

## 17<sup>th</sup> International Conference on Wetland Systems for Water Pollution Control



### Final Program

6 – 10 November 2022  
Lyon, France

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## Program Committee

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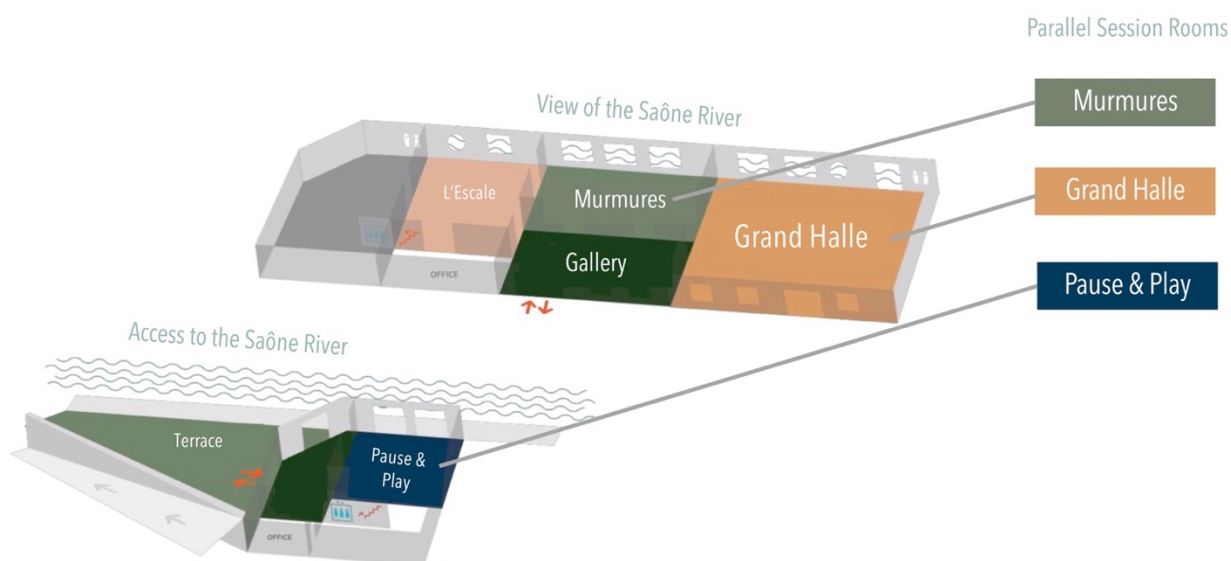
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Miguel Martin Monerris	Spain
Bernhard Pucher	Austria
Anacleto Rizzo	Italy
Alexandros Stefanakis	Greece
Otto Stein	USA
Jun Zhai	China

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## VENUE

The conference will be held at the [L'Embarcadère](#) in Lyon, France ([13 Bis Quai Rimbaud, 69002 Lyon](#)). Situated in the heart of Lyon, it is centrally located along the banks of the Saône river, with many hotels and restaurants within walking distance. Easy to access with public transport, the L'Embarcadère is an environmentally conscious venue that prioritizes local and sustainable event management and catering services tailored to recycle and reduce waste.



## CONFERENCE TOPICS

- Topic 1. **Wetlands for Water Pollution Control:** Wetlands treating agriculture runoff, sludge, industrial wastewater, stormwater, combined sewer overflow, domestic wastewater
- Topic 2. **Water Reuse and Resource Recovery:** Treatment wetlands and their roles in circular economy, treatment wetlands for water reuse, treatment wetlands for agronomic resource recovery, wetlands for biomass production, wetlands in the bioeconomy
- Topic 3. **Climate Change and Adaptation:** Design adaptations and implementation of treatment wetlands in tropical climates, arid climates, cold climates, developing countries and regions
- Topic 4. **Emerging Contaminants:** Removal of persistent and emerging organic compounds, microplastics, metals and metalloids compounds including effects on wetlands, biodiversity, and humans.
- Topic 5. **Co-benefits and Multifunctionality:** Treatment wetlands and ecosystem services (biodiversity, carbon capture and sequestration), treatment wetlands and social awareness (landscape issues, public participation, education, policy, and planning).
- Topic 6. **Process Understanding and Modelling:** New developments in wetland process understanding, microbiology, modelling, biogeochemistry of porous media, fluid flows, multi-phase interactions and reactions
- Topic 7. **Intensified Wetlands:** Aerated wetlands, hybrid wetlands, microbial fuel cell wetlands
- Topic 8. **Urban Wetlands:** Treatment wetlands and other nature-based solutions (green walls, green roofs, bioswales) for urban water management, circular cities

## PROGRAM AT A GLANCE

Sunday, 06/11/2022

17:00 – 20:00 Welcome Reception at L'Embarcadere

Monday, 07/11/2022

	Grand Halle	Murmures	Pause and Play
07:40 – 08:00	Registration and Poster Installation		
08:00 – 09:00	<b>Opening Ceremony</b>		
09:00 – 09:40	<b>Keynote:</b> Anacleto Rizzo		
09:40 – 10:20	Coffee Break + Poster Session		
10:20 – 12:00	<b>Wetlands for Water Pollution Control I</b> Chair: Bernhard Pucher	<b>Water Reuse and Resource Recovery I</b> Chair: Pascal Molle	<b>Climate Change and Adaptation</b> Chair: John Bavor
12:00 – 13:20	Lunch + Group Photo		
13:20 – 14:00	<b>Keynote:</b> Katharina Tondera		
14:00 – 15:20	<b>Water Projects Europe</b> Chair: Andrea Rubini	<b>Emerging Contaminants I</b> Chair: Kela Weber	<b>Co-benefits and Multifunctionality I</b> Chair: Magdalena Gajewska
15:20 – 16:00	Coffee Break + Poster Session		
16:00 – 17:20	<b>Water Projects Europe</b> Chair: Andrea Rubini	<b>Emerging Contaminants II</b> Chair: Zhongbing Chen	<b>Co-benefits and Multifunctionality II</b> Chair: Otto Stein
17:20 – 18:20	<b>IWA Specialist Group Meeting</b> Everyone is welcome!		

