15 June 2020

Peatlands International

issue 2.2020

International Peatland Society

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1913

we make it grow

Klasmann-Deilmann

Editorial

Tallinn, 2 - 7 May 2021

New Congress dates confirmed!

We are glad to inform you that the new dates for the 16th International Peatland Congress are 2 - 7 May 2021. The Congress will take place in the Tallinn Creative Hub (KultuuriKatel).

Estonia has managed the COVID-19 situation well. The emergency restrictions have ended, and only certain restrictions apply now. The country intends to open its borders to tourists from the Schengen area in mid-summer, and after that, it will be opened up to everybody. Hotels and businesses are open, and restrictions on organizing events are being lifted slowly but surely. We, therefore, hope that in a year's time, we will be able to come together to enjoy the Congress without restrictions and in a way that is comfortable and convenient for all participants.

The format of the Congress, with its main topic, "Peatland Ecosystem Services", will remain as planned for 2020 - four days filled with scientific sessions, an industry summit, PEAT talks, field trips, a student programme, pre-congress tours in the Baltic States and Finland, a movie programme and public lectures, an exhibition, and social and networking events.

The photo competition to highlight the versatility of peatlands is up and running, and work can be submitted via the Congress website until the end of March 2021.

All registrations for 2020 that have not been cancelled by delegates have automatically been transferred to next year. New delegates will be able to register from October 2020 onwards.

All hotel bookings made through the Congress accommodation booking system that have not been cancelled by delegates have also been transferred to the Congress dates for 2021. As the Congress venue has changed, the Secretariat will contact all delegates with valid accommodation bookings and will offer them the chance to have

Impressum

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Are you interested? Contact susann.warnecke@peatlands.org.

Cover: Duck boards at Rhododendron park.

www.peatlands.org/publications

their booking transferred to one of the additional Congress hotels near the new Congress venue.

Abstracts submitted for the 2020 Congress which have been accepted by the Scientific Committee will retain their status for the 2021 Congress. The authors will receive detailed instructions from the Congress Secretariat at the beginning of June, in case they need to update their short or extended abstracts.

The Scientific Committee for IPC2021 has also decided to invite additional abstract submissions in October 2020, which will give new authors the opportunity to present their work at the Congress. Exact guidelines will be published on the Congress website: www.peatlandcongress2021.com.

Please stay in touch via Facebook and Instagram and subscribe to the newsletter on the Congress website in order to receive relevant updates about the Congress.

Stay safe and see you in Estonia next year!

Local Organizing Committee and Congress Secretariat

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Follow us also at ---> linkedin.com/company/peatlands :)

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The First World Peatlands Day has skyrocketed online!

What, why and how?

The first ever World Peatlands Day was held this month, on 2 June 2020. The IPS Secretariat felt that we should have a special day to raise awareness of peatlands and peat, and the Executive Board launched the event in autumn 2019. The intention was to highlight the many benefits for the environment, economy and society, and to celebrate positive outcomes that have been achieved to date in many parts of the world.

As the IPS's resources are somewhat limited, we started with a virtual campaign on Facebook and Instagram, thinking that our National Committees, Expert Groups and members would join in with actual face-to-face events on sites that are usually not accessible, for instance, on World Wetlands Day in February, especially in the Northern Hemisphere. However, corona then kicked in – and we had to fully rely on online activities.

The date was chosen to be similar to World Wetlands Day (easy to remember!), but 2 June was, in fact an important day in IPS history because on that day, in 1967, our first constitution was approved in Aberdeen, Scotland. This was IPS' "baby shower" in the middle of the Cold War – and now we are celebrating with people from all around the world on the internet, at home or in the field.

The IPS Facebook event was seen by some 3,968 people, supported by a small advertising campaign. In total, 53 participants "joined", and 93 expressed an interest in joining. The IPS Secretariat offered a 30% discount on all items in our online shop from 2 - 7 June, and we prepared an infographic with basic facts about peatlands. Aside from this, we gave free rein to all who wanted to celebrate with us, as intended.

About a week before the event, the first results were visible, and these noticeably increased when RE-PEAT's 24-hour seminar began on 31 May. They had a very interesting programme of videos, reading, webinars, online workshops and other peatland activities, from a broad range of sectors and areas. They also mentioned World Peatlands Day and used our hashtag #worldpeatlandsday. Thanks for that!

As a result, other websites, blogs and influencers also took up the topic and posted their own content, most of which was on the subject of conservation and restoration. Climate and carbon impacts were also highlighted. We saw great photographs of pristine bogs, restoration areas, bog plants and people who are concerned about peatlands.

As this day is intended for all of us IPS members, we also warmly encourage our corporate members, society experts, scientists, foresters, plant growers and peat associations to include their views next year, for instance, demonstrating their restoration efforts and benefits of peat. We are really looking forward to World Peatlands Day 2021! Mark the date: 2nd of June.

Facebook

Here are some of the Facebook posts, shortened (copyright of the authors):

LIFE (EU Projects)
To celebrate the upcoming #WorldPeatlandsDay, #LIFEproject Peat Restore contributes to the global online festival Peat Fest...

Canadian Youth Biodiversity Network
Happy First World Peatlands Day

Badan Restorasi Gambut (Indonesian Peatland Restoration Agency)
#TaukahSobatGambut lahan gambut tersebar di 175 negara, melingkupi 3% dari total daratan bumi atau sekitar 400 juta hektar (Ha) dan sekitar 11% diantaranya atau 42 juta Ha adalah gambut tropis.

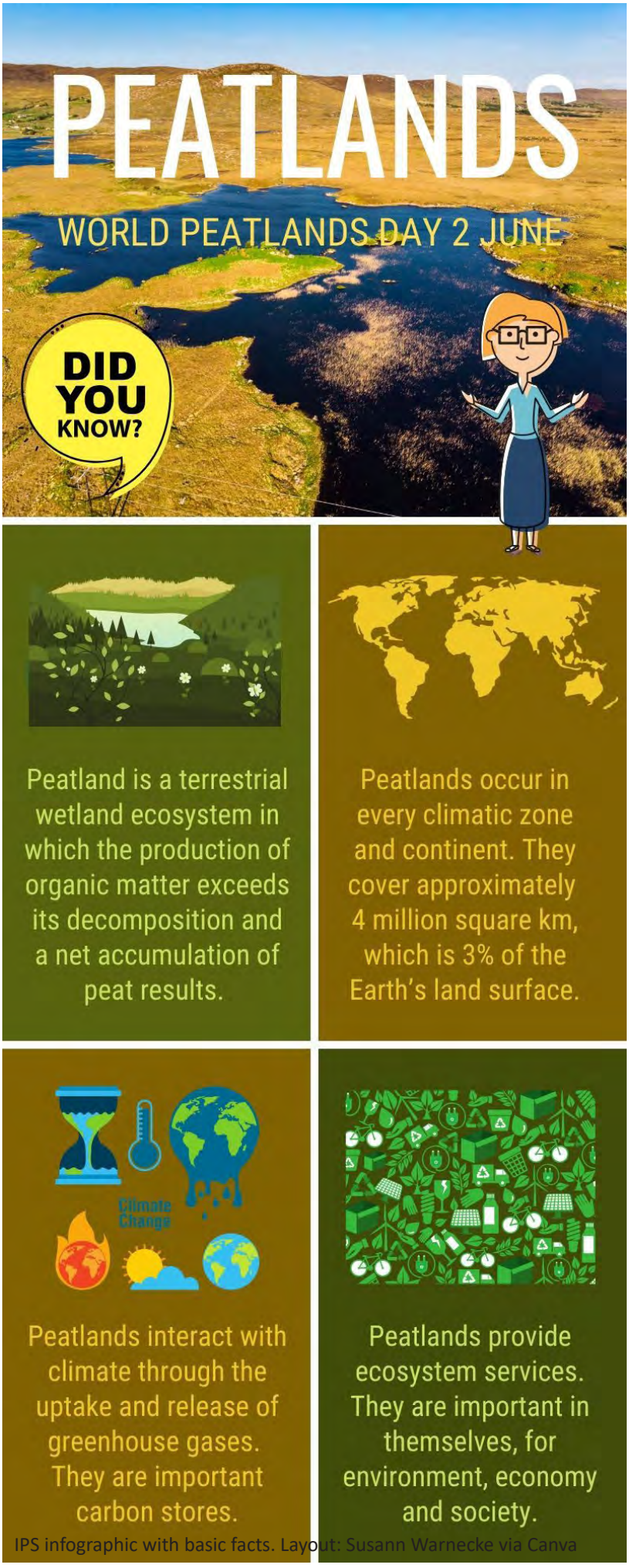
RE-PEAT an 24hr Online Global Peat-Fest
Today we celebrate #WorldPeatlandsDay! We will be posting some of the sessions from #peatfest so you can (re)watch some sessions that you missed/loved.

Dalefoot Composts
It's #WorldPeatlandsDay Did you know Dalefoot have restored over 32,700 hectares of damaged UK peat bog in 20 years?

British Ecological Society Conservation Ecology Group
To celebrate the first ever World Peatlands Day on Tuesday 2nd June, the BES Peatlands Research and Conservation Ecology Groups are co-hosting the best quiz in lockdown!

Save the Orangutan
Today is World Peatlands Day - a day to celebrate the important peatlands!

Senator Pippa Hackett (Ireland, Green Party)
Today is #WorldPeatlandsDay, and I count myself lucky to live so close to



IPS infographic with basic facts. Layout: Susann Warnecke via Canva

some of the finest raised bogs in Ireland, if not Europe.

Richard Carter - writing & photography
As it's #WorldPeatlandsDay, what better excuse could I possibly have for plugging my book inspired by the patch of Yorkshire peatland closest to my heart?

Butterfly Conservation Yorkshire
Yesterday was #WorldPeatlandsDay and appropriately these photos were taken on the Humberhead Peatlands.

Revive: The coalition for grouse moor reform
It's #WorldPeatlandsDay - there is a lot of deep peat on grouse moors, but they are under threat from muirburn.

Environmental Land Management Solutions Limited
Today is #worldpeatlandsday #elmsolutionslimited have had the pleasure of working on both upland and lowland Peatlands across the north of England.

Thomas Westhoff
Om de "World Peatlands Day" te vieren en aandacht te vragen voor deze belangrijke landschappen heb ik een korte documentaire gemaakt.

Peatlands in Southeast Asia
Let's get peaty. GEC is participating in an online 24-hour global Peat Fest today to celebrate World Peatlands Day.

Okarito Boat Tours
Well - this was news to us too - but did you know, it's World Peatlands day.

Moorschutz Brandenburg (Germany)
Heute wird erstmalig der World Peatlands Day begangen.

Garnock Connections
Since this week is #VolunteerWeek and today is #WorldPeatlandsDay, it seemed appropriate to share some images of volunteers working on a peatland.

Agusan Marsh Wildlife Sanctuary Protected Area Management Office
Before this day ends, we would like to greet everyone Happy World Peatlands Day!

Cork Nature Network - West Cork
Today, June 2nd, is World Peatlands Day.

Scottish Land & Estates
Estate owners and gamekeepers are stepping up their efforts to help Scotland meet its climate change targets.

Facebook bookstore campaign. Layout: Susann Warnecke via Canva

The Gift of Grouse
Scotland's peatlands cover more than 20% of the country and store around 1,600 million tonnes of carbon.

