Peat plateau mire Storflaket, Abisko, Sweden. Photo: Hans Joosten.

IMCG Bulletin:
February – March 2019

INTERNATIONAL MIRE CONSERVATION GROUP

www.imcg.net

Contents of this Bulletin

IMCG issues

Word from the Secretary-General

Dear mire friends,
Important achievements in the last months! The UN Environmental Assembly adopted a strong and progressive peatland resolution. The resolution is a commitment by all UN member states in the world to "give greater emphasis to the conservation, sustainable management and restoration of peatlands worldwide in support of the sustainable practice of the peatland management". Parallel, the UN General Assembly by Resolution 73/284 designated 2021-2030 as the UN Decade for Ecosystem Restoration. All about this and much more on peatland conservation, restoration and wise use worldwise in this Bulletin!
On a more local (but not quite ;-)) level is the announcement that Greifswald Univeristy is inviting applications for a Professorship of Peatland Sciences for appointment at the earliest possible date: https://www.uni-greifswald.de/en/university/information/jobs/current-vacancies/professuren/professorship-w3-of-peatland-sciences/ Indeed, my successor, who is thought to run a year parallel with me before I retire (but not quite ;-)) at the end of 2020. So consider applying!
Keep sending news, photographs, papers and other contributions for the next Bulletin **by May 5, 2019** to Hans Joosten at joosten@uni-greifswald.de.

Mires and Peat

In February and March 2019 the following papers were published in Mires and Peat:

- Does the autecology of core species reflect the synecology of functional groups during the assembly of vegetation in abandoned extracted peatlands? [Liira, J., Triisberg-Uljas, T., Karofeld, E., Karu H. & Paal, J.] Volume 24: Article 08 http://mires-and-peat.net/pages/volumes/map24/map2408.php
- Geotechnical properties and microstructural characteristics of Northeast Indian peats. [A. Paul & M. Hussain] Volume 24: Article 07 http://mires-and-peat.net/pages/volumes/map24/map2407.php
- Impact of soil collar insertion depth on microbial respiration measurements from tropical peat under an oil palm plantation. [S.F. Batubara, F. Agus, A. Rauf & D. Elfiati] Volume 24: Article 06 http://mires-and-peat.net/pages/volumes/map24/map2406.php
- Thirty years of vegetation dynamics in the Rospuda fen (NE Poland). [E. Jablonska, P. Pawlikowski, F. Jarzombkowski, M. Tarapata & S. Klosowski] Volume 24: Article 05 http://mires-and-peat.net/pages/volumes/map24/map2405.php
- High N_2O and CO_2 emissions from bare peat dams reduce the climate mitigation potential of bog rewetting practices. [O. Vybornova, H. van Asperen, E. Pfeiffer & L. Kutzbach] Volume 24: Article 04 http://mires-and-peat.net/pages/volumes/map24/map2404.php
- An incubation study of GHG flux responses to a changing water table linked to biochemical parameters across a peatland restoration chronosequence. [R. Hermans, N. Zahn, R. Andersen, Y.A. Teh, N. Cowie & J.-A. Subke] Volume 23: Article 08 http://mires-and-peat.net/pages/volumes/map23/map2308.php
- Vitality of bog pine and colonising Norway spruce along environmental gradients within a bog.[H. Böhner, L. Rose, P. von Sengbusch & M. Scherer-Lorenzen] Volume 24: Article 03 http://mires-and-peat.net/pages/volumes/map24/map2403.php
- Identification and classification of unmapped blanket bogs in the Cordillera Cantábrica, northern Spain. {G. Chico, B. Clutterbuck, R. Lindsay, N.G. Midgley & J. Labadz] Volume 24: Article 02 http://mires-and-peat.net/pages/volumes/map24/map2402.php
- Vegetation of Andean wetlands (bofedales) in Huascarán National Park, Peru. [M.H. Polk, K.R. Young, A. Cano & B. León] Volume 24: Article 01 http://mires-and-peat.net/pages/volumes/map24/map2401.php
- Comparison of plant traits of sedges, shrubs and Sphagnum mosses between sites undergoing forest-to-bog restoration and near-natural open blanket bog: a pilot study. [W. Konings, K.G. Boyd & R. Andersen] Volume 23: Article 07 http://mires-and-peat.net/pages/volumes/map23/map2307.php
- Ground surface subsidence in an afforested peatland fifty years after drainage and planting. [T.J. Sloan, R.J. Payne, A.R. Anderson, P. Gilbert, D. Mauquoy, A.J. Newton & R. Andersen] Volume 23: Article 06 http://mires-and-peat.net/pages/volumes/map23/map2306.php

- Net ecosystem exchange from two formerly afforested peatlands undergoing restoration in the Flow Country of northern Scotland. [G. Hambley, R. Andersen, P. Levy, M. Saunders, N.R. Cowie, Y.A. Teh & T.C. Hill] Volume 23: Article 05 http://mires-and-peat.net/pages/volumes/map23/map2305.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.

Papers

Peatland prose from the past: the trembling soils of Pliny the Elder (23-79 CE)

Pim de Klerk (pimdeklerk@email.de, www.pimdeklerk-palynology.eu)

Pliny the Elder was one of the most important authors on natural science of ancient Roman times. His only preserved work 'Natural history' is an encyclopaedia of 37 books that covers numerous themes including geography, animals, plants, diseases and remedies, metals, stones, and arts. There are many passages that relate to peatlands and wetlands. Pliny died in a fall-out of hot ashes and pumice from the Mount Vesuvius eruption in 79 CE, as was descibed by his nephew Pliny the Younger (61-c. 113 CE) in a letter to the historian Tacitus. Currently the type of volcanic outburst is known as "Plinian eruption".

Pliny wrote: "*There are soils that tremble when treaded, e.g. near Gabii, not far from Rome, about 200 iugera* [c. 50 ha] *shake when horse riders pass it*; *the same in Rieti*." ("*Quaedam vero terrae ad ingressus tremunt, sicut in Gabiensi agro non procul urbe Roma iugera ferme ducenta equitantium cursu, similiter in Reatino*") ('Natural history' Book II chapter 96).

The quote refers to peat soils bouncing back after being compressed when treaded upon, especially under the heavy weight of a horse with rider. Rieti (70 km northeast of Rome) lies in a large former lake basin (see Coccia & Mattingly 1992). Large water level fluctuations occurred during the Holocene, and in early Roman times the area will have consisted of some relict lakes within a large marsh: Coccia & Mattingly (1992) specify 'marsh deposits' as silt with a peat admixture. Consul Manius Curius Dentatus had the lake drained completely in the early 3rd century BCE by the construction of a canal, which is told by Cicero (106-43 BCE) in a letter to Atticus. At present most peats have vanished due to drainage and oxidation, but in the time of Pliny peat soils will still have been prominent. The ruins of the city Gabii (18 km east of Rome) are located in a region with various lakes, and hydrological regulation dates back to the early 4th century BCE (Bersani & Castellani 2005). Also here peaty soils originating from lake-marginal terrestrialisation zones will have been common. Both in Rieti and Gabii some wetland regeneration took place after Roman times because of negligence of the hydrological constructions, but the lakes were drained again in the 17th-19th centuries CE.

Probably neither Pliny nor his audience comprehended the processes at work, as there are clear indications in Roman literature that the substance peat was not known nor understood. But at least the processes were noticed and reported upon, leaving an eye-witness report for present-day peatland scientists.

Roman Literature:

Cicero (Marcus Tullius Cicero): Epistulae ad Atticum (Letters to Atticus). - Original text and English translation by Shuckburgh, E.S.: Complete works of Cicero. Delphi Classics, Hastings, 2014 (kindle edition).

Pliny the Elder (Gaius Plinius Secundus): Naturalis Historia (Natural History). – German translation by Wittstein, G.C.: Die Naturgeschichte des Caius Plinius Secundus Band 1 / Band 2. Marix Verlag, Wiesbaden, 2007. – Original text and English translation by Bostock, J. & Riley, H.T.: The complete works of Pliny the Elder. Delphi Classics, Hastings, 2015 (kindle edition). – Original text and English translation by Rackham, M.A. and Jones, W.H.S.: Pliny Natural History in ten volumes. Loeb Classical Library: volumes L330, L352, L353, L370, L371, L392, L393, L394, L418, L419; various editions.

Pliny the Younger (Gaius Plinius Caecilius Secundus): Epistulae (The Letters). – Original text and English translation by Firth, J.B. & Lewis, J.D.: Complete works of Pliny the Younger. Delphi Classics, Hastings, 2014 (kindle edition). - Original text and English translation by Radice, B.: Pliny letters volume 1; Pliny letters volume 2 Panegyricus. Loeb Classical Library: volumes L055 & L059; various editions.

References:

Bersani, P. & Castellani, V. (2005): Considerations on water flow regulation in ancient time in the Alban hills / Considerazioni sulla regolazione delle acque in epoce antica nell'area dei colli Albani. t&a 1/2005: 59-102.

Coccia, S. & Mattingly, D. (1992): Settlement history, environment and human exploitation of an intermontane basin in the central Apennines: The Rieti survey 1988–1991, part I. Papers of the British School at Rome 60: 213-289. doi:10.1017/S0068246200009831

Peatland news

Global

United Nations Environmental Assembly

The fourth session of the UN Environment Assembly (UNEA-4) took place in Nairobi, Kenya, from 11-15 March 2019, on the theme of "Innovative solutions for environmental challenges and sustainable consumption and production (SCP)." UNEA-4 was preceded by the fourth meeting of the Open-Ended Committee of Permanent Representatives to UNEP (OECPR 4), taking place from 4-8 March 2019.

UNEA sessions usually adopt many resolutions, which are proposed and negotiated by Member States. Though not legally binding, the resolutions identify key issues for the global environment and provide impetus for coordinated action. UNEA sessions also serve as forums for promoting the environmental dimension of the 2030 Agenda and providing input to annual sessions of the High-Level Political Forum on Sustainable Development (HLPF). UNEA-4 had three areas of focus:

- tackling the environmental challenges related to poverty and natural resources management, including sustainable food systems, food security and halting biodiversity loss;
- introducing life-cycle approaches to resource efficiency, energy, chemicals and waste management; and
- ensuring sustainable business development at a time of rapid technological change.

Finally, the Sixth Global Environmental Outlook report (GEO-6) and a summary for policy makers was released at UNEA-4 – the first such comprehensive assessment to be published by UNEP in almost seven years.

UNEA is the highest decision-making body on environmental matters in the UN system, and has universal membership of all 193 UN Member States, as well as the participation of Major Groups and other stakeholders. Various documents adopted by the Assembly contain explicit or implicit and usefull reference to the importance of peatlands, most importantly a resolution specifically for peatlands. These documents and respective statements are listed below.

- http://enb.iisd.org/unep/oecpr4-unea4/
- http://web.unep.org/environmentassembly/ministerial-declaration-resolutions-and-decisions-unea-4 (all decisions in all UN languages)

Conservation and sustainable management of peatlands

This resolution, proposed by Indonesia, was introduced in the OECPR on Monday, 4 March. On Tuesday, 5 March, a developed country bracketed the entire text and suggested it could be merged with another resolution. Delegates agreed to defer discussion until a revised draft was available. On Wednesday, 6 March, one country opposed language linking peatland conservation and restoration with climate mitigation and adaptation, and with implementation of the Sustainable Development Goals (SDGs), also arguing that a proposal for UNEP to undertake a global peatland inventory and other actions duplicated work done under the Ramsar Convention on Wetlands of International Importance. A developing country proposed a reference to irresponsible clearing and burning of peatland as a driver for biodiversity loss, land degradation, and greenhouse gas emissions, while another objected to mentioning air quality deterioration in this context.

On Thursday, 7 March, they debated whether to cite a UNEP report stating that peatlands occur in more than 180 countries, with one developing country arguing there is a lack of awareness that peatlands occur not only in tropical and sub-tropical regions, while a developed country argued against "cherry-picking" statistics. On Friday, 8 March, a developed country opposed references to various MEAs, including the Paris Agreement, saying that these processes do not necessarily reference peatlands, and that valuable work takes place at all levels, not only the global level. A coalition of developed countries highlighted their commitment to regional approaches, and stressed that there are co-benefits and synergies with other processes and conventions. Delegates agreed to change the title of the draft resolution from "Sustainable peatlands management to tackle climate change" to "Conservation and sustainable management of peatlands." They agreed to refer only to "degraded peatlands, caused by multiple activities, instead of "the draining, clearing and burning of peatlands," and also deleted mention of air quality deterioration. The resolution was agreed and forwarded to UNEA-4 on Friday, 8 March.

Agriculturally used peatland close to Nairobi, Kenya. Photo: Hans Joosten.

Final Outcome: The resolution (UNEP/EA.4/L.19) urges Member States and other stakeholders to give greater emphasis to the conservation, sustainable management, and restoration of peatlands worldwide in support of sustainable peatland management including through existing efforts implemented by institutions such as UNEP and FAO. UNEA requests UNEP, within existing resources and in consultation with the Ramsar Secretariat, to coordinate efforts to create a comprehensive and accurate global peatlands inventory. UNEA also encourages Member States and other stakeholders to enhance regional and international collaboration for the conservation and sustainable management of peatlands, including but not limited to:

- sharing information and knowledge, and best practices in conservation and sustainable management of peatlands;
- continuing inter-disciplinary research to advance the conservation and sustainable management of peatlands;
- capacity building for the conservation and sustainable management of peatlands; and
- promotion of a multi-stakeholder approach for the conservation and sustainable management of peatlands, involving private landowners, business sectors, concession holders, and other relevant stakeholders.
- http://enb.iisd.org/vol16/enb16153e.html
- http://enb.iisd.org/vol16/enb16146e.html

The full text: https://papersmart.unon.org/resolution/uploads/k1900781.pdf#overlay-context=node/233

UNITED NATIONS

EP

UNEP/EA.4/L.19

Distr.: Limited
9 March 2019

Original: English

United Nations Environment Assembly of the United Nations Environment Programme

United Nations Environment Assembly of the United Nations Environment Programme
Fourth session
Nairobi, 11–15 March 2019

Conservation and sustainable management of peatlands*

The United Nations Environment Assembly,

Recalling the commitment made by heads of state and government in the outcome document agreement of the United Nations Conference on Sustainable Development (Rio+20 Conference) titled "The Future we want" that recognized ecosystem conservation, regeneration, and restoration and resilience as important in the face of new and emerging challenges,

Recognizing that peatlands occur in more than one hundred and eighty countries across different regions of the world, and the fact that although covering only about 3% of the earth's land area[1], peatlands contain a far higher proportion of global organic soil carbon, making them one of the world's largest carbon storage, and contributing to global climate change mitigation through sequestration of carbon,

Bis. Recognizing that degraded peatlands caused by multiple activities contributes to biodiversity loss, environmental degradation as well as a substantial source of greenhouse gas emissions globally

Considering the benefits and values of peatlands including but not limited to providing vital ecosystem functions and services reducing the scale and mitigating the impact of flooding and drought, preventing, preserving biodiversity, and supplying food and water that maintains ecological systems and improves human livelihoods,

Recognizing the value of improving the management of peatlands to improve their carbon storage capacity on degraded sites, strengthen resilience and improve socio-economic livelihoods of population around peatlands and increase biodiversity, noting that such actions can contribute to the implementation of the Paris Agreement, the UN Framework Convention on Climate Change (UNFCCC), the Convention on Wetlands of International Importance Especially as Water Fowl Habitat, the Ramsar Convention the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets, the 2030 Agenda for Sustainable Development, and the Sendai Framework for Disaster Risk Reduction 2030, the Convention on Migratory Species and the convention on biological diversity, as

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* The present document is being issued without formal editing.

