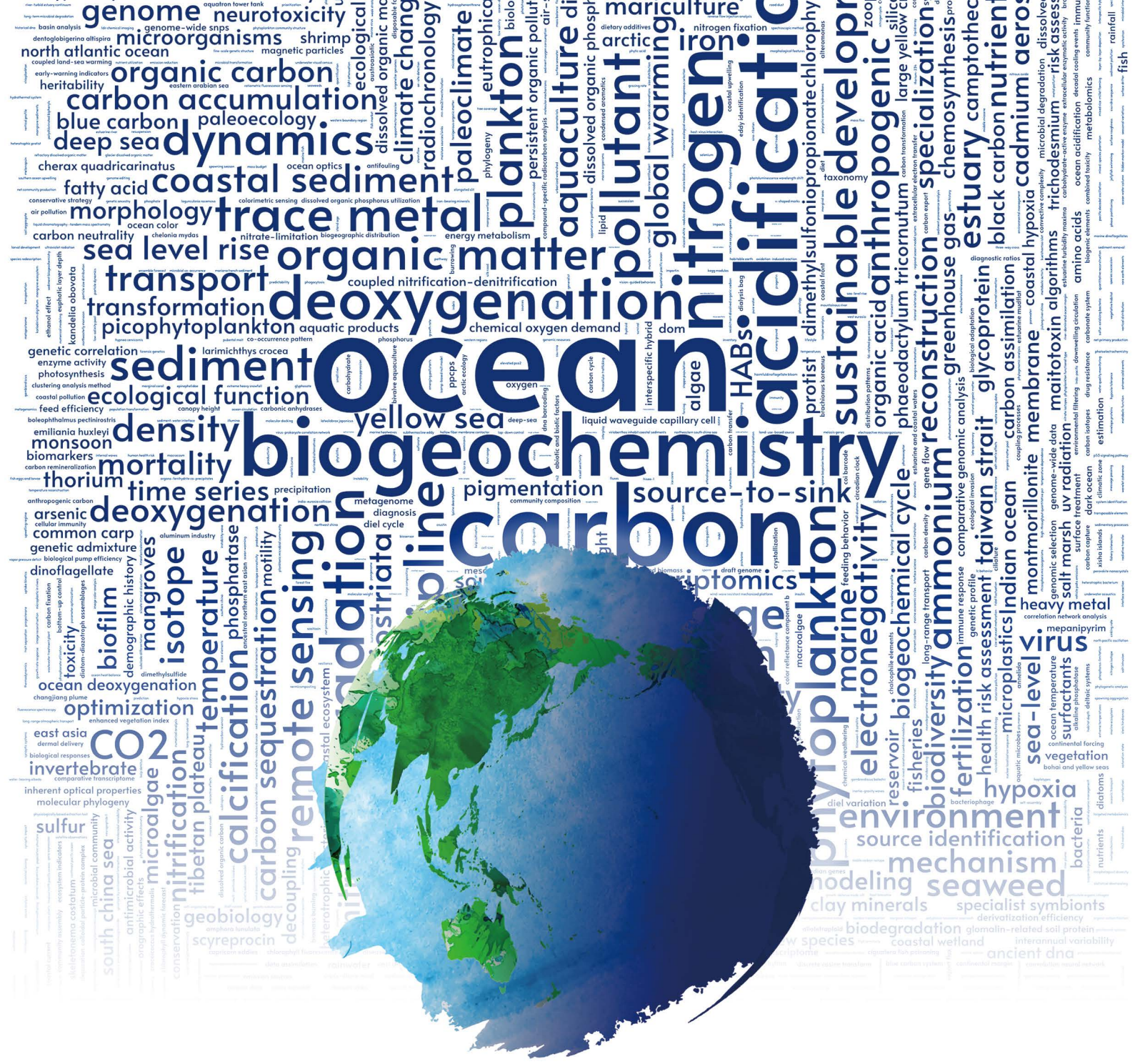


2022

ANNUAL REPORT

近海海洋环境科学国家重点实验室（厦门大学）

State Key Laboratory of Marine Environmental Science
(Xiamen University)

MEL INTRODUCTION

The Laboratory of Marine Environmental Science (MEL) was formally promoted to a state key laboratory in March 2005 and specializes in marine environmental science research. It was recognized as one of the best state key laboratories in the last two nation-wide reviews (2010 and 2015) by the Ministry of Science and Technology (MOST).

To meet the nation's strategic needs of carbon-neutrality, an ocean powered country and ecological civilization, MEL is dedicated to cutting-edge and interdisciplinary research related to global and regional environmental changes focused on marine biogeochemistry and its ecosystem dynamics. The ultimate goal of MEL is to be an internationally recognized institution in advanced marine environmental research and a platform for fostering talent and academic cooperation.

MEL ACADEMIC COMMITTEE

Honorary Director

Dunxin Hu

Director

Lixin Wu

Associate Directors

Congqiang Liu
Nianzhi Jiao

Members

Fei Chai
Bojie Fu
Zhengtang Guo
Zhimin Jian
Paul K.S. Lam
Weibo Song
Qisheng Tang
Fan Wang
Hui Wang
Ching-Ling Wei
Si Zhang
Meixun Zhao
Tong Zhu
Yongguan Zhu

MEL LEADERSHIP TEAM

Honorary Directors

Huasheng Hong
Minhan Dai

Director

Dalin Shi

Associate Directors

Yao Zhang
Zhiyu Liu
Zhimian Cao
Jian Ma
Mengmei Lin

CONTENTS

01 A MESSAGE FROM THE DIRECTOR

03 2022 HEADLINES

05 FIGURES AT A GLANCE

07 MEL HIGHLIGHTS

- 09 RESEARCH
- 23 PROJECTS
- 31 EDUCATION

35 MEL AFIELD

41 MEL SYNERGY

47 MEL IN THE COMMUNITY

51 ADVANCING SCIENCE THROUGH INNOVATION

57 MEL - A NEW LOOK

63 APPENDIX

A MESSAGE FROM THE DIRECTOR

On the 18th anniversary of its promotion to state key lab status, I am honored to be appointed the Director of the State Key Laboratory of Marine Environmental Science (MEL). It is my pleasure to take the torch from my predecessors and work with our committed and talented professionals who will, with an eye toward the global frontiers of science and technology and the significant needs of the country, lead MEL toward innovation driven development.

We have been inspired by the pioneering work and achievements of our colleagues over the past year. Prof. Yonglong Lu was elected a foreign member of the Russian Academy of Sciences and also appointed a fellow of the International Science Council. Prof. Minhan Dai was awarded the 2022 Axford Medal from the Asia Oceania Geosciences Society (AOGS). Prof. Zhiyu Liu received the Zeng Chengkui Marine Science and Technology Award for Young Scientists. Prof. Caihuan Ke received the Zhang Fusui Shellfisheries Award for Outstanding Contributions. Prof. Peng Xu and Prof. Qiang Zheng received the NSFC Fund for Distinguished Young Scholars and the NSFC Fund for Excellent Young Scientists respectively.

MELers have worked hard in 2022 and reaped the fruits of their research outcomes. 42 government-sponsored projects, including 3 National Major Research and Development Programs and 2 NSFC Major Research Plan Programs were awarded to MEL, approaching 70 million RMB in funding. On May 23, the NSFC Basic Science Center of Ocean Carbon Sink and Biogeochemical Processes, led by Prof. Nianzhi Jiao, was launched, serving as the first Chinese NSFC Basic Science Center in the marine science field.

As always, we have broadened our research scope and achieved breakthroughs this year. My own research group found out the nutrient regulation of biological nitrogen fixation across the tropical western North Pacific. Prof. Shuh-Ji Kao's research group suggested that epipelagic nitrous oxide production offsets carbon sequestration by the biological pump. Prof. Senjie Lin's research group defined trypsin as a coordinate regulator of N and P in marine phytoplankton. Prof. Yonglong Lu's research group explored the stress put on coastal ecosystems by climate and anthropogenic drivers of multiple pollutants. In 2022, 2 technical protocols for air-sea CO_2 flux monitoring and assessment, and 4 measurement protocols for online determination of trace nutrients in seawater developed by our colleagues were approved by the National Marine Standardization Technical Committee and released by the Ministry of Natural Resources.

The advance of MEL's space-based, sea-based, land-based, and underwater multi-dimensional ocean observation system and technical support system equips us to sail further. HiSea-1 and HiSea-2, producing nearly 10 thousand images this year, provided emergency monitoring for global events. The research vessel Tan Kah Kee carried out 5 research cruises, totaling 205 working days at sea and sailing more than 23,000 nauticalmiles. Alongside the research, development and testing of the 2nd Generation Coral Ecosystem Cabled Observatory (CECO-II) was carried out by the National Observation and Research Station for the Taiwan Strait Marine Ecosystem (T-SMART) team in Dongshan. The Center of Major Equipment and Technology (COMET) continued providing efficient technical support.

MEL never stops building a maritime community with a shared future. In 2022, Prof. Nianzhi Jiao initiated Global Ocean Negative Carbon Emission (ONCE), endorsed as one of the UN Ocean Decade programs based on the global consensus on carbon neutrality. The Surface Ocean—Lower Atmosphere Study (SOLAS) International Office (China) was dedicated to providing a platform for collaboration and coordination. Of course, global dialogues took place during the international conferences we hosted, including the 8th International Ra-Rn Workshop and the 4th Open Science Symposium on Western Pacific Ocean Circulation and Climate.

Finally, MEL did and always will keep preparing new blood for the development of the marine cause. In 2022, the MEL Marine and Environmental International Joint Training Program received consistent special funds from the China Scholarship Council. Joint educational programs with the Faculty of Science of The University of Hong Kong, Outstanding Postdoctoral Fellowship, Ph.D. Fellowship, and MEL Summer Undergraduate Research Fellowship provided further learning and communication opportunities. Executed by COSEE China and the 70.8 Media Lab, various events and outreach products such as Xiamen University's Ocean Science Day, Junior Blue Pioneer Training Program and Marine Lecturers Program were carried out. MEL has moved forwards to advance the marine science communication 2.0 era.

2023 will be a year of renewal and openness; it will also be an essential time for MEL's restructuring. We are ready for a new start. Therefore, as we close out another year and welcome a new one, I'd like to extend my greeting to our colleagues and friends at home and abroad who have always been concerned with the growth of MEL. Wish you all the best!

Dalin Shi, Director
December 31, 2022

2022 HEADLINES

January

- MEL's leadership team was newly appointed, with Dalin Shi as the new director and Yao Zhang, Zhiyu Liu, Zhimian Cao, Jian Ma and Mengmei Lin as associate directors.

- HiSea-1 and HiSea-2 satellites are operating stably in orbit. They have carried out a total of over 10,000 imaging missions. In January, the HiSea satellites relayed attention to the impact of the Tonga volcanic eruption on the ecological environment of the surrounding seas, demonstrating their application capabilities in emergency response and disaster prevention and mitigation.

Feburary

- Dalin Shi's research entitled "Nutrient regulation of biological nitrogen fixation across the tropical western North Pacific" was published in *Science Advances*. It suggests that Fe:N supply ratio is an important factor regulating biological nitrogen fixation in the tropical and subtropical western North Pacific.

March

- Minhan Dai's group was invited to publish a review article entitled "Carbon fluxes in the coastal ocean: Synthesis, boundary processes and future trends" in the *Annual Review of Earth and Planetary Sciences*. It examines the current understanding of the global coastal ocean carbon cycle and provides a new quantitative synthesis of air-sea CO_2 exchange.

April

- Nianzhi Jiao received the Xiamen University Nanqiang Outstanding Contribution Award.
- Minhan Dai, Hongyue Dang, Kunshan Gao, Huasheng Hong, Nianzhi Jiao, Senjie Lin, Xi Chen, Rongrong Ji, Xiangyang Liu, and Chuanchao Wang were listed among the "Highly Cited Chinese Researchers of 2021" by Elsevier.

June

- Yonglong Lu was elected a foreign academician of the Russian Academy of Sciences in June, and was elected a Fellow of the International Council for Science in December.
- The 8th International Ra-Rn Workshop, hosted by MEL and explored the latest advances in the use of radium and radon tracers and technologies in oceanography and provided insightful perspectives for relevant scientists, managers, and policymakers.
- Based on the global consensus on carbon neutrality and international research frontiers on ocean negative carbon emissions, Nianzhi Jiao led the launch of Global ONCE, a UN Ocean Decade Program.

- MEL hosted the 2022 Annual Meeting of the China Council for International Cooperation on Environment and Development, "Ocean Governance-Past and Future", and made several policy recommendations related to marine economic development and environmental protection.
- Minhan Dai received the Axford Medal Award from the Asia Oceania Geosciences Society (AOGS).

July

- Senjie Lin's research entitled "Trypsin is a coordinate regulator of N and P nutrients in marine phytoplankton" was published in *Nature Communications*. It revealed a new mechanism of coordinated nitrogen and phosphorus utilization mediated by marine phytoplankton trypsin.

August

- Peng Xu received the NSFC Fund for Distinguished Young Scholars; Qiang Zheng received the NSFC Fund for Excellent Young Scientists.

September

- The "Surface Ocean-Lower Atmosphere Study (SOLAS)" International Project Office (China) co-organized the 8th SOLAS International Open Science Conference.

- The MEL team presided over the development of 2 technical protocols for air-sea CO_2 flux monitoring and assessment, and 4 measurement protocols for online determination of trace nutrients in seawater which were approved by the National Marine Standardization Technical Committee and released by the Ministry of Natural Resources.

October

- MEL locally organized the 4th Open Science Symposium on Western Pacific Ocean Circulation and Climate, which attracting 260 experts and scholars from home and abroad.

November

- Dalin Shi's research entitled "Phosphate limitation intensifies negative effects of ocean acidification on globally important nitrogen fixing cyanobacterium" was published in *Nature Communications*. It revealed the inhibitory effect and mechanism of phosphorus restriction on nitrogen fixation of *Trichomonas fasciatus* by intensifying ocean acidification.
- The 2022 Maritime Silk Road International Conference on the Cooperation and Integration of Industry, Education, Research and Application Sub-forum on Marine Technology and Engineering was held virtually and in person to promote the development of emerging marine industries towards low carbon practices.
- The Academic Committee Meeting of the National Observation and Research Station for the Taiwan Strait Marine Ecosystem (T-SMART) was held in Dongshan.
- Caihuan Ke received the Zhang Fusui Shellfisheries Award for Outstanding Contributions; Zhiyu Liu was awarded the Zeng Chengkui Marine Science and Technology Award for Young Scientist.
- SOLAS International Project Office (China) co-organized a side event at 27th Conference of the Parties to the United Nations Framework Convention on Climate Change (COP27) on "Wildfire increase, a challenge for Earth system and societies" to discuss fire risk from a natural and social science view.

December

- Yonglong Lu was invited by the 15th Conference of the Parties (COP15) of the United Nations Convention on Biological Diversity (CBD) to jointly publish an editorial article on "Curtailing the Collapse of the Living World" in *Science Advances*.
- Shuh-Ji Kao's research entitled "Epipelagic nitrous oxide production offsets carbon sequestration by the biological pump" was published in *Nature Geoscience*. It suggests that the nitrogen regeneration cycle triggered by the mineralization of organic matter in the epipelagic ocean will actively release N_2O, which can offset the greenhouse effect reduced by~10% of carbon sequestration and CO_2 absorption by the biological pump.
- The R/V Tan Kah Kee continues to provide advanced equipment and technical support for marine scientific research. It has carried out 5 research cruises, totaling 205 working days at sea and sailing more than 23,000 nautical miles.

FIGURES AT A GLANCE

PROJECTS

42 Newly Funded Projects

1 UN Ocean Decade Endorsed Program

3 National Key Research and Development Programs

2 NSFC Major Research Plan Programs

2 NSFC Talent Programs

4 NSFC Joint Fund/ NSFC Fund for International Scientists

16 NSFC General Programs and Young Scientist Fund Projects

5 Other National Programs

9 Other Programs

NEW MEMBERS

4 Faculty

4 Research Scientists

5 Outstanding Postdoctoral Fellows

21 Research Assistants

4 Administrative Staff

EDUCATION

301 Enrolled Postgraduates

345 Enrolled Doctoral Students

66 Master's Graduates

56 Ph.D. Graduates

BROADER IMPACTS

24+
Outreach Programs

338
Wechat Posts

EXCHANGES AND COLLABORATIONS

16
Conferences, Meetings, Trainings Hosted

61
Invited Talks in National / International Conferences

19
Newly Appointed in Journals

36%
International Joint Publications

24
Visiting Scholars

31
Newly Appointed in Organizations or Associations

CRUISES

79
Cruises

525
People

1130
Days at Sea

Ranging form the NW Pacific to the East China Sea, South China Sea, and the sea area near Fujian.

450
Papers Published

2
Books

3
Chapters

3
Journal Special Issues

6
Marine Industry Standards

29
Patents and Software Copyrights


MEL
HIGHLIGHTS

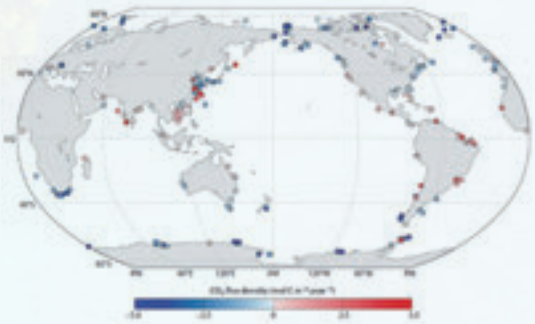
RESEARCH

The joy of scientific research lies in discovery, intensive exploration, and revealing the mysteries of the ocean.

- **SCOPE 1: Marine Geochemistry: Processes and Fluxes**
- **SCOPE 2: Marine Ecology: Processes and Mechanisms**
- **SCOPE 3: Marine Environmental Change: Processes and Effects**
- **SCOPE 4: Ocean Dynamics and Land-Ocean-Atmosphere Interactions**
- **SCOPE 5: Marine Ecosystem Integration and Sustainable Development**
- **SCOPE 6: Marine Microbial Carbon Pump and Carbon Neutralization**

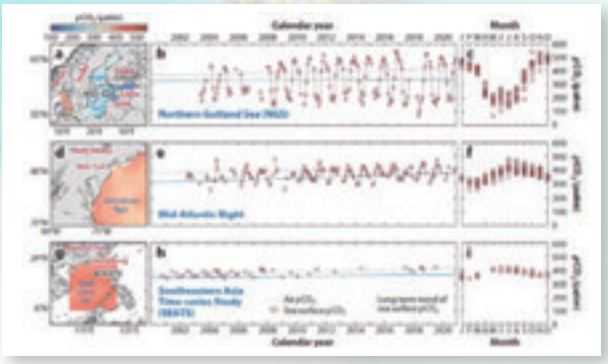
Carbon Fluxes in the Coastal Ocean: Synthesis, Boundary Processes and Future Trends

The ocean is an important carbon sink, taking up CO_2 that is released into the atmosphere by anthropogenic activities such as fossil fuel burning and land use changes. Besides the crucial role of the "natural" ocean sink for anthropogenic CO_2, ocean-based CO_2 removal techniques could contribute to climate change mitigation and help meet the Paris Agreement goals of limiting global warming well below 2°C. As the coastal ocean is a hotspot for the transformation of carbon pools, it is vital to understand the complex processes that take place at the land-ocean interface and how these systems respond to future changes (such reaching net-zero emissions or employing CO_2 removal techniques). However, coastal ocean processes are complex and can vary seasonally, temporally, and spatially, which makes its inclusion in Earth system models, and consequently climate policies, challenging.



Updated sea-air CO_2 flux density in the global coastal oceans.

The shelf surface area (gray bars), CO_2 flux density (colored circles), and spatially integrated CO_2 flux (red and blue bars) estimated for the seven shelf classes and global shelves.



Spatial, long-term, and seasonal variability of sea surface pCO_2 in (a–c) the Baltic Sea, (d–f) the Mid-Atlantic Bight, and (g–i) the South China Sea.

Our recent work published in the *Annual Review of Earth and Planetary Sciences* attempts to shed a light on the current understanding of the coastal ocean carbon cycle, with a focus on the air-sea CO_2 exchange, at the regional and global scales. Based on a data synthesis of CO_2 flux estimates from 214 sites, we estimate that the coastal ocean carbon sink globally takes up 0.25±0.05 Pg C per year. Notably, the greatest removal of atmospheric CO_2 (>90%) was found in polar and subpolar regions.

By developing a framework that includes both the river-dominated ocean margin and ocean-dominated margin systems, the researchers were able to conceptualise the exchanges, boundary transport, and biogeochemical reactions that form part of the coastal ocean carbon cycle. The study also showcases how surface CO_2 concentration varies in three distinct coastal regions (namely the Baltic Sea, Mid-Atlantic Bight, and South China Sea) are well covered with observations. Our results indicate that physical and/or biogeochemical processes other than the abiotic atmospheric CO_2 can be important controls on the evolution of air-sea CO_2 exchanges in specific coastal regions. Ocean carbon models that range from box models to three-dimensional coupled circulation-biogeochemical models are reviewed in terms of the ability to simulate key processes and project future changes in different continental shelf regions. Common unresolved challenges remain for the implementation of these models across RiOMar and OceMar systems. Long-term changes in ocean carbon fluxes since pre-industrial times were revealed by both observations and numerical model simulations, which are expected to continue until and even after net-zero emissions are reached, although large uncertainties are associated with impacts arising from concurrent changes in the land-ocean-atmosphere coupled system.

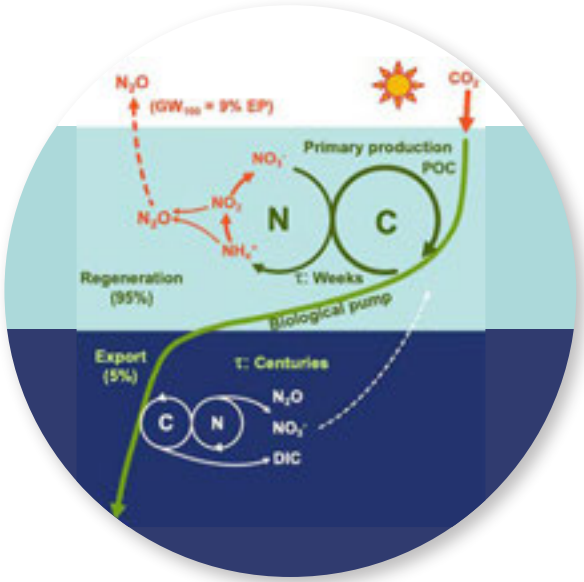
Reference

Dai, Minhan*; Su, Jianzhong; Zhao, Yangyang; Hofmann, Eileen E.; Cao, Zhimian; Cai, Wei-Jun; Gan, Jianping; Lacroix, Fabrice; Laruelle, Goulven G.; Meng, Feifei; Mueller, Jens Daniel; Regnier, Pierre A. G.; Wang, Guizhi; Wang, Zhixuan. Carbon fluxes in the coastal ocean: synthesis, boundary processes and future trends. *ANNUAL REVIEW OF EARTH AND PLANETARY SCIENCES*. 2022. 50: 593-626.

Epipelagic Nitrous Oxide Production

Offsets Carbon Sequestration by the Biological Pump

The removal of carbon dioxide from the atmosphere by the marine biological pump is a key regulator of Earth's climate; however, the ocean also serves as a large source of nitrous oxide, a potent greenhouse gas and ozone depleting substance. Although biological carbon sequestration and nitrous oxide production have been individually studied in the ocean, their combined impacts on net greenhouse forcing remain uncertain. Here we show that the magnitude of nitrous oxide production in the epipelagic zone of the subtropical ocean covaries with remineralization processes, and thus acts antagonistically to weaken the radiative benefit of carbon removal by the marine biological pump. Carbon and nitrogen isotope tracer incubation experiments and nitrogen isotope natural abundance data indicate enhanced biological activity promotes nitrogen recycling, leading to significant nitrous oxide production via both oxidative and reductive pathways. These shallow water nitrous oxide sources account for nearly half of the air-sea flux and counteract 6-27% (median 9%) of the greenhouse warming mitigation achieved by carbon export via the biological pump.



Schematic of the proposed linkage between surface N_2O production and CO_2 removal by the biological pump. Carbon and nitrogen undergo rapid cycling in the epipelagic ocean and slow cycling in the ocean's interior. During the operation of biological pump processes, only a small fraction of newly produced organic matter (in our study, only around 5% of primary production) was exported to depth. This export drives slow recycling of C and N, during which N_2O and CO_2 are produced and accumulate at longer timescales (centuries to millennia) before exchanging with the atmosphere. In contrast, most of the newly produced organic matter is rapidly remineralized (days to weeks) in the epipelagic ocean to drive intense recycling of C and N, during which N_2O is produced through both oxidative and reductive pathways and emitted to the atmosphere. This more rapid recycling in the epipelagic waters can offset a substantial part (6-27%, median 9%) of the decreased radiative forcing due to biological CO_2 removal to depth in our study.

References

Wan, Xianhui Sean; Sheng, Hua-Xia; Dai, Minhan; Zhang, Yao; Shi, Dalin; Trull, Thomas W.; Zhu, Yifan; Lomas, Michael W.; Kao, Shuh-Ji*. Ambient nitrate switches the ammonium consumption pathway in the euphotic ocean. *NATURE COMMUNICATIONS*. 2018. 9, 915.

Wan, Xianhui S.; Sheng, Hua-Xia; Dai, Minhan; Casciotti, Karen L.; Church, Matthew J.; Zou, Wenbin; Liu, Li; Shen, Hui; Zhou, Kuanbo; Ward, Bess B.; Kao, Shuh-Ji*. Epipelagic nitrous oxide production offsets carbon sequestration by the biological pump. *NATURE GEOSCIENCE*. 2022. 16, 29-36.

Biodegradation of Terrigenous Organic Matter in A Stratified Large-Volume Water Column:

Implications of the Removal of Terrigenous Organic Matter in the Coastal Ocean

Large amounts of terrigenous organic matter (TOM) are delivered to the ocean every year. However, the removal processes of TOM in the ocean are still poorly constrained. We here report results from a 339-day dark incubation experiment with a unique system holding a vertical stratified freshwater-seawater column. The quality and quantity of dissolved organic matter (DOM), RNA-based size-fraction microbial communities and environmental factors were high-frequency monitored. Microbial processes impacted TOM composition, including increased DOM photobleaching rate with incubation time. The mixed layer had changed bacterial community structure, diversity, and higher oxygen consumption rate. A two-end member modeling analysis suggested that estimated nutrient concentrations and prokaryotic abundance were lower, and total dissolved organic carbon was higher than that of the measured values. These results imply that DOM biodegradation was stimulated during freshwater-seawater mixing. In the bottom layer, fluorescent DOM components increased with the incubation time and were significantly positively related to highly unsaturated, oxygenated, and presumably aromatic molecular formulas. These results suggest that surfaced-derived TOM sinking leads to increased DOM transforming and likely results in carbon storage in the bottom water. Overall, these results suggested that microbial transforming TOM play more important biogeochemical roles in estuaries and coastal ocean than what we know before.

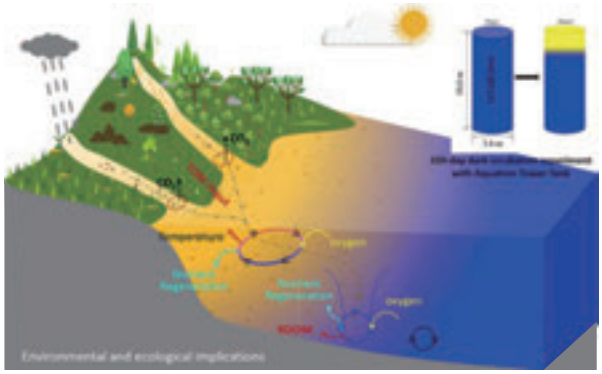


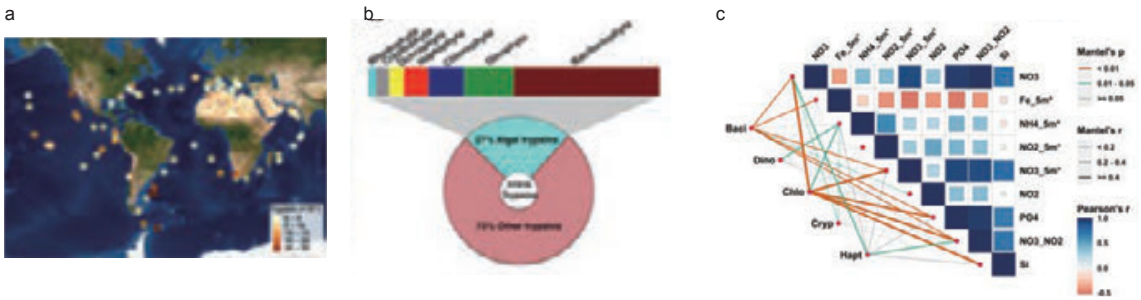
Diagram of microbial transforming terrigenous organic matter in the coastal ocean. Freshwater-seawater mixing enhanced DOM mineralization coupled with inorganic nutrients regeneration and oxygen consumption, and terrigenous materials input stimulated microbial activity and accelerated RDOM production and oxygen utilization.

Reference

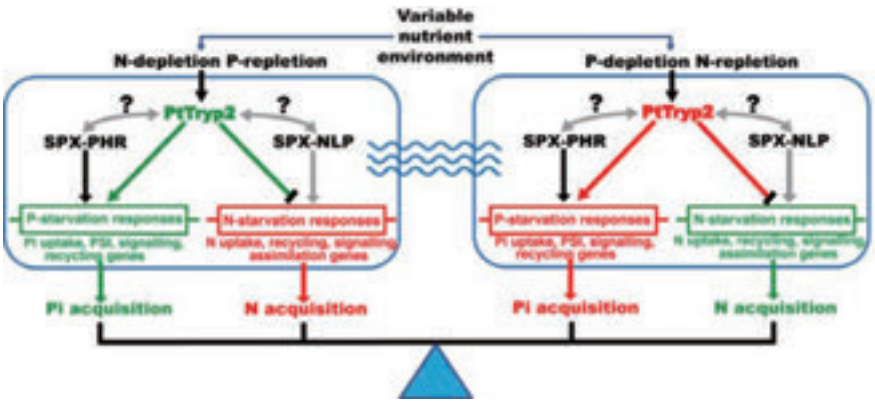
Xiao, Xilin; Powers, Leanne C.; Liu, Jihua; Gonsior, Michael; Zhang, Rui; Zhang, Lianbao; MacIntyre, Hugh L.; Chen, Xiaowei; Hu, Chen; Batt, John; Shi, Qiang; Xu, Dapeng; Zhang, Yao; Jiao, Nianzhi*. Biodegradation of terrigenous organic matter (TOM) in a stratified large-volume water column: implication of the removal of TOM in estuarine systems. *ENVIRONMENTAL SCIENCE & TECHNOLOGY.* 2022. 56, 5234-5246.

Trypsin is A Coordinate Regulator of N and P Nutrients in Marine Phytoplankton

Trypsin is best known as a digestive enzyme in animals, but remains unexplored in phytoplankton. Using *CRISPR/Cas9* mediated-knockout and overexpression analyses, we revealed that trypsin *in Phaeodactylum tricornutum (PtTryp2)* functions to repress N acquisition, but its expression decreases under N-deficiency to promote N acquisition. However, *PtTryp2* promotes PO_4^{3-} uptake per se, and its expression increases under P-deficiency to further reinforce P acquisition. *PtTryp2* knockout also led to amplitude magnification of the NO_3- and PO_4^{3-} uptake "seesaw", whereas *PtTryp2* overexpression dampened it, linking *PtTryp2* to stabilizing N:P stoichiometry. This indicates that *PtTryp2* is a coordinate regulator of N:P stoichiometric homeostasis and opens a window for deciphering how phytoplankton adapt to nutrient-variable marine environments.



Widespread occurrence and environmental stimuli responsiveness of trypsin in global marine phytoplankton. (a) Wide geographic distribution of trypsin in phytoplankton found in *Tara* Oceans. (b) Wide taxonomic distribution of trypsin in algae found in PhyloDB. (c) Environmental nutrient drivers of phytoplankton trypsin abundance.

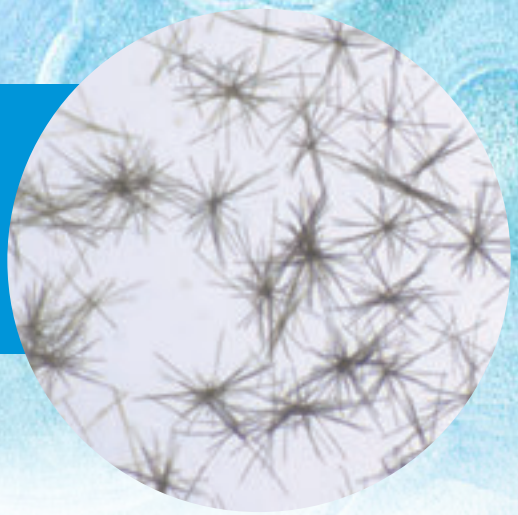


Hypothetical model depicting the role of *PtTryp2* in balancing N and P uptake and intracellular contents.

Reference

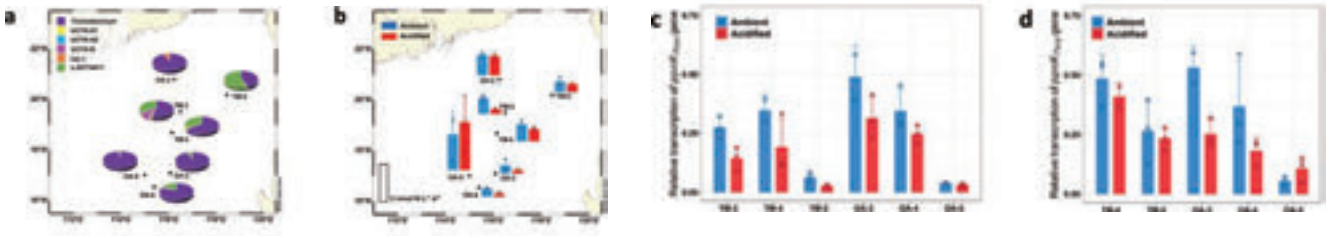
You, Yanchun; Sun, Xueqiong; Ma, Minglei; He, Jiamin; Li, Ling; Porto, Felipe Wendt; Lin, Senjie*. Trypsin is a coordinate regulator of N and P nutrients in marine phytoplankton. *NATURE COMMUNICATIONS.* 2022. 13, 4022.

Phosphate Limitation Intensifies Negative Effects of Ocean Acidification on Globally Important Nitrogen Fixing Cyanobacterium



Trichodesmium colonies.

Growth of the prominent nitrogen-fixing cyanobacterium *Trichodesmium* is often limited by phosphorus availability in the ocean. How nitrogen fixation by phosphorus-limited *Trichodesmium* may respond to ocean acidification remains poorly understood. Here, we use phosphate-limited chemostat experiments to show that acidification enhanced phosphorus demands and decreased phosphorus-specific nitrogen fixation rates in *Trichodesmium*. The increased phosphorus requirements were attributed primarily to elevated cellular polyphosphate contents, likely for maintaining cytosolic pH homeostasis in response to acidification. Alongside the accumulation of polyphosphate, decreased NADP(H):NAD(H) ratios and impaired chlorophyll synthesis and energy production were observed under acidified conditions. Consequently, the negative effects of acidification were amplified compared to those demonstrated previously under phosphorus sufficiency. Estimating the potential implications of this finding, using outputs from the Community Earth System Model, predicts that acidification and dissolved inorganic and organic phosphorus stress could synergistically cause an appreciable decrease in global *Trichodesmium* nitrogen fixation by 2100.



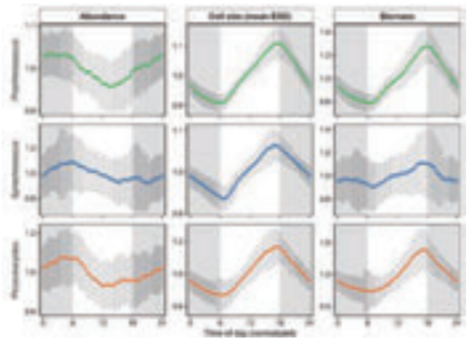
The effect of ocean acidification on natural *Trichodesmium* populations in the northern South China Sea surface seawater. a, b Relative contribution of different diazotrophs (a) and N_2 fixation rate (b) under ambient and acidified conditions of the diazotroph community. c, d Relative transcription of the NAD kinase gene ppnk of two major *Trichodesmium* clades *T. tenue* (c) and *T. erythraeum* (d) in the diazotroph community under ambient and acidified conditions.

Reference

Zhang, Futing; Wen, Zuozhu; Wang, Shanlin; Tang, Weiyi; Luo, Ya-Wei; Kranz, Sven A.; Hong, Haizheng*; Shi, Dalin*. Phosphate limitation intensifies negative effects of ocean acidification on globally important nitrogen fixing cyanobacterium. *NATURE COMMUNICATIONS*, 2022. 13: 6730.

