



Curriculum Vitae:

Dr Katharina Tondera

Expert in treating and assessing variable flows



Professional Profile

Dr Katharina Tondera is a specialist on treatment systems for highly variable inflow, which is mostly, but not exclusively driven by precipitation, including the application of water sensitive urban design. She is experienced in assessing and evaluating treatment solutions, treatment wetlands and nature-based solutions as well as “grey” treatment methods, with a strong background in urban hydrology.

Since her graduation in 2010 with an engineering diploma in Waste Management Engineering and a special focus on Sanitary Engineering, Katharina has been involved in numerous research projects, which are always involving stakeholders from the private and public sector. Between 2011 and 2017, she was hired as a research assistant at the RWTH Aachen University in Germany, which resulted in a doctoral thesis in 2016 on the removal of pathogens and micropollutants from combined sewer overflows. During this time, she was responsible for the management of six research projects in the field of urban drainage, applications for new research projects and teaching activities.

Katharina left Germany in 2017 for a contract as a postdoctoral researcher at the University of the Sunshine Coast (USC), Australia, where she investigated floating treatment wetlands for stormwater treatment. She deepened her experience in the field of treatment wetlands in a research project on bioaugmentation of vertical-flow systems in a collaboration of Irstea and IMT Atlantique, campus Nantes. This initiated her removal to the metropolitan region of Lyon in France, where she has been living since 2018. In May 2020, she started working as research fellow at INRAE, research unit REVERSAAL, in a project on carbon capture in large wastewater treatment plants. In 2022, she took the opportunity to work for six months as project manager in a European collaborative project on urban drainage elements at the non-profit association Graie. Additionally, she is working as an independent consultant for suppliers of off-the-shelf stormwater treatment devices.

During her research career, Katharina has been applying successfully for funding, resulting in mostly collaborative projects with a budget of more than 1.4 million €. She has published over 20 articles, was co-editor of two books on nature-based solutions and has been involved in teaching and student supervision. She is member of the specialist group ES 3.5 "Retentionsbodenfilter" (treatment wetlands for stormwater) of the German Association for Water, Wastewater and Residues (DWA) and the IWA Working Group on Nature-based Solutions for Water and Sanitation.



Core Competencies

- Assessment and evaluation of treatment solutions for highly variable flow, including nature-based, sustainable systems
- Optimization of treatment solutions in a multi-scale approach from lab to field-scale
- Stormwater and wastewater engineering (urban runoff, combined sewer overflows, municipal wastewater)
- Consulting on project proposals and product development for stormwater and wastewater treatment
- Funding acquisition
- Scientific research and publishing
- Teaching, training and capacity building
- Data assessment and interpretation

Qualifications

- **Habilitation à Diriger des Recherches:** Treatment of variable stormwater and wastewater flows, Université C. Bernard Lyon I and INSA Lyon, France (2022)
- **Doctorate** in Engineering: Advanced Treatment of Combined Sewer Overflows, RWTH Aachen University, Germany (2016)
- **Engineering Diploma in Waste Management / Sanitary Engineering:** Phosphate recovery from sludge dewatering supernatant RWTH Aachen University, Germany (2010)

Training

- Certificate in Academic Teaching (basics), RWTH Aachen University, Germany (2017)
- Undergraduate studies in Physics (2006)

Professional History

2019 – ongoing

Independent consultant
Tondera Environmental Engineering Consulting
Lyon, France

2018 – ongoing

Associate lecturer
Université Lumière Lyon 2, UFR Temps et Territoires
Lyon, France

04/2022 – 12/2022

Research fellow
DEEP, INSA Lyon
Villeurbanne, France

04/2022 – 09/2022 (part-time)

Project manager
Graie - group of research, technical coordination and water information
Villeurbanne, France

05/2020 – 03/2022

Research fellow
REVERSAAL, INRAE, centre Lyon-Grenoble
Villeurbanne, France

05/2018 – 04/2020

Post-doctoral researcher
IMT Atlantique, campus Nantes, in collaboration with Irstea, REVERSAAL, Lyon
Villeurbanne and Nantes, France

04/2017 – 03/2018

Post-doctoral researcher
University of the Sunshine Coast
Maroochydore, Australia

03/2020 – 05/2010 and 12/2010 – 03/2017

Research assistant
Institute of Environmental Engineering, RWTH Aachen University
Aachen, Germany



