Looking towards Glen Coe valley, Scotland. Photo: Hans Joosten.

IMCG Bulletin 2021-6: Nov – Dec 2021

The international peatland news that matters

INTERNATIONAL MIRE CONSERVATION GROUP

www.imcg.net

Contents of this Bulletin

IMCG issues

Word from the Secretary-General

Dear mire friends,
You will have noticed: covid has played tricks on us again. Our friends from Southern Africa had prepared the December 2021 **Field Symposium**, Congress and General Assembly so well, when suddenly the new Omicron variant appeared on the screen and our point of destination became factually isolated with skipped traffic and the treath of having to spend Christmas in quarantain. The organization team reacted promptly to limit the organizational and financial losses and postponed the events to March 2022. As a consequence also the IMCG **General Assembly has been postponed to March 23, 2022**.
The adagium of the legendary football player Johan Cruyff was: "Every disadvantage has an advantage". The advantage of the postponement of the December 2021 events is, that you can still 1) consider to participate in person (but be fast!!), 2) consult the virtual excursion programme that Niels Grootjans has constructed and participate in relevant conservation management discussions, and 3) **candidate for the new IMCG Main Board**.
Much attention in this Bulletin to the **Climate Convention in Glasgow** and the **Peatland pavilion**, which we present in a separate **annex**. It provides good memories or an impression of what you have missed. In any case, all resources are now available online!
Keep sending news, photographs, papers and other contributions for the next Bulletin to Hans Joosten at joosten@uni-greifswald.de.

IMCG General Assembly March 23, 2022 (online, link will be provided later)

The agenda of the General Assembly, March 23, 2022, **10.00 – 13.30 h (GMT+2)** is:

0. Election of the chairperson of the General Assembly
1. Opening by the chairperson. Welcome address by Kerryn Morrison (Vice President and Director of Africa of ICF and Senior Conservation Manager Africa of the EWT): 'Synergies in Africa between the IMCG and the International Crane Foundation / Endangered Wildlife Trust Partnership – beyond peatlands'.
2. Minutes of the General Assembly of August 31, 2018 in Utrecht, the Netherlands, see http://www.imcg.net/modules/download_gallery/dlc.php?file=295&id=1552072984
3. Biennial report (2018–2021) on the state of affairs in the IMCG and the tasks of international mire conservation
4. Balance sheet and the statement of profit and loss
5. Election of the Main Board
6. Nomination of Honorary Life Members
7. Conference resolutions
8. Next venues
9. Any Other Business
10. Closing of the General Assembly

Main Board elections

If you are interested to be part of the new IMCG Main Board, **nominate yourself** before **March 8, 2022**, by sending a short note (see below) to joosten@uni-greifswald.de. Elections will be organized via internet, so take care that we have your right internet address and keep an eye on incoming IMCG mails. The following persons have already been nominated for IMCG Main Board Member.

Jacolette Adam (South-Africa, 47 years, female)

I completed my degree at the University of Pretoria, and obtained my Master of Science degree in Zoology in 2000 from the same institution. I am a registered Natural Science Professional since 2002, and registered Environmental Assessment Practitioner with 20 years of experience. I hold a Master of Science as well as a Master of Law, specialising in Environmental Law. Since 2002, I have led and completed numerous ecological and wetland specialist studies as well as environmental assessments throughout South Africa and Africa, for a wide range of clients including the mining sector, large-scale housing developments, private lodge developments, telecommunication industry, various engineering projects including linear projects such as pipelines,road construction, road up-grades as well as site-based engineering services. I have also been responsible for various strategic projects such as Integrated Environmental Management Programmes for municipalities as well as Provincial State of the Environment Reports. Since my early years as a scientist, wetlands became an interest and passion and since then I have been assessing and delineating wetlands wherever I go.Through the years I have been involved in the Gauteng Wetland Forum, KwaZulu-Natal Wetland Forum as well as the Wetland Society. My passion for wetlands advanced further through the directorship of WETREST since 2016. WETREST is a Public Benefit Organisation directed at Wetland Rehabilitation and includes training and awareness raising. I have been a Fellow member of the Water Institute of South Africa (WISA) since 2012. For my work as the owner of Exigent, an environmental consulting company, I was the awarded KZN Regional Business Women of the Year 2019 in the Environmental Entrepreneur category and have recently been appointed as the Chairperson of the GDARD external appeal panel for a 3-year period.

Olivia Bragg (Scotland/UK, female, 'over 60')

A first degree combining biological and physical sciences led to postgraduate research in Dundee (Scotland) which got me totally 'hooked' on mires. After seven years as a postdoctoral researcher in what I decided to call 'mire ecohydrology', the supply of things to do with and for peatlands and peatland people - both in Scotland and elsewhere in the world - has never stopped. At various times I have been classified as an academic, a private consultant and a Biologist. Nowadays I am a Research Fellow in Geography working primarily on severely degraded mires in the Scottish Cairngorm Mountains with a view to finding ways to restore the most difficult sites. My vision for peatland conservation worldwide is that by sharing knowledge, experience and ideas, humankind will be empowered to manage these precious ecosystems more effectively and with fewer disastrous outcomes in the future.

Because it is so important that peatland people communicate with one another, I have organised and helped with various peaty conferences over the years and I was co-ordinator of the Darwin Initiative Peatland Biodiversity Programme which shared Scottish expertise with peatland experts from central/east European countries in preparation for their accession to the European Union. As an IMCG Main Board member, I have been responsible for maintaining contact with members from the UK, Ireland and Iceland. However, since 2004 my main contribution has been setting up and establishing our community-published joint (with IPS) open access academic journal *Mires and Peat*.

Zhao-Jun Bu (China, male, 49 years old)

Ph.D, Professor, Associate Dean at School of Geographical Sciences, Northeast Normal University, China. Peatland scientist and *Sphagnum* ecologist. He has published more than a hundred peer-reviewed articles such as New Phytologist, Oecologia, Basic and Applied Ecology, American Journal of Botany, Plant and Soil, Wetlands, etc. As a co-author he has published 5 monographs, e.g. "Jilin Wetlands" and "Wetlands and Wetland Research in China". He is vice director of Key Laboratory of Geographical Processes and Ecological Security in Changbai Mountains, Ministry of Education, China. He owns memberships of International Mire Conservation Group (IMCG), International Peat Society (IPS) and International Association of Bryologists (IAB) He is an associate editor for the journals Mires & Peat and Wetlands. His vision of mire conservation: Mires and peatlands should be cherished and efficiently conserved in the whole world.

Marte Fandrem (Norway, 34, female)

PhD student at the Department of Natural History at NTNU University Museum in Trondheim. I got one foot down in the peatlands in 2015 working as a research assistant for our mire group at the University Museum, and has firmly planted both deep in the mire water since then. I currently work on my PhD in Applied Ecology where I look at several projects aiming at improving the outcome for peatlands in Norway, both mitigating degradation and improving restoration success. I look at things from the scale of competition and success of various Sphagnum species, to calculating carbon content of defined peatland areas for better decision making in development planning. The PhD will at some point be completed, but two kids along the way does make for a slight delay. I am admittedly in the very beginning of my (mire) career, but I have had the extraordinary opportunity to join the IMCG from the very beginning of my time working with peatlands, and got to join the field symposiums to both Borneo/Malaysia, Northern European Russia and the Netherlands. I have been part of the MBs of the regional organizations for the Botanical Society of Norway (NBF) and the umbrella organization Forum for Nature and Outdoor Recreation (FNF) since 2015. I sincerely believe that good communication, networking and discussions both within our field, but also directed outwards is key to success for conservation and sustainable use of nature. The IMCG seems to me as an amazing forum for all that have peatlands close to heart, and I would love to continue my exploration of peatlands together with you.

Ab Grootjans (Netherlands, male, 70 years old)

Worked at the University of Groningen, Netherlands, as an associate professor (1976-2017) and also as a visiting professor at the Radboud University of Nijmegen (2007-2017). He was trained as a vegetation scientist, but later worked on ecohydrological approaches to restore wetlands on the landscape scale. He participated for more than 20 years in the national OBN programme (= Survival Plan of Dutch Nature) aimed at restoring nature reserves that were acidified due to high atmospheric nitrogen deposition and drainage in surrounding agricultural areas. The last two decades he was involved in restoration projects in more or less natural mires in Polen, (Eastern) Germany, Slovakia, Tierra del Fuego (Argentinië), Russia, Latvia and South Africa. Ab has published over 140 articles in peer reviewed journals, ca 50 chapters in books and more than 100 professional publications. He supervised more than 120 master students and 15 PhD students. Ab is a member of the board of the IMCG since 2011 and associate editor of Mires and Peat since 2016.

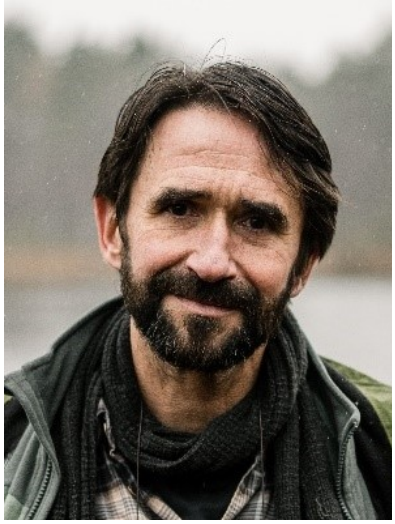
Samantha Grover (Australia, female, 46 years)

Soil scientist with 17 years of experience working in peatlands in Australia and around the world. Lecturer in Environmental Science at the Royal Melbourne Institute of Technology. Active in peatland research in the Australian Alps, Indonesia and Tibet with research interests focussing around carbon and water fluxes through the soil-plant-atmosphere continuum, with multidisciplinary collaborations extending into microbiology, environmental history, culturally and environmentally sustainable land use and beyond. Sam has an extensive network of peat-enthusiast colleagues in the Oceania region, having worked at Landcare Research in New Zealand in 2011. As IMCG Board member, she will share knowledge of peatland matters in both directions, keeping the Board and international community abreast of local and regional peat activities, as well as ensuring that the Oceania peatland community is up to date with IMCG matters.

Piet-Louis Grundling (South-Africa, male, 55 years)

Was trained as a geologist at the University of Pretoria. Has a wide overview of peatlands and mires in Southern Africa. For six years he was actively involved in the South African programme 'Working for Wetlands' on the restoration of wetlands that had been affected by erosion. In 2004 he led the team that organised the IMCG Assembly and Field Symposium in South Africa. In 2006 he started a PhD project at the University of Waterloo, Canada, where he successfully defended the thesis on the hydrology of Mfabeni, the oldest and largest fen in South Africa. He later joined the government programme Working for Wetlands again and supervised restoration works all over South Africa. Currently, since August 2019 he provides technical support to the Environmental Management Inspectorate, national Department of Fisheries, Forestry and the Environment, South Africa.He has published numerous reports and scientific publications on wetland restoration and hydrological functioning of wetlands and mires. He is affiliated with the Free State University and involved in training of students and employees of National Parks and workers in government programmes on restoration. He is a member of the board of the IMCG since 2010 and he was president of the IMCG between 2010 and 2016.

Wiktor Kotowski (Poland, male, 49 years)

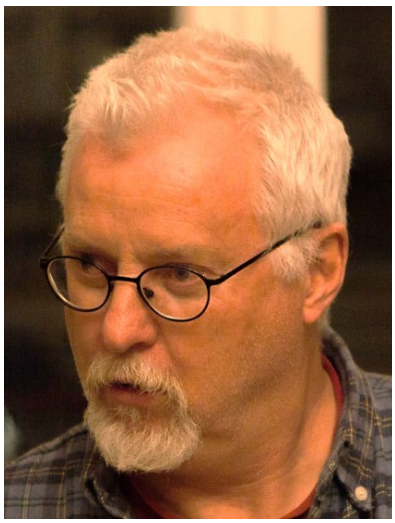


I am connected to peatland science for 25 years, starting with MSc on fen plant ecology (1996, University of Warsaw), through PhD on fen vegetation processes (2002, University of Groningen) and habilitation on the use of functional plant ecology in fen conservation and restoration (2015, University of Warsaw). I hold a professor position at the University of Warsaw, Institute of Botany, where I lead a research group on wetland ecology. My current research interests cover fen vegetation dynamics, peat-forming processes, plant functional traits, ecosystem services, and strategies of conservation and restoration of peatlands. I lecture vegetation ecology, mire ecology and conservation, conservation policy and global change. My publication record includes c. 60 papers in the field of ecology and nature conservation, most of them connected to mires, especially fens and a few book chapters in international monographs.

I have participated in >10 mire-related conservation and research projects and co-ordinated several of them, including recently the projects MIRACLE (Mires & Climate), REPEAT (on the prospects of restoring peat formation in fens) and CLEARANCE (on multifunctional wetland buffer zones).

In addition to research and teaching, I also engage in conservation of wetlands as a board member, and one of founders, of Wetland Conservation Centre (CMok), a society established in 2002 to support wetland conservation in Poland. In 2016, CMok became a founding member of Wetland International European Association, in which I served as board member between 2018 and 2021. I am engaged in mire conservation also as a member of the scientific board of the Biebrza National Park protecting the largest complex of fens in Central and Easter Europe. I am a member of IMCG since 1999; in 2010 I co-organised the IMCG Field Symposium in Poland. I have been elected for the Main Board in 2018 and I am offering to continue this role for another term. I see the role of IMCG as a guardian of mires status worldwide, an advocate for their restoration, and an expert network mainstreaming peatlands in international climate and biodiversity policies.

Hans Joosten (Germany/Netherlands, male, 66 years)



Studied biology and worked as university researcher and policy officer (Ministry of Agriculture) in the Netherlands. Since 1996 headed the Department of Peatland Studies and Palaeoecology of Greifswald University (Germany), partner in the Greifswald Mire Centre, since 2008 as an Extraordinary Professor. Since 2000 Secretary-General of IMCG for which he co-edited the books 'Wise use of mires and peatlands' (2002) and 'Mires and peatlands of Europe' (2017) and an abundance of IMCG Newsletters and Bulletins. Co-edited the books 'Paludiculture – productive use of wet peatlands' and 'Peatland restoration and ecosystem services' (2016) and wrote the 'Ramsar Global Guidelines for Peatland Rewetting and Restoration' (2021). Intensively involved in UNFCCC negotiations and IPCC guidance development, especially with respect to accounting for emissions from organic soils, and in FAO in advancing climate-responsible peatland management.

Steering committee member of the Global Peatlands Initiative. Participated in the 'International Peat Mapping Team', which won the 2018 $1 million Indonesian Peat Prize. Hans' agenda for international mire conservation is: 1) Keep wet peatlands wet, 2) Make drained peatlands wet again, 3) If you need to use them, use them wet (paludiculture). Hans plans to retire as IMCG Secretary-General but hopes to continue working in the IMCG Main Board.

Tatiana Minayeva (World, female, 59 years)

Educated as classical geobotanist at Moscow State University in the 1980s (USSR) and PhD in Mire Science under supervision of Marina Boch in Komarov Botanical Institute (St Petersburg, Russia). Joint IMCG in 1997. Worked on peatlands ecological research, conservation, including protection, restoration and wise use in Russia (boreal and Arctic peatlands), Mongolia and Canada in different positions: researcher in the Central Forest Biosphere Reserve in Russia, manager of scientific research for decision making in governmental structures in Russia, project coordinator in Wetlands International in Russia and in The Netherlands Currently Tatiana is working in the consultancy Care for Ecosystems in Germany, cooperates with Wetlands International as associate expert and with the Peatlands Ecosystem Centre of the Institute of Forest Sciences RAS, and is associate professor at Yugra State University in Khanty-Mansiysk (West-Siberia). Tatiana was involved in many international initiatives within the Ramsar Convention on Wetlands being Ramsar STRP member and Secretary of the Coordinating Committee of Global Action on Peatlands (CCGAP). She also participated in the work of other international agreements (CBD, UNFCCC, CAFF) working on their synergy for mire conservation. She has long term experience of cooperation on peatlands conservation with NGOs, governments and private sector – such as peat industry, oil and gas companies etc. Tatiana has more than 200 publications on mire research, conservation and restoration. She has been a long-time member of both the Main Board and Executive Committee of IMCG and organised the IMCG excursions to the Russian Arctic in 2017 and to Mongolia in 2019.

Faizal Parish (UK/Malaysia, male, 60 years)

Faizal Parish is a wetland ecologist with nearly 40 years' experience in assessment and management of peat swamp forests, mangroves and rivers. He is the Director of the Global Environment Centre, a Malaysian non-profit rnization working throughout East and Southeast Asia on peatland, forest and river management. He is a Malaysian Permanent Resident and has been living in Malaysia since 1983. Working for 20 years with the ASEAN Member States to promote sustainable peatland management and founder with the ASEAN Secretariat of the ASEAN Peatland Management Initiative in 2002. He is currently the Senior Technical Advisor of the ASEAN Programme on Sustainable Management of Peatland Ecosystems 2014-2020 (APSMPE).

He co-chairs the RSPO Peatland Working Group (2009-2012 and 2017-2021) and is co-author of two RSPO Manuals on BMPs for oil palm cultivation on peatlands and conservation and rehabilitation of peatlands. He has been actively involved in IMCG activities since 2004 and organised the IMCG Field Symposium in Malaysia/Brunei in 2016.

Line Rochefort (Canada, female, 60 years)

A short note to let you know that I am interested to continue to act as an IMCG board member. Currently, I am the Canadian Ramsar Scientific and Technical Review Panel (STRP) National Focal Point and one of the contributing lead author for the North American chapter of the Global Peatland Assessment, a starting 2-years project of the GPI (Global Peatland Initiative). I am still directing the Peatland Ecology Research Group (web site: www.gret-perg.ulaval.ca), which is made up of a team of multidisciplinary researchers from across Canada. I am involved in research in the high arctic (polygon fen dynamic on Bylot Island), in Québec, New Brunswick and Alberta (peatland ecology and restoration) and in fen creation in northern Alberta (in the tar sand region).

Jean Rousselot (France, male, xxx years)

Based in Angers (France) and IMCG member since 2015 I did my studies in Aquatic Environments (M. Sc) in France and Sweden (Tours, Kristianstad). With more than ten years' experience with wetland and river restoration in which 2010-2015 in charge of Natura 2000 and water management of a 1000 ha fen called Marais de Sacy (40 km in the North of Paris). Developing projects mainly in the field of water management and biodiversity from monitoring to restoration works (2M€) and maintenance such as grazing with water buffaloes. This includes the coordination of a group of experts in order to designate the site in the RAMSAR Convention and helping to establish an historical association related to the site. Currently managing director of a local public institution "Syndicat Mixte Basses Vallées Angevines Romme" in charge of river, wetland restoration and flood prevention. Developing a peatland inventory in partnership with a regional NGO is an example of work done. Employed on implementation strategy dealing with politics and coordination of technical issues in a transdisciplinary approach.In order to raise awareness on peatland conservation and restoration it is important to create and sustain a connection between scientists and practitioners so that it can be brought to decision makers at various levels. IMCG is an important network to share knowledge and good practices while offering the possibility to raise the community for peatland protection. The excursion to the Netherlands in 2018 was a good example in those matters.

Rob Stoneman (United Kingdom, male, 54 years)

BSc (Hons) in Geography (1988) from the University of Liverpool followed by PhD at University of Southampton (1993) studying the palaeoecology of lowland raised bogs, specifically to look at whether it was possible to pick out a Holocene climate signal through the study of macro-fossils. This was followed by a career in nature conservation with the Wildlife Trusts in the UK. I have worked at five Wildlife Trusts – as Project Manager for the Scottish Raised Conservation Project with Scottish Wildlife Trust (1993-97), as Chief Executives of the Sheffield (1997-2001), Hampshire (2002-2006) and Yorkshire (2006-2019) Wildlife Trusts and a short time as Director of Conservation at the Royal Society of Wildlife Trusts (2001-2002). I have returned to the Wildlife Trusts as Director of Landscape Recovery after working for two years with Rewilding Europe (2019-2021). I have maintained a strong interest in peatland ecology and conservation throughout my career.

Currently I am board member of the IUCN-UK Peatland Programme. Publications include the Bog Management Handbook, Conserving Bogs (1997), IUCN-UK Peatland Programme Commission of Inquiry (2011) and Peatland Restoration and Ecosystem Services (2016).

My vision for peatlands is for the restoration of all the world's peatlands. My particular role is focussed primarily on the UK in setting up the Yorkshire Peat Partnership that to date has brought into conservation management about 30,000 ha of eroded blanket mire in the Pennines and North York Moors in the UK, primarily through revegetation of bare peat, hydrological restoration and gully re-profiling. At a UK level, my role is one of advocacy through the IUCN-UK Peatland programme helping decision-makers, especially Government, to recognise the value of peatlands to Society and engender funding for the complete restoration of Britain's peatlands within the next 30 years. The IUCN-UK Peatland Programme has an additional role in promoting global peatland conservation through the Global Peatland Initiative.

Franziska Tanneberger (Germany, female, 44 years)

Based at Greifswald Mire Centre (GMC) in Germany and IMCG member since 2003. Studied landscape ecology in Greifswald (DE) and Reading (UK) with diploma thesis on peatlands in Western Siberia (2003). PhD about habitats of Aquatic Warbler, a characteristic fen mire bird (2008). Over the last 10 years experience in peatland research and restoration mainly in Germany, Russia, Belarus, Poland, and Lithuania, focusing on fen ecology, especially biodiversity, mowing management and peat formation. Contributed to 32 articles in peer-reviewed journals. I coordinate annual conservation farming, monitoring and research of 150 ha of wet peatlands for a small NE-German NGO since 2005. In 2012-2017, I finalised the IMCG book "Mires and peatlands of Europe" with Hans Joosten and Asbjørn Moen as co-editors and 134 peatland scientists from all over Europe.

Being part of this network was and is very stimulating and enriching. In 2018, I published the "Aquatic Warbler conservation handbook" with Justyna Kubacka as co-editor and 48 authors from Europe and Africa.

Along the scientific work and jointly with Greta Gaudig, I am Director of the GMC, which combines the experience of more than 50 peatland experts of various disciplines. The GMC coordinates the IMCG Global Peatland Database (GPD), the Database of Potential Paludiculture Plants (DPPP), and the Peatland and Nature Conservation International Library (PeNCIL). GMC is, together with IMCG, member of the Global Peatlands Initiative (GPI). Recently, we were co-organisers of the first ever 'Peatland Pavilion' at COP26 in Glasgow (UK) together with many peatland organisations and long-term IMCG members. I would like to support IMCG in maintaining a strong position in the global fight for preserving undrained peatlands and restoring degraded ones. We should discuss how to position it in the coming years and with regard to other, new organisations. I will bring

in the GMC's experience in bridging science, policy and practice with regard to peatlands, and I am looking forward to learning from others within the IMCG network.

Adriana Urciuolo (Argentina, female, 63 years)

Graduated from Universidad Nacional de Córdoba, worked as university researcher and as the director of Tierra del Fuego Water Resources Office for over 20 years gaining experience in management of peatlands and water basins. Coordinator of the Strategy for the wise use of Tierra del Fuego peatlands; leaded the planning process, which resulted in a regulation of mires use zoning (2011). Since 2012 full Professor in the Institute of Polar Sciences, Environment and Natural Resources at Universidad Nacional de Tierra del Fuego (Ushuaia, Argentina) with research focus on ecosystems service, management and conservation of peatlands. Published several articles related to peatlands services, management and wise use. IMCG member since 2000, organized the 2005 IMCG Tierra del Fuego Field Symposium and participated in several IMCG activities. Since 2008 has worked in collaboration with Chilean colleagues on peatland conservation in Patagonia, organizing a joint Strategy for their wise use.Currently is Coordinating lead author for the Latin America and the Caribbean Chapter of the Global Peatland assessment.

IMCG Field Symposium, Congress and General Assembly, 13 – 23 March 2022

The Centre for Wetland Research and Training is excited to announce the final programme for the 2022 IMCG Field Symposium and General Assembly. The programme runs from Sunday the 13th of March until Wednesday the 23th of March. The hybrid scientific congress – both virtual and in-person - will take place on the 22nd of March in eSwatini and the virtual General Assembly will take place in South Africa on the 23th of March. These two events will be co-hosted by WetResT and the University of Eswatini. The in-person costs of the Field Symposium and Conference are €950 (all in, excl. your trip to and for South-Africa). The updated **registration form** can be found under https://forms.gle/rHp6kyM95y4bxdk8A

The full programme is as follows:

Day		Date	Activity, Venue	Accommodation
1	Sunday	13-Mar-22	Depart from O.R. Tambo Airport by bus at 12H00 to Nylvlei Ramsar Site	Letaba River Accommodation & Venue
2	Monday	14-Mar-22	Mojaji Cycad Reserve enroute to Baleni-Soutini mire at the Baleni Cultural Village	Shingwedzi Camp, Kruger National Park
3	Tuesday	15-Mar-22	Malahlapanga Hot Spring Mire	
4	Wednes-day	16-Mar-22	Mfayeni Hot Spring Mire	
5	Thursday	17-Mar-22	Hot spring mire management rehabilitation workshop with SANParks at Shingwedi: 08H00 to 10H00	Satara Rest Camp, Kruger National Park
6	Friday	18-Mar-22	Skukuza nursery and Camp / Pretoriuskop seep mire	Pretoriuskop Rest Camp, Kruger National Park
7	Satur-day	19-Mar-22	PCD test in Nelspruit	
8	Sunday	20-Mar-22	Travel to Malolotja Nature Reserve, Kingdom of Eswatini: Sebibe Rock Mire site	Malolotja Cabins, Malolotja Nature Reserve
9	Monday	21-Mar-22	Malolotja Mire	
10	Tuesday	22-Mar-22	University of Eswatini, Manzini: Scientific Congress - In person and virtual	
11	Wednes-day	23-Mar-22	General Assembly (Virtual at Chrissiesmeer); Visit Tevredenpan	Miss Chrissies Guest House, Chrissiesmeer

Post-conference field trip				
12	Thursday	24-Mar-22	Donkerhoek seep mire at Ryno Park near Pretoria. Battle of Donkerhoek talk	Rustenburg Palm Lodge, Rustenburg
13	Friday	25-Mar-22	Kgaswane Mires; Marico Biosphere info session enroute at Groot Marico	Molemane/Kaya Inkalamo Game Lodge, Zeerust
14	Satur-day	26-Mar-22	Molopo and Molemane Mires	Molemane/Kaya Inkalamo Game Lodge, Zeerust
15	Sunday	27-Mar-22	Seasonal Tuffa and Bokkraal Tuffa Mire, Depart to Marakele National Park, Thabazimbi	Environmental Education Centre, Marakele National Park
16	Monday	28-Mar-22	Matlabas Mire	Environmental Education Centre, Marakele National Park
17	Tuesday	29-Mar-22	Mire restoration workshop; Visit Tlope wetland restoration site	Environmental Education Centre, Marakele National Park
18	Wednes-day	30-Mar-22	Return to O.R. Tambo	

Virtual excursions and field discussions on Southern African peatlands and their management problems will be offered in the format of digital "story maps" (see below).

Elephant trampeled mires in Kruger National Park. Photo: Tom Kirschey.

Experience South Africa's unique mires and peatlands through a series of 'Digital Fieldtrips'

Niels Grootjans (niels.grootjans@egea.eu)

The International Mire Conservation Group (IMCG) invites you to join on a series of 'digital fieldtrips' to some of South Africa's most fascinating peatlands. The digital fieldtrips are organised in conjunction with our bi-annual Field Symposium and General Assembly, which will be held in South Africa and the Kingdom of Eswatini (Swaziland) in March 2022.

The digital fieldtrips, which are created through the medium of Story Maps, will bring you to the following places:

1. Introduction to the digital fieldtrips and the Field Symposium in South Africa
2. Mires on Fire: Vasi Wetlands
3. Mires on Fire: Marakele National Park
4. Hot Springs in Kruger Park
5. Mines and Mires: Tevreden Pan, Watervalvlei

The aims of the digital fieldtrips are: 1) to present IMCG-supported research to a wider audience in an interactive and stimulating way, by recreating the sense of 'being there', 2) to familiarize you with some of the sites that we will visit during the Field Symposia, 3) to venture new pathways as to how the IMCG can have its impact on the world by adding digital means (and thereby reducing its carbon footprint), in addition to the existing activities. We hope you enjoy the series of digital fieldtrips

Two IMCG members (Gina and Tom) did not in time receive the message that the Field Symposium had been postponed and arrived in South-Africa. There the Field Symposium team solved the problem by organizing a special trip for the two of them (a big thanks to the organizers for the flexibility and effort!). Below is the report of this exquisite 'final rehearsal' of the March 2022 Field Sympsium.

Gina's IMCG's early South Africa excursion reflections

Gina Gumindega (charitygumi@gmail.com)

I left Germany for South Africa on the 25th of November, hoping to be a week early for my very first IMCG symposium. The timing of the COVID-19 Omicron variant announcement could not have been more inconvenient as I read about the announcement of the travel bans during my stopover in Dubai. Still heading to South Africa, I was looking forward to meeting my family and friends in South Africa but I could not imagine my stay without the field symposium to look forward to. Nevertheless, I received a phone call early on Monday the 6th of December that Dr Tom Kirschey had also landed in South Africa and we could go for a WETREST-guided field tour from 7 to 16 December along the IMCG route with Dr Piet-Louis Grundling, with the support of other scientists who would join us along the way. With our IMCG gift bag in hand, we were on our way early Tuesday morning!

The IMCG Field Symposium Gift Bag. Photo: Renée Grundling

We started the tour with a visit to Kgaswane Nature Reserve, a Ramsar site, in the North West Province. We made a day-long tour in the reserve as we visited some of the wetlands which included the magnificent Watervalvlei Mire and its waterfall. The park itself is situated on a plateau in the quartzitic Magaliesberg mountain range. The nutrient-poor quartzites provide the perfect setting to create crystal clear streams and seep zones with *Sphagnum* moss and *Drosera* plants in places.

The highlight of the day, for me, was a visit to an accidental wetland formed by potable water leaking from nearby reservoir into the reserve. Surprisingly, although there were still large communities of wetland plants, the wetland was drying up in places. Ms Renée Grundling who has been studying this wetland informed us that just

two months earlier in October 2021, the wetland was a thriving ecosystem and it was reported that the leak was being repaired. If the upcoming field symposium route passes this wetland in March towards the end of the rainy season, it would be interesting to find out how much change would have taken place.

Top row: Sampling clear waters and Sphagnum *peat. Bottom row:* Drosera *and a walk in the Watervalvlei mire. Photos: Renée Grundling*

On Wednesday the 8th of December, we met up with another great team in Groot Marico, North West province. Here, we visited calcareous Tufa wetlands. The Bokkraal Tufa still exists as a mire, which forms a beautiful waterfall of approximately 60 metres high. The second tufa has long-dried up (possibly for thousands of years) but one can still see that it flows on a ephemeral basis during very wet seasons with the traces of water flow paths on the rock surface.


Struggling vegetation in the accidental wetland (left photo) and our team grappling with the question if this system should belong in nature reserve? (right photo). Photos: Piet-Louis Grundling


The Bokkral – (Left photo) and seasonal Tufa Mires at Kuilfontein. Photos: Renée Grundling

As I am especially interested in the social aspects of peatlands, I had a very interesting conversation with Mr. Daan van der Merwe who is the CEO of the Marico UNESCO Biosphere. Wetland rehabilitation activities in Groot Marico (a town named after the local Groot (large) River) and surrounding areas have long provided a source of employment for the poor households. However, due to government funding cut-off, these people have been left without substantial sources of income which has led some of them towards environmentally destructive activities such as harvesting indigenous trees to sell as firewood. Since the area has great potential for game farming, one of the ways they are currently exploring to address these challenges is through tourism. While tourism development would increase revenue and open up job opportunities, it also requires a certain level of environmental modification. These might impact valuable and sensitive landscapes occurring on privately owned land and access to regulate these activities is often restricted.

For example, right next to the Bokkraal Tufa Mire mentioned earlier, the landowner had constructed some structures which likely alter the wetland functions. Thus, the dilemma for the ecologists in this area is to ensure conservation and alleviate poverty simultaneously while at the same time maintaining good relations with the land owners and politicians who make the final decisions.

In conversation with Daan van der Merwe (Marico Biosphere). Photo: Piet-Louis Grundling

From Groot Marico we drove all the way from the North West Province to Limpopo Province to spend the night at Marekele National park in preparation for the next day. On Thursday the 9th, we visited the wetlands inside the park. Apparently according to Brian, the ranger protecting us that morning, there is a leopard that is known to have made that area surrounding the wetlands its home. (Un)Fortunately we did not spot the leopard! At Marekele, I for the first time witnessed an artesian peat dome which can easily be mistaken for a small hillock.

A day-long drive on Friday the 10th led us to the Kruger National Park through some of the most vibrant South African towns, townships, and rural areas. However, we spent the entire day on the road due to the thrilling sights of animals, birds and vegetation inside the Kruger National Park. Despite being very tired, we enjoyed the beautiful safari sunset just before we arrived at our accommodation at Sirheni Bush Camp. Early Saturday morning (04H30!), after picking up Misheck (our ranger for the day), we went to the Malahlaphanga Hot Spring Mire inside the park. We did not even need a map because Dr. Grundling knew almost every corner of the park!

Standing on a peat dome in Marakele National Park. Photo: Renée Grundling

On numerous occasions along the way, he would point to several big and small wetlands that he had studied inside the park. After our short tour of the hot spring mires, we observed that the main influencing factor in the hot spring mires were the elephants. They played a serious role in creating new pools and destroying the domed peat. We were fortunate enough to witness a large herd in action as they came for one of their afternoon peat mud baths. That day the temperature was close to 40°C!

On Sunday the 12th, we made yet another long drive south through the park towards a different camp in another province of South Africa: Pretoriuskop Camp in Mpumalanga Province. We left our camp very early with the hopes of spotting a Leopard before sunrise but luck was not on our side. We did manage to see some lions on the way and as is allowed in the Kruger National Park, we stopped on several demarcated bridges for short coffee breaks and some bird watching under the hot scorching sun. That evening we were joined by and had a wonderful dinner together with Mr Pieter Botha and his son Juan as well as Professor Heinz Beckendahl, who would take over from Dr Grundling in the last few days of our tour. After dinner, Dr Tom Kirschey and myself went on an amazing Safari night drive even witnessing a pack of bloody and drowsy lions shortly after their dinner.

Fun moment in the Malaphanga Hot Spring Mires. Photo: Piet-Louis Grundling

On Monday the 13th we visited the nearby town of Nelspruit to have our COVID requirements ready for the last part of the tour in the Kingdom of Eswatini under the care of Prof. Heinz Beckendhal. *En route* to Eswatini on the 14th, we drove along the Barberton Greenstone Belt which is a globally well-known range of mountains known for their gold mineralisation, komatiites and ultramafic volcanic rocks- some of which are among the oldest known exposed rocks in the world. In Eswatini, we stayed at Malolotja Nature Reserve which is a protected area also hosting a largely pristine wetland ecosystem which we visited on the 15th. As we were told by Ms. Thandeka Ndlela and Prof. Beckendahl, the peatland in the Reserve is always inundated and also has a very high fauna and flora species diversity of which many of the plants are critically endangered.

A sneak peek of the March symposium: Dr Tom Kirschey's prediction is that this particular peatland will be the highlight for most people...let's wait and see! We woke up early on the 16th, not ready to say goodbye to the Malolotja landscapes and sadly not to one another as our tour had come to an end. While Dr Tom Kirschey took a shuttle back to OR Tambo International Airport, Prof. Beckendahl took me through the old Ngwenya mine on the Bomvu ridge near the border of South Africa. Considered one of the oldest mines in the world, although no longer in operation, remnants of the magnetite and hematite are still extant such that the wetland waters in this area are very much iron-filled. All in all, the tour was a success and I can only imagine how wonderful and fulfilling it will be in a large group!!

Early morning coffee in at Stolsnek dam in the Kruger National Park. From left to right: Tom Kirshey, Geogina (Gina) Gumindega, Heinz Beckendahl, Piet-Louis Grundling, Juan Botha and Pieter Botha

Iron-filled waters of a wetland at Ngwenya Mine (left), Barberton Greenstone Belt Landscape view (right).

Mires and Peat

In November - December 2021 the following papers were published in Mires and Peat:

- Effects of land use conversion on selected physico-chemical properties of peat in the Leyte Sab-a Basin Peatland, Philippines. [S.C.P. Decena, A.O. Arribado, S. Villacorta-Parilla, M.S. Arguelles & D.R. Macasait Jr.] Volume 27: Article 32 http://mires-and-peat.net/pages/volumes/map27/map2732.php
- Running out of time? Peatland rehabilitation, archaeology and cultural ecosystem services. [B.R. Gearey & R. Everett] Volume 27: Article 31 http://mires-and-peat.net/pages/volumes/map27/map2731.php

- The potential role of coconut in improving the sustainability of agriculture on tropical peatland: A case study of 32 years' practice in Pulau Burung District. [N.I. Fawzi, A.N. Rahmasary & I.Z. Qurani] Volume 27: Article 30 http://mires-and-peat.net/pages/volumes/map27/map2730.php
- Description of a peatland complex in an agricultural landscape on Terceira Island (Azores): Criação do Filipe Case Study. [C. Mendes, E. Dias & D. Pereira] Volume 27: Article 29 http://mires-and-peat.net/pages/volumes/map27/map2729.php

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

My (HJ) last picture of Tapio when he brought his huge book collection to the Peatland and Nature Conservation International Library (https://greifswaldmoor.de/pencil-142.html) and – of course – we went into the field…

24.11.2021 Hans Joosten to IMCG Main Board: „It is with great sadness that I have to inform you that our friend and IMCG Main Board colleague **Tapio Lindholm** died yesterday of cancer. With his quiet character, great knowledge and enormous commitment, he has successfully worked for nature and mire conservation in Finland and Russia over many decades. We will miss him."
25.11.2021 Harri Vasander to IMCG Main Board: "A good friend and colleague during 47 years has passed away. I spent last evening with Tapi's family and some friends at their home remembering him. His last words were: "**Please, continue to make the world better**". This is for us all."

Papers

Peatland prose from the past: The displeasing land of Cabul (NW Israel)

Pim de Klerk (Greifswald Mire Centre/State Museum of Natural History Karlsruhe; pimdeklerk@email.de, www.pimdeklerk-palynology.eu)

Mires are rare in the regions east of the Mediterranean Sea because the hot and dry climate (cf. Rogerson 1989) hampers their development. In Israel luxurious reed marshes occur almost exclusively along the River Jordan, especially along the Sea of Galilee and in the Hula valley. References to mires and wetlands are, therefore, rare in the Hebrew Tanakh and the Christian Bible, except for the texts dealing with ancient Egypt and the River Nile. There is, however, an intriguing passage in the 'First book of kings' (according to some old numberings the 'Third book of kings') that mentions a region in present-day northwestern Israel named "Cabul" (alternatively also transliterated as "Kabul"). At present "Cabul" is the Hebrew word for peat, and the question arises how peat connects to the passage in the Tanakh. The text tells that Hiram, the king of Tyre (Phoenicia), had helped king Solomon to build the temple and palace in Jerusalem, after which Solomon expressed his gratitude by giving Hiram 20 cities.