Quasi-antiphase Diel Patterns of Abundance and Cell Size/Biomass of Picophytoplankton in the Oligotrophic Ocean

Picophytoplankton are tiny, single-celled photosynthetic organisms that contribute to almost all primary production in the vast euphotic zones of the oligotrophic ocean. Understanding their roles in that environment is critical but challenging, mainly because of their minuscule size and the complexity of microbial processes and interactions. Time-series observations based on flow cytometry, a powerful technique that provides information about the numbers and sizes of picophytoplankton cells, have elucidated many ecological and biogeochemical processes associated with picophytoplankton, but some questions remain. A field survey in the northern South China Sea combined with a published dataset revealed that picophytoplankton cell numbers and cell sizes/biomasses were tightly synchronized to the day-night cycle, but they were in a quasi-antiphase relationship to each other. This pattern is a confirmation and extension of previous studies. Such quasi-antiphase cycles are likely a general feature of near-steady-state oligotrophic ecosystems and reflect the cycles of carbon fixation, energy storage, and cell growth during the daytime and cell division and energy depletion during the night. Mortality rates estimated via modified dilution experiments showed that *Prochlorococcus and Synechococcus* were subject to considerable grazing pressure throughout the day and night. This work significantly improves our understanding of these microorganisms and may have implications for the carbon cycle in oligotrophic marine ecosystems.



Average half-hourly values of cell numbers, cell sizes, and carbon biomasses of three picophytoplankton groups across all 38 cruises. Note that because the values have been normalized, they are unitless and fluctuate about 1. Error bars denote standard deviations (n ranges from 181 to 218).

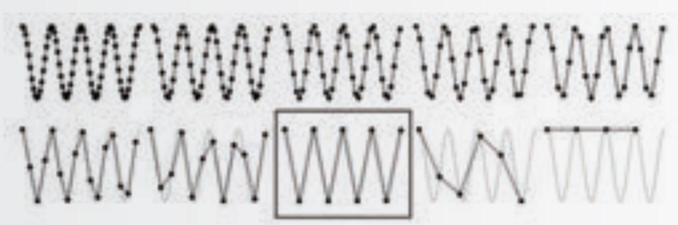
Reference

Li, Changlin; Chiang, Kuo-Ping; Laws, Edward A.; Liu, Xin; Chen, Jixin; Huang, Yibin; Chen, Bingzhang; Tsai, An-Yi; Huang, Bangqin*. Quasi-antiphase diel patterns of abundance and cell size/biomass of picophytoplankton in the oligotrophic ocean, *GEOPHYSICAL RESEARCH LETTERS*. 2022. 49, e2022GL097753.

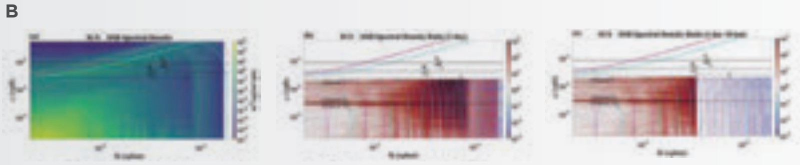
Interpreting Consequences of Inadequate Sampling of Oceanic Motions

Inadequate sampling of oceanic motions, which commonly occurs for both oceanic measurements and simulations, can cause peculiar spectral features and potentially leads to misinterpretations. Here, we combine an extremely high-frequency moored velocity record and a high-resolution numerical simulation with the basic signal-processing theory to quantitatively explore how varying sampling rates affect the ability to represent oceanic motions, especially internal gravity waves (IGWs). The moored measurements and simulations demonstrate that hourly sampling is sufficient to capture horizontal internal tidal velocities, but inadequate to faithfully characterize the vertical velocity for nearly all frequencies. The daily-sampled model simulation shows a complicated frequency-wavenumber spectral pattern of IGWs. Due to contrasting periodicities in time and space, temporal subsampling tends to retain the total variance of original IGWs, while spatial subsampling directly induces spectral energy loss. This study sheds light on data applications of the upcoming satellite altimetry missions.

A



B



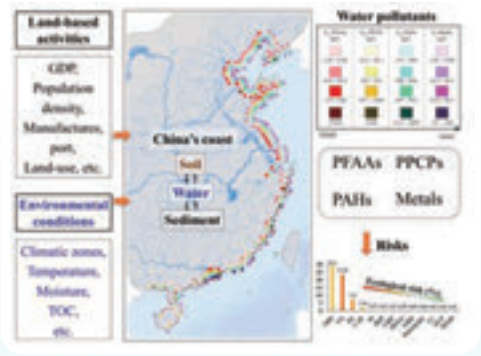
Reference

Wang, Chuanyin; Liu, Zhiyu*; Lin, Hongyang*. Interpreting consequences of inadequate sampling of oceanic motions, *LIMNOLOGY AND OCEANOGRAPHY LETTERS*. 2022. 7: 385-391.

(A) Schematic showing a given continuous signal (gray sinusoidal curve) that is discretely sampled with varying frequencies. The box corresponds to sampling at the Nyquist frequency (From Cushman-Roisin & Jean-Marie (2011)). (B) The frequency-wavenumber spectral density of the original SSH and its ratios to the spectral densities of the subsampled SSH in the South China Sea.

Multiple Pollutants Stress the Coastal Ecosystem with Climate and Anthropogenic Drivers

Coastal ecosystem health is of vital importance to human well-being. Field investigations of major pollutants along the whole coast of China were carried out to explore associations between coastal development activities and pollutant inputs. Measurements of target pollutants such as PFAAs and PAHs uncovered notable levels in small estuary rivers. The Yangtze River was identified to deliver the highest loads of these pollutants to the seas as a divide for the spatial distribution of pollutant compositions. Soil concentrations of the volatile and semi-volatile pollutants showed a cold-trapping effect in pace with increasing latitudinal gradient. The coastal ecosystem is facing high ecological risks from metal pollution, especially copper (Cu) and zinc (Zn), while priority pollutants of high risks vary for different kinds of protected species, and the ecological risks were influenced by both climate and physicochemical properties of environmental matrices, which should be emphasized to protect and restore coastal ecosystem functioning.



Spatial distribution of the four categories of pollutants in the estuary water along China's coast and analysis of the related influencing factors and risk assessment.

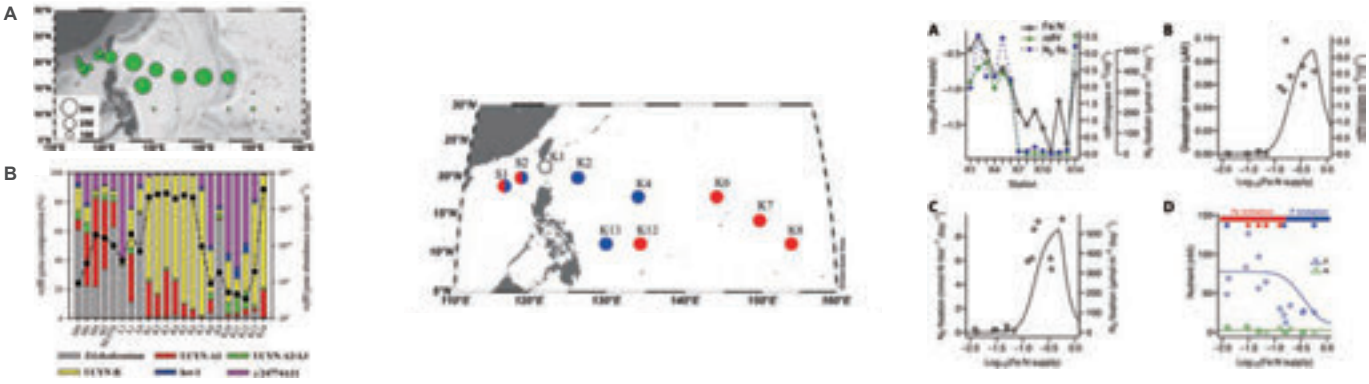
Reference

Lu, Yonglong*; Wang, Pei; Wang, Chenchen; Zhang, Meng; Cao, Xianghui; Chen, Chunci; Wang, Cong; Xiu, Cuo; Du, Di; Cui, Haotian; Li, Xiaoqian; Qin, Wenyou; Zhang, Yi; Wang, Yichao; Zhang, Anqi; Yu, Mingzhao; Mao, Ruoyu; Song, Shuai; Johnson, Andrew C.; Shao, Xiuqing; Zhou, Xuan; Wang, Ting; Liang, Ruoyu; Su, Chao; Zheng, Xiaoqi; Zhang, Sheng; Lu, Xiaotian; Chen, Yuqing; Zhang, Yueqing; Li, Qifeng; Ono, Kotaro; Stenseth, Nils C.; Visbeck, Martin; Ittekkot, Venugopalan. Multiple pollutants stress the coastal ecosystem with climate and anthropogenic drivers. *JOURNAL OF HAZARDOUS MATERIALS*. 2022. 424, 127570.

HiSea-2

Nutrient Regulation of Biological Nitrogen Fixation Across the Tropical Western North Pacific

Nitrogen fixation is critical for the biological productivity of the ocean, but clear mechanistic controls on this process remain elusive. Here, we investigate the abundance, activity and drivers of nitrogen-fixing diazotrophs across the tropical western North Pacific. We find a basin-scale coherence of diazotroph abundances and N_2 fixation rates with the supply ratio of iron: nitrogen to the upper ocean. Across a threshold of increasing supply ratios, the abundance of *nifH* genes and N_2 fixation rates increased, phosphate concentrations decreased and bioassay experiments demonstrated evidence for N_2 fixation switching from iron to phosphate limitation. In the northern South China Sea, supply ratios were hypothesized to fall around this critical threshold and bioassay experiments suggested colimitation by both iron and phosphate. Our results provide evidence for iron: nitrogen supply ratios being the most important factor in regulating the distribution of N_2 fixation across the tropical ocean.



(1) (2) (3)

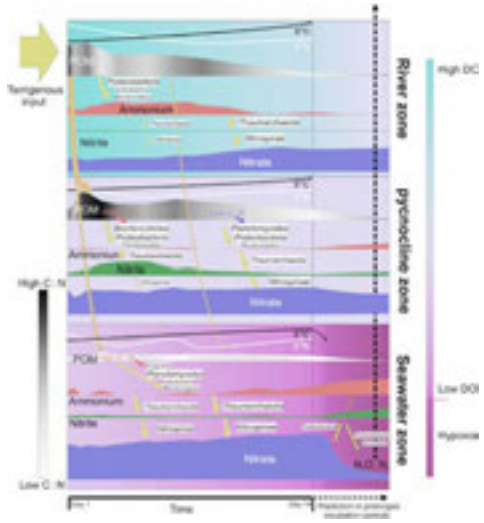
(1) N_2 fixation rates (A) and *nifH* gene composition of diazotrophs (B).
(2) Response of N_2 fixation to nutrient addition. red, Fe limitation; blue, P limitation; split red/blue, Fe-P colimitation; white, Fe and P replete.
(3) Regulation of diazotrophs and N_2 fixation by Fe:N supply ratios. (A) Basin-scale coherence of calculated Fe:N supply rates, derived from vertical turbulent diffusion and model aerosol deposition, with depth-integrated *nifH* and N_2 fixation rates; (B and C) Outcome of a resource competition model under increasing Fe:N supply rates (lines), with observations over-plotted (gray points); (D) Changes in steady-state phosphate and nitrate concentrations in the model (lines), with observations overplotted. (symbols; concentrations are those averaged over the upper 50-m water column depth). The solid red and blue bars indicate where the model diazotrophs are limited by Fe and P, respectively; Filled symbols below indicate the limiting nutrient for N_2 fixation found in the bioassay experiments.

Reference

Wen, Zuozhu; Browning, Thomas J.; Cai, Yihua; Dai, Rongbo; Zhang, Ruifeng; Du, Chuanjun; Jiang, Ruotong; Lin, Wenfang; Liu, Xin; Cao, Zhimian; Hong, Haizheng; Dai, Minhan; Shi, Dalin*. Nutrient regulation of biological nitrogen fixation across the tropical western North Pacific. *SCIENCE ADVANCES*. 2022. 8, eabl7564.

Weidi Yang

Microbially Driven Fate of Terrigenous Particulate Organic Matter in Oceans



(A)

(B)

(A) Overview of microbially driven fate of terrigenous POM in the river–seawater stratified simulation system.
(B) Aquatron Facility at Dalhousie University.

A long-standing enigma in oceanography is why terrestrial organic matter is “missing” in the global ocean, despite the considerable discharge into it every year. Although some explanations, such as mineralogical composition, hydrodynamic processes, and priming effect, have been proposed, we hypothesize that the essential mechanism behind the missing organic matter is microbial processing, for which the underlying coupled geochemical, molecular, and genetic evidence is unknown. An ultra-large-volume, long-term river–seawater stratified simulation system was constructed to unravel the microbially driven fate of terrigenous particulate organic matter (POM) in oceans. Analysis of combining the molecular with POM chemical composition data suggests that Bacteroidetes could act as pioneers in the processing of terrigenous POM in oceans, degrading high-molecular-weight, high-carbon compounds such as polysaccharides. Remaining low-molecular-weight nitrogenous organic matter is subsequently degraded by Planctomycetes and Proteobacteria. Isotopic signals show that this preferential degradation causes a distinct “aging” effect of POM, and along with nitrification enhanced by remineralization, causes a decrease in the POM C: N ratio. Degradation of terrigenous POM and bacterial biomass biosynthesis leads to positive deviations in $\delta^{15}N$ and $\delta^{13}C$. Relatively refractory hydrocarbons, aromatic compounds, and phenols are accumulated by microbial processes in this system. This study provides mechanistic insights into the missing chemical and isotopic signals and microbially driven fate of terrigenous POM in the ocean, with important implications for how riverine material input affects marine carbon and nitrogen cycling.

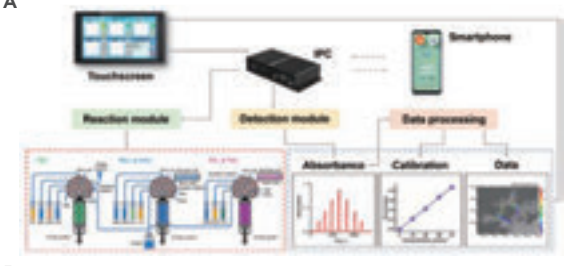
Reference

Zhang, Lianbao; Chen, Mingming; Zheng, Yue; Wang, Jianning; Xiao, Xilin; Chen, Xiaowei; Hu, Chen; Shen, Jiaming; Liu, Jihua; Tang, Kai; Xu, Dapeng; Shi, Qiang; Ning, Xiaoyan; Thomas, Helmuth; Qin, Wei; Zhao, Meixun; Jiao, Nianzhi*; Zhang, Yao*. Microbially driven fate of terrigenous particulate organic matter in oceans. *LIMNOLOGY AND OCEANOGRAPHY*. 2022. 9999: 1–17.

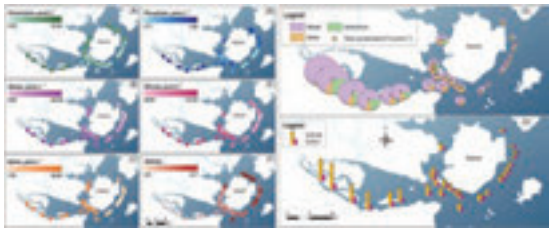
Real-Time Underway Mapping of Nutrient Concentrations of Surface Seawater Using an Autonomous Flow Analyzer

(A) Schematic diagram of the *i*SEA-II system for nutrient determination. (B) Real-time underway mapping of nutrient concentrations in estuarine and coastal using *i*SEA-II system.

A



B



C

(C) The *i*SEA-II system for on-site application.

High-frequency field nutrient analyzers offer a promising technology to solve time-consuming and laborious sampling problems in dynamic and complex river–estuarine–coastal ecosystems. However, few studies on the simultaneous underway analysis of five key nutrients (ammonium, nitrite, nitrate, phosphate, and silicate) in seawaters are available because of the limitations of the technique. In this study, a state-of-the-art autonomous portable analyzer for the shipboard analysis of nutrients in the environment of varied salinities and concentration ranges was reported. The analyzer consisted of compact hardware that was well suited for shipboard deployment with minimal maintenance. Moreover, a novel LabVIEW-based software program was developed, containing additional functions such as automated calibration curve generation, auto-dilution of high-concentration samples, and a user-friendly interface for multiparameter analysis using a single instrument. After the optimization of chemical reactions and work flow chart, the analyzer exhibited low limits of detection, a large linear range with automated dilution, and relative standard deviations of less than 2% (n = 11). Compared to other flow-based techniques, this analyzer is more portable and consumes less reagent with an autonomous data processing function and applicability within a broad salinity range (0-35). The analyzer was successfully applied for real-time analysis in the Jiulong River Estuary–Xiamen Bay with excellent on-site accuracy and applicability. The relationship between high spatial resolution nutrient concentrations and salinities showed very different patterns in estuarine and coastal areas, indicating the benefit of using an underway automated analyzer for chemical mapping in a dynamic environment.

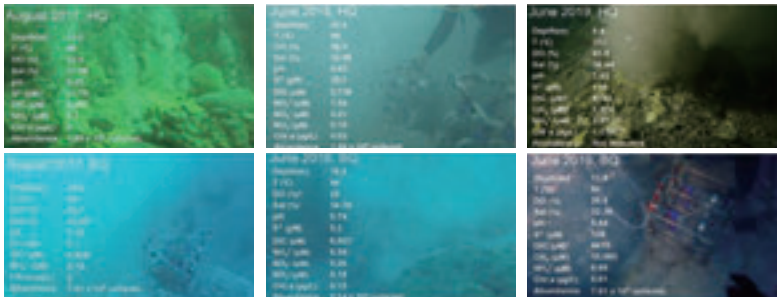
Reference

Fang, Tengyue; Bo, Guangyong; Zhang, Zijie; Ma, Jian*. Real-time underway mapping of nutrient concentrations of surface seawater using an autonomous flow analyzer. *ANALYTICAL CHEMISTRY.* 2022. 94, 11307-11314.

Genome-centric insight into Metabolically Active Microbial Population in Shallow-sea Hydrothermal Vents

The discovery of hydrothermal systems has greatly expanded our knowledge and understanding of the habitat range and the origin of life. Shallow-sea hydrothermal systems are ecological intermediates of deep-sea systems and terrestrial springs, generally occurring along active plate margins, in the flank of volcanic regions, or on top of submarine volcanoes. Little has been known about the communities inhabiting the shallow-sea hydrothermal systems. The shallow-sea hydrothermal system offshore of Keishantao Island harbors unique and complex ecosystems, supported by photosynthesis and chemosynthesis simultaneously. It is an excellent site for studying the origin of life, biogenic elements cycling processes, ecosystem evolution, and microbial resource and environmental effects.

Here, we used genome-resolved metagenomic and metaproteomic approaches to probe into the genetic potential and protein expression of microorganisms from the shallow-sea vent fluids off Kueishantao Island, over a 3-year sampling period. The families *Nautiliaceae* and *Campylobacteraceae* within the Epsilonbacteraeota and the *Thiomicrospiraceae* within the Gammaproteobacteria were prevalent in vent fluids. We successfully reconstructed the *in situ* metabolic modules of the *Nautiliaceae* and *Thiomicrospiraceae* populations by mapping the metaproteomic data back to metagenome-assembled genomes. Those active bacteria could use the reductive tricarboxylic acid cycle or Calvin-Benson-Bassham cycle for autotrophic carbon fixation, with the ability to use reduced sulfur species, hydrogen or formate as electron donors, and oxygen as a terminal electron acceptor via cytochrome bd oxidase or cytochrome bb3 oxidase. Comparative metagenomic and genomic analyses revealed dramatic differences between the submarine and terrestrial geothermal systems, including microbial functional potentials for carbon fixation and energy conversion. Furthermore, shallow-sea hydrothermal systems shared many of the major microbial genera that were first isolated from deep-sea and terrestrial geothermal systems, while deep-sea and terrestrial geothermal systems shared few genera. The metabolic machinery of the active populations within Epsilonbacteraeota and Gammaproteobacteria at shallow-sea vents can mirror those living at deep-sea vents. Concerning specific taxa and metabolic potentials, the microbial realm in the shallow-sea hydrothermal system presented ecological linkage to both deep-sea and terrestrial geothermal systems.



The environmental parameters of sampling sites of the yellow and white vents from 2017 to 2019.

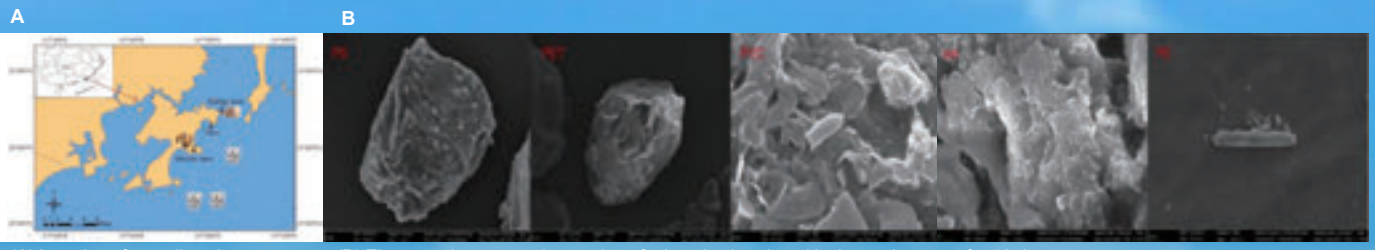
In situ metabolic modules of Epsilonbacteraeota (A) and Gammaproteobacteria (B).

Reference

Chen, Xiaofeng; Tang, Kai*; Zhang, Mu; Liu, Shujing; Chen, Mingming; Zhan, Peiwen; Fan, Wei; Chen, Chen-Tung Arthur; Zhang, Yao*. Genome-centric insight into metabolically active microbial population in shallow-sea hydrothermal vents. *MICROBIOME*. 2022. 10, 170.

Selective Adsorption of Antibiotics on Aged Microplastics Originating from Mariculture Benefits the Colonization of Opportunistic Pathogenic Bacteria

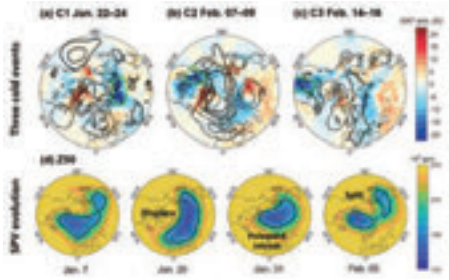
Microplastics and antibiotics widely coexist in the aquatic environment, especially in mariculture regions. However, antibiotics adsorbed on microplastics and their role in the colonization of microorganisms on micro-plastics are poorly understood. Therefore, *in situ* aging experiments were conducted to investigate the impact of antibiotics and microplastics co-occurrence on microorganisms and assess their potential risks to human health. Results showed that antibiotics were adsorbed selectively on microplastics, with 29 investigated antibiotics (n = 40) detected in surrounding water but only 6 investigated antibiotics were adsorbed on microplastics. The concentration of antibiotics accumulated on microplastics was controlled by microplastic types and environ-mental conditions. For example, aged polypropylene (PP) had more developed pore structures resulting in higher adsorption of antibiotics than other



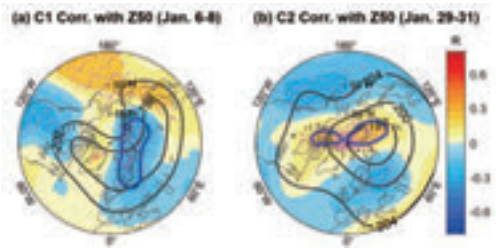
(A) Location of sampling sites. (B) Electron microscope observation of microplastics placed in the environment for 50 days.

Impacts of Sudden Stratospheric Warming on Extreme Cold Events in Early 2021: An Ensemble-Based Sensitivity Analysis

Sudden stratospheric warming (SSW) is an extraordinary event in winter polar stratosphere, characterized by a rapid rise of temperatures and weakening of the stratospheric polar vortex (SPV). SSW is largely induced by vertically propagating planetary waves of tropospheric origin and can, in turn, results in negative phase of Arctic oscillation in the troposphere and therefore severe surface cold surges in mid- and high-latitude regions. The longer timescale of stratospheric variability than that in troposphere makes SSW a promising predictor for surface weather and climate.



Three cold events and evolution of SPV during early 2021. (a–c) surface air temperature anomalies (shading) and sea-level pressure anomalies (contour) during three cold events, with green box indicating the cold region; (d) daily mean 50-hPa geopotential height on respective date, with bold black indicating 19800-gpm contour.



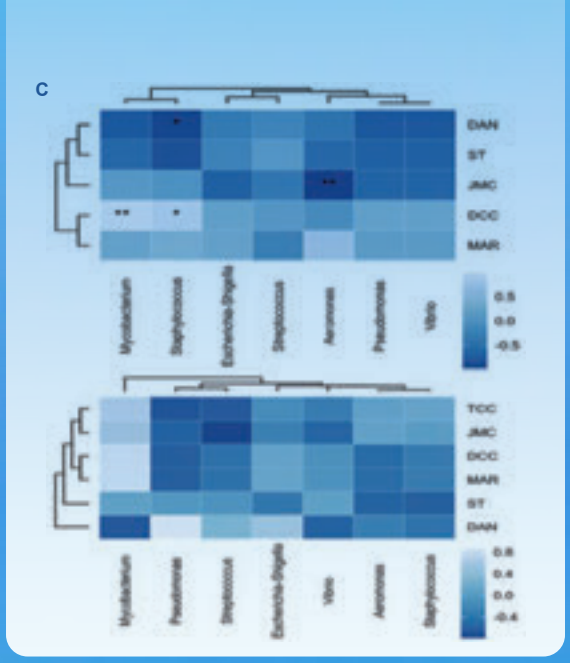
Correlations between intensity of cold events and SPV based on ensemble forecasts. (a) correlations between C1 and 50-hPa Z (shading), with ensemble mean 50-hPa Z (black contours) indicating the location of SPV; highly-sensitive region is outlined in blue. (b) is the same as (a) but for C2.

Impacts of SSW on three severe cold events (C1–C3) over Northern Hemisphere in early 2021 were investigated using sub-seasonal-to-seasonal ensemble forecasts. The SSW was characterized by successive displacement and split of the stratospheric polar vortex (SPV). Ensemble-based sensitivity analyses showed that C1 over Siberia and C2 over western Canada were more related to SPV variations at a lead time of 1–2 weeks than C3 over central U.S. Within ensemble forecasts, a more elongated SPV with higher geopotential height over northern Eurasia were conducive to C1, whereas a SPV with the more poleward retreat from displacement contributed to C2. The forecast accuracy of stratospheric heights over the sensitive region at 2 weeks lead was significantly correlated with the forecast skill of the tropospheric circulation pattern preceding C1, implying that prediction of specific cold weather events may be improved by a better forecast of key features in SPV variations.

Reference

Zhang, Murong; Yang, Xiao-Yi*; Huang, Yipeng. Impacts of sudden stratospheric warming on extreme cold events in early 2021: An ensemble-based sensitivity analysis. *GEOPHYSICAL RESEARCH LETTERS*. 2022. 49, e2021GL096840.

microplastic types. High-throughput sequencing showed higher diversity and distinct composition of microorganisms attached to the microplastics than the surrounding water. Opportunistic pathogenic bacteria such as Mycobacterium possessed positive relationships with tetracycline and doxycycline on aged microplastics, which showed adsorbed antibiotics on aged microplastics could benefit some specific pathogens colonized on the microplastics and spread into unaffected ecosystems, marine organisms even humans. The health risk quotient (HQ) implied the potential human health risk of consuming commercial sea-food polluted by antibiotics and microplastic loaded with antibiotics. This study revealed the interaction of antibiotics and microorganisms with aged microplastics in aquaculture systems, providing a novel insight into their synergistic effects on ecological and human health.



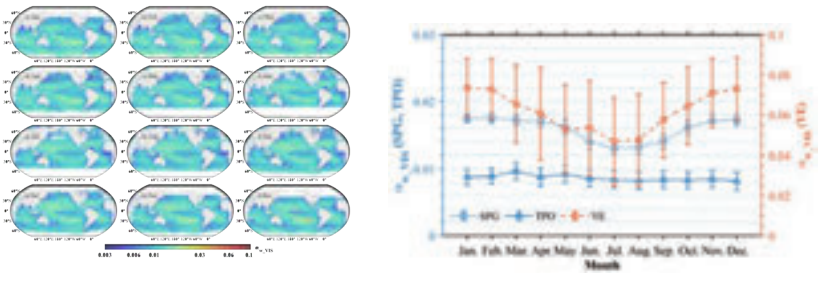
(C) The relationship between antibiotics and opportunistic pathogens on microplastics in scallop farm and abalone farm.

Reference

Yu, Xiaoxuan; Du, Huihong; Huang, Yuhong; Yin, Xiaohan; Liu, Yawen; Li, Yongyu; Liu, Huatai; Wang, Xinhong*. Selective adsorption of antibiotics on aged microplastics originating from mariculture benefits the colonization of opportunistic pathogenic bacteria. *ENVIRONMENTAL POLLUTION*. 2022. 313, 120157.

Estimating the Water-leaving Albedo from Ocean Color Remote Sensing

Water-leaving albedo (α_w), defined as the ratio of water-leaving irradiance to downwelling irradiance just above the surface, is a major component of ocean surface albedo (α) but has long been ignored or underrepresented. For example, conventional schemes estimate α_w from chlorophyll-a (Chl) concentration (termed Chl-α_w), but we show that Chl-α_w is lack of internal consistency, as there is no guarantee of closure between the modeled remote sensing reflectance ($R_{rs}(\lambda)$) from Chl-inferred inherent optical properties (IOPs) and the input $R_{rs}(\lambda)$ that is used to derive Chl. Thus, we propose a semi-analytical scheme based on IOPs, termed IOPs-α_w, to estimate spectral $\alpha_w(\lambda)$ from ocean color measurements, which ensure the closure of $R_{rs}(\lambda)$. Evaluations with numerical simulations of radiative transfer show that IOPs-α_w outperforms Chl-α_w. IOPs-α_w is later implemented to monthly composite data of the Visible Infrared Imaging Radiometer Suite (VIIRS), where reasonable spatial distributions and seasonal patterns of $\alpha_w(\lambda)$ are obtained. In particular, broadband α_w in the visible domain, termed α_{w_VIS}, obtained via IOPs-α_w is over 50% higher than the previous estimation by Chl-α_w in most oceanic waters. Furthermore, this study concludes that α_{w_VIS} could contribute up to 20% to α in oceanic waters under low solar-zenith angles. Thus, we suggest that neither the spatial variability of α_{w_VIS} nor the contribution of α_{w_VIS} to α shall be neglected, and it is necessary to incorporate IOPs-α_w into current parameterizations of α in coupled ocean-atmosphere and climate models.
Upper panel: The global distribution of α_{w_VIS} estimated by IOPs-α_w using VIIRS monthly composite data in 2019. Lower panel: Monthly variation of α_{w_VIS} in three regions of interest in the South Pacific Gyre (SPG), the Tropical Pacific Ocean (TPO), and the Yangtze estuary (YE).



Upper panel: The global distribution of α_{w_VIS} estimated by IOPs-αw using VIIRS monthly composite data in 2019. Lower panel: Monthly variation of α_{w_VIS} in three regions of interest in the South Pacific Gyre (SPG), the Tropical Pacific Ocean (TPO), and the Yangtze estuary (YE).

References

Yu, Xiaolong*; Lee, Zhongping. Scheme to estimate water-leaving albedo from remotely sensed chlorophyll-a concentration. *OPTICS EXPRESS*. 2022, 30: 36176-36189.

Yu, Xiaolong*; Lee, Zhongping; Shang, Shaoling; Wang, Menghua; Jiang, Lide. Estimating the water-leaving albedo from ocean color. *REMOTE SENSING OF ENVIRONMENT*. 2021, 269, 112807.

PROJECTS

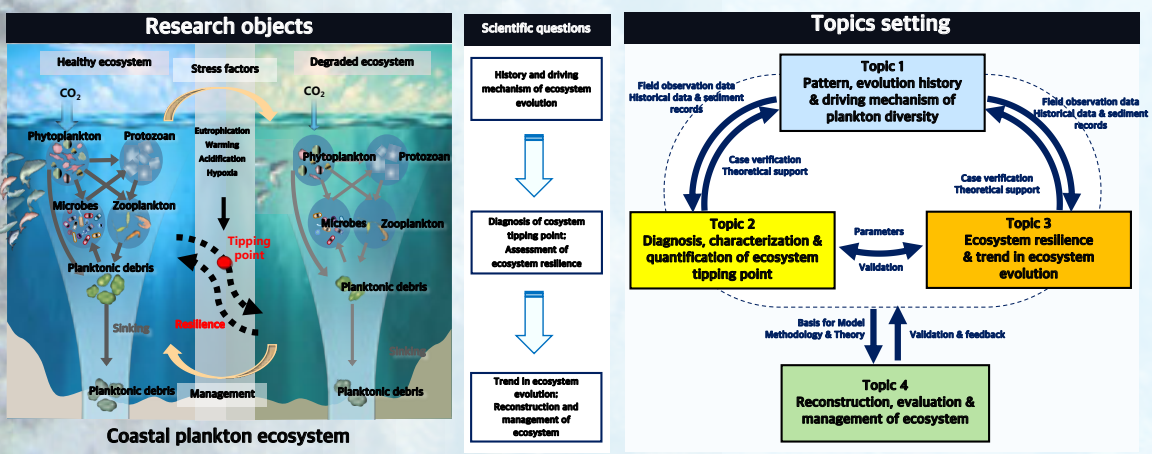
Weidi Yang

Newly Funded Projects

Tipping points, Resilience and Reconstructure of Plankton Ecosystem in Typical Marine Areas of China

- **National Key Research and Development Program**
- **Dazhi Wang**

This project aims at the core scientific question on "Tipping points, resilience and restructures of plankton ecosystem in typical marine areas under dual stresses of human activities and global changes", The plankton ecosystems in the Yangtze River Estuary, the Pearl River Estuary and adjacent waters that are significantly stressed by human activities and global changes, are selected as the research objects. We will integrate the existing pattern, historical data, sediment records of plankton diversity, and the system's steady-state transformation in different stressed environments and extreme events, establish the theory and method of characterizing and quantifying the system's tipping points, evaluate the resilience and restoring ability under multiple environmental stresses, built the theory and method of system reconstruction, develop the prediction model of system evolution trend and realize the application demonstration of intelligent and situational prediction, and put forward management strategies suitable for the coordinated development of China's offshore economy, human health and ecological environment, strengthen the scientific understanding of the tipping points, resilience and restoring the ability of plankton ecosystem, clarify the evolution history, existing situation and driving mechanism of the planktonic ecosystem under the dual stress of global change and human activities. This project will provide theoretical and methodological support for formulating biodiversity conservation and climate change strategies, and implementing national strategies such as land and sea integration and carbon neutrality.



Combining ancient and modern

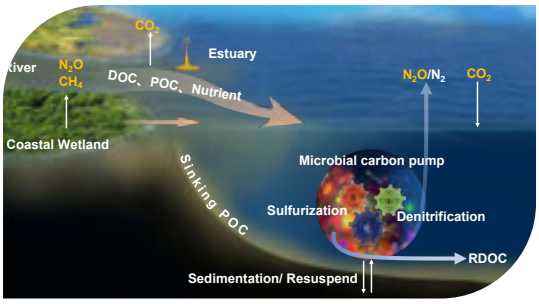
Multidisciplinary approach

Field investigation, Laboratory simulation, Mesoscale enclosure, Ecological model, Integrated ecomics, Artificial intelligence big data, Paleooceanography, Multi-element fusion method, Environmental input-output model, etc.

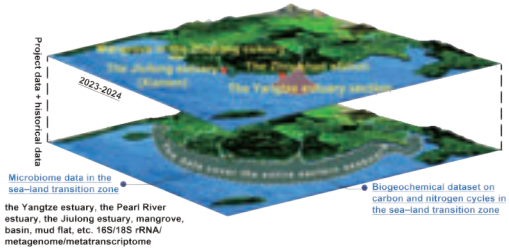
Integrated Project on the Mechanism of Carbon, Nitrogen and Sulfur Cycling by Microorganisms and Carbon Source and Sink Effects in the Sea–land Transition Zone

- **Integated Project of the NSFC Major Research Plan Program**
- **Kai Tang**

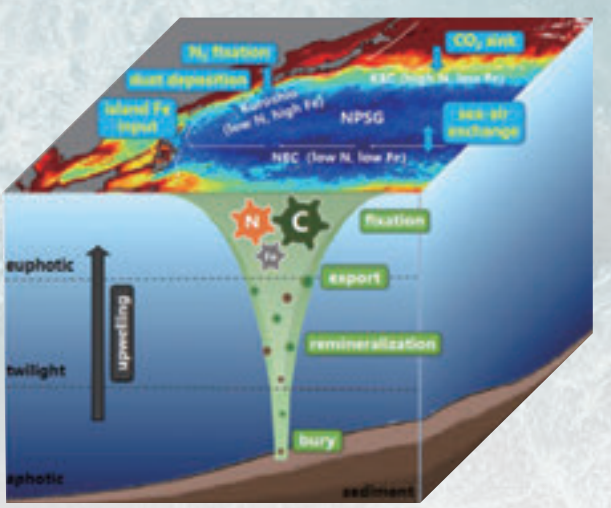
This project builds a multi-disciplinary, complementary team, especially with research expertise in marine science, life science, and environmental science based on our previous five individual projects involved in carbon, nitrogen, and sulfur cycling in the sea–land transition zone. We will systematically analyze previously obtained results and related historical data, and concentrate on the key scientific question “the effects of microbially-driven carbon, nitrogen and sulfur cycling processes on carbon source and sink as well as their responses to global change”. By a combination of macroscale and microscale approaches, we will focus on the sea-land transition zone of estuaries, coastal wetlands, and near-shores, quantify important biochemical processes and elucidate element cycling and coupling mechanisms across river-estuary-nearshore, coastal wetland-nearshore or water-sediment intersection systems. Through long-term and time-series sampling and analysis, we will explore the dynamic patterns of microbial communities across environmental gradients, time and space scales; with emphasis on key microbial carbon cycling processes, we will extend to relevant key nitrogen and sulfur cycling processes and environmentally regulatory mechanisms; by data integration of carbon cycling processes and mechanisms from sea–land transition zones, the above studies will advance our understanding of carbon source-sink effects, realize multi-disciplinary research, promote our current research to a high level, and result in the future research and development of coordinated land-ocean management strategies and ocean carbon sink enhancement. This project aims to provide novel insights and breakthroughs for the key research program, and has important implications for China to respond to global change.