Moors for the Future
It's #WorldPeatlandsDay today. If you would like to find out more about a magnificent type of peatland called blanket bog, have a watch.

Robin A Crawford
Delighted to be participating in #peatfest tomorrow as part of the celebrations for #WorldPeatlandsDay.

McAuliffe Pig Farms
Today is #WorldPeatlandsDay - a day where we celebrate the importance of peatlands.

ShamrockSpring
Wishing all who save peat a great #WorldPeatlandsDay

Cyforgorsydd Cymru Welsh Raised Bog
Happy #WorldPeatlandsDay!! Watch our video to find out more about our raised peat bogs in Wales.

National Herbarium of Ireland - DBN
Happy World Peatlands Day. Very apt day for our mossy Monday. Sphagnum mosses are bog builders.

Loch Lomond & The Trossachs National Park
He's back! For World Peatlands Day, Ranger Adam has got another great #Lochdown Learning experiment you can watch and then try at home.

National Botanic Gardens of Ireland
One thing we can thankfully enjoy at the moment is the glorious summer weather. On a very parched World Peatlands Day, however, spare a thought for the peatland habitats that need a lot more water than your average garden!

Hefflin Lazuardi
World Peatlands Day. Hari Gambut seDunia

Crichton Carbon Centre
Happy World Peatland Day!

Galloway Glens Landscape Partnership
#WorldPeatlandDay
#GallowayPeat

Laboratory of Climate Change Ecology - LCCE
Today we celebrate First World Peatlands Day!

Torvströfabriken Ryttaren
World Peatlands Day

The Lancashire Peatlands Initiative
Today is World Peatlands Day!

Rita O'Sullivan
HAPPY WORLD PEATLANDS DAY

Alpine Garden Society
Happy World Peatlands Day!

Twitter

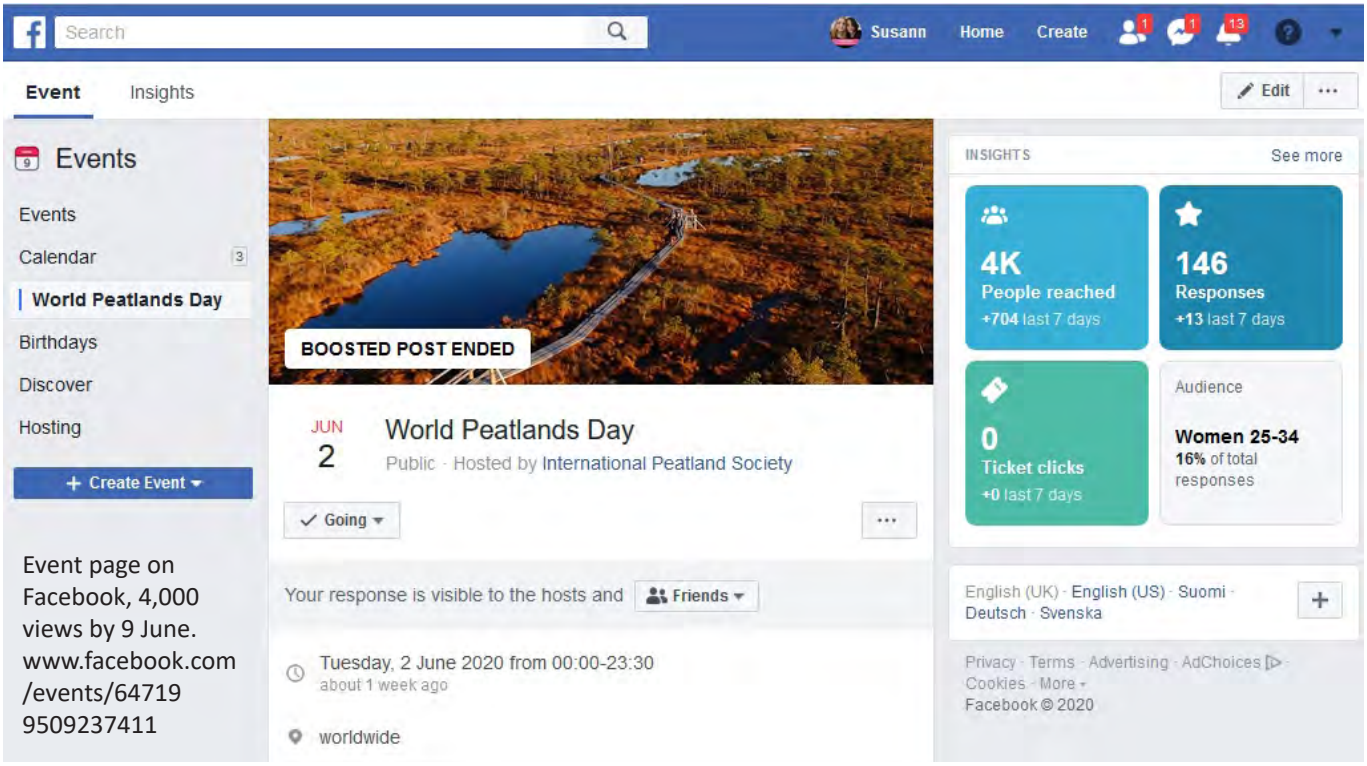
Most busy was, as expected, Twitter. Depending on the hashtag tracking tool, we obtained some 130-200 posts, including numerous retweets of popular entries. Of course, some people and organisations also cross-posted on different media. Climate, restoration and pristine bogs were also here most popular.

Below are some results (shortened, copyright of the authors).

Martha Rojas Urrego (Ramsar Secretary General)
Happy #WorldPeatlandsDay; peatlands trap and store #carbon, help regulate water cycles, purify water and support a wealth of biodiversity. They cover an estimated 3% of the earth's land surface, yet they hold twice as much carbon as the world's forest biomass #NatureSolutions

Peatland Ecology Research Group (Canada)
Happy #WorldPeatlandsDay Share your favorite peatland picture and tag us!

LinkedIn bookstore campaign. Layout: Susann Warnecke via Canva



Event page on Facebook, 4,000 views by 9 June. www.facebook.com/events/647199509237411

Luke (Natural Resources Institute Finland)
#WorldPeatlandsDay can't wait to go back

Flow Country (UK)
Happy #WorldPeatlandsDay to all, from the amazing Flow Country

Culture~Heritage~Gaeltacht
Great news for World Peatlands Day - @LIFEraisedbogs has been recognised for its work in raised bogs restoration in Ireland.

Girley Bog Meitheal
Happy World Peatlands day everyone

BES Peatland Research
We are celebrating this evening the #WorldPeatlandsDay Today, more than ever, we can be proud to be an international organisation (flags) doing research in different peatlands

Alex Mills
It's #WorldPeatlandsDay. Have some Sphagnum pulchrum and the obligatory Famous Seamus: 'To lift the lid of the peat / And find this pupil dreaming / Of neolithic wheat! / When he stripped off blanket bog / The soft-piled centuires // Fell open like a glib.'

LIFE for MIRES - život pro šumavské mokřady
Today is the #WorldPeatlandsDay! We care, we restore on both sides of the Czech-German border.

Marsden Moor
Did you know 1/4 of England's peat is in Yorkshire?

Occasionally Lost
Some pictures of the cotton grass on Brown Knoll last week to celebrate the inaugural #worldpeatlandsday.

Kate Foster (peat)
Don't miss this - an active network and a developing archive. What a fantastic contribution @repeatearth have made to support #WorldPeatlandsDay

Liam Lysaght
Today is #WorldPeatlandsDay - what should be a special habitat in Ireland to conserve.

Magnus Davidson
It's #WorldPeatLandsDay so here's a view looking out over the peatland at Strathmore, part of the flows of Caithness

Ann Lingard
#WorldPeatlandsDay Some Sphagnum beauties from Bowness Common, on the edge of the #Solway

Mariusz Lamentowicz
Today we celebrate #WorldPeatlandsDay. #Peatlands store #carbon they are full of amazing species but they are also simply beautiful.

David Olefeldt
Happy #WorldPeatlandsDay!

Crichton Carbon Ctr
Happy World Peatland Day! We are surrounded by beautiful peatland. These diverse landscapes change and grow over the year.

Earth globe asia-australia
Over the last five years, @Exmoor_Mires Partnership has restored over 1,000 hectares of degraded peatland on #Exmoor.

Iain Detrey
Its been near enough 7 years since my first field trip to a peatland and I learnt about the enormous importance and value of these systems to our global climate!

Lost Peatlands Project/Prosiect Adfer Mawndiroedd
Happy World Peatlands Day! To celebrate, we will be posting fun facts about Peatlands every hour today.

Dr James Bonsall
Hiking yesterday in the uplands of County #Sligo #Ireland I saw a diverse peatland landscape. Recent (and older) peat diggings, craters, flooded cuts, loughs, cottongrass, dragonflies and a viviparous lizard.

South West Water
It's #WorldPeatlandsDay

Lydia Cole
The 1st official day to celebrate #bogs, #fens & #swamps & all #peat-forming ecosystems - #WorldPeatlandsDay. They come in many shapes & sizes, & do a service for us ALL, absorbing the carbon we emit... along with so much more.

Katie Holten
Today, on the first ever #WorldPeatlandsDay, Ardee Bog is experiencing a heatwave and a gorse fire blazed over the weekend.

Eosense
Celebrating #WorldPeatlandsDay with a photo of Nova Scotia #peatland from @nsgov

Katie Gaffney
Happy #WorldPeatlandsDay!! Peatland protection and restoration will be vital to mitigating climate change and they have so many other important services as well.

National Trust in the North
Peat is one of nature's secret superheroes but sadly 80% of the UK's peatland is damaged or deteriorating.

Pete Farrell
Bigger things afoot but worth mentioning that is #WorldPeatLandsDay

Katarzyna Marcisz
Happy First World Peatlands Day! #WorldPeatlandsDay

Suotrendi -tutkimushanke
Hyvää kansainvälistä Suopäivää! Tässä kuussa emme koronan vuoksi pääse Tallinnaan kv-konferenssiin esittelemään tutkimustamme, mutta v. 2021 siirretyn konferenssin merkintä on kalenterisssa. #worldpeatlandsday

Gerald Jurasinski
Happy #WorldPeatlandsDay with a picture of a nice little peatland I found the day before yesterday during a hike with friends.

GRAMP
Celebrating #WorldPeatlandsDay with photos of paleoenvironmental #peatlands sites in the Pyrenees!

Dr Scott Shanks
Happy #WorldPeatlandsDay. Here's some lovely Common cottongrass fluttering in the breeze at Darnrig Moss SSSI, Slamannan

Garnock Connections Landscape Partnership
Great opportunity to show off this #BoggyBouquet that @ScottShanks01 and his team of volunteers created on Bankhead Moss.

Katy Thorpe
Surveying #peatlands on #worldpeatlandsday It's a beautiful day on Blackstone Edge but its tinder dry.

BorneoNatureFdn
It's #WorldPeatlandsDay! BNF is using the latest drone thermal technology to help protect the peatlands.

Andy
#WorldPeatlandsDay End the damaging practice of setting fire to upland peat bogs

Mark Cocker
My photo of the month in celebration of the High Peak blanket bog on #WorldPeatlandsDay

Welsh Raised Bogs
Happy #WorldPeatlandsDay!! Watch our video to find out how peat bogs in good condition bring massive benefits to wildlife and people & help fight climate change.

Liam Lysaght
Today is #WorldPeatlandsDay - what should be a special habitat in Ireland to conserve.

