—and that of the country's remaining rainforests and the communities that depend on them—depends on how this race plays out.
Read the full paper of Robin Hicks under http://www.eco-business.com/news/development-or-destruction-an-inside-look-at-apps-mega-paper-mill/

BRG says progress on peatland restoration behind target

Indonesia's Peatland Restoration Agency BRG is still far behind their target of restoring 2.4 million hectares of peatland by 2020 due to the limited rights it has to restore peatlands within concession areas. Budi S. Wardhana, deputy of planning and cooperation at BRG, said the agency has restored at least 200,000 hectares of degraded peatland in those provinces since it was founded in January 2016. The agency has set a target of 1 million hectares of restored peatland by this year. "We're still far away from our target. Because we can't directly restore peatland in areas controlled by industrial forest concession holders," Budi said on Tuesday 31 October. Budi said only licensors have the right to demand concession holders to restore degraded peatlands.
The agency will launch legal proceedings against concession holders in a bid to restore the degraded peatlands, he said. "We can base the legal proceedings on our environmental law and forestry law, especially for those who hold permits to use peatland areas for production," Budi said. "Concession holders carry land use permits, so they must be responsible to restore degraded peatlands in their concession areas," Budi said.
http://jakartaglobe.id/news/brg-says-progress-peatland-restoration-behind-target/

World praises Indonesia for success with peat governance

The success of the Indonesian government in dealing with peatlands over the past two years has drawn attention of many countries in the world. Indonesia is getting attention for being considered to have made an 'unusual leap' and achievements in peat governance, amidst the increasingly challenging threats to climate change. One indicator is that if Indonesia has been routinely experiencing forest and land fires for decades, which mostly occur in peatlands, for 2016 and 2017, similar disasters can be addressed properly. "We prove that Indonesia is not a lagging state [in peat governance]. Many references are taken from this conference. From Indonesia, the world learns about peatland governance," said Environment and Forestry Minister Siti Nurbaya at the 23rd Conference of Party (COP 23 UNFCCC) in Bonn, Germany.
Various efforts and government policies managed to reduce the number of hotspots significantly. Based on NOAA satellite data as of November 17, 2017, the number of hotspots was reduced from 21,929 (2015) to 3,915 or 82 percent in 2016. While in 2017, the hotspots were 2,546 or decreased by 91 percent from 2015 to 2017. The same indication can also be seen from the monitoring of the TERRA NASA satellite. The hotspots were reduced to 95 percent from 2015 (70,971 hotspots) to 2016 (3,844 hotspots). Whereas in 2017 compared to 2015, it was reduced to 98 percent (2,326 hotspots). Another indicator is the area of burning, from 2.6 million hectares (ha) in 2015 down to 128 thousand ha in 2017. This means that the area of forest and land fires is reduced by 95 percent. Minister Siti Nurbaya revealed in an area of 2.6 million hectares burned in 2015, there are about 900 thousand ha of peatland forest. In 2016, there was a drastic decline of burning peatlands, to only about 67 thousand ha or decreased by 93 percent. Until November 17, 2017, peatland in Indonesia is burned only about 10 thousand hectares or has been reduced to 99 percent compared to 2015. With these efforts, Indonesia has been able to successfully avoid the forest and land fires and smoke debris in 2016 and 2017, after previously taking place for decades. "The restoration agenda in Indonesia is driven by science and because this is the biggest global effort to restore tropical peat, it will generate new insights and paradigms in tropical peatland management," said Minister Siti.
http://www.en.netralnews.com/news/currentnews/read/15119/indonesia.earns.world.praise.for.success.with.peat.governance.amid.climate.change.threat

Peatlands becomes pineapple plantations to prevent forest fire

Peatlands in the Ogan Ilir district, South Sumatra, will be used as pineapple plantations to make the lands more productive and prevent forest and peatland fires. Fires on peatland are difficult to extinguish so many parties are joining together to transform peatlands into areas that are beneficial to communities.
http://www.en.netralnews.com/news/currentnews/read/13349/peatlands.becomes.pineapple.plantations.to.prevent.forest.fire

Pine apple and oil palm cultivation in South-Sumatra. Photo: Hans Joosten.

Japan

Japan's green energy incentives cast spotlight on controversial use of palm oil

Since Japan, in the wake of the Fukushima reactor meltdowns in 2011, guarantees prices for power generated by renewable sources such as solar, wind and biomass, palm oil is becoming more popular. The category's total capacity soared to 11.5 gigawatts, up from just 3 gigawatts in 2016, and palm oil projects account for almost 40 percent, according to government data. "Palm oil is carbon-neutral, while with fossil fuels, the more you use the more CO_2 is emitted," said Masaru Kubo, vice president of Osaka-based Sankei Energy Co. "We think using palm oil will help deter global warming," he said, adding that he's hopeful there will be more certified palm oil available. But the impact calculation can get complicated, as the math has to account for emissions caused by the draining and burning of carbon-rich peatlands and tropical forests that are destroyed to make way for oil palm trees. Most of the palm trees are grown in Malaysia and Indonesia.

Eneres Co., a Tokyo-based energy-management company with two plants that use palm oil, said the material used in power plants is typically just a byproduct from refining the edible kind. As for the impact planting has: "We are not in a position to assess the impact and situation on the destruction of rain forests and peatlands, as well as carbon dioxide emissions at this point," Eneres said in an email. "We will collect information on those issues as well as pay close attention to the government's position and guidance."

The economics help explain palm oil's popularity. A power plant that uses palm oil for a diesel engine generator is cheaper and requires less space than many other types of biomass facilities. Construction costs about ¥210,000 ($1,840) a kilowatt, compared with ¥410,000 for plants using wood pellets and chips, yet they all qualify for the same feed-in tariff, according to the Biomass Power Association. And palm-oil facilities take up far less land than solar and wind operations.
https://www.japantimes.co.jp/news/2017/11/09/business/japans-green-energy-incentives-cast-spotlight-controversial-use-palm-oil/#.WkV1lHkiHiw

Malaysia

Social Forestry Programme in Selangor, Malaysia

A Social Forestry Roadshow was jointly organised by Selangor State Forestry Department, Forestry Department of Peninsular Malaysia and Global Environment Centre from 27-29 November 2017. Held in Raja Musa Forest Reserve and Sg Sireh Agrotourism Homestay, the theme was "Peat Swamp Forest (PSF) based ecotourism by local communities in Selangor". It was attended by over 65 participants from government departments, local communities and NGOs. The programme promotes the forestry and social programme by Selangor Forestry in North Selangor Peat Swamp Forest and highlights the potential of PSF as an ecotourism attraction. It also Increases awareness on the role of forests to ecological balance and community wellness through learning and information sharing and also offered participants a chance to learn better methods and strategies for generating sustainable income from PSFs.

