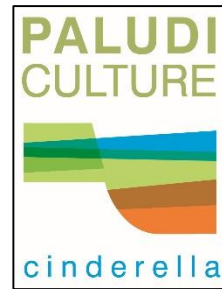


CINDERELLA - Update XI

February 2017, W. Wichtmann

“Comparative analysis, integration and exemplary implementation of climate smart land use practices on organic soils: progressing paludicultures after centuries of peatland destruction and neglect”



By irregular updates the CINDERELLA community and colleagues are informed about dates, news and other interesting issues within the scope of the CINDERELLA project, ref. paludiculture. All partners are kindly asked to provide current information which can be inserted here. The idea is to keep all project partners informed on the same level, to exchange information, to ask project related current questions, to arrange meetings and to make appointments as well as to prepare common activities (publications, new projects, etc.).

Conferences and workshops

South German meeting on conservation of peatlands

Peatland protection in South Germany - situation, key factors, future (from the 26th to the 27th of April, 2017), town hall Biberach

In Bavaria and Baden-Wurttemberg peatlands can be found especially in the low mountain ranges. Natural landscape conditions and historical land use as well as peatland protection activities are very similar in both federal states. Because of this a long-term cooperation of the forestry administration and nature conservation authorities of both federal states developed for peatland protection. The conference informs by presentations and excursions about on peatland protection in southern Germany. Practical examples on preservation and peatland rewetting will be shown. Online-registration until 5th of April 2017: www.fva-bw.de

Upcoming: 2nd reed conference (rrr2017) in Greifswald: Reminder

The 2nd announcement for the rrr2017 conference in Greifswald to be held in September 2017 (<http://www.paludiculture.uni-greifswald.de/en/projekte/rrr2017/index.php>) has recently been released. Please consider your participation and **register soon** so that the organisers get an overview on number of participants and topics which will be covered by oral and poster presentations. More information will be provided continuously on the homepage mentioned above.

Other meetings and conferences (provided by GMC, Franziska Tanneberger)

- 21.-23.03.2017 Global Symposium on Soil Organic Carbon (GSOC17), FAO Rome, <http://www.fao.org/about/meetings/soil-organic-carbon-symposium/en/> special focus on “Managing SOC in soils with high SOC”, registration deadline 31.01.2017
- 02.-06.05.2017 SWS-Europe chapter meeting, Faro, Portugal, abstract deadline 31.12.2016 subtheme “Paludiculture as a sustainable use of wetlands”

- 18.-21.05.2017 25th International Symposium "Deltas and Wetlands", http://www.ddni.ro/index.php?page_id=334&siteSection=7§ionTitle=Events, Tulcea, Danube Delta, registration deadline 01.03.2017
- 29.-31.05.2017 IPS Annual Convention „Responsible Management of Drained Peatlands“ in Aberdeen: www.peatlands2017.net, incl. a session on paludiculture
- 19.-29.06.2017 International Field Symposium “West Siberian Peatlands and Carbon Cycle: Past and Present” (?)
- 28./29.06.2017 Congress: "Eco-innovations from biomass". For more information: <https://ec.europa.eu/eip/agriculture/en/content/congress-eco-innovations-biomass>
- 11./12.07.2017 International conference “Conservation and Management of Wetland Habitats”, Riga, registration <https://goo.gl/DWi2hv>, abstract deadline 31.03.2017
- 22.07.-04.08.2017 IMCG Field Symposium “Mires of the Northern Part of European Russia” http://www.imcg.net/media/2016/imcg_bulletin_1610.pdf
- 20.-24.08.2017 9th Int. Symposium on Ecosystem Behavior (BIOGEOMON) in Prague, Session on Wetland Biogeochemistry, deadline for abstracts: 10.03.2017

CINDERELLA meeting CAOS project representatives in Greifswald

A meeting between representatives of the FACCE JPI Era net+ Climate Smart Agriculture “sister” projects CAOS and CINDERELLA took place the 20th of February in Greifswald. This was continued the next day and followed by a short excursion into the Peene River lowlands including a visit to the Paludiculture plant Malchin.

Participants: Bärbel Tiemeyer, Arndt Piayda (Thünen Institut Braunschweig, CAOS Projekt), André Jansen (Unie van Bosgroepen, Ede, Netherlands), members from GMC incl. CINDERELLA project representatives.