Publications

Peer-reviewed articles

- Schwammburger, P.F., Tondera, K., Headley, T.R., Borne, K.E., Yule, C.M., Tindale, N.W. (2023) Performance monitoring of constructed floating wetlands: Treating stormwater runoff during the construction phase of an urban residential development. *Science of the Total Environment*, 865, 161107.
- Wirtz, H., Ruppelt, J.P., Schippers, J.H.M., Neinhuis, A.E., Luetjens, L., van Dongen, J.T., Pinnekamp, J., Tondera, K. (2023) Are floating treatment wetlands more suitable for retrofitting highway runoff basins than vertical-flow treatment wetlands? *Ecological Engineering*, 187, 106862.
- Tondera K., Chazarenc F., Brisson J., Chagnon P.-L. (2023): Structure and impact of root-associated fungi in treatment wetland mesocosms. *Science of the Total Environment*, 858, 159958.
- Guthi R.-S., Tondera K., Gillot S., Buffière P., Boillot M., Chazarenc F. (2022): A-Stage process: Challenges and drawbacks from lab to full scale studies: a review. *Water Research* 226, 119044. <https://doi.org/10.1016/j.watres.2022.119044>.
- Tirpak, A., Tondera, K., Tharp, R., Borne, K., Schwammburger, P., Ruppelt, J., Winston, R. (2022): Optimizing floating treatment wetland and retention pond design through random forest: A meta-analysis of influential variables. *Journal of Environmental Management* 312, 114909. <https://doi.org/10.1016/j.jenvman.2022.114909>.
- Ruiz-Ocampo, H., Tondera, K., Paing, J., Molle, P., Chazarenc, F. (2022): Long-term investigations on ammonium removal with zeolite in compact vertical flow treatment wetlands under field conditions. *Water Science and Technology* 85 (3), 746. <https://dx.doi.org/10.2166/wst.2022.022>.
- Ruiz-Ocampo, H., Tondera, K., Katusic, V., Paing, J., Molle, P., Chazarenc, F. (2021): Effect of filter media and depth on hydrodynamics and treatment performances of single-stage French Vertical Flow Treatment Wetlands treating domestic effluent. *Water Air and Soil Pollution* 232:282. <https://dx.doi.org/10.1007/s11270-021-05228-7>.
- Tondera, K., Chazarenc, F., Chagnon, P.-L., Brisson, J. (2021): Bioaugmentation of treatment wetlands – a review. *Science of the Total Environment* 775, 145820, <https://dx.doi.org/10.1016/j.scitotenv.2021.145820>
- Botturi A., Özbayram E.G., Tondera K., Gilbert N.I., Raoult P., Caradot N., Gutierrez O., Daneshgar S., Frison N., Akyol C., Foglia A., Eusebi A.L., Fatone F. (2021): Combined Sewer Overflows: A critical review on best practice and innovative solutions to mitigate impacts on environment and human health. *Critical Reviews in Environmental Science and Technology* 51(15), 1585-1618, <https://dx.doi.org/doi:10.1080/10643389.2020.1757957>
- Tondera, K., Shang, K., Vincent, G., Chazarenc, F., Hu, Y., Brisson, J. (2020): Effect of Plant Species and Nutrient Loading Rates in Treatment Wetlands for Polluted River Water Under a Subtropical Climate. *Water Air and Soil Pollution* 231:480. <https://dx.doi.org/10.1007/s11270-020-04830-5>
- Ruppelt J.P., Tondera K., Button M., Pinnekamp J., Weber K.P. (2020): Assessing the role of microbial communities in the performance of constructed wetlands used to treat combined sewer overflows. *Science of the Total Environment* 736, 139519. <https://dx.doi.org/10.1016/j.scitotenv.2020.139519>
- Rizzo A., Tondera K., Pálffy T.G, Dittmer U., Meyer D., Schreiber C., Zacharias N., Ruppelt J.P., Esser D., Molle P., Troesch S., Masi F. (2020): Constructed wetlands for combined sewer overflow treatment: a state-of-the-art review. *Science of the Total Environment* 727, 138618. <https://dx.doi.org/10.1016/j.scitotenv.2020.138618>
- Ruppelt, J.P., Pinnekamp, J., Tondera, K. (2020): Elimination of micropollutants in four test-scale constructed wetlands treating combined sewer overflow: influence of filtration layer height and feeding regime. *Water Research* 169, 1-10. <https://dx.doi.org/10.1016/j.watres.2019.115214>



