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# Science of the Total Environment

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## Preface

### Mercury cycling and bioaccumulation in a changing environment



Mercury (Hg) pollution is a widespread and chronic environmental and public health issue and has garnered significant interest from the scientific and international policy communities. In 2017, the Minamata Convention on Mercury (MCM) was entered into force in an effort to reduce anthropogenic releases of Hg and to protect human health and the environment. The signing and organization of the MCM was a significant global policy and diplomatic achievement, one that highlights the importance of the Hg pollution issue from both environmental and public health standpoints. With the establishment of the MCM comes the next steps of evaluating its effectiveness along with the challenges of developing robust monitoring protocols, data harmonization, meaningful risk communication strategies and the establishment of analytical method support for developing countries that can be used to support and implement the MCM. At the root of these challenges is conducting and interpreting Hg science in a changing environment. The alterations of the environment by humans have never been more self-evident and have extended to the farthest reaches of terrestrial and aquatic ecosystems. Drivers such as climate change, which were often overlooked in the context of understanding the factors governing Hg biogeochemical cycling and bioaccumulation, are now commonplace in the recent Hg literature and these concepts are widely used in the experimental design of laboratory and field studies.

Herewith, we present a Virtual Special Issue (VSI) in *Science of the Total Environment* (STOTEN) entitled *Mercury Cycling and Bioaccumulation in a Changing Environment* to improve our understanding of Hg science in the context of environmental change. This VSI is based, in part, on the “Mercury in the Environment” session held at the 19th International Conference on Heavy Metals in the Environment (ICHMET 2018) in Athens, Georgia USA. However, due to additional interest and demand from the scientific community we established an open call for the VSI. This VSI covers a wide range of topics within the Hg research sphere and includes papers on all aspects of the Hg cycle in the context of an environmental change theme. Research from multiple geographic areas and biomes throughout the globe is presented and this diverse set of papers represents a significant contribution to furthering our understanding of the complex processes involved in Hg speciation, distribution, air-sea exchange, soil biogeochemistry, biological uptake and accumulation, oceanography, environmental chemistry, food safety and toxicology and human exposure. The number of scientific disciplines covered by this VSI is impressive and highlights the complex nature of the Hg issue. Additionally, the VSI provides strong examples of how Hg studies can be mechanistic and serve as baselines for biomonitoring for important matrices such as soils and biota.

In conclusion, this VSI summarizes critical advances of Hg science and will be an important contribution for guiding the implementation of the MCM. Hg cycling is inherently complex and we hope this VSI will help the scientific community develop strategies, ideas and approaches to further our understanding of Hg which is widely considered one of the world's most complex and important pollutants.

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