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## Editorial

# Coastal ecosystem in East Asia: Pollution and management



### 1. Socio-ecological significance of coastal region

Coastal areas have long been deteriorated by various pollution sources mainly from the human activities, and coastal and marine pollution become common and significant issues world widely. In particular, the continuing rapid and heavy industrialization in burgeoning East Asia during the past half century have resulted in increasing coastal and marine pollution. In particular, the Yellow Sea situated between mainland China and Korean Peninsula would be one hotspot region receiving significantly increasing concerns on coastal pollution and ecosystem deterioration. The pollution problem of the Yellow Sea would not be a just local issue considering its geographic scale and the huge coastal ecosystem services currently being produced. More recently, multiple stressors through continuing coastal development including large scale reclamation, land-based coastal pollution, and sometimes accidental oil spills have threatened the ecological health status of the Yellow Sea and further might have resulted in adverse effects on human well-being. However, the systematic and integrated approach and/or long-term monitoring program in the Yellow Sea coastal environment has so far been limited. Thus, more elaborated efforts would be acknowledged to gather and exchange the scientific data, knowledge, and experience relating to the Yellow Sea between two countries in the coming years.

### 2. Yellow Sea ecosystem symposium networking

Cooperation between China and Korea would warrant solving the coastal to marine pollution problems in the Yellow Sea region as both countries share the given ecosystem geographically and socio-economically. Since 2015, several groups of the Asian scientists working on the multiple areas of environmental and marine sciences, encompassing the broad scientific fields such as environmental chemistry, environmental toxicology, marine ecology, and marine policy etc., have been gathering, through the series of the Yellow Sea Ecosystem Symposiums (YES), as below.

- 1) 1st YES in Nanjing University, Nanjing, 2015 (chaired by Prof. Xiaowei Zhang)
- 2) 2nd YES in Seoul National University, Seoul, 2016 (chaired by Prof. Jong Seong Khim)
- 3) 3rd YES in Chinese Academy of Science, Beijing, 2017 (co-chaired by Prof. Tiejun Wang and Prof. Jong Seong Khim)
- 4) 4th YES in Seoul National University, Seoul, 2018 (co-chaired by Prof. Jong Seong Khim and Prof. Xiaowei Zhang).

The present special issue entitled “Coastal Pollution & Health” is the result of the 3rd YES (official title: the 3rd Sino-Korea

Symposium on Environmental Health and Ecological Safety). Of note, the 2nd YES has been successfully documented as the special issue in the *Chemosphere*, with a total of 30 research articles included (Khim et al., 2017). The goal of the YES is providing a platform for the next generation to share scientific knowledge and to improve our understanding on the Yellow Sea and its ecosystem, specifically targeted in the assessment and management issues relating to the coastal and marine pollution in the region towards enhancing its ecosystem services.

### 3. Theme and topics of the special issue (The 3rd YES)

The 3rd YES in 2017 was more successful and productive with increased contributions, i.e., a total of >150 participants and 82 presentations including two excellent keynotes, 19 invited talks, and 61 posters. The theme of the 3rd YES was “Environmental Health and Ecological Safety” and topics included 1) Current Status of Environmental Pollution; 2) Ecological Effect and Ecosystem Assessment; 3) Toxicology and Environmental Health; and finally 4) Ecological Risk Assessment and Management.

Firstly, Prof. Yonglong Lu from the Chinese Academy of Sciences, China, the world well-known ecologist, gave the first keynote speech entitled “Ecological impacts of emerging pollutants in Bohai and Yellow Seas of China”, as an overview of our 10 years of the pollution assessment studies in the Yellow Sea. The second keynote speech, which was given by the well-known expert on marine policy, Prof. Chang-Hee Lee from the Myongji University, Korea, was entitled “Recent progress of environmental policy and management in Korean Estuary”. Both keynotes gave an excellent balance between science and policy and highlighted the importance of collaborative work between natural scientists and social scientists, which would be one particular direction (or aspect) of our YES networking.