Raja Musa Forest Reserve Recognised as Part of the Queen's Commonwealth Canopy

The Queen's Commonwealth Canopy (QCC) is an initiative that creates a network for forest conservation throughout the 53 Commonwealth nations. The 23,000 hectare Raja Musa Forest Reserve was named as one of the Queen's Commonwealth Canopy (QCC) sites on 13 September 2017. The forest reserve is part of the North Selangor Peat Swamp Forest area and is sustainably managed by the Selangor State Forestry Department with active collaboration with other stakeholders including local communities and the plantation sector. There is an indefinite moratorium on logging in the reserved forest.

Europe

Bogs in Europe are affected by global change but climatically robust

A group of European biologists under the leadership of Utrecht University Prof Jos Verhoeven has studied how peat bogs react to climate change and increased levels of sulphur and nitrogen in the air. To their surprise, they discovered that these changes may cause plant species to disappear, but that these are replaced by others with a similar function in the ecosystem. The results of their study are published in Nature Communications on Friday 27th October. "We know that the changing climate and increases in nitrogen and sulphur in the atmosphere cause certain plant species to disappear from areas. That may also have strong consequences for certain biological functions in the area, like carbon sequestration by peat bogs", explains first author Bjorn Robroek. Recent research, however, has shown that the biodiversity of peat bog plant communities is less affected by climate change than, for example, in grasslands or dune ecosystems. Comparing 56 peat bogs across Europe the researchers found clear differences in vegetation between individual peat bogs, but remarkably they all displayed similar levels of biodiversity - the number of different species in each area. Further analysis showed that two clusters of plants with opposing preferences grow together. One group thrives under higher temperatures and precipitation, while the other prefers slightly lower temperatures and less precipitation. The data showed that the absence of species with certain functions is compensated by the presence of species from the other cluster with the same functions. In this way, the peat bog can continue to function properly even if the plant species composition shifts as a result of environmental change.

That is good news, considering the estimated 500 billion tonnes of carbon that lies sequestered in peatlands around the world. However, the continued existence of peatlands remains vulnerable. Most European peatlands have either disappeared or been seriously affected by human activity. "It is therefore vital that the existing peatlandss are not damaged by drainage or other major interventions", according to research leader Prof Jos Verhoeven from Utrecht University.

- https://www.uu.nl/en/news/plant-communities-in-peat-bogs-are-affected-by-global-change-but-their-ecological-function-is-robust
- http://iop.msgfocus.com/c/11rg8HRVlxSibNYe5z6T794QXk
- https://www.scientificamerican.com/article/massive-carbon-sink-may-be-more-resilient-than-scientists-thought/

European Union

Invitation to submit a tender for GHG measurements in peatlands in LV, LT, PL and D

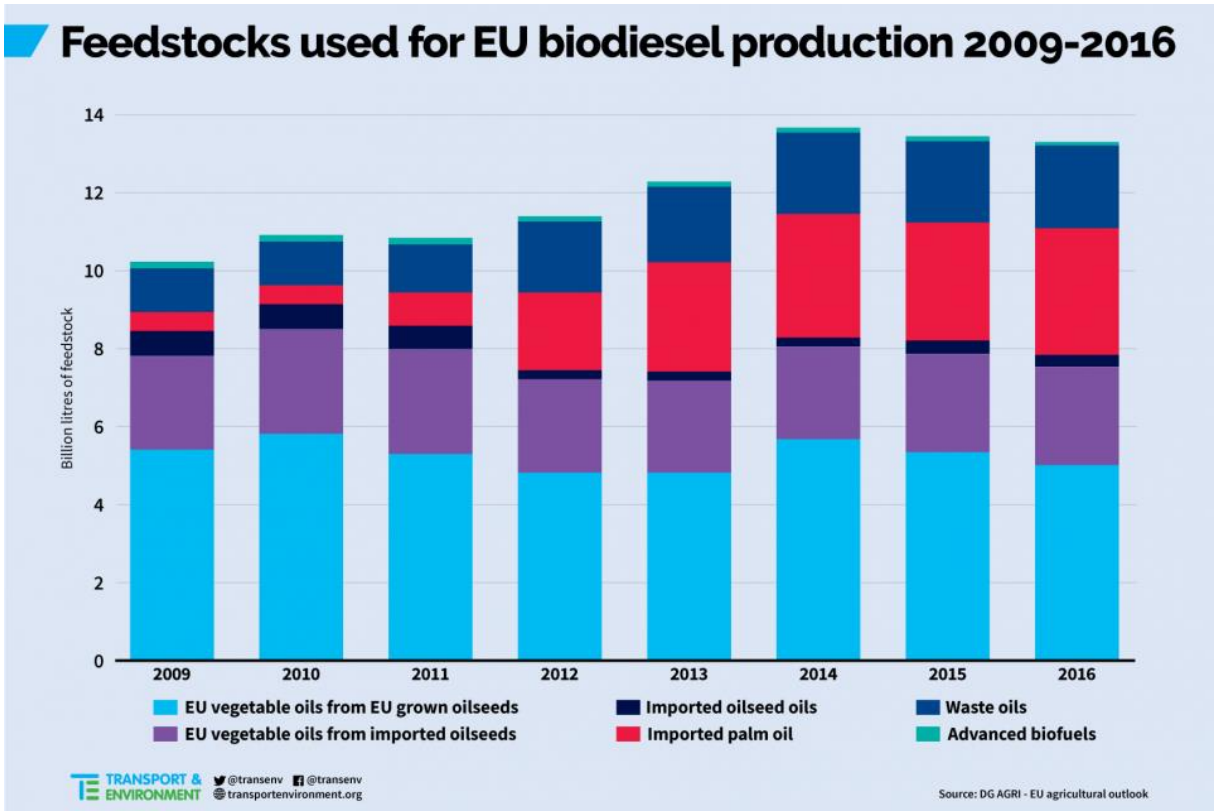
NABU Nature and Biodiversity Conservation Union, Coordinating Beneficiary of the EU-LIFE project LIFE 15 CCM/DE/00138 "Reduction of CO_2 emissions by restoring degraded peatlands in Northern European Lowland" intends to contract services to conduct greenhouse gas measurements and modelling in restored peatlands. Starting from the beginning of the vegetation period 2018 on, at in total 10 project sites GHG are to be measured in Latvia, Lithuania, Poland and Germany. This is a public invitation to submit a tender according to German procurement law. The contract notice is available under https://life-peat-restore.eu/en/publications/ and on www.bund.de. For more information: Letícia Jurema, Leticia.Jurema@NABU.de, Phone: +49 (0)30.28.4984 – 1726.