Research Features.



Research Area.



Research contents: material flux, biological pump process, and climate effect.

Integrated Study on the Multiscale Material Cycling at the Sea-air Interface in the West Pacific

- **Integated Project of the NSFC Major Research Plan Program**
- **Zhimian Cao**

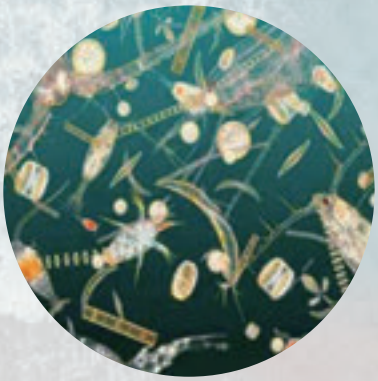
The oceanic biological pump plays an important role in modulating the sea-air material exchange and carbon sink of the ocean. Based on the scientific outcomes from the NSFC Major Research Plan, West-Pacific Earth System Multispheric Interactions and datasets and results obtained from the literature, this project aims to clarify how the biological pump modulates such exchange and its climate effect in the western boundary current area of the northern West Pacific.

Spatially, material transport and exchange will be investigated and compared between the North Equatorial Current, the North Pacific Subtropical Gyre and the Kuroshio and its extension. We will reveal the fluxes and processes of carbon, nitrogen, and iron and their coupling and/or decoupling across ocean-land-air interfaces and within the water column.

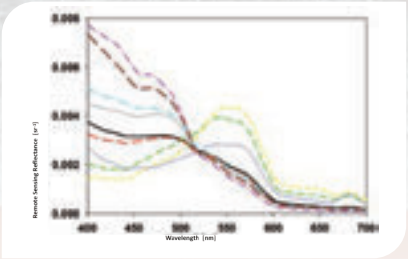
Temporally, we will trace the biological pump and circulation in the present and future. The nature of CO_2 and N_2O sources/sinks and their evolution in the northern West Pacific and their coupling climate effect will be evaluated in the context of global change. Through an integrated study, a better understanding of the oceanic carbon and nitrogen cycling on multiple spatio-temporal scales is anticipated. Moreover, this project will aid the prediction the West Pacific’s potential as a carbon sink, providing a scientific basis for future marine CO_2 removal targeting carbon neutrality.

Identification and Quantification of Primary Phytoplankton Functional Types in the Global Oceans from Hyperspectral Ocean Color Remote Sensing

- **NSFC Fund for International Senior Scientists**
- **Zhongping Lee**



Morphology of different phytoplankton functional types from Plankton for Health.



Marine hyperspectral remote sensing reflectance spectra.

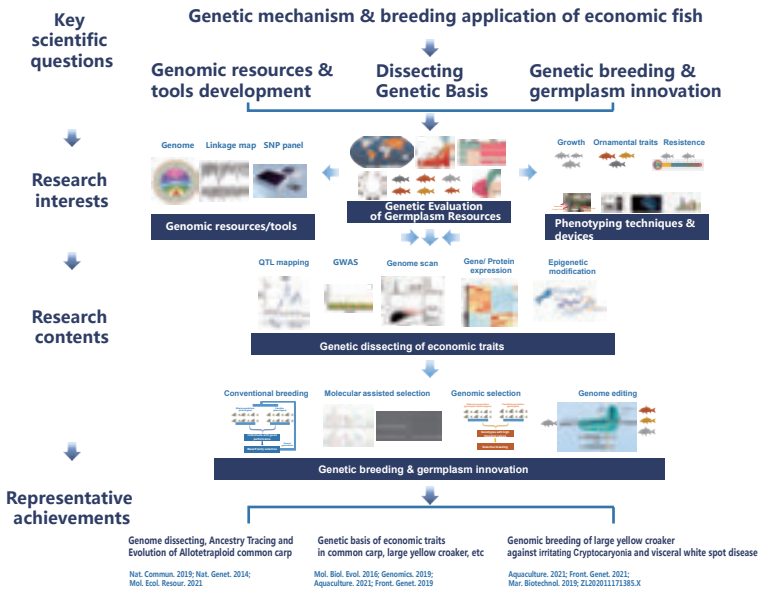
The overarching goal of this project is to develop a robust system to identify and quantify primary phytoplankton functional types (PFTs) in oceanic and coastal waters from hyperspectral satellite ocean color measurements. Phytoplankton play unique ecological and biogeochemical roles in aquatic ecosystems. Knowledge of their abundance and composition is a key to understanding global carbon cycles and the role of the ocean ecosystem in climate change.

Global information about PFTs' (such as *prochlorococcus, synechococcus*, haptophytes, diatoms, dinoflagellates, and coccolithophores) spatial distributions and temporal variations can only be obtained from satellite ocean color remote sensing. Since the launch of the Coastal Zone Color Scanner (CZCS) in the 1970s, there has been a global accounting of chlorophyll-a concentrations (CHL) from ocean color measurements; However, CHL provides little or no information regarding PFTs. In particular, accurate information on PFTs is difficult, if not impossible, to obtain from multi-band ocean color satellites, such as CZCS and those launched around year 2000.

The planned next generation of ocean color satellites, such as China's HY-1E (around 2023) and the US's PACE (around 2024), will equip sensors with hyperspectral capabilities, which then provide a great opportunity to extend decades of ocean color remote sensing from the estimation of CHL to the estimation of PFTs. In view of both HY-1E and PACE, this is timely and important work that will contribute significantly to ocean color remote sensing and ocean biology in the hyperspectral era.

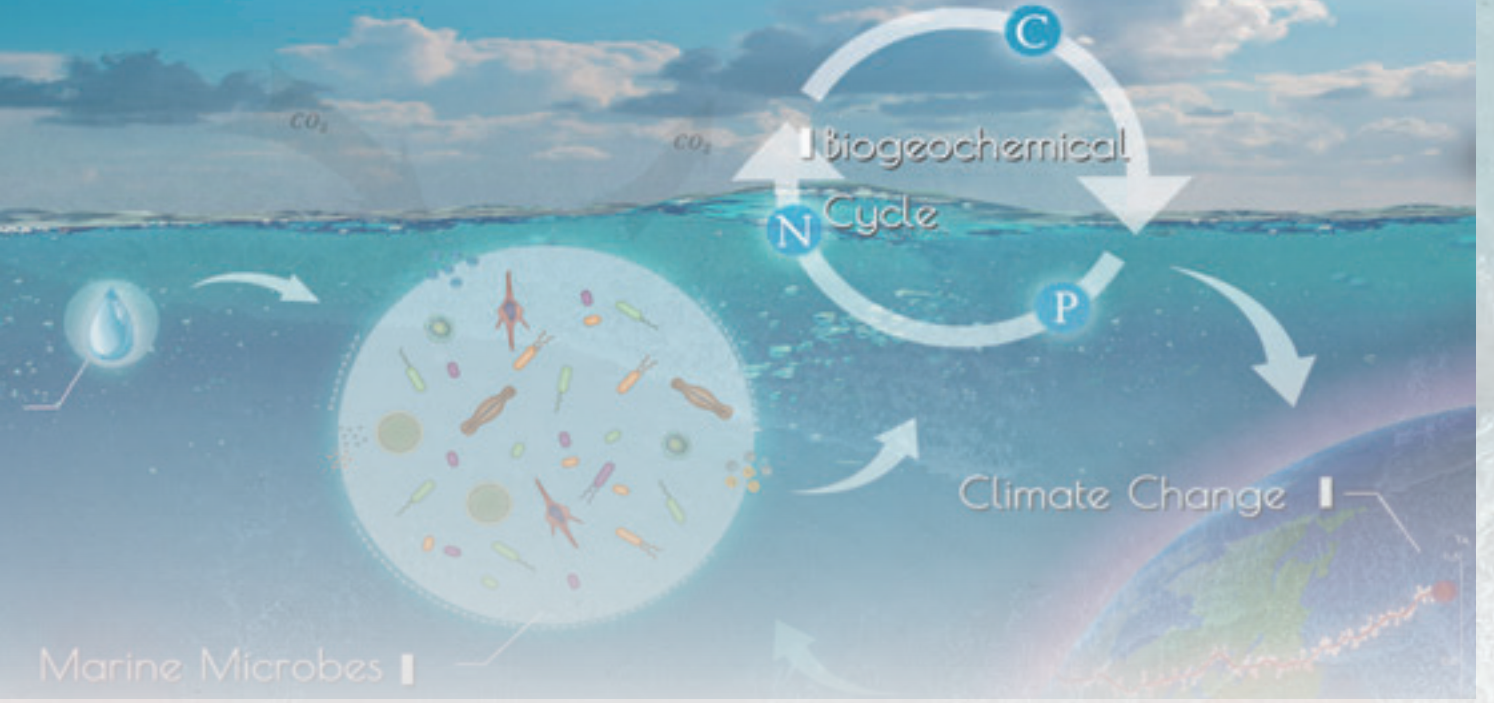
Fish genetics and genetic breeding

- **NSFC Fund for Distinguished Young Scholars**
- **Peng Xu**



Research framework and representative achievements of the project leader in the field of Fish genetics and genetic breeding.

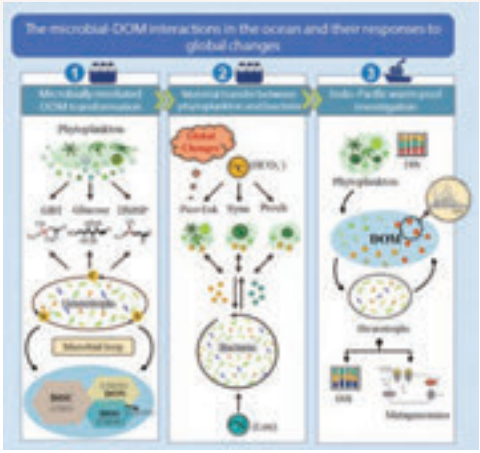
This project proposes to establish a comprehensive high-throughput standardized technical system and device for measuring swimming performance traits in large yellow croaker, to accurately study the correlation between swimming performance traits and robustness traits expressed in the important economic traits such as integrated resistance, growth performance, and nutritional utilization in fish at the population scale, to precisely locate the genes and genetic seats related to swimming performance traits in the large yellow croaker genome using multi-omics analysis, and to resolve the genetic basis of these traits. The genetic basis and molecular mechanism of the genomic selection and breeding tools for swimming performance and robustness of large yellow croaker are being explored and established, and innovative research on the genetic basis of swimming performance traits and breeding applications is being carried out to explore new selection strategies and directions for high-quality and robustness breeding, and to provide a theoretical basis and research foundation.



Marine Microbial-DOM Interactions and Their Responses to Global Changes

- **NSFC Fund for Excellent Young Scientists**
- **Qiang Zheng**

Marine microbes are part of an interactive ecological network in the ocean, and their metabolic activities at the micro-scale play an important role in the global biogeochemical cycle. To deepen our understanding of their role in this cycle, the project focuses on “the response mechanisms of marine microbes and variations of dissolved organic carbon under the global change scenario” using “phytoplankton-organic matter-heterotrophic bacteria” as the research objects. Experiments consisting of *in situ* observations, incubation and modeling will be used to elucidate C-N-S coupling metabolic processes as mediated by microbial transformation of labile organic matter. Material transfer rates between photoautotrophs and heterotrophs under global change conditions (temperature rise, hypoxia, eutrophication) will be explored and temporal-spatial dynamic relationships among phytoplankton-DOM-heterotrophic bacteria in the Indo-Pacific Warm Pool will be analyzed. Through the bacterially mediated organic molecular transformation, matter exchange between photo-and heterotrophs, and the coupling of marine microbes and biochemical organic molecules we hope to reveal those processes within the biogeochemical cycle that are mediated by microbes and the response of these microbes and the environment to global change.

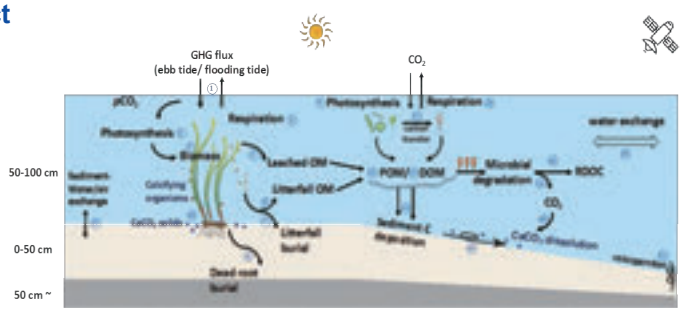


Research contents.

BLUE-CARE: Blue Carbon Ecosystem Assessment, Restoration and Accounting Project

- **Marine Carbon Sink Technology Development Project**
- **Minhan Dai**

This BLUE CARE project jointly launched by Xiamen University and Tencent Company, aims to clarify the status and mechanisms of carbon sequestration in seagrass bed ecosystem, develop a methodology for carbon sink assessment in seagrass bed in China, provide guidance for China's blue carbon trading, restore seagrass bed and evaluate the ecosystem values before performing carbon trading under China Certified Emission Reduction, and raise public awareness of the conservation and restoration of coastal wetland ecosystem through community programs.



Blue carbon cycle for seagrass bed.

Selected On-Going Projects

Carbon Fixation and Export in Oligotrophic Ocean

- **NSFC Major Program | 2019-2023**
- **Minhan Dai**

The oligotrophic ocean occupies about 30% of the ocean surface and has been conventionally regarded as ocean deserts. It is characterized by nutrient depletion in the surface waters and extremely low net biological production and hence, per unit area, contributes little to carbon export from surface to deep waters. Emerging evidence, most notably based on ocean time-series studies such as those at the Hawaiian Ocean Time-series station, has shown a wider than previously assumed dynamic range of nutrient inputs and biological responses in this vast oceanic system. This project studies sources and fluxes of macronutrients (i.e., N, P, Si) and micronutrients (e.g., Fe) and their spatiotemporal distributions and how these factors support biological pump at the two distinct layers of the euphotic zone in the North Pacific Subtropical Gyre (NPSG), one of the world's largest oligotrophic regimes. It aims to frame new understandings on key mechanisms controlling the biological pump and efficiency of carbon storage in the ocean.

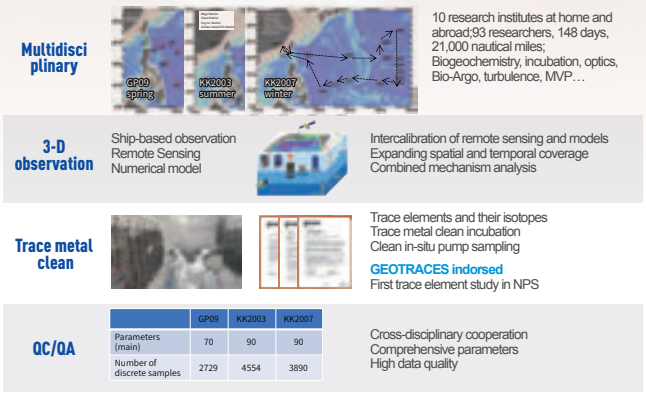


Fig. 1. Highlights of three multidisciplinary cruises conducted in the subtropical Northwest Pacific Ocean by Carbon-FE.

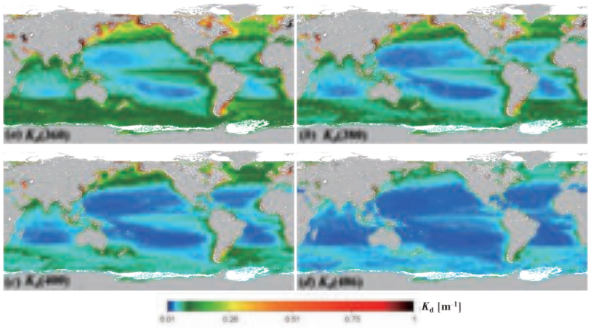


Fig. 2. Global distribution of VIIRS K_d (λ) climatology data. (a) K_d (360), (b) K_d (380), (c) K_d (400), (d) K_d (486) (Wang et al., *OPTICS EXPRESS*, 2022).

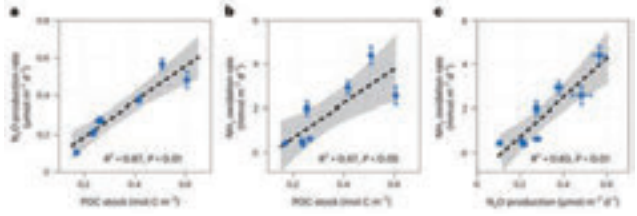


Fig. 3. Correlations between depth-integrated (0 - 200 m) N_2O production rates, ammonia oxidation rates and POC inventories. (Wan et al., *NATURE GEOSCIENCE*, 2022).

By integrating *in situ* and remote sensing observations, and numerical simulations, Carbon-FE has been carrying out innovative researches during the past four years since the launch of the project. Three multidisciplinary cruises were conducted in the subtropical Northwest Pacific (Fig. 1), all of which are endorsed by GEOTRACES either as section cruise or process-study cruises. The project has achieved a series of breakthroughs in optimization and innovation of methods and techniques, generation of data products and scientific understanding. We highlight some of the major achievements as follows. (1) Optimization and innovation of methods and technologies. A full suite of clean sampling and measurements of trace elements has been established. We developed a new scheme to obtain the remote sensing reflectance at near-blue and UV bands from ocean color measurements at visible bands and redefined the euphotic zone depth (Fig. 2). A coupled physical-biogeochemical numerical model with constraints on iron cycle and nitrogen fixation has been developed. (2) Data products. Datasets of trace elements and oceanographic parameters, as well as remote sensing products in the NPSG have been generated. (3) Improvement of scientific understanding. We investigated the spatiotemporal distribution of dissolved Fe and nutrients in the NPSG. Their sources and fluxes into the euphotic zone have been clarified. The patterns of diazotrophs and nitrogen fixation rates have been described. Substantial nitrous oxide production in the epipelagic zone of the subtropical ocean partially offsets carbon sequestration by the marine biological pump, according to observation from the South China Sean and the Subtropical North Pacific Gyre (Fig. 3). We found acidification enhanced phosphorus demands and decreased phosphorus-specific nitrogen fixation rates in *Trichodesmium*. And further predicted that acidification and phosphorus stress could synergistically cause an appreciable decrease in global *Trichodesmium* nitrogen fixation by the end of this century (Fig. 4). Also, mechanisms of phosphorus limiting in the NPSG have been studied. At last, we constrained the POC export flux from the euphotic zone and analyzed its spatial variability associated with nutricline depths and N_2 fixation rates.

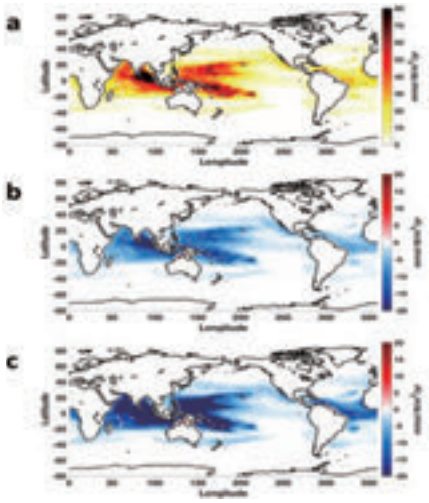
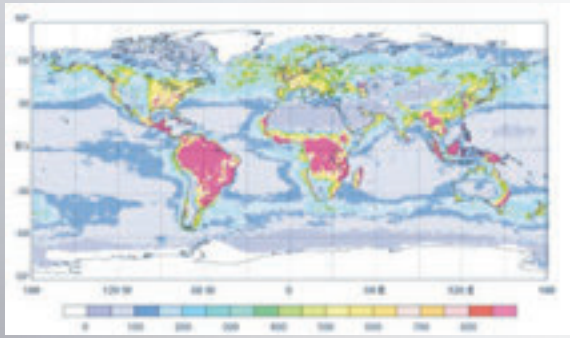


Fig. 4. Modeled changes in global marine N_2 fixation contributed by *Trichodesmium*. (a) Predicted global *Trichodesmium* N_2 fixation (47.4 Tg N yr^{-1}) in 2081-2100. (b), (c) Additional changes in predicted *Trichodesmium* N_2 fixation due to ocean acidification alone (-11.3 Tg N yr^{-1}) (b) and to ocean acidification and P limitation combined (-22.8 Tg N yr^{-1}) (c) in 2081-2100. (Zhang et al., *NATURE COMMUNICATIONS*, 2022).

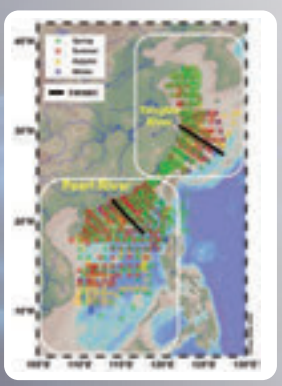
Key Processes and Regulation Mechanisms of Carbon Sequestration in China Seas

- **NSFC Key Program | 2022-2025**
- **Bangqin Huang**

This project aims at key processes and regulation mechanisms of carbon sequestration in China Seas of the Program “Major Basic Scientific Problems and Countermeasures of National Carbon Neutralization”. Core scientific and technological questions are “How to accurately assess the carbon sequestration rate in China Seas?”and “What are the key process and mechanisms of regulating its temporal and spatial changes?”. To answer these questions, the project will explore the regulation mechanism of key carbon sink processes such as seawater carbonate system, phytoplankton primary production, net community production, zooplankton feeding, and community respiration, based on the integration and analysis of a large number of field data and satellite remote sensing data from Xiamen University and the Second Institute of Oceanography, MNR and based on accurate, comprehensive, and high spatial-temporal resolution assessment of carbon sequestration capacity in China Seas. The project will also assess the long-term changes in photosynthetic carbon fixation rate in the past 20 years in China Seas. Also, the project will reveal the impact of natural and human activities, e.g., warming and eutrophication, on the carbon sequestration function of the marine ecosystem. The ultimate goal is to clarify the relationship between the typical marine ecosystem structure and carbon sink function in China's Seas. The implementation of the project will significantly improve the research level of carbon sequestration in China, comprehensively and accurately assess the carbon sequestration rate in China Seas, reduce its uncertainty, provide a list of marine carbon sinks, and support the optimization of national carbon neutralization scheme and the decision-making of management policy. At present, the project is progressing steadily according to the expected annual plan, focusing on the collection, collation, and analysis of historical data, especially the comparison, verification, and analysis of field data and satellite remote sensing data.



Global annual NPP (in grams of C per square meter per year) for the biosphere, calculated from the integrated CASA-VGPM model. (Field et al., 1998).



Carbon Fixation Rate

- The China Seas
- High Spatial-temporal Resolution

Key Process & Mechanism

ECS versus SCS

Inshore, Shelf, Slope, Basin

Long-term Changes

Typical Regions in the Past 20 Years

Sample distribution and research ideas.

An Investigation of Meso- to Small-scale Processes in the Western Pacific Ocean: Scale Interactions and Energy Cascades

• **Key Project of the NSFC Major Research Plan Program | 2019-2022**

• **Zhiyu Liu**

The ocean is a forced-dissipative system being operated at a wide range of spatiotemporal scales. In order to achieve quasi-equilibrium, the kinetic energy in the ocean transfers from scales of forcing at the basin scale to viscous dissipation at the molecular scale. This energy transfer process, covering nearly ten orders of magnitude, is called energy cascade. Oceanic energy cascade is a fundamental issue of physical oceanography and also a classic puzzle due to challenges in observations as well as in numerical and theoretical modeling. Processes at all these scales occur in the western Pacific Ocean, for example from the strong western boundary currents, vigorous mesoscale eddies and internal waves down to small-scale overturns. Thus, it is an ideal experimental area for studies of oceanic energy cascade and multi-scale interactions.

Over the past four years, the research group implemented the project using a combination of *in situ* and remote sensing measurements, coupling numerical simulations, and theoretical analyses of ocean dynamics. Key findings/research outcomes include dynamical decomposition of oceanic multi-scale motions, mechanisms of tide-induced near-inertial waves (NIWs) and their interactions with wind-induced NIWs, and mechanisms controlling the fission of shoaling internal solitary waves, etc. With such research progress, we have gained a much better understanding of the interactions and energy cascades of oceanic multi-scale motions. Specifically,

(1) By extending the dynamic theory of (un) balanced modes, we proposed a dynamical filter to decompose oceanic balanced and unbalanced motions and obtained the decomposed physical fields and the corresponding governing equations (Fig. 1) for the two types of motions, establishing a new framework for quantifying the cross-scale interactions and associated energy transfers.

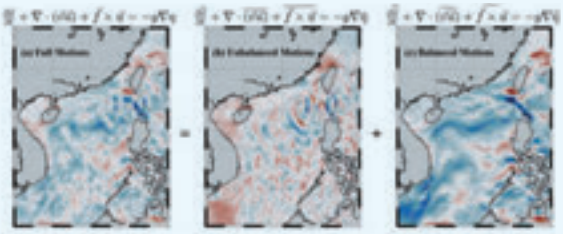


Fig. 1. Application of the dynamical decomposition in the South China Sea.

(2) Proposed a new mechanism of tide-induced NIWs, i.e., tidal forcing alone can generate a Garrett-Munk internal wave spectrum and further elucidated the nonlinear interacting mechanisms controlling the mutual enhancement of wind- and tide-induced NIWs (Fig. 2).

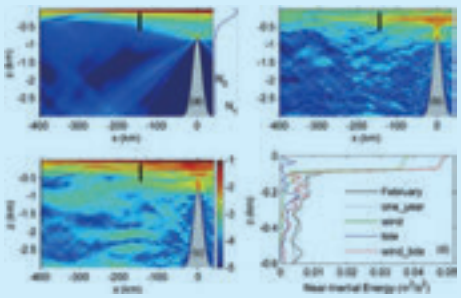


Fig. 2. Near-inertial energy for cases driven by (a) wind only, (b) tide only and (c) both wind and tide. (d) Near-inertial energy from observations and numerical simulations.

(3) Proposed a new route for tidal energy cascade, i.e., fission of shoaling internal solitary waves via generating high-frequency internal waves (Fig. 3) and elucidate mechanisms of polarity reversal, shoaling and fission of internal solitary waves induced by tidal currents via modulating isopycnals on shelves.

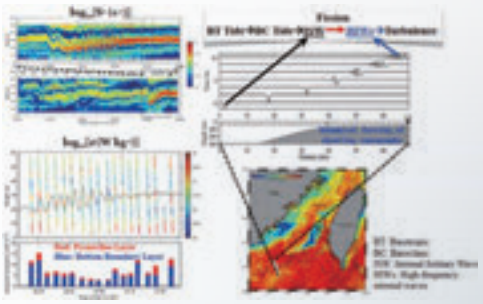


Fig. 3. Pathway of tidal energy cascade via fission of shoaling internal solitary-like waves: Observational evidence and process-oriented numerical simulations.

EDUCATION

MEL's educational and talent training is conducted through the College of Ocean and Earth Sciences and the College of the Environment and Ecology year-round. In 2022, 5 people were awarded the Outstanding Postdoctoral Fellowship, 5 people were selected for the Outstanding Doctoral Scholarship and 33 were awarded the MEL Summer Undergraduate Research Fellowship. MEL carries out international joint training programs with the University of Delaware, GEOMAR Helmholtz Centre for Ocean Research Kiel, Sorbonne University, University of Southampton, the University of Hong Kong for Ph.D. students and postdocs. MEL encourages students to initiate and organize various academic activities, such as the MEL Graduate Forum and the University Consortium on Aquatic Sciences Symposium. These activities provide diverse platforms for students' growth, leadership training and academic exchange.

D-smart

Haoran Liu (4th from left in the last row) participated in the GEOTRACES GP21 international cooperation cruise in the South Pacific organized by GEOMAR. The participants of the cruise also included MEL student Zhongwei Yuan, postdoc Zuozhu Wen and alumni Zhouling Zhang.

RV Sonne

Marine and Environmental International Joint Training Program

The MEL Marine and Environmental International Joint Training Program for Innovative Talents was launched in 2020. The program supports Ph.D. candidates, postdoctoral fellows and faculty members to visit or study at the College of Earth, Ocean and Environment of the University of Delaware (UD) and the GEOMAR Helmholtz Centre for Ocean Research Kiel (GEOMAR) for joint training. The program was renewed in 2022 for another 3-year term, with the School of Ocean and Earth Science of University of Southampton (SOES) and Laboratoire d'Océanographie de Villefranche, Sorbonne University – CNRS (LOV) joining as new partner institutions. 5 candidates were awarded the scholarship in 2022.

Haoran Liu, a Ph.D. student majoring in environmental science, arrived at the GEOMAR in January 2022. He is co-supervised by Prof. Bangqin Huang at MEL and Dr. Thomas Browning and Prof. Eric Achterberg at GEOMAR. He, along with his GEOMAR supervisors, worked on a study initiated at MEL, on deconvolving nutrient, light and community signals in phytoplankton photophysiology across the South China Sea based on high-resolution fast repetition rate fluorometry observation. The results of this study was published in *Frontiers in Marine Science* in 2022. It deconstructs the effects of nutrients, light and phytoplankton community structure on the photophysiological status of phytoplankton in the South China Sea.

Outstanding Postdoctoral Fellowship

Aiming to foster innovative research and interdisciplinary collaborations, MEL initiated the Outstanding Postdoctoral Fellowship Program in 2014. The Fellowship funds original, ground-breaking projects that have the potential to advance knowledge in marine environmental sciences and other interdisciplinary research that fits into MEL's research scopes. 5 applicants were funded in 2022. They are Dr. Yan Wang from South China University of Technology, Dr. Guangyi Su from the University of Basel in Switzerland, Dr. Chao Zhang from Fudan University, Dr. Lingqi Ma from Xiamen University and Dr. Jingqiang Fu from Xiamen University.

Murong Zhang participated in a scientific training in the Yellow River Loop under the project named Desert-oasis Convergence line and Deep convection Experiment (DECODE)

Yijing Liu

Qing Zhu participated in the 2022 NSFC Summer Cruise to the Taiwan Strait

Lingqi Ma

Zhi Wang participated in the "XMU at Sea" undergraduate training cruise and working on the field sampling of benthic organisms

Yinru Dai

Ph.D. Fellowship

MEL initiated the MEL Ph.D. Fellowship in 2016, aiming to cultivate academically outstanding Ph.D. students in marine environmental sciences and other interdisciplinary research fields that fit into MEL's research scopes. Applicants must have completed a Bachelor's or Master's degree before their admission date and should be seeking admission as full-time Ph.D. students at Xiamen University. 9 awardees joined MEL in September 2022.

Mingzhen Zhang won the Excellent Oral Presentation Award in the 2022 Environmental Ecological & Future Earth National Graduate Forum.

Jiayu Yin

Yuanjie Li on the NSFC Cruise to the Taiwan Strait.

Jing Zheng

Joint Ph.D. and Postdoc Fellowship Program between XMU and HKU

In 2022, the Swire Institute of Marine Science, The University of Hong Kong (SWIMS) and MEL launched the Joint Ph.D. and postdoc fellowship program to encourage collaborative and multidisciplinary research. The program provides support for Ph.D. and postdoctoral fellows to receive joint training at the two universities. One Ph.D. student from each institute was awarded in 2022.

Jialu Huang from Marine Chemistry

Jiamian Hu

"In the joint training program of MEL and SWIMS, I made friends with peers and scientists and experienced different cultures and research environments. With the joint help of both sides, I have the opportunity to further broaden and improve my research, get new ideas and make a better implementation of it."

Jialu Huang (3rd from right) with groupmates in Peng Chau, Hong Kong

MEL Graduate Forum

The 7th MEL Graduate Forum took place at the Dongshan Swire Marine Station, from July 18 to 20, attended by over 40 graduate students. With the theme “Touched by the Sea”, the forum included topics in physical oceanography, marine biogeochemistry, marine biology, marine ecology, marine geology and paleoclimate and environmental science.

MESSA

University Consortium on Aquatic Sciences Symposium

From March 27 to 31, the 14th UCAS (University Consortium on Aquatic Sciences) Symposium was held online and in person. Over 70 graduate students from Xiamen University, Taiwan Ocean University, Taiwan Sun Yat-sen University, The University of Hong Kong, Zhejiang Ocean University, Shanghai Ocean University, the First Institute of Oceanography (MNR), Taipei University, Taiwan University, Chung Hsing University, Universiti Malaysia Terengganu, University of Malaya, and several other institutes participated. Topics covered included marine ecology and biodiversity, biogeochemistry, physical oceanography, and aquaculture. Keynote presentations, oral talks, posters and salons were held.

Jiachen Li

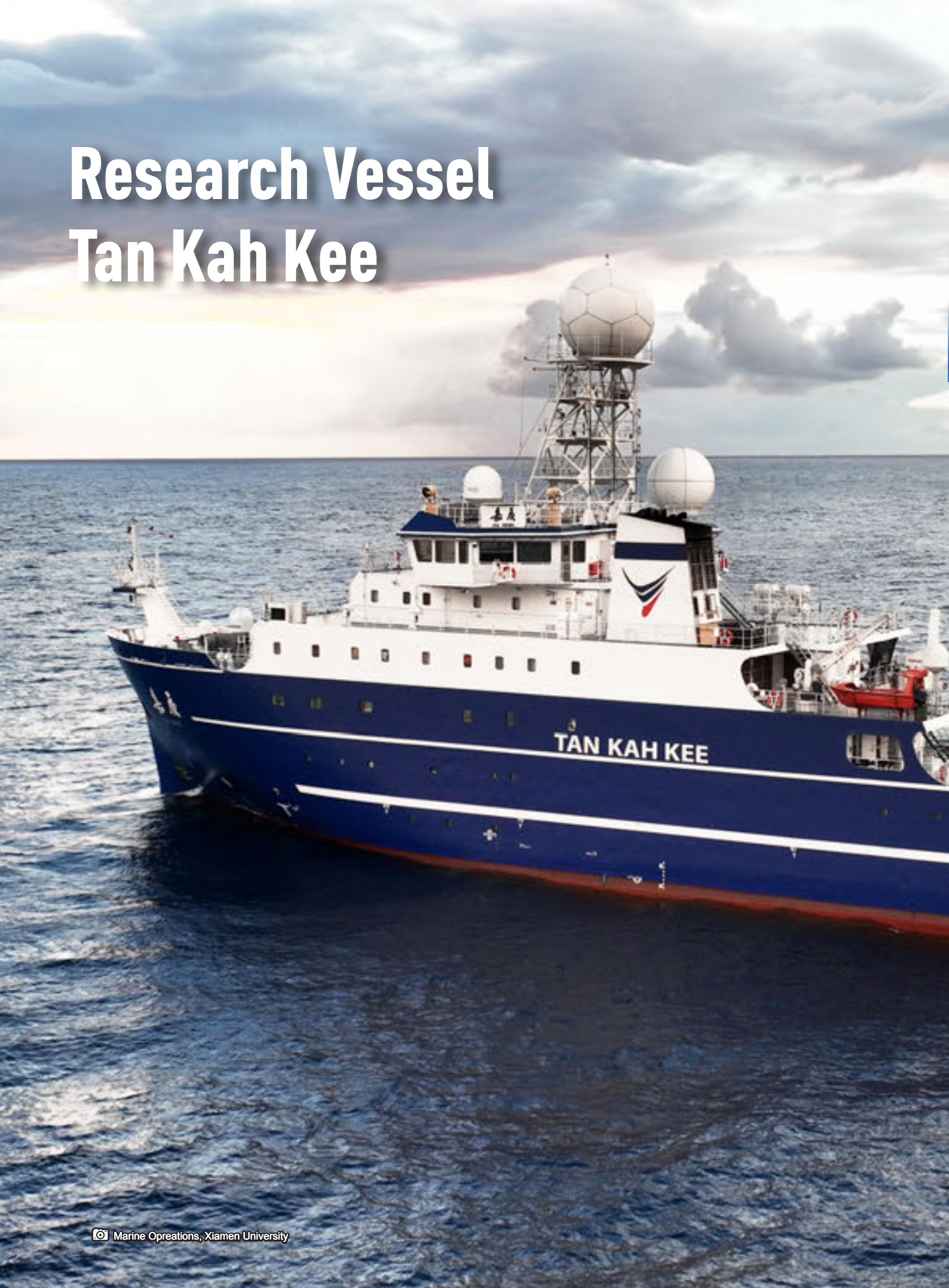
Yanran Liu

Summer Undergraduate Research Fellowship

Initiated in 2014, the MEL Summer Undergraduate Research Fellowship in Marine Environmental Science (URF) encourages undergraduates to pursue science and technology careers by providing research experiences at MEL. 33 undergraduate students from 15 universities joined the program in 2022 working on mini research projects with individual supervisors. They also received training on lab safety and facility operations. Several interactive seminars and field studies were also organized for participants.


