



# NEVSLETTER

April-June, 2025





# **NEWSLETTER**

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#### **PREFACE**

Relying on the Faculty of Earth Science and Technology (FEST) of Xiamen University, Fujian Institute for Sustainable Oceans (FISO) draws advantages from its top disciplines including oceanography and ecology, and integrates marine related natural and social sciences such as environment, planning, economics, law, history and management, will serve as a provincial level S&T platform. Designated as a pioneering part of the Fujian Ocean Innovation Center (Fujian-OI), FISO is the key supporting unit of its sustainable ocean hub. In September 2023, FISO was recognized as a key provincial level S&T platform.

Since its establishment in 2020, FISO has been rooted in Fujian province with a focus on marine affairs, consistently striving to build itself into a nationally recognized research institute with international influence and a leading hub for marine research. It provides strategic and decision-making support in both national and local levels, achieving remarkable accomplishments including: the annual release of the Capacity Index of Sustainable Coastal Development for Countries Along the Maritime Silk Road in both Chinese and English since 2021, participation in compiling Eighteen Lectures on Maritime Culture, practices in international and domestic collaborations on marine spatial planning, conducting various capacity building activities on sustainable ocean and coastal development etc.

In the second quarter of 2025, FISO has advanced multiple initiatives focusing on key areas such as international cooperation in marine spatial planning, capacity building on integrated coastal management, and high-quality development of the marine economy. Key efforts included deepening technical collaboration with Indonesia on the marine spatial planning (MSP) project for Balikpapan Bay where its new capital is located, establishing exchange platform for marine governance in the East Asian Seas region, leveraging domestic best practices to support the formulation of China's 15th Five-Year Plan for the marine economy, and producing influential scientific research outcomes with global impact.

#### FISO Team Visits Indonesia for Field Survey and Workshop on the Marine Spatial Planning Project for Balikpapan Bay, Where the New Capital is Located

From May 25 to 29, 2025, at the invitation of the Ministry of Marine Affairs and Fisheries (MMAF) of Indonesia, Professor Li Yangfan, Vice Dean of the Fujian Institute for Sustainable Oceans (FISO), Xiamen University, led a delegation of 7 to visit Indonesia. The purpose was to carry out field survey and technical workshop as part of the Joint Marine Spatial Planning (MSP) project for the Balikpapan Bay area (hereinafter referred to as the "MSP project"), where Indonesia's new capital Nusantara is located. The visit aimed to better understand the current conditions of the study area, and to

discuss the next steps of the MSP project. The delegation included MSP technical team members Research Fellow Luo Meixue, Director of the Fujian Provincial Key Laboratory of Coast and Island Management Technology Study, and Associate Research Fellow Weng Yubin, Deputy Director of the same laboratory.

The team first conducted a field survey in Balikpapan Bay, focusing on key marine spatial conflicts within the MSP project scope. The aim was to gain an in-depth understanding of the status and challenges





related to port construction, industrial and mining activities, fisheries and fishing communities, tourism development, and ecological conservation in the context of Indonesia's new capital development. The team then visited the Balikpapan Mangrove Center, learning about the current status of mangrove conservation and restoration, as well as the region's biodiversity advantages. The team then attended the technical workshop of the MSP Project held at IPB University. The workshop focused on technical discussions, with senior officials and technical staff from MMAF, as well as researchers from IPB and University Gadjah Mada (UGM), presenting and exchanging ideas.

The team also visited MMAF in Jakarta. Mrs. Kartika Listriana, Director General of the Directorate General of Marine Spatial Planning at MMAF, hosted the delegation. She said that the MSP project offers

systematic MSP support for Indonesia's new capital, representing a fruit of maritime cooperation under the Indonesia-China 'Five Pillars' initiative. She expressed hope that the project would serve as a foundation for further collaboration with FISO and Xiamen University. Professor Li Yangfan expressed his gratitude for MMAF's invitation and highlighted that FISO would leverage China's experience in integrated coastal management and marine spatial planning, as well as the multidisciplinary strengths of Xiamen University, to support MSP planning and capacity-building for Balikpapan Bay.

This five-day exchange and field visit marks a critical stage of substantive advancement in the MSP project between FISO and MMAF. Balikpapan Bay is rich in marine and coastal resources and holds strategic value for Indonesia's new capital Nusantara. The MSP Project is supported by China Oceanic Development Foundation (CODF). As the executive organization for the Chinese side and also the technical support unit, FISO collaborates with MMAF to develop marine spatial plans for Balikpapan Bay area, and provide technical and capacity building support, aiming to support the high-level design of marine spatial planning for Indonesia's new capital development.



