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)

20TH
MEL
ANNIVERSARY REVIEW

MEL

20周年纪念册
2005-2025

学汇百川　励行致远

MEL 20TH ANNIVERSARY REVIEW

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实验室简介 About MEL

近海海洋环境科学国家重点实验室(厦门大学)(MEL)于 2005 年 3 月启动建设，2007 年 6 月通过科技部验收，2010、2015 年连续获评优秀国家重点实验室。实验室现有固定科研人员 100 人，技术人员及研究助理 121 人，行政人员 7 人。实验室瞄准全球变化这一国际前沿，面向碳中和、海洋强国、生态文明等国家战略需求，立足基础研究和应用基础研究，以多学科交叉和技术创新为动力，主攻海洋生物地球化学与生态系统动力学。实验室坚持走国际化发展道路，科学研究力求具备全球视野，管理体系参比国际标准，文化建设崇尚自由宽松，努力建设成为具有重要国际影响力的海洋环境科学研究和创新人才聚集基地。

The Laboratory of Marine Environmental Science (MEL) was 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 nationwide 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 focusing 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.

风起鹭岛 微澜成浪 同舟共启双秩之约

岁月匆匆，廿载弹指一挥间。而今回首，2005年的涛声犹在耳畔，这一年《京都议定书》正式生效，中国政府发表《中国的和平发展道路》白皮书，世界正向全球化大步迈进。在诸多历史事件中，近海海洋环境科学国家重点实验室（MEL）的成立仅是其中微不足道的插曲，但风起青萍，竟致微澜成浪。20年风雨兼程，以浩洋为纸、碧海为墨，经受过现实的磨炼，也经受住时光的洗礼，书写了一卷与时偕行、孜矻奋斗的慷慨华章！值此MEL成立20周年之际，吾辈以诚敬之心，回顾勃兴之路，谨此开启MEL双秩庆典序幕。

扬帆济海，华章初现（2005-2010）

“一五”弓开得胜。MEL成立之初即确定了“瞄准国际化、坚持学科交叉创新、主攻海洋生物地球化学、集中发展海洋观测力量”的前进方向，继而喜讯频传，洪华生教授当选国际海洋科学委员会（SCOR）副主席，“海洋生物地球化学过程和机制”团队获批国家自然科学基金委创新研究群体，主持“973”计划项目，“大型仪器与技术服务中心”启动建设等。2010年，MEL获评“优秀”国家重点实验室，为第一个五年画上了圆满的句号。

驭波前行，穿云破雾（2010-2015）

“二五”成长蜕变。在“海洋强国”战略背景下，MEL 发展格局继续扩大。焦念志教授当选中国科学院院士，“头雁”领航带动“雁群”竞飞；厦门海洋环境开放科学大会（XMAS）创立，MEL 开始打造国际交流特色品牌；再获国家自然科学二等奖，创新成果陆续刊登在 Science 等国际一流期刊，MEL 逐渐成为国内外海洋生物地球化学研究重镇。2015 年，MEL 再度获评“优秀”国家重点实验室，顺利进入下一个腾飞的十年。

敢为人先，潮头思变（2015-2020）

“三五”屹立潮头。在“百年未有之大变局”中，MEL挺膺担当，在平台升级、队伍建设、学科发展等方面成果井喷，也不断思考着未来的前进方向。“嘉庚”号科学考察船、东山太古海洋观测与实验站交付启用，立体海洋观测体系初具雏形；戴民汉教授当选中国科学院院士，“海洋氮循环与全球变化”团队获批国家自然科学基金委创新研究群体，彰显MEL人才强基的“高光”；支撑海洋科学和以海洋为特色的生态学入选“双一流”学科建设名单、海洋科学获评A+学科，学科建设走在前列。

奋楫搏浪，潜力无限（2020-2025）

“四五”持续发力。高举“高水平科技自立自强”，MEL始终围绕国家战略和国际前沿，在海洋生物地球化学领域协同攻关重大科技任务。海丝卫星发射成功，福建台湾海峡海洋生态系统国家野外科学观测研究站获批，海-陆-空-天观测体系初步建成；新增国家自然科学基金委“海洋碳汇与生物地球化学过程”基础科学中心、“海洋新陈代谢与元素循环”创新研究群体；领衔“海岸带可持续发展（Coastal-SOS）”和“海洋负排放（ONCE）”国际大科学计划；MEL获“全国教育系统先进集体”荣誉称号，赓续创新文化。2024年，MEL完成重组申报，在成立20周年之际再赴新征程，期待未来无限潜力。

“廿”念不忘，曾经同舟共济，方成千帆竞发、百舸争流之盛景。此刻，特别感谢慷慨无私、燃灯辟路的老一辈海洋环境人，感谢20年来栉风沐雨、勤耕不辍的MEL同仁！正是他们，凝聚了“学汇百川、励行致远”的宏伟室格，结出了原创性、引领性的累累硕果，鼓舞了耕海谋强、向海而歌的无数后浪。诚然，科学之路所以长青，在于一代代后来人相继奔赴科学的洪流；前行之路所以璀璨，在于“青出于蓝胜于蓝”的澎湃抱负。望MEL的新生力量继往开来、砥砺奋进，以青春之热血，镌刻时代之答卷！

楮墨有限，不尽欲言！鉴往知来，我们“紧扣要处”，谋划科技、人才、教育一体化发展；“凸显长处”，攻坚海洋生物地球化学与新兴学科融合发展；“根植深处”，探索体制机制特色发展；“放眼高处”，助力全球海洋环境领域永续发展。关山初度，碧浪洗尘，征程再起，使命在肩，愿再度携手同行，蓄力向新求变、以质求实，为实现高水平海洋科技自立自强，为加快建设海洋强国，为助推人类进一步认识海洋、经略海洋而踔厉奋发、赓续向前！

史大林 主任
近海海洋环境科学国家重点实验室
2025年1月1日

How a Drop Grew From a Ripple to a Wave

A Message from the Director

Time flies, and twenty years pass in the blink of an eye. Yet the ripples that began two decades ago continue to resonate. In 2005, the Kyoto Protocol came into force, and the Chinese government released its white paper, China's Path of Peaceful Development. Amid these significant milestones, the founding of the State Key Laboratory of Marine Environmental Science (MEL) seemed but a small ripple in the vast ocean. But what began as a single drop has since swelled into a mighty wave.

Over the past two decades, we have faced challenges, embraced opportunities, and evolved alongside the times. As we mark MEL's 20th anniversary, I invite you to join us in celebrating not only our achievements but also the journey that has brought us here–one shaped by innovation, perseverance, and a relentless pursuit of excellence. Here's to the growth we have witnessed and to the future we are still building.

IN THE BEGINNING (2005-2010)

From its inception, MEL set its sights on becoming "an international, interdisciplinary hub focused on marine biogeochemical research and dedicated to advancing marine observation." And the achievements began to unfold. Prof. HONG Huasheng was elected a member of the Scientific Committee on Oceanic Research (SCOR), marking a significant milestone for the institution's international recognition. The research initiative "Marine biogeochemistry: Processes and mechanisms" received prestigious support from National Natural Science Foundation of China (NSFC) Science Fund for Creative Research Group. The establishment of the Center of Major Equipment and Technology (COMET) provided vital infrastructure for the growing laboratory. Meanwhile, the "Carbon cycling in China Seas-budget, controls, and ocean acidification (CHOICE-C)" project gained funding from the National Basic Research Program (973 Program), underscoring MEL's role in cutting-edge scientific investigation.

By the end of 2010, MEL had earned the distinction of "Excellent" in the nationwide review of state key laboratories–an outstanding accomplishment that marked the successful conclusion of our first five years.

SECOND ACT(2010-2015)

The following five years marked a period of rapid growth and expansion. Prof JIAO Nianzhi's election to the Chinese Academy of Sciences (CAS) as an Academician served as a beacon of excellence, inspiring his colleagues and elevating MEL's reputation. Driven by a desire to distinguish itself, MEL hosted its inaugural "Xiamen Symposium on Marine Environmental Sciences" (XMAS), establishing itself as a dynamic hub for marine environmental research, both within China and on the global stage.

Our achievements continued to build momentum, with the laboratory receiving the second prize in the National Natural Science Award once more, and several groundbreaking papers published in prestigious journals such as ***Science***. These accolades helped to further cement our standing as a leader in marine science.

In 2015, MEL was once again honored with an "Excellent" ranking during the nationwide review of state key laboratories–an outstanding recognition that marked the successful conclusion of this transformative phase and set the stage for the exciting decade to come.

STEPPING INTO THE LIGHT (2015-2020)

The years leading into the 2020s were marked by profound transformation, a period of change not seen in a century. This wave of change propelled MEL into a leadership role, with remarkable breakthroughs across our facilities, team building, and research. Notable milestones included the launch of the research vessel Tan Kah Kee (RV *TKK*) and the establishment of the Xiamen University Dongshan Swire Marine Station (D-SMART), both of which strengthened our capabilities in marine observation and research.

Prof. DAI Minhan's election to the Chinese Academy of Sciences (CAS) as an Academician was another significant achievement, while the project "Ocean nitrogen cycle under global change" received support from NSFC Science Fund for Creative Research

Group, further enhancing our scientific reach. In recognition of our efforts, Xiamen University's marine science program was designated as a "First-Class Discipline" at the national level and ranked "A+" during the 4th national disciplines review of Chinese universities.

Despite these achievements, MEL never paused in its pursuit of excellence. Rather, we remained focused on the journey ahead, determined to push the boundaries of marine science and pave the way for an even brighter future.

MEL NEVER STOPS (2020-2025)

Over the past five years, MEL has continued to surge to the forefront of academic innovation, aligning closely with national strategies. We have worked in concert with global and domestic partners on major scientific and technological initiatives in marine biogeochemistry, with a steadfast commitment to advancing self-reliance and self-strengthening in science and technology.

A pivotal milestone was the launch of the HiSea Satellites, alongside the development of the National Observation and Research Station for the Taiwan Strait Marine Ecosystem (T-SMART), marking the beginning of MEL's comprehensive, multidimensional marine observation system. In parallel, NSFC approved the establishment of a basic science center for "Marine carbon sequestration and biogeochemical processes," solidifying MEL's leadership in cutting-edge marine research.

MEL's influence on the global stage was further strengthened as the "Coastal-SOS" and "Global-ONCE" initiatives were endorsed as official projects of the United Nations Ocean Decade. Recently, the "Marine metabolism and element cycles" research group was once again supported by the NSFC Science Fund for Creative Research Group, further cementing MEL's standing as a powerhouse in marine science.

Adding to these achievements, MEL was recognized as one of the "Outstanding Groups and Institutions" in the education sector by China's Ministry of Education. As 2024 dawns, marking the beginning of a new decade, MEL has completed a major restructuring and is now poised for an even brighter, limitless future.

At this moment, the faces and moments of the past twenty years unfold before me like a vivid tapestry, each one an essential thread in the fabric of MEL's journey. I am filled with deep gratitude for our devoted, selfless predecessors and the resilient, hardworking colleagues who have made these milestones possible. Without their unwavering dedication, these achievements would not have materialized, nor would we have been able to pursue excellence with the knowledge, integrity, and spirit that continue to inspire the next generation of marine environmental scientists.