"*And Hiram came from Tyre to see the cities that Solomon had given him: and he did not like them. He said: 'What cities did you give me, my brother?' And they are called the land of Cabul unto this day.*"

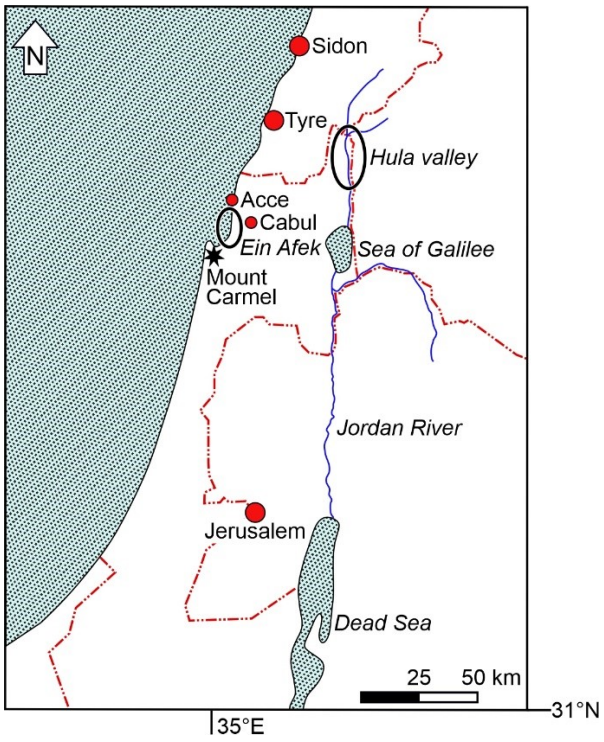
וַיֵּצֵא חִירָם, מִצֹּר, לִרְאוֹת אֶת-הֶעָרִים, אֲשֶׁר נָתַן-לוֹ שְׁלֹמֹה; וְלֹא יָשְׁרוּ, בְּעֵינָיו.
וַיֹּאמֶר--מָה הֶעָרִים הָאֵלֶּה, אֲשֶׁר-נָתַתָּה לִּי אָחִי; וַיִּקְרָא לָהֶם אֶרֶץ כָּבוּל, עַד הַיּוֹם הַזֶּה.
('1st book of kings' 9:12/13).

The subsequent verse 14 tells that Hiram gave 120 talents of gold to Solomon, and some commentators assumed that the cities were part of a repayment for money borrowed by Solomon (Easton 1893; Unger 1988; Lipiński 2010), or – in contrast – that Hiram had bought the cities for 120 talents of gold (Noth 1983; Parker 1988; Markoe 2003). The 'Second book of chronicles' (8:2) mentions that Solomon had rebuilt cities given to him by Hiram, and Easton (1893), Unger (1988) and Douglas & Tenney (2011) hypothesized that these were the 20 cities that Hiram had given back because he did not like them. According to Finkelstein (2013) the story may be a mere etiological tale to explain why parts of Galilee were in possession of the kingdom of Tyre (see also Frankel 2008; Keimer 2020). Regardless of whether the tale is historical or mythological, the region itself actually existed and the Hebrew text has, thus, (palaeo)geographical significance. The reign of Solomon – if he was a historical person – is estimated to 967-928 BCE (Rogerson 1989), 965-932 BCE (Clauss 2014), 965/964-926/925 BCE (Schipper 2018) or 960-922 BCE (Bryce & Birkett-Rees 2016). The reign of Hiram is envisaged between 969-936 BCE (Clauss 2014).

Among specialists there is no consensus where the land of Cabul was located precisely (see Keimer 2020). The 'Book of Joshua' (19:27) positioned it in the land of the Jewish tribe Asher, which corresponded approximately to the region between Mount Carmel and Sidon (Rogerson 1989; Hull & Jotischky 2009). Lehmann (2008) posed some doubt to the attribution of the cities to the land of Asher but is not sure about this. According to Easton (1893) the 20 cities were in the mountains of the tribe Naphtali east of Asher.
The present-day town Cabul lies at the western margins of the hills of lower Galilee. It was probably not established prior to the last centuries BCE (Gal 1990; see also Lehmann 2008) and postdates the writing of the writing of the 'First book of kings' (see Schipper 2018). However, the town may have been named after an older geographical designation. Keimer (2020) assumed that the land of Cabul corresponded to the lower hills adjacent to the town. Gal (1990, 1993) posed that Cabul was the archaeological site Ḥorvat Rosh Zayit, also known as Khirbet Rās ez-Zētūn, a Phoenician fortress around 1-1.5 km northeast of present-day Cabul.

Even more diverse are the opinions of the meaning of the word "cabul" ("כָּבוּל" in Hebrew), that predominantly derive from works from Antiquity that – already confusingly - tried to explain it.

The Jewish historian Josephus (37-c.100 CE) - who used the Greek designation Χαβαλών (Chaballo) - wrote that the name came from the Phoenician language and meant "what does not please" ('Jewish antiquities' 8:5,3). There is, however, according to Cheyne & Sutherland Black (1899) no evidence preserved for this. A footnote in the Loeb edition of the work by Josephus states that he probably interpreted this meaning from the original notion in the Tanakh that Hiram was not pleased. Following Josephus specialists provided various more or less synonymous translations. For example, a footnote in the consulted edition of the 'King James Bible' states that "cabul" means "displeasing" or "dirty". Easton (1893) wrote that it meant "how little", "as nothing", or "good for nothing", and Rawlinson (1896) provided the meaning "disgusting". Unger (1988) thought that Hiram – since the Phoenicians were seafaring people – was not pleased because the cities were not coastal, but Unger (1988) also posed that the cities – inhabited by heathens – were in an awfully bad condition.



The 'Septuagint' - the 3rd and 2nd century BCE Greek translations of Hebrew holy books - contains the Greek word "Ὅριον" ("Orion"; "boundary"): this translation will originate from the interpretation of the word "cabul" as "גבול" ("gevul") (Frankel 2008), which means "border", "boundary", "limit" etc. Following this interpretation there are explanations that the land of Cabul was named as such since it was a border region (see Frankel 2008; Keimer 2020), either between the lands of Solomon and Hiram, or between the lands of Asher and Zebulon (immediately south of the lands of Asher and Naphtali). Lipiński (2010) wrote that "gevul" could also have meant "hill country", and similarly Keimer (2020) stated that an interpretation as "mountain" is feasible and – since he assumed that the land of Cabul corresponded to the lower hills of southern Galilee - posed that the region was considered worthless because of its hilly / mountainous character with forests and poor soils.

The 'Babylonian Talmud' – the collection of Jewish texts from the 3rd to 6th centuries CE explaining the Tanakh - tells that the area may have been named Cabul because the inhabitants were dressed ("מכלמ", "mekubalim") in silver and gold, and that Hiram was not satisfied because the wealthy inhabitants did not perform corvée. The 'Babylonian Talmud' furthermore contains the explanation that the area was dry and "did not produce fruits", i.e. was infertile. It furthermore includes an explanation that the name related to salty soils, in which the foot sank to the ankle ("כבלה", "kabla"). Following this "sinking" hypothesis, Bochart (1681) quoted sources that claimed that the foot sank in mud or sand, and Schallinger (1983) wrote that it sank in peat.

Sommer (2008) noted that "cabul" meant "dry wood" but did not provide a source for this. Lipiński (2010), apart from his "hilly country" interpretation quoted above, added that Hiram may have characterised Cabul as "a land like a lump ("בּוּל", "bul"), i.e. "a shapeless mass of things thrown together".

Apart from "peat", the present-day word "cabul" also means "bound", "chained" or similarly, and Noth (1983) indeed interpreted "cabul" as such. Keimer (2020) speculated that this could imply that Hiram considered the region to fetter him.

Contrary to the assumed negative meaning, Markoe (2003) noted that the land of Cabul was prosperous because of cultivation of wheat and production of olive oil. Similarly, Noth (1983) remarked that the area around present-day Cabul – i.e. the hills – was by no means unpleasant.

An unrelated text is reported by Hoover & Hoover (1950) in a footnote in their translation of 'De re metallica' by Georgius Agricola (published in 1556 CE). The footnote contains a passage from 'Sarepia oder Bergpostill' by

Johann Mathesius (published 1562 CE) that states that the word "cobalt" – a detested metal – was named after the land of Cabul where it may have been mined in the 20 cities, of which Mathesius assumed that they were mining towns. He posed that Hiram – according to him an excellent and experienced miner - was displeased with the 20 cities because the mines provided relatively much of this "displeased" cobalt rather than gold and silver. In reality, however, the word "cobalt" comes from the German "Kobold" ("goblin") (Seebold 2011), which was also mentioned as possibility by Hoover & Hoover (1950) in the same footnote.
These different opinions show that readers / translators / commentators did not really know what to do with the word "cabul" or the name Cabul, but none of them has thought about a connection to the substance peat.

Between the hills with the town of Cabul and the Mediterranean Sea lies the Ramsar Nature reserve Ein Afek, which is a remnant of a large wetland fed by the Na`aman River (Olsvig-Whittaker et al. 2005). Most organic sediments in the area consist of organic clay, but peat layers of less than 2 m thickness occur along the margins of the wetlands (Zviely et al. 2006).
The Na`aman River was known in Antiquity because here sand was found that was used to produce glass. Within this context Tacitus mentioned it as Belius in 'The histories' (5:7), and Josephus as Beleos ("Βήλεος") in the 'Jewish war' (2:10,2), but both authors did not write about wetlands. Pliny the Elder, however, wrote:

"Nearby are Getta and Gebas, and the river Pacida or Belus, whose small banks consist of a sand suitable for glass: this river flows from the marshes of Cendebia at the foot of Mount Carmelus [mount Carmel]*. Nearby is the colony Ptolemais of Emperor Claudius, previously called Acce* [present-day Acre or Akko] *…*" ("*iuxta Getta, Geba, rivus Pacida sive Belus, vitri fertiles harenas parvo litori miscens; ipse e palude Cendebia a radicibus Carmeli profluit. iuxta colonia Claudi Caesaris Ptolemais, quae quondam Acce...*") ('Natural History' 5:17).

and:

"In a part of Syria, adjacent to Judea, there is a region called Phoenicia, where the marsh Candebia [note that Pliny alternatively named it Cendebia and Candebia] *lies at the foot of Mount Carmelus. From here, they believe, the River Belus springs which after a course of five miles flows into the sea near the colony Ptolemais. It flows slowly, the water is unhealthy, but* [the river] *is holy, it is muddy and very deep…" ("Pars Syriae, quae Phoenice vocatur, finitima Iudaeae intra montis Carmeli radices paludem habet, quae vocatur Candebia. ex ea creditur nasci Belus amnis quinque milium passuum spatio in mare perfluens iuxta Ptolemaidem coloniam. lentus hic cursu, insaluber potu, sed caerimoniis sacer, limosus, vado profundus…"* ('Natural History' XXXVI:65).

It is very likely that the land of Cabul of the Tanakh was the Cendebia marsh, or at least that the Cendebia marsh was part of the land of Cabul. It will have been considered worthless since as a marshland it had not really value for ancient Hebrews and Phoenicians. It is, however, unlikely that 20 cities existed in this marsh.
It is at present unknown what the original meaning of the word "cabul" may have been: if the Land of Cabul was named after the substance peat, the translators and commentators would have known this since the word would have been sufficiently common to have entered everyday speech in ancient times. It seems, therefore, more likely that - when in the course of time the substance "peat" got its own word in the Hebrew language – it was derived from the region where peat actually occurrs.

I am grateful to Immanuel Musäus for crucial linguistic advice and critical comments.

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Peatlands for climate change mitigation: On the nature of 'peatland-based solutions'

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Peatlands are rapidly gaining attention for the 'nature-based solutions' they provide, especially with respect to climate change mitigation and adaptation. This note presents some propositions on the nature of these 'solutions' and some ballpark figures on their magnitude. In addressing the issue, it is important to distinguish between carbon (C) storage ('stocks') and carbon (and greenhouse gas) fluxes. Fluxes include sequestration ('sinks') and emission ('sources').

- The world's peatlands contain 600,000 Mt C, making them a globally significant carbon stock.
- A carbon stock has, however, no significance for the climate if the stock does not change, i.e. if it does not decrease (and acts as a C source) or increase (and acts as a C sink).
- Currently, the 500,000 km^2 of drained peatlands worldwide (of the world's 4,000,000 km^2 of peatlands) are a source of 500 Mt C per year by microbial oxidation, peat fires and peat erosion (= 2,000 Mt CO_2e). This corresponds to 5% of the 10,000 Mt annual anthropogenic C emissions.
- The remaining 3,500,000 km^2 of undrained peatlands are a sink of 100 Mt C per year. This corresponds to only 1% of all global annual anthropogenic C emissions.
- Through peatland rewetting we can **stop** the annual 500 Mt of C losses and a major part of the 2,000 Mt CO_2e of annual peatland emissions.
- Through peatland rewetting by water level rise we can **store** 2,000 Mt of C globally in the newly established peat-forming layer at the surface, i.e. 20% of annual global C emissions, but this is a one-off sink that happens only *once*.
- Through peatland rewetting we may also reinstall continuous C **sequestration**. If after rewetting we would get the same long-term peat accumulation rate in the rewetted peatlands as in natural peatlands, this would give us 15 Mt C of extra annual C sink (which is less than 0.2% of current global annual emissions).
- Even if we could reach in natural and rewetted peatlands FIVE times this natural C accumulation rate (because of higher temperatures, atmospheric N fertilisation, higher atmospheric CO_2 concentrations, hydrologic and hydrochemical manipulation, and directed vegetation management), the annual sink effect of all peatlands worldwide would be equivalent to only 5% of all anthropogenic emissions today.
- Ergo: peatlands will not save the world.
- But: We have to stop them from being a substantial source (by rewetting all drained peatlands) and we have to prevent their huge carbon stocks from being mobilized (by protecting all undrained peatlands).
- And we must cherish the sink function of undrained and rewetted peatlands. Not because that function is so substantial but because perpetual sinks are extremely rare and we will desperately need sinks to compensate for really unavoidable emissions from vital human activities and for getting CO_2 out of the atmosphere.
- Mangroves, saltmarshes and seagrass beds partly have a similar (or thanks to allogenic C-input even larger) C-sink effects and C stocks per unit area as peatlands. Because of their worldwide much smaller area, their importance as C sinks is correspondingly smaller. Their importance is – similar to peatlands – not so much in their sink effect, but in their space-effectiveness as stocks.
- The current natural peatlands worldwide are an annual methane source of 30 Mt CH_4. This persistent emission does not increase the CH_4-concentration in the atmosphere because its short atmospheric residence time means that every year the same amount of CH_4 is being removed from the atmosphere as is being added. A steady state in peatland-derived atmospheric CH_4 concentration has been reached.
- Rewetting of drained peatlands leads to a renewed emission of CH_4 from these peatlands. This CH_4 emission is unavoidable if we want to stop the much larger emissions of CO_2. However, because of its short residence time, this new and persistent CH_4 emission soon (within a few decades) results in a steady state in atmospheric CH_4 concentrations, whereas the persistent emission of CO_2 from drained peatlands would, without rewetting, lead to a continuously rising concentration of CO_2.

- In the case of peatlands, you thus have to choose between *either* methane from rewetted peatlands *or* CO_2 from drained peatlands. Confronted with this choice, you always have to choose for the short-lived methane and against the long-lived CO_2.
- (On a side-note: the concept of global warming potential (GWP), i.e. expressing the warming effect of emissions of different greenhouse gases in terms of CO_2-equivalents or CO_2e was aimed to compare the effect on global warming of different greenhouse gases. It was not designed to guide choices about which gas would be 'worse' or 'better' to emit. Originally introduced as a 'place-holder' measure, GWP has gained political weight, which is why we cannot avoid it entirely.)
- Rewetting all drained peatlands globally will result in an additional anthropogenic emission of 7 Mt CH_4 per year (= 2 % of the current anthropogenic CH_4 emissions). Using the 20 yr GWP of CH_4 of 81 (IPCC AR6), this would mean that we have to "invest" less than 600 Mt CO_2e of CH_4 to prevent anthropogenic emissions of 2,000 Mt CO_2e. Because of the short atmospheric life-time of CH_4, the investment becomes cheaper with time. After a few decades the CH_4 burden reaches a steady state and a pure gain of CO_2 emission reductions remains. Using the standard 100 yr GWP of CH_4 of 28 (IPCC AR6), we have to "invest" 200 Mt CO_2e of CH_4 to prevent anthropogenic emissions of 2,000 Mt CO_2e: truly a fair deal.
- We should therefore rewet as quickly as possible to prevent CO_2 from drained peatland building up in the atmosphere *and* to reach the CH_4 steady state as soon as possible. Nevertheless, we should limit the incidence of CH_4 emissions upon rewetting, for which various techniques and strategies exist.

Further reading:

Convention on Wetlands. 2021. Global guidelines for peatland rewetting and restoration. Ramsar Technical Report No. 11. Gland, Switzerland: Secretariat of the Convention on Wetlands. 77 p. https://www.ramsar.org/sites/default/files/documents/library/rtr11_peatland_rewetting_restoration_e.pdf

Günther, A., Barthelmes, A., Huth, V., Joosten, H., Jurasinski, G., Koebsch, F. & Couwenberg, J. 2020. Prompt rewetting of drained peatlands reduces climate warming despite methane emissions. Nature Communications 11, 1644. https://www.nature.com/articles/s41467-020-15499-z.pdf

Joosten, H., Sirin, A, Couwenberg, J., Laine, J. & Smith, P. 2016. The role of peatlands in climate regulation. In: Bonn, A., Allott, T., Evans, M., Joosten, H. & Stoneman, R. (eds.): Peatland restoration and ecosystem services: Science, policy and practice. Cambridge University Press/ British Ecological Society, Cambridge, pp. 63-76. https://www.cambridge.org/core/books/abs/peatland-restoration-and-ecosystem-services/role-of-peatlands-in-climate-regulation/24EC1D07B9504D1184890DADBF6F0AC9

Global

Fifth session of the United Nations Environment Assembly 28 February – 2 March 2022

Hosted by the UN Environment Programme, the United Nations Environment Assembly (UNEA) brings together representatives of the 193 Member States of the UN, businesses, civil society and other stakeholders to agree on policies to address the world's most pressing environmental challenges. The resumed Fifth Session of the United Nations Environment Assembly (UNEA-5) takes place online and in Nairobi on 28 February – 2 March 2022. The overall theme for UNEA-5 is "Strengthening Actions for Nature to Achieve the Sustainable Development Goals". This highlights the pivotal role nature plays in our lives and in social, economic and environmental sustainable development.

UNEA-5 is an opportunity for Member States to share best practices for sustainability. It will create momentum for governments build on and catalyze impact on multilateral environmental efforts to protect and restore the natural world on which our economies and societies depend.

Looking ahead to the resumed session of UNEA.5, the UNEA President has re-initiated the consultations process on a ministerial declaration. In his letter dated 6 October 2021, the President presents an updated version of the zero draft declaration that considers what has already been achieved during previous consultations. The letter also proposes a consultation timeline before final consideration and adoption of the draft at the upcoming resumed session of UNEA-5. The draft structure of UNEA-5.2 is available here.

Immediately after UNEA-5.2, the Assembly will hold a Special Session on 3 - 4 March 2022, which is devoted to the commemoration of the 50th anniversary of the creation of UN Environment Programme in 1972 (UNEP@50).

- https://www.unep.org/environmentassembly/unea5

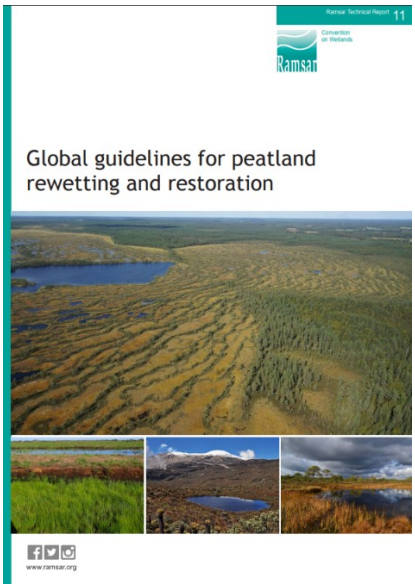
World Wetlands Day on 2 February 2022: Wetlands Action for People and Nature

Information and outreach materials for World Wetlands Day on 2 February 2022 are available to download online at: www.worldwetlandsday.org. 2 February 2022 is the first year that World Wetlands Day will be observed as a United Nations international day, following its adoption by the General Assembly on 30 August 2021. The Resolution was co-sponsored by 75 Member States and can be found in the six official languages of the United Nations under https://undocs.org/en/A/75/L.125.

'Wetlands Action for People and Nature', the theme for the 2022 edition, highlights the importance of actions that ensure that wetlands are conserved and sustainably used.

Global guidance for peatland rewetting and restoration

The Ramsar Convention recently launched the following key documents to guide peatland restoration globally:



A **policy brief** for restoring drained peatlands- Provides a set of recommendations to improve national peatland policy and financial frameworks. The idea is built on how comprehensive emission reporting, including precise peatland restoration impacts with socio-economic information, may give the issue surrounding peatland drainage visibility: https://www.ramsar.org/policybrief

A **briefing note** for practical peatland restoration- Gives a summary of various evaluated components in rewetting (e.g. material and design of canal blocking) and reported context for revegetation (e.g. characteristics of the peat soil and site, and growth characteristics of the vegetation species): https://www.ramsar.org/briefingnote

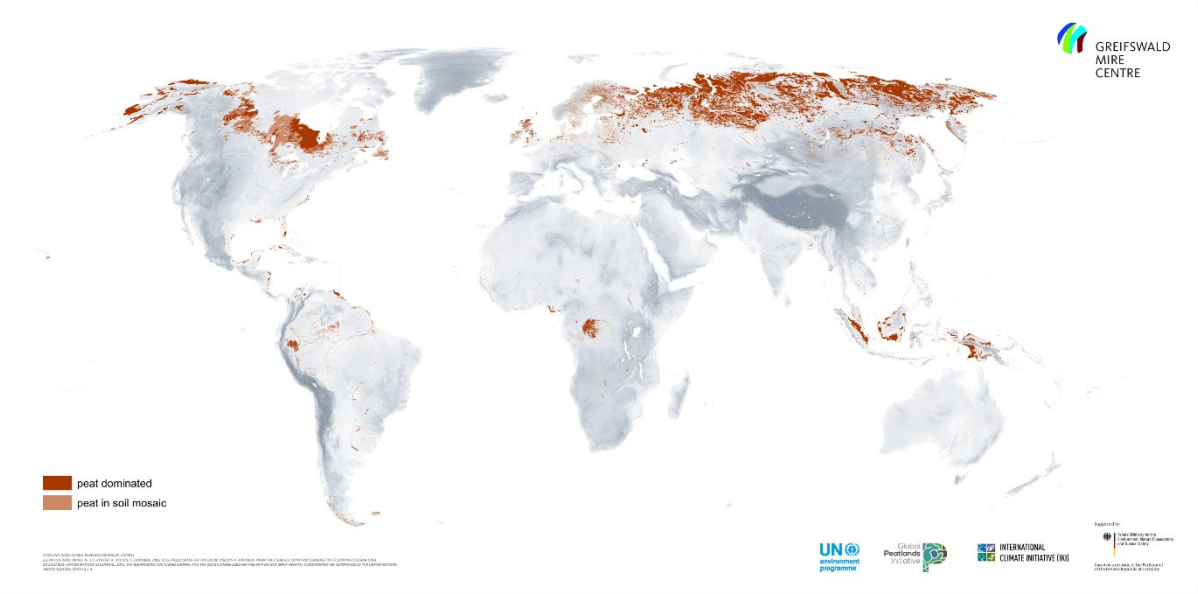
A **technical report** on global guidelines for peatland rewetting and restoration. Provides comprehensive background and technical guidance for the decision-makers for considering rewetting and restoring peatlands: https://www.ramsar.org/technicalreport

Peatlands mapping and monitoring

In December, FAO, under the GPI project and supported by GMC on the technical segments, organized one mapping workshop session in DRC and two in Peru, with the theme of "Locating and Mapping Peatlands". In DRC, the training aimed to build capacity among members of government agencies and other stakeholders to facilitate contribution to peatland mapping efforts led by the Ministry of Environment and Sustainable Development (MEDD) and other partners under the coordination of the Ministry. The session aimed at building capacity in field measurement protocols, as well as remote sensing techniques for peatland delineation, based on methodologies applied by the SWAMP program, GMC and others. In Peru, the first session, held on 24th of September and entitled "Peatland mapping training: field work" aimed at providing an introduction to the ecological characteristics and formation of peatlands in Peru and presenting and discussing procedures for the design and implementation of field surveys for mapping of peatlands. The second session, held on the 16th of December focused on getting to know and gathering the data and procedures for creating peatland probability maps.

Global Peatlands Assessment (GPA) update

GPI's flagship product aims to establish the State of the World's Peatlands. The GPA process was officially launched at the Peatland Pavilion during COP26. A total of 30 Coordinating Lead Authors (CLAs), being peatland experts from all around the world, are currently participating in the GPA to coordinate its different chapters which will be divided in Global Chapters (focused on Peatland Extent, Status, Policy Context, Actions, and Recommendations), and Regional Chapters (including Africa, Asia, Europe, Latin America and the Caribbean, North America, and Oceania). Each chapter will count on the support of several Contributing Authors which are still being currently selected. During the First Author's Meeting, held at the end of September 2021, all CLAs were brought together to define the working methodology of the assessment and to harmonize the different global perspectives into a common overall goal, which is to collect the best available science in order to protect our peatlands from all over the world. In addition, the Greifswald Mire Centre (GMC), being a core partner of the GPA Development Team, has been supporting the GPA process through the identification of the databases and spatial layers available through their Global Hotspot Atlas of Peatlands and the Global Peatland Map 2.0. The first draft of the GPA will be ready for Q1 2022, while the final version is expected to be concluded by the end of 2022.



The Global Peat Press Project (GP3)

The Global Peatlands Initiative (GPI) created quite a stir of awareness partnering with the North Pennines AONB Partnership for a "relay race" of peatland champions across Europe, dubbed the Global Peat Press Project (GP3). International partners share their successful experiences, demonstrating how healthy peatlands counter the climate and nature crises. It highlights how and why restoring degraded peatlands is critical while giving unsung heroes like site managers an opportunity to showcase their work, connect with others, learn and be inspired to do more. The outreach effort promotes peatland restoration actions for the UN Decade on Ecosystem Restoration and for the UNFCCC COP26. The GP3 has now pivoted to focus on the vital importance of peatlands for nature, aiming to build momentum and interest in advance of the Convention on Biological Diversity (CBD) COP15 in April next year. For those who have missed the journey of the baton, here's a little recap:

The campaign started in the UK as the host of COP26 with The North Pennines AONB (https://www.northpennines.org.uk/peatland-welcome-for-decade-of-ecosystem-restoration/), the baton then passed through Care-Peat (https://www.nweurope.eu/projects/project-search/care-peat-carbon-loss-reduction-from-peatlands-an-integrated-approach/news/eat-sleep-re-peat-repeat-taking-care-of-peatlands-is-working-to-tackle-climate-change/), followed by Niall O' Brolchain (NUI Galway) and the Irish Peatland Restoration Initiative (https://www.insight-centre.org/united-nations-recognizes-major-irish-peatland-restoration-initiative/), Bax & Company (https://baxcompany.com/insights/european-experts-join-forces-to-guide-vital-action-on-peatlands/), The Wildlife Trusts (https://www.lancswt.org.uk/news/global-peatland-partners-come-together-spread-peaty-word), the GPI & EUROSITE Social Media Campaign (https://www.globalpeatlands.org/gpi-eurosite-peatlands-social-media-campaign-restore-peatlands-to-stop-the-climate-emergency/), LIFE for Welsh Raised Bogs Project

(https://naturalresources.wales/about-us/our-projects/nature-projects/new-life-for-welsh-raised-bogs/?lang=en), NABU (https://en.nabu.de/news/2021/30417.html), Moors for the Future Partnership (https://www.moorsforthefuture.org.uk/the-latest/recent-news/other-news-articles/peak-district-study-reveals-depths-of-carbon-stored-in-threatened-landscapes), Metsähallitus (https://www.metsa.fi/en/press-releases/towards-flourishing-peatlands-in-finland/), Natural Resources Wales (https://nrw-newsroom.prgloo.com/news/updated-version-re-issued-welsh-peatland-project-joins-global-peat-press-project-gp3), Community Wetlands Forum together with Landscape Finance Lab (https://communitywetlandsforum.ie/wp-content/uploads/2021/09/Peatland-Finace-Ireland-GP3-press-release.pdf), Terra Motion (https://www.terramotion.co.uk/carbonpotentialmapgp3), GRI Green Restoration Ireland (https://greenrestorationireland.coop/), Belarus peatlands restoration efforts (https://minpriroda.gov.by/en/news-en/view/land-of-forests-and-peatlands-belarus-is-among-the-world-leaders-in-restoring-drained-peatlands-3880/), Ulster Wildlife Trusts (https://www.ulsterwildlife.org/news/saving-our-peatlands-through-partnership-new-peatland-map-ni), UNEP's World Conservation Monitoring Centre (https://www.unep-wcmc.org/news/research-reveals-a-quarter-of-europes-peatlands-are-degraded--ahead-of-key-climate-and-biodiversity-summits), Greifswald Mire Centre (https://www.greifswaldmoor.de/files/dokumente/Presse/20211027_MI_GP3_Paludiculture%20tiny-house_GMC.pdf), Conservatoire d'Espaces Naturels (https://www.pole-tourbieres.org/IMG/pdf/CP_GP3_Carbone_FCEN.pdf); (https://www.pole-tourbieres.org/IMG/pdf/CP_GP3_Restauration_FCEN.pdf); (https://www.pole-tourbieres.org/IMG/pdf/CP_GP3_Terreau_sans_tourbe_FCEN.pdf); (https://www.pole-tourbieres.org/IMG/pdf/CP_GP3_JMZH_FCEN.pdf), Cairngorms National Park (https://cairngorms.co.uk/), North Pennines AONB (https://www.northpennines.org.uk/peatland-partners-work-together-to-raise-international-profile-before-cop26/), CINEA-LIFE (https://cinea.ec.europa.eu/news/how-life-protecting-europes-degraded-peatlands-2021-11-26_en), Baltic Environmental Forum Lithuania: (https://meldine.lt/en/new-hope-to-save-europes-rarest-passerine-songbird-pioneering-translocation-of-aquatic-warbler-between-lithuanian-and-belarusian-peatlands-marks-important-milestone-in-fight-for-species/), Yorkshire Peat Partnership (https://www.globalpeatlands.org/wp-content/uploads/2021/06/YPP-Annual-report_GP3.pdf), and now the baton has returned again to Belarus!

After a successful 1st GP3 series of 20 press releases over 21 weeks which helped to build momentum for a focus on peatlands at the UNFCCC COP26 - we are ready to launch the 2nd GP3 series focusing on the importance of peatlands for biodiversity and nature in the lead up to the Convention on Biological Diversity (CBD) COP15.

We warmly invite you to join the GP3 effort and pledge your collective support to GPI and our work to protect nature, combat climate change and safeguard the health of our planet through this fun press release relay. (More info here: https://www.globalpeatlands.org/global-peat-press-project-gp3-campaign-kick-off/).

If you would like to join the GP3 relay around the world's peatlands – please contact maudie.fraser@un.org.

Indonesia's peatland restoration activities get nod of approval at COP26 event

Daniel Murdiyarso, a principal scientist at the Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF), shared some recommendations regarding rewetting drained peatlands in a presentation on the sidelines of the COP26 climate summit, which was hosted by the International Tropical Peatlands Center (ITPC) at the Indonesia Pavilion. Elevating or increasing the level of water tables is one method, but the many variables and high cost of blocking canals are yet to be determined, Murdiyarso said. Monitoring ground water levels reveals that it is possible to predict when levels should be increased, particularly to avoid fires. Rewetting can also help reduce ground subsidence rates. "Tropical peatlands are physically unique, but they can be characterized," he said. "Through the ITPC, we should be able to further explore emerging opportunities concerning the wise use and sustainability of peatlands."

In his presentation, Hans Joosten, a professor of Peatland Studies and Paleoecology at the University of Greifswald in Germany affirmed the value of the ITPC as a knowledge platform. "I would like to stress the word knowledge — knowledge is not only science — knowledge is about wisdom and goes much further than only talking about facts," he said. "We must have such a platform to exchange ideas and information for the very specific purpose of solving problems, we have large problems, we will have even more and we have to address these problems."

The ITPC will become a global knowledge platform, said Dianna Kopansky, coordinator of the Global Peatlands Initiative in the Freshwater, Land and Climate Branch at the U.N. Environment Programme. "We're 46 partners strong," Kopansky said. "We've really been working hard to bring together international experts, practitioners, people of business, and also, of course, our clients, which are the governments, to really pursue the conservation, restoration and sustainable management events." Haruni Krisnawati, a principal researcher with Indonesia's Ministry of Environment and Forestry who is lead coordinator of ITPC, described progress on a new ITPC knowledge platform website. "It will be a 'go-to' place for information on peatlands and provide space for users to browse, search and also to contribute to a variety of knowledge products," she said.

In another session, experts described Indonesia's extensive experience and multitude of lessons learned from peatlands management.

The ITPC is a valuable platform for international, multi-stakeholder and multi-donor South–South cooperation, Krisnawati said. The Center, which is coordinated by the Ministry of Environment and Forestry of the Republic of Indonesia, with support from CIFOR and Global Peatlands Initiative of the U.N. Environment Programme, and the U.N. Food and Agriculture Organization, as coordinating partners. "The principles are true cross-sectoral collaboration and integration, building a resilient and holistic platform for science, policy and practice, attracting the best minds working on tropical peatlands research and practice," she added.

SPM Budisusanti, director for Peatland Degradation Control in the Indonesian Ministry of Environment and Forestry, said that Indonesia has the largest area of tropical peatland in the world: 24.66 million hectares managed by 865 peat hydrological units, holding 36 percent of the world's tropical peatlands. Many laws, regulations and guidelines have been introduced. "We have produced detailed maps of peatland extent for canal blocking, water management, peat domes, village management units and monitoring," she said. As such, Indonesia's history of peat management can serve as an important cautionary tale for the governments of the Democratic Republic of the Congo, Republic of the Congo, and Republic of Peru — members of the ITPC — as they strategize over their peatland management.

In another session hosted by the Indonesia Pavilion at COP26, Alue Dohong, vice-minister, Indonesian Ministry of Environment and Forestry, described how the ITPC was formed in 2018, explaining that it has been an important platform for South–South cooperation over the last three years while also contributing to Indonesia's national agenda, especially regarding climate ambition. "We're building up a centre of excellence to share knowledge about managing tropical peatlands: researchers, scientists, practitioners, policymakers and others come together to work on peatland issues," Dohong said.

In Peru, peatlands are not exploited but protected, and the strategy is to ensure local communities benefit, said José Alvarez Alonso, director-general of Biological Diversity in Peru's Ministry of Environment**.** Peatlands in Peru are found in Amazonia, the Andes and coastal areas, including in the form of palm, hydromorphic and open swamps, wetlands, reed beds, and mangrove swamps. "We need a strategy to manage the peat outside of protected areas," Alvarez said, adding that "collaboration and exchange of information between the four nations about better practices and management, knowledge and strategies for funding should engage all stakeholders — public and private — and strengthen the capacity of peatland monitoring."

Jean Jacques Bambuta, national coordinator and focal point for peatland, Ministry of Environment and Sustainable Development, DRC noted the large number of national parks in the country, the presence of REDD+ schemes and other activities, especially restoration, to counter degradation of peatlands.

Franziska Tanneberger, a researcher at the Institute of Botany and Landscape Ecology at Greifswald University and co-director of the Greifswald Mire Centre in Germany, which co-hosted the Peatland Pavilion during COP26, said Greifswald is involved in policies and practical work on peatlands and is the only German university with a chair of peatland sciences. "We've studied peat formation in Southeast Asia, peatland ecology and vegetation in Peru and we host the global peatland database that produced the global peatland map," she said. "Experts estimate half of Europe's peatlands are not properly reported so the problems extend beyond the Global South." Indonesia is the frontrunner for restoration, Tanneberger added. "It has rewetted in the last few years 10 times the area that Europe has rewetted in all of history. If Indonesia can do it, why not Germany?"

In Indonesia's Riau and South Sumatra provinces 7,000 hectares of plantations have been retired to become conservation areas, said Elim Sribata, chief sustainability officer at the Sustainability and Stakeholder Engagement Division, Asia Pulp and Paper, Sinar Mas Forestry**.** This effort included improving canal blocks and monitoring water to zero ground level and the return of native species. "We applied natural regeneration after clearing acacia trees and rewetting, but there have been many challenges," Sribata said. "It's important to select the right species and seedlings for site conditions. Restoration is a long process before there are viewable results."

The Congo Basin is at the beginning compared to Indonesia, said Simon Lewis of the Congo Peat Project and chair in Global Change Science, School of Geography, University of Leeds, England. "We mapped the peat and vegetation using remote sensing and computer analysis to produce 'peatland probability' maps," Lewis said. "The Congo is the world's largest contiguous area of peatland, about a quarter of the world's tropical peat and three

years' worth of anthropogenic carbon emissions. Potential threats exist in the basin from logging, mining and oil palm. "We want to avoid the negative outcomes seen in other countries," he added. "We have a large, multi-disciplinary, cross-border team and we now understand the effects of climate change on the peatlands and vice versa. But we need much greater investment in Congolese scientists and scientific infrastructure so that the analyses we are now doing in the UK can be done in-country."

- https://www.tropicalpeatlands.org/article/indonesias-peatland-restoration-activities-get-nod-of-approval-at-cop26-event/

Very good new film of Mongabay on peatlands of the Congo Basin and worldwide:

- https://www.youtube.com/watch?v=Z-I_G1JlOyA

Why we should all be obsessed with peatlands

Ireen is an Amsterdam University College alumnus, climate activist, peat-enthusiast and member of RE-PEAT, a youth-led collective pushing for a peatland paradigm shift. In this TED Talk she discusses all things peatlands and how we can use the collective imagination to think of a world beyond ecological destruction and climate disruption: https://www.youtube.com/watch?v=fOYaUZdgCA0

GPI Research Working Group

The GPI Research Working Group, with more than 170 members, co-led by Prof Mark Reed (SURC) and Dianna Kopansky (UNEP), is organizing a series of online training sessions for peatland researchers to help build their capacities, improve and enable inter-disciplinary research, and help to advance and harmonize peatlands research approaches across regions while strengthening the network by inspiring and facilitating impactful collaboration across the global research community. The series, which kicked off in December 2020 will carry on through to 2022. The network and associated training program is supported by funding from the British Academy. On October 1st the 8th session was held, entitled "Designing and facilitating meetings/workshops with partners & stakeholders". To learn more about previous sessions and for not to miss any other training check regularly our website: http://www.globalpeatlands.org/global-peatlands-initiatives-research-working-group/

Economics of Peatlands Conservation, Restoration and Sustainable Management

The "Economics of Peatlands Conservation, Restoration and Sustainable Management" policy report, authored by Edward Barbier and Joanne Burgess of Colorado State University, identifies that the leading causes of peatland mismanagement are undervaluation and underinvestment. Launched as part of the Global Peatlands Initiative's contribution to the UN Decade on Ecosystem Restoration, the report finds that the principal cause for peatlands mismanagement is the undervaluation of their economic contributions. Commercial activities and policies that degrade and convert these high-carbon ecosystems often ignore or fail to take account of their benefits to society. In addition, global peatland conservation and restoration suffer from chronic underinvestment.

Meeting the goal of keeping the global average temperature increase below 2˚C requires urgent action to hold peatland carbon where it is – wet, and in the ground. At the same time, we must re-wet and restore many already drained and degraded peatlands to halt their greenhouse gas emissions and protect the other benefits they provide. Peatlands protection and restoration can be a low-cost, low-tech and high impact nature-based solution for both climate action and biodiversity. Full report

About the Global Methane Pledge

Methane is a powerful but short-lived climate pollutant that accounts for about half of the net rise in global average temperature since the pre-industrial era. Rapidly reducing methane emissions from energy, agriculture, and waste can achieve near-term gains in our efforts in this decade for decisive action and is regarded as the single most effective strategy to keep the goal of limiting warming to 1.5˚C within reach while yielding co-benefits including improving public health and agricultural productivity. President Biden and President Von der Leyen announced at the September 17 Major Economies Forum (MEF) meeting that the United States and the European Union are inviting countries to support the Global Methane Pledge to be launched at COP 26 in November 2021 in Glasgow. Participants joining the Pledge agree to take voluntary actions to contribute to a collective effort to reduce global methane emissions at least 30 percent from 2020 levels by 2030, which could eliminate over 0.2˚C

warming by 2050. This is a global, not a national reduction target. Participants also commit to moving towards using the highest tier IPCC good practice inventory methodologies, as well as working to continuously improve the accuracy, transparency, consistency, comparability, and completeness of national greenhouse gas inventory reporting under the UNFCCC and Paris Agreement, and to provide greater transparency in key sectors.
With over 100 countries on board, representing nearly 50% of global anthropogenic methane emissions and over two thirds of global GDP, we are well on our way to achieving the Pledge goal and preventing more than 8 gigatons of carbon dioxide equivalent emissions from reaching the atmosphere annually by 2030.