Climate Smart Agriculture on Organic Soils (CAOS) 23-24 November 2017, Uppsala

CAOS is an EU-financed research project aiming to distribute knowledge of how active peatland management under wet conditions can improve the productivity of biomass, yield stability and quality, trafficability, and soil and water quality, while providing greenhouse gas (GHG) mitigation and thus resilience to climate change. Proceedings of the International Conference on Climate Smart Agriculture on Organic Soils 23rd – 24th of November 2017, Uppsala, Sweden, can be found under: https://pub.epsilon.slu.se/14739/1/berglund_et_al_171121.pdf

Over half of crops used for biofuel imported to EU, new report reveals

New analysis reveals that over half of the crops used to produce biodiesel in the EU have been imported and are not grown by European farmers. Transport & Environment (T&E), a leading European environmental NGO, has called for more "transparency" in the "opaque" biofuel industry following analysis revealing that 53 per cent of crops are imported. T&E's analysis shows that the amount of EU-produced biodiesel from crops grown in Europe has remained stable since 2009 but that palm oil imports have skyrocketed to meet the growing needs of the biofuels market. The 2017 *EU Energy Statistical Pocketbook* revealed that biodiesel, derived from rapeseed, palm and soya vegetable oils, comprises 80 per cent of the EU biofuels market. Bioethanol makes up the remaining 20 per cent.



A T&E report from 2016 found that, on average, biodiesels from virgin vegetable oil can produce 80 per cent higher emissions over their full lifecycle than the fossil fuels they replace. Lifecycle emissions include land-use change emissions where cropland biofuel production displaces the current land use, in many cases leading to peatland drainage and deforestation.
In April, European politicians voted in favour of resolution calling for a halt to incentives for biofuels used in the transport sector that is linked to deforestation and peatland destruction. In 2015, 46 per cent of all the palm oil used in Europe ended up in cars and trucks. The EU's current 2020 biofuel mandate calls for 10 per cent of the transport fuel of every member state to come from renewables such as biofuels. The European Parliament is currently reviewing the Renewable Energy Directive, which will decide what role biofuels will play over the next decade.

- https://greennews.ie/over-half-crops-imported-biofuels-eu-new-study/
- https://greennews.ie/swedish-ngos-sustainability-concern-red/

Austria

Session "Peatland Hydrology" at EGU General Assembly 2018 in Vienna (08 – 13 April)
Peatlands develop in specific hydrological settings and react sensitively to changes in climatic and hydrological boundary conditions. The hydrology of peatlands is fundamental to their function and development. Soil hydrological properties can change drastically after human interventions such as drainage, causing challenges for both model parameterisation and re-wetting measures. Pristine peatlands offer and regulate a number of ecosystem services such as biodiversity, carbon storage and nutrient retention. Hydrology is a key control for a number of these services but studies on peatland hydrology are surprisingly scarce. Furthermore, the effects of peatlands (both pristine and disturbed) on flood retention and on regional climate are much debated, but there seem to be more myths than data. As hydrological and biotic processes in peatlands are strongly coupled, estimating the eco-hydrological response of peatlands under climate change and linking it to vegetation development and greenhouse gas emissions is a demanding task for modellers.
The session aims to bring together peatland scientists to focus on improved understanding of hydrological processes operating in all types of peatlands. Peatlands being considered may be pristine or disturbed and degraded and may also include rehabilitation and re-wetting interventions. Hydrological data may have been collected for other reasons (e.g. carbon flux calculations) but the session welcomes re-examination of such hydrological data in its own right or as supporting data for other studies. Results from research focussing on all aspects of peatland hydrology are welcome in this session. Our scale of interest ranges from the plot to the regional scale. Field, laboratory or modelling studies on hydrological, hydrochemical or geophysical topics are welcome. Studies examining hydrological ecosystem service provision such as nutrient retention or flood protection would be welcome. The deadline for the receipt of Abstracts is 10 January 2018 - 13:00 CET.
http://meetingorganizer.copernicus.org/EGU2018/session/26664

EGU Session "Environment-friendly management of organic soils and paludiculture – from innovation to implementation"
Globally, 10–20% of peatlands have been drained for agriculture or forestry, and these emit 6% of global CO_2 emissions. There are countries in Europe that have more than 60% of their agricultural emissions originating from cultivated organic soils, and the fate of South-East Asian peatlands is of global concern. However, there are peat-rich countries that are unable to include these emissions in their emission statistics due to lack of data. Innovative mitigation measures that sustain economically viable biomass production while diminishing environmental impacts and supporting ecosystem services of organic soils are vigorously studied. How to implement innovations in practice and into national GHG inventories is a challenge. We invite studies addressing new, innovative management practices on organic soils. We also welcome contributions that address policy coherence and identify policy instruments for initiating and implementing new management practices on organic soils. For more information: Hanna Silvennoinen: Hanna.Silvennoinen@nibio.no
Deadline for the receipt of abstracts is 10 Jan 2018, 13:00 CET. More information about submission can be found here

Belarus

UNDP: Environmental projects in Belarus yield tangible results

Environmental projects in Belarus yield tangible results. It is as important to disseminate best practices to other territories, UN Resident Coordinator/UNDP Resident Representative in Belarus Sanaka Samarasinha said at the final training seminar of the project ClimaEast: Conservation and sustainable management of peatlands in Belarus to minimize carbon emissions and help ecosystems to adapt to the climate change on 24 November. The project implemented in the reserves Zvanets and Sporovsky helped restore almost 4,000 hectares of wetlands, greatly increase the population of Aquatic Warbler listed in the Red List of Endangered Species of Belarus, reduce the number of fires in ecosystems and carbon emissions into the atmosphere. "This experience can easily be extended to other areas. We need to go this way to save other peatlands for the sake of future generations," Sanaka Samarasinha believes. Local residents show interest in such initiatives as they mean new jobs and enhance the value of the area. "The preservation of peatlands is not only a matter of economy or ecology. This also includes a social dimension. The focus should be placed on these points. The information campaign should disseminate knowledge on the advantages of preserving ecosystems and their biological diversity," so the UN/UNDP Resident Representative in Belarus. He stressed that economic performance is also an important indicator in the achievement of the Sustainable Development Goals. The four-year project demonstrated a comprehensive approach to the sustainable management of lowlands in the nature reserves Zvanets and Sporovsky. Infrastructure has been developed to use biomass in power engineering, construction and agriculture. Special equipment has been acquired for cutting and collecting reeds, grass and trees. A total of 3,893 hectares in pilot areas were cleared of vegetation; 33 jobs were created. All equipment has been transferred into the ownership of the Sporovsky reserve. Harvested wood and shrubby wood chips are used as biofuel, partly replacing fossil hydrocarbon raw materials which are one of the major sources of greenhouse gas. http://eng.belta.by/society/view/undp-environmental-projects-in-belarus-yield-tangible-results-107060-2017/

Zvanets mire reserve, Belarus. Photo: Hans Joosten.

