Dr. Maricor Arlos is an Assistant Professor in the Civil and Environmental Engineering at the University of Alberta. She started in April 2020 shortly after finishing a postdoctoral fellowship at the Swiss Federal Institute of Technology – Zurich (ETH-Zurich). She completed her PhD in Biology in 2018 at the University of Waterloo where she was awarded William B. Pearson Doctoral Thesis Award. Dr. Arlos’s research is truly interdisciplinary. Her roots and skillsets are in Environmental Engineering, but she has a diversity of projects that span environmental chemistry, nanotechnology, and ecotoxicology. She particularly has a strong focus on the emerging issues associated with municipal wastewater-derived micropollutants, substances released at low concentrations into the receiving environments. Also, her work on fate/transport and toxicokinetics modelling has benefited many aspects of ecotoxicology, and she is looking forward to contributing more to the potential remediation and regulation of trace organic contaminants in Canada.

ABSTRACT

Quantifying the exposure of micropollutants (pharmaceuticals, personal care products) stemming from wastewater pollution is necessary when assessing risks to non-target organisms. Several advancements in analytical chemistry and bioanalytical techniques have improved the understanding of the fate/transport of micropollutants in the environment. Not only that target compounds are quantified, their potential biological effects on exposed organisms can also be identified using bioanalytical techniques (e.g., cell-based bioassays). More recently, suspect and non-target screening methods using sophisticated analytical methods (e.g., high resolution tandem mass spectrometry) further expanded the micropollutant monitoring efforts to unidentified substances including transformation products. However, the availability of spatially and temporally varying concentrations arising from these analyses are limited due to several practical reasons (cost, deployment). This challenge is further exacerbated by the diversity of trace organics in the environment. Modelling techniques have been used in the absence of monitoring data as well as to complement existing chemical and bioanalytical results. Toxicokinetic-toxicodynamic models can additionally provide predictions that are helpful in establishing the linkages of exposure conditions to potential adverse effects in the wild. Hence, a combination of several techniques in exposure science is vital for monitoring micropollutant dynamics in the receiving environment and in organisms that were inadvertently exposed.