EAS CONGRESS2024 XIAMEN, CHINA 6-8 NOVEMBER

WOW 19th 2024厦门国际海洋周 World Ocean Week in Xiamen

Blue Synergy for a Shared Future: One Sustainable and Resilient Ocean

6-8 NOVEMBER 2024 • XIAMEN CITY, CHINA

SUBTHEME 2.2
GLOBAL CHALLENGES, LOCAL SOLUTIONS

Training Session on Pollution Assessment and Management (PAM)

PROCEEDINGS

CONVENER:

SKLMP 海洋污染國家重點實驗室

中华人民共和国自然资源部 Ministry of Natural Resources of the People's Republic of China

厦门市人民政府 Xiamen Municipal People's Government

PEMSEA

Training Workshop on Pollution Assessment and Management (PAM)

10:00–12:00, 7 November 2024

2C Meeting Room, Xiamen International Conference Centre

1.0 Session Information

Session Title: Training Workshop on Pollution Assessment and Management (PAM)
Date and Time: 10:00–12:00, 7 November 2024
Venue/Platform: 2C Meeting Room, Xiamen International Conference Centre
Convening Organization: State Key Laboratory of Marine Pollution, City University of Hong Kong
Session Coordinator Contact Details: Professor Kenneth Mei Yee Leung (kmyleung@cityu.edu.hk)

2.0 Introduction

The PAM training workshop aimed to foster collaboration and knowledge exchange among environmental scientists and practitioners from East Asian Seas countries. With over 20 participants, the event provided a platform for discussing the latest advancements in environmental risk assessment (ERA) and management techniques.

The training session focused on new pollutants, such as per- and polyfluoroalkyl substances (PFASs), antibiotic resistance genes (ARGs), and their impacts on marine ecosystems and public health. Discussions provided participants with a comprehensive understanding of these emerging challenges and equipped them with the knowledge to develop local solutions to global environmental issues. The workshop facilitated active engagement and collaboration, allowing participants to share their experiences and expertise in ERA and environmental management. This exchange of information and best practices was instrumental in enhancing the collective understanding of environmental risks and fostering a collaborative approach to addressing them.

3.0 Session Highlights

3.1 Opening Messages

At the commencement of the workshop, Prof. Kenneth Leung delivered a welcoming introductory speech. He emphasized that ERA is a systematic approach for identifying, evaluating, mitigating, and controlling potential hazards, ensuring effective risk management. Moreover, he noted that ERA is not only a vital outcome of scientific advancement but also an essential requirement for societal security.

3.2 Technical Presentations

Prof. Kenneth Mei Yee Leung, City University of Hong Kong

Title: Environmental Risk Assessment and Risk Management

Key Messages:

- ERA is very useful in environmental management in particular for risk management of chemical contaminants, seafood safety and harmful algal blooms.
- ERA can also be applied in assessing the risk of introduction of exotic species for aquaculture or aquarium trade.
- For instance, ERA approaches have been adopted by FAO in risk assessment and management for aquaculture practices.

Significant findings or innovations: The Harbour Area Treatment Scheme has centralized the treatment of sewage from densely populated urban areas in Hong Kong, significantly improving water quality and the biodiversity of benthic ecosystems. However, some PFASs present medium to high risks, necessitating further regulation.

Recommendations: Effective ERA also includes effective risk communication. Coordination of risk assessments and risk communication strategies requires information sharing and establishing networks of working relationships between groups and agencies. This topic will be taught in our future training workshop series by our State Key Laboratory of Marine Pollution.

Links to SDGs or regional targets: Effective pollution assessment and management can support SDG 3 (to ensure healthy lives and promote well-being for all at all ages), SDG 14 (to conserve and sustainably use the oceans, seas and marine resources for sustainable development), and SDG 15 (to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests,

combat desertification, and halt and reverse land degradation and halt biodiversity loss). For Asia and the Pacific region, it is vital to intensify efforts to mitigate marine pollution and enhance marine conservation while strengthening the long-term sustainability of marine resources. Additional support is necessary for small island developing states and least developed countries, whose sustainable marine practices are critical to support not only their local economies and communities but also ocean biodiversity.

Prof. Xuemei Mao, The University of Hong Kong

Title: Standardization in environmental antibiotic resistance genes (ARGs) surveillance

Key Messages:

- To reveal the distribution and transmission of ARGs across a wide geographic and longitudinal scope, standardized methodologies and international collaboration are essential.
- Technologies for environmental ARGs surveillance were introduced.
- Risk assessment schemes incorporating factors such as transfer potential, host species, viability, and absolute quantification are required to effectively identify high-risk priority ARGs.

Significant findings or innovations:

- A standardized and quantitative framework were recommended for generating comparable and large-volume datasets for ARG surveillance.
- The research results of rivers presented a comprehensive understanding of the resistome, mobilome, and microbiome in river ecosystems and unveiled the antimicrobial resistance risk by metagenomic analysis.

Recommendations: Metagenomic analysis was recommended for high-throughput ARG detection and risk assessment, coupled with ARGs-OAP pipeline for ARG quantification and environmental reference materials as technical benchmarks.

Links to SDGs or regional targets: To present a comprehensive understanding of the regional resistome by a large-scale AMR monitoring scheme

3.3 Panel Discussions/Interactive Sessions

The discussion section of the PAM training workshop was led by Professors Kenneth M. Y. Leung and Xuemei Mao. Both in-person and online attendees actively

participated in a dynamic discussion, focusing on the future directions of ERA and management. The discussion focused on the following key topics:

- **The integration of ERA into national and regional environmental policies.**
    - Exploring how ERA can be incorporated into national and regional environmental policies to enhance regulatory frameworks and decision-making processes.
- **Challenges and opportunities in monitoring and managing new pollutants.**
    - Addressing the challenges and opportunities in monitoring and managing emerging pollutants, such as PFAS, ARGs, and their impacts on ecosystems and public health.
- **Strategies for enhancing international collaboration and data sharing.**
    - Developing strategies to improve international collaboration and data sharing among countries, fostering a unified approach to environmental management.