## Tuesday, 08/11/2022

08:00 – 17:00

Technical Tours (off site)

## Wednesday, 09/11/2022

	Grand Halle	Murmures	Pause and Play
07:40 – 08:00	Registration and Poster Installation		
08:00 – 08:40	<b>Keynote:</b> Katharine Cross		
08:40 – 10:00	<b>Wetlands for Water Pollution Control II</b> Chair: Maria Alejandra Maine	<b>Water Reuse and Resource Recovery II</b> Chair: Ana Galvão	<b>Process Understanding and Modeling I</b> Chair: Miguel Martin Monerris
10:00 – 10:40	Coffee Break + Poster Session		
10:40 – 12:00	<b>Wetlands for Water Pollution Control III</b> Chair: Carlos Arias	<b>Water Reuse and Resource Recovery III</b> Chair: Fabio Masi	<b>Process Understanding and Modeling II</b> Chair: Günter Langergraber
12:00 – 13:20	Lunch		
13:20 – 14:00	<b>Keynote:</b> John Bavor		
14:00 – 15:20	<b>Wetlands for Water Pollution Control IV</b> Chair: Jan Vymazal	<b>Water Reuse and Resource Recovery IV</b> Chair: Alexandros Stefanakis	<b>Process Understanding and Modeling III</b> Chair: Scott Wallace
15:20 – 16:00	Coffee Break + Poster Session		
16:00 – 17:20	<b>Wetlands for Water Pollution Control V</b> Chair: Marco Hartl	<b>Water Reuse and Resource Recovery V</b> Chair: Anacleto Rizzo	<b>Process Understanding and Modeling IV</b> Chair: Nicolas Forquet
17:20 – 19:00	<b>Young Water Professional Event</b>		

## Thursday, 10/11/2022

	Grand Halle	Murmures	Pause and Play
07:40 – 08:00	Registration and Poster Installation		
08:00 – 08:40	<b>Keynote:</b> Srikanth Mutnuri		
08:40 – 10:00	<b>Process Understanding and Modeling V</b> Chair: Stevo Lavrić	<b>Intensified Wetlands I</b> Chair: Yaqian Zhao	<b>Urban Wetlands I</b> Chair: Jacques Brisson
10:00 – 10:40	Coffee Break + Poster Session		
10:40 – 12:00	<b>Emerging Contaminants III</b> Chair: Darja Istenič	<b>Intensified Wetlands II</b> Chair: Srikanth Mutnuri	<b>Urban Wetlands II</b> Chair: Katharine Cross
12:00 – 13:20	Lunch + Group Photo		
13:20 – 14:00	<b>Keynote:</b> Yaqian Zhao		
14:00 – 15:20	<b>Emerging Contaminants IV</b> Chair: Mathieu Gautier	<b>Intensified Wetlands III</b> Chair: Margit Kõiv-Vainik	<b>Urban Wetlands III</b> Chair: Diederik Rousseau
15:20 – 16:00	Coffee Break + Poster Session		
16:00 – 17:20	<b>Emerging Contaminants V</b> Chair: Tao Lyu	<b>Intensified Wetlands IV</b> Chair: Boram Kim	<b>Urban Wetlands IV</b> Chair: Katharina Tondera
17:20 – 18:20	<b>Closing Ceremony</b>		

## Oral Presentation Instructions

Each time slot is 20 minutes: 15 minutes for the presentation + 5 minutes for questions. Please respect the timing and leave time for questions from the audience.

The presenters must prepare their presentation in advance and either send it to the conference email address by 03/11/2022 16h (GMT+1) to [ICWS2022@insight-outside.fr](mailto:ICWS2022@insight-outside.fr) or provide it with your own USB stick at least 40 minutes in advance of your session. USB sticks will **not** be provided at the conference.

Oral presentations by participants online are asked to also send a pre-recorded video of their presentation in case there are technical difficulties or if your presentation time slot is not convenient for you to give your presentation live via zoom. Video recordings should be sent to [ICWS2022@insight-outside.fr](mailto:ICWS2022@insight-outside.fr) by 03/11/2022 16h (GMT+1).

## Poster Presentation Instructions

Posters will be presented on a rotating basis – each poster will be displayed for one day only. Please look to the detailed schedule to know which day your poster will be presented. Please arrive in advance on the day of your poster presentation (7:40 – 8:00 am) to place your poster.

All posters (in-person and online) must be sent to conference email address by 03/11/2022 16h (GMT+1) to [ICWS2022@insight-outside.fr](mailto:ICWS2022@insight-outside.fr). Your poster will be displayed in a slow rotation on the large screen in the main conference room during all breaks and lunches.

## Templates

Templates for oral presentations and poster presentations can be found on the conference website: [www.icws2022@insight-outside.fr](http://www.icws2022@insight-outside.fr).