EU will continue to support environmental projects in Belarus

The European Union will continue supporting to environmental projects in Belarus, Head of the EU Delegation to Belarus Andrea Wiktorin said at the final training seminar of the ClimaEast project (see above). "We are currently discussing our plans for the next four years. We cooperate with representatives of civil society, the

authorities, discuss priorities. It is important to cover as many different elements as possible, including environmental protection, climate change, and regional development. The goal is to make the results sustainable, expand them to other areas with a view to preserving the environment." The ClimaEast project is designed to help the Eastern Partnership member states and Russia reduce greenhouse gas emissions. "Climate has no borders. Climate change mitigation is a strategic priority for the European Union. In Belarus the ClimaEast project implements new approaches to sustainable management of natural resources, including peatlands. Funded by the European Union and implemented by the UN Development Program, the project has become a notable example of the green economy. The project demonstrated a comprehensive approach to the sustainable management of lowlands in the nature reserves Zvanets and Sporovsky. Infrastructure has been developed to use biomass in power engineering, construction and agriculture. Special equipment has been acquired for cutting and collecting reeds, grass and trees. The density of Aquatic Warbler in the model areas increased 1.5-2 times in Zvanets compared with the beginning of the project, and 1.2-1.5 times in Sporovsky.
http://eng.belta.by/society/view/wiktorin-eu-will-continue-to-support-environmental-projects-in-belarus-107048-2017/

Germany

Mire experts visit dam building construction works for poldering and rewetting of the Dellstedter Moor, Schleswig-Holstein. Photo: Michael Trepel.

Peatland restoration in the Eider-Treene-Sorge area

Michael Trepel (michael.trepel@melund.landsh.de)

From 12th to 14th October, a group of around 25 experts discussed during a seminar organized by German Peat Society (DEGMT) peatland restoration in the Eider-Treene-Sorge region (ETS) in Schleswig-Holstein, Germany. In the ETS-region mire developed on around 18.000 ha; and more than half of them were formerly raised bogs. These mires lost their peat accumulating properties due to drainage for peat extraction and agriculture. Since, the 1980ies the Stiftung Naturschutz has bought around 8.700 ha of peatland and is restoring the area by rewetting. Since 2011 – in the frame of the new adapted Mire Conservation Program – new rewetting techniques with damming are tested. With this technique 1.320 ha were rewetted, said the Jutta Walter from Stiftung Naturschutz. In the by damming poldered peatlands, the water table raised after swelling of the white *Sphagnum* peat, which has often only a low degree of humification, to the surface. During the dam building, all former drainage facilities were destroyed, so that the area is not drained any more. *Sphagnum* species like *Sp.*

fimbriatum, cuspidatum, fallax but also *Sp. rubellum* and *magellanicum* established quickly in some parts of the rewetted areas. This is considered by the experts as a remarkable success. For rewetting with peat dams, it is necessary to know the elevation of the area precisely explained the consultant Holger Mordhorst-Brettschneider and to build dams following the elevation contour lines. The success of the dam building work depends to a large extent on the knowledge and experience of the truck driver, agreed the experts during the field visit.

Ireland

Community conservation project provides lifeline for iconic Red Grouse and Curlews

Bord na Móna and the Community of Ballydangan, Co. Roscommon are celebrating the remarkable achievements of a project that has conserved populations of Red Grouse, Curlew and other species of national significance. Ballydangan Bog, which is owned by Bord na Móna, has been the focus of a joint company and community conservation effort since 2010. Their efforts in controlling predators and rewetting the bog have conserved a population of the iconic and rare Red Grouse and helped the endangered Curlew flourish on the bog. Since the Project began, the bog has become a national hotspot for Curlews. Minister for Communications, Climate Action and Environment Denis Naughten TD said "The Red Grouse Conservation Project is an exemplary model of the success that can be wrought from the local engagement by the State and State companies. The environmental benefits of the hard work of all involved here are wide ranging, but perhaps most significantly from a Climate Action perspective, a blueprint is provided for unlocking the carbon sequestration potential of our nations boglands."
http://www.mccarthykos.ie/News/November-2017/Community-Conservation-Project-provides-lifeline-for-iconic-Red-Grouse-and-Curlews

Netherlands

Heel Holland Zakt – Entire Holland subsides

On November 9, 2017, the 350 participants of the second national congress on peat soil subsidence Heel Holland Zakt paid ample attention to peat soil subsidence and possible effective measures. See the photos, presentations and videos.
https://www.youtube.com/watch?v=Dxpj-HJ3XQQ

Construction materials produced from paludiculture crops, exhibited at Heel Holland Zakt.

During the Deltacongres in Leeuwarden on November 2, 2017 the over 1500 participants heared a plea for a 'Space for peat' ('Ruimte voor het veen') programme, because areas with peat subsidence are very sensitive to climate change. http://www.slappebodem.nl/Nieuws/Deltacongres-2017-veen-op-de-agenda/

De bodem daalt sneller dan dat de zeespiegel rijst – The soil subsides faster than the sea level rises

New subsidence maps show effects of climate

The renewed climate atlas of the Netherlands now also shows in detail how much subsidence will take place in an area until 2050 if no mitigating actions are undertaken. The Klimaateffectatlas is a collection of maps showing the effects of climate change on a regional level. As a result of climate change the groundwater level in the Netherlands will fall leading to increased peat oxidation and soil subsidence. Read and view more here.

International Peatland Society (IPS) 50th anniversary Jubilee Symposium 2018 in the Netherlands

On the occasion of the 50th anniversary of IPS, the IPS Dutch National Committee (Nederlands Veengenootschap) is organizing a symposium on the wise use of peatlands, as well as peat, past and future, along with specific topics that will attract experts from all around the world during 11 - 13 September 2018. A grand gala evening will also be part of the programme. The symposium will be held in Rotterdam. The setting for this high-profile international jubilee symposium will be announced in January. The organizers aim to bring together scientists, policymakers, regulators, NGO representatives and industry managers (peat harvesting, growing media and energy) to share the most recent scientific research and technical developments in the field of peatland use in agriculture, forestry and the peat industry. The following subjects will get extra attention: Subsidence of drained peatlands, CO_2 emissions, submerged drains, paludiculture, landscape history, use of peat in horticulture, planning of worldwide demand for food production, future availability of peat. In January, it will be possible to register for this symposium. Interested people can pre-register without any obligation by sending their name to secretaris@veengenootschap.nl The organizing committee kindly asks relevant speakers to indicate their interest in presenting an oral presentation on Thursday, 13th September 2018, by submitting a preliminary title and two to five sentences describing the topic by e-mail to Mr. Jan van den Akker JanJH.vandenAkker@wur.nl

Norway

No more ditching of mires in Norway?

