



Ponderful

PONDS FOR CLIMATE



Deliverable 5.10

Publish newsletters (PONDERFUL News and Freshwater Reports) with updates of first year

Pond Ecosystems for Resilient Future
Landscapes in a Changing Climate



This project has received funding from the European Union's Horizon 2020 Research and Innovation Programme under Grant Agreement No ID 869296



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Katholieke Universiteit Leuven (Belgium) – Prof. Luc De Meester (PI, WP2 coordinator)

Haute Ecole Spécialisée de Suisse occidentale (Switzerland) – Prof. Beat Oertli (PI, WP4 coordinator)

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Executive Summary

The PONDERFUL e-mail newsletter aims to strengthen the external communication of the project. This document includes the technical information of the newsletters, as well as the first two PONDERFUL newsletters, released in 2021.

Email newsletters are emails sent periodically to an email list of subscribers. The PONDERFUL News and Freshwater Reports is a biannual email newsletter, which aims to provide relevant information on the main activities of the project, such as updates on each work package, as well as fieldwork details and news and events. Each newsletter has a section called Freshwater Reports that provides a review of some papers and events of general interest for freshwater ecologists that are thought or action provoking. The newsletter also lists PONDERFUL and other pond-related events, such as the European Pond Conservation Network (EPCN) conference.

We used the Mailchimp marketing platform to create newsletter campaigns and manage our audience, which to date contains 232 subscribers. In 2021, the newsletter was sent to a list of subscribers in August and November, these newsletters are presented below.





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PONDS FOR CLIMATE

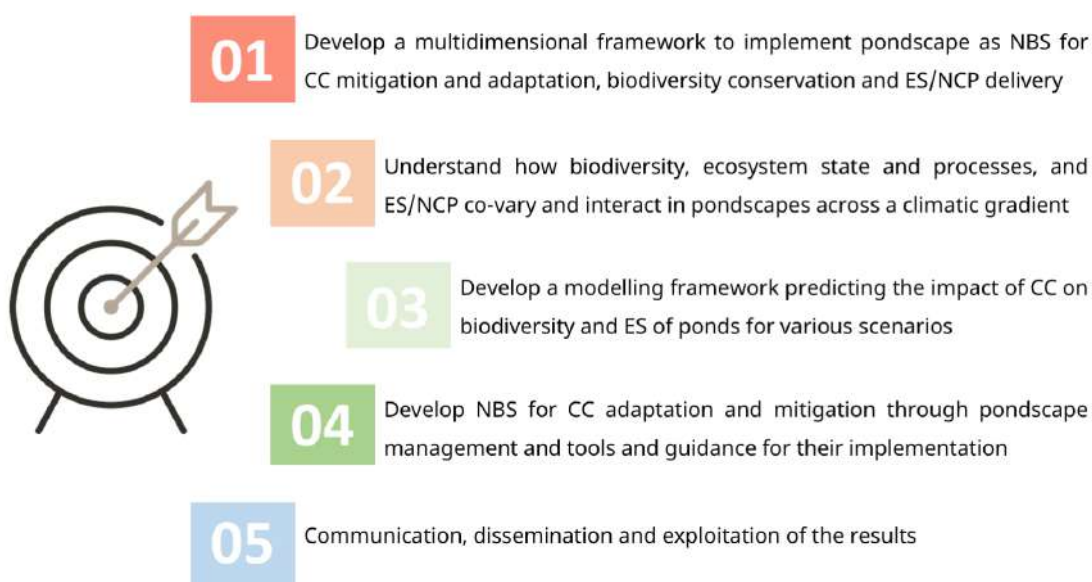
PONDERFUL News and Freshwater Reports

Issue No. 1

WHAT IS PONDERFUL?

PONDERFUL (POND Ecosystems for Resilient Future Landscapes in a changing climate) is a H2020 “Research and Innovation Programme” project funded by the European Union within the Call: Inter-relations between climate change, biodiversity and ecosystem services.

Our goals



Know our Partners

The PONDERFUL consortium involves **18 participants** spread across **10 countries**.

The project is composed of participants with complementary knowledge, skills, and experience and brings established scientific and practice networks.



[Read more about our partners >>](#)

Meet our team members

Today we will introduce you to **Julie Fahy**, a PhD student and assistant in the aquatic ecology group of the University of Applied Sciences and Arts of Western Switzerland (HEPIA - HES-SO) in Geneva.



I am in the first year of my PhD, co-supervised by Prof. Beat Oertli (HES-SO) and Prof. Anthony Lehmann, from the University of Geneva. I mostly play a part in the second work package of PONDERFUL and I am notably responsible for carrying out the project's main protocol in Switzerland, organising fieldwork and lab analyses. I have already spent a lot of time in the field this year, paddling, wading and taking various samples in ponds all over the Geneva area. Later in the project, I will also conduct data analyses to try and make sense of some of the bits and pieces of information collected in the field.



