

CONFERENCE REPORT

INEF 2015 - Toronto, Canada (August 3-6, 2015)

This year was our 5th, and largest INEF conference ever with 198 delegates! The program included over 100 presentations in a wide variety of environmental topics including; multidimensional chromatography, microbial source tracking, passive sampling, human exposure, petroleum hydrocarbons, monitoring freshwater and wastewater, emerging contaminants of concern, statistics and legal case studies. There was a lively social program for networking which included a Monday evening mixer at the Hockey Hall of Fame, a Tuesday evening Dinosaur Social at the Royal Ontario Museum and a more relaxing Wednesday evening on the rooftop terrace at the Madison House.

We had a fantastic turn out from the student community this year and the quality of all their presentations was excellent. I would like to say a special congratulations to top four presenters in our student competition; Nicole McLellan (1st), Larissa Richards (2nd), David Bowman (3rd) and Sujan Fernando (4th). This year, thanks to support from the Royal Society of Chemistry, we were able to provide over £2,500 of travel grants to students and they have kindly produced reports to let us know there experience of the conference.



Finally I would like to say a massive thank you to the conference organisers, the sponsors, the presenters, and our green army of INEF volunteers. You all helped to make it a fantastic event and I really hope you will join us at another INEF conference in the near future.

Kind Regards,



Eric Reiner, 2015 Conference Committee Chair

Student Perspectives on INEF 2015

Paulina Piotrowski

Penn State, U.S.A.

I would like to extend my sincerest thanks for allowing me the opportunity to attend and present my research at the 2015 International Network of Environmental Forensics Conference in Toronto. I made valuable contacts with other scientists in the field, gained research ideas, and learned about other exciting research in the area of environmental forensics.

As a second-year Ph.D. student, the conference allowed me to present my still preliminary research project and discuss my ideas, gain feedback, and meet potential collaborators. I felt that I took part in many meaningful conversations. From the research presentations I learned about new analytical techniques and later discussed the merits for applying them to my samples with the speaker. I was able to network with scientists working in similar research areas and those using similar instrumentation. This helped develop some of my research ideas and recruit specialists who may be able to help me in the future. I also met potential collaborators, from whom I look forward to receiving samples from in the near future.

I really enjoyed the small, intimate setting of the conference and the numerous social activities. The various locations really showed all that Toronto has to offer. Overall, I had a great time at the INEF Conference and I look forward to attending again next year.



Dawei Geng

Örebro University, Sweden

The link between me and environmental sciences started with a master programme in Research Center for Eco-Environmental Sciences, Chinese Academy of Sciences (RCEES/CAS), in Beijing, which was mainly focusing on developing sampling and analytical methods for PCDD/Fs, PCBs, PBDEs et al.; environmental pollution of POPs in some regions in China; environmental behavior of POPs in the environment and multimedia model for POPs. After finishing the master degree, I started the PhD study in Örebro University. The programme is mainly to develop and validate novel analytical methods for POPs including NBFRs, Dioxins and the others. Meanwhile, I am also involved in a study which is aiming to find the association between POPs and diseases related to obesity. Apart from this, I am very interested in human exposure, the new Environmental Forensics techniques and statistical fingerprinting which means the two short courses on Monday were really beneficial for me. Teaching is counted as part of my PhD programme.

As to presentation on the conference, I changed quite a big load of the contents before the scheduled time. I was suggested to put up more slides of the data from the osprey eggs instead of describing details of the analytical methods and trouble shooting, since the talk was not in the section of ‘new techniques’. The data showed quite a variation comparing with other similar studies in Canada and other countries, so it attracted a few following discussions, which could create a potential of collaboration in the future. From period of preparing the presentation to finishing the presentation, I always feel nervous especially right before the talk. But it is getting more able to control the heart beat after each time. The answers to the questions after the talk were also better dealt with every time in a way.

I was very excited to attend the presentations about GC*GC applications, because some of the studies I was intending to cite in my publications and some of the studies showed quite aggressive data due to the same technique that we were using. What drew more of my attention were the studies of human exposure and emerging contaminants of concern. I would like to spend more time in these areas in the near future.