MEL
AFIELD

Research Vessel Tan Kah Kee



Marine Opreations, Xiamen University

Jiajun Huang

The R/V TKK embarked on the first expedition of the year to the South China Sea (SCS) in early April 2022. By early November, five research expeditions had been completed, totaling 205 at-sea working days and around 23,000 nautical miles.

Research Expedition in the Northwest Pacific

On July 25, a major expedition studying the processes, mechanisms and evolution of the biological pump carbon fixation was conducted (NORC2022-306). Dalin Shi and Zhimian Cao from MEL served as chief scientist of the project and chief scientist of the cruise, respectively. During the 47-day expedition, multiple over-the-side operations were conducted on the ship, including 101 regular CTD casts, 13 *in situ* pumps, 25 multiple plankton sampler deployments and 19 trace metal clean (TMC) casts. With the joint efforts of the research team and marine technicians, 6 box cores and 8 gravity cores were collected onboard.

Ruotong Jiang

Yuye Han

Yuyan Zhang

Research Expedition in the Central South China Sea Basin

From September to December, the NSFC Open Research Expedition in the central SCS (NORC2022-06) was conducted onboard the R/V TKK. This expedition was split into two legs - the comprehensive biogeochemical one and the geological and geophysical one. Xin Liu and Yuan Shen from MEL served as chief scientists for each leg. This cruise supported 33 NSFC-funded projects carried by 68 scientists and researchers from 12 domestic institutions. On this expedition, 108 over-the-side operations were implemented on the ship, including 59 CTD casts, 1 *in situ* LVPs, 19 gravity cores, 6 box cores, 2 heat flow probes, 3 benthic trawls, 1 rock trawl and the operation of a deep-sea remotely operated platform.

T-smart hosted the National Beach Cleaning Activity (Dongshan) with NGO "Donghai Guard".

The National Observation and Research Station for the Taiwan Strait Marine Ecosystem (T-SMART)

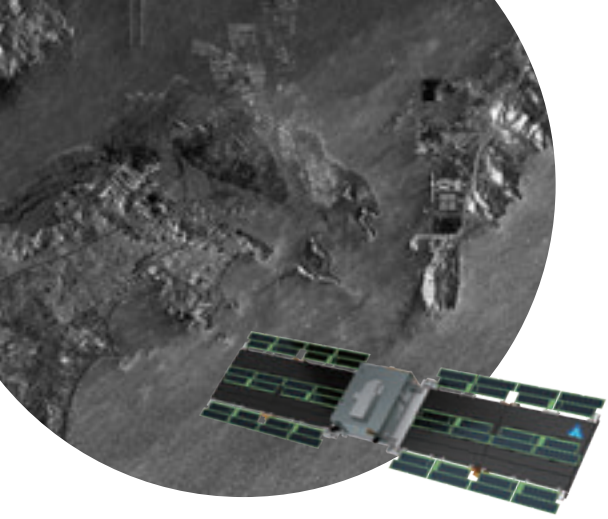
T-SMART is committed to the long-term monitoring of and experimental research on marine ecosystem structure and function, providing scientific and technological solutions for healthy ecosystems and sustainable economic development. T-SMART quarterly cruises in 2022 included observations of the upwelling region in the Taiwan Strait, Dongshan Bay, Xiamen Bay and Zhangjiang Estuary, as well as improvements to its intelligent observation facilities. In total, over 35 GB of observational data were collected. The first T-SMART Academic Committee Meeting and Strategic Planning Meeting was held on November 16.

T-smart hosted the National Beach Cleaning Activity (Dongshan) with NGO "Donghai Guard"

CECO-II

The second generation of the Coral Ecosystem Cabled Observatory (CECO-II) passed sea trials and was officially launched. Biodiversity assessments in restored mangroves in the Zhangjiang Estuary were also completed.

"HiSea" Satellites

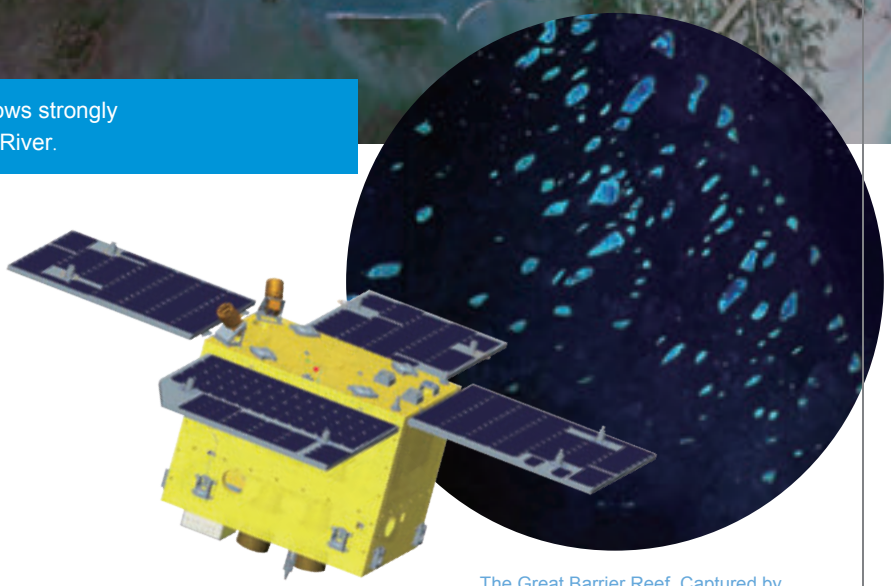


Dongshan Bay. Captured by HiSea-1 September 22, 2022.

HiSea-1 has performed more than 6,000 imaging missions, acquired tens of thousands of high-definition surface radar images, established an operational inversion system for sea surface wind field and waves, produced the first provincial-level autonomous high-quality meter-level SAR map for Fujian Province, developed and completed several artificial intelligence learning data sets including ships, aircraft, water bodies, and other target and environmental elements, and supported several research projects, providing data services for more than 50 units in the ocean science, earthquake science, meteorology, geology, water conservancy, natural resources conservation, emergency response, national defense and other related departments, universities, and research institutes. HiSea-1 also provided emergency photography during events such as the Suez Canal ship blockage, the Henan flood, the volcanic eruption in Tonga and the Russia-Ukraine conflict. This demonstrates the application capability of SAR satellites in emergency response and disaster prevention and mitigation.

A HiSea-2 image collected on January 23, which shows strongly varying water quality at the mouth of the Mississippi River.

From its launch on June 11, 2021 to December 13, 2022, a total of 3065 imaging missions have been carried out by HiSea-2, 25T of raw data received by the ground station and 19,371 images of Level 1 products processed, covering an area of over 400 million square kilometers.



The Great Barrier Reef. Captured by HiSea-2 June 13, 2022.

MEL SYNERGY

MEL carries out a large number of academic exchanges and cooperation. In 2022, MEL organized 16 scientific conferences, a Nanqiang academic lecture, 8 luncheon seminars and 3 Ling Feng Forums. A total of 24 scholars were approved for the MEL Visiting Fellowship Program, 14 scholars visited MEL onsite despite of COVID-19. MEL scientists were also actively involved in international efforts for a better ocean through the SOLAS IPO (China), the Coastal-SOS Project and the Global ONCE Program.


Y

International Projects

Ocean Negative Carbon Emission (ONCE)

- **UN Ocean Decade Endorsed Program**
- **Nianzhi Jiao**

Based on the global consensus on carbon neutrality and international research frontiers on ocean negative carbon emissions, Nianzhi Jiao led the launch of Global ONCE, a UN Ocean Decade Programme, in June 2022.
Its objective is to provide data, knowledge and best practices to enable society to develop mitigating and adaptative approaches to climate impacts. Global ONCE will establish a network of instrumented marine field stations and research facilities to evaluate such approaches, develop the protocols for initiation and evaluation, undertake and facilitate co-designed interdisciplinary research on key ecosystem carbon processes, build technical and personnel capacity and enhance knowledge exchange between scientists, policy makers, industry, managers and communities. The approaches considered span nature-based interventions to optimize organic carbon sequestration capability alongside biodiversity as well as chemical and engineering technologies. Global ONCE will promote equitable ocean governance of adaptative and mitigative approaches, through enhanced interaction with local, regional and global industries, decision makers and legislators.

For more information, go to https://www.global-once.org

Key objectives of Global ONCE are:

- Construction of a network of coastal and ocean study sites and experimental infrastructure
- Improve technical and personnel capacity and ocean literacy
- Provision of the scientific, technological and governing frameworks for assessment, implementation and monitoring of adaptative and mitigative approaches
- Improve ocean-climate mitigative and adaptative strategies, policies and governance

Coastal Zones under Intensifying Human Activities and Changing Climate: A Regional Programme Integrating Science, Management and Society to Support Ocean Sustainability (Coastal-SOS)

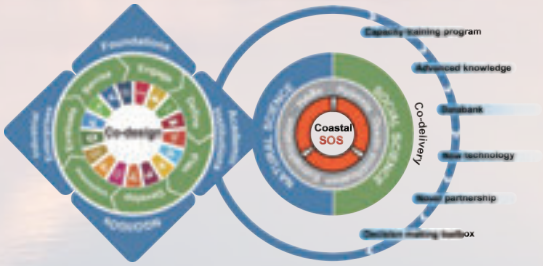
- **UN Ocean Decade Endorsed Project**
- **Minhan Dai**

Led by MEL, the COASTAL-SOS was endorsed as a project of the UN Ocean Decade in 2021. COASTAL-SOS partners cross-sectoral stakeholders, including leading academic institutions, industrial enterprises, non-profit foundations and nongovernmental/intergovernmental organizations (NGO/IGOs) from East Asian countries to advance scientific understanding of critical coastal ocean health issues. Since its endorsement, COASTAL-SOS has held its launch meeting during the UN Ocean Decade Regional Kickoff Conference for the Western Pacific and its Adjacent Areas. The International Project Office has settled at MEL. Multiple research funds for COASTAL-SOS have been granted through the Xiamen Ocean Development Bureau, Chinese Academy of Sciences, China Ocean Development Foundation and Tencent. Implementation plans are progressing in an orderly manner. In 2022, COASTAL-SOS organized several activities targeting different stakeholders, including 2022 Sustainable Ocean Forum, Virtual Training Program for Sustainable Oceans 2022 and 6th China Oceanic Development Foundation Beach Cleanup Event. Furthermore, COASTAL-SOS cooperated with other UN Ocean Decade actions and actively participated in UN Ocean Decade-related events, such as a satellite event for the 2022 International Digital Twins of the Ocean Summit. An invited review entitled “Persistent eutrophication and hypoxia in the coastal ocean” has been accepted by *Cambridge Prisms:* Coastal Futures, aiming to provide a new perspective on tackling eutrophication and hypoxia problems.

For more information, go to http://coastal-sos.xmu.edu.cn/

Ocean Negative Carbon Emissions

O N C E



Surface Ocean - Lower Atmosphere Study, SOLAS

Formally launched in 2004, the Surface Ocean-Lower Atmosphere Study (SOLAS) aims to achieve quantitative understanding of the key biogeochemical-physical interactions and feedbacks between the ocean and atmosphere, and of how this coupled system affects and is affected by climate and global change. The SOLAS International Project Office (IPO)-China has been hosted by MEL since January 2021. Minhan Dai was the co-chair of the SOLAS Scientific Steering Committee for a 3-year term from 2021 to 2023. The IPO-China is led by Li Li, SOLAS Co-Executive Director.

SOLAS International Project Office

What we have done this year:

In 2022, the IPO coordinated and released the SOLAS 2022–2023 Implementation Strategy, and continued providing support to the SOLAS global community, including 31 National/Regional Networks, 19 Sponsored/Endorsed Projects and 3 Integrated Atmosphere-Ocean Time Series Stations.

SOLAS embraced digital and hybrid solutions for its 8th Open Science Conference, which was held in September 2022 in Cape Town, South Africa. The conference welcomed nearly 200 ocean-atmosphere scientists from over 30 countries to share their research work around 5 core themes and 3 cross-cutting themes in the SOLAS science plan.

To continue providing the needed multidisciplinary air-sea interaction background for the next generation of Earth system scientists, SOLAS offered its 8th Summer School in a virtual format in June 2022, which hosted 62 students from 24 countries and involved 31 lecturers.

A quarterly seminar series was launched to foster discussions on cutting-edge scientific questions and provide researchers at all career stages with the opportunity to interact and build the SOLAS community across the globe. The first three seminars were held in China, France, and Portugal.

SOLAS has been dedicated to ensuring effective implementation of science in policy and decision-making on climate and environmental health by getting engaged in the 27th Conference of the Parties to the United Nations (UN) Framework Convention on Climate Change (COP27), the UN Ocean Conference 2022 and the UN Decade of Ocean Science for Sustainable Development (2021-2030). Co-design and co-delivery with partners have played an important role in the whole process.

Douglas Hamilton from SOLAS Early Career Scientist Committee (2nd from left, COP27).

Douglas Hamilton

20
International Conferences, Meetings and Workshops

24
National/Regional Reports

5
Event Reports

12
Issues of Newsletters

69
Announcements

378
Tweets

Conferences

Shuiping Li

The 4th Open Science Symposium on Western Pacific Ocean Circulation and Climate

The 4th Open Science Symposium on Western Pacific Ocean Circulation and Climate was held in Xiamen and online from October 24 to 27, 2022. More than 260 experts, early career scientists and students around the world shared their latest research during the conference. A total of 88 presentations were given, including 6 keynote talks and 22 invited speeches, focusing on the Northwestern Pacific Ocean Circulation and Climate Experiment's (NPOCE) 5 major scientific topics, furthering academic exchanges on key topics related to ocean circulation and climate in the Western Pacific.

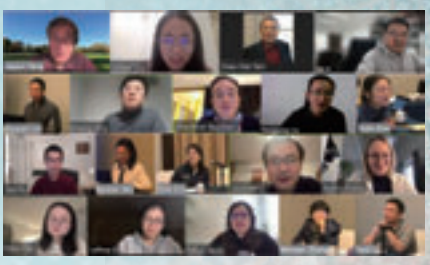
The 8th International Ra-Rn Workshop

The 8th International Ra-Rn Workshop hosted by MEL was held in Xiamen from June 6 to 10, 2022. Prof. Guizhi Wang was chairman of the organizing committee. 86 experts and scholars from 11 countries attended the workshop in person or virtually. The theme of the workshop was “Ra/Rn tracer application in the oceanography and its measurement technology development”. Prof. Bill Burnett from Florida State University and Prof. Hailong Li from Southern University of Science and Technology delivered keynote speeches. The scope of presentations included the use of Ra/Rn isotopes in process studies of oceanic, groundwater and pore water systems and their effects on the marine carbon cycle, ocean acidification, and nearshore eutrophication.The International Ra-Rn Workshop has been held 7 iterations since its inception in 2006. The workshop was held in China for the first time. Here, timely insights helps scientists, administrators and policymakers identify the latest trend in the application and measurement of Ra and Rn isotopes as environmental tracers.

Lei Chen

The 1st Symposium on the Atlantic Meridional Overturning Circulation (AMOC) and Climate Variability

The 1st Symposium on the Atlantic Meridional Overturning Circulation (AMOC) and Climate Variability, hosted by MEL, was held in Xiamen from January 21-22, 2022 in a hybrid format. The symposium focused on cutting-edge research on AMOC and its role in the global climate system. The symposium focused on “Observational perspectives”, “Modeling and paleo perspectives,” and “Climatic implications”. A total of 18 oral presentations were made on topics covering the multiscale temporal and spatial variability of AMOC, its driving mechanisms, paleoclimate reconstruction and climate modeling, and Atlantic and Indo-Pacific interactions. Nearly 40 experts and early-career scholars from France, England, Germany, America attended the symposium.



Feili Li

Visiting Fellowship Program

The MEL Visiting Fellowship Program was launched in 2009 and supports visiting fellows to conduct collaborative studies with MEL scientists for durations of 1 to 6 months. It provides research funds, travel and living expenses. 24 fellows were sponsored in 2022 and 19 were able to visit MEL. A total of 10 papers were published under the project funding.

Shuiping Li

Luncheon Seminars

The MEL Weekly Luncheon Seminar Series was launched in 2014 to facilitate interactions among faculty, staff, students and visitors. 8 Luncheon Seminars were held in 2022. Scholars who received the “MEL Visiting Fellowship Program” also interacted with the students and faculty through a luncheon presentation.

MEL's Academic Visits

On September 23，Prof. Chunzai Wang from the South China Sea Institute of Oceanology, Chinese Academy of Sciences was invited to give a Nanqiang academic lecture entitled “Causes of Northern Hemisphere Summer Super Heat Waves and Their Research Prospects”.

Lei Chen

Emily King

Cindy Lee, Distinguished Professor Emeritus of Stony Brook University, visited MEL from October to December. She was invited to give a talk at Xiamen Binlang Middle School to introduce marine chemistry and marine chemists' works, sharing experience of being a scientist.

MEL IN T
COMMUN

Working with COSEE China and the 70.8 Media Lab, MEL not only continues to develop community outreach programs but is moving into a new era of ocean science communication, striving to become a high-quality communicator of ocean science, raise the awareness of the ocean.


HE
NITY

Encouraging Xiamen to "Think Blue" for Over a Decade

For over a decade, COSEE China has developed ocean science educational programs for the greater Xiamen community. During that time, its programs have evolved and gained incredible popularity - such as the annual Ocean Science Day, which swelled from 700 visitors at the 2012 inaugural event to around 8000 at its peak (pre-COVID). Other programs have remained intentionally small in order to provide participants with nearly one-on-one facilitated learning opportunities with the university's ocean science experts.

Some programs are developed as needed, to meet the needs of the community. The Science at Sea program utilizes the R/V Ocean II to bring middle school students to the ocean to experience it and science in ways that they hadn't before. But bringing people to the sea is not always possible. That's why special collaborations like the ones this year with the Grand Balam Theatre and Xiamen Youth and Children's Palace are so important. They allow us to bring some of the magic of the ocean and ocean science directly to the people in new and imaginative ways.

While it can be hard to effectively gauge the long-term success of an outreach program, there are some early indications of impact. As one-time participants in COSEE China events have grown up, some have gone on to participate in ocean science competitions, joined other marine science camps and programs, or even major in ocean science as they enter university.

We don't know what tomorrow will bring. But we do know that together, we CAN save the ocean and make tomorrow a better place.

COSEE China

Marine Science Communication 2.0: Towards a New Era – 70.8 Media Lab

This year marked the 3rd anniversary of the 70.8 Media Lab. Since its establishment in 2020, the lab has produced hundreds of original, high quality works. Each piece is edited and vetted by a team of scientific advisors to insure the accuracy of the content. However, the media lab is much more than that. In 2022, we have continued to explore ways to best communicate MEL's marine science to the masses and make even broader impacts among the greater Xiamen community.

Not content with the current ways of promoting ocean science, we have been experimenting with new graphical ways to represent science, creating more videos and online content utilizing multimedia across multiple platforms to create a new 3D landscape of science communication.

As part of International Women's Day, we highlighted some of MEL's female scientists in our publications, spotlighting their contributions to ocean science. The "Ocean Talk" series gave viewers access to the true interdisciplinary nature of marine research with broad topics that cross science, arts, and humanities while the "Ocean Idealist" series brought the public face to face (virtually) with ocean scientists, allowing them to directly engage with researchers.

Yet, while we are innovating for tomorrow, we have never forgotten our purpose – to be a "Cradle of Blue." To that end we have continued to train future generations of science communicators with our annual 70.8 Media Lab Training Camp. We've furthered this capacity building into high schools this year with the launch of the "Junior Blue Pioneer Training Program" which saw 27 high school students from all across the country participate in a customized training program incorporating theory and practice to cultivate China's future marine research talents. This has all lead us to hosting Xiamen's first ocean-themed youth science communication competition – the "70.8 Youth Speak" – which called for more young people to further raise awareness of ocean conservation.

Over the last 3 years, the 70.8 Media Lab has grown and evolved and continues to build upon its strengths. Our establishment was marked with an ocean science popularization forum. So it seemed only fitting that our 3rd anniversary saw the return of this forum. We continued to grow throughout the year, expanding beyond Xiamen University to collaborate with government, industry, schools, foundations, television, and other platforms and institutions. As we enter 2023, we will not only continue to sail along this current but also explore other ways to connect overseas lovers of the ocean and bring ocean science out of the lab and into everyone's everyday life.

70.8 Media Lab

Yue Gao

Center of Major Equipment and Technology (COMET)

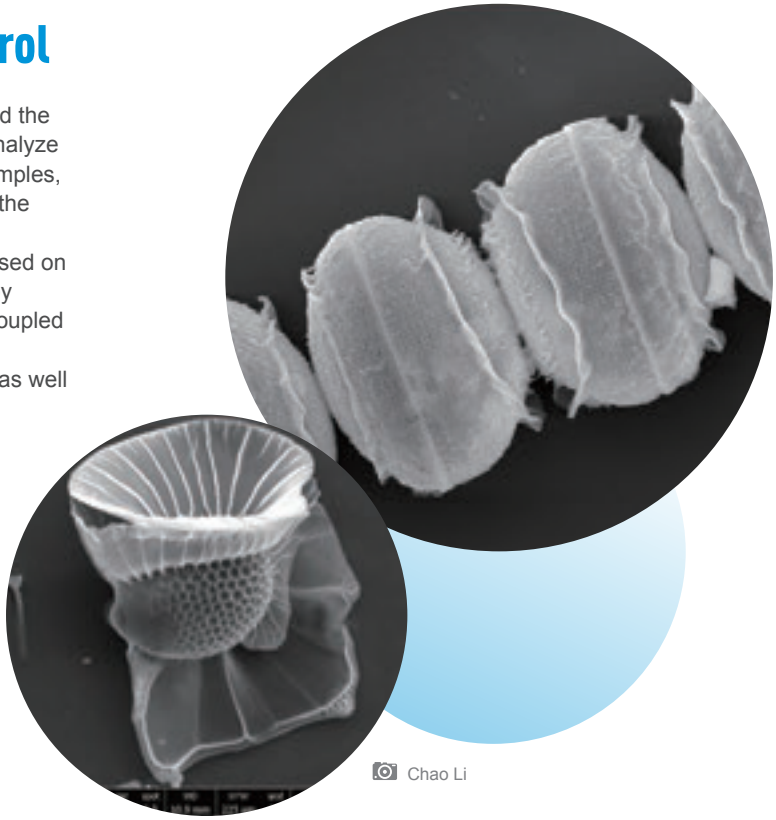
The COMET was established in 2008 to better maintain MEL's scientific instruments with higher efficiency and lower operating costs. COMET continues to strive for excellence as part of the infrastructure for research and teaching and hopes to inspire innovative research discoveries.

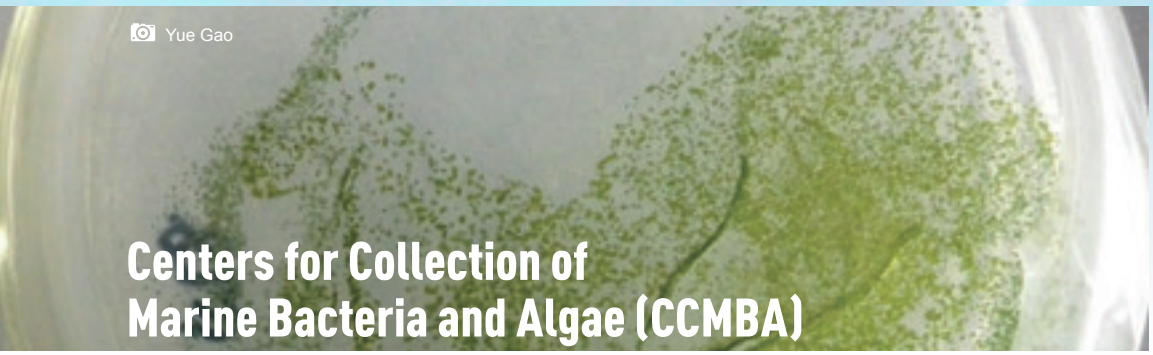
In order to improve the operation, monitoring and maintenance of field equipment deployed by MEL in offshore waters, an online platform for field observation equipment management was developed in 2021. The platform provides automatic monitoring and visualization of the status of the equipment and records in real-time the operational status, error warnings, and handling of multiple automatic observation systems.

Equipment Highlight

Chemical Imaging System with Temperature and Humidity Control

Acquired in June 2019, a large number of users have utilized the chemical imaging system for various projects including to analyze atmospheric particulate matter, classify diatoms in water samples, examine the morphology of geological samples and look at the morphology and characteristics of bacteria. This chemical imaging system with temperature and humidity control is based on Field Emission Environmental Scanning Electron Microscopy (FESEM) and an Energy Dispersive Spectrometer (EDS), coupled with a cooling stage and gas input units. It can be used for physical and chemical characterization of various samples, as well as for *in situ* observation of dynamic processes.



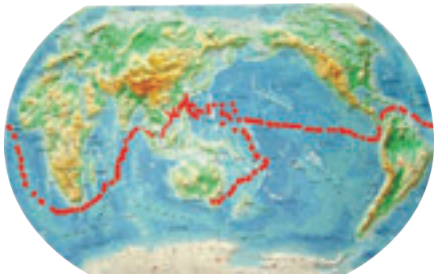


Yue Gao

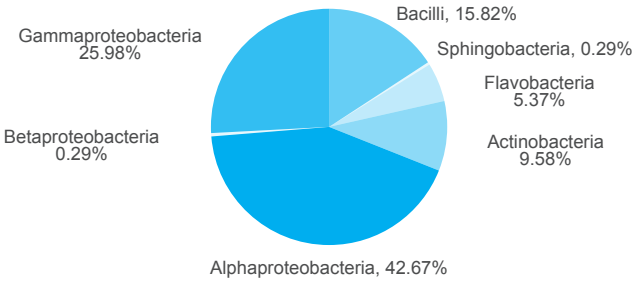
Centers for Collection of Marine Bacteria and Algae (CCMBA)

CCMBA has all the facilities and technology needed for the isolation of and basic analysis of microbes.

Center for Collection of Marine Bacteria (CCMB)



Distribution of samples subjected in our isolation.



Preliminary classification of bacterial strains based on 16S rDNA.

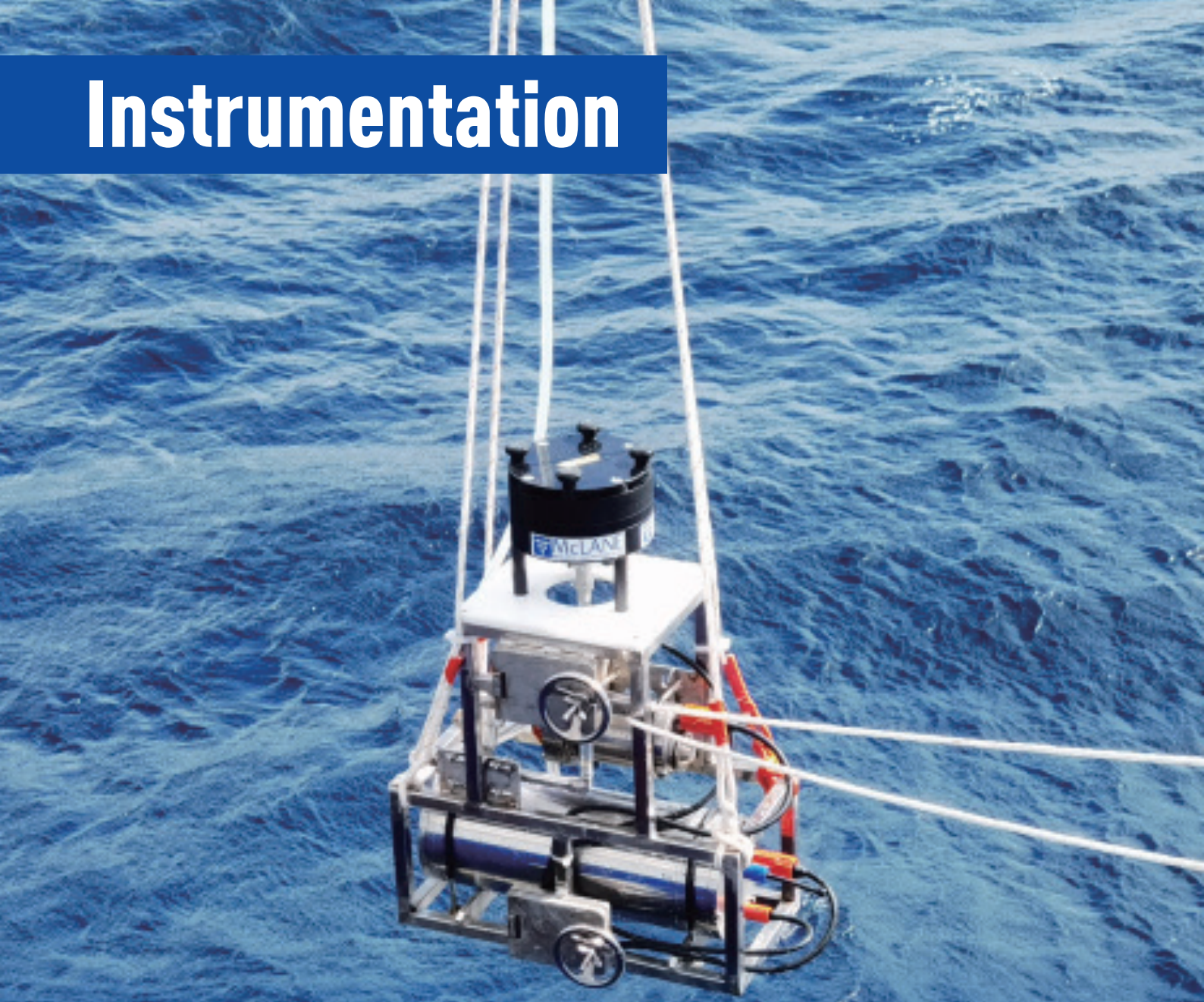
The CCMB focuses on the isolation and classification of bacteria collected from Chinese sea areas, open oceans, and polar regions, including sediments, surface seawater, the deep sea, and hydrothermal events from Kuishan Island. The CCMB specializes in working on colored bacteria strains, such as aerobic anoxygenic photosynthetic bacteria that contain different pigments. To date, 3309 strains have been preserved, and results based on 16S rDNA of nearly 2000 strains showed diverse distribution in 461 (sub) species, and 178 genera of 7 classes. More than 30 taxonomic type strains were published.

Shuiping Li

Center for Collection of Marine Algae (CCMA)

The CCMA conducts the collection, separation, identification and preservation of micro phytoplankton (algae), which play special and important ecological roles in China's offshore and adjacent waters. According to the research needs of various research groups, the CCMA also provides technical support services such as algae culturing, algae separation and purification, and microscopic analysis of algae diversity in water bodies.

Instrumentation



Portable *in situ* Deep-Sea Particulate Sampling Pump

The portable *in situ* deep-sea particulate sampling pump can be equipped with multi-stage filter membranes with different particle sizes, and reach a working depth of 4km. Programming and configuration of the device can be done wirelessly and it also has a built-in USB storage and a removable, independent battery pack.

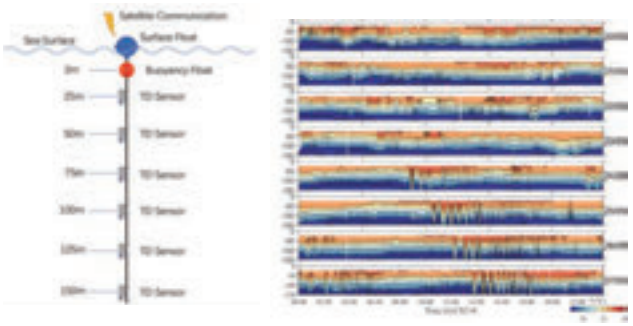
Platform Upgrade in Marine Data Management System

The Ocean Data Center (ODC) upgraded the Ocean Data Management System (ODMS), which includes the business platform of the metadata service and data sharing service, to better protect IP rights. This provides a flexible solution in terms of connectivity and integration with management systems, equipment, and external application resources of research vessels (self-owned or third party).

Xianwei Bai

A Floating Temperature and Depth (TD) Chain System

The Marine Operation Center developed a floating TD chain system which can provide autonomous observations of temperature profiles in the upper layer of the ocean and transmit the data in real-time via satellite. When compared against traditional observation buoys, this system expands the observation capabilities below the surface and is affordable, easy to deploy, and has wide ranging applicability.



Zhenyu Sun

Jian Ma

Development and Testing of the 2nd Generation Coral Ecosystem Cabled Observatory (CECO-II)

An underwater camera module was developed independently by the D-smart team and is a core component of the entire system. In addition to providing underwater video, it also provides power and networks the system. The system can also be equipped with a variety of observation instruments to achieve three-dimensional ocean observation. With real-time transmission, a wide underwater viewing angle, stable operation and easy maintenance, this system utilizes machine learning and target recognition algorithms to realize data such as coral coverage, growth rate, and fish densities and species.

Underwater Automated Clean Sampling System Sea Trial

Weidi Yang

Weifang Chen

To conduct multidisciplinary investigation in the upper ocean, the underwater automated clean sampling system has been developed by the joint research team of MEL (XMU) and State Key Laboratory of Robotics (CAS). The sampling system has been tested onboard R/V TKK in September 2022 and was capable of collecting the in-situ multi-layer particulate and dissolved samples automatically and simultaneously. The comparison of nutrient, POC and genomic measurements between our sampling system and traditional CTD sampling show the sampling system could be a powerful tool to obtain the reliable samples, which is important to capture the fine-scale biogeochemical processes. More effort will be focus on how to collect the uncontaminated dissolved and particulate samples for trace elements synchronously, which might provide scientists a new platform for the GEOTRACES research frontier.

MEL - A NEW LOOK

New Members

Faculty

Xiaolin Bai

Associate Professor ✉ **xbai@xmu.edu.cn**

Dr. Xiaolin Bai received his Doctor of Science degree from Xiamen University in 2018. From 2018 to 2022, he worked as a postdoctoral researcher at the University of Waterloo in Canada and Xiamen University. In 2022, he joined Xiamen University as a faculty member. His research interests include nonlinear internal waves and multiscale interactions in the ocean as well as the ecological and climatological effects of dynamic processes.

Fei Chai

Tang Shifeng Chair Professor in Marine Sciences ✉ **fchai@xmu.edu.cn**

Dr. Fei Chai received his Ph.D. in biological oceanography from Duke University in 1995 and served as the Director of the School of Marine Sciences at the University of Maine from 2012 to 2015. He also served as the Director of the State Key Laboratory of Satellite Marine Environmental Dynamics (SOED) at the Second Institute of Oceanography from 2016 to 2022. In September 2022, he joined Xiamen University as a Tang Shifeng Chair Professor in Marine Science. He studies the physical and biological processes contributing to the global carbon cycle, ocean acidification, open ocean and coastal hypoxia, and climate variability affecting marine ecosystems and fisheries and Ocean-Based Carbon Dioxide Removal (CDR). He is an expert in developing and testing physical-biological models and using models along with observations from multiple platforms including BGC-Argo and satellite remote sensing to address key regional and global questions and issues.

Kewei Lyu

Professor ✉ **kewei.lyu@xmu.edu.cn**

Dr. Kewei Lyu received his Ph.D. in physical oceanography from Xiamen University in 2015. Before joining Xiamen University in August 2022, he was a postdoctoral researcher at the University of California, Irvine (2016-2018), the Australian Commonwealth Scientific and Industrial Research Organization (2018-2021), and the University of Tasmania (2021-2022). Dr. Lyu's research focuses on sea level change, decadal climate variability, dynamic processes of the Southern Ocean, and ocean/climate modeling.

Zengkai Zhang

Professor ✉ **zengkaizhang@xmu.edu.cn**

Dr. Zengkai Zhang obtained his Ph.D. from Xi'an Jiaotong University. Before coming to Xiamen University, he worked as a faculty of Tianjin University (2015.8-2022.5). His major research interests lie in the field of climate change mitigation and adaptation, global production fragmentation, environmental policy simulation and assessment, as well as the marine economy.

