



THE EAST ASIAN SEAS CONGRESS



Charting a New Decade of Healthy Ocean, People and Economies

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Collab 21

Training Session on Pollution Assessment and Management

26 November 2021, 8:00 AM - 4:00 PM (GMT+7)

Online via Zoom

ORGANIZERS:



State Key Laboratory of Marine Pollution



香港城市大學
City University of Hong Kong

City University of Hong Kong



Department of Applied Biology and
Chemical Technology, The Hong Kong
Polytechnic University



Department of Science and Environmental
Studies, The Education University of
Hong Kong

Collab 21: Training Session on Pollution Assessment and Management

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1. Introduction

The training session introduced the fundamental concept and best practices in environmental risk assessment and management of chemical contaminants, and gave an overview on the frontier technologies in monitoring and assessment of marine pollution. Special focus placed on emerging chemicals of concern, and their risk posed to the marine ecosystem and public health.

Through this training session, participants were able to acquire the concepts and principles of environmental risk assessment, risk management and communication as applied in practice. They also understood the basic risk assessment tools (i.e., prospective, retrospective, and tiered approaches) for environmental risk management. Through learning from latest research, participants learnt about advanced methods for monitoring emerging chemicals of concern and their current status in coastal environments around the world. This training session also enabled participants to appreciate, and employ modern approaches in pollution assessment and management in environmental policy formulation and decision making.

The event was organized by State Key Laboratory of Marine Pollution (SKLMP); City University of Hong Kong (CityU); Department of Applied Biology and Chemical Technology, The Hong Kong Polytechnic University (PolyU); and Department of Science and Environmental Studies, The Education University of Hong Kong (EdUHK).

2. Opening Ceremony

Professor Kenneth Leung from the State Key Laboratory of Marine Pollution (SKLMP), City University of Hong Kong (CityU) and Dr. Ling Jin from the Department of Civil and Environmental Engineering, Hong Kong Polytechnic University co-chair the Training Session, and gave a welcome speech and introduction of this Session.

3. Environmental Risk Assessment and Risk Communication and Management

Professor Kenneth Leung, Director of SKLMP, introduced what is Environmental (Ecological) Risk Assessment (ERA) and the key steps of ERA in the following areas process:

- 1) Problem Formulation;
- 2) Parallel Analysis of Exposure and Effect;
- 3) Risk Characterization.

Professor Kenneth Leung then provided more insight into the Risk Communication and Management, and raised the importance of risk communication with a case study about mercury in seafood, and demonstrated diverse methods for effective risk communication. Seven rules for the risk communication consideration for risk managers were suggested as follows:

- 1) Plan carefully and evaluate the success of your communication efforts;
- 2) Coordinate and collaborate with other credible sources;
- 3) Accept and involve the public as a legitimate partner;
- 4) Listen to the public's specific concerns;
- 5) Be honest, frank and open;
- 6) Speak clearly and with compassion;
- 7) Meet the needs of the media.

4. Microplastics Pollution

Dr. James Fang from the Department of Applied Biology and Chemical Technology, PolyU gave a presentation focusing on Microplastics Pollution. Raman spectroscopy-based approach was used to assess microplastics in biological samples. According to common procedures of microplastics, he proposed a series of technical concern got the following objectives:

- 8) Identify a filter substrate with minimal Raman signals;
- 9) Increase the biomass digestion efficiency and bypass the need of density separation;
- 10) Determine the particle recovery rates of microplastics;
- 11) Assess any size change and surface damage of microplastics;
- 12) Adopt an automated mapping approach for microplastics.

5. Environmental Monitoring and Conservation and Environmental Management: A Paradigm Shift

Professor Rudolf Wu from the Department of Science and Environmental Studies, The Education University of Hong Kong (EdUHK) first focused his presentation on Environmental Monitoring. He explained the necessity of doing Environmental Monitoring and classified it into the following

three aspects: physical, chemical, and biological monitoring. With the disadvantages and limitations of chemical and physical monitoring was presented, examples from different countries are given to highlight the advantages of biological monitoring. He gave the future prospects and directions of environmental monitoring by biological monitoring and said that there is still a long way to go in the future.