# DETAILED SCHEDULE: ORAL PRESENTATIONS

Monday morning, 07/11/2022

	Grand Halle	Murmures	Pause and Play
07:40 – 08:00	Registration and Poster Installation		
08:00 – 09:00	Opening Ceremony		
09:00 – 09:40	Wetland community expertise in the new Nature-Based Solution and Circular Economy vision: links and new research and design trends Keynote: Anacleto Rizzo		
09:40 – 10:20	Coffee Break + Poster Session		
	Wetlands for Water Pollution Control I Chair: Bernhard Pucher	Water Reuse and Resource Recovery I Chair: Pascal Molle	Climate Change and Adaptation Chair: John Bavor
10:20 – 10:40	Removal of nitrogen from tile drainage in constructed wetlands with horizontal subsurface flow Jan Vymazal	Use of Constructed Wetlands for Sustainable Irrigational Wastewater Reuse in the Mediterranean Stevo Lavrić	Drainage and Drought Initiate Greenhouse Gas Emissions in the World's Peatlands Ülo Mander
10:40 – 11:00	High greenhouse gas emissions as trade-off for water treatment in constructed wetlands reducing diffuse agricultural pollution Kuno Kasak	MULTISOURCE: Aerated wetland treating black and grey water for reuse at campsite Belgium Dion van Oirschot	Greenhouse Gas Production from Treatment Wetlands in Winter Otto Stein
11:00 – 11:20	Effect of hydraulic loading rate, filter media, and type of wastewater on the purification performance of multistage wetland systems for agricultural wastewater treatment with special attention to oxygen transfer rate Kunihiko Kato	Demonstration of an indoor vertical green wall system for water purification and reuse of household wastewater in an eco-village in south-eastern Austria Marco Hartl	Life cycle assessment and life cycle costing of constructed wetlands for greywater recycling in Brazil and Germany Hugo Henrique de Simone Souza
11:20 – 11:40	Effect of Floating Treatment Wetland (FTW) Coverage Ratio on Nitrogen (N) Removal from Agri-Food Tertiary Effluent Rita Abi Hanna	Development of a Constructed Wetland for Greywater Treatment for Reuse in Arid Regions: Case Study in Rural Burkina Faso Ynoussa Maiga	Possible challenges for rain gardens as a component of green infrastructure in urban areas Magda Kasprzyk
11:40 – 12:00	Free-water surface wetland filters hypereutrophic lake water Ryan Pierce	The potential of the French Wetland System for reuse - Results of a long-term project in the Peruvian arid coast area Rosa Maria Miglio	Wetland rehabilitation by using industrial treated effluents to protect biodiversity Marie-Christine Huau
12:00 – 13:20	Lunch + Group Photo		



Monday afternoon, 07/11/2022			
	Grand Halle	Murmures	Pause and Play
13:20 – 14:00	Treatment wetlands for management of stormwater and combined sewer overflows in an urban context Keynote: Katharina Tondera		
	Water Projects Europe Chair: Andrea Rubini	Emerging Contaminants I Chair: Kela Weber	Co-benefits and Multifunctionality I Chair: Magdalena Gajewska
14:00 – 14:20	Water Projects Europe	<b>Constructed Wetlands, micropollutants and climate change</b> Tao Lyu	<b>Modular-constructed wetland treating greywater for urban water reuse and landscaping</b> Paula Paulo
14:20 – 14:40		<b>Enhanced constructed wetlands for the treatment of agricultural wastewaters: a focus on pesticide degradates, plant safeners and adjuvants</b> Adam Sochacki	<b>Baseline survey on socio-economic impact for Wetland+®</b> Pavla Svermova
14:40 – 15:00		<b>Accumulation of organic and inorganic micropollutants over time and space in a CW for urban runoff</b> Julia Roux	<b>Life cycle analysis of resource recovery from wastewater: who bears the environmental burden and who can claim the environmental benefits?</b> Alban Echchelh
15:00 – 15:20		<b>Removal of Emerging Pollutants from Industrial Wastewater Using Nature-Based Solution</b> Othman Almashaqbeh	<b>Influence of Woody Constructed Wetlands on Global Warming</b> Bruno Boaretto Santos
15:20 – 16:00		Coffee Break + Poster Session	
	Water Projects Europe Chair: Andrea Rubini	Emerging Contaminants II Chair: Zhongbing Chen	Co-benefits and Multifunctionality II Chair: Otto Stein
16:00 – 16:20	Water Projects Europe	<b>Fate and effect of per- and polyfluoroalkyl substances in treatment wetland mesocosms</b> Arman Poonja	<b>Operational experiences with a sludge treatment wetland as part of a municipal WWTP in Brazil</b> Heike Hoffman
16:20 – 16:40		<b>Wetland+ technology: A passive solution for HCH dump effluents</b> Aday Amirbekov	<b>Could STRB be applied for beach wrack?</b> Magdalena Gajewska
16:40 – 17:00		<b>Upgrading of CW with upstream (advanced) oxidation technology to improve micropollutants removal from municipal wastewater</b> Silvia Venditti	<b>Treating greywater with green walls: the effect of recirculation with recycled materials as filling media</b> Ana Galvão
17:00 – 17:20		<b>Quantification of micropollutants at the outlet of a constructed wetland and implementation of a full-scale UVC/H<sub>2</sub>O<sub>2</sub> advanced oxidation process</b> Anaëlle Gabet	<b>Repurposing Infrastructure for Engineered Natural Treatment of Contaminated Groundwater</b> David Thomas
17:20 – 18:20	IWA Specialist Group Meeting		
Tuesday all day, 08/11/2022: Technical Tours (off site)			

