



Ministry of Infrastructure
and Water Management

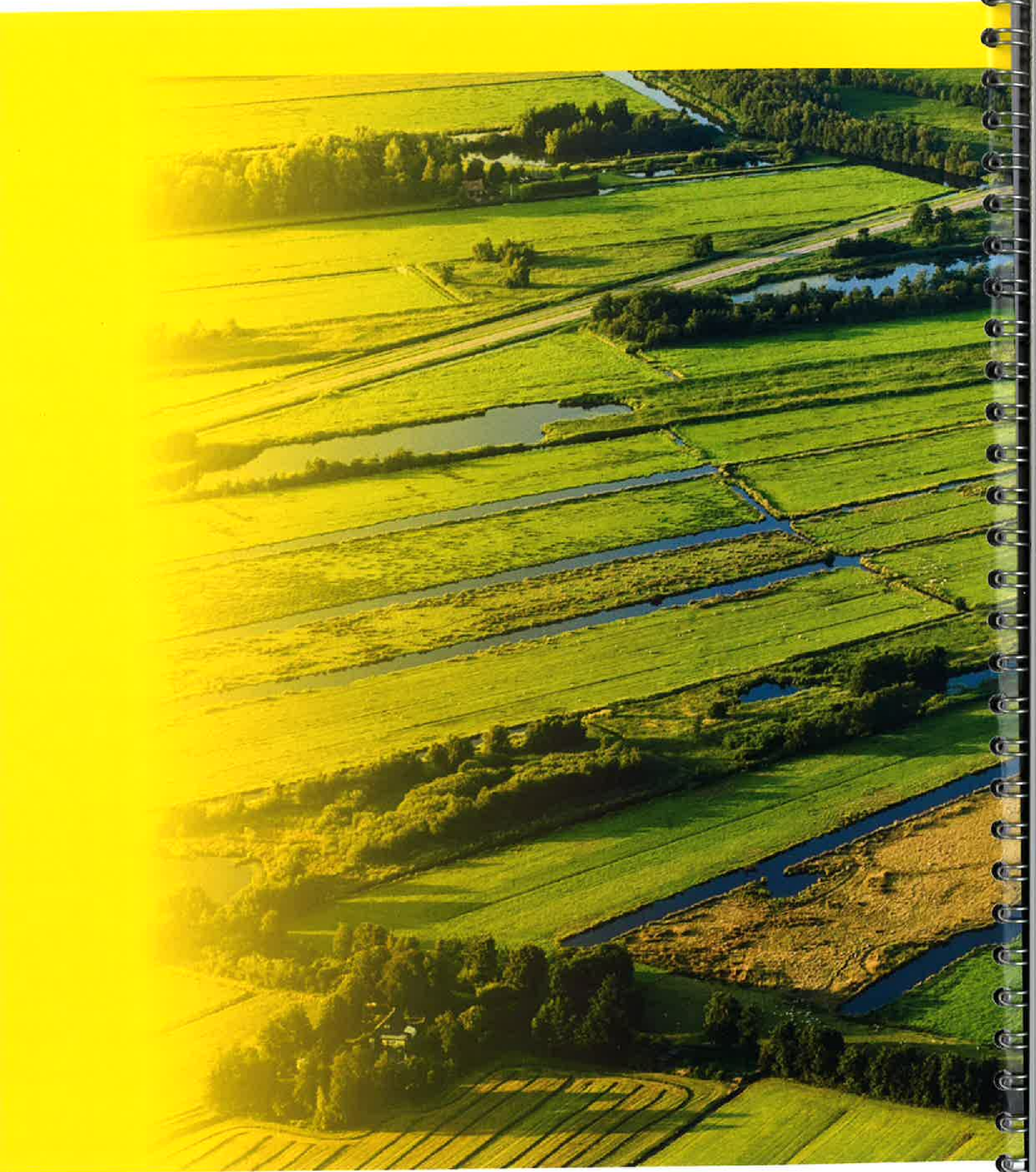
Deltares

International Conference 2024: (Micro-nano)Plastics in Soil

13-14 March, 2024

Utrecht, the Netherlands





International Conference 2024 (Micro-Nano)-Plastics in Soil

13-14 March 2024 – Utrecht, The Netherlands

WIFI location Leeuwenbergh:
Networkname: ConcertLab guests
Password: ListenMusic1A

WIFI location Quinton House:
Networkname: Nieuwegracht 60
Password: W3lk0m2W!F!