# Visiting Scholars from Ministry of Marine Affairs and Fisheries, Indonesia Visits FISO



From May 6 to 22, 2025, Ms. Deenisa, Head of Cooperation and Data for Directorate General of Marine Spatial Planning, MMAF of Indonesia, and Ms. Hetty Priyanti Efendi, Coastal Marine and Ecosystem Manager of Coastal and Marine Resources Management Agency of Pontianak, were invited to Fujian Institute for Sustainable Oceans (FISO), Xiamen University, as visiting scholars, to facilitate the smooth progress of the MSP project collaborated between FISO and MMAF.

During their visit to FISO, both sides reported on the current work progress. The Chinese team presented the current status analysis report for Balikpapan Bay and highlighted the challenges and issues facing the study area, while the Indonesian team



shared the existing conditions in the Balikpapan Bay area, including industrial zones and port areas, and elaborated on current sea use conflicts. The two sides also had warm discussions on technical issues, such as shoreline delineation, jurisdiction of different areas, and the development visions of the new capital. The visit yielded fruitful outcomes.



# Training on "Marine Spatial Planning (MSP) Application in the Scaling-up of Integrated Coastal Management (ICM)" Collaborated with PEMSEA Successfully Held in Xiamen

From April 20-26, 2025, the Training on "Marine Spatial Planning (MSP) Application in the Scaling-up of Integrated Coastal Management (ICM)" was held in Xiamen. The training, supervised by the China Oceanic Development Foundation (CODF), was jointly organized by FISO/ Sustainable Coastal Development Capacity-Building Research Lab (SCD Lab) and the Partnerships in Environmental Management for the Seas

of East Asia (PEMSEA). Over 40 researchers from 20 institutions across 11 countries, including Brunei, Cambodia, China, Indonesia, Laos, Malaysia, the Philippines, Singapore, Thailand, Timor-Leste, and Vietnam, participated in the event. Targeting members of the PEMSEA Network of Learning Centers (PNLC) as well as professionals from maritime institutions in the East Asian Seas region, the training aimed

to foster expertise in ICM and MSP by exploring their core concepts, the role of land-sea coordination in MSP, and the development of training frameworks, thereby advancing capacity-building in this field.

Based on in-class lectures and case studies, the participants had field visits to Xiamen's ICM demonstration sites (Baicheng Beach, Yundang Lake, Gaoji Causeway, Xiamen Horticulture Expo Garden, Guanyinshan Beach, and Wuyuan Bay), which allowed them to observe firsthand how ICM and MSP

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tools harmonize ecological restoration, spatial optimization, blue economy development, and biodiversity conservation. The "Xiamen ICM Model" provided valuable insights and reference for coastal governance in their home countries, significantly impressing the participants. Besides, the 7-day training also involved diverse activities such as training simulation, course development and capacity building network discussions, receiving tremendously positive feedback from all participants.



## Joint Research on Blue Economy



From June 24 to 27, 2025, FISO and the Xiamen Academy of Social Sciences jointly conducted a thematic research tour in Qingdao and Shanghai on marine economy development. The study aimed to gain in-depth insights into innovative practices in local marine industries, gathering critical experience to inform the formulation of China's 15th Five-Year Plan for the marine economy and related research initiatives.

The four-day research mission was jointly led by Professor XUE Xiongzhi, Dean of FISO, and Professor XU Long, Vice Dean of the Xiamen Academy of Social Sciences. The research team conducted field investigations in Qingdao's Laoshan District and Huangdao District (West Coast New Area), as well as Shanghai's Lingang New Area, visiting numerous marine high-tech enterprises. Through on-site surveys, facility tours, and roundtable discussions, the team systematically examined innovative practices across multiple sectors including marine biomedicine, information technology, and port logistics. The study focused on evaluating policy impacts on marine economic development, analyzing digital transformation models in marine industries, particularly smart port operations and cold-chain logistics, and collecting best

practices in technological innovation, research commercialization, and management modernization.

Based on this research, FISO will leverage its strengths as an interdisciplinary research platform to enhance collaboration with local governments, research institutions, and enterprises. We are committed to providing knowledge-based and technological support derived from our research outputs to contribute to China's 15th Five-Year Plan for the marine economy and promote high-quality development in this sector.

#### **Policy Brief Highlights**

In November 2019, the Fujian Provincial Bureau of Ocean and Fisheries, acting on behalf of the Fujian Provincial Government, entered into a strategic cooperation agreement with Xiamen University to jointly establish the Fujian Institute for Sustainable Oceans (Xiamen University). Since its inception, FISO has been committed to providing scientific and technological support for Fujian's initiative to become a leading marine province, and has achieved significant progress. In light of these accomplishments, the Fujian Provincial Bureau of Ocean and Fisheries and Xiamen University have agreed to extend the agreement for a new term since March 2025.