It is this "new blood"–even more ambitious, capable, and daring than those before them–that breathes fresh life into our work, keeping the flame of science burning ever brighter. It is their passion and vision that will carry MEL into the future, ensuring that our legacy remains vibrant and full of promise. I trust that the next generation at MEL will build on the foundation laid by those who came before, rising to meet the challenges of our time with courage, ingenuity, and an unwavering commitment to progress.

While these few pages offer but a fleeting glimpse of MEL's past and present, they are enough to illuminate the horizon of our future. MEL has always pursued the harmonious integration of science and technology, talent development, and education, driving interdisciplinary breakthroughs in marine biogeochemistry and emerging fields. We have tirelessly advanced our facilities, fostered collaboration, and made meaningful contributions to the sustainable development of the global marine environment.

The dust and fatigue of any journey may be swept away by time, but the journey itself remains eternal. So too do our aspirations and mission. Let us continue to move forward hand in hand towards the self-reliance and self-improvement of high-level marine science and technology. Together, let us contribute to the building of a maritime power, and deepen humanity's understanding and stewardship of the ocean, ensuring that the path ahead is as vast and boundless as the sea itself.

SHI Dalin, Director

State Key Laboratory of Marine Environmental Science

January 1, 2025

第一章
栉风沐雨，上下求索

CHAPTER 1: HISTORY OF OCEAN SCIENCES AT XMU

1920

厦门大学海洋生物科学研究起步，在《科学》发表文章介绍厦门文昌鱼

Marine biological research began at Xiamen Universty (XMU). Research on *Branchiostoma belcheri* (Gray) was published in *Science*

1946

成立中国第一个海洋学系及第一个海洋研究所（中国海洋研究所）

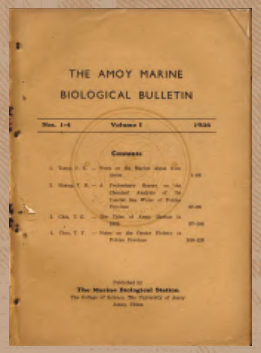
China's first Department of Oceanography and the first Institute of Oceanography (The China Institute of Oceanography) were established

1935

成立厦门海洋生物工作站

次年出版厦门海产生物学集刊

The Marine Biological Station was established and the *Amoy Marine Biological Bulletin* was issued the following year



1982

●成立厦门大学环境科学研究所

The XMU Institute of Environmental Science was founded

●《自然》发表文章介绍中国河流的主要离子化学特征

Research on "Major ion chemistry of some large Chinese rivers" was published in *Nature*

1995

"海洋生态环境开放研究实验室"于 1995 年获国家教委批准建立。1999 年更名为"海洋环境科学教育部重点实验室"，2000 年成立"教育部、福建省海洋环境科学联合重点实验室"，组建海洋与环境学院。

In 1995, the Lab of Marine Environmental and Ecological Sciences was established with sponsorship from the Ministry of Education (MOE). In 1999, it was renamed the Key Laboratory of Marine Environmental Science (MOE). In 2000, the Joint Key Laboratory of Marine Environmental Science of the MOE and Fujian Province was established

1992

厦门大学环境科学研究所扩建成立厦门大学环境科学研究中心

XMU Institute of Environmental Science was merged with several other labs and became the XMU Center of Environmental Science Research

2005

"近海海洋环境科学国家重点实验室(厦门大学)"(MEL)建设论证

Panel Review for the founding of MEL

第二章
披星戴月，廿载蝶变

CHAPTER 2: HIGHLIGHTS OF MEL FROM THE FIRST TWO DECADES

●启动建设“大型仪器与技术服务中心”

The Center of Major Equipment and Technology (COMET) was established

●研究成果“海洋初级生产力结构与微型生物生态过程”获国家自然科学二等奖

Research on “The structure of marine primary productivity and microbial ecology” won the second place of National Natural Science Award

●首次主持“973”计划项目——“中国近海碳收支、调控机理及生态效应研究”

The project “Carbon cycling in China Seas-budget, controls and ocean acidification (CHOICE-C)” was supported by the National Basic Research Program (“973”Program)

2005 扬帆济海，华章初现 2010

●“近海海洋环境科学国家重点实验室（厦门大学）”获科技部批准建设

MEL was promoted to the State Key Laboratory of Marine Environmental Science (Xiamen University), by the Ministry of Science and Technology (MOST)

●“海洋生物地球化学过程和机制”团队获国家自然科学基金“创新研究群体”科学基金资助（2009 年、2012 年获二期、三期资助）

The Group of Excellence “Marine biogeochemistry: Processes and mechanisms” was supported by the NSFC Science Fund for Creative Research Group (renewed in 2009 and 2012)

●MEL 获评为优秀国家重点实验室

MEL was categorized as an excellent state key laboratory during a nationwide review sponsored by MOST

●成立“中国海洋科学卓越教育伙伴计划”

The Center for Ocean Sciences Education Excellence China (COSEE China) was established

●焦念志当选中国科学院院士

JIAO Nianzhi was elected an Academician of the Chinese Academy of Sciences

●《科学》发表有关甲藻基因表达和珊瑚共生分子机制的研究成果

Research on "The *Symbiodinium kawagutii* genome illuminates dinoflagellate gene expression and coral symbiosis" was published in *Science*

●科研成果“微型生物在海洋碳储库及气候变化中的作用”获国家自然科学二等奖”

Research on "The role of microbes in ocean carbon storage and climate change" won the second place of National Natural Science Award

2010 驭波前行，穿云破雾 2015

●创办厦门海洋环境开放科学大会

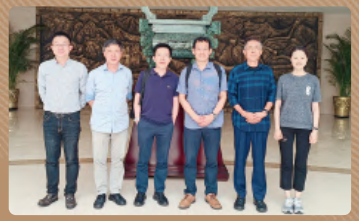
The Xiamen Symposium on Marine Environmental Sciences (XMAS) was initiated

●MEL 再次获评为优秀国家重点实验室

MEL was categorized as an excellent state key laboratory for the second time during a nationwide review sponsored by MOST

●“嘉庚”号科学考察船交付使用

The research vessel Tan Kah Kee (RV *TKK*) was launched



●获批“海洋氮循环与全球变化”国家自然科学基金创新研究群体

The Group of Excellence "Ocean nitrogen cycle under global change" was supported under the NSFC Science Fund for Creative Research Group

●成立70.8海洋媒体实验室

The 70.8 Ocean Media Lab was established

●根据基本科学指标数据库统计，实验室为主支撑的厦门大学“地学”学科进入近十年（2008 年 -2018 年）该领域全球研究机构排名前 1%

Xiamen University ranked among the top 1% highly cited institutions in the ESI field of geoscience from 2008 to 2018

●设立“MEL 海洋环境创新型人才国际合作培养项目”

The MEL Marine and Environmental International Joint Training Program for Innovative Talents was initiated

2015 敢为人先，潮头思变 2020

●厦门大学东山太古海洋观测与实验站落成启用

Xiamen University Dongshan Swire Marine Station (D-SMART) was put into use

●《科学》发表有关海洋酸化抑制束毛藻固氮作用的研究成果

Research on "The complex effects of ocean acidification on the prominent N_2-fixing cyanobacterium *Trichodesmium*" was published in *Science*

●戴民汉当选中国科学院院士

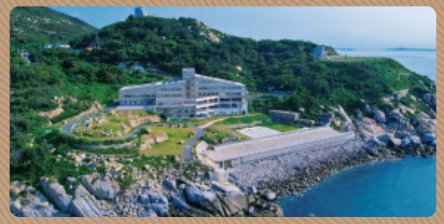
DAI Minhan was elected as an Academician of the Chinese Academy of Sciences

●支撑海洋科学和以海洋为特色的生态学入选“双一流”学科建设名单，海洋科学学科获评为 A+ 学科

Xiamen University's marine science program was listed among the national First-Class Disciplines, and ranked in category "A+" during the 4th national disciplines review among Chinese universities

●“海丝一号”卫星搭载长征八号运载火箭在文昌卫星发射中心发射

The HiSea-1 Satellite is launched from the Wenchang Spacecraft Satellite Launch Center aboard the Long March-8 carrier Rocket



●台湾海峡海洋生态系统野外科学观测研究站入列国家野外科学观测研究站

The Taiwan Strait Marine Ecosystem Research and Observation Field Station was approved by MOST as a national station

●“海洋新陈代谢与元素循环”研究团队获国家自然科学基金创新研究群体项目资助

The Group of Excellence "Marine metabolism and element cycles" was awarded the NSFC Science Fund for Creative Research Group

2020 —— 驰而不息，潜力无限 —— 2025

●“海丝二号”水色小卫星搭载长征二号丁运载火箭在山西太原卫星发射中心成功发射

The HiSea-2 Satellite was launched from the Taiyuan Satellite Launch Center aboard the Long March-2D carrier Rocket

●《自然》发表有关海洋生物碳泵的全球分布格局的研究成果

Research on "Biological carbon pump estimate based on multidecadal hydrographic data" was published in *Nature*

●实验室获教育部“全国教育系统先进集体”荣誉称号

MEL was awarded Outstanding Groups and Institutions in the Education Sector, by the Ministry of Education

第三章
步履铿锵，阔步向前

CHAPTER 3:
MEL IN DEPTH

科学研究
Research

01

建立“大洋主控型边缘海(OceMar)”碳循环框架
Established the carbon cycle framework of Ocean-Dominated Margins (OceMar)

基于在中国海近 20 年的系统观测和研究

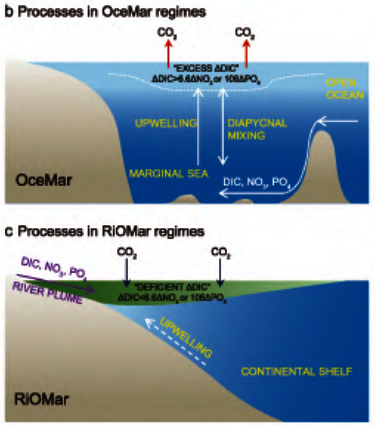
- 构建了迄今最为完整的中国海海 - 气 CO_2 通量产品，揭示东海是 CO_2 强汇，南海是 CO_2 弱源、但主要释放来自太平洋输入的溶解无机碳
- 构建物理 - 生物地球化学耦合诊断新方法，深入解析中国海和世界典型边缘海 CO_2 源汇格局与控制机理，提出了 “大洋主控型”和“河流主控型”碳循环概念框架

显著提升了对边缘海碳循环的机制性理解，为实现“碳中和”提供关键数据和科学支撑

教育部自然科学一等奖 2010; *Sci. Adv* 2022, 2024; *NSR* 2020; *Annu Rev Earth Pl Sc* 2022; *GRL* 2023

Based on nearly 20 years of systematic observations and research in the China Seas

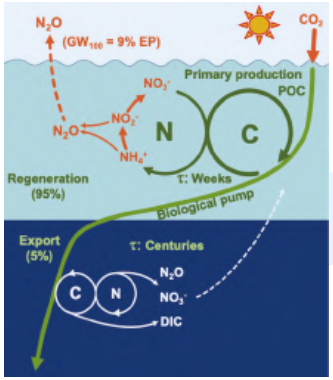
- The most complete sea-air CO_2 flux products in the China Seas have been constructed so far, revealing that the East China Sea is a strong CO_2 sink while the South China Sea is a weak source of CO_2, with the major release coming from dissolved inorganic carbon imported from the Pacific Ocean.
- A new coupled physical-biogeochemical diagnostic method has been developed to deeply analyze CO_2 source-sink patterns and control mechanisms in the China Seas and typical marginal seas around the world; the conceptual frameworks of "OceMar" and "RiOMar" carbon cycles have been proposed.