# Wednesday morning, 09/11/2022

	Grand Halle	Murmures	Pause and Play
07:40 – 08:00	Registration and Poster Installation		
08:00 – 08:40	<b>Nature-based solutions for climate resilient water and sanitation services</b> Keynote: Katharine Cross		
	Wetlands for Water Pollution Control II Chair: Maria Alejandra Maine	Water Reuse and Resource Recovery II Chair: Ana Galvão	Process Understanding and Modeling I Chair: Miguel Martin Moneris
08:40 – 09:00	<b>Microplastic abundance, characteristics and removal in large-scale multi-stage constructed wetlands for effluent polishing in northern China</b> Xu Zhou	<b>Optimization of a full-scale experimental vertical flow constructed wetland towards effluent irrigation standards</b> Alexandros Stefanakis	<b>Structural and functional spatial dynamics of microbial communities in aerated and non-aerated horizontal flow treatment wetlands</b> Daniele Silveira Damasceno
09:00 – 09:20	<b>Innovative hybrid INTensive - EXTensive resource recovery from wastewater in small communities</b> Carlos Arias	<b>Nutrients recovery and pathogen removal for wastewater reuse combining microalgae and wetland systems</b> David Marín de Jesus	<b>Peaks, Valleys, and Dragon Eggs - Uncovering the Heterogeneous Nature of Biofilm Architecture</b> Anbareen Farooq
09:20 – 09:40	<b>Two-step hybrid wetlands as the low-maintenance solution for communities in cold climates - approvals and implementation</b> Anton Skorobogatov	<b>Norovirus, Hepatitis A, and SARS-CoV-2 surveillance within CW horizontal sub-surface flow for domestic wastewater recycling</b> Cristina Alejandra Villamar Ayala	<b>The adaptation of push-pull tests for the in-situ determination of oxygen consumption in horizontal subsurface CWs</b> Flor Louage
09:40 – 10:00	<b>Variation of the feeding/resting period and footprint in modified vertical TWs to be proposed for treating rural domestic wastewater in tourist areas</b> Ismael L. Vera-Puerto	<b>Steps towards circularity in touristic accommodations: greywater treatment and edible cultivation in hydroponic systems</b> Esther Mendoza	<b><sup>14</sup>N/<sup>15</sup>N isotopic distribution and nitrification / denitrification microbial potential to investigate nitrogen dynamics in filter media of VF treatment wetland</b> Kevin Maciejewski
10:00 – 10:40	Coffee Break + Poster Session		
	Wetlands for Water Pollution Control III Chair: Carlos Arias	Water Reuse and Resource Recovery III Chair: Fabio Masi	Process Understanding and Modeling II Chair: Günter Langergraber
10:40 – 11:00	<b>The use of constructed wetlands for individual sanitation: 15 years of feedback</b> Martin Werckmann	<b>Vertical Flow Treatment Wetland for Greywater in Central Chile: An Alternative to Mitigate Drought in Rural Areas</b> Ignacio Rodriguez-Jorquera	<b>Ontology: a tool to ease communication and reveal hidden knowledge</b> Sophie Guillaume
11:00 – 11:20	<b>Organic Content Removal from Domestic Wastewater of Sri Lankan Households Using Selected Macrophytes</b> Saumya Amarakoon Mudiyansele	<b>Greywater VFCW for phosphorus and micropollutant elimination, extensive nitrification, partial disinfection, and provision of evaporative cooling</b> Carlo Morandi	<b>The biomantle: A key component of French Vertical Flow treatment wetlands</b> Nicolas Forquet
11:20 – 11:40	<b>Simulating removal of Cs from emergency outflow of NPP by constructed wetlands modified by filter additives</b> Dana Komínková	<b>Efficiency and performance of biofilters treating greywater - long-term experimental results</b> Jaroslav Vacula	<b>Influence of the nature of plants on drainage, purification performance and biosolids quality on planted drying beds treating faecal sludge in Senegal</b> El Hadji Mamadou Sonko
11:40 – 12:00	<b>Constructed wetlands for the remediation of cyanotoxins: microbes, transformation products and operational design</b> Alba Martinez I Quer	<b>Comparison of Free Water Surface Constructed Wetlands and Vertical Flow Wetlands for Greywater Treatment</b> Mahmut Ekrem Karpuzcu	<b>Influence of the drainage network on flow patterns within a treatment wetland: the case study of the Life ADSORB project</b> Ania Morvannou

## Wednesday afternoon, 09/11/2022

	Grand Halle	Murmures	Pause and Play
12:00 – 13:20	Lunch		
13:20 – 14:00	Where have we been and where are we going – a retrospect on wetland systems for water pollution control Keynote: John Bavor		
	Wetlands for Water Pollution Control IV Chair: Jan Vymazal	Water Reuse and Resource Recovery IV Chair: Alexandros Stefanakis	Process Understanding and Modeling III Chair: Scott Wallace
14:00 – 14:20	<b>Treatment of industrial sludge in a pilot Sludge Treatment Wetland planted with <i>Phragmites australis</i> and <i>Schenoplectus californicus</i></b> Steen Nielsen	<b>Dewatering performance in Earthworm enhanced Sludge Treatment Reed Bed (E-STRB) in the Mediterranean region</b> Amir Gholipour	<b>Development of data driven models for predicting the removal efficiency of emerging organic contaminants in constructed wetlands based on their physicochemical properties</b> Huma Ilyas
14:20 – 14:40	<b>Treatment of Diluted Tequila Vinasse in Two Types of Constructed Wetlands</b> Florentina Zurita	<b>Reed beds for drying sludge from a winery wastewater treatment plant in Spain: the WETWINE project</b> Riccardo Bresciani	<b>A mechanistic model for phosphorus retention in apatite filters</b> Laura Delgado-Gonzalez
14:40 – 15:00	<b>Vertical flow wetlands as a core for the sustainable treatment of coffee wastewater in small communities in Colombia</b> Tatiana Chaparro	<b>Hydrothermal Carbonisation &amp; Wetland Engineered Treatment Systems for Nutrient Recovery and its Biomass Conversion into High-value Products [Willow-<i>Salix Viminalis</i>].</b> Andres Acosta	<b>Water Flow and Reactive Transport simulations by HYDRUS - CWM1 biokinetic model in a Horizontal Flow Wetland in Sicily</b> Feliciana Licciardello
15:00 – 15:20	<b>Removal and Retention of Copper and other Metals in a Constructed Wetland over 20 Years</b> Anna Knox	<b>Municipal wastewater treatment and biomass production through a short rotation coppice system in India using willows, poplars and bamboo</b> Mirko Hänel	<b>Advances in Computational Fluid Dynamics models for Horizontal Surface Flow Wetlands: porous media vs plant direct representation</b> Lineker Max Goulart Coelho
15:20 – 16:00	Coffee Break + Poster Session		