Asbjørn Moen (asbjorn.moen@ntnu.no)

The Norwegian Ministry of Agriculture and Food (Landbruks- og matdepartementet) send 11.07. 2017 a proposal to forbid ditching of mires for agriculture in Norway The main reason for the proposal was to reduce greenhouse gas emissions. The proposal had wide distribution and more than 100 opinions were given. The Parliament (Stortinget) will later discuss and decide if mires are protected against being agricultural land. In 2009 there was a similar initiative to stop ditching of mires, and then it was decided to finish all ditching for forestry. But the use of mires for agriculture was then not forbidden.

Annexes to the proposal of the Ministry were two reports the Norwegian Institute of Bioeconomy Research (NIBIO; Barcena et al. 2016, 2017). NIBIO was established in 2015 by the merger of three institutes, which each of them had earlier been established by the merger of other institutes, so all together NIBIO now includes more than 10 former institutes/associations, which were working on topics like forest, mire, soil, vegetation and landscape mapping, plant health and agricultural economy. NIBIO is a rather large and heterogeneous research institute with more than 700 employees, with "a particular focus on food security and climate change".

Agriculture peatland in Smøla, Norway. Photo: Hans Joosten.

The director of NIBIO recently told the media that he is against the proposal to forbid ditching of mires for agriculture in Norway. At the same time NIBIO told senior researcher Arne Grønlund that he should not work and write more on the topic of peat and greenhouse gasses and he was taken off such projects at NIBIO. Grønlund has done much research and published a large number of publications and reports on greenhouse gas emissions from peatlands; he is a leading researcher on this topic in Norway and has participated in many international projects. He has been active in arguing for protection of peatlands as an important stock for C.
Over the last weeks there have been very hard discussions in Norway between people who want the protection of peatlands and people arguing for using peatlands as agricultural land. Inside NIBIO there are different opinions. There have been proposals that mires with less than 30 cm of peat should be left out of the proposal (mires are often defined in Norway as areas with more than 30 cm of peat). Mires with thin peat cover large areas in Norway and many mires with deep peat also include thin-peated areas.
Another argument from people who want to use mires is that C loss from 'inverted peatlands' (i.e. where mineral soil has been placed on top of the peat layer) is less than from conventionally cultivated peatlands. However, no scientific studies have been done to confirm this. For me it seems reasonable that inverted areas keep the carbon for a shorter time, but not during a long period. Personally I hope that Norway this time decides to protect the peatlands from digging out. It will help Norway to reduce its greenhouse gas emissions and therefore be an important decision for the future.

References

Barcena, T.G., Grønlund, A., Hoveid, Ø., Søgaard, G. & Lågbu, R. 2016. Kunnskapsgrunnlag om nydyrking av myr. – NIBIO Rapport 2016 43: 1-59.

Barcena, T.G., Bjørkelo, K., Grønlund, A., Hoveid, Ø., Mittenzwei, K. & Øygarden, L. 2017. Tilleggsutredning knyttet til kostnadseffektivitet og klimaeffekter av forbud mot nydyrking av myr. – NIBIO Notat. 35 p. Unpubl.

United Kingdom

£6 million invested in Northern England's peatlands

This October saw the launch of Pennine PeatLIFE, a new £6 million project to fix large swathes of peatland in the North Pennines, Yorkshire Dales and Forest of Bowland over the next four years. The project aims to restore 1,300 ha of peat, test innovative funding mechanism, the Peatland Code, and trial new ways of

monitoring change using UAVs. The project is financed by EU LIFE, Environment Agency, Yorkshire Water, Northumbrian Water and United Utilites.

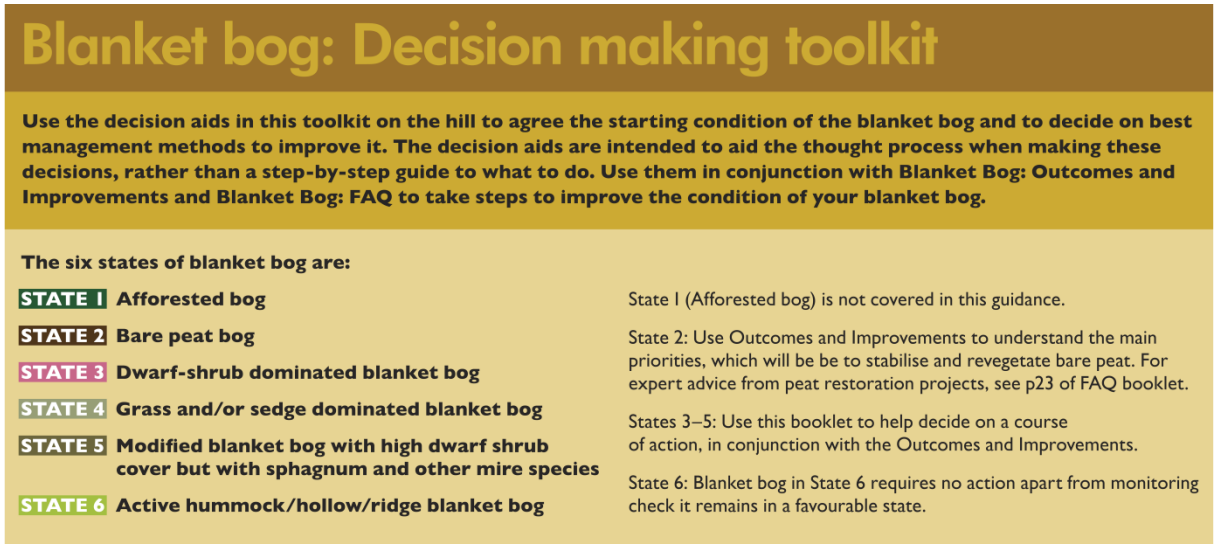
- http://www.iucn-uk-peatlandprogramme.org/news-and-events/news/%C2%A36-million-invested-restoring-nature%E2%80%99s-natural-carbon-store-northern-england
- http://www.stackyard.com/news/2017/10/environment/02_npaonb_peat.html

New restoration projects in the Cairngorms National Park

Six new restoration projects have started at the end of October in the Cairngorms National Park. The projects will restore 532 ha in total on sites at above 500 metres. Financed by **Peatland Action**, five estates are involved in the projects. http://www.iucn-uk-peatlandprogramme.org/news-and-events/news/peatland-restoration-projects-cairngorms-national-park

New peatland restoration toolkit launched

A new toolkit has been launched by the Uplands Management Group to enhance land managers' understanding of the current condition of blanket bog and allow them to implement peatland restoration methods to make improvements. http://www.moorsforthefuture.org.uk/news/new-peatland-restoration-toolkit-launched



Blanket bog: Decision making toolkit

Use the decision aids in this toolkit on the hill to agree the starting condition of the blanket bog and to decide on best management methods to improve it. The decision aids are intended to aid the thought process when making these decisions, rather than a step-by-step guide to what to do. Use them in conjunction with Blanket Bog: Outcomes and Improvements and Blanket Bog: FAQ to take steps to improve the condition of your blanket bog.