- https://www.globalmethanepledge.org/

National Trust calls for ban on products containing peat

National Trust organisations around the world are calling for a ban on the use of peat in compost as part of efforts to tackle the effects of climate change. The National Trust said healthy peatlands act as carbon sinks, trapping in carbon to help mitigate the impacts of climate change, as well as helping to control flooding and encourage vegetation that can provide homes for wildlife. Organisations from 19 countries – including Scotland Ireland Germany and Indonesia – are also calling on their cumulative eight million members to stop buying products that rely on peat and instead seek sustainable alternatives. National Trust director general Hilary McGrady said: "We are all taking action in our organisations to eliminate the use of peat in our gardens and through our supply chains – but we can't end this practice alone. "So today, I join a host of international National Trust organisations in calling on our members to make a positive choice for climate and for nature when shopping at garden centres and buy peat-free compost to use in their gardens and check whether the plants they are buying are peat free.
"It is through this sort of collective effort that we can unite in the fight against climate change. "We also need Government to step up and play their part by bringing in legislation that bans the sale of products containing peat."

- https://www.standard.co.uk/news/uk/government-indonesia-ireland-peak-district-germany-b964803.html

The extensive peatlands of Peninsula Mitre, Tierra del Fuego, Argentina. Photo: Hans Joosten.

‘Cooling the climate for 10,000 years’: How saving wetlands can help save the world

Buffeted by the Atlantic Ocean on one side and the Pacific on the other, the Mitre Peninsula, at the far southern tip of South America, is one of the coldest, harshest places on the planet. “It’s the end of the earth,” said Martina Sasso, program coordinator at Rewilding Argentina. But this 2,400-square-kilometer slab is also a complex, carbon-rich wetland that holds 85% of all of Argentina’s peat. “The amazing part of this ecosystem, this great wetland, is that it is almost pristine,” Sasso told Mongabay. These Patagonian peatlands are the main carbon sink outside of the tropics in the southern hemisphere, a largely unbroken, unspoiled “carpet” dominated by the cushion-forming perennial *Astelia pumila*, which creates a bog that can absorb carbon four and a half times faster than those dominated by sphagnum moss and sedges. Peat forms in waterlogged, acidic conditions, as layer upon layer of decomposing vegetation slowly builds up. It can take 1,000 years to form just one meter of peat, the rotting organic matter locking in the carbon as the bog grows. In places on the peninsula the peat is 3m deep and it’s estimated that these mires contain 315 million metric tons of carbon, the equivalent of Argentina’s total emissions for three years.

The peatlands also form an important link between different ecosystems from mountains and valleys, to forests, lagoons and rivers, while huge carbon-guzzling kelp forests fringe the coast, adding to this remarkable area’s importance. The landscape supports rich biodiversity too, including South American sea lions (*Otaria flavescens*) and rare southern river otters (*Lontra provocax*), while huge condors (*Vultur gryphus*), usually more at home over the Andes, ride the clifftop thermals.

Just 200,000 people live on this remote part of Tierra del Fuego. But despite the lack of human presence, threats to this unique ecosystem are growing. Rewilding Argentina is supporting legislation to protect this unique environment, Sasso explained. A bill is currently in front of legislators for the fifth time in the last 30 years but until now it has been held back by “other interests,” she said. These include oil companies convinced that rich reserves sit below the peat. However, Sasso said that two years ago, she and her colleagues unearthed an unpublished document, produced by an oil company together with government researchers, that conceded there was no oil under the peat after all. They went public immediately, finally laying one long-running threat to rest.

Peatland under exploitation in Tierra del Fuego, Argentina. Photo: Rodolfo Iturraspe.

But others remain. Invasive wild cattle and horses roam the peatlands unchecked, their hooves crushing delicate bog plants. Beavers, introduced to Argentina in the 1940s to provide fodder for the fur industry, have wreaked havoc on ecosystems not evolved to tolerate them, building dams that flood bogs with water rich in peat-damaging nutrients while drying out downstream areas .

Underregulated tourism is also expanding and parts of the bog have already stopped growing, while other areas have been eroded, Sasso said. “Peat bogs can recuperate by themselves,” she said. But at a growth rate of about 5 millimeters per year, it can take a long time. “It doesn’t need restoring yet… what we need to do now is create some policy that can protect it in the long-term.”

Wetlands under threat

Wetlands come in many different forms, from mangroves and salt marshes, to flood plains and beds of seagrass, to peatlands, which make up around 3% of the planet’s land cover. They fulfill many different roles, from controlling water flow to providing forests with nutrients and helping biodiversity thrive. They also soak up carbon, and while the oceans may be our largest carbon sink, no other terrestrial ecosystems capture carbon more effectively than wetlands. Yet, from the vast frozen mires of the arctic to the peat swamps of Asia: “all wetlands are under threat,” said Jane Madgwick, CEO of Wetlands International. “We’re losing them three times as fast as forests.” When it comes to peatlands, the biggest threat is allowing them to dry out. By draining the surface to grow crops such as palm oil, explained Madgwick, it becomes vulnerable to the smallest spark. Fires can then burn undetected below the surface, before suddenly venting upwards. “It can go on for years, even under ice,” she said. Peat fires also release massive amounts of CO_2 and can destroy villages, close down whole cities and damage the health of those living near and far. Research indicates Indonesia’s haze crisis of 2015, which was caused primarily by uncontrolled fires burning on drained peatland, sickened half a million people and contributed to the premature deaths of more than 100,000.

A group works to block a canal made to drain a peatland near Dayun village in the Sumatran province of Riau, Indonesia. Photo: Wetlands International.

But simple chemistry can help restore the peat and its carbon storing potential. “Raise the water level by just 10cm and you can reduce CO_2 release by 90%… the more you re-wet, the better,” Madgwick said. “Biochemical process [that would decompose peat and release its carbon] aren’t going to operate if you keep it anaerobic.”

In the Russian Federation, Wetlands International has been re-wetting degraded peatlands on the outskirts of Moscow on a massive scale after wildfires in 2010 left the city enveloped in a thick, acrid smoke. The land had been drained for agriculture, forestry and peat extraction, explained Madgwick, but then abandoned, left dried out, inflammable and: “sitting there, giving off greenhouse gases.” Now this barren wasteland has been given a new lease of life, with sustainable management supporting the introduction of paludiculture (wet agriculture) and sphagnum moss cultivation. “If you can convert degraded peatlands to new commercial uses, and not create new monocultures, then you’ve got a real incentive for governments and the private sector,” Madgwick said.

Rewetted peatland in Russia. Photo: Hans Joosten

While some of the world’s peatlands, such as those in Indonesia, have natural tree cover, most are unwooded; around 80% of the arctic peatlands are treeless, for instance. Some rewilding groups advocate reforesting peatlands by replanting native trees, but the gains in carbon reduction would be minimal, according to Madgwick. What’s really needed, she said, is more re-wetting and Wetlands International has an ambitious target of restoring 50 million hectares of peatland this way by 2050. Madgwick concedes they are a long way from achieving this, which is one reason the NGO also supports the purchase of carbon offsets. She knows offsetting – by which companies or individuals invest in reforestation and other carbon sequestration projects to compensate for their own greenhouse gas emissions – is controversial, but done by companies that have followed a strict mitigation hierarchy of “avoid, minimize, restore and offset,” she believes it offers an important source of revenue. “It shouldn’t be a greenwashing option,” she said. “Transparency needs to be there.”

Arctic peatlands

Further north from Moscow lies the largest expanse of peatlands on the planet. Fifty percent of the world’s peatlands are concentrated in the lower arctic circle, said Gustaf Hugelius, a director at the Bolin Centre of Climate Research, with much of it buried beneath permafrost. These northern peatlands collectively hold 400-500 gigatons of carbon, he added, which is more than humanity has added to the atmosphere since the start of the industrial revolution. As with the Mitre Peninsula, some of these areas, notably in the far east of Russia and Canada’s Hudson Bay lowlands, are pristine and vitally important for regulating global temperature. But it is also here that global warming is one of the greatest threats. “Most of those peatlands have permafrost, so they are frozen all year round,” explains Hugelius. “They have been cooling the climate for 10,000 years, (then) global

warming pushes them through the thaw threshold… the peatlands essentially switch from a carbon sink to a carbon source, which keeps emitting greenhouse gases."

Peat fires in Alaska. Photo: Western Arctic National Parklands via Wikimedia Commons (CC BY-SA 2.0).

New infrastructure such as roads and oil and gas pipelines can disturb the balance too, releasing huge spikes of methane, a powerful greenhouse gas that is far more damaging than even CO_2.

Anna-Marja Persson also has a keen interest in the health of these arctic peatlands. As well as working for the Saami Council as an environmental project co-ordinator, she is a reindeer herder in northern Sweden. Indigenous peoples such as the Saami are an integrated part of the arctic wetland ecosystem. They have been using the bogs, mires and forests for millennia, Persson said, from hunting geese to picking cloudberries and even harvesting a special kind of grass they use to insulate their boots. But it's their herds of reindeer that rely most on the peatlands.

While some herders move their animals seasonally to the mountains, she explained, others stay in the lowlands all year round. "The wetlands are crucial to reindeer," she said. "In spring, they are the first place where the snow melts, providing a very rich source of food."

In addition to grazing grounds, peatlands also provide safe places for reindeer to calve and protection from inclement weather, as well as accessible migration routes. And despite their bulk, Persson said, the reindeer benefit the mires too, their grazing preventing them from becoming overgrown with larger, more rigorous types of vegetation. "They're not as heavy as a four-wheel machine," she said, "which are destroying the environment."

Persson lists mining companies, tourism, forestry, farming and wind farms as the major direct threats to this tough yet delicately balanced ecosystem. "There are many exploiters trying to take a piece here and there," she said. In 2022 she hopes to start a long-delayed project with two communities of reindeer herders in northern Sweden, asking them to document how they use the wetlands and why they are so important. The finding will be passed on to legislators at the Arctic Council – a multinational forum promoting cooperation in the region – to show why the wetlands need to be preserved. "We need to have the wetlands as they are now, we cannot give away more for mining and the 'green deal,' it's impossible," Persson said.

Peatland landscape near Tornetrask, North Sweden. Photo: Hans Joosten.

At both ends of the planet, campaigns are now underway to raise the profile of peatlands and save these precious and irreplaceable carbon sinks. “The importance of wetlands is now undisputed,” Madgwick said, although she fears that without giving wetlands the same protection as forests, “world leaders are missing the point.”

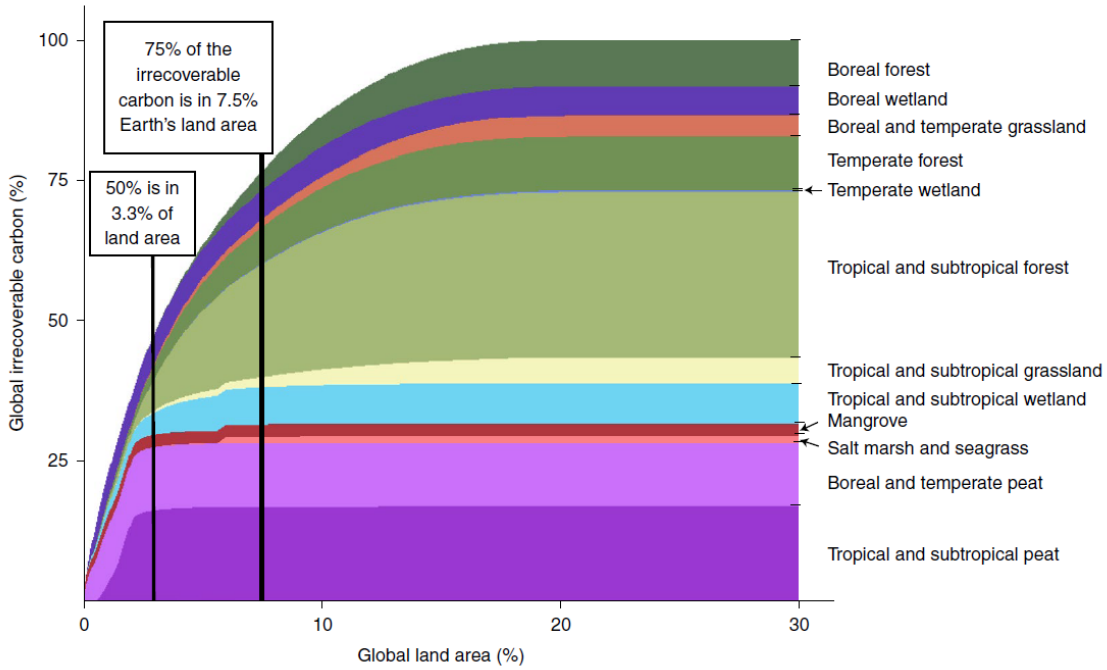
- https://news.mongabay.com/2021/12/cooling-the-climate-for-10000-years-how-saving-wetlands-can-help-save-the-world/

Over three-quarters of the world’s vital carbon stores are unprotected

Our planet stores carbon in a range of ecosystems, such as forests and peatlands. When humans degrade these ecosystems for commercial purposes, such as agriculture, large amounts of carbon may be released into the atmosphere, contributing to global warming. Once released, it can take years, centuries or even millennia for carbon to be stored in such ecosystems again. The carbon that can’t be recovered by 2050, which is when the world must reach net-zero emissions to avoid the worst impacts of climate change, is known as irrecoverable carbon. Since 2010, agriculture, logging and wildfire have caused emissions of at least 4.0 Gt of irrecoverable carbon. The world’s remaining 139.1 ± 443.6 Gt of irrecoverable carbon faces risks from land-use conversion and climate change.

To map the areas of irrecoverable carbon globally, Monica Noon at Conservation International, an environmental charity based in Virginia, and her colleagues aggregated several carbon storage data sets. They found that half of the planet’s irrecoverable carbon is stored on just 3.3 per cent of its land. The highest concentrations of irrecoverable carbon reserves are in the peatlands and forests of the Amazon and Congo basin, the forests of North America and Siberia, and in mangroves and wetlands elsewhere. Less than a quarter of these lands fall under protected status. Currently, 23.0% of irrecoverable carbon is within protected areas and 33.6% is managed by Indigenous peoples and local communities. Half of Earth’s irrecoverable carbon is concentrated on just 3.3% of its land, highlighting opportunities for targeted efforts to increase global climate security.

By identifying the irrecoverable carbon hotspots, Noon hopes to encourage better nature-based solutions to tackle climate change and policies to manage and protect these crucial carbon storage ecosystems. In the short term, this could include paying governments to reduce deforestation.



In the long term, it could mean strengthening the rights of Indigenous people, who look after over a third of the land that contains irrecoverable carbon, and financing the expansion of protected areas around the world. "Eighty-seven per cent of biodiversity overlaps with high irrecoverable carbon areas, which means that we can feasibly protect areas and kind of have a win-win situation when we're looking at biodiversity and climate," says Noon.

- https://www.newscientist.com/article/2298226-over-three-quarters-of-the-worlds-vital-carbon-stores-are-unprotected/#ixzz7Fj5P1QHE
- https://www.nature.com/articles/s41893-021-00803-6.pdf
- https://www.conservation.org/projects/irrecoverable-carbon
- https://www.conservation.org/docs/default-source/publication-pdfs/irrecoverable-carbon-report.pdf?sfvrsn=16207fea_2

Protect ecosystems first for maximum carbon storage, study says

When it comes to slowing climate change, there's one natural solution that has recently gripped the world: large-scale tree planting and reforestation. But a new study warns that other natural climate solutions should be considered first. In fact, by comparing different natural climate solutions (NCS) against four criteria, the study proposes a hierarchy: protect ecosystems first, then improve their management, and lastly restore them.

“I am really happy this paper was published,” said Forrest Fleischman, associate professor at the University of Minnesota, U.S., who was not involved in the study. “A huge amount of time, energy, and rhetoric is being put into restoration as a low-cost climate solution, whereas scientists have been saying that protecting existing ecosystems is the high-priority climate solution. It is generally much cheaper and more reliable than restoring damaged ones. What the hierarchical framework helps with is in making the cost-benefit calculation on these different investments clearer.”

“Very importantly, natural climate solutions are not a substitute for fossil-fuel emissions reduction. We absolutely need those,” said Susan Cook-Patton, the lead author of the new study, who works for global environmental nonprofit The Nature Conservancy (TNC). “That said, even if we were to sharply drop our emissions, we’re still going to need to pull additional carbon out of the atmosphere and natural climate solutions are particularly helpful in that context.”

There are more than 20 NCS, according to Cook-Patton, but for the purpose of the study, she and her colleagues focused on three big ones: protection, improved management, and restoration of ecosystems. The scientists then compared the potential of these three solutions against four criteria that they could assess at a global level. These were the amount of climate benefit each solution offers; how quickly the climate impacts become apparent; cost-effectiveness, that is, how much climate benefit each provides per dollar invested; and co-benefits to people and nature.

The analysis showed that, on a broad scale, protection of natural ecosystems offers the greatest climate benefits, fairly quickly, at relatively low cost. Improved ecosystem management comes next, followed by restoration. Prioritizing protection of intact ecosystems also brings other benefits, the authors write. These include protecting the livelihoods and cultures of Indigenous peoples and local communities, reducing the impact of rising sea levels and extreme weather events, and providing clean air and water.

Consider the example of Canada: In a study published earlier this year, Cook-Patton and several co-authors showed that, by 2030, out of more than 20 NCS, preventing the conversion of grasslands and peatlands to other land uses like agriculture would provide the single largest climate benefit by keeping carbon stocks locked in the soil. Improved management of agricultural lands and forests would also offer big benefits. However, the country has instead been prioritizing tree planting, Cook-Patton said. “Canada has this 2 billion tree program that is all about tree planting and restoration of tree cover. And what we found was that in 2030, there’s very little mitigation available from it.” The benefits of restoration efforts would only start appearing by 2050, the June study found, and not within the next decade, which scientists deem critical for keeping planetary warming below 1.5° Celsius. “If you want large, near-term climate mitigation, you really should think about protecting those intact ecosystems, and improving the management of agricultural lands,” Cook-Patton said.

William Bond, a grasslands researcher and emeritus professor at the University of Cape Town in South Africa who was not involved in either study, said the new study’s hierarchical framework would be particularly useful to evaluate in developing countries, “where international funding of tree planting is a major incentive.” “It is not a rational response to plant trees to combat climate change,” Bond said in an email. “It is an emotional concern exploited by those who benefit, for example, by delaying more rigorous [fossil-fuel] emissions control. So it is up to us, the ecological and restoration ecology communities, to inform and broaden public opinion on options for NCS. The authors used credible carbon economy data and credible economics to develop their case.”

Cook-Patton acknowledged that local contexts could change what solution people prioritize. Yet, she said the purpose of the paper was to get people working for corporations and governments to think about their options for protecting and better managing ecosystems first, before jumping onto the restoration bandwagon.

Bond said the paper’s protect-manage-restore message can serve another audience: people wanting to contribute to climate projects who could use more information about where their money will have the greatest effect. “At the personal level, I am generally extremely reluctant to pay the ‘carbon tax’ when travelling. I know it is highly likely to be spent on some poorly planned reforestation project planting trees where they likely never existed in a pristine grassland,” he said. “If I knew that the carbon tax was instead going to support protection of those grasslands and managing them for greater carbon storage, I would fully endorse paying the carbon tax.”

Fleischman, while agreeing that the new paper’s findings are valuable, highlighted a concern. “What does it mean to ‘protect’?” he wrote in an email.

Fleischman also said it's important to be clear about why restoration is having a big moment in global discourses, while protection is not. "Protection is often harmful to powerful interests that would like to destroy natural ecosystems to extract resources," he said. "These interests have a big seat at the global decision-making table. Restoration often fails but it makes a nice slogan, and organizations that are harming the earth can commit to long-term restoration as a way to greenwash their work. Since restoration takes decades, it will be decades before we can hold them accountable for the likely failures and shortcomings. Hopefully, this paper will make it harder for these organizations, but we'll have to see."

That is Cook-Patton's hope too. "My title is senior forest restoration scientist, and I love tree planting, I love restoring forests; my science is targeted around quantifying accurately, the mitigation potential of that," she said. "But even I want to make sure that people don't forget there are these other powerful ways in which we can use nature to help tackle climate change."

- https://news.mongabay.com/2021/12/hold-the-tree-planting-protect-ecosystems-first-for-maximum-carbon-storage-study-says/

Healthy peat soils – hidden gem for carbon storage

Hosted every year on 5 December, the World Soil Day 2021 cannot be celebrated without highlighting the importance of healthy soils, including healthy, wet peatlands, for ecosystem functioning and human well-being. The conservation and sustainable management of peatlands are needed to prevent the release of carbon from peat soil. To ensure that peatland conservation is a success, the key step is to verify the location and extent of peatlands to allow communities and countries to manage these valuable resources and their ecosystem services sustainably. Moreover, it is critical to secure the livelihoods of local communities living around a peatland by diversifying sustainable peatland practices that do not threaten the peatland function, such as sustainable use of fisheries, or certain types of biomass production on wet peatlands, 'paludiculture.'

The Food and Agriculture Organization of the United Nations (FAO) and an abundant list of partners have jointly collected case studies of sustainable peatland practices since 2014. These practices can help practitioners, land managers, and policymakers to identify locally suitable, context-specific, and sustainable practices. FAO also continues to invite new partners to submit cases to this collection. Some national governments have acknowledged the significance of peatland ecosystems in achieving their climate commitments. During side events held at the Peatland Pavilion of the UNFCCC COP26, countries such as Peru and Indonesia discussed the opportunities and challenges of incorporating peatlands into their nationally determined contributions (NDCs) and long-term low greenhouse gas emission development strategies (LTSs). NDCs and LTSs are official national documents of the Paris Agreement, and they map out countries' plans to adapt to and mitigate climate change.

The agreement reached at COP26 in November 2021, also known as the Glasgow Climate Pact, encourages countries to protect their ecosystems, and specifically requests national governments to "revisit and strengthen the 2030 targets in NDCs…by the end of 2022." Notably, an upcoming FAO publication with the Global Peatlands Initiative will help to identify good, concrete ways to integrate peatlands into climate commitments.

However, there is still more to be done to overcome barriers and achieve robust soil organic carbon measurement, mapping, monitoring and reporting, especially in peatland ecosystems. Ultimately, the sustainable management of peatlands is a sensible step towards achieving part of our climate goals, with the help of healthy soils. Let's save our peatlands to not only secure this hidden gem, but also mitigate climate change.

More details on peatlands, carbon sequestration and best management practices can be found in the recently published FAO technical manual of management practices. In particular, Volume 2 of the manual describes why peatlands – also called 'organic soils', 'bogs', 'fens', 'swamps', or 'mires', are hotspots. This means that they are very sensitive to climate change and can easily become sources of greenhouse gas emissions due to their high soil organic carbon content. For this reason, peatland conservation and restoration are extremely important for climate change mitigation and adaptation. Learn more:

- Publication: Recarbonizing global soils – A technical manual of recommended management practices
- Website: World Soil Day 2021
- Publication: Peatland mapping and monitoring. Recommendations and technical overview (FAO, 2020)
- Case study template: Submit a peatland management case study

- https://www.fao.org/national-forest-monitoring/news/detail/en/c/1458734/

The first call for UN Decade on Ecosystem Restoration Partners to suggest World Restoration Flagships by 31 March 2022 has been announced. Do consult the site for a quick summary of "Why, What & How": World Restoration Flagships.

Africa

Congo Basin

The past, present and future of the Congo peatlands: 10 takeaways

In the first half of December 2021, Mongabay published a four-part series on the peatlands of the Congo Basin. Only in 2017 did a team of Congolese and British scientists discover that a sprawling wetland known as the Cuvette Centrale spanning the border between the Republic of Congo and the Democratic Republic of Congo (DRC) actually contains a massive amount of peat. Their satellite mapping and ground truthing revealed that these peatlands cover an area the size of England and are the largest and most intact across the world's tropics. But how did they get there? Why are they so important? And what does the future hold for the peatlands of the Congo Basin? The Mongabay series probes these questions and more in detail, tapping into the ongoing research and surveying the threats that could disrupt, degrade or even destroy this unique ecosystem. Here are 10 takeaways from the reporting.

Peat swamp forest in the Cuvette Central, Republic of Congo. Photo: Hans Joosten.

1. The peatlands of the Congo Basin hold more than 30 billion metric tons of carbon.

For at least the last 10,000 years, bits of organic matter have been piling up in this part of Central Africa, layer upon layer. Water from surrounding streams and rivers and in the form of rainfall has continually swamped the soil, slowing to a crawl the decomposition that would normally occur in this part of the world's second-largest rainforest. In the process, carbon that would have been released into the atmosphere has remained locked underground. As a result, the peatlands provide an unseen but critical benefit by preventing this carbon from further warming the global climate. Researchers calculate that the peatlands contain around two-thirds as much

carbon as the aboveground trees in the entire Congo rainforest on only about 4% of the land area. That 30 billion metric tons is roughly the same amount of carbon released by the global economy in three years.

2. The Cuvette Centrale peatlands are also home to human communities.

People have been living in and around the peatlands for centuries. They rely on these wetland forests for wood, medicine and food from the fruits and fisheries found there, to name just a few of the resources provided by the peatlands. In spite of — or indeed, perhaps because of, in part — their use of the forest, these communities appear to have done little to degrade the peatlands thus far. They are considered the most intact in all the world's tropics, and research is underway to understand how people in the area use them sustainably.

The Likouala-aux-Herbes river near Epena, Republic of the Congo. Photo: Hans Joosten.

3. Showstopping wildlife, along with diverse plant species, live in the peatlands.

The peatlands are remote and very difficult for humans to travel through. That's made the area a refuge for a wondrous array of wildlife, many species of which are threatened. Forest elephants (*Loxodonta cyclotis*), chimpanzees (*Pan troglodytes*), bonobos (*Pan paniscus*) and western lowland gorillas (*Gorilla gorilla gorilla*) all lurk in the forests of the peatlands. Surveys by University of Kisangani botanist Corneille Ewango and others have turned up a dizzying variety of plants as well. In just one section, Ewango and his colleagues found 110 species. "And we're still finding more," he says.

4. But industrial logging, agriculture and resource extraction could disrupt or degrade the Congo Basin peatlands.

As relatively pristine as they are, the peatlands also figure in the development plans for both the Republic of Congo and the DRC. Concessions for agriculture, logging or oil and gas cover 80% of the area of the peatlands, according to the environmental NGO Greenpeace.

5. The prospect of oil could prove an enticing avenue for boosting the economies of the Republic of Congo and the DRC.

Research in 2019 suggested that the peatlands might rest atop a huge pool of oil. Today, it's still unclear just how much, but international oil companies and consulting firms are exploring for the presence of hydrocarbons deep below the surface. Some suggest that extracting the oil may be possible with little disruption to the peatlands by using techniques commonly associated with offshore drilling. But the danger to the peatlands posed by the

prospect of oil spills is an open question, and the construction of roads required to truck oil out from the peatlands can cause widespread damage to the wetland forests.

6. Industrial logging and agriculture plantations could spell disaster for the peatlands.

As Southeast Asia has become saturated with oil palm especially, but also industrial cash crops such as rubber, producers have turned their attention to Africa and other parts of the tropics for new lands to cultivate. But clearing the forest and draining the peatlands of water to grow oil palm would be unwise, scientists say. Large areas of peat have been turned over to industrial agriculture in Indonesia, and they now add climate-warming carbon to the atmosphere instead of being a secure repository for it. The practice has also destroyed the complex ecosystems that peatlands support.

7. The 2018 signing of the Brazzaville Declaration, calling for international collaboration to protect tropical peatlands, between Indonesia, the Republic of Congo and the DRC buoyed the optimism of many scientists and conservationists.

The agreement has paved the way for the two Congos to protect the Cuvette Centrale peatlands before they are degraded or destroyed. Lessons from Indonesia demonstrate that it is far easier to protect the peatlands and the carbon they contain than it is to restore the full wetland-anchored ecosystem, a process that can take hundreds to thousands of years. Still, there are benefits to rewetting former peatland areas, including halting the release of CO_2 into the atmosphere. The three countries, along with Peru, have formed the Global Peatlands Initiative to further provide support for protection and restoration.

8. Leaders in the Republic of Congo and the DRC say they need further international support to protect the peatlands for the benefit of the world at large.

The United Nations and international NGOs are working to find ways to finance economic development while also encouraging countries like the Republic of Congo and the DRC to protect their forests and peatlands. Initiatives such as REDD+, short for reducing emissions from deforestation and forest degradation in developing countries, could provide a path toward bolstering the countries' investments in education, employment and health care while keeping the forest standing and the peatlands intact. Under such schemes, it is important to ensure that the communities that live in these areas benefit and that their land rights are secure, said Rainforest Foundation UK executive director Joe Eisen.

9. Scientists aren't sure how warming temperatures will affect the peatlands or what the broader consequences might be.

Scientists can't yet fully predict the impact of climate change on the peatlands. On one hand, the rising CO_2 levels responsible for global warming could boost plant growth and thus a primary organic input into the peat system. On the other hand, changing weather patterns could tip the balance the other way. Research has shown that the peatlands of the Congo Basin owe their existence in part to regional rainfall patterns. If climate change fiddles with the length of the rainy season, it could dry out the peatlands, pushing them toward becoming a net source of CO_2.

10. Research on the peatlands continues, in the hopes that learning more about the ecosystem's past will tell us something about its future.

A growing team of scientists continues to interrogate the inner workings of the peatlands from every angle. Some are looking at the ancient botanical history of the peatlands, identifying new species of plants preserved in core samples. Others are trying to construct models that mimic the dynamics of the peatlands and their impact on the global carbon budget that can then feed into broader climate models. And new sociological research recently began that aims to tease apart the relationship between humans and the peatlands. The end goal is to better understand the role that peatlands will play today and in the future, not just in the communities that live nearby, but on the global scale.

To learn more about the research project, follow the researchers in real time on Twitter at @CongoPeat.

- https://news.mongabay.com/2021/12/the-past-present-and-future-of-the-congo-peatlands-10-takeaways-from-our-series/
- https://news.mongabay.com/2021/12/carbon-and-communities-the-future-of-the-congo-basin-peatlands/
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- https://news.mongabay.com/2021/12/layers-of-carbon-the-congo-basin-peatlands-and-oil/
- https://news.mongabay.com/2021/12/the-idea-uncovering-the-peatlands-of-the-congo-basin/

The Oubangui River forms the boundary between the Republic of the Congo and the Democratic Republic of Congo within the Cuvette Centrale peatland area. Photo: Hans Joosten.

$1.5 billion Congo Basin pledge a good start but not enough, experts say

On Nov. 2 2021, a group of 12 donors, including the European Commission, United Kingdom, United States and the Bezos Earth Fund, collectively pledged at least $1.5 billion in financing toward protection and sustainable management of the Congo Basin forests over the next four years. The pledge is part of a broader $12 billion commitment agreed at the COP26 climate summit in Glasgow, Scotland, by 100 leaders to halt and reverse forest loss and land degradation by 2030, and has received a mixed response from regional experts.

The news of the declaration is "very, very positive," said Patrick Saidi, national coordinator of Dynamique des Groupes des Peuples Autochtones (DGPA), a network based in Kinshasa, in the Democratic Republic of Congo (DRC), of organizations working to secure the rights of Indigenous peoples. Saidi said DGPA has been fighting for years for recognition of the conservation practices of Indigenous and forest-dependent peoples, and for measures to be put in place to support these practices. "It is a significant effort," said Alain Karsenty, an economist and senior researcher at CIRAD, the French government's agricultural research center for international development. "Given the enormous needs, it is certainly not enough."

The pledge comes at a critical time. According to recent research, the degradation of tropical forests in Amazonia and Southeast Asia may soon make them net emitters of carbon, leaving the Congo Basin as possibly the last significant land-based tropical carbon sink. At the same time, the governments of the six Congo Basin countries — Cameroon, the Central African Republic, the DRC, the Republic of Congo, Equatorial Guinea, and Gabon — are looking to develop their economies through infrastructure projects and resource extraction, all of which risk exacerbating deforestation if not managed correctly. "What we should understand is that there is no other way out of the climate and biodiversity crisis … without the Congo Basin forests," said Armstrong Mba, sustainable business adviser for the Zoological Society of London's Sustainability Policy Transparency Toolkit program and based in Cameroon.

The joint donor statement says they recognize the value of the Congo Basin forests, welcome leadership from Central African countries on forest management, and acknowledge that sustainable management and restoration will require significant funding. At this stage the finer details of the pledge are not known, leaving commentators to assess its potential impact based on the current situation and past performance.

While both Mba and Karsenty said they welcome the pledge, they made clear that it's nowhere near enough, given the importance of the Congo Basin in the fight against climate change. "Though a great step, the $1.5 billion remains insignificant compared to what these same pledgers pay as subsidies to the fossil fuel industry each year," Mba said. "Have we really grasped the danger we all face as a species?"

Small-scale agriculture is the most significant driver of deforestation in the region, and an issue that Karesenty said can only be resolved with an evolution in agricultural systems. Instituting new farming practices, particularly in rural areas with endemic poverty, is no easy task and will take time for Congo Basin governments to achieve. Saidi said it's crucial that communities living in forested areas are at the center of any plans and policies. They must be "beneficiaries of these funds, but also — and this is the most important element — actors of these funds," he said.

Improvements in forest governance, land tenure rights and access to clean alternative fuel sources to charcoal are also key issues that will need to be addressed, all of which will require significant will from Congo Basin governments. President Félix Tshisekedi of the DRC pledged to fight deforestation and protect Indigenous rights in his speech at COP26. However, Irene Wabiwa, international project leader for Greenpeace Africa's Congo Basin forest campaign, questioned the intent of both the donors and the DRC government. "[The pledge is] a complete joke," she said. "Coming as it does just as most of these same donors have greenlighted DRC's plan to lift its 2002 moratorium on new logging titles as early as a year from now."

In June 2021, the DRC government approved a new plan for its rainforest management, which controversially included the lifting of a 20-year moratorium on new logging concessions. In an interview with National Geographic, the country's environment minister, Ève Bazaiba Masudi, said that while the government could now grant new logging concessions, that didn't mean it would. With two-thirds of the Congo Basin forests lying within the DRC, the move has alarmed environmental groups such as Greenpeace Africa.

Smallholder deforestation in the Republic of Congo. Photo: Hans Joosten.

One of the key concerns of environmental groups is that, even if the political will exists, many of the Congo Basin countries struggle with weak and opaque institutions that are a relic of colonial rule. "The lack of efficient public services and administrations, the limited skilled human resources, the widespread corruption and hidden agendas of some politicians will make disbursements and effective use of this money difficult," Karsenty said.

There have already been two major initiatives in the region aimed at reducing deforestation. The first of these, the Congo Basin Forest Fund (CBFF), was planned to run from 2008-2018 but was cancelled in 2014 before all funds had been disbursed, after an assessment by the U.K. government raised questions over the fund's governance. The CBFF was replaced by the Central African Forest Initiative (CAFI) in 2015, to which donor countries have so far committed $500 million to reduce deforestation and forest degradation. To date, less than half the committed amount has been disbursed, with significant challenges in agreeing on parameters for performance-based payments and in finding suitable initiatives with robust governance in place. "We are tired of promises," Saidi said. "This is not the first time that there have been promises like this, it is not the first time decisions like this have been made in these big climate meetings."

With deforestation deeply interrelated with poverty, development, governance and politics, the Congo Basin countries require interrelated cross-sectoral solutions, the advocates say — something that may be currently beyond the grasp of some of the Congo Basin states even if additional funding does come through. "The idea that a country could decide to stop deforestation in the same way that it could close down coal-fired power stations is an illusion," Karsenty said. "Much deforestation, especially in these Congo Basin countries, is — at least for the time being — beyond the reach of governments."

The challenge of reducing deforestation in the Congo Basin is significant, as are the local and global consequences if the Congo Basin countries are unable to do so. While the Congo Basin pledge can be seen as a step in the right direction, all commentators said it's clear that this is a long road with no easy fixes, and that the Congo Basin countries will need willing international partners if they are to achieve equitable development without sacrificing their forests.

- https://news.mongabay.com/2021/12/1-5-billion-congo-basin-pledge-a-good-start-but-not-enough-experts-say/

Peat soil in the Cuvette Centrale, Republic of Congo. Photo: Hans Joosten.

Democratic Republic of Congo

COP26: DRC peatlands, one of the solutions to climate problems!

At CoP26, on November 4, 2021, the Democratic Republic of Congo presented its plans to better protect the country's peatlands. Apart from those already identified in the provinces of its central basin (Equateur, Mai-

Ndombe, Tshuapa, Sud-Ubangi and Mongala), the DRC has peatlands in the mangrove swamps of the Atlantic coast, in the Albertine Rift Valley and in the Katanga Plateau. In-depth studies are currently underway to map all peatlands and their carbon stock. With its peatlands, the DRC has an important asset to contribute to the reduction of global warming. DRC also presented its vision "protecting peatlands for people and nature". Peatlands are further evidence of the ecosystem services provided by the forests of the DRC to all humanity. It is also right that conservation efforts are recognised and valued, so that the country has the means to improve the lives of local communities and indigenous peoples.

"We are in Glasgow to show the world that the Democratic Republic of Congo, with its various ecosystems of high conservation value, including peatlands, is the solution country in the fight against climate change," said Jean-Jacques Bambuta Boole, the coordinator of peatlands. "The DRC therefore holds the key to regulating the global climate," he concluded.

- https://www.mediacongo.net/article-actualite-95880_cop26_les_tourbieres_de_la_rdc_l_une_des_solutions_face_aux_problemes_du_climat.html

DRC environment minister panned for allegedly facilitating illegal concessions

Greenpeace Africa is spearheading calls to investigate the vice president and environment minister of the Democratic Republic of Congo, Ève Bazaiba, over her alleged involvement in a series of illegal forest concessions. Controversial plans to end a 19-year moratorium on industrial logging have been on hold since October, when President Felix Tshisekedi ordered an audit of the DRC's forest concessions along with a suspension of all "questionable contracts," following complaints of irregularities.

Among the contentious contracts are six so-called conservation concessions given to DRC-registered company Tradelink, which were illegally awarded by Bazaiba's predecessor, Claude Nyamugabo, in September 2020. Combined, they cover around 1.4 million hectares. Minutes from the Oct. 15 session of the Council of Ministers confirm the "illegality of many contracts, including those signed in September 2020." DRC law limits concessions to a maximum of 500,000 hectares to any single company. President Tshisekedi told his cabinet it was "imperative that these issues can be emptied of their substance." The ministerial meeting came two weeks before the COP26 climate summit in Glasgow, as the DRC was preparing to position itself as a "solutions country" in the global fight against climate change.

At the summit, a group of donors including the United Kingdom and the European Union pledged $1.5 billion to protect the Congo Basin, the world's second-largest rainforest. In what was hailed as a landmark deal, the Central African Forest Initiative (CAFI) also announced a 10-year agreement (2021-2031), with $500 million earmarked for the DRC during the first five years. "It's inconceivable that a country in receipt of millions/billions of dollars to safeguard these forests, is simultaneously pushing through plans that will destroy these same forests, because once that moratorium is lifted, 70 million hectares of forest will be in peril," Irène Wabiwa, Greenpeace Africa's Congo Basin forest international project manager, told Mongabay.

While campaigners welcomed the president's intervention, they expressed reservations over the timing of the suspension — "sheer coincidence" — just ahead of the climate summit, noting that more than a year has passed since the Tradelink concessions were first granted and that many months have passed since the first alarms were raised. "To date, we have yet to see any action taken by the government, unless of course things have been done out of sight," Wabiwa said. "Officially, there are no signs that the government has mobilized to carry out the audit, as per the president's instructions."

In June, the Council for the Defense of the Environment through Legality and Traceability (CODELT) and the Congolese Organization of Ecologists and Allies of Nature (OCEAN) lodged an administrative appeal calling on Bazaiba to cancel the contracts. However, end October it emerged that Bazaiba had signed a mission order, on Sept. 13, for seven environment ministry officials to accompany a Tradelink team in the province of Tshopo, three days after the legal deadline to respond to the administrative appeal had passed unheeded. According to the mission order, the delegation's objective was to "Facilitate the negotiation and signing of social clause agreements, carry out socioeconomic surveys, and sign the free, prior and informed consent [FPIC] of the TRADELINK Company." Greenpeace Africa issued a stinging response: "Free, Prior and Informed Consent (FPIC) is a notion Ms. Bazaiba clearly misunderstands: 'prior' means before the signing of juicy contracts, not after the 'agreed sums' have been pocketed," it said in a press release published Oct. 29.