[1] Parish F., Sirin A., Charman D., Joosten H., Minayeva T. & M. Silvius (eds.) 2008. Assessment on Peatlands, Biodiversity and Climate Change: Main Report. Global Environment Centre, Kuala Lumpur and Wetlands International, Wageningen. P. 179, P. 99-117 Available at http://www.imcg.net/media/download_gallery/books/assessment_peatland.pdf (Accessed 8 March 2019).

well as specific peatland related initiatives such as the Brazzaville Declaration on the Third Peatland Partnerships Initiatives, the Global Peatland Initiative, and the International Peatlands Society,

Recognizing also that actions to advance sustainable peatland conservation and sustainable management can also contribute to address climate change,

Noting United Nations Environment Assembly Resolution 3/5, entitled "Investing in Innovative Environmental Solution for Accelerating the implementation of the Sustainable Development Goals", which urge member states to adopt, as appropriate, measures for preventing, reducing and reversing ecosystem degradation and loss in order to sustainably use and manage natura resources towards sustainable development,

Bis. Recalling Ramsar Convention Resolution XIII.13 on restoration of degraded peatlands to mitigate and adapt to climate change and enhance biodiversity and disaster risk reduction

Recognizing common interests among countries in different global regions towards enabling better management of peatlands, and on-going efforts by governments to conserve and sustainably use peatlands,

Bis. Willing to increase respective capacity through collaboration to promote best practices for conservation and sustainable management of peatlands,

Ter. Appreciating the engagement in the above-mentioned endeavours, of partners such as UNEP, FAO, CIFOR, the [Ramsar Convention on Wetlands of International Importance] where appropriate, and national research institutions,

Quater. Recognizing that policymakers', practitioners and local communities need access to sound, credible and science-based information, analysis, and relevant tools needed to design and implement conservation and sustainable use of peatlands and consistent with laws and regulations in respective countries,

1. *Urges* Member States and other stakeholders to give greater emphasis to the conservation, sustainable management and restoration of peatlands worldwide in support of the sustainable practice of the peatland management including through existing effort implemented by institutions such as UNEP and FAO;

2. *Requests* the UN Environment Programme Executive Director, within existing resources and in consultation with the Ramsar Secretariat, to coordinate efforts to create a comprehensive and accurate global peatlands inventory, which will be crucial as a basis to identify the extent of peatlands around the world, determine the appropriate interventions, understand carbon sequestration value and potential, and plan for sustainable peatlands management;

2 *bis. Welcomes* the development of technical guidance on peatlands, including tropical peatlands, and in that regard noting the guidance in Resolution XIII.13/Ramsar Convention as an important way of encouraging improved ecological functioning of degraded peatlands, as well as further welcomes collaboration efforts, and in that regard noting CBD Resolution 14/5 Biodiversity and Climate Change;

3. *Encourages* member states and other stakeholders to enhance regional and international collaboration for the conservation and the sustainable management of peatlands, including but not limited to:

(a) Share information and knowledge, and best practices in conservation and sustainable management of peatlands;

(b) Continue inter-disciplinary research to advance the conservation and sustainable management of peatlands;

(c) Build capacity for the conservation and sustainable management of peatlands; and

(d) Promote a multi-stakeholder approach for the conservation and sustainable management of peatlands, involving private landowners, business sectors, concession holders, and other relevant stakeholders;

4. *Encourages* Member States, international organizations, private sector, and all other actors involved with peatland conservation, management and restoration, at national and regional levels including, inter alia, the International Tropical Peatland Centre which has been established in Indonesia, to cooperate with existing national, regional, and international peatland management organization and all actors including the UN Global Peatland Initiative to foster the conservation and sustainable management of peatlands.

Innovative solutions for environmental challenges and sustainable consumption and production:

1. We, the world's Ministers of the Environment, having gathered at the fourth session of the United Nations Environment Assembly in Nairobi, together with the representatives of international organizations and stakeholders, recall the outcomes of the United Nations Environment Assemblies and are dedicated to address environmental challenges through advancing innovative solutions and to move towards sustainable and resilient societies through sustainable consumption and production patterns; …

d) We will promote sustainable food systems by encouraging the implementation of sustainable and resilient agricultural practices, improving value generation, and significantly reducing waste and energy use along the food supply chain to help to ensure food security and ecosystem functions and services;

e) We will implement sustainable ecosystems restoration, conservation and landscape management measures to combat biodiversity loss, land degradation, droughts, soil erosion and pollution, desertification and sand and dust storms;

- https://papersmart.unon.org/resolution/uploads/k1900824.pdf#overlay-context=node/243

Innovation on biodiversity and land degradation:

Acknowledging that action to combat desertification, restoration of degraded land and ecosystems can deliver multiple benefits with the potential to act as an accelerator for achieving sustainable development goals, …

Taking note with appreciation of the thematic assessments on land degradation and restoration and the regional assessments on biodiversity and ecosystem services conducted by the Intergovernmental Science Policy Platform on biodiversity and Ecosystem Services (IPBES), the first edition of the UNCCD Global Land Outlook as well as the FAO's State of World's Biodiversity for Food and Agriculture, and their key messages and recommendations,

Deeply concerned by the continued high loss of biodiversity and the latest assessment showing most of the Aichi Biodiversity Targets are not on track to be achieved by 2020, and stressing the importance of an integrated and robust monitoring on the status of biodiversity that is based on up-to-date scientific data at national, regional and global levels for the Post 2020 Global Biodiversity Framework, …

1. *Encourages* Member States to strengthen commitments and step up their efforts to prevent the loss of biological diversity and the degradation of land and soil, including through their conservation and sustainable use and appropriate policies and innovative measures such as partnership arrangements, mutually agreed transfer of technology, and financing mechanisms; …

9. *Requests* the Executive Director of UNEP to continue collaboration with the UN FAO and its global soil partnership, the CBD, the UNFCCC, UNCCD and other related conventions, including, CITES, CMS, and the ITPGR and Ramsar and relevant intergovernmental panels, where appropriate, to foster innovative ways to address biodiversity loss, climate change and soil, land and ecosystems degradation in an integrated manner; …

12. *Requests* the Executive Director of UNEP, in response to the invitation contained in UN General Assembly Resolution, 73-284, to lead the implementation of the Decade for ecosystem restoration, together with FAO, and in collaboration with the Secretariats of the Rio Conventions, other relevant multilateral environmental agreements and entities of the UN System;

- https://papersmart.unon.org/resolution/uploads/k1900855.pdf#overlay-context=node/230

Sixth Global Environment Outlook - summary for policymakers:

64. Freshwater ecosystems are among the world's most biodiverse habitats and valuable natural infrastructures. Wetlands buffer against impact from climate change (both drought and floods) and improve water quality, but 40 per cent of all wetlands have been lost since 1970 through agricultural development, urbanization, infrastructure development and overexploitation of water resources. Severe consequences include the loss of inland fisheries, which affects the livelihoods of millions of people (likely). The total annual economic cost of wetland losses over the 15-year period from 1996 to 2011 has been estimated at US$2.7 trillion (likely). Greater investment, both public and private, would facilitate more sustainable wetland management and restoration. {9.6}

65. The decomposition, due to human intervention, of peatlands, a type of wetland that stores more carbon than all the world's forests combined, currently contributes approximately 5 per cent of annual global carbon emissions (established but incomplete). The thawing permafrost in boreal peatlands, agricultural conversion of some tropical peatlands and the transformation and loss of other peatlands are causing increased carbon emissions, infrastructure damage and wildfires. Protection and restoration of peatlands, including rewetting of drained peatlands, is an important climate change mitigation strategy. {9.6.2}

- http://wedocs.unep.org/handle/20.500.11822/27652

Draft minutes of the 142nd meeting of the Committee of Permanent Representatives to the United Nations Environment Programme, held on 10 May 2018:

13. With the support of the United Nations Environment Programme, on 22 March 2018 the Governments of Indonesia, the Democratic Republic of the Congo and the Republic of the Congo had signed a political declaration entitled the "Brazzaville Declaration", which was intended to protect peatlands in the Congo basin. The instrument represented an excellent example of South-South cooperation since, through it, Indonesia would share with the two neighbour countries its ample experience in peatland restoration. Given that peatlands were the largest natural terrestrial carbon store, it was vital that they be protected and preserved….
38. … One representative highlighted the enormous challenge of managing peatlands in the Congo basin and its implications for climate change, while another drew attention to work to protect rainforests, including peatlands.

Peatland in the Aberdare Mountains, Kenya. Photo: Hans Joosten.

Emerging Issues of Environmental Concern

The UN Environment Assembly deliberations began on the same day as the launch of UN Environment's flagship science-policy report, Frontiers, which identifies five key issues of emerging global concern: synthetic biology, permafrost peatlands, ecological connectivity, the nitrogen fix, and maladaptation to climate change—all of which are highly relevant to the future of the ecosystems on which we depend for our economies, and well-being.

- https://www.unenvironment.org/resources/frontiers-201819-emerging-issues-environmental-concern
- See also: https://wedocs.unep.org/bitstream/handle/20.500.11822/27687/Arctic_Graphics.pdf?sequenc

Permafrost Peatlands: Losing ground in a warming world

With rising global temperatures, the Arctic is warming twice as fast as the global average and scientists are becoming increasingly alarmed at the accelerating rate of permafrost thaw. While research is ongoing, too little is currently known of the intricate relationships and dynamics between the perennially frozen ground that is permafrost and the insulating layer of dead plant remains – or peat – that covers a significant percentage of the Northernmost areas of our planet.

Permafrost thaw not only has direct impacts on the ecology and infrastructure of the peatland regions, it is also a potential 'tipping element' towards a runaway greenhouse effect. Preservation of these rich soil-carbon deposits is imperative to cushion the global effects of climate change and to avoid the worst effects and risks of unlocking these frozen assets, which keep carbon and other greenhouse gases sequestered underground and out of the atmosphere. Likely scenarios and the collaborative research urgently needed to ensure preservation of these crucial deposits are thoroughly explored in this chapter, from the ground up.

Flat palsas in Komi Republic (Russian Federation). Photo: Hans Joosten.

UN Decade on Ecosystem Restoration

The UN Decade on Ecosystem Restoration 2021-2030, declared on 1 March 2019 by the UN General Assembly, aims to massively scale up the restoration of degraded and destroyed ecosystems as a proven measure to fight climate change, and enhance food security, water supply and biodiversity. The degradation of land and marine ecosystems undermines the well-being of 3.2 billion people and costs about 10 per cent of the annual global gross domestic product in loss of species and ecosystems services. Key ecosystems that deliver numerous services essential to food and agriculture, including supply of freshwater, protection against hazards and provision of habitat for species such as fish and pollinators, are declining rapidly.

Restoration of 350 million hectares of degraded land between now and 2030 could generate US$9 trillion in ecosystem services and take an additional 13 to 26 gigatons of greenhouse gases out of the atmosphere. UN Environment and the Food and Agriculture Organization of the United Nations will lead implementation of the UN Decade on Ecosystem Restoration.

The Decade will accelerate existing global restoration goals, for example the Bonn Challenge, which aims to restore 350 million hectares of degraded ecosystems by 2030, an area almost the size of India. Currently, 57

countries, subnational governments and private organizations have committed to bringing over 170 million hectares under restoration. This endeavour builds on regional efforts such as the Initiative 20x20 in Latin America that aims to restore 20 million hectares of degraded land by 2020, and the AFR100 African Forest Landscape Restoration Initiative that aims to bring 100 million hectares of degraded land under restoration by 2030.

"We have a small window of opportunity, but I believe there is every reason to be hopeful. There are many opportunities to halt land degradation and shift to a more sustainable world," says Tim Christophersen, head of UN Environment's Freshwater, Land and Climate Branch, and Chair of the Global Partnership on Forest and Landscape Restoration. Ecosystem restoration is fundamental to achieving the Sustainable Development Goals, mainly those related to climate change, poverty eradication, food security, water and biodiversity conservation. It is also a pillar of international environmental conventions, such as the Ramsar Convention on wetlands and the Rio Conventions on biodiversity, desertification and climate change.

- https://www.unenvironment.org/news-and-stories/story/new-un-decade-ecosystem-restoration-inspire-bold-un-environment-assembly

The initial concept for the U.N. decade emerged from the Bonn Challenge to restore 150 million hectares of land by 2020, and 350 million hectares by 2030, which was launched in 2011 by the government of Germany and the International Union for the Conservation of Nature (IUCN), and later endorsed and extended by the New York Declaration on Forests at the 2014 U.N. Climate Summit. In its infancy, the concept of the U.N. Decade on Ecosystem Restoration was supported by El Salvador, UN Environment, IUCN and GLF.

"Restoration of 350 million hectares of degraded land between now and 2030 could generate $9 trillion in ecosystem services and take an additional 13-26 gigatons of greenhouse gases out of the atmosphere," said UN Environment and the Food and Agriculture Organization of the United Nations (FAO) in a statement.

The decade, launched by UN Environment and FAO, weaves together a range of international agreements – including the U.N. Sustainable Development Goals, U.N. Convention on Biodiversity Aichi Targets, U.N. Framework Convention on Climate Change, U.N. Paris Agreement on climate change, U.N. Convention to Combat Desertification, Ramsar Convention on wetlands and the U.N. Strategic Plan on Forests 2017-2030.

- https://www.globallandscapesforum.org/glf-news/media-advisory-global-landscapes-forum-salutes-u-n-decade-on-ecosystem-restoration-2021-2030

Landscape News spoke with UN Environment's Tim Christophersen, who serves as chair of the Global Partnership on Forest and Landscape Restoration and of the Global Peatlands Inititative about why the world not only needs the Decade but is readier than ever before to receive it.

- "Why are countries, such as Russia and the US, that have been resistant in other climate talks supportive of the Decade?"

The Decade has so many co-benefits for the Sustainable Development Goals (SDGs) that go way beyond climate change. Restoration includes measures to create green jobs, help biodiversity, help farm income, stabilize water supply for big cities, stabilize food supply. I think that's why it's found such broad support.

- "El Salvador first put the Decade forward about a year ago at a global Bonn Challenge event in Brazil. What was your first reaction to the idea?"

I felt that if we really need to mobilize more than 800 billion dollars until 2030 in mostly private investment to restore the 350 million hectares of the Bonn Challenge, then we need a high-level awareness raising platform, like a UN Decade. Obviously it depends a lot on the member states and what UN Environment and FAO make of it. If it will be a success, it will require a lot of hard work, but it is a great opportunity to build momentum and political will, awareness and technical capacity at all levels.

- "How will the Decade be different from the Bonn Challenge and other major non-binding restoration efforts?"

I think there are many stars that are aligning now. There are popular protests for stronger climate action. There is clear understanding that if we are to stop biodiversity loss, we have to conserve what is left – stop the bleeding – but also give patient Earth, who is in the emergency ward, a blood transfusion. These things need to go in parallel. There's a clearer understanding of that now, and the broad movement for restoration now has many years of experience.

From left to right: Nazir Foead (Indonesian Peat Restoration Agency BRG), H. Afedri (Deputy Regent of Siak), Tim Christophersen (UN Environment), Georges Claver Boundzanga (Rep. of Congo), Dianna Kopansky (UN Environment), Alberto Paniagua (Peru). Photo: Hans Joosten.

- "Who will drive it forward?"

Now, with the adoption by the General Assembly, it is no longer the responsibility of one country, but of the global community. El Salvador will remain a champion. Germany will remain a strong champion because of the Bonn Challenge and their clear, continued push for restoration. In India, there is a lot happening on restoration. Indonesia is leading on peatland restoration. We have regional initiatives like AFR100 and Initiative 20×20. And we believe China will step up because of the experience they have to share – there's no other country in the world that has as much experience with large-scale ecosystem restoration. Also they're hosting the CBD COP 15 in Kunming in 2020. The more leaders, the better.

- "Has there been talk of alignment with existing public campaigns?"

Certainly we are not a political movement like the climate strikes, though anyone who wants to pick up the baton for restoration is welcome to do so. But we are happy if restoration becomes part of the 'green' in a Green New Deal; if restoration becomes a very specific target in the New Deal for Nature under the CBD; if it becomes a very strong action under Article 5 of the Paris Agreement. The UN Decade exists to raise awareness of the opportunities, and encourage people to act.

- "How will funds be mobilized to finance the Decade?"

There are two things we need to separate: the amount of money that is needed globally to restore ecosystems at a large scale – that is a lot of money – and the amount of money we need to run the Decade, which is a little money. For the small amount, we will work with governments, as well as foundations and private philanthropies. For the larger portion, we hope to look at how to restructure fiscal policies to support restoration and by unlocking private finance. For example, UN Environment set up a USD 1 billion fund with the Dutch Bank called the Agri3 Fund, which invests in restoration of degraded agricultural landscapes. We will push other banks to invest in such funds, so we create a new asset class for restoration of degraded ecosystems. Another big potential source of funding is municipal and local government public funds. Sometimes their investment in green infrastructure doesn't require much money, but it does take some public push for political will. There is no shortage of money, it's just often being spent on short-sighted things right now, such as subsidies for oil, coal and gas.

- "Was there ever discussion about the Decade's framework being binding in any way?"

The UN Decades are never binding, but they do relate to many multilateral environmental agreements. For example, the restoration target under the Aichi framework, REDD+ under Article 5 under the Paris Agreement, the Land Degradation Neutrality target – these are much stronger international agreements that are sometimes binding, sometimes not. It doesn't matter if the Decade is not binding, but it matters that it reaches a lot of people that will speak with their governments and demand action, and that we can measure progress.

- "Now that it has been adopted, what are the immediate next steps?"

We [UN Environment and FAO] will develop a plan for which agencies we'll work and partner with, and for that we'll immediately have discussions this month. Then we will reach out to all countries. We will organize a series of events this year and next to lead into the Decade. And then it will depend on linking with existing policy processes that have targets and quantified goals that relate to this decade. We don't want to duplicate those; we want to help them achieve what they agreed to do by shining a spotlight on what is needed – the political will, the money, the capacity – and how it all fits together. It's not everyone working on their own on restoration, but it's a global effort, a joint effort of humankind to restore planet Earth.

- https://news.globallandscapesforum.org/32980/a-decade-to-restore-the-health-of-patient-earth/

Climate Strategy in Peatlands Conservation: Managing Competing Demands from Food, Energy and the Environment

This panel session at the Global Landscape Forum Kyoto, Monday 13 May 2019, 13:00-14:00 h, will explore engagement for more effective South-South co-operative efforts to tackle challenges around peatland conservation and restoration. The International Tropical Peatlands Centre (ITPC) and the Research Institute for Humanity and Nature in Kyoto are co-organizers of this session, which aims to provide a platform for exchanges among stakeholders concerned with the sustainability of tropical peatlands.

Over the past five decades, the global population has doubled, accelerating demand for food and other natural resources. Peat swamp forests have been cleared, drained and turned into oil palm plantations and agricultural cropland, triggering social concerns related to climate change and land tenure. Accelerated extraction and processing of natural resources over the last 20 years accounts for more than 90 percent of global biodiversity loss and water stress, and approximately half of global climate change impacts as greenhouse gas (GHG) emissions have increased.