Outstanding Postdoctoral Fellows

Jingqiang Fu
jingqiangfu@xmu.edu.cn

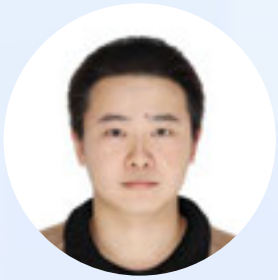
Research Interests
Shellfish biodiversity and genetic breeding, an adaptation of shellfish to environmental changes

LingQi Ma
lqma@xmu.edu.cn

Research Interests
Marine ecology, phytoplankton community ecology, marine physical-biological coupling

Guangyi Su
guangyisu@xmu.edu.cn

Research Interests
Methane biogeochemistry



Yan Wang
wangyanlq11@xmu.edu.cn

Research Interests
Marine biotechnology, protein heterologous expression

Chao Zhang
chaozhang@xmu.edu.cn

Research interests
coupled linkage of Tibetan Plateau-Arctic sea ice

Research Scientists

Peihong Kang
Assistant Research Scientist
Email: kangph@xmu.edu.cn

Research Interests
Organic geochemistry, compound-specific isotope analysis

Xinyou Lin
Associate Research Scientist
Email: linxinyou@xmu.edu.cn

Research Interests
Residual flow dynamics in shallow seas and ocean numerical simulation

Chichi Liu
Research Scientist
Email: liuchichi@xmu.edu.cn

Research Interests
Coral-dinoflagellate symbiosis biology, coral reef ecology, coral reef conservation, coral reef observing technology

Yangyang Zhao
Assistant Research Scientist
Email: yyzhao@xmu.edu.cn

Research Interests
Marine carbon cycle, ocean deoxygenation and acidification

Research Assistants

Rongguang Cao
crg@xmu.edu.cn

Qiurong Chen
chqr@xmu.edu.cn

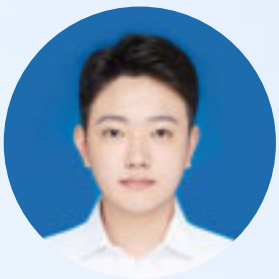
Xinfeng Chen
2332004080@xmu.edu.cn

Yimin Chen
yiminchen777@xmu.edu.cn

Yu Cong
congyu@xmu.edu.cn

Jiafang He
jiafang@xmu.edu.cn

Rong Huang
huangrong@xmu.edu.cn



Zerong Jiang
571256372@xmu.edu.cn

Huiqiong Li
lihuiqiong@xmu.edu.cn

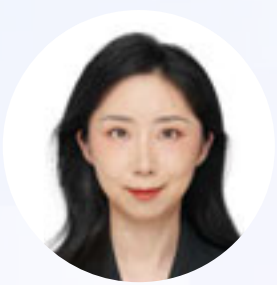
Jun Li
liuyun28@xmu.edu.cn

Xuejing Li
lixuejing1989@xmu.edu.cn

Yating Li
liyating@xmu.edu.cn

Guizhen Ning
guizhen@xmu.edu.cn

Shuhong Qiu
shuhongqiu@xmu.edu.cn



Xiaoyi Wang
xywang@xmu.edu.cn

Wei Xiang
xiangwei@xmu.edu.cn

Cuiqing Xie
xiecuiqing@xmu.edu.cn

Ting Xie
xieting@xmu.edu.cn

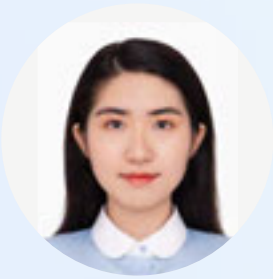
Jingru Zeng
zengjingru@xmu.edu.cn

Lufei Zheng
zhenglf@xmu.edu.cn

Shaowei Zheng
mmisobs@xmu.edu.cn

Wencai Zou
wencaizou@xmu.edu.cn

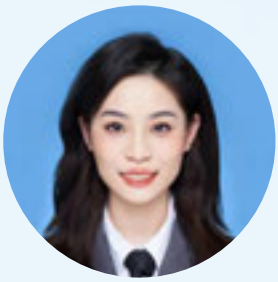
Administrative Staff



Guanfei Wang
Secretary
gfwang@xmu.edu.cn

Jinhua Xue
Secretary
xuejinhua@xmu.edu.cn

Zhaozhi Yi
Logistics Assistant
yizhaozhi@xmu.edu.cn



Lili Zhang
Secretary
lilizhang@xmu.edu.cn

Newly Appointed in Journals

Bangqin Huang, Editorial Board Member, *Advances in Marine Science* (in Chinese)
Chuanchao Wang, Editorial Board Member, *Acta Anthropologica Sinica* (in Chinese)
Dalin Shi, Associate Editor, *Journal of Marine Sciences* (in Chinese)
Dalin Shi, Editorial Board Member, *Geosystems and Geoenvironment*
Haipeng Liu, Associate Editor, *Frontiers in Immunology*
Hongyan Bao, Youth Editor, *Carbon Research*
Hongmei Chen, Review Editor, *Frontiers in Earth Science* and *Frontiers in Marine Science*
Jianyu Hu, Associate Editor, *Journal of Tropical Oceanography* (in Chinese)
Kejian Wang, Associate Editor, *Frontiers in Marine Science* and *Frontiers in Bioengineering and Biotechnology*
Weidong Guo, Editorial Board Member, *Marine Environmental Science* (in Chinese)
Xing Jian, Editorial Board Member, *Journal of Palaeogeography* (in Chinese)
Xin Liu, Editorial Board Member, *Journal of Tropical Oceanography* (in Chinese)
Xudong Zhu, Associate Editor, *Frontiers in Environmental Science, Frontiers in Ecology and Evolution, Frontiers in Earth Science*

Newly Appointed in Organizations or Associations

Bangqin Huang, Associate Director, Marine Ecology Professional Committee of The Ecological Society of China (ESC)
Dalin Shi, Associate Director, Stable Isotope Ecology Professional Committee of The Ecological Society of China (ESC)
Fei Chai, Vice Chair, Scientific Steering Committee for Northwest Pacific Ocean Circulation and Climate Experiment (NPOCE)
Guizhi Wang, Member, Global Ocean Oxygen Database and ATlas (GO2DAT) Steering Committee
Kewei Lyu, Working Group 2 of Explaining and Predicting Earth System Change (EPESC) Lighthouse Activity, World Climate Research Programme (WCRP)
Minhan Dai, Member, China Council for International Cooperation on Environment and Development (CCICED)
Minhan Dai, Associate Director, Chinese Society for Oceanology and Limnology (CSOL)
Nianzhi Jiao, Counsellor, The People's Government of Fujian Province
Yao Zhang, Member of Presidium, Youth Committee of Scientific Committee on Oceanic Research-China (SCOR-China)
Yonglong Lu, Fellow, International Science Council (ISC)
Zhiyu Liu, Managing Director, Chinese Society for Oceanology and Limnology (CSOL)

Selected invited talks in international conferences

Minhan Dai. Ocean carbon cycle and ocean-based carbon dioxide removal. 19th Annual Meeting of the Asia Oceania Geosciences Society. August 1 - 5, 2022. Online. (AOGS Axford Medal Lecture)

Minhan Dai. Coastal-SOS and BRICS cooperation under UN Decade framework. The BRICS Workshop on Climate Prediction and Marine Disaster Prevention and Mitigation. December 12 - 13, 2022. Qingdao, China. Online. (Keynote speech)

Minhan Dai. Ecosystem-based integrated ocean management as an instrument for developing sustainable blue economy with special references to island countries. China-Island Countries High-level Forum on Ocean Cooperation. November 9, 2022. Pingtan, China. (Keynote speech)

Nianzhi Jiao. Global Ocean Negative Carbon Emissions (Global-ONCE). 7th BRICS Young Scientist Forum. August 29 - September 1, 2022. Xiamen China. (Invited talk)

Senjie Lin. ENDS: Beginning of a holistic molecular ecological approach to understanding phytoplankton regime shift and algal blooms. 2022 International Conference on international Cooperation and Integration of Industry, Education, Research and Application for Future Ocean. November 27 - 28, 2022. Qingdao, China. Online. (Invited talk)

Xin Liu. Progress of key biogeochemical parameters of plankton community in the NPSG. The Japan Oceanographic Society fall meeting - The 2nd Cooperative Study of the Kuroshio and Adjacent Regions (CSK2). September 3 - 7, 2022. Nagoya, Japan. Online. (Invited talk)

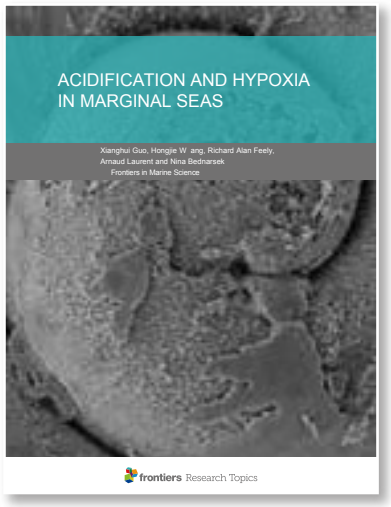
Dalin Shi. The complex effect of ocean acidification on marine primary producers in a multi-stressor environment. 5th International Symposium on the Ocean in a High CO_2 World. September 13 - 16, 2022. Lima, Peru. Online. (Plenary talk)

Stephan Steinke. Late quaternary environmental history of western and southern Indonesia. 1st International Symposium on Eastern Indonesian Marine Ecosystem (ISEIME). November 24, 2022. Online. (Invited talk)

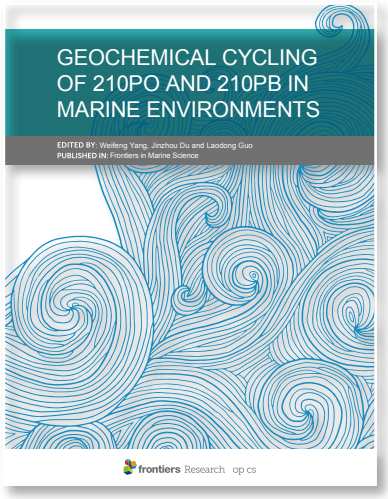
Bingbing Wang. Micro-spectroscopic characterization and ice formation potential of marine related aerosol particles. 8th hybrid SOLAS Open Science Conference. September 25 - 29. Cape Town, South Africa. Online. (Invited talk)

Peng Xu. Genomic tools and genome selection for disease resistance breeding of large yellow croaker in China. 2022 International Symposium on Genetics in Aquaculture - ISGA XIV TALKS. January 20, 2022. Puerto Varas, Chile. Online. (Invited talk)

Publications

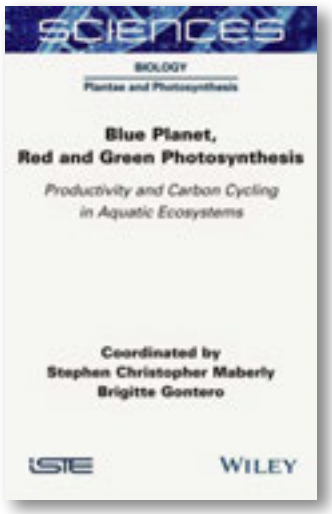


Xianghui Guo, Hongjie Wang, Richard Alan Feely, Arnaud Laurent, Nina Bednarsek (Topic Editors). 2022. Acidification and Hypoxia in Marginal Seas. *Frontiers in Marine Science.* 544 Pages.

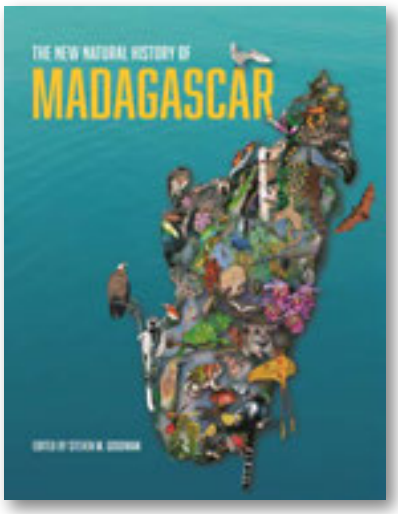


Weifeng Yang, Jinzhou Du, Laodong Guo (Topic Editors). 2022. Geochemical Cycling of 210Po and 210Pb in Marine Environments. *Frontiers in Marine Science.* 152 Pages.

Minhan Dai, Guirui Yu, Xiliang Zhang, Zhijun Jin, Xiaoye Zhang, Xudong Zhu (Section Leads). 2022. Fundamental research and policy on carbon neutrality. In: Carbon Neutrality. *Fundamental Research.* 2, 355-356.



Kunshan Gao, Wenyan Zhao, John Beardall (Section Leads). 2022. Future responses of marine primary producers to environmental changes. In: Blue planet, red and green photosynthesis: Productivity and carbon cycling in aquatic ecosystems. Stephen Christopher Maberly, Brigitte Gontero (Eds.). ISTE and Wiley. 273-304.



Judith C. Masters, Fabien Génin, Romain Pellen, Paul P.A. Mazza, Yurui Zhang, Thierry Huck, Marina Rabineau, Daniel Aslanian (Chapter Authors). 2022. Geodispersal as a biogeographic mechanism for Cenozoic exchanges between Madagascar and Africa. In: The New Natural History of Madagascar. Steven M. Goodman (E.d.). Princeton University Press. 78–81.

Guizhi Wang, Xiaolin Li, Marc Humphries, Venkatesh Chinni, Khanittha Uthaipan, Minhan Dai (Chapter Authors). 2022. Coastal Pollution. In: Blue Economy: An Ocean Science Perspective. Edward R. Urban Jr., Venugopalan Ittekkot (Eds.). Springer. 251-286.

Abate, R; Hetharua, BH; Patil, V; Lin, DE; Kifle, D; Liang, JR; Chen, CP; Sun, L; Kao, SJ; Bi, YH; Huang, BQ*; Gao, YH*. Responses of phytoplankton and its satellite bacteria to exogenous ethanol. *JOURNAL OF OCEANOLOGY AND LIMNOLOGY*. 2022. DOI: 10.1007/s00343-021-1224-5.

Alpert, PA*; Kilthau, WP; O'Brien, RE; Moffet, RC; Gilles, M; Wang, BB; Laskin, A; Aller, JY; Knopf, DA*. Ice-nucleating agents in sea spray aerosol identified and quantified with a holistic multimodal freezing model. *SCIENCE ADVANCES*. 2022. 8, eabq6842.

Azizullah, A*; Gao, KS*; Khan, S; Gao, G. The interplay between bisphenol A and algae-A review. *JOURNAL OF KING SAUD UNIVERSITY SCIENCE*. 2022. 34, 102050.

Bai, YL; Gong, J; Zhou, ZX; Li, BJ; Zhao, J; Ke, QZ; Zou, XQ; Pu, F; Wu, LN; Zheng, WQ; Zhou, T; Xu, P*. Chromosome-level assembly of the Southern Rock Bream (*Oplegnathus fasciatus*) genome using PacBio and Hi-C technologies. *FRONTIERS IN GENETICS*. 2022. 12, 811798.

Bai, YL; Qu, A; Liu, Y; Chen, XT; Wang, JY; Zhao, J; Ke, QZ; Chen, L; Chi, HS; Gong, H; Zhou, T; Xu, P*. Integrative analysis of GWAS and transcriptome reveals p53 signaling pathway mediates resistance to visceral white-nodules disease in large yellow croaker. *FISH & SHELLFISH IMMUNOLOGY*. 2022. 130: 350-358.

Bai, YL; Wang, JY; Zhao, J; Ke, QZ; Qu, A; Deng, YC; Zeng, JJ; Gong, J; Chen, J; Pan, Y; Chi, HS; Gong, H; Zhou, T; Xu, P*. Genomic selection for visceral white-nodules diseases resistance in large yellow croaker. *AQUACULTURE*. 2022. 559, 738421.

Bai, YL; Wang, M; Zhao, J; Bai, HQ; Zhang, XY; Wang, JY; Ke, QZ; Qu, A; Pu, F; Zheng, WQ; Zhou, T*; Xu, P. Comparative transcriptome analysis reveals immunoregulation mechanism of lncRNA-mRNA in gill and skin of large yellow croaker (*Larimichthys crocea*) in response to Cryptocaryon irritans infection. *BMC GENOMICS*. 2022. 23, 206.

Bai, YL; Zhou, ZX; Zhao, J; Ke, QZ; Pu, F; Wu, LN; Zheng, WQ; Chi, HS; Gong, H; Zhou, T; Xu, P*. The draft genome of *Cryptocaryon irritans* provides preliminary insights on the phylogeny of ciliates. *FRONTIERS IN GENETICS*. 2022. 12, 808366.

Bao, HY*; Qiao, J; Huang, DK; Niggemann, J; Yi, YB; Zhao, WQ; Ni, SL; Dittmar, T; Kao, SJ. Molecular level characterization of the biolability of rainwater dissolved organic matter. *SCIENCE OF THE TOTAL ENVIRONMENT*. 2022. 862, 160709.

Bao, HY*; Qiao, J; Zhang, RY; Huang, DK; Wang, BY; Lin, XH; Kao, SJ. Multiproxy probing of anthropogenic influences on the different components of dissolved organic matter in coastal rainwater. *SCIENCE OF THE TOTAL ENVIRONMENT*. 2022. 824, 153846.

Bao, MR; Huang, QH*; Lu, ZB; Collard, F; Cai, MG; Huang, P; Yu, Y; Cheng, SP; An, LH; Wold, A; Gabrielsen, GW. Investigation of microplastic pollution in Arctic fjord water: a case study of Rijpfjorden, Northern Svalbard. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH*. 2022. 29: 56525-56534.

Bao, RQ; Wang, ZZ; Qi, HY; Mehmood, T; Cai, MG; Zhang, YM; Yang, RL; Peng, LC*; Liu, FJ. Occurrence and distribution of microplastics in wastewater treatment plant in a tropical region of China. *JOURNAL OF CLEANER PRODUCTION*. 2022. 349, 131454.

Boamah, GA; Huang, ZK; Shen, YW; Lu, YS; Wang, ZX; Su, Y; Xu, CA; Luo, X; Ke, CH*; You, WW*. Transcriptome analysis reveals fluid shear stress (FSS) and atherosclerosis pathway as a candidate molecular mechanism of short-term low salinity stress tolerance in abalone. *BMC GENOMICS*. 2022. 23, 392.

Cai, LL; Feng, C; Xie, L; Xu, B; Wei, W; Jiao, NZ; Zhang, R*. Ecological dynamics and impacts of viruses in Chinese and global estuaries. *WATER RESEARCH*. 2022. 226, 119237.

Cai, SJ; Wang, FP; Laws, EA; Liu, Y; Xu, C; Ma, LQ; Xiao, WP*; Huang, BQ. Lingkages between bacterial community and extracellular enzyme activities crossing a coastal front. *ECOLOGICAL INDICATORS*. 2022. 145, 109639.

Cai, Y; Wang, B; Pan, F; Fu, YY; Guo, WD; Guo, ZR; Liu, HT*. Effects of manganese, iron and sulfur geochemistry on arsenic migration in the estuarine sediment of a small river in Xiamen, Southeast China. *ENVIRONMENTAL POLLUTION*. 2022. 293, 118570.

Cao, ZY; Hu, ZD; Bai, XL*; Liu, ZY. Tracking a rain-induced low-salinity pool in the South China Sea using satellite and quasi-Lagrangian field observations. *REMOTE SENSING*. 2022. 14, 2030.

Chen, BH; Ye, YT; Lin, D; Zhang, M; Sun, J; Tang, K*. *Croceicoccus hydrothermalis* sp. nov., isolated from shallow- sea hydrothermal system off Kueishantao Island. *INTERNATIONAL JOURNAL OF SYSTEMATIC AND EVOLUTIONARY MICROBIOLOGY*. 2022. 72, 5472.

Chen, CC; Lu, YL*; He, GZ. Driving mechanisms for decoupling CO_2 emissions from economic development in the ten largest emission countries. *ECOSYSTEM HEALTH AND SUSTAINABILITY*. 2022. 8, 2059016.

Chen, JC; Fang, C; Zheng, RH; Chen, ML; Kim, DH; Lee, YH; Bailey, C; Wang, KJ; Lee, JS; Bo, J*. Environmentally relevant concentrations of microplastics modulated the immune response and swimming activity, and impaired the development of marine medaka Oryzias melastigma larvae. *ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY*. 2022. 241, 113843.

Chen, LF; Lee, ZP*; Lin, G; Wang, YC; Wang, JW; Lai, WD. Experimental evaluation of temperature dependence of pure water absorption coefficient in near-infrared domain. *ACTA OPTICA SINICA*. 2022. 42, 1801007.

Chen, LF; Lee, ZP*; Lin, G; Wang, YC; Wang, JW; Lai, WD. On the measurement of remote sensing reflectance by a traditional above-water approach in small water bodies. *APPLIED OPTICS*. 2022. 61: 8664-8670.

Chen, LM; Zeng, MH; Jin, JW; Yao, QH; Ye, TX; You, LJ; Chen, X*; Chen, XM*; Guo, ZY*. Nanoenzyme reactor-based oxidation-induced reaction for quantitative SERS analysis of food antiseptics. *BIOSENSORS*. 2022. 12, 988.

Chen, NW*; Wang, J*; Liu, XC*; Zhang, CY; Huang, BQ; Beusen, AHW; Middelburg, JJ; Bouwman, AF. Exploring seasonal and annual nitrogen transfer and ecological response in river-coast continuums based on spatially explicit models. *JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES*. 2022. 127, e2021JG006634.

Chen, Q; Lonborg, C; Chen, F; Gonsior, M; Li, YY; Cai, RH; He, C; Chen, JX; Wang, Y; Shi, Q; Jiao, NAZ; Zheng, Q*. Increased microbial and substrate complexity result in higher molecular diversity of the dissolved organic matter pool. *LIMNOLOGY AND OCEANOGRAPHY*. 2022. 67: 2360-2373.

Chen, QR; Tang, K*; Chen, XF; Jiao, NZ*. Microbial sulfurization stimulates carbon sequestration in marine oxygen minimum zones. *SCIENCE BULLETIN*. 2022. 67: 895-898.

Chen, X; Liu, JH*; Chen, JF; Wang, JN; Xiao, XL; He, C; Shi, Q; Li, G; Jiao, NZ. Oxygen availability driven trends in DOM molecular composition and reactivity in a seasonally stratified fjord. *WATER RESEARCH*. 2022. 220, 118690.

Chen, XF; Han, Y; Chen, QR; Lin, HY; Lin, SS; Wang, DL; Tang, K*. Ubiquitous occurrence of a biogenic sulfonate in marine environment. *SUSTAINABILITY*. 2022. 14, 1240.

Chen, XF; Tang, K*; Zhang, M; Liu, SJ; Chen, MM; Zhan, PW; Fan, W; Chen, CTA; Zhang, Y. Genome-centric insight into metabolically active microbial population in shallow-sea hydrothermal vents. *MICROBIOME*. 2022. 10, 170.

Chen, YF*; Han, H; Zhang, MR; Zhao, YH; Huang, YP; Zhou, M; Wang, C; He, GY; Huang, R; Luo, B; Hu, YT. Trends and variability of ozone pollution over the mountain-basin areas in Sichuan Province during 2013-2020: Synoptic impacts and formation regimes. *ATMOSPHERE*. 2022. 12, 1557.

Chen, ZW; Liu, GB; Liu, ZY; Chen, SM; Lu, HH; Xu, JX*; Gong, YK; Xie, JS; He, YH; C, Ju; H, YK; Cai, SQ*. Mutual enhancement of wind- and tide-induced near-inertial internal waves in Luzon Strait. *JOURNAL OF PHYSICAL OCEANOGRAPHY*. 2022. 52: 3259-3272.

Cheng, ZJ; Weng, CY*; Steinke, S; Mohtadi, M. Marine pollen records provide perspective on coastal wetlands through Quaternary sea-level changes. *ECOLOGICAL INDICATORS*. 2022. 133, 108405.

Cheng, ZY; Yu, FL*; Chen, NW; Yang, H; Ruan, XY; Tao, SQ; Huang, ZQ. Branched glycerol dialkyl glycerol tetraethers as indicators for environmental parameters in a subtropical mountainous river, southern China. *CHEMICAL GEOLOGY*. 2022. 609, 121043.

Cottier-Cook, EJ*; Cabarubias, JP; Brakel, J; Brodie, J; Buschmann, AH; Campbell, L; Critchley, AT; Hewitt, CL; Huang, J; Hurtado, AQ; Kambey, CSB; Lim, PE; Liu, T; Mateo, JP; Msuya, FE; Qi, ZZ; Shaxson, L; Stentiford, GD; Bondad-Reantaso, MG. A new Progressive Management Pathway for improving seaweed biosecurity. *NATURE COMMUNICATIONS*. 2022. 13: 7401.

Cui, HT; Lu, YL*; Zhou, YQ; He, GZ; Li, QF; Liu, CF; Wang, R; Du, D; Song, S; Cheng, YY. Spatial variation and driving mechanism of polycyclic aromatic hydrocarbons (PAHs) emissions from vehicles in China. *JOURNAL OF CLEANER PRODUCTION*. 2022. 336, 130210.

Cui, YS; Wu, JX*; Tan, EH; Kao, SJ. Role of particle resuspension in maintaining hypoxic level in the Pearl River Estuary. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS*. 2022. 127, e2021JC018166.

Cui, YZ; Liu, MY; Selvam, S; Ding, YC; Wu, QQ; Pitchaimani, VS; Huang, P; Ke, HW; Zheng, HW; Liu, FJ; Luo, BJ; Wang, CH; Cai, MG*. Microplastics in the surface waters of the South China sea and the western Pacific Ocean: Different size classes reflecting various sources and transport. *CHEMOSPHERE*. 2022. 299, 134456.

Dai, MH*; Su, JZ; Zhao, YY; Hofmann, EE; Cao, ZM; Cai, WJ; Gan, JP; Lacroix, F; Laruelle, GG; Meng, FF; Muller, JD; Regnier, PAG; Wang, GZ; Wang, ZX. Carbon fluxes in the coastal ocean: Synthesis, boundary processes, and future trends. *ANNUAL REVIEW OF EARTH AND PLANETARY SCIENCES*. 2022. 50: 593-626.

Dai, XF; Chen, MM; Wan, XH; Tan, EH; Zeng, JL; Chen, NW; Kao, SJ; Zhang, Y*. Potential contributions of nitrifiers and denitrifiers to nitrous oxide sources and sinks in China's estuarine and coastal areas. *BIOGEOSCIENCES*. 2022. 19: 3757-3773.

Deng, C; Peng, WZ; Ma, Z; Ke, CH; You, WW*; Wang, Y*. AquaGWAS: A genome-wide association study pipeline for aquatic animals and its application to reference-required and reference-free genome-wide association study for abalone. *FRONTIERS IN MARINE SCIENCE*. 2022. 9, 841561.

Deng, YF; Liu, ZQ*; Zu, TT; Hu, JY; Gan, JP; Lin, YX; Li, ZB; Quan, Q; Cai, ZY*. Climatic controls on the interannual variability of shelf circulation in the Northern South China Sea. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS*. 2022. 127, e2022JC018419.

Ding, GM; Chen, HR; Gu, HF; Zhang, YQ; Li, RM; Zhang, SF*. Inorganic nitrogen uptake characteristics of three typical bloom-forming algae in the East China Sea. *WATER*. 2022. 14, 2580.

Ding, WX; Zhang, CY*; Shang, SP. The early assessment of harmful algal bloom risk in the East China Sea. *MARINE POLLUTION BULLETIN*. 2022. 178, 113567.

Ding, WX; Zhang, CY*; Shang, SP; Li, XD. Optimization of deep learning model for coastal chlorophyll a dynamic forecast. *ECOLOGICAL MODELLING*. 2022. 467, 109913.

Du, D; Lu, YL*; Zhou, YQ; Zhang, M; Wang, CC; Yu, MZ; Song, S; Cui, HT; Chen, CC. Perfluoroalkyl acids (PFAAs) in water along the entire coastal line of China: Spatial distribution, mass loadings, and worldwide comparisons. *ENVIRONMENT INTERNATIONAL*. 2022. 169, 107506.

Duan, AM*; Liu, SenF; Hu, WT; Hu, D; Peng, YZ. Long-term daily dataset of surface sensible heat flux and latent heat release over the Tibetan Plateau based on routine meteorological observations. *BIG EARTH DATA*. 2022. 6: 480-491.

Duan, AM*; Peng, YZ; Liu, JP; Chen, YH; Wu, GX; Holland, DM; He, B; Hu, WT; Tang, YH; Li, XC. Sea ice loss of the Barents-Kara Sea enhances the winter warming over the Tibetan Plateau. *NPJ CLIMATE AND ATMOSPHERIC SCIENCE*. 2022. 5, 26.

Fahrni, J; Dovgal, I; Qu, ZS*. Molecular phylogeny of Chonotrichia (Ciliophora, Phyllopharyngea) inferred from SSU rDNA sequences. *EUROPEAN JOURNAL OF PROTISTOLOGY*. 2022. 86, 125920.

Fan, BX; Li, YF*. Coupled land-sea warming dominates the net land carbon uptake variability in the Greater Bay Area of South China. *EARTHS FUTURE*. 2022. 10, e2021EF002556.

Fang, TY; Bo, GY; Ma, J*. An automated analyzer for the simultaneous determination of silicate and phosphate in seawater. *TALANTA*. 2022. 248, 123629.

Fang, TY; Bo, GY; Zhang, ZJ; Ma, J*. Real-time underway mapping of nutrient concentrations of surface seawater using an nutonomous flow analyzer. *ANALYTICAL CHEMISTRY*. 2022. 94: 11307–11314

Feng, XT; Li, HM; Zhang, ZH; Xiong, TQ; Shi, XY; He, C; Shi, Q; Jiao, NZ; Zhang, YY*. Microbial-mediated contribution of kelp detritus to different forms of oceanic carbon sequestration. *ECOLOGICAL INDICATORS*. 2022. 142, 109186.

Feng, Y*; Huang, JW; Du, Y; Balaguru, K; Ma, WW; Feng, QY; Wan, XQ; Zheng, YC; Guo, XH; Cai, SQ. Drivers of phytoplankton variability in and near the Pearl River Estuary, South China Sea during Typhoon Hato (2017): A numerical study. *JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES*. 2022. 127, e2022JG006924.

Fu, HJ; Jian, X*; Liang, HH; Zhang, W; Shen, XT; Wang, L. Tectonic and climatic forcing of chemical weathering intensity in the northeastern Tibetan Plateau since the middle Miocene. *CATENA*. 2022. 208, 105785.

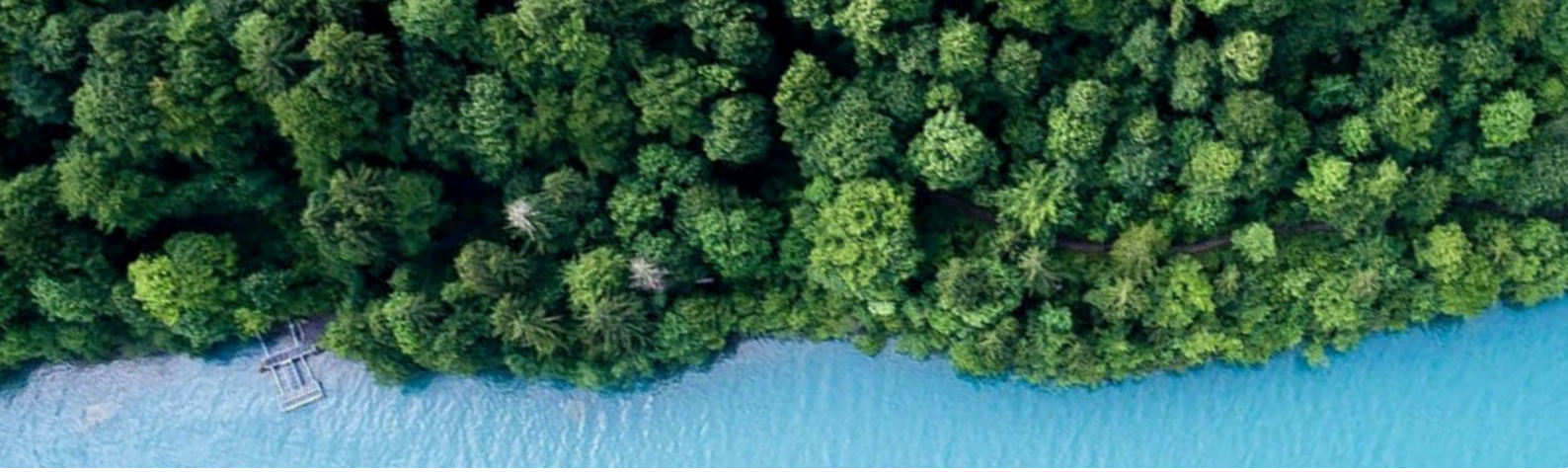
Fu, WJ; Song, ZC*; Wang, T*; Gao, ZY; Li, J; Zhang, P; Zhang, Y*. Acoustic deterrence to facilitate the conservation of pantropical spotted dolphins (*Stenella attenuata*) in the Western Pacific Ocean. *FRONTIERS IN MARINE SCIENCE*. 2022. 9, 1023860.

Fu, WW*; Wang, WL*. Biogeochemical equilibrium responses to maximal productivity in high nutrient low chlorophyll regions. *JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES*. 2022. 127, e2021JG006636.

Gao, C; Liang, YT*; Jiang, Y; Paez-Espino, D; Han, MAX; Gu, CX; Wang, MW; Yang, YM; Liu, FJ; Yang, QW; Gong, Z; Zhang, XR; Luo, ZX; He, H; Guo, C; Shao, HB; Zhou, C; Shi, Y; Xin, Y; Xing, JY; Tang, XX; Qin, QL; Zhang, YZ; He, JF; Jiao, NZ; McMinn, A; Tian. Virioplankton assemblages from challenger deep, the deepest place in the oceans. *ISCIENCE*. 2022. 25, 104680.

Gao, G*; Beardall, J; Jin, P; Gao, L; Xie, SY; Gao, KS. A review of existing and potential blue carbon contributions to climate change mitigation in the Anthropocene. *JOURNAL OF APPLIED ECOLOGY*. 2022. 59: 1686-1699.

Gao, G*; Gao, L; Fu, QQ; Li, XS; Xu, JT. Coculture of the Pacific white shrimp Litopenaeus vannamei and the macroalga Ulva linza enhances their growth rates and functional properties. *JOURNAL OF CLEANER PRODUCTION*. 2022. 349, 131407.



Gao, G*; Gao, L; Jiang, MJ; Jian, A; He, LW. The potential of seaweed cultivation to achieve carbon neutrality and mitigate deoxygenation and eutrophication. *ENVIRONMENTAL RESEARCH LETTERS*. 2022. 17, 14018.

Gao, G; Wang, TF; Sun, JZ; Zhao, X; Wang, LF; Guo, XH; Gao, KS*. Contrasting responses of phytoplankton productivity between coastal and offshore surface waters in the Taiwan Strait and the South China Sea to short-term seawater acidification. *BIOGEOSCIENCES*. 2022. 19: 2795-2804.

Gao, KL; Wang, J; Chen, DL; Hu, WT; Zhang, YJ*; Duan, AM; Zhang, XX. Synoptic climate settings and moisture supply for the extreme heavy snowfall during 6–8 November 2021 in Northern China. *JOURNAL OF METEOROLOGICAL RESEARCH*. 2022. 37: 1-15.

Gao, KS*; Beardalla, J. Using macroalgae to address UN Sustainable Development goals through CO_2 remediation and improvement of the aquaculture environment. *APPLIED PHYCOLOGY*. 2022. 3: 360-367.

Gao, RL; Liu, LK; Wang, H; Jian, JT; Liu, MJ; Liu, YR; Liu, HP*. CqFlightless-I promotes the depolymerization of actin cytoskeleton to reduce white spot syndrome virus infection in Cherax quadricarinatus. *AQUACULTURE*. 2022. 552, 737977.

Gao, XL; Lin, SH; Zhang, M; Lyu, MX; Liu, YF; Luo, X; You, WW; Ke, CH*. Review: Use of electrophysiological techniques to study visual functions of aquatic organisms. *FRONTIERS IN PHYSIOLOGY*. 2022. 13, 798382.

Gao, XL; Zhang, M; Lyu, MX; Lin, SH; Luo, X; You, WW; Ke, CH*. Role of Bmal1 in mediating the cholinergic system to regulate the behavioral rhythm of nocturnal marine molluscs. *COMPUTATIONAL AND STRUCTURAL BIOTECHNOLOGY JOURNAL*. 2022. 20: 2815-2830.

Gong, RH; An, Z; Zhang, WB; Chen, FY; Wang, KJ*. The antimicrobial peptide LJ-hep2 from *Lateolabrax japonicus* exerting activities against multiple pathogenic bacteria and immune protection in vivo. *MARINE DRUGS*. 2022. 20, 651.

Gong, WP; Lin, ZY*; Zhang, H; Lin, HY. The response of salt intrusion to changes in river discharge, tidal range, and based on wavelet in the Modaomen China. *OCEAN & COASTAL MANAGEMENT*. 2022. 219, 106060.

Gonzalez-Nayeck, AC*; Mohr, W; Tang, TN; Sattin, S; Parenteau, MN; Jahnke, LL; Pearson, A. Absence of canonical trophic levels in a microbial mat. *GEOBIOLOGY*. 2022. 20: 726-740.

Gu, BW; Huang, HC; Zhang, YZ; Li, R; Wang, L; Wang, Y; Sun, J; Wang, JN; Zhang, R; Jiao, NZ; Xu, DP*. High dynamics of ciliate community revealed via short-term, high-frequency sampling in a subtropical estuarine ecosystem. *FRONTIERS IN MICROBIOLOGY*. 2022. 13, 797638.

Gu, LD; Yue, XL; Zhong, HW; Mei, K; Wang, DL*. A new technique of quantifying protoporphyrin IX in microbial cells in seawater. *FRONTIERS IN MARINE SCIENCE*. 2022. 9, 991126.

Gu, XX; Zhao, HW; Peng, CJ; Guo, XD; Lin, QL; Yang, Q; Chen, LZ*. The mangrove blue carbon sink potential: Evidence from three net primary production assessment methods. *FOREST ECOLOGY AND MANAGEMENT*. 2022. 504, 119848.

Gu, ZJ; Ruthensteiner, B; Moura, CJ; Liu, LH; Zhang, R; Song, XK*. Systematic affinities of Zygophylacidae (Cnidaria: Hydrozoa: Macrocolonia) with descriptions of 15 deep-sea species. *ZOOLOGICAL JOURNAL OF THE LINNEAN SOCIETY*. 2022. 196: 52-87.

Guo, BX; Liu, YQ*; Liu, KS; Shi, Q; He, C; Cai, RH; Jiao, NZ. Different dissolved organic matter composition between central and southern glaciers on the Tibetan Plateau. *ECOLOGICAL INDICATORS*. 2022. 139, 108888.