Mélina Guêné-Nanchen
Mine would be a string fen found up north in the James Bay Lowlands! What a beauty! #WorldPeatlandsDay

Benjamin Gearey
On #WorldPeatlandsDay don't forget that entangled socio-economic forces led to this. We can rehabilitate but should not hope to rewind to a pristine 'Wild' #ContestedLandscapes

Ben Jennings
#WorldPeatlandsDay image from a dry Ilkley Moor

Joey Pickard
Trees on peat! Common in our areas as large swathes of South Wales were planted post WW2. Sphagnum remains in the furrows between checked trees on deep peat.

Heli Juottonen
Happy #WorldPeatlandsDay! #Siikaneva

BuglifeScotland
Its #worldpeatlandsday what better time to learn about these wonderful habitats and our latest project to restore them.

WCGov Enviro Affairs
Dont forget to join in #PeatFest online in celebration of #WorldPeatlandsDay.

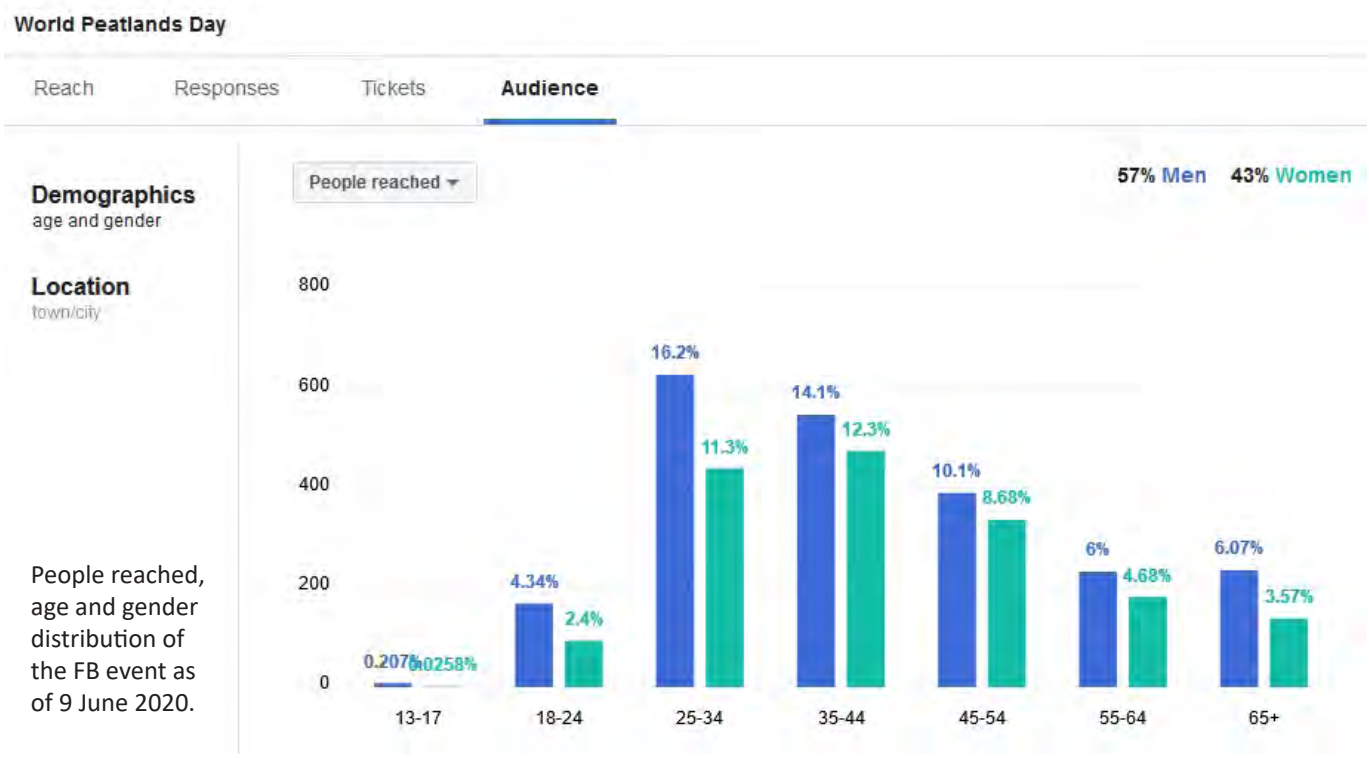
Elena Aitova
While Ireland is enjoying the sunny weather, here is a photo of Cloncrow bog on a rainy day from my first trip there.

Earth globe asia-australia
https://tinyurl.com/yb7973wr

Heaney's Bog Poems
Happy #WorldPeatlandsDay to all! We stand for the protection and education on the value of peatlands and peatland heritage

Sarah Rubalcava
During this hectic gardening season please use #peatfree compost today and everyday. Or better still start making your own garden compost. #WorldPeatlandsDay

Notice Nature Ireland
Happy #WorldPeatlandsDay



People reached, age and gender distribution of the FB event as of 9 June 2020.

Sheila
There's a #worldpeatlandsday & #peattwitter

Jess Williams-Mounsey
Today is the 1st #worldpeatlandsday I've celebrated by hammering silver tags into wooden stakes patiently preparing for when I can go and mark out all of my survey points with them on Moorhouse NNR

Cultural Geography Group, Wageningen University
Happy #WorldPeatlandsDay

Home Turf Project
Happy #WorldPeatlandsDay from the Netherlands! After the great @repeatearth festival of this weekend another initiative to highlight the importance of #peatlands worldwide.

Mike Waddington
#WorldPeatlandsDay Some of the many @McMasterU researchers examining #peatland #ecohydrology #carboncycling #wildfire #restoration

Joey Pickard
What #WorldPeatlandsDay thread would be complete without some diggers? Even if its not #DiggerFriday yet, here's one from the @LostPeatland project area from the first @VattenfallUK site to progress.

Soren C Sorensen
The peatlands and climate connection is being studied in Minnesota. There are indications that increasing temperatures threaten to turn Northern MN's extensive peatlands and bogs from carbon sinks into carbon emitters.

Buxton Civic Assoc
Today is #WorldPeatlandsDay. In Buxton, we are lucky to be surrounded by moorlands on blanket bog.

Environment Agency - Yorkshire & North East
It's #WorldPeatlandsDay today - why not find out more about the bog ecosystem from @moorsforfuture

West Yorkshire Fire and Rescue Service
Today is #WorldPeatlandsDay.

Buxton Civic Assoc
Some really important facts about the importance of peatlands. Please read. #WorldPeatlandsDay

Cara Donald
Fortunate to live somewhere I also have #peatland as well as trees on my doorstep.

Peak District National Park Foundation
#WorldPeatlandsDay find out more about blanket bog and if you can please support our #FireFund

2nd World Peatlands Day 2 June 2021

PeatlandACTION
#PeatlandACTION are celebrating World Peatland Day. Join us by sharing your peatland photos... here we share some of our favourites from Flanders Moss NNR.

Off-Piste Agri Ltd
The @_PistenBully_ 100 is small and highly versatile with industry leading power to size ratio ensuring it is the most effective machine for supporting the regeneration of peatland and environmental projects.

Rosie Everett
Big thank you to the @repeatearth organisers for a wonderful 24hours of #peatland celebrations.

Michael O'Connell
Bog flow, Tullyscreen Bog, #Leitrim, May 1985. Very dry weather followed by downpour on 25&26 & turf cutting by sausage machine implicated.

Amy Pickard
The bog cotton is out in all its fluffy glory at the Red Moss of Balerno - one of my favourite local peatlands #WorldPeatlandsDay

Taco Regensburg
Today we celebrate the first #worldpeatlandsday. Increased water consumption at UK homes during lockdown shows how urgent peatland restoration is in UK.

WCGov Enviro Affairs
Dont forget to join in #PeatFest online in celebration of #WorldPeatlandsDay.

National Trust in the North
Peat is one of nature's secret superheroes but sadly 80% of the UK's peatland is damaged or deteriorating.

Max Lupascu
1st World Peatlands day!

Budiman
#WorldPeatlandsDay .. Human-induced changes in Indonesian peatlands increase drought severity https://iopscience.iop.org/article/10.108

BDS Scotland
A number of our #Dragonfly #Hotspots are on #peatlands - #Flanders Moss, #Portmoak Moss & #Greenhead Moss

Andy Clark
This #WorldPeatlandsDay let's prioritise peatland restoration as one of our most powerful tools in combating the #climatecrisis.

Callum Stone NRW
Happy #WorldPeatlandsDay

Insta, blogs and press

The IPS announced World Peatlands Day, among earlier publications, in Peatland Snippets 6.2020 as well as Peatlands International 4.2019 and 1.2020.

Expert Lydia Cole also wrote an interesting blog post (https://lydiaescole.com/2020/06/03/worldpeatlandsday-the-first), and German BUND took up the day with a press release on peat-free growing media for gardening.

The IPS also promoted the event on LinkedIn but with less of a response. We received 120 impressions and seven likes for our post. However, the search facility on this particular social media platform is rather limited, so we are however quite pleased with these results.

Instagram received 22 photos with the hashtag of #worldpeatlandsday, so there is room for improvement!

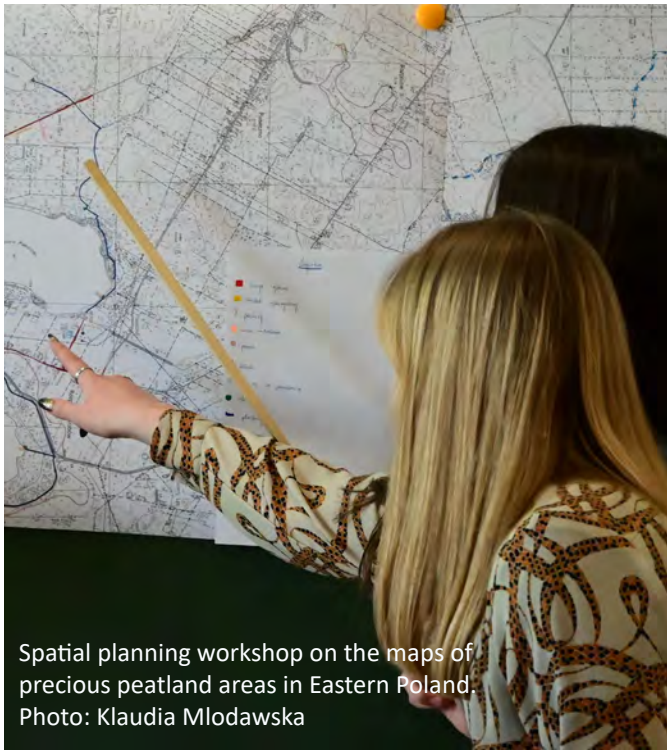
Having said that, the event was very popular among younger and middle-aged people, and it was almost gender balanced, with 47% women and 53% men attending. Well done, folks.
See you next year. And join the IPS!

Susann Warnecke

IPS Communications Manager
susann.warnecke@peatlands.org

World Wetlands Day in Lublin, Poland

On February 7, 2020, the Faculty of Earth Sciences and Spatial Management of the Maria Curie-Skłodowska University in Lublin (Poland) for the third time celebrated World Wetlands Day, which this year was held under the title "Wetlands and biodiversity". The biggest wetland national park in Poland - the Biebrza National Park - was the co-organizer of this year's event.