## Wednesday afternoon, 09/11/2022

	Grand Halle	Murmures	Pause and Play
	Wetlands for Water Pollution Control V Chair: Marco Hartl	Water Reuse and Resource Recovery V Chair: Anacleto Rizzo	Process Understanding and Modeling IV Chair: Nicolas Forquet
16:00 – 16:20	<b>Modified First Stage of French Vertical Flow Constructed Wetlands performance during extreme operation conditions</b> Maria Belen Arevalo	<b>Optimization of hybrid and aerated constructed wetlands for domestic wastewater treatment and agricultural reuse</b> Guiseppa Mancuso	<b>Predicting vertical flow wetlands performance for domestic wastewater treatment from design parameters</b> Alba Canet-Martí
16:20 – 16:40	<b>Unclogging of Horizontal Subsurface Flow Constructed Wetlands Using Hydrogen Peroxide</b> Gabriel Vasconcellos	<b>Constructed Wetlands and Water Reuse in Texas Provides Water Supply plus Opportunities &amp; Benefits</b> Loretta Mokry	<b>Modelling treatment wetlands for domestic wastewater treatment using operational and design parameters</b> Mario Salinas Toledano
16:40 – 17:00	<b>Saturated constructed wetland-Microbial fuel cell system effect on ammonium removal and electricity generation</b> Thais Gonzalez	<b>Application of a full-scale UASB and two-stage constructed wetland system for water reclamation and nutrient recycling of domestic wastewater in arid areas</b> Taxiarchis Seintos	<b>Horizontal flow wetland design: moving from the P-k-C* approach to the TIS model based on a practical estimation of the apparent number of tanks in series and an adaptation of removal rate coefficients</b> Marcos von Sperling
17:00 – 17:20	<i>Preparation for YWP Event</i>	<b>Investigation of the use of different filling materials in unsaturated vertical flow constructed wetlands for the treatment of UASB effluent from domestic wastewater</b> Taxiarchis Seintos	<b>Practical aspects in the determination of first-order removal rate coefficients (k) for horizontal flow treatment wetlands</b> Scott Wallace
17:20 – 19:00	Young Water Professionals Event + “Taste of Lyon”		
19:30 – 23:30	Gala Dinner at Musée des Confluences (86 Quai Perrache, 69002 Lyon)		



# Thursday morning, 10/11/2022

	Grand Halle	Murmures	Pause and Play
07:40 – 08:00	Registration and Poster Installation		
08:00 – 08:40	<b>Vertical Flow Constructed Wetlands as Decentralized wastewater treatment systems in India</b> Keynote: Srikanth Mutnuri		
	Process Understanding and Modeling V Chair: Stevo Lavrić	Intensified Wetlands I Chair: Yaqian Zhao	Urban Wetlands I Chair: Jacques Brisson
08:40 – 09:00	<b>Effective removal of nutrients, metals, and pathogens in CWs cotreating mine water and sewage treatment plant effluent</b> Jidapa Plaimart	<b>Preliminary assessment of hybrid vertical flow-free water surface CW electrically networked as CW-MFC</b> Supriya Gupta	<b>Influence of flow regime and feeding interval on the treatment performance of pot based green walls</b> Bernhard Pucher
09:00 – 09:20	<b>Three years of monitoring evolution of secondary treated effluent infiltration pattern in a soil-based constructed wetland</b> Nicolas Forquet	<b>Assessing the treatment performance of crude sewage by Microbial Electrochemical Technology intensified Treatment Wetlands (METland)</b> Amala Chimamaka	<b>Urban horticulture effluent treatment on a green wall: Progression towards city resilience via food production coupled with water recovery</b> Ewa Wojciechowska
09:20 – 09:40	<b>New biosensor for continuous internal diagnosis of the proper functioning of vertical flow treatment wetlands</b> Boram Kim	<b>Treatment Performance Intensification in Constructed Wetlands using Electroactive Beds</b> Asheesh Yadav	<b>Design of a sand gravel filter for urban stormwater runoff treatment in the recreational park Wolvenberg</b> Birgit de Bock
09:40 – 10:00	<b>Global vegetation monitoring in a large-scale surface flow constructed wetland</b> Marie-Noelle Pons	<b>Geochemical Augmentation with Alumina for Phosphorus Removal in Treatment Marshes</b> Rafael Vazquez-Burney	<b>Response of vegetated pots to aggressive cleaning products in greywater in a green wall for water treatment purposes</b> Elisa Costamagna
10:00 – 10:40	Coffee Break + Poster Session		
	Emerging Contaminants III Chair: Darja Istenič	Intensified Wetlands II Chair: Srikanth Mutnuri	Urban Wetlands II Chair: Katharine Cross
10:40 – 11:00	<b>Enhanced removal of priority micropollutants from treated effluent by VF constructed wetlands with novel non-fossil adsorption substrate materials</b> Thomas Wagner	<b>Comparative Study of Nitrobenzene Degradation in Constructed Wetland microcosm and CW integrated Microbial Fuel Cell microcosm</b> Ashmita Patro	<b>Constructed wetlands for Wastewater Treatment Plants: feedback and best practices</b> Christelle Pagotto
11:00 – 11:20	<b>Performance of Different Biofilter Media Additives on the Removal of Selected Micropollutants from Greywater</b> Öykü Çomez	<b>Polishing Treatment of Palm Oil Mill Effluent (POME) using Constructed Wetland-Microbial Fuel Cell (CW-MFC) with Tidal Flow and Effluent Recirculation</b> Mohamed Fairus Rabuni	<b>A viable household-scale prototype based on treatment wetlands for on-site wastewater treatment and reuse in Mexico City</b> Flor Yunuen Garcia-Becerra
11:20 – 11:40	<b>Phytoremediation and bioaugmentation processes for the removal of halogenated pharmaceuticals</b> Joana Fernandes	<b>Electroactive and intensified pilot-scale constructed wetlands for the treatment of high loads of septic tank effluent</b> Fabio Masi	<b>Flow-Through Column Experiment for Tunnel Wash Water Treatment</b> Hanne Vistnes
11:40 – 12:00	<b>Effect of arbuscular mycorrhizal fungi on pharmaceuticals removal in constructed wetland</b> Zhongbing Chen	<b>Effect of macrophyte species and biochar on the performance of subsurface flow treatment wetland mesocosms in removal of the pesticides chlorantraniliprole, atrazine and glyphosate</b> Margit Kõiv-Vainik	<b>The Role of Wetlands and Nature-based Solutions in Circular Cities</b> Günter Langergraber