Guo, S; Wei, CX; Zhu, YX; Zhang, Y*. How surfactants affect the depuration of polycyclic aromatic hydrocarbons adsorbed on the mangrove leaf surfaces: insight from an in situ method. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH*. 2022. 29: 31413-31425.

Guo, XH*; Bednarsek, N; Wang, HJ; Feely, RA; Laurent, A. Editorial: Acidification and hypoxia in marginal seas. *FRONTIERS IN MARINE SCIENCE*. 2022. 9, 861850.

Guo, XH*; Yao, ZT; Gao, Y; Luo, YH; Xu, Y; Zhai, WD. Seasonal variability and future projection of ocean acidification on the East China Sea shelf off the Changjiang Estuary. *FRONTIERS IN MARINE SCIENCE*. 2022. 8, 770034.

Guo, XL; Yan, XL*; Bao, HY; Wu, JW; Kao, SH. Differential response of nutrients to seasonal hydrological changes and a rain event in a subtropical watershed, Southeast China. *WATER*. 2022. 14, 834.

Guo, ZY*; Huang, GB; Zhang, C; Yao, QH; Ye, TX; Zhang, L; Chen, X*. Amphipathic engineering of magnetic composites reinforced with ion-copolymer-activated protein-bioconjugate functionalized surface. *MATERIALS CHEMISTRY FRONTIERS*. 2022. 6: 237-244.

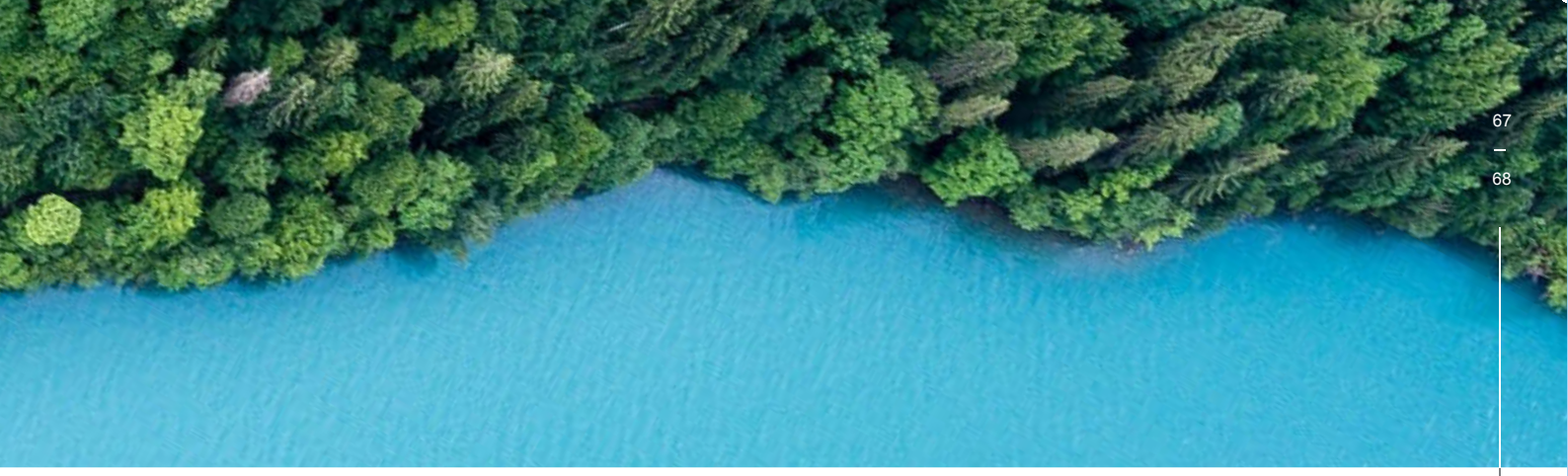
Guo, ZY; Yao, QH; Zheng, WH; Jiao, RW; Zhang, C; Zhang, L; Ye, TX; Chen, X*. Highly crosslinking core-shell magnetic nanocomposites based catalyst and heat free polymerization for isolation of glycoprotein. *ANALYTICAL AND BIOANALYTICAL CHEMISTRY*. 2022. 414: 6393-6402.

Han, AQ; Gan, JP*; Dai, MH; Lu, ZM; Liang, LL; Zhao, XZ. Intensification of downslope nutrient transport and associated biological responses over the northeastern South China Sea during wind-driven downwelling: A modeling study. *FRONTIERS IN MARINE SCIENCE*. 2022. 8, 772586.

Hao, HH; Chen, SY; Wu, ZW; Su, P; Ke, CH; Feng, DQ*. The degradation and environmental risk of camptothecin, a promising marine antifoulant. *SCIENCE OF THE TOTAL ENVIRONMENT*. 2022. 821, 153384.

Hao, JL; Ma, SH; Hou, YS; Wang, WJ; Dai, X; Sui, X*. Concise and efficient asymmetric homogeneous Janus membrane for high-performance osmotic energy conversion based on oppositely charged montmorillonite. *ELECTROCHIMICA ACTA*. 2022. 423, 140581.

He, CF; Liu, JH*; Wang, R; Li, YN; Zheng, Q; Jiao, FL; He, C; Shi, Q; Xu, YL; Zhang, R; Thomas, H; Batt, J; Hill, P; Lewis, M; MacIntyre, H; Lu, LF; Zhang, QH; Tu, QC; Shi, T; Chen, F; Jiao, NZ. Metagenomic evidence for the microbial transformation of carboxyl-rich alicyclic molecules: A long-term macrocosm experiment. *WATER RESEARCH*. 2022. 216, 118281.



He, GL*; Zhang, YH; Wei, LH; Wang, MG; Yang, XM; Guo, JX; Hu, R; Wang, CC*; Zhang, XQ*. The genomic formation of Tanka people, an isolated gypsies in water in the coastal region of Southeast China. *AMERICAN JOURNAL OF BIOLOGICAL ANTHROPOLOGY.* 2022. 178: 154-170.

Hu, D; Duan, AM*; Zhang, P. Association between regional summer monsoon onset in South Asia and Tibetan Plateau thermal forcing. *CLIMATE DYNAMICS.* 2022. 59: 1115-1132.

Hu, WT*; Duan, AM; He, B; Hao, S. Dynamic and thermal effects of the Tibetan and Iranian Plateaus on the northward-propagating intraseasonal oscillation during boreal summer. *JOURNAL OF CLIMATE.* 2022. 35: 2173-2188.

Hu, XY; Xue, HJ*; Liang, LL. Impact of ENSO on the entrance of the Indonesian Throughflow: The oceanic wave propagation. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS.* 2022. 127, e2022JC018782.

Hu, YS; Wang, M; Ma, TX; Huang, MP; Huang, GP; Zhou, WL; Ping, XG; Lu, YL; Wei, FW*. Integrated index-based assessment reveals long-term conservation progress in implementation of Convention on Biological Diversity. *SCIENCE ADVANCES.* 2022. 8, eabj8093.

Huang, J; Sun, C; Liu, DT; Zhao, NN; Shavit, JA; Zhu, Y*; Chen, SX*. Nuclear progestin receptor-mediated linkage of blood coagulation and ovulation. *ENDOCRINOLOGY.* 2022. 163, bqac057.

Huang, KX; Wang, Z; Tan, JZ; Wang, DZ; Dai, XF; Cen, JY; Ou, LJ*; Lu, SH. Phosphomonoesterase and phosphodiesterase activities and their regulation during dinoflagellate blooms under different external phosphate conditions. *MARINE ECOLOGY PROGRESS SERIES.* 2022. 698: 41-54.

Huang, L; Zhuang, W*; Wu, ZL; Meng, LS; Edwing, D; Edwing, K; Wang, LN; Yan, XH*. Decadal cooling events in the south Indian Ocean during the Argo era. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS.* 2022. 127, e2021JC017949.

Huang, P; Wang, WM; Chen, FJ; Cai, MG*; Ke, HW; Liu, MA; Deng, HX; Chen, MA; Zheng, XH; Wang, CH. Spatial and temporal trends of anthropogenic carbon storage in typical marginal seas along the Asia continent in the northern hemisphere. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 823, 153580.

Huang, SY; Jiang, RG; Song, QY; Zhao, YH; Lv, SP; Zhang, YBA*; Huo, YL; Chen, YJ. The Hg behaviors in mangrove ecosystems revealed by Hg stable isotopes: A case study of Maowei mangrove. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH.* 2022. 29: 25349-25359.

Huang, YP; Meng, ZY*; Zhang, MR. Synoptic impacts on the occurrence of mesoscale boundaries and their associated convection over an area of sharp vegetation contrast. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2022GL099449.

Huang, YP; Zhang, MR*; Zhao, YC; Jou, BD; Zheng, H; Luo, CR; Chen, DH. Inter-zone differences of convective development in a convection outbreak event over southeastern coast of China: An observational analysis. *REMOTE SENSING.* 2022. 14, 131.

Huang, ZX; Qian, LY; Cao, WZ*. Developing a novel approach integrating ecosystem services and biodiversity for identifying priority ecological reserves. *RESOURCES CONSERVATION AND RECYCLING.* 2022. 179, 106128.

Hung, CC; Huang, BQ; Chou, WC; Soong, K; Muller, FLL*. Editorial: Biogeochemical and ecological responses to wind- or tide-induced disturbances over marginal seas. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 1051194.

Ianiri, HL*; Shen, Y; Broek, TAB; McCarthy, MD. Bacterial sources and cycling dynamics of amino acids in high and low molecular weight dissolved organic nitrogen in the ocean. *MARINE CHEMISTRY.* 2022. 241, 104104.

Jian, X*; Fu, L; Wang, P; Guan, P; Zhang, W; Fu, HJ; Mei, HW. Sediment provenance of the Lulehe Formation in the Qaidam basin: Insight to initial Cenozoic deposition and deformation in northern Tibetan plateau. *BASIN RESEARCH.* 2022. DOI: 10.1111/bre.12712.

Jiang, MJ; Gao, L; Huang, RP; Lin, X; Gao, G*. Differential responses of bloom-forming *Ulva intestinalis* and economically important *Gracilariopsis lemaneiformis* to marine heatwaves under changing nitrate conditions. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 840, 156591.

Jiang, MY; Chen, RS; Chen, FY*; Zhu, XW; Wang, KJ. A new crustin gene homolog SpCrus8 identified in *Scylla paramamosain* exerting *In vivo* protection through opsonization and immunomodulation. *FRONTIERS IN IMMUNOLOGY.* 2022. 13, 946227.

Jiang, MY; Chen, RS; Zhang, JR; Chen, FY*; Wang, KJ*. A novel antimicrobial peptide spampcin$_{56-86}$ from *Scylla paramamosain* exerting rapid bactericidal and anti-biofilm activity in vitro and anti-infection in vivo. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES.* 2022. 23, 13316.

Jiang, XW; Li, H; Tong, SY; Gao, KS*. Nitrogen limitation enhanced calcification and sinking rate in the coccolithophorid gephyrocapsa oceanica along with its growth being reduced. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 834358.

Jiang, Y; Lin, BA; He, HY; Ding, GM; Yan, LT; Zhang, G; Liu, M*; Zheng, LM*. Species composition and assemblages of ichthyoplankton in Sansha Bay, Fujian Province, China. *FRONTIERS IN MARINE SCIENCE.* 2022. 8, 758089.

Jiang, YL*; Li, BJ; Yu, MH; Chang, SH; Li, SQ; Xu, J; Feng, JX; Zhang, Q; Zhang, HY; Xu, P*. Genome-wide association study and gene editing reveals the causal gene responsible for abnormal red skin color in Yellow River carp. *AQUACULTURE.* 2022. 560, 738530.

Jiang, Z; Zhang, M; Liu, KY; Xue, YG; Li, XJ; Dong, CJ*. Phylogeny of the HO family in cyprinus carpio and the response of the HO-1 gene to adding Bacillus coagulans in feed under Cd^{2+} stress. *ELECTROANALYSIS.* 2022. 48: 117-131.

Jiao, NZ*; Dai, MH; Jian, ZM; Wang, XX; Zhang, R. Research strategies for ocean carbon storage mechanisms and effects. CHINESE SCIENCE BULLETIN-CHINESE. 2022. 67: 1600-1606.

Jin, JW; Lin, J; Huang, YP; Zhang, LC; Jiang, YQ; Tian, DJ; Lin, FY; Wang, YR; Chen, X*. High sensitivity ratiometric fluorescence temperature sensing using the microencapsulation of CsPbBr3 and K_2SiF_6:Mn^{4+} phosphor. *CHINESE CHEMICAL LETTERS.* 2022. 33: 4798-4802.

Jin, P; Wan, JF; Zhang, JL; Overmans, S; Xiao, MT; Ye, MC; Dai, XY; Zhao, JY; Gao, KS; Xia, JR*. Additive impacts of ocean acidification and ambient ultraviolet radiation threaten calcifying marine primary producers. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 818, 151782.

Jin, P; Wan, JF; Zhou, YY; Gao, KS; Beardall, J; Lin, JM; Huang, JL; Lu, YC; Liang, SM; Wang, KQ; Ma, ZL; Xia, JR*. Increased genetic diversity loss and genetic differentiation in a model marine diatom adapted to ocean warming compared to high CO_2. *ISME JOURNAL.* 2022. 16: 2587-2598.

Jin, P; Zhang, JL; Wan, JF; Overmans, S; Gao, G; Ye, MC; Dai, XY; Zhao, JY; Xiao, MT; Xia, JR*. The combined effects ofocean acidification and heavy metals on marine organisms: A meta-analysis. *FRONTIERS IN MARINE SCIENCE.* 2022. 8, 801889.

Jin, XB; Liu, CAL*; Xu, J; Guo, XH. Coccolithophore abundance, degree of calcification, and their contribution to particulate inorganic carbon in the South China Sea. JOURNAL OF GEOPHYSICAL *RESEARCH-BIOGEOSCIENCES.* 2022. 127, e2021JG006657.

Ju, PL; Chen, MR*; Cheung, WWL; Tian, YJ*; Yang, SY; Sun, P; Jiang, CP; Lu, ZB. Modelling the structure and functioning of an upwelling ecosystem in the Southern Taiwan Strait, China. *JOURNAL OF MARINE SYSTEMS.* 2022. 226, 103666.

Kim, HH*; Bowman, JS; Luo, YW; Ducklow, HW; Schofield, OM; Steinberg, DK; Doney, SC. Modeling polar marine ecosystem functions guided by bacterial physiological and taxonomic traits. *BIOGEOSCIENCES.* 2022. 19: 117-136.

Kolody, BC; Smith, SR; Allen, LZ; McCrow, JP; Moustafa, A; Shi, D; Hopkinson, BM; Morel, FMM; Ward, BB; Allen, AE*. Nitrogen and iron availability drive metabolic remodeling and natural selection of diverse phytoplankton during experimental upwelling. *MSYSTEMS.* 2022. 7, DOI: 10.1128/msystems.00729-22.

Kong, J; Wang, L; Lin, C; Kuang, FF; Zhou, XW; Laws, EA; Sun, P*; Huang, H*; Huang, BQ*. Contrasting community assembly mechanisms underlie similar biogeographicpatterns of surface microbiota in the tropical North Pacific Ocean. *MICROBIOLOGY SPECTRUM.* 2022. 10, e00798-21.

Kong, XR*; Dou, J; Chen, SZ; Wang, BB; Wu, ZJ*. Progress of synchrotron-based research on atmospheric science. *PROGRESS IN CHEMISTRY.* 2022. 34: 963-972.

Le Quiniou, C; Schmitt, FG*; Calzavarini, E; Souissi, S; Huang, YX. Copepod swimming activity and turbulence intensity: Study in the Agiturb turbulence generator system. *EUROPEAN PHYSICAL JOURNAL PLUS.* 2022. 137, 250.

Lee, ZP*. Beauty of math in ocean optics: Two-stream equations of Aas. *ACTA OPTICA SINICA.* 2022. 42, 1200004.

Letscher, RT*; Wang, WL; Liang, Z; Knapp, AN. Regionally variable contribution of dissolved organic phosphorus to marine annual net community production. *GLOBAL BIOGEOCHEMICAL CYCLES.* 2022. 36, e2022GB007354.

Li, CH; Tan, LY; Gao, YH; Li, XS; Sun, L; Liang, JR; Zhang, J; Huang, LQ; Chen, CP*. Morphology of *Amphora lunulata* AH Wachnicka & EE Gaiser and its transfer to Seminavis DG Mann. *DIATOM RESEARCH.* 2022. 37: 63-69.

Li, CL; Chiang, KP; Laws, EA; Liu, X; Chen, JX; Huang, YB; Chen, BZ; Tsai, AY; Huang, BQ*. Quasi-antiphase diel patterns of abundance and cell size/biomass of picophytoplankton in the oligotrophic ocean. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2022GL097753.

Li, DH; Wang, ZG; Xue, HJ*; Thomas, AC; Etter, RJ. Wind-modulated western maine coastal current and its connectivity with the Eastern Maine Coastal Current. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS.* 2022. 127, e2022JC018469.

Li, DL; Yang, MH; Liu, LK; Meng, C; Li, MQ; Liu, HP*. Invasion and propagation of white spot syndrome virus: Hijacking of the cytoskeleton, intracellular transport machinery, and nuclear import transporters. *JOURNAL OF VIROLOGY.* 2022. 96, e0220521.

Li, DX; He, YH; Zheng, Y; Zhang, SF; Zhang, H; Lin, L; Wang, DZ*. Metaproteomics reveals unique metabolic niches of dominant bacterial groups in response to rapid regime shifts during a mixed dinoflagellate bloom. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 823, 153557.

Li, FB; Zhu, XK*; Ding, HL; Zhang, K. Local hydrothermal sources for Superior-type iron formations: Insights from the Animikie Basin. *PRECAMBRIAN RESEARCH.* 2022. 377, 106736.

Li, HG; Zhu, YM; Liu, XL; Guo, ZY; Huang, YN; Chen, X*. Colorimetric sensing of hydrogen peroxide based on the wavelength-shift of CsPbBr3 perovskite nanocrystals on water-oil interface. *JOURNAL OF ANALYSIS AND TESTING.* 2022. DOI: 10.1007/s41664-022-00231-1.

Li, HM; Zhang, ZH; Xiong, TQ; Tang, KX; He, C; Shi, Q; Jiao, NZ; Zhang, YY*. Carbon sequestration in the form of recalcitrant dissolved organic carbon in a seaweed (Kelp) farming environment. *ENVIRONMENTAL SCIENCE & TECHNOLOGY.* 2022. 56: 9112-9122.

Li, HQ; Fang, TY; Tan, QG; Ma, J*. Development of a versatile smartphone-based environmental analyzer (vSEA) and its application in on-site nutrient detection. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 838, 156197.

Li, HY; Yuan, B; Yan, CL; Lin, QX; Wu, JJ; Wang, Q; Liu, JC; Lu, HL; Zhu, H; Hong, HL*. Release of sediment metals bound by glomalin related soil protein in waterfowls inhabiting mangrove patches. *ENVIRONMENTAL POLLUTION.* 2022. 293, 118577.

Li, HY; Yuan, B; Yan, CL; Lin, QX; Wu, JJ; Wang, Q; Liu, JC; Lu, HL; Zhu, H; Hong, HL*. Extraction and purification of glomalin-related soil protein (GRSP) to determine the associated trace metal(loid)s. *METHODSX.* 2022. 9, 101670.

Li, J; Wang, G; Gou, XL; Xiang, J*; Huang, QT; Liu, GK. Revealing trace nanoplastics in food packages─An electrochemical approach facilitated by synergistic attraction of electrostatics and hydrophobicity. *ANALYTICAL CHEMISTRY.* 2022. 94: 12657-12663.

Li, JH*. Accelerate the offshore CCUS to carbon-neutral China. *FUNDAMENTAL RESEARCH.* 2022. DOI: 10.1016/j.fmre.2022.10.015.

Li, JH*; Liu, PY; Menguy, N; Zhang, XL; Wang, J; Benzerara, K; Feng, LJ; Sun, L; Zheng, Y; Meng, FQ; Gu, L; Leroy, E; Hao, JL; Chu, XL; Pan, YX. Intracellular silicification by early-branching magnetotactic bacteria. *SCIENCE ADVANCES.* 2022. 8, eabn6045.

Li, JS; Qiu, WL; Hao, H; Chen, FY; Wang, KJ*. Morphology of the complete embryonic and larval development of commercially important mud crab *Scylla paramamosain*. *AQUACULTURE RESEARCH.* 2022. 53: 2298-2316.

Li, JW; Zhang, LP; Li, YF; Liu, KS; Liu, YQ; Huang, SJ; Li, FR; Chen, CTA; Zhang, Y*; Hu, AY*. A comprehensive profile of antibiotic resistance genes in the water column of a shallow-sea hydrothermal vent ecosystem. *SUSTAINABILITY.* 2022. 14, 1776.

Li, MS; Zhang, J*; Zhu, YX; Zhang, Y*. Interactions between hydroxylated polycyclic aromatic hydrocarbons and serum albumins: multispectral and molecular docking analyses. *LUMINESCENCE.* 2022. 37: 1972-1981.

Li, NN*; Yu, FL*; Sack, D; Huang, ZQ; Tian, GH; Liu, ST. Phytolith assemblages as a promising tool for quantitative canopy coverage reconstruction in subtropical forests, China. *FRONTIERS IN PLANT SCIENCE.* 2022. 13, 912627.

Li, NN; Song, LA; Sack, D; Lu, ZY; Yu, FL; Gao, GZ; Li, DH; Li, MZ; Yang, Y; Zong, YZ; Jie, DM*. Phytolith and simulation evidence for precipitation-modulated vegetation dynamics along the East Asian monsoon margin. *PALAEOGEOGRAPHY PALAEOCLIMATOLOGY PALAEOECOLOGY.* 2022. 590, 110842.

Li, P; Yuan, DX; Huang, YM; Lin, KD*. Improving the measurement of total dissolved sulfide in natural waters: A new on-site flow injection analysis method. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 829, 154594.

Li, TC; Liu, GL; Yuan, HT; Chen, JW; Lin, X; Li, HF; Yu, LY; Wang, C; Li, L; Zhuang, YY; Lin, SJ*. Eukaryotic plankton community assembly and influencing factors between continental shelf and slope sites in the northern South China Sea. *ENVIRONMENTAL RESEARCH.* 2022. 216, 114584.

Li, W; Wang, TF; Campbell, DA; Gao, KS*. Light history modulates growth and photosynthetic responses of a diatom to ocean acidification and UV radiation. *MARINE LIFE SCIENCE & TECHNOLOGY.* 2022. DOI: 10.1007/s42995-022-00138-x.

Li, WF; Li, S; Wang, XF; Chen, HY; Hao, H; Wang, KJ*. Internal carbohydrates and lipids as reserved energy supply in the pubertal molt of *Scylla paramamosain*. *AQUACULTURE.* 2022. 549, 737736.

Li, X; Shang, SL*; Lee, ZP; Lin, G; Zhang, YN; Wu, JY; Kang, ZJ; Liu, XX; Yin, C; Gao, Y. Detection and biomass estimation of *Phaeocystis globosa* Blooms off Southern China from UAV-based hyperspectral measurements. *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING.* 2022. 60, 4200513.

Li, XJ; Liang, YT; Wang, ZH; Yao, YY; Chen, XL; Shao, AR; Lu, LF*; Dang, HY*. Isolation and characterization of a novel *Vibrio natriegens*-infecting phage and its potential therapeutic application in abalone aquaculture. *BIOLOGY.* 2022. 11, 1670.

Li, XQ; Lu, YL*; Shi, YJ; Wang, P; Cao, XH; Cui, HT; Zhang, M; Du, D. Effects of urbanization on the distribution of polycyclic aromatic hydrocarbons in China's estuarine rivers. *ENVIRONMENTAL POLLUTION.* 2022. 301, 119001.

Li, ZB; Cai, ZY; Liu, ZQ*; Wang, XH; Hu, JY.. A novel identification method for unrevealed mesoscale eddies with transient and weak features-Capricorn Eddies as an example. *REMOTE SENSING OF ENVIRONMENT.* 2022. 274, 112981.

Lin, HN; Wu, WW; Sun, L; Witkowski, A; Li, XY; Patil, V; Liang, JR; Li, XS; Gao, YH*; Chen, CP*. Erratum to: *Chinia gen*. nov.-a second diatom genus with the simonsenioid raphe type from mangroves in Fujian Province, China. *JOURNAL OF OCEANOLOGY AND LIMNOLOGY.* 2022. 40: 1286-1286.

Lin, HN; Wu, WW; Sun, L; Witkowski, A; Li, XY; Patil, V; Liang, JR; Li, XS; Gao, YH*; Chen, CP*. *Chinia gen*. nov.-the second diatom genus simonsenioid raphe from mangroves in Fujian, China. *JOURNAL OF OCEANOLOGY AND LIMNOLOGY.* 2022. 40: 1220-1232.

Lin, JJ; Krom, MD; Wang, FF; Cheng, P; Yu, QBA; Chen, NW*. Simultaneous observations revealed the non-steady state effects of a tropical storm on the export of particles and inorganic nitrogen through a river-estuary continuum. *JOURNAL OF HYDROLOGY.* 2022. 606, 127438.

Lin, LH; Wang, JY*; You, CY; Qiu, LH; Lin, JS; Zhang, FL; Yang, ZL; Zhang, YJ; Chen, X*; Li, JF*. Shell-isolated nanoparticle-enhanced electrochemiluminescence. *SMALL.* 2022. 18, 2203513.

Lin, LJ; Yuan, B; Zhang, BH; Li, HY; Liao, R; Hong, HL*; Lu, HL; Liu, JC; Yan, CL*. Uncovering the disposable face masks as vectors of metal ions (Pb(II), Cd (II), Sr(II)) during the COVID-19 pandemic. *CHEMICAL ENGINEERING JOURNAL.* 2022. 439, 135613.

Lin, SH; Gao, XL*; Zhang, M; Lyu, M; Ke, CH*. Feeding strategy trade-off and selection of marine nocturnal gastropods under predation risk. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 1015076.

Lin, SJ*; Li, TC; Yuan, HT; Li, HF; Yu, LY; Zhuang, YY; Li, L; Huang, BQ; Liu, GX. Sediment trap study reveals dominant contribution of metazoans and dinoflagellates to carbon export and dynamic impacts of microbes in a subtropical marginal sea. *JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES.* 2022. 127, e2021JG006695.

Lin, SJ*; Yu, LY; Wu, XM; Li, MZ; Zhang, YQ; Luo, H; Li, HF; Li, TC; Li, L. Active meiosis during dinoflagellate blooms: A'sex for proliferation' hypothesis. *HARMFUL ALGAE.* 2022. 118, 102307.

Lin, WH*; Yu, KF*; Du, JQ; Lin, HY; Yu, W; Mo, MT. Consequences of marine ecological environment and our preparedness for Fukushima radioactive wastewater discharge into the ocean. *CHINESE SCIENCE BULLETIN-CHINESE.* 2022. 66: 4500-4509.

Lin, WQ; Lin, HY*; Hu, JY*; Huang, LF. Relative contributions of open‐ocean forcing and local wind to sea level variability along the west coasts of ocean basins. *JOURNAL OF GEOPHYSICAL RESEARCH: OCEANS.* 2022. 127, e2022JC019218.

Lin, Y; Cai, MG*; Chen, M; Huang, P; Lei, RB; Chen, M; Gui, DW; Ke, HW. Evidence for the growing importance of Eurasian local source to PAHs in the Arctic central basin. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 851, 158373.

Lin, YH; Dai, Y; Xu, WN; Wu, XB; Li, YY; Zhu, HM; Zhou, HT*. The growth, lipid accumulation and fatty acid profile analysis by abscisic acid and indol-3-acetic acid induced in *Chlorella* sp. FACHB-8. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES.* 2022. 23, 4064.

Liu, CY*; Huo, D; Liu, ZY; Wang, XW; Guan, C; Qi, JF; Wang, F*. Turbulent mixing in the barrier layer of the equatorial Pacific Ocean. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2021GL097690.

Liu, CY; Feng, L*; Kohl, A; Liu, ZY; Wang, F*. Wave, vortex and wave-vortex dipole (Instability Wave): Three flavors of the intra-seasonal variability of the North Equatorial Undercurrent. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2021GL097239.

Liu, D; Zhang, J; Chen, LF; Zhu, YX; Zhang, Y*. Study on the Binding of Methylphenanthrene Isomers with Different Methylated Positions to Human Serum Albumin Employing Spectroscopic Techniques Combined with Molecular Docking. *POLYCYCLIC AROMATIC COMPOUNDS.* 2022. 42: 2704-2722.

Liu, HH; Wang, Z; Wu, WW; Li, CH; Zhang, JW; Gao, YH*; Li, XS; Sun, L; Liang, JR; Zhang, J; Chen, CP*. A new marine epipsammic diatom species, Ambo dajingensis sp. nov. (Bacillariophyceae), from the coast of Southeast China. *PHYTOKEYS.* 2022. 210: 23-34.

Liu, HR; Xie, YY*; Browning, TJ; Xu, FP; Huang, BQ*. Phytoplankton photophysiology across tropical eddies: Deconvolving nutrient, light, and community signals. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 934391.

Liu, JY; Li, DW*; Ding, Y; Ge, TT; Chen, WF; Huh, CA; Zhao, MX*. Influences of the 1855 AD Huanghe (Yellow River) relocation on sedimentary organic carbon burial in the southern Yellow Sea. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 824617.

Liu, JY; Peng, WZ; Yu, F; Lin, WH; Shen, YW; Yu, WC; Gong, SH; Huang, HY; You, WW; Luo, X*; Ke, CH*. Development and validation of a 40-K multiple-SNP array for Pacific abalone (*Haliotis discus hannai*). *AQUACULTURE.* 2022. 558, 738393.

Liu, JY; Peng, WZ; Yu, F; Shen, YW; Yu, WC; Lu, YS; Lin, WH; Zhou, MZ; Huang, ZK; Luo, X; You, WW*; Ke, CH*. Genomic selection applications can improve the environmental performance of aquatics: A case study on the heat tolerance of abalone. *EVOLUTIONARY APPLICATIONS.* 2022. 15: 992-1001.

Liu, L; Xue, HJ*. Estimating the ocean interior from satellite observations in the Kerguelen Area (Southern Ocean): A combined investigation using high-resolution CTD data from animal-borne instruments. *JOURNAL OF PHYSICAL OCEANOGRAPHY.* 2022. 52: 2463-2478.

Liu, MJ; Graham, N; Wang, WY; Zhao, RZ; Lu, YL; Elimelech, M*; Yu, WZ*. Spatial assessment of tap-water safety in China. *NATURE SUSTAINABILITY.* 2022. 5: 689-698.

Liu, MY; Cai, MG*; Duan, MS; Chen, M; Lohmann, R; Lin, Y; Liang, JH; Ke, HW; Zhang, K. PAHs in the North Atlantic Ocean and the Arctic Ocean: Spatial distribution and water mass transport. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS.* 2022. 127, e2021JC018389.

Liu, MY; Zheng, HW; Chen, M; Liang, JH; Duan, MS; Du, HH; Chen, M; Ke, HW; Zhang, K; Cai, MG*. Dissolved PAHs impacted by air-sea interactions: Net volatilization and strong surface current transport in the Eastern Indian Ocean. *JOURNAL OF HAZARDOUS MATERIALS.* 2022. 431, 128603.

Liu, SJ; Xie, ZX; Wu, PF; Zheng, RW; Liu, Y; Lin, L; Liu, HP; Wang, DZ*. Composition and assembly of the bacterial community in the overlying waters of the coral reef of China's Xisha Islands. *FRONTIERS IN MICROBIOLOGY.* 2022. 13, 1059262.

Liu, W; Li, CQ; Cai, PH; Zhao, SB; Guo, JJ; Burnett, WC; Song, SS; Chen, GQ; Xu, BC*. Quantifying $^{224}Ra/^{228}Th$ disequilibrium in sediments via a pulsed ionization chamber (PIC). *MARINE CHEMISTRY.* 2022. 245, 104160.

Liu, Y*; Moore, JK*, Primeau, F; Wang, WL. Reduced CO_2 uptake and growing nutrient sequestration from slowing overturning circulation. *NATURE CLIMATE CHANGE.* 2022. 13: 83-90.

Liu, ZH; Yan, QY; Jiang, CY; Li, J; Jian, HH; Fan, L; Zhang, R; Xiao, X; Meng, DL; Liu, XD; Wang, JJ*; Yin, HQ*. Growth rate determines prokaryote-provirus network modulated by temperature and host genetic traits. *MICROBIOME.* 2022. 10, 92.

Liu, ZZ; Zhao, HY; Wang, J; Wang, ZW; Di, SS; Xu, H; Wang, Q; Wang, XH*; Wang, XQ; Qi, PP. Rapid and sensitive analytical strategy for multi-class antibiotic residues analysis in aquatic products with amphiphilic magnetic polymer particles as an effective cleanup adsorbent. *FOOD CHEMISTRY.* 2022. 400, 134036.

Liu, ZZ; Zhao, HY; Wang, J; Wang, ZW; Di, SS; Xu, H; Wang, Q; Wang, XH*; Wang, XQ*; Qi, PP*. Magnetic polymer particles as a highly efficient and facile cleanup adsorbent for multi-pesticide residues analysis in aquatic products. *ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY.* 2022. 241, 113830.

Long, S; Chen, FY; Wang, KJ*. Characterization of two new Scygonadin homologous SCY4 and SCY5 in *Scylla paramamosain. AQUACULTURE.* 2022. 559, 738428.

Lozier, MS*; Bower, AS; Furey, HH; Drouin, KL; Xu, XB; Zou, SJ. Overflow water pathways in the North Atlantic. *PROGRESS IN OCEANOGRAPHY.* 2022. 208, 102874.

Lu, LJ; Zheng, XF*; Chen, Z; Yan, W; Wu, SZ; Zheng, LW; Wang, XS; Chen, Y; Kao, SJ. One-to-one coupling between Southern Ocean productivity and Antarctica climate. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2022GL098761.

Lu, HH; Chen, ZW*; Xu, K; Liu, ZY; Wang, CZ; Xu, JX; Gong, YK; Cai, SQ*. Interannual variability of near□inertial energy in the South China Sea and western North Pacific. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2022GL100984.

Lu, WF; Wang, J; Jiang, YW; Chen, ZZ; Wu, WT; Yang, LY; Liu, Y*. Data-driven method with numerical model: A combining framework for predicting subtropical river plumes. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS.* 2022. 127, e2021JC017925.

Luo, H; Wang, JT; Goes, JI*; Gomes, HR; Al-Hashmi, K; Tobias, C; Koerting, C; Lin, SJ*. A grazing-driven positive nutrient feedback loop and active sexual reproduction underpin widespread Noctiluca green tides. *ISME COMMUNICATIONS.* 2022. 2, 103.

Luo, SH; Wang, WL; Zhou, ZF; Xie, Y; Ren, B; Liu, GK*; Tian, ZQ*. Visualization of a machine learning framework toward highly sensitive qualitative analysis by SERS. *ANALYTICAL CHEMISTRY.* 2022. 94: 10151-10158.

Luo, WC; Inomura, K; Zhang, H; Luo, YW*. N_2 fixation in *Trichodesmium* does not require spatial segregation from Photosynthesis. *MSYSTEMS.* 2022. 7, 10.1128/msystems.00538-22.

Lv, SN; Meng, LS; Edwing, D; Xue, SH; Geng, XP; Yan, XH*. High-performance segmentation for flood mapping of HISEA-1 SAR remote sensing images. *REMOTE SENSING.* 2022. 14, 5504.

Lv, ZQ; Xiao, XL; Wang, Y; Zhang, Y*; Jiao, NZ*. Improved water quality monitoring indicators may increase carbon storage in the oceans. *ENVIRONMENTAL RESEARCH.* 2022. 206, 112608.

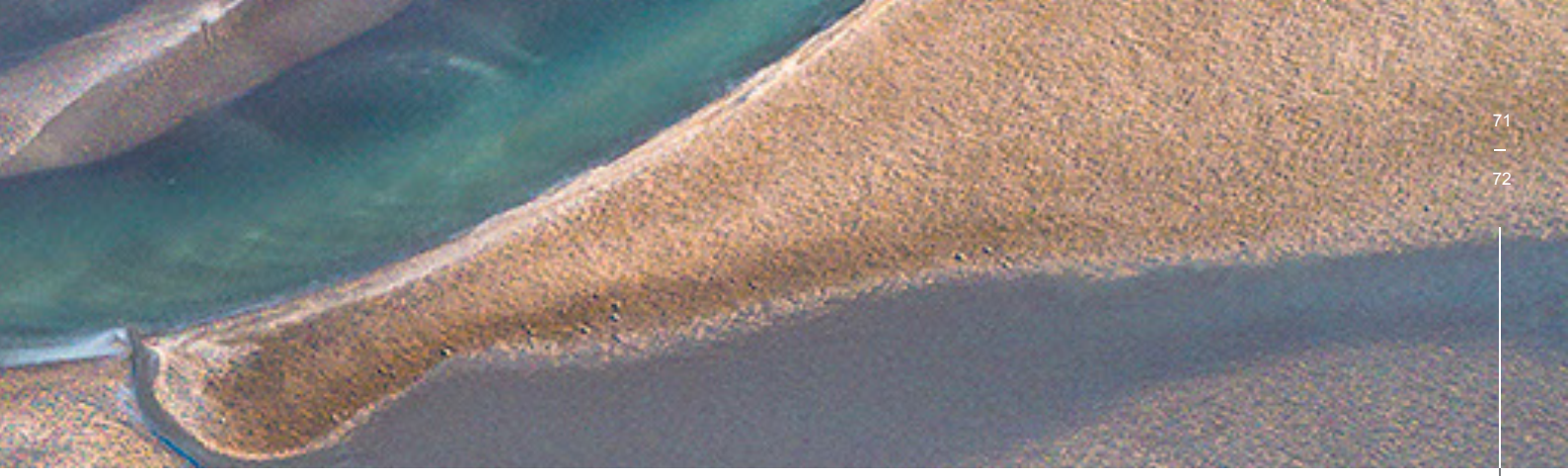
Lyu, DY; Wang, PS; Zhang, S; Liu, GK*; Ren, B*. Revealing protein binding affinity on metal surfaces: an electrochemical approach. *CHEMICAL COMMUNICATIONS.* 2022. 58: 3537-3540.