The six states of blanket bog are:

STATE 1 **Afforested bog**

STATE 2 **Bare peat bog**

STATE 3 **Dwarf-shrub dominated blanket bog**

STATE 4 **Grass and/or sedge dominated blanket bog**

STATE 5 **Modified blanket bog with high dwarf shrub cover but with sphagnum and other mire species**

STATE 6 **Active hummock/hollow/ridge blanket bog**

State 1 (Afforested bog) is not covered in this guidance.

State 2: Use Outcomes and Improvements to understand the main priorities, which will be be to stabilise and revegetate bare peat. For expert advice from peat restoration projects, see p23 of FAQ booklet.

States 3–5: Use this booklet to help decide on a course of action, in conjunction with the Outcomes and Improvements.

State 6: Blanket bog in State 6 requires no action apart from monitoring check it remains in a favourable state.

Broads gets £630,000 of European cash to restore Hickling Broad reed beds

Early October key international partners from Belgium, Germany, Denmark, Netherlands and Great Britain met in the Broads to kick off a new £5m project. The match-funded Canape (Creating A New Approach to Peatland Ecosystems) project will give the Broads Authority £630,000 from the European Regional Development Fund to continue delivering the 'Hickling Vision'. The project will see innovative geo-textile materials used to form a wall into which sediments dredged from Hickling will be pumped and then planted with local reeds. The project is also seen as an opportunity for people working in the Broads to transfer new and innovative concepts about managing lowland peatlands across the North Sea region of Europe. Partners will improve how to assess lake and peatland restoration options, as well as examining the benefits of peatlands, including flood storage and carbon capture. They will also explore the creation of future jobs by the development of new wetland products and the economic benefits this approach could produce. Peter Hahn, from the Ministry of Environment and Food in Denmark, said: "This is a valuable opportunity to exchange knowledge and most importantly to have a really positive impact upon climate change." The Canape project is seen as an opportunity for the Broads Authority to share its knowledge of lowland peatland management with its European partners.
http://www.eveningnews24.co.uk/news/broads-gets-630-000-of-european-cash-to-restore-hickling-broad-reed-beds-1-5232916

Major drive to bring new life to bogs in Wales

Natural Resources Wales' (NRW) £4 million project will bring new life to Welsh raised bogs. The project will improve the condition of seven of the most important sites in Wales. These have been altered by centuries of peat cutting and drainage. But, in peak condition, they help tackle climate change by storing vast amounts of carbon that would otherwise be released into the atmosphere. The drive to repair them will include closing

drainage systems, cut invasive species, remove scrub and introduce light grazing – all in partnership with local communities, landowners and contractors. Cors Caron, near Tregaron, and Cors Fochno in north Ceredigion are the two largest sites in the project. Restoration work will also take place at sites near Trawsfynydd, Fishguard, Crosshands, Crickhowell and Builth Wells. Funding for the four-year project has come from an EU LIFE programme grant and NRW, with support from Welsh Government and the Snowdonia National Park Authority.
http://www.abergavennychronicle.com/article.cfm?id=106503&headline=Major%20drive%20to%20bring%20new%20life%20to%20precious%20habitats&sectionIs=news&searchyear=2017

New land motion map of Scotland
Using hundreds of satellite radar images a complete map of mainland Scotland has been made showing small but significant rates of land motion. This wide-area monitoring technique offers the future means of generating a European-wide relative land motion map. The current study showed that large areas of Scotland's vast lowland and highland peatland areas are dominated by subsidence. This is notable as collapsing peatlands are a significant source of greenhouse gases. Dr Andy Sowter, Chief Technology Officer of GVL, the company which processed the satellite images explained, "If Scotland is to reach its climate change targets, which are currently under scrutiny by the UK Committee on Climate Change, land motion maps like this can provide vital evidence on the health of peatlands and with regular monitoring, the beneficial effect of peatland restoration towards improving the carbon balance." https://phys.org/news/2017-11-coast-to-coast-motion-scotland-derived-satellite.html#jCp

Central- and South-America

Cuba

Symposium Wetlands 2017 promotes care for peatlands in Caribbean Basin
The 11th International Symposium Wetlands 2017 (Ciénaga de Zapata, Cuba) dedicated space to promote the preservation of peatlands in the Caribbean. Scientists from Chile and Germany participated in the peatland round table: hidden treasures of the Caribbean during the event held in Cuba's Biosphere Reserve and Ramsar site. The Director of the Neo-Tropical Training Center of Wetlands in Chile, Elier Tabilo Valdivieso told that countries must work together to protect the wetland ecosystems that have peatlands in tune with the strategy directed to face climate change. Peatlands are found in specific types of wetlands, systems saturated with water. He stressed that Zapata Swamp has important reserves of peatland and mentioned that public policies are among the favorable alternatives to care the ecosystems. The expert added that it is important to educate the communities settled in the wetlands, which depend on them as food in order to use the natural resources in a sustainable matter. We are motivated in visiting Zapata Swamp where there is an important history in the conservation of peatlands and we expect to use this experience in a future project, said Tabilo Valdivieso. The

11th International Symposium Wetlands 2017 run from 6-10 November participation of scientists from Germany, Chile, Costa Rica, Guatemala, Holland, Panama and Cuba.
http://www.cubanews.acn.cu/science/7462-wetlands-2017-promotes-care-for-peatlands-in-caribbean-basin

Greifswald Mire Centre coring peat in Honduras, Central-America, November 2017. Photo: Hans Joosten.