Spatial planning workshop on the maps of precious peatland areas in Eastern Poland. Photo: Klaudia Mlodawska

Awareness is growing of the significant role played by wetland areas in maintaining a proper water balance in the environment. The increasing interest in World Wetlands Day, now celebrated in nearly 100 countries, is evidence of this awareness. In the context of climate change, recent periods of dramatic drought across the world and other extreme hydrometeorological phenomena associated with the accelerated circulation of water in the environment, the role of wetland areas is of particular importance. Wetlands are not only important for absorbing CO_2 from the atmosphere, but also contribute to maintaining biodiversity and protecting valuable plant and animal species.

Registration office of the event in the main hall of the Faculty of Earth Sciences and Spatial Management. Photo: Klaudia Mlodawska

World Wetlands Day has growing support and interest from

Participants from the secondary schools from Eastern Poland. Photo: Klaudia Mlodawska

young people and representatives of institutions related to the functioning and protection of the natural environment. Participating in this year's event were 190 students and their teachers from six high schools from Lublin and three other Polish towns (Świdnik, Włodawa and Kozienice).

The event was predominantly educational and its main purpose was to disseminate knowledge about the role of wetlands among high school teenagers. The scientific achievements of the employees of the Institute of Earth and Environmental Sciences of the Maria Curie-Sklodowska University are significant in this field and are published in leading scientific journals devoted to the recognition and protection of wetland ecosystems.

Magdalena Suchora PhD explains the living strategy of Sphagnum. Photo: Klaudia Mlodawska

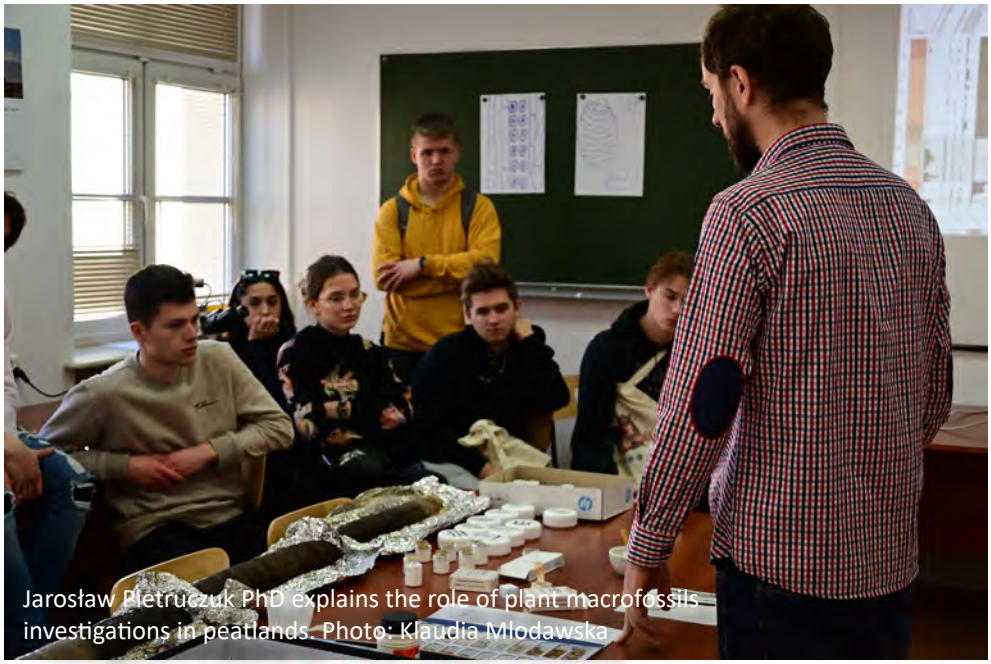
The celebrations of February 7, 2020 were divided into two parts. The first lecture took place in the Assembly Hall, where Vice-Dean Prof. Wojciech Zgłobicki welcomed participants and invited guests and opened the photography exhibitions.

This was followed by lectures on various environmental and social aspects related to wetlands, given by current and former employees - Prof. Wojciech Janicki, Dr. Katarzyna Mięsiak-Wójcik, Dr. Marek Turczyński, and representatives of the Biebrza National Park - Bogdan Browarski and Mirosław Gadomski.

At the end of the lecture session, a wetland knowledge competition was conducted using smartphones. The high school students could win attractive prizes, including an invitation to take part in scientific field research conducted by the employees of the Institute of Earth and

Environmental Sciences of Maria Curie-Skłodowska in Lublin.

In the second part of the celebrations, students had the opportunity to take part in classes selected from 12 thematic workshops (a total of 34 topics).



Jarosław Pietruczuk PhD explains the role of plant macrofossils investigations in peatlands. Photo: Klaudia Młodawska

Topics included "The unusual properties of wetland soils. Soil science workshops", "History of wetlands recorded on maps - computer workshops" and "Is Ledum palustre growing in the swamp? Swamp vegetation quiz".

Running in parallel with the workshops, was a scientific session led by Prof. Irena Agnieszka Pidek. During this session, invited guests had the opportunity to discuss topics related to the protection of wetland areas within Eastern Poland and beyond. Lecturers were given by Prof. Ignacy Kitowski, Krzysztof Wawer (Regional Directory of Environment Protection in Lublin) and Krzysztof Wojciechowski (Landscape Parks of the Lublin Voivodship).

The event was graced with four photographic exhibitions on wetland topics: "Polesie in photography by Louise Arner Boyd" (University of Wisconsin-Milwaukee), "Biebrza in the past and today" (Biebrza National Park), "Faces of swamps" (Student Circle of Nature Photography, Maria Curie-Sklodowska University) and "MicroPolesie" (Landscape Parks of the Lublin Voivodship). These exhibitions were open until the end of April this year at the Faculty of Earth Sciences and Spatial Management MCSU in Lublin.

This year's World Wetlands Day celebration at the Faculty was organized with willingly help from employees and students (among others: the Student Council, the Geography Students' Association, the "Globetrotter" Student Club, the "SmartCity" Student Scientific Group). The event was held under the honorary patronage of the Rector of Maria Curie-Skłodowska University Prof. Stanisław Michałowski and the following five institutions: Regional Directorate for Environmental Protection in Lublin, Voivodship Fund for Environmental Protection and Water Management in Lublin, Poleski National Park, Roztoczański National Park, Landscape Parks of the Lublin Voivodship.

The event was sponsored by the Polish Water State Farm, the Municipal Water and Sewage Company in Lublin, and Kuźmiuk Bakery.

On behalf of the Organizing Committee, we would like to invite you to the celebrations next year!

Irena Agnieszka Pidek, Katarzyna Mięsiak-Wójcik, Joanna Sposób, Karolina Łabęcka, Kamil Kultys, Klaudia Młodawska and Jagoda Ziewiec

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Introducing a new project: Cultural research of contemporary mire trends in Finland

Today in Finland, more and more people visit the mires for a variety of reasons than they did earlier, for example 50 years ago. Traditional uses of mires and peatlands, such as cultivation, silviculture, energy peat extraction, hunting, berry picking and hiking are still common, but they have been accompanied by new, more unconventional uses.

According to the trend of the 2000s, the environmental, commenting art (e.g., dance and music performances) and various cultural and sporting events related to mires (e.g., playful swamp soccer and swamp volley competitions) have increased. Various other forms of exercise on mires have also become more common. Preserving mires in their natural state and the restoration of ditched mires are examples of the trend that emphasizes the protective use of nature. New mire trends can also be seen in cultural products (such as literature and film) and media coverage. Presumably, new ways of using the mires reflect a significant change in the cultural relationship with nature and the cultural heritage associated with mires.

One of Finland's most important foundations supporting academic research, the Kone Foundation, provided research funding for three years (2020-2022) for the Mire Trend research project (full name of the project: Nakedness, puddles and critical comments: mire trend as changing the cultural heritage) which is being implemented at the University of Eastern Finland.

The multidisciplinary research group includes four researchers representing various disciplines: cultural studies/folklore studies (PI, Dr. Kirsi Laurén), folklore studies (Dr. Pauliina Latvala-Harvilahti), literature and environmental aesthetics (Dr. Virpi Kaukio) and ethnomusicology (Dr. Noora Vikman).

By using the methods of humanistic environmental research, the project is exploring the new ways that the mires and peatlands are utilized today and

Mires are also suitable for sports.
Photo: Kirsi Laurén

how they are affecting the human-environment relationship. The aim is to bring cultural research perspectives into the expert debate on climate change, where the mire and peatland debate is dominated by ecological, political and economic perspectives. The central research question is: What is the mire trend like and how does it influence the construction of a new cultural heritage?

The aim of the research is 1) to reveal the cultural forms of the mire trend and discover how they influence the values, attitudes and meanings of nature, and how they remodel the cultural heritage of mires, 2) to provide up-to-date information about the cultural heritage of mires, 3) to provide research-based information on the culturally sustainable use of mires, and 4) to participate in multidisciplinary and societal debate over the use of mires. Research materials include 21st century writing (e.g., personal writing about mire experiences), mire illustrations and photographs, interviews and observations of the actors and participants in the artistic and sporting events on mires, and cultural products (media and literature).

See the Mire Trend website: https://uefconnect.uef.fi/en/group/mire-trend-research-project for more information.

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Mires and Peat

New articles published in the last two months

The ecosystem of peatland research: a bibliometric analysis.
by S. van Bellen, V. Larivière (Mires and Peat 26: Article 15) Published online: 29.05.2020

Effects of invasion by birch on the growth of planted spruce at a post-extraction peatland.
by T.G. Bravo, M.E. Brummell, L. Rochefort, M. Strack (Mires and Peat 26: Article 14) Published online: 14.05.2020

Adding Sphagnum to peat growing medium improves plant performance under water restricting conditions.
by A. Kämäräinen, K. Jokinen, L. Lindén (Mires and Peat 26: Article 13) Published online: 14.05.2020

Substratum sedimentology and topography of two riparian peat bogs in the Bieszczady Mountains (Carpathians).
by J. Kukulak, M. Szubert (Mires and Peat 26: Article 12) Published online: 30.04.2020

Plant diversity and spatial vegetation structure of the calcareous spring fen in the "Arkaulovskoye Mire" Protected Area (Southern Urals, Russia).
by E.Z. Baisheva, A.A. Muldashev, V.B. Martynenko, N.I. Fedorov, I.G. Bikbaev, T.Yu., Minayeva, A.A. Sirin (Mires and Peat 26: Article 11) Published online: 30.04.2020

Biogas and combustion potential of fresh reed canary grass grown on cutover peatland.
by K. Laasasenaho, F. Renzi, H. Karjalainen, P. Kaparaju, J. Konttinen, J. Rintala (Mires and Peat 26: Article 10) Published online: 30.04.2020

Stabilisation of peat with colloidal nanosilica.
by S. Wichmann, M. Krebs, S. Kumar, G. Gaudig (Mires and Peat 26: Article 09) Published online: 30.04.2020

www.mires-and-peat.net

Schrodinger's Peat : is a bog in a box dead or alive?

At a latitude of 60° north, the Shetland islands archipelago forms the most northerly part of the United Kingdom and plays a significant role in the North Sea oil and gas industry.

In 2010 construction began on the Shetland gas plant, an onshore natural gas refinery receiving gas from offshore wells to supply the UK mainland. Shetland also has one of the higher peatland cover per area in the British Isles. Unavoidably, the site selected for the construction was one of Atlantic blanket bog between 1 and 5 meters deep.