02

阐明生物泵效率、调控机制及分布格局

Elucidated the efficiency, regulatory mechanisms, and distribution patterns of the biological pump



基于多年现场观测和系统研究

- 提出了真光层“双层结构”（营养盐匮乏层和营养盐充足层）新假说，厘清生物泵固碳储碳的物质基础和时空格局，为诠释寡营养海区的增汇潜力与气候效应提供了新的理论框架
- 深入揭示了碳氮硅等生源要素对生物泵过程的调控，阐明了浮游植物群落结构演替与生物泵效率的协同关系
- 精细刻画碳、氮在生物泵中的生物地球化学新途径以及两者的耦合与分异

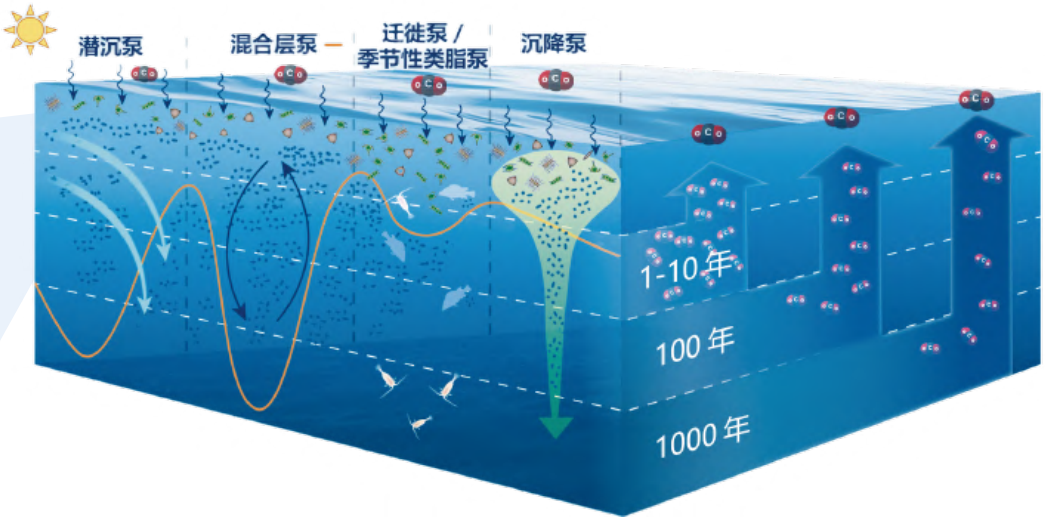
为深入理解与评估生物泵的气候调节能力提供新的视角

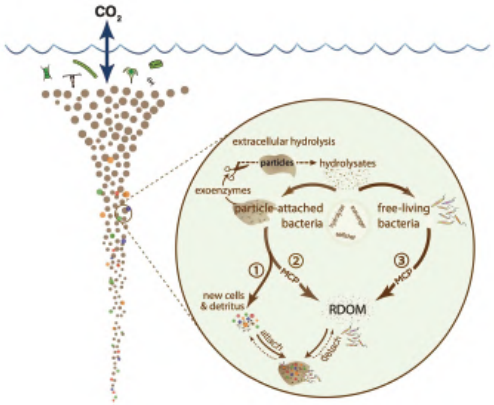
Nature 2023; *Nat Geosci* 2023; *Sci. Adv* 2023; *Nat Clim Change* 2020; *Nat Commun* 2020, 2018, 2015

Providing a new perspective for in-depth understanding and assessment of the climate

regulation ability of the biological pump

- A new hypothesis for the "double-layer structure" (the Nutrient-depleted layer and the Nutrient-replete layer) in the euphotic zone has been proposed, clarifying the material basis and spatio-temporal patterns of carbon sequestration and storage by the biological pump.
- The regulation of the biological pump process by biogenic elements such as carbon, nitrogen, and silicon has been thoroughly revealed, and the synergistic relationship between the succession of phytoplankton community structure and the efficiency of the biological pump has been elucidated.
- The new biogeochemical pathways of carbon and nitrogen in the biological pump as well as their coupling and differentiation have been precisely characterized.





03

提出“微型生物碳泵 (MCP)”储碳原创理论

Proposed the original "Microbial Carbon Pump (MCP)" carbon storage theory

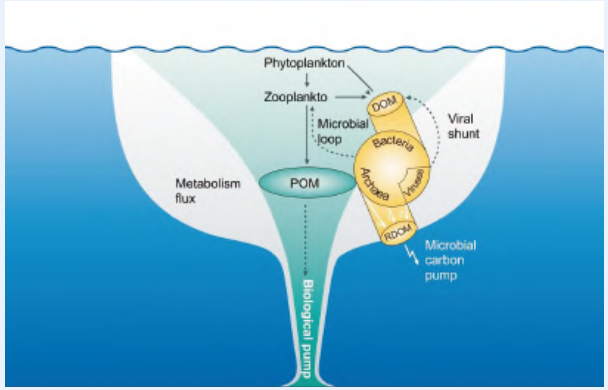
- 提出“微型生物碳泵”（MCP）理论，证实了 MCP 的储碳机制，厘清了国际上关于深海有机碳“惰性说”与“稀释说”之争
- 耦合氮硫过程填补了深海碳汇中的黑暗碳固定一环，耦合动力过程揭示并量化了边缘海侧向输运对深海微生物碳汇的贡献

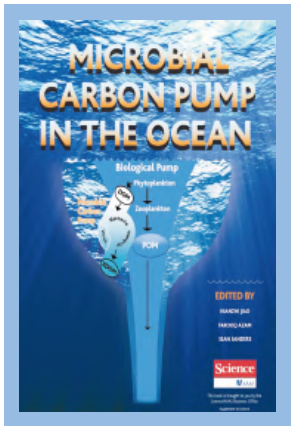
MCP 发表迄今已形成较为系统的理论体系和应用基础，被《科学》杂志评论为“巨大碳库的幕后推手”，应用于指导陆海统筹近海增汇实践，并主要基于该理论领衔“海洋负排放”国际大科学计划

国家自然科学二等奖 2006, 2015; *Science* 2015; *Nat Ecol Evol* 2021; *Sci. Adv* 2021; *NSR* 2018, 2019, 2020; *PNAS* 2020

MCP has formed a relatively systematic theoretical framework and application foundation

- Confirmed the MCP carbon storage mechanism and clarified the debate on the “structural recalcitrance hypothesis” or the “dilution hypothesis” of deep-sea organic carbon.
- Unveiled the mechanisms and flux of dark carbon fixation driven by the nitrogen and sulfur redox processes, bridged the gap in understanding the deep-sea carbon sink, and coupled dynamic and biogeochemical processes to reveal and quantify the impact of lateral transport in marginal seas on the deep-sea microbial carbon sink.



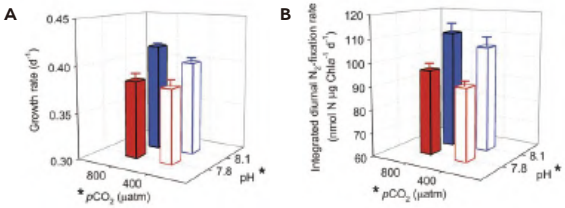


Science magazine said the MCP acted as the “the invisible hand behind a vast carbon reservoir”; it has been applied to guide the practice of increasing carbon sinks in coastal areas; it has led the “Global Ocean Negative Carbon Emission” international mega-science program.

04

揭示全球变化海洋生理生态效应

Revealed the Physiological and Ecological Effects of Global Change on the Marine Ecosystem



通过从基因到生态系统的跨尺度多学科整合研究

- 聚焦海洋酸化、暖化、缺氧、富营养化等全球气候变化和区域人类活动双重胁迫
- 揭示了海洋浮游生物生物量、生产力、群落结构和多样性的时空演变，固碳固氮等关键生物地球化学过程的调控机制，酸化暖化富营养化等环境变化的生理生态效应和气候反馈

显著提升我国全球变化生理生态效应研究的影响力和国际地位，为应对全球变化实施海洋增汇的生态风险评估奠定重要科学基础

教育部自然科学一等奖 2022; *Science* 2015, 2017; *Nat Clim Change* 2012; *NSR* 2018; *Nat Comm* 2015, 2019, 2022; *PNAS* 2018, 2019

05

创新关键生地化参数分析与观探测方法技术

Developed innovative approaches for analyzing and observing/detecting key biogeochemical parameters

Laying an important scientific foundation for ecological risk assessments when implementing oceanic carbon sequestration in response to global change

- Focusing on the dual stressors of global climate change (such as ocean acidification, warming, hypoxia, eutrophication) and regional human activities.
- Revealing the spatio-temporal evolution of the biomass, productivity, community structure, and diversity of marine plankton, the regulatory mechanisms of key biogeochemical processes, as well as the physiological and ecological effects and climate feedbacks of environmental changes.

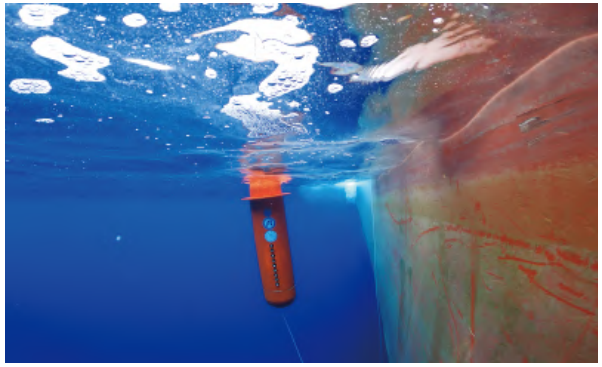
针对海洋监测仪器“卡脖子”问题

- 研制了具有自主知识产权的适用于船载走航、原位在线、快速实时的系列多参数（常量 / 痕量营养元素和碳酸盐体系参数）分析仪和传感器
- 改进了初级生产力的遥感估算模型，统一了真光层深度的光学与生物学定义，建立了紫外辐射遥感估算和垂向衰减模型
- 构建了融合船基观测、原位传感和卫星遥感的多源数据集，研发了高分辨率三维物理 - 生态耦合模式

为实验室的原创高水平科研提供了坚实支撑

Researching and developing key technologies of marine monitoring instruments

- A series of multi-parameter analyzers and sensors have been developed, possessing independent intellectual property rights and applicable for shipboard underway measurement, in situ online monitoring, and rapid real-time detection.



- The remote sensing estimation model for primary productivity has been improved. The optical and biological definitions of the euphotic layer depth have been unified, and remote sensing estimation and vertical attenuation models for ultraviolet radiation have been established.
- A multi-source dataset integrating ship-based observations, *in situ* sensing, and satellite remote sensing has been constructed, and a high-resolution three-dimensional physical-ecological coupling model has been developed.