I have always been fascinated by aquatic ecosystems, and I owe my current position to dragonflies! I studied the odonate communities of a river floodplain during my master's degree in environmental sciences at the University of Geneva, which sparked a passion for aquatic communities and ecological research, and led me to meet the team I'm working now. Freshwater systems have much to offer, and they represent a constant source of wonder to me.

able to shed light on the interrelations between the biodiversity and ecosystem services of ponds, and to draw attention to these wonderful small water bodies. Climate change is currently at the heart of concerns and understanding how ponds may be impacted by it and how they contribute is no trivial task.

More personally, PONDERFUL is a great opportunity for me to learn and be a part of an inspiring community of scientists. I feel like I have already acquired a lot of new skills and knowledge during these first months, and I cannot wait to see where the rest of this scientific journey will take us!

Updates on our work

Work Package 1 - Stakeholder Involvement



WP1 already has achieved its first Milestone, a PONDERFUL Concept Note – a document framing the whole PONDERFUL project, introducing and explaining key concepts and terms. It also covered results of stakeholder mapping, providing an overview of the types of stakeholders involved in the project, their power to impact pondscapes and their interest in PONDERFUL. Currently, the WP1 team is planning the first stakeholder workshop. Such a workshop aims to get to know stakeholders of each DEMO-site (see below) and start the process of their engagement in the project. At the same time WP1 is finalising its first Deliverable, which will

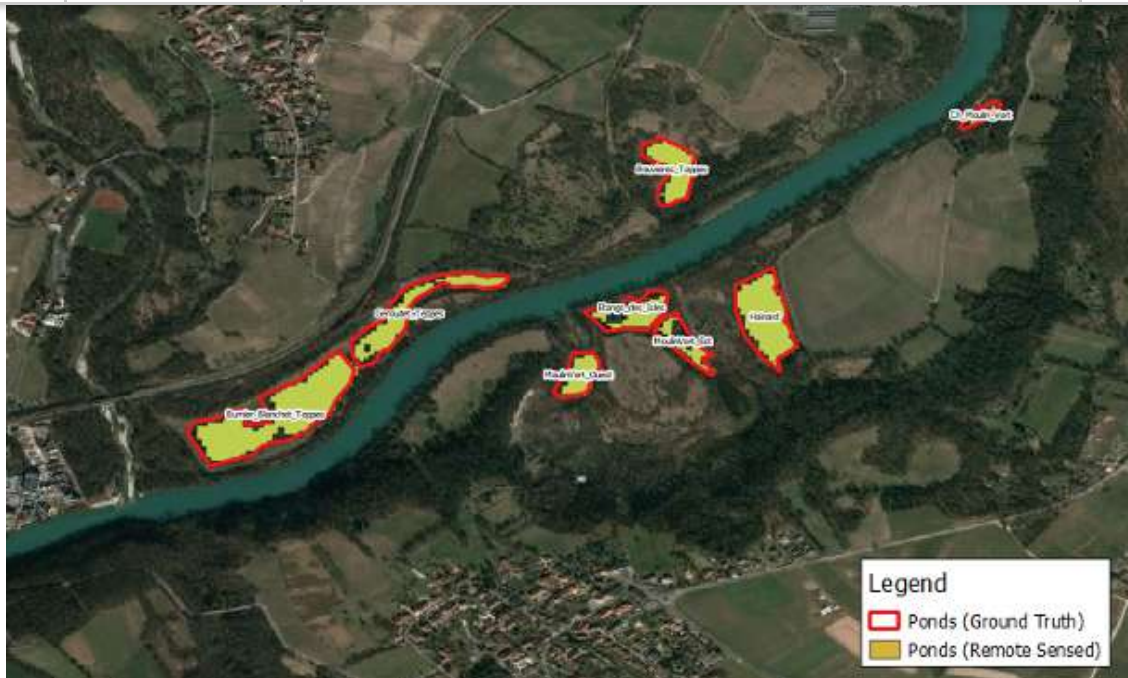
Malgorzata Blicharska

Work Package 2 - Effect of climate change on biodiversity, ecosystem functions and services and their interactions in ponds

PONDERFUL partners have selected ponds along gradients of land use intensity in 6 different pondscapes in their country. Research teams from different countries have been involved in intensive field campaigns to assess local environmental pond conditions, pond biodiversity, pond metabolism and greenhouse gas emissions by ponds following the PONDERFUL field protocol. The PONDERFUL team will start with the assessment of temporal dynamics in fish ponds in Belgium and France upcoming summer.