In an effort to mitigate and minimize the impact of the project all peat (approximately 672,000m^3) was excavated from the site, and stored "wet" into purpose-built storage containers for safeguarding until such a time that the plant could be decommissioned, possibly several decades. At this point, the peat would be reinstated and the landscape 'restored'. There are two stores each approximately 25 meters deep with concrete clad retaining walls and constrained drainage. The surfaces are open and receive water from rainfall and were hydroseeded with the aim of creating a vegetative cap of bog species.

IPS' Allan Robertson Grants (€500) are awarded to:

a) young peatland and peat researchers carrying out research or practical work or
b) young professionals in early stages of their career in managing peatlands or peat industry.

More info: peatlands.org/about-us/honoursgrants

Overlooking the Shetland Gas Plant and neighbouring Sullom Voe Oil Terminal. The smaller of the plants two peat stores is in the midground with its southern retaining wall visible. Photo: Iain Detrey

A retaining wall of the Shetland Gas Plant's larger peat store. It measures approximately 11m in height with the remaining depth of the store excavated into bedrock. Iain Detrey

To our knowledge peat has never been stored in such a way or for this purpose, and it is therefore unknown what consequences the storage may have on the peat, its properties, key processes and ultimately how it will support future restoration.

Some of these unknowns are what my PHD project, 'Bog in a box: is long term peat storage for future restoration viable?' hopes to address. As well as understanding the effect of storage on peat, I also look into other aspects such as how much carbon was invested into constructing the stores compared to that contained within the peat.

The project is funded through the European Social Fund and supervised by Dr Roxane Andersen, Dr Beth Mouat and Prof Susan Waldron and is based at the Environmental Research Institute in the Thurso, Scotland and the NAFC Marine Centre, Scalloway, Shetland, both part of the University of the highlands and islands (UHI) network.

One of the questions that I am keen to answer in my project is how the storage, has affected the microbial belowground processes of the peat, and in particular the processes that govern the carbon and nutrient turnover. These vital processes play a role in the succession and sustainability of vegetative communities and the overall carbon balance of both the constructed system within the stores, and could potentially affect the future rehabilitation of the gas plant site.

To this end I chose to use the Allan Robertson grant to measure soil enzyme activity of hydrolases and phenol oxidases over a depth profile in the stored peat to compliment data I had already been collecting on nutrient mineralisation rates, with the buried bag technique, and decomposition rates using the tea bag index method in conjunction with monthly water chemistry measurements.

These data will be compared with data collected from a reference location adjacent to the gas plant and to a Scottish peatland action restoration site also on Shetland. The enzyme analysis is something that I was unable to achieve at my bases in Scotland so the grant enabled me to travel to the Wolfson Carbon Capture Laboratory at Bangor University Wales, to perform the analysis.

This suite of data should help to paint a picture of how the microbial communities within the stored peat have established themselves. It would also help to answer if the novel system is behaving in a similar way to its natural analogue or if the disturbance and storage is catalysing a degradation of the peat. The latter would potentially make it more challenging for the future rehabilitation of the site as a blanket bog after decommissioning.

I would like to thank the IPS for the Allan Robertson Grant which helped me to carry out this additional analysis and thereby making my PhD project richer and fuller. For further information about this project, or any other enquiries please contact me.

Iain Detrey

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Peatlands, Pongos and Pyromania:

The effects of the 2015 forest fires on the behaviour and health of Bornean orangutans in Central Kalimantan

In March 2019, I embarked on 9-months of fieldwork in the peat swamp rainforests of Central Kalimantan, Indonesia to collect data for my masters by research project.

This masters by research project is a collaboration between the University of Exeter, Borneo Nature Foundation (BNF) and Universitas Palangka Raya and is supported financially by the Royal Geographical Society, Thomas and Elizabeth Williams Scholarship, Orangutan Republik and of course, the Allan Robertson Grant.

This project investigates the impacts of forest fires in peat swamp rainforests on the critically endangered Bornean orangutan (*Pongo pygmaeus*). Forest fires are now the greatest threat to peat swamp rainforests, yet very little research exists on the effects on biodiversity.

In 2015, Indonesia experienced its worst forest fires since the 1997 fire event. 2.6Mha of land was burned, with 33% of this being peatlands. Much of Indonesia's peatlands are already highly modified from their natural state, with an estimate of only 36% of historical peat swamp forest remaining. A major problem in peat swamps are canals; remnants of illegal logging activity (Photo 1).

Canals were constructed to float felled trees out of forests. Canals drain the naturally waterlogged peat, drying it out and making it highly susceptible to burning. Forest fires are adding to the decades of existing habitat loss caused by oil palm and wood pulp plantations, logging, mining and infrastructure development, further imperilling the survival of species inhabiting peat swamp forests.

Photo 1. Part of a logging canal in peatland. Photo: Helen Morrogh-Bernard

Forest fires are becoming ever more frequent and severe in Indonesia as land modification

continues and the global climate warms. Therefore, it is critical we understand the effects on biodiversity to appropriately design conservation programmes to prevent extinction of species.

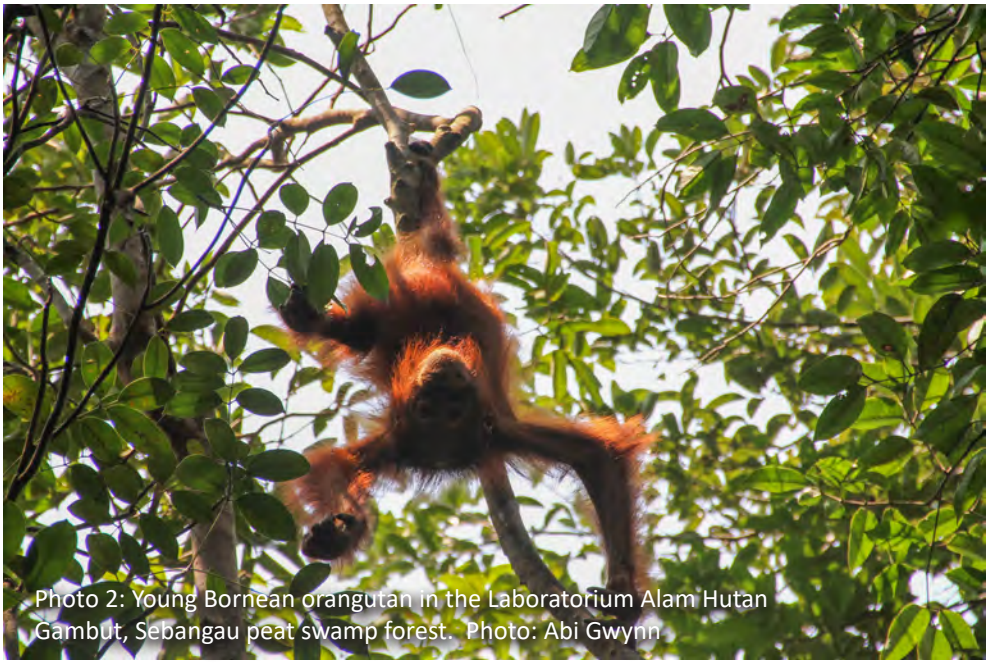

Photo 2: Young Bornean orangutan in the Laboratorium Alam Hutan Gambut, Sebangau peat swamp forest. Photo: Abi Gwynn

My project focuses on the Bornean orangutan as it is an already critically endangered species, under threat from habitat loss, hunting and the pet trade. Orangutans act as an umbrella species for tropical peat swamp forests as they require large home ranges and an intact forest canopy for feeding on their primary food source, fruit, and travelling arboreally.

They are also essential in maintaining ecological balance because the high proportion of fruit in their diet means they act as seed dispersers, with many plant species relying solely on orangutans to disperse their seeds. Therefore, to conserve sustainable and viable orangutan populations, large areas of land are needed, which in turn benefits other species inhabiting peat swamp forests.

My fieldwork for this project involved gathering data on orangutan activity budgets and collecting urine and faecal samples to analyse changes in behaviour and physiology before and after the 2015 forest fire event, which burned large areas of forest to the east and south-west of my study site. Activity budget data was obtained by finding, and then following habituated orangutans, recording data on their activity at 5-minute intervals from when the animal woke up to when it went to sleep.

My fieldwork added to the long-term orangutan behaviour project, run by BNF since 2003, so that changes in orangutan activity patterns can be analysed over a long time period and in relation to environmental stressors such as fire. Urine samples were collected to assess changes in urinary ketones and specific gravity (a measure of hydration) by comparing samples collected by the long-term project before the 2015 fires. Faecal samples were used to trial a new, in-field parasite monitoring protocol using the Mini-FLOTAC technique (Cringoli et al. 2017). Based on the published literature, this is the first time the Mini-FLOTAC has been used in an ape study.

Preliminary results suggest that the 2015 fire period has affected orangutan activity patterns, but very slightly. Sexually-active female orangutans (those pregnant or with/in-between offspring) seem to be reducing their active period (time spent awake) over time, with a decrease from pre to post-2015 fire. Furthermore, the time orangutans spend resting seems to decrease after the 2015 fire, which may be due to the reduction in active period for sexually-active females or that they are investing more of their time in other activities such as feeding or travelling (Fig. 1). I am currently continuing with data analysis to investigate this.

The rationale of establishing the parasite monitoring protocol was to create a method which could analyse faecal samples for gastrointestinal parasites, from collection to identification, fully in the field without the need for expensive and specialised laboratory equipment other than a microscope. The Mini-FLOTAC technique allowed me to count the eggs and larvae of nematode parasites using a non-toxic flotation solution and without the need for centrifuging samples. This made it possible to conduct my analyses in a very basic laboratory at the research camp.

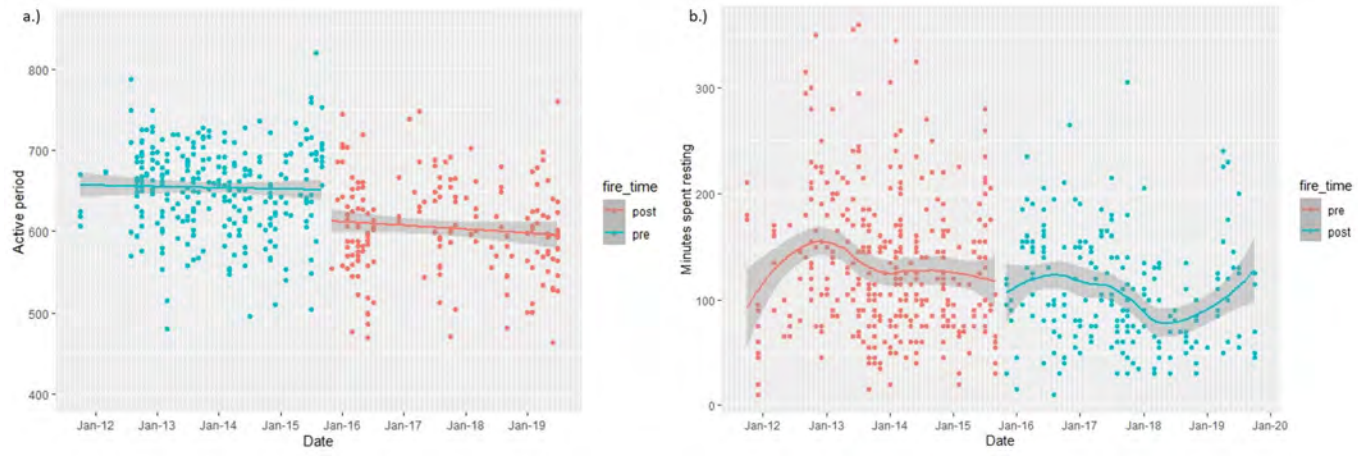

Fig. 1: a.) Active period of sexually active females over time split by pre and post-2015 fire with lm regression line. b.) Minutes spent resting over time split by pre and post-2015 fire with loess regression line.