Lyu, MX; Gao, XL*; Zhang, M; Lin, SH; Su, Y; Luo, X; You, WW; Ke, CH*. Development of a feeding strategy for *Haliotis discus hannai* female x Haliotis fulgens male hybrids and parental H. discus hannai. *AQUACULTURE.* 2022. 554, 738158.

Ma, H; Yang, MS; Zhang, YT; Qiu, HT; You, XX; Chen, SX*; Hong, WS*. Expressions of melanopsins in telencephalon imply their function in synchronizing semilunar spawning rhythm in the mudskipper *Boleophthalmus pectinirostris. GENERAL AND COMPARATIVE ENDOCRINOLOGY.* 2022. 315, 113926.

Ma, RJ; Shao, S; Wei, SZ; Ye, JL; Yang, YH; Jiao, NZ; Zhang, R*. A novel phage infecting the marine photoheterotrophic bacterium *Citromicrobium bathyomarinum. VIRUSES-BASEL.* 2022. 14, 512.

Ma, XY; Liu, L; Tang, K*. Carbon dioxide sequestration by microbial carbonic anhydrases from submarine hydrothermal systems. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 908818.



Ma, YB; Zou, WG; Ai, CX; You, WW; Liu, ST; Luo, X*; Ke, CH*. Evaluation of optimal dietary protein levels for juvenile hybrid abalone under three temperatures: Growth performance, body composition, biochemical responses, and antioxidant capacity. *AQUACULTURE NUTRITION.* 2022. 2022, 7008746.

Madhavaraju, J*; Armstrong-Altrin, JS; Selvaraj, K; James, RA. Microtextures on quartz grains from the Gulf of Mexico and the Mexican Pacific coastal sediments: Implications for sedimentary processes and depositional environment. JOURNAL OF *PALAEOGEOGRAPHY-ENGLISH.* 2022. 11: 256-274.

Mao, GN; Ji, MK; Xu, BQ; Liu, YQ*; Jiao, NZ. Variation of high and low nucleic acid-content bacteria in Tibetan ice cores and their relationship to black carbon. *FRONTIERS IN MICROBIOLOGY.* 2022. 13, 844432.

Mao, SH; Zhang, HH; Zhuang, GC*; Li, XJ; Liu, Q; Zhou, Z; Wang, WL; Li, CY; Lu, KY; Liu, XT; Montgomery, A; Joye, SB; Zhang, YZ; Yang, GP*. Aerobic oxidation of methane significantly reduces global diffusive methane emissions from shallow marine waters. *NATURE COMMUNICATIONs.* 2022. 13, 7309.

Mei, K; Wang, DL*; Jiang, Y; Shi, MQ; Chen, CTA; Zhang, Y; Tang, K. Transformation, fluxes and impacts of dissolved metals from shallow water hydrothermal vents on nearby ecosystem offshore of Kueishantao (NE Taiwan). *SUSTAINABILITY.* 2022. 14, 1754.

Mei, K; Wu, GR; Liu, JC*; Wu, JJ; Hong, HL; Lu, HL; Yan, CL. Dynamics of low-molecular-weight organic acids for the extraction and sequestration of arsenic species and heavy metals using mangrove sediments. *CHEMOSPHERE.* 2022. 286, 131820.

Meng, LS*; Yan, XH. Remote sensing for subsurface and deeper oceans: An overview and a future outlook. *IEEE GEOSCIENCE AND REMOTE SENSING MAGAZINE.* 2022. 10: 72-92.

Naeem, S; Lu, YL; Jackson, J. Curtailing the collapse of the living world. *SCIENCE ADVANCES.* 2022. 8, eadf9317.

Nan, F*; Xue, HJ; Yu, F*; Ren, Q; Wang, JF. Diapycnal mixing variations induced by subthermocline eddies observed in the north Pacific western boundary region. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 997599.

Nargis, A; Habib, A*; Islam, MN; Chen, K; Sarker, MSI; Al-Razee, ANM; Liu, WB; Liu, GR; Cai, MG*. Source identification, contamination status and health risk assessment of heavy metals from road dusts in Dhaka, Bangladesh. *JOURNAL OF ENVIRONMENTAL SCIENCES.* 2022. 121: 159-174.

Nargis, A; Habib, A*; Zhao, SZ*; Nigar, R; Liu, X; Zhang, G; Cai, MG*. Monitoring of atmospheric polycyclic aromatic hydrocarbons by polyurethane foam-passive air samplers in Bangladesh: Source apportionment and health risk assessment. *ATMOSPHERIC ENVIRONMENT.* 2022. 289, 119346.

Nawaz, MZ; Sasidharan, RS; Alghamdi, HA; Dang, HY*. Understanding interaction patterns within deep-sea microbial communities and their potential applications. *MARINE DRUGS.* 2022. 20, 108.

Pan, F; Wang, B; Zhang, YL; Zhang, XT; Cai, Y; Liu, HT*; Guo, ZR*; Wang, XH. Bioavailability, (im)mobilization kinetics, and spatiotemporal patterns of arsenic and cadmium in surficial sediments of a river-estuary-coast system. *JOURNAL OF HYDROLOGY.* 2022. 612, 128140.

Pang, GW; Gao, XL; Hong, JW; Luo, X; Wu, YS; You, WW*; Ke, CH*. Growing abalone on a novel offshore platform: An on-site test of the effects of stocking density and diet. *AQUACULTURE.* 2022. 549, 737769.

Peng, B; Hossain, KB; Lin, Y; Zhang, MY; Zheng, HW; Yu, JJ; Meng, XL; Wang, JL; Cui, YZ; Wu, B; Lou, LH; Cai, MG*. Assessment and sources identification of microplastics, PAHs and OCPs in the Luoyuan Bay, China: Based on multi-statistical analysis. *MARINE POLLUTION BULLETIN.* 2022. 175, 113351.

Peng, YZ; Duan, AM*; Hu, WT; Tang, B; Li, XY; Yang, XY. Observational constraint on the future projection of temperature in winter over the Tibetan Plateau in CMIP6 models. *ENVIRONMENTAL RESEARCH LETTERS.* 2022. 17, 34023.

Petit-Marty, N*; Liu, M; Tan, IZ; Chung, AR; Terrasa, B; Guijarro, B; Ordines, F; Ramirez-Amaro, S; Massuti, E; Schunter, C*. Declining population sizes and loss of genetic diversity in commercial fishes: A simple method for a first diagnostic. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 872537.

Qi, HY; Li, HL; Meng, XL; Peng, LC; Zheng, HW; Wang, LR; Wang, WM; Chen, K; Zhang, JJ; Zhang, HF; Cai, MG*. Fate of microplastics in deep-sea sediments and its influencing factors: Evidence from the Eastern Indian Ocean. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 828, 154266.

Qian, PY*; Cheng, AF; Wang, RJ; Zhang, R. Marine biofilms: Diversity, interactions and biofouling. *NATURE REVIEWS MICROBIOLOGY.* 2022. 20: 671-684.

Qu, A; Bai, YL; Zhang, XY; Zeng, JJ; Pu, F; Wu, LN; Xu, P; Zhou, T*. Tissue-specific analysis of alternative splicing events and differential isoform expression in large yellow croaker (*Larimichthys crocea*) after Cryptocaryon irritans infection. *MARINE BIOTECHNOLOGY.* 2022. 24: 640-654.

Qu, LY; He, C; Wu, ZT; Dahlgren, RA; Ren, MX; Li, PH; Shi, Q; Li, Y; Chen, NW*; Guo, WD*. Hypolimnetic deoxygenation enhanced production and export of recalcitrant dissolved organic matter in a large stratified reservoir. *WATER RESEARCH.* 2022. 219, 118537.

Qu, ZS*; Pan, HB; Gong, J; Wang, CC; Filker, S; Hu, XZ*. Historical review of studies on cyrtophorian ciliates (Ciliophora, Cyrtophoria) from China. *MICROORGANISMS.* 2022. 10, 1325.

Ratul, SB; Gu, XX; Qiao, PY; Sagala, FW; Nan, S; Islam, N; Chen, LZ*. Blue carbon sequestration following mangrove restoration: Evidence from a carbon neutral case in China. *ECOSYSTEM HEALTH AND SUSTAINABILITY.* 2022. 8, 2101547.

Ren, HW; Hu, YB*; Liu, JH*; Zhang, Z; Mou, L; Pan, YN; Zheng, Q; Li, G; Jiao, NZ. Response of a coastal microbial community to olivine addition in the muping marine ranch, Yantai. *FRONTIERS IN MICROBIOLOGY.* 2022. 12, 805361.

Ren, QQ; Leung, PTY; Xu, Q; Yan, M; Yang, GH; Wei, JH; Liu, M*. Fish assemblages in subtidal seagrass meadows surrounding the West Sand, South China Sea. *FRONTIERS IN ENVIRONMENTAL SCIENCE.* 2022. 9, 765702.

Richards, JL; Sheng, V; Chung, HWY; Liu, M; Tsang, RHH; McIlroy, SE*; Baker, D*. Development of an eDNA-based survey method for urban fish markets. *METHODS IN ECOLOGY AND EVOLUTION.* 2022. 13: 1568-1580.

Rong, CH; Zhou, K; Li, SM; Xiao, K; Xu, Y; Zhang, R; Yang, YL*; Zhang, Y*. Isolation and characterization of a novel cyanophage encoding multiple auxiliary metabolic genes. *VIRUSES-BASEL.* 2022. 14, 887.

Shang, ZH; Yu, XL*; Lee, ZP. Direct measurement system of water-leaving albedo in the field by the skylight- blocked approach: Monte Carlo simulations. *OPTICS EXPRESS.* 2022. 30: 23852-23867.

Shangguan, MJ; Qiu, JW; Yuan, JL; Shu, ZF; Zhou, LF; Xia, HY*. Doppler wind lidar from UV to NIR: A review with case study examples. *FRONTIERS IN REMOTE SENSING.* 2022. 2022. 2, 787111.

Shao, ZB; Luo, YW*. Controlling factors on the global distribution of a representative marine non-cyanobacterial diazotroph phylotype (Gamma A). *BIOGEOSCIENCES.* 2022. 19: 2939-2952.

Shellock, RJ*; Cvitanovic, C; Mackay, M; McKinnon, MC; Blythe, J; Kelly, R; van Putten, IE; Tuohy, P; Bailey, M; Begossi, A; Crona, B; Fakoya, KA; Ferreira, BP; Ferrer, AJG; Frangoudes, K; Gobin, J; Goh, HC; Haapasaari, P; Hardesty, BD; Haussermann, V; Ho. Breaking down barriers: The identification of actions to promote gender equality in interdisciplinary marine research institutions. *ONE EARTH.* 2022. 5: 687-708.

Shen, C; Cai, YM; Li, JL; He, CY; Zuo, ZH*. Mepanipyrim induces visual developmental toxicity and vision-guided behavioral alteration in zebrafish larvae. *JOURNAL OF ENVIRONMENTAL SCIENCES.* 2022. 124: 76-88.

Shen, C; He, J; Zhu, KY; Zheng, NA; Yu, Y; He, CY; Yang, CN*; Zuo, ZH*. Mepanipyrim induces cardiotoxicity of zebrafish (*Danio rerio*) larvae via promoting AhR-regulated COX expression pathway. *JOURNAL OF ENVIRONMENTAL SCIENCES.* 2022. 125: 650-661.

Shen, C; Zhao, XJ; He, CY; Zuo, ZH*. Developmental toxicity and neurotoxicity assessment of R-, S-, and RS-propylene glycol enantiomers in zebrafish (*Danio rerio*) larvae. *ENVIRONMENTAL SCIENCE AND POLLUTION RESEARCH.* 2022. 29: 30537-30547.

Shen, Y*; Benner, R. Reply to comment: Controls on turnover of marine dissolved organic matter-testing the null hypothesis of purely concentration-driven uptake. *LIMNOLOGY AND OCEANOGRAPHY.* 2022. 67: 680-683.

Shen, ZL; Duan, AM*; Li, DL; Li, JX. Quantifying the contribution of internal atmospheric drivers to near-term projection uncertainty in september Arctic sea Ice. *JOURNAL OF CLIMATE.* 2022. 35: 3427-3443.

Shi, Y; Chen, BH; Kong, SN; Zeng, QM; Li, LB; Liu, B; Pu, F; Xu, P*. Comparative genomics analysis and genome assembly integration with the recombination landscape contribute to Takifugu bimaculatus assembly refinement. *GENE.* 2022. 849, 146910.

Shu, C; Xiu, P*; Xing, XG; Qiu, GQ; Ma, WT; Brewin, RJW; Ciavatta, S. Biogeochemical model optimization by using satellite-derived phytoplankton functional type data and BGC-Argo observations in the Northern South China Sea. *REMOTE SENSING.* 2022. 14, 1297.

Shu, HL; Wang, S; Liu, BM; Ma, J*. Effects of salt matrices on the determination of glyphosate, glufosinate, aminomethylphosphonic acid and 2-aminoethylphosphonic acid using reversed-phase liquid chromatography after fluorescence derivatization. *MICROCHEMICAL JOURNAL.* 2022. 179, 107659.

Shu, HL; You, YC; Wang, HW; Wang, JT; Li, L; Ma, J*; Lin, X*. Transcriptomic-guided phosphonate utilization analysis unveils evidence of clathrin-mediated endocytosis and phospholipid synthesis in the model diatom, Phaeodactylum tricornutum. *MSYSTEMS.* 2022. 7, e0056322.

Song, JH; Lin, BA; Jia, YY; Dutton, PH; Kang, B; Balazs, GH; Liu, M*. New management unit for conservation of the Endangered green turtle *Chelonia mydas* at the Xisha (Paracel) Islands, South China Sea. *ENDANGERED SPECIES RESEARCH.* 2022. 47: 145-154.

Su, H*; Jiang, JW; Wang, A; Zhuang, W; Yan, XH. Subsurface temperature reconstruction for the global ocean from 1993 to 2020 using satellite observations and deep learning. *REMOTE SENSING.* 2022. 14, 3198.

Su, J*; Yin, BC; Chen, LZ; Gasparatos, A. Priority areas for mixed-species mangrove restoration: The suitable species in the right sites. *ENVIRONMENTAL RESEARCH LETTERS.* 2022. 17, 65001.

Su, YY; Qi, HY; Hou, YP; Gao, MY; Li, J; Cai, MG; Zhu, XS; Chen, M; Ge, CJ; Fu, DD; Wang, ZZ; Peng, LC*. Combined Effects of Microplastics and Benzo[a]pyrene on the Marine Diatom *Chaetoceros muelleri*. *FRONTIERS IN MARINE SCIENCE.* 2022. 8, 779321.

Sun, B; Lu, YL*; Yang, YF; Yu, MZ; Yuan, JJ; Yu, R; Bullock, JM; Stenseth, NC; Li, X; Cao, ZW; Lei, HJ; Li, JL. Urbanization affects spatial variation and species similarity of bird diversity distribution. *SCIENCE ADVANCES.* 2022. 8, eade3061.

Sun, H; Chen, FY; Hao, H; Wang, KJ*. Multi-dimensional investigation and distribution characteristics analysis of gut microbiota of different marine fish in Fujian Province of China. *FRONTIERS IN MICROBIOLOGY.* 2022. 13, 918191.

Sun, JZ; Wang, TF; Huang, RP; Yi, XQ; Zhang, D; Beardall, J; Hutchins, DA; Liu, X; Wang, XY; Deng, ZC; Li, G; Gao, G; Gao, KS*. Enhancement of diatom growth and phytoplankton productivity with reduced O_2 availability is moderated by rising CO_2. *COMMUNICATIONS BIOLOGY.* 2022. 5, 54.

Sun, P*; Wang, Y; Huang, X; Huang, BQ*; Wang, L. Water masses and their associated temperature and cross-domain biotic factors co-shape upwelling microbial communities. *WATER RESEARCH.* 2022. 215, 118274.

Sun, P; Liao, YY; Wang, Y; Yang, EJ; Jiao, NZ; Lee, Y; Jung, J; Cho, KH; Moon, JK; Xu, DP*. Contrasting community composition and co-occurrence relationships of the active pico-sized haptophytes in the surface and subsurface chlorophyll maximum layers of the Arctic Ocean in summer. *MICROORGANISMS.* 2022. 10, 248.

Sun, XQ; Lin, D; Han, Y; Sun, J; Ye, JN; Chen, BH; Tang, K*. *Roseovarius carneus* sp. nov., a novel bacterium isolated from a coastal phytoplankton bloom in Xiamen. *INTERNATIONAL JOURNAL OF SYSTEMATIC AND EVOLUTIONARY MICROBIOLOGY.* 2022. 72, DOI: 10.1099/ijsem.0.005577.

Sun, ZY; Hu, JY*; Lin, HY; Chen, ZZ; Zhu, J; Yang, LQ; Hu, ZY; Chen, XR; Wu, XW. Lagrangian observation of the Kuroshio Current by surface drifters in 2019. *JOURNAL OF MARINE SCIENCE AND ENGINEERING.* 2022. 10, 1027.

Suo, N; Zhou, ZX; Xu, J; Cao, DC; Wu, BY; Zhang, HY; Xu, P*; Zhao, ZX*. Transcriptome analysis reveals molecular underpinnings of Common Carp (*Cyprinus carpio*) under hypoxia stress. *FRONTIERS IN GENETICS.* 2022. 13, 907944.

Tamborski, JJ*; Cai, PH; Eagle, M; Henderson, P; Charette, MA. Revisiting ^{228}Th as a tool for determining sedimentation and mass accumulation rates. *CHEMICAL GEOLOGY.* 2022. 607, 121006.

Tan, EH*; Hsu, TC; Zou, WB; Yan, XL; Huang, ZX; Chen, B; Chang, YK; Zheng, ZZ; Zheng, LW; Xu, M; Tian, L; Kao, SJ*. Quantitatively deciphering the roles of sediment nitrogen removal in environmental and climatic feedbacks in two subtropical estuaries. *WATER RESEARCH.* 2022. 224, 119121.

Tang, B; Hu, WT*; Duan, AM; Gao, KL; Peng, YZ. Reduced risks of temperature extremes from 0.5 degrees C less global warming in the earth's three poles. *EARTHS FUTURE.* 2022. 10, e2021EF002525.

Tang, JM; Xu, MN; Lin, YX; Chen, HX; Jin, HQ; Han, LL; Zou, WB; Kao, SJ*. The biological transformation of ammonium and urea in a eutrophic estuarine system in Southern China. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 1040554.

Thyssen, M*; Grégori, G; Créach, V; Lahbib, S; Dugenne, M; Aardema, HM; Artigas, LF; Huang, B; Barani, A; Beaugeard, L; Bellaaj-Zouari, A; Beran, A; Casotti, R; Del, AY; Denis, M; Dubelaar, GBJ; Endres, S; Haraguchi, L; Karlson, B; Lambert, C, Louchart, A. Interoperable vocabulary for marine microbial flow cytometry. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 975877.

Tian, DJ; Lai, ZW; Xu, H; Lin, FY; Jiang, YQ; Huang, YP; Wang, SY; Cai, YT; Jin, JW; Xie, RJ*; Chen, X*. Low-dimensional organic lead halides with organic-inorganic collaborative luminescence regulated by anion in dimension. *CHEMISTRY OF MATERIALS.* 2022. 34: 5224-5231.

Tian, J; Yang, WF*; Chen, M; Zheng, MF; Chen, D; Qiu, YS. Auto-deposition of ^{210}Bi and ^{210}Po on nickel discs and their application in the analysis of natural waters. *JOURNAL OF RADIOANALYTICAL AND NUCLEAR CHEMISTRY.* 2022. 331: 1039-1049.

Tian, Q; Liu, D*; Yuan, P; Li, MY; Yang, WF; Zhou, JY; Wei, HH; Zhou, JM; Guo, HZ. Occurrence of structural aluminium (Al) in marine diatom biological silica: Visible evidence from microscopic analysis. *OCEAN SCIENCE.* 2022. 18: 321-329.

Tian, Y; Yi, XQ; Gao, KS*. Applying dialysis bags to grow microalgae and measure grazing rates by secondary producers. *FRONTIERS IN PHYSIOLOGY.* 2022. 13, 838001.

Tu, JB; Fan, DD*; Liu, ZY; Smyth, W*. Scaling the mixing efficiency of sediment-stratified turbulence. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2022GL099025.

Veeran, Y*; Bose, RSJ; Kandasamy, S. Local knowledge of coastal population to sea level rise and climate change - a case study in fishermen community, Kanyakumari district, Tamil Nadu, India. *JOURNAL OF CLIMATE CHANGE.* 2022. 8: 23-34.

Wan, XH; Sheng, HX; Dai, MH; Casciotti, KL; Church, MJ; Zou, WB; Liu, L; Shen, H; Zhou, KB; Ward, BB; Kao, SJ*. Epipelagic nitrous oxide production offsets carbon sequestration by the biological pump. *NATURE GEOSCIENCE.* 2022. 9, 915.

Wan, XHS; Lin, H; Ward, BB; Kao, SJ; Dai, MH*. Significant seasonal N2O dynamics revealed by multi-year observations in the Northern South China Sea. *GLOBAL BIOGEOCHEMICAL CYCLES.* 2022. 36, e2022GB007333.

Wang, C; Lu, YL*; Sun, B; Zhang, M; Mao, RY; Li, XQ; Song, S; Zhao, JX; Yu, MZ; Shi, YJ; Wang, P. Biomanipulation impacts on per-and polyfluoroalkyl substances accumulation and trophic transfer in an eutrophic lake. *ENVIRONMENT INTERNATIONAL.* 2022. 160, 107057.

Wang, C; Lu, YL*; Sun, B; Zhang, M; Wang, CC; Xiu, C; Johnson, AC; Wang, P. Ecological and human health risks of antibiotics in marine species through mass transfer from sea to land in a coastal area: A case study in Qinzhou Bay, the South China sea. *ENVIRONMENTAL POLLUTION.* 2022. 316, 120502.

Wang, C; Lu, YL*; Sun, B; Zhang, M; Wang, R; Li, XQ; Mao, RY; Cao, ZW; Song, S. Contamination, transport, and ecological risks of pharmaceuticals and personal care products in a large irrigation region. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 851, 158179.

Wang, C; Sun, XQ; Wang, JT; Tang, JM; Gu, YF; Lin, SJ*. Physiological and metabolic effects of glyphosate as the sole P source on a cosmopolitan phytoplankter and biogeochemical implications. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 832, 155094.

Wang, C; Wang, JT; Li, L; Wang, YJ; Lin, SJ*. P-limitation promotes carbon accumulation and sinking of emiliania huxleyi through transcriptomic reprogramming. *JOURNAL OF APPLIED PHYSICS.* 2022. 9, 860222.

Wang, C; Ye, PY; Liu, M; Zhang, Y; Feng, HQ; Liu, JY; Zhou, HL; Wang, JJ*; Chen, X*. Comparative Analysis of Four Complete Mitochondrial Genomes of Epinephelidae (Perciformes). *GENES.* 2022. 13, 660.

Wang, CAY; Liu, ZY*; Lin, HY*. Interpreting consequences of inadequate sampling of oceanic motions. *LIMNOLOGY AND OCEANOGRAPHY LETTERS.* 2022. 7: 385-391.

Wang, CC*; Lu, YL; Wang, C; Xiu, C; Cao, XH; Zhang, M; Song, S. Distribution and ecological risks of pharmaceuticals and personal care products with different anthropogenic stresses in a coastal watershed of China. *CHEMOSPHERE.* 2022. 303, 135176.

Wang, DZ*; Xin, YH; Wang, MH. Gambierdiscus and its associated toxins: A minireview. *TOXINS.* 2022. 14, 485.

Wang, F*; Harindintwali, JD; Yuan, ZZ; Wang, M; Wang, FM; Li, S; Yin, ZG; Huang, L; Fu, YH; Li, L; Chang, SX; Zhang, LJ; Rinklebe, J; Yuan, ZQ; Zhu, QG; Xiang, LL; Tsang, DCW; Xu, L; Jiang, X; Liu, JH; Wei, N; Kastner, M; Zou, Y; Ok, YS; Shen, JL; Peng, D. Technologies and perspectives for achieving carbon neutrality. *INNOVATION.* 2022. 2, 100180.

Wang, FF; Song, AG; Zhang, Y; Lin, XB; Yan, RF; Wang, Y; Chen, NW*. Saltmarsh sediments with wastewater input emit more carbon greenhouse gases but less N_2O than mangrove sediments. *CATENA.* 2022. 213, 106205.

Wang, FF; Xiao, K*; Santos, IR; Lu, ZY; Tamborski, J; Wang, Y; Yan, RF; Chen, NW*. Porewater exchange drives nutrient cycling and export in a mangrove-salt marsh ecotone. *JOURNAL OF HYDROLOGY.* 2022. 606, 127401.

Wang, H; Luo, YW*. Top-down control on major groups of global marine diazotrophs. *ACTA OCEANOLOGICA SINICA.* 2022. 41: 111-119.

Wang, H; Zheng, Y*; Liu, JW; Zhu, BL; Qin, W; Zhao, F*. An electrochemical system for the rapid and accurate quantitation of microbial exoelectrogenic ability. *BIOSENSORS & BIOELECTRONICS.* 2022. 215, 114584.

Wang, L; Zhao, JL; Wang, ZM; Li, N; Song, JM; Zhang, R; Jiao, NZ; Zhang, YY*. phoH-carrying virus communities responded to multiple factors and their correlation network with prokaryotes in sediments along Bohai Sea, Yellow Sea, and East China Sea in China. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 812, 152477.

Wang, PX; Laws, E; Wang, YZ; Chen, JX; Song, X; Huang, RP; Wang, TF; Yi, XQ; Sun, JZ; Guo, XH; Liu, X*; Gao, KS; Huang, BQ. Elevated pCO2 changes community structure and function by affecting phytoplankton group-specific mortality. *MARINE POLLUTION BULLETIN.* 2022. 175, 113362.

Wang, Q; Kang, Q; Zhao, B; Li, HY; Lu, HL; Liu, JC; Yan, CL*. Effect of land-use and land-cover change on mangrove soil carbon fraction and metal pollution risk in Zhangjiang Estuary, China. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 807, 150973.

Wang, SQ; Cai, YZ; Ma, LY; Lin, XP; Li, Q; Li, YY; Wang, XH*. Perfluoroalkyl substances in water, sediment, and fish from a subtropical river of China: Environmental behaviors and potential risk. *CHEMOSPHERE.* 2022. 288, 132513.

Wang, SQ; Ding, GH; Liu, YH; Dou, ZY; Chen, HZ; Ya, ML; Lin, XP; Li, Q; Li, YY; Wang, XH*. Legacy and emerging persistent organic pollutants in the marginal seas of China: Occurrence and phase partitioning. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 827, 154274.

Wang, SQ; Lin, XP; Li, Q; Li, YY; Yamazaki, E; Yamashita, N; Wang, XH*. Particle size distribution, wet deposition and scavenging effect of per- and polyfluoroalkyl substances (PFASs) in the atmosphere from a subtropical city of China. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 823, 153528.

Wang, SQ; Lin, XP; Li, Q; Liu, C; Li, YY; Wang, XH*. Neutral and ionizable per-and polyfluoroalkyl substances in the urban atmosphere: Occurrence, sources and transport. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 823, 153794.

Wang, SS; Yan, YW; Qian, H; Li, J; Liu, T; Mo, ZL*. Dynamics of planktonic microbial community associated with *Saccharina japonica* seedling. *JOURNAL OF MARINE SCIENCE AND ENGINEERING.* 2022. 10, 726.

Wang, SY; Koedooder, C; Zhang, FT; Kessler, N; Eichner, M; Shi, DL; Shaked, Y*. Colonies of the marine cyanobacterium *Trichodesmium* optimize dust utilization by selective collection and retention of nutrient-rich particles. *ISCIENCE.* 2022. 25, 103587.

Wang, T; Huang, YM; Zhu, Y; Xu, J; Li, DW; Wang, B; Guo, WD*; Yuan, DX*. A shipboard method for catalytic kinetic spectrophotometric determination of trace Cu(II) concentrations in seawater using reverse flow injection analysis coupled with a long path length liquid waveguide capillary cell. *MICROCHEMICAL JOURNAL.* 2022. 179, 107441.

Wang, TH; Yu, P; Wu, ZL; Lu, WF*; Liu, X; Li, QP; Huang, BQ. Revisiting the intraseasonal variability of chlorophyll-a in the adjacent Luzon Strait with a new gap-filled remote sensing data set. *IEEE TRANSACTIONS ON GEOSCIENCE AND REMOTE SENSING.* 2022. 60, 4201311.

Wang, WL; Pu, SH; Hu, WY; Gu, JL; Ren, B; Tian, ZQ; Liu, GK*. Revealing the synergistic effect of capillary force and electrostatic attraction for D-SERS sensitivity. *CHEMICAL COMMUNICATIONS.* 2022. 58: 3953-3956.

Wang, X*; Vannier, J; Yang, XG; Leclere, L; Ou, Q; Song, XK; Komiya, T; Han, J*. Muscle systems and motility of early animals highlighted by cnidarians from the basal Cambrian. *ELIFE.* 2022. 11, e74716.

Wang, X; Guan, ZC; Shi, HY; Jin, PA; Liu, GK*; Du, RG*. Fabrication and photoelectrochemical cathodic protection effect of Bi_2S_3/CdSe Co-modified TiO_2 Nanotube Film. *CHINESE JOURNAL OF INORGANIC CHEMISTRY.* 2022. 38: 861-872.

Wang, X; Qu, M; Liu, YL; Schneider, RF; Song, Y; Chen, ZL; Zhang, H; Zhang, YH; Yu, HY; Zhang, SY; Li, DX; Qin, G; Ma, SB; Zhong, J; Yin, JP; Liu, SS; Fan, GY; Meyer, A*; Wang, DZ*; Lin, Q*. Genomic basis of evolutionary adaptation in a warm-blooded fish. *INNOVATION.* 2022. 3, 100185.

Wang, XF; Hong, X; Chen, FY; Wang, KJ*. A truncated peptide $Spgillcin_{177-189}$ derived from mud crab *Scylla paramamosain* exerting multiple antibacterial activities. *FRONTIERS IN CELLULAR AND INFECTION MICROBIOLOGY.* 2022. 12, 928220.

Wang, Y; Gan, Y; Zhang, JP; Xiao, QZ; Shen, YW; Chen, YX; You, WW; Luo, X*; Ke, CH*. Performance of triploid *Haliotis discus hannai* cultured in a subtropical area using sea-based suspended systems. *AQUACULTURE.* 2022. 548, 737722.

Wang, Y; Liu, YB; Li, YY; Sun, J; Lai, QL; Zhu, HM; Zhou, HT*. *Pseudemcibacter aquimaris* gen. nov., sp. nov., isolated from an aquaculture farm. *INTERNATIONAL JOURNAL OF SYSTEMATIC AND EVOLUTIONARY MICROBIOLOGY.* 2022. 72, 5327.

Wang, Y; Xie, R; Shen, Y; Cai, RH; He, C; Chen, Q; Guo, WD; Shi, Q; Jiao, NZ; Zheng, Q*. Linking microbial population succession and DOM molecular changes in *Synechococcus*-derived organic matter addition incubation. *MICROBIOLOGY SPECTRUM.* 2022. 10, e0230821.

Wang, YC; Lee, ZP*; Ondrusek, M; Li, X; Zhang, S; Wu, JY. An evaluation of remote sensing algorithms for the estimation of diffuse attenuation coefficients in the ultraviolet bands. *OPTICS EXPRESS.* 2022. 30: 6640-6655.

Wang, YT; Chen, HH; Tang, R; He, D; Lee, ZP; Xue, HJ; Wells, M; Boss, E; Chai, F*. Australian fire nourishes ocean phytoplankton bloom. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 807, 150775.

Wang, YZ; Hong, HL; Qian, L; Wang, Q; Li, JW; Huang, Q; Jiang, YC; Lu, HL; Liu, JC; Dong, YW; Li, J; Yan, CL*. Polycyclic aromatic hydrocarbons at subcritical levels as novel indicators of microbial adaptation in a pre-industrial river delta. *CHEMOSPHERE.* 2022. 295, 133858.

Wang, Z*; Xu, T; Qiu, JW; Ji, YL; Yu, ZS; Ke, CH. Morphological analysis of *Rhynchospio* aff. *asiatica* (Annelida: Spionidae) and comments on the phylogeny and reproduction of the family Spionidae. *JOURNAL OF OCEANOLOGY AND LIMNOLOGY.* 2022. 40: 1257-1276.

Wang, ZX; Wang, GZ*; Guo, XH; Hu, JY; Dai, MH. Reconstruction of high-resolution sea surface salinity over 2003–2020 in the South China Sea using the machine learning algorithm lightGBM model. *REMOTE SENSING.* 2022. 14, 6147.

Wei, L; Cai, PH*; Shi, XM; Cai, WJ; Liu, W; Hong, QQ; Wu, T; Bai, Y; Cheng, P; Sun, ZY. Winter mixing accelerates decomposition of sedimentary organic carbon in seasonally hypoxic coastal seas. *GEOCHIMICA ET COSMOCHIMICA ACTA*. 2022. 317: 457-471.

Wei, LL*; Hong, HL; Bee, MY; Wu, YY; Ndayambaje, P; Yan, CL; Kao, SJ; Chee, PS; Wang, YZ. Different adaptive strategies of three mangrove species to nutrient enrichment. *PLANT ECOLOGY*. 2022. 223: 1093-1102.

Wei, W; Chen, XW; Weinbauer, MG; Jiao, NZ*; Zhang, R*. Reduced bacterial mortality and enhanced viral productivity during sinking in the ocean. *ISME JOURNAL*. 2022. 16: 1668-1675.

Wei, XQ; Liu, LH*; Chen, XP; Jin, GR; Liu, L; Cai, MG; Qiu, ZY. Microbial diversity in marine sediments of two hydrocarbon reservoir areas in the eastern Atlantic Ocean. *AQUATIC MICROBIAL ECOLOGY*. 2022. 88: 109-122.

Wen, ZZ; Browning, TJ; Cai, YH; Dai, RB; Zhang, RF; Du, CJ; Jiang, RT; Lin, WF; Liu, X; Cao, ZM; Hong, HZ; Dai, MH; Shi, DL*. Nutrient regulation of biological nitrogen fixation across the tropical western North Pacific. *SCIENCE ADVANCES*. 2022. 8, eabl7564.

Wen, ZZ; Browning, TJ; Dai, RB; Wu, WW; Li, WY; Hu, XH; Lin, WF; Wang, LF; Liu, X; Cao, ZM; Hong, HZ*; Shi, DL*. The response of diazotrophs to nutrient amendment in the South China Sea and western North Pacific. *BIOGEOSCIENCES*. 2022. 19: 5237-5250.

Won, EJ; Byeon, E; Lee, YH; Jeong, H; Lee, Y; Kim, MS; Jo, HW; Moon, JK; Wang, MH; Lee, JS; Shin, KH*. Molecular evidence for suppression of swimming behavior and reproduction in the estuarine rotifer *Brachionus koreanus* in response to COVID-19 disinfectants. *MARINE POLLUTION BULLETIN*. 2022. 175, 113396.

Wu, GX; Zhou, XJ; Xu, XD; Huang, JP; Duan, AM*; Yang, S; Hu, WT; Ma, YM; Liu, YM; Bian, JC; Fu, YF; Yang, HJ; Zhao, P; Zhong, L; Ma, WQ. An integrated research plan for the Tibetan Plateau land–air coupled system and its impacts on the global climate. *BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY*. 2022. DOI: 10.1175/BAMS-D-21-0293.1.

Wu, JH; Goes, JI*; Gomes, HD; Lee, Z*; Noh, JH; Wei, JW; Shang, ZH; Salisbury, J; Mannino, A; Kim, W; Park, YJ; Ondrusek, M; Lance, VP; Wang, MH; Frouin, R. Estimates of diurnal and daily net primary productivity using the Geostationary Ocean Color Imager (GOCI) data. *REMOTE SENSING OF ENVIRONMENT*. 2022. 280, 113183.

Wu, QL; Su, QJ; Simpson, SL; Tan, QG; Chen, R; Xie, MW*. Isotopically modified bioassay bridges the bioavailability and toxicity risk assessment of metals in bedded sediments. *ENVIRONMENTAL SCIENCE & TECHNOLOGY*. 2022. 56: 16919–16928.

Wu, WW; Sun, L; Li, XS; Liang, JR; Gao, YH*; Chen, CP*. A new small marine *Diploneis* species (Diploneidaceae, Bacillariophyta) from Guangdong Province, China. *PHYTOTAXA*. 2022. 560: 233-240.