Pieter Lemmens

Work Package 3 - Scenarios and Modelling



The team at the Middle East Technical University, Turkey, is improving our ability to map ponds from space! Using long-term satellite imagery data, we have been developing an algorithm that allows us to identify and map ponds in Europe. The next step is to see whether this can be improved to also capture smaller-sized ponds.

The team at Bangor University, UK, have been preparing the first interaction with stakeholders to co-produce scenarios of future changes in the European ponds. We will explore different Nature-based Solutions (NbS) as a way to mitigate expected climate change impacts.

Finally, the team in Universidad De La República, Uruguay, has been investigating the role that disturbance intensity and species dispersal ability have in landscape recovery capacity. This is crucial work to understand how climate change may impact the metacommunity dynamics of ponds and pondscapes. For more details, see [here](#) the research paper published recently in *Ecography*.

Isabel Rosa

Work Package 4 - Development of 8 DEMO sites, in Europe, Turkey and Uruguay



The DEMO-sites are pondscapes where Nature-based Solutions NbS have been implemented at the local scale (pond) or regional scale (network of ponds).

Pondscapes were selected in seven European countries and in Uruguay, in close collaboration with the stakeholders.

What are pond or pondscape Nature-based Solutions?

There are broadly 4 types of pond/pondscape NbS: (i) pond creation, (ii) pond restoration, (iii) pond management actions, and (iv) pondscape-scale management actions .

Toward a databases on pond-pondscape Nature-based Solutions!

To support stakeholders in the implementation of pond/pondscapes Nature-based Solutions in Europe and CELAC, PONDERFUL is proposing to create a database of examples of pond NbS that have successfully provided mitigation and adaptation to climate change. To populate the database, we are currently developing an online survey about the role of ponds and pondscapes as NbS. The responses will provide the basis for the database, which is a key deliverable of WP4.

Beat Oertli , Pascale Nicolet

Demo sites

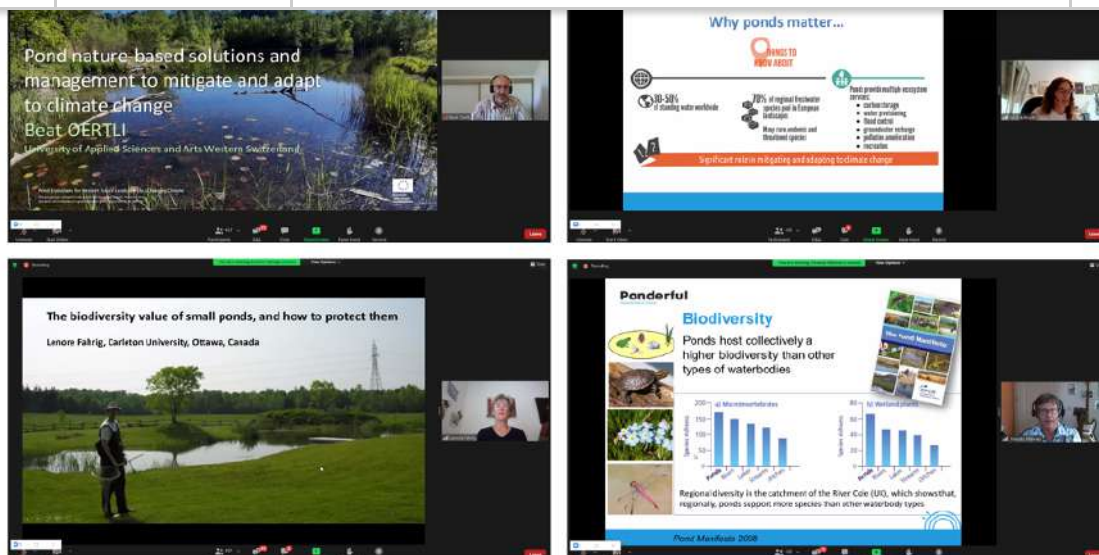


PONDERFUL will assess scenarios of pondscape management in eight countries where its ideas will be tested in a network of demonstration (DEMO) sites: **restoration and management for biodiversity** and **ecosystem services**, and **climate change adaptation and mitigation**.

[Know more about our DEMO sites >>](#)

News and Events

PONDERFUL Launch Event



Thursday 10th June saw the official launch of the PONDERFUL project. The online event was a great success and attracted an **audience of over 500 people** from around the world.

The afternoon kicked off with an introductory video from Dr Jeremy Biggs, CEO of the Freshwater Habitats Trust in the UK, followed by a welcome message from Tobias Salathe, Senior Advisor for Europe at the Ramsar Convention on Wetlands of International Importance. Members of the PONDERFUL project team, including Dr Thomas Mehner, Prof. Beat Oertli and Project Coordinator Prof. Sandra Brucet, then gave presentations introducing the work of the PONDERFUL project.