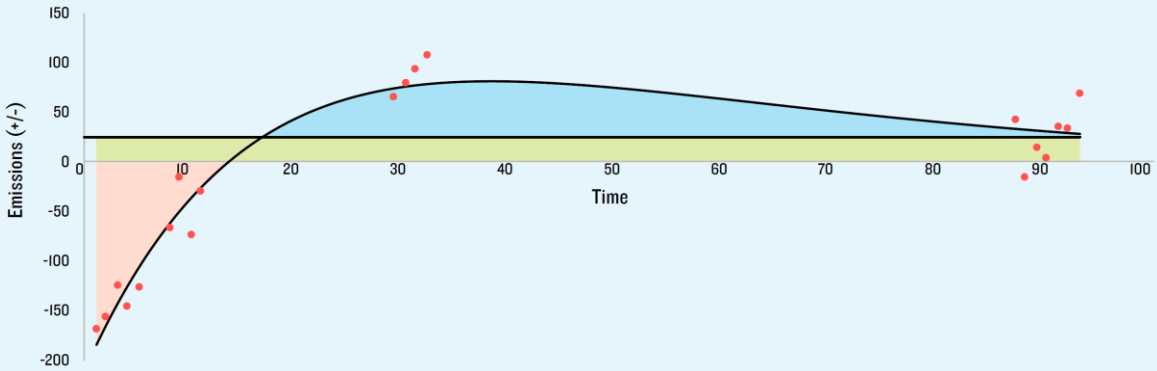
North America

Canada

Stop development on unprotected areas of Burns Bog!
Burns Bog Conservation Society has launched a petition calling on the Canadian government to use the Species At Risk Act to stop development on unprotected areas of Burns Bog: http://www.burnsbog.org/sign-the-petition-to-save-endangered-wildlife-in-your-backyard/ .

Clearcutting in boreal forest unleashes unmeasured emissions of carbon dioxide
Clearcutting in Canada's boreal forest unleashes significant emissions of carbon dioxide once locked up in soil, creating a threat to the global climate crisis that has gone largely unmeasured and unreported, according to a new analysis by the Natural Resources Defense Council. "Clearcutting in Canada's boreal forest is opening a Pandora's box of uncounted carbon dioxide emissions that threaten our planet's climate. It also threatens Indigenous communities and their cultural heritage and is destroying a unique forest ecosystem that is one of the world's best tools for avoiding the worst impacts of climate change," said Josh Axelrod, a policy analyst with NRDC's Canada Project. "Protecting and rehabilitating one of the world's last great forests is necessary for the planet and for Canada to maintain its position as a leader in fighting climate change."
NRDC's analysis shows a massive amount of the boreal forest's carbon is released through clearcutting that is currently unaccounted for in Canadian climate modeling and international reporting. An average of 1 million acres is clearcut in Canada annually, releasing an estimated 26 million metric tons of carbon dioxide. These uncounted climate impacts of boreal logging are on par with the upstream tar sands production emissions expected if the proposed Keystone XL tar sands pipeline were built.

The curve represents a forest site's response to clearcutting over time, with the curve fitted to measured data points (red dots). At harvest, there is a large initial release of carbon dioxide at the site, followed by a gradual decrease in the rate of release while the site recovers. The red area shows the period when the site is a net source of carbon dioxide. The green area shows the assumed sequestration potential of an unharvested site. The blue area shows the period when the site is a net sink of carbon dioxide. Importantly, the "carbon debt" created by the initial harvest is not "paid off" when the curve crosses the x-axis (red area becomes blue area). Our modeling suggests this does not occur for more than 60 years—meaning carbon neutrality at the site is not achieved until after that time.



The boreal forest is a green crown of trees that spans nearly the entire globe just below the Arctic Circle. Stretching over 1 billion acres, the Canadian boreal forest is one of the world's most important climate regulators and carbon storehouses. Compared to tropical forests, which are estimated to hold more than 50 percent of their carbon in trees and other above-ground biomass, boreal forests hold as little as 5 percent of their carbon in trees and other plants. This means 95 percent of the boreal forest's stored carbon is "locked up" in its soils, wetlands and peatlands. Clearcutting degrades and disturbs the boreal forest's ability to store carbon, by removing most living trees and damaging forest soils and peatlands in the process. Yet many in the forest industry defend clearcutting methods, taking the extreme position that increased use of harvested wood products is a climate solution. Blanket claims that wood products from "sustainably managed forests are always a carbon sink," oversimplify the carbon storage issue, but it's a message that Canada's federal and provincial governments are increasingly adopting to justify more logging. Huge quantities of trees clearcut from the boreal forest become wood pulp consumed in Canada or to U.S. manufacturers of throw-away products like newsprint, paper and tissue. NRDC's report, "*Pandora's Box: Clearcutting in the Canadian Boreal Unleashes Millions of Tons of Previously Uncounted Carbon Dioxide Emissions*" is based on a comprehensive review of scientific literature regarding the climate benefits of the boreal forest.
http://www.wisconsingazette.com/news/clearcutting-in-boreal-forest-unleashes-unmeasured-emissions-of-carbon-dioxide/article_dc8f09e2-bf1d-11e7-aea5-eb3841ae790e.html

United States of America

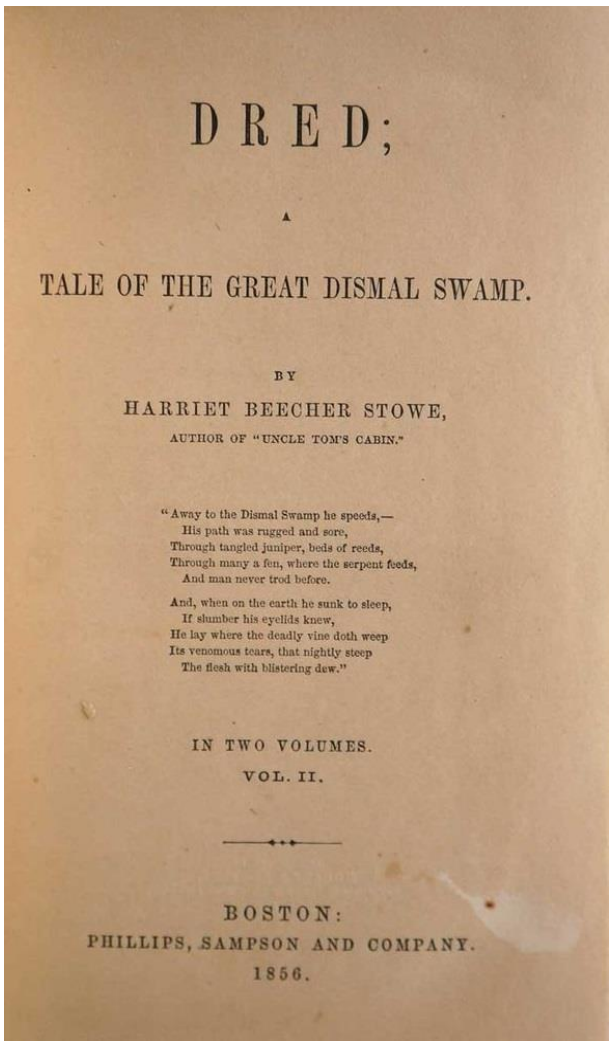
Broad protest against revision of the definition of 'waters'

