

#### **4.01.07 A Prototype Bayesian Network for the Environmental Risk Assessment of Pharmaceuticals in Norway** [S. Welch](#), NIVA -

Norwegian Institute for Water Research / Ecotoxicology; K. Olsen, Norwegian Institute of Public Health / WHO Collaborating Centre for Drug Statistics Methodology; J. Moe, Norwegian Institute for Water Research (NIVA) / Section of Ecotoxicology and Risk Assessment; M. Nouri Sharikabad, Norwegian Institute of Public Health / WHO Collaborating Centre for Drug Statistics Methodology; K. Tollefsen, NIVA - Norwegian Institute for Water Research / Section of Ecotoxicology and Risk Assessment; M. Grung, NIVA / Ecotoxicology and Risk Assessment. Despite rising awareness of the role of pharmaceutical pollution in the fractured and growing environmental risk landscape, the environmental risk assessment of this class of chemicals is marred by the sparsity and fragmentation of effects data and measurements. Current predictions of risk must, therefore, contend with the inclusion of considerable uncertainty, creating a situation where different assessments of the same chemicals can produce wildly different results. Bayesian Networks – causal networks of nodes linked by conditional probability distributions – have since their formal inception in the 1980s presented a potential alternative for modelling relationships between pollutants, environmental conditions and risk, permitting for a more nuanced prediction that includes quantified uncertainty. Here, we present a prototype Bayesian network for the prediction of environmental risk in Norwegian surface water from pharmaceuticals, using sales data from the Norwegian Drug Wholesales Statistics, Norwegian Institute of Public Health to predict environmental concentrations and publicly available Predicted No-Effect Concentrations as a measure of toxicity. In the future, we intend to expand this Bayesian network to incorporate the effects of projected population, demographic and climate change, as well as mixture effects between substances with similar modes of action.