Headlining the launch event was our Special Guest Speaker, leading international landscape ecologist and conservation scientist, Prof. Lenore Fahrig from Carleton University, Canada. Her talk presented evidence that several small wetlands contribute more to biodiversity than a single large wetland and discussed why it is difficult to shift the perception that bigger is better.

If you missed the event, now you can watch the full recording of the PONDERFUL launch event on our YouTube channel:

[Watch the full Launch Event here](#)

Here we quickly review some papers and events of general interest for freshwater ecologists that caught our eye and are thought or action provoking.

- In the US, **Tim Swartz** and **James Miller** highlighted a whole new North American pond-rich region in the Eastern Great Plains described in their paper a new zone of mainly constructed ponds separate from better known systems. [Read the article here.](#)

- In Australia, **Martino Malerba**, **Nicholas Wrightband** and **Peter Macreadie** counted farm dams, reporting 1.77 million waterbodies with an average area of 1000 m², adding to knowledge of the distribution of small waters globally. [Read the article here.](#)

- In North America, **David Manning** and **Mažeika Sullivan** reported on the relationship between stream and lake pollution, impacts on aquatic invertebrates and food for birds provided by emergent insects, suggesting an important impact of water pollution on bird populations. [Read the article here.](#)

- A global analysis of the distribution patterns of drying of streams has recently been published by **Mathis Loïc Messenger** and **colleagues**. This shows that 51–60% of the world's streams do not flow for at least one day per year, and that 44–53% of global stream length is dry for at least one month each year. [Read the article here.](#)

- Studies of greenhouse gases and small waters have continued to provide information on emissions and the results of the paper by **Mike Peacock** and **colleagues** added further useful data. They note that ditch and man-made pond emissions were larger per unit area than equivalent natural streams and ponds. [Read the article here.](#)

- In 2019, a contrasting trend had been identified in the role of farm ponds as a sink for nitrous oxide, also a potent greenhouse gas, by **Jackie Webb** and **colleagues**. Their paper on farm ponds reported that 'Widespread nitrous oxide undersaturation in farm waterbodies creates an unexpected greenhouse gas sink'. [Read the article here.](#)

waters growing, with practical projects about to be launched with support from the EU-LIFE programme. The **Symposium for Freshwater Sciences**, organised this year, ran a special session on small waterbodies. Several members of the PONDERFUL team contributed to this session.

Away from small waters, three important reports caught the eye of the PONDERFUL team suggesting important innovations for the protection and management of freshwater biodiversity.

1) Published just before the official start of PONDERFUL, the study by **Cecília Leal** and **colleagues** emphasise the importance of considering how land managed to protect terrestrial nature should also consider freshwater too because the potential benefits of low intensity nature-led land for freshwater biodiversity are obvious and well-documented. Read the article [here](#) and comments [here](#).

2) This paper, by some of Europe's most experienced freshwater ecologists, is such an important part of the policy and practical context for the PONDERFUL's work, and the potential benefits for biodiversity of working with ponds, that we feel its message is worth repeating regularly. The opening lines deserves wide attention: "*Stream restoration efforts have increased, but the success rate is still rather low. The underlying reasons for these unsuccessful restoration efforts remain inconclusive and need urgent clarification.*" [Read the article here](#).

3) And finally, we turn to an important reminder of the pervasiveness of small stream pollution. **Matthias Liess** and **his colleagues** have produced another study emphasising the widespread impact of pesticide pollutants in small waters in Europe. They provide evidence of the chronic impacts of farm chemicals. Read the introduction on the [FreshwaterBlog website](#).

The PONDERFUL team in Freshwater Habitats Trust have a strong sense of *déjà vu* reading this paper, having worked with the Liess team nearly 20 years ago developing the [SPEAR assessment system](#). In the meantime nothing much really seems to have changed in the condition of the streams.

EPCN Conference



The long awaited **9th European Pond Conservation Network (EPCN) conference** took place virtually on 25th-26th May. The conference included a host of great pondy speakers and poster presentations as well as some fun in the evening with a Eurovision Pond Contest Quiz!

Following on from the conference the EPCN is running a series of monthly seminars on the first Wednesday of every month. These **monthly seminars will run until Christmas 2021** and aim to provide a space for sessions and speakers, who we could not fit into the May conference. The hope is that these sessions will bring the European pond community even closer together.

Become a member of the EPCN to make sure that you don't miss out on future conferences and seminars! It is free to join, just fill in the online form [here](#).

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Ponderful

PONDS FOR CLIMATE

PONDERFUL News and Freshwater Reports

Issue No. 2

WHAT IS PONDERFUL?