Program:

Mo, 20.02.2017	
11:19	Arrival of guests
13:15	GMC, general part, peatland dialogue, report on and upcoming conferences, open calls, ..
14:15	CAOS presentation and discussion
15:15	General discussion on peatland projects of GMC
	Guided tour to Botanical Institute, DUENE offices , Botanical Garden (incl. Paludarium) and Succow Foundation
ca. 1h	optimisation of an article on common understanding of peatland restoration and paludiculture (BT and FT)
19:00	Dinner
Tu, 21.02.2017	
8:30	Cinderella-presentation of project and last results (max. 1h) Field-activities (CO), harvesting trials (TD), GEST approach optimisation (FR), preparation of excursion, general exchange of projects: Cinderella – CAOS
10:30	Excursion
11:30	Aalbude, Kummerower See → GESTs, vegetation, Cattail stands after rewetting Randow-Rustow rewetted within compensation measure for construction of the A 20 Sites at Lake Kummerow which are regularly harvested
13:00	Lunch in Malchin
14:00	Heating plant in Malchin, explanations by Ludwig Bork → coffee and cake
15:42	BT and AP: Train to Braunschweig from Malchin station

The CAOS project considers very different utilization schemes (from grazing by buffaloes to corn production). Political analyses relevant for peatland utilization, investigations on trafficability of drained peatlands, biomass quality and quantity (incl. modelling) are activities within the project. Some methodological issues were intensively discussed, based on the exemplarily presentation from Arndt Piayda on the preliminary results from the CAOS project, like e.g. the smoothing of graphs which show soil parameters related to soil depth, the possibility to use v.d. Post degree of humification to assess peat from horizons strongly degraded by drainage and the use of water table measurements during one or two years to predict long term water table behavior. It turned out that the combination of data from very different sites all over Europe seems to be suboptimal to deduce general statements. Intensive and extensive land use on grasslands could only hardly be distinguished. In the CAOS project they are differentiated by numbers of harvesting (more than two times a year = intensive).



Photo: polder Ranow Rustow (Peene River valley) near Demmin which was restored by step-wise raising the water table during a time period of 15 years to give vegetation a chance to grow corresponding to water tables (André Jansen)



Photo left: André Jansen, Arndt Piayda and Bärbel Tiemeyer during coring peat in the Seewiesen Neukalen, right: John Couwenberg and Felix Reichelt coring with the Polnische Klappsonde



Photo: Coring near Aalbude, profile with sedge and reed peat

Potential interfaces, delimitation and synergies of the projects CAOS and CINDERELLA

It's obvious that CINDERELLA works on the same basis as the CAOS project: organic soils respectively peatlands. Partly in both projects comparable approaches are used to show that Climate Smart Agriculture (CSA) on peatlands is possible: evaluation of land use systems, ecological monitoring, economic assessments and evaluation of environmental impacts of the studied land use system and several other activities.

The different site conditions considered enable a clear delineation between both projects: CAOS orientates on drier peatlands with stabilized water tables (in comparison to "normal" land use on peatlands) which still can be managed (maintenance, fertilizing, harvesting) with conventional techniques, as normally used on dryland. This has effects also on GHG emissions and nutrient losses to groundwater which are stabilized on a medium level. Means for stabilizing water tables which are analysed are subsurface irrigation, impounding of ditches etc. which leads to medium water tables at 40 to 80 cm below surface. It's possible to use conventional techniques for harvesting and transport of biomass from the field. Dominating plant species considered are Reed Canary Grass (*Phalaris arundinacea*), Timothé (*Phleum pratense*) and Tall Fescue (*Festuca arundinacea*)- Also the utilization of the biomass seems to be conventional (fodder, silage for fodder or biogas).



Photo: Ludwig Bork from Heizwerk Malchin explaining the round bales disintegrating unit

CINDERELLA orientates on fully rewetted *peatlands* (paludiculture), with medium water tables at or over the soil-surface where adapted agricultural techniques are required for harvesting etc., as the carrying capacity / trafficability of the wet organic soil is much lower. The crops under consideration are different (*Phragmites australis*, *Typha spec.*, *Arundo donax*), although some overlap exists with grasslands, dominated by Reed Canary Grass (*Phalaris arundinacea*), of which the drier type is studied by the CAOS project, the wetter type by CINDERELLA. Aim of paludiculture is to allow economic exploitation and utilization of biomass at strongly reduced GHG emissions and nutrient losses (climate smart agriculture), while simultaneously providing other ecosystem services.