The panelists shared their perspectives and engaged in addressing questions from the audience. They provided practical recommendations for advancing ERA practices, emphasizing the importance of collaborative efforts and innovative solutions in tackling environmental challenges.

4.0 Key Outcomes

This workshop offered both theoretical and practical training in ERA and environmental risk management. It introduced key concepts and principles, explored frontier technologies for monitoring and assessing marine pollution, and reviewed research progress from various global studies. Prof. Leung's lecture enhances our understanding of emerging chemicals of concern and their current status in coastal environments worldwide, while also predicting the relationships between environmental stressors and ecological effects. Prof. Mao's presentation emphasizes the use of antibiotic resistance gene surveillance in developing risk assessment schemes and standardizing analytical methods. Overall, the workshop provided valuable insights into addressing global challenges and implementing local solutions within the "One Health" framework.

5.0 Recommendations and Ways Forward

The PAM training workshop successfully highlighted the significance of ERA and the need for international collaboration in tackling environmental challenges. The insights gained from the workshop will contribute to the ongoing efforts in environmental protection and sustainable development.

- **Enhance International Collaboration:**
    - Strengthen partnerships among East Asian Seas countries to share data, methodologies, and best practices in ERA and environmental management.
    - Establish a regional network for continuous communication and collaboration on environmental issues.
- **Standardize Surveillance Methodologies:**
    - Develop and implement standardized protocols for monitoring new pollutants, such as ARGs, to ensure consistency and comparability of data across regions.
    - Promote the adoption of these standardized methodologies through training and capacity-building initiatives.
- **Leverage Advanced Technologies:**
    - Utilize cutting-edge analysis technologies and bioinformatic tools to improve the accuracy and efficiency of ERA.
    - Invest in research and development to advance these technologies and make them more accessible to environmental practitioners.
- **Promote Public Awareness and Education:**
    - Increase public awareness of environmental risks and the importance of ERA through outreach and education programs.
    - Engage communities in environmental monitoring and management efforts to foster a sense of shared responsibility.

6.0 Annexes

ANNEX 1. Session Agenda

SKLMP Parallel Session No.1_PAM (ST2.2)
Training Workshop on Pollution Assessment and Management (PAM)

10:00–12:00 on 07 Nov. 2024

Chair: Professor Kenneth Leung, State Key Laboratory of Marine Pollution, City University of Hong Kong

Time	Topic	Lecturer
10:00–10:10 (10 min)	Welcoming and Introduction	Professor Kenneth Leung
10:10–10:55 (40 min)	Environmental Risk Assessment and Risk Management	Professor Kenneth Leung
10:50–11:00 (10 min)	Break	
11:00–11:40 (40 min)	The Threats and Monitoring Techniques for Antibiotic Resistant Gene	Professor Xuemei Mao
11:40-12:00 (20 min)	Free Discussion and Closing Remarks	Professor Kenneth Leung Professor Xuemei Mao

ANNEX 2. Participant Information

Participant Information

Total number of participants: 25

No.	First Name	Last Name	Country/Region	Organization
1	Xuemei	Mao	Hong Kong, China	The University of Hong Kong
2	Kenneth	Leung	Hong Kong, China	City University of Hong Kong
3	Matthew	Tabilog	Philippines	PEMSEA
4	Prabhakar	Sharma	India	Nagaland University
5	Ade	Supriatin	Indonesia	Institut Teknologi Bandung
6	Hernando	Bacosa	Philippines	Mindanao State University -Iligan Institute of Technology
7	Vesna	Cerkvenik Flajs	Slovenia	University of Ljubljana
8	Rachael	Wyse-Mason	Trinidad & Tobago	The University of the West Indies
9	Demilade	Adedipe	Hong Kong, China	City University of Hong Kong
10	Chong	Chen	Hong Kong, China	City University of Hong Kong
11	Jiayong	Lao	Hong Kong, China	City University of Hong Kong
12	Shaopeng	Xu	Hong Kong, China	City University of Hong Kong
13	Huiju	Lin	Hong Kong, China	City University of Hong Kong
14	Mengyang	Liu	Hong Kong, China	City University of Hong Kong
15	Ming	Liu	Hong Kong, China	City University of Hong Kong
16	Xuemei	Mao	Hong Kong, China	City University of Hong Kong
17	Qiang	Ou	Hong Kong, China	City University of Hong Kong
18	Yuefei	Ruan	Hong Kong, China	City University of Hong Kong
19	Qi	Wang	Hong Kong, China	City University of Hong Kong
20	Meng	Yan	Hong Kong, China	City University of Hong Kong
21	Qihui	Zhao	Hong Kong, China	City University of Hong Kong
22	Veronica	Lam	Hong Kong, China	City University of Hong Kong
23	Junhao	Chen	Hong Kong, China	City University of Hong Kong
24	Keran	Yang	Hong Kong, China	City University of Hong Kong
25	Huo	Xu	Hong Kong, China	City University of Hong Kong

ANNEX 3. Presentation Materials

- Links to the presentation can be found here

ANNEX 4. Documentation

Prof' Kenneth Leung's talk

Prof. Xuemei Mao's Talk

Discussion Section or Open Forum

Discussion Section or Open Forum

Group photo with the participants