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Meet our team members

Maria Cuenca Cambroneró - postdoc at UVic



Hi! I am Maria, an aquatic ecologist specializing in zooplankton communities, eco-evolutionary dynamics, trophic interactions, and ecosystem functions. My research focuses on understanding the impact of human-driven global change on species and ecosystems, with particular attention on freshwater ecosystems. I completed my PhD at the University of Birmingham, under Dr. Luisa Orsini supervision, where I studied the evolutionary responses of the species *Daphnia magna* to environmental changes, including eutrophication and temperature increase, over the past 100 years. After my PhD, I moved to Switzerland as an EMBO postdoctoral fellow, with Dr. Blake Matthews' group at Eawag, where I studied the responses of zooplankton communities to fish pressures and changes in nutrient concentration by using artificial ponds and time series analysis.

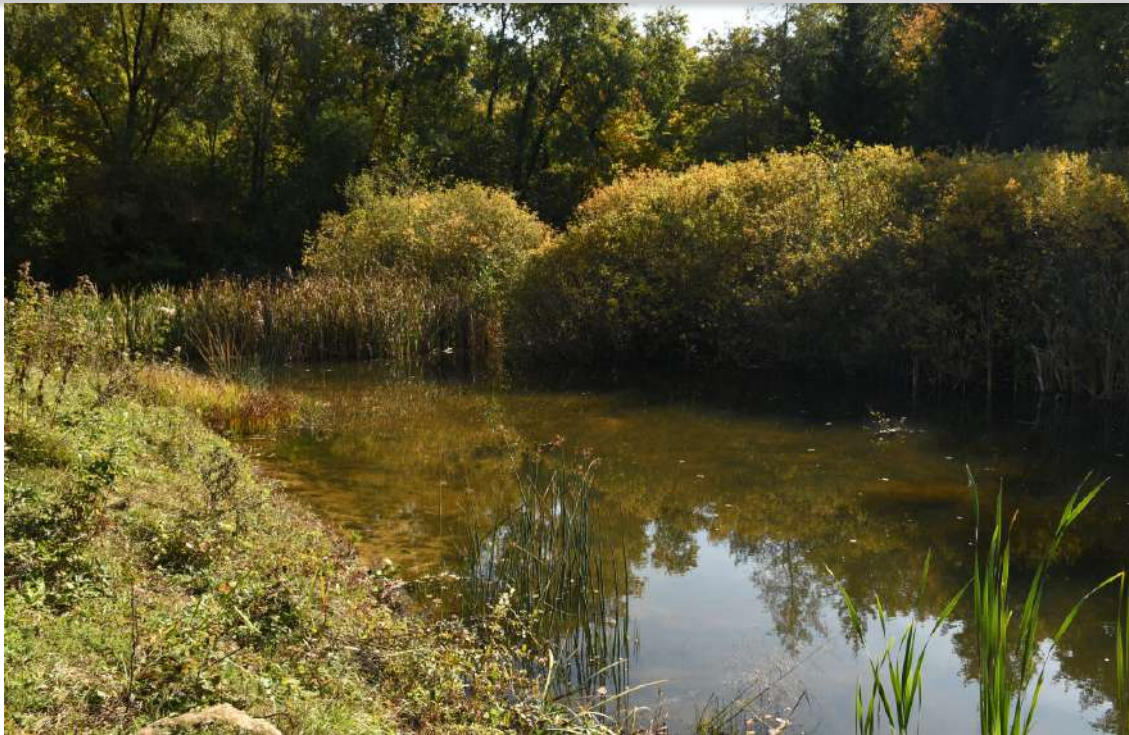


Currently, I am a postdoc at the University of Vic, Spain, in the Aquatic Ecology Group led by Prof. Sandra Brucet. I am part of the PONDERFUL project and involved in work package two. I lead the sampling campaign, data collection, the laboratory analysis and the statistical analysis carried out in Spain. I am also part of the integrative data analysis of the temporary ponds across Europe as part of the stratified data collection from the different groups of PONDERFUL. We investigate the effect of climate change and land use on ponds with different hydroperiods, and how the loss of biodiversity in those key environments could affect the ecosystems services they provide.

[Read more >>](#)

Updates on our work

Work Package 1 - Stakeholder Involvement



The focus of **Work Package 1** (WP1) is Stakeholder involvement, policy, society, and sustainable financing. The overarching aim is to develop a **framework that supports the implementation of pondscapes as nature-based solutions (NbS)** for climate change mitigation and adaptation, biodiversity conservation, and other ecosystem services. Part of the work of WP1 is guiding and supporting DEMO site leaders in stakeholder workshop organisation and data gathering.