Next, a total of 19 invited talks and 61 poster presentations demonstrated the most up-to-date scientific results under the four topics (sessions) mentioned above. Twelve outstanding poster presentations were recognized for the best student presentation awards; 2, 4, and 6 posters are selected for the first, second, and third place awards, respectively. The first place awards are given to: 1) Wendi Fang from Nanjing University, China (Title: Global survey of emerging pollutants in surface water); 2) Junghyun Lee from Seoul National University, Korea (Title: Long-term changes of dioxin-like and estrogenic compounds in sediment from Lake Sihwa and surrounding creeks, Korea: Between, 1999 and 2015).

The present special issue finally includes 59 selected, outstanding, original articles through strict review processes under the following three themes:

- 1) Environmental Chemistry

- 2) Ecotoxicology and Human Health
- 3) Environmental Assessment and Management

(Lee et al., 2018).

### 3.3. Environmental Assessment and Management (14 articles)

#### 3.1. Environmental chemistry (25 articles)

The articles in this section mainly deal with “pollution” in terms of occurrence, distribution and sources, behavior, transport, and fate of legacy and emerging persistent organic pollutants as well as heavy metals. Target environments and media widely encompass surface water, sediments, soils and organisms of rivers, estuaries, and coastal areas in the Yellow Sea. There are two review papers in this section. The first demonstrates the simulated occurrence of perfluorooctane sulfonate (PFOS) in the urbanizing Bohai Rim of China from 1981 to 2050 (Su et al., 2018). While the second review presents the technical advances of nitrogen isotope of amino acids in trophic magnification study (Won et al., 2018). Also, four laboratory works and 19 filed studies are included in this section.

#### 3.2. Ecotoxicology and Human Health (20 articles)

The very section includes general “toxicological subjects” relating to adverse toxic effects and potential risk to ecosystem and human health, with 2 reviews, 5 laboratory based works, and 13 field studies. Two review papers in this section provide an overview of hexabromocyclododecane (HBCDs) in environmental media in China (Cao et al., 2018), and bioaccumulation of organic pollutants in Indo-Pacific humpback dolphin (Sanganyado et al., 2018). Some studies emphasized the importance and significant use of multiple lines of evidences approach, such as novel eDNA bioassessment (Xie et al., 2018a), to assess and integrate adverse effects of multiple stressors (Xie et al., 2018b). It should be also noteworthy that some articles document long-term ecotoxicological effects associated with coastal pollution in the Yellow Sea region

This section contains articles on various subjects primarily related to “policy”, such as ecological risk assessment and management and further environmental sustainability. Couple of review papers demonstrate the long-term changes in ecological qualities against the environmental deterioration due to the rapid and heavy industrialization in the Yellow Sea region (He et al., 2018; Kim et al., 2018). Some other articles highlight the value of ecosystem services, such as regulating and cultural services provided from the coastal areas in the Yellow Sea region and suggest the future management strategy and/or policy guideline (Yim et al., 2018; You et al., 2018).

#### 4. Future directions for the YES networking

Overall, the 59 research articles in this special issue provide the most recent scientific advances in understanding of pollution of coastal environments, potential toxic effects, community responses, integrated assessment, and environmental management of the Yellow Sea, but not limited to this specific region. We believe that the international audience will find our long-term scientific efforts and challenges towards sustainability of the Yellow Sea and its ecosystem services through compact review (12 articles) and various case studies conducted in the field (37 articles) and laboratory (10 articles). Built upon the increasing success of series of 1st to 4th YES during the past four years, we look forward to the next symposium of the 5th YES in Shantou University, in July of 2019 (being chaired by Prof. Wenhua Liu), to further demonstrate and communicate the ongoing progress in the improvement of “Ecosystem Assessment and Management of the Yellow Sea”, through continuing joint efforts between Korea and China.



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Xiaowei Zhang\*  
Nanjing University, China

Jing You  
Jinan University, China

Jong Seong Khim\*\*  
Seoul National University, Republic of Korea

Tieyu Wang  
Chinese Academy of Sciences, China

\* Corresponding author.

\*\* Corresponding author.

E-mail address: zhangxw@nju.edu.cn (X. Zhang).

E-mail address: jskocean@snu.ac.kr (J.S. Khim).

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