- Tondera K., Ruppelt J., Pinnekamp J., Kistemann T., Schreiber C. (2019): Reduction of micropollutants and bacteria in a constructed wetland for combined sewer overflow treatment after 7 and 10 years of operation. *Science of the Total Environment* 651, 917-927. <https://dx.doi.org/10.1016/j.scitotenv.2018.09.174>.
- Ruppelt J.P., Tondera K., Vorenhout M., Van der Weken L., Pinnekamp J. (2019): Redox potential as a method to evaluate the performance of retention soil filters treating combined sewer overflows. *Science of the Total Environment* 650, 1628-1639, <https://dx.doi.org/10.1016/j.scitotenv.2018.09.043>.
- Tondera K. (2019): Evaluating the performance of constructed wetlands for the treatment of combined sewer overflows. *Ecological Engineering* 137, 53-59. <https://dx.doi.org/10.1016/j.ecoleng.2017.10.009>.
- Jaeger R., Tondera K., Jacobs C., Porter M., Tindale N. (2019): Numerical and physical modelling to improve discharge rates in open channel infrastructures. *Water (MDPI)*, 11(7):1414. <https://dx.doi.org/10.3390/w11071414>.
- Jaeger R., Tondera K., Pather S., Porter M., Jacobs C., Tindale N. (2019): Flow Control in Culverts: A Performance Comparison between Inlet and Outlet Control. *Water (MDPI)*, 11(7):1408. <https://dx.doi.org/10.3390/w11071408>.
- Jaeger R., Jacobs C., Tondera K., Tindale N. (2019): Improving Flows in Misaligned Culverts. *Water (MDPI)*, 11(9), 1932, <https://dx.doi.org/10.3390/w11091932>.
- Sanicola O., Lucke T., Stewart M., Tondera K., Walker C. (2019): Root and Shoot Biomass Growth of Constructed Floating Wetlands Plants in Saline Environments. *International Journal of Environmental Research and Public Health*, 16(2):275, <https://dx.doi.org/10.3390/ijerph16020275>.
- Ruppelt J.P., Tondera K., Schreiber C., Kistemann T., Pinnekamp J. (2018): Reduction of bacteria and somatic coliphages in constructed wetlands for the treatment of combined sewer overflow (retention soil filters). *International Journal of Hygiene and Environmental Health*, 221(4), 727-733. <https://dx.doi.org/10.1016/j.ijheh.2018.04.011>.
- Tondera K., Klaer K., Roder S., Brueckner I., Pinnekamp J. (2017): Improving the microbiological quality of the Ruhr River near Essen: comparing costs and effects for the removal of Escherichia coli and intestinal enterococci. *Water Science and Technology* 75(11), 2659-2668. <https://dx.doi.org/10.2166/wst.2017.141>.
- Walker C., Tondera K., Lucke T. (2017): Stormwater treatment evaluation of a Constructed Floating Wetland after two years operation in an urban catchment. *Sustainability* 9(10), 1687. <https://dx.doi.org/10.3390/su9101687>.
- Tondera K., Klaer K., Koch C., Hamza I.A., Pinnekamp J. (2016): Reducing Pathogens in Combined Sewer Overflows Using Performic Acid. *International Journal of Hygiene and Environmental Health* 219, 700-708. <https://dx.doi.org/10.1016/j.ijheh.2016.04.009>.
- Tondera K., Klaer K., Roder S., Brueckner I., Strathmann M., Kistemann T., Schreiber C., Pinnekamp J. (2016): Developing an Easy-to-Apply Model for Identifying Relevant Pathogen Pathways into Surface Waters Used for Recreational Purposes. *International Journal of Hygiene and Environmental Health* 219, 662-670. <https://dx.doi.org/10.1016/j.ijheh.2015.11.005>.
- Tondera K., Klaer K., Gebhardt J., Wingender J., Koch C., Horstkott M., Strathmann M., Jurzik L., Hamza I.A., Pinnekamp J. (2015): Reducing Pathogens in Combined Sewer Overflows Using Ozonation or UV Irradiation. *International Journal of Hygiene and Environmental Health* 218(8), 731-741. <https://dx.doi.org/10.1016/j.ijheh.2015.09.002>.
- Tondera K., Koenen S., Pinnekamp J. (2013): Survey monitoring results on the reduction of micropollutants, bacteria, bacteriophages and TSS in retention soil filters. *Water Science and Technology* 68 (5), 1004-1012. <https://dx.doi.org/1004-1012>. 10.2166/wst.2013.340.



**WETLAND +
ECOLOGICAL
TREATMENT**
SYSTEMS

Dr Katharina Tondera

Curriculum vitae



Books

- Cross K., Tondera K., Rizzo A., Andrews L., Pucher B., Istenič D., Karres N., McDonald R. (eds.) (2021) Nature-based solutions for wastewater treatment. eISBN 9781789062267, IWA Publishing, London.
- Tondera K., Blecken G.-T., Chazarenc F., Tanner C. (eds.) (2018): Ecotechnologies for the treatment of variable stormwater and wastewater flows. Springer Briefs in Water Science and Technology, ISBN 978-3-319-70012-0, Springer, Cham.