[Read more >>](#)

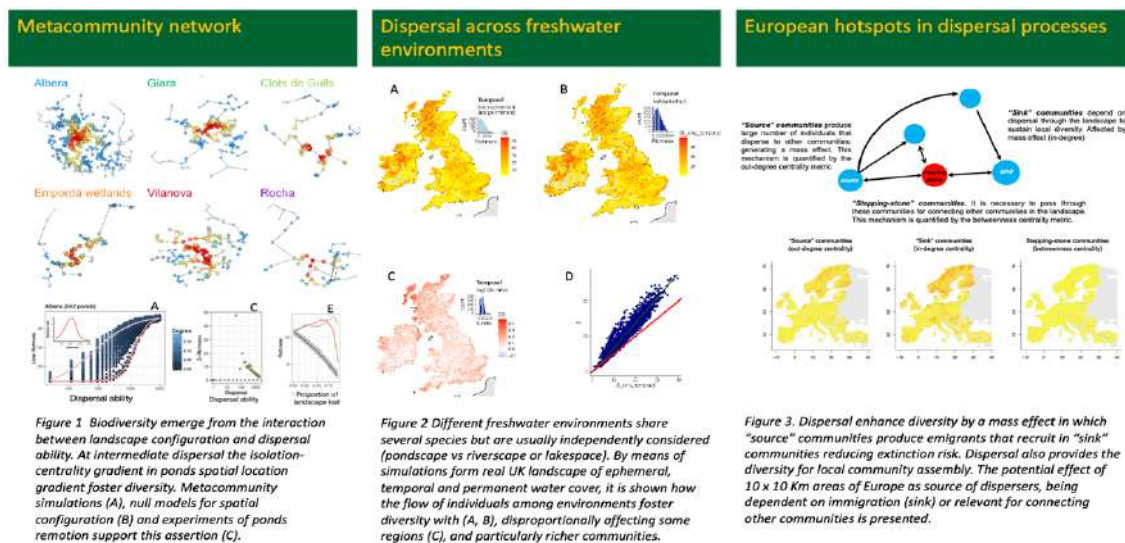
Work Package 2 - Effect of climate change on biodiversity, ecosystem functions and services and their interactions in ponds



The PONDERFUL field season 2021 has been extremely exciting and busy

pond conditions and collected samples for the assessment of pond biodiversity, carbon sequestration, greenhouse gas emissions and pond metabolism from ponds in 8 countries. While multiple teams finished their field season of 2021, the team of Uruguay just started their spring sampling campaign. The team in Turkey will soon start sampling as well. The PONDERFUL team will be very active in the lab the coming months to process the large number of field samples. The consortium recently had a virtual meeting to evaluate the PONDERFUL sampling protocol, to organise data management, and to discuss details on the sampling strategy next year. Several targeted discussions on specific topics related to WP2 will be organised the coming weeks.

Work Package 3 - Scenarios and Modelling



The team in METU (Turkey) has been mapping the spatial distribution of the ponds. Demo-site ponds and the ponds selected for stratified sampling within the PONDERFUL project have been integrated into a digital application where the hydro-periods of the ponds larger than 0.5 ha can be monitored from satellite images dynamically. The developed web application presents the **spatial distribution of the ponds and the global land use/cover information** from open-source databases. It allows users to **download ponds' available data and hydro period** information easily. The **challenge to capture smaller-sized ponds (< 0.5 ha) continues**.

[Read more >>](#)



During 2021, as part of WP4, a process to assess pondsapes was developed and this will continue in 2022. The question is whether pond Nature-based Solutions have an important role for climate adaptation and mitigation and so should be encouraged and more widely implemented. The assessment of each pondscape is based on three pillars: (i) biodiversity assessment, (ii) an assessment of the other Ecosystem Services/Nature's Contributions to People at the pondscape, and (iii) a cost-benefit analyses of pond NbS.

[Read more >>](#)

Have a look at what we are doing

FIRST PONDERFUL Workshop, Switzerland



The **first ever workshop of PONDERFUL** was organised by HEPIA-HES and was held in **Meinier, Switzerland** on **19th October 2021**. This workshop and the subsequent workshops in every DemoSite of PONDERFUL target stakeholders engaged in water management and biodiversity. The participants came from NGOs, public administration, consultancy and industry (hydroelectricity). The purpose of the workshop was to start a process of communication and trust building between them and the PONDERFUL team.