队伍建设
People

优化结构，建构奋楫逐浪的科研队伍
A Team Ready For Excellence

中国科学院院士
焦念志、戴民汉

Academicians, CAS:
JIAO Nianzhi, DAI Minhan

6人
长江学者
Chang Jiang Scholars

11人
万人计划科技创新领军人才
National Science and Technology Innovation Programs for Leading Scientists

12项
国家杰出青年科学基金
NSFC Distinguished Young Scholars Funds

固定研究人员 Faculty members **100人**
研究员系列 Research scientists **4人**
技术人员 Technicians **33人**
科研助理 Research assistants **88人**
管理人员 Admin staff **7人**

12项
国家优秀青年科学基金
NSFC Excellent Young Scientists Funds

23项
国家级人才项目
National High-level Talents Funds

1
基金委基础科学中心
NSFC Basic Science Center
海洋科学领域首个
First one in marine science

3
基金委创新研究群体
NSFC Creative Research Groups
海洋领域首个连获三期资助
First one received 3 successive terms of funding

2
教育部创新团队
MOE Creative Research Groups

科技部重点领域创新团队
MOST Creative Research Group in Key Fields

人才培养
Education

奖学金及联合培养项目
Fellowships

厦门大学 - 特拉华大学海洋学双博士学位项目
2010 年设立，至今培养 17 名学生。

University of Delaware - Xiamen University Dual PhD Degree Program in Oceanography
Initiated in 2010. 17 students have been enrolled in this joint training.

MEL 杰出博士后基金
2014 年设立，至今支持 44 名博士后开展研究。

MEL Outstanding Postdoctoral Scholarship Program
Launched in 2014. 44 postdoctoral fellows have been supported.

海洋环境科学本科生暑期科研奖学金项目
2014 年设立，至今已开展 10 届，共有来自中国、美国、英国、巴西、新加坡、马来西亚 6 个国家与地区 67 所高校 234 名学生参与。

MEL Summer Undergraduate Research Fellowship Program
Launched in 2014, with a participation of 234 students from 67 universities and institutes in 6 countries and regions such us China, the USA, the UK, Brazil, Singapore and Malaysia.

MEL 优秀博士生基金
2016 年设立，至今共资助 53 名学生。

MEL PhD Fellowship
Launched in 2016. 53 PhD students have been supported.

海洋环境创新型人才国际合作培养项目
2020 年设立，选派联合培养博士研究生、博士后及访问学者赴美国特拉华大学、德国亥姆霍兹基尔海洋研究中心与法国索邦大学滨海自由城海洋学实验室进行联合培养。2022 年获滚动支持。至今共有 23 名师生获批出访。

MEL Marine and Environmental International Joint Training Program for Innovative Talents
Initiated in 2020, supporting PhD candidates, postdoctoral fellows, and faculty members to visit or study at the University of Delaware, GEOMAR Helmholtz Centre for Ocean Research Kiel, and Laboratoire d'Océanographie de Villefranche, Sorbonne University-CNRS. 23 students and faculty members have joined the program.

厦门大学地球科学与技术学部 - 香港大学理学院博士生、博士后联合培养项目

2021 年设立，至今共有 3 名博士生获支持。

XMU MEL - HKU SWIRE Joint Educational Placement for PhD and Joint Post Doctoral Fellowships Program

Launched in 2021. 3 students have been funded.

洪华生海洋与环境科学教育奖

于 2021 年设立，设有前沿交叉研究、优秀科普人才奖教金及奖学金，至今共有 17 人获奖。

HONG Huasheng Marine and Environmental Science and Education Award

Initiated in 2021, awarding faculty and students for outstanding interdisciplinary research, education and outreach performance. 17 students and faculty have been awarded.

学术实践活动
Academic and Practical Activities

水环境科学研究高校联盟研讨会

2008 年与香港大学太古海洋研究所的研究生共同发起成立，后吸引台湾海洋大学、台湾中山大学加入，由研究生自主举办年度研讨会，至今已举办 16 届。

University Consortium on Aquatic Sciences Symposium (UCAS)

Established by graduate students from MEL and the Swire Institution of Marine Sciences of The University of Hong Kong in 2008. The symposium is organized annually and has attracted Taiwan Ocean University and Taiwan Sun Yat-sen University to join as permanent committee members later. So far, 16 symposia have been held.

系列研究生暑期学校

2008 年起与香港城市大学联合举办，后台湾海洋大学、北京大学加入合作，至今共举办 6 次。

Joint Summer Schools

MEL and City University of Hong Kong, and joined by Taiwan Ocean University and Peking University later, have co-organized several graduate summer courses/schools since 2008. Up to now, 6 sessions have been held.

第 6 届“表层海洋 - 低层大气研究”国际研究生暑期学校

于 2013 年主办。

The 6th SOLAS Summer School

Hosted in 2013.

MEL 研究生学术论坛

2016 年由 MEL 研究生自主发起、组织，至今已举办 8 届。

MEL Graduate Forum

Initiated in 2016 and annually organized by MEL graduate students. 8 sessions have been held so far.

厦门大学“海丝学堂”本科生实习航次

自 2018 年起，已依托“嘉庚”号执行了五届，近 400 名本科生通过该项目获得海上科考机会。

XMU @ Sea Undergraduate Training Cruise

Since 2018, 5 cruises have been launched aboard the RV *TKK*, involving nearly 400 students.

海洋痕量元素与同位素生物地球化学国际讲习班

2018 年主办。

Training Workshop on Metal Speciation and Isotopes in the Ocean for GEOTRACES and beyond

Hosted in 2018.

首届全球海洋氧气网络国际研究生暑期学校

于 2019 年承办。

The 1st Global Ocean Oxygen Network Summer School

Hosted in 2019.

学术交流 Exchanges

专项 Programs

2004 设立“凌峰论坛”

Initiated the “Lingfeng Forum”

2007 海洋生物地球化学”创新引智计划(简称 “111”计划)获得教育部、外专局资助(2012 年获二期资助,2019 年获 2.0 项目支持)

The international collaborative project “Marine Biogeochemistry and Ecotoxicology” was funded through the Program of Introducing Talents of Discipline to Universities (known as the “111” Program) (renewed in 2012 and 2019)

2009 设立“访问学者与开放课题”基金

获批科技部国际科技合作基地,基地于 2021 年评估优秀

Launched the MEL Visiting Fellowship Program
Awarded the MOST International Science and Technology Cooperation Base, which was categorized as excellent base in 2021

2014 启动“周一午餐交流会”

Commenced the “MEL Luncheon Seminars”

左侧上至右侧上为: MEL“郑重”杰出访问学者台湾中山大学陈镇东教授,杰出访问学者美国石溪大学 Cindy Lee 教授、美国路易斯安那州立大学 Edward A. Laws 教授,“郑重”杰出访问学者崂山实验室蔡文炬教授、中国科学院地球环境研究所安芷生院士,杰出访问学者美国华盛顿大学 James Murray 教授

From top left to top right: MEL “ZHENG Zhong” Distinguished Visiting Fellow Prof. C. T. Arthur Chen (Taiwan Sun Yat-Sen University), Distinguished Visiting Fellow Prof. Cindy Lee (Stony Brook University) and Prof. Edward A. Laws (Louisiana State University), “ZHENG Zhong” Distinguished Visiting Fellow Prof. CAI Wenju (Laoshan Laboratory) and Prof. AN Zhisheng (Institute of Earth Environment, CAS), Distinguished Visiting Fellow Prof. James Murray (University of Washington)

国际科学计划 Featured International Projects

海洋负排放

Global Ocean Negative Carbon Emission (Global ONCE)

由焦念志院士牵头，于 2022 年获批为联合国“海洋科学促进可持续发展十年（2021-2030）（‘海洋十年’）”大科学计划，基于“微型生物碳泵(MCP)”原创理论框架，通过多学科交叉融合，创建综合储碳理论体系(BCMS)。自 2017 年启动以来，Global-ONCE 已吸引了来自全球 33 个国家 79 所科研院校的数百位专家学者参与。

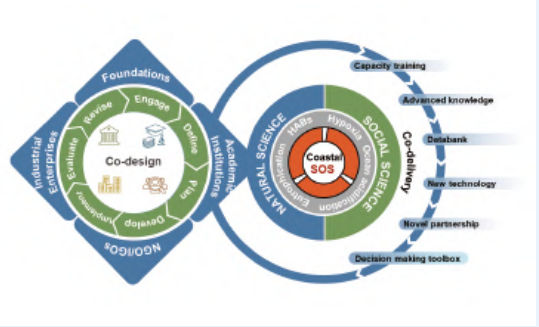
Endorsed by the United Nations Decade of Ocean Science for Sustainable Development (UN Decade) in 2022, Global ONCE, led by Prof. JIAO Nianzhi, is based on his original theoretical framework for the Microbial Carbon Pump (MCP), aiming to establish a comprehensive carbon storage system and collectively form the BCMS framework. Since 2017, Global-ONCE has attracted participation from hundreds of experts and scholars from 79 research institutions in 33 countries.

融通科学、管理和社会参与：助力海岸带可持续发展

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

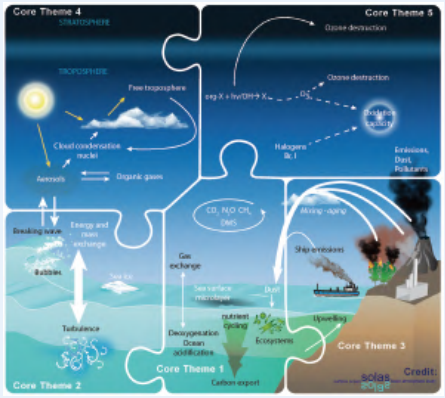
由戴民汉院士领衔，于 2021 年获批为“联合国海洋科学促进可持续发展十年（2021-2030）”倡议计划框架（UN Decade）下的科学项目，拟通过多学科、跨领域、跨区域的合作，科学创新实践及其成果的转化，与各领域伙伴机构促进科学、管理和社会参与的融合，为海岸带的可持续发展提供解决方案。

Endorsed by the UN Decade in 2021, the COASTAL-SOS Project, led by Prof. DAI Minhan, aims to promote the integration of science, management and social participation through multidisciplinary, cross-field and cross-regional cooperation with partners plus scientific innovation practices and transformations, so as to provide solutions for the sustainable development of the coastal zone.



表层海洋-低层大气研究

Surface Ocean-Lower Atmosphere Study (SOLAS)



于 2004 年正式启动，旨在研究海洋与大气间的生物地球化学与物理过程和机理，揭示海洋 - 大气圈层相互作用对气候和环境变化的影响和反馈。SOLAS 区域办公室(2017)和国际计划办公室(2021-)先后落户于 MEL。戴民汉院士于 2021 年 -2023 年担任 SOLAS 国际科学指导委员会共同主席。

Formally launched in 2004, 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 Regional Office (2017) and International Project Office (IPO)-China (2021) are hosted by MEL. Prof. DAI Minhan served as a Co-Chair of the SOLAS Scientific Steering Committee from 2021 to 2023.

