



## SS12

### Planetary boundaries for chemical pollution

Sverker Molander<sup>1</sup>, Martin Scheringer<sup>2</sup>, Thomas Backhaus<sup>3</sup>

<sup>1</sup>Chalmers University of Technology, Gothenburg, Sweden

<sup>2</sup>Swiss Federal Institute of Technology, Switzerland

<sup>3</sup>University of Gothenburg, GOTHENBURG, Sweden

This session aims to fill a gap in the assessment concept published by J. Rockstrom et al. in their paper on 'A safe operating space for humanity' (Nature 461 (2009), 472-475). The authors suggested planetary boundaries for eight types of anthropogenic stressors but left a planetary boundary for chemical pollution as to be determined - in particular because 'thresholds leading to unacceptable impacts on human health and ecosystem functioning [are] largely unknown.' The integrated assessment of chemical pollution that is needed for defining such thresholds is multifaceted and complex, relying on the transdisciplinary collaboration of a diverse set of disciplines, encompassing amongst others environmental modeling, chemistry, toxicology, ecotoxicology, ecology and systems analyses. Challenges include especially the identification of robust, integrating indicators of chemical impact and the determination of acceptable boundaries in relation to ecosystem properties and services.

Hundreds of thousands of different man-made and natural chemicals potentially impact ecosystem or human health. For several of them we already know a great deal about their emissions, fate, distribution, and (eco)toxicological effects. However the individual pieces of chemical-by-chemical information are often not sufficiently integrated.

Additionally, a connection between chemical and (eco)toxicological characteristics and the specific properties of exposed ecosystems is typically missing. Hence a coherent and balanced overarching picture of chemical impacts is usually missing. The session will therefore contribute to the definition of planetary boundaries for chemical pollution by finding ways to compile and synthesize the current fragmented and heterogeneous knowledge about chemical pollution into a global perspective.

Concepts towards planetary boundaries for chemical pollution are needed for developing appropriate assessment strategies, and are critical for working towards the global reduction of chemical risks and the future development of sustainable chemical technologies. The suggested session is hence strongly linked to the sustainable development millennium goals and SETACs on-going work within the Strategic Approach to International Chemicals Management (SAICM) under the auspices of UN and OECD.

We will select contributions from key areas that contribute to solving the basic question of how planetary boundary for chemical pollution could be defined both in terms of what to measure and/or model and how to define appropriate thresholds. In other words, the contributions will analyze how the impact of anthropogenic chemical pollution on various different ecosystems in different parts of the world can be assessed in an integrative way and how the current levels of pollution might be evaluated in a nuanced way at the global level.