[Read more >>](#)

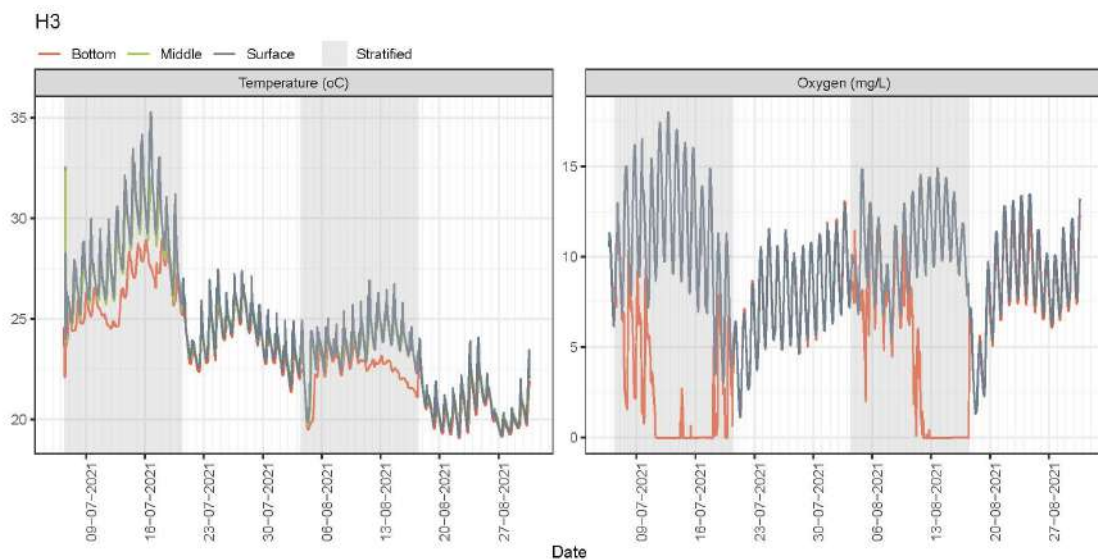
Sampling in Spanish ponds



frequency, the encounter is not very gentle and involves significant physical effort. However, I think that I am not wrong if we also consider this part of research as one of the most satisfying, at least, if you study nice environments such as ponds and their wonderful inhabitants. Many events can make the sampling day harder when they happen (e.g. someone falling into the pond; cows changing or even destroying our "attractive" equipment, etc.), but they are also amusing to remember some days later. And, of course, ponds dwellers make the field days more amazing. It is always fantastic to find creatures such as newts, water beetles and fairy shrimps – like an unexpected gift.

[Read more >>](#)

Warming Mesocosm Experiment



Please allow me to introduce the Lake **Warming Mesocosm Experiment (LWME)** which has been running at the department of Ecoscience at Aarhus University since late 2013. The experiment is part of the AQUACOSM plus network, but also contributes data to a number of other projects, not least PONDERFUL. The experiment consists of **24 land based mesocosms with six treatments** with two different nutrient levels crossed with three different temperatures. The project is designed to investigate how nutrient enrichment interacts with the warming associated with climate change and it has proved very valuable in this respect. However, climate change does not only change average temperatures but also

more temporary streambeds or shallow lakes and ponds – something that a few years ago was considered rare but may be more common than we think.

[Read more >>](#)

News and Events

UN Climate Change Conference of the Parties (COP26)



When somebody last checked in 2007, Scotland had 198 000 ponds. One of them is the tranquil Cyprus Duck Pond in Kelvingrove Park, just a short walk from the COP26 conference venue in Glasgow. **Inside the COP, nature-based solutions (NbS) were high up on the agenda,** heralded as one of the paths to prevent catastrophic global warming. NbS such as planting trees or rewetting peatlands offer significant potential for climate change mitigation.

[Read more >>](#)

PONDERFUL Launch Event

Last June the PONDERFUL project had its official launch with an **audience of over 500 people** from around the world.

If you missed the event, you can still watch the full recording on our YouTube channel and check the [FAQ_page](#) on our website for the answers to some of the questions that were asked during the event.

[Watch the full Launch Event here](#)

Upcoming Events

- 1st - 2nd December 2021

SEMIAQUATIC LIFE: Recreating habitat complexity for semi-aquatic fauna, Final seminar.

Talk: "The potential of ponds for climate adaptation – what we know (and don't know) about carbon sequestration and emissions" – Thomas Davidson, Aarhus University.

PONDERFUL colleague Thomas Davidson will present his talk during a final seminar of the SemiAquaticLife project. Click [here](#) to participate.

- 5th – 10th December 2021

VI Uruguayan Congress of Zoology & III International Meeting on Conservation Ecology

UdelaR will be presenting the PONDERFUL project.

- 26th June – 1st July 2022

Symposium in the World Biodiversity Forum in Davos: The importance of being small: biodiversity conservation in ponds and other small freshwater systems.