会议 Conferences

01

02

03

04

05

01 微量元素和同位素海洋生物地球化学循环计划(GEOTRACES)区域研讨会
02 上层海洋——底层大气研究计划(SOLAS)国际开放科学大会
03 厦 - 港海洋环境研究学术研讨会
04 厦门海洋环境开放科学大会
05 美国与中国近海可持续性动态生态系统服务研讨会

2005

承办“微量元素和同位素海洋生物地球化学循环计划(GEOTRACES)区域研讨会”

Hosted a Regional GEOTRACES Workshop

2007

承办第三届“上层海洋——底层大气研究计划（SOLAS）国际开放科学大会”

Hosted the 3rd SOLAS Open Science Conference

2008

主办“厦 - 港海洋环境研究学术研讨会”

Co-organized the Joint MMS Workshop on Marine Environmental Research

承办“第十届河口生物地球化学国际研讨会”

Hosted the 10th International Estuarine Biogeochemistry Symposium-Estuaries in a Changing World

2009

主办国际海洋科学委员会(SCOR)“海洋微型生物碳泵”科学工作组第一次会议

Organized the 1st meeting of SCOR Working Group 134 "Microbial Carbon Pump in the Ocean"

2011

承办“微量元素和同位素海洋生物地球化学循环计划”科学指导委员会委员及数据管理委员会会议

Hosted the GEOTRACES Scientific Steering Committee Meeting and Data Management Committee Meeting

主办“气候变迁与海洋碳循环——观测、遥感与数值模拟国际研讨会”

Organized the Climate Change and Ocean Carbon-Field Observation, Remote Sensing and Modeling-A Joint International Workshop of OCCOS and CHOICE-C

2012

与美国特拉华大学联合举办“美国与中国近海可持续性动态生态系统服务研讨会”

Co-hosted the Sustaining Dynamic Ecosystem Services in the Coastal Oceans Workshop between the USA and China with the University of Delaware

主办“第九届海峡两岸海洋科学研讨会”

Organized the 9th Cross-Strait Marine Science Conference

2013

承办第六届“表层海洋-低层大气研究”国际研究生暑期学校

Hosted the 6th SOLAS Summer School

2014

创办“厦门海洋环境开放科学大会”，至今共举办七届

Initiated the Xiamen Symposium on Marine Environmental Sciences (XMAS) in 2014 and has organized 7 symposia so far.

承办第 126 期双清论坛——“国家自然科学基金共享航次计划回顾与展望”

Hosted the 126th Shuangqing Forum in 2014 on NSFC Ship-time Sharing Program

承办“第二届海底观测科学大会”

Organized the 2nd Sea Floor Observation Symposium

2015

承办“海洋酸化研究最佳实践培训班”

Hosted the OA-ICC Training Course on Best Practices in Ocean Acidification Research

2016

举办“戈登研究论坛”海洋生物地球化学与碳汇分论坛，焦念志为论坛的首创发起人及第一次会议主席

Held the Gordon Research Conference on Ocean Biogeochemistry, chaired by Prof. JIAO Nianzhi

主办国际海洋科学委员会“海洋放射性研究”工作组第二次会议及海洋放射化学国际讲习班

Hosted the 2nd WG workshop of SCOR Working Group 146, and the International Training Workshop on Marine Radiochemistry

2017

举办“首届雁栖湖会议国际论坛”，焦念志院士发起并担任主席

Held the 1st Yan-Qi Lake International Conference, convened and chaired by Prof. JIAO Nianzhi

主办“第 17 届中国水色遥感大会”

Hosted the 17th China Ocean Color Remote Sensing Conference

2018

组织召开“海洋生源要素循环过程与效应”国际研讨会

Convened the International Workshop on Processes and Effects of Biogenic Element Cycling in the Ocean

2019

承办“第六届国际硝化及相关微生物过程大会”

Organized the 6th International Conference on Nitrification and Related Processes

主办 “全球变化下的海洋新陈代谢与营养盐循环” 国际研究计划中国策划研讨会

Hosted BioGeoSCAPES China Planning Workshop

2020

联合主办“第四届青年动力论坛”

Co-hosted the 4th Young Scientist Forum on Ocean Dynamics

召集第 255 期双清论坛——“海岸带 - 近海多界面跨圈层相互作用与可持续健康海洋”

Convened the 255th Shuangqing Forum, NSFC on "Coastal Zones under Intensifying Human Activities and Changing Climate: A reginal Programme Integrating Sciences, Management and Society to Support Ocean Sustainability"

2021

召集第 279 期双清论坛——“面向国家碳中和的重大基础科学问题与对策”

Covened the 279th Shuangqing Forum of NSFC on "Major Fundamental Scientific Issues and Countermeasures on National Carbon Neutralization"

承办“第 32 次鼓岭科学会议”

Hosted the 32nd Guling Science Conference

主办“第八届生物 - 有机地球化学研讨会”

Organized the 8th Symposium on Bio-Organic Geochemistry

主办“首届离岸碳捕集、利用与封存论坛”

Hosted the 1st Offshore Carbon Capture, Utilization and Storage Forum

2022

主办“第八届镭 - 氡国际研讨会”

Organized the 8th International Ra-Rn Workshop

主办“首届大西洋翻转环流与气候变率研讨会”

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

2023

共同承办“第二届数字孪生海洋国际峰会”

Hosted the 2nd International Digital Twins of the Ocean (DITTO) Summit 2023

2024

承办“第九届青年地学论坛”

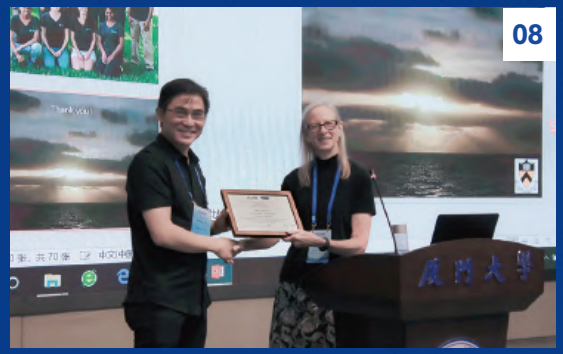
Hosted 9th Young Scientist Forum of Earth Science

承办 “海洋观测和生物地球化学模式协同作用范围界定” 研讨会

Hosted the Scoping Workshop on Synergy of Ocean Observations and Biogeochemical Models

06

07



08

09

10

06 “戈登研究论坛”海洋生物地球化学与碳汇分论坛

07 国际海洋科学委员会“海洋放射性研究”工作组第二次会议及海洋放射化学国际讲习班

08 第六届国际硝化及相关微生物过程大会

09 第二届数字孪生海洋国际峰会

10 第九届青年地学论坛

合作伙伴 Partners

GEOMAR

mio Mediterranean Institute of Oceanography

LOV

Universidade Vigo

UNIVERSITÀ POLITECNICA DELLE MARCHE

HOKKAIDO UNIVERSITY

IMER

UNIVERSITY OF MALAYA

Northeastern University Marine Science Center

1865 THE UNIVERSITY OF MAINE

SAN DIEGO STATE UNIVERSITY

Stony Brook University School of Marine and Atmospheric Sciences

UNIVERSITY OF DELAWARE EARTH, OCEAN & ENVIRONMENT

DALHOUSIE UNIVERSITY

RCEG

NATIONAL TAIWAN OCEAN UNIVERSITY

State Key Laboratory in Marine Pollution SKLMP

THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

香港浸會大學 HONG KONG BAPTIST UNIVERSITY

ZHEJIANG UNIVERSITY

中国科学院沈阳自动化研究所 SHENYANG INSTITUTE OF AUTOMATION, CHINESE ACADEMY OF SCIENCES

UNIVERSITY OF DELAWARE

CAMPUS DO MAR KNOWLEDGE IN DEPTH

CityU 香港城市大學 City University of Hong Kong

OCEAN OBSERVATORIES INITIATIVE

UPMC SORBONNE UNIVERSITÉS

Aix*Marseille université Initiative d'excellence

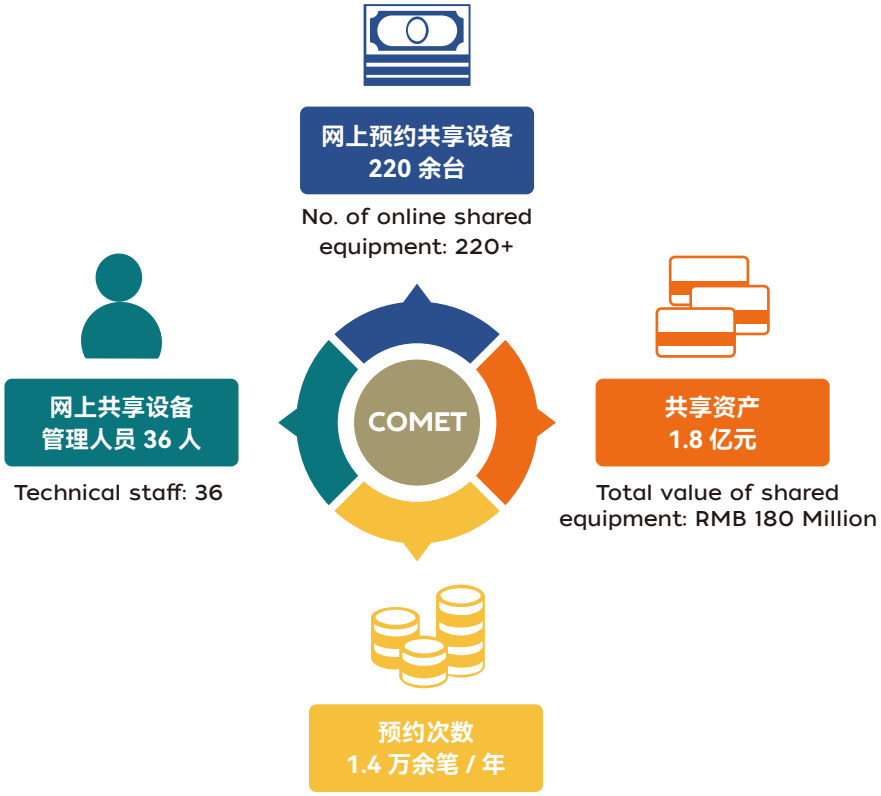
IPGP Sciences pour la planète

PML Plymouth Marine Laboratory

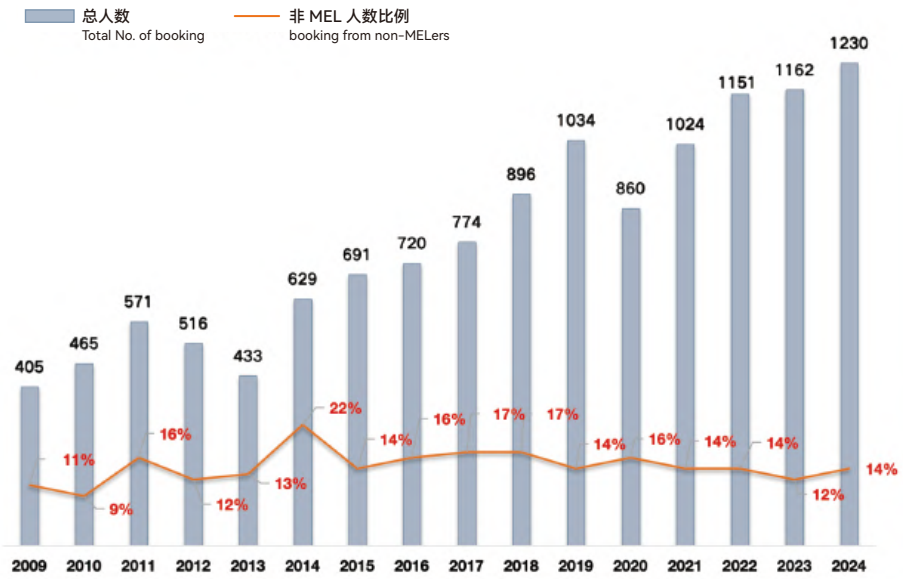
平台建设
Facilities

大型仪器与技术服务中心 COMET

2008 年成立“大型仪器与技术服务中心(COMET)”。
Established “Center of Major Equipment and Technology (COMET)” in 2008.