Delegates to this discussion will share ideas on peatland conservation and restoration, and progress and challenges for restoration activities on degraded peatlands, such as blocking canals, cultivating vegetation and growing bioenergy crops. They will also discuss regulatory frameworks around the Paris Agreement and Nationally Determined Contributions (NDC), and relating peatland restoration to the NDC processes. Delegates will review advances in science and innovations applied to assessing GHG emissions from peatlands, peat hydrology, fire risks and provision of ecosystem services. These will also consider engagement with the private sector and local communities concerning peatland conservation and restoration, in the context of climate change mitigation and adaptation.

Efforts by Indonesia's government to reduce GHG emissions, and to prevent and control fires on peatlands will be reviewed during the session, which will also discuss potential for an emission reduction strategy, based on identification of responsible peatland management options. That should include synchronization of national plans at regional levels to attract business investment. Discussions will turn to the need for restoration of degraded peatlands and re-wetting of peatland areas, with contributions to local livelihoods, bringing economic benefits for communities. Bioenergy crops grown on rewetted, degraded and under-utilized peatlands presents a promising solution for energy security. Joint research by Indonesia's government and Kyoto University on peatland restoration seeks a promising solution to meet requirements for food and energy security and land restoration.

- https://events.globallandscapesforum.org/agenda/glf-kyoto-2019/day-1-monday-13-may-2019/climate-strategy-in-peatlands-conservation-managing-competing-demands-from-food-energy-and-the-environment/

Africa

GEF announces partnership to address forest loss and degradation in Congo Basin

The Global Environment Facility (GEF) has announced an initiative to address environmental degradation in the Congo Basin. The six-country initiative will help stabilize forest cover, peatlands and wildlife. The Congo Basin encompasses 530 million hectares across Cameroon, the Central African Republic (CAR), the Democratic Republic of the Congo (DRC), Equatorial Guinea, Gabon and the Republic of the Congo. The area contains 70 percent of Africa's forest cover and one of every five species on the planet, including the largest population of the endangered forest elephant, nearly the entire range of the western lowland gorilla, a large part of the range of the chimpanzee and the entire range of the bonobo. The Congo Basin's forests hold over 60 billion tons of carbon, more than the tropical forests in the Amazon and Asia combined, making them critical for

climate change mitigation. According to the GEF, the Congo Basin faces threats from a heavy reliance on natural resource exploitation, a growing population and national policies focused on "economic emergence."
The partnership will address the fundamental drivers of environmental degradation.
The six-year Congo Basin Sustainable Landscapes Program aims to tackle the drivers of forest loss and degradation. More specifically, the Program will work to strengthen the management and financing of protected areas, support land use planning, create an improved enabling environment for forest governance and decrease the impacts of natural resource use by local communities and the private sector.

Front to back: Maria Nuutinen (FAO), Johannes Refisch (UN Environment) and Rosa Román-Cuesta (CIFOR) in Congo Basin peat swamp forest. Photo: Hans Joosten.

GEF CEO Naoko Ishii announced the USD 63 million Congo Basin Sustainable Landscapes Program on 14 March 2019 at the One Planet Summit. Ishii emphasized the commitment of African leaders and the global community to preserve forests in the Congo Basin. Ishii expressed hope that the partnership will "address the fundamental drivers of environmental degradation."
The UN Environment Programme (UNEP), the World Bank, the International Union for the Conservation of Nature (IUCN), the World Wildlife Fund (WWF) and the Governments of Cameroon, CAR, the DRC, Equatorial Guinea, Gabon and the Republic of the Congo will implement the Congo Basin Sustainable Landscapes Program with the financial support of the GEF. The Program is part of the GEF's Sustainable Forest Management Impact Program, which aims to produce benefits for biodiversity, climate change and land degradation by addressing the long-term health of the Congo Basin, the Amazon and drylands landscapes.

- http://sdg.iisd.org/news/gef-announces-partnership-to-address-forest-loss-and-degradation-in-congo-basin/

- The UN Environment Annual Report for 2018 published on March 4, 2019, includes a feature story about peatlands and our "Vow to protect massive African peatland a huge win for planet", focusing on the collaborative work of Global Peatlands Initiative partners working to protect the Cuvette Centrale Congo Basin peatlands:

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Aerial roots in swamp forest in Gabon. Photo: Hans Joosten.

Vow to protect massive African peatland a huge win for planet

People have lived in the Congo Basin for more than 50,000 years. Today, 75 million people from over 150 distinct ethnic groups depend on the health of the forest that covers much of the Congo Basin peatland complex. Known as the Cuvette Centrale, this complex is the size of the United Kingdom and straddles the Democratic Republic of the Congo and the Republic of the Congo. It is rich in biodiversity and—according to 2017 estimates—contains around 30 gigatonnes of carbon, equivalent to 15 years of emissions from the United States. Brought together by UN Environment and other Global Peatlands Initiative partners, the Democratic Republic of the Congo, the Republic of the Congo and Indonesia signed the Brazzaville Declaration in March 2018 to protect this complex. The Global Peatlands Initiative, led by UN Environment, helps peatland countries save or restore these vital wetlands, which cover about 3 per cent of global land area.

"For biodiversity, for climate and for people, we need healthy peatlands," said Dianna Kopansky, Global Peatlands Initiative Coordinator, UN Environment. "Cuvette Centrale is home to 14 globally threatened species including bonobos, gorillas and chimpanzees. This peatland is a global treasure that deserves global attention and efforts for now and for our future."

The Brazzaville Declaration shows that neither the international community nor the governments involved want to see the pattern of peatland drainage or destruction that happened in Indonesia repeated. Although relatively undisturbed due to its remote location, Cuvette Centrale is at risk from oil, gas and forestry concessions, as well as infrastructure development. If the area is used for agricultural purposes such as palm oil, the ecosystem could be drained and degraded, and the entire hydrology of the Basin disturbed. The first step to avoid such outcomes, according to Republic of the Congo's Minister of Tourism and Environment, Arlette Soudan-Nonault, is to improve understanding of how this vital ecosystem works. "As an example for the implementation of the Brazzaville Declaration, the Government of the Republic of the Congo has decided to set up a high-level scientific committee to enable the country to improve its understanding of this biodiversity-rich ecosystem," she said. But issues remain. For example, while logging on swamplands is prohibited in the Democratic Republic of the Congo, the Rainforest Foundation UK says that "Congolese legislation does not precisely define what constitutes a swamp".

Many of the forestry concessions given out in Cuvette Centrale have expired. Greenpeace campaigners are calling for these concessions to be "shut down and returned to the state". This is a key step in protection of the peatlands, and one local residents hope will preserve their way of life. "We hope our government will support us in our role as guardians of this ancient forest and provide us with the needed support to safeguard

peatlands for our children and for the world," said Valentin Egobo, a member of the Lokolama community, which lives on the edge of the peatlands in the Democratic Republic of the Congo.

Indonesia's role is to share its hard-won lessons on peatlands management. Indonesia has over 15 million hectares of tropical peatlands and experienced large-scale peatland fires in 2015. The nation is now rewetting over two million hectares of dried-out peatland, while scaling up information sharing globally. Laws are in place to make sure regulations—including a nationwide ban prohibiting new peatland drainage—are enforced.

The chances of survival for all peatlands were further boosted in October, when countries and Global Peatlands Initiative partners came together for a South-South exchange that culminated in the International Tropical Peatland Center, which will strengthen international collaboration. During the visit, Indonesia and the Republic of the Congo signed the first-ever agreement on the protection and management of peatlands between an African and an Asian country.

UN Environment Acting Executive Director Joyce Msuya called the joint effort on Cuvette Centrale, "South-South cooperation at its best". "We will need such excellence to continue if we are to conserve peatland biodiversity and keep huge amounts of carbon in the ground," she said.

- https://www.unenvironment.org/annualreport/2018/chapter-03-ecosystem-management.php

Scientists urge countries to protect peatlands as part of climate strategies

A special issue of the Springer journal 'Mitigation and Adaptation Strategies for Global Change' reports on research from the world's largest peatlands and urges countries to protect these vulnerable wetland ecosystems as part of their climate strategies, and to learn from each other's experiences to sustainably manage them. Tropical peatlands are one of the main carbon stocks in the planet, but are under threat from agriculture, infrastructure and mining. The volume presents nine papers from Indonesia, the Congo basin and the Peruvian Amazon, offering new insights to help policy-makers balance development, climate and conservation goals. 'Tropical peatlands under siege: the need for evidence-based policies and strategies,' has been led by the Center for International Forestry Research (CIFOR) in collaboration with the US Forest Service and with USAID's support. "Peatlands present us with a golden opportunity to confront climate change, but we need policy-makers and scientists to work hand-in-hand in the creation of sound strategies," says Centre for International Forestry Research principal scientist, Daniel Murdiyarso, on behalf of the other Guest Editors Erik Lilleskov and Randy Kolka of the US Forest Service. "It is also vital that countries exchange knowledge to avoid tripping over the same stone twice when it comes to peatland conservation and management," he adds.

Tropical peatlands in Southeast Asia continue to be converted at an alarming rate – particularly in Indonesia, where peatland development for oil palm and pulpwood took off in the 1980's. Peatlands in the Amazon and Congo Basin are a lot less degraded, but they might follow the same unsustainable pathway if they do not take action, warn researchers.

The document explores how lessons learned from Indonesia can inform policies to protect relatively intact peatlands in Peru and the Republic of Congo, noting that in these three regions alone peat swamp forests cover a total of 50 million hectares and store up to 3,000 tons of carbon per hectare. Scientists emphasize the need for strong policies that protect peatlands from hydrocarbon mining and infrastructure development, and call on countries to exchange practical knowledge before it is too late. The research has other policy implications. For example, the papers identify drivers of conversion and can be used to refine emission factors –essential to quantifying greenhouse gas emissions from the degradation of peatlands. "The data reported in this special issue enriches existing information, including the emission factors in the Wetland Supplement of the IPCC guidelines," notes the document. Studies also unravel peatland hydrology –vital to restoring drained ecosystems— and look into better ways of modeling and remotely monitoring water regimens. All this knowledge could be harnessed by national bodies such as the Indonesian Peatland Restoration Agency, tasked with restoring more than two million hectares of degraded peat swamp forests by 2020.

For authors, a deeper understanding of peatland characteristics is important for countries to deliver on both national priorities and global climate goals, for instance, through evidence-based REDD+ programs and nationally appropriate mitigation actions (NAMAs).

"Policies that recognize peatlands as a unique and yet vulnerable ecosystem type at the national level, alongside an appropriate valuation of their ability to store carbon over long periods of time, could up their chances of remaining carbon sinks rather than becoming major sources of greenhouse gases," conclude the authors of the synthesis of the nine papers published in the issue.

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- https://www.cifor.org/press-releases/scientists-urge-countries-to-protect-peatlands-as-part-of-climate-strategies/
- https://www.cifor.org/library/7078

Congo Basin rainforest may be gone by 2100, study finds

Africa's Congo Basin is home to the second-largest rainforest on the planet. But according to a new study, this may soon not be the case. It finds that at current rates of deforestation, all primary forest will be gone by the end of the century. The study was conducted by researchers at the University of Maryland (UMD) in the U.S. who analyzed satellite data collected between 2000 and 2014. Their results were published in *Science Advances*. It reveals that the Congo Basin lost around 165,000 km^2 of forest during their study period. In other words, one of the world's largest rainforests lost an area of forest bigger than Bangladesh in the span of 15 years.

The new study reveals that the dominant force behind rising Congo deforestation, driving more than 80 % of the region's total forest loss, is small-scale clearing for subsistence agriculture. The researchers write that most of it is done by hand with simple axes. According to the authors, the preponderance of small-scale deforestation of Congo rainforest is due largely to poverty stemming from political instability and conflict in the region. The Congo Basin rainforest is shared by six countries: Cameroon, the Central African Republic (CAR), the Democratic Republic of the Congo (DRC), Equatorial Guinea, the Republic of the Congo (RoC) and Gabon. Of these, the DRC holds the largest share of Congo forest – 60 % – and is home to more people than the other five combined. The DRC, along with CAR, has a human development index in the bottom 10 percent, meaning that lifespans, education levels and per capita GDP there are among the lowest in the world.

With few livelihood options, most people survive by carving farmland out of the forest. These plots are farmed until the soil runs dry of nutrients, whereupon a new plot is cleared and planted. Before now, it wasn't exactly understood how much this type of smallholder farming called "shifting cultivation" and other forms of small-scale agriculture were contributing to overall Congo deforestation. So UMD researchers looked for patterns signalling different types of deforestation in regional tree cover loss data captured by satellites.

According to study coauthor Alexandra Tyukavina, "it was important for us to explicitly quantify proportions of different drivers, to demonstrate just how dominant the small-scale clearing of forests for shifting cultivation is within the region, and to show that it's not only re-clearing of secondary forests, but also expansion into primary forests." Tyukavina and her colleagues found that small-scale forest clearing for agriculture contributed to around 84 percent of Congo Basin deforestation between 2000 and 2014. When zooming in on the portions contained only in the DRC and CAR, that number goes up to more than 90 percent. The only country where small-scale agriculture isn't the driving force of deforestation is Gabon, where industrial selective logging is the biggest single cause of forest loss. The study also reveals that the majority – 60 percent – of Congo deforestation between 2000 and 2014 happened in primary forests and woodlands, and in mature secondary forests. The United Nations projects that there will be a fivefold increase in human population in the Congo Basin by the end of the century. The researchers found that if current trends hold, this means that there will be no primary Congo rainforest left by 2100. In their study, the researchers also warn of "a new wave" of large-scale clearing for industrial agriculture. While contributing a comparatively scant 1 % of Congo deforestation during the study period, it appears to be trending upward, particularly in coastal countries. "Land use planning that minimizes the conversion of natural forest cover for agro-industry will serve to mitigate this nascent and growing threat to primary forests," the researchers write.

Citation: Tyukavina, A., et al., (2018) Congo Basin forest loss dominated by increasing smallholder clearing. *Science advances* 4(11), eaat2993. DOI: 10.1126/sciadv.aat2993

- https://news.mongabay.com/2018/11/congo-basin-rainforest-may-be-gone-by-2100-study-finds/

South-Africa

The Society for Ecological Restoration, together with our local partners at the South African Department of Environmental Affairs and South African Water Research Commission, proudly invite you to Cape Town for this first-ever global restoration conference in Africa! Join us from 24-28 September 2019 to connect with researchers, practitioners, policymakers, and students from around the world and expand your knowledge about the latest issues and developments in ecological restoration. The conference program, oriented around the theme "Restoring Land, Water & Community Resilience," will include more than 100 oral sessions on a wide range of topics, as well as poster sessions, workshops, training courses, and field trips.

- https://ser2019.org/register/registration/

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Asia

Planning a haze-free ASEAN

ASEAN's vision of a haze-free region by 2020 looks increasingly cloudy by the day. A decades-long problem for the region, ASEAN defines haze as smoke resulting from land and/or forest fires which harm health, living resources, ecosystems and material property and impairs or interferes with amenities and other legitimate uses of the environment. The ASEAN Agreement on Transboundary Haze Pollution (AATHP) was signed in 2002 to tackle haze in the region, and three years ago in 2016, ASEAN member nations agreed on the ASEAN Cooperation towards Transboundary Haze Pollution Control with Means of Implementation, a guideline for the region as it strives towards its declaration to be haze-free by 2020.

However, with the vaguely worded goal of ensuring "regional transboundary haze pollution is eliminated through intensifying collective actions to prevent and control forest and/or land fires," and no concrete steps outlined to achieve that target, enforce laws or clamp down on the patronage policies within industries which clear land for farming or other sectors, it is easy to see why the haze remains ASEAN's most pressing regional environmental problem. As forests are illegally burnt either due to wildfire or to clear land for agriculture, the haze that engulfs the area and spreads to other regions causes numerous health issues as well as economic, ecological and social damage. Although these fires are usually started in Indonesia, the haze also travels with the wind to neighbouring Malaysia and Singapore – thus the need for a concerted region-wide initiative to curb the annual headache.

It is no surprise, then, that the haze is back again this year. In Indonesia, the Riau Disaster Mitigation Agency today said that 2,719 hectares in the Riau province have been destroyed by wildfire this year, with fires that burned throughout last month likely to keep spreading. The military deployed an aircraft to create artificial rain last month as the haze reached hazardous levels and forced schools on Sumatra island to close. Indonesia usually bears the brunt of the blame for the haze each year. During the 2015 haze crisis which affected the region for weeks, Indonesia produced more carbon than the entire EU economy during the same period of time. However, other ASEAN countries are not blameless. Almost 300 hectares of peatland went up in flames in Malaysia's Terengganu state this month, where firefighters had to battle for nearly two weeks before finally managing to get the blaze under control. The state of Johor, which borders Singapore, recorded 1,443 incidents of open burning in the first two months of this year – with the Johor Fire and Rescue Department stating that 141 cases involved forest fires while 879 were bush fires. With unhealthy Air Pollutant Index (API) readings recorded in some Malaysian districts, the country's Education Ministry gave school administrators the power to close schools or restrict outdoor activities as they see fit. In Thailand, the country's Climate Change Data Centre – which measures fire hotspots in the Mekong region – reported that the haze in the country's northern regions was due to the 149 hotspots they recorded from 4-10 February. Cambodia had 159 while Vietnam had 61 and Myanmar 18 – with the fires blamed on the burning of several controlled fires in cane and rice plantations as farmers get ready to plant new crops. Dr. Chaicharn Pothirat, a lecturer at Chiang Mai University's Faculty of Medicine, pointed out that most farmers in Thailand are unconcerned about the ban on agricultural fires due to the poor law enforcement on the issue.