Activities in Nijmegen (Jeroen Geurts and Christian Fritz)

Relevant meetings:

Representatives of the Knowledge Centre Paper & Cardboard asked us to inform them about the possibilities of the application of cattail and reed fibers (or other components) in the paper industry. They are especially interested in using regional biomass for making sustainable packaging for biological products. At the moment they are building a new factory near Nijmegen, where also new fiber sources could be tested, including cattail. Because of the heavy texture, it is hard to bleach, so it is not suitable for industrial production of graphical paper.

Two weeks ago we spoke with a public servant from the ministry of Economic Affairs concerning the letter (e.g. permanent grassland legislation) we send last year about optimising framework conditions for wet utilization of organic soils. We had a very nice and open conversation about the topic. He gave us a lot of information and also suggestions to whom we should speak to, for example the Netherlands Environmental Assessment Agency (PBL). This autonomous research institute contributes to improving the quality of political and administrative decision-making by conducting outlook studies, analyses, calculations and evaluations. The Netherlands Enterprise Agency (RVO) will inform us about how paludiculture and paludiculture crops fit in the CAP and if there are possibilities for subsidies. Within the CAP there are at least possibilities for knowledge-driven innovation projects with market parties/cooperations and bigger pilots.

The main questions of the Ministry of Economic Affairs focused on upscaling possibilities of paludiculture, both technical and financial, if market parties are interested in paludiculture, and if we could support our claim that paludiculture leads to more CO₂ emission reduction than permanent grasslands. He stressed that it is important to focus on the combination of ecosystem services/functions, not climate only, because there are already a lot of climate change mitigation measures. It is also important to incorporate agricultural organizations and fodder producing companies, which can influence farmers to change their agricultural activities. They can also indicate fodder quality requirements and food safety issues. Besides that, assessing product environmental footprints could be interesting for paludiculture products.

Meeting with the Stowa (Research Unit of all Dutch Water Authorities). Cinderella and other Nijmegen projects are now included in the National Program *Soil, Water and Climate* which largely focuses on peat oxidation and land subsidence. On the 15th of June we will present results from pilots on a national congress with the aim of formulating research calls to fill knowledge gaps.

Several student groups from different universities are performing (or performed) integral projects about paludiculture and have contacted us for more information. They are all commissioned by governmental parties (municipalities, provinces or water authorities) or consultancies. The quality of these projects varies quite a lot, but at least it is a hot topic amongst students and commissioners.

Publications:

Draft versions have been prepared for two Dutch journals, *Bodem* (Soil) and *H₂O*.

Temmink et al. released <http://dx.doi.org/10.1016/j.ecoleng.2016.10.069> ("Sphagnum farming in a eutrophic world" is in press (and attached). The result of a nice collaboration between Aquatic Ecology (RU), B-WARE and the paludiculture experts from Greifswald University, Germany

Research:

In January, we harvested biomass in our field experiment in Zegveld (*T. latifolia*, *T. angustifolia*, *Phragmites*, *Salix* and *Miscanthus*), comparing changes in yield and moisture content between species and water levels (+20cm and -20cm since October 2016). *T. latifolia* gained the highest yield: 700 g DM/m² in the 2 year old plot vs. 300 g DM/m³ in the 1 year old plots. Moisture content was 5% lower at the low water level compared to the high water level. Other analyses are in progress.

The last 2 weeks (6th and 7th CW), Nora Köhn (student from Claudia in Greifswald) came to Nijmegen to analyze the samples of her experiment and some joint field samples. This worked out very well and a

lot of useful data will be available soon. We also received new samples from the experimental ponds in Sweden, and they are processed and analyzed at the moment.

In the greenhouse, we are starting new experiments now. One experiment is a cattail experiment on peat soil with different mineral and organic N sources and frequencies. Focus will be on nutrient uptake, soil processes and GHG emissions. The other experiment compares the growth of 3 species (*T. angustifolia*, *Salix* and *Miscanthus*) at 3 different water levels (-30, fluctuating, +20).

Both experiments will be repeated (in +/- similar design) under field conditions this season, which is the last Cinderella season. During your visit here we will show you the field location where the different paludiculture crops are planted.

World wetlands day

The world Wetlands Day was celebrated on Monday, January 30th, 2017. There were three events in Germany, all organised by the Greifswald Mire Centre.

1st event: Thursday, February 2nd, 2017 at 11 o'clock the Greifswald Mire Centre invited to the first mechanical cattail harvest in Mecklenburg-Western Pomerania. The harvest took place on an agriculturally used peatland site, on which a cattail population has spontaneously established because of continuous water supply through a permeable dike. In cooperation with local reed harvesters, the mechanical harvest was tested with a Seiga an amphibious vehicle with low ground pressure (see also corresponding press release below).