Thursday afternoon, 10/11/2022			
12:00 – 13:20	Lunch		
	<b>Grand Halle</b>	<b>Murmures</b>	<b>Pause and Play</b>
13:20 – 14:00	<b>Where Do We Stand to Oversee Constructed Treatment Wetland?</b> Keynote: Yaqian Zhao		
	Emerging Contaminants IV Chair: Mathieu Gautier	Intensified Wetlands III Chair: Margit Kõiv-Vainik	Urban Wetlands III Chair: Diederik Rousseau
14:00 – 14:20	<b>Organic micropollutant removal from urban waters by nature-based solutions: introduction to MULTISOURCE project</b> Vaidotas Kisieličius	<b>Intensifying constructed wetland performance via artificial aeration</b> Arvinda Kumar Ragen	<b>Application of constructed wetlands for domestic wastewater treatment in Latin America and the Caribbean - a systematic review</b> Florela Salazar
14:20 – 14:40	<b>Constructed wetlands for safeguarding wastewater-born antibiotic emissions into aquatic systems</b> Pedro Carvalho	<b>Intensified French Treatment Wetlands - Influence of operating parameters on nitrogen removal</b> Alain Petitjean	<b>Life of a 10-year-old urban stormwater constructed wetland: water budget, physico-chemistry and micropollutants storage</b> Eloïse Lenormand
14:40 – 15:00	<b>Nature-Based Solution (NBS) as a tertiary wastewater treatment to reduce the discharge of antibiotics into the aquatic ecosystems. Preliminary results</b> Edward Jair Pastor López	<b>Mine Water Treatment Wetland with Active Aeration</b> Vit Rous	<b>WATERUN project overview on green infrastructures to mitigate diffuse water pollution in urban areas</b> Luz Herrero Castilla
15:00 – 15:20	<b>Surface flow constructed wetland neutralize AMR pollution distributed by microplastics</b> Franciszek Bydalek	<b>Infiltration Marshes for Passively Intensified Denitrification</b> Rafael Vazquez-Burney	<b>Nature-based solution pilots for sustainable urban water cycle in Spain</b> Ivan Blanco
15:20 – 16:00	Coffee Break + Poster Session		
	Emerging Contaminants V Chair: Tao Lyu	Intensified Wetlands IV Chair: Boram Kim	Urban Wetlands IV Chair: Katharina Tondera
16:00 – 16:20	<b>Removal of Microplastics from Greywater Using a Green Wall Treatment System</b> Sami Mashreki	<b>Treatment of de-icer contaminated runoff at a UK airport using intensified Nature Based Solutions - A 10-year operational performance review</b> Andy Freeman	<b>Hybrid pilot structure treating metal contaminated water in Nordic climate conditions</b> Heini Postila
16:20 – 16:40	<b>Polystyrene microplastics accumulation in vertical flow constructed wetlands: impacts and fate</b> Zhenchen Li	<b>Kinetic of COD removal in an intensified constructed wetland under tropical climate of Mauritius</b> Nazeemah Nurmahomed	<b>Insights into the organic matter of stormwater sediments from retention and infiltration basins</b> Vincent Chatain
16:40 - 17:00	<b>The role of estuarine wetlands (saltmarshes) in sediment microplastics retention</b> Marisa Almeida	<b>TAYA - a novel approach to reciprocal wetlands</b> Keren Aizenberg	<b>French Constructed Wetlands for Municipal Wastewater Treatment in a Sub-Tropical Climatic Region: Results from the SWINGS Prototype in India</b> Nadeem Khalil
17:00 – 17:20	<b>Less tackled contaminants in nature-based treatment plants: microplastics and plant viruses in willow systems and treatment wetlands</b> Darja Istenič	<b>Hybrid constructed wetlands with temperature-controlled carbon dosing for the treatment of floriculture drainage water</b> Diederik Rousseau	<b>Constructed WetRoof (CWR) Technology as a new approach to supply and enhance the cooling effect of PV Systems on Green Roofs</b> Frank van Dien
17:20 – 18:20	Closing Ceremony		

# DETAILED SCHEDULE: POSTER PRESENTATIONS

Monday 07/11/2022

## Process Understanding and Modeling

**P1: Proposal of a framework to perform advanced flow modeling for Subsurface Flow Wetlands**

Lineker Goulart Coelho

**P2: Modelling of a pilot-scale VF wetland for dairy wastewater treatment**

Maria Alejandra Maine

## Water Reuse and Resource Recovery

**P3: Hybrid Subsurface saturated and partially saturated wetlands for the purification of wastewater from rural areas**

Daniela López

**P4: Coupling French Reed Bed and Short Rotation Plantation for developing circular economy of wastewater in India: A case of PAVITR prototype**

Anacleto Rizzo

**P5: Treatment wetlands used in a factory of recycled paper products**

Maria Alejandra Maine

## Wetlands for Water Pollution Control

**P6: Redesign of willow evapotranspiration systems in Ireland treatment to mitigate surface water pollution from domestic wastewater in areas with low permeability soils**

Laurence Gill

**P7: Vertical Constructed Wetlands Applied as Decentralized Wastewater Treatment in Southern Brazil**

Pablo Sezerino

**P8: Treatment of textile industry wastewater using Phragmites karka and Vetiveria zizanioides in sequential subsurface wetland system**

Murugesan Devasena

**P9: Treatment wetlands as a tool to improve riverine water quality and to protect and enhance biodiversity**

Carlos Arias

**P10: The French two-stage vertical flow constructed wetland in subarctic climate**

Rasmus Klapp

**P11: Multistage Constructed Wetland for Dairy Farm Wastewater Treatment: Performance and Hydraulic Behavior**

Giuseppe Cirelli

**PE1. ReMe-diation – a closed loop of olive mill and cork processing waste valorisation towards sustainable agriculture in the Mediterranean**