As home to some of the world's fastest growing economies and populations, it is understandable that ASEAN has to strike a delicate balance between environmental concerns and economic development. However, time is quickly running out for the region to combat this recurring problem. Proper enforcement, constructive measures and a stricter ASEAN-wide stance on haze will go a long way in ensuring the AATHP remains relevant going forward.

- https://theaseanpost.com/article/planning-haze-free-asean

India

Need to protect hill wetlands today to save water for future

Peatland in Kodaikanal, Western Ghats, India.

A solution to tackling water scarcity in the sun-baked plains could lie high above, in the mountains. A team of researchers from Chennai-based Care Earth Trust is now studying waterbodies in elevated areas, one of the first places of water capture in the hydrological cycle, as part of a major effort to conserve them for sustainability in future. Started three years ago in the marshes of Dindigul district's Kodaikanal in the Western Ghats, the location of the study has moved to the Nilgiris, said Avanthika Bhaskar of the Trust. Preliminary research has reiterated that wetlands in the hills are the key to sustaining biodiversity, especially herbaceous plants, birds and mammals.

Armed with the findings of the study, after it is completed, the state forest department is set to incorporate mountain wetlands in its plans for integrated watershed management and forest conservation, in addition to involving local communities for sustainable use in future, Bhaskar added. Water stored in swamps and wetlands atop hills is important for recycling. Despite the significance, conducting research into these 'water towers' is challenging mostly because of the small size and the subjects often being difficult to map using standard wetland inventory techniques. In spite of their elevated location, the hydrological characters of the various wetland types — herbaceous wetlands with mineral soils, including marshes, wet meadows and salt flats; peat lands; and riparian wetlands along streams — change frequently, mainly due to human intervention. For example, in the Nilgiris, when the water runoff from the numerous tea estates dotting the region drains in such wetlands, the chemical residues in the runoff impacts the soil as well as the water quality, said Bhaskar.

One of the major threats to these water sources is conversion from one form to another, resulting in the loss of key hydrological regions. Global warming is another major threat and with mountain wetlands identified as being among the most sensitive to climate change could affect their very existence.

- https://timesofindia.indiatimes.com/city/chennai/need-to-protect-hill-wetlands-today-tosave-water-for-future/articleshow/68514932.cms

Indonesia

No more fires in Indonesia? Blazes on Sumatran peatland say otherwise

Forest fires have intensified in Sumatra, raising questions about the government's claims it has succeeded in tackling the annual problem. An area spanning nearly 26 km^2 has gone up in smoke in the province of Riau, according to local media reports. Eleven of the 12 districts that make up the province have been affected, with thousands of people suffering from breathing problems due to the haze from the fires. "The fires in Riau these past two months have been severe," Muhammad Teguh Surya, executive director of the environmental NGO Yayasan Madani Berkelanjutan, told Mongabay. "And the worst thing is that this thing hasn't caught much attention. Instead, the president said there are no more fires, even though fires are raging hard [in Riau]." President Joko Widodo famously claimed, during a debate with election rival Prabowo Subianto in February, that his administration's policies had resulted in no fire incidents since the devastating blazes that swept the country in 2015. The Ministry of Environment and Forestry later acknowledged that there had been fires every year since, just on a smaller scale.

That pattern has resumed again this year, with all of the fires in Riau occurring on carbon-rich peatlands. "In Riau, the most vulnerable are peat areas because they're dry," Isnadi Esman, secretary general of a network of peat conservation activists called Jaringan Masyarakat Gambut Riau, told Mongabay. "Last year, there were still fires on mineral soil. But this year, we haven't detected fires on mineral soil. They're all on peat."

The presidentially appointed Peatland Restoration Agency (BRG), set up after the 2015 fires, says this is because the dry conditions at this time of year are still confined to coastal areas, where peat forests abound. Mineral lands in the western part of Riau remain wet, BRG deputy Haris Gunawan told Mongabay. But this kind of reasoning, say activists, points to there being little improvement since the 2015 fires that engulfed large swaths of forests in Sumatra and Borneo and sent clouds of toxic haze as far as Malaysia and Singapore. “This means there hasn’t been an overhaul in the way the government handles land and forest fires,” Khalisah Khalid, a spokeswoman for the Indonesian Forum for the Environment (Walhi), the country’s biggest green NGO, told Mongabay.

The ongoing forest fires have cast doubt on the government’s ambitious plan to nearly halve the number of fire hotspots in Indonesia by 2019, which was announced in late 2017. Yayasan Madani’s Teguh said the decline in the number and intensity of forest fires in the past three years was a mere fluke, thanks to wetter than normal weather. The area of burned land in 2017, at around 1,700 km^2, was only 6 % of the total lost in 2015. “We know the government is working [to address forest fires], but there’s no need to be cocky,” Teguh said, in reference to President Widodo’s claim of credit for “ending” the fires. If anything, say environmentalists, the absence of an El Niño weather pattern in 2016 and 2017 helped keep fire incidents down during that period. The 2015 El Niño was blamed for a longer-than-usual dry season that year, which exacerbated the fire disaster. And when the dry season returned in full force in 2018, so did the incidence of haze. Last year saw a significant uptick in forest fires, with 5,100 km^2 of land scorched — three times the area burned in 2017 — as a result of the more intense dry season than in the previous two years. And that came despite the government deploying more resources than usual — more than $70 million in South Sumatra province alone — to prevent haze disrupting the 2018 Asian Games, which was co-hosted in the provincial capital, Palembang.

Teguh said this focused effort, in service to a one-off special event in which Indonesia’s global reputation was at stake, epitomized a key problem with Indonesia’s approach to fighting forest fires. “Does the government make the same kind of effort in other provinces? And does it do so all the time?” he said. “That’s the problem with our approach, which is situational. During the rainy season, we’re not on guard. It’s not until the dry season that we wake up. But by then it’s too late.” Teguh said the government continued to take a responsive tack in combating forest fires, deploying firefighters and waterbombing planes only after a blaze has broken out.

The establishment of the peat restoration agency, the BRG, was supposed to change that approach to a preventive one. The agency is tasked with spearheading nationwide efforts to restore 24,000 km^2 across the country by the end of 2020. The idea is that restoring degraded peatland — by blocking drainage canals and rewetting the dried-out peat soil — will make these areas less prone to burning. And even if they do catch fire, it should be easier to contain the fires and extinguish them. But Teguh said the peat restoration initiative was lacking in its implementation, with civil society groups rarely asked to be involved. Some of the areas burning in Riau this year are those where BRG programs are in place, such as Lukun village in the district of Tebing Tinggi. Haris of the BRG said the affected area, about 8 kilometers from the village, was the site of illegal logging, and that as a result of that activity, a project to block the peat drainage canals there hadn’t been able to start. He also said the villagers preferred that build fire-prevention measures be implemented closer to their homes and farms, even if areas further away were more susceptible to fires. Khalisah of Walhi said the BRG should overcome these on-the-ground challenges if it truly wanted to be effective. “The government can’t keep doing business as usual. If there are fires on locals’ plantations, what will the government do?” she said.

One of the main problems with how the government implements the peat restoration program is a lack of transparency about the progress of the initiative, according to Teguh. The BRG is required to report its progress to the Ministry of Environment and Forestry as well as the office of the president’s chief of staff, or KSP, every quarter. “The program’s been running for three years now but no one knows the actual progress of the initiative,” Teguh said. “We admit the BRG has done a lot, but since it doesn’t report its progress to the public periodically, we can’t contribute and participate.”

Another obstacle to the effectiveness of the government’s efforts is the lack of any review of existing permits on peatlands, according to Walhi policy analysis department head Even Sembiring. Under a 2016 peat protection regulation, companies must relinquish those parts of their peat concessions that contain areas designated as protected for conservation. These include areas where the peat layer is deeper than 3 meters and which contain high biodiversity. Even said many companies held permits that spanned such areas. In some cases, he said, companies submitted bogus environmental impact analyses, known locally as Amdal, to exploit forests with peat layer thicker than 3 meters, as evidenced in a government-sanctioned audit of companies in

Riau in 2014. But there's been no follow-up to the audit, and no order for a review of existing permits, meaning it's business as usual for those companies. "The only way to save our peatland and to keep the carbon below the ground is to evaluate all permits on peat ecosystem," Even told reporters in Jakarta. "The government should have made that a priority."

Teguh said he was worried the ongoing fires in Riau weren't getting a lot of public attention, with the news cycle gripped by the presidential and legislative elections slated for April 17. "If the dry season persists and the government continues to sit around like it's doing now, we're worried that the elections might be disrupted," Teguh said. "If there's a repeat of the 2015 fire episode, our elections might be cancelled. Who wants to go to the polling stations if they can barely breathe?"

- https://news.mongabay.com/2019/03/no-more-fires-in-indonesia-blazes-on-sumatran-peatland-say-otherwise/

Burned peatland in South-Sumatra. Photo: Hans Joosten.

Wildfires rage on in Riau, authorities use helicopters to put out flames

The total area lost to wildfires in Riau this year has increased to 2,719 hectares. The head coordinator of the Riau Disaster Mitigation Agency (BPBD), Edwar Sanger, said the wildfires were likely to keep spreading, as the Meteorology, Climatology and Geophysics Agency (BMKG) in Pekanbaru was still detecting hot spots. Edwar said Bengkalis was the hardest hit regency with 1,263 ha of burned land. Most districts in the regency have experienced wildfires since early this year. However, the worst wildfires were recorded on Rupat Island, where peatland was on fire throughout February, causing thick smoke that spread to the city of Dumai on the Sumatran mainland. Aside from Bengkalis, severe wildfires were reported in the east coast areas of Rokan Hilir (407 ha), Meranti (222.4 ha) and Dumai (192.25 ha). Moreover, Edwar revealed that wildfires had ravaged 314.5 ha in Siak regency, 107.1 ha in Indragiri Hilir and 64.5 ha in Indragiri Hulu. The Indonesian Military, police, BPBD and Manggala Agni fire department are attempting to put down the flames through aerial firefighting with helicopters. "The National Disaster Mitigation Agency (BNPB) already lent us three helicopters. We received three [more] from private parties, and they will lend us one more." Edwar said as quoted by the *Antara* news agency. He added that the Environment and Forestry Ministry (KLHK), the police and the military would also lend one helicopter each to help with the effort.

- https://www.thejakartapost.com/news/2019/03/25/wildfires-rage-on-in-riau-authorities-use-helicopters-to-put-out-flames.html

Rp1 trillion spent on fighting land fires in 2018

The government spent Rp1 trillion for fighting wildfires on peatlands in South Sumatra province last year, Chief of the National Disaster Mitigation Board (BNPB) Lt. Gen. Doni Monardo said on March 12. In view of the high cost, he felt it was necessary to familiarize the public with the effort to preempt wildfires. It is better to prevent wildfires by familiarizing people nearby on how to tackle fires before they inflict losses worth hundreds of billions of rupiahs, he added. The Rp1 trillion was spent on preventing smoke from reaching South Sumatra, which hosted the Asian Games in 2018, he remarked.

- https://en.antaranews.com/news/122644/rp1-trillion-spent-on-fighting-land-fires-in-2018

Indonesia: S. Sumatra to likely face longer drought

The South Sumatra Disaster Mitigation Agency (BPBD) has forecast that this year's drought may last longer than that of 2018. No rain was received during the peak of this year's dry season. Hence, to halt bush and forest fires, preventive measures are necessary since South Sumatra has peatland areas, the agency's head, Iriansyah, stated in Palembang on March, 22. It was not easy to extinguish the wild fires in peatland areas, he stated, adding that the BPBD officials had mapped South Sumatra Province's fire-prone districts of Ogan Komering Ilir, Ogan Ilir, Banyuasin, Musi Banyuasin, and Muaraenim. Due to the presence of peatland areas in these five districts, the BPBD has continued to maintain alertness. However, the agency's officials also conduct regular surveillance as a precautionary measure against the occurrences of bush and forest fires in other districts, he noted. The central and provincial governments have been making attempts to restore the peatland areas in South Sumatra Province. Last year, peatland restoration was targeted to cover some 594,231 hectares in South Sumatra. According to Head of the Regional Peatland Restoration Team Najib Asmani, the process of peatland restoration is to be completed in 2020.

- https://wildsingaporenews.blogspot.com/2019/03/indonesia-s-sumatra-to-likely-face.html

Burned peatland in Jambi, Sumatra. Photo: Hans Joosten.

Terra and Aqua Satellites detect 165 hotspots in Riau, Sumatra

The Terra and Aqua Satellites, on Wednesday morning March 20, detected a total of 187 hotspots on Sumatra Island, including 165 in Riau Province, according to the Pekanbaru meteorology station. The number of hotspots in Riau increased to 165, from 156 on the previous day, according to a statement issued by the local meteorology station. In Riau, 39 hotspots were found in Bengkalis District, 37 in Pelalawan, 31 in Meranti Islands, 17 in Rokan Hilir, 16 in Dumai, 11 in Siak, six in Indragiri Hulu, three in Indragiri Hilir, two

each in Kampar and Rokan Hulu, and one in Pekanbaru. Of the 12 districts in Riau, only Kuantan Singingi had no hotspot. Of the total 165 hotspots, 107 had an accuracy of above 70 percent of being spots of forest fires. The Riau provincial administration has declared a forest fire emergency status until October 2019. Peatland fires have occurred since January 2019, and the number significantly increased during March. Since January 2019, wildfires had gutted a total area of 2,038 hectares in the province, including 1,045 hectares in Bengkalis, Edwar Sanger, head of the Riau Disaster Mitigation Office (BPBD), stated on March 19.

- https://en.antaranews.com/news/122815/terra-and-aqua-satellites-detect-165-hotspots-in-riau-sumatra

Stunting, loss of earning potential linked to Indonesia's 1997 wildfires

It was 1997, and while record fires were raging across Indonesia a new socio-economic crisis may have been quietly unfolding among the country's infants and unborn children, according to a new study. The study suggests that the fires had a direct and irreversible impact on those babies: Their growth was stunted by up to 3.4 centimeters compared to the norm for other 17-year-olds, which in turn may have negatively affected their abilities to earn a comparable income. In 1997, a drought caused by El Niño rapidly spread what were intended as controlled, land-clearing fires.

Subhrendu Pattanayak, a professor at Duke University, and Jie-Sheng Tan-Soo, an assistant professor at the National University of Singapore, sought to assess the impact of this environmental disaster in the longer term. "Pursuit of short-term economic gains results in air pollution that causes long-term, irreversible health impacts." To arrive at this conclusion, the pair studied 560 children tracked since 1993 from the Indonesian Family and Life Survey (ILFS), a series of surveys conducted by the RAND Corporation, as well as the mothers' residential records and their babies' birth dates in particular districts to "identify the air pollution exposure for each fetus from August to October 1997, when the fires and air pollution were most intense," they wrote. They then focused on the children's heights when they were 3, 10 and 17 years of age.

While lower birth weight and premature birth are already known to be associated with air pollution, the evidence they gathered showed that the affected children were shorter at these subsequent three stages, too and that directly affected their earning potential by up to 4 percent. "Consider the fact that 1.13 million individuals were in their prenatal stage during August through October 1997 in the impacted provinces of Sumatra or Kalimantan [Indonesian Borneo], where the air pollution and fires were most intense," the authors wrote. Taking into consideration assumed working ages, average blue-collar wages of about $860 and other factors, the researchers, "Estimate that the lifetime productivity loss for this exposed population of 1.13 million is about US$392 for each individual."

Research has shown a correlation between a person's height and their income, and that "these negative impacts on stature (which translate into physical stamina) and cognition result in lower economic productivity, earning 8-46 percent lower wages and owning up to 66 percent fewer assets."

While Indonesian President Joko Widodo promised to tackle the issue of stunting in an address last year, he's also campaigning on a pledge to increase palm oil production. In addition, fines levied against 11 companies that started fires to clear land have yet to be collected, and fires have continually been recorded across the country since massive blazes that ravaged the country again in 2015.

The Indonesian ministries of health and environment did not respond to requests for comment before publication. Pattanayak said in an email that he hoped the study could help guide policymakers who are focused on short-term solutions. "[When] we don't know the full, long term costs, we tend to over-emphasize shortsighted policies," he wrote. "Applied research is needed to support bolder policies by governments to make the right choice." In this case, he said that analysis has shown that "social net benefits from clearing for oil palm using fire is lower compared with net social benefits of (*i*) clearing using mechanical means, (*ii*) stronger enforcement of fire bans, and (*iii*) better fire suppression efforts."

- https://news.mongabay.com/2019/02/stunting-loss-of-earning-potential-linked-to-indonesias-1997-wildfires/

Emergency declared over Indonesian peat fires

The administration of Riau province, Sumatra, has on Feb. 19 declared an eight-month emergency period to deal with peat fires despite President Joko Widodo having just days before had claimed there that there had been no such blazes for several years. Governor Wan Thamrin Hasyim said peatland fires had become widespread in some areas in recent weeks. He also said that weather forecasters are predicting a long dry season ahead. At least 843 hectares of land have already been burned, according to the National Disaster Mitigation Agency. Agency spokesman Sutopo Purwo Nugroho said in a statement that the peat fires, mostly resulting from land clearing, have caused haze with low duration. Nugroho said the local disaster mitigation agency has worked with police and military personnel to combat fires, including by using water-bombing helicopters.