In June, the Environmental Protection Agency and the U.S. Army Corps of Engineers announced the proposed repeal of the 2015 Clean Water Rule in anticipation of replacing it with a narrower definition of "Waters of the U.S." This new definition would include only those relatively permanent, standing or continuously flowing bodies of water and only those wetlands with a continuous surface connection to bodies that are 'waters of the United States' in their own right. Twelve scientific societies, representing nearly 200,000 members, have thereupon urged EPA and the Corps to include headwaters, tributaries and wetlands with a significant nexus to primary waters in any new definition of WOTUS even if they do not exhibit a continuous surface connection to primary waters. Excluding these waters poses a significant threat to the integrity and security of drinking water, public health, fisheries, and wildlife habitat, while significantly increasing the risks and costs associated with flood and storm damage. The organisations stress that the new definition would likely exclude most wetlands that are currently regulated and that the definition relies on an artificial visual characteristic that is unrelated to the functional connection between waters and wetlands Countless headwater streams, tributaries and millions of prairie pothole and vernal pool wetlands across the country would be unprotected. Many, if not most, forested, shrub/scrub, peatland and marsh wetlands are not continuously connected to relatively permanent or continuously flowing bodies of water and would not be protected. Even some iconic waters and

wetlands would be excluded from jurisdiction under such a definition including: the iconic Big Cypress Swamp in the Western Everglades, parts of the Okefenokee Swamp in Georgia and Florida, wetland permafrost areas in Alaska, the patterned peatlands in Minnesota such as those in the Lake Agassiz Lowlands, the Atchafalaya Swamp in Louisiana, and the Hockomock Swamp in Massachusetts.
See the full letter under: http://www.sws.org/images/sws_documents/WOTUSCWR-Step2-Cmt-Ltr-FINAL.pdf

ACR approves carbon offset methodology for restoration of pocosin wetlands

The American Carbon Registry (ACR), has announced the approval of a new methodology developed by The Nature Conservancy and TerraCarbon to measure and verify greenhouse gas (GHG) emissions reductions from the restoration of peat soils. The methodology is the result of eight years of Conservancy research in northeastern North Carolina. Landowners who restore peat soils can use this methodology to document and sell carbon credits on the voluntary carbon market. North Carolina's Albemarle-Pamlico peninsula is a patchwork of peat soils called pocosins (Algonquin for 'swamp on a hill'). Similar peat deposits are found along the United States coast from southern Virginia to southern Georgia. The methodology applies to those areas as well, offering private landowners in all these states a financial incentive for restoration. These pocosins have been ditched and drained since Colonial times. In fact, one drainage canal at the Great Dismal Swamp in Virginia is named the George Washington Canal because its construction was led by the first president of the United States. The Conservancy worked with TerraCarbon, which develops and sells carbon offsets to fund forest and wetland conservation around the world, to develop the methodology and shepherd it through ACR's stakeholder consultation and scientific peer-review approval process. The work was funded by Duke Energy, the Wildlife Conservation Society and the U.S. Fish and Wildlife Service. Other partners include United States Geological Survey, East Carolina University and Duke University. http://americancarbonregistry.org/news-events/news/american-carbon-registry-approves-carbon-offset-methodology-for-restoration-of-pocosin-wetlands



DRED;

A

TALE OF THE GREAT DISMAL SWAMP.

BY

HARRIET BEECHER STOWE,

AUTHOR OF "UNCLE TOM'S CABIN."

"Away to the Dismal Swamp he speeds,—
His path was rugged and sore,
Through tangled juniper, beds of reeds,
Through many a fen, where the serpent feeds,
And man never trod before.

And, when on the earth he sunk to sleep,
If slumber his eyelids knew,
He lay where the deadly vine doth weep
Its venomous tears, that nightly steep
The flesh with blistering dew."

IN TWO VOLUMES.

VOL. II.

BOSTON:
PHILLIPS, SAMPSON AND COMPANY.
1856.

Harriet Beecher-Stow's novel 'Dred' is interesting in the historical context of runaway slave communities surviving for a long time in swamp areas. Swamps were places where runaway slaves could hide, and therefore became a taboo subject, particularly in the south of the United States. The novel contains detailed descriptions of the wetlands in the "Dismal Swamp" and of the way African Americans related to that environment.

Rewetting Dismal Swamp, 250 years after George Washington drained it

It was a young George Washington, working as a surveyor 254 years ago, who saw profits in the wetlands straddling the Virginia-North Carolina border. The seemingly impenetrable Dismal Swamp had been dismissed as a deadly morass where explorers vanished and runaway slaves escaped. Washington and his fellow investors had slaves dig a ditch to drain the spongy peat soil and log the cypress and cedar trees. Their rot-proof lumber was perfect for ship masts, roof shingles and fence posts. Washington never drained the whole swamp, but loggers kept plundering it for generations thereafter, drying out the soil, altering the habitat and making it more vulnerable to wildfires. What's left of it didn't become a national wildlife refuge until 1974.

Now the U.S. Fish and Wildlife Service is trying to undo the damage by gradually "rewetting" the swamp. Refuge manager Chris Lowie and his staff are slowly raising the water table in the swamp's remaining 113,000 acres by capturing and rechanneling rainfall in the vast network of ditches that scar the land. Aluminum pipes and wooden boards now control water levels in about a third of the refuge. Such projects have become more urgent, with far-reaching consequences, as scientists pay more attention to how peat swamps impact climate change. Peat soil consists of partially decomposed remains of plants that have accumulated in wet conditions over centuries. When this soil dries and is exposed to oxygen, microscopic organisms break down the peat into carbon dioxide and release the greenhouse gas. Peat fires are also a major concern. According to the U.S. Geological Survey, the last two big fires at the Great Dismal Swamp released an estimated total of 6.2 megatons of carbon dioxide. Last year, the refuge agreed to share rewetting research with Sebangau National Park in Indonesia.

The Great Dismal Swamp was once ten times bigger than it is now, stretching for a million acres. In 1728, land surveyor William Byrd described its heart as a horrible desert that "no beast or bird approaches," with woods so thick, "friendly beams of the sun can never penetrate them to warm the earth." The thick stands of cypress and cedar trees Washington spotted in the 1760s have mostly given way to trees that grow in drier conditions, such as red maple and gum. Lowie knows the swamp will never again resemble the place Washington knew. "But I can say we're doing great things," he said. "Not just for the Great Dismal Swamp, but for the world." https://apnews.com/4279f688a7f4476e9664de5372b9decb/250-years-after-Washington-drained-it,-feds-soak-a-swamp

Peatland conservation relevant papers October/November 2017

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

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41. Estimation and uncertainty of recent carbon accumulation and vertical accretion in drained and undrained forested peatlands of the Southeastern USA: http://onlinelibrary.wiley.com/doi/10.1002/2017JG003950/abstract
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