Alexandros Stefanakis

**PE2. Constructed wetlands for the removal of trace elements of Mine Tailings in the Peruvian highlands**

Rosario Pastor

# DETAILED SCHEDULE: POSTER PRESENTATIONS

Wednesday 09/11/2022

## Wetlands for Water Pollution Control

**P12: A review of advances in the use of constructed wetlands for the restoration of aquatic ecosystems**

Daniela López

**P13: Treatment wetlands for wastewater depuration and reuse in Chile: a project to understand its performance along 2,600 km latitudinal climate gradient**

Ignacio Rodriguez-Jorquera

**P14: A Novel Hybrid Coagulation-Constructed Wetland System for the Treatment of Dairy wastewater**

Ahmed Mohamed

**P15: Sustainable Wastewater Treatment: Learnings from Applications of Constructed Wetlands in India**

Shweta Lokhande

**P16: Remediation of P and N polluted water using Floating Treatment Wetlands with *Canna indica***

Gisela Alfonsina Di Luca

**P17: Application of innovative constructed wetlands to treat leachates from landfills.**

Santiago Gómez Cuervo

**P18: Treatment of faecal sludge from septic tanks using First Stage of French Vertical Flow Constructed Wetlands**

Maria Belen Arevalo

**P19: Propagule bank study in 10-year-old stormwater ponds: evolution of floristic diversity before and after dredging.**

Eloïse Lenormand

**P20: Parameters influencing Enhanced Denitrification in Bio-electrochemical Systems: A Review**

Sharvari Sunil Gadegaonkar

**P21: Current Status and Performance Assessment of Treatment Wetlands in South Korea**

Hyeseon Choi

**P22: Evaluation of Heavy Metal Removal in Pilot-Scale Constructed Wetlands: Comparison Between Surface and Subsurface Flow**

Gabriel Vasconcellos

## Co-benefits and Multifunctionality

**P23: A Guide of Flora and Fauna for Public Use in Educational Activities on the Biodiversity of Treatment Wetlands**

Carmen Hernández-Crespo

**P24: Treatment wetlands technologies in sanitation of indigenous communities: the model of Embera-Katio people in Colombia**

Miguel Martin Moneris

**P25: Aerated Vertical Flow Treatment Wetlands Treating Combined Sewer Overflow and Stormwater to Improve Water Quality**

Daniella Portela

**P26: Multifunctional constructed wetlands with focus on productive plants for further valorisation in seven pilot sites in different African countries and contexts**

Marco Hartl



# DETAILED SCHEDULE: POSTER PRESENTATIONS

Thursday 10/11/2022

## Emerging Contaminants

**P27: Occurrence and removal of antibiotics from domestic wastewater in a full-scale constructed wetland system**

Vaidotas Kisielius

**P28: Biofilters based on hazelnut shell/sawdust treating PPCPs from domestic wastewater**

Cristina Villamar Ayala

**P29: Estuarine salt marshes as a nature-based solutions to remove micropollutants: a case study in Portugal**

Ana M. Gorito

**P30: Floating treatment wetlands as a green engineering solution for surface water contaminated with potentially toxic elements (Cd, As, Cu, Pb): efficiency evaluation in a temperate climate**

Nicole Nawrot

**P31: Fate of Cyanotoxins in Treatment Wetlands: Transformation Products**

Pedro N. Carvalho

**P32: Biodegradation of Microcystin-LR and Cylindrospermopsin in constructed wetland mesocosms**

Alba Martinez I Quer

**P33: The comparative study for pesticide transformations between simulated river and wetland systems**

Daeho Kang

**P34: LIFEPOPWAT, bioremediation of HCH using a full scale Wetland+ system; an innovative hybrid treatment wetland**

Carlos Arias

## Intensified Wetlands

**P35: Dynamics of pathogen removal by an aerated horizontal flow treatment wetland**

Elodie Higelin

**P36: Hydraulic characterization in a hybrid vertical/horizontal treatment wetland with forced aeration.**

Caroline Miyazaki

## Urban Wetlands

**P37: Organic carbon and nitrogen removal characteristics of tidal flow Constructed Wetland**

Akimasa Miwa

**P38: Aerated treatment wetlands in Denmark, the establishment of an effective technology at high speed**

René Kilian

**P39: Grey Water an Issue in Urban Slums - Collection and Treatment by Tailor made Constructed Wetlands**

Uwe Kappelmeyer

**P40: Combining Constructed Wetlands and Mechanized Systems for Achieving Sustainable Wastewater Treatment and Recycling**

Shweta Lokhande

**P41: Constructed wetlands for the treatment of combined sewer overflow upstream of centralised wastewater treatment plants**

Chiara Sarti

## Wetlands for Water Pollution Control

**P42: Long-term vegetation monitoring by remote sensing on a large-scale surface flow constructed wetland**

Marie-Noelle Pons

# TECHNICAL TOURS

## OPTION 1

### Rainwater management (30 people maximum)

#### Details

Begin: 8:30 am at INRAE (5 rue de la Doua, 69100 Villeurbanne; take tram T1 (direction IUT Feyssine) or T4 (direction La Doua – Gaston Berger) to the tram stop “La Doua – Gaston Berger”)

End: 12 pm for a picnic lunch in Tête d’Or park. Afternoon free for exploring Lyon on your own

#### Green roof experimental facility



A set of six structures designed to receive various types of green roofs for long term experiments (some months to several years) aiming to monitor the behavior of green roofs (interception, storage, evaporation and evapotranspiration, state of vegetation, etc.), to estimate their hydrological performance and to provide data for modelling purposes. It is installed on the top of a building at INSA Lyon. A first structure has been built and tested in Spring 2019 to assess the quality of the strain gauges measurements used to estimate evapotranspiration. The other 5 structures have been installed in December 2019 and then equipped with all sensors. The facility started experiments in Summer 2020. Users can test various types of green roofs: preference is given to innovative green roofs.