On Feb. 17, President Widodo, who is seeking a second term in a presidential election scheduled for April, said during a second televised presidential debate that there had been no fires for the past three years. However, the next day he corrected himself, saying there had been a small number of fires but the impact was low and there had been no complaints for several years from neighboring countries such as Singapore and Malaysia. Data from the Environment and Forestry Ministry shows that the number of so-called fire hotspots in the country decreased from 70,971 in 2015 to 9,245 in 2018. Meanwhile, Riko Kurniawan, executive director of the Riau chapter of the Indonesian Forum for the Environment, urged the local government to stop fires by paying more serious attention to law enforcement. "What the government has done so far is to put out fires instead of enforcing the law," he told ucanews.com. He stressed that peatland forest fires are mostly caused by illegal agricultural practices. He also noted the importance of a new review of peatland management and restoration to prevent fires from recurring.

- https://www.ucanews.com/news/emergency-declared-over-indonesian-peat-fires/84554

Land fires in Riau arose far from settlement: BRG

The land and forest fire in Riau Province occurred in areas far from the settlement and farmers` plantation, according to the Peatland Restoration Agency (BRG). "Peatland areas engulfed by the fire are those on which rewetting was yet to be carried out," BRG Chief Nazir Foead told Antara on February 23. The agency`s peatland restoration program, conducted since 2016 in the province, has involved the local government and public. Foead affirmed that rewetting of peat soil was prioritized in locations close to settlements and plantations, as they have limited sources to cover all peatland regions. "Usually, people choose peatland areas that are close to settlement and plantation areas. Hence, their houses, schools, and plantations would remain safe in case fire engulfed the peatland area," he explained. According to data of Riau University, the province has 4.8 million hectares of peatland area, or some 51.06 percent of Riau`s total area. "We know that more than half of Riau Province is peatland area. Peatland clearing has occurred for years, and the damage was quite extensive. A long time would be needed to restore the land," he remarked. In 2019, fire engulfed more than 850 hectares of land in Riau. The largest fire was detected in Rupat Island of Bengkalis District.

- https://en.antaranews.com/news/122412/land-fires-in-riau-arose-far-from-settlement-brg
- https://www.sportbreakingnews.com/2019/02/land-fires-in-riau-arose-far-from-settlement-brg/

Indonesian forest fires highlight president's campaign gaffe

Deliberately set fires are burning through peatland forests in the Indonesian province of Riau, the disaster agency said on February 19, just two days after President Joko Widodo incorrectly claimed there'd been no fires for several years. The agency said that 843 hectares of land have burned in Riau since the beginning of the year and that fire-fighting teams are currently battling blazes in several locations. "Conditions are expected to become more dry so the potential for fires increases," it said in a statement. Widodo has had to correct claims made in a presidential election debate about Indonesia's annual dry season fires that are set to clear land for plantation agriculture. Local media reported he now says the amount of land affected has fallen dramatically since disastrous fires in 2015 when 2.6 million hectares burned, polluting Indonesia and neighboring countries with a health-damaging haze.

Ministry of Environment and Forestry data shows more than 510,000 hectares of land burned last year, up from 165,000 hectares in 2017. Large areas of the island of Sumatra, which includes Riau, are prone to fires because of the practice of draining swampy peatland forests for plantations, making them highly combustible.

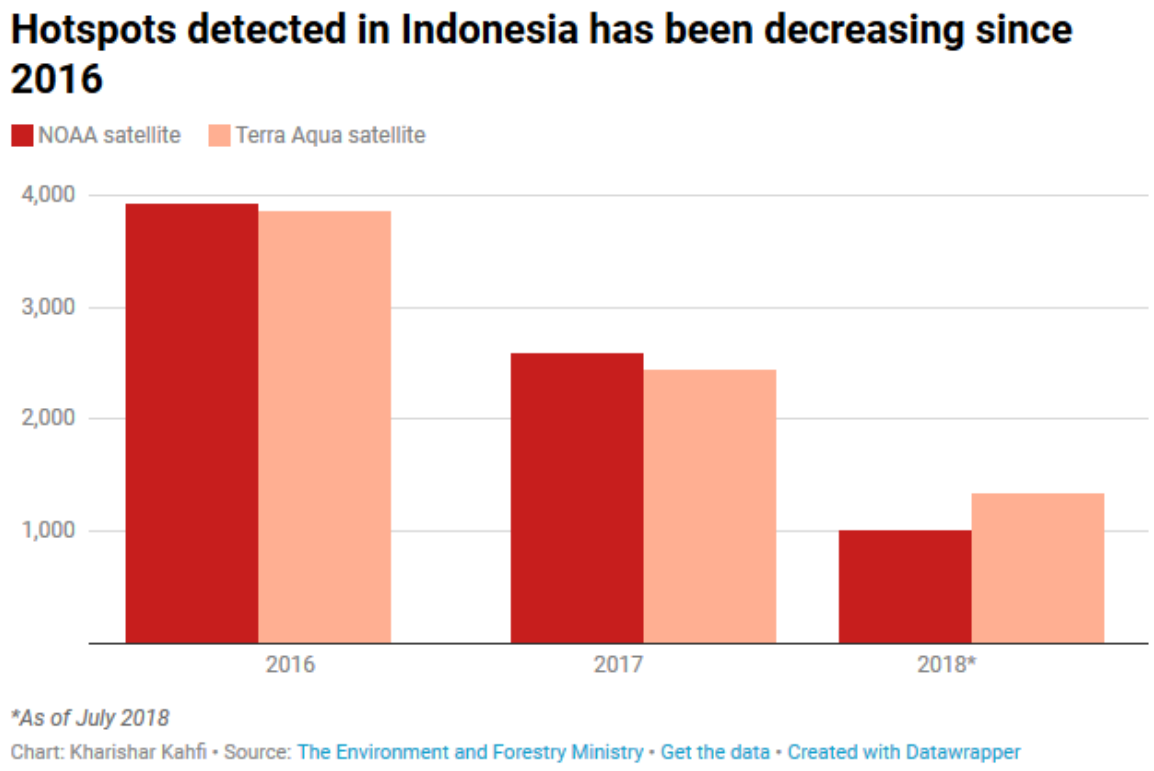
Plantation companies have been fined about $1.3 billion for fires and other environmental destruction but none have paid the penalties in cases that date back to 2009. Raffles Brotestes Panjaitan, the director of forest

fires control at the Environment Ministry, said there were more fires in 2018 than the previous year because regional elections distracted officials from fire prevention efforts. "This year requires extra hard effort because there are parliament elections and the presidential election as well as moderate El Nino effects," he said.

- https://www.thenewstribune.com/news/nation-world/article226451870.html
- http://www.asahi.com/ajw/articles/AJ201902200031.html

Indonesia braces for wildfires ahead of El Niño

The government has declared 16 provinces across the country as prone to forest and land fires ahead of the upcoming El Niño. An official with the Office of the Coordinating Political, Legal and Security Affairs Minister, Bambang Sugeng, said the emergency declaration that certain areas were wildfire-prone was done as a warning for these regions to stay alert to prevent forest and land fires. “We are prioritizing some provinces, such as South Sumatra, Jambi, Aceh and Riau.” Four additional provinces have been added to the list of fire-prone areas since last year, namely Bengkulu, East Nusa Tenggara, Papua and West Papua, because agencies recorded wildfires breaking out in those regions throughout 2018.



According to a report by the United States Climate Prediction Center issued in Feb. 19, El Niño conditions were expected to continue through this year’s Northern Hemisphere spring. In Indonesia, Bambang said authorities were still waiting for a report from the Meteorology, Climatology and Geophysics Agency (BMKG) on the start of the prolonged dry season because the climatic conditions of each region were different.

Riau became one of the first provinces in the country to respond to forest and land fires, as its administration declared an emergency status concerning ongoing peat land and forest fires. The status, valid from Feb. 19 to Oct. 31 this year, was issued based on the growing number of peat land and forest fires in the area, such as in Dumai, Rokan Hilir and Bengkalis. Smokey haze created by such fires in Riau forced administrations to close schools, distribute free face masks and advise students to avoid outdoor activities. From Feb. 12 to 16, the Riau Health Agency recorded 1,081 cases of smoke-related illnesses, mostly in patients below 20 years of age. Environment and Forestry Minister Siti Nurbaya Bakar said fire was a regular occurrence in Riau as a high number of hot spots were always detected around late February. “Despite the regularity, we always work to take care of any detected hot spots. Once we detect a fire, we immediately extinguish it. That is our current prevention concept,” Siti told journalists recently. She added that the authorities also asked corporations to keep peatlands in their concession from drying out, as well as to increase patrols on lands owned by other people. The minister echoed Bambang's wish to not let a haze disaster similar to the one in 2015 from happening.

According to a 2015 presidential instruction on handling land and forest fires, regions are required to form a task force tasked to mitigate the hazards of fire even before their administrations declare an emergency status. The task forces are to take a number of measures to prevent fires from occurring, from digging artesian wells to waterbombing dried peat land. Meanwhile, a local military unit in South Sumatra's Banyuasin regency is using a biochemical agent to try to prevent peatland from burning. The agent, named Bios 44, is expected to close off holes and pores on dry peat soil that make it easier for air to enter and any give fires more oxygen.

- https://www.thejakartapost.com/news/2019/02/25/indonesia-braces-for-wildfires-ahead-of-el-nio.html
- https://www.straitstimes.com/asia/se-asia/indonesia-braces-for-wildfires-ahead-of-el-nino

BNPB spokesperson laments theft of wildfire warning tools

National Disaster Mitigation Agency (BNPB) spokesman Sutopo Purwo Nugroho has lamented the theft of a forest and land fire early warning system in South Sumatra, a province prone to wildfires. On Feb. 28, National Peatland Restoration Agency (BRG) education task group head Suwignya Utama said at least five Sipalaga (wildfire early detection systems) had gone missing since 2018, as reported by Antara. Each was valued at around Rp 100 million (US$7,091). Responding to the news, Sutopo took to his Twitter *@Sutopo_PN* to say: "Not only a tsunami early-warning buoy but also forest fire detection units [....], seismographs [and] tsunami warning sirens were stolen. We barely have enough, yet they were stolen." He said the theft was a "non-structural problem that is not easily solved, similar to littering". Each Sipalaga early-warning unit records the water level and humidity of peat soil as well as rainfall. All of the data recorded is sent to a central monitoring system. The BRG has installed around 142 Sipalaga units in seven provinces with peatland, 21 of which are located in South Sumatra. Suwignya said the theft occurred only in South Sumatra.

- https://www.thejakartapost.com/news/2019/03/03/bnpb-spokesperson-laments-theft-of-wildfire-warning-tools.html

Vegetable cultivation on peat in Central Kalimantan. Photo: Hans Joosten

Governor calls on people to cultivate peatlands for farming

West Kalimantan Governor Sutarmidji has called on people to utilize peatland areas in the region to plant horticulture commodities as part of the efforts to prevent land and forest fires in the region. "People will surely be able to prevent fires from arising in the land after they begin cultivating it for farming," Sutarmidji stated here on February 25. He cited the example of North Pontianak`s farmers, who have produced some 30 tons of different vegetables daily from 800 hectares of land. "In fact, many types of crops can be cultivated in peat soil, such as the Pontianak sweet taro, which is known for its good quality," he added. Onions can also be cultivated in peat soil and, with good farming management, it could produce 20 tons of onions per hectare, the governor

stated. Sutarmidji believes that the utilization of peatland for farming will help to prevent land fires in the area and at the same time improve the people`s welfare. "This because when people plant vegetables in the peatland, they have to water the plants every day. This is one solution to avoiding peatland fires," he remarked. West Kalimantan Police Chief Insp. Gen. Didi Haryono had earlier noted that all related institutions in the province should continue to educate people on the negative impacts of haze and called on them to stop using fire to clear land. "Let us continue to educate the people on the impacts of haze, and hopefully, they will thereafter stop setting fire to their land," he stated. According to Haryono, almost 99 percent of forest and land fires in the province were not the result of accidental burning but since the people had set fire to clear the land. The West Kalimantan Police had recorded that during 2018, land and forest fires in the province covered some 1,100 hectares of peatland area. Six people were killed in the fires, and the police have initiated legal process against 30 individuals for alleged involvement in the land fires.

- https://en.antaranews.com/news/122430/governor-calls-on-people-to-cultivate-peatlands-for-farming

Malaysia

Peatland fire in Lembah Bidong

The peatland fire in Lembah Bidong, Setiuwhich began on March 11, continues to spread despite the week-long fire fighting operation. Terengganu Fire and Rescue Department operations division assistant director Senior Superintendent II Mohd Salahuddin Isa said the fire initially involved 57 hectares of land but spread to involve over 300 ha before its was extinguished. He said the situation was due to wind changing directions rapidly, with inadequate water resources in some areas.

- http://bernama.com/en/news.php?id=1706113
- https://headtopics.com/my/terengganu-firemen-put-out-300ha-peatland-blaze-the-malaysian-insight-4908169

Philippines

PHL island women lead in peatland restoration

Eluminada Roca has lived all her life next to the Leyte Sab-a Basin peatlands. The grandmother from San Isidro village on Leyte Island grew up looking at the green hills that feed water to the peatland, she harvested *tikog*—a peatland grass to weave mats—and ate the delicious fish that was once in abundant in the waters. But today, the land is losing its water, the grass is disappearing and the fish stock has drastically decreased. The community is mainly subsistence food growers and dependent on the catching and selling of fish both for consumption and sale. So, at the age of 70, Roca has joined hands with women of her village to restore the peatland to its previous health.

In the 1970s, the Philippine government encouraged its people to clear the peatland forests and start farming. In Leyte Sab-a Basin, it resulted in destroying some hills to build roads and canals. However after decades, the canals are draining the peatland water, making them go dry. Fortunately, there is now a new effort to undo the damage. In a hot, March afternoon, Roca sits with the members of San Isidro Village Women's Association, discussing why they must restore the peatland. "We need to make the peatland whole again, so we can resume our life as it used to be," Roca is heard saying. Everyone nods in agreement, including Janeline Garcia who, at 32, is the youngest woman in the group.

According to the Department of Environment and Natural Resources (DENR), the total area of identified peatlands in the Philippines is 20,000 hectares, including Leyte Sab-a Basin peatland. Spread over four villages, including San Isidro, this is one of the two major peatlands in the country. In 2013, when Philippines was hit by the devastating Supertyphoon Yolanda (international code name Haiyan), everything in Leyte and its capital city Tacloban was razed to the ground. According to an Oxfam report, the natural disaster had "brought out the greater vulnerabilities of women, children, persons with disabilities, elderly people and the LGBT [lesbian, gay, bisexual and transgender] individuals in already poor communities." As they struggled to get their lives back in track, the locals who live near the peatland areas began to notice the changes around them. They started identifying them one by one. The trees, including *lanipao* (*Terminalia copelandii*) and syzygium flowering plants, were destroyed; and the bats, birds and tarsiers that inhabited the peatlands were almost gone. The loss of the wildlife concerned the local communities, with many feeling that the peatland was becoming unhabitable.

In 2017, Weaver—a women's-led nongovernment organization in Tacloban—started a project to restore 1,180 hectares of Leyte Sab-a Basin peatland by roping in local women with support from the local government, the Visayas State University and International Institute for Rural Reconstruction, an international NGO. "It is a project where the local women will be the main actors. The different partners will contribute by doing research on what alternative crops the locals can grow, what alternative livelihood they can have because they cannot just be taken out of the place. We will help them organize, give them training and help them have an income through peatland restoration," Paulina Lawsin Nayra, founder of Weaver, tells Inter Press Service (IPS). According to Nayra, training of the women will begin after April. It will include deepening their knowledge of peatland, its link to climate change, its vulnerability to fire and the various ways to restore it. The training will include collecting seeds and planting the trees that only grow on peatland, vigilance against fire and keeping nurseries. While they are yet to be trained in the restoration work, the women of San Isidro already are looking at the future. "If we plant enough trees, birds will be back and we can start a bird sanctuary, which can be a tourist attraction," Maria Cabella, 52, who heads the village women's group, tells IPS. "We can also start a ropeway cable car for the tourists to enjoy the view of the peatland below," Estilita Cabella, 42, tells IPS. "We can restart making *tikog* mats," reminds Roca. But for Janeline Garcia, a young mother, the future health of the peatlands is related closely to the future of 9-month-old son. "Once we restore the peatland, my husband can catch enough fish to support our child," she tells IPS with a smile.

- https://businessmirror.com.ph/2019/03/18/phl-island-women-lead-in-peatland-restoration/

Eluminada Roca (left), 70, and Janeline Garcia, 32, with her son (9 months)—the oldest and the youngest members of San Isidro village women's association—are engaged in restoring Leyte Sab-a Basin peatland.