Convener: Maria Cuenca-Cambronero, University of Vic, Spain.
[maria.cuenca@uvic.cat]

Co-Conveners

Sandra, Brucet, University of Vic & ICREA, Spain

Luc De Meester, Leibniz Institute of Freshwater Ecology and Inland Fisheries (IGB), Germany

Details: Recent studies have highlighted the importance of small habitats for biodiversity conservation (Wintle et al. 2019), particularly in freshwater ecosystems (Biggs et al. 2017). However, small water bodies are often neglected in existing water-related policy frameworks. In this session we will hear from a variety of experts in freshwater ecosystems on why small sized freshwater habitats are crucial for biodiversity conservation and what are the main threats to their existence. The following presentation are proposed:

- Jon Chase (iDiv) – Germany, showing how biodiversity analyses using synthesized large datasets can provide important metacommunity insights at multiple spatial scales.

- Zsofia Horvath (Institute of Aquatic Ecology) – Hungary, will discuss existing threats to ponds, and the effect of the disappearance of ponds on biodiversity.
- Klement Tockner (ETH Zurich) – Switzerland, will show that these threats also impact flowing waters.
- Margaret Palmer (Uni Maryland) – UUEE, will then focus on the restoration of small freshwater systems, with a focus on rivers' restoration.
- Dr Jeremy Biggs / Dr Pascale Nicolet (FHT): will describe the implications for policy makers of growing recognition of the critical role of small waters, and the problems caused by their limited recognition in water and environment policy.
- Dr Tobias Salathé (Ramsar), will talk about the policy goals for the protection and management of small waters and wetlands: the RAMSAR international wetlands convention perspective.

- 28th August – 2nd September 2022

INTECOL 2022: Frontiers in Ecology: Science & Society

PONDERFUL will be represented at the INTECOL 2022 conference in Geneva. This is a hybrid event with participants joining in person and online [here](#).

Freshwater reports

Here we quickly review some papers and events of general interest for freshwater ecologists that caught our eye and are thought or action provoking.

- In the the Western Balkans, **Pešić et al.**, describe *the use of ponds and other small waters by large branchiopods, algae, amphibians and leeches* as well as dealing with specific protected ponds types including Mediterranean temporary ponds. [Read the article here](#).

- In France, **Frédéric Labat et al.**, provide new information on the aquatic plants in reference quality ponds. [Read the article here](#).

- Outside Europe, **Junyao Sun et al.**, found that *'ponds supported the highest species richness [of wetland plants], followed by lake, ditch, river*

- In another part of Asia, **Heather Moorhouse *et al.***, takes a novel approach to describing Tropical Asian mega-delta ponds. [Read the article here.](#)
- Elsewhere in Asia, **Sourav Das *et al.***, provides an ecosystem-services based analysis of this region which they say supports millions of ponds. [Read the article here.](#)
- In Finland, **Mikko Tolkkinen *et al.***, conclude that the positive effect of forested buffer zones on river ecological status is an important message to environmental managers and policy makers. [Read the article here.](#)
- In the Amazonian Brazil, **Renato Martins *et al.***, shows just how little forest cover needs to be removed to start damaging freshwater assemblages. [Read the article here.](#)
- Finally we turn to **John Downing *et al.***, who found that the global value of avoiding eutrophication exceeded local values of either beach use or sport fishing by 10-fold. [Read the article here.](#)
- Last, we return to an important reminder of the pervasiveness of small stream pollution. **Matthias Liess *et al.***, found out that pesticides are the dominant environmental stressor on sensitive invertebrates in small streams, with most agricultural streams having a reduced number of pesticide vulnerable species. [Read the article here.](#)

[Read our full review >>](#)

EPCN Seminars

European Pond Conservation Network (EPCN)

The objective of EPCN is to promote pond conservation and their biodiversity in a changing European landscape. EPCN proposes to:

- Develop exchanges of information between researchers and managers;
- Encourage the development of fundamental and applied research;

- Disseminate the importance and conservation of ponds in Europe;
- Promote the sharing of knowledge with a group of international institutions.



EPCN will be running a winter Seminar session on **Pond Landscapes and Genetics** on **Wednesday 1st December (3pm UK BST / 4pm CET)**. Below you can find details on the talks.

- **How freshwater bryozoans influence biodiversity and ecosystem function.** Keynote: Beth Okamura - Natural History Museum, United Kingdom

- **Global phylogeography of fairy shrimps reveal distinct evolutionary histories in the Palaearctic.** Dunja Lukic - Research Department for Limnology Mondsee, University of Innsbruck, Austria

- **Differential local genetic adaptation to pesticide use in organic and conventional agriculture.** Rafaela Almeida – KU Leuven, Belgium

In 2022 the seminar series will run on the following 1st Wednesdays of the month (4pm CET/3pm UK time)

- Spring: March 2nd 2022 (including EPCN President - Sandro Lanfranco & Natural England representative UK;)

- Winter: December 7th 2022

Become a member of the EPCN to join the Seminar and make sure that you don't miss out on future conferences and seminars! It is free to join, just fill in the online form [here](#).

**Stay tuned for more information on PONDERFUL Project
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Ponderful



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