Introduction and a warm welcome



One of the major environmental issues in soil and water management is the presence of plastics. Awareness is growing that pollution by plastics must be prevented and recent research shows that it becomes a bigger issue especially in soil. Knowledge about plastics in the soil is also still a young branch of science while the input sources of plastics into soil are manifold. It is of great relevance to bring experts from different disciplines together for exchanging knowledge, learning through in-depth discussions, and having discussions with decision makers in the sector and politics.

Therefore, Deltares and the Dutch Ministry of Infrastructure and Water management have initiated the organization of this international conference. Thank you for coming to Utrecht and by joining this conference: you will contribute to the understanding of risks and to develop crucial mitigation strategies, and towards limiting and managing the impact on human health and the environment on a national, EU and international level.

This book of abstracts shows that the urgency is internationally felt and that your fellows are working hard to get more in-depth knowledge to support the prospect of action. Please learn and enjoy the scientific presentations, workshops, discussions, and all great network moments here in Utrecht.

The conference chairs,

Petra Krystek, PhD,
Deltares
Subsurface and Groundwater,
The Netherlands
(Lead organizer; scientific program)

Petra.krystek@deltares.nl

Lisette Peters, M.Sc.,
Ministry of Infrastructure and Water
Quality management (I&W), DGWB,
The Netherlands
(Lead organizer; general organization and facilities)

Lisette.peters@minienw.nl



Additional information for presenters - special issue publication -

We kindly invite all presenters (oral -, workshop - and poster presentations) to publish their presented research outcomes. The conference proceedings will be published as a special issue of the journal Chemosphere after peer review of manuscripts submitted online to the journal. Instructions for manuscript preparation are available on the journals' webpages (<https://www.sciencedirect.com/journal/chemosphere>).

All papers within the special issue will be held to the same standards and undergo the same extensive external peer review as regular research papers. This special issue will have three guest editors: Prof. Bart Koelmans, Dr. Petra Krystek and Prof. Stefan Krause. The intended submission period is between 15 March 2024 and 31 July 2024. We appreciate the submission of your outstanding research on (Micro-Nano)-Plastics in soil.

Prof. Bart Koelmans, Wageningen University, Wageningen, The Netherlands
Dr. Petra Krystek, Deltares, Utrecht, The Netherlands
Prof. Stefan Krause, University of Birmingham, United Kingdom



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1 Program

International Conference 2024 (Micro-Nano)-Plastics in Soil 13 & 14 March 2024, Utrecht, The Netherlands

Wednesday 13-03-2024

12 00 – 13 00 Registration, welcome coffee & sandwiches

13 00 – 13 15 Welcome and opening by the conference chairs

Petra Krystek, Deltares, The Netherlands and

Lisette Peters, Ministry of Infrastructure and Water Management, The Netherlands

13 15 – 13 25 Welcome by organizing institutions

Gerard Blom, director unit Subsurface and Groundwater Systems, Deltares, The Netherlands

SESSION 1 (Micro)plastics in soil – The broader scope and risk assessments

Chair: **Petra Krystek**, Deltares, the Netherlands

13 25 – 13 50 OP01 Invited lecture: Microplastics in soil – an underestimated problem?

Annegret Biegel-Engler;

German Environment Agency (UBA), Germany

13 50 – 14 10 OP02 Plastics in the environment using mass flow analysis, including degradation, accumulation and environmental dispersion

Anna Elisa Schwarz, Sietske Lensen, Jan Harm Urbanus, Luke Parker and Eline Langeveld;

TNO, The Netherlands

14 10 – 14 30 OP03 Spatiotemporal variation and risk assessment of microplastic from landfill to surrounding soil-water system

Jaswant Singh, Brijesh K. Yadava and Stefan Krause;

Indian Institute of Technology Roorkee, India & University of Birmingham, United Kingdom

14 30 – 14 50 OP04 Risk assessment of microplastics in soils applying data alignment methods and strict quality criteria

Bart Koelmans;

Wageningen University, The Netherlands

14 50 – 15 45 Coffee break and opening poster session
(see table of all posters on last page)

15 00 – 15 30 *Poster presenters are asked to be at their poster location for discussions*

SESSION 2 Workshops as breakout sessions - parallel
(CHOICE FOR ONE WORKSHOP MUST BE MADE BY REGISTRATION)
15 45 – 17 15 (see table below)

	Topics	Organised by	Location
WS1	Plastics in soil: From risk assessment to policy	Dr. Joris Quik , Prof. Bart Koelmans , and Lisette Peters , M.Sc.	Quinton House, Great Chamber
WS2	(Micro-nano) Plastics in soil: The main analytical challenges in sampling, extraction, and analysis & testing	Prof. Stefan Krause , and Dr. Petra Krystek	Leeuwenbergh, Conference Room
WS3	Case studies: Micro-nano-plastics in "One Health" (human, animals, and ecosystems)	Dr. Hilde Aardema , Prof. Juliette Legler , and Prof. Dick Vethaak	Quinton House, Drawing Room