Vietnam

Kien Giang focuses on eco-tourism in U Minh Thuong National Park

The southern province of Kien Giang is carrying out a project to develop eco-tourism in U Minh Thuong National Park for 2019-2020 with a vision to 2030, with a total investment of over 150 billion VND (6.46 million USD). Vice Chairman of the provincial People's Committee Mai Anh Nhin said that the project aims to preserve natural resources and bio-diversity, while making the most appropriate use of the forest's potential so as to develop eco-tourism and environmental education in U Minh Thuong National Park. Through the project, the province will gradually complete the infrastructure system in the park and establish attractive tours to make U Minh Thuong one of the outstanding national parks in the Mekong Delta region and the world. Located in An Minh Bac and Minh Thuan communes of U Minh Thuong district, the park has a total area of 21,107 ha, including a 8,038-ha core zone; a 13,069-ha buffer zone; 365 ha of preventative forest and 2,728 ha of production forest; and 9,976 ha of farming land, aquaculture area, and land for other purposes. The park, home to various rare flora and fauna species, is considered a large natural museum on the submerged ecosystem. In 1994, the U Minh Thuong cajuput forest became the U Minh Thuong Nature Reserve. Three years later, it was officially recognised as a national relic site. The U Minh Thuong National Park was established in 2002. It was recognised as the fifth ASEAN Heritage Park in Vietnam and the first ASEAN Heritage Park located on peatland in the region in 2012, as well as the eighth Ramsar site in Vietnam in 2016. In recent years, the national park has come to be known as an attractive eco-tourist destination in the Mekong Delta region. According to the national park's Deputy Director Nguyen Van Cuong, it welcomed 63,180 visitors in 2018, up 5 percent year-on-year. In the first few months of 2019, over 15,000 tourists visited the park. The park has paid attention to diversifying and increasing the quality of its tourism products, with the aim of serving over 70,000 visitors this year.

- https://en.vietnamplus.vn/kien-giang-focuses-on-ecotourism-in-u-minh-thuong-national-park/148930.vnp

U Minh Thuong National Park became the eighth Ramsar site in Vietnam and the 2,228th in the world in 2016 Photo: VNA.

Europe

European Union

European Commission adopts Delegated Act on biofuels sustainability criteria

On March 13, 2019, the European Commission (EC) adopted a Delegated Act on sustainability criteria for biofuels as requested by the European Parliament and the Member States. According to the Commission, the enhanced use of electricity produced from renewable sources, including in the transport sector, is crucial for the decarbonisation of the EU's economy and the reduction of greenhouse gas (GHG) emissions. A new binding, EU-wide renewable energy directive (RED II) for 2030 with a target of at least 32 percent was agreed between the Member States and the European Parliament in June 2018. Already in force, the RED II includes a review clause by 2023 for a possible upward revision of the EU level target. The RED II also includes a gradual reduction of the amount of certain types of biofuels for which a significant expansion of the production area into land with high-carbon stock is observed – so-called high Indirect Land-Use Change (ILUC) risk biofuels, bioliquids and biomass fuels, to be counted towards the renewable energy targets.

ILUC can occur when pasture or agricultural land previously destined for food and feed markets is diverted to biofuel production. In this case, food and feed demand still needs to be satisfied, which may lead to the extension of agriculture land into areas with high carbon stock such as forests, wetlands, and peatlands. This, the Commission says, implies land use change by changing such high carbon stock areas into agricultural land as it may cause the release of GHG emissions by releasing carbon dioxide (CO_2) stored in trees and soil that negates emission savings from the use of biofuels instead of fossil fuels.

The Member States will still be able to use, and import, biofuels covered by these limits, but they will not be able to include these volumes when calculating the extent to which they have fulfilled their renewable targets. These limits consist of a freeze at Member States' 2019 levels for the period 2021-2023, which will gradually decrease from the end of 2023 to zero by 2030. The Directive also stipulates an exemption from these limits for biofuels, bioliquids and biomass fuels certified as low ILUC-risk.

To implement this approach, as required by the Directive, the Commission has published a Delegated Act and its Annex that sets out the criteria both for determining high ILUC-risk feedstock and for certifying low ILUC-risk

biofuels, bioliquids and biomass fuels. The Commission has also adopted an accompanying report on the status of production expansion of relevant food and feed crops worldwide, based on the best available scientific data. Following the adoption by the Commission, the European Parliament and the Council of Ministers, have a two-month period scrutiny period and a right to express an objection, after which, if none are received, the text will be published in the Official Journal of the European Union. This two-month period can be extended by other two months if requested by any of them.

- https://bioenergyinternational.com/policy/european-commission-adopts-delegated-act-on-biofuels-sustainability-criteria

Europe, in bid to phase out palm biofuel, leaves fans and foes dismayed

The European Commission has officially approved a measure to phase out palm oil-based biofuel by 2030. But while the move has angered major palm oil producers, it hasn't entirely pleased environmental activists either. The so-called delegated act marks yet another step by the European Union (EU) to curb the use of crops that cause deforestation in transportation fuel, over concerns that their production contributes to global carbon emissions and thus exacerbates climate change. But the phase-out doesn't mean a ban on palm oil in biofuels. EU member states will still be able to import and use palm oil-based biodiesel, but it will no longer be considered a renewable fuel or be eligible for the attendant subsidies. The process will also be gradual. Member states' maximum share of palm oil-based biodiesel that can be counted toward EU renewable transport targets for national governments (and hence be eligible for subsidies) will be capped at 2019 levels until 2023. After that, it will be progressively phased out of renewable targets to zero percent by 2030.

Bas Eickhout, a Dutch Green member of the European Parliament, lauded the commission's decision. "Burning food for fuel is nonsense and has a huge impact on climate change and biodiversity," he said as quoted by *Forbes*. "Today's decision sets the tone that Europeans want to shift away from unsustainable biofuels."

Officials in Indonesia and Malaysia, which together account for 85 percent of global palm oil supply, have slammed the European Commission's decision as discriminating against palm oil to support producers of other types of vegetable oils, primarily made in Europe. Malaysian Primary Industries Minister Teresa Kok said the decision wasn't based on any science, but rather on "the politics of protectionism," and that it was "totally without foundation." "The Delegated Act is discriminatory against the economies of developing nations in Southeast Asia, Africa and Latin America which produce palm oil," Kok said in a statement received by Mongabay. "And it is designed to hurt the livelihoods of millions of small farmers."

The EU is the second-largest market for palm oil from the two Southeast Asian countries, after India, importing 4.37 million tons of the commodity from Indonesia in 2016, according to the Indonesian Palm Oil Association (Gapki), and 2.06 million tons from Malaysia. In 2017, more than half of the palm oil imported into the EU, around 4 million tons, was used to make biodiesel.

Indonesia's Coordinating Ministry for the Economy said the government would challenge the European Commission's latest decision at the World Trade Organization (WTO). "[T]his is a form of discrimination against Indonesian products," Musdhalifah Machmud, the ministry's deputy for food and agriculture, told local news site Bisnis.com. The WTO can order member states to remove policies deemed to be in breach of free trade rules. The Indonesian government disputes the EU's assessment of the risk of carbon emissions from palm oil production compared to other vegetable oils, saying in a document reviewed by Reuters that the list of criteria "gives advantages to local European Union commodities such as rapeseed oil." The government also plans to lobby individual EU member states to reject the delegated act. The member states as well as the European Parliament and the Council of Ministers can raise objections to the European Commission's decision during a two-month scrutiny period. "If the EU proceeds [with the phase out], then we will also keep fighting," Darmin Nasution, the coordinating minister for the economy, said as quoted by Bisnis.com, adding that officials would visit Europe in April as part of their lobbying efforts. "We won't wait anymore," Darmin added. "We will try to convey our position to them."

Malaysia, meanwhile, has threatened retaliatory restrictions on European imports should the EU proceed with the palm oil phase-out. "Malaysia's Prime Minister has made clear that if the Delegated Act is finally adopted, Malaysia will investigate retaliatory actions against European exports, to combat this aggressive protectionist measure," Primary Industries Minister Kok said. "Malaysia will also be working with partner countries in the Council of Palm Oil Producing Countries to address this issue in the WTO." She said palm oil wasn't a major driver of deforestation, and that both Malaysia and Indonesia were committed to capping the expansion of oil palm plantations in a bid to address environmental concerns and improve the commodity's reputation abroad. President Joko Widodo of Indonesia last year declared a moratorium on the issuance of new permits for oil

palm plantations; Malaysia is mulling a cap on the country's total palm oil estate at 60,000 square kilometers (23,200 square miles), an area just 2.5 percent larger than currently planted.

The delegated act leaves in some provisions that will allow certain types of palm oil to be counted as renewable energy, mainly those produced by smallholder farmers. Palm oil cultivated on unused land, which includes abandoned or severely degraded land, is also exempted from the phase-out, as is palm oil derived from improved yields. The delegated act considers palm oil produced under these circumstances as low-risk crops in the context of carbon emissions.

The act defines smallholders as farmers with less than 2 hectares of land. The Malaysian government, though, says that all farmers with up to 5 hectares of land should be considered smallholders. Both Malaysia and Indonesia say that the palm oil industry has lifted millions of their citizens out of poverty by supporting smallholders' livelihoods, and that any restrictions will be detrimental to them. "This is totally unacceptable and it is discriminatory and insulting to smallholders in the palm oil producing countries," Kok said.

Environmental groups are also unhappy with the exemptions, though for different reasons. They say the assumption behind the smallholder exemption is that these farmers generally convert tiny patches of existing cropland and produce few negative environmental impacts, whereas big businesses generally clear large swaths of forests to make way for industrial-scale plantations. This isn't always the case, environmental activists say; instead, by allowing this exemption for palm oil, the measure opens up a potential loophole for exploitation.

Oil palm on peatland in Sabah, Malaysia. Photo: Hans Joosten.

An analysis by the Rainforest Foundation Norway has found that while corporate plantations play a major role in the razing of primary and peat forests into farmland, independent smallholders of all sizes are also present in these areas and thus shouldn't automatically be deemed "low-risk." "Agricultural land scarcity combined with restrictions on corporate plantations may have spill-over effects by encouraging smallholders to expand even further," the report says. It also cites evidence that smallholders contribute to expansion of plantations into land with high carbon stock. A study by the Center for International Forestry Research (CIFOR) in Indonesian Borneo has found that smallholders are more likely than ever to clear carbon-rich peat forests as a result of land scarcity. "The agricultural land that people are prepared to convert to palm oil has already been converted — and a lot of the existing farmland is becoming exhausted, so farmers are venturing further away and going into more marginal areas," said CIFOR senior scientist George Schoneveld. By 2030, the study projects, the

majority of smallholder oil palm expansion will happen on peat soils. “From the perspective of greenhouse gas emissions this type of conversion is especially disastrous,” Schoneveld said.
In Indonesia, smallholders are also predicted to overtake companies as the majority owners of oil palm plantations. The combined area cultivated by smallholders is expected to expand from 40 percent of total national acreage in 2016 to more than 60 percent by 2030. This could spell disaster for the climate, as peat soils store huge amounts of carbon, and the drainage that occurs when they’re cleared for planting releases that carbon into the atmosphere. Palm oil-based biodiesel has since 2009 enjoyed generous subsidies under the EU’s Renewable Energy Directive. But the policy failed to make any distinctions between the various feedstock available to produce biofuels, leading to a surge in palm oil biodiesel, the cheapest of biodiesel variants due to high yield of the feedstock. The rapid expansion of palm oil plantations in countries like Indonesia and Malaysia has destroyed vast swaths of tropical rainforests that are home to endangered species such as orangutans, tigers and elephants. As a result, green groups have been pushing to get palm oil-based biodiesel out of the EU market, calling it “the environmentally worst form of biodiesel.”
A 2016 study by the European Federation for Transport and Environment showed that palm oil-based biodiesel was on average three times worse for the climate than fossil fuel, due to the emissions from the deforestation carried out to produce the commodity.
Palm oil opponents have also criticized the delegated act for treating another vegetable oil, soybean oil, as low risk. They argue that soy cultivation can be as disastrous for the environment and climate change — perhaps even more so — than palm oil. A report last year by the International Union for Conservation of Nature (IUCN) found that while palm oil production can lead to deforestation and biodiversity losses, replacing it with other types of vegetable oils might be even worse for the environment. The key factor is the high yield of oil palms, with other oil crops requiring up to nine times as much land to produce the same volume of vegetable oil. Transitioning to the latter would shift the deforestation associated with palm oil production to other regions, such as South America, a major producer of soybeans. The decision not to label soy as high risk seems quite arbitrary, said Laura Buffet, a clean fuels expert with the clean mobility NGO Transport & Environment (T&E).
“Soy expansion has led to significant deforestation as the Commission acknowledged and soy biodiesel is on average two times worse for the climate than fossil diesel,” she said as quoted by Euractiv.
She called the European Commission’s decision to approve the delegated act a “breakthrough,” as reported by Bloomberg, but qualified it as a “partial victory since soy and some palm oil can still be labelled green.” Eickhout, the MEP campaigning to ditch biofuels made from palm oil and soy, called the latter “the new palm oil.” “The Commission’s own estimates show that at least 8 percent of global soybean expansion caused direct deforestation since 2008,” he said. “This is in complete contradiction with the EU’s commitment to halt deforestation by 2020.”

- https://news.mongabay.com/2019/03/europe-in-bid-to-phase-out-palm-biofuel-leaves-fans-and-foes-dismayed/
- https://theoilpalm.us12.list-manage.com/track/click?u=f74f7a4c6773e701721f99e04&id=ada38c2ff3&e=76c69b58bc
- https://aseaneconomist.com/malaysia-ready-to-hit-eu-with-sanctions-over-palm-oil/

France

Groupe d'Etude des Tourbières

The proceedings of the 2018 symposium of the Groupe d'Etude des Tourbières on "les tourbières dans leur cadre géomorphologique" are now accessible under http://www.get.pole-tourbieres.org/colloque_2018_Aubrac.htm

About the report “Terres d’eau, terres d’avenir” ("Lands of water, lands of the future")

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Mrs Tuffnell, MP, and Mr Bignon, Senator, at the request of the Prime Minister, drafted a report on the situation and measures to be taken in favour of wetlands in France. Entitled "Lands of Water, Lands of the Future", it has just been handed over to the Prime Minister and made public (http://www.environnement-urbanisme.certu.developpement-durable.gouv.fr/IMG/pdf/2019_rapport-terres-d-eau-terres-d-avenir.pdf, 17.8 Mb).

Its subtitle "Making our wetlands pioneering territories of ecological transition" already announces the desire not only to conserve passively, but to put all wetlands at the centre of a positive dynamic. Peatlands would clearly participate in this dynamic:
The drafters emphasize "the role that wetlands play in addressing global warming, either to combat it: better performance in carbon storage - including peatlands and mangroves - or to mitigate its effects on the water cycle" (p. 5). This role is one of the reasons, not the only one, for a "National Restoration Programme of 100,000 ha of peatlands that the Mission is proposing to the government to launch before the end of 2019" (p. 5). The authors call for "the removal of anachronisms such as the overtaxing of peatlands (instituted in 1908)" (p. 6); this overtaxing, however, only applies to parcels noted as "peatlands" in the land register, which is in practice not the case for most peaty areas. Public information on the role of peatlands and other wetlands should be strengthened (knowledge of the role of atmospheric carbon sequestration on p. 7). The report wishes (pp. 7-8) to entrust the IGN with wetland mapping work. The mapping of peatlands as such is itself still very imperfect in France! Financial measures are recommended (pp. 8-9): securing the budget of the Water Agencies for the preservation, management and restoration of wetlands, using the tax levied under GEMAPI (Aquatic Environment Management and Flood Prevention), studying the feasibility of creating regional investment funds for "wetlands" supplied by the carbon emitters of the territories concerned.
It can therefore be seen from these strengths, and from other references throughout the report (cf. insert "Peatlands and greenhouse gas emissions" on p. 21...), that peatlands should not be forgotten... provided that these excellent recommendations are followed by action.

Updating the bibliography

Every year, Olivier Manneville updates the bibliography of the 2006 book “Le monde des tourbières et des marais: France, Suisse, Belgique, Luxembourg”. Here you find the latest version (Jan. 2019): http://reseau-cen-doc.org/dyn/portal/digidoc.seam?statelessToken=wZXIWONC4hB1Ltqc1Aq7_2TSwyz9alky7QGklst5Cn4&actionMethod=dyn%2Fportal%2Fdigidoc.xhtml%3AdownloadAttachment.openStateless

Focus on peatlands and paludiculture: 150 farmers in Potsdam; Germany, inform themselves about cultivation and application and funding opportunities (February 27, 2019). Photo: Greifswald Mire Centre.

Germany

New peatland professorship Greifswald: application open!

The University of Greifswald’s Faculty of Mathematics and Natural Sciences invites applications for a Professorship (W3) of Peatland Sciences for appointment at the earliest possible date. The position on offer shall be located at the Institute of Botany and Landscape Ecology.
Greifswald University is seeking an internationally recognised expert with a strong research record in peatland science and experience in one or more of these topics: Biogeochemistry, ecohydrology, paleoecology, biodiversity research, ecosystem ecology and ecosystem services, restoration ecology. The continuation of basic and applied research related to paludiculture, which is one of the current research directions at the

Institute of Botany and Landscape Ecology, is a viable option. The candidate will be asked to contribute scientifically to the Greifswald Mire Centre (GMC) and represent the university and the Department of Biology in the GMC.