For a Chinese living in Sweden but visiting Canada for the first time, the social events were the coolest among the ones I have attended. I could easily felt the different views upon different things with the help of a little bit beer and what else I could say is ROM ROCKS! Many thanks to Eric, Dave and the others who helped me to get the chance to attend the conference, talk to the excellent researchers and spend the memorable week in Toronto.

Yanna Lui

University of Alberta, Canada

First I would like to thank the INEF Committee for the travel grant, which enabled me to be at the INEF 2015 conference (Victoria College, University of Toronto, Toronto, ON, Canada) to present my PhD research, to meet great scientists, and to learn from them.

My research is focused on the identification of unknown organic fluorinated compounds in environmental and biological samples. Using an influent samples from a wastewater treatment plant located in a fluorochemical industrial park in China, we developed a sensitive and fast HPLC-ESI-Orbitrap-MS/MS method for non-targeted fluorinated compound discovery. Attending an international conference like INEF 2015 is a great opportunity to present my work, and to learn from other scientists about the progress in the environmental research areas. Presentations on “multidimensional chromatography”, “emerging contaminants of concerns” and “persistent organic pollutants” etc. showed some cutting-age analytical techniques and skills, and could be used in my research in the future to improve my method. Sessions like “advances in analytical assessment”,



“atmospheric source tracking” and “statistics” etc. broadened my horizon and gave me insights into other areas in environmental forensics.

Presenting my research at the conference was a great opportunity to show my work to a large international scientific audience. Very good and challenging questions came out for me after the presentation, and it was really helpful to discuss the very detailed instrument settings and analytical techniques with them. Very friendly, some scientists gave me very GREAT suggestions on how to improve my method! Big thanks to them!

The social events were amazing. I do not like wines, but I really enjoyed the touring in Royal Ontario Museum while talking with the masters in the environmental fields. How amazing it is to talk to great scientists whom you can only see in textbooks before!

Once again, sincere thanks for the travel grant, which gave me this opportunity to be there. I enjoyed the conference, and learnt a lot from scientists from all over the world.

Larissa Richards

University of Victoria, Canada

This summer I attended the INEF 2015 conference at the University of Toronto, and I would like to thank the INEF committee for awarding me a travel grant to help cover the cost! INEF 2015 is the first targeted thematic conference I have attended, as well as the first conference where I have given an oral presentation. It was a great experience, I learned so much from the experts in attendance, and I was thrilled to be awarded a student presentation award. The copy of Introduction to Environmental Forensics has already been put to good use!

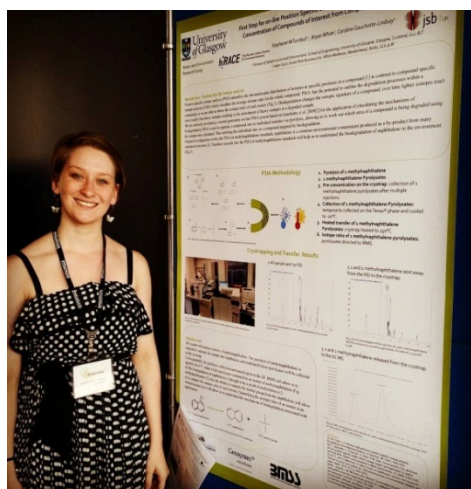


The goal of my research is to use full scan mass spectral data collected from a mobile membrane introduction mass spectrometry (MIMS) system for the source apportionment of atmospheric VOCs. MIMS is an instrumental technique that allows for direct, continuous analysis of VOCs in air without separation, producing full scan data which can be used as a fingerprint. My INEF presentation showed that PCA is an effective tool for discriminating between lab-based samples, such as the VOCs off-gassed from diesel and diluted bitumen, based on their full scan MIMS data, and that PCA can identify clusters in geo-referenced mobile MIMS data, such as data collected around an industrial area in Northern Alberta. My presentation led to many great questions and conversations that have helped me both with the challenges inherent to small, ion trap mass spectrometers, and with different data analysis techniques.