2009-2025 年 COMET 仪器预约共享情况
2009-2025 Effectiveness of COMET



2009-2024 年COMET仪器预约系统使用人数
Users of COMET Online Booking System (2009-2024)

“嘉庚”号科考船 RV Tan Kah Kee

59 个
科学考察航次

1700+ 天
累计航次作业突破

200,000+ 海里
总航程

截至 2024 年 12 月，“嘉庚”号已顺利执行 59 个科学考察航次，累计航次作业超 1,700 天，总航程突破 200,000 海里，足迹遍及南海、西北太平洋等海域，为超 2,200 名海洋科研工作者提供支持与服务。2020 年，“嘉庚”号启动“嘉庚号海洋大讲堂”项目，邀请国内基础教学名师随船参与海上科考，通过网络直播的形式在科考现场进行授课，迄今已成功举办 4 届。

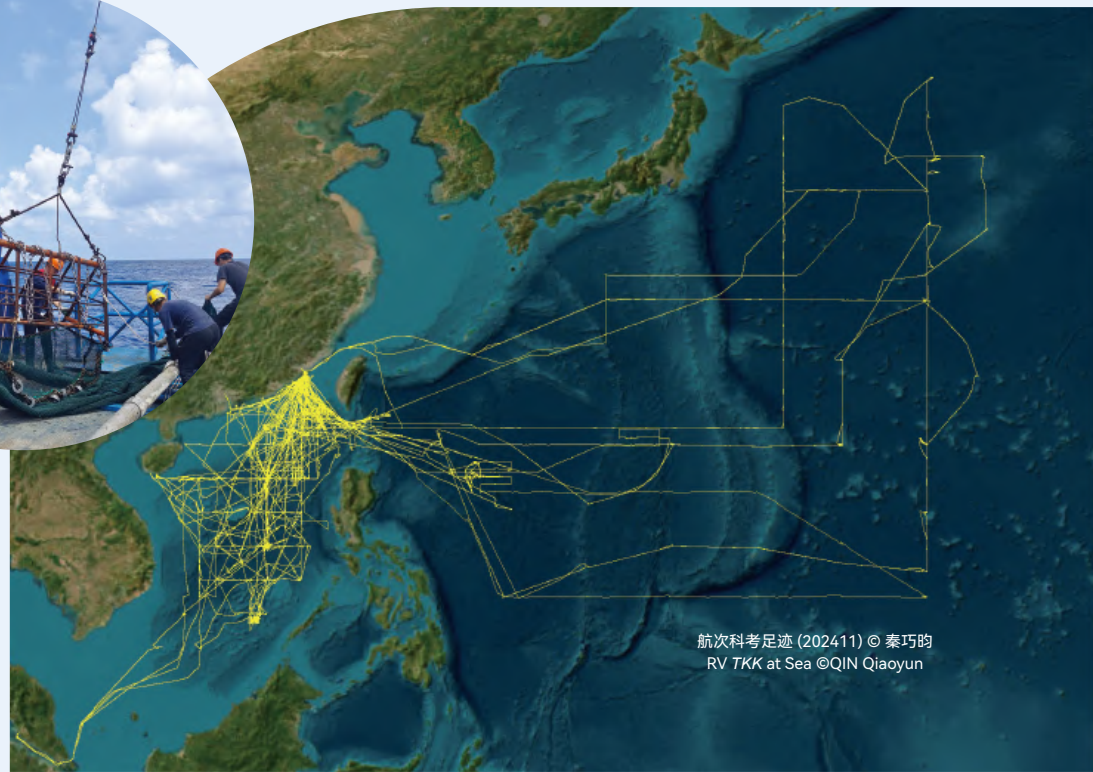
By December 2024, RV *TKK* has sailed 59 expeditions, with over 1,700 days and nearly 200,000 nautical miles, across the South China Sea and the Northwest Pacific Ocean, serving over 2,200 oceanographers from institutions worldwide. In 2020, “Teacher at Sea onboard RV *TKK*” program was launched, offering seagoing opportunities for teachers to participate onboard and providing first-hand ocean science knowledge to K-12 students online. There have been 4 sessions successfully held so far.

2011 启动厦门大学“嘉庚号”科学考察船建设项目。
Initiated XMU’s RV Tan Kah Kee (RV *TKK*) project.

2015 在广船国际有限公司开工建造。
Started the RV construction at Guangzhou Shipyard International Company Limited.

2017 “嘉庚”号科学考察船交付使用。
RV *TKK* was officially delivered and put into service.

航次 KK2002 © 于亚楠
Cruise KK2002 ©YU Yanan



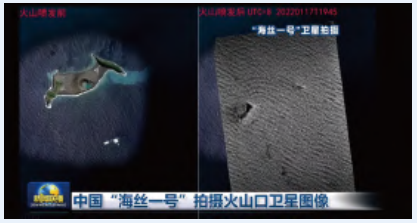
航次科考足迹 (202411) © 秦巧昀
RV *TKK* at Sea ©QIN Qiaoyun

海丝卫星 HiSea Satellites

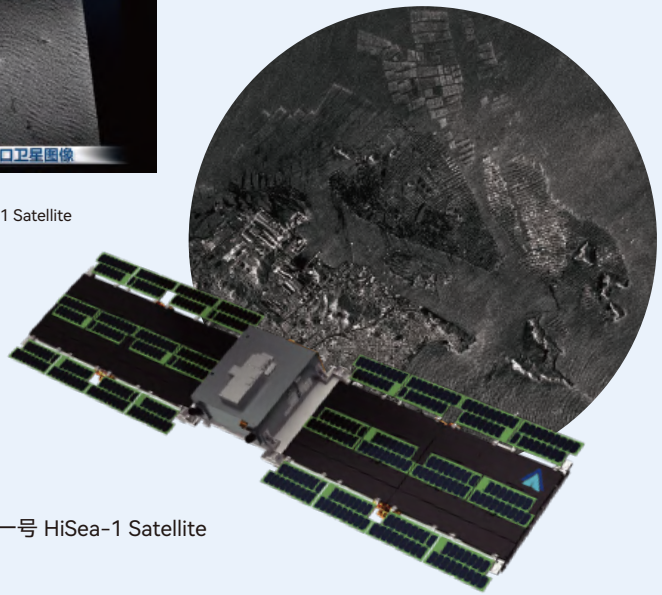
2020

“海丝一号”卫星搭载长征八号运载火箭在海南文昌发射，是国际首颗 C 波段轻小型 SAR 卫星、国内高校首颗近海与海岸带遥感卫星，用于支持全球变化背景下海洋动力环境参数的遥感反演、海洋灾害监测、洪水监测和地表形变分析等。2022 年，“海丝一号”与“海丝二号”卫星接力关注汤加火山喷发对周边海域生态环境的影响，展现了其在应急响应和防灾减灾等方面的应用能力。

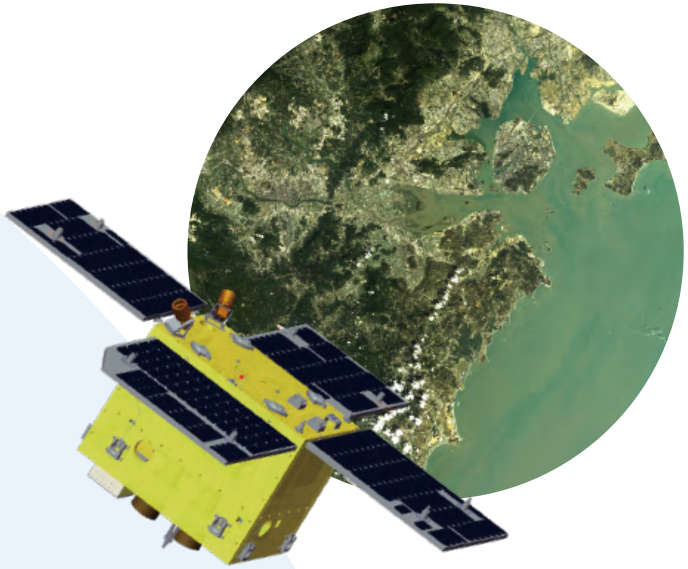
The HiSea-1 Satellite, launched aboard the Long March 8 carrier rocket from Wenchang, Hainan, is the world's first lightweight C-band SAR satellite and the first nearshore and coastal remote sensing satellite developed by domestic universities. It is designed to support remote sensing inversion of ocean dynamic environment parameters under global change, as well as ocean disaster monitoring, flood monitoring, and surface deformation analysis. orbit. In 2022, 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.



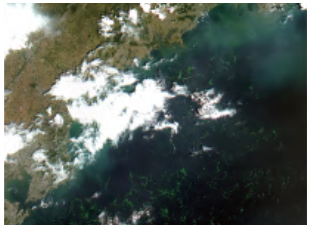
海丝一号拍摄汤加火山口
Crater of Tonga Vocalno by HiSea-1 Satellite



海丝一号 HiSea-1 Satellite



海丝二号 HiSea-2 Satellite



墨西哥湾卡门市附近近海水域
Offshore waters near the city of Carmen in the Gulf of Mexico by HiSea-2 Satellite

黄海大面积浒苔
Seashore moss in the Yellow Sea by HiSea-2 Satellite

2021

“海丝二号” 卫星搭载长征 2 号丁运载在山西太原卫星发射中心发射，是国内高校首颗高分辨多光谱水色小卫星，也是国际首颗以海洋近岸、浅海岛礁地形及内陆水体生态环境为观测目标的大幅宽、高信噪比光学小卫星，获得超过 10 亿平方公里的观测数据，成功捕获到黄海大面积爆发的浒苔(2021)，墨西哥湾卡门市附近近海水域的水质状况(2023)等。

The HiSea-2 Satellite was launched by the Long March 2D rocket from the Taiyuan Satellite Launch Center in Shanxi, China. It is the first high-resolution, multi-spectral ocean-color SmallSat developed and operated by a domestic university and the first wide-swath and high signal-to-noise ratio multiband SmallSat designed spedifically targeting the ecosystm parameters of coastal and inland waters, and bathymetry of shallow islands. The satellite has collected over 1 billion square kilometers of observation data, capturing large-scale outbreaks of Ulva prolifera in the Yellow Sea (2021) and a wide range of water quality conditions in offshore areas near Carmen City of Mexico (2023), etc.