- https://www.uni-greifswald.de/en/university/information/jobs/current-vacancies/professuren/professorship-w3-of-peatland-sciences/

Ireland

National review of land use called for in climate action report

The Oireachtas Joint Committee on Climate Action has called for a national review of land use to optimise planning and help tackle carbon emissions. The committee made the recommendation in its climate action report, which was published March 28. The review called for would include adaptation co-benefits such as rewetting or forest regrowth to mitigate flooding risks in river catchments, drawing on a similar report published by the UK Climate Change Committee for inspiration.

The committee calls for the rewetting of peatland and bogs, seeking the roll-out of bog rehabilitation on all designated bogs – Special Areas of Conservation for habitats and species (SACs), Special Protection Areas for Birds (SPAs) and Natural Heritage Areas (NHAs) – as set out in the National Peatland Strategy. The Oireachtas report also recommends that the Climate Action Council in conjunction with the National Parks and Wildlife Service, develop a verifiable pathway in line with the overall national targets to achieve net sequestration nationally by 2050. This “pathway” should include the development of a set of scientifically informed targets for the rehabilitation and restoration of natural peatlands, cutover peatlands, afforested peatlands, farmed peatlands, and industrially cutaway peatlands by this time next year.

The Government should assign responsibility for a national programme of rewetting and restoration for inclusion in Budget 2020 based on the Climate Action Councils recommendation, according to the report. This should be provided for in the National Energy and Climate Plan (NECP) along with adequate multi-annual funding and resources to deliver this target, the committee advises.

- https://www.agriland.ie/farming-news/climate-action-committee-report-whats-in-it-on-agri-production/

Irish Wildlife Trust objects to Bord na Móna plan for Longford windfarm

The Irish Wildlife Trust (IWT) has objected to plans from Bord na Móna for a 24-turbine windfarm within the Shannon Wilderness Park in Co Longford. The Trust submitted an objection to An Bord Pleanala. The IWT has said it is not opposed to wind energy generation, but is "increasingly concerned that turbines are being inappropriately located, especially on peatland habitats. "In particular, the presence of turbines can be at odds with biodiversity protection, the restoration of which is equally as important as addressing climate change", it said. Bord na Móna has proposed to install 24-turbines across the proposed Shannon Wilderness Park. But the IWT has claimed the plan envisages the creation of a new, restored peatland landscape that "has the potential to be a haven for wildlife and a unique tourist/amenity attraction." "For many ecologists this was the perfect site for the reintroduction of long-extinct Irish birds such as crane and bittern, while it was hoped that white-tailed sea eagles (breeding in some western counties) would colonise the shores of Lough Ree." "A bank of turbines however is totally incompatible with these goals and would effectively negate any sense of unique identity which would be essential for the success of the Wilderness Park", the IWT added.

Large, migratory birds are the most at risk from collision with turbines, according to a 2017 study from BirdLife International. IWT campaigns officer is Pádraic Fogarty: "We're very disappointed that the hard work and hopes of local communities for the Shannon Wilderness Park are being swept aside by Bord na Móna in their pursuit of this wind energy project. "There's a huge opportunity in creating a distinct and unique identity for this part of Longford, something people would travel from far and wide to experience. "Bord na Móna should be working with local people and ecologists in trying to deliver this, rather than working against them to impose an unwanted wind farm. We hope An Bord Pleanala can refuse permission."

The Shannon Wilderness Park. |Photo: Bord na Móna

According to a document from Bord na Móna, the proposed Derryadd Wind Farm would create up to 120 jobs at peak construction - as well as indirect employment through the sub-supply of a wide range of products and services. It would also see the upgrading of road infrastructure in the vicinity of the wind farm, and development of access to a significant land area - that could support both eco-tourism and energy tourism.

- https://www.newstalk.com/news/irish-wildlife-trust-objects-bord-na-mona-plan-longford-windfarm-842170
- https://www.irishtimes.com/news/environment/wind-turbines-on-bog-would-defeat-park-plan-for-endangered-birds-iwt-1.3842033

State urged to rewet 270,000ha of peatland

The state is being urged to "rewet" 270,000 ha of the country's peatlands over the next two decades in a bid to create carbon sinks, newly-tabled proposals outline. The proposals – prepared by the Joint Committee on Climate Action– recommend that an initial 130,000 ha of bogland should be rewetted by 2030. According to the white paper – expected to be put forward under the National Climate Action Plan (NCAP) – it is considered "feasible" to "restore" a target of 130,000ha (50% of natural peatlands) over the next 12 years – despite challenges "where turbury rights for turf cutting are still an issue".

This is one of seven recommendations outlined in the draft report under the chapter on Agriculture, Forestry and Other Land Use. It states that emissions from soils due to agriculture, forestry, peatland drainage and extraction are "a major element in Irish emissions". Conversely, it also adds that the restoration of soils to carbon sequestering status can both "prevent these emissions and (more slowly) start to re-adsorb carbon".

To address the urgent need for peatland restoration, rehabilitation and rewetting, the committee recommends that the Government finances and assigns responsibility for a national programme of rewetting and restoration commencing in 2019 to reduce emissions. It is claimed that such a programme could develop a pathway to achieve net sequestration nationally by 2040. It is advised that the standing committee (budget and finance committee) should "return to this as soon as possible in 2019" given the "significant sequestration potential" of peatlands. "The committee should also consider additional targets for the restoration of specific categories of peatlands such as for national bogs, for industrially-extracted peatlands, cut-over bogs, farmed peatlands and afforested peatlands," the committee outlines.

As for the 80,000ha of peatlands owned by Bord na Mona (BNM), it is noted that when peat extraction stops, as is planned in the coming years, BNM's bogs will continue to emit greenhouse gas emissions unless they are "actively rewetted". Rewetting these peatlands is considered an important climate change mitigation tool to reduce emissions and create suitable conditions for carbon sequestration. "For this reason, peatland conservation and restoration is often described as one of the most cost-effective options for mitigating climate change. "Rewetting peatlands also contributes to a range of additional environmental benefits such as biodiversity and water quality," the report states.

- https://www.agriland.ie/farming-news/state-urged-to-rewet-270000ha-of-peatland-under-new-proposals/

Fitzmaurice slams committee's 'cuckoo cloud' bog proposal

Michael Fitzmaurice, independent TD for Galway-Roscommon, has said he believes "it would be unwise" of the Government to "go after ordinary people" around rural parts of Ireland in a bid to "rewet boglands". The

comments were made in response to a draft proposal – prepared by the Joint Committee on Climate Action– which recommends that a total of 270,000ha of Irish peatland should be "rewetted" by 2040, in order to reduce the country's carbon footprint. Speaking on the latest episode of *FarmLand*, Fitzmaurice said: "If the state wants to do something with their own lands, that's fine. "I think people are living in a little cuckoo cloud in that committee for the simple reason of private ownership. The state learned a fair bit from the first battle they got into 10 or 12 years ago with us on turf cutting. With cooperation and agreement of individuals where they have done rewetting, no one has a problem. "The figures being kicked out there are basically living in a fantasy world. "Do they realise the cost first of all? I know what it costs to rewet because I know what the contractors have to get to do that work." Concluding, Fitzmaurice said: "If they think they are going to infringe on private property, let them come looking for it and they'll get a fair answer back."

- https://www.agriland.ie/farming-news/fitzmaurice-slams-committees-cuckoo-cloud-bog-proposal/

Netherlands

Dutch homes are not subsiding due to climate change, but due to agriculture

Peatland subsidence comes at tremendous societal costs. Time for a call for a drastic change in land use. Including marsh plants.

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Houses in the Netherlands are not only sagging due to natural gas extraction in the province of Groningen. It was recently announced that at least one million homes in the Netherlands are subsiding, particularly on peat and clay soils. The costs will easily amount to 50,000 euros per damaged house. Climate change is often blamed for this. Farmers on peat soil also complain about climate damage, but then because of the extreme drought.

The fact that climate change leads to stronger and more frequent droughts is evident, and has irrefutably been proven. However, something is bothering us. All over the Netherlands, peatlands have been subsiding for centuries at an average rate of one meter per century. This is the reason why many church towers in peat meadow areas are out of plumb, as are many residences along the Amsterdam canals. This subsidence of the landscape is caused by strong drainage to facilitate current agricultural practice. Peat that is drying out is not only subsiding but also being broken down at a fast pace. Just like the wooden poles on which houses are built. Everyone living on peat knows this.

Climate change reinforces subsidence

The soil degradation in peat meadow areas (mainly situated in the provinces of North and South Holland, Utrecht, Overijssel, Friesland) releases a lot of CO_2 that was stored in the soil. This contributes to climate change. For the Netherlands, this emission equals that of an old-fashioned coal-fired power plant, or two to three million petrol cars. Although climate change is not the cause of the problem, it does exacerbate subsidence. Drier and warmer peat soils are broken down more easily, which only aggravates the problem.

This drainage-based agricultural land use has not only led to a sharp decline in biological diversity and resilience, but also to enormous societal costs. Unfortunately, these are largely hidden costs, and Dutch citizens pay a lot of tax money for this without even knowing. Soil subsidence leads to huge damage and repair costs in order to restore subsiding infrastructure (dikes, sewers, pipelines, roads, and yes, houses). In addition, the costs for water management are constantly rising to continue facilitating the current form of agriculture, and to tackle flood risks. We can still go down many meters more.

In addition, subsidence leads to adverse water quality due to high nutrient and sulfate losses from decomposing peat and fertilization, and due to pesticide leaching. The costs for Dutch society, estimated at many tens of billions of euros for the next thirty years, are much higher than the agricultural benefits. For these serious societal, economic and ecological reasons, the rewetting of peat meadow areas is an important topic for the upcoming elections for the Provincial Councils and for the Water Boards (water management districts), on 20 March.

Land use must change

The current use of the Dutch peatlands inevitably has to change, given the substantial damage it causes to our homes, our economy, our climate, our water and our nature. The only way to halt subsidence and concomitant problems in peat landscapes is to stop the deep drainage that we have applied for centuries, but is now

completely outdated. It should no longer be taken for granted that subsidence is routinely followed by further lowering of the groundwater table. Fortunately, alternative options are available for the traditional, drainage-based type of agriculture on peat with its negative macroeconomic returns. One example is the implementation of paludiculture (the Latin word palus means marsh), where crops are grown on rewetted peat. As an example, the spongy stems of cattail, a marsh plant, appear to be extremely suitable as natural insulation material in construction. With this type of agriculture, fossil carbon and nutrients remain in the soil, and CO_2 is even captured. Other parts of peat meadow areas can be converted into wet nature and recreation areas, with CO_2 sequestration instead of loss as a bonus. However, additional measures will be needed to prevent the massive release of nutrients from rewetted peat into the water, and to prevent high methane production. These measures are available.

There are alternatives

Currently, alternative drainage methods that slow down subsidence and at the same time continue to facilitate conventional agriculture are also being investigated. In the longer term, however, the goal of halving the rate of subsidence and CO_2 emission is insufficient: we are still emitting fossil carbon into the atmosphere against all climate objectives, entirely comparable to coal and oil combustion. How do we explain to our children and grandchildren that 'only' half a meter of subsidence per century is acceptable? And what do we tell them if it turns out that even this halving is not achieved?

It is a bad thing that houses are being damaged. However, this does finally unveil the tip of the iceberg of hidden costs related to our problematic peat land use. This is not to blame the farmers only, but also the entire Dutch community. We must take responsibility by now opting for sustainable use of our peat landscape in terms of climate, economy and environment, based on rewetting. As producers and consumers. This requires a new vision and sound planning for a healthy Dutch landscape in a rapidly changing climate. With politicians who not only show guts, but above all respect and care for future generations.

(Leon Lamers, Sarian Kosten and Fons Smolders are working at the Department of Aquatic Ecology and Environmental Biology, Institute for Water and Wetland Research, Radboud University Nijmegen, The Netherlands)

- https://www.volkskrant.nl/nieuws-achtergrond/de-keuze-koeien-in-de-wei-of-moeras-in-de-polder~b4cd4dbc/

Cattail harvesting in Northeast Germany. Photo: Hans Joosten.

United Kingdom

Saddleworth Moor fire: 'Apocalyptic' blaze breaks out in Yorkshire after Britain's hottest ever winter day

Firefighters from across the UK have been battling a string of wildfires after Britain saw its hottest winter day on record on February 26. The most recent blaze was whipped up on Saddleworth Moor, which witnesses described as "apocalyptic". The fire near Marsden could be seen for miles around as crews from West Yorkshire Fire and Rescue Service battled to contain it through the night. Witnesses described the "terrible" scene of fire coming close to buildings high on the moorland. West Yorkshire Fire and Rescue Service said it had five fire engines and two specialist moorland firefighting units at the scene.

In June 2018, a fire on moorland in that area took hold and burned for weeks; the army was called in, carbon-storing peatland and entire ecosystems were incinerated. But that was during a memorably hot, dry summer. We are now witnessing the strange spectacle of large winter wildfires.

Fires on moorland - even at this time of year - are actually fairly typical. "This is the 'muirburn' season," Dr Thomas Smith, an environmental geography researcher from the London School of Economics, explained. "That's when Natural England permit fires on moorlands, before a ban on burning around mid-April. Those burns are part of the management of moorland - particularly when it is used for grouse shooting. Grouse prefer a habitat where heather is not overgrown, and burning small areas removes older growth and allows plants to regenerate and new shoots to come through. Land managers and fire services often work closely together to ensure conditions are right for controlled burns. "Looking at the satellite image for Tuesday (26 February), there were plenty of well managed fires burning across Northumberland and Highland moor sites," said Dr Smith.

But there is an important distinction to be made between controlled burns and large wildfires that crews have been battling around the country - fires that scientists say we may see more of in the future. The scale of the West Yorkshire moorland fire has been driven in part by a favourite British talking point - the weather. Sunny, dry conditions created a tinderbox effect that we usually see in the spring. Prof David Demeritt from Kings College London explained: "It's unseasonable. "Landscape fires in Britain happen disproportionately in the Spring, because on the moors and in the forest, you have no leaf cover. "Sticks and leaf litter dry out. And because this has been a relatively dry winter, there's more of that fuel on the ground - everything has dried out early."

Commenting on the high February temperatures, Dr Friedericke Otto, acting director of the Environmental Change Institute at Oxford University, said: "I am very confident to say that there's an element of climate change in these warm temperatures," she said. "But climate change alone is not causing it. You have to have the right weather systems too." Prof Demeritt agreed. "This is consistent with what we might expect in the future, but attributing one particular warm weather event to climate change is tricky. "Weather patterns are noisy, but the general trend is earlier springs, so this is consistent with that trend."

The good news about the fires, according to Dr Smith, is that they will probably not cause significant ecological damage. Because soil is wetter at this time of year - despite well below average rainfall in January and February - their spread will be limited. "The fires could even be doing us a favour - burning off overgrowth that may have become fuel for worse fires later in the season."

We are unlikely to see big casualties from wildfires in the UK, like you do see in Australia, California and the Mediterranean. "Here, the fires are smaller in extent and intensity," explained Dr Demeritt. "But what they will cause is lots of smoke and other atmospheric emissions. This is likely to make our air quality problems worse, particularly if fires occur upwind of urban areas that are already struggling with poor air quality." Dr Smith added: "These warm spells will become more likely with climate change, so we should expect fire activity like we've seen this week to happen more frequently in future."

- https://www.bbc.com/news/science-environment-47389480
- https://www.telegraph.co.uk/news/2019/02/27/saddleworth-moor-fire-apocalyptic-blaze-breaks-yorkshire-britains/

Applications open for funding to restore Scotland's peatlands

The latest Peatland ACTION Fund round is now open with £1.5 million available to restore damaged peatlands across Scotland. The funding comes through the Scottish Government's Climate Change Plan commitments, which sets out the long-term ambition to restore 250,000 hectares of peatland by 2030. With more than 80% of peatland habitats estimated to be damaged in Scotland, restoration is crucial to "locking-in" carbon, helping to tackle climate change. The funding primarily supports on-the-ground restoration activities. This includes

installation of peat dams in man-made ditches to increase water levels, allowing Sphagnum to re-establish. It also supports more novel techniques such as peat hag re-vegetating by using the surrounding vegetation to stabilise the bare eroding peat. More than 20% of Scotland's land area is covered in peaty soils. Large areas have been damaged over centuries with extensive damage to the core peat reserves and its specialised vegetation. If we were to lose all of the carbon stored in our peat soils, it would be the equivalent of more than 140 times Scotland's annual greenhouse gas emissions. Urgent action is needed now to reverse this trend, and to restore and improve our precious peatlands. To date, Peatland ACTION has set over 15,000 hectares of Scotland's peatlands on the road to recovery, working with over 200 applicants.

Andrew McBride, Peatland ACTION Project Delivery Manager, said: "With this ongoing investment come multiple benefits to both local communities and nature. Previous applicants have employed local contractors to undertake the restoration work, supporting the local economy, and we are seeing some landowners seeking the benefits of carbon offsetting as part of a suite of measures to become carbon neutral. "In the face of climate change, healthy peatlands can provide multiple solutions, such as increased water availability for livestock and wildlife, as a wild fire retardant and by slowing river flows helping to reduce downstream flooding."

The funding round opened on 25 February and closes 17 May 2019. Applicants will be informed if their application has been successful from July 2019. Further information and guidance for people thinking of applying to the fund is available on the SNH website.

- https://www.nature.scot/applications-open-funding-restore-scotlands-peatlands

Peatland restoration in Scotland. Photo: Hans Joosten.

