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Conference Report

International Conference on Contaminated Sediments – ContaSed 2015
8–13 March 2015, Monte Verità, Ascona, Switzerland

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Abstract: About 80 participants from 22 countries from industry and academia gathered at the International Conference on Contaminated Sediments (ContaSed 2015) held at the Congressi Stefano Franscini (CSF), the conference center of ETH Zurich, located at Monte Verità, Ascona, Switzerland. ContaSed 2015 provided a platform for top experts as well as for junior researchers from different scientific disciplines to present recent results and novel approaches on the analysis, assessment and remediation of contaminated sediments. ContaSed 2015 served as a unique communication and discussion opportunity for environmental scientists with an emphasis on chemistry, sedimentology, ecotoxicology or remediation engineering.

Keywords: Contaminants · Environment · Lakes · Oceans · Remediation · Risk assessment · Sediments

Contaminated Sediments: Environmental Chemistry, Ecotoxicology and Engineering



At beautiful conference facilities with an amazing view on Lake Maggiore, the International Conference on Contaminated Sediments (ContaSed 2015) took place in the venue of *ETH Zurich – Congressi Stefano Franscini (CSF)* – located at Monte Verità, Ascona, Switzerland. About 80 researchers from different scientific disciplines and from 22 countries presented and discussed their

recent results and novel approaches on the analysis, assessment and remediation of contaminated sediments. ContaSed 2015 offered 14 sessions over four and a half days, during which 44 talks and 29 posters were presented. All the sessions were introduced by a total of 13 invited keynote speakers covering different topics on Organic and Inorganic Contaminants, Effects and Risk Assessment, Remediation and Engineering as well as on Future Perspectives.

ContaSed 2015 was organized by the Division of Chemistry and the Environment of the European Association for Chemical and Molecular Sciences (EuCheMS) in cooperation with CSF and with the support of the Division of Analytical Sciences of the Swiss Chemical Society.

Lake Sediments: A Relevant Environmental Compartment

With increasing concern on the occurrence and fate of chemical contaminants in the environment, recent sediments have become an environmental compartment of high importance, since they can act as a major sinks for pollutants in aquatic ecosystems. One key aspect is reflected by historic records of many legacy compounds preserved in dated sediment cores.

Derek Muir (Canada) presented novel approaches, which provide insights into both the past and current inputs and dynamics of atmospheric loadings of polycyclic aromatic compounds (PAH), through chemical and paleo-ecological analyses in the Athabasca oil sands development area (Alberta, Canada). Although, many substances have been banned or were severely restricted for several decades, today their presence in the environment is still challenging, for example in the case of dichloro-diphenyl-trichloroethane (DDT) in Lake Maggiore. *Licia Guzzella* (Italy) and *Diana Lin* (USA) discussed the DDT contamination of Lake Maggiore, where the source of pollution



ContaSed 2015 participants in front of the Monte Verità main building.

was attributed to a factory producing DDT and for many years discharged contaminated wastewater effluents into the lake. In 2001, average DDT concentrations in sediments exceeded quality guidelines, posing a threat to benthic communities. However, contemporary sediments show a decrease of the residual levels of contamination.

The results of trace analyses of aquatic sediments have been used mostly to reconstruct historic archives for highly lipophilic chemicals. However, recent research has shown that sediments can also provide a sink for less lipophilic and amphiphilic contaminants. **Juliane Hollender** (Switzerland) showed how using target, suspect and non-target screening analytical approaches using state of the art technology has allowed the successful identification of different personal care products, pesticides, biocides, pharmaceuticals and bacteriostatic agents in two lakes in Switzerland. Additionally, historical records of sewage-derived organic contaminants from Jamaica Bay (New York, USA) were presented by **Pablo Lara-Martin** (Spain). The vertical distribution of a wide range of surfactants and pharmaceuticals in dated sediment cores showed to be a powerful concept for monitoring the exposure of aquatic systems to wastewater over several decades. In both presentations, concentrations of many contaminants originating from wastewater correlate with wastewater treatment plant efficiencies, while concentrations of substances that only recently came into use or their usage recently increased showed elevated sedimentary concentrations over the last decades.

Effects and Risk Assessment

Emerging contaminants are very relevant due to their ubiquitous occurrence in many parts of the environment and because they can be potentially harmful to the biota and to humans. In the last years, antibiotic-resistant bacteria and the genes conferring antibiotic resistance (ARGs) are being discussed as another type of contaminants of environmental concern. **Helmut Bürgmann** (Switzerland) presented the contribution of ARGs in wastewater treatment plants, finding that ARG levels in sediments in close proximity to a sewage discharge point were up to 200 times higher compared to levels away from the sewage discharge. He highlighted the fact that only few research results are available about the risks associated with this type of biological contamination.