Professor Rudolf Wu then provided some example to illustrate Conservation and Environmental Management from different directions. Then he concluded the following:

- 1) We should manage our environment based on science
- 2) We must also identify keystone species and functionally important species and accorded them the highest level of protection.
- 3) Species-specific resistance and resilience must be fully understood before we can predict the risk of human disturbance on biodiversity.
- 4) In the absence of such knowledge, the precautionary approach should be used.

6. Toxicity Assessment of Chemical Mixtures

Dr. Ling Jin proposed that chemical and bio-analysis are complementary and deliver pieces of the puzzle and gave examples of the analysis of chemistry and biology. He made the following points:

- 1) The cocktail effects of chemicals in the environment follow the concentration-additive manner in general;
- 2) Mixture-toxicity modeling combining chemical analysis and bioassays can help quantitatively prioritize the mixture-effect drivers in complex environmental samples;
- 3) Effect-directed analysis for identification of unknown mixture-effect drivers;
- 4) Effect-based trigger values that is regulation of mixture effect.

7. Contaminants of Emerging Concern (CECs) in the Coastal Marine Environment

Dr. Yuefei Ruan from SKLMP, CityU emphasized that: A critical component in the ability to assess the environmental impact of CECs is the identification and quantification of these chemicals in environmental media; We need trace analysis technique to address these questions: Are they there? At what levels? Can we trace them from the source to sink?

She then presented two prominent groups of CECs related to POPs, focusing on their analytical methodologies and environmental behaviors: (1) halogenated flame retardants HFRs, and (2) per- and polyfluoroalkyl substances (PFASs). She also established and optimized a novel methodology for future research of those CECs.

8. Introduction of Global Projects

Focusing on the global initiatives for combating marine pollution and supporting sustainable development, Professor Kenneth Leung introduced the UN Decade of Ocean Science for Sustainable Development (2021-2030) and Global Estuaries Monitoring (GEM) Programme with the following three outlines:

- 1) Marine pollution became a global threat to oceans;
- 2) The importance of global initiatives to combat pollution;
- 3) Some new global initiatives.

Professor Kenneth Leung concluded his speech as follows:

- 1) Global joint effort is needed to promote ocean sustainability.
- 2) Development of a panel for Science-Policy interface in chemical management is essential.
- 3) Good science can help develop good policy and solutions.
- 4) With more global initiatives, the future of our oceans is hopeful and positive.

ANNEX 1. AGENDA.

Time (GMT+7)	Topic	Lecturer
08:00 AM - 08:10 AM	Welcoming and Introduction	Professor Kenneth Leung and Dr. Ling Jin
08:10 AM - 08:50 AM	Environmental Risk Assessment	Professor Kenneth Leung
08:50 AM - 09:20 AM	Risk Communication and Management	Professor Kenneth Leung
09:20 AM - 09:30 AM	Break	
09:30 AM - 10:00 AM	Microplastics Pollution	Dr. James Fang
10:00 AM - 11:00 AM	Environmental Monitoring	Professor Rudolf Wu
11:00 AM - 01:00 PM	Lunch Break	
01:00 PM - 02:00 PM	Conservation and Environmental Management: A Paradigm Shift	Professor Rudolf Wu
02:00 PM - 02:30 PM	Toxicity Assessment of Chemical Mixtures	Dr. Ling Jin
02:30 PM - 02:40 PM	Break	
02:40 PM - 03:10 PM	Contaminants of Emerging Concern (CECs) in the Coastal Marine Environment	Dr. Yuefei Ruan
03:10 PM - 03:25 PM	Introduction of Global Projects	Professor Kenneth Leung
03:25 PM - 04:00 PM	Roundtable Discussion	All Lecturers and Participants

ANNEX 2. SUPPORTING FILES.



Group Photo: <https://tinyurl.com/Collab21-GroupPhoto>

Recording: <https://youtu.be/GR4AR1dKQy4>