The mission order also raises questions regarding the role of a provincial ministry employee who traveled as a "representative of the company" and the fact that the cost of the trip was "covered by the concessionaire." According to Greenpeace, the team remained in the field until Oct. 28, "almost two weeks after the president ordered the suspension of Tradelink concessions on 15 October. A document of the social clause was finalized during the mission and ready for signature. A printer failure prevented it from being signed."

Greenpeace Africa's revelations triggered a series of extraordinary exchanges with the Environment Ministry. Even before the latest evidence linking Bazaiba to Tradelink, she issued a barbed statement saying the government had "no lessons to learn about our resources from an NGO." A letter penned by a coalition of civil society organizations, Indigenous groups and NGOs, including Greenpeace Africa, urging donor countries to suspend their funding of rainforest protection in the DRC until the logging ban was extended was described as "beyond daring for the 21st century" by Bazaiba. "We will use our resources as we see fit," she said. "We hope to leave development aid behind and instead aim for win-win partnerships, so our people can benefit from the riches of their nation. "The moratorium will be lifted," she added.

Bazaiba's office has rejected all of the allegations, with the war of words escalating into the threat of legal action by Bazaiba's chief of staff, Yves Kitumba. The spokesman said the mission order in question is precisely what alerted the government to the illegality of the Tradelink concessions: "The denunciation made to the Council of Ministers was thanks to this team," Kitumba told Actualite.CD.

- https://news.mongabay.com/2021/11/drc-environment-minister-panned-for-allegedly-facilitating-illegal-concessions/

Morocco

PAGES Agadir 2022

Due to the continuing uncertainties related to the COVID-19 pandemic, the 6th Open Science Meeting (OSM) and 4th Young Scientists Meeting (YSM) "Learning from the past for a sustainable future" will not be taking place on-site in Agadir, Morocco, in May 2022, but online. The Open Science Meeting (16-20 May 2022) and the associated Young Scientists Meeting (9-13 May 2022) are the premier scientific events of Past Global Changes (PAGES), which is a Global Research Project of Future Earth and a scientific partner of the World Climate Research Programme and World Data Service for Paleoclimatology. Further information and updates will be communicated on the OSM/YSM website https://pages-osm.org, as well as the PAGES website.

Many sessions will feature peatland-based research, but one is especially devoted to peatlands: '37. Peatland ecosystem functioning and ecosystem services: How paleoscience and management can feed back to each other' with as Co-conveners Morag Angus, Sakonvan Chawchai, Minna Väliranta and Angela Gallego-Sala:

'Peatlands are important archives of past environmental changes and, at the same time, provide vital ecosystem services including carbon sequestration and storage, water, biodiversity, fisheries, etc. In the recent past, the number of threats that pose a risk to their stability has increased globally. Climate change and other direct anthropogenic pressures may strengthen or weaken the peatland carbon sink and induce non-linear responses that may alter an ecosystem's ability to provide other ecosystem services. For example, anthropogenic pressures in tropical peatlands are proving to be more intense threats to these large tropical carbon stores than any environmental changes from climate change (Page et al. 2009, Chapter 9). In Europe, historic degradation together with climate change is threatening peatlands, and this may relate to a drying trend observed in the recent past in many European peatlands (Swindles et al. 2019). All anthropogenic burdens and rapid forcings on these ecosystems have resulted in ecological and biogeochemical changes in peatlands that are found in the stratigraphic record. For this session, we welcome scientific contributions of investigations that focus on how we may use peatland paleo records of recent or long-term changes to provide better process understanding of peatland ecosystem functioning, and to inform peatland management.'

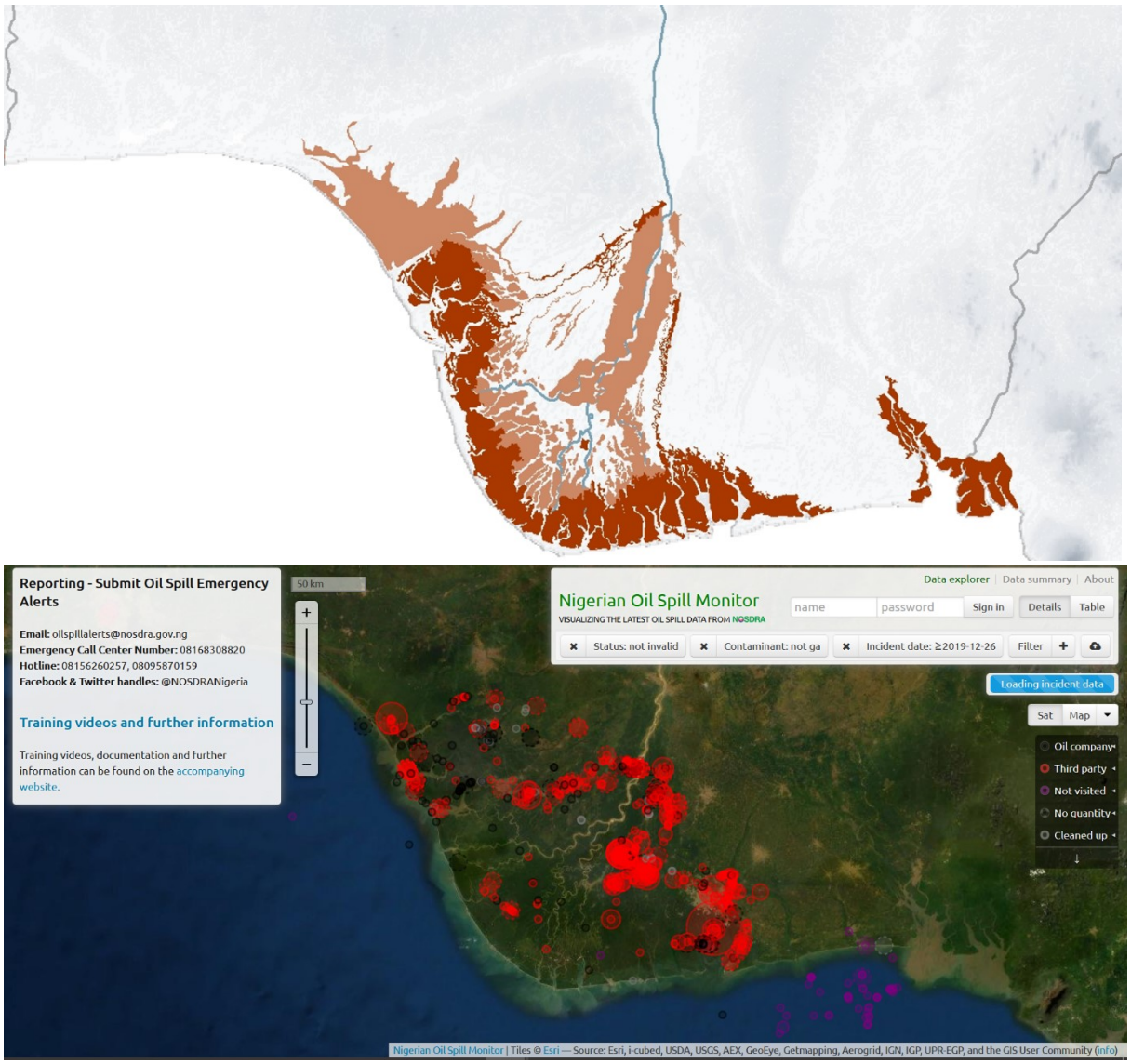
Abstract submission deadline is 31 January.

Nigeria

Niger Delta communities in 'great danger' as month-old oil spill continues

Crude oil from a blowout has been pouring into creeks in the Niger Delta since Nov. 5, with the well's owner, Nigerian energy firm Aiteo, unable to contain the spill and specialists called in to help. The blowout, at a non-producing well in the Santa Barbara field in Bayelsa state, has caused extensive pollution of rivers and farmland in the Nembe local government area, according to the state governor, Douye Diri. According to the News Agency of Nigeria, he said Aiteo should not think that "this criminal neglect of its facilities and disregard for human life and the environment, as demonstrated by its conduct, will not be accounted for." In a statement released Nov. 22, the company blamed the incident on sabotage. "Aiteo remains committed to ascertaining, immediately the well head is secure, the immediate and remote causes of the leak which will be driven by a [joint investigative visit] that will follow," it said.

The oil industry in Nigeria attributes many oil spills to sabotage by people trying to steal crude. Nigeria's National Oil Spill Detection and Response Agency (NOSDRA), which relies almost entirely on the industry itself for access to on- and offshore oil facilities, reports that around 75% of spills are caused by sabotage and theft. Map of incident reports in the Niger Delta since June 2019, courtesy NOSDRA.



Distribution of peatland (from Global Peatland Map 2.0) and recent oil spills (from https://oilspillmonitor.ng) in the Niger Delta, Nigeria

The joint team initially despatched to the Nembe spill was unable to determine the cause of the spill, as the wellhead could not be accessed "due to hydrocarbon fumes that saturated the atmosphere in the area." A video of the spill site, captured Nov. 29, showed a high-pressure stream of brownish liquid spraying through the creeks from a wellhead as technicians worked on the site.

The scale of the spill has overwhelmed local disaster response capabilities, and U.S.-headquartered oil-well control specialist Halliburton Boots and Coots has been drafted in to "kill the well," a process that involves injecting cement into the well to plug it.

The Niger Delta is rich in biological diversity and natural resources. Its creeks, swamps and mangrove forests are home to fishing and farming communities as well as threatened species including manatees (*Trichechus senegalensis*), chimpanzees (*Pan troglodytes ellioti*), and the Niger Delta red colobus (*Piliocolobus epieni*). But decades of oil production have made the region one of the most polluted places on Earth. NOSDRA recorded 639 oil spills in just the past two years, resulting in 28,003 barrels spewed into the environment, according to the agency's data.

Bayelsa is where oil was first discovered in Nigeria, in 1956. In the decades since, oil spills from wells and pipelines have contaminated farmland and water bodies, and exposed residents to toxic chemicals. Flaring of gas has led to acid rain falling on the area, while contributing to making Nigeria the 17th largest producer of greenhouse gas emissions in the world. This environmental destruction has been caused by oil majors including Shell, Chevron and Eni. The Nembe well was bought from Shell by Lagos-based Aiteo in 2015.

"It is extremely disturbing because the trend we are seeing now is that international oil companies know that their equipment are dilapidated, and to avoid responsibility, they move offshore and sell to gullible local companies who think they can make profit and are not ready or equipped to [deal with] this kind of emergencies," said Nnimmo Bassey, an environmentalist and founder of the Health of Mother Earth Foundation (HOMEF), a prominent green NGO in Nigeria.

Dead and dying trees near the site of a previous Niger Delta oil spill in 2020. Photo: Sosialistisk Ungdom (SU) via Flickr (CC BY-ND 2.0).

The impact of the Nembe spill on local communities and the environment is still to be determined, but Samuel Oburo, an environmental activist affiliated with Friends of the Earth, who lives about 50 kilometers from Nembe,

says villagers in the area have been badly impacted. “I can tell you that the people there face great danger. They have started crying out. They have started experiencing strange illnesses due to the unfriendly atmosphere this spill has exposed the community to,” he told Mongabay over the phone.

But getting oil firms to clean up or pay for environmental crimes in Nigeria is difficult. Legal claims for compensation can take years, even decades, and companies are expected to pay relatively little in fines when they err.

NOSDRA’S regulations say oil companies have 24 hours to respond to the discovery of a spill. A joint visit by government agencies, company officials and community representatives should take place as soon as possible. But a 2018 study by Amnesty International found frequent delays, with some spills continuing for months after they were reported. Shell, one of the largest operators in the country, visited spill sites within 24 hours on just 26% of occasions, Amnesty said. The slowest response time recorded was when Eni took 430 days to respond to a spill in Bayelsa state. “These delays point to serious negligence. Shell and Eni are wealthy, powerful multinationals: why can’t they act faster? Why can’t they do more?,” the report said.

But the penalties for noncompliance are negligible: 1 million naira ($2,400) for an initial default, and an additional 500,000 naira for every day after that. “How much is N500,000 to an oil company?” NOSDRA’s Idris Musa said. An amendment increasing the fines is in progress.

Speaking to the ongoing spill at Nembe, HOMEF’s Bassey said that considering the apparent scale and duration of the latest spill, the safest option for residents of the area is to be relocated. “This area does not have pipe-borne water, and when the river is covered with crude oil, it means they have to depend on imported water,” he said. “Some may drink from that river because these areas are permanently polluted and they have no option. Children will swim in that river and people will drink from that river.”

“Crude oil contains very toxic heavy metals like lead; you know, lead affects a lot things concerning people, the nervous system, causes cancer. You have mercury in oil, you have cadmium, you have arsenic and benzene and many others,” he told Mongabay. “So anybody eating fish from that river is in trouble already. So the relief that they are giving, I believe they should actually evacuate people from that territory at this time.” Oburo agreed: “So long as the spill continues, there is nothing that can be done to restore the air quality. The only solution is to evacuate those people from there because their lives are precious.” Bayelsa government spokesperson Dan Alabrah said the state is providing relief materials to communities, but had no plans to relocate them.

- https://news.mongabay.com/2021/12/niger-delta-communities-in-great-danger-as-month-old-oil-spill-continues/?mc_cid=b773b88dd9&mc_eid=268d1757f8

Republic of Congo

Arlette Soudan-Nonault, the Republic of Congo’s minister of the environment, sustainable development and the Congo Basin, said the peatlands are an important ecosystem not just for the two countries, “but also for the entire planet.” Soudan-Nonault said the Republic of Congo is committed to protecting the peatlands.

“That said, we are not naïve and we do not intend to stop our development just so the planet can breathe easier,” she told Mongabay in an email. “The invaluable ecosystem service that our peatlands and our forests render to the planet cannot remain free forever, to the detriment of our populations’ aspiration for well-being.”

- https://news.mongabay.com/2021/12/carbon-and-communities-the-future-of-the-congo-basin-peatlands/

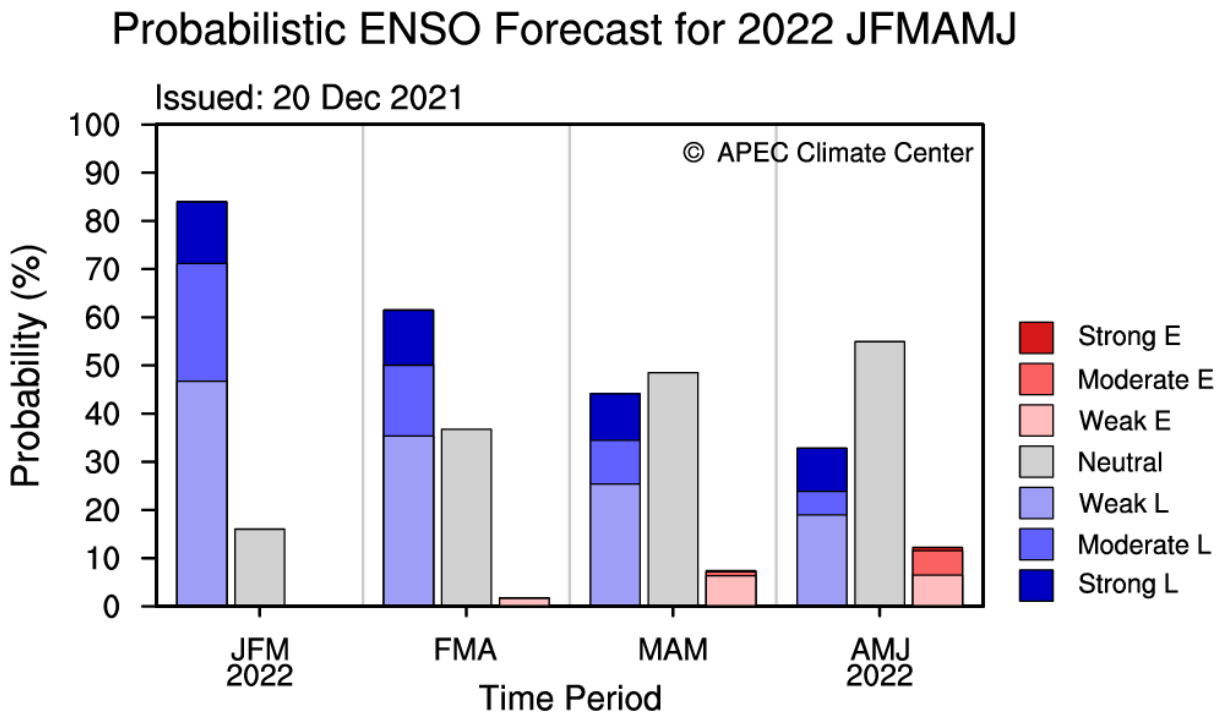
Asia

Asean Meeting on Transboundary Haze Pollution in the Mekong Sub-Region

The Tenth Meeting of the Sub-Regional Ministerial Steering Committee on Transboundary Haze Pollution in the Mekong Sub-Region (10th MSC Mekong) was held on 8 December 2021 through Video Conference hosted by Myanmar. The Meeting was attended by Ministers/representatives responsible for land, forest fires and haze from Cambodia, Lao PDR, Myanmar, Thailand, and Viet Nam, and the Secretary-General of ASEAN, under the Chairpersonship of H.E. Khin Maung Yi, Union Minister of Natural Resources and Environmental Conservation,

Ministry of Natural Resources and Environmental Conservation of Myanmar. The Sixteenth Meeting of the Technical Working Group on Transboundary Haze Pollution in the Mekong Sub-Region (16th TWG Mekong) preceded the Meeting.

The Meeting expressed concern over the smoke haze affecting the northern part of the ASEAN region in the past two years, and appreciation for the continuous engagement of all MSC Mekong countries. The Meeting noted information on the review and outlook of weather and smoke Haze situation presented by the ASEAN Specialised Meteorological Centre (ASMC). Hotspot count for the Mekong sub-region in 2021 was slightly less compared to 2020 and 2019, many parts of the sub-region were affected by transboundary smoke haze for several days during the dry season. The upcoming dry season for the Mekong sub region is expected to start in end 2021 and stretch to mid-2022. The La Niña conditions which were present in December 2021 are forecast to persist till early 2022.



* ENSO Intensity based on 3M Mean Nino3.4 SST Anomaly (Category Boundaries: +/-1.5, 1.0, 0.5°C)
E = El Niño, L= La Niña.
https://aseanpeat.us15.list-manage.com/track/click?u=c7d372af80a7f079e3d4e8298&id=1225127883&e=b0e5925c37

The Meeting noted ASMC's continual efforts in enhancing its technical capabilities in monitoring, assessment and early warning of weather and haze conditions in the region, and weather and climate prediction modelling. The Meeting reaffirmed its commitment at the 16th Meeting of the Conference of the Parties to the ASEAN Agreement on Transboundary Haze Pollution (COP-16) on 22 October 2021. The Meeting agreed to further working collectively and individually in intensifying in-country actions through respective National Action Plans as well as exploring further cooperation on technologies and innovation on fire monitoring.

The Meeting recalled the in-principle agreement at the 9th MSC Mekong in 2020 to extend the Chiang Rai 2017 Plan of Action to 2025 with renewed hotspot reduction target. In line with the COP-16, the Meeting agreed for the MSC Mekong countries to consider joint indicators for 20% hotspot reduction for next year and tasked TWG Mekong to undertake the preparation under the leadership of Thailand.

The Meeting welcomed the completion of the final review of the ASEAN Peatland Management Strategy (APMS 2006-2020) by the ASEAN Task Force on Peatlands (ATFP). The Meeting emphasised the importance to continuously strengthen national and regional capabilities and cooperation in assessment, prevention, mitigation and management of land and/or forest fires and thus looked forward to the development of the next roadmap and APMS.

The Meeting appreciated the continued support and valued the contributions of ASEAN's external partners to promote sustainable management of peatlands in the ASEAN region through the Sustainable Use of Peatland and Haze Mitigation in ASEAN (SUPA) funded by EU and Germany, GEF-6 Project on Sustainable Management of Peatland Ecosystems in Mekong Countries by International Union for Conservation of Nature (IUCN), and Measurable Action for Haze-Free Sustainable Land Management in Southeast Asia (MAHFSA) funded by International Fund for Agricultural Development (IFAD). The Meeting reiterated the importance of collective actions and enhanced cooperation to support and sustain local livelihoods, reduce risk of fire and associated haze and contribute to global environmental management.

- https://www.thailand-business-news.com/asean/86331-asean-meeting-on-transboundary-haze-pollution-in-the-mekong-sub-region.html

ASEAN peatlands: Critical in mitigating the climate crisis

Peatlands are one of the most important ecosystems on Earth for capturing and storing carbon. The Association of South-East Asian Nations (ASEAN) is playing a key role in efforts to ensure their protection, delegates attending an event on the sidelines of the COP26 climate summit in Glasgow heard. Of the 10 ASEAN nations, Indonesia has the largest area of tropical peatlands in the world and the fourth largest extent of peatland overall, at over 20 million hectares. Its peatland landscapes hold an estimated 57.4 gigatonnes or 65 percent of ASEAN's total peatland carbon. Malaysia is next, holding around 9.1 Gt or 10 percent of the total. In total, Southeast Asia's tropical peat volume is estimated to be over 1,300 cubic gigameters or 77 percent of global tropical volume. The region's peat carbon pool is estimated at 68.5 gigatonnes, representing 11 to 14 percent of global peat carbon.

These are big, impressive figures but so too are those on the negative side. Carbon emissions from peat degradation owing to land clearing and drainage have contributed 1.3 to 3.1 percent of current global CO_2 emissions from fossil-fuel combustion. And long-burning, hard-to-extinguish peat fires — started by natural causes or burning for clearing drained land for cultivation — have been the source of massive amounts of emissions in the form of toxic smoke, referred to euphemistically as "haze," for decades. Recent efforts have substantially reduced this phenomenon, one incident of which was estimated to have led to around 100,000 premature deaths in the region through the spread of transboundary haze, closing schools, businesses and whole communities until the smoke cleared, which took weeks.

"ASEAN places climate change high on its agenda and all ASEAN member states are the contracting parties of U.N. Framework Convention on Climate Change and the Paris Agreement," said Vong Sok, head of the Environment Division, Sustainable Development Directorate, ASEAN Socio-Cultural Community Department of the Jakarta-based ASEAN secretariat. "In the last decade, the ASEAN Member States have shown their commitment in efforts to achieve Nationally Determined Contributions (NDCs) by reducing national emissions. Whereas the importance of peatlands is enormous, and their potential for delivering healthy and nature-based solutions has not been fully realized, particularly by contributing to NDCs and adapting to climate change."

Vong Sok was introducing a side event, titled the Importance of ASEAN Peatlands to Contributing to Global Climate Change Mitigation, as part of a two-day series at the Peatland Pavilion at the COP26 venue. The series was co-organized by the ASEAN Secretariat with support from the Measurable Action for Haze-Free Sustainable Land Management in Southeast Asia Programme, which is funded by the International Fund for Agricultural Development, and the Sustainable Use of Peatland and Haze Mitigation.

"As part of *Indonesia*'s 2020–2049 plan to protect peatland, we have restored about 3.6 million hectares, mainly conducted by concession holders — 249 concessions divided into 70 forestry plantations and 224 oil-palm plantations — with around 10,800 stations for water-level monitoring established in the concessions," said Budisusanti, director of Peatland Degradation Control at Indonesia's Ministry of Environment and Forestry. "We continuously monitor water levels in peatlands as part of a rewetting process and restoration of the ecosystems. As well as the concession areas, we have brought 46,000 hectares of community areas under the Desa Mandiri Gambut or Independent Peat Village programme, which means residents participate directly in peatland protection and management and improve their livelihoods at the same time."

Budisusanti highlighted the importance of financial and technical support from donor agencies and nations, particularly, in development of a major monitoring system, siMATAG-0.4m, which extends the length of the country, cross-referencing high-resolution satellite imagery with field measurements to ensure accuracy and

reduce false claims. The programme is also carrying out essential hydrological work, such as blocking former drainage canals to rewet the peat, and training hundreds of community facilitators to help communities adapt their farming and forestry practices.

“It is very easy to understand why peatlands are crucial for mitigation,” said Thibaut Portevin, head of Cooperation with the European Union Delegation to Indonesia and ASEAN. “They are the most efficient carbon sink on the planet: 3 percent of land, 30 percent of carbon. Left undisturbed, they store more than all other types of land use combined. They are also unique ecosystems, providing diverse habitat for unique flora and fauna. With the Kunming Declaration and now COP26, we must focus on peatlands. Despite their importance, they are the most highly threatened of all forests and wetlands. Conversion has high economic costs that are often not accounted for, such as reduction of food and other resources. All benefits and costs must be taken into account.”

Nepenthes *and* Sphagnum *in Genting highlands mossy forest peatland, Peninsular Malaysia. Photo: Hans Joosten.*

Mohammad Puat Dahalan, senior director of the Forest Management Division and GEF6-SMPEM project director for the government of *Malaysia* noted that the country had kept its promise made at the Rio Convention more than 20 years ago to devote half of the nation’s land area to forest. Of that, more than 18 million hectares, only 253,447 hectares or 5.27 percent was peatland. Nevertheless, in recognition of the landscape’s importance, peatland has long since featured in national plans for protection and restoration, with substantial achievements. Yet challenges remained. Fire was an ever-present threat despite decreasing in scale and impact thanks to effective management. Other non-forestry land uses, including rapid development of urban areas, put pressure on peat land but the high-level commitment from federal and state levels governments has allowed Malaysia to maintain peat extent as planned.

For other ASEAN Member States, peatland has even come as a surprise. In the *Philippines*, it was a workshop in Malaysia in 2005 that drew the attention of experts to the possible presence of peatland in their home country. “After the workshop, we started in Agusan Marsh on wetland conservation with communities, providing awareness and technical information and we found peatland,” said Anson Tagtag, chief of the Caves, Wetlands and other Ecosystems Division of the Biodiversity Management Bureau. “This led us to initiate an action plan, through which we learned of other peatlands. We have now identified approximately 24 peatlands covering 20,000 hectares, which amounts to about 0.3% of forestland. This is small but important, especially for

emissions." The government has been working in various peatlands with communities to protect the landscapes and also improve local livelihoods. Learning from Indonesia and Thailand, the division ensured the direct participation of communities in land-use planning, ecotourism and restoration. Together, they developed biodiversity-friendly livelihoods that are already contributing to local resilience to extreme weather events. For example, water hyacinth was a problem in the wetlands but is now being harvested and made into various products.

Kobsak Wanthongchai, dean of the Faculty of Forestry at *Thailand*'s Kasetsart University in, agreed with Tagtag that working together with communities in managing peatland ecosystems was critical for the ecosystems' protection and for the welfare of the people. "Communities around the peat forests and outsiders engage in illegal logging, clear for oil palm and cattle grazing or build settlements, draining the water and burning," he said. "This leads to degradation, biodiversity loss and carbon release. But people and the peat forests cannot be separated: they live together. Peat forests are a foodbank and source of incomes for local people. If they are hungry or need money they collect food or material they can sell."

To manage the forests sustainably, Wanthongchai and colleagues have been building communities' awareness and knowledge of the importance of preserving the peatlands, providing technologies and prototypes and developing cross-sectoral cooperation, bringing together residents, researchers, government and the private sector. Through development of three working models, the team has created strategic information for conservation nationwide, youth programme, media campaign, management plans, built capacity through "forest teachers" and found incentives, such as funding mechanisms and development of forest enterprises dealing in non-timber forest products. They have also inventoried peatlands in Thailand and established criteria and methods for assessments for a national strategy.

The situation in *Laos*, while experiencing the same essential focus on community awareness and participation in protection, restoration and development of livelihoods, also was unique, stressed Khonesavanh Louangraj, the director of the Environment Promotion Division at the Department of Environment, part of the Ministry of Natural Resources and Environment. "Peatland management is new to Lao PDR," he said. "One project with FAO, 2016–2021, that focused on wetlands found peatland in them in Xe Champone and Beung Kiat Ngong. Peatland conservation requires wetland conservation through supporting viable local food security and livelihoods within and surrounding wetlands." He noted that the challenge in maintaining peatlands was to maintain the whole wetland's functions, which are integrated, needing the natural flood pattern to support habitats and ecology for native fish migration. Isolated, conservation reserves alone will not suffice. Dams and rice fields do not provide suitable functions and are expanding, he said.

The solutions were manifold, such as providing diversified livelihoods' options; delineate wetland (and peatland) boundaries; form water-use agreements; restore storage areas, lakes and irrigation; improve wells; halt wetland clearance; control invasive species; reforest catchments; establish tree and fish nurseries; carry out planning for development of non-timber forest products; conduct women's programmes; improve land-use planning; conduct flood mapping; survey catchments; and monitor water levels and use.

"The way forward," said Vong Sok in his closing remarks, "is to strengthen climate action in sustainable peatland management, in particular, by developing and implementing a new ASEAN Peatland Management Strategy (2021-2030) and National Action Plans for Peatland management in ASEAN Member States."

Moderated by Gita Syahrani, executive director of Lingkar Temu Kabupaten Lestari, the session provided a glimpse into the importance of peatlands for ASEAN Member States and globally and offered an opportunity for joining together in continued investment in protection and restoration.

For more information on this topic, please contact Michael Brady at m.brady@cgiar.org. This research was supported by the European Union, the government of Germany, and the International Fund for Agricultural Development.

- https://forestsnews.cifor.org/75056/asean-peatlands-critical-in-mitigating-the-climate-crisis

Indonesia

BRGM educates communities to tackle rejection of restoration program

The National Peatland and Mangrove Restoration Agency (BRGM) has said it will continue to educate and prepare the surrounding communities living around restoration areas to overcome people's rejection of the restoration program. "The problem arises since the surrounding people have used the peatland for cultivation. Thus, sometimes they reject restoration activities," BRGM's deputy for construction, operation, and preservation, Tris Raditian, said at the 'BRGM Year-End Reflection' event here on December 30, 2021. Thus, the agency's attempts for blocking water canals from peatlands are often met with protests since the people use them to drain the land they intend to cultivate, he added. The canals are also utilized as public or crop transportation routes, he noted. Hence, the BRGM's deputy for education and socialization, participation and partnership, Myrna A. Safitri, said the agency has continued to carry out socialization, education, and community development to support the restoration program. She said she believes that peatland restoration and mangrove rehabilitation attempts cannot be separated from the community's interests. Thus, the attempts must be related to village development, she added. "Hence, the Independent Village Cares for Peatland and Independent Village Cares for Mangroves programs have become the focus of our work," she remarked. The two programs aim to prepare the community for peatland restoration by educating them on the importance of the ecosystem, strengthening village institutions, and integrating the program with the village development plan for the sustainability of the restoration and rehabilitation attempts, she informed.

During 2017–2020, 640 Caring Villages for Peatland were established, covering an area of 7.4 million hectares, she said. Meanwhile, in 2021, the new Independent Village Cares for Peatland program has been implemented in 111 villages. Some of the villages are new, but there are also some villages that were involved in the previous Caring Village for Peatland program. The Independent Village Cares for Mangroves program was first introduced in 2021. A total of 220 villages are involved in the program in nine provinces in BRGM's priority work areas, she added.

- https://en.antaranews.com/news/207193/brgm-educates-communities-on-tackling-rejection-of-restoration-program

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

BRGM plans to restore 360,000 hectares of peatland in 2022

The National Peatland and Mangrove Restoration Agency (BRGM) plans to restore 360 thousand hectares of peatland in 2022 by implementing the peatland hydrological unit (KHG) model, BRGM's deputy of construction, operations, and preservation has informed. Speaking at the 'BRGM Year-End Reflection' event on December 30, Tris Raditian said that the target has been determined in accordance with Presidential Regulation Number 120/2020 regarding BRGM. Based on the regulation, the total restoration target till 2024 is 1.2 million hectares, he noted. The 2022 peatland restoration program will be conducted in seven provinces: Riau (158,636 hectares), Jambi (37,225 hectares), South Sumatra (46,642 hectares), West Kalimantan (36,498 hectares), Central Kalimantan (68,513 hectares), South Kalimantan (922 hectares), and Papua (11,564 hectares).

In addition to the KHG model, the agency will also resort to systematic and integrated peat ecosystem management to achieve the restoration target, Raditian revealed. "Previously, we acted based on the 'quick response' principle, thus the implementation of the restoration program was unintegrated. However, currently, we will focus on achieving a systematic and structured KHG model," he emphasized. The KHG model was developed based on empirical experience gained during the previous program implementation period from 2016 to 2021, as well as a number of relevant theories, he said. The establishment of the model is aimed to obtain optimum KHG with a balanced and stable ecosystem, he added. The development of the model was carried out through the stages of planning, institutionalization, technical determination of restoration interventions, empowerment and incentives provision, as well as monitoring and evaluation, Raditian said. At the same event, the agency disclosed that it rehabilitated 34,911 hectares of mangroves in 2021, exceeding its target of 33 thousand hectares. Initially, the target for the mangrove rehabilitation in 2021 was 83 thousand hectares, it informed. However, it was revised to 33 thousand hectares on account of the COVID-19 pandemic.

- https://en.antaranews.com/news/207165/brgm-plans-to-restore-360000-hectares-of-peatland-in-2022

Weather modification technology to prevent fire

The Environment and Forestry Ministry of Indonesia affirmed that weather modification technology will continue to be promoted to be an integral part of the efforts to prevent and control forest and land fires. "The years 2020 and 2021 have demonstrated the effectiveness of weather modification technology to prevent land fires. Wetting of areas forecast to experience drought can be immediately," Director General of Climate Change Control at the Environment and Forestry Ministry Laksmi stated during a virtual event on 23rd December 2021. "We are optimistic that in future, weather modification technology would become an inseparable part of the solution to control forest and land fires," she noted. Weather modification is used to moisten soils, such as peatlands, and to maintain humidity and address the issue of smog due to forest fires. It is also used to extinguish fires in large areas and surmount the drought experienced in certain areas. Laksmi stressed that the weather modification effort was the result of collaborative work of the Environment and Forestry Ministry, the National Disaster Mitigation Agency, national defense force, police force, and the National Research and Innovation Agency, among others. The ministry's forest fire control brigade Manggala Agni and the people, who are concerned about land fires, conduct patrols to encourage fire prevention. As of November 2021, integrated patrols, involving land fire-aware communities, were conducted across Indonesia. Some 242 posts monitored 633 villages around them. Independent patrols by Manggala Agni were also conducted at 804 village posts in various provinces prone to forest and land fires. Data from the ministry showed that during the period from January to November 2021, forest fires occurred in an area of 353,222 hectares, an increase as compared to 296,942 hectares in 2020. It showed an increase in the area by 56,280 hectares or 15.93 percent.

- https://en.antaranews.com/news/206077/weather-modification-technology-to-prevent-forest-fire-ministry

2019 fires in Indonesia were twice as bad as the government claimed, study shows

In 2019, fires raged through Indonesia's rainforests and peatlands, sparked by the deliberate burning of land for agriculture, and fanned by an El Niño system bringing drier-than-usual weather conditions. Ultimately, the Indonesian Ministry of Environment and Forestry would put the total affected area at 1.64 million hectares, an area half the size of Taiwan. But the true extent of the burned area is nearly twice as large, according to an independent study by researchers in Europe and Canada. They found more than 3.11 million hectares of areas had been burned in 2019, an area bigger than Belgium. It's also far more extensive than the 2.6 million hectares

that the environment ministry says was burned in 2015, in what was the worst fire season in Indonesia this century.

Study co-author David Gaveau, from France-based satellite mapping initiative TheTreeMap, said his team had shared its analysis with the Indonesian environment ministry but hadn't received any response. Mongabay also contacted the ministry for comment but didn't receive a response.

The study derives its higher total for the burned area thanks to what the researchers say is a more accurate satellite-imaging platform — the European Space Agency's Sentinel-2 satellite time-series analysis — than the one used by the ministry, the U.S. Geological Survey's Landsat 8 OLI/TIRS Earth-observation satellite.

Both satellites measure infrared light, which can be used to detect charred vegetation. And both have medium-resolution imagery (10-30 meters), which allow them to produce more detailed burned-area maps compared to coarse-resolution satellites (more than 250 m), which generally omit small-scale fires. But despite these similarities, the Landsat satellite takes photos of the same area once every 16 days. As a result, it may not detect some of the burns, especially when there's obstruction in the form of cloud cover or smoke, Gaveau said. The Sentinel-2 satellite, meanwhile, takes photos more frequently, every five days, increasing the chances of getting an obstruction-free photo of the ground. The Sentinel-2 system is also comprised of two satellites, Sentinel-2a and 2b, and the overlap between them means the frequency at which some sites are photographed, known as the temporal resolution, shrinks to just two days, according to Gaveau. All this makes it more likely that burning that's not detected by Landsat due to cloud cover and smoke can still be observed by Sentinel-2. This allows the latter to capture smaller areas — less than 100 hectares — and intermediate-size areas — 100 to 1,000 hectares — of burns, usually in the form of small-scale agricultural fires and controlled burning. "Indonesian skies can be very cloudy," Gaveau told Mongabay. "With more frequent acquisitions such as Sentinel, we can detect more fires."

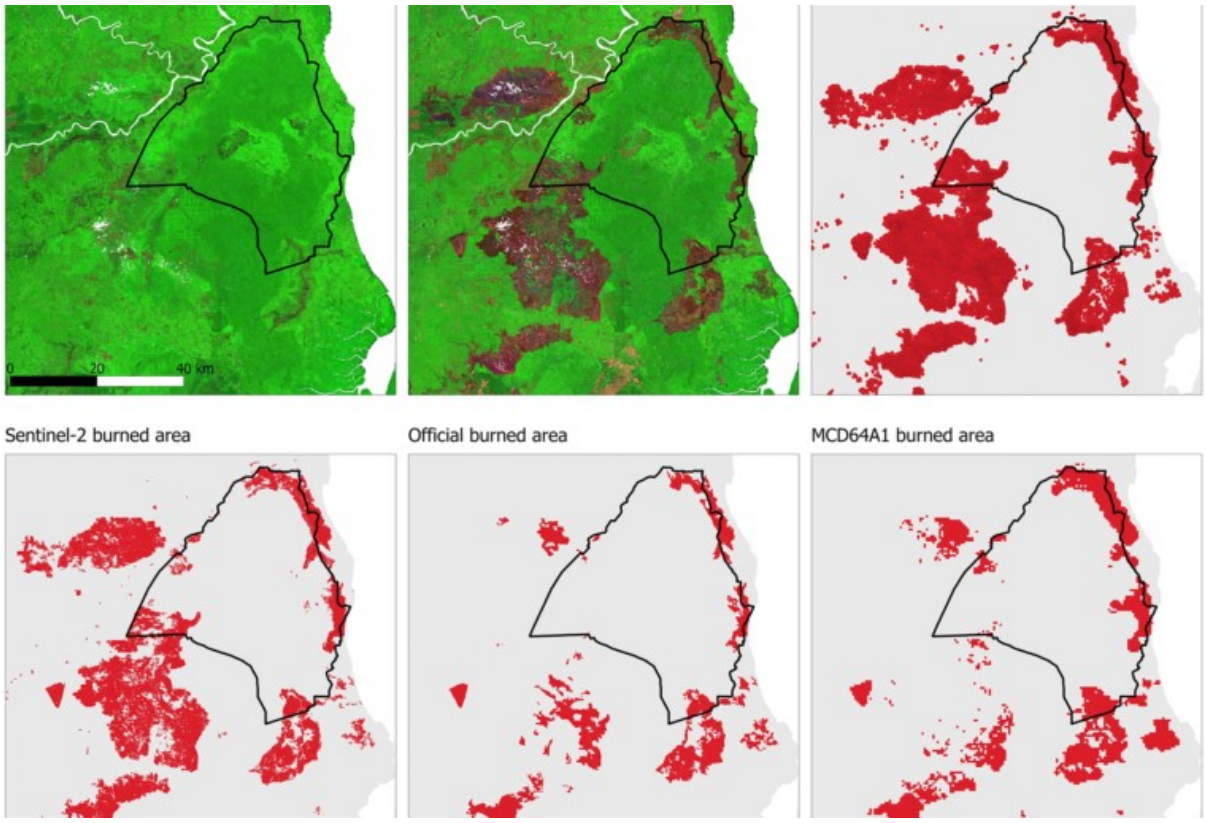
In the case of the Indonesian environment ministry's estimates, there's also the possibility of omission as a result of the use of visual interpretation to flesh out the Landsat 8 Imagery. Visual interpretation is essentially a computer operator using a mouse to manually mark out the borders of a burned area. And while the method can yield accurate results for individual burned patches, it becomes much more intensive and time consuming at large spatial scales, when tens of thousands of small burn scars have to be marked out, according to Gaveau. "Therefore, many small burn scars were missed by the official data set from the [environment] ministry," he told Mongabay. In analyzing the Sentinel imagery, by contrast, the researchers didn't have to manually outline the burn perimeters, and instead employed the computational capabilities and automation of the Google Earth Engine. This allowed them to analyze more images and thus map more and smaller burn scars and associated details. "In total we analyzed more than 47,000 images to detect fires, thanks to the computing power of the Google Earth Engine, which a traditional visual method could not obviously do," Gaveau said.