Oil spills are of environmental concern due to the threats to aquatic ecosystems caused by petroleum hydrocarbons. **David Hollander** (USA) explained the oil-well blowout of the *Deepwater Horizon (DWH)* in the northern Gulf of Mexico that released in 2010 5 million barrels of liquid petroleum hydrocarbons during 87 days. In his talk, Hollander explained the consequences of the spill due to the extreme depths, high pressures and low temperatures. He concluded that benthic habitats were significantly impacted as well as a substantial portion (4-12%) of the DWH oil reached the seabed.

Excursion to Monte Brè and Lake Lugano

After two days of very interesting oral and poster presentations, the conference group undertook an excursion by firstly riding in a bus from the conference venue to the bottom station of the cable car to Monte Brè near Lugano. After a 10 minutes ride and gaining more than 600 meters of altitude, the conference participants could enjoy the fantastic panoramic view including the distant Monte Rosa and many summits of the Bernese and Valais Alps. The nice weather allowed for a great outdoor lunch with local food at the Osteria Funicolare followed by a wonderful

downhill hike to the lake shore village Gandria and a boat cruise on Lake Lugano.



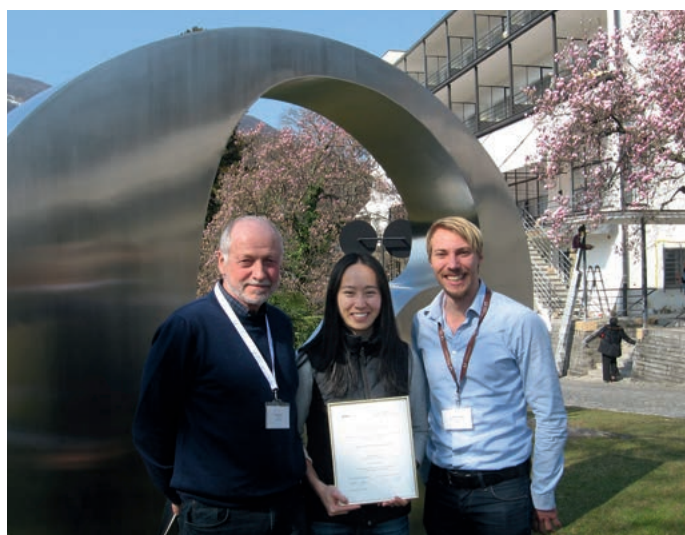
ContaSed 2015 participants on Lake Lugano.

Awards

The CSF award for the best presentation by a young scientist was granted to **Diana Lin** from Stanford University for her talk on 'Field assessment of natural attenuation from DDT in Pallanza Bay, Lake Maggiore'.

The DCE award for the best poster presentation was given to **Lukas Mustajärvi** from Stockholm University for his poster on 'Determining the release of hydrophobic organic contaminants from sediment by in-situ benthic flow-through chambers'.

In addition, thanks to the financial supports of the Swiss National Science Foundation (Program SCOPES) and of the Organization for the Prohibition of Chemical Weapons (OPCW, Conference Support Program), it was possible to award travel and conference grants to eight junior and three senior scientists from five Eastern European countries.



The award winners Diana Lin and Lukas Mustajärvi with the conference chair Walter Giger (on the left).

Future Perspectives

The last session of ContaSed 2015 was devoted to a roundtable discussion, during which **Marc Babut** (France) and **Bernhard Wehrli** (Switzerland) emphasized various topics that need to be addressed in the future. With **Lee Ferguson** (USA) as moderator, the participants discussed several topics of current and future interest. Among the emphasized aspects was the scarce knowledge about the effects of contaminants detected in sedimentary environments. It is technically feasible to identify and quantify pollutants in sediments at trace levels. However, it is still largely unknown what toxic effects they can have and at which concentrations such effects start to occur.



The discussion session on Future Perspectives.

Conclusion

The attendants generally considered ContaSed 2015 as a great success enabling the exchange of a lot of very valuable information through a high-level scientific program and many fruitful discussions that helped to significantly enlarge scientific and personal networks.

The Congressi Stefano Franscini is very much acknowledged for hosting the ContaSed 2015 in its beautiful conference centre and generously making available superb conference facilities. The financial support by Congressi Stefano Franscini and the Swiss National Science Foundation is greatly appreciated. Sincere thanks go to the organizing and scientific committee, partner institutions and last but not least to several generous sponsors. Gratefully acknowledged is the support of the member companies of the Kontaktgruppe für Forschungsfragen (KGF): BASF, Hoffmann-La Roche, Novartis Pharma and Syngenta Crop Protection. The conference organizers thank the Division of Analytical Sciences of the Swiss Chemical Society, the Swiss Federal Office for the Environment and the United States National Science Foundation for their financial contributions.

It is planned to publish a Special Issue of the journal *Environmental Science and Pollution Research* with articles based on the contributions to ContaSed 2015. In addition, abstracts and presentation files can be downloaded from the conference website: www.contased.org.

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