Workshop session 1 - From risk assessment to policy
(including the following presentations)

- WS1-01** **Unraveling tire wear's trail: a multi-criteria analysis of assessing risks due to microplastics on a regional scale**
Shaya Algoe, Lout Kuiper, **Sacha Raven** and Daisy Bos;
Sweco, the Netherlands

Workshop Session 2 - The main analytical challenges in sampling, extraction, and analysis & testing
(including the following presentations)

- WS2-01** **Microplastics in solid materials**
- Status on development of CEN standard on the analysis of
microplastics in solid material (soil, sediment, waste)
Jaap-Willem Hutter;
JaHu Consult, the Netherlands
- WS2-02** **„Structure matters” – crucial role of physical and chemical
characterization of soil nano- and microplastic**
Agnieszka Monika Dąbrowska;
University of Warsaw, Poland
- WS2-03** **Assessing the suitability of standardized tests to monitor the
biodegradation of microplastics in soil**
Grace Davies, Stefan Krause, Samantha Marshall, Massimiliano Mascelloni,
Iseult Lynch;
University of Birmingham, United Kingdom
- WS2-04** **An automated microplastic recognition and spectrum collection
workflow based on YOLOv8**
Junhao Xie, Aoife Gowen and Jun-Li Xu;
University College Dublin, Ireland

Workshop Session 3 - Case studies: Micro-Nano-Plastics in "One Health" (human, animals, and ecosystems)

(including the following presentations)

- WS3-01** **Assessment of potential ecological risks of microplastics in urban farmland soils of Mabibo Bonde la Mchicha Farm, Dar es salaam**
Emmanuel Kato, Zainab Katima and Rwaichi Minja;
University of Dar es salaam, Tanzania
- WS3-02** **Quantitative tracking of nanoplastics along the food chain from lettuce (*Lactuca sativa*) to snails (*Cantareus aspersus*)**
Laura J. Zantis, Maria Kazour, Caterina Borchi, Rebecca Agati, Romain Colpaert, Frédéric Gimbert, Martina G. Vijver, Willie Peijnenburg,
Thijs Bosker;
Leiden Universiteit, The Netherlands
- WS3-03** **Microplastics in the terrestrial environment and the scopus of the H2020 MINAGRIS project**
Esperanza Huerta Lwanga;
WUR, The Netherlands
- WS3-04** **The biodistribution and toxicity of polystyrene nanoparticles administered intravenously in the chicken embryo**
Meiru Wang, Shuhao Chen, Shixiong Cheng, Tom A. Nederstigt, Robert E. Poelmann, Marco C. DeRuiter, Gerda E. Lamers, Joost J. Williemse, Chiara Mascitelli, Martina G. Vijver, **Michael K. Richardson**;
Leiden Universiteit, The Netherlands
- WS3-05** **Nanoplastics are taken up by the bovine cumulus-oocyte-complex and hamper oocyte maturation**
J. Yang, J.H. Kamstra, J. Legler, H. Aardema;
Utrecht University, The Netherlands
- 17 20 – 17 30** **Wrap-up of day 1**
Workshop leaders and conference chairs
Petra Krystek, Deltares, The Netherlands and
Lisette Peters, Ministry of Infrastructure and Water Management, The Netherlands
- 17 30 – 18 15** **Networking drinks with poster session**
Poster presenters are asked to be at their poster location for discussions.
- 18 15 – 20 00** **Buffet dinner**

Thursday 14-03-2024

- 08 45 – 09 00 Registration and coffee**
09 00 – 09 10 Welcome by the conference chairs
Petra Krystek, Deltares, The Netherlands, and
Lisette Peters, Ministry of Infrastructure and Water Management, The Netherlands
- 09 10 – 09 35 OP05 Invited lecture: European Commissions measures against microplastics pollution**
Silvia Forni;
European Commission Directorate-General for Environment, Belgium