I successfully identified four different taxa of parasite and analysed differences in their prevalence and load between the wet and dry season. The parasites varied significantly in their prevalence, with hookworm sp. being 100% prevalent, *Strongyloides* spp. 86%, *Enterobius vermicularis* 29% and *Trichuris trichiura* 14%.

Trends suggest that prevalence of *Strongyloides* spp. decreases into the dry season whereas *T. trichiura* and *E. vermicularis* increase from wet to dry season. *E. vermicularis* also shows an increase in parasitic load from wet to dry season. The successful implementation of the Mini-FLOTAC technique in this study provides a protocol for the long-term monitoring of wildlife health with all analysis able to be conducted in the field. The relatively low cost and ease of implementation means that this could be used at many remote field sites where parasitological monitoring was previously not possible due to lack of resources.

The awarded Allan Robertson grant 2019 has been used to help facilitate my time in the field by supporting my subsistence and contributing to the purchase of the Mini-FLOTAC equipment for parasitological analysis. I am extremely grateful for the support of the IPS and I hope that the work from this project will aid in peat swamp conservation efforts to protect this delicate and vulnerable habitat from future forest fires.

Photo 3: A. Gwynn analysing faecal samples for parasites under the microscope at the field site. Photo: Duncan Andrew Murrell

Reference

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Investigating Methane and Carbon Dioxide Fluxes in a Disturbed Raised Bog Invaded by Native Birch Regeneration

Over 80% of Scottish peatlands are degraded (Artz & Chapman, 2016). Controlling birch regeneration invading formerly open areas is a major management issue on many degraded sites requiring significant time and investment to remove. Some Scottish policy on peatland management now proposes that low-density native woodland establishing on peatlands could be a positive management option in some situations.

Forestry Commission Scotland (now Scottish Forestry) proposed that low density, predominantly native woodlands could be established on some existing deep peat forestry plantations after the current stocks are harvested (Forestry Commission Scotland, 2015). This novel management option is termed Peatland Edge Woodland and, according to the practice guide, should be considered if the site is not deemed appropriate for either commercial restocking or open bog restoration.

Photo 1-3: My field site and its trees through the seasons - but always cloudy! Photo: Will Jessop

Photo 4: My closed dynamic chamber used to take flux measurements. Presented uncovered during a light measurement. Photo: Will Jessop

Peatland Edge Woodland is an artificial habitat as it would be established on sites with a history of disturbance caused by afforestation and, furthermore, will be established on sites that are considered to be naturally open habitats. Significant uncertainties therefore exist about what biodiversity or climate benefits these new habitats might provide.

My PhD has been investigating the concept of allowing or even promoting native woodland growth on ex-forestry sites. For over half a year I have been collecting data at Flanders Moss National Nature Reserve. My field site is an area of former commercial plantation which, subsequent to some restoration work after the clearing of the original plantation, has been invaded by stunted birch regeneration. The trees on this site now range in height from 1-4 meters (Photos 1-2).

I am comparing one area that has been colonised by birch trees with an adjacent open area. The study consists of vegetation surveys and greenhouse gas flux measurements to assess the impact the trees are having.

I am currently (in as far as Covid-19 allows!) collecting flux measurements for carbon dioxide (CO_2) and methane (CH_4) from the vegetated peat surface in my wooded and open plots (picture 4). I am taking measurements throughout the year to estimate an annual flux budget for CO_2 and CH_4 at each plot to assess the effect of the growth of trees. So far, I only have measurements taken outside of the growing season so I am unable to make many inferences about the sites yet.

I am also planning to measure the direct contribution of the trees to CO_2 and CH_4 flux. Taking flux measurements directly from trees is a new and rapidly advancing field. My study adds more novelty to this field by enclosing entire small trees in a chamber 2.5 metres tall. This chamber is still in the testing phase but when ready I hope to use it to get diurnal measurements of tree fluxes.

I applied for the Allan Robertson Grant to help pay for some of the equipment I needed for my field work. I spent part of it on a dual sensor HOBO temperature logger to record temperature at my site throughout my period of study. This is a crucial variable for modelling my data over a whole year. I spent the rest of the grant on a 36 Amp lithium iron phosphate battery which can run the gas analyser I use for a whole day.

Before I had this battery, I had to carry 5 lead acid batteries to the site, all individually heavier than my new battery. During measurements I had to switch the old batteries connected to the analyser every 1.5 hours to avoid power outage. My new battery makes taking measurements a lot more efficient (and easier on my back!).

I would like to thank the IPS for awarding me the Allan Robertson Grant which has greatly aided my research.

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Sylvia Toet (University of York),
Russell Anderson (Forest Research) &
Roxane Andersen (University of the Highlands and Islands)

Impact of wildfire on methane emissions from a continental boreal peatland

I would like to thank the International Peatland Society for awarding me one of the 2019 Allan Robertson grants. This research grant funded my travel expenses to allow me to present an oral presentation at the European Geosciences Union 2019 Annual Meeting in Vienna, Austria. I was lucky enough to present my findings on wildfire impacts on methane emissions in the 'Peatlands Under Pressure' session.

Western Boreal Canada is currently undergoing increasing pressures from wildfire, with fire extent and frequency expected to double by the end of this century. Understanding how

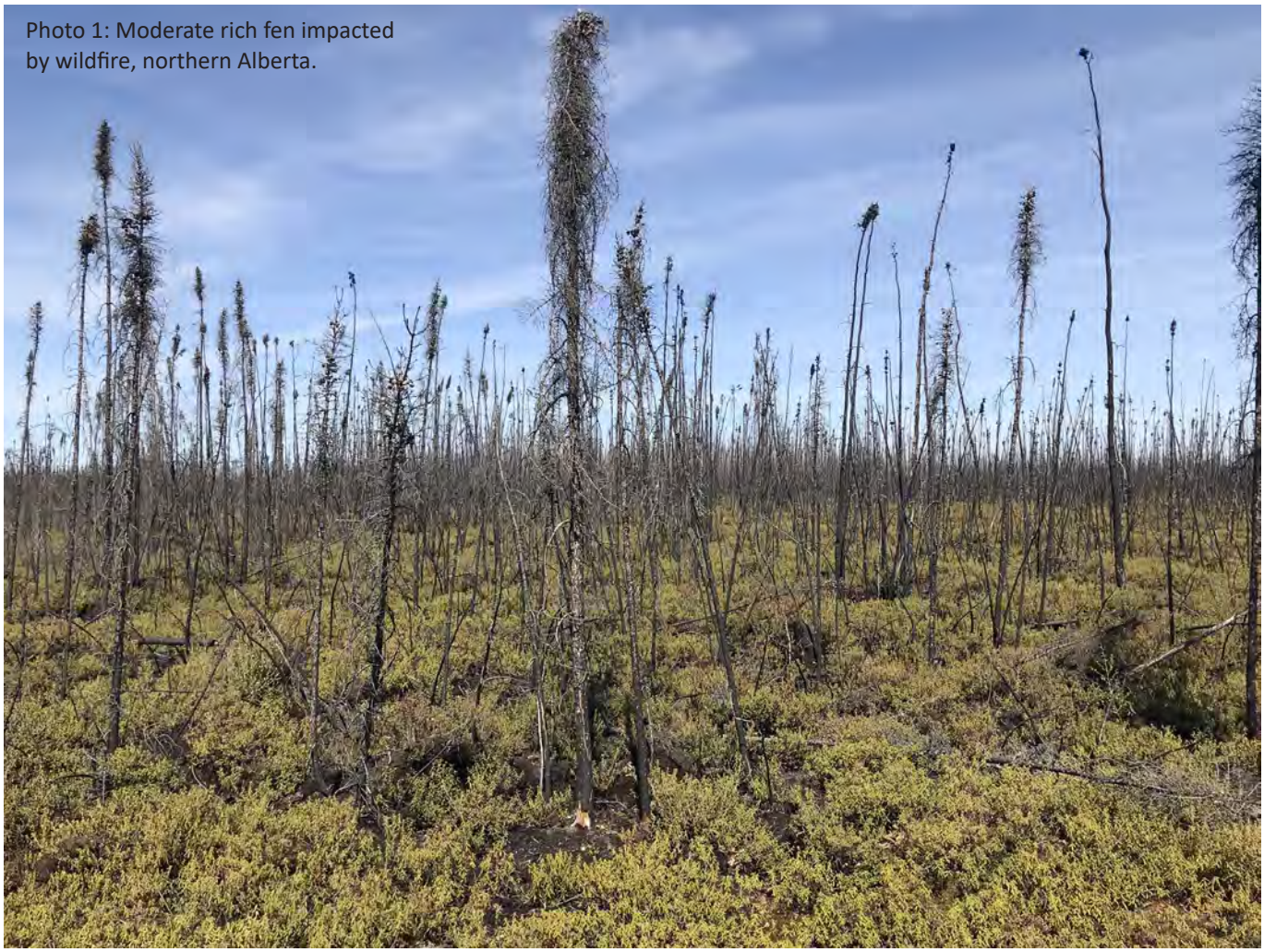

Photo 1: Moderate rich fen impacted by wildfire, northern Alberta.

Title slide of EGU presentation.

carbon cycling and greenhouse gas dynamics are impacted after wildfire is important, especially given boreal peatland vulnerability to changes in wildfire regime. However, despite these increasing pressures, there is still a knowledge gap in our understanding of the impact on methane emissions.

My research[1] examined the impacts of the Horse River Wildfire on methane emissions at a boreal in fen in northern Alberta. We found the fire had a significant impact on methane emissions one- and two-years post fire, reducing the magnitude of fluxes at burned sites compared to the unburned site. Results also indicated a switch in the typical understanding of boreal peatland methane emissions.

A lack of relationship with water table was found at the burned sites, contrasting with the typical significant relationship at the unburned site, even though they had similar hydrological conditions. Furthermore, an incubation study found almost zero methane production at the burned sites, indicating a reduction in the organic matter and microbial communities needed for methane production.

This research highlights the importance of understanding hydrologic and hydrogeologic controls on carbon cycling in boreal peatlands, especially given the expected increase in wildfires.

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[1] Davidson SJ, van Beest C, Petrone R, Strack M (2019) Wildfire overrides hydrological controls on boreal peatland methane emissions www.biogeosciences.net/16/2651/2019

In Memoriam: Dr Ir. Yusurum Jagau Sahay

On behalf of the International Peatland Society we wish to convey our deep sorrow at the passing of Dr Ir. Yusurum Jagau Sahay, MS., on Sunday 29th March 2020 after a prolonged struggle against colon cancer, age 56.

Dr Jagau was a prominent academic figure at the University of Palangka Raya (UPR), in Central Kalimantan, Indonesia, and a dedicated researcher and environmentalist. He started work as a lecturer and researcher at the University of Palangka Raya in 1987 and continued in post until the end of his life.