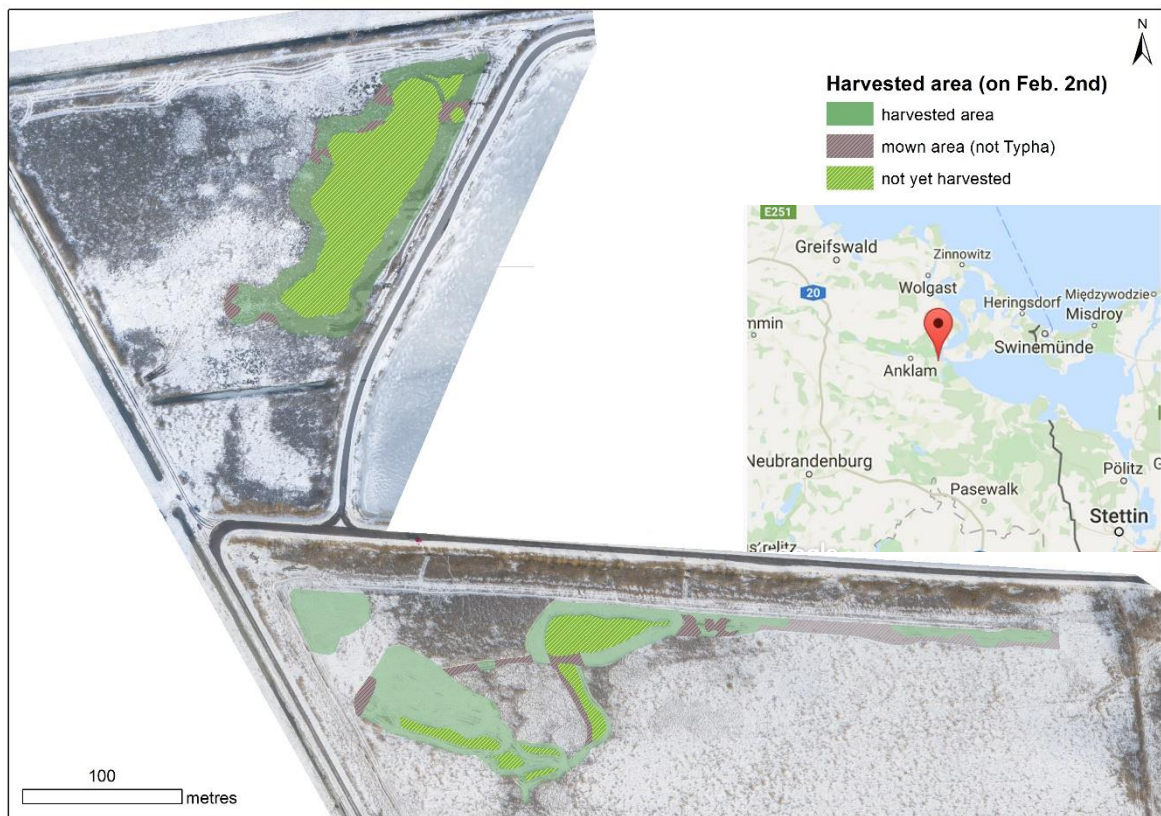


Figure: Aerial map of the typha harvesting site near Kamp, Mecklenburg-Vorpommern (Tobias Dahms, google)

2nd event: Peatlands in world politics: literature evenings at PeNCIL / Greifswald Mire Centre on Thursday, February 2nd, 2017

Peatlands have been stages for wars and catastrophes but also for beauty and culture. The role of peatlands in world history is the topic at Prof. Hans Joosten's literature readings. He talked about Mao's long march through the peatlands of Tibet (08.02.) or how peatland studies evolved also through the blockade of Leningrad (22.02.). Peatlands' role during the invasion in the Bay of pigs in Cuba (08.03.) are subject of a reading as well as Saddam Hussein's "Final solution" for the Marsh Arabs (22.03.). The extensive library „Peatland and Nature Conservation International Library“ (PeNCIL) is part of the Greifswald Mire Centre.