The results reflect the differences. Gaveau and colleagues identified 137,000 hectares of forests impacted by the 2019 fires, nearly double the 70,000 hectares indicated in the ministry's data set. They also found 0.96 million hectares of burned peatland, accounting for nearly a third of the total estimated burned area. This compared to the 0.64 million hectares of burned peatland identified by the government.

Yet even with the higher accuracy, the new analysis is still likely to underestimate the true size of burned areas, with the researchers declaring a 24.4% omission error rate in their method. This means that there's potentially 24.4% of burned areas that remained undetected. This is because the researchers prioritized high user accuracy over absolute burned-area coverage, omitting burns that are hard to detect, such as low-intensity burns that occur beneath the forest canopy on mineral soils or on grasslands, which tend to regreen rapidly. But this omission error is still smaller than the 50.5% omission error of the environment ministry's estimate. "Although we cannot extrapolate a corrected burned area across Indonesia, we are confident that more than 3.11 million hectares burned in 2019," the researchers concluded in their paper.

Besides many small burns, the Landsat satellite also failed to capture more than 15,000 hectares of burned forests and peatlands around Berbak National Park in Jambi province on the island of Sumatra, the researchers wrote. The park is home to immensely rich and diverse habitats that harbor hundreds of species, including the critically endangered Sumatran tiger (*Panthera tigris sumatrae*), Sumatran elephant (*Elephas maximus sumatranus*), painted terrapin (*Batagur borneoensis*), helmeted hornbill (*Rhinoplax vigil*), and the endangered

Malayan tapir (*Tapirus indicus*). The 2019 fires forced some tigers out of the forests, resulting in at least five recorded incidents of human-tiger conflict in nearby villages.



The pair of cloud-free pre- and post-fire Sentinel-2 composites over Berbak National Park (black line) and surrounding areas in Jambi Province, revealing large burned areas around Berbak National Park (areas that have transitioned from green to dark brown/red tones). These large burn scars have been detected by VIIRS hotspots and by the Sentinel-2 burned-area map, but some have been missed by the official and MCD64A1 datasets.

Gaveau said Landsat failed to detect these large burn scars around Berbak because they were obscured by clouds or by the thick smoke the fires produced, whereas the Sentinel satellites could better capture cloud- and smoke-free images of the ground. Some of these losses were recorded only in 2020 by the Landsat-powered Global Forest Watch system that tracks changes in forest cover globally, Gaveau said. He added the methods used in his study can be easily replicated to study other years, thanks to the code that the researchers published for generating pre- and post-fire composites for any year. Getting more accurate estimates of burned lands is central to addressing concerns about regional air quality and informing Indonesia's policies on tackling climate change, Gaveau said. This is especially important for fires on carbon-dense peatlands, a major source of Indonesia's greenhouse gas emissions. The country is home to 36% of the world's tropical peatlands, but its benchmark for reducing forest-related emissions, known as the FREL and submitted to the U.N. in 2016, failed to include emissions from peat fires as it lacked sufficient data.

The government is in the process of updating its FREL by adding emissions from peat fires and other wetlands. Gaveau said the new analysis can help policymakers come up with a more accurate FREL. "Combined with daily fire hotspots, our detailed burned-area map can also help identify ignition sites and estimate fire duration more precisely, and therefore contribute to forensic analyses of burning in concessions as well as assess policies and practices intended to reduce fires," he said.

Yosi Amelia, a climate and forest program officer at environmental NGO Madani, welcomed the new methodology for estimating burned areas, but said a major hurdle is the reluctance of government officials to accept independent analyses. "If the methodology [of civil society groups] is different [from that used by the government], the result will be different," Yosi told Mongabay. "Sometimes it's difficult for us to communicate with the government if we have our own data. We have to truly justify" why it's beneficial to have different data

sets and methodologies. Gaveau, who has been researching Indonesia's forests for nearly two decades, is no stranger to rubbing government officials the wrong way with data they consider unfavorable. Last year, he came under scrutiny for publishing the preliminary results of his analysis of areas in seven provinces that were burned during the 2019 fires. (The new study builds on that analysis.) In the early analysis, Gaveau found that 1.6 million hectares of forest and degraded peatlands were burned between January and October in the seven provinces, compared to the environment ministry's figure of less than 1.2 million hectares in those same provinces. The findings were published on the website of the Center for International Forestry Research (CIFOR), where Gaveau worked at the time as a research associate. The environment ministry criticized the publication, saying that the results were flawed because they hadn't been peer reviewed or verified by observations on the ground. CIFOR subsequently took down the analysis from its blog, and a month after that, Indonesian immigration authorities deported Gaveau. The environment ministry claimed Gaveau's deportation wasn't related to the publication of the data, but because the French national didn't have the proper permit to conduct research in Indonesia. Gaveau said he believed he was deported because the Indonesian government didn't like the fact that his research had identified a larger extent of burned areas than the official narrative. "This [deportation] shouldn't happen. The [environment] ministry should debate the pros and cons for each method [of estimating burned areas] instead," he said. "It's not a very progressive thing to do. It's not a constructive thing to do [to deport me]."

Some researchers have described Gaveau's deportation a sign of growing tensions between the Indonesian government and the scientific community. Most recently, Greenpeace Indonesia received backlash from the government after it criticized President Joko Widodo's speech during the COP26 climate talks in Glasgow, Scotland, where he touted the country's success in bringing its deforestation rate to a two-decade low. Citing the government's own data, Greenpeace Indonesia pointed out that Indonesia's deforestation rate had, in fact, increased from 2011 to 2019. After that, Luhut Binsar Panjaitan, the chief investment minister and a close confidant and business partner to the president, demanded a financial audit of NGOs spreading "fake news" about Indonesia's deforestation rate, in an apparent jab at Greenpeace Indonesia.

Gaveau said he hoped the government, especially the environment ministry, would be more open to working with scientists in mapping deforestation and burned areas, rather than seeing them as an enemy. "Mapping technique is such a fast evolving field," he said. "By engaging in debate, the [environment] ministry will be able to improve its mapping technique."

- https://news.mongabay.com/2021/12/2019-fires-in-indonesia-were-twice-as-bad-as-the-government-claimed-study-shows/

Strategies to promote sustainable management of lowland ecosystems in Indonesia

Lowlands in Indonesia - covering approximately 36 million hectares of peatlands, mangroves, and freshwater swamp forests - have powered significant economic growth and livelihood improvements, particularly in Kalimantan, Papua and Sumatra. However, while the conversion of lowlands for the expansion of agriculture for crop production in recent decades has been a major source of growth through the generation of export revenues and employment, this has been associated with high environmental and health costs due to deforestation, and increased risk of flooding, subsidence, and fire.

To minimize these unsustainable trade-offs, the Government of Indonesia has taken steps to make lowlands development and governance more sustainable, particularly through policy measures aimed at protecting peatlands and improving their mapping and governance. Broader reforms have also been undertaken to improve cross-sectoral coordination for fire prevention, strengthening of forest management units, and the development of a community-based sustainable livelihood model.

To support the government's efforts to enhance the sustainable management of lowlands, three World Bank reports present a range of policy options and support the business case for the sustainable management of lowlands, especially peatlands, which can lead Indonesia to achieve economic growth, improved livelihoods' and environmental conservation. Here are some of the key findings of the reports.

Sustainable Lowland Agriculture Development in Indonesia

Lowlands, that cover over 20 percent of Indonesia's total area, hold considerable potential to meet national targets set for food and industrial crop production. But unsustainable use of lowlands for agriculture may

continue to result in globally significant greenhouse gas emissions, loss of important biodiversity, and pollution from fires.

Sustainable lowland agriculture can be made possible when sustainability indicators are put into place. Land suitability, environmental and social risks, the profitability of agricultural practices, and the value chains of key commodities are some of the key factors of sustainability.

In translating this sustainability vision into action, there is a need to focus on three key guiding principles related to (i) technologies and practices; (ii) the use of a systems approach, and (iii) the enabling environment.

Well-maintained, but unsustainable drained peatland horticulture in Central Kalimantan. Photo: Hans Joosten

Improving Governance of Indonesia's Peatlands and Other Lowland Ecosystems

This report highlights key current governance challenges for integrated landscape management of the lowlands, which include a lack of common definition of the term 'lowlands', policy targets that need to be coordinated, limited integrated water management based on hydrological boundaries, unsynchronized forestry and spatial planning regulations and the difficulty in effectively monitoring private sector practices.

To improve the governance of peatlands and lowlands, the report makes the following recommendations:

Indonesia could aim to develop a national government-level common vision for Indonesia's lowland management and incorporate it into formal planning instruments such as a National Action Plan, National or Subnational Development Plans, provincial spatial plans, and green growth plans. This vision statement can embed key sustainability indicators, including the enhancement of regional economic prosperity and of increased livelihoods of lowland populations as well as a reduction of greenhouse gas emissions in lowland regions.

Further, managing peatlands would require viewing lowland areas as an integrated unit. A master plan for land-use zoning of lowland hydrological units could be developed, covering conservation, development, and adaptive development zones. Further, water management standards are required for each area or zone. In parallel to these two steps, an integrated regional economic development plan based on hydrological units could be developed for each lowland region.

Addressing Persistent Forest and Land Fires in Indonesia: Institutional and Expenditure Review

This report discusses elements critical to developing an Integrated Fire Management (IFM) strategy in Indonesia. Some of the key findings include:

- The majority of fires tend to recur in the same seven provinces in the islands of Sumatra and Kalimantan, where fire prevention efforts should be focused.
- The effectiveness of fire management in Indonesia needs to be supported by strong leadership and more integrated jurisdictions across at least seven ministries and agencies identified with mandates linked to addressing the drivers of fires.
- Central government spending on programs linked to fire prevention should be driven by geographic distribution of fires and needs to be coordinated across fragmented jurisdictions.

As fires spread across the boundaries of administrative jurisdictions, Indonesia urgently needs to adopt an IFM approach, defined as a holistic multi-stakeholder approach to achieving sustainable ecosystems and human livelihoods in fire-prone landscapes. Specifically, there are several opportunities for Indonesia to strengthen its implementation of the IFM.

The World Bank's Sustainable Landscape Management Program has been supporting the Government of Indonesia in efforts for sustainable lowlands management since 2016, and will continue to provide support on this critical agenda through analytics, technical assistance, and on-the-ground investments.

Do you have any views on how Indonesia can sustainably manage its low land ecosystem? Please share in the comment section below.

Watch the recording of the Bicara Bumi event discussing the findings of the three reports here.

- https://www.marketscreener.com/news/latest/Strategies-to-promote-sustainable-management-of-lowland-ecosystems-in-Indonesia--37301885/

'Forests will disappear again,' activists warn as Indonesia ends plantation freeze

Palm oil industry watchdogs are warning of a possible surge in deforestation across Indonesia, after the government ended a three-year freeze on issuing permits for new plantations. The moratorium had been imposed in 2018, ostensibly to allow the industry to address the problems of deforestation, land conflicts and labor abuses long associated with palm oil. It expired at the end of September, and although the government had the option of renewing it, it chose not to do so. This means palm oil companies can now apply for licenses for new plantations. And with the price of crude palm oil (CPO) hitting a record high in early October due to tightening supply, the pent-up demand to establish new plantations could pose a serious threat to Indonesia's forests, said Bony, a researcher at the NGO Sawit Watch. "They were just waiting for the tap to be turned back on," he said as quoted by local media. "They've been waiting a long time, so now that the opportunity is here, it's going to be speeded up."

Without the moratorium in place, Indonesia could potentially lose an area half the size of California to make way for new plantations. That's according to calculations by the NGO Forest Watch Indonesia (FWI), which carried out an analysis of government maps showing lands that are deemed suitable for conversion into plantations. The total area identified by the government covers 47.3 million hectares, of which intact forests account for 21 million hectares, said FWI researcher Mufti Fathul Barri. "If these forests are granted permits [by the government], more than 21 million hectares of forests will disappear," Mufti said. He added that a tenth of this forest area consists of customary lands that are home to Indigenous peoples, who now face the prospect of losing their home to oil palm plantations. "So social conflicts will keep arising because the previous ones haven't been resolved either," Mufti said. "And when this [palm oil expansion] is executed, of course [land conflicts] will increase."

At the end of 2020, Indonesia had 95.6 million hectares of forest cover remaining, or 50.9% of the country's total land area. If all 21 million hectares of forests that the government deems suitable for conversion into oil palm plantations are cleared, the country's total forest cover will drop to just a third of its total area. It will also kill any chance of Indonesia achieving its stated target for reducing greenhouse gas emissions. Deforestation and land use change account for the bulk of the country's emissions, and its reduction target acknowledges this, calling for limiting the deforestation rate to 325,000 hectares per year, or a total of 3.25 million hectares by the 2030 deadline for the Paris Agreement. Mufti said this would make a major expansion of oil palm plantations "very harmful to our forests."

For now, Indonesia is home to the world's third-largest expanse of tropical rainforest, after Brazil and the Democratic Republic of Congo. But for decades it has been losing this forest to commercial development, including mining and agriculture — primarily oil palm. An average of 450,000 hectares of new oil palm plantations

were established every year in Indonesia from 1995 to 2015, according to a 2017 study. And while most plantations are developed outside forest areas, this expansion still contributed an average of 117,000 hectares of deforestation each year. In the past five years, the deforestation rate has declined by 90%, from more than 1 million hectares year in 2016, to a historic low of 115,459 hectares in 2020. The government has attributed the achievement to various policies, including the palm oil moratorium.

This is all the more reason, experts say, why the moratorium should have been renewed: so that the country's remaining forests could be protected and the huge amount of carbon stored in them could be prevented from being released into the atmosphere. "Even though the deforestation rate is declining, some regions with lots of forests remaining, such as in Papua, still record high rates of forest loss," said Mouna Wasef, a researcher at the environmental NGO Auriga. "If the moratorium is stopped, they [companies] will be eyeing regions which still have large forest cover." Bayu Eka Yulian, head of politics and policy at the Bogor Institute of Agriculture's (IPB) land studies center, said the end of the moratorium marks a victory for plantation companies as they can now resume expanding at the expense of forests. "Our forests will disappear once again," he said.

Drained, deforested, burned….Former peat swamp forest in Central Kalimanan. Photo: Hans Joosten.

Eddy Martono, the head of GAPKI, the national association of palm oil companies, said the end of the moratorium doesn't necessarily mean a rush to develop new plantations. He said GAPKI member companies are instead focused on increasing productivity in their existing concessions rather than expanding. However, Maruli Gultom, an adviser to GAPKI and chairman of the board at palm oil company PT Provident Agro, said he welcomed the end of the moratorium, calling the policy "a historical mistake" imposed as a result of pressure from outside the country. "So it's clear that we don't want the moratorium to be continued," he said.

For now, however, there won't be a free-for-all expansion of oil palm plantations into forests, according to the Ministry of Environment and Forestry, which is responsible for delisting forest areas so that they can be turned into plantations. With the moratorium expired, said Ruandha Agung Sugardiman, the ministry's director-general of planning, "the minister has determined that there will be no issuance of new permits to release forest areas for palm oil plantations." Speaking during an online press conference, he said converting forests into new plantations isn't necessary as long as producers can focus on boosting the yields of their current estates instead. "We already have 16 million hectares of oil palm plantations, 3.4 million hectares of which are in forest areas,"

Ruandha said. “That’s what we have to improve [the productivity of]. Don’t open up forest areas [for plantations] anymore, especially areas that still have good [forest cover].”

But unlike the moratorium, this stance by the environment ministry isn’t enshrined in any regulations, and neither the current government nor future administrations are legally obligated to deny new permits for forest conversion. That means there’s nothing stopping companies from applying for new licenses and expanding into the country’s forests, according to Grita Anindarini, program director at the Indonesian Center for Environmental Law (ICEL). “The commitment of the environment ministry to continue not issuing new forest conversion permits even though the moratorium has ended should be appreciated,” she told Mongabay. “But it would be better if this good commitment is accompanied by legal instruments like a presidential instruction, which will strengthen its position.”

The government has argued that even with the moratorium now expired, there’s already a new law in place to serve as a legal basis for improving the management and sustainability of the palm oil industry. The law in question is the so-called omnibus law on job creation, which ushered in a wave of deregulation across a range of industries, including rolling back environmental protections and incentivizing extractive industries such as mining and plantations, in an attempt to cut red tape and spur investment. While the omnibus law caps the size of new oil palm plantations at 100,000 hectares, it doesn’t include a freeze on new plantation licenses and it doesn’t place a limit on how many new plantations are allowed per year.

Teguh Surya, founder of environmental NGO Madani, said the omnibus law doesn’t explicitly prohibit the palm oil industry’s expansion into areas designated as forests. As such, he said, the government can rezone these areas as non-forest areas so that they can be cleared for plantations. Data from Madani show there are 5.7 million hectares of natural forests earmarked for industrial activities, which means they’re eligible to be licensed out for plantations in the future if the environment ministry approves a forest conversion permit. There are an additional 6.9 million hectares of standing rainforest on land that’s zoned as non-forest area, for which companies do not require a conversion permit to start exploiting. Even if the environment ministry sticks to its promise not to issue new forest conversion permits, other government agencies can still issue oil palm licenses for non-forest areas, Grita said.

But at the local level, some district governments have gone a step further than the national government and enshrined the terms of the moratorium in their bylaws. The districts of Sanggau and Gorontalo, on the islands of Borneo and Sulawesi, respectively, have done just that. Both districts are members of the Sustainable Districts Platform (LTKL), a group of nine district governments taking collective action toward greater sustainability. The government of Sorong district in West Papua province, which is not a member of the LTKL, is another that’s committed to not issuing new plantation permits. Salmon Samori, the head of the Sorong investment board, said he hadn’t noticed any companies applying for new palm oil licenses, nor signs of companies preparing to do so now that the moratorium has ended.

Gita Syahrani, executive director of the LTKL secretariat, said that while these individual commitments are welcome news, they don’t detract from the fact that the end of the moratorium is still a major setback. “It’s still a loss because there’s no instruction from the president [to not issue new permits],” she told Mongabay. That said, there are still some policies that could support sustainability efforts in the palm oil industry, such as the central government’s national action plan on sustainable palm oil and its guidance for sustainable plantations, Gita added. “So even though the moratorium has ended, let’s monitor these two other instruments so that they’re implemented,” she said.

The end of the moratorium came two weeks after Indonesia terminated a long-standing agreement with Norway, in which the latter had agreed to pay $1 billion to Indonesia to reduce its emissions from deforestation. In 2019, the Norwegian government agreed to pay 530 million krone ($56 million) for Indonesia preventing the emission of 11.23 million tons of carbon dioxide equivalent (CO_2e) by reducing its deforestation rate in 2017. When the announcement was made, environmentalists lauded it, saying that the funding serves as both an acknowledgement of the years of efforts to reach this stage of protecting the country’s forests, and an incentive to boost measures to combat deforestation. However, Norway didn’t made the payment as it had set additional requirements that had not been established in the agreement, including requests for Indonesia to show documentation on how the money would be spent and other operational details. The termination of the deal

took many green groups by surprise as they had high hopes that the cooperation between Indonesia and Norway could help the former in combating deforestation.

FWI's Mufti said the timing of the events — the end of the moratorium and the scrapping of the $1 billion deal with Norway — indicated that the two might be connected, with both opening up more opportunities for companies to expand into Indonesia's forests. "This is still based on assumption, but if we're looking at the trends that have been happening so far, it's very likely that all these are connected," Mufti said.

Hariadi Kartodihardjo, a forestry policy lecturer at the Bogor Institute of Agriculture, agreed that both developments cast doubts over Indonesia's commitment to curb deforestation and combat climate change. "If [the agreement with] Norway is terminated, and then the moratorium is also stopped, there's a negative image in that context," he said. "When the cooperation with the international [community] ends, the commitment turns out to be weak." Mufti pointed to a third development: the omnibus law on job creation, which he said was in parallel paving the way for the plantation industry to expand by rolling back environmental protections and incentivizing the extractive industries. For instance, the omnibus law gives plantation companies operating illegally in forest areas a grace period of three years to obtain the proper permits to legitimize their operations. The same lawmakers that passed the omnibus bill into law have called this provision "a whitewashing" of criminal activity. "We've already lost ever since the omnibus law was passed," Mufti said. "So now we're only waiting for surprises that are related to natural resources. First is the cancellation of the agreement with Norway. Next is the end of the palm oil moratorium. We don't know what surprises will be next."

Hariadi said it's now up to the government to prove that it's committed to tackling deforestation and mitigating climate change. "After we broke up with Norway, we have to commit [to ourselves]," he said. "Our independence is proven by making sure that the management of the palm oil industry remains a concern. And we're waiting for affirmative policies and those don't have to be dictated by anyone else in order for them to be carried out."

- https://news.mongabay.com/2021/12/forests-will-disappear-again-activists-warn-as-indonesia-ends-plantation-freeze/

Simple ditch blocks in Central Kalimantan peatland. Photo: Hans Joosten.

Indonesian peat restoration has more benefits than it costs, study finds

The benefits of effective peatland restoration — blocking drainage canals to restore water levels and reestablishing vegetation cover — will outweigh the cost of restoration, according to the peer-reviewed paper

published in the journal *Nature Communications* on Dec. 2, 2021. The study authors calculate that peatland restoration could have resulted in economic savings of $8.4 billion between 2004 and 2015, when the six largest fire events in the country caused a total of $93.9 billion in economic losses. In addition to the damage to plantations, forestry and agriculture, the burning of the peatlands also resulted in massive volumes of CO_2 emissions and adverse health effects for residents exposed to the haze from the fires.

Since the particularly severe fires of 2015, the administration of President Joko Widodo has earmarked up to $7 billion to restore 2.5 million hectares of degraded peatland across the archipelago. These ecosystems hold an estimated 57 million metric tons of carbon, or roughly 55% of the world's tropical peatland carbon. Since 2011 there's also been a moratorium on converting peatlands for new developments.

Nightly peat fires in Kalimantan. Photo: Hans Joosten.

"There is clearly a worldwide benefit to restoring and safeguarding Indonesian peatlands," Laura Kiely, lead author of the new study and a doctoral researcher at the University of Leeds in the U.K., said in a statement.

The researchers used satellite data and models to estimate that, if completed, peatland restoration would have contributed to significant reductions for 2004-2015 in fire losses and damages (9%), CO2 emissions (46%), PM2.5 emissions (54%), health-related losses (30%), and land-cover losses (24%). The World Bank suggests that restoring 2 million hectares of peatland would cost $1.9 billion; another study estimates that restoration costs would exceed $4.6 billion. "Using either value, the cost associated with restoring peatland is less than the associated reduction in fire-related costs," the authors write in the paper. They noted that randomly allocating the 2.5 million hectares of restoration reduced emission reductions by more than half, demonstrating the importance of prioritizing areas for peatland restoration. They recommend restoring peatlands with the greatest emissions over 2004-2015, as carbon emissions are greatest the first time a peatland burns and typically decline with subsequent fires. "Restoring unburned peatlands in areas of high fire risk will therefore lead to the greatest reduction in emissions," the paper says.

The authors also highlighted the importance of preventing degradation of intact peatlands. Indonesia has a moratorium on cutting primary forest, but this only covers 32% of the country's peatlands, leaving large swaths unprotected. Fires lit to clear land can burn out of control and spread into degraded forests and peatlands, particularly during drought. Deforestation and drainage associated with expanding agriculture have caused

extensive destruction to Indonesian peatlands, making the naturally fire-resilient landscapes more susceptible to fire. Fires are more likely to occur on degraded land than in protected areas of forest, and the use of drainage canals in agriculture can make fires nearly five times as likely.

Kiely said the findings were presented at the COP26 climate summit in Glasgow, Scotland, in November. The team also plans to show them to the Indonesian government in the near future, with the aim of encouraging continued support for the government's Peatland and Mangrove Restoration Agency, which has been tasked with restoring and rewetting degraded peatlands, and for investors to provide financing for peatland restoration projects. Kiely added that local communities must be involved closely in peatland restoration to ensure they benefit. "Future climate change will put Indonesian peatlands — and peatlands all over the world — at greater risk of further degradation and fire," study co-author Dominick Spracklen from the University of Leeds said in the statement. "The efforts being made by the Indonesian government to restore their peatlands could be a leading example in the years to come."

- https://news.mongabay.com/2021/12/indonesian-peat-restoration-has-more-benefits-than-it-costs-study-finds/
- https://www.eurasiareview.com/27122021-restore-burned-out-peatlands-save-billions-of-dollars/
- https://www.straitstimes.com/asia/se-asia/for-peats-sake-study-reveals-benefits-of-restoring-indonesias-fragile-peat-lands

BRGM holds peatland product expo to boost local economy

The Peatland and Mangrove Restoration Agency (BRGM) has held a two-day exhibition that showcase the potential of peatland products in South Sumatra to improve people's economy. BRGM Deputy for Education and Socialization, Participation and Partnership Myrna A Safitri said peatland restoration as well as other environmental development would not run sustainably without considering the economic aspect. "Therefore, BRGM has used the strategy of 3R, rewetting, revegetation, and revitalization. This economic revitalization has targeted people, that peatland restoration would not harm the public," Safitri said in a statement. Peatland restoration would not dispossess local people, on the other hand, it supports the government to improve people's welfare, Safitri remarked. The exhibition on November 27-28 in Palembang was the first of its kind held by BRGM and the South Sumatra government. It has become an evidence of the success of peatland restoration in the past five years. "Today, we are proud of having 10 booths in the exhibition. This is a proof for our five-year joint effort along with the regional government, village administration, community groups, and people, to see the potential of peatland that can be explored without damaging the ecosystem," she said. According to Safitri, the products have been sold in online market and have met the export quality standard. Vice Governor of South Sumatra Mawardi Yahya said the exhibition was part of efforts to prevent forest and land fires.

- https://en.antaranews.com/news/201861/brgm-holds-peatland-product-expo-to-boost-local-economy

Report: Orangutans and their habitat in Indonesia need full protection now

"The Government of Indonesia under President Widodo has made some progress on the drivers of orangutan decline in recent years," the U.S.-based Environmental Investigation Agency (EIA) said in the report "Orangutans in Crisis," published Oct. 29. "However, the multitude of threats still facing orangutans daily outlined in this report, and their toll on orangutan populations, demonstrate how much further there is to go." The EIA's analysis of commercial concessions on forested land in Indonesia showed that orangutan habitat in Sumatra and Kalimantan (Indonesian Borneo) occurs in millions of hectares of oil palm, pulpwood and logging plots. The recent expiration of a moratorium on new oil palm concessions and the deregulation of environmental protections ushered in by controversial legislation passed last year further exacerbate the risks to orangutan habitat, the report says. "The confluence of threats facing orangutans is nothing short of a crisis," Taylor Tench, EIA policy analyst, said in a press release.

Indonesia is home to the world's three orangutan species: Sumatran (*Pongo abelii*), Tapanuli (*P. tapanuliensis*) and Bornean (*P. pygmaeus*) orangutans. The Sumatran and Tapanuli orangutans are found nowhere else on Earth, while the Bornean orangutan also occurs in Malaysia and possibly Brunei, which share the island of Borneo with Indonesia. Habitat loss, fires, poaching, and human-wildlife conflict are the main factors that have generally driven these species to the brink of extinction in the wild.

A 2018 study calculated that the island of Borneo lost nearly 150,000 orangutans between 1999 and 2015, largely due to deforestation and killing. A population assessment by the Indonesian government published in 2016

estimated that none of Sumatra's wild orangutan populations would survive beyond the next 500 years unless habitat destruction and poaching were resolved. Meanwhile, the Tapanuli orangutan, the world's rarest great ape species, with a population of less than 800, was only described by scientists in 2017 and is already particularly threatened by a hydroelectric dam being built in its only known habitat.

The EIA said the Indonesian government has systematically failed to protect orangutan habitat, enforce existing wildlife laws, or reverse the decline of these species. "For decades, Indonesia has prioritized industry and profit over environmental health and biodiversity protection, and orangutans have paid the price," Tench said.

Orangutans in Indonesia are ostensibly protected under the country's 1990 Conservation Act, but wildlife experts have criticized a lack of prosecutions and, in the rare instances when cases do go to court, lenient sentences. The country currently has no conservation strategy and action plan in place, either, to guide national and subnational actions to save orangutans. "The future of Indonesia's orangutans requires immediate action at the presidential level. Anything less will be too late for these iconic species," said EIA president Allan Thornton in the press release. The group called on the Indonesian government to come up with a comprehensive strategy to save the remaining orangutans, including plans to place their habitat (primary forests, secondary forests, and forest fragments) under formal protection by including them within the permanent forest moratorium area. The EIA also recommended expediting the recognition of customary forest claims for indigenous and local communities living in and adjacent to orangutan habitat; beefing up firefighting efforts; and halting the construction of the Batang Toru dam in the Tapanuli orangutan habitat. "Indonesia has a pivotal role to play in contributing to global efforts to overcome the twin crises of climate change and biodiversity loss, and securing the protection of orangutans and their habitat would go a long way toward overcoming both," Tench said.

- https://news.mongabay.com/2021/11/report-orangutans-and-their-habitat-in-indonesia-need-full-protection-now/

Managing peatlands in Indonesia's South Sumatra for multiple benefits

The Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF) and partners have been conducting research to demonstrate sustainable land-use practices, including exploration of a climate smart agrosilvo-fishery approach to restoring degraded peatlands. "The province of South Sumatra in Indonesia is a classic case," said Himlal Baral, senior scientist with CIFOR-ICRAF, and moderator of a side event at the COP26 climate summit in Glasgow. "How we manage South Sumatra's peatlands will have a positive or negative impact on carbon storage, climate and livelihoods."

According to Indonesia's Peatland and Mangrove Restoration Agency, South Sumatra has the second-largest national target for restoring degraded peatland: more than 600,000 hectares since 2016. Pandji Tjahjanto, head of the Forestry Department and Darna Dahlan, head of the Peatland Restoration Agency for South Sumatra Province, speaking on behalf of Herman Deru, the provincial governor, said that forest fires in 2015 that blanketed the region in toxic smoke were mostly the result of human activities. More than 700,000 hectares were burned, much of it peatland. After a dip, in 2019 a surge of more than 17,000 individual fires burned more than 400,000 hectares.

In addition to declaring several new regulations to reduce the risk of fires, the government also instituted a large program of rewetting, revegetating and revitalizing the degraded and burned peatlands. Rewetting involves blocking and filling-in drainage canals so that higher water levels can return, and installing wells for use by residents. Revegetating includes not only assisted natural regeneration, but establishing nurseries to grow native tree species, with an accompanying planting program. Revitalization focuses on community livelihoods through adaptation to the unique peatland environment, growing crops — such as sago palm, gelam, jelutong and talas rawa — along with indigenous fish, livestock and developing ecotourism.

From 2018 to 2021 around 70 hectares have been revegetated in six districts, nearly 300 wells installed and over 1,000 canals segmented and blocked. The COVID-19 pandemic slowed progress. Sustainable management of peatlands can provide various ecosystem goods and services. "Approaches include qualitative assessments that identify key indicators of the ecosystem services through interviews with key informants; and quantitative assessments of the biophysics of peat landscapes using proxies," said Yustina Artati, senior research officer with CIFOR-ICRAF. "The value of services, particularly carbon and water, are also assessed."

Jelutong plantation in on rewetted peat in South-Sumatra. Photo: Hans Joosten.

Research focused on a pilot site in the Padang Sugihan landscape in the east of the province, which was prone to fire and degradation. It features conservation areas for Sumatran elephants, and large plantations of timber and oil palm. Fires used for land clearing have led to degradation.

Using the Integrated Valuation of Ecosystem Services and Tradeoffs (InVEST) suite of models, the team examined four scenarios:

1. Business as usual: no change in the economic framework of communities
2. Sustainable management with paludiculture: for economic and environmental benefits
3. Conservation-centric: assuming peatland is for conserved for reducing carbon dioxide emissions
4. Intensive agriculture with more drainage until 2030 accompanied by weak law enforcement

Of the four, sustainable management using paludiculture techniques was perceived to have the greatest economic and environmental benefits, including increased incomes for communities, reduced fire risk and increased tree cover and carbon storage. “The key to communities’ economic success was the introduction of agrosilvofishery systems that combined agriculture, trees and fisheries,” said Artati.

Bastoni Brata, senior researcher in silviculture with the Environment and Forestry Research and Development Institute (the Indonesian acronym is BP2LHK) in South Sumatra, said that sustainable peatland management is based on Peatland Hydrological Units. “The government promulgated regulations seven years ago for protection of peatland,” he said, coinciding with the fires of 2015. “Peatland Hydrological Units were established to do this.”

In the production areas of the units, paludiculture is applicable, Bastoni said. It is a peat-friendly farming system that uses peatlands — including rewetted areas — for production and carbon storage, maintaining water levels at a consistent height throughout the year. Paludiculture can restore degraded peatland so it can be used for economic activities while obstructing peat decomposition and decreasing emissions and subsidence. “We’ve been researching paludicultural restoration practices since 1995 in degraded peat forests in South Sumatra and Jambi provinces,” he said. “Native tree species grew well, generating high levels of carbon sequestration and high-quality wood that attracts high prices. We found that after 10 years, natural versus artificial regeneration had similar canopy cover.” Bastoni and team recommended that paludicultural practices such as agrosilvofishery are best suited for shallow peat and already cultivated areas. “After three years, there was very good growth,” he said. “Nine local fish species were suitable for cultivation.”

Conducting research in the degraded agricultural land of Perigi Village in Ogan Komering Ilir District, Erizal Sodikin, associate professor with the Department of Agronomy, Faculty of Agriculture at Sriwijaya University in South Sumatra, found that improved rice cultivation techniques increased yields from 1.18 to 3.69 tonnes per hectare. “The impact of agrosilvofishery is very positive,” he said. “Farmers more frequently visit and take care of the land, avoiding fire. Various crops are successfully cultivated along with forest trees and fish species. There is a general improvement in biodiversity and increased productivity with associated increases in community incomes and indirect improvement in their nutrition quality.”

The capacity to sustainably manage peatlands is central to the success of any restoration and livelihood efforts, said Soozin Ryang, program officer for education and training with the Regional Education and Training Center of the Asian Forest Cooperation Organization. Ryang and team conducted research in peatlands in Kalimantan on the island of Borneo. “Apart from the technical aspects of peatland restoration,” said Ryang, “we adopted ‘people-centered development’ through a landscape approach, building human capabilities, people’s well-being and quality of life. Our basic assumption was that people must be empowered with the tools and knowledge to build their communities to successfully restore degraded peat ecosystems.” The team established a demonstration site to test adaptive agroforestry tree species for peatland restoration as a learning site for community-based peatland management. Canals were established to help farmers understand the importance of maintaining water levels, growing suitable agricultural crops and fish, animal husbandry and producing charcoal. Experiments were conducted into soil microbes on the decomposition of wood waste to assess the potential to reduce fire, rapidly improve soil conditions and support production of compost.

Eunho Choi, research scientist with the National Institute of Forest Science, Republic of Korea in collaboration with CIFOR-ICRAF and partners has been exploring opportunities to restore degraded peatlands for multiple economic and environmental values, particularly for local residents. The Institute has been supporting partners in Buntoi Village in the province of Central Kalimantan and Perigi Village in South Sumatra to test and demonstrate a variety of peat-friendly tree species. Choi’s work involves market value analyses and preference surveys with residents. Selected species were suitable for apiculture, biofuels, cosmetics and medicines, all of which had the potential to increase income while maintaining ecosystem services, and that residents welcomed.

In summary, Baral noted that meaningful partnerships seem to be the key to successful restoration of peat ecosystems, bringing together farmers, policymakers, government technical agencies and scientists.

For more information on this topic, please contact Himlal Baral at h.baral@cgiar.org.

- https://forestsnews.cifor.org/75126/managing-peatlands-in-indonesias-south-sumatra-for-multiple-benefits?fnl=en

Government-business partnership to protect Sumatra’s peat ecosystem

During a session in the Indonesia Pavilion at CoP26, APRIL Group's Deputy Director Dian Novarina shared how its ecosystem restoration program, Restorasi Ekosistem Riau (RER) is an integral part of fulfilling APRIL's 1-for-1 Commitment where the company aims to protect or restore one hectare of forest for every hectare of sustainable fiber plantation it managed. Until 2020, the company has fulfilled 81 percent of its target.

RER landscape management model is based on a production-protection approach. The RER concession area is ringed by APRIL's plantation, which served as a protective buffer zone from illegal activities while at the same time providing reliable and consistent funding. The RER program will not be possible without the support of the government in guiding its operation. "Last year, RER took part in a government-led effort in returning a rehabilitated female Sumatran tiger named Corina back into the wild on the Kampar Peninsula," Dian said. RER location was selected after extensive surveys. These surveys suggested the RER area, with its healthy forest condition, the abundance of prey species, and the presence of active protection, was the suitable location for Corina's release.

RER peat swamp forest on the Kampar Peninsula and Padang Island in Riau stores a massive amount of carbon below its peat soil. Besides that, they help sequester carbon from the atmosphere, which is crucial in fighting climate change, and contribute to government effort in reducing emissions from forest and other land use (FoLU).

RER areas on the Kampar Peninsula and Padang Island are also rich in biodiversity. RER has identified more than 800 species of animals and plants. "Sixty six of the identified species are listed in the IUCN red list. A recent census revealed that the RER area is home to 57 dragonfly species, with one species being the first to be recorded in

Indonesia. This shows that there is still a big knowledge gap that we need to fill by managing this important ecosystem," Dian Novarina said, highlighting the importance of the RER program.
With the APRIL2030 Commitment launched last year, RER will play an essential part in fulfilling one of its four pillars, the Thriving Landscape. APRIL aims to improve forest protection and increase biodiversity gains through partnerships, collaboration, and advancing knowledge on tropical peatland science.

- https://jakartaglobe.id/special-updates/governmentbusiness-partnership-to-protect-sumatras-peat-ecosystem

Indonesia wants to reduce deforestation, not completely end it

Indonesia, home to a third of the world's rainforests, has backtracked from a global pledge to end deforestation by 2030, calling for a gradual approach that will allow for the country to continue with its development plans. Officials in the world's fourth most populous country said that they have a less absolute interpretation of a clause in an agreement signed on November 1, 2021, at the COP26 climate talks calling for a "halt and reversal" of forest loss. Indonesian ministers said that the pledge to stop deforestation was "inappropriate and unfair", and the characterisation of the agreement by UK ministers was misleading. The government said that it never agreed to a complete stop to deforestation by 2030, and that a zero-deforestation target is against its development plans.

Freshly planted oil palm plantation in Central Kalimantan. Photo: Hans Joosten.

Officials say more land is needed for the fast-developing country to build infrastructure, food security and industry development. "There must be a balance," Environment and Forestry Minister Siti Nurbaya Bakar said. Indonesia is the top producer of palm oil, which has been linked to land clearing. Its pulp and paper industry has also been linked to deforestation and its up-and-coming nickel and electric vehicle sectors are likely to use up more land. In a low-carbon and climate resilience plan submitted to the United Nations Framework Convention on Climate Change (UNFCCC) in April, Indonesia proposed strategies for emissions reduction until 2050. This included a "carbon net sink" in its forestry sector by 2030, meaning that the sector will absorb more greenhouse gas emissions than it emits. Under this plan, Indonesia is aiming to reduce deforestation and increase the rehabilitation of peatland and abandoned land, alongside with "sustainable forest management" practices to prevent fires that have wiped out swathes of forests. By 2050, Indonesia is targeting for its forest sector to absorb

as much as 540 million CO_2 equivalent, the environment ministry said in a statement in August. It did not say how it compared to current levels of carbon capture in the forestry industry.