During his university career Jagau served in numerous administrative academic positions. From 2011 to 2015 he served as Dean of the Faculty of Agriculture. In addition, he was Executive Director of the PILAR (Palangka Raya Institute for Land Use and Agricultural Research) from 2013 to 2019, Chair of the Commission for Genetic Resources for the Central Kalimantan Region, Chair of the Indonesian Soil Conservation Society Commission (MKTI), member of the Indonesian Peat Society (IPS), Chair Central Kalimantan Provincial Research Council, as well as Indonesian Orchid Association. He was a member of the Commission on REDD+ and Chairman of the REDD+ Social and Environmental Standards Committee in Central Kalimantan. Throughout his career he was involved in many activities related to peatland and peat.

For the last two years Dr Jagau was Director of the University of Palangka Raya International Centre for Management of Tropical Peatland

Yusarum Jagau at the entrance to the Natural Laboratory for Peat Swamp Forest in Central Kalimantan. Photos provided by Adi Jaya

(CIMTROP) that promotes projects in the fields of research, environmental conservation and responsible management of tropical peatland. As one of CIMTROP's responsibilities, Dr Jagau made a major contribution to safeguarding the status of the Natural Laboratory for Peat Swamp Forest in the upper catchment of Sungai Sabangau. In the ongoing protection of this unique forest his legacy will live on, and CIMTROP will continue this work in his memory. At CIMTROP, he was actively involved in leading the control of forest and land fires in the Sabangau area, hosting several technical meetings in collaboration with national and international institutions. He promoted research collaboration with the Indonesia Peatland Restoration Agency (Badan Restorasi Indonesia; BRG) on the impact of fires on peat swamp forest ecology, with various national and foreign institutions.

I first met Yusurum Jagau in 1993 when I commenced research on peat swamp forest in the upper catchment of the Sabangau River in Central Kalimantan, Indonesia. He was one of a few members of UPR staff who joined that field research programme in its early days and supported it over the years. He had a great sense of humour and coined the terms 'big Jack' for me and 'little Jack' for himself, which he reminded me every time we met. I met him for the last time when I attended an international conference on Tropical Peatland Ecosystems in Palangka Raya in November 2018, but I was in regular contact with him by email over numerous matters. The last communication I had with him was at the end of January 2020 when he informed me that he had obtained funding to participate in the 16th International Peatland Congress in Tallinn. After then he didn't reply to my emails.

His last major project was to re-establish the International Journal of Tropical Peatland that was first published in 2001 as part of an EU-funded project. As CIMTROP Director he took this task under his wing and at the time of his death the first issue of this revived journal was about to be published. Its importance is that for the first time there will be a regional journal of

international importance dedicated to tropical peatland. We shall ensure this part of his unfinished work will be completed.

Yusarum Jagau was born in Palangka Raya on July 16, 1964, the eldest of 8 siblings. He completed elementary school, middle school and high school in Palangka Raya, capital of Central Kalimantan Province of Indonesia. He continued his education at Bogor Agricultural University, graduating S2 in 1986, completing his master's degree in 1993 and PhD in 2000, specialising in plant breeding.

He underwent colon cancer surgery in May 2019 in Surabaya and again in Jakarta in February 2020, and with various efforts made by his family. He died at Doris Silvanus Hospital, Palangka Raya, leaving his wife and two children. Our thoughts and prayers go out to his family, friends and everybody who has had the honour to know, and work with Dr Ir. Yusurum Jagau Sahay MS. Rest in Peace, colleague, friend and peat man.

Professor Jack Rieley,
International Peatland Society, University of Nottingham, UK

Professor Susan Page,
UK Peatland Society, University of Leicester, UK

Dr Adi Jaya, University of Palangka Raya

Improving water quality from Irish bogs: Reform Water and Swamp projects

Terrestrial and aquatic systems are interlinked; and this is particularly true for peatlands, which hover between land and water. Typically, nutrients and organic matter are transported in water from land to lakes via streams and rivers. The drainage for peatland utilisation lowers the water table and leads to significant changes in peat properties (subsidence and compaction) but more critically it enhances the aerobic decomposition of organic matter, resulting in significant emissions of gaseous and fluvial carbon dioxide to the atmosphere (IPCC, 2014), and degradation of water quality (Bonn et al., 2016).

Irish peatland forestry at different rotation stages (Glenveagh, Co. Donegal). Photo: Flo Renou-Wilson

Clearfelling of *Pinus contorta* plantation on blanket bog (Owenirragh, Co. Mayo). Photo: Flo Renou-Wilson

Drainage, required for agricultural, extraction or forestry activities, has immediate and direct impacts on the hydrology of peatlands, notably in the way water is stored and flows off the peat surface (Price et al., 2003). The altered runoff regimes of degraded peatlands are accompanied by changes in the water quality of downstream water bodies. Intensive drainage networks lead to large runoff peaks and increased erosion, causing siltation, eutrophication and oxygen consumption of downstream water courses (Marttila and Kløve, 2010).

The effects of "brownification" often result in increased hypoxia and even anoxia, which has further consequences for aquatic species. Moreover, the leaching of metals (iron, manganese), nutrients (especially nitrogen and phosphorus), and dissolved and particulate organic carbon further pollutes water bodies (Armstrong et al., 2010, Holden et al., 2004, Cummins and Farrell, 2003b, Cummins and Farrell, 2003a).

Crucially, although elevated nutrient levels have been measured in industrial cutaway peatlands for other countries (Renou-Wilson et al., 2011, Heikkinen et al., 1995, Renou-Wilson and Farrell, 2007, Kløve, 2001), no data has been published from extracted Irish peatlands. Drainage waters from industrial cutaway bogs have also been found to be polluted with ammonia, which may be critical in areas with calcareous geology. As peatland monocultural forest plantations reach their 2nd and 3rd rotations in Ireland, the choice of forest practices, in particular harvesting, aerial fertilisation and drainage of peatlands has been shown to play an important role in determining downstream water quality, especially dissolved organic matter (O'Driscoll et al., 2011, Rodgers et al., 2010).

In addition, with the cessation of peat extraction for industrial fuel in Ireland by 2028, the rehabilitation of large banks of cutaway peatlands within small catchments will need forward planning to reduce the long-term impact of drainage. Continued extraction of the horticultural peat will also require stricter pollution controls.

There is now widespread evidence that drained/extracted peatlands can negatively affect the delivery of water related ecosystem services (Bonn et al., 2016, Renou-Wilson et al., 2011) and solutions are urgently required to satisfy not only Ireland's international commitments with regards to EU laws (Water Framework Directive) but also with regards to climate change and sustainability demands.

The Reform Water and Swamp projects will improve our understanding of the extent and status of mitigation measures in the peat extraction and forestry sectors, and how to minimise potential impacts and capitalise on

An industrial peatland cutaway (with deep drains) where peat is extracted for energy generation. Photo: Flo Renou-Wilson

the full range of ecosystem services provided by peatlands.

The **Reform Water project** is an international WATER JPI funded project (www.waterjpi.eu) run alongside partners in Finland, Sweden and Estonia. The Irish branch of the project is funded by the Environmental Protection Agency (EPA) and aims to investigate less invasive practices to reduce the harmful effects of peatland forest management on inland waters under the increased demands for tree biomass and the threat of climate change.

Key objectives are as follows:

1. Review the existing data from peatland forests and associated catchments (mostly in the west of Ireland).
2. Investigate alternative management practices to existing clear-cutting and ditch drainage maintenance, including Continuous Cover Forestry by monitoring dissolved organic matter and associated site characteristics (water and soil).
3. Combine the data with other water quality data from monitored peatland-forested catchments in order to inform a model-based management tool to be developed by partners.
4. Ultimately the model will run for site-specific scenarios in Ireland in order to mitigate the adverse effects of forest management on water quality.
5. Finally, the project will give recommendations for peatland-dominated forested catchments to protect water quality in freshwater systems.

Swamp is an EPA funded project and aims to investigate the pressures on Irish waters from drained/extracted peatlands and develop mitigation measures in order to protect water quality, with potential for synergy with biodiversity-climate change measures and policies.

Key objectives are as follows:

1. To improve our understanding of the hydrology, hydrogeology, water balances and nutrient exports from drained and extracted peatlands.
2. To investigate the impacts and pressures on water quality (chemistry, aquatic biota and hydromorphology) arising from the drainage and mining of peatlands by identifying contaminant pressure zones and assessing the significance and extent of these environmental impacts, vis-à-vis the Water Framework Directive and Flood Directive targets.
3. To evaluate environmental protection measures in order to develop Best Practice Guidelines by appraising and developing (a) robust water purification methods, and (b) sustainable land-use management practices that include restoration/rewetting and after-use of cutaway/cutover bogs.
4. To integrate solutions to prevent/reduce water pollution with local rehabilitation plans and

examine their potential synergy with other climate change-biodiversity measures.

5. To review and develop hydrological models for cutaway peatlands in order to predict the impacts of peatland drainage and peat extraction on downstream flooding, hydrograph peaks and environmental flows and, thus, to assess expected pollution levels in affected streams.

It is an opportune time for research to improve our understanding of pressures on inland waters arising from drained/extracted peatlands (including domestic turf cutting) and management for commercial forestry. From this, appropriate regulatory measures and innovative technologies, such as biochar filters, can be developed to ensure the status of water bodies is protected, maintained and improved in line with the requirements of national and international environmental standards (Water Framework Directive and Flood Directive).

Sustainable methods to prevent environmental damage from peat extraction developed through the Swamp project will include water pollution prevention measures, as well as peak flow control (such as controlled flooding in peatland ditches and flood plains). In addition, the Reform Water and SWAMP projects will produce Best Practice Guidelines in terms of management of both peatland forests and extracted peatlands to improve water qualitybut also water purification, with the latter of value to the regulatory/ enforcement sector, as well as to industry.

Projects links

Reform Water (Reducing the effects of forest management to inland waters)
Website: https://blogs.uef.fi/reformwater
ResearchGate: www.researchgate.net/project/ReformWater
Twitter: @ReformWater_IE

Swamp (Strategies to improve Water quality from Managed Peatlands)
Website: www.ucd.ie/swamp
ResearchGate: www.researchgate.net/project/SWAMP-Strategies-to-improve-water-quality-in-managed-peatlands
Twitter: @SWAMP_Project

Dr Cat Pschenyckyj &
Dr Flo Renou-Wilson

University College Dublin
florence.renou@ucd.ie

Drainage outlet of a large industrial cutaway bog in the Irish Midlands. Photo: Flo Renou-Wilson

Using an improved modelling approach to investigate peatland carbon dynamics at different temporal scales across the pan-Arctic

The majority of northern peatlands were initiated during the Holocene around 8,000 to 12,000 years ago. Owing to their mass imbalance, they have sequestered huge amounts of organic carbon in the terrestrial ecosystem. The distribution of soil organic carbon is widespread and uneven across the pan-Arctic (45-75ºN latitude).

Recent syntheses have filled some existing gaps, however, the extent and remoteness of many peatland locations pose challenges in developing a reliable regional peatland carbon accumulation estimate. The aim of Nitin Chaudhary's current work at the University of Oslo is to reduce the current and future uncertainties related to the northern peatland carbon cycle. The study will also increase our understanding of land-surface interactions and their impact on climate.