Photo: Hans Joosten during one of his presentations on peatlands in world's politics (lensecaples.org)

3rd event: Excursion: The salt meadows near Greifswald - natural flooding dynamics for coastal and climate protection

The Greifswald Mire Centre invited to an excursion to the Karrendorfer Wiesen on the World Wetlands Day. The Karrendorfer Wiesen, a 360 ha large salt meadow area at the gates of Greifswald, are part of a protected area today, owned by the Michael Succow Foundation. They are remains of coastal flood peatlands covering over 21,000 ha along the coast of Western Pomerania. Most of these valuable natural spaces were lost through intensification in the 19th and 20th century. Today, the Karrendorfer Wiesen are a good example for a successful restoration of natural flooding dynamics, adapted coast protection, as well as sustainable use of sensitive coastal flooding areas. They also are a great location for rare and endangered plants of the salt meadows as well as a habitat for water- and other coastal



birds. The vegetation slows erosion of the shore zone and promotes sedimentation. Especially coastal flood peatlands contribute to the stability of the flat coasts of the Baltic Sea. After flooding, natural waterways ensure rapid drainage. In addition, the conservation of peatlands is important for climate protection. Their drainage leads to immense amounts of greenhouse gas emissions.

Figure: Map of centre of Western Pomerania and the location of Karrendorfer Wiesen (goggle maps)

Press releases

Bauernzeitung 1: Losses in reed production can be avoided by active cultivation of reed

In Germany, more than 80% of the reed used for thatching is imported from abroad. People preferring to thatch their roofs with regionally produced reed, will have more problems this year. The cause is a total loss of the current thatching reed harvest in Western Pomerania. Solutions to avoid this would be so easy, it's true.

The reed harvester and thatcher Detlef Schramm from Gnevezin possibly will lose his total harvest. The traditionally harvested reedbeds in Peene river valley and at the Baltic Sea shoreline were flooded in January 2017 resulting in different water tables. Freezing at different levels destroyed the reedbeds so that harvesting will be difficult or impossible. By the rising and falling water level, infers with frost, ice lumps have formed at different heights in the reed. Additionally, snow loads snapped many stalks. This makes the harvest almost impossible. The iced up reed cannot be bundled up. The problem is not unknown to reed harvesters, it is called `Bolleis`. In the Peene river floodplains and the lagoon coast expect this every 6-7 years. Bolleis can also lead to losses in the subsequent year, because reed surfaces may be harvested only till the end of February. If harvesting of reed is not possible till then, the reed stops growing. This lowers the quality of the next harvest and must be combed out with big expenditure. However, these losses are avoidable.

This appears with Harald Nordt, reed harvester on Rugia island. He also mows poledered areas with reed stands. Here he can control the water level and the area is protected against flooding. "Nevertheless, my areas that are leveled with open waters are already lost to 50% and may get totally lost this year. However, in the poldered areas we are currently harvesting." he says. He does not lack experience. For more than 25 years Harald Nordt harvests reedbeds on Rugia island and employs 10 workers. His sustainably produced construction material has a very good quality and is strongly demanded in the region.

Diking nature near peatland areas is no way out. But poldered and drained peatlands currently used as grasslands could be used for reed cultivation. The regional material does not cover the demand. 80% of the reed obstructed in Germany is imported. Nevertheless, for the local reed harvesters it is not easy to increase their production. Reed in Germany is not accepted as an agricultural product and, hence, cannot be grown on agriculturally used areas. Reed harvesters in Germany can harvest their reed only in protected vegetation stands. This traditional use is compatible in many areas with the demands of nature conservation, an expansion of the harvest areas, nevertheless, is not possible.

In the peatlands nearby the small village Rozwarowo nearby Wolin in Poland the reed harvesters and thatchers have long term experience to use poldered peatlands and how water tables have to be adjusted for optimal reed cultivation already for many years. This kind of wet utilization of peatlands keeps traditional business alive, it guarantees income and jobs in the rural area and saves expensive draining of peatlands. Above all, however, this wet peatland utilisation is good for climate protection, because wet peatlands are great CO₂ stocks! From intact wetlands and their sustainable use not only the local reed harvesting companies, but also the German efforts for climate protection will benefit. Solutions are so easy: The cultivation of reed would have to be recognised as an agricultural measure and reed should be actively cultivated.