东山实验场(蔡其思摄)
D-SMART © CAI Qisi

福建台湾海峡海洋生态系统国家野外科学观测研究站

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

2017

东山太古海洋观测与实验站 (D-SMART) 一期建成并启用

Dongshan Swire Marine Station (D-SMART) accomplished its first-stage construction and was put into use

2019

东山站联合漳江口红树林湿地生态站获批建设为台湾海峡海洋生态系统教育部野外科学观测研究站(台海站)

D-SMART and the Zhangjiang Estuary Mangrove Observation and Research Station (M-ECORS) were approved as the Observation and Research Station for the Taiwan Strait Marine Ecosystem of the Ministry of Education (T-SMART)

2021

台海站正式获批科技部国家级野外观测研究站

T-SMART is approved as the National Observation and Research station of MOST

福建台湾海峡海洋生态系统国家野外科学观测研究站(以下简称“台海站”)包含东山太古海洋观测与实验站(东山实验场)和漳江口红树林湿地生态站(漳江口实验场)，聚焦台湾海峡海洋生态系长期演变及其驱动机制开展一系列观测、研究、示范、服务等工作，并积极开展海洋科学公众科普教育，推动地区生物资源可持续利用、蓝碳交易、珊瑚与红树林保护修复。

The National Observation and Research Station for the Taiwan Strait Marine Ecosystem (T-SMART) consists of two comprehensive stations, Dongshan Swire Marine Station (D-SMART) and Zhangjiang Estuary Mangrove Wetland Ecosystem Station (M-ECORS). T-SMART has conducted a series of research, observations, demonstration studies and services, focusing on long-term evolution and its driving mechanism of typical ecosystems in the Taiwan Strait. T-SMART plays a significant role in public education in ocean science and the promotion of regional sustainable use of biological resources, blue carbon trade, and restoration of coral and mangroves.

楼宇沿革 MEL's home

2005–2007

凌峰楼

From 2005 to 2007
Lingfeng Building

2007–2013

曾呈奎楼

From 2007 to 2013
ZENG Chengkui Building

2013–

周隆泉楼

Since 2013
ZHOU Longquan Building

公共教育
Outreach

2010

成立“中国海洋科学卓越教育伙伴计划”

Established the Center for Ocean Sciences Education Excellence China (COSEE China)

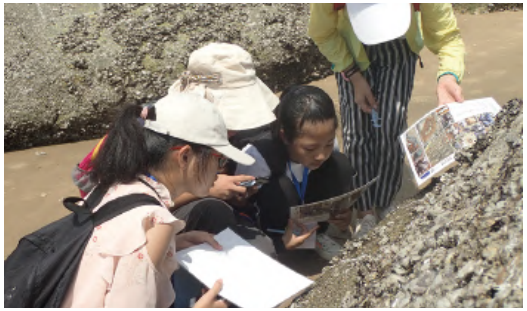
2012

举办首届厦门大学海洋科学开放日，至今已举办 13 届

Organized the 1st Xiamen University Ocean Sciences Day, and has 13 sessions so far

创办水生科学暑期生态营，至今已举办 10 届

Initiated the Aquatic Sciences Eco-Learning Programme, which has 10 sessions so far



2018

与法国塔拉号科考帆船联合举办公众开放活动

Co-organized a series of outreach events with French research schooner TARA

2019

成立 70.8 海洋媒体媒体实验室

Established the 70.8 Ocean Media Lab

Media Lab 海洋媒体实验室

2020-

陆续打造少年蓝色先锋培养计划、海洋讲师团、海洋科普星等科学普及与公众教育品牌活动

Launched a series of public education programs such as the Junior Blue Pioneers Training Program and Ocean Lecturers Program and Outreach Stars, etc.

少年蓝色先锋培养计划
Junior Blue Pioneers Training Program

海洋讲师团
Marine Lecturers Program

第四章
水流有源，点滴在心

CHAPTER 4: MEL IN THEIR EYES

吴立新 WU Lixin

中国科学院院士
崂山国家实验室主任
MEL 学术委员会主任

Academician of CAS
Director of Laoshan Laboratory
Chair of MEL's Academic Committee

廿载同行，MEL应时代之变，以开阔的国际视野，务实的发展定位，强劲的创新实力，交付海洋环境科学发展的高质量答卷。辉煌成就来之不易，面向未来任重道远。二十载青春正当时，望MEL以青春之名，担时代重任，在新科技发展浪潮中再展风华，谱写新章！

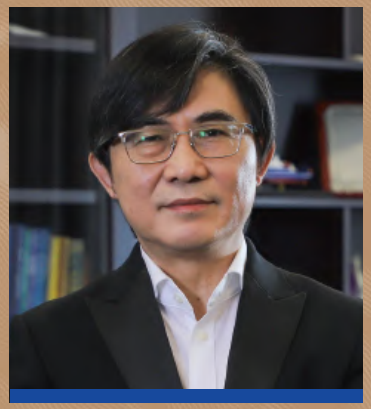
洪华生 HONG Huasheng

厦门大学教授
MEL 名誉主任

Professor of Xiamen University
MEL's Honorary Director

二十載風雨同舟
齊創造今日輝煌
路漫漫其修遠兮
砥礪前行拓新篇

洪華生於鷺島



戴民汉 DAI Minhan

中国科学院院士
厦门大学教授
MEL 名誉主任

Academician of CAS
Professor of Xiamen University
MEL's Honorary Director

廿载逐梦，共赴深蓝！

转瞬之间，MEL 已然走过二十个年头。廿载沐雨经风，华彩日新，成果璀璨，它们是几代 MELers 智慧的结晶、心血的倾注、汗水的凝聚，也是各界朋友热忱支持、众多合作者倾心提携的珍贵收获。

何其有幸，我见证了 MEL 从启动建设，到 2010 年评估荣膺“优秀”的惊艳蝶变，而后渐入国际学术研究前沿之境。MEL 也是本人扎根海洋研究、砥砺成长的沃壤。凡此种种，很大程度得益于科技与海洋发展的时代契机。近二十年，中国科技迅猛发展，海洋科技顺势崛起，立足世界舞台。放眼国际，过去二十年，同样是全球政府与民众携手推进海洋事业的二十年。

2022 年，MEL 迎来全新领导班子。诸多才俊相继加盟，为其注入新鲜血液。他们在 MEL 的舞台上尽情施展才华，奏响开放、包容、开拓的乐章。我们坚信，MEL 的未来将更加美好，共同期待其下一个廿年的辉煌。

MEL的朋友们
MEL'S FRIENDS

蒋国平 Kuo-Ping Chiang

台湾海洋大学教授

Professor of Taiwan Ocean University

个人亲眼目睹MEL草创、成长及茁壮各个时期，2016-2025为MEL重要成长及茁壮期，在此10年间MEL经历由海洋楼迁移到翔安校区及嘉庚号科考船落成等重大划时代进展。经历10年快速成长，过去两次五年复评，由于绩效卓著均被列为优秀国家重点实验室。经过长期耕耘与努力，MEL已经成为国内重要海洋生地化重点研究平台，也为大陆面对世界“2050净零”重要研究机构。在此10年间，个人观察到MEL完成最重要且最困难的工作是“人才培育”及“传承”，此10年间除了大量国外年轻学者投入MEL，更令人兴奋的是非常多MEL培养的学生也开始投入研究工作，同时研究成果斐然，此结果让国内外学者确认MEL为国内海洋教育摇篮。同时许多MEL第二代研究学者，已经站在第一线，承担起MEL未来发展之重责大任。期许当2035年MEL下个10年时，MEL已经由中国海洋研究中心成为世界海洋研究之重镇。

蔡卫君 CAI Wei-jun

美国特拉华大学教授

Professor of University of Delaware, USA

It is a privilege and honor to contribute to MEL's 20th Anniversary Brochure! Reflecting on those early days when MEL was just beginning, I vividly recall the excitement and energy that permeated the air. Professor DAI and his team set an ambitious vision for MEL, benchmarking it against some of the world's leading institutions. It was truly inspiring to witness their determination to achieve such high standards. Every few years, as we revisited these goals, it became evident that MEL was steadily advancing toward its aspirations. Today, MEL stands proudly among the world's premier institutions for marine biogeochemical research–a testament to the dedication and excellence of its team.

From day one, international collaboration has been woven into the very fabric of MEL. This global perspective has undoubtedly played a significant role in its remarkable success. MEL has always been a place where the brightest students and scientists thrive on an international stage, fostering a spirit of innovation and discovery.
As MEL celebrates this incredible milestone, I am confident that it will continue to lead with creativity and excellence, shaping the future of marine science. Here's to an equally inspiring and successful journey over the next 20 years–and beyond!

胡敏 HU Min

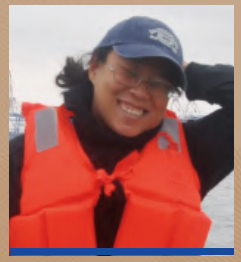
北京大学教授
环境模拟与污染控制国家重点联合实验室主任

Professor of Peking University
Director of State Key Joint Laboratory of
Environmental Simulation and Pollution Control

祝贺MEL喜迎二十周年庆典！二十年风雨兼程，MEL以卓越的科研成就和深厚的学术积淀，引领了我国海洋环境科学研究的蓬勃发展。在这里程碑式的时刻，向MEL全体师生致以最崇高的敬意！相信MEL会再创辉煌，成就非凡！

祝愿厦门大学与北京大学之间的深厚友谊如同海洋般浩渺无垠，代代相传，历久弥新，永远充满生机与活力！

祝福双方的合作如海洋与大气的和谐共生，不断催生新的智慧浪花，为全球气候变化、生态环境保护以及可持续发展贡献卓越力量！



Emily King

中国海洋科学卓越教育伙伴
计划科普顾问

COSEE China Outreach
Program Advisor

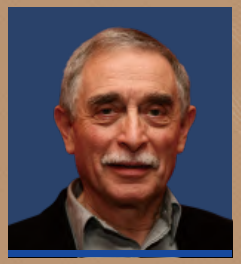
I joined MEL at the end of 2011 as the development coordinator for their newly established outreach platform. Little did I know what that meant at the time - the opportunities it would afford me, the people it would introduce me to, the paths it would lead me down. Looking back, I can honestly say MEL provided an environment like no other, one where I was given the freedom to experiment, try new approaches to outreach, and hone my skills as a science communicator. And not only was I afforded these things but every program implemented under COSEE China was met with support and enthusiasm. Together, we were able to not only genuinely make science for everyone but also create a deeper connection between people and the ocean, for both the public and our own faculty, staff and students. What an amazing experience, one that I will forever be indebted and grateful to MEL for. So, here's to another 20 years and beyond - of groundbreaking research and ocean science education excellence!

Cindy Lee

美国石溪大学荣退教授

Distinguished Professor Emeritus of Stony Brook University, USA

It is indeed an honor to write for the MEL's 20-year commemorative album! As someone who has watched MEL grow since its earliest days on the main XMU campus, I can say that its growth has been phenomenally successful. MEL is recognized world-wide among oceanographic circles as a first-rate institution, particularly in marine biogeochemistry! I made many friends there in the early days, and now some of my former students are MEL professors. It feels like home when I visit. I enjoyed very much teaching a 2-month-long class there for 4 years; the students are exceptional, and I am still in contact with some of them. I fully expect that MEL will continue and increase its upward trajectory!