Deforestation control is part of Indonesia's commitments in the global Paris accord to combat climate change. It had previously aimed to limit deforestation to between 325,000 and 450,000 hectares a year, a level it believes will still allow economic development. The new plan submitted to the UNFCCC did not specify a new deforestation limit, but did say that Indonesia had expanded the area for protected forests by 26.1 percent, from 51.8 million hectares to 65.3 million hectares in the country's National Medium-Term development Plan for 2020-2024. The country also proposed to double its reforestation goal, by rehabilitating abandoned and degraded land, from 5.3 million hectares. In 2018, President Joko "Jokowi" Widodo issued a moratorium on palm oil permits, which was a response to devastating forest fires in 2015, when approximately 2.6 million hectares were burned. The deforestation rate has since fallen, with last year's size of burnt forests at the lowest in 20 years of 115,500 hectares, officials said. The moratorium was not extended when it lapsed in September this year, although top officials have said that they would not approve new palm permits. Despite the gains, Indonesia is still expecting to lose millions of hectares of forests within the decade, the environment ministry said in a report. Even by reaching net carbon sink by 2030, Indonesia's future deforestation will be at 6.8 million hectares at the very least.

- https://www.thejakartapost.com/indonesia/2021/11/05/indonesia-wants-to-reduce-deforestation-not-completely-end-it.html.

Malaysia

GEC calls for end to clearance, conversion of catchment forests and peatlands

The Global Environment Centre (GEC) has urged the government to put an end to the clearance and conversion of catchment forests and peatlands as a flood prevention measure. GEC director Faizal Parish said the unprecedented flash floods that inundated most parts of the country showed that Malaysia lacked well-coordinated disaster preparedness efforts. "Forests and wetlands are effective in absorbing rainfall and reducing flood peaks. Once forests are cleared, the run-off can increase by five to 10 times, and eroded soil can clog rivers and drains. Malaysia, he said, should look at its neighbours for lessons.

"We need to learn from our neighbours. After severe floods in 1998, Thailand banned the logging of all natural forests in the country. "Forests were protected and restored, to reduce floods and maintain water supply. Many of the forests were designated as national parks, which supported a booming ecotourism industry. "We should follow this good example and improve forest and wetland protection and rehabilitation in Malaysia to help prevent the occurrence of floods," he said in a statement.

GEC's River Care Programme Manager, Dr Kalithasan Kailasam, said the government should gradually relocate vulnerable communities out of flood-prone areas and halt further development in these places. "Based on data from the Drainage and Irrigation Department, nine percent of Malaysia's land are flood-prone areas. "Unless our communities are flood-proofed, our infrastructures well-prepared and catchments and wetland protected, we will be increasingly vulnerable to the impacts of flooding, as shown recently," he said.

- https://www.nst.com.my/news/nation/2021/12/757297/gec-calls-end-clearance-conversion-catchment-forests-and-peatlands
- https://www.eco-business.com/news/tracking-the-malaysia-floods-a-visual-story/

Countries' climate pledges built on flawed data, Washington Post investigation finds

Malaysia's latest catalogue of its greenhouse gas emissions to the United Nations reads like a report from a parallel universe. The 285-page document suggests that Malaysia's trees are absorbing carbon four times faster than similar forests in neighboring Indonesia. The surprising claim has allowed the country to subtract over 243 million tons of carbon dioxide from its 2016 inventory — slashing 73 percent of emissions from its bottom line.

Across the world, many countries underreport their greenhouse gas emissions in their reports to the United Nations, a Washington Post investigation has found. An examination of 196 country reports reveals a giant gap between what nations declare their emissions to be vs. the greenhouse gases they are sending into the atmosphere. The gap ranges from at least 8.5 billion to as high as 13.3 billion tons a year of underreported emissions. At the low end, the gap is larger than the yearly emissions of the United States. At the high end, it approaches the emissions of China and comprises 23 percent of humanity's total contribution to the planet's

warming, The Post found. The plan to save the world from the worst of climate change is built on data. But the data the world is relying on is inaccurate.

Smallholder peatland deforestation and reclamation in Sarawak, Malaysia. Photo: Hans Joosten.

The Post's analysis found at least 59 percent of the gap stems from how countries account for emissions from land, a unique sector in that it can both help and harm the climate. Land can draw in carbon as plants grow and soils store it away — or it can all go back up into the atmosphere as forests are logged or burn and as peat-rich bogs are drained and start to emit enormous surges of carbon dioxide.

A key area of controversy is that many countries attempt to offset the emissions from burning fossil fuels by claiming that carbon is absorbed by land within their borders. In other words, much of the gap is driven by subtractions countries have made on their balance sheets. And some of this carbon absorption isn't even happening — or at least not on the scale that countries assert. Malaysia, for example, released 422 million tons of greenhouse gases in 2016, placing it among the world's top 25 emitters that year, according to data compiled by the Food and Agriculture Organization of the United Nations. But because Malaysia claims its trees are consuming vast amounts of CO_2, its reported emissions to the United Nations are just 81 million tons. "It's hard to imagine how policymakers are going to pursue ambitious climate actions if they're not getting the right data from national governments on how big the problem is," said Glenn Hurowitz, chief executive of Mighty Earth, an environmental advocacy group.

Malaysia's skewed data vividly illustrates the high stakes countries face as they confront the growing pressure to reduce emissions while managing the very real economic consequences that process triggers. In 2016, the last year Malaysia has reported its numbers to the United Nations, the world's experts on peatlands convened in Kuching, the capital of the Malaysian state of Sarawak, for the 15th International Peat Congress on the vast tropical island of Borneo.

Jenny Goldstein, then a new faculty member at Cornell University, walked into the five-star Pullman Kuching Hotel and found herself in the midst of a propaganda war to make the controversial oil palm industry look good. There were more participants from the palm oil industry than scientists at the normally staid academic conference. Industry meetings were held in a giant hotel ballroom, while the scientific presentations took place in the basement — rooms so small that some scientists had to sit on the floor. Out of curiosity, Goldstein ventured

upstairs. “There were almost all men sitting in these ballrooms listening to presentations about how great Malaysian peatlands have been managed for oil palm,” recalled Goldstein, now a global development professor at Cornell. In the basement, world peat experts were presenting cutting-edge research on the massive carbon bombs peatlands contain.

The conference was a historic occasion, held in the tropics for the first time in its 62-year history, and hosted by the Malaysian Peat Society with the Sarawak government’s support. The leader of the conference, Sarawak Tropical Peat Research Institute Director Lulie Melling, has asserted that oil palm developers can plant on peatland without releasing huge amounts of carbon. She holds a PhD in environmental science from Japan’s Hokkaido University. Melling said in an interview with The Post that other peat scientists, who have studied peat in other parts of the world, don’t understand the unique qualities of the peat in her region. “It’s like comparing cheesecake with Swiss cheese,” she said. She has often cast the scientific debate in nationalist or anti-colonialist terms. Earlier this year, she told the New Sarawak Tribune, an English-language newspaper, that the Tropical Peat Research Institute was at the “front line on behalf of the state to inform the public that agriculture practices on peatlands have minimal impact on their roles as carbon sources.” “I single handedly, backed by my small laboratory, pioneered and published the groundbreaking research work on peat use and [greenhouse gas] emission to rebut the maligned western detractors on the use of peat as arable land,” she said. Melling’s pro-industry stance took scientists at the conference by surprise, Goldstein said, as did her use of vulgar language in public remarks.

Recently established oil palm plantation on peatland in Sarawak, Malaysia. Photo: Hans Joosten.

In the wake of the conference, some scientists were stunned to read in news reports that the event had presented new evidence that palm oil development can proceed without major environmental disruption. “Malaysia challenges the world over palm oil peatland,” said the English-language Jakarta Post. In response, 139 scientists — including Goldstein — objected to the articles, noting an abundance of peer-reviewed studies on peatland emissions. The letter was published by scientific journal Global Change Biology.

Malaysia’s government has downplayed the palm oil industry’s climate impact across several categories in its U.N. reports. In 2016, Malaysia claimed that it had not converted a single acre to cropland. “This is patently untrue,” said Susan Page, an expert on peatlands at the University of Leicester who also signed the letter

objecting to presentations at the 2016 International Peat Congress. In fact, in a peer-reviewed study funded by the Malaysian government itself, scientists documented the expansion of an oil palm plantation atop carbon-rich peatland in Sarawak in the very same year as Malaysia's latest report. The study estimated that 138 tons of carbon dioxide were released per hectare in converted areas. In other words, a giant pulse of emissions occurred due to land conversion. It was happening all across the country that year. Drawing on a satellite-based data set, Esri found a net addition of about 410,000 acres of oil palm plantations in 2016, though it is unclear how many of these were on peatland.

The scientific evidence suggests the country is also underestimating emissions from drained peatland, which occur in the years after the land is converted. Using an outdated estimate of how much peatlands emit, the nation calculated that its croplands atop drained peat emitted just 29 million tons of CO_2 in 2016. John Couwenberg, a peatlands expert from the University of Greifswald in Germany, said Malaysia's estimate is "way too low." He reworked the numbers for The Post and got a total of 111 million tons of carbon dioxide equivalent emissions. A 2017 study agreed, finding a figure of nearly 100 million tons of carbon dioxide per year for all of Malaysia. In other words, Malaysia's peatland emissions could easily be about three times as high as the country is claiming.

And then comes the biggest problem of all. Malaysia claims an annual forest carbon sink of over 243 million tons from just about 68,000 square miles of forested area. That's not far from what neighboring Indonesia claims for a forest more than five times its size.

U.N. technical reviewers have questioned what they called Malaysia's "unusually large figure" for forest carbon storage and said they were unable to reproduce it despite using three separate methods. Several scientists told The Post that the figures would only make sense if all of Malaysia's forests were growing at a rate similar to that seen in young saplings — which they aren't.

Read the full contribution under

- https://www.washingtonpost.com/climate-environment/interactive/2021/greenhouse-gas-emissions-pledges-data/

Is Malaysia underreporting its GHG emissions?

Environment and Water Ministry (KASA) secretary-general Datuk Seri Dr Zaini Ujang, on behalf of the Ministry, stressed that Malaysia's Biennial Update Report (BUR), which was highlighted in the article, is prepared in accordance to the rigorous process set by the UN Framework Convention on Climate Change (UNFCCC). "Our report was noted as 'exemplary' by the UNFCCC. When they train officials in other countries to prepare their BUR, they indicate that Malaysia's report is a good example," says Zaini.

Faizal Parish, director of the Global Environment Centre, says the emissions factor used in the BUR3 are based on the 2006 guidelines, which are not the latest version, he says. According to the website, there was a refinement of the guidelines in 2019. "We have discussed this twice with them. When we met with them in April, it was agreed that for the next BUR, they will update the emissions factor," says Faizal. Another issue is that the government was relying on land use data provided by the State governments, he says. This includes data on what area has been deforested or converted. "The data they presented was that there was no land that was deforested or (converted) for agriculture in the last 10 to 20 years. There was a little bit of land converted to settlements, but none to agriculture. From our perspective, that data needs to be looked at," he says.

Ultimately, while he understands the constraints that the government faces in collecting such data, Faizal believes that a more inclusive approach with stakeholders is needed. "They don't have the capacity to go out and track all the data. We already had one meeting with the Ministry to talk about peatland emissions, so it is thinking about modifying or enhancing the approach of the next BUR," he says. "It is critical if there is much better stakeholder engagement, not just of the civil society but also the private sector and others. If you are going to make a change, you need to have an inclusive approach."

The government has engaged with NGOs when preparing the BUR, Faizal admits, but "my understanding is that NGOs were only invited at the last week before the report was submitted. For the Nationally Determined Contribution (NDC) process, we were promised to be engaged but they never engaged us."

Minister of Water and Environment Tuan Ibrahim Tuan Man He presented Malaysia's climate commitments at the high-level segment at COP26 in Glasgow. "The Prime Minister has committed that we will achieve net zero as early as 2050, and we are doing many things to reach that goal. As a developing country, we have to face huge

challenges to meet our goal. But we've succeeded in keeping 50% of our forests. That is the government's commitment and this can offset our carbon emissions," says the Minister.

- https://www.theedgemarkets.com/article/malaysia-underreporting-its-ghg-emissions

Australasia

New Zealand

Haastboer pursued after excavation of drainage at peatland

In its first prosecution involving damage to a protected wetland, West Coast Regional Council took John Cowan to court earlier this year for excavating a 270m long drainage line adjacent to the Department of Conservation's wetland. The drain was dug several years ago on a paper road bordering Cowan's farm and conservation land. It went unnoticed until the farmer dug it up again in mid-2020, and a complaint followed. Cowan was indicted in Queenstown District Court for violating regional rules by carrying out illegal earthworks and diverting water from a natural moorland. The charges were later dismissed by the court after Cowan completed the council's alternative (restorative) legal path. By agreement, he paid $ 20,000 to a Haast community group to go to a local bike park. He was also required to hire a consultant to design a remedial action plan, and to obtain permission from sources for work to mitigate the consequences of his unauthorized digging. Cowan also had to pay the research costs, legal costs and legal costs of the municipality, which according to Helem were significant. The prosecution dates back to the new national environmental standards for freshwater, which bring even stricter rules near a natural peatland.

- https://bahamas.kivazen.com/haastboer-pursued-after-excavation-of-drainage-at-peatland/

Europe

EGU2022

Registration for EGU22 is now open: https://www.egu22.eu/. The General Assembly will take place **23–27 May 2022**. All presentations will be short orals that can be delivered and viewed both virtually or on-site.
Registration is also available for on-site or virtual participation, **on-site registration is open until 14 April 2022, 13:00 CEST** due to Austrian event restrictions. For more information and to seek assistance with regards to this change please visit this page. Dedicated peatland sessions include:

- BG3.10 'Old Peat, New Voices: Insights into Global Peatland Research from Early Career Researchers'. Convener: Liam Heffernan | Co-conveners: Scott J. Davidson, Martina Schlaipfer, Nicole Sanderson, Iuliia Burdun. https://meetingorganizer.copernicus.org/EGU22/session/42303
- BG3.15 'Peatlands under pressure'. Convener: Annalea Lohila | Co-conveners: Jorge Hoyos-Santillan, Claudio Zaccone, Angela Gallego-Sala, Julien Arsenault, Gareth Clay, Maxim Dorodnikov, Frans-Jan W. Parmentier. https://meetingorganizer.copernicus.org/EGU22/session/42356
- BG3.27 'Peatland management and restoration'. Convener: Hanna Silvennoinen | Co-conveners: Susan Page, Franziska Tanneberger, Bärbel Tiemeyer. https://meetingorganizer.copernicus.org/EGU22/session/42375
- HS10.7 'Peatland hydrology: from tropical to subarctic latitudes' Convener: Michel Bechtold | Co-conveners: Alex Cobb, Marie Larocque, David Olefeldt, Emma Shuttleworth. https://meetingorganizer.copernicus.org/EGU22/session/42669

European Union

New EU Common Agricultural Policy regulation

On 2 December 2021 the European Union published Regulation (EU) 2021/2115 f the European Parliament and of the Council, establishing rules on support for strategic plans to be drawn up by Member States under the

common agricultural policy (CAP Strategic Plans) and financed by the European Agricultural Guarantee Fund (EAGF) and by the European Agricultural Fund for Rural Development (EAFRD) and repealing Regulations (EU) No 1305/2013 and (EU) No 1307/2013. The regulation contains the following peatland relevant paragraphs:'(16) … Agricultural areas should not become ineligible for direct payments when cultivated with non-agricultural products by way of paludiculture under either Union or national schemes which contribute to achieving one or more environmental or climate-related objectives of the Union. …
(63) … Member States should have the possibility to set up eco-schemes for agricultural practices carried out by farmers on agricultural areas, in particular agricultural activities but also certain practices going beyond agricultural activities. Those practices may include the enhanced management of permanent pastures and landscape features, the rewetting of peatlands, paludiculture, and organic farming. …
Article 4 Definitions and conditions to be provided in the CAP Strategic Plans
1. Member States shall provide in their CAP Strategic Plans the definitions of 'agricultural activity', 'agricultural area', 'eligible hectare', 'active farmer', 'young farmer' and 'new farmer', as well as the relevant conditions in accordance with this Article.
2. 'Agricultural activity' shall be determined in such a way that it allows to contribute to the provision of private and public goods through one or both of the following:
(a) the production of agricultural products, which includes actions such as raising animals or cultivation including by way of paludiculture, where agricultural products means products listed in Annex I to the TFEU with the exception of fishery products, as well as cotton and short rotation coppice; …
4. For the purpose of types of intervention in the form of direct payments, 'eligible hectare' shall be determined in such a way that it covers areas which are at the farmer's disposal and which consist of:
….(c) any area of the holding that gave a right to payments under Title III, Chapter II, Section 2, Subsection 2, of this Regulation or under the basic payment scheme or the single area payment scheme laid down in Title III of Regulation (EU) No 1307/2013, and which is not an 'eligible hectare' as determined by Member States on the basis of points (a) and (b) of this paragraph:
….(ii) as a result of area-based interventions set out under this Regulation covered by the integrated system referred to in Article 65(1) of Regulation (EU) 2021/2116 allowing for the production of products not listed in Annex I TFEU by way of paludiculture, or under national schemes for biodiversity or greenhouse gas reductions the conditions of which comply with those area-based interventions, provided that those interventions and national schemes contribute to achieving one or more specific objectives set out in Article 6(1), points (d), (e) and (f), of this Regulation;'

- https://eur-lex.europa.eu/legal-content/DE/ALL/?uri=CELEX:32021R2115

WaterLANDS: New European Green Deal project launched to lead largescale restoration of European wetlands
An ambitious project has been launched to tackle largescale restoration of Europe's wetlands, with €23 million of funding from the EU Horizon 2020 Programme Green Deal. WaterLANDS (Water-based solutions for carbon storage, people and wilderness) will restore wetland sites across Europe which have been decimated by human activity and lay the foundations for scalable protection across much wider areas.
WaterLANDS will undertake hands-on restoration of specific wetland sites, covering an initial 10,500 ha, and create best practice models that can be applied to wetland restoration at other sites. By engaging with local communities and stakeholders, the project will ensure that wetland restoration results not only in environmental gains, but also social and economic benefits for the communities involved. The five-year project is led by University College Dublin (UCD), Ireland and brings together 31 other organisations from research, industry, government and non-profit sectors in 14 European countries.
Funding for **WaterLANDS** is part of the European Commission's Green Deal ambition to make Europe the first climate neutral continent by 2050 with a sustainable economy that leaves no one behind.

- https://erinn.eu/news/waterlands-new-european-green-deal-project-launched-to-lead-largescale-restoration-of-european-wetlands/

How LIFE is protecting Europe's degraded peatlands
Restoring and managing peatlands improves water retention and quality, stores carbon, reduces greenhouse gas emissions and increases biodiversity. Since 1992 LIFE has been working hard on this. The EU Habitats Directive

and the Natura 2000 network of protected areas are vital for saving Europe's peatlands. 33 000 km^2 of peatlands are already protected under this Directive across 8 700 Natura 2000 sites. Also, the European Commission's EU Biodiversity Strategy for 2030 calls for peatland restoration and their strict protection. This is vital as only 10% of Europe's peatlands are currently in good condition. Considering the high rates of biodiversity loss and climate change impacts, it is critical to safeguard peatlands through effective management and active restoration. Doing this can help reach the European Green Deal's ambitious targets.

Between 1992 and 2020, LIFE funded 388 projects that have contributed to the restoration of Europe's drained and degraded peatlands. Almost one-third of these projects have focused primarily on peatlands, while the remainder involves peatland restoration and associated habitats as part of a more extensive landscape approach. LIFE peatland restoration projects have been implemented in all European peatland-rich countries and regions such as Ireland, Fennoscandia and the Baltic States. Typical actions have included rewetting by damming and closing drainage systems, deforesting drained peatlands and getting rid of invasive alien species. Among the most significant results so far have been the restoration of 170 000 hectares of mires in the United Kingdom and 40% of Belgium's peatlands. In recent years, some large-scale LIFE peatland restoration projects have brought significant positive impacts on both climate and biodiversity.

The new LIFE programme (2021 - 2027) encourages projects to aim to restore and preserve peatlands; not only in the Natura 2000 network but also outside of it. This includes severely degraded peatlands from agricultural and forestry use as well as from industrial peat extraction. LIFE's experience in developing sophisticated monitoring systems is a big chance for organisations across the board to apply for LIFE funding.

A selection of LIFE's peatland projects include: LIFE Peat Restore, LIFE Mires Estonia, Hydrology LIFE, Marches Mosses BogLIFE, LIFE Welsh Raised Bogs, and LIFE REstore

Want to find out more? Factsheet: Peatlands for LIFE, Brochure: Bringing nature back through LIFE

- https://cinea.ec.europa.eu/news/how-life-protecting-europes-degraded-peatlands-2021-11-26_en

Peatland in the Spanish Pyrenees. Photo: Hans Joosten.

Commission adopts EU Soil Strategy for 2030

On 17 November 2021 the European Commission presented its new EU Soil Strategy - an important deliverable of the European Green Deal and the EU Biodiversity Strategy for 2030 for tackling the climate and biodiversity

crises. The Strategy sets a framework with concrete measures for the protection, restoration and sustainable use of soils and proposes a set of voluntary and legally binding measures. This strategy aims to increase the soil carbon in agricultural land, combat desertification, restore degraded land and soil, and ensure that by 2050, all soil ecosystems are in a healthy condition.

The Strategy calls for ensuring the same level of protection to soil that exists for water, the marine environment and air in the EU. This will be done through a proposal by 2023 for a new Soil Health Law, following an impact assessment and broad consultation of stakeholders and Member States. The Strategy also mobilises the necessary societal engagement and financial resources, shared knowledge, and promotes sustainable soil management practices and monitoring, supporting the EU ambition for global action on soil.

To achieve a climate-neutral Europe by 2050, and land-based neutrality by 2035, it is crucial to stop emissions from drained peatlands and to increase the carbon that is stored in other soils. Restoring peatlands alone could significantly reduce CO_2 emissions, which comes with numerous additional benefits including for nature, biodiversity and water protection.

The Commission will launch a carbon farming initiative and join the global "4 per 1000" initiative to increase the soil organic carbon content in agricultural land. The ambition of the initiative is to encourage stakeholders to transition towards a productive, highly resilient agriculture, based on the appropriate management of lands and soils.

- https://ec.europa.eu/environment/strategy/soil-strategy_en

EU proposes ambitious ban on products tied to legal and illegal deforestation

The European Union is considering an ambitious new proposal that would regulate imports of products linked to global forest loss. The law would require suppliers to prove their products haven't contributed to deforestation, whether legal or illegal. If passed, it would force producers to raise their environmental standards or risk losing out on a market of 27 countries and 450 million people. The proposal gives special focus to products with some of the most egregious environmental track records, including soy, beef, palm oil, wood, cocoa and coffee, as well as leather, chocolate and furniture. Should the proposal pass, importers will have to meet stricter traceability measures, such as sharing geographic coordinates of where their products originated. It also establishes a benchmarking system to determine which countries are the most at risk of deforestation, and pledges 1 billion euros to help them develop more sustainable forest management programs. The EU predicts the proposal will cut at least 31.9 million metric tons of annual carbon emissions and save around 3.2 billion euros.

While the EU's proposal takes ambitious steps to protect forests, it falls short when it comes to other types of carbon-rich ecosystems, some environmental groups pointed out. For example, the proposal's current language would exclude protection of many savannas, wetlands and peatlands. Mongabay has reported extensively on the rapid disappearance of wetlands and peatlands due to palm oil, timber and other agricultural commodities, as well as governments' continued omission of these landscapes from legislation.

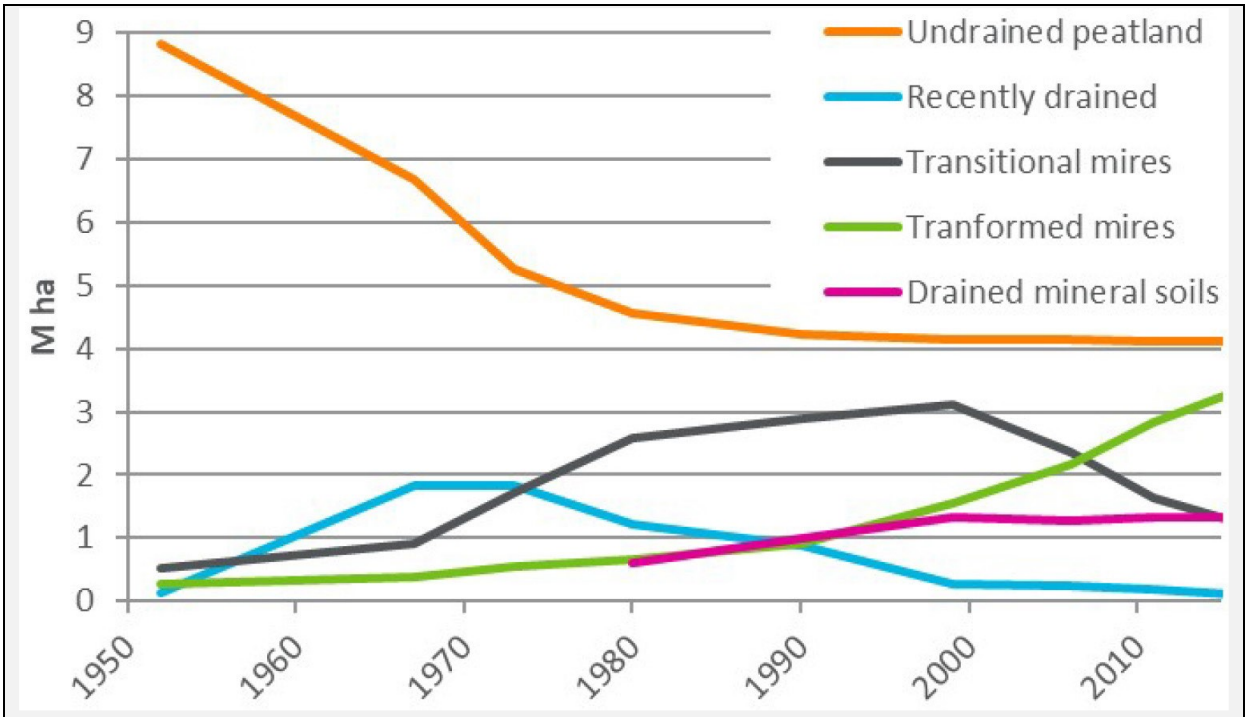
- https://news.mongabay.com/2021/11/eu-proposes-ambitious-ban-on-products-tied-to-legal-and-illegal-deforestation/

Finland

Energy peat extraction collapses further in Finland

The Bioenergy Association of Finland announced at its Peat Day in Tampere on 22 November that peat extraction has decreased again by about one third, to 6.2 million m^3 compared to the previous season. Of this, 43% is used for energy and 57% for other purposes, such as growing media and animal bedding. Peat use for energy has been halved again, compared to 2020, and the sector has lost about 2000 jobs during the current government period. Entrepreneurs are truly worried about their future as just transition measures are delayed or diluted. Main reasons for the collapse, which is happening much faster than planned, are high emission prices and tax changes. Quick changes in legislation and administration are also needed to allow the restoration of current extraction areas to carbon sinks, including mires, lakes and forest. For the full press release (in Finnish) visit:

- https://bit.ly/3oQ4JWr.



"The restoration of the peatland, i.e. measures to restore the peatland to its natural condition by blocking the ditches, was observed 14 000 ha during the preceding 10-year period and totally on 22 000 ha." From: Korhonen et al. 2021. Forests of Finland 2014–2018 and their development 1921–2018.
https://www.silvafennica.fi/pdf/article10662.pdf

Germany

Malchin AEE Municipality of the Month thanks to rewetted fens

The district of Malchin in Mecklenburg-Vorpommern (Germany) is the Renewable Energy Agency's (AEE) Municipality of the Month for December 2021. According to the AEE, Malchin has been operating an innovative fen peatland heat and power plant since 2014. This will make a decisive contribution to the emission-free heat supply of urban flats from 2023 onwards, it said. The fen power plant in Malchin shows how the preservation and restoration of original landscapes and the expansion of sustainable energy generation capacities can be implemented together. With the construction of the power plant, Malchin has shown how innovative projects can be implemented together with committed citizens and state funding. Every year, the fenland heat and power plant converts about 5,000 bales of fenland growth into sustainable heat. That is about 800 to 1,200 tonnes of fuel. Ninety per cent of the fuel comes from restored fenland areas, which also serve as a CO_2 sink. Woodchips also contribute to the supply. The power plant has a nominal heat output of 800 kilowatts and supplies heat to about 490 flats, two school buildings and several office buildings. From 2023 onwards, the power plant wants to supply a large part of the buildings in the city area with up to 75 per cent renewable district heating through a cooperation with the municipal housing company Wogema.

- https://www.solarserver.de/2021/12/16/malchin-dank-niedermoor-aee-kommune-des-monats/

New government on course for climate and nature protection?

The measures for "natural climate protection" and the classification of peatland protection as a 'public interest' in the coalition agreement of the new Germa government are a big step in the right direction. However, they are too much located in the realm of nature conservation and not an elementary component of future agriculture, according to the analysis of the Succow Foundation, as published on 25 November 2021. Peatlands, as the largest source of emissions in this sector, offer particularly large reduction potential with solutions such as paludiculture. The future government must take the LULUCF sector (land use, land use change and forestry) much more seriously for climate protection. "The new German government is clearly committed to the 1.5°C target of the Paris Agreement and other environmental and sustainable development commitments. It focuses on nature-

based solutions, such as organic farming and peatland management with paludiculture," says Jan Peters, Executive Director of the Succow Foundation. "The measures in peatland protection are classified as being in the public interest, but remain too vague. The transformation away from drainage-based peatland use cannot succeed in this way."

Nature-based solutions such as peatland restoration and protected area development are also to be given greater prominence in external climate policy in the treaty entitled "Dare more progress - Alliance for freedom, justice and sustainability". In particular, the European exchange at government level on best practice examples in peatland protection must be intensified in the course of the legislature.

Domestically, peatland protection requires not only a clear peatland protection strategy, which must now be rapidly developed into a government strategy for all ministries, but also planning law instruments to enable actors to quickly implement peatland restoration and paludiculture. In this area, too, the new federal government must overcome silo thinking and accelerate planning and approval in order to still be able to achieve the climate goals. In all these areas, a science-based climate check is needed for draft legislation by the ministries that affect peatlands.

There also seems to be new movement in agricultural policy. Especially the plans for the upcoming, but also for the future development of the Common Agricultural Policy (CAP) with a perspective of rewarding climate and environmental services and phasing out flat-rate direct payments make us feel positive. This, in conjunction with the target of 30 percent organic farming by 2030 and additional funding for nature conservation and climate adaptation in the Joint Task for Agricultural Structures and Coastal Protection (GAK), offers sufficient scope for more sustainable agriculture in Germany and Europe. Model regions for the concrete further development of concepts of regional value creation and functioning lighthouses are urgently needed here, which the Succow Foundation is happy to support. Unfortunately, however, the results of the "Commission on the Future of Agriculture" with its far-reaching demands, negotiated in broad social discourse, were not included in the coalition agreement.

A more pronounced national and European soil policy that emphasises the special aspects of organic soils, i.e. peat soils in particular, as opposed to mineral soils, is indispensable, especially in view of the aforementioned goals of climate protection, climate adaptation and the preservation of biodiversity.

It is also positive that one of the central future fields of research is to be climate, biodiversity and sustainability research, and that the focus is also to be on sustainable agricultural and food systems. Here, research and development on land use on peat soils with paludiculture must play an important role.

When it comes to climate protection in the building sector, we point out that attention should not only be paid to the energy consumption of buildings, but also to the climate and environmental impact of the building materials. Regionally processed building materials from paludiculture materials, e.g. for insulation, can thereby ensure local value creation from rewetted peatlands and thus even lead to carbon negative building materials, since in addition to replacing fossil substances, emissions from the peatlands can also be stopped.

"We wish the new federal government a good start with this groundbreaking coalition agreement! The Succow Foundation will be happy to be involved as a reliable partner in the further design and also the implementation for ambitious, nature-based climate and nature conservation with a special focus on peatlands for a more sustainable Germany," says Jan Peters, Managing Director of the Succow Foundation, partner in the Greifswald Mire Centre.

- https://civicrm.succow-stiftung.de/civicrm/mailing/view?id=453

Ireland

Farm:Carbon: Restoration and agricultural alternatives for Offaly's peatlands

An initiative to create an Irish Wetland Code wants to reward farmers financially in return for enhancing the public and ecosystem service potential of their peatlands. By carrying out a comprehensive program of practical surveys and scientific work, before and after the implementation of selected measures, the initiative wants to quantify changes in carbon storage, greenhouse gas emissions, biodiversity of farm habitats, water quality and soil health. Participating 'lighthouse' farms will act as research centres to explore ways of protecting the carbon stock, restore the sequestration of carbon, maximise ecosystem benefits, and build resilience to the impacts of

climate change. For peatland areas, restoration works will include but are not limited to, re-wetting, partial re-wetting or paludiculture (wetland agriculture). Participating farmers may be eligible for a combination of action- and results-based payments that address the environmental impacts arising from agricultural peatlands and adjacent lands.

The two-year project (2021-2023) is co-funded by the Department of Agriculture, Food and the Marine and the EU and is being conducted on peatlands in the catchments of Camcor, Little Brosna and Silver River in County Offaly and neighbouring counties.

- https://farmcarbon.ie/

Bill allowing for peat extraction opposed by government

The Horticultural Peat (Temporary Measures) Bill 2021, brought to the Seanad by Fine Gael's Regina Doherty and Fianna Fáil's Robbie Gallagher, has not been taken up by the government. Minister of State at the Department of Housing, Local Government and Heritage. Malcolm Noonan – who is preparing a report on peat alternatives – has said that the proposed bill ran the risk of breaching EU law. Speaking before the Seanad, Minister Noonan said, "while I believe that this Bill is well intentioned, any proposals that we bring forward to address these concerns must be in compliance with Ireland's obligations under the environmental impact assessment and habitats directives. Otherwise, we will find ourselves in breach of European law." He continued, "My Department has received initial legal advice on the Bill from the Office of the Attorney General, which has indicated that there are serious legal issues with the Bill in terms of EU environmental law. We must take those concerns very seriously but we also have to work together to find solutions for the domestic horticultural industry."

Addressing the concerns of many in the horticulture industry, Minister Noonan said, "In the context of interruptions to the supply of peat in the horticultural industry, the Government wants to protect jobs, livelihoods and our domestic horticultural industry." Minister Noonan is in the process of preparing a government report on peat alternatives. However, the report has been frequently delayed, leading to criticisms from fellow ministers and stakeholders in the horticulture sector.

- https://horticultureconnected.ie/featured/bill-allowing-for-peat-extraction-opposed-by-government/

Cut-over peatland in Ireland. Photo: Hans Joosten.

New peat legislation slammed as 'incompatible' with climate targets and EU law

A bill that would exempt peat extraction for the horticulture industry from the need for planning permission has been slammed by legal experts as incompatible with EU law. The Horticultural Peat (Temporary Measures) Bill 2021, set to be debated in the Seanad on November 30, has also been criticised by peatland experts as out of touch with Ireland's climate ambitions.

The Bill would give a planning derogation for peat extraction for horticultural purposes until 2026 and potentially as far out as 2030. The Bill makes clear that previously unauthorised peat extraction activity does not affect entitlement to this exemption.

Currently, large-scale peat extraction needs both planning permission and EPA licensing, with in-depth assessment of environmental and climate impacts assessed under both regimes in line with requirements under EU law. To date, no peat companies have both planning permission and licences.

Many senators have expressed their concern for the future of the horticultural industry which is facing a shortage of supply this year as stockpiles of peat run out. The mushroom and professional plant growing sectors are most badly impacted. Most large peat companies stopped peat extraction after a landmark High Court ruling in September 2019 struck down regulations introduced earlier that year. The regulations exempted peat harvesting from the need for planning permission and brought all large-scale extraction solely under a new EPA licensing system. Following the ruling, the system returned to the previous set-up, meaning that large-scale peat extraction needs both planning permission and EPA licensing.

The proposed Bill would again see companies wishing to extract peat for horticulture fall solely under an EPA system. The Bill only allows the EPA to make specific rules to "ensure a high level of environmental protection equivalent to that achievable with individual permits". However, the Bill proposes that any pending enforcement action against peat extraction operations would be paused or "stayed" while the derogation is in place. According to Attracta Uí Bhroin, environmental law officer at the Irish Environmental Network, a coalition of over 30 environmental NGOs, this is "an outrageous proposal". "As an EU Member State we can't simply disregard EU environmental law and our duties under the EU Treaties," she said. She said the Bill "appears, at face value, to seek to reward unlawful operators and circumvent the environmental protection objectives of key EU Directives and would amount to a breach of Ireland's duty of sincere cooperation," a core element of the EU Treaties. "What is really needed is a concerted approach to managing a just transition for all those caught up by these issues, including our outstanding EU law obligations and the need to manage and restore our peat resources differently to meet our climate change and biodiversity targets," Uí Bhroin added.

According to Assistant Professor at the UCD Sutherland School of Law, Dr Andrew Jackson, the Bill is "very clearly inconsistent with EU and international environmental law". Dr Jackson, an EU environmental law expert, also noted the press release accompanying the new Bill that described legal proceedings that quashed the previous regulations to take large-scale extraction outside the planning system as a "foolish legal action". "This is just the latest example in a worrying trend of environmental litigants being disparaged for exercising their right to access justice," Dr Jackson said. "The High Court warned about this earlier this year," he noted. The quote in the press release from Senator Doherty was referencing the decision of Friends of the Irish Environment (FIE) to challenge the 2019 peat regulations. This led to the landmark 2019 High Court decision to quash the regulations as they were judged to be in breach of EU environmental law. Tony Lowes from FIE said that the group's "legal action in 2019 successfully vindicated EU law, so it's hard to see how it can be described as 'foolish'."

Doherty told *Noteworthy* that she used this language as "the consequences of the action has led to the Irish horticultural growers relying on imported horticultural peat to meet their needs". "The result of this action, which could have been foreseen, is leading to increased costs for growers and ultimately higher prices for consumers, putting jobs at risk and having a negative environmental impact given the need to transport horticultural peat across Europe," she added.

While peat imports have increased, *Noteworthy* revealed last week that over 500,000 tonnes of peat products have been exported this year, including to the mushroom industry in North America. The annual needs of the Irish horticulture industry is around 90,000 tonnes.The horticultural peat sector has always been export focused. According to the Department of Agriculture, 90% of horticultural peat is exported as milled peat or for mushroom casing. The Bill does not specify if the proposed exemption would apply solely to peat extracted for the horticultural needs of the domestic market. "Do the promoters of the new peat Bill envisage that large-scale peat

exports should and will continue from Ireland?" UCD's Dr Jackson asked. "This should clearly be considered as part of the current debate," he said. "If peat wasn't extracted in Ireland for horticulture, those bogs could in principle be rewetted, resulting in very large annual carbon savings – this needs to be factored in."

The return to widespread extraction on any scale would have a negative impact "from a climate point of view", according to Dr David Wilson, a research scientist specialising in peat. "This is clearly not compatible with any kind of climate action." According to Dr Wilson, who has produced work for the Intergovernmental Panel for Climate Change (IPCC) and the International Peatland Society, the Bill is "vague and nebulous", leaving it "wide open to interpretation" by peat companies as to the level of activity they can carry out.

Several other peatland experts who spoke to *Noteworthy* were also critical of the Bill, including UCD scientist Dr Florence Renou-Wilson who said continued peat extraction is "not sustainable and environmentally damaging". She questioned the legality of the proposal to pause or stay any enforcement action that, she said, would see the State in breach of the EU environmental law. TCD's Dr John Connolly, an expert in peatland mapping, said he was "concerned" about the phrasing of "temporary measures", especially as the horticultural industry has said that switching to peat-free production is still years away. "What will happen if these horticultural bogs are mined to exhaustion and there is still 'a lack of proven alternatives'?" Dr Connolly said. "Will more bogs be opened up for exploitation under this Bill?"