<https://co-udlabs.eu/access/research-facilities/groof/>

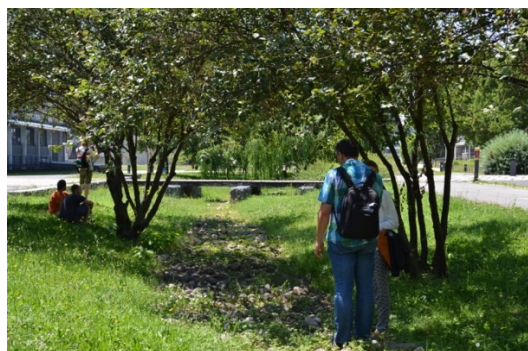
#### SUDS for stormwater management at Eco Campus (swale, trench, and a porous car park)



Three infrastructures to manage stormwater and runoff, monitored by OTHU (Field Observatory on Urban Drainage – [www.othu.org](http://www.othu.org)).

The systems are:

- A porous pavement of around 90 m<sup>2</sup> with a reservoir structure;
- A 290 m<sup>2</sup> infiltration swale;
- An infiltration trench of 240 m<sup>2</sup> located at a parking lot catchment.



This facility is being used to analyze in-situ SUDS performance through long term field measurements, using as a basis the data recorded during 4 years in the catchment, including rainfall intensities, inlet and outlet flow rates and water quality (temperature, conductivity and micropollutants such as metals, PAHs, pesticides, alkylphenols, PBDEs loads). The analyses are also carried out on dissolved and particulate phases in order to evaluate their ability to reach underground or surface water environments.

<https://co-udlabs.eu/access/research-facilities/othu-suds/>

# TECHNICAL TOURS

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## OPTION 2

### Domestic wastewater treatment (80 people maximum)

#### Details

Begin: 7:30 am at INRAE (5 rue de la Doua, 69100 Villeurbanne; take tram T1 (direction IUT Feyssine) or T4 (direction La Doua – Gaston Berger) to the tram stop “La Doua – Gaston Berger”)

End: 6:00 pm at INRAE (5 rue de la Doua, 69100 Villeurbanne)

#### Challex wastewater treatment plan



The Challex Vertical flow system (French system) designed for 2,000 PE by SCIRPE is in operation since 2010. It has been designed to treat wastewater from a combined sewer covering a 60-ha domestic catchment area. A specific design has been implemented to treat rain events as well.

The system has been fully monitored in the framework of a PhD research project to assess the limits of French system to accept hydraulic overloads during rain events.

#### Collonges WW treatment plant

Collonges treatment plant is designed to treat domestic wastewater for 3,300 PE. Designed by SCIRPE, it is composed of a trickling filter with a high loading rate to start the carbon degradation followed by two stages of vertical flow treatment wetlands with bottom-saturated layer. The first TW stage aims at storing and treating the sludge as well as treating carbon and nitrogen forms. The second stage aims at finishing the treatment on dissolved part. It is a classical design from AZOE process where the level of saturation in each TW stage can be adjusted according to TN removal objectives.

#### Léaz WW treatment plant

Léaz treatment plant is designed to treat domestic wastewater for 400 PE. It is a classical French vertical flow system (2 stages), designed by SCIRPE that works with solar panels.



# TECHNICAL TOURS

## OPTION 3

### Domestic wastewater treatment and CSO treatment (80 people maximum)

#### Details

Begin: 8:00 am at INRAE (5 rue de la Doua, 69100 Villeurbanne; take tram T1 (direction IUT Feyssine) or T4 (direction La Doua – Gaston Berger) to the tram stop “La Doua – Gaston Berger”)

End: 5:00 pm at INRAE (5 rue de la Doua, 69100 Villeurbanne)

#### CSO treatment – Marcy l’Etoile



The system is in operation since 2012. It is designed to treat CSO until a hydraulic load of 1,160 m<sup>3</sup>/d while guarantying specific outlet levels for COD, BOD<sub>5</sub>, TSS and TKN. Constructed by Syntea company the system is composed of a vertical flow system (490 m<sup>2</sup>) with a bottom-saturated layer and a controlled outflow structure. The system has been fully monitored during the first four years of operation and used as research site for a PhD.

#### Chazelles sur Lyon wastewater treatment plant



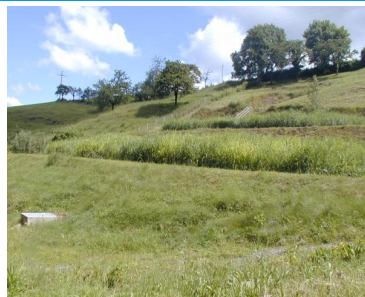
Chazelles treatment plant is designed to treat domestic wastewater for 1,450 PE. In operation since 2020, the system is composed of Rhizosph’air system of 1740 m<sup>2</sup> (forced bed aeration feed by raw wastewater – Syntea Company) followed by a chemical phosphorus precipitation, a lamellar decantation and sludge treatment wetlands for chemical sludge (240 m<sup>2</sup>). It treats 186m<sup>3</sup>/d in dry weather conditions and 840 m<sup>3</sup>/d in rain events and must reach TN removal (40 mg/L) and P removal (2.5 mg/L).

#### Les Halles wastewater treatment plant



Les Halles treatment plant is designed by Syntea Company to treat domestic wastewater for 800 p.e.. In operation since 2013, the system is composed a French vertical flow system (1<sup>st</sup> and 2<sup>nd</sup> stage) followed by a saturated vertical flow filter and a rough trickling filter, a filtering ditch, and a granulated apatite filter. The particularity of the design is to treat until TN and P only by gravity (no energy on site).

#### Montromant wastewater treatment plant



Montromant treatment plant is designed by SINT Company to treat domestic wastewater for 200 PE. In operation since 1993, the system is one of the oldest French vertical flow system (1<sup>st</sup> and 2<sup>nd</sup> stage) in the area. Working by gravity, the system must fully nitrify the wastewater. The sludge deposit on the first stage has been removed once since the operation.



# NOTES

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