To take the cultivation of reed away from illusions and to develop reed cultivation as a real alternative, currently peatland areas are demanded for the implementation of demonstration pilots for reed cultivation. Interested land users should contact Christian Schröder (christian.schroeder@uni-greifswald.de) from Greifswald Mire Centre

Information: www.paludikultur.de, www.greifswaldmoor.de; authors: Christian Schröder, Tobias Dahms (both Greifswald Mire Centrum; correspondence: Christian Schröder: christian.schroeder@uni-greifswald.de)



Photo: Ice in reedbeds is responsible for great losses of harvestable reed for thatching (Photo: lensescape.org)

Bauernzeitung 2: Premiere – First machine based harvest of Cattail in Mecklenburg-Western Pomerania

Premiere in Mecklenburg-West Pomerania - at the World Wetland Day 2017 the Greifswald Mire Centre in cooperation with the thatcher Detlef Schramm from Genevezin successfully harvested Cattail by machine. Now the harvested material is transported to the HEMP FIBER Uckermark company in Prenzlau where it is processed to "blow-in-insulation", funded by the Dutch foundation WetlandProduct. Afterwards a guest house in close vicinity to the harvest area will be insulated with it.

Cattail (*Typha spec.*) is a terrific raw material, it's true. It combines good insulation with decent construction qualities. For the first time Cattail was successfully harvested in Mecklenburg-West Pomerania by a balloon tired machine usually used for harvesting of reed. Harvesting and processing of Cattail-biomass could successfully be demonstrated. Further development and optimization is necessary. The harvest took place on an agriculturally used area on which Cattail stands spontaneously developed. There is a great interest in the cultivation of Cattail on agriculturally used peatlands and

additional sites are demanded. In the Netherlands the first cultivated Cattail stands were already implemented.

The cultivation of Cattail offers an economic alternative to the conventional use of fen peatlands. „Instead of draining peatlands, in future, degraded peatlands can be irrigated by nutrient-loaded waters from agricultural catchment areas. Nutrients from diffuse sources can be mitigated by this“, explains Christian Schröder from Greifswald Mire Centre. Besides, the emission of greenhouse gases from drained peatlands is reduced by raising the water levels. According to Schröder, „Cattail makes a double contribution to climate protection – on one hand by the raising of the water levels and on the other hand by it’s utilization as an ecological insulating material“.

Besides, for local reed farmers the Cattail cultivation comprises the possibility to continue with their traditional business. The cultivation of Cattail on agriculturally used peatlands would be an ideal supplement and would extend the product range of ecological building materials. New jobs for cultivation, harvest and utilisation can be created.

But also for farmers the cultivation of Cattail can be economical alternative. Up to now Cattail is imported from the Danube delta. The costs for 1 tonne of raw material are up to 300-600 €. If nutrient rich water is available, up to 20 t of dry mass per hectare can be harvested. At the moment for the cultivation in Germany suitable peatlands are demanded. Interested land users can contact Christian Schröder of Greifswald Mire Centre (christian.schroeder@uni-greifswald.de).

More information: www.paludikultur.de, www.greifswaldmoor.de; authors: Christian Schröder, Tobias Dahms (Greifswald Moor Centrum; correspondence: christian.schroeder@uni-greifswald.de)



Photo: First mechanical harvesting of Cattail in Western Pomerania (Photo: lensescape.org)

Fellows at Greifswald Mire Centre

André Jansen

André Jansen works as a senior hydro-ecologist at the Unie van Bosgroepen (Forest Support Groups), a cooperation of owners of forests and natural areas in the Netherlands, such as estates and communities, aiming at economic, social and ecological sound management of their areas in the long term. During his 5 months sabbatical period he works on the publication of a book on the remaining Dutch bogs. In Greifswald he orientates on the possibilities of bringing paludiculture into practice together with Bosgroepen members. Further, he does some literature research on the germination of *Typha* species.



Marina Abramchuk

Marina Abramchuk is a new fellow at the Michael Succow Foundation in the peatland working group. She graduated with a Master in Environmental Management from Warsaw University. Her thesis focused on influence of large tracked mowers, applied for conservation of Aquatic Warbler habitat, on vegetation structure and functional plant diversity of fens. Marina has been a member of APB-Birdlife Belarus for 12 years. As a Marion Dönhoff Fellow she is pursuing her research on management of fen as habitat of globally threatened Aquatic Warbler in Germany and Belarus and potential conflicts in nature conservation.



IMCG bulletin January/February 2017

The latest bulletin by IMCG will be published end of this week. Again it provides several information on project related relevant issues and gives an overview on recently published papers on peatland protection: <http://www.imcg.net/>

Mires and Peat

Take a look at the latest volume (Vol. 19) of Mires and Peat: <http://mires-and-peat.net> and use this online magazine to publish your newest results!

Publication

Peters, J. & M. v. Unger (2017): Peatlands in the EU Regulatory Environment - Survey with case studies on Poland and Estonia. BfN-Skripten 454, 103 p.
<http://www.bfn.de/fileadmin/BfN/service/Dokumente/skripten/skript454.pdf>