The Green Party also opposes the Bill. Speaking last week, Senator Pauline O'Reilly raised concern that the Bill is "not consistent with European law". "The Greens will not support a Bill that allows widespread extraction of peat without environmental impact assessments which is what this Bill will do," she said.

Launching the Bill last week, Senator Doherty said that she "worked closely" on the Bill with Growing Media Ireland (GMI), which represents most horticultural peat producers, and the Irish Farmers' Association (IFA). Both organisations have recently lobbied Ministers and politicians about the need to bring in new legislation to allow harvesting to start up again.

Doherty said that her engagement with the representative bodies on the Bill was in the facilitation in meeting with growers and producers around the country "before I drafted this legislation to rectify the problem".

A GMI spokesperson said that "as an industry representative group GMI provided assistance" to the senators behind the Bill. The IFA did not respond to our requests for comment.

Fine Gael also released a video last week in which Doherty appeared alongside Ciaran Cuddy of the IFA's Mushroom Committee. As stated in the video, Mr Cuddy is also the Chief Operating Officer of Harte Peat that identifies itself as "one of the top four mushroom casing suppliers" in the world.

Harte Peat is currently subject to legal proceedings brought by the EPA. The agency claims that the company has been extracting peat without an EPA licence from a site in Co Westmeath for which a licence is required. Harte Peat is challenging the basis of this claim, and is also seeking a judicial review of an EPA decision to refuse to process an application for an EPA licence. Harte Peat applied for a licence in October 2019 while the now quashed regulations exempting the need for planning were still in effect. Both sets of proceedings are due to be heard before the High Court in January 2022.

- https://www.thejournal.ie/peats-sake-pt2-peat-bill-5611539-Nov2021/
- https://www.agriland.ie/farming-news/peat-bill-to-be-introduced-to-allow-harvesting-for-horticulture/

Peat Bill proposes to put a stay until 2030 on decision to end extraction

Bórd na Móna put a complete stop to harvesting peat from its bogs in 2020 following a High Court decision the previous year which made extraction subject to a complex process involving multiple licensing, planning and environmental approvals. The end of extraction has plunged the horticultural industry, the mushroom industry (which relies on peat for growing) and suppliers of horticultural products such as peat moss into crisis. The industry says that some 17,000 jobs will be affected as a result. With the stockpile of milled peat quickly diminishing, imports of peat from countries such as Latvia into Ireland commenced in September. The industry has claimed that the imported product is inferior to Irish peat.

An expert group which examined the issue has reported to Minister of State for Heritage Malcolm Noonan but the document has yet to be made public. It is understood that it concluded that there are no easy solutions other than to continue research into feasible alternatives. There may be a partial solution that would allow harvesting in areas of bog below 30 hectares – they would not be subject to the same onerous planning and licensing

conditions. It would mean that extraction could continue on a temporary basis in bigger bogs until a licence is granted or refused. The Senators said that, if allowed, extraction would be subject to very strict environmental conditions and subject to a review after two years. They also said that if the 2026 date for ending harvesting were to be extended, peat extraction would not be allowed to continue beyond 2030.

- https://www.irishtimes.com/news/politics/peat-bill-proposes-to-put-a-stay-until-2030-on-decision-to-end-extraction-1.4736720

Rewetted cut-over bog site in Ireland. Photo: Hans Joosten.

Peatlands Climate Action Scheme - Bunahinly - Kilgarvan Bogs

Bord na Móna is a climate solutions company building its renewable energy, recycling and carbon capture operations in the midlands and across Ireland. Earlier in 2021, the company permanently ceased industrial peat production on all their peatlands. In line with Bord na Móna's accelerated decarbonization strategy, and the availability of government funding, the company has committed to ambitious enhanced peatland decommissioning and rehabilitation improvements, initially targeting over 30,000 hectares in over 80 Bord na Móna bogs. Under this Peatlands Climate Action Scheme (PCAS), enhanced rehabilitation has commenced on eighteen bogs in 2021 and additional bogs will be rehabilitated in 2022.

The enhanced rehabilitation scheme will deliver benefits across climate action by optimising carbon storage potential within the residual peat, reducing Green House Gas emissions and accelerating the development of carbon sequestration by promoting the development of Sphagnum-rich vegetation, where possible. This will also enrich the State's natural capital, increase eco-system services, strengthen biodiversity, improve water quality and storage attenuation as well as enabling the amenity potential of the peatlands. The measures proposed will set sites on an accelerated trajectory towards the development of a variety of habitats including developing natural peatland, wetland and woodland. The rehabilitation measures will focus on optimising suitable hydrological conditions (water-levels) across the peatlands to maximise climate action benefits. The key target will be to bring water levels close to the peat surface to re-wet peat and accelerate the development of naturally functioning peatland habitats and the trajectory of sites to become reduced carbon sources and ultimately carbon sinks again.

Bord na Móna propose to carry out rehabilitation measures on **Bunahinly- Kilgarvan Bog** under this scheme. Bunahinly- Kilgarvan Bog in County Westmeath is located circa 3km south-east of Athlone Town (Google location:

https://goo.gl/maps/A92wRGcvXR3tbXvL9) and consists of two adjacent bog units. Bord na Móna have defined the key goal and outcome of rehabilitation at Bunahinly-Kilgarvan Bog as environmental stabilisation, optimising and maximising residual peat re-wetting, and setting the site on a trajectory towards establishment of a mosaic of compatible habitats including wetland, fen, Reed swamp, heath, scrub, poor fen, embryonic Sphagnum-rich peatland communities and Birch woodland, where conditions are suitable. A Draft Rehabilitation Plan and associated Map Books for Bunahinly-Kilgarvan Bog are now available on

- https://www.bnmpcas.ie/2022bogsrehabilitation/
- https://www.westmeathppn.ie/index.php/node/2061

Midlands bogs to be restored as part of climate strategy to make Ireland carbon neutral by 2050

The largest plan in the history of the State to restore thousands of acres of bogland in the midlands will form a core element of the Government's strategy to cut the State's carbon emissions in half by 2030. Once restored, the lands will include peat-forming bogs and a mosaic of wetlands, grasslands and native woodlands, enhancing biodiversity and contributing to the target of making Ireland carbon neutral by 2050. The plan will be backed by €108 million from the State and €18 million from Bord na Móna, and the lands will be restored using a wide array of engineering and ecology works to encourage and accelerate natural processes, the climate action plan says. Returning peatlands to a natural state will protect the existing storage of 100 million tonnes worth of carbon, while restoration will ensure that 3.3 million tonnes more of carbon will be stored in the bogs than would otherwise happen.

Work will be begin on restoring 4,400 hectares of protected raised bogs in the midlands, backed by €10 million of European Union funding that will seek to show to local people the benefits to be won from protecting the bogs. A seven-year project will also be launched to engage the community with the benefits of peatland restoration, while a Peatlands Knowledge Centre of Excellence will lay down best practices. Green industries will be encouraged across the midlands, including the creation of renewable energy hubs. Support for biomass and anaerobic digestion in the midlands through the Just Transition Fund is promised, too. Meanwhile, a major effort will be made to encourage opportunities to develop tourism, outdoor and recreation amenities, partly drawing on the region's green credentials created by the bogs.

- https://www.irishtimes.com/news/ireland/irish-news/midlands-bogs-to-be-restored-as-part-of-climate-strategy-1.4719713
- https://www.irishtimes.com/news/environment/midlands-to-receive-assistance-due-to-closure-of-power-stations-1.4719752
- https://www.agriland.ie/farming-news/workshops-taking-place-in-midlands-to-engage-communities-with-peatlands/

Lithuania

Lithuania to take up MoorFutures Carbon Standard

It is increasingly recognised that peatlands aren't valued enough. Despite the many gifts that healthy peatlands offer us, like the long-term storage and sequestration of carbon, water regulation and filtration, fire protection, spiritual and historic meaning, and unique biodiversity, they are largely degraded in many parts of the world. Creating an incentive for people to value these wetland ecosystems may be one of the most crucial tasks of this decade, especially when it comes to their vital role in mitigating climate change. That's why carbon projects such as MoorFutures have started to pop up across Europe and beyond.

MoorFutures is a German carbon certificate developed in 2010, which is based on the re-wetting of drained peatlands for carbon dioxide (CO_2) mitigation. As a customer of this certificate you can pay €64 to keep 1 tonne of carbon dioxide from the atmosphere. With this money peatland rewetting programs can take place. This particular carbon credit is currently being sold on the voluntary carbon market, for anyone who wants to offset their carbon footprint. The exciting thing is that rewetting peatlands can be so much more than carbon emission reductions; a good quality certificate like MoorFutures also brings back the peatland's other gifts, as mentioned at the start.

This year, Wetlands International Europe and the Michael Succow Foundation have supported the Foundation for Peatland Restoration and Conservation in the adaptation of this certificate for suitability in Lithuania. As part of this project, the MoorFutures standard and methodology has been translated into Lithuanian, a legal analysis has been carried out to make sure that the project is feasible, two pilot sites have been selected for the first

carbon projects, monitoring schemes have been set up for Greenhouse Gas Emissions Site Types (GEST), water level and biodiversity, webinars for local stakeholders have taken place, and a website has been launched.
The project comes at a crucial turning point in European policy, as the European Commission just launched the Carbon Farming initiative with the communication on Sustainable Carbon Cycles. In this EU communication peatlands were highlighted as one of the key carbon farming mechanisms. In fact, the MoorFutures methodology was widely mentioned in the Carbon Farming Study requested by the ENVI committee.
In the coming years, we look forward to seeing these two pilot sites restored to their boggy states, and for many more peatlands to be rewet across Lithuania. Furthermore, because of the similarities in peatlands across the Baltic states, there is a huge opportunity for replicating this project in other neighbouring countries like Latvia, Estonia and Belarus.

- https://europe.wetlands.org/news/https-europe-wetlands-org-news-lithuania-to-take-up-moorfutures-carbon-standard/
- https://www.succow-stiftung.de/en/peatland-climate/baltic-states-peatland-restoration-projects

Netherlands

Slowing down subsidence in government coalition agreement

The coalition agreement of the new Dutch government 'Looking out for each other, looking forward to the future' was presented on 15 December. The Platform Slappe Bodem (Platform Soft Soil, a cooperation of authorities, practitioners and knowledge institutes that works on awareness and agenda-setting of subsidence within various national, local and regional policy fields and agendas) is positive about the fact that soil subsidence is mentioned in the agreement. The coalition also wants to focus on water and soil as a guiding principle in spatial planning, climate adaptation and climate-proof new building. A national approach, as advocated by the platform, is not (yet) being discussed. Also, the approach to the peat meadows is not well reflected in the agreement, while attention is paid to innovation and alternative earning models for agriculture.
Much now depends on further elaboration and financing. The Platform gives the coalition the following advice:

- Subsidence is more than just the problem of foundations of buildings and the problem of foundations is more than just subsidence. A (too) strict linking of these themes would leave some of the villages, towns and home owners in the Netherlands out in the cold.
- The regional peat meadow strategies, with the climate objectives as the driving force, deserve a long-term vision and financing. In the peat meadow areas, measures to slow down subsidence and reduce greenhouse gas emissions have a major impact on residents and entrepreneurs. Therefore, a national long-term strategy is necessary, not forgetting the connection with built-up areas.
- Making towns and cities in the western and northern Netherlands climate-proof cannot be seen in isolation from combating subsidence. This requires investments in knowledge, innovation and sustainable soil subsidence-resistant measures, such as maintenance costs for infrastructure, sewers, bridges and viaducts. Regional and national roads and railways are also subsiding. With national targets and resources, this can be tackled (more) powerfully.
- Water and soil as a basis for climate-proof development is important to prevent the subsidence problems of the future. Here too, national targets and investments are needed.
- The Platform Slappe Bodem is convinced that we can only slow down subsidence together. Like the Association of Netherlands Municipalities (VNG), the Association of Water Boards (Unie van Waterschappen) and the Association of Provincial and Local Authorities (IPO), the Platform emphasises the importance of good cooperation between the national government and the decentralised authorities in order to jointly tackle the major social issues that are central to the coalition agreement. The Slack Soil Platform is keen to work with the government on a National Programme on Subsidence.

- https://slappebodem.nl/nieuws/304/aanknopingspunten-voor-remmen-bodemdaling-in-coalitieakkoord
- https://www.youtube.com/watch?v=Mzf9myQXBUc&t=2s

Switzerland

Millions for restoring the Gruère and Prédame bogs in the Jura

The canton of Jura has announced its intention to continue its work to revitalise its peat bogs of national importance, located between Saignelégier and Le Bémont, as well as at Le Prédame in Les Genevez. To this end, a budget of almost CHF 5.3 million will be set aside for La Gruère and a further CHF 1 million for Le Prédame. The Confederation and various foundations will cover the bulk of the costs, while the canton of Jura will finance the two projects to the tune of 287,000 and 250,000 francs respectively.

In both cases, the interventions should make it possible to "re-establish the hydrological and biological functions of these two currently degraded natural environments", notes the canton. The workers will fill in ditches and drains and build dykes with the aim to keep the water in the bog, which one has long wanted to to exploit the land. Earlier work was carried out between 2017 and 2018 at La Gruère. The new works concern an area of 15 hectares. They will be carried out in stages between 2022 and 2027. The 15 Jura bogs are all located in the Franches-Montagnes district. They represent just over 6% of the remaining bogs in the country.

- https://www.arcinfo.ch/articles/regions/jura-jura-bernois/jura-des-millions-pour-les-tourbieres-de-la-gruere-et-du-predame-1124474

Ditch blocking in 2018 to restore the natural dynamics of the bog. Photo: SP-Canton du Jura

United Kingdom

Department for Environment, Food and Rural Affairs written question – answered on 31st December 2021.

Baroness Fookes Deputy Chairman of Committees, Deputy Speaker (Lords):

To ask Her Majesty's Government what is the total acreage of peatland in England; and how many acres are used for the production of peat for horticultural purposes.

To ask Her Majesty's Government how much peat has been extracted from peatlands in England for horticultural purposes over the last five years for which statistics are available.

Lord Goldsmith of Richmond Park The Minister of State, Department for Environment, Food and Rural Affairs, Minister of State (Foreign, Commonwealth and Development Office):

Peat is extracted in England for, primarily, horticultural purposes. Commercial extraction in England is licensed on approximately 664 hectares of peatland, across 29 sites. Whilst this represents less than 1% of England's peatlands, extraction is a major source of carbon emissions, causes biodiversity loss and destroys habitats.

Industry data tells us that in 2020 alone, 2.2 million cubic metres of peat were sold in the UK, 70% of which was imported. Recent years have seen the development of a number of high-quality peat-free alternatives that are as effective as current peat-based options, many of which are much less damaging to the environment than using peat. We are therefore continuing to focus on reducing demand for peat in horticulture in England, to protect peatlands at home and abroad. We have published a full consultation on ending the use of peat, with our preferred option being to ban the sale of peat and peat containing products in the amateur sector by the end of this Parliament. We are also turbo-charging current levels of peatland restoration through the Nature for Climate Fund, which will aim to provide funding for the restoration of approximately 35,000ha of peatland by 2025. This represents a tripling of historical average annual restoration levels.

More information about our actions to protect and restore our vulnerable peatlands is available at these links to the consultation (https://www.gov.uk/government/consultations/ending-the-retail-sale-of-peat-in-horticulture-in-england-and-wales) and the England Peat Action Plan (England Peat Action Plan - GOV.UK (www.gov.uk). Relevant documents are also attached to this answer.

Peat in horticulture consultation (pdf, 190.1KB)

England Peat Action Plan (pdf, 2595.6KB)

- https://www.theyworkforyou.com/wrans/?id=2021-12-15.HL5011.h&p=24911

It's time to ditch 'festive' poinsettias and protect our peatlands.

The ubiquitous, peat-grown Christmas poinsettias are the ultimate symbol of our climate-trashing, nature-trashing consumer society. Over 8 million are sold in the UK every year but they will generally last just a few weeks, before their petals fall off and they get binned, along with their plastic pots and the precious peat that they were grown in.

It's a scandal that the government still allows our precious, carbon and wildlife-rich peatlands to be ravaged for an unnecessary horticultural purpose. For decades, they and the major retailers have promised to phase it out but in yet another government consultation on peat sales launched last week, they are proposing to allow industrial peat extraction to continue until the end of the decade. The consultation also suggests watering down the proposed 2024 ban on amateur usage of peat, with the introduction of a "bag charge" on peat and mandatory labelling.

- https://www.independent.co.uk/climate-change/opinion/peat-peatlands-poinsettia-carbon-b1983356.html
- https://feedlily.com/opinion-it39s-time-to-ditch-39festive39-poinsettias-and-protect-our-peatlands

Sales of peat for gardening to be banned in England and Wales from 2024

The sale of peat for use in domestic horticulture is to be banned in England and Wales from 2024, and for professional use by 2028, the government has said. The government set a voluntary target in 2011 for compost retailers to end sales of peat by 2020. But peat use fell by only 25% from 2011-2019 and increased by 9% in 2020 as Covid lockdowns boosted gardening as a hobby. However, the government consultation also contains measures that fall short of an outright ban, instead including an additional charge on the price of peat compost, or the provision of information on the environmental impact of peat at the point of sale. The government said it did not intend to ban the sale of plants in pots that contained peat and that its plans would not affect current licences for peat extraction. The environment minister Rebecca Pow said: "We are committed to bring forward the ban [on the sale of peat to gardeners] by the end of this parliament – that's an absolute commitment."

But conservationists said the government's consultation process on the ban has "set the bar too low", and have called for an immediate ban on all peat sales, peat extraction and peat imports to help address the worsening climate and biodiversity crises. Craig Bennett, of the Wildlife Trusts, said: "The government has been dithering

over this crucial issue for decades and the consultation on the use of peat by gardeners is long overdue. But it's a damp squib. "It refers to the damaging effects of peat extraction, but this activity is still allowed in England, which is absurd. We need an immediate ban on the use of peat by individuals and the wider horticulture industry and an immediate end to extracting peat." Alan Titchmarsh, Kate Bradbury and James Wong are among the high-profile gardeners who have backed a ban, and Monty Don has called peat in compost "environmental vandalism". Peat may become harder to buy in the UK in any case because most is imported from bogs in Ireland, where the state-backed company Bord na Móna ended all peat extraction in 2020, although its reserves are still being sold. Some big retailers of peat have implemented their own bans, including Dobbies and the Co-op in 2021, and B&Q by 2023.

Stuart Brooks advertising peat free compost. Photo: Hans Joosten.

In the UK the extraction of peat is primarily for horticultural usage, forming a key component of compost. But peatlands are increasingly being recognised as a vital carbon store, with the UK's peat bogs holding around 3 billion tonnes of carbon – or as much as the forests of the UK, Germany and France combined. Peatlands also help to store water, slowing surface-water run off and preventing soil erosion and flooding. They form rich ecosystems which support increasingly rare plants and animals. Despite their crucial role, just 13 per cent of the UK's peatlands are in good condition, and their degradation releases the carbon they have stored. In their current woeful state, peatlands in England emit around 10 million tonnes of CO_2 every year – around the same as the UK's industrial processes.

The government said: "By ending the retail sale of peat in horticulture, we will be protecting our vulnerable peatlands and helping to prevent climate change." Environment Minister Rebecca Pow said: "Our peatlands are an incredibly valuable natural resource. They play a crucial role in locking up carbon, provide habitats for wildlife and help with flood mitigation. "The amateur gardening sector has made huge strides in reducing peat use and there are now more sustainable and good quality peat-free alternatives available than at any other time, so I am confident now is the right time to make the shift permanent. "Today's consultation directly contributes towards the government's net zero carbon emissions target. The protection of our peatlands will also help us deliver on commitments in the 25 Year Environment Plan whilst also preserving these landscapes for future generations."

But Craig Bennett, the chief executive of The Wildlife Trusts described the consultation as a "damp squib", and called for an immediate outright ban. He said: "The UK government has been dithering over this crucial issue for decades and the consultation on the use of peat by gardeners is long overdue. But this consultation is a damp squib. It refers to amateur gardeners – but why not professional gardeners and the rest of the industry? It refers to the damaging effects of peat extraction – but this activity is still allowed in England which is absurd given the excellent alternatives to peat that are now available. "Peatlands are vital carbon-storing habitats and it's absolutely crucial that they remain intact for nature's sake and to help us tackle climate change. When a peatland is degraded or extracted from, it stops storing carbon and emits it instead. So it's vital that UK governments ensure peatlands function as nature intended by taking urgent action right now. "This means an immediate ban on the use of peat by individuals and the wider horticulture industry, an immediate end to extracting peat, and a ban on the import of peat in any form – right now."

- https://www.gov.uk/government/news/plans-to-phase-out-the-use-of-peat-in-the-amateur-horticulture-sector
- https://www.independent.co.uk/climate-change/news/peat-ban-horticulture-compost-carbon-b1979396.html
- https://ilandscapin.com/plans-to-phase-out-the-use-of-peat-in-the-amateur-horticulture-sector.html
- https://www.theguardian.com/environment/2021/dec/18/peat-sales-to-gardeners-in-england-and-wales-to-be-banned-by-2024

An open consultation to end the retail sale of peat for horticulture in England and Wales has been published by Defra on **18 December**. The document can be found at Consultation Ending the retail sale of peat in horticulture in England and Wales.pdf Views are invited by **18 March 2022**. Defra needs contributions on:

- measures to end the use of peat and peat containing products in retail horticulture
- views on each of the proposed measures and how they could operate
- any evidence you can provide on the impacts of ending the use of peat and peat containing products in the professional horticulture and wider sectors

https://consult.defra.gov.uk/soils-and-peatlands/endingtheretailsaleofpeatinhorticulture.

Northern Ireland peatlands plan to be finalised in 2022

The plan aims to restore peatland across NI so that it is able to take in rather than emit carbon.

- https://www.farmersjournal.ie/ni-peatlands-plan-to-be-finalised-in-2022-670140

Peatland restoration to play 'key role' in plans to reduce NI carbon emissions

Environment Minister Edwin Poots has visited the Peatland Pavilion at COP26 in Glasgow to see the "global significance" of peatlands in tackling climate change. The minister has noted the "critical role" that restoration of Northern Ireland's peatlands "to a healthy state will play in reversing carbon and biodiversity loss". A virtual Peatland Pavilion is also available for people to access, showcasing peatland projects from around the world, including Northern Ireland case studies. These include the Cooperation Across Borders for Biodiversity (CABB) and Collaborative Action for the Natural Network (CANN) projects, funded through the INTERREG VA programme, to restore important lowland raised and blanket bog sites; as well as the National Trust's restoration work on Divis and Black Mountain.

Restoration of Northern Ireland's peatlands "will be key to plans to address the climate and biodiversity crises, with peatland habitats and peat soils covering 18% of Northern Ireland". Minister Poots was invited to visit the Peatland Pavilion in Glasgow by John Martin, Northern Ireland head of policy and advocacy with the UK's largest nature conservation charity RSPB, who presented the findings of the RSPB 'Valuing our Peatlands' report at the pavilion. The minister said he was "delighted" to see the "importance of Northern Ireland's peatlands and some of our exemplar peatland restoration projects showcased on a global stage". "Peatland restoration will play a key role in our plans to reduce carbon emissions and lead to a low-carbon, high-nature future, as envisioned through the draft Green Growth Strategy, which I recently launched on behalf of the Northern Ireland Executive." The minister added that his department has also recently consulted on a draft Northern Ireland Peatland Strategy. "This strategy, which we hope to publish in the new year, will provide a framework for peatland conservation and restoration in Northern Ireland over the next two decades."

- https://www.agriland.ie/farming-news/peatland-restoration-to-play-key-role-in-plans-to-reduce-ni-carbon-emissions/

Major-peatland-restoration-carbon-capture-and-woodland-creation-scheme-announced/

On 20th December 2021, forestry investment fund manager PAR EQUITY ('Par') and Aviva Investors announced plans to deliver a significant woodland creation and peatland restoration scheme in the North-East of Scotland that aims to capture over 1.4 million tonnes of carbon. Par and Aviva Investors have established an investment vehicle which has acquired 6,300 hectares of moorland in the Glen Dye area of West Aberdeenshire as its first investment. Following detailed public and statutory consultation, applications will be made to undertake extensive peatland restoration work across c.1800 hectares and new planting over c.3000 hectares, including up to 1,000 hectares of productive conifer and 2,000 hectares of native woodland. The project will be designed, implemented and managed by Scottish Woodlands Ltd, one of the UK's leading forestry management organisations and undertaken over five years. It is expected to make a substantial contribution to both Scottish and UK forestry planting targets and forms part of Aviva Investors' Climate Transition Fund and commitment to achieving net zero across the entirety of its Real Assets platform by 2040.

- https://scottishbusinessnews.net/major-peatland-restoration-carbon-capture-and-woodland-creation-scheme-announced/

Green push to plant trees and restore peatlands drives soaring land prices in Scotland

Sites with 'natural capital' potential are attracting huge interest from environmental buyers and fetching as much as 40 per cent over the asking price. The value of land planted with commercial forestry has been rising steadily over the past five years, but now demand for rougher hill ground, traditionally considered to have limited uses, has risen significantly. And buyers are willing to pay a premium to get their hands on it. One recent "stand-out" example was a 72-hectare agricultural property with a mix of permanent pasture and rough grazing in Aberdeenshire, which was advertised for sale at offers over £875,000. It attracted multiple offers, sold very quickly and fetched way above the guide price – changing hands for almost £1.2 million. Property experts say aspirations to plant trees – both productive forestry and native woodlands – are one of the key factors driving the trend and attracting new entrants to the market. Carbon markets, which convert and monetise ecosystem services into recognised carbon credits, are also providing incentives. But consultants at real estate firm Bidwells believe investors are looking for more than just financial returns from land and seeking "responsible projects" – things they are proud to put their names to, that will help tackle the twin crises of climate change and loss of wildlife species. It is thought new appreciation of the countryside and nature, brought about during Covid-19 lockdowns, has also contributed.

National agency Forestry and Land Scotland (FLS) has announced a new acquisition strategy for buying land that can be used to help curb climate change. The new strategy will allow FLS to purchase land for plant commercial conifers or native woodlands, sites suitable for peatland restoration and areas that will enhance natural capital and other environmental benefits. But there are fears the new rush for poorer-quality sites could have unintended consequences and keep pushing property prices skyward. FLS chief executive Simon Hodgson said: "We are aware that only recently a parcel of poor hill land of just over 200 hectares, adjacent to one of our sites in Galloway, sold at a price which reflects a six-fold increase on value in about three years.

- https://www.scotsman.com/news/environment/green-push-to-plant-trees-and-restore-peatlands-drives-soaring-land-prices-in-scotland-3506352

Just 124 people own most of England's deep peat – its largest carbon store

A new report by Guy Shrubsole, environmental campaigner and author of Who Owns England?, has revealed that 60% of England's peatlands are owned by a small group of people. In the uplands, 249,000 hectares of peat are owned by 101 grouse moor estates, while 20 landowners oversee 43,706 hectares of lowland peat in the Fens, about one-third of the total, according to the analysis. Alongside large areas owned by the Duchy of Cornwall, Forestry Commission and the Ministry of Defence, just 124 landowners control more than 450,000 hectares of England's peat.

Shrubsole, a former policy and campaigns coordinator with Rewilding Britain, said: "England's single largest carbon store is owned by a vanishingly small number of landowners, whose mismanagement of this ecosystem by burning and draining it is currently adding to the climate disaster. "The public urgently needs to challenge these landowners to protect and restore our peatlands, so that they help fix climate breakdown rather than

making it worse. And the UK government must tighten its peatland-burning legislation, so that landowners can no longer set fire to our carbon."

"This monopolised system has emerged out of centuries of aristocratic ownership, with deeds passed along the generations for so long that some ownership has become indiscernible over time. Around 15 per cent of land in England and Wales remains unregistered today. And the other 85 per cent? With 24 million titles in the Land Registry, and each costing £3 to access, uncovering ownership of England and Wales alone would cost £72 million. Even this wouldn't be enough to truly uncover the mystery, explains Shrubsole, who says that titles are often divorced from maps – making it hard to match owners to their parcels of land. He believes this secrecy is by design. Ownership of land has traditionally been intertwined with power, and authorities wish to avoid "revealing how concentrated land ownership really is", he says.

River Etive blanket bog landscape, Scotland. Photo: Hans Joosten.

Over time, the public have become "alienated" from the land, says Shrubsole; a process starting as far back as the Highland Clearances and continuing with the erosion of rural rights of way. "We'll often hear landowners assure us that they're the custodians and have looked after it for centuries. But the land isn't in great shape now, and if we want to fix it, maybe we should all become custodians," he says. Shrubsole does add that not all landowners are wreaking havoc on the environment, with many already "doing plenty" for the environment.

Land campaigners remain divided on the issue of land reform, with opinions diverging on whether state, private or community ownership would be the best model for climate-friendly land management.

The government's own climate change advisers, the Climate Change Committee, recently expressed disappointment that the UK did not include a plan for agriculture or the management of land in its net zero strategy, noting in its assessment of the document that "a combined decarbonisation strategy for agriculture and land is needed urgently."

- https://www.bigissue.com/news/environment/why-a-handful-of-uk-landowners-hold-the-keys-to-the-climate-crisis/
- https://www.theguardian.com/environment/2021/nov/15/just-124-people-own-most-of-england-deep-peat-its-largest-carbon-store-aoe

Peat bog takes a small step towards world heritage status

A vast area of peat bog, lochs and pools in north Scotland is moving closer to being listed alongside the Grand Canyon and the Great Barrier Reef as a natural world heritage site. The Flow Country of Caithness and Sutherland successfully passed a technical evaluation stage last year to become the UK's official candidate for world heritage site inscription.

- https://www.thetimes.co.uk/article/peat-bog-takes-a-small-step-towards-world-heritage-status-6rhjpv372

Ditch reprofiling in the Flow Country. Photo: Hans Joosten.

Landowners who own a third of England make 'climate-friendly' carbon pledge

A group of organisations led by the National Trust, who own and manage a third of England's land, have signed a pact to make their grounds more climate-friendly by boosting peat bogs, woodlands and rivers. Forests and peatland absorb large amounts of carbon dioxide while measures to reconnect rivers and slow down their flow, for example by making them more bendy, can help prevent flooding and coastal erosion. Other signatories to the pledge include the RSPB, the National Association for Areas of Outstanding Natural Beauty (NAAONBs), Church Commissioners for England, the Duchy of Cornwall, National Parks England, Soil Association, The Wildlife Trusts and Woodland Trust.

Managing more than 10.5 million acres of countryside, these groups have have pledged to cut emissions, create and restore habitats for wildlife and carbon storage, and work with local communities to care for landscapes and deliver benefits for people. The pact also stresses the importance of actively cutting emissions through shifting towards renewable energy, using electric vehicles, cutting agricultural pollution and making buildings more energy-efficient. As part of the pact, Prince Charles' Duchy of Cornwall estate, which owns 550 square kilometres of land in Cornwall, Devon, Herefordshire, Somerset and the Isles of Scilly, has pledged to enhance biodiversity across its estates by 30 per cent by 2030. Meanwhile Yorkshire Water said it will to cut 'operational emissions' to net zero by 2030 and plant a million trees in the county by 2028. Targets also include pledges by the NAAONBs to create and restore at least 100,000 hectares of wildlife-rich habitat outside protected areas and plant or regenerate 36,000 hectares of woodland as part of their efforts. The National Trust aims to be net zero and plant and establish 20 million trees by 2030, and the national parks are developing an action programme with moves to reduce emissions and adapt to climate change on a landscape scale. In England, the Government has ambitions

to scale up woodland creation and protect thousands of acres of peatland to reduce climate emissions, and to protect 30 per cent of the country's land by 2030.

- https://inews.co.uk/news/environment/landowners-third-england-climate-friendly-carbon-pledge-1323805

Path clear for construction to start on Strathy South Wind Farm after Ministers give go-ahead to taller turbines

A bid by power company SSE Renewables to increase by 65m the height of turbines on its planned Strathy South wind farm has succeeded. Scottish Ministers have agreed to grant a variation to the existing planning consent, allowing the height to be raised from the initial proposed 135m to 200m, which will make the turbines the tallest in the area. SSE Renewables has welcomed the decision, with project manager Jon Soal saying it reflected the "incredible levels of support" for the development from the local community. Construction is now expected to begin next year.

Strathy South is located to the south of SSE Renewables' operational Strathy North Wind Farm, approximately 12km to the south of Strathy. SSE Renewables gained consent for a 39-turbine scheme in 2018 following a public inquiry. A fresh application was lodged in September 2020 seeking permission to vary the heights and also to make changes to access tracks to avoid areas of deep peat. Highland Council agreed in June 2021 not to object to the revisions but said its support was subject to four turbines being removed, which it was felt would alleviate the visual impact. SE Renewables agreed to reduce the turbine numbers to 35. The scheme will have a generating capacity of up to 208mw.

Strathy South has widespread local support with three north coast community councils in favour - Strathy and Armadale; Bettyhill, Strathnaver and Altnaharra; and Melvich. When Highland Council met to decide it stance on the higher turbines, a number of local people showed their backing for the development by holding placards stating that the wind farm would create local jobs, aid peatland restoration and provide community benefit funds.

Windmills in the Flow Country, Scotland. Photo: Hans Joosten.

IUCN UK Peatland Programme Conference 2021 recordings now available

The 2021 IUCN UK Peatland Programme conference 'Peatlands in Partnership: a road to recovery' took place as a virtual event in September over four days and attracted over 470 delegates from across the globe. This year's

theme brought a focus on peatlands and the people behind them, exploring peatland conversation, restoration and sustainable management in action as well as the partnerships, evidence, policy and practice driving progress towards the UK Peatland Strategy goals. Each session is now available to watch online here and registered delegates can access the conference platform until March 2022. Our 11th annual conference was delivered in partnership with Pennine PeatLIFE, led by the North Pennines Area of Outstanding Natural Beauty (AONB) Partnership in collaboration with Yorkshire Wildlife Trust and Forest of Bowland AONB Partnership, and Moors for the Future Partnership's MoorLIFE2020 project. Read more...

Peatland Code update

The Peatland Code now has 48 Projects registered with a total of almost 8000 ha of peatland restoration. Of these 48 projects, 8 are validated with a total of around 900 ha and 167,442 tonnes of CO_2e emission reductions over their project lifetimes. Another 27 projects are undergoing validation right now and at least 2500 PIU's ((a PIU, or 'Pending Issuance Unit', is effectively a 'promise to deliver' a Peatland Carbon Unit in the future) have been sold so far. Read more...

Pennine PeatLIFE presents PeatLIFE People: A film by Land & Sky Media

At the September IUCN UK Peatland Programme/LIFE conference film night, the North Pennines AONB Partnership launched its new film, PeatLIFE People. The Pennine PeatLIFE staff team worked with Land & Sky Media to create this documentary style film for the conference. Completing the filming in August this film was provided at no cost as part of the Land & Sky effort to support worthy environmental projects. Read more...

British Trust for Ornithology (BTO): Climate change and UK birds – a focus on peatlands

In early November, the British Trust for Ornithology (BTO) launched a new report on the impacts of climate change on UK birds. James Pearce-Higgins; Director of Science (BTO) provides a peatland-focused overview of the report. Read more...

Peatlands Gathering 2021 recordings

The first Peatlands Gathering welcomed all who are interested in peatlands: community groups, farmers, land managers, forestry groups, peat producers, academics, public representatives, policy makers and the general public. Each session is now available to watch online. Learn more...

John Muir Trust has reiterated its objection to plans for a large wind farm on Shetland peatlands

The John Muir Trust (JMT) acknowledged that the developer recently downscaled the size of the planned wind farm on Shetland from 23 to 18 turbines but it maintained that the "ecological harm" created "would be nationally significant".The organisation urges the Scottish Government's Energy Consents Unit to refuse the Energy Isles proposal and uphold national policies created to protect peatlands. Meanwhile, the Scottish Environment Protection Agency (SEPA) has confirmed that following a number of meetings with the developer it has removed its objection "in principle". A decision whether to grant the Statkraft-owned 126MW wind farm proposal planning consent is now expected in 2022 after Shetland Islands Council, a statutory consultee, requested more time to respond. Because the project at 126MW size is larger than 50MW it will be decided by the Scottish Government rather than on a local authority level.

John Muir Trust points out that the habitat restoration measures proposed by the developer "do not make up for the overall expected loss of priority peatland habitats". Peatlands are important carbon stores and are increasingly recognised as one of Scotland's main assets in mitigating against climate change, and many scientists are now advising against building wind farms on peatlands. Quoting Energy Isles' own documentation, JMT's senior policy officer Rosie Simpson points out that most of the wind farm would be built on deep peat – up to a maximum depth of more than six metres – with over 200,000 m^3 of the carbon rich soil expected to be removed and displaced during construction. The construction of the wind farm is estimated to release 39,351 tonnes of CO_2 equivalent (tCO_2e), while a further 57,617 tCO_2e is expected be emitted during operation – however only a fraction of that is set to be compensated for through restoration measures. She is also highly critical of the developer's updated habitat management plan which proposes compensatory measures "through offsite

restoration management elsewhere on Shetland". Simpson wrote: "This will not be offset by the expected gains of 'carbon fixing' through peatland restoration which are estimated at 7,072 tCO_2e." Describing peatlands as an "irreplaceable habitat" she questions whether any compensatory measure could mitigate the harm that would be caused and continues by saying that Shetland Amenity Trust confirmed in its own objection that "recreating active blanket bog is very difficult". She added that the proposal of building a wind farm in a remote corner of Yell was "at odds" with national policy directions which prioritise "re-powering, extensions and development on brownfield sites". In her objection letter, logged with the Energy Consents Unit on 28 October, Simpson concludes: "Weighed in the balance of the national importance of priority peatlands habitats as stronghold for biodiversity and as stores of carbon, the carbon releasing and ecological harm that would result from this proposed development would be national significant. "We maintain our objection and urge decision makers to refuse permission."

Meanwhile SEPA said it had made a climate change commitment to protect and enhance natural carbon sinks and keep stored carbon where it is, but felt that Energy Isles had made sufficient changes to its plans that would allow it to remove its objection. A spokesperson said: "Until we have received more information on exactly how these changes will be done and the off-site mitigation, we retain an objection around the level of information provided. We will continue to engage with the applicant on these issues. "Renewable energy is an essential component in achieving climate change targets and we are supportive, where possible, of such projects. "As a key agency in the land use planning process in Scotland we will continue to work constructively with the applicant to consider any amendments to the scheme that would avoid unnecessary carbon emissions and achieve positive gains for both carbon balance and nature."

Speaking in response to concern from Shetland Amenity Trust on the peatland impact, Energy Isles Limited director Derek Jamieson said: "Renewable energy must be part of the strategic fight against climate change and reduction of carbon emissions. "That is why our proposals have evolved to ensure that the Energy Isles Wind Farm is the correct size to contribute to renewable energy and why we have submitted a robust peat management plan that will not only minimise the impact on the site itself but regenerate vital carpet bog areas elsewhere as well for a net gain in the amount of quality peatland here in Shetland."

- https://www.shetnews.co.uk/2021/11/08/wild-land-charity-objects-to-yell-wind-farm-plans/

Collapsed in five years with 50 million tons of carbon emitted, according to satellite mapping survey

THE UK has emitted around 50 million tonnes of carbon in the last five years from 'collapsing' peatlands. This has been revealed ahead of the start of the COP26 Climate Change Conference in Glasgow. Environmental monitoring specialists Terra Motion mapped the surface motion of all peatland areas across England, Wales, Scotland and Northern Ireland and, from the 2.2 million hectares of the UK surveyed, the results showed that some 19 per cent have collapsed by more than 2.5cm since 2016. The map was generated from the analysis of five years' worth of radar images from the European Sentinel-1 satellite. Thousands of images were processed using Terra Motion's APSIS technology which is uniquely able to work over vegetated and natural surfaces, to generate land motion measurements across the country. The data has been analysed by studies led by the University of Nottingham and the Environmental Research Institute, Thurso.