SESSION 3 (Micro)plastics in soil – Agriculture and farmlands

Chair: **Hilde Aardema**, Utrecht University, The Netherlands

- 09 35 – 09 55 OP06 Sources and fate of biodegradable plastics in agricultural soil**
Claire Coutris, Pierre-Adrien Rivier, Erik Joner, Anders Aas and Linn Solli;
Norwegian Institute of Bioeconomy Research, Norway
- 09 55 – 10 15 OP07 Biodegradable microplastics induce profound changes in lettuce (Lactuca sativa) defense mechanisms and to some extent deteriorate growth traits in a mesocosm experiment**
Sylwia Adamczyk, **Laura J. Zantis**, Sam van Loon, Cornelis A.M. van Gestel, Thijs Bosker, Rachel Hurley, Luca Nizzetto, Bartosz Adamczyk and Sannakajsa Velmala;
Leiden University, The Netherlands
- 10 15 – 10 35 OP08 Impact of microplastics on soil: Impact of microplastics on soil nutrients from sludge treatment in UK farmland**
Joanna Jesionkowska, Yoseph Araya, Pallavi Anand, Wesley Fraser and Peter Vale;
The Open University, United Kingdom
- 10 35 – 11 30 Coffee break with poster session**
10 45 – 11 15 *Poster presenters are asked to be at their poster location for discussions*

SESSION 4 (Micro)plastics in soil – from infrastructural and surface materials

Chair: **Jacob de Boer**, emeritus professor VU and editor-in-chief
Chemosphere, The Netherlands

- 11 30 – 11 50 OP09 Microplastics in soil – do biodegradable plastics offer a solution?**
Bruno de Wilde;
Normec OWS, Belgium
- 11 50 – 12 10 OP10 Potential release of microplastics from geosynthetic applications: a case study**
Daniele Cazzuffi, Simon De Meyer and Francesco Fontana;
CESI SpA, Italy, Beaulieu International Group, Belgium, and A&B srl, Italy
- 12 10 – 12 30 OP11 Assessment of microplastic emissions from artificial turf sports pitch**
Maria Kittner, Korinna Altmann, Sven Hamann, Rüdiger Weyer and Ute Kalbe;
Bundesanstalt für Materialforschung und -prüfung (BAM), Germany
- 12 30 – 12 50 OP12 Expanded polystyrene (EPS) case study**
Bas Coolsma;
Antea Group, The Netherlands
- 12 50 – 14 00 Lunch**

- SESSION 5 (Micro)plastics in soil – A closer look to different sources**
Chair: **Petra Krystek**, Deltares, the Netherlands
- 14 00 – 14 20 OP13 Distribution of microplastics in subsurface, sediments, river Waal, Netherlands**
Thaiënne van Dijk, Lee Haverson, Stefan Krause, Uwe Schneidewind, Liam Kelleher, Sophie Comer-Warner and Jim Best;
Deltares, The Netherlands
- 14 20 – 14 40 OP14 Dispersion, transformation and fate of TWP in roadside soil**
Luke Parker and Peter Tromp;
TNO, The Netherlands
- 14 40 – 15 00 OP15 Microplastic and microrubber pollution in road dust: unveiling the environmental footprint of urban activities in a highly developed city, Gorgan, Iran**
Nematullah Khodadadi, Arash Amini, **Reza Dehbandi** and Stefan Krause;
Golestan University, Iran & University of Birmingham, United Kingdom
- 15 00 – 15 20 OP16 Microplastic fate in soil: understanding transport dynamics and environmental impact across different polymer types and soil conditions**
Rozita Soltani Tehrani, Jos van Dam and Xiaomei Yang;
Wageningen University and Research, The Netherlands
- 15 20 – 15 40 Poster price announcement and closing words by conferences chairs**
Petra Krystek, Deltares, The Netherlands, and
Lisette Peters, Ministry of Infrastructure and Water Management, The Netherlands

Additional last-minute posters

P26 Strategic options for reducing microplastics

Natasa Stojic, Ljiljana Curcic, Dunja Prokic, Biljana Panin, Galina Curcic, Mira Pucarevic
Faculty of environmental protection, Educons University, Serbia

The goal of the strategic roadmap is to stimulate the transformation of social and economic systems through accumulated scientific and technological knowledge. This will trigger the development of a national strategy for microplastics based on scientific excellence, policy and industry readiness for environmentally friendly lifestyles to address the growing amount of microplastics in the environment. In order to achieve the goal of the proposed initiative on a national strategy for microplastics, the following specific objectives have been established: Pollution prevention through the improvement of a sustainable plastic waste management system and more efficient use of waste in the circular economy; Developing a circular economy based on industrial symbiosis and increasing resource efficiency; Identifying and advancing product alternatives; Develop a monitoring program for microplastics; Define risk thresholds and develop a risk assessment framework; Sources and pathways prioritization; Evaluating new solutions to mitigate microplastics contamination; Improvement of the environmental protection financing system; Strengthened capacities of institutions for reducing microplastics and harmonized regulations with EU regulations; Conduct consumer education and awareness-raising campaigns.