In this work, Nitin employed a dynamic global vegetation model (LPJ-GUESS) with peatland and permafrost functionality to quantify the long-term carbon accumulation rates and to assess the

Stordalen mire, Sweden. Photo: Nitin Chaudhary

effects of historical and projected climate change on peatland carbon balance and permafrost distribution. Nitin's earlier studies highlighted that reasonable carbon accumulation rates can be modelled and the uncertainty in predicting peatland carbon accumulation rates can be minimized if the models are constrained with correct peatland basal ages.

Peat basal ages provide an understanding of past changes in climate, associated deglaciation processes and minimize uncertainty related to the timing of peatland formation. We combined three published peat basal age datasets with some independent measurements to form the most up-to-date peat basal age surface for the pan-Arctic region. We then used this value to constrain the model.

We divided our analysis into two parts – the carbon accumulation changes detected within the observed peatland boundary and at pan-Arctic scale under two contrasting future climate scenarios (RCP8.5 and RCP 2.6). Our results are largely consistent with published long-term carbon accumulation rates. We found that northern peatlands mostly accumulated carbon at a rate of 10-50 g C m^{-2} y^{-1} in the recent past (averaging across 1991-2000).

However, there are some areas in Europe and Northern Canada which have been a net source of carbon to the atmosphere. In the coming decades, peatlands would continue to act as a carbon sink under both scenarios, but their sink capacity would be substantially reduced under the high-end climate scenario (RCP8.5) after the year 2050. Peatlands within the observed boundary showed similar behavior as the pan-Arctic scale, but their carbon sink capacity would be further strengthened under the low-end scenario (RCP 2.6).

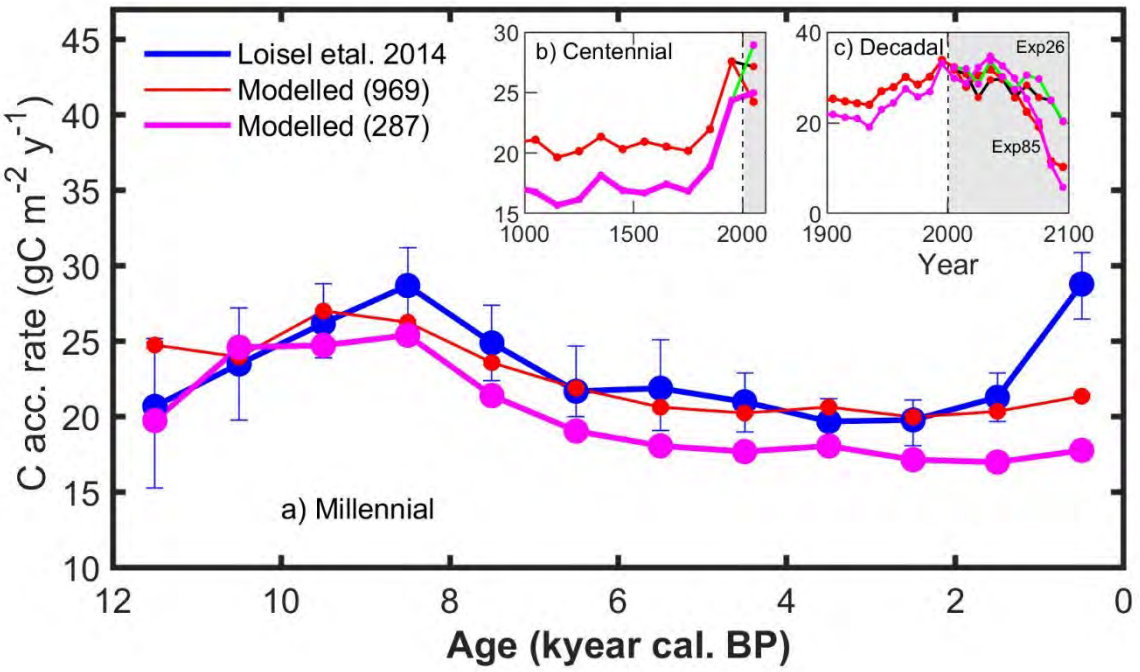

Figure 1. Here we present the modelled and observed mean carbon accumulation rates (CAR in g C m^{-2} yr^{-1}) for each millennial (1000-year period) for the last 12,000 years (kyear). Red: modelled mean CAR based on 969 random sites and modelled clipped sites (287 sites) in magenta. Blue points are observed CARs (g C m^{-2} yr^{-1}) based on 127 Loisel et al. (2014) ; blue points) with error bars showing the standard errors of the means, b) Modelled unclipped (1000 sites in red) and clipped (287 sites) for centennial (100-year period in magenta) rates (in gC m^{-2} y^{-1}/ year); and c) decadal (10-year period) rates (in gC m^{-2} y^{-1}/ year) under RCP2.6 (Exp26) with 287 ●– and 1000 ●– and RCP8.5 (Exp85) with 287 ●– and 1000 ●– sites

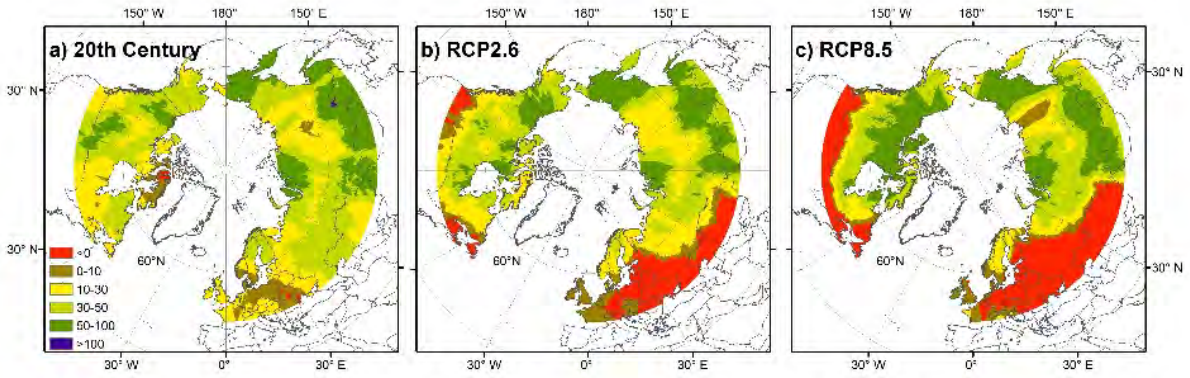

Figure 2 a) Net carbon accumulation rates (in g C m^{-2} y^{-1}, average 1990–2000), b) following the RCP2.6 scenario (Exp26; average 2091–2100), c) following the RCP8.5 scenario (Exp85; average 2091–2100)

We found some areas where the peat production was initially hampered by permafrost and low plant productivity due the cold climate conditions. These areas would benefit from initial warming coupled with a moisture-rich environment caused by permafrost thaw, a higher precipitation rate and higher CO_2 levels. On the other hand, areas with reduced precipitation rates and no permafrost will experience moisture stress conditions and lose more carbon in the near future, particularly peatlands located in the European region and between 45-55°N latitude. Drier conditions promote shrub expansion to the north, affecting the plant litter composition and peat quality.

Nitin Chaudhary

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New Members of the IPS

New members (or new contact persons for corporate and institute members, and industry partners) are mainly approved by our National Committees.

For all other countries, the approval is made by the Executive Board of the IPS. Each National Committee is asked to compare their membership list to that of the IPS at least once a year (status below as of 9 June 2020).

Welcome to the IPS!

Individual members:
China: Meng Wang, Zucheng Wang
Philippines: Rogelio Jr Logronio
Russia: Olga Grum-Grzhimaylo

Corporate & institutional members:
Finland: Juha Mäkinen (Kekkilä-BVB), Ahti Martikainen (Vapo Oy)
Russia: Evgeny Vlasenkov (Terraflor)

Membership fees are collected by the National Committees on their own conditions and timetables. For members in countries without a National Committee, invoices are sent by the IPS Secretariat in late June, after the Annual Assembly. You can ask for, change or delete your membership information any time by contacting info@peatlands.org. **More info: www. peatlands.org/join-us**

Peat and Peatland Events

Cancellations or changes of dates due to Covid-19 threat possible. Check the event websites for updates!

IPS Annual Assembly
10 - 18 June, by email

IPS Executive Board Meeting
18 June, 14 hrs, online

IPS Scientific Advisory Board Meeting
18 June, 15 hrs, online

CBD COP 15
Kunming, China
15 - 28 October 2020
www.cbd.int

German Peat and Humus Day 2020
Bad Zwischenahn, Germany
29 October 2020
www.ivg.org/veranstaltungen/deutscher-torf-und-humustag

9th Asian Wetland Symposium
Suncheon, South Korea
23 - 27 November 2020
http://rrcea.org

IUCN World Conservation Congress
Marseille, France
7 - 15 January 2021
www.iucn.org

IV. ISHS International Symposium on Horticulture in Europe (SHE)
Stuttgart, Germany
8 - 12 March 2021
https://she-ihs-fav2020.de

16th International Peatland Congress
2nd Global Peatland and Peat Industry Summit
Tallinn, Estonia
2 - 7 May 2021
www.peatlandcongress2021.com
www.facebook.com/peatlandcongress
www.facebook.com/events/1162609177193984

Tenth International Symposium on Land Subsidence (TISOLS)
Delft-Gouda, the Netherlands
17 - 21 May 2021
www.tisols2021.org

2nd World Peatlands Day
2 June 2021 online
www.peatlands.org/event/world-peatlands-day

9th SER World Conference on Ecological Restoration and Québec RE3 Conference 2021
From Reclaiming to Restoring and Rewilding
Quebec City, Canada
19 - 24 June 2021
www.re3-quebec2021.org

ISHS-IPS II International Symposium on Growing Media, Soilless Cultivation, and Compost Utilisation in Horticulture
Ghent, Belgium
22 - 27 August 2021
www.ishs.org/symposium/712

SER Europe: 2021 Conference
Alicante, Spain
31 August - 4 September 2021
https://sere2020.org

AsiaFlux Conference 2020
Kuching, Sarawak, Malaysia
21 - 23 September 2021
www.asiaflux.net

UNFCCC COP 26 CMP 16 CMA 3
Glasgow, Scotland, United Kingdom
1 - 12 November 2021
https://unfccc.int

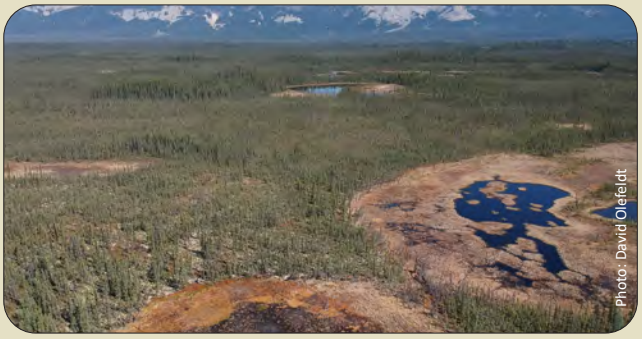
More at: www.peatlands.org/events

Next issue...

You are welcome to write!

Please send your manuscript (500-2000 words, A4, Arial, no full cap lines, with author contact details, language proofread if possible, e.g. **www.englishproofread.com**), photos and illustrations (separate jpg files with the names of the photographers, you need to have copyrights and persons' consent) and advertisements (pdf files, prices according to Media Kit) to susann.warnecke@peatlands.org.

Submission deadline: PI 3.2020: **1 September!**



More Reports on the Allan Robertson Grants 2019

Peatland Certification and Responsible Management of Peatlands

Your article here!