Andrew Sowter, Director at Terra Motion, who discussed these findings at COP26 on 11 November 2021, said: "This is the first time that such an extensive survey has been performed across the UK and it shows that significant areas of peatlands are collapsing across the country, a likely sign of extensive damage. "From the 2.2 million hectares of the UK surveyed, some 19 per cent have collapsed by more than 2.5cm over five years. Assuming that this collapse is an indication of active erosion or oxidation, we estimate that, as a whole, the UK peatlands surveyed were emitting around 10 million tonnes of carbon (CO_2 equivalent) per year during 2016-21."

The Government has committed the UK to net zero by 2050 but restoration of these peatlands would help it to meet its ambitious targets to reduce its emissions by 78 per cent by 2035 according to Mr Sowter.

However, Mr Sowter says that targets will not be met without the considerable support of private investment. He estimates that the economic potential of UK peatland restoration could be worth over £500 million per year. This means that corporate companies and carbon offsetting organisations can invest in helping landowners restore peatlands and, in return, they receive 'carbon credits'.

Businesses can buy 'carbon credits' to compensate for the emissions that they been unable to eliminate themselves. It has been reported that the voluntary carbon market will have to expand 15-fold by 2030 and 100-fold in order for the UK to achieve net zero by 2050.

"Using the emission figures from the Terra Motion survey and an approximate current commercial value of carbon of around £50 per tonne CO_2e, we estimate that the economic potential of UK peatland restoration could be worth over £500 million per year," said Mr Sowter. "Using an estimate of £1,000 per hectare for total restoration costs, we conclude that with an appropriate carbon offsetting scheme, any actual costs of a restoration project could be recovered in the first year of operation, making investing in peatlands restoration a highly lucrative proposition.

"Peatland restoration is a nature-based solution which brings with it other co-benefits such as improved biodiversity and water quality, as well as the promise of increasing job opportunities in rural areas, which also have significant economic benefits to landowners and local communities."Dianna Kopansky Programme Management Officer and Global Peatlands Initiative Coordinator at UNEP, said: "Linking up to raise awareness of the potential of healthy peatlands for climate action, nature protection and our overall well-being is vital.

"The cutting-edge work carried out by Terra Motion clearly shows that UK peatlands are rapidly degrading and that their restoration makes economic and climate sense. Sharing and learning from novel techniques shows that together we can highlight the importance and opportunity of peatlands restoration to help us address the climate and nature emergency."

- https://businessmanchester.co.uk/2021/11/12/collapsed-in-five-years-with-50-millon-tonnes-of-carbon-emitted-says-satellite-mapping-survey/
- https://www.express.co.uk/news/science/1515978/uk-carbon-emissions-map-satellite-pictures-peatlands-co2-climate-change-terra-motion
- https://www.terramotion.co.uk/carbonpotentialmapgp3

Peatlands: The race to protect NI's valuable ecosystems

About 18% of Northern Ireland is covered by peatland, with semi-natural peatland covering about 12%, according to the Department of Agriculture, Environment and Rural Affairs (Daera). The department says that even though semi-natural peatlands cover just 12% of land, they account for 53% of the soil carbon pool, highlighting their environmental importance. Daera recently ran a 12-week public consultation into its Peatlands Strategy, which

will provide a framework for conserving and restoring semi-natural peatlands. It sets out the actions the department considers necessary to ensure that they can survive as functioning ecosystems. These include:

- Ensuring that, by 2040, all peatlands supporting semi-natural vegetation are being managed for their peatland biodiversity and ecosystem function
- Ensuring that, by 2030, degraded peatland habitats are prioritised for restoration to favourable conservation status

Projects are already taking place in Northern Ireland to help these restoration efforts.

At the COP26 climate gathering in Glasgow, Environment Minister Edwin Poots said restoring peatlands would play a key role in plans to reduce carbon emissions and lead to a low carbon, high nature future, as envisaged in the Northern Ireland's Executive's draft Green Growth Strategy, released in October.

Graeme Swindles, professor of geography at the School of Natural and Built Environment, Queen's University Belfast, argues that "healthy peatlands could have a hugely positive impact on our climate targets". "An ambitious programme to restore the peatlands can accelerate our pursuit to reach the UK target of net zero emissions by 2050, while helping us to meet our biodiversity targets" he says.

- https://www.bbc.com/news/uk-northern-ireland-59150915
- https://farmweek.com/poots-cites-crucial-role-of-peatland/

Scotch rocket site approved by government despite fears it will destroy precious peat bogs

A spaceport in the Highlands was approved by the Scottish Government despite fears that it will destroy precious bogs storing 400million tons of carbon. The £17.3million rocket launch site in the Highlands is set to send small satellites into space by late 2022. But environmentalists raised serious concerns that the development could lead to the destruction of Europe's largest blanket peat bog, in Sutherland's Flow Country. And a report drafted by a team of researchers in 2019 investigating the Sutherland development stated: "The damage caused by the construction and operation of the spaceport will lead to the further destruction of this Highland wild land."

The spaceport in A'Mhòine is expected to create 61 local jobs and 250 more across the region, with 12 rocket launches planned each year. Scotland's space industry has the potential to add £4billion to the economy and create 20,000 jobs by 2030, according to a Government report published November 2021 and a Strategy for Space in Scotland was unveiled by business minister Ivan McKee in an online event at the Expo 2020 Dubai trade show. It claims there is an opportunity to create a network of sites giving Scotland the greatest capacity to launch spacecraft in Europe.

- https://www.dailyrecord.co.uk/news/scottish-news/scots-rocket-site-approved-government-25397868

North America

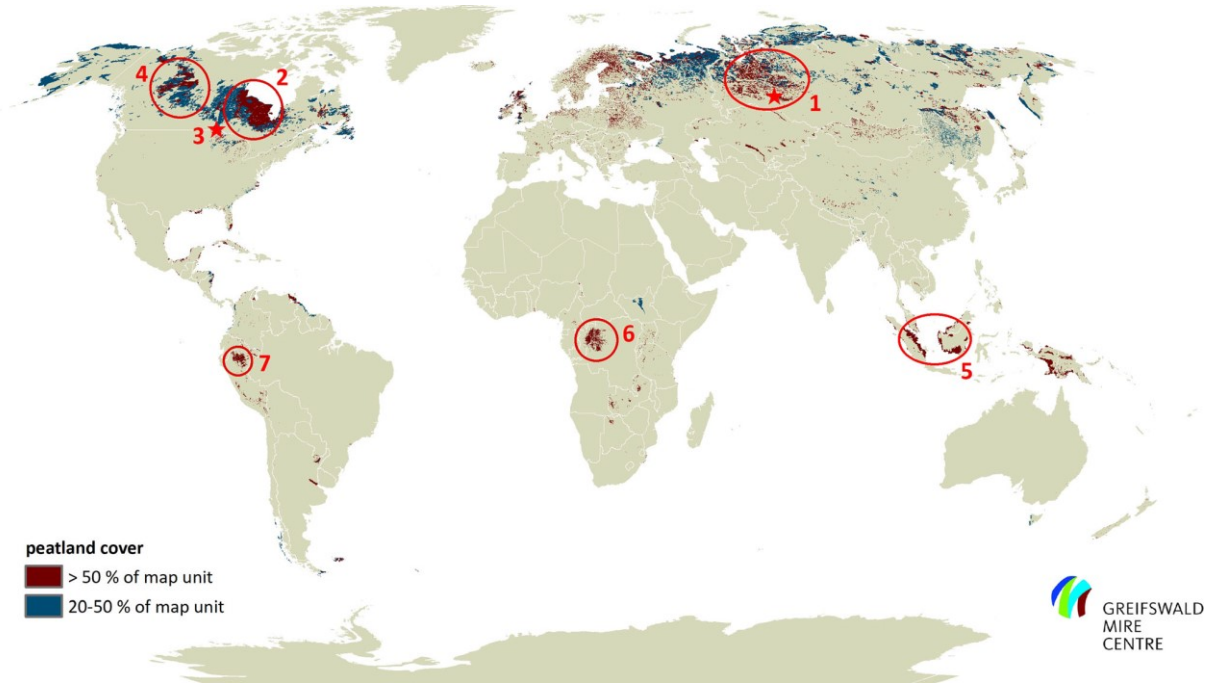
Canada

N.W.T. peatlands store 24 billion tonnes of carbon and are worth protecting, experts say

The Northwest Territories (N.W.T.) is home to nearly one-fifth of Canada's peatlands, according to Lorna Harris, a postdoctoral fellow and ecosystem scientist at the University of Albert. Peatlands cover about 230,000 square kilometres of land in the N.W.T. and they store 24 billion tonnes of carbon. "It is a large portion in the N.W.T., relative to some other provinces," she said, noting that the Mackenzie River basin, stretching from northern Alberta to the N.W.T., is the second largest expanse of peatland in Canada next to the Hudson Bay Lowlands.

A World Wildlife Fund-Canada (WWF) study unveiled at the Conference of the Parties (COP26) said Canada stores more than a quarter of the world's soil carbon, and suggests keeping that carbon in the ground — so it doesn't further exacerbates global warming —is key to the country's climate efforts.

Harris, the lead author of a separate study published recently in Frontiers in Ecology and the Environment, concludes the biggest threats to northern peatlands are human activities like mining, logging and agriculture, as well as wildfire and permafrost thaw.



Global peatland distribution with the location of the 'big bog basins' (red circles) and the 'principle patterned peatlands' (stars). (1) West Siberian Plain with Great Vasugan Mire, (2) Hudson Bay Lowland, (3) Red Lake Peatlands, (4) Mackenzie River Basin, (5) Sundaland, (6) Cuvette Centrale, (7) Pastaza-Marañon. (From: Kirpotin et al. 2021 Ambio 50: 2040).

Steven Nitah, a senior advisor to the Indigenous Leadership Initiative and one of lead negotiators in the establishment of the Thaidene Nëné Indigenous Protected Area, said parts of the N.W.T., like its peatlands, are "globally significant" and "provide a nature service that's definitely required to give us a fighting chance" in the face of climate change. He said the first thing that needs to be done is to identify those important areas and to work across levels of government — Indigenous, territorial and

The federal government has committed to protecting or conserving 25 per cent of Canada's land by 2025 and working toward protecting 30 per cent by 2030, as part of the country's efforts to fight climate change and defend vulnerable species and ecosystems. Nitah said Canada has protected about 15 per cent of its land so far and that the N.W.T. can continue to demonstrate itself as a leader in Indigenous land protection and management by identifying the right areas for protection as the federal government works toward that goal.

Another solution for protecting peatlands, highlighted by both Harris and Nitah, would be for the carbon offset market to place a value on their capacity to store carbon. "You can go in and damage a peatland and then, any reduction in that damage is considered an offset," said Harris, of the current offset system. "Whereas just leaving the peatland alone, without it being at risk of any damage, there's no real value given to that." Harris said it's dangerous to only put value on carbon when it's part of a restoration activity for damage that's already being done, especially when it comes to peatlands. She also described the carbon stored in peatlands as being "irrecoverable" because it would take roughly 1,000 years for one metre of peatlands to re-accumulate, if it were to be stripped away. "Restoring them now is not going to gain enough carbon that was lost from the damage that was caused," she explained. Putting a value on the carbon service provided by the natural environment could also help fund land protection and management programs in the N.W.T., said Nitah, who pointed out the territory doesn't have a big enough tax base to fund such projects on its own. "The responsibility for management certainly is within the Canadian jurisdiction, but the responsibility for paying for it should be global," he said.

Funding from the carbon offset market could be used for wildfire management practices like vegetation management, said Nitah, which is sometimes also called forest thinning. Nitah said it's something Indigenous people have traditionally done to clean the forest floor, to reduce the amount of fuel that a wildfire can burn and to increase biodiversity. Wildfires are becoming more frequent and more severe because of the world's changing climate, and they release carbon that is stored in the trees that are burned — but they can also damage the

peatlands below. Harris said if peat is dry at the surface of the ground, it too will burn. "I think up to a metre has been lost in some peatlands here in Western Canada," she said. Peat fires are notoriously difficult to fight: they are especially smoky, and they can burrow underground, re-emerging days or even months after they appear to have been put out. Harris said fire can also speed up the rate of permafrost thaw, which releases even more carbon into the atmosphere. Harris said the N.W.T. government has a "big role to play" in protecting peatlands, because decisions about mining development, oil and gas exploration and forestry are made at the territorial level. "They should really be developing some kind of management plan for peatlands, or a land-use plan, identifying where … the peatlands are in the region, where they can protect the peatlands, [and] where they can restore peatlands as well." Harris also wants to see the federal government increase research funding and implement a national peatland strategy that outlines a set of goals and targets to help guide provinces and territories in their individual decision-making processes. A main objective, she said, should be not to dig up peatlands or remove the peat that's inside them. "Just leave it in place," she said.

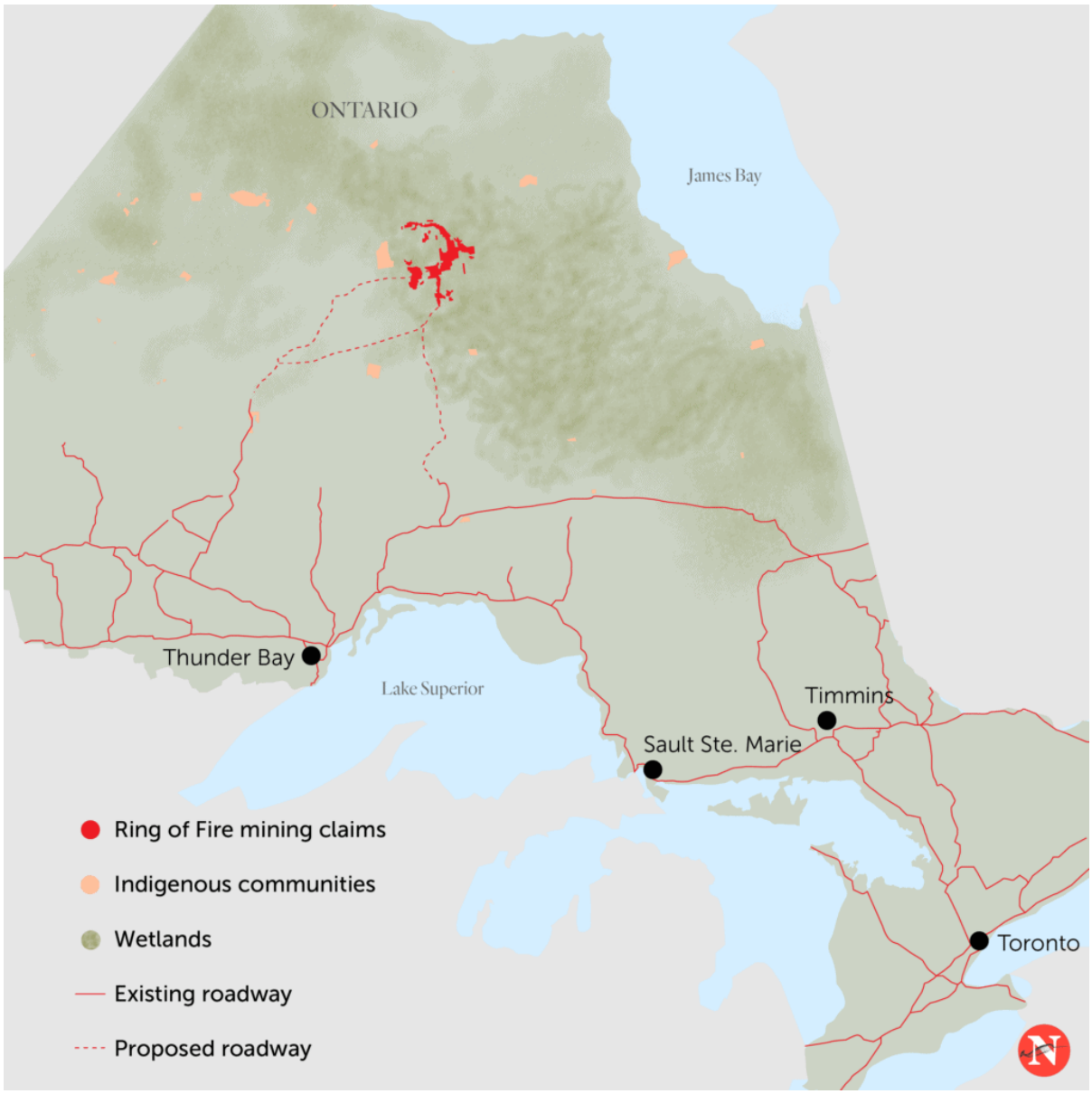
- https://www.cbc.ca/news/canada/north/peatlands-nwt-carbon-protection-1.6273262
- https://www.cbc.ca/news/canada/north/nwt-peatlands-carbon-action-1.6275869

Miners competing over Ontario's Ring of Fire

Beneath the peat of the James Bay lowlands, about 540 kilometres northeast of Thunder Bay, lie mineral deposits at the heart of a bidding war between two Australian mining giants. Wyloo Metals and BHP are facing off to gain control of Canadian junior mining firm Noront Resources. At stake are the nickel deposits in the Ring of Fire that Noront controls — a key component of electric vehicle batteries, and a resource miners are rushing to secure ahead of a forecasted burst of demand. Both companies are aiming for a climate-conscious image amid a global shift to clean technology, and could define the Ring of Fire's future as they do it. And both BHP and the billionaire backing Wyloo Metals, Andrew "Twiggy" Forrest, say if they succeed in the takeover, they plan to forge relationships with the First Nations who live in the region. But each also has a history of contentious relationships with Indigenous people in Australia. For now, BHP is outgunning Wyloo in the takeover battle, and the two have entered discussions to hash out whether Wyloo, already part-owner of Noront, will back BHP's bid. It's the latest development in a long-running saga about environmentally-sensitive land that might make miners billions of dollars — or not much at all.

For more than a decade, governments and mining companies have been pushing to drill below the peatlands of the Ring of Fire, which was named after the shape of the deposits and a Johnny Cash song. Mining companies first discovered minerals there in 2007, sparking a frenzy as they sought to stake claims. At first the rush revolved around chromite, a key material used to make stainless steel. But as global demand for chromite has dropped, focus in the region has turned to a nickel deposit at a proposed mine called Eagle's Nest where Noront owns mining rights, as it does in 85 per cent of the Ring of Fire. Miners — 18 companies and individuals — hold over 13,000 active claims in the region.

In past years, governments have claimed the deposits in the Ring of Fire could be worth $60 billion. But much of that total is based on what amounts to an educated guess, as the Globe and Mail reported in 2019, calling such speculation "aspirational hogwash." It's also unclear whether the profits would be enough to justify the cost of getting the nickel out of the ground, considering the impacts of mining such a sensitive landscape. Reaching the Ring of Fire is not simple as there are no permanent roads to the area. Peatland is boggy and difficult to build on. The road would cost an estimated $1.6 billion, which no level of government has committed to fully funding, and Ottawa is conducting several impact assessments that are expected to take years. Miners have also spent $278 million on exploration in the area. Even so, Ontario Premier Doug Ford has promised to make it happen, famously pledging to build access roads "if I have to hop on a bulldozer myself." Ford hasn't jumped on any construction equipment yet, but on Nov. 12, Energy, Northern Development and Mines Minister Greg Rickford, who once sat on Noront's board of directors, said that the government is making progress, "more than any other government has done in a couple of decades." "It's clear our plan for building Ontario is working," he added.



A map of the Ring of Fire and the routes of proposed access roads. Map: Carol Linnitt / The Narwhal

In October, Neskantaga First Nation, alongside the Environmental Justice and Sustainability Clinic at York University's Osgoode Hall, asked Ontario's auditor general to investigate the provincial government's spending in the Ring of Fire. Their position is that the public deserves answers about how and why the province is financially supporting mining claims that do not have consent from all of the affected First Nations.

Northern Ontario's peatlands store an enormous amount of carbon — an estimated 35 billion tonnes. Damaging the sensitive ecosystem would destroy crucial wildlife habitat, and drastically hamper the fight against climate change. It could also cause harm downstream and on the coast of James Bay.

The relatively-untouched muskeg is part of Treaty 9, and home to more than a dozen Indigenous communities who have lived there since time immemorial. Many are coping with overlapping crises with poverty, boil water advisories, soaring food prices and youth suicides. Some support development in the region — Marten Falls and Webequie First Nations, for example, have backed efforts to build access roads and get mining projects started.

Marten Falls is seeking partnerships that will help improve the community's quality of life, Chief Bruce Achneepineskum said in a phone interview. "There's a lack of growth in the community and a lack of infrastructure," he said. "These are systemic issues that we're talking about. Why can't youth be supported in these kinds of essential things that our forefathers had envisioned when they signed the treaty?"

Others have deep concerns about whether the approval process for road and mining proposals is enough to assess potential risks in the region, and want to see greater priority given to First Nations decision-making. In April 2021, Attawapiskat, Fort Albany and Neskantaga First Nations declared a moratorium on all development in the Ring of Fire. “We have a profound and sacred duty to ensure that this part of the Earth is not so wounded from Ring of Fire development that it can no longer support our relations and ways of life, or help protect the world from catastrophic climate change,” they wrote in a statement.

Another concern is that previous mining projects in the Far North — though outside the Ring of Fire — didn’t deliver the prosperity they promised, said Mike Koostachin, director of Friends of the Attawapiskat River, a coalition of local community members and environmentalists from across Ontario. Attawapiskat First Nation is near the now-closed Victor diamond mine owned by De Beers, which pleaded guilty to failing to report data on mercury levels in local waterways (the company has said that although it didn’t disclose the results, it did take samples and mercury levels were within the approved range). In 2013, amid complaints from the nation about whether the economic benefits of the mine were helping the community, a group from Attawapiskat blockaded the road to the mine. And in 2016, the community experienced a devastating suicide crisis, another sign that any returns from the mine hadn’t been enough to counteract the effects of colonialism. “There was no benefit in the end,” Koostachin said in an interview.

- https://thenarwhal.ca/ring-of-fire-noront-bhp-wyloo/
- http://www.garthlenz.com/ring-of-fire (pictures)
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Could an Indigenous conservation area in Hudson Bay also be the key to saving carbon-rich peatlands?

The Mushkegowuk Council has been pushing to protect the area in northern Ontario — a major carbon sink the size of Portugal — for decades. Lawrence Martin can’t put a date on when he first heard community Elders call for conservation efforts in James Bay and Hudson Bay — but the interest goes as far back as he can remember.

Martin is the marine region manager for a new conservation project spearheaded by the Mushkegowuk Council, which represents seven First Nations in the Hudson Bay Lowlands in northern Ontario. He says Elders have been encouraging an initiative like this for decades. “They wanted to conserve the millions and millions of migratory birds that come up here. They see the seals, the belugas, the walruses, the polar bears roaming around. And as climate change happens, you see a lot of these animals coming inland.”

Northern Ontario’s James Bay and Hudson Bay — known in western Cree as Weeneebeg and Washaybeyoh — are 800-plus kilometres north of Toronto at their most southerly point, and unconnected to the rest of the province by road. The coastline and adjacent wetlands have long been understood as a globally significant site of migration and breeding for hundreds of bird species, and dozens of species at risk. The Mushkegowuk Council has resolutions on record from as early as the 1980s, calling for the creation of a Tribal Conservation Authority to manage this critical ecosystem. In the last two years, it seems, the stars have aligned.

In August, the Mushkegowuk Council signed a memorandum of understanding with Parks Canada to establish a National Marine Conservation Area in James Bay and southwestern Hudson Bay. At more than 90,000 square kilometres — an area roughly the size of Portugal — the conservation area would be the largest in Ontario and second largest in the country, after Nunavut’s Tallurutiup Imanga.

The project is precedent-setting in Ontario. Not only has it been driven by Mushkegowuk community members and leadership from the very start, but community members and federal government representatives have come to the table with a mutual interest in establishing the conservation area. “When the government and Crown of the day created the Chapleau Game Preserve or Polar Bear Provincial Park, they didn’t come to us,” then-Grand Chief Jonathan Solomon said at the signing of the memorandum, referencing land designations made in central and northern Ontario in the 1920s and 1980s, respectively, with little or no consultation with local Indigenous nations. Chapleau Game Preserve, in particular, stripped local First Nations of their right to hunt, trap and fish in the area. “This time, it’s different,” Solomon continued. “We will drive that process. We will determine the future of our waters, of the shores, of the bays.”

In 2019, the council reopened the discussion around conservation after hearing of the Grand Council of the Crees’ plans to create a protected area on the Quebec side of James Bay. It didn’t make sense to protect just one side

of the bay, says Vern Cheechoo, director of lands and resources at the Mushkegowuk Council. “The current comes from the west coast of Hudson Bay, James Bay and then goes up the east side. So whatever happens on the west side could be felt on the east.”

Establishing a marine conservation area on the west coast of James Bay would not only provide a protected habitat for vulnerable species, but give them greater opportunity to replenish wildlife populations that could go on to live elsewhere in the bay. The benefits would spread outwards, beyond the boundaries of the conservation area itself and into the adjacent rivers and wetlands — part of the world’s largest peatland complex, an underappreciated ecosystem composed of partially decomposed plant matter that builds up over centuries.

Known to the Omushkego as ‘The Breathing Lands,’ the peatlands serve as a crucial carbon store — containing more than 35 billion tonnes of carbon, and sequestering an additional 6 million tonnes, equivalent to taking nearly 6.5 million cars off the road, each year. The peatlands in the Hudson Bay Lowlands can contain up to five times as much carbon as the Amazon rainforest per square metre. And this ecosystem is directly impacted by any changes that take place in the bay.

The proposed boundaries of the marine protected area trace the shoreline from the southern tip of James Bay at the border of Ontario and Quebec, skirting past Polar Bear Provincial Park at its mouth, and north to the Manitoba border on Hudson Bay.

During the feasibility assessment, the proposed boundaries for the marine conservation area could be altered. This is where the Mushkegowuk Council faces one of its greatest challenges — or opportunities. The siloed Canadian approach to conservation gives the federal government jurisdiction over James Bay and Hudson Bay, and the Ontario government has jurisdiction over the adjacent peatlands. This worldview diverges significantly from that of the Omushkego organizers, for whom there is no division between the land and water: they’re part of the same system and thus need to be protected holistically. Waterways flow from the peatlands and rivers into the bay, and animals travel between the two freely. “The Elders talk about the otters — you don’t see the otter swimming up the river, but all of a sudden, they appear way inland, because there are water systems in the Muskeg, in the peatlands, that the otters use to get up into other parts of the area,” Martin says. The result is a landscape that can’t be divided, where what happens upstream impacts habitats, biodiversity and human life downstream, and vice-versa. Leaving the peatlands unprotected while conserving the bay leaves them open to the impacts of industry, risking wildlife and water — and vast stores of carbon.

- https://thenarwhal.ca/james-bay-hudson-bay-lowlands-mushkegowuk/

Ducks Unlimited Canada poised to help deliver on COP26 climate commitments

Now that COP26 has come to a close, work must begin on implementing the plans agreed upon by world leaders in the newly minted Glasgow Climate Pact. Here in Canada, the country’s leading conservation organization has a running start. Ducks Unlimited Canada’s (DUC) well-established work in key, carbon-rich landscapes is delivering the kind of nature-based solutions needed to achieve the goal of limiting global temperature rise to 1.5 degrees Celsius. Section four of the pact recognizes the need for mitigation and emphasizes the importance of “protecting, conserving and restoring nature and ecosystems … including through forests and other terrestrial and marine ecosystems acting as sinks and reservoirs of greenhouse gases and by protecting biodiversity while ensuring social and environmental safeguards.”

DUC is well-poised to answer this call. Earlier in 2021, DUC was the largest recipient in the first round of funding from the Government of Canada’s new Nature Smart Climate Solutions Fund. The organization will receive $39.2 million to conserve and restore wetlands and grasslands across Canada. “Climate mitigation and adaptation is now a core element of our habitat conservation programming,” says Larry Kaumeyer, DUC’s chief executive officer. “For more than 80 years, Ducks Unlimited Canada has been working with governments, landowners, Indigenous Peoples, and industry to develop comprehensive, science-based solutions to conservation challenges. Looking ahead, one of our greatest opportunities exists in the boreal region of the country where large areas of wetlands remain intact.”

Kevin Smith, DUC’s national manager of boreal programs, spoke to COP26 delegates and the public as part of a national panel on Canada’s peatlands. He shared research that showed how these carbon-rich wetland ecosystems, which are scattered throughout the boreal region, are a nature-based solution to climate change and deserve enhanced protection. “Given that Canada has one-quarter of the world’s carbon stored in its

peatlands, and if Canada is going to reach net zero by 2050, we need effective nature-based climate solutions that keep the legacy carbon in the ground and peatlands continuing to sequester carbon," Smith says. "Canada has an opportunity to show global leadership and real progress towards collective climate goals."

DUC is already making significant progress: more than 135.6 million acres have already been positively influenced in the boreal region to date, with the goal of conserving at least 660 million acres in the next 10 years. Projects such as the creation of the 10,000 square-kilometre Indigenous Protected Area Ts'udé Niljné Tuyeta near Fort Good Hope, N.W.T. are an example of the boreal program's role in uniting Indigenous communities, government and other land users in supporting collaborative management and protection of these ecologically indispensable regions.

However, according to Smith, protection is only part of the puzzle. Sustainable land management and knowledge sharing are also key pieces needed to reach Canada - and the world's - climate action goals. "Sustainable land management can happen in a number of ways," says Smith. "This includes influencing higher certification standards for industries operating in boreal peatlands and forests, establishing direct industry conservation partnerships, and influencing the adoption of codes of practice, policies and regulation that help to maintain peatland function."

DUC steps up in these areas as well, offering services to land managers and owners, and equipping them with the knowledge they need to make informed decisions on land use. Practitioner guides such as the *Guiding Principles for Wetland Stewardship and Forest Management*, and *Wetland Best Management Practices for Forest Management Planning & Operations* were created by DUC's boreal program as the result of collaborative knowledge-sharing, and cumulative research on these sensitive areas, which Smith hopes will help with understanding the importance and value of these areas.

- https://www.yahoo.com/now/ducks-unlimited-canada-poised-help-193700001.html
- https://www.globenewswire.com/news-release/2021/11/10/2331519/0/en/Ducks-Unlimited-Canada-presents-at-COP26.html

United States of America

Biden climate plan to save forests pivots on peatlands

Protecting peatlands are crucial to President Joe Biden's forest conservation plan announced at the United Nations climate summit in Glasgow. Peatlands are among the "critical ecosystems" the White House plan says are essential to turning down the heat on climate change. The U.S. announcement is significant because peatlands have been "used and abused" for centuries, said Stuart Brooks, peatland chair for the International Union for Conservation of Nature and head of policy for the National Trust of Scotland, speaking at COP26.

The White House plan to protect forests worldwide more broadly comes as 100 countries agreed to halt deforestation by 2030 and to finance forest and ecosystem conservation globally. The U.S. plan seeks to boost private sector support for forest and peatland conservation, build government capacity to manage forests, and inspire governments worldwide to set conservation goals with climate change in mind. "The plan comprehensively recognizes contributions from forests, rather than trees, and also recognizes the value of other ecosystems in storing carbon, including wetlands and grasslands," said Carla Staver, an ecology professor at Yale University.

> For the purposes of this Plan, "critical ecosystems" refers to terrestrial and coastal ecosystems including forests, mangroves, peatlands, wetlands, and grasslands that are biologically rich, essential to humanity, and serving as important carbon sinks. Carbon sinks in this context are forests, other vegetation, or soils that capture and store carbon dioxide from the atmosphere.

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South-America

Chile

Courtesy of the Chilean Pavilion at the Venice Biennale.

Turba Tol Hol-Hol Tol April 23–November 27, 2022

The Ministry of Cultures, Arts and Heritage of Chile and DIRAC are pleased to announce *Turba Tol Hol-Hol Tol* as the project that will represent Chile at the upcoming 59th International Venice Biennale. *Turba Tol Hol-Hol Tol* stands out for being a collective project that, in this time of climate crisis, illuminates a *wet fiction*, an experimental path towards conserving the peatlands of Patagonia. The pavilion is curated by Camila Marambio, whose transdisciplinary work encourages research, ecological performance, and collaborative sense-making. *Turba Tol Hol-Hol Tol* brings together a multidisciplinary team of Chilean creatives: Ariel Bustamante, an artist whose work focuses on transhuman conversations and Andean listening practices; Carla Macchiavello**,** an art historian and educator whose research focuses on contemporary Latin American artistic practices linked to ecology and social change; Dominga Sotomayor, an award-winning filmmaker and academic, and Alfredo Thiermann, an architect whose multisensory work explores the relationship between constructed spaces and history. The artists are joined by ecologist Bárbara Saavedra, Selk'nam writer Hema'ny Molina**,** cultural producer Juan Pablo Vergara, and additional plurinational collaborators.

"Hol-Hol Tol" is the "heart of peatlands" in the language of the Selk'nam people, who are indigenous to Tierra del Fuego, Patagonia. The Selk'nam people inhabited Tierra del Fuego freely and lived in harmony with the peatlands of their ancestral territory for 8,000 years until the arrival of the colonists who were responsible for their genocide. Official history insists that the Selk'nam people became extinct. Today, the Selk'nam Covadonga Ona community repudiates this myth in a movement to be recognised as a living culture and language. The Selk'nam Hach Saye Cultural Foundation teaches us that their rights and those of the peatlands are interdependent. Selk'nam leaders draw a connection between their movement and the necessity of peatlands to be acknowledged as a living body. Peatlands are in urgent need of conservation. All over this increasingly hot

and dry world, these wetlands are imperiled. Their conservation is intrinsically linked to the future wellbeing of humankind, and in Patagonia, to the rebirth of the Selk'nam people.

Peatlands play a crucial role in regulating the planet's climate by absorbing carbon from the atmosphere and storing it in deep layers of undisturbed organic matter (peat). This capacity places these wetlands "among the most valuable ecosystems on earth" (WCS Chile), yet peatlands are overlooked due to their fundamentally buried structure. This condition increases their exposure to serious threats: mining, harvesting peat moss, and drainage for development. Once drained and destroyed, peatlands go from being carbon sinks to being sources of carbon emissions, releasing enormous amounts of greenhouse gasses into the atmosphere. Peatlands challenge us to create a new, turbid and multivocal aesthetic that remixes the stories of the Patagonian peat bogs, emphasizing their role as a Southern bastion in the face of climate change.

Turba Tol extends from the investigative research of the collective platform Ensayos, in close collaboration with the Wildlife Conservation Society-Chile, Karukinka Park in Tierra del Fuego, and the Selk'nam Hach Saye Cultural Foundation. For more information and to learn how to be involved: info@turbatol.org

- https://www.e-flux.com/announcements/425102/turba-tol-hol-hol-tol/

The former Selk'nam habitat: the peatlands of Peninsula Mitra, Tierra del Fuego, Argentina. Photo: Hans Joosten.

Peru

Study on emissions breaks new ground in Peru's palm-swamp peatlands

A new study marked a series of "firsts" for understanding greenhouse gas (GHGs) emissions and land degradation in the palm-swamp peatlands of the Pastaza-Marañon Basin in Peru. The palm-swamp peatlands, dense in *Mauritia flexuosa* palms, store vast amounts of carbon. Their waterlogged conditions allow organic matter in the soil to slowly decompose and accumulate over thousands of years. However, this ecosystem is still largely misunderstood and understudied. Between 2015 and 2018, a collaborative team of research institutions led by the Center for International Forestry Research and World Agroforestry (CIFOR-ICRAF) — and with joint efforts from the Peruvian Amazon Research Institute (IIAP) — pioneered the first long-term study on soil nitrous oxide (N_2O) and methane (CH_4) fluxes in palm swamps of the Peruvian Amazon. It was also among the first to look at how these GHG emissions vary with different levels of forest degradation.

“Our research offers really important data for the country [Peru] if they want to report their emissions from peatlands,” said lead author and CIFOR senior scientist, Kristell Hergoualc’h. “These are local, robust estimates that policy makers and governments can use in their national reporting. The default emission factors for peatlands, up until now, were taken from the IPCC guidelines, which were developed using data from Southeast-Asian peatlands.”

Degraded peatland area. Photo: Kristell Hergoualc'h.

One of the main causes of degradation in the palm swamps, known locally as “aguajales,” is the unsustainable harvesting of aguaje fruits. These fruits grow on the *Mauritia flexuosa* palms and are key ingredients in traditional drinks and recipes. Because the fruit grows so high up in the trees, it is often easier to cut down the whole palm to harvest it. Such forest degradation has had measurable effects on the landscape. Thirty-one percent of palm swamps are severely degraded, 42 percent are moderately degraded and 27 percent have low levels of degradation, according to a 2017 study which looked at a 350,000 ha sample area in Peru. Degradation could affect the ratio of the palm swamps’ natural mosaic of hummocks — raised areas made up of the palms’ root structures — and hollows — the low, flooded areas in between.

In the most recent publication, Hergoualc’h and her team theorized that GHG emissions could be affected by continued changes in site-level microtopographies as well as macro-level changes, which combine microscale measurements with tree density. “In Indonesia, the ratio of hummocks to hollows is about 50:50,” said Hergoualc’h. “In our study, which also helped to quantify this ratio for South American, palm-swamp peatlands, hollows made up more than 80 percent of the total surface area. These environmental differences between Southeast Asia and South America, in addition to degradation gradients, could affect the amount of GHG emissions that is released from peatlands.”

Over the study’s three-year period, the team examined three sites representing an undegraded (intact) site, moderately degraded site and highly degraded site. They measured soil nitrous oxide and methane fluxes along with environmental factors such as temperature, water table depth (WT) and water-filled pore space (WFPS) in the soil. While degradation levels did lead to changes in GHG emissions at the microscale, there was little to no change in emissions at the macroscale, according to the study. However, water levels did play a large role in GHG fluxes at the three sites.

Soil net nitrification rates and both WT and WFPS levels significantly influenced nitrous oxide emissions. In addition, the research team found a strong relationship between methane emissions and rainfall: more rain leads to greater methane emissions. This is because the lack of oxygen in flooded palm-swamps stimulates microorganisms to produce more methane than they consume.

Satellite images have already shown that tropical South American wetlands have higher methane emissions than those in tropical Southeast Asia. However, the link this study found between rainfall and methane is significant considering that climate-change estimates for this region in South America predict long-term increases in rainfall. Hence, the study suggests the palm swamps will also see long-term increases in emissions. “There has already been global concern about increased methane emissions from melting permafrost associated with higher global temperatures,” said Hergoualc’h. “For the Amazon, we still do not have much data, but our study shows that more rainfall due to climate change could be yet another cause of increased methane emissions.”

Additionally, the scientists found that nitrous oxide levels in Peruvian palm swamps were significant, despite the water-flooded environment. Normally, one would expect the reduced oxygen levels in the swamps to cause nitrous oxide to reduce to N_2, leading to minimal emissions. However, nitrous oxide emissions in the peatlands have remained counterintuitively high, remarked Hergoualc’h. The magnitude of emissions for both gases observed in this study, as well as their correlation with the peatland’s water levels, highlights the need to improve bio-geochemical modeling of these GHGs, according to the study.

While Hergoualc’h noted that this study’s findings may not be representative of all sites in the Amazon, it is a first step towards understanding their contributions to mitigate or exacerbate climate change. “We are working with the Peruvian government because they want to include peatlands in their Nationally Determined Contributions (NDCs),” said Hergoualc’h. “They want to know how much they could decrease GHG emissions if they put in place a plan for sustainable management of these forests.” The context-specific knowledge that studies like these provide help support sustainable policy shifts at the national level and beyond. During the COP26 in Glasgow, a representative from Peru’s Ministry of the Environment spotlighted opportunities for private investment in Peru’s aguajales that would encourage sustainable fruit-harvesting practices.

Cross-sectoral opportunities like these that bring together policy makers, local communities, corporations and scientists are key to developing sustainable value chains and restoring peatlands.

For more information on this topic, please contact Kristell Hergoualc'h at k.Hergoualch@cgiar.org. This research forms part of the CGIAR Research Program on Forests, Trees and Agroforestry, which is supported by CGIAR Fund Donors.

- https://forestsnews.cifor.org/75382/study-on-emissions-breaks-new-ground-in-perus-palm-swamp-peatlands?fnl=en

Peatland conservation relevant papers November – December 2021.

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

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6. Sources of stream base flow in blanket peat covered catchments: https://www.sciencedirect.com/science/article/pii/S0022169421010155/pdfft
7. Economics of Peatlands Conservation, Restoration and Sustainable Management policy report: https://wedocs.unep.org/bitstream/handle/20.500.11822/37262/PeatCRSM.pdf
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