I attended the short course Statistical Fingerprinting as a Line of Evidence in Forensic Evaluation with Dr. Michael Bock on the first day of the conference, and learned so much! The course introduced me to various methods of receptor modelling that I am excited to use in my research. The sessions I attended, including Multidimensional Chromatography, Wastewater, and Emerging Contaminants of Concern, were very interesting, and really highlighted the complexity of analyzing consumer products and environmental samples for both known and unknown contaminants.

The social events at the end of each day were so much fun. I really enjoyed talking to, and learning from, scientists from around the world in an informal setting. My favourite event was the evening at the Royal Ontario Museum. It was so cool to see the dinosaurs and have after-hours access to the Pompeii exhibit.

Thanks again to the INEF committee for my travel grant. INEF was the most informative conference I've attended and I sincerely hope to attend again in the future!



Stephanie Turnbull

University of Glasgow, Scotland

I was fortunate enough to present my current research on position specific isotope analysis (PSIA) at the INEF conference in Toronto. PSIA is a developing environmental forensics technique which identifies the intramolecular distribution of isotopes at a specific position in a compound. This technique is presented in contrast to the developed technique of compound specific isotope analysis (CSIA), which calculates the average isotope ratio for the whole compound. PSIA has the potential to outline the degradation processes within a compound, as we are able to obtain the isotopic ratio of each moiety in a compound.

In the environment biodegradation changes the isotopic signature of a compound and over time lighter isotopes react more readily than heavy isotopes, resulting in the enrichment of heavy isotopes in a degraded sample. We use this information to calculate the extent of degradation in a compound via isotope analysis.

We are currently developing a second generation on-line PSIA system based on Gauchotte et al., 2009 for the application of elucidating the mechanisms of biodegradation. PSIA is used to separate a compound into its individual moieties via pyrolysis, allowing us to work out which area of a compound is being degraded using the calculated isotope ratio. Thus outlining the individual sites in a compound targeted by microbes during biodegradation.

The conference provided me with a detailed insight into the possible applications of my research in the environmental forensics. Explaining the concept and development of position specific isotope analysis (PSIA) to experienced consultants quickly outlined the pitfalls and the potential successes associated

with the investigation technique. PSIA remains a niche area of research with most consultants concentrating on CSIA due to its increased versatility; the conference proved as a platform to directly inform many sceptics which was extremely valuable.

The poster social at the conference allowed me to showcase my work prompting detailed conversations with many academics, environmental consultants and fellow students. I was frequently asked about the applications of PSIA on polycyclic aromatic hydrocarbons (PAHs). The main restriction in using PSIA is that you are limited by the pyrolysis mechanism of the compound being analysed. To outline the isotope ratio at a position specific level you have to pyrolyse a compound into its associated moieties; pyrolysis can't be controlled at a carbon specific level. Controlling the pyrolysis of a compound is very difficult as you have to prevent the formation of secondary reactants as these will influence the isotope ratio you are able to calculate. Thus the development process for compound analysis via PSIA is very lengthy and we are currently concentrating on the analysis of methylnaphthalenes, as it is thought to be easier to control the breaking of a methyl bond in pyrolysis.

The conference ultimately allowed me to understand the direction in which my research should continue, in terms of standard testing and site sample possibilities. Similarly, the different topics presented at the conference opened my eyes to the diversity of environmental forensics. Presentations ranged from river water quality monitoring by passive sampling and GCxGC to NMR spectroscopy in environmental and analytical chemistry. I particularly enjoyed a presentation on microscopy in environmental forensics and how as a technique the form of analysis remains valuable in the source determination of fugitive particles.

Whilst at the conference we were lucky enough to have social events in the Royal Ontario Museum with vast dinosaur skeletons hanging from the ceiling twinned with gin and tonics in hand; great combination for forensic networking. Similarly we went to the Hockey Hall of Fame which was my personal favourite and we even got to try out in the simulated hockey section. I never realised how hard it was playing in net until I was faced with pucks flying towards my face and only a stick and a glove to defend myself. It is fair to say that my lack of coordination didn't help me, so I think I will stick to a career in forensics. Toronto



is a beautiful city with endless attractions, I visited the CN tower and attended a baseball game which were great experiences. The local baseball team the Blue Jays were on surprising form and I enjoyed watching them win against Kansas City. Overall I had a fabulous time at the conference and it was great to meet such inspiring and likeminded people.