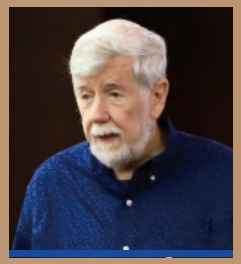


Peter Liss

英国东英吉利大学荣退教授
第二届国际咨询委员会主席

Emeritus Professor of University of East Anglia, UK
Chair of the 2nd International Review Panel

It is a pleasure to write about MEL on its 20th anniversary. Over the last two decades MEL has grown into a leading international centre for marine biogeochemical research. This is due to the work of the devoted staff and distinguished leadership of Academician Professor DAI Minhan. I was privileged to Chair the international Peer Review Group of the Laboratory a few years back and we were able report and comment on the excellence of the research at MEL and its scientific leadership. We found the research was innovative and of world class quality. The staff were individually of high international standing and well able to explain their research to our largely English-speaking group. I wish MEL continuing world leading excellence in their research over the coming years.



Willard Moore

美国南卡罗莱纳大学荣退教授

Distinguished Faculty Emeritus of
University of South Carolina, USA

Congratulations, MEL, on your 20th Anniversary! I consider my time spent at MEL to be among the most productive of my career. Here are a few highlights. From 2009 I have spent many days with MEL scientists along the China coast documenting the quantity and effects of submarine groundwater discharge. In the lab we developed new methods of determining pore water exchange rates and calibrating instruments for measuring radium isotopes. In 2012 I taught Introduction to Oceanography to a select group of freshmen, who rewarded me as being the most attentive and curious students I have ever taught. As a member of the International Advisory Committee for the MEL Marine lab, it has been my privilege to witness the birth and growth of this facility and to see many of the recommendations of the Committee incorporated into its development. Although I have not sailed on the MEL research vessel, RV TKK, I was very impressed to tour its facilities during a port visit. Earlier this year I was an instructor for a training workshop on marine radioactivity at Xiamen University Malaysia, where MEL has a strong presence. Thanks, MEL, for introducing me to so many people and ideas.

朱彤 ZHU Tong

中国科学院院士
北京大学教授
MEL 学术委员会委员

Academician of CAS
Professor of Peking University
Member of MEL's Academic Committee

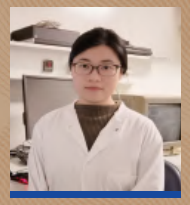
祝贺 MEL 获批建设 20 周年！

很荣幸在 1999 年起就每年参与厦门大学的海洋与环境学术交流，至今已 25 年。与 MEL 的很多成员洪华生老师、焦念志老师和戴民汉老师等建立了深厚的友谊。

作为 MEL 每届的学术委员会委员，我参加了每年的学术委员会，亲身见证实验的发展壮大和优秀人才的迅速成长，深深体会到实验室的活跃的学术氛围、温厚的人文关怀、宽广的国际视野、高质量的管理水平。

祝贺 MEL 百尺竿头更进一步！

毕业生代表
Alumni



徐佳奕 XU Jiayi

第五届UCAS研讨会参会者，现为华东师范大学河口海岸学国家重点实验室副研究员

Participant of the 5th UCAS Symposium, now an Associate Professor of the State Key Laboratory of Estuarine and Coastal Research, East Normal University, China

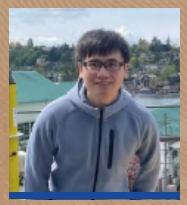
我很庆幸，我最美好的一段青年时代是在厦大海洋度过的。在学期间，各位师长的科学素养和个人魅力是我一直以来景仰和学习的对象。厦大海洋开放热烈的学术氛围极大地开阔了我的眼界，并促成我至今仍在海洋生物学专业不断求索。未来，我将继续以我的老师们为榜样，坚持梦想，勇敢拼搏，同时我也将尽我所能为更年轻的一代海洋人提供帮助。

宋鲁平 SONG Luping

MEL 2020级优秀博士生奖学金获得者，现为浙江海洋大学讲师

Recipient of the MEL PhD Fellowship in 2020, now an lecturer of Zhejiang Ocean University, China

MEL有着奇特的魔力，这里有自由的学术氛围，老师们科研上的专业和生活中的体贴让我深陷其中，这里拓宽了我的视野和认知，更坚定了自己的方向与信心，无时不提醒自己不要浪费每一次和高精仪器共处的时光。



黄毅彬 HUANG Yibin

MEL首届研究生学术论坛组委会成员，现为近海海洋环境科学国家重点实验室副教授

Committe Member of the 1st MEL Graduate Forum, now an Associate Professor of MEL

在MEL的学习生涯中，深刻感受到这片沃土所孕育的自由与活力。在与同学们共同创办MEL研究生学术论坛的过程中，我逐渐明白，学术不仅是孤独的探索，更是并肩的征程。MEL赋予了我们广阔的天空与自由的翅膀，让我们的科研旅程充满灵动与诗意。如今，作为教师回到MEL，我希望将曾经获得的支持与激励传承下去，与同事和学生们一起营造充满活力与无限可能的学术氛围。感恩MEL，愿它未来更加璀璨，为更多逐梦者提供自由翱翔的舞台！

毛舜 MAO Shun

MEL本科生暑期科研奖学金项目2015级学员，现为伍兹霍尔海洋研究所博士后

Participant of the URF Program (2015), now an Postdoctoral Fellow of Woods Hole Oceanographic Institution, USA

时光荏苒，我对URF的记忆犹新。在导师刘志宇教授、白晓林学长的共同指导下，我接触到了科学研究的前沿，对培养科学研究习惯、形成未来职业规划起到了重要的帮助作用；同时，MEL的行政团队（尤其是当时的项目秘书施薇）也为我们在厦门的学习与生活提供了周到的保障。我衷心祝愿MEL迎来更加辉煌的未来！

顾依帆 GU Yifan

MEL本科生暑期科研奖学金项目2019级学员，厦门大学马来西亚分校2021届毕业生，现为美国康涅狄格大学博士研究生

Participant of the MEL URF Program (2019), graduate of Xiamen University Malaysia in 2021, now an PhD Student of University of Connecticut, USA

2019年乘坐嘉庚号来到MEL的场景仍历历在目，从URF项目，到保研厦大，到如今远隔重洋，我依然记得第一次踏进MEL的震撼和惊喜，以及这几年的所有美好与热烈。我学到的不仅是知识和技能，还有严谨治学的科研态度，更有人文关怀的理想主义。海洋历久弥新，而科学的探索永不止息。如果说人生是一个不断追梦的过程，MEL就是我梦开始的地方。

附录 Appendix

附录 1：历届学术委员会
Appendix 1. Academic Committees

第一届学术委员会(2005.3-2009.12)
1st MEL Academic Committee (2005.3-2009.12)

主　任：胡敦欣
副主任：洪华生
委　员：
柴　扉、陈宜瑜、黄荣辉、黄天福、李　立、李永祺、林　海、施　平、苏纪兰、
王　辉、王小如、袁业立、周名江、朱　彤

第二届学术委员会(2010.1-2016.12)
2nd MEL Academic Committee (2010.1-2016.12)

主　任：胡敦欣
副主任：洪华生
委　员：
柴　扉、陈镇东、黄荣辉、黄天福、林群声、宋微波、苏纪兰、唐启升、
王　辉、徐　洵、赵美训、朱　彤、朱永官

第三届学术委员会(2017.1-2024.12)
3rd MEL Academic Committee (2017.1-2024.12)

名誉主任：胡敦欣
主　任：吴立新
副主任：刘丛强、焦念志
委　员：
柴　扉、傅伯杰、郭正堂、翦知湣、林群声、宋微波、唐启升、魏庆琳、
王　凡、王　辉、张　偲、赵美训、朱　彤、朱永官

附录 2：历届国际咨询委员会
Appendix 2. International Review Panel

第一届国际咨询委员会(2005)
1st International Review Panel

成　员：
蔡卫君、柴　扉、陈　荔、陈　峰、胡传民、顾继东、林群声、罗尚德、黄天福

第二届国际咨询委员会(2018)
2nd International Review Panel

主　席：Peter Liss
成　员：Katja Fennel, Catherine Jeandel, James T. Liu, Curtis Suttle

第三届国际咨询委员会(2025)
3rd International Review Panel

主　席：Mark Wells
成　员：Wei-Jun Cai, John Church, Kenneth Mei Yee Leung, Peter Liss, Joanna Steneva, Bess Ward

附录 3：历届领导班子名单
Appendix 3. MEL Leadership

2005.3-2010.12

名誉主任：洪华生
主　任：戴民汉
副主任：焦念志、江云宝、李　炎

2011.1-2021.12

名誉主任：洪华生
主　任：戴民汉
副主任：焦念志、王海黎、林光辉(2011-)、林孟妹(2020-)

2022.1-

名誉主任：洪华生、戴民汉
主　任：史大林
副主任：张　瑶、刘志宇、曹知勉、马　剑、林孟妹

附录 4：历届室务委员会
Appendix 4. MEL Administrative Committees

2005.4-2008.9

洪华生、戴民汉、焦念志、江云宝、李　炎、陈　敏、黄邦钦、王大志、王克坚、王秋泉、王文卿、商少凌、叶　勇、袁东星、张　勇

2008.5-2011.9

洪华生、戴民汉、焦念志、江云宝、李　炎、陈　敏、高坤山、林光辉、黄邦钦、王大志、王克坚、袁东星、张　勇

2011.10-2013.12

洪华生、戴民汉、焦念志、李　炎、高坤山、高树基、黄邦钦、林光辉、林森杰、王大志、王海黎、王克坚、袁东星、张　勇

2014.1-2016.10

戴民汉、焦念志、蔡平河、高坤山、高树基、黄邦钦、林森杰、刘志宇、史大林、王大志、王海黎、王克坚、袁东星、张　锐

2016.11-2021.12

戴民汉、焦念志、蔡平河、高坤山、高树基、黄邦钦、林孟妹、林森杰、刘志宇、史大林、王大志、王海黎、王克坚、张　锐

2022.1-

戴民汉、焦念志、曹知勉、柴　扉、黄邦钦、李骁麟、林孟妹、刘志宇、马　剑、商少凌、沈　渊、史大林、王大志、王克坚、张　瑶

工作委员会

杰出博士后评审委员会
MEL Outstanding Postdoctoral Fellowship Committee

研究生培养委员会
Graduate Education Committee

研究生国际交流项目管理委员会
Graduate International Exchange Program Committee

本科生暑期科研奖学金委员会
Undergraduate Research Fellowship Committee

学术会议组织委员会
Conference Organizing Committee

(地学部)学术行为规范督查委员会
Research Ethics Committee

访问学者与开放课题基金委员会
MEL Visting Fellowship Committee

海洋科学与技术交叉创新研究基金委员会
Marine Science and Technology Interdisciplinary Innovation Fund Committee

大型仪器与技术服务中心委员会
COMET Executive Committee

自主研究课题评审委员会
MEL Internal Research Fund Committee

2005

2006

2007

2008

2009

2010

2011

2012

2013

2014

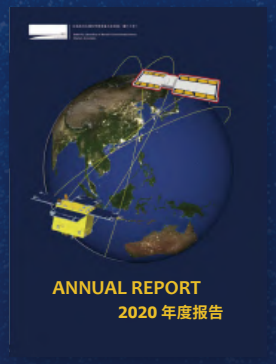
2015

2016

2017

2018

2019



2020

2021

2022

2023

2024

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