

Wastewater effluents: How research can improve risk assessment and regulation

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The majority of chemicals discharged to the aquatic environment are delivered in the form of effluents - aqueous mixtures of chemicals derived from industrial processes or the treatment of domestic sewage. Municipal wastewater treatment works are designed primarily to treat domestic wastewater and biological treatment processes are therefore employed to facilitate the removal of ammonia, nitrite and nitrate, rather than to deal with the broad range of chemicals present in industrial and domestic wastewater. Additional 'tertiary' or 'advanced' treatments may help to deal with specific substances and reduce potential risks to the receiving environment. Moreover, the regulatory focus has shifted in recent years from industrial chemicals onto those derived from domestic sewage (e.g. pharmaceuticals, personal care products, etc). This session will focus upon the considerable challenges, which underpin the risk assessment, regulation and control of these point-sources of chemical contamination. For this purpose, high quality information is required on the composition of effluents, the characteristics of the receiving environment, the sources of substances in the effluent, the effectiveness of advanced effluent treatments, and the effects of the substances (both alone and as a mixture) on ecosystems. Although this is an issue of global relevance, the systems used to monitor, control and regulate industrial and domestic sewage effluents differ among regions and countries. Some authorities focus on the overall ecotoxicological effects of effluents while others apply regulatory systems dealing with chemicals on a 'substance by substance' basis. In this session we invite presentations which highlight how recent insights can be used to advance, support or challenge the regulatory processes that are applied to control wastewater effluents. This may include: • Reviews of the effectiveness of regulations and procedures used to assess risk and control wastewater effluents, or substances entering wastewater systems, • Chemical monitoring of wastewater effluents and the receiving environments, • Sources of substances and potential source controls, • The efficiency of new or existing treatment technologies and/or factors that may affect the viability of such treatments, • The behaviour of substances discharged in effluents and their fate after discharge, • Population-relevant ecotoxicological effects inferred by substances present within wastewater effluents (alone or in combination), • Studies, which help to improve the resolution with which we can measure environmental change (e.g. following the introduction of new controls).