As a provincial-level interdisciplinary science and technology platform, FISO is committed to translating research outcomes into policy recommendations, providing evidence-based support to governments at all levels. During the first half of 2025, FISO members submitted a total of 12 policy briefs, encompassing a broad spectrum of issues. Among them, 9 were adopted by provincial/ministerial-level authorities, and 3 received written instructions from senior officials at or above the provincial/ministerial level.

#### **SELECTED RESEARCH PROGRESS:**

#### **Eighteen Lectures on Marine Culture**

Eighteen Lectures on Marine Culture, a comprehensive introductory textbook on ocean studies edited by Academician Dai Minhan, was recently published by Xiamen University Press. As the Chief Scientist of FISO, Academician Dai anchors the book in the core philosophy that "One must know the ocean to govern it wisely", emphasizing maritime civilization constitutes the bedrock of China's land-sea-integrated cultural identity. Aligned with China's national strategy of "building a strong maritime nation", the book leverages Xiamen University's interdisciplinary strengths to synthesize expertise from marine science, humanities, economics, law, and other fields. It spans oceanography, environmental science, history, and more, marking China's first comprehensive general-education textbook on marine studies for university students. Through a multidisciplinary lens, its eighteen lectures



systematically elucidate the ocean's natural attributes, civilizational evolution, and contemporary value, highlighting strategic imperatives via cases like the technological breakthroughs of the "Striver" deep-sea submersible to cultivate students' maritime awareness.

The editorial team was led by Academician Dai Minhan, who oversaw the framework and spearheaded the "Natural Ocean" section, covering marine geography and physical oceanography to provide readers with foundational knowledge. Professor Xue Xiongzhi, as co-lead of Part V, authored two lectures: "Scientific Ocean Governance" and "Integrated Oean Management: Theory and Chinese Practices", offering systematic analyses of management frameworks and case studies. Professor Shi Yubing, another co-lead of Part V, contributed to Lecture 18, "Maritime Legal Systems and Rights Protection", delving into international treaties, regional governance, and sovereignty disputes. Professors Sun Chuanwang and Zhang Zengkai jointly co-led Part IV and were responsible for "The Ocean and Modern Society" part, addressing marine technology, resource development, and sustainable economies. Six universities in Fujian Province will pilot courses based on this textbook, tailoring content to their disciplines, thereby providing cultural and intellectual support for China's maritime development goals.

#### **SELECTED RESEARCH PROGRESS:**

### Ocean Economic Input-Output Tables of Coastal Provinces in China

A research team led by Prof. Zhang Zengkai from FISO, in collaboration with multiple domestic research institutions, compiled an ocean economic input-output (IO) table for China's coastal provinces. This work provides an open-access dataset for studies in the field of marine economy and management in China, with potential applications in integrated socio-economic and natural ecological systems research related to the ocean. The research progress was published in *Scientific Data* under the title "Ocean Economic Input-Output Tables of Coastal Provinces in China."

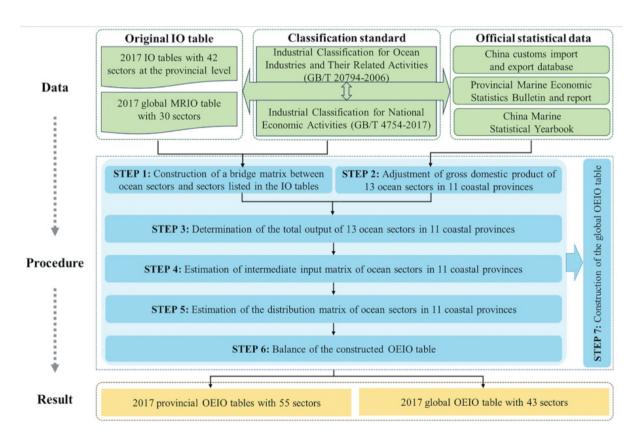


Figure: Construction process of OEIO tables of coastal provinces in China

#### **Research Background**

The ocean economy refers to the totality of ocean and ocean-related industrial activities that aim for the development, utilization and protection of the ocean. Many coastal countries have prioritized the development of their ocean economies as a fundamental strategy, positioning ocean sectors as the convergence zone for both international competition and cooperation. The ocean economy is serving as a new engine for China's economic development, with a particularly prominent impact on the economic growth of Chinese coastal provinces. In 2023, China's gross ocean product (GOP) reached 9.9 trillion yuan, accounting for 7.9% of the country's GDP.

In 1936, Wassily Leontief proposed the input-output analysis model, which provided a practical economic methodology for studying interdependencies among sectors of

social production, particularly for systematically analyzing intricate economic transactions between industries. After its introduction to China, the input-output model has been extensively applied in analyzing the country's economic realities and has served as a crucial reference for economic decision-making across different periods. The input-output table, serving as the data foundation of this model, is essentially a balanced accounting framework that reflects inter-sectoral linkages and proportional equilibrium relationships during a given period. However, the input-output tables published by statistical authorities still adhere to traditional sectoral classifications, making it difficult to capture the heterogeneity between marine and terrestrial sectors, a limitation that poses significant challenges for conducting comprehensive and nuanced analyses of the marine economy.

#### **Research Results**

We constructed the OEIO datasets of China's coastal province in 2017, based on the official provincial IO tables published by the National Bureau of Statistics and the global MRIO table published by OECD that contains Chinese provinces. The processes of separating the characteristics of the ocean economy entail seven key steps: (1) We constructed a bridge matrix linking 13 ocean sectors with 42 sectors listed in the provincial IO tables based on Industrial Classification

for Ocean Industries and Their Related Activities (GB/T 20794-2006) and Industrial Classification for National Economic Activities (GB/T 4754-2017). (2) We collected the gross domestic product of ocean economy at the sectoral and provincial level respectively, and adjusted the data to maintain consistency in total values. (3) We estimated the total outputs of ocean sectors in coastal provinces based on the gross domestic product and value-added rates derived from

micro-level enterprise data. (4) We estimated the intermediate input matrix of ocean sectors based on the stripping coefficients, which are calculated as the ratio of the output of ocean sectors to the output of corresponding sectors in the official IO tables. (5) We estimated the distribution matrix of ocean sectors in coastal provinces based on the stripping coefficients calculated in the previous step. (6) We adopted the RAS method to balance the constructed provincial OEIO tables. (7) We repeated the above steps

to differentiate the Chinese ocean sectors in a global MRIO table that contains Chinese provinces.

This open-source dataset offers significant analytical potential for marine economic accounting systems, inter-sectoral linkage analysis in marine industries, environmental impact assessments of marine economic activities etc., providing robust support for marine economy evaluation and management policy formulation.

The full text of this research is available at: https://www.nature.com/articles/s41597-025-05221-3 The dataset is available for download at: https://doi.org/10.6084/m9.figshare.27959550



## Reflections on My Academic Journey at Xiamen University

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Sponsored by Xiamen University Coastal Sustainable Development Scholarship

Choosing Xiamen University (XMU) for my postgraduate studies was a decision grounded in academic ambition and strategic alignment with my research interests. XMU has long been recognized as one of the most prestigious universities in China, known not only for its outstanding academic reputation

nationally but also for its growing prominence on the global stage. As someone deeply involved in the field of fisheries science and coastal resource management, I found XMU to be a natural choice, given its strong programs in marine and environmental sciences and its robust

research ecosystem focused on coastal studies.

One of the most valuable applied learning experiences I had was participating in the marine spatial planning training program focused on Balikpapan Bay, Indonesia. In this program, I assisted in the exchange and discussion between the two sides, especially on the overview of the ecological and socio-economic conditions of the bay and to compare them with the successful coastal management initiatives implemented in Xiamen. Balikpapan Bay is a complex area where small-scale fisheries operate in close proximity to heavy maritime traffic and large-scale industrial activities such as mining and gas production. In contrast, Xiamen has demonstrated remarkable success in managing its coastal industrial zones in harmony with environmental conservation efforts. This comparative perspective allowed me to reflect on how lessons from Xiamen particularly in balancing industrial development with ecosystem sustainability could be adapted and applied in Balikpapan and other similar regions in Indonesia.

In addition, one of the key lessons I learned at XMU was the shift from sectoral-based

management toward integrated coastal management. The curriculum provided a clear progression from single-sector resource management to multidisciplinary and ecosystem-based approaches. This transition helped me understand the importance of harmonizing multiple uses of coastal zones under a unified framework. As a vast archipelagic country, integrated coastal management is critical for both environmental sustainability and community resilience in Indonesia. With this knowledge, I am now better equipped to teach my students about these concepts both in theory and in practice, helping to build the next generation of coastal managers.

The knowledge and experience I gained at XMU have significantly contributed to shaping my academic and professional trajectory. It has not only deepened my expertise in coastal and fisheries management but also broadened my worldview and reinforced my commitment to academic excellence. I am sincerely grateful to the faculty, staff, and fellow students at XMU for their support, and I look forward to contributing to the growing legacy of this distinguished institution.