Wu, XM; Li, L; Lin, SJ*. Energy metabolism and genetic information processing mark major transitions in the life history of *Scrippsiella acuminata* (Dinophyceae). *HARMFUL ALGAE*. 2022. 116, 102248.

Wu, XM; Liu, YL; Weng, YB; Li, L; Lin, SJ*. Isolation, identification and toxicity of three strains of *Heterocapsa* (Dinophyceae) in a harmful event in Fujian, China. *HARMFUL ALGAE*. 2022. 120, 102355.

Wu, Y*; Koch, BP; Wang, XA; Witt, M; Wang, XL; Bao, HY; Gan, SC; Kattner, G; Zhang, J. Molecular composition of dissolved organic matter in the Changjiang (Yangtze River) - imprints of anthropogenic impact. *FRONTIERS IN MARINE SCIENCE*. 2022. 9, 980176.

Wu, Y; Wang, SQ; Wu, LB; Yang, YJ; Yu, XX; Liu, QX; Liu, XL; Li, YY; Wang, XH*. Vertical distribution and river-sea transport of microplastics with tidal fluctuation in a subtropical estuary, China. *SCIENCE OF THE TOTAL ENVIRONMENT*. 2022. 822, 153603.

Wu, YM; Leng, ZR; Li, J*; Jia, H; Yan, CL; Hong, HL; Wang, Q; Lu, YY; Du, DL. Increased fluctuation of sulfur alleviates cadmium toxicity and exacerbates the expansion of Spartina alterniflora in coastal wetlands. *ENVIRONMENTAL POLLUTION*. 2022. 292, 118399.

Wu, YM; Leng, ZR; Li, J*; Yan, CL; Wang, XH; Jia, H; Chen, LY; Zhang, S; Zheng, XJ*; Du, DL. Sulfur mediated heavy metal biogeochemical cycles in coastal wetlands: From sediments, rhizosphere to vegetation. *FRONTIERS OF ENVIRONMENTAL SCIENCE & ENGINEERING*. 2022. 16, 102.

Wu, Z; Lee, WH; Liu, ZJ; Lin, SJ*; Lam, PKS*. Microbiome associated with gambierdiscus balechii cultures under different toxicity conditions. *FRONTIERS IN MARINE SCIENCE*. 2022. 9, 760553.

Xia, Y; Liu, PJ; Liu, XQ; Zhang, J*; Tan, XF; Jia, XL; Jin, YM; Liu, T; Hu, Y. Complete organellar genomes and molecular phylogeny of *Hypnea cervicornis* (Gigartinales, Florideophyceae) from China. *JOURNAL OF APPLIED PHYCOLOGY*. 2022. 34: 2705-2717.

Xiao, QZ; Gan, Y; Yu, F; Boamah, GA; Shen, YW; Wang, Y; Huang, ZK; You, WW; Luo, X*; Ke, CH*. Study of hybrid and backcross abalone populations uncovers trait separation and their thermal resistance capacity. *AQUACULTURE RESEARCH*. 2022. 53: 2619-2628.

Xiao, QZ; Shen, YW; Gan, Y; Wang, Y; Zhang, JP; Huang, ZK; You, WW; Luo, X*; Ke, CH*. Three-way cross hybrid abalone exhibit heterosis in growth performance, thermal tolerance, and hypoxia tolerance. *AQUACULTURE*. 2022. 555, 738231.

Xiao, XL; Powers, LC; Liu, JH*; Gonsior, M; Zhang, R; Zhang, LB; MacIntyre, HL; Chen, XW; Hu, C; Batt, J; Shi, Q; Xu, DP; Zhang, Y; Jiao, NI*. Biodegradation of terrigenous organic matter in a stratified large-volume water column: Implications of the removal of terrigenous organic matter in the coastal ocean. *ENVIRONMENTAL SCIENCE & TECHNOLOGY*. 2022. 56: 5234-5246.

Xie, L; Zhang, R; Luo, YW*. Assessment of explicit representation of dynamic viral processes in regional marine ecological models. *VIRUSES-BASEL*. 2022. 14, 1448.

Xie, ND; Bai, MH; Liu, L; Li, JQ; He, YD; Collier, JL; Hunt, DE; Johnson, ZI; Jiao, NZ; Wang, GY*. Patchy blooms and multifarious ecotypes of labyrinthulomycetes protists and their implication in vertical carbon export in the pelagic Eastern Indian Ocean. *MICROBIOLOGY SPECTRUM*. 2022. 10, DOI: 10.1128/spectrum.00144-22.

Xie, SC*; Jiao, NAZ; Luo, GM; Li, DD; Wang, PX. Evolution of biotic carbon pumps in Earth history: Microbial roles as a carbon sink in oceans. *CHINESE SCIENCE BULLETIN-CHINESE.* 2022. 67: 1715-1726.

Xie, SC*; Jiao, NZ; Wang, PX. Promoting studies on the geological evolution of marine biological carbon pumps. *CHINESE SCIENCE BULLETIN-CHINESE.* 2022. 67: 1597-1599.

Xie, SY; Lin, F; Zhao, X; Gao, G*. Enhanced lipid productivity coupled with carbon and nitrogen removal of the diatom Skeletonema costatum cultured in the high CO_2 level. *ALGAL RESEARCH-BIOMASS BIOFUELS AND BIOPRODUCTS.* 2022. 61, 102589.

Xie, XH*; Wang, Y; Liu, ZY; Liu, XH; Chen, DK; Zhang, DS; Wang, JN. Observation of near-inertial waves in the bottom boundary layer of an abyssal seamount. *JOURNAL OF PHYSICAL OCEANOGRAPHY.* 2022. DOI: 10.1175/JPO-22-0026.1.

Xie, ZX; He, YB; Zhang, SF; Lin, L; Wang, MH; Wang, DZ*. Metaexoproteomics reveals microbial behavior in the ocean's interior. *FRONTIERS IN MICROBIOLOGY.* 2022. 13, 749874.

Xie, ZX; Yan, KQ; Kong, LF; Gai, YB; Jin, T; He, YB; Wang, YY*; Chen, F; Lin, L; Lin, ZL; Xu, HK; Shao, ZZ; Liu, SQ*; Wang, DZ. Metabolic tuning of a stable microbial community in the surface oligotrophic Indian Ocean revealed by integrated meta-omics. *MARINE LIFE SCIENCE & TECHNOLOGY.* 2022. 4: 277-290.

Xing, XG*; Lee, ZP; Xiu, P; Chen, SL; Chai, F. A dual-band model for the vertical distribution of photosynthetically available radiation (PAR) in stratified waters. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 928807.

Xiong, YL; Gao, L; Qu, LY; Xu, JT; Ma, ZL; Gao, G*. The contribution of fish and seaweed mariculture to the coastal fluxes of biogenic elements in two important aquaculture areas, China. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 856, 159056.

Xu, B; Li, FY; Cai, LL; Zhang, R; Fan, L*; Zhang, CL. A holistic genome dataset of bacteria, archaea and viruses of the Pearl River estuary. *SCIENTIFIC DATA.* 2022. 9, 49.

Xu, DP*; Kong, HJ; Yang, EJ; Wang, Y; Li, XR; Sun, P*; Jiao, NZ; Lee, YJ; Jung, JY; Cho, KH. Spatial dynamics of active microeukaryotes along a latitudinal gradient: Diversity, assembly process, and co-occurrence relationships. *ENVIRONMENTAL RESEARCH.* 2022. 212, 113234.

Xu, JX; Chen, Q; Lonborg, C; Li, YY; Cai, RH; He, C; Shi, Q; Hu, YX; Wang, YM; Jiao, NZ; Zheng, Q*. You exude what you eat: How carbon-, nitrogen-, and sulfur rich organic substrates shape microbial community composition and the dissolved organic matter pool. *APPLIED AND ENVIRONMENTALMICROBIOLOGY.* 2022. 88, e0155822.

Xu, Q; Jiang, Y; Fang, LP; Liu, M*; Jiang, XB. Reproductive dynamics of three important clupeiform food fishes in the Min River Estuary and its adjacent nearshore waters, China. *MARINE AND COASTAL FISHERIES.* 2022. 13: 679-692.

Xu, T; Sun, YA; Wang, Z; Sen, A; Qian, PY*; Qiu, JW*. The morphology, mitogenome, phylogenetic position, and pymbiotic bacteria of a new species of Sclerolinum (Annelida: Siboglinidae) in the South China Sea. *FRONTIERS IN MARINE SCIENCE.* 2022. 8, 793645.

Xu, XH; Liu, CS*; Li, JH*; Miao, YC. Trajectory clustering for SVR-based Time of Arrival estimation. *OCEAN ENGINEERING.* 2022. 259, 111930.

Xu, Z; Dou, SZ; Ding, SX; Liu, JX*. Temporal genetic stability despite decades of overexploitation for large yellow croaker in the East China Sea. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 861840.

Ya, M*; Wu, YL; Wang, XH; Wei, HC. Fine particles and pyrogenic carbon fractions regulate PAH partitioning and burial in a eutrophic shallow lake. *ENVIRONMENTAL POLLUTION.* 2022. 314, 120211.

Ya, ML; Wu, YL; Wang, XH*; Li, YY; Su, GY*. The importance of compound-specific radiocarbon analysis in source identification of polycyclic aromatic hydrocarbons: A critical review. *CRITICAL REVIEWS IN ENVIRONMENTAL SCIENCE AND TECHNOLOGY.* 2022. 52: 937-978.

Yan, LT; Jiang, Y; Xu, Q; Ding, GM; Chen, XY; Liu, M*. Reproductive dynamics of the large yellow croaker *Larimichthys crocea* (Sciaenidae), a commercially important fishery species in China. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 868580.

Yan, MZ; Li, BJ; Wang, JY; Bai, YL; Ke, QZ; Zhou, T; Xu, P*. Disruption of mstn Gene by CRISPR/Cas9 in large yellow croaker (*Larimichthys crocea*). *MARINE BIOTECHNOLOGY.* 2022. 24: 681-689.

Yan, W*; Feng, XJ; Lin, TH; Huang, XY; Xie, L; Wei, SZ; Zhou, K; Chen, YL; Luo, WC; Xu, WQ; Zhang, W; Nawaz, MZ; Luo, YW; Zeng, QL; Zhang, R*; Jiao, NZ*. Diverse subclade differentiation attributed to the ubiquity of *Prochlorococcus* high-light-adapted clade II. *MBIO.* 2022. 13, e03027-21.

Yan, XL; Yang, JYT; Xu, MN; Wang, HJ; Dai, MH; Kao, SJ*. Nitrogen isotope constraint on the zonation of multiple transformations between dissolved and particulate organic nitrogen in the Changjiang plume. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 818, 151678.

Yang, D; Wu, JJ; Yan, LB; Yu, LF; Liu, JC; Yan, CL*. A comparative study of sediment-bound trace elements and iron-bearing minerals in S. *alterniflora* and mudflat regions. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 806, 151220.

Yang, JYT*; Tang, JM; Kang, SJ; Dai, MH; Kao, SJ; Yan, XL; Xu, MN; Du, CJ. Comparison of nitrate isotopes between the South China Sea and western North Pacific Ocean: Insights into biogeochemical signals and water exchange. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS.* 2022. 127, e2021JC018304.

Yang, JYT; Hsu, TC; Tan, EH; Lee, K; Krom, MD; Kang, SJ; Dai, MH; Hsiao, SSY; Yan, XL; Zou, WB; Tian, L; Kao, SJ*. Sedimentary processes dominate nitrous oxide production and emission in the hypoxic zone off the Changjiang River estuary. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 827, 154042.

Yang, W*; Wei, H; Liu, ZY; Li, GX*. Intermittent intense thermocline shear associated with wind-forced near-inertial internal waves in a summer stratified temperate shelf sea. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS.* 2022. 126, e2021JC017576.

Yang, W; Guo, XH; Cao, ZM; Su, JZ; Guo, LG; Wang, LF; Xu, Y; Huang, T; Li, Y; Xu, YP; Wang, Z; Wang, GZ; Dai, MH*. Carbonate dynamics in a tropical coastal system in the South China Sea featuring upwelling, river plumes and submarine groundwater discharge. *SCIENCE CHINA-EARTH SCIENCES.* 2022. DOI: 10.1007/s11430-021-9963-8.

Yang, WF*; Du, JZ*; Guo, LD*. Editorial: Geochemical cycling of ^{210}Po and ^{210}Pb in marine environments. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 852558.

Yang, WF*; Zhao, XF; Chen, M; Qiu, YS; Zheng, MF. Lagrangian observation of 234Th and its application in constraining the sinking of particulate organic carbon on the slope of the northeastern South China Sea. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 831937.

Yang, WF*; Zhao, XF; Zheng, MF. Slow-sinking particulate organic carbon and its attenuation in the mesopelagic water of the South China Sea. *FRONTIERS IN MARINE SCIENCE.* 2022. 9, 1018825.

Yang, Y; Chen, F; Qiao, K; Zhang, H; Chen, HY; Wang, KJ*. Two male-specific antimicrobial peptides SCY2 and scyreprocin as crucial molecules participated in the sperm acrosome reaction of mud crab *Scylla* paramamosain. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES.* 2022. 23, 3373.

Yang, Y; Chen, HY; Hao, H; Wang, KJ*. The anticancer activity conferred by the mud crab antimicrobial peptide scyreprocin through apoptosis and membrane disruption. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES.* 2022. 23, 5500.

Yang, YH; Ma, RJ; Yu, C; Ye, JL; Chen, XW; Wang, L; Jiao, NZ; Zhang, R*. A novel alteromonas phage lineage with a broad host range and small burst size. *MICROBIOLOGY SPECTRUM.* 2022. 10, e0149922.

Yang, ZG*; Liu, BH; Qi, LH; White, PR; Li, JH; Kan, GM; Yu, SQ. Measurement of bistatic sea surface scattering with a parametric acoustic source. *JOURNAL OF THE ACOUSTICAL SOCIETY OF AMERICA.* 2022. 151: 2474-2485.

Yao, Y; Alpert, PA; Zuend, A; Wang, BB*. Does liquid-liquid phase separation impact ice nucleation in mixed polyethylene glycol and ammonium sulfate droplets. *PHYSICAL CHEMISTRY CHEMICAL PHYSICS.* 2022. 25: 80-95.

Yi, XJ; Lu, YL*; He, GZ; Li, HK; Chen, CC; Cui, HT. Global carbon transfer and emissions of aluminum production and consumption. *JOURNAL OF CLEANER PRODUCTION.* 2022. 362, 132513.

Yi, YB; Li, SL*; Zhong, J; Wang, WF; Chen, SA; Bao, HY; He, D. The influence of the deep subtropical reservoir on the karstic riverine carbon cycle and its regulatory factors: Insights from the seasonal and hydrological changes. *WATER RESEARCH.* 2022. 226, 119267.

Yin, MM; Liu, CW; Ge, R; Fang, Y; Wei, J; Chen, X; Chen, QS; Chen, XM*. Paper-supported near-infrared-light-triggered photoelectrochemical platform for monitoring *Escherichia coli* O157:H7 based on silver nanoparticles-sensitized-upconversion nanophosphors. *BIOSENSORS & BIOELECTRONICS.* 2022. 203, 114022.

Yin, MM; Wang, WJ; Wei, J*; Chen, XM*; Chen, QS*; Chen, X; Oyama, M. Novel dual-emissive fluorescent immunoassay for synchronous monitoring of okadaic acid and saxitoxin in shellfish. *FOOD CHEMISTRY.* 2022. 368, 130856.

You, YC; Sun, XQ; Ma, ML; He, JM; Li, L; Porto, FW; Lin, SJ*. Trypsin is a coordinate regulator of N and P nutrients in marine phytoplankton. *NATURE COMMUNICATIONS.* 2022. 13, 4022.

Yu, B*; Wang, XLL; Feng, Y; Chan, R; Compo, GP; Slivinski, LC; Sardeshmukh, PD; Wehner, M; Yang, XY. Northern hemisphere extratropical cyclone activity in the Twentieth Century reanalysis version 3 (20CRv3) and its relationship with continental extreme temperatures. *ATMOSPHERE.* 2022. 13, 1166.

Yu, J; Tian, JY; Gao, G; Xu, R; Lai, JG; Yang, GP*. Growth, DMS and DMSP production in *Emiliania huxleyi* under elevated CO_2 and UV radiation. *ENVIRONMENTAL POLLUTION.* 2022. 294, 118643.

Yu, WC; Gong, SH; Lu, YS; Shen, YW; Liu, JY; Huang, ZK; Luo, X; You, WW*; Ke, CH*. Genome sequence-based genome-wide association study of feed efficiency in Pacific abalone. *AQUACULTURE.* 2022. 561, 738630.

Yu, WC; Liu, JY; Yu, F; Shen, YW; Gong, SH; Lu, YS; Peng, WZ; Wang, Y; Gan, Y; Xiao, QZ; Luo, X; You, WW*; Ke, CH*. Heritability and genetic correlation for residual feed intake of Pacific abalone *Haliotis discus hannai*. *AQUACULTURE.* 2022. 553, 738060.

Yu, WC; Lu, YS; Shen, YW; Liu, JY; Gong, SH; Yu, F; Huang, ZK; Zou, WG; Zhou, MC; Luo, X; You, WW*; Ke, CH*. Exploring the intestinal microbiota and metabolome profiles associated with feed efficiency in Pacific abalone (*Haliotis discus hannai*). *FRONTIERS IN MICROBIOLOGY.* 2022. 13, 852460.

Yu, WC; Shen, YW; Liu, JY; Zou, WG; Huang, ZK; Huang, MQ; Lu, Y; Ke, JW; Luo, X; You, WW*; Ke, CH*. Genotype by environment interactions in feed efficiency of Pacific abalone (*Haliotis discus hannai*) reared at different water temperatures. *AQUACULTURE.* 2022. 562, 738764.

Yu, XL*; Lee, ZP. Scheme to estimate water-leaving albedo from remotely sensed chlorophyll-a concentration. *OPTICS EXPRESS.* 2022. 30: 36176-36189.

Yu, XX; Du, HH; Huang, YH; Yin, XH; Liu, YW; Li, YY; Liu, HT; Wang, XH*. Selective adsorption of antibiotics on aged microplastics originating from mariculture benefits the colonization of opportunistic pathogenic bacteria. *ENVIRONMENTAL POLLUTION.* 2022. 313, 120157.

Yuan, B; Li, HY; Hong, HL; Wang, Q; Tian, Y; Lu, HL; Liu, JC; Lin, LJ; Wu, GR; Yan, CL*. Immobilization of lead(II) and zinc(II) onto glomalin-related soil protein (GRSP): Adsorption properties and interaction mechanisms. *ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY.* 2022. 236, 113489.

Zakem, EJ*; Bayer, B; Qin, W; Santoro, AE; Zhang, Y; Levine, NM. Controls on the relative abundances and rates of nitrifying microorganisms in the ocean. *BIOGEOSCIENCES.* 2022. 19: 5401-5418.

Zeng, JJ; Long, F; Wang, JY; Zhao, J; Ke, QZ; Gong, J; Bai, YL; Deng, YC; Jiang, PX; Qu, A; Tong, BC; Suo, N; Wang, YS; He, Q; Pu, F; Zhou, T; Xu, P*. GWAS reveals heritable individual variations in the inherent swimming performance of juvenile large yellow croaker. *AQUACULTURE.* 2022. 559, 738419.

Zhai, YJ*; Yang, JY; Wan, XQ*; Zou, SJ. The eastern atlantic basin pathway for the export of the North Atlantic deep waters. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 48, e2021GL095615.

Zhang, C; Lai, ZW; Liu, XL; Ye, M; Zhang, LC; Zhang, L; Chen, X*. Voltammetric determination of Pb^{2+} in water using Mn-doped MoS2/MWCNTs/Nafion electrode coupled with an electrochemical flow analysis device. *ELECTROANALYSIS.* 2022. 34: 1638-1643.

Zhang, CY*. Interannual and decadal changes in harmful algal blooms in the coastal waters of Fujian, China. *TOXINS.* 2022. 14, 578.

Zhang, FT; Wen, ZZ; Wang, SL; Tang, WY; Luo, YW; Kranz, SA; Hong, HZ*; Shi, DL*. Phosphate limitation intensifies negative effects of ocean acidification on globally important nitrogen fixing cyanobacterium. *NATURE COMMUNICATIONS.* 2022. 13, 6730.

Zhang, H*; Gu, BW; Zhou, YP; Ma, X; Liu, TQ; Xu, HK; Xie, ZX; Liu, KL; Wang, DZ; Xia, XM*. Multi-omics profiling reveals resource allocation and acclimation strategies to temperature changes in a marine dinoflagellate. *APPLIED AND ENVIRONMENTAL MICROBIOLOGY.* 2022. 88, DOI: 10.1128/aem.01213-22.

Zhang, HY; Zhu, YX; Xu, P; Zhao, ZX; Feng, JX; Wu, BY; Jiang, YL; Dong, CJ; Xu, J*. Multi-omics data reveal amino acids related genes in the common carp *Cyprinus carpio*. *FISHES.* 2022. 7, 225.

Zhang, JH; Zhang, TY; Dong, EQ; Zhang, C; Lin, ZL; Song, ZC; Li, HQ; Fang, NX; Zhang, Y*. Bioinspired hydrogel jellyfish with mechanical flexibility and acoustic transparency. *CELL REPORTS PHYSICAL SCIENCE.* 2022. 3, 101081.

Zhang, JW; Chen, YH; Ren, XY; Patil, V; Sun, L; Li, XS; Liang, JR; Zhang, J; Gao, YH*; Chen, CP*. Distribution of phytoplankton in the East China Sea and the southern Yellow Sea in spring in relation to environmental variables and dimethylsulfide compounds. *ACTA OCEANOLOGICA SINICA.* 2022. 41: 41-53.

Zhang, KDA; Li, JS; Wang, JR; Lin, X; Li, L; You, YC; Wu, XM; Zhou, Z; Lin, SJ*. Functional differentiation and complementation of alkaline phosphatases and choreography of DOP scavenging in a marine diatom. *MOLECULAR ECOLOGY.* 2022. 31: 3389-3399.

Zhang, LB; Chen, MM; Zheng, Y; Wang, JN; Xiao, XL; Chen, XW; Hu, C; Shen, JM; Liu, JH; Tang, K; Xu, DP; Shi, Q; Ning, XY; Thomas, HM; Qin, W; Zhao, MX; Jiao, NZ*; Zhang, Y*. Microbially driven fate of terrigenous particulate organic matter in oceans. *LIMNOLOGY AND OCEANOGRAPHY.* 2022. 68: 148-64.

Zhang, M; Gao, XL; Lyu, MX; Lin, SH; Luo, X; Ke, CH; You, WW*. Behavioral and physiological responses of *Haliotis discus hannai* to different spectral compositions. *AQUACULTURE.* 2022. 555, 738228.

Zhang, M; Gao, XL; Lyu, MX; Lin, SH; Luo, X; You, WW*; Ke, CH. AMPK regulates behavior and physiological plasticity of Haliotis discus hannai under different spectral compositions. *ECOTOXICOLOGY AND ENVIRONMENTAL SAFETY.* 2022. 242, 113873.

Zhang, MR; Rasmussen, KL; Meng, ZY*; Huang, YP. Impacts of coastal terrain on warm-sector heavy-rain-producing MCSs in Southern China. *MONTHLY WEATHER REVIEW.* 2022. 150: 603-624.

Zhang, MR; Yang, XY*; Huang, YP. Impacts of sudden stratospheric warming on extreme cold events in early 2021: An ensemble-based sensitivity analysis. *GEOPHYSICAL RESEARCH LETTERS.* 2022. 49, e2021GL096840.

Zhang, MY; Lin, Y; Booth, AM; Song, XK; Cui, YZ; Xia, B; Gu, ZJ; Li, YF; Liu, FJ; Cai, MG*. Fate, source and mass budget of sedimentary microplastics in the Bohai Sea and the Yellow Sea. *ENVIRONMENTAL POLLUTION.* 2022. 294, 118640.

Zhang, MZ; Krom, MD; Lin, JJ; Cheng, P; Chen, NW*. Effects of a storm on the transformation and export of phosphorus through a subtropical river-turbid estuary continuum revealed by continuous observation. *JOURNAL OF GEOPHYSICAL RESEARCH-BIOGEOSCIENCES.* 2022. 127, e2022JG006786.

Zhang, MZ; Zhou, ZM; Xu, J; Wang, WL; Pu, SH; Hu, WY; Luo, P; Tian, ZQ; Gong, ZB; Liu, GK*. Qualitative analysis of trace quinolone antibiotics by SERS with fine structure dependent sensitivity. *SPECTROCHIMICA ACTA PART A-MOLECULAR AND BIOMOLECULAR SPECTROSCOPY*. 2022. 278, 121365.

Zhang, P; Duan, AM*; Hu, J. Combined effect of the tropical Indian Ocean and tropical North Atlantic Sea surface temperature anomaly on the Tibetan Plateau precipitation anomaly in late summer. *JOURNAL OF CLIMATE.* 2022. 35: 3899-3918.

Zhang, PF; Yongo, E; Feng, H; Pan, S; Sun, AF; Zhou, L; Guo, ZQ; Ke, CH*. Effects of substrate, temperature, salinity, size and transportation on burrowing capacity of juvenile undulated surf clam Paphia undulata. *AQUACULTURE RESEARCH.* 2022. 53: 2796-2805.

Zhang, Q; Luo, YW*. A competitive advantage of middle-sized diatoms from increasing seawater CO_2. *FRONTIERS IN MICROBIOLOGY.* 2022. 13, 838629.

Zhang, S; Jian, X*; Liu, JT; Wang, P; Chang, YP; Zhang, W. Climate-driven drainage reorganization of small mountainous rivers in Taiwan (East Asia) since the last glaciation: The Zhuoshui River example. *PALAEOGEOGRAPHY PALAEOCLIMATOLOGY PALAEOECOLOGY.* 2022. 586, 110759.

Zhang, SF; Wu, Y; Lin, L; Wang, DZ*. Molecular insights into the circadian clock in marine diatoms. *ACTA OCEANOLOGICA SINICA.* 2022. 41: 87-98.

Zhang, SF; Yuan, CJ; Chen, Y; Lin, L; Wang, DZ*. Quantitative proteomics provides insight into the response of the marine dinoflagellate *Prorocentrum donghaiense* to changes in ambient phosphorus. *JOURNAL OF OCEANOLOGY AND LIMNOLOGY.* 2022. 40: 563-576.

Zhang, WY; Wang, Z; Zhuo, SQ*; Gao, YH; Li, XS; Zhang, J; Sun, L; Liang, JR; Chen, CP*. Two new species of *Plagiostriata* (Bacillariophyaceae) from sand sediments of southern China. *PHYTOTAXA.* 2022. 556: 87-93.

Zhang, WY; Zhou, T; Li, JH; Xu, C*. An efficient method for detection and quantitation of underwater gas leakage based on a 300-kHz multibeam sonar. *REMOTE SENSING.* 2022. 14, 4301.

Zhang, YJ; Yu, HZ; Zhang, MR; Yang, YW; Meng, ZY*. Uncertainties and error growth in forecasting the record-breaking rainfall in Zhengzhou, Henan on 19-20 July 2021. *SCIENCE CHINA-EARTH SCIENCES.* 2022. 65: 1903-1920.

Zhang, YL; Leng, ZR; Wu, YM; Jia, H; Yan, CL; Wang, XH; Ren, GQ; Wu, GR; Li, J*. Interaction between nitrogen, phosphorus, and invasive alien plants. *SUSTAINABILITY.* 2022. 14, 746.

Zhang, YM; Zhao, ZH; Liao, EH; Jiang, YW*. ENSO and PDO-related interannual and interdecadal variations in the wintertime sea surface temperature in a typical subtropical strait. *CLIMATE DYNAMICS.* 2022. 59: 3359-3372.

Zhang, YP; Qin, ZC; Li, TT; Zhu, XD*. Carbon dioxide uptake overrides methane emission at the air-water interface of algae-shellfish mariculture ponds: Evidence from eddy covariance observations. *SCIENCE OF THE TOTAL ENVIRONMENT.* 2022. 815, 152867.

Zhang, YR*; De Boer, AM; Lunt, DJ; Hutchinson, DK; Ross, P; Van de Flierdt, T; Sexton, P; Coxall, HK; Steinig, S; Ladant, JB; Zhu, J; Donnadieu, Y; Zhang, ZS; Chan, L; Abe-Ouchi, A; Niezgodzki, I; Lohmann, G; Knorr, G; Poulsen, CJ; Huber, M. Early eocene ocean meridional overturning circulation: The roles of atmospheric forcing and strait geometry. *PALEOCEANOGRAPHY AND PALEOCLIMATOLOGY.* 2022. 37, e2021PA004329.

Zhang, Z; Xu, N; Li, YF*; Li, Y. Sub-continental-scale mapping of tidal wetland composition for East Asia: A novel algorithm integrating satellite tide-level and phenological features. *REMOTE SENSING OF ENVIRONMENT.* 2022. 269, 112799.

Zhang, ZH; Zhao, HS; Mou, SL; Nair, S; Zhao, JL; Jiao, NZ; Zhang, YY*. Phage infection benefits marine diatom *Phaeodactylum tricornutum* by regulating the associated bacterial community. *MICROBIAL ECOLOGY.* 2022. DOI: 10.1007/s00248-022-02045-1.

Zhao, B; Jia, YL; Wu, SJ; Wei, LL; Li, J; Hong, HL; Yan, CL; Williams, MA; Wang, Q*. Preservation of soil organic carbon in coastal wetlands promoted by glomalin-iron-organic carbon ternary system. *LIMNOLOGY AND* OCEANOGRAPHY. 2022. DOI: 10.1002/lno.12238.

Zhao, JL; Jing, HM*; Wang, ZM; Wang, L; Jian, HH; Zhang, R; Xiao, X; Chen, F; Jiao, NAZ; Zhang, YY*. Novel viral communities potentially assisting in carbon, nitrogen, and sulfur metabolism in the upper slope sediments of mariana trench. *MSYSTEMS.* 2022. 7, e01358-21.

Zhao, WL; Cai, MG; Adelman, D; Khairy, M; Lin, Y; Li, ZH; Liu, HJ; Lohmann, R*. Legacy halogenated organic contaminants in urban-influenced waters using passive polyethylene samplers: Emerging evidence of anthropogenic land-use-based sources and ecological risks. *ENVIRONMENTAL POLLUTION.* 2022. 298, 118854.

Zhao, WQ; Bao, HY*; Huang, DK*; Niggemann, J; Dittmar, T; Kao, SJ. Evidence from molecular marker and FT-ICR-MS analyses for the source and transport of dissolved black carbon under variable water discharge of a subtropical Estuary. *BIOGEOCHEMISTRY.* 2022. 162, 43-55.

Zhao, XT; Zhang, H; Zhang, QQ; Qu, ZS; Warren, A; Wu, D; Chen, XR*. A case study of the morphological and molecular variation within a ciliate genus: Taxonomic descriptions of three *dysteria* species (Ciliophora, Cyrtophoria), with the establishment of a new species. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2022. 23, 1764.

Zhao, Y; Jiang, CP; Ju, PL; Xiao, JM; Chen, MR*. Reproductive biology of the Pacific Spadenose Shark *Scoliodon macrorhynchos*, a heavily exploited species in the southern Taiwan Strait. *MARINE AND COASTAL FISHERIES*. 2022. 14, e10216.

Zhao, YZ; Li, YF*. Impact of fisheries footprint on an early warning indicator of resilience reduction in marine net primary productivity. *ICES JOURNAL OF MARINE SCIENCE*. 2022. 79: 2741-2751.

Zhao, YZ; Li, YF*; Wang, XW. The land-sea system dynamics model with shared socioeconomic pathways can identify the gaps in achieving Sustainable Development Goal 14. *RESOURCES, CONSERVATION AND RECYCLING*. 2022. 181, 106257.

Zhao, ZH; Oey, LY; Huang, BQ; Lu, WF; Jiang, YW*. Off-Coast phytoplankton bloom in the Taiwan Strait during the northeasterly monsoon wind relaxation period. *JOURNAL OF GEOPHYSICAL RESEARCH-OCEANS*. 2022. 127, e2022JC018752.

Zhdanov, I; Lokhov, A; Belesov, A; Kozhevnikov, A; Pakhomova, S; Berezina, A; Frolova, N; Kotova, E; Leshchev, A; Wang, XH; Zavialov, P; Yakushev, E*. Assessment of seasonal variability of input of microplastics from the Northern Dvina River to the Arctic Ocean. *MARINE POLLUTION BULLETIN*. 2022. 175, 113370.

Zheng, SC; Meng, FN; Li, DL; Liu, LK; Ge, D; Wang, Q*; Liu, HP*. A deacetylase CqSIRT1 promotes WSSV infection by binding to viral envelope proteins in *Cherax quadricarinatus*. *VIRUSES-BASEL*. 2022. 14, 1733.

Zheng, SL; Li, HQ; Fang, TY; Bo, GY; Yuan, DX; Ma, J*. Towards citizen science. On-site detection of nitrite and ammonium using a smartphone and social media software. *SCIENCE OF THE TOTAL ENVIRONMENT*. 2022. 815, 152613.

Zhou, MZ; Chen, JR; Peng, WZ; Liu, JY; Yu, F; Lin, WH; Xie, QY; You, WW; Ke, CH; Luo, X*. Estimation of genetic parameters for growth relevant traits in adult Pacific abalone (*Haliotis discus hannai*). *AQUACULTURE RESEARCH*. 2022. 53: 5018-5028.

Zhou, Y*; Li, HK*; Guo, WW; Liu, H; Cai, MG. The synergistic effect between biofertility properties and biological activities in vermicomposting: A comparable study of pig manure. *JOURNAL OF ENVIRONMENTAL MANAGEMENT*. 2022. 324, 116280.

Zhu, J; Hu, JY*; Zheng, QA. An overview on water masses in the China seas. *FRONTIERS IN MARINE SCIENCE*. 2022. 9, 972921.

Zhu, JW; Ma, YF; Huang, LF; Zhang, WJ*. Homogeneous selection is not always important in bacterial community in the eutrophic enclosed bay. *ECOLOGICAL PROCESSES*. 2022. 11, 27.

Zhu, KF; Guo, XF; Zhang, ZK*. Reevaluation of the carbon emissions embodied in global value chains based on an inter-country input-output model with multinational enterprises. *APPLIED ENERGY*. 2022. 307, 118220.

Zhu, XW; Chen, FY; Li, S; Peng, H; Wang, KJ*. A novel antimicrobial peptide sparanegtin identified in *Scylla paramamosain* showing antimicrobial activity and immunoprotective role in vitro and vivo. *INTERNATIONAL JOURNAL OF MOLECULAR SCIENCES*. 2022. 23, 15.

Zhu, YL*; Feng, YY; Browning, TJ; Wen, ZZ; Hughes, DJ; Hao, Q; Zhang, RF; Meng, QC; Wells, ML; Jiang, ZB; Dissanayake, PAKN; Priyadarshani, WNC; Shou, L; Zeng, JN; Chai, F. Exploring variability of Trichodesmium photophysiology using multi-excitation wavelength fast repetition rate fluorometry. *FRONTIERS IN MICROBIOLOGY*. 2022. 13, 813573.

Zhu, YN; Wang, B*; Li, JH; Zhang, YW; Xie, FT. Y-shaped net-based signal detection for OFDM-IM systems. *IEEE COMMUNICATIONS LETTERS*. 2022. 26: 2661-2664.

Zhu, YT; Li, JH; Wang, Q*; Yu, CH; Tang, L; Bai, YC. Intrusion detection by optical fiber in windy conditions. *IEICE ELECTRONICS EXPRESS*. 2022. 19, 20220098.

Zhu, Z; Huang, MM; Zhou, ZY; Chen, GX; Zhu, XD*. Stronger conservation promotes mangrove biomass accumulation: Insights from spatially explicit assessments using UAV and Landsat data. *REMOTE SENSING IN ECOLOGY AND CONSERVATION*. 2022. 8: 656-669.

Zhuang, MR; Duan, AM*; Lu, RY; Li, PX; Yao, JL. Relative impacts of the orography and land-sea contrast over the Indochina Peninsula on the Asian summer monsoon between early and late summer. *JOURNAL OF CLIMATE*. 2022. 35: 3037-3055.

Zou, SX; Groeneveld, J; Giosan, L; Steinke, S*. Determining the habitat depth of the planktic foraminifera Dentoglobigerina altispira in the eastern Arabian Sea during the middle Miocene. *MARINE MICROPALEONTOLOGY*. 2022. 170, 102075.

Zou, WG; Ma, YB; Ai, CX; Yu, WC; Gao, XL; Liu, ST; Luo, X; You, WW*; Ke, CH*. Dietary curcumin influence on growth, antioxidant status, immunity, gut flora and resistance to Vibrio harveyi AP37 in Haliotis discus *hannai*. *AQUACULTURE REPORTS*. 2022. 26, 101336.

Zou, XQ; Chen, L; Li, BJ; Xiao, JZ; Xu, P*. The neuropeptide Y receptor gene repository, phylogeny and comparative expression in allotetraploid common carp. *SCIENTIFIC REPORTS*. 2022. 12, 9449.

State Key Laboratory of Marine Environmental Science (Xiamen University)
Zhou Long Quan Building, Xiang'an Campus, Xiang'an South Road, Xiamen 361102, China
Tel: 86-592-2187538 Fax: 86-592-2184101 Email: mel@xmu.edu.cn
Website: http://mel.xmu.edu.cn