Cumbrian Bogs LIFE+ end of project conference 7-8 May 2019, Penrith, UK

This conference marks the end of the five year, EU LIFE-funded lowland raised peatbog restoration project, which has taken place over 3 sites in Cumbria: Bolton Fell Moss, Wedholme Flow, and Roudsea Wood and Mosses. The two-day event includes morning presentations followed by afternoon site visits to Roudsea Wood and Mosses and Bolton Fell Moss. The programme will explore the challenges and lessons learnt at each site, and features a film showing restoration techniques, and presentations on monitoring, community engagement and cultural ecosystem services. Other elements of the programme will include: a study of the project's carbon balance and future projections; a question and answer session with the contractors involved in the project; the history and use of peat; and what happens after LIFE. The conference is free of charge and is funded through the EU LIFE programme. Bookings for the conference close on Friday 12th April!

- https://www.eventbrite.co.uk/e/cumbrian-bogs-life-end-of-project-conference-tickets-56403418142
- https://cumbria-bogs-life-2019.eventbrite.co.uk

Exploring the heritage of our peatland

A new exhibition has opened at Yr Ysgwrn in Trawsfynydd, Wales, celebrating Meirionnydd's extraordinary peatland heritage. Peatland and marshes formed an integral part of Meirionnydd's rural way of life for centuries, and the traditions and histories that grew from them are just as fascinating as the peat itself.

Over the past two years the Snowdonia National Park Authority has been leading the Cyfoeth ein Corsydd (The Wealth of our Bogs) project to gather and record the wealth of information and local recollections of the marshes. As well as ensuring that these recollections are not consigned to the dustbin of history, it was also an opportunity to nurture an appreciation and pride amongst the community, in particular the younger generation, in their local heritage. During the course of the project a close relationship was formed between local communities and schools, and many bog and peatland-based activities were held – from cutting and stacking peat and dyeing wool using plants from the bog, to a rush candle-making evening at Yr Ysgwrn. An important aspect of the National Lottery Heritage Fund was the development of an exhibition at the end of the two-year period that would bring together all the research. The aim of the exhibition is to spark and encourage an interest in our natural environment and generate a will to protect it for future generations.

Haf Roberts, project officer, said: "We learnt a great deal through the project – about traditions such as the practice of keeping the peat fire alight for years on end in the upland areas, the use of lichen to dye wool, and the priority given to rush candle-making at a time when wax candles were taxed. "These practices feature in the exhibition and thanks to Yr Ysgwrn's recent museum accreditation, amongst other props you will see treasures on loan from other museums."

The exhibition will be on display until August. Following its period at Yr Ysgwrn, it will go on tour for a few months so that everyone can have the opportunity to visit and learn about the wealth of our bogs.

- http://www.cambrian-news.co.uk/article.cfm?id=127853&headline=Exploring%20the%20heritage%20of%20our%20peatland&sectionIs=news&searchyear=2019

North-America

United States of America

Interior hid scientists' criticism of Arctic National Wildlife Refuge drilling report

Newly leaked Interior Department documents raise questions about the environmental review of oil drilling in the Arctic National Wildlife Refuge's coastal plain. The documents show that federal scientists drafted 18 memos detailing the environmental "unknowns" of drilling in the Arctic refuge, according to Public Employees for Environmental Responsibility (PEER), which recently obtained the documents and published them on March 12. PEER charged that those documents have been excluded from public view and not released in accordance with Freedom of Information Act (FOIA) requests filed by advocacy groups. The advocacy group has petitioned the Interior Office of Inspector General to review the matter. But top Interior Department officials, including

Assistant Secretary Joe Balash and career employee and Fish and Wildlife Service (FWS) Alaska Regional Director Greg Siekaniec, fiercely defended the agency's process and said PEER's claims were untrue. "The Department is still processing numerous FOIA requests regarding the Coastal Plain, including request to which the information referenced by PEER may be responsive. PEER's assertion that the Department is willfully 'hiding' relevant documents in response to those requests is untrue," Balash said in a statement to E&E News.

PEER asserted otherwise. "These memos were treated as if they did not exist," said Tim Whitehouse, the new PEER executive director and a former EPA attorney. "The Trump administration apparently does not want to admit that it is flying blind in opening one of the most sensitive places on the planet to petroleum development."

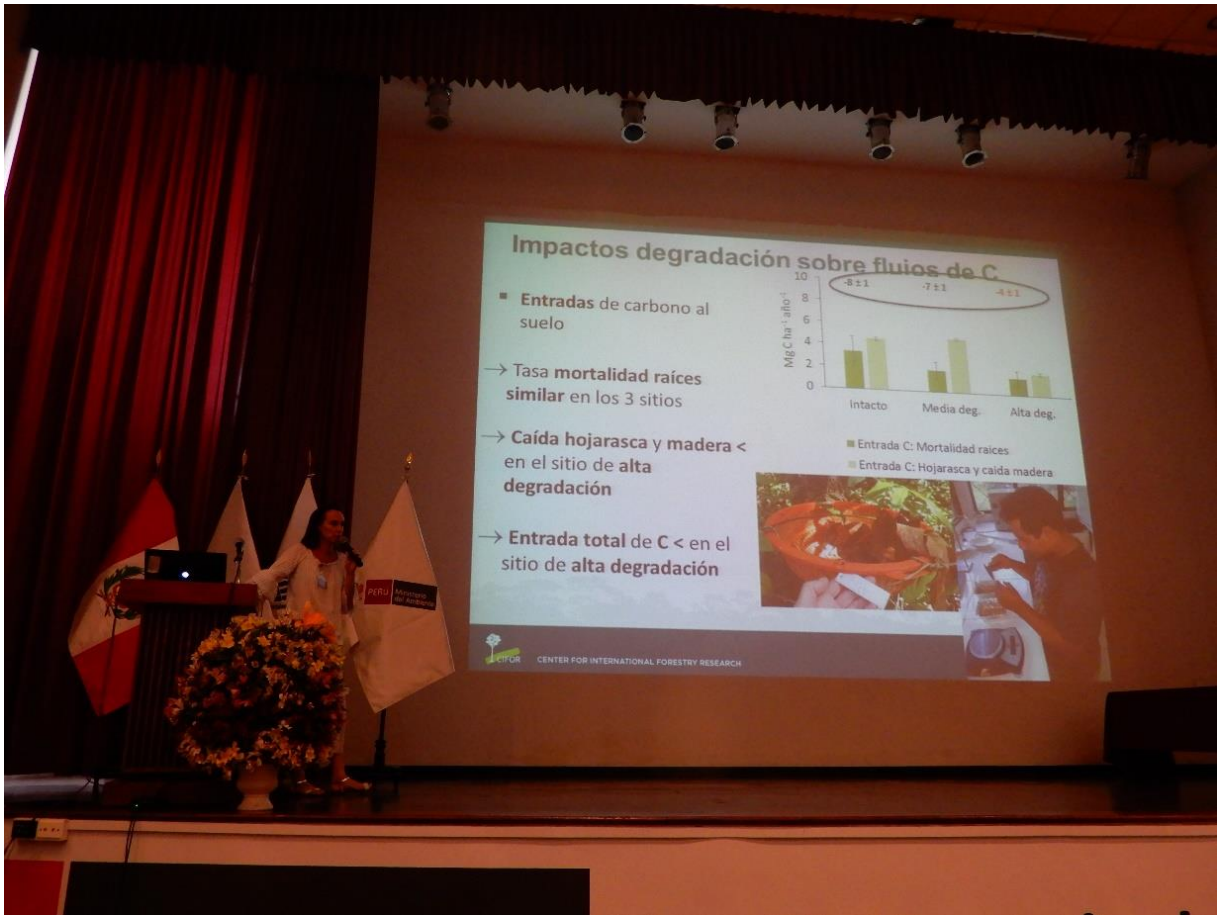
In December, the Trump administration released its draft environmental review for a potential oil and gas lease sale on the refuge's 1.5-million-acre coastal plain. The agency has held eight public hearings on the proposal; the public comment period ended in February tomorrow (*Energywire*). Those memos were drafted last year and covered a wide range of work by government scientists, including on soils, permafrost, wetlands, climate, air quality, oil spills and various species in the area, including the populous caribou herd. They covered topics that were both "extensive" and "of major significance," PEER said. PEER also charged the agency with intentionally excluding scientific work from the draft environmental assessment.

PEER is an organization of federal employees who work on environmental issues. It has for decades exposed alleged wrongdoing at agencies and protected whistleblowers. Whitehouse said the large number of government employees participating in the Arctic refuge environmental review makes them nearly impossible to overlook. The employees work for the Bureau of Land Management as well as the Fish and Wildlife Service.

"We believe that they were deliberately withheld both from the DEIS process and from FOIA requests to which these memos would have been directly responsible," he said.

- https://www.eenews.net/stories/1060127067

South America



Presentation of Kristell Helgohuach (CIFOR) in the Conference "Wetlands and Climate Change". Photo: Mónica Maldonado.

Peru

Celebrating World Wetlands Day in Perú

Zarela Reyes and Mónica Maldonado (mmaldonado@corbidi.org)

The Environmental Ministry of Perú and the National Committee of Wetlands organized the open conference "Wetlands and Climate Change", on 05 February in Lima with representatives from the Peruvian government and research institutes. Four presentations focused on peatlands: "Bofedales: characteristics and importance in climate change" by Beatriz Fuentealba from the National Institute for Research on Glaciers and Mountain Ecosystems (INAIGEM); "Bofedales: peat extraction and its implications under climate change" by Mónica Maldonado from the International Mire Conservation Group and CORBIDI; "Ecological and cultural aspects of the Pastaza-Marañon basin: third largest region of tropical peatland" by Jhon del Aguila Pasquel from the Research Institute of the Peruvian Amazon (IIAP); and "Degradation of aguajales peatlands, carbon reserves and greenhouse gases" by Kristell Helgohuach from the International Centre for Forestry Research (CIFOR). The first two presentations were about High-Andean peatlands (bofedales), the latter about Amazonian peatlands. The importance, variety, threats and need of wise use of these ecosystems in Peru were highlighted, emphasizing their role in carbon sequestration and storage.

Peruvian Wetland Congress organizers, Association of extractors of wetland plants of Chincha and the traditional dance group "Renacer (Rebirth) in San Luis Gonzaga University (Ica, Perú). Photo: Mónica Maldonado.

Second Peruvian Wetland Congress (II COPEHU)

Zarela Reyes and Mónica Maldonado (mmaldonado@corbidi.org)

On 08 and 09 February in Ica, the II COPEHU gathered researchers, students and private organizations working on coastal, Andean and Amazonian wetlands. The goal was disseminating national and international research related to the state of wetlands and to strengthen scientific research in the country. Several presentations on Andean and Amazon peatlands were given, including "Peatlands of the Peruvian Amazon: geochemical and ecological controls in the carbon cycle" by Dr. Hinsby Cadillo et al. (School of Life Sciences, Arizona State University, USA); "The role of bofedales in the high Andean upper basins - experiences and preliminary results

of an eco-hydrological monitoring system in the microbasin of Mariño River (Abancay, Apurímac)" by Jan Baiker (HELVETAS Swiss Intercooperation and CONDESAN); "Lotic environments in two high Andean bofedales and aquatic macroinvertebrates (Ayacucho 2017)" by Carlos Carrasco et al (National University San Cristobal of Huamanga); and "Problems of peat extraction in bofedales in the community of Carampoma, Huarochirí, Lima" by Mónica Maldonado et al. (CORBIDI). The importance and wise use of wetlands plants was also addressed, and associations of plant extractors and craftswomen were present in the Congress.
The II COPEHU´s brief book (in Spanish) is available here.

Peatland conservation relevant papers February and March 2019

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

1. Republic of Indonesia JICA (Japan International Cooperation Agency) – BRG (Peatland Restoration Agency in Indonesia) Project Final Report, incl. Guidebook for estimating tropical peatland ecosystem carbon and water dynamics-2nd Edition: http://open_jicareport.jica.go.jp/pdf/12320909_01.pdf (14 Mb)
2. Patterns and drivers of peat topographic changes determined from Structure-from-Motion photogrammetry at field plot and laboratory scales: https://onlinelibrary.wiley.com/doi/abs/10.1002/esp.4571
3. Predicting hotspots for threatened plant species in boreal peatlands: https://link.springer.com/article/10.1007%2Fs10531-019-01717-8
4. Fine-scale vegetation mosaics in Pyrenean mires are driven by complex hydrological regimes and threatened by extreme weather events: https://onlinelibrary.wiley.com/doi/abs/10.1002/eco.2070
5. Detection and validation of tropical peatland flaming and smouldering using Landsat-8 SWIR and TIRS bands: https://www.mdpi.com/2072-4292/11/4/465
6. Distribution of Cranberry Blue butterflies (*Agriades optilete*) and their responses to forest disturbance from in situ oil sands and wildfires: https://www.mdpi.com/1424-2818/10/4/112
7. Salinization lowers nutrient availability in formerly brackish freshwater wetlands; unexpected results from a long-term field experiment: https://link.springer.com/article/10.1007%2Fs10533-019-00549-6
8. Widespread global peatland establishment and persistence over the last 130,000 y: https://www.pnas.org/content/early/2019/02/15/1813305116
9. Carbon farming: how agriculture can both feed people and fight climate change: https://theconversation.com/carbon-farming-how-agriculture-can-both-feed-people-and-fight-climate-change-111593
10. A complete Holocene climate and environment record for the Western Carpathians (Slovakia) derived from a tufa deposit: https://journals.sagepub.com/doi/abs/10.1177/0959683618816443
11. Evidence for ecosystem state shifts in Alaskan continuous permafrost peatlands in response to recent warming: https://www.sciencedirect.com/science/article/abs/pii/S0277379118307583
12. Functional traits in *Sphagnum*: http://uu.diva-portal.org/smash/get/diva2:1282760/FULLTEXT01.pdf
13. Long-term growth rates of two caulescent rosette species, *Coespeletia timotensis* (Cuatrec.) Cuatrec., and *Espeletia schultzii* Wedd., in an Andean páramo: https://www.sciencedirect.com/science/article/pii/S0367253018300902
14. Long-term transcriptional activity at zero growth of a cosmopolitan rare biosphere member: https://mbio.asm.org/content/10/1/e02189-18
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16. Tropical peatlands under siege: the need for evidence-based policies and strategies: https://www.springerprofessional.de/tropical-peatlands-under-siege-the-need-for-evidence-based-polic/16447860 and - https://www.cifor.org/library/7078
17. Arctic wetlands: time bomb or saving grace?: https://www.sei.org/wp-content/uploads/2019/02/arctic-wetlands-project-brief.pdf
18. Sources of dissolved organic carbon (DOC) in a mixed land use catchment (Exe, UK): https://www.sciencedirect.com/science/article/pii/S0048969719307223
19. Soil organic carbon stock as an indicator for monitoring land and soil degradation in relation to United Nations' Sustainable Development Goals: https://onlinelibrary.wiley.com/doi/full/10.1002/ldr.3270
20. Environmental impacts as affected by different oil palm cropping systems in tropical peatlands: https://www.sciencedirect.com/science/article/pii/S0167880919300362
21. Responses of vegetation and testate amoeba trait composition to fire disturbances in and around a bog in central European lowlands (northern Poland):

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23. Holocene vegetation and hydroclimatic dynamics in SE Lithuania – Implications from a multi-proxy study of the Čepkeliai bog: https://www.sciencedirect.com/science/article/pii/S1040618217305682
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25. A 7300-yr-old environmental history of seabird, human, and volcano impacts on Carlisle Island (the Islands of Four Mountains, eastern Aleutians, Alaska): https://www.cambridge.org/core/journals/quaternary-research/article/7300yrold-environmental-history-of-seabird-human-and-volcano-impacts-on-carlisle-island-the-islands-of-four-mountains-eastern-aleutians-alaska/AD1B00614093631BD652F04198EFF0B7
26. Methane levels in five shallow lakes in China: Effect of lake paludification: https://www.sciencedirect.com/science/article/pii/S1040618217315264?dgcid=raven_sd_via_email
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34. Impact of fertiliser, water table, and warming on celery yield and CO_2 and CH_4 emissions from fenland agricultural peat: https://www.sciencedirect.com/science/article/pii/S004896971930868X
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45. Stable oxygen isotope records ($\delta^{18}O$) of a high-Andean cushion peatland in NW Argentina (24° S) imply South American summer monsoon related moisture changes during the late Holocene: https://www.frontiersin.org/articles/10.3389/feart.2019.00045/full

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62. Spatial pattern of Late Glacial and Holocene climatic and environmental development in Western Mongolia - A critical review and synthesis: https://www.sciencedirect.com/science/article/pii/S0277379118307935
63. Vikings, peat formation and settlement abandonment: A multi-method chronological approach from Shetland: https://www.sciencedirect.com/science/article/abs/pii/S0277379118305444
64. Combining multiple proxies to investigate water table fluctuations in wetlands: A case study from the Rėkyva wetland complex, Lithuania: https://www.sciencedirect.com/science/article/pii/S0031018217312075
65. A 7000-year pollen and plant macrofossil record from the Mid-Russian Upland, European Russia: Vegetation history and human impact: https://www.sciencedirect.com/science/article/pii/S1040618217309941
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68. Genesis and evolution of the "Bonales" or peatlands of Puebla de Don Rodrigo (Ciudad Real, Central Spain): https://www.preprints.